TRAFFIC ANALYSIS REPORT FOR

Newcastle Dairy Farmers Corner

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Type: Residential
Status: Prospect
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1. SUMMARY

People flow in Newcastle Dairy Farmers Corner is analyzed. The building has 31 floors and the travel height is 93 meters.
The assumed population is 292 persons.
BUILDING TYPE: **Residential**

1.1. ELEVATOR ANALYSIS

DESIGN CRITERIA

	UP-PEAK	TWO-WAY
Target design criteria	Satisfactory	Satisfactory
Average waiting time	60 s	60 s
Average time to destination	150 s	150 s
Interval	100 s	100 s
Nominal travel time	50 s	50 s
Peak passenger demand	5 % / 5 min	5 % / 5 min

SIMULATION RESULTS

ELEVATOR GROUP : Elevator group 4 GROUP CONTROL: FULL COLLECTIVE CONTROL

No of Elevators 2 | Floors/Stops 2 - 30 / 31 | Load(person) 17 | Speed (m/s) 2 | NTT (s) 46.5 | Population 292 | Car Load Factor(CLF) 80%

TRAFFIC TYPE	DEMAND (% / 5 min)	DEMAND (persons / 5 min)	CLF (% of rated load)	AWT (s)	% of long waits	ATTD (s)	% of long journeys	MEETS THE CRITERIA
Up-peak	5	15	16	38	7	102	7	Yes
Two-way	5	15	13	43	12	95	6	Yes

DISCLAIMER

The results of the report are valid exploring theoretical vertical-traffic planning scenarios which involve KONE products, services, and people flow planning tools. The results of the report are sensitive to the parameter values used and data which is used as input, and are applicable only with the input values shown in the report. Therefore, results should not be interpreted as any kind of representation or warranty of the performance of any actual elevator installation. KONE shall in no event be liable for any damage caused by or incurred in connection with the use of the results. The user shall have no right to make copies of, or reproduce, disassemble, decompile, reverse engineer or modify the results of the report or disclose it to any third party.

2. BUILDING DATA

Assumed population is 292 persons

Floor	Comment	Height (m)	Travel (m)	Population	Entry %
30			93	6	0
29		3.1	89.9	6	0
28		3.1	86.8	6	0
27		3.1	83.7	6	0
26		3.1	80.6	6	0
25		3.1	77.5	6	0
24		3.1	74.4	12	0
23		3.1	71.3	12	0
22		3.1	68.2	12	0
21		3.1	65.1	12	0
20		3.1	62	12	0
19		3.1	58.9	12	0
18		3.1	55.8	12	0
17		3.1	52.7	12	0
16		3.1	49.6	12	0
15		3.1	46.5	12	0
14		3.1	43.4	12	0
13		3.1	40.3	12	0
12		3.1	37.2	12	0
11		3.1	34.1	12	0
10		3.1	31	12	0
9		3.1	27.9	12	0
8		3.1	24.8	12	0
7		3.1	21.7	12	0
6		3.1	18.6	12	0
5		3.1	15.5	6	0
4		3.1	12.4	4	10
3		3.1	9.3	9	10
2		3.1	6.2	9	10
1		3.1	3.1	0	10
0		3.1	0	0	60

3. ELEVATORS

3.1. ELEVATOR PARAMETERS

ELEVATOR GROUP PARAMETERS	
Number of elevators in group	2
Rated speed	2 m/s
Acceleration	0.6 m/s^2
Jerk	0.8 m/s^3
Rated passenger capacity	17 persons

DOOR PARAMETERS	
Type	High duty
Opening	Side
Width	1000 mm
Closing time	4.1 s
Opening time	1.9 s
Two-way transfer times per passenger	2.5 s
Photocell delay	1.2 s
Start delay	0.7 s

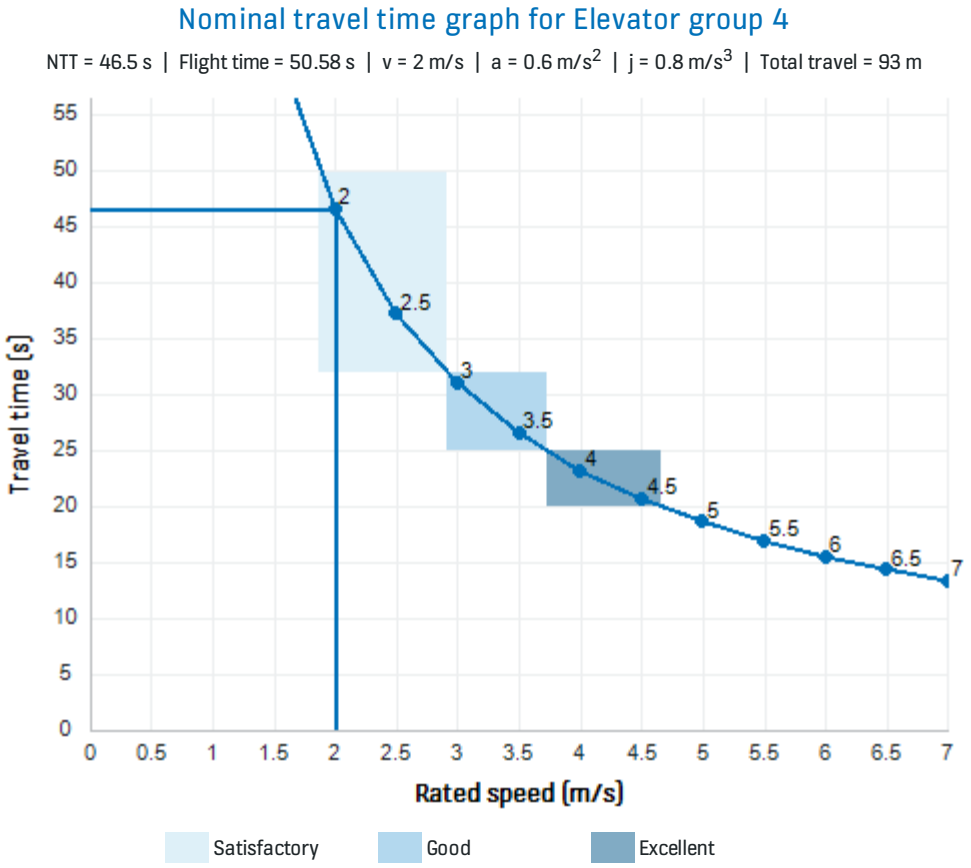
ADVANCE DOOR OPENING	
Distance	0.15 m
Speed	0.3 m/s

3.2. SPEED SELECTION

RECOMMENDED SPEEDS	
Satisfactory	1.9 - 2.9 m/s
Good	2.9 - 3.7 m/s
Excellent	3.7 - 4.6 m/s

RATED SPEED CLASSIFICATION	
Rated speed	2 m/s
Travel height	93 m
Populated floors	2 - 30
Nominal travel time	46.5 s Satisfactory
Minimum flight distance where full speed is reached	8.17 m

NOMINAL TRAVEL TIME GRAPH - FULL COLLECTIVE CONTROL



3.3. ELEVATOR CALCULATION RESULTS

OVERALL CLASSIFICATION	
Target design criteria	KONE - Satisfactory
Overall performance	Satisfactory

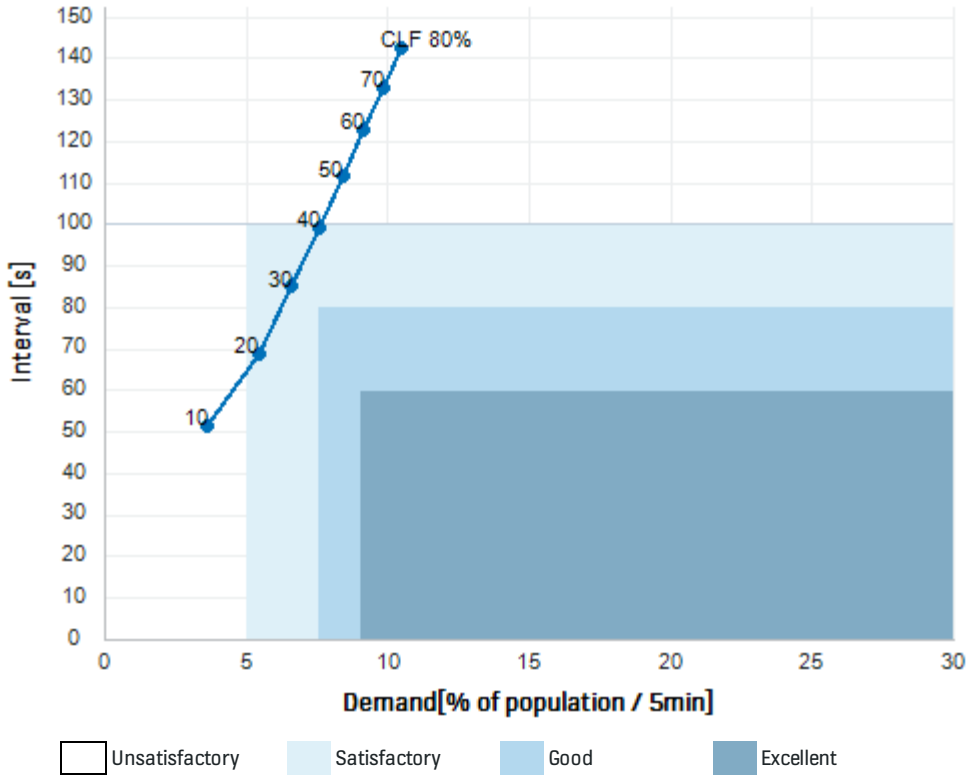
UP-PEAK RESULTS	
Car Load Factor (CLF)	80% (13.6 persons)
Handling Capacity (HC5)	30.7 persons / 5 min
Relative Handling Capacity (%HC5)	10.5 % / 5 min Excellent
Average Round Trip Time	284.9 s
Average Interval	142.4 s- Unsatisfactory

Note: Handling capacity, interval and round trip time are only for Full collective control.

PERFORMANCE GRAPH - FULL COLLECTIVE CONTROL

Performance Graph

Total population 292(persons), | 2 elevators, | 17(persons), | 2 m/s

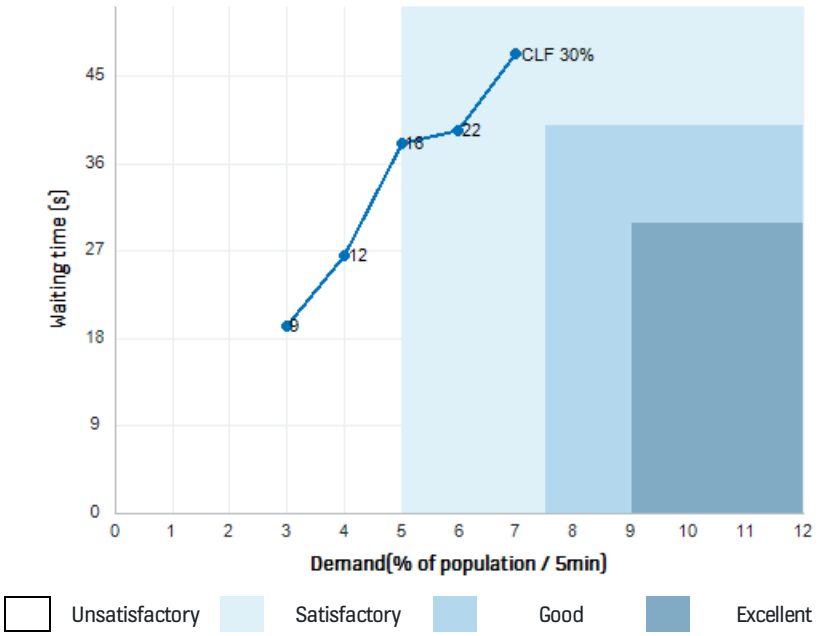


3.4. SIMULATION RESULTS

Simulation settings		
NAME	UP-PEAK	TWO-WAY
Simulation time (h)	2	2
Traffic components (incoming – outgoing - interfloor)	100-0-0	50-50-0
Peak passenger demand (% of pop./ 5 min)	5	5

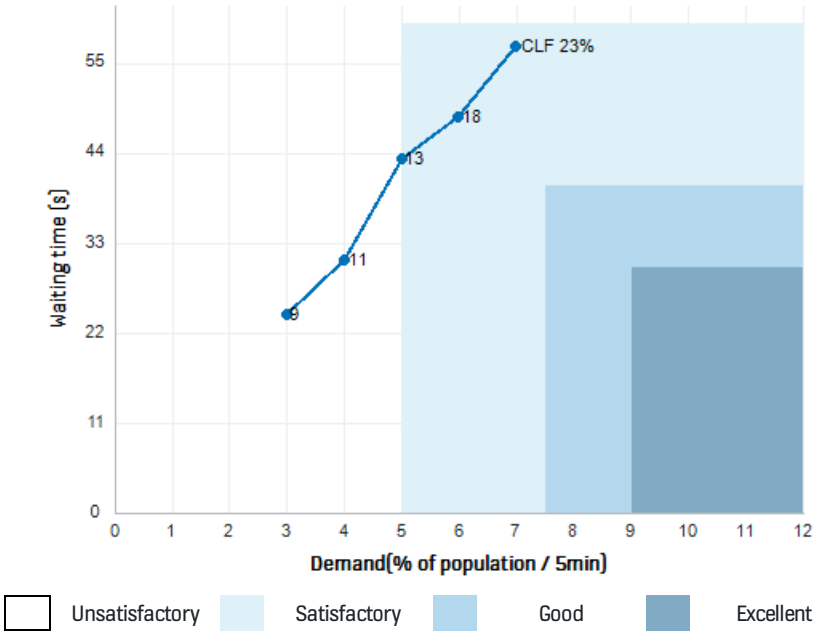
UP-PEAK WAITING TIMES

Elevator group 4



TWO-WAY TRAFFIC WAITING TIME

Elevator group 4

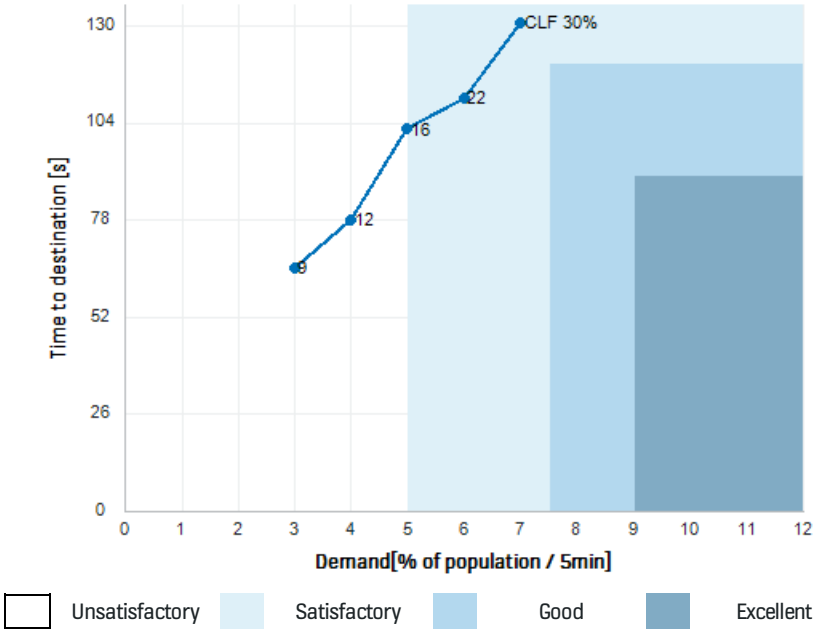


Average waiting times

DEMAND	Elevator group 4		DEMAND	Elevator group 4	
	DEMAND	UP-PEAK		DEMAND	Two-way
[% / 5 min]	persons/5 min	AWT(s)	[% / 5 min]	persons/5 min	AWT(s)
3	9	19.23	3	9	24.28
4	12	26.49	4	12	30.92
5	15	38.04	5	15	43.29
6	18	39.41	6	18	48.39
7	20	47.2	7	20	57.04

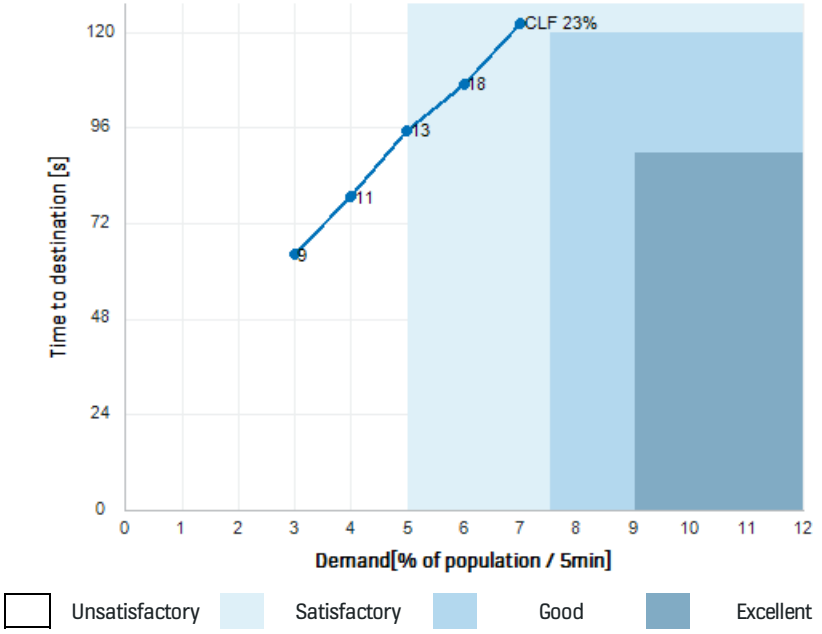
UP-PEAK TIME TO DESTINATION

Elevator group 4



TWO-WAY TRAFFIC TIME TO DESTINATION

Elevator group 4



Average time to destination

DEMAND	Elevator group 4		DEMAND	Elevator group 4	
	DEMAND	UP-PEAK		DEMAND	TWO-WAY
[% / 5 min]	persons/5 min	ATTD(s)	[% / 5 min]	persons/5 min	ATTD(s)
3	9	65.08	3	9	64.07
4	12	77.86	4	12	78.63
5	15	102.18	5	15	95.39
6	18	110.56	6	18	107.05
7	20	130.72	7	20	122.33

4. TERMS

Handling Capacity (HC) is 80% of the theoretical Transportation Capacity considering randomness in passenger arrivals and saturation in queuing.

Transportation Capacity (TC) is the theoretical number of persons per hour the system can transport.

Car Load Factor (CLF) is the maximum load in percent of nominal load reached during elevator round trip.

Utilization Factor (UF) is the actual demand in percent of transportation capacity.

Level of Service (LOS) shows the pedestrian space around, classified to A-F. Level A is spacious, level F is very tight.

Interval shows how often elevators leave the lobby during up-peak.

Nominal travel time (NTT) is obtained by dividing the travel height by the elevator rated speed.

Average waiting time (AWT) is the time from when a passenger either registers a landing call, or joins a queue, until the responding elevator begins to open its doors at the boarding floor.

Average time to destination (ATTD) is the time from when a passenger either registers a landing call or joins a queue until the passenger alights at the destination floor.

Percentage of long waits is the proportion of passengers whose waiting time exceeds 60 seconds.

Percentage of long journeys is the proportion of passengers whose Time to destination exceeds 120 seconds.

Average queue length (AQL) shows the line of people with constant traffic.

Full Collective (FC) control with up and down call buttons at landings and elevator serves the landing calls according to the running direction.

Destination Control System (DCS) with Destination Operation Panels at the landings and people with the same destination calls are allocated in the same cars.

Destination Operation Panel (DOP) is a keypad at a landing where passenger can directly give the destination floor call to the elevator group.

Brake to brake time begins when the elevator car starts to move and ends when the elevator car has stopped after the run.

Door closed to brake closed begins when the door is closed and ends when the elevator car has stopped after the run.

Door closed to beginning of door opening begins when the door is closed and ends when the door starts to open near the end of the run before the car has stopped.

Door to door performance time begins when the door starts to close and ends when the door is 800 mm open after the run.

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Geotechnics / Environment / Groundwater

Integrated Practical Solutions

Remediation Action Plan

Proposed Mixed Use Multi-Storey Development
924 Hunter Street, Newcastle West

Prepared for
Thirdi Dairy Farmers Pty Ltd

Project 102077.02
April 2022

Douglas Partners
Geotechnics / Environment / Groundwater

Document History

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The undersigned, on behalf of Douglas Partners Pty Ltd, confirm that this document and all attached drawings, logs and test results have been checked and reviewed for errors, omissions and inaccuracies.

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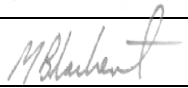
Reviewer		29 April 2022

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Appendix A: About This Report
Appendix B: Laboratory Summary Tables B1 to B7 (DP, 2022)
Appendix C: Drawing 1 – Test Location Plan and Site Features
CKDS – Proposed Development Plans
Positive Survey Solutions (2021) – Survey Plan (Ref 21194_Det_B)

Remediation Action Plan
Proposed Mixed Use Multi-Storey Development
924 Hunter Street, Newcastle West

1. Introduction

This remediation action plan (RAP) was prepared for a proposed mixed use multi-storey development at 924 Hunter Street, Newcastle West. The work was commissioned by Catalyst Consulting on behalf of Thirdi Dairy Farmers Pty Ltd.

The RAP has been developed based on available standards and guidelines prepared by the relevant authorities, the results of the recent *preliminary site investigation (PSI) and preliminary contamination testing* conducted by Douglas Partners Pty Ltd (DP) in 2022 (DP, 2022) for the proposed development.

The previous investigation conducted by DP (2022) identified the following contamination issues:

- The presence of four redundant underground storage tanks (USTs) and associated infrastructure located in the central and southern parts of the site. Whilst hydrocarbon impacts to soil and groundwater were not identified, it was considered that residual hydrocarbon impacts may be present in tank backfill or excavations;
- The presence of friable and/or bonded asbestos containing materials (ACM) within fill at three bore locations and bonded ACM at the surface within a garden bed at one location (S1) which exceeded land use criteria (i.e. no ACM in upper 0.1 m);
- Friable asbestos as asbestos fines (AF) in the fill at Bore 305/0.55 m comprising cement material (< 7 mm in size). The percentage of asbestos fines, being less than 7 mm, exceeded the adopted criterion for industrial / commercial land use based on NEPC (2013);
- Owing to the presence of variable fill at the site to depths ranging between 1.0 m and 2.3 m, the presence of building waste within fill materials across the site and former demolition activities on site it was considered that there is a high risk of hazardous building materials (HBM) and other ACM to be present in fill at unobserved or untested parts of the site.

This RAP has been prepared to describe procedures for the remediation/management of the following:

- UST areas:
  - Decommissioning and removal of remnant fuel infrastructure;
  - Excavation, remediation and/or off-site disposal of residual hydrocarbon-impacted soils (if identified);
  - Treatment of remnant groundwater contamination (if required).
- ACM or potential ACM impacted fill/surface soils:
  - Removal of site fill to a level of RL1.5 (AHD) containing ACM or potential ACM as part of the proposed initial groundworks:
  - Off-site disposal of fill or natural soils to an appropriately licensed landfill or suitable location based on material classification;

- Further detailed investigations at the time of construction to demonstrate the suitability of fill below RL 1.5 or other fill above this level to remain on site (e.g. re-use of fill materials to backfill UST excavations or similar). Assessment would require further sieving of bulk samples and laboratory testing for asbestos fines/friable asbestos to confirm asbestos concentrations and the suitability of materials to remain on-site. Materials deemed unsuitable to remain on site would be appropriately disposed off-site.

The RAP includes an unexpected finds protocol and contingency measures to manage other issues which may arise during the course of remediation and redevelopment works.

The results of previous soil and groundwater analysis conducted by DP with comparison to NEPM 2013 criteria are provided in the summary Tables B1 to B7 in Appendix B from DP (2022).

This RAP details the aims, methods and procedures by which the remediation and site validation will be achieved. It will enable the site to be declared suitable for the proposed mixed use multi-storey development.

This RAP has been prepared with reference to the NSW EPA (2020) *Guidelines for Consultants Reporting on Contamination Sites* and NSW EPA (2017) *Guidelines for the NSW Site Auditor Scheme (3rd Edition)*.

2. Proposed Development

It is understood that the proposed development of the site comprises two main towers of 80 m and 99 m in height. The lower levels will consist of a mixture of carparking and commercial offices. The upper levels are proposed for residential units. No basement is proposed. Conceptual plans of the proposed development are shown in Appendix A.

It is understood that initial ground works will require removal of upper fill materials to allow for construction of an imported engineered fill platform to facilitate drilling of piles. Based on information provided by the client, a proposed excavation level of RL 1.5 (AHD) is proposed which is about 1.5 m to 2.5 m below current site levels. The depth of upper excavation is to be confirmed following further geotechnical assessment.

3. Methods and Objectives of the RAP

The following remediation methods are proposed:

- Decommission and remove USTs and associated infrastructure, remediate residual hydrocarbon impacted soils if present (and groundwater, if required) with subsequent validation to confirm appropriate removal;
- Excavation and off-site disposal of ACM impacted site fill, the bulk of which will be removed during the proposed excavation and off-site removal of fill (some of which contains ACM or potential ACM) to RL1.5. Fill materials below or above RL 1.5 to be retained (if any) will require further detailed assessment to confirm suitability to remain on-site (ie validated).

The above remediation methods will remove impacted fill/soil from the site and remediate localised groundwater impacts (if any) such that long-term management of contamination on the site is not required.

The objective of the RAP is to ensure that the site is remediated in an acceptable manner, with minimal environmental impact, to a condition suitable for proposed mixed use multi-storey development. The objectives of this RAP are therefore to provide a strategy for site remediation which:

- Minimises impacts from the site on the environment and on public health and safety during site remediation;
- Maximises the protection of workers involved with site remediation;
- Renders the site safe for the proposed land use and substantially reduces potential exposure pathways to contaminants;
- Minimises impacts on the local environment during and following site remediation.

The RAP also provides an outline working plan for the excavation, stockpiling, management and disposal of soil and sediment controls and a contingency plan.

The extent of “chase-out” excavation of contaminated soil would necessarily be limited by the proximity of the impact to site boundaries and consideration of adjacent underground services.

Based on the above considerations the remediation excavations will be extended to the extent practicable. If residual contamination is present at the practical limit of excavation, then either; (a) risk assessment would be conducted to assess the actual risk associated with the residual contamination and/or (b) a mitigation and management strategy will be devised to appropriately manage the residual contamination. It is noted that the previous investigation by DP (2022) did not identify gross hydrocarbon impact from known USTs, therefore hydrocarbon impacts (if any) are expected to be localised and not extending beyond site boundaries.

4. Review of Site Information

4.1 Site Description

The site is identified 924 Hunter Street Newcastle West and comprises the following adjacent lots:

- Lot 1 D.P.342675
- Lot 2 D.P.445736
- Lot 1 D.P.1091173
- Lot 1 D.P.395367
- Lot 2 D.P.126
- Lot 1 D.P.456088
- Lot 2 D.P.1091173

The site is an irregular-shaped area of approximately 3950 m^2.

Adjacent sites are as follows:

- North – Tighe Street, then commercial developments (vehicle service centre) and railway line;
- East – Commercial developments (self-storage units and retail);
- West – Railway Street, then mixed-use developments (car dealerships and possible servicing);
- South – Hunter Street / Maitland Road / Tudor Street, then mixed-use developments (car dealership, car hire, general business, church and shop top residential).

The subject lot is shown in Figure 1 and Drawing 1 in Appendix C.

Figure 1: Lot layout (Source: Six Maps)

The site is currently occupied by:

- A car dealership which utilises the western site building and open space areas in the western and central portions of the overall site for vehicle parking/storage etc;
- A fitness / health centre which utilises the eastern building and open space on the eastern portion for vehicle parking.

It is understood that that the site is zoned B3 Commercial Core, which permits a range of land uses with consent, from childcare centres to commercial premises.

A survey plan provided by the client (refer Appendix C) indicates that site levels range from RL 4.2 on the southern boundary and slopes down to about RL 3.4 on the northern boundary.

4.2 Geology and Hydrogeology

Reference to the Newcastle Coalfields Surface Geology Sheet, published by BHP, indicates that the site is underlain by the Quaternary aged alluvium. Based on previous investigations by DP, these alluvial soils are underlain by rocks belonging to the lower parts of the Lambton subgroup of the Newcastle Coal Measures. The Newcastle Coal Measures are of Permian age and typically comprises sandstone, conglomerate, siltstone, claystone, coal and tuff. Information suggests that the site and adjacent sites are not undermined.

Reference to the Newcastle 1:100,000 Soil Landscapes Sheet indicates West the site is located within the Hamilton soil landscape comprising residual soils. This group comprises 'deep' soils (>15cm), well-drained weak Podzols with some 'deep' (>100cm) well-drained Brown Podzolic Soils on fans. Limitations include wind erosion hazard, ground water pollution hazard, strong acidity, non-cohesive soils.

Reference to NSW ASS mapping indicates that the site is mapped as a low probability occurrence of ASS at depths greater than 3 m below the ground surface. An area of high probability occurrence of ASS within 1 to 3 m of ground surface is located near the northern boundary of the site (approx 10 m to 30 m from lot boundary).

Groundwater flows are expected to the north-east towards the Hunter River which is the nearest sensitive receptor. Groundwater was expected at approximately 3 m to 5 m depth based on previous investigations in the area, consistent with site specific investigations discussed below.

5. Previous Investigations

DP has conducted a PSI (DP, 2022) with contamination testing of soils and groundwater in 2021 and 2022. It is noted that the PSI report was updated as Revision 2 following completion of additional field investigations in March 2022 to further assess site conditions. Previous geotechnical investigations were also undertaken by DP in 1995 and 2020 (DP, 1995; 2020) and these were also reviewed as part of DP (2022).

The PSI comprised the following:

- Desktop assessment of published information;
- Review of geotechnical investigations by DP at the site (DP, 1995; 2020);
- Site history assessment, comprising review of historical aerial photos, discussions with previous site occupiers, Council records search, NSW EPA and Safe Work NSW search;
- Drilling of boreholes across the site to target potential contamination sources and provided an overall assessment of site conditions. In total, 22 bores were drilled, including six large diameter boreholes which were subject to field screening/sieving of fill for asbestos;
- Groundwater well installation and sampling of new and existing wells to assess potential groundwater impacts from USTs and upgradient sources; and
- Preparation of a report presenting the results of the investigation.

The results of site history indicated the following:

- Prior to 1930/1940s, site use is unconfirmed. The site comprised a number of smaller lots with various land owners and as such may have been a mix of residential, business or commercial / industrial use. Blacksmith use may have occurred for the central and eastern part of the site (Lot 1-2 D.P. 1091173);
- From 1930s the site included construction of a number of buildings / sheds for commercial milk processing and distribution (i.e. bottling of milk, return of bottles, washing, transport of milk and administration). The facility also extended to the north, outside the current investigation area;
- Details about the use of buildings, furnaces, fuel storage etc during these times are unknown. Aerial photos were often of low resolution to confirm site details;
- Records do not suggest animals were kept on site during dairy production site use;
- WorkCover records indicated that:
    - One 900 L UST was installed in the central area of 924 Hunter Street in about 1936. The tank was approximately near the ~10,000 L UST which remains in place (not identified by the Safe Work search records).
    - Three 7500-10,000 L USTs (two diesel and one leaded petrol) were installed on the southern boundary, located adjacent to Hunter Street in about 1950 associated with the 'Dairy Farmers Corner' (DFC) operations;
- Most site buildings were demolished around mid-1990s with the exception of the south-western corner building still in place (DFC administration building – façade area only) and the eastern site building;
- From about 1995, the site included additions to the original DFC building to form the Regal Motors car dealership showroom, with this building current presently. Internal areas of buildings, including the eastern site building were used as showrooms. Records do not suggest that on site vehicle servicing has occurred, rather this was undertaken for the site to the north of Tighe Street in conjunction with the Regal Motors site operations;
- The ~10,000 L UST on the eastern side of the site may have been installed around 1995 for refuelling of vehicles which was common at the time. Records to confirm UST installation and cessation of use have not been located at this time. The bowser was removed between mid-2018 and mid-2019;
- It is also possible that the known UST located in the north-eastern portion of the site was initially installed around 1994-1995 associated with a former Coach Depot (maintenance and parking), however, site history details have not been conclusive;
- Car sales and showroom operations continued to present, noting that images suggest a period in 2019-2020 where the site was unoccupied/untenanted;
- The eastern part of the site has more recently been tenanted for fitness / health clubs;
- The site is surrounded by industrial and commercial premises and include several service stations, factories (including former Steggles factory), car dealerships and servicing centres, some of which may be upgradient of the site.

A site walkover in October 2021 and subsequent ground penetrating radar (GPR) survey in March 2022 provided the following key observations:

- Current use of the site as a car dealership and fitness businesses (as outlined above);
- One UST in the central/eastern side of the site, with the location of the former bowser near the north-western corner of the eastern building. Fill / dip points were observed and were serviceable). One tank vent pipe was located on the northern side of the building;
- Three other USTs were identified on a WorkCover records search. There were no observations of the USTs or associated infrastructure apparent at the surface. GPR survey indicated that the tanks remain in ground in the southern part of the site. GPR scanning was not undertaken within buildings or garden beds and the presence of parked vehicles precluded a detailed grid based survey of the pavement area. The inferred locations identified by the search and confirmed by the GPR are shown on Drawing 1 in Appendix C.

On the basis of the above, a preliminary conceptual site model (CSM) was prepared with reference to NEPC (2013). The identified potential sources of contamination are summarised as follows:

- S1: Fill (source unknown): Associated with site filling / levelling, fill / waste generated on site.
- S2: Former structures: Associated with site former buildings on the site, demolition, building wastes.
- S3: Possible blacksmiths: Associated with site former buildings on the site, demolition, building wastes.
- S4: UST and associated infrastructure (including pipework, bowser and vent pipes);
- S5: Former commercial / industrial use as DFC (milk processing, bottling), possible furnace, storage of fuels, chemicals, drips/spills, carparking, waste placement;
- S6: Possible storage of oils / automotive goods if servicing was conducted on site:
- S7: Carparking, drips / spills leaks (possible former unsealed carpark areas?):
- S8: Adjacent/upgradient commercial developments to the west and south (car yards, service stations, tram line etc).

It is noted that the initial CSM has not been reproduced from DP (2022), noting that some sources and pathways were confirmed not to be present following site investigations (refer below for further details)

The scope of work for the subsurface investigation comprised a judgemental sampling strategy to target the above sources of potential contamination. It is noted that access was limited by the presence of existing buildings, underground services and access for personal and equipment.

The scope of work for the subsurface investigation was as follows:

- Investigation of soils via:
  - Collection of one fibro material at the surface (S1/F1) and underlying soil (S1/0-0.05 m) for asbestos identification testing;
  - Drilling of seven boreholes (Bores 301 to 307) to depths of 0.5 m to 3.0 m below ground level by hand auger (central and western part of the site);
  - Nine boreholes to a depth of 5 m below ground level using a track mounted drilling rig with continuous push tube as follows:

- Bores 201 to 205 were drilled within the north eastern part of the site near underground fuel infrastructure known at the time of fieldwork. Groundwater monitoring wells were installed in Bores 203 and 204;
- Bores 401 to 403 were drilled within the southern part of the site near underground fuel infrastructure. Groundwater monitoring wells were installed in Bores 401 to 403. Bore 401 was also considered for the assessment of upgradient sources south of Hunter Street;
- Bore 404 was drilled in the north-western part of the site to assess conditions from upgradient sites. A groundwater monitoring well was installed in Bores 404;

  - Drilling of bores using an excavator equipped with a 300 mm diameter auger for field sieving and sampling of upper fill;

- Investigation of groundwater via:
  - Groundwater level gauging of all site wells using an oil-water interface meter;
  - Purging and sampling of groundwater from six new groundwater wells (Bores 203, 204 and 401 to 404) and two existing wells (GW1 and GW3);
  - Inspection of the fill / dip point for the central UST with accessible surface infrastructure;

Locations were based on site history information received at the time, access and the CSM. The rationale is provided in DP (2022). Borehole locations are shown on Drawing 1 in Appendix C.

The key findings of the PSI and subsurface investigation were as follows:

- **Site conditions:**
  - Presence of fill across the site to depths of between 1.0 m and 2.3 m (denoted Unit 1A and 1B). The average fill depth was generally less than 1.5 m, with observations suggesting possible deeper fill areas were associated with UST backfill;
  - Upper fill materials (Unit 1A) comprising sandy gravel fill (subgrade) was also identified beneath pavements to depths of 0.2 m to 0.4 m, however, was not continuous across the site;
  - Upper fill materials were variable based on observations during drilling and the results of testing of selected soils and indicated building materials were present within fill across the site (potential source of HBM including ACM).
- **Soil contamination:**
  - The results of testing indicate the general absence of gross contamination at the test locations and depths assessed based on field observations and laboratory testing of selected soil samples. This included areas downgradient of the USTs no longer in use;
  - Most soil contamination concentrations were within the adopted human health and ecological investigation levels (EIL) / ecological screening levels (ESLs) and site assessment criteria (SAC) for a generic commercial land use (scenario 'D') which is applicable for sites with ground floor parking or commercial use based on NEPC (2013). Minor exceedances were as follows:
    - Exceedance of EIL D at 401/2.0 m (copper) and 506/1.2 m (zinc);
    - Asbestos in soil at Bore 305/0.55 m (bonded and friable ACM), and bonded ACM at the surface at S1.

- The ecological exceedances were not considered to be significant due to the current land use and proposed land use which will result in the majority of the site being paved or with limited access to soil;
- Bonded asbestos was identified in four fibro fragments; one fragment each for filling at Bore 305/0.55 m, 503/1.2-2.0 m, 506/1.0-1.4 m and one at the surface of garden bed material (S1/F). Friable asbestos as asbestos fines (AF) was identified in the fill at Bore 305/0.55 m comprising fibre cement material (< 7 mm in size). The percentage of asbestos fines, being less than 7 mm, exceeded the adopted criterion for industrial / commercial land use based on NEPC (2013). Bonded ACM containing fill at 503/1.2-2.0 m and 506/1.0-1.4 m contained asbestos fines/friable fines concentrations below laboratory reporting limits and therefore within the commercial / industrial land use criteria
- Owing to the presence of fill at the site, the widespread presence of building materials in fill and the historical demolition of former buildings on the site there is a high risk of hazardous building materials (HBM) including asbestos in unobserved or untested parts including UST backfill materials;
- Hydrocarbon impact to soil was not identified within bores near the USTs, noting that bores were necessarily limited by the underground infrastructure and safe set back distances. Residual impacts may be present in the vicinity of underground fuel tank and associated infrastructure (i.e. tank backfill, fuel/service lines). This may include residual impacts to soil and possible localised impacts to groundwater, if present;
- It is noted that there is a potential for additional underground fuel infrastructure on the site and/or former hazardous chemical storage/use on the site.

- **Waste Classification**
  - Preliminary waste classification testing on upper fill materials indicated a General Solid Waste (GSW) (SCC1/TCLP1) classification with reference to NSW EPA (2014a) based on total and leachable contamination concentrations. This classification is based on low leachability results and inferred classification of similar material types (i.e. TCLP testing not undertaken on all samples with elevated results). Due to the observed presence of bonded ACM in upper fill materials, the preliminary classification of upper fill is GSW containing asbestos waste (Special Waste);
  - The classification of underlying natural soils will need to consider ASS conditions as discussed further in DP (2022). Natural soils which are not ASS, could possibly be classified as virgin excavated natural material (VENM) subject to confirmation of contaminant concentrations;
  - Further testing could be undertaken at the time of construction (building and pavement removal) to confirm waste classification prior to disposal of soils from the site which may allow for classification of some materials as GSW only and disposal of some natural (non ASS) soils as VENM. Some materials may also be suitable for classification under a general or specific resource recovery exemption.
- **Acid Sulfate Soils (ASS)**
  - The absence of potential ASS for sands above the groundwater table (i.e. upper 2.6 m and above RL 1);
  - Presence of potential ASS for natural silty clay/clayey sands both above and below the water table (i.e. below about 2.3 m depth and below RL 1.7 AHD for some bores only);

- Presence of potential ASS for natural sand soils below the water table (i.e. below about 2.6 m and RL 1 AHD).
- Bulk excavation of fill to RL 1.5 as proposed for piling platform construction is generally not expected to disturb PASS, with the exception of natural silty clay soils which were locally as shallow as RL 1.26 at Bore 403.
- A site-specific acid sulfate soil management plan (ASSMP) is required for the proposed development.

- **Groundwater**
  - The contaminant concentrations in groundwater were generally low and suggests the absence of significant hydrocarbon impact to groundwater from the USTs and associated infrastructure. The groundwater conditions encountered at the site, are generally consistent with similar nearby sites within the Newcastle central business district which often have slightly elevated heavy metals, in particular copper and zinc. It should be noted that groundwater levels are affected by factors such climatic conditions and soil permeability and will therefore vary with time.

On the basis of the subsurface investigation, an updated CSM was prepared which has been reproduced in Table 1.

Table 1: Updated Summary of Potentially Complete Exposure Pathways for Proposed Commercial / Industrial Land Use (DP, 2022)

Source and COPC	Transport Pathway	Receptor	Remediation Action Required
S1: Fill: metals, TRH, BTEX, PAH, PCB, OCP, OPP, PCB, asbestos, SMF, lead in paint. S2: Former structures : asbestos, SMF, lead in paint, S3: Blacksmiths: TRH, PAH, BTEX, metals, VOC, cyanide S4: DFC industrial use: metals, TRH, BTEX, PAH, PAH, OCP, OPP, ACM, SMF	P1: Ingestion and dermal contact; P2: Inhalation of dust and/or vapours.	R1: Current users [commercial users and customers] R2: Construction and maintenance workers; R3: End users [ground floor commercial users and residential occupants];	Preliminary site investigation indicates the absence of gross chemical contamination to soils and groundwater. Chemical contaminant concentrations within commercial/industrial land use criteria. ACM (bonded and friable) impacts identified in soil at four test locations. Owing to the presence of fill at the site, history of building demolition and presence of building waste within fill across the site there is a high risk of further ACM to be present within upper fill materials. Remediation is required for ACM impacted fill to render the site suitable for the proposed development from a contamination perspective. Further detailed asbestos investigations would be required to further assess upper fill to remain on-site (and confirm ACM concentrations are within the SAC) if the development and corresponding remediation approach is not to remove all fill. It is recommended that the RAP incorporate a procedure for this as a contingency.
	P2: Inhalation of dust and/or vapours	R4: Adjacent site users [commercial].	
	P3: Surface water and sediment run-off; P4: Lateral migration of groundwater providing base flow to water bodies	R5: Surface water [Hunter River]	
	P5: Leaching of contaminants and vertical migration into groundwater	R6: Groundwater	
	P6: Contact with terrestrial ecology P7: Inhalation, ingestion and absorption	R7: Terrestrial ecosystems	
S2: UST lead, TRH, BTEX, PAH, VOC	-	-	Testing of soil and groundwater indicates the absence of hydrocarbon impacts near and downgradient of known USTs. USTs should be appropriately removed and validated with reference to a site specific remediation action plan (RAP) with reference to NSW EPA (2014c).
S8: Adjacent/upgradient developments: TRH, BTEX, PAH, metals and VOC.	-	-	Testing of soil and groundwater indicates that contaminants associated with adjacent land uses do not appear to be significantly impacting the site.

The PSI (DP, 2022) indicated that remediation would be required to render the site suitable for the proposed development from a contamination perspective, due to the bonded and friable ACM impacts in fill materials and possible residual impacts in the vicinity of underground fuel infrastructure.

The PSI noted the proposed excavation works to remove upper fill to facilitate construction of a piling platform from RL1.5 (1.5 m to 2.5 m below existing ground levels) would remove/remediate most, if not all, ACM impacted fill (actual or potential ACM fill). Localised deeper excavations may be required for UST removal.

Subject to inspection and validation to be detailed in a site-specific RAP, the PSI noted that removal of fill would render the site suitable from a contamination perspective and would negate the requirement for on-site management/capping.

Further detailed investigations during construction were identified as a requirement to assess the suitability of other fill materials to remain on-site (ie. following removal of upper bulk fill).

The PSI noted that the feasibility of excavating all fill should be considered from a practical, cost-effective and time-effective perspective based on discussions with the client/developer.

6. Assessment of Remediation Options

A number of remediation options were reviewed with reference to the principles and criteria defined in relevant documents, including, the following:

- NEPC (2013), *National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013;*
- NSW EPA (2017), *Guidelines for the NSW Site Auditor Scheme (3rd Edition).*

NEPM (2013) states that the preferred hierarchy of options for site clean-up and/or management are as follows:

- On-site treatment of the contamination so that it is destroyed or the associated risk is reduced to an acceptable level; and
- Off-site treatment of excavated soil, so that the contamination is destroyed or the associated risk is reduced to an acceptable level, after which soil is returned to the site; or

If the above are not practicable:

- Consolidation and isolation of the soil on site by containment with a properly designed barrier; and
- Removal of contaminated material to an approved site or facility, followed, where necessary, by replacement with appropriate material;

or

- Where the assessment indicates remediation would have no net environmental benefit or would have a net adverse environmental effect, implementation of an appropriate management strategy.

Based on the distribution and depth of contaminated soils, subsurface conditions, the type of contamination (i.e. ACM, and possible hydrocarbons from USTs and infrastructure), the following remediation options were considered as follows:

1. No Action.
2. Off-site disposal of contaminated soils to a licensed landfill.
3. On-site treatment and re-use (volatile hydrocarbon impacted soils only).
4. On-site management (i.e. containment) of the contaminated soils (i.e. asbestos impacts only);
5. A combination of Options 2 to 4.

No Action

The “No Action” option involves no remediation response to the contamination identified or likely to be present on the subject site. This option was considered not appropriate as it does not provide any means to appropriately address, remediate, alleviate, and/or manage the long and short-term human health and environmental risk of the contamination already identified on-site or render the site suitable for the proposed development.

Off-site Disposal of Contaminated Soils

Off-site disposal of the contaminated soils is the most likely remediation option for both localised hydrocarbon-impacted soils near USTs and ACM impacted soils, since the proposed development requires excavation of the majority of impacted soils for piling pad construction. On-site treatment of hydrocarbon impacts (if identified in UST pits) may be required to enable a ‘General Solid Waste’ classification prior to off-site disposal, or treatment of natural soils to enable on-site re-use.

On-Site Management of Contaminated Soils

On-site management of contaminated soils involves placement/retention of the contaminated soils within the site area such that the proposed development is constructed over the contaminated soils, minimising the potential for access to the contaminated soils. The management of contaminated soils at the site requires the preparation and implementation of a long-term Site Management Plan (SMP) at the site which outlines the procedures used to render the site suitable for the proposed development. The SMP also provides the procedures for managing contaminated soils should access to the soils be required following construction. On-site management of contaminated materials also requires that a notice be on the Section 10.7 Planning Certificate. On-site management is generally considered for non-volatile contaminants which have a low propensity to leach.

On-site management of ACM impacted soils is considered to be a suitable remediation strategy for ACM-impacted soils given the distribution (i.e. potentially sporadic or widespread within fill materials) and characteristics (i.e. ACM is not a contaminant which is subject to leaching, impact to groundwater or migration). This remediation approach, however, is not considered suitable at this stage as the majority of impacted soils require removal as part of the piling pad platform.

On-site management is not considered suitable for possible localised volatile hydrocarbon impact associated with the UST and fuel infrastructure.

On-site Treatment and Re-use of Contaminated Material

In general on-site treatment is most applicable to hydrocarbon contaminants and requires sufficient time and space to allow impacted materials to be remediated via bioremediation prior to validation and re-use on site. Depending on the contaminant compounds and their concentrations, the time taken to remediate the soils to levels suitable for re-use may vary from weeks to several months. Whilst this option is suitable for short-medium chain length TRH impacted materials on site, it may not be suitable for the longer chain TRH contamination. Given constraints likely to be associated during construction (ie timing, space) and the requirement to remove the majority of fill off-site regardless this option is not likely to be practical.

Adopted Remediation Approach

Based on the above, the adopted remediation approach for the development is as follows:

- Decommissioning and removal of any remnant fuel infrastructure, with off-site disposal of localised hydrocarbon impacted soils if present;
- Off-site disposal of fill including ACM impacted soils;
- Validation of excavations;
- Contingency procedure for further detailed investigations at the time of construction to demonstrate the suitability of site fill to remain on site if required (e.g. use of site fill for re-instatement of UST excavations or similar).

If hydrocarbon concentrations in excavated soils exceed the criteria for direct disposal to landfill, localised bioremediation will be conducted to reduce hydrocarbon concentrations to allow direct disposal to landfill.

Off-site disposal of contaminated soils would generally comprise the following:

- Excavation of contaminated soils to the full depth of impact for UST pits;
- Excavation of upper fill in remaining parts of the site to the base of fill (RL1.5 AHD or higher);
- Direct disposal of contaminated soils to an appropriately licensed waste disposal facility or other facility subject to material classification;
- Validation of the stripped surface/remaining soils to confirm appropriate removal of contaminated soils;
- Re-instatement of site soils (where required) to achieve design levels and piling platform with ‘clean’ soil (ENM/VENM or suitable resource recovery exemption (RRE) material) and subject to geotechnical requirements.

7. Remediation Goals and Acceptance Criteria

7.1 Remediation Goals

7.1.1 Removal of USTs and Associated Infrastructure

The main objective of this remediation approach will be to appropriately decommission and remove remaining USTs and associated infrastructure and excavate and 'chase out' any localised residual soil contamination for off-site disposal to an appropriate licensed landfill.

The remediation process will remove this source of potential contamination thereby minimising potential risks to human health and the environment.

7.1.2 Off-site Disposal of ACM-Impacted Fill

The main objective of this remediation approach will be to excavate contaminated ACM impacted fill for removal from site, followed by validation of the remaining soils to confirm removal of the identified impacts.

Any materials requiring off-site disposal should be classified with reference to NSW EPA waste classification guidelines (NSW EPA, 2014b), and disposed to a facility which is licensed to receive such materials. It is noted that previous investigation has indicated the fill materials tested were classified as 'General Solid Waste' based on total and leachable contaminant concentrations (SCC1/TCLP1) and inferred classification of similar material types. It is noted asbestos impacted soils would be classified as 'Special Waste' in addition to the chemical classification.

This process of remediation will remove the potential for human contact with materials that are contaminated so that the development site can be made suitable for the proposed mixed use development with commercial ground floor use.

7.2 Remediation Acceptance Criteria

The RAC used to assess/validate the removal of the USTs, associated infrastructure, any residual impacted soils and the ACM-impacted upper filling have been developed in line with the proposed use of the site for mixed use development with commercial use on the ground floors (i.e. generic commercial/industrial land use scenario).

The contaminants of concern associated with the USTs are hydrocarbons (TRH, BTEX, VOCs and PAHs) and heavy metals. The contaminants of concern associated with the impacted upper filling are asbestos, PAH and heavy metals.

It is considered that the validation analysis should focus on the identified contaminants of concern in the area of concern. In order to provide for contingency situations, however, RAC are also established for other contaminants (e.g. OCP/OPP, PCB etc). This should, however, only be used as and when required (i.e. if signs of such contaminants are observed, suspected or found).

The adopted criteria are as follows:

- NEPM (2013) - Health investigation levels (HIL) and health screening levels (HSL) for commercial / industrial land use (HIL D/HSL D);
- NEPM (2013) - Management limits for commercial / industrial land use – coarse soil texture for TRH impact;
- NEPC (2013) – Ecological Investigation Levels (EIL) and Ecological Screening Levels (ESL) for commercial / industrial land use (EIL D/ESL D);CRC Care (2011) – Petroleum based HSL for direct contact for commercial / industrial land use (HSL D);
- CRC Care (2017) - Risk-based Management and Remediation Guidance for Benzo(a)pyrene.

For the purposes of providing a single RAC for each analyte the lowest of the above criteria (i.e. most conservative) has been adopted as the RAC as shown in Table 2. It is noted that the use of commercial/industrial land use is consistent with the zoning and proposed land use at the site (i.e. ground floor commercial / industrial land use without a basement).

Although the investigation/screening levels are not intended to be used as clean up levels, they establish concentrations above which further investigation (e.g. Tier 2) should be undertaken. If the concentrations of contaminants in the remaining soils (i.e. following remediation) are within the investigation levels, it is considered that the site would be suitable for the intended land use.

Table 2: Site RAC for Soil (mg/kg)

Contaminant	NEPM HIL D[b] / HSL D[c]	CRC Care Direct Contact - HSL D[a]	NEPM Management Limits – Commercial/ Industrial Land use / Coarse Soil [d]	NEPM EIL D / ESL D (fill / natural soils) [h, i, j]	Adopted RAC [f, i, j] (mg/kg)
Asbestos [e]	0.001% for FA and AF; 0.05% w/w for ACM over the impacted volume; and No visible asbestos for surface soils	NC	NC	NC	Nil (imported fill and excavation validation) OR 0.001% for FA and AF, 0.05% w/w for ACM AND No visible asbestos for surface soils for existing filling
Arsenic	3,000	NC	NC	160	160
Beryllium	500	NC	NC	NC	500
Boron	300,000	NC	NC	NC	300,000
Cadmium	900	NC	NC	NC	900
Chromium (VI)	3,600	NC	NC	540	540
Cobalt	4,000	NC	NC	NC	4,000
Copper	240,000	NC	NC	300/85	300/85 [g]
Lead	1,500	NC	NC	1800	1,500
Manganese	60,000	NC	NC	NC	60,000
Mercury (inorganic)	730	NC	NC	NC	730
Methyl mercury	180	NC	NC	NC	180
Mercury	6,000	NC	NC	NC	6,000
Nickel	10,000	NC	NC	NC	10,000
Zinc	400,000	NC	NC	730/250	730/250 [g]

Contaminant	NEPM HIL D[b] / HSL D[c]	CRC Care Direct Contact - HSL D[a]	NEPM Management Limits – Commercial/ Industrial Land use / Coarse Soil [d]	NEPM EIL D / ESL D (fill / natural soils) [h, i, j]	Adopted RAC [f, i, j] (mg/kg)
Barium	NC	NC	NC	NC	NC
Molybdenum	NC	NC	NC	NC	NC
Antimony	NC	NC	NC	NC	NC
Selenium	NC	NC	NC	NC	NC
Tin	NC	NC	NC	NC	NC
TRH (C_6-C_{10})-BTEX (F1)	260	26,000	700	215	215
TRH (>C_{10}-C_{16})-Naphthalene (F2)	NL	20,000	1000	170	170
TRH (>C_{16}-C_{34})	NC	27,000	3500	1700	1700
TRH (>C_{34}-C_{40})	NC	38,000	10,000	3300	3300
Benzene	3	430	NC	75	3
Toluene	NL	99,000	NC	135	135
Ethylbenzene	NL	27,000	NC	165	165
Xylene	230	81,000	NC	180	180
Total PAH	4,000	NC	NC	NC	4000
Benzo(a)pyrene	NC	NC	NC	33	33
Benzo(a)pyrene TEQ	40	NC	NC	NC	40
Naphthalene	NL	11,000	NC	370	370
PCBs	7	NC	NC	NC	7
DDT+DDE+DDD	3600	NC	NC	640	640
Aldrin and dieldrin	45	NC	NC	NC	45
Chlordane	530	NC	NC	NC	530
Endosulfan	2000	NC	NC	NC	2000
Endrin	100	NC	NC	NC	100
Heptachlor	50	NC	NC	NC	50
HCB	80	NC	NC	NC	80
Methoxychlor	2500	NC	NC	NC	2500
Chlorpyrifos	2000	NC	NC	NC	2000

Notes for Table 2:

a CRC Care (2011) – Petroleum based HSL for direct contact – Table B4

b NEPC (2013) Health-based investigation levels (HIL) – Table 1A(1)

c NEPC (2013) Health-based screening levels for vapour intrusion – commercial/industrial land use (Sand 0 to <1 m as conservative) – Table 1A(3) c

d NEPC (2013) Management Limits for TPH – Table 1 B(7) Ref 6

e NEPM (2021) – Asbestos trigger levels for commercial/industrial land use

f Adoption of a lower RAC should be considered when the material will be below the groundwater table or potentially in contact with groundwater due to the leachable characteristics of Naphthalene.

g It is noted that if EIL exceedances for zinc and copper are identified for existing materials, active remediation would not be required as discussed above in Section 5.

h based on derivation of ecological criteria in DP (2022). Values shown for “coarse soil and fill “ and “sand / natural soils”

i EIL/ESLs apply to the top 2 m of the soil profile. Some EILs are based on conservative soil parameters, which may be increased subject to the results of additional analysis of pH and CEC

j CRC (2017) high reliability screening level for aged contamination adopted in lieu of NEPC (2013) low reliability value

EIL Ecological investigation level

ESL Ecological screening level

NC No Criteria

NL Non Limiting

NEPC (2013) provides the following definitions for forms of asbestos:

- Bonded **asbestos containing material (ACM)** comprises ACM which is in sound condition, although possibly broken or fragmented, and where the asbestos is bound in a matrix such as cement or resin (eg asbestos fencing and vinyl tiles). This term is restricted to material that cannot pass a 7 mm x 7 mm sieve. This sieve size is selected because it approximates the thickness of common asbestos cement sheeting and for fragments to be smaller than this would imply a high degree of damage and hence potential for fibre release;
- **Fibrous asbestos (FA)** comprises friable asbestos material and includes severely weathered cement sheet, insulation products and woven asbestos material. This type of friable asbestos is defined here as asbestos material that is in a degraded condition such that it can be broken or crumbled by hand pressure. This material is typically unbonded or was previously bonded and is now significantly degraded (crumbling);
- **Asbestos fines (AF)** include free fibres, small fibre bundles and also small fragments of bonded ACM that pass through a 7 mm x 7 mm sieve. Bonded ACM fragments to pass through a 7 mm x 7 mm sieve implies a substantial degree of damage which increases the potential for fibre release.

From a risk to human health perspective, FA and AF are considered to be equivalent to 'friable' asbestos.

In addition to the above analytical criteria, the soil should be assessed based on the basis of aesthetic considerations. The soil should be free from odours and deleterious materials. Odour will be assessed on the basis of olfactory observations made by the environmental consultant.

Conformance with the RAC will be attained when either all validation samples meet the specified RAC, or, as a minimum for chemical contamination, the 95% UCL mean concentration value of each contaminant in the materials remaining on-site (validation samples) are below the respective RAC level, and no individual exceedance is greater than 2.5 times the RAC.

In addition to the above, imported fill used to reinstate site excavations, raise site levels or for piling pad construction (if required) should be classified as Virgin Excavated Natural Material (VENM) or classified under an appropriate resource recovery order (RRO) and should be accompanied by a certificate from the supplier, otherwise detailed assessment (including analysis of representative samples) will be required prior to use on-site.

The results of groundwater testing at the site indicated the general absence of gross groundwater contamination across the site from USTs and upper fill. Off-site hydrocarbon migration was not identified. Some localised hydrocarbon impact may be encountered in groundwater in the vicinity of the USTs within the backfill.

Active groundwater remediation is generally not considered to be necessary within the site based on the results of testing, however, further groundwater testing during and following soil remediation is recommended to assess residual impacts (if any).

In the event, however that localised groundwater impact remains following UST removal and soil remediation, groundwater RAC should be adopted for validation purposes. The adopted criteria are as follows:

- ANZG (2018), *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*;
- NEPM (2013) – Health screening levels for vapour intrusion in groundwater for commercial / industrial land use (HSL-D) for volatile hydrocarbon impact.

For the purposes of providing a single RAC for each analyte the lowest of the above criteria (i.e. most conservative) has been adopted as the RAC as shown in Table 3. It is noted that the use of commercial/industrial land use is consistent with the zoning and proposed land use at the site.

Table 3: Site RAC for Groundwater (µg/L)

Analyte		ANZG (2018) Marine Waters [2]	NEPC (2013) HSL D Vapour Intrusion	Adopted RAC (µg/L)
Metals	Arsenic (V)	NC	NC	NC
	Barium	NC	NC	NC
	Cadmium	0.7	NC	0.7
	Chromium (VI)	4.4	NC	4.4
	Cobalt	1	NC	1
	Lead	4.4	NC	4.4
	Manganese	80	NC	80
	Mercury (total)	0.1	NC	0.1
	Nickel	7	NC	7
	Selenium	3	NC	3
	Copper	1.3	NC	NC Elevated metals in groundwater are not uncommon in the Newcastle area, in particular copper and zinc, and may be representative of background / urban environments or associated with prior commercial / industrial use. If heavy metal testing is conducted concentrations should be compared to previous groundwater testing (DP, 2022)
	Zinc	8	NC	
PAH	Naphthalene	50	NL	50
	Benzo(a)pyrene	0.1	NC	0.1
TRH	C6 – C10 (less BTEX) [F1]	NC	6000	6000
	>C10-C16 (less Naphthalene) [F2]	NC	NL	NL
BTEX	Benzene	500	5000	500
	Toluene	180	NL	180
	Ethylbenzene	80	NL	80
	Xylene (o)	NC	NC	NC
	Xylenes (Total)	NC	NL	NC
VOC[3]	Chloroform	370	NC	370
	Trichloroethene	70	NC	70
	Isopropylbenzene	30	NC	30

Notes to Table 3:

1 In cases where no high reliability trigger values are provided, the low reliability trigger values provided in ANZECC & ARMCANZ (2000) have been used as screening levels

2 Investigation levels apply to typically slightly-moderately disturbed systems

3 Given the exhaustive list of VOC contaminants, only a few have been included in this table.

NL -The solubility limit is defined as the groundwater concentration at which the water cannot dissolve any more of an individual chemical based on a petroleum mixture. The soil vapour which is in equilibrium with the groundwater will be at its maximum. If the derived groundwater HSL exceeds the water solubility limit, a soil-vapour source concentration for a petroleum mixture could not exceed a level that would result in the maximum allowable vapour risk for a given scenario. For these scenarios no HSL is presented for these chemicals. These are denoted as not limiting 'NL'.

It is noted that the generic HSL are not appropriate when the depth to groundwater impact is less than 2m. Under these circumstances a site-specific risk assessment may be needed. The adopted HSLs have therefore been used for preliminary assessment purposes only.

NC No Criteria

It should be noted that for the generic HSLs to be applicable, groundwater should be at least 2 m below the finished floor level (FFL) of the proposed new building. Where groundwater is <2 m below the FFL and hydrocarbon impact is confirmed site specific risk assessment would be required in the absence of further remediation to remove hydrocarbon impacts.

8. Roles and Responsibilities

In order to achieve the goals of the remediation/earthworks programme, the following roles and responsibilities have been identified for the contractor and consultants:

Client / Project Manager

- Overall project management;
- Engaging suitably qualified remediation contractor, occupational hygienist (OH) and environmental consultant to conduct the remediation works;
- Ensure necessary approvals, notifications and licenses have been obtained prior to remedial works commencing;
- Liaison with the regulator (Newcastle City Council, (NCC)), environmental consultant, OH and remediation contractor during remediation process;
- Submission of validation reports to the regulator and SafeWork NSW, where required.

Construction Contractor / Remediation Contractor

The contractor is responsible for on-site operations including:

- Decommissioning and removal of USTs, and associated infrastructure (i.e. fuel lines etc.);
- Handling of soil/fill materials (contaminated or otherwise) including excavations, stockpiles, segregation, placement, compaction, and disposal of unsuitable or excess materials;
- Treatment of contaminated materials (i.e. bioremediation of hydrocarbon contaminated soils) if required;
- Disposal of contaminated soil/fill material (hydrocarbon-contaminated material and ACM contaminated fill) to a licensed landfill (after classification);
- Disposal of groundwater to a suitable location (licensed facility, trade waste etc) after classification, required;
- Safety of all personnel on site;
- Measures to minimise environmental effects;
- Preparation of a site specific construction environmental management plan (CEMP) and WHS plan. The CEMP should reference this RAP and will require review and comment by DP and occupational hygienist to confirm meets SafeWork NSW requirements for asbestos work; to confirm consistency with the objectives of the RAP prior to commencement of remediation;
- Ensure required licenses (including WorkSafe NSW licence) and approvals from regulatory authorities are obtained prior to remediation works commencing. It is noted that an appropriately

licenced contractor will be required to conduct earthworks within the site due to the presence of bonded/friable asbestos in fill;

- Collation of waste/ import tracking documentation, disposal dockets, delivery receipts, air monitoring records etc and submission to the client and the environmental consultant in a timely manner for review and inclusion in the validation report.

Occupational Hygienist (OH)

- Advice on management of asbestos contamination (if required);
- Set-up and maintenance, analysis and reporting of air monitoring for air borne asbestos fibres during construction works resulting in the disturbance of fill materials (i.e. any excavations, stockpiling, placement or transport of fill materials);
- Provision of asbestos clearance reports following removal of HBM from buildings prior to demolition and following demolition and removal of pavements.

The key responsibilities for the Class A Asbestos Assessor (or Occupational Hygienist who must hold a Class A Asbestos Assessor licence) is to ensure the asbestos materials removal Contractor achieves a satisfactory level of workmanship, and complies fully with statutory requirements and the requirements of this RAP. The Class A Asbestos Assessor (or Occupational Hygienist who must hold a Class A Asbestos Assessor licence) must be independent of the Contractor.

Commensurate with the above requirements, the specific duties of the Asbestos Assessor includes:

- Inspection of the asbestos materials removalist's equipment, including (if required) but not limited to decontamination units, water filtration systems, vacuum equipment, personal protective equipment (PPE);
- Assessment of the asbestos removalist's work methods, use and maintenance of PPE/RPE and decontamination procedures;
- Clearance visual inspection of the work area after the removal of ACM and ACM impacted filling to ensure the ACM has been removed to a satisfactory standard; and
- Organising air monitoring and developing the air monitoring requirements for the particular ACM removal / placement.

General Site Validation (Suitably Qualified Environmental Consultant)

- Full time inspection associated with excavation and validation of hydrocarbon contaminated soils in the areas of USTs and associated infrastructure (i.e. fuel lines etc.);
- Validation/classification of bioremediated soils (if required) prior to off-site disposal;
- Advice on excavation and segregation of contaminated soils;
- Validation of excavations;
- Regular inspections of remediation and validation works;
- Waste classification of soil / fill requiring off-site disposal;
- Review of proposed imported material reports / certificates to confirm suitability for use on-site prior to importation;
- Sampling and classification of imported fill materials (where required);

- Provision of a remediation and validation report;
- Correspondence/liaison with the regulatory authority throughout the remediation works.

Client

- Overall project management;
- Engaging suitably qualified remediation contractor, and Environmental Consultant to conduct the remediation works;
- Ensure necessary approvals and notifications have been obtained prior to remedial works commencing;
- Liaison with the regulator (Newcastle City Council - NCC), environmental consultant, remediation contractor during remediation process;
- Submission of validation reports to NCC.

Prior to the commencement of remediation works, a site meeting between the client, contractor and environmental consultant is recommended to confirm responsibilities and procedures in accordance with the agreed management plan.

9. Regulatory Approvals and Licences

State Environmental Planning Policy No. 55 - Remediation of Land (SEPP 55) aims to provide a state-wide planning approach to the remediation of contaminated land. Under clause 7(1) of SEPP 55 the approval authority is required to consider whether the land is contaminated, and:

a) If the land is contaminated, it is satisfied that the land is suitable in its contaminated state (or will be suitable, after remediation) for the purpose for which the development is proposed to be carried out; and

b) If the land requires remediation to be made suitable for the purpose for which the development is proposed to be carried out, it is satisfied that the land will be remediated before the land is used for that purpose.

This RAP presents the proposed remediation methodologies to address asbestos contamination on site, and remediation of remnant fuel infrastructure and residual soil contamination (if present). Implementation of the RAP will render the site suitable for the proposed development.

In accordance with Clause 9 of SEPP 55 the definition of Category 1 remediation works which require development consent are as follows:

a) Designated development, or

b) Carried out or to be carried out on land declared to be a critical habitat, or

c) Possibly have a significant effect on a critical habitat or a threatened species, population or ecological community, or

d) Development for which another State environmental planning policy or a regional environmental plan requires development consent, or

e) Carried out or to be carried out in an area or zone to which any classifications to the following effect apply under an environmental planning instrument:

   i) coastal protection,

   ii) conservation or heritage conservation,

   iii) habitat area, habitat protection area, habitat or wildlife corridor,

   iv) environment protection,

   v) escarpment, escarpment protection or escarpment preservation,

   vi) floodway,

   vii) littoral rainforest,

   viii) nature reserve,

   ix) scenic area or scenic protection,

   x) wetland, or

f) Carried out or to be carried out on any land in a manner that does not comply with a policy made under the contaminated land planning guidelines by the council for any local government area in which the land is situated (or if the land is within the unincorporated area, the Western Lands commissioner).

It is understood that site remediation works are considered to be Category 1 under SEPP55 requiring development consent as the site may be flood prone land and with heritage conservation items present.

It is noted that the proposed development and excavation of upper soils, which is integral to the remediation of the site (i.e. concurrent excavation to remove impacted soils) will require development consent from Council regardless of whether the remediation works are Category 1 or 2 under SEPP55. It is recommended that Council review this in assessing this RAP.

Based on review of Appendix VI of the Guidelines for the NSW Site Auditor Scheme, the following consent, notification or licence requirements are anticipated:

- Any conditions outlined in the DA;
- Notifications of the consent authority;
- EPA licences or permits for the transportation and disposal of wastes under the POEO Act;
- SafeWork NSW asbestos removal work licence under the Work Health and Safety Regulation 2011 (WHS Regulation) and appropriate notification prior to commencement.

Remediation works are not expected to involve groundwater extraction, nor is significant dewatering likely to be required for site redevelopment. A groundwater interference permit through the NSW Office of Water is therefore not expected to be required under the NSW Aquifer Interference Policy.

It is noted that previous asbestos testing at the site indicated the presence of asbestos ‘fines’ (friable asbestos) in fill materials, which should be considered in the work license application to SafeWork NSW and when assessing appropriate remediation contractor for the works (ie friable licensed contractors required).

It is recommended that the proposed development is staged and conditional upon the submission of a validation report for the site.

10. Remediation Strategy

10.1 Sequence of Remediation

The following staged remediation methodology is recommended to achieve the remediation goals.

Stage 1: Initial Preparation and Site Meeting

- Client/Contractor to obtain all necessary approvals and notifications to allow commencement of the works, including Council approvals and SafeWork NSW permit for friable/non-friable asbestos related works (i.e. excavation, handling and disposal of soils containing asbestos). The contractor should hold the relevant licences/approvals for asbestos related works;
- Site inception meeting between environmental consultant, the remediation contractor, demolition contractor and the site owner to discuss remediation methodologies and responsibilities, prior to demolition activities.

Stage 2: Demolition

- Contractor to set up environmental controls and secure the site. OH to setup air monitoring stations as required;
- Contractor to demolish and remove existing buildings across the site;
- Following building demolition / removal of concrete surface, interim environmental management procedures should be implemented where ACM impacts are identified at the surface. Occupational Hygienist to provide advice on recommended procedures.
- Following removal of buildings and pavements inspection of the underlying ground surface by the environmental consultant to assess the presence of any significantly contaminated soil / fill (ie soils with volatile hydrocarbon impact) which may affect the proposed remediation approach or waste classification of soils requiring off-site disposal.
- A clearance report(s) must be provided following demolition of buildings and following interim remediation of surface impacts where relevant. The clearance report/s will be included in the environmental consultant's validation report;

Stage 3: Decommissioning of Remnant Fuel Infrastructure

- USTs, fuel lines etc to be decommissioned and removed by a licensed contractor (under full time inspection by environmental consultant) in accordance with regulatory requirements. It is recommended that decommissioning of the accessible UST in the north eastern portion of the site is conducted prior to removal of pavements as a precaution.

Stage 4: Remediation / Validation – Petroleum Hydrocarbon Materials

- Preparation of a soil remediation/stockpiling area for on-site bioremediation of hydrocarbon contaminated soil (if required) and to allow waste classification for off-site disposal (contractor). Ideally, sufficient concrete slabs would be left in place to facilitate this;
- Excavation and 'chasing out' of petroleum hydrocarbon affected soils by the contractor (commencing at identified locations) based on visual and olfactory observations and screening with a photoionisation detector (PID) by environmental consultant (full-time inspection);
- Validation of excavated areas (environmental consultant);
- Collection and analysis of groundwater grab samples from water within the excavation during and following soil excavation and validation to assess groundwater conditions;
- Remediation of petroleum hydrocarbon affected soils using bioremediation techniques (on-site treatment) – if required, and/or disposal of hydrocarbon-impacted soil to a licensed landfill i.e. off-site disposal by the contractor, following waste classification sampling and testing by environmental consultant.

Stage 5: Remediation and Validation of Asbestos Contaminated Soils

- Preparation of a soil stockpiling area for waste classification of contaminated soils for off-site disposal (contractor) where required;
- Excavation and 'chasing out' of fill material by the contractor based on visual observations and material types by environmental consultant and/or the required excavation RL. Consideration should be given to the geotechnical suitability of the materials ;
- Validation of excavated areas (environmental consultant);
- Disposal of affected soils to a licensed landfill i.e. off-site disposal by the contractor, following waste classification sampling and testing by the environmental consultant for materials not previously classified (refer Section 10.3.4).

Stage 6: Detailed In-Situ / Stockpile Assessment of Fill Materials to be Retained on Site (Potentially Contaminated Soils) (if required)

- Sieving of bulk samples and sampling and analysis for any fill materials proposed to be retained on site to be located beneath proposed piling platform (environmental consultant). Frequency of testing to meet the sampling density commensurate with the risk rating as outlined in WA DoH (2009) and NEPC (2013);
- Disposal of soils not suitable to be retained on site (ie which do not fall within the RAC) to a licensed landfill following waste classification. Where suitable to remain on site. they should be placed within a validated area (contractor).

Stage 7: Validation – Imported Fill Materials (if required)

- All imported fill materials must be confirmed for use by the environmental consultant prior to use on-site. Where supporting documentation is not available to confirm the proposed materials are VENM or meet a suitable RRO sampling and analysis at the source site would be required prior to importation to confirm levels are within RAC as required;
- Inspection by environmental consultant of all imported fill materials to confirm materials are consistent with the supplied VENM/RRO documentation prior to use on site.

In addition to the above, natural silty/sandy clay soils as well as natural sands underlying fill below the groundwater table have been identified as potential acid sulfate soils (PASS) and where disturbed (ie excavated or dewatered) will require treatment with reference to an acid sulfate soil management plan. The ASS status of natural soils will affect the waste classification and re-use opportunities for this material if off-site disposal is required (refer to Section 10.7 below).

10.2 Remediation of Petroleum Hydrocarbon-Affected Soils

10.2.1 Methodology

Remnant fuel infrastructure, including fuel lines and USTs, have been identified within the site. The proposed remediation strategy is to remove any remnant fuel infrastructure off-site to an appropriately licensed facility and to excavate and disposal off-site following waste classification any identified hydrocarbon-impacted soils.

The following general procedures are recommended for the remediation and validation of hydrocarbon affected soils:

- Decommissioning and removal of remnant fuel infrastructure by a licensed contractor (with full time inspection by the environmental consultant);
- Inspection of areas potentially containing hydrocarbon-impacted soils;
- Contractor to progressively excavate affected soils under full-time inspection by the environmental consultant;
- Contaminated material will be excavated/chased from the walls and base of the tank pits/excavations, fuel lines, bowser locations etc until visual and olfactory evidence, and the results of PID screening, indicates the absence of such materials;
- The environmental consultant to validate excavated areas as discussed in Section 10.2.3.

Procedures for stockpiling of excavated soil/fill materials are discussed below.

Soil/fill material containing visual or olfactory evidence of potential contamination is considered to be contaminated material until classification has found otherwise.

10.2.2 Stockpiling of Hydrocarbon Contaminated Soils

The following outlines the basic procedure for stockpiling of hydrocarbon-impacted soils, noting that testing to date has not indicated the presence of gross hydrocarbon impact to soils.

Hydrocarbon contaminated soil should be placed on-site in a specified area, prepared as follows:

- Nominate stockpile area on-site, away from the possible excavation of contaminated soil, and as far as practicable from adjacent commercial properties.
- Provision should be made to allow for expansion of the stockpile area should this be required during the course of the works;
- Cover any drainage pits (if present) within the stockpile area to minimise leachate from contaminated soils entering the stormwater system;

- Cover the base of the stockpile area with plastic sheeting, and surround with straw bales and/or absorbent boom;
- Placement of plastic sheeting around the outside of perimeter bales to minimise the potential for leachate to migrate beneath the bales or absorbent boom during storage;
- Stockpile hydrocarbon contaminated material over plastic sheeting;
- Cover hydrocarbon impacted soils with plastic sheeting to manage possible odours/vapours during waste classification, prior to direct disposal to a licensed landfill as appropriate;
- Barricade the perimeter of the stockpiled material.

A photoionisation detector and visual/olfactory observation by the environmental consultant will be used as a guide to excavate/chase out hydrocarbon contaminated soil from the impacted area.

Stockpiled materials will be sampled and tested for waste classification at a minimum frequency of one sample per 50 m^3 prior to disposal to a licenced landfill.

10.2.3 Validation of Excavations/Stripped Surfaces

The following procedure is recommended for validation of identified areas of hydrocarbon-contaminated soils following stripping/removal:

- The stripped surface should be inspected by the environmental consultant to confirm, visually, the absence of potentially contaminated soils;
- As a minimum, validation samples will be collected at the following frequency:
    - Base of excavation – a minimum of one sample from the base of excavation (per tank), or one sample per 10 m^2 area for larger excavated areas;
    - Side of excavations – one location per side wall (per tank) or one per 5 m length of wall. Additional samples may be required due to the observed soil profile (e.g. upon signs of contamination and at the depth of groundwater seepage);
    - Fuel lines/pipe lines – a minimum of one sample per 5 m linear metres or at least one sample from beneath each fuel line (if present);
    - Chemical analysis will be conducted by a NATA registered laboratory on samples collected to validate the removal of materials containing hydrocarbon contamination.

The above analysis will be utilised to determine contaminant levels with respect to the RAC in the validated areas.

If validation results exceed the RAC, further removal (additional scraping/excavation) will be required, followed by additional validation sampling and analysis, until the RAC is met. Note that at least seven working days are required for laboratory analysis.

Excess rain water entering tank pit excavations or groundwater will be sampled and analysed to assess the potential for contamination.

10.2.4 Monitoring Procedures

The following monitoring procedures are recommended during remediation activities:

- The contractor/site manager inform nearby occupants of the proposed remediation activities, and provide contact details of the site manager (including after-hours contacts) to report a loss of amenity due to the remediation of hydrocarbon-impacted soils (e.g. hydrocarbon odours);
- Monitoring of volatile hydrocarbon levels using a calibrated photo ionisation detector (PID) as well as olfactory observations should be undertaken as follows:
    - During excavation of hydrocarbon-impacted soils (i.e. adjacent to the excavation);
    - During placement of contaminated soils in the proposed stockpiling area;
    - Periodic monitoring during site inspections at site boundaries.

The above monitoring should be undertaken by a suitable qualified contaminated land or WHS consultant. The remediation contractor will be responsible for appropriate WHS and environmental monitoring and management during site remediation.

Detectable levels of volatile hydrocarbons (PID readings above ambient levels at site boundaries) or olfactory evidence of loss of amenity will trigger additional contingency management, as indicated below.

10.2.5 Loading and Transport of Contaminated Materials

Transport of contaminated material off the site shall be via a clearly demarcated haul route and this route exclusively shall be used for entry and egress of vehicles used to haul identified contaminated materials within and away from the site.

Removal of waste materials from the site shall only be carried out by a licensed contractor holding appropriate licences, consents and approvals from NSW EPA and/or other Authorities to transport and dispose the waste materials according to the classification guidelines.

Details of all contaminated materials removed from the site shall be documented by the contractor with copies of weighbridge slips, trip tickets and consignment disposal confirmation (where appropriate). Such information should be provided to the environmental consultant for reporting purposes. A site log/tracking sheets shall be maintained by the remediation contractor for stockpiles (numbered locations), to enable the tracking of disposed loads against on-site origin and location of the materials and corresponding (validation) sample numbers.

Measures shall be implemented to minimise the potential for contaminated material to be spilled onto public roadways or tracked off-site on vehicle wheels. Such measures could include the deployment of a vehicle washing / cleaning facility, which should be placed at a location before the egress point of the site. The facility shall be able to handle all vehicles and plant operating on site (if required). Residue from the cleaning facility will be deemed contaminated unless shown by validation to be below RAC criteria.

The proposed waste transport route should be notified to the local Council and truck dispatch shall be logged and recorded by the contractor for each load leaving the site. The waste tracking procedure should be confirmed by the environmental consultant.

10.2.6 Limits of Excavation

In the event that significant contamination has occurred, consideration must be given to site boundaries, building infrastructure and infrastructure of the surrounding properties. The stability of the structures and adjacent features must be maintained at all times. If a field assessment or validation data indicate that contamination in the soil extends beyond a point where stability may be threatened, advice should be sought from a qualified geotechnical or structural engineer before any further excavation is undertaken in this direction. Temporary retaining structures may be recommended, however, in any event, excavation will not progress beyond the site boundary or within a reasonable proximity to existing structural elements. Validation samples will be taken at the limit of excavation notwithstanding that there may be residual contamination present.

10.2.7 Contingency Procedures

10.2.7.1 Hydrocarbon Impacts in Soil

Contingency action will be required if elevated PID levels are encountered, olfactory evidence of loss of amenity is observed, or the outcomes of the RAP are not being achieved. Contingency procedures shall comprise the following (in no particular order):

- Postponement of remediation and validation works (including fuel infrastructure decommissioning/removal, excavation, etc.) until such time that the loss of amenity is ameliorated and prevailing conditions are suitable to recommence;
- Covering of excavated soils within the stockpiling area until loss of amenity is ameliorated and prevailing conditions are suitable;
- Application of a suppressant, such as BioSolve, to reduce volatiles and odours from hydrocarbon-impacted soils within the excavation or the stockpile area.

10.2.7.2 Seepage/Groundwater

Active groundwater remediation is not proposed based on the results of previous investigations (DP, 2022). As part of the validation process, grab samples of groundwater or seepage water encountered in the remediation excavations will be collected.

Groundwater (or surface water) grab samples will be analysed for TRH, BTEX, PAH, and heavy metals. The results of the groundwater analysis will be incorporated with the validation report and assessed against the criteria in Section 7.2.

If hydrocarbon free product or slick is observed over seepage/groundwater within the excavation, appropriate absorbent materials should be utilised to skim/absorb such materials. Further grab sampling and analysis of remaining waters within the excavation will be conducted to confirm the groundwater conditions and requirements for further remediation and/or management (if any).

10.2.7.3 Waste Classification – Hydrocarbon-impacted Soils

Active soil remediation for hydrocarbon-impacted soils is not proposed at this site. Direct excavation and disposal to an appropriately licensed landfill is proposed for hydrocarbon impacts.

Additional remediation may be required where contaminant concentrations exceed waste classification criteria for direct disposal to licensed landfill. Contingency options for localised remediation of hydrocarbon-impacted soils for disposal include, but may not be limited to, the following:

- Excavation and removal of the impacted soils to an appropriately licensed facility for additional treatment and subsequent disposal;
- On-site bioremediation of hydrocarbon impacts in accordance with (NSW EPA, 2014a) (i.e. biological process to attenuate or breakdown the contaminating substances) under controlled conditions to minimise uncontrolled emissions of volatile gases, leachates and odours.

10.3 Remediation of Asbestos-Impacted Soils

10.3.1 Methodology

Based on the results of laboratory testing from previous investigations (DP, 2022), there were several location containing asbestos in fill. Based on the results of subsurface investigation, the affected fill could be present across the whole site, noting areas under building slabs have not been assessed as yet. The proposed remediation strategy is to remove the asbestos impacted fill as required during the bulk excavations required to facilitate construction of the imported piling pad fill layer.

The following general procedures are recommended for the remediation and validation of asbestos-impacted soils:

- Contractor to progressively excavate affected soils from across the site areas under full-time inspection by the environmental consultant;
- Contaminated material will be excavated/chased from the site until visual evidence indicates the absence of such materials;
- The environmental consultant to validate excavated areas as discussed in Section 10.3.3;
- Contractor to dispose of the excavated soils to an appropriately licensed landfill, following waste classification of the soils.

Procedures for stockpiling of excavated soil/fill materials are discussed in Section 10.3.4.

10.3.2 Excavation and Direct Loading and Stockpiling of Asbestos Contaminated Soils for Disposal

Subject to practicalities, the upper ACM impacted soils could be progressively excavated and loaded into trucks for direct disposal by the contractor. This would be suitable for areas which have already been subject of waste classification assessment (i.e. areas investigated as part of PSI (DP,2022)) or following supplementary investigations following demolition and inspection.

A combination of direct loading for disposal and stockpiling may be required.

Direct Loading

Asbestos contaminated soil or soils previously classified could be excavated and loaded for disposal as follows:

- Contractor to progressively excavate soils and direct loading to truck(s) under full-time inspection by the environmental consultant. Excavations should be progressive to minimise re-tracking over stripped areas if possible;
- Consultant to visually assess material types and description against previously classification results. Materials that differ in description and possible classification should be segregated / stockpiled for assessment (refer below);
- The environmental consultant advise the required depth of excavation (i.e. excavated minimum 0.05 m into natural soils and validate surface;
- Contractor lightly condition load by sprinkler and covered by plastic or similar to prevent dust blow (undertaken by the remediation contractor - refer to Section 13.5) for transport to the licensed facility;
- A record of excavation areas, descriptions, environmental controls, etc. should be maintained by the contractor.
- A site log/tracking sheets shall be maintained by the remediation contractor for stockpiles (numbered locations), to enable the tracking of disposed loads against on-site origin and location of the materials and corresponding (validation) sample numbers.

Stockpiling

Asbestos contaminated soil or soils not subject to prior assessment or classification should be placed on site in a specified area, prepared by the contractor as follows:

- The environmental consultant to nominate designated stockpile area in consultation with the contractor. The stockpile should be away from the possible excavation of contaminated soil, and as far as practicable from adjacent residences or other sensitive land uses;
- The proposed stockpile area should be inspected to confirm the absence of deleterious or potentially contaminated materials at the surface prior to the placement of materials;
- Provision should be made to allow for expansion of the stockpile area should this be required during the course of the works;
- An impermeable membrane such as plastic sheeting should be provided at the surface by the remediation contractor prior to stockpiling;
- Stockpile areas should be demarcated by the remediation contractor (i.e. fence/pickets and hazard tape) to prevent access, and clearly delineate the stockpiles;
- Stockpiles that are observed to contain or potentially contain asbestos materials should be lightly conditioned by sprinkler and covered by plastic or similar to prevent dust blow (undertaken by the remediation contractor - refer to Section 13.5);

- Measures should be taken by the remediation contractor to prevent the migration of stockpile materials (i.e. perimeter bunds, hay bales, silt fences, etc.);
- A record of stockpile locations, dimensions, descriptions, environmental controls, etc. should be maintained by the contractor.

Excavation, handling, transport etc. of asbestos-impacted materials should be undertaken by the licensed contractor with reference to the appropriate statutory and regulatory guidelines.

10.3.3 Validation of Excavations/Stripped Surfaces

The following procedure is recommended for validation following stripping / removal of upper fill materials identified or suspected to contain asbestos impacts:

- The stripped surface should be inspected by the environmental consultant to confirm the visual absence of potentially contaminated fill/soils (it is noted that the upper impacted fill is visually different to the underlying natural silty clay/clayey or sandy soils which have been demonstrated suitable to remain on site from a contamination perspective);
- Validation samples for chemical testing will be collected by the environmental consultant over the stripped surface (ie following complete removal of the upper fill layer) as follows:
    - Systematic Locations:
        - At a sampling density of at least a 10 m x 10 m grid over the stripped area;
    - Targeted locations:
        - At the approximate location of previously identified contamination;
        - Within 5 m of previously identified contamination to assess potential lateral impacts associated with identified contamination;
- Chemical analysis will be conducted by a NATA registered laboratory on samples collected to validate the removal of impacted materials.

The above analysis will be utilised to determine contaminant levels with respect to the RAC in the validated areas.

If validation results exceed the RAC, further removal (additional scraping/excavation) will be required, followed by additional validation sampling and analysis, until the RAC is met. Note that at least seven working days are required for laboratory analysis. Excavation of contaminated material will be limited to the extent of site boundaries.

It is further noted that the remediation methodology assumes that all fill will be removed from site, and that validation testing will be conducted on the remaining clean soils across the entire site footprint. Procedures for further detailed assessment of fill materials to be retained on site (stockpile / in-situ) are detailed as Stage 6 in Sections 10.1 and 10.3.4.

10.3.4 Fill Stockpile Classification and Disposal/Reuse Options

Segregated fill stockpiles containing potentially contaminated materials are classified in accordance with the NSW EPA (2014) Waste Classification Guidelines for disposal purposes.

Fill materials to be retained on site to be located beneath proposed piling platform (if proposed) will require validation to confirm the materials are within the RAC for the site. Validation sampling and testing will require field sieving of bulk samples and sampling and analysis of discrete samples for chemical analysis (including 500mL asbestos identification testing as outlined in Sections 11.3.2 and 11.3.3). This could be undertaken in-situ with the frequency of testing to meet the sampling density commensurate with the risk rating as outlined in WA DoH (2009) and NEPC (2013). Alternatively, bulk samples should be collected for field sieving /testing at a density of 1 per 25 m^3 to confirm acceptance with the RAC.

It is noted that 'emu picking' of ACM fragments in soil is not a suitable remediation approach as outlined in April 2022 guidance from NSW EPA and given presence of friable asbestos within fill materials

For soils to be disposed off-site, representative samples should be collected by the environmental consultant from the segregated fill stockpiles (i.e. where sufficient waste classification testing has not already been conducted as part of previous investigation). Samples should be analysed for the potential chemical contaminants as discussed in Section 11.3.2. The frequency of samples will depend on the size and composition/characteristics of the stockpile. A minimum frequency of one sample per 70 m^3 as per frequency guidelines for stockpiles in WA (2009) is recommended.

The results of analysis will be utilised to confirm options for off-site disposal, or re-use at the site, as follows:

- Satisfies RAC:
  - Re-use on site, subject to geotechnical suitability as engineered fill;
  - Dispose off-site to a licensed landfill.
- Satisfies RAC and off-site re-use criteria:
  - Re-use on site, subject to geotechnical suitability as engineered fill;
  - Dispose off-site to a licensed landfill;
  - Re-use off-site, subject to geotechnical suitability and classification as ENM.
- Exceeds RAC but satisfies landfill disposal guidelines;
  - Dispose off-site to a licensed landfill.
- Exceeds RAC and exceeds landfill disposal guidelines:
  - Develop on-site remediation strategy (hydrocarbons only) and continue until guidelines are satisfied;
  - Carry out appropriate immobilisation for off-site disposal to licensed landfill (subject to regulatory approvals).

10.3.5 Loading and Transport of Contaminated Materials

The procedures for the loading and transport of contaminated material are detailed in Section 10.2.5.

10.4 Disposal of Contaminated Materials

Upper fill materials to be removed to a level of RL1.5 (AHD) as part of the proposed initial groundworks must be disposed of to an appropriately licensed landfill or re-used on another site under a general or specific resource recovery exemption (where possible). ACM containing soils would not be suitable for beneficial re-use as per current NSW EPA guidance.

Previous investigations (DP, 2022) indicated the following:

- Preliminary waste classification testing on upper fill materials indicated a General Solid Waste (GSW) (SCC1/TCLP1) classification with reference to NSW EPA (2014b) based on total and leachable contamination concentrations. This classification is based on low leachability results and inferred classification of similar material types (i.e. TCLP testing not undertaken on all samples with elevated results). Due to the observed presence of bonded ACM in fill materials (predominately Unit 1B), the preliminary classification of upper fill is GSW containing asbestos waste (Special Waste);
- Upper pavement materials (Unit 1A) may be suitable for re-use under a resource recover order, subject to inspection, segregation and detailed assessment under full time inspection by the environmental consultant and following OH clearances;
- The classification of underlying natural soils will need to consider ASS conditions as discussed further in Section 10.7. Natural soils which are not ASS, could possibly be classified as virgin excavated natural material (VENM) subject to confirmation of contaminant concentrations;
- Further testing could be undertaken at the time of construction (building and pavement removal) to confirm waste classification prior to disposal of soils from the site which may allow for classification of some materials as GSW only and disposal of some natural (non ASS) soils as VENM. Some materials may also be suitable for classification under a general or specific resource recovery exemption.

Excess materials not containing ACM or potential ACM could be assessed for beneficial off-site re-use or recycling (where possible) in order to minimise disposal costs.
Any materials which require off-site disposal must be classified in accordance with NSW EPA (2014b). The criteria for disposal in accordance with NSW EPA (2014b) are presented in Table 4 and Table 5. In addition, asbestos contaminated soil/fill/sediment will require disposal to a licensed landfill as ‘special waste’ in accordance with NSW EPA (2014b). Consideration of the presence of ASS will also be required as per NSW EPA (2014d) and the site specific ASSMP.

Table 4: Landfill Disposal Criteria – Total Concentrations

Contaminant Threshold Values for Classifying Waste by Chemical Assessment Without Doing The Leaching Test (1)		
Contaminant	Maximum Values of Total Concentration for Classification without TCLP	
	General Solid Waste CT1 (mg/kg)	Restricted Solid Waste CT2 (mg/kg)
Benzene	10	40
Toluene	288	1152
Ethyl Benzene	600	2400
Xylenes (total)	1000	4000
C_6-C_9 petroleum hydrocarbons	650	2600
C_{10}-C_{36} petroleum hydrocarbons	10 000	40 000
Lead	100	400
Arsenic	100	400
Cadmium	20	80
Chromium (total)	100	400
Mercury	4	16
Nickel	40	160
Polycyclic Aromatic Hydrocarbons (total)	200	800
Benzo(a)pyrene	0.8	3.2

Notes to Table 4:
Adopted from Table 1 – NSW EPA (2014b)

Table 5: Landfill Disposal Criteria – Leachable and Total Concentrations

Leachable Concentration (TCLP) and Total Concentration (SCC) For Classifying Waste By Chemical Assessment (1)				
Contaminant	Maximum Values for Leachable Concentration and Total Concentration when used together			
	General Solid Waste		Restricted Solid Waste	
	Leachable Concentration TCLP1 (mg/L)	Total Concentration SCC1 (mg/kg)	Leachable Concentration TCLP2 (mg/L)	Total Concentration SCC2 (mg/kg)
Benzene	0.5	18	2	72
Toluene	14.4	518	57.6	2073
Ethyl Benzene	30	1080	120	4320
Xylenes (total)	50	1800	200	7200
C_6-C_9 petroleum hydrocarbons(2)	N/A(2)	650	N/A(2)	2600
C_{10}-C_{36} petroleum hydrocarbons(2)	N/A(2)	10 000	N/A(2)	40 000
Lead	5	1500	20	6000
Arsenic	5	500	20	2000
Cadmium	1	100	4	400
Chromium (total)	5	1900	20	7600
Mercury	0.2	50	0.8	200
Nickel	2	1050	8	4200
Polycyclic Aromatic Hydrocarbons (total)	N/A	200	N/A	800
Benzo(a)pyrene	0.04	10	0.16	23

Notes to Table 5:

(1) Adopted from Table 2 – NSW EPA (2014b)

(2) Petroleum hydrocarbons are assessed only by total concentration (SCC1 or SCC2)

N/A – Not applicable

Classification of materials for off-site disposal will include inspection, sampling and analysis. The frequency of testing required for classification should be confirmed by a suitably qualified environmental consultant and will depend on the volume and consistency of the material and the results of previous testing.

Groundwater disposal (if required) must be conducted by a licensed contractor in accordance with statutory and regulatory requirements. Groundwater requiring off-site disposal is classed as Liquid Waste in accordance with NSW EPA (2014b).

Truck dispatch shall be logged and recorded by the contractor for each load leaving the site (refer to Section 10.2.5). A record of the truck dispatch will be provided to the environmental consultant by the contractor. The waste tracking procedure should be confirmed by the OH due to the potential presence of bonded asbestos.

10.5 Imported Fill

Imported fill used to reinstate site excavations (where required), raise site levels or utilised for the proposed development (i.e. landscape areas, pavement materials etc.) should be classified:

- Virgin excavated natural material (VENM), excavated natural material (ENM); or
- Material classified under an appropriate resource recovery order; and
- Must be accompanied by an appropriate certificate from the supplier including suitable analytical testing that is representative of the materials in question (other than material supplied directly from a licensed VENM quarry);
- Must meet the adopted RAC;
- Must be assessed to be “fit for purpose”;
- Should be confirmed to be VENM / ENM or an approved resource recovery material prior to delivery to the site.

If an appropriate certificate from the supplier cannot be provided, detailed assessment (including analysis of representative samples) will be required prior to use on-site and confirmation the material meets classification requirements and the RAC.

10.6 Geotechnical Considerations

The site stripping, excavation and the placement and compaction of fill materials should be carried out with due consideration of geotechnical requirements for development. Deleterious inclusions such as organics, timber, metal, concrete (>200 mm) should be segregated from filling that may be used as engineered fill (i.e. for support of buildings or pavements).

Fill materials that will support structural loads, pavement, services or form structural backfill, should be placed and compacted to a suitable geotechnical specification that takes account of the intended purpose of the fill. Stability of excavations should also be considered.

The geotechnical specification for earthworks should be prepared as part of the final design.

10.7 Acid Sulfate Soil Management

Based on the results of the previous investigation (DP, 2022), natural silty clay/clayey sands above/below the water table and natural sands below the water table are acid sulfate soils. Disturbance of these materials (i.e. excavation or dewatering) will need to be conducted in accordance with a site specific Acid Sulfate Soil Management Plan (ASSMP) to be prepared by DP.

It is noted that disturbance of potential ASS during remediation works is likely for upper silty clay/sandy clay soils, and possibly for deeper UST excavations.

ASS are pre-classified by NSW EPA (2014?) as general solid waste (GSW) (assuming they are not impacted by other contaminants) and require neutralisation and validation prior to off-site disposal to landfill (if required).

10.8 Unexpected Finds Protocol

10.8.1 Potentially Contaminated Soils

The results of previous assessments at the site indicate the presence of PAH, heavy metal and asbestos contamination within upper filling at the site. Residual hydrocarbon impacts from UST within backfill / tank pits and associated fuel lines may be identified. Due to the historical use of the site, history of demolition and the presence of uncontrolled filling at the site, there is potential for additional contamination within site soils. Contingency procedures are required should additional potentially contaminated soils be identified during site development, however, it is noted that the proposed remediation strategy and bulk earthworks proposed for piling pad construction will remove the majority, if not all, of the fill.

The following general procedures are suggested for the assessment and management of potentially impacted fill/soils during remediation/earthworks. Based on the results of previous assessment, soils/fill may be potentially impacted by petroleum hydrocarbons, heavy metals, PAH and asbestos:

- Excavation, handling loading and transport of contaminated materials should be undertaken by a licensed contractor in accordance with the appropriate regulatory approvals and legislative requirements;
- The progress of site excavations during construction should be inspected by the contractor during earthworks, and periodically by the contaminated lands consultant.(Potential soil contamination may include stained soils, odorous soils, soils containing fibro fragments, soils containing building rubble (i.e. bricks, tiles, concrete, timber etc.) and slag/ash products;
- If additional/unknown potentially contaminated soils are encountered (i.e. visual or olfactory indication of contamination), excavation of fill should cease, and the extent of the affected fill/soil should be assessed by the environmental consultant ;
- The affected soils may need to be segregated based on visual/olfactory observations, and stockpiled for further assessment;
- If the assessment of impacted materials indicates that the materials are not suitable to remain on-site, the materials should be classified for disposal to an appropriately licensed landfill with reference to the NSW EPA (2014) waste classification guidelines;

- The affected area should be stripped and validated by the environmental consultant;
- Excavation in the affected area cannot recommence until the validation testing indicates the absence of gross impact and no visual or olfactory indicators of contamination;
- Licensed contractor to load classified materials directly into appropriate trucks for transport and disposal to a licensed facility (Note: waste classification is required prior to off-site disposal).

The occupational hygienist should provide work health and safety advice to the contractor during site works.

10.8.2 Migration Along Preferential Pathways

In the event that contamination is found to be migrating along preferential pathways (such as service trenches and conduits) in the vicinity of the identified hydrocarbon contamination, the following contingency procedure will be adopted:

- Remediation excavations will be continued in the direction of migration to the practical extent possible (without causing damage to infrastructure) as directed by the structural engineer (it is anticipated that the extent to which impacted materials can be chased-out along service conduits would be limited due to structural elements and services) and site boundaries;
- If impacted materials are present at the practical limits of the remedial excavation, validation samples will be collected and analysed per the requirements of Section 11.3 to determine the degree of residual contamination present;
- If concentrations of residual contaminants at the practical extent of the remedial excavation exceed the adopted RAC, then the following additional contingencies may be adopted:
    - Site specific risk assessment will be undertaken to determine the actual level of risk to human health;
    - Additional groundwater monitoring wells/soil bores will be considered (if feasible) hydraulically down gradient of the observed impacted material/preferential pathway to attempt to define extent and degree of preferential migration;
    - Consideration of vapour intrusion risks to the proposed development; and
    - Based on the results of the above, additional management controls and/or groundwater remediation measures may be required.

11. Sample Collection and Analysis

11.1 Sample Collection and Handling

11.1.1 Soil

Soil sampling will be directly from the exposed surface of excavation, or, in the case of remediation stockpiles, from various depths between the surface and the base. Sampling data shall be recorded to comply with routine chain of custody (COC) requirements.

The general sampling, handling, transport and tracking procedures comprises:

- The use of stainless steel sampling equipment;
- The use of disposable gloves for each sampling event;
- Washing of all sampling equipment in contact with the sample, in a 3% solution of phosphate free detergent (Decon 90) then rinsing with distilled water prior to each sample being collected;
- Transfer of the sample immediately into new glass jars;
- Collect ~500 ml samples for FA and AF analysis;
- Collect bulk (~10 L) soil samples for ACM field sieve test;
- Collect ~40 g to 50 g samples in zip-lock bags for asbestos (presence / absence) analysis (surface of natural soils only);
- Collection of 10% replicate samples for quality assurance / quality control (QA/QC) purposes;
- Collection of replicate soil samples in zip-lock plastic bags for PID screening;
- Labelling of the sample containers with individual and unique identification including project number and sample number;
- Placement of the containers into a chilled, enclosed and secure container for transport to the laboratory; and
- Use of chain of custody documentation so that sample tracking and custody can be cross-checked at any point in the transfer of samples from the field to hand-over to the laboratory.

11.1.2 Seepage / Groundwater

The general sampling, handling, transport and tracking procedures for the collection and analysis of a seepage/groundwater sample from water within the excavation comprises:

- Collection of seepage/groundwater ‘grab’ sample using a long-handled ‘swing-sampler’ fitted with new laboratory prepared containers for analysis;
- Field filtering of samples for dissolved metals testing;
- The use of disposable gloves for each sampling event;
- Collection of 10% replicate samples for QA/QC purposes;
- Collection of replicate water samples in a laboratory prepared jar for field screening of the groundwater with a PID;
- Labelling of the sample containers with individual and unique identification including project number and sample number;
- Placement of the containers into a chilled, enclosed and secure container for transport to the laboratory; and
- Use of COC documentation so that sample tracking and custody can be cross-checked at any point in the transfer of samples from the field to hand-over to the laboratory.

11.2 Sample Holding Times

The maximum sample holding times are as follows:

Soil

- Metals – 6 months (if required);
- TRH/BTEX – 14 days;
- PAH – 14 days, and 40 days following extraction (if required);
- Asbestos – no holding time.

Groundwater

- Metals – 6 months (if required);
- TRH/BTEX – 14 days;
- PAH – 14 days, and 40 days following extraction (if required).

All samples must be collected in appropriate containers and stored at 4°C or below.

11.3 Validation Sample Analysis

11.3.1 Tank Pits and Infrastructure – Potentially Hydrocarbon Impacted Soils

Validation analysis for the classification of excavated hydrocarbon impacted soils should comprise the following:

- Total Recoverable hydrocarbons (TRH);
- Benzene, Toluene, Ethylbenzene and Xylene (BTEX);
- Polycyclic Aromatic Hydrocarbons (PAHs);
- Heavy Metals (lead);
- If there are observations of ACM or indicators of potential ACM (building materials etc), validation sampling of fill or natural soils should also be undertaken for asbestos as per Section 11.3.2 below.

The analytical programme will be reviewed following excavation, segregation and sampling to confirm analysis for testing. Leachability (TCLP) analysis may be required for stockpile samples if total contaminant levels are found to exceed NSW EPA (2014b) ‘General Solid Waste’ criteria.

11.3.2 ACM Fill Stripping / Removal – Potential Asbestos-Impacted Soils

Analysis for the validation of excavated fill material including those with ACM and potential ACM asbestos impacted soils should comprise asbestos 500 ml identification (FA and AF analysis) for the surface of areas stripped to the level of natural soils.

For any areas with fill to remain or be reinstated, these areas will require detailed assessment via sieving (in-situ of stockpiled materials), and asbestos 500 ml identification for validation.

Stockpiled materials should also be analysed for asbestos to classify the material prior to off-site disposal. Alternatively, fill can be assumed to contain ACM and classified as Special Waste (subject to confirmation of the other chemical concentrations against CT1).

11.3.3 Waste Classification for Off Site Disposal

Analysis for waste classification of excavated soils should comprise collection of bulk samples for field screening/sieving and testing of discrete samples for the following:

- Total recoverable hydrocarbons (TRH);
- Benzene, toluene, ethylbenzene and Xylene (BTEX);
- Polycyclic aromatic hydrocarbons (PAHs);
- Heavy metals (arsenic, cadmium, chromium, copper, lead, nickel, mercury, and zinc);
- Asbestos 500 ml identification (FA and AF analysis).

To classify soils as General Solid Waste (i.e. no ACM impact), the density of testing should at a minimum comprise testing of 1 sample per 25 m^3, or greater, depending on the observations and potential for ACM to be present in fill.

The analytical programme will be reviewed following excavation, segregation and sampling to confirm analysis for testing. Leachability (TCLP) analysis may be required for stockpile samples if total contaminant levels are found to exceed NSW EPA (2014b) 'General Solid Waste' criteria.

Any materials which are imported onto the site (e.g. to backfill excavations or used in piling pad construction) should be classified as virgin excavated natural materials (VENM), excavated natural material (ENM) or under an appropriate resource recovery order and an appropriate report must be made available to the environmental consultant prior to the importation of the material.

11.3.4 Groundwater

Analysis of seepage/groundwater sample from water within the excavations (where required) should comprise the following:

- TRH;
- BTEX;
- PAH;
- Dissolved lead.

12. Quality Assurance Plan

12.1 Field Quality Assurance

Sampling accuracy and precision should be maintained through the analysis of:

- Minimum 10% field duplicate/replicate samples;
- Field/trip spikes/blanks to be analysed at a rate of one per day of validation sampling;
- Rinsate samples are collected and analysed at a rate of one per day of validation sampling;
- Trip spike/blank samples during storage/transport of samples to the laboratory.

Appropriate sampling procedures should be undertaken to minimise potential for cross contamination, for example:

- Standard operating procedures are followed;
- Site safety plans are developed prior to commencement of works;
- Duplicate or replicate field samples are collected and analysed;
- Equipment rinsate samples are analysed as part of the QA/QC programme;
- Samples are stored under secure, temperature controlled conditions;
- COC documentation is employed for the handling, transport and delivery of samples to the selected laboratory.

12.2 Laboratory Quality Assurance and Quality Control

The preferred laboratory routinely undertakes in-house QA/QC procedures involving the routine testing of:

- Reagent blanks;
- Spike recovery analysis;
- Laboratory duplicate analysis;
- Analysis of control standards;
- Calibration standards and blanks;
- Statistical analysis of QC data.

12.3 Data Quality Indicators

Based on the analysis of quality control samples i.e. duplicates/replicates and in-house laboratory QA/QC procedures, the following data quality indicators have been assigned for the validation testing:

- Conformance with specified holding times;
- Accuracy of spiked samples within the laboratory's acceptable range (typically 70% to 130% for inorganic contaminants and greater for some organic contaminants);

- Field and laboratory duplicates and replicates samples will have a precision average of +/- 50% relative per cent difference (RPD). Elevated RPDs may be present due to heterogeneity of materials;
- Rinsate samples will show that the sampling equipment is free of introduced contaminants (i.e. the analytes within the normal range for deionised water);
- Field duplicates/replicates will be collected at a frequency of 10% of all samples, and rinsate samples of field equipment will be collected at one per day of sampling.

An assessment of the overall data quality will be presented in the final validation report.

12.4 Validation Reporting

A validation report will be prepared by the environmental consultant with reference to NSW EPA (2020) *Guidelines for Consultants Reporting on Contamination Sites* and other appropriate guidance documentation.

The report shall be submitted to Council at the completion of the remediation works program. The validation report shall confirm that the site has been remediated to a suitable standard for the proposed development.

With respect to the remediation and validation of excavations (if required), backfilling and subsequent construction should only commence following validation of the excavations.

The validation report shall include (where required):

- Details of the total volume of contaminated materials excavated;
- Detailed analytical results;
- Confirmation that excavation areas and remediated soils re-used on site are validated;
- Indicate the final disposal destination of the materials removed from site;
- Detail all materials imported to site and confirm their suitability for use;
- Provide comment on the suitability of the site for the proposed development.

It is noted that an interim validation report may be required at the completion of validation works for building demolition, UST removal and fill removal, detailed fill assessment (if required) and validation of imported fill. The interim report will detail the status of the site prior to commencement of the piling works and generation of piling spoil (i.e. validation works will potentially affect the classification of fill / natural soils to be intermixed with pile spoil).

13. Environmental Management Plan (During Construction)

13.1 Introduction

The contractor should undertake the work with due regard to the minimisation of environmental effects and to meet all statutory and regulatory requirements.

The contractor shall have in place a Construction Environmental Management Plan (CEMP) so that work on the site complies with, but not limited to, the requirements of the following legislation:

- Protection of the Environment Operations Act;
- Contaminated Land Management Act;
- Dangerous Goods Act;
- Construction Safety Act;
- Work Health and Safety Act (SafeWork NSW);
- Council Development Approval Conditions.

The contractor shall also be responsible that the site works comply with the following conditions:

- Wastes generated at the site are disposed in an appropriate manner;
- Fugitive dust leaving the confines of the site is minimised. Air monitoring will be conducted at the boundaries of the site to monitor the presence of airborne asbestos fibres;
- No water containing any suspended matter or contaminants leaves the site in a manner which could pollute the environment;
- Vehicles shall be cleaned and secured so that no mud, soil or water are deposited on any public roadways or adjacent areas;
- Noise and vibration levels at the site boundaries comply with the legislative requirements.

Asbestos materials have been associated with various human respiratory diseases. The risk of contracting these diseases from contact with asbestos depends entirely on the fibres becoming airborne. It is important during disturbance of potential asbestos impacted soils that the potential for generating airborne asbestos fibres should be minimised. Moreover, levels of airborne asbestos fibres immediately outside the works area should be maintained to within the acceptable background level (i.e. <0.01 fibre/mL). As asbestos material identified on the site was generally identified in the form of fragments or bundles of fibre cement sheet, there is generally a low risk of asbestos fibres becoming airborne. Localised friable asbestos was identified in one sample, however, and as such appropriate air monitoring should be conducted by the OH during remediation in addition to any other recommendations made by the OH.

In order to achieve a minimisation of environmental effects, the following measures are recommended, and should be adopted by the appointed contractor.

The contractor's CEMP is to include:

- Contingency plans to respond to site incidents;
- Site management plan for the operation phase of remediation works;
- A remediation schedule and hours of operation (which will be subject to development consent conditions);
- Details of relevant contacts;
- Requirements outlined in Newcastle City Council Technical Manual: Contaminated Land Management (June 2012) and development application conditions;
- Procedure(s) for dealing with deleterious materials that may affect use as fill;
- Incident management/emergency response procedures;
- Any community consultation requirements.

At the commencement of site works and following demolition and removal of concrete slabs, interim measures should be adopted to manage possible human-health and environmental impacts from ACM observed at the surface (i.e. prior to full scale earthworks and remediation). Such measures could include use of spray / sprinklers to prevent dust blow or temporary covers. Requirements for interim control measures should be confirmed following demolition with the OH.

13.2 Traffic Management

All vehicular traffic shall use only routes approved by Council, to and from the selected landfill where off-site disposal is undertaken. All loads shall be tarpaulin covered and lightly wetted to minimise the potential for materials or dust are dropped or deposited outside or within the site. The proposed landfill should be consulted for any additional requirements.

Each vehicle that has trafficked potentially impacted site soils within the site shall be inspected for cleanliness before being logged out as clean (wheels and chassis), or hosed down into a wheel wash or wash down bay until designated as clean when exiting the site (if required).

Wheel wash silt residues should be collected periodically and either returned to the excavation area or included in the remediation stockpile. Such material will be treated as contaminated unless analysis proves otherwise.

Removal of waste materials from the site shall only be carried out by a licensed contractor holding appropriate licence, consent or approvals to dispose the waste materials according to the waste classification.

Waste tracking should be conducted by the licensed contractor in accordance with regulatory requirements. Details of all materials removed from the site shall be documented by a contractor with copies of weighbridge slips, trip tickets and consignment disposal confirmation (where appropriate) provided to the environmental consultant responsible for site validation. A site log shall be maintained by the contractor to track disposed loads against on-site origin and location of the materials.

Truck dispatch shall be logged and recorded by the contractor for each load leaving the site. A record of the truck dispatch should be provided to the environmental consultant responsible for site validation by the contractor.

Similarly tracking and documentation of all on-site movements of material should be maintained by the contractor.

13.3 Excavations

Records of all excavations and stockpile locations should be maintained. A site diary should also be maintained by the contractor to record daily progress, abnormal occurrences, incidents, and truck movements.

Contaminated material should be stockpiled at suitable locations within the site. All temporary stockpiles of contaminated material shall be secured and demarcated to clearly delineate their boundaries.

All excavations shall be made with due regard to the stability of adjacent footings and structures. It will be the contractor's responsibility to provide adequate battering, shoring and/or underpinning to protect adjacent structures (if required).

No person shall be permitted to enter an unsupported excavation where it is more than 1.5 m deep or where it is considered to be unstable, irrespective of depth.

Records of all imported filling and placement should also be maintained by the contractor.

13.4 Stormwater Management and Control

Appropriate measures shall be taken to minimise the potential for potentially contaminated water or sediments to leave the site. Such measures could include:

- Construction of diversion bunds to divert stormwater from contaminated areas and contaminated soil stockpiles;
- Provision of sediment traps including geotextiles or hay bales. This would be required for contaminated soil stockpiles to prevent losses by surface erosion; and
- Construction of sediment control basins (if required).

Discharge of any waters should meet the consent conditions from the appropriate authority. This should be verified by sampling and analyses undertaken by the contractor. For example, if excavations fill with water during validation works (i.e. due to rainfall), the water will require analysis to determine appropriate options for discharge (i.e. disposal to stormwater, sewer or collection by a licensed contractor).

13.5 Control of Dust and Odour

Control of dust and odour during the course of the remediation works shall be maintained by the contractor and may include, but not necessarily be limited to, the following:

- The use of a water cart, as and when appropriate, to eliminate wind-blown dust;
- Use of sprays/sprinklers to prevent dust blow from stockpiles;
- Covering of stockpiles with plastic sheeting or geotextile membranes;
- Restriction of stockpile heights to 2 m above surrounding site level;
- Ceasing works during periods of inclement weather such as high winds or heavy rain;
- Regular checking of the fugitive dust and odour issues. Undertake immediate remediation measures to rectify any cases of excessive dust or odour;
- Provision of temporary capping over site soils.

13.6 Noise Control

Noise and vibration will be restricted to reasonable levels. All plant and machinery used on site should not breach statutory noise levels. Working hours will be restricted to those specified by Council.

14. Work Health and Safety

All site work must be undertaken in a controlled and safe manner with due regard to potential hazards, training and safe work practices. The practices outlined should generally comply with the WHS policies specified by the relevant Authorities.

All personnel on site should be required to wear the following protection as a minimum:

- Steel-capped boots;
- Safety glasses or safety goggles with side shields meeting AS1337 requirements (as necessary);
- Hard hat meeting AS1801 requirements;
- Hearing protection meeting AS1270 requirements when working around machinery or plant equipment if noise levels exceed exposure standards.

For personnel who are required to work in areas of potential contact with asbestos containing materials, protection will be required in accordance with the WorkSafe Australia: Asbestos – Code of Practice and Guidelines Notes.

Excavation, handling, stockpiling, transport etc of materials containing asbestos should be undertaken by a licenced contractor in accordance with the WorkSafe Australia: Asbestos – Code of Practice and Guidelines Notes, and the relevant statutory requirements such as Section 29 of the Protection of the Environment Operations (Waste) Regulation 2014. Based on the results of the previous investigations, the presence of asbestos materials is likely to comprise bonded asbestos containing material (i.e. fibro fragments) and localised friable asbestos.

It is recommended that the licensed asbestos contractor prepare a work health and safety management plan with reference to Worksafe Australia requirements, to include but not limited to the following:

- Induction requirements;
- Hazards at the site;
- Hours of operation;
- Licensed contractor training;
- Asbestos notification;
- Fencing and signage for asbestos areas;
- Restriction of access to asbestos works areas;
- Personnel protective equipment;
- Asbestos remediation equipment;
- Airborne asbestos monitoring;
- Decontamination;
- Hygiene;
- Asbestos waste;
- Emergency plan;
- Reportable incidents.

The following measures should also be considered to minimise potential safety risks to adjacent commercial occupiers and foot traffic etc:

- Stage construction activities in order to minimise the area of contaminated soils exposed at any one time;
- Provide temporary covers over exposed contaminated soils where works cannot be completed in a timely fashion to minimise exposure risks.

Excavation, handling, stockpiling, transport etc. of materials containing asbestos should be undertaken by a licenced contractor in accordance with regulatory requirements including the Work Safe Australia: Asbestos – Code of Practice and Guidelines Notes, and the relevant statutory requirements such as Section 29 of the Protection of the Environment Operations (Waste) Regulation 2014. Based on the results of the previous investigation, the presence of asbestos materials were mainly in the form of larger bonded fibro fragments. Asbestos fines (i.e. small fibro fragments and fibre bundles) has been identified locally within fill and may also be present elsewhere in fill given the history of demolition at the site. The OH should confirm if the works are deemed friable asbestos works and recommend any additional controls/requirements in this regard.

The contractor shall prepare a project-specific environmental management and WHS plans to supplement measures presented in this RAP.

15. Conclusion

This RAP provides the clean-up objectives, remediation acceptance criteria (RAC), principles, methods and procedures by which the remediation and validation of the site will be achieved.

Upon implementation of the remediation and management measures it is considered that human health and environmental values will be appropriately protected, and the site will be rendered suitable for the proposed landuse.

Prior to commencement of remediation and construction works, it is recommended that a site inception meeting is held between the developer, remediation contractor and consultant to discuss the remediation and validation process and to identify the tasks and responsibilities for the remediation of the site to a condition suitable for the proposed mixed use multi-storey development.

16. References

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17. Limitations

Douglas Partners (DP) has prepared this report for this project at 924 Hunter Street, Newcastle West in accordance with DP's proposal 102077.01.P.001.Rev0 dated 4 August 2021 and email proposal dated 14 February 2022 and acceptance received from Thirdi Dairy Farmers Pty Ltd and its representatives. The work was carried out under DP's Conditions of Engagement. This report is provided for the exclusive use of Thirdi Dairy Farmers Pty Ltd for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of DP, does so entirely at its own risk and without recourse to DP for any loss or damage. In preparing this report DP has necessarily relied upon information provided by the client and/or their agents.

The results provided in the report are indicative of the sub-surface conditions on the site only at the specific sampling and/or testing locations, and then only to the depths investigated and at the time the work was carried out. Sub-surface conditions can change abruptly due to variable geological processes and also as a result of human influences. Such changes may occur after DP's field testing has been completed.

DP's advice is based upon the conditions encountered during previous investigations. The accuracy of the advice provided by DP in this report may be affected by undetected variations in ground conditions across the site between and beyond the sampling and/or testing locations. The advice may also be limited by budget constraints imposed by others or by site accessibility.

The assessment of atypical safety hazards arising from this advice is restricted to the environmental components set out in this report and based on known project conditions and stated design advice and assumptions. While some recommendations for safe controls may be provided, detailed 'safety in design' assessment is outside the current scope of this report and requires additional project data and assessment.

This report must be read in conjunction with all of the attached and should be kept in its entirety without separation of individual pages or sections. DP cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion stated in this report.

This report, or sections from this report, should not be used as part of a specification for a project, without review and agreement by DP. This is because this report has been written as advice and opinion rather than instructions for construction.

Asbestos has been detected by observation and by laboratory analysis, on the surface of the site and in filling materials at selected the test locations sampled and analysed. Building demolition materials, such as concrete, brick, metal, glass, ceramic tile, were located in filling across the site, and these are considered as indicative of the possible presence of other hazardous building materials (HBM), including asbestos.

Although the sampling plan adopted for the previous investigation was considered appropriate to achieve the stated project objectives, there are necessarily parts of the site that have not been sampled and analysed. This is either due to undetected variations in ground conditions or to budget constraints (as discussed above), or to parts of the site being inaccessible and not available for inspection/sampling. It is therefore considered possible that HBM, including asbestos, may be present in unobserved or untested parts of the site, between and beyond sampling locations, and hence no warranty can be given that asbestos is not present.

Douglas Partners Pty Ltd

Appendix A

About this Report

About this Report

Douglas Partners

Introduction

These notes have been provided to amplify DP's report in regard to classification methods, field procedures and the comments section. Not all are necessarily relevant to all reports.

DP's reports are based on information gained from limited subsurface excavations and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

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This report is the property of Douglas Partners Pty Ltd. The report may only be used for the purpose for which it was commissioned and in accordance with the Conditions of Engagement for the commission supplied at the time of proposal. Unauthorised use of this report in any form whatsoever is prohibited.

Borehole and Test Pit Logs

The borehole and test pit logs presented in this report are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will provide the most reliable assessment, but this is not always practicable or possible to justify on economic grounds. In any case the boreholes and test pits represent only a very small sample of the total subsurface profile.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes or pits, the frequency of sampling, and the possibility of other than 'straight line' variations between the test locations.

Groundwater

Where groundwater levels are measured in boreholes there are several potential problems, namely:

- In low permeability soils groundwater may enter the hole very slowly or perhaps not at all during the time the hole is left open;
- A localised, perched water table may lead to an erroneous indication of the true water table;
- Water table levels will vary from time to time with seasons or recent weather changes. They may not be the same at the time of construction as are indicated in the report; and
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water measurements are to be made.

More reliable measurements can be made by installing standpipes which are read at intervals over several days, or perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from a perched water table.

Reports

The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, the information and interpretation may not be relevant if the design proposal is changed. If this happens, DP will be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical and environmental aspects, and recommendations or suggestions for design and construction. However, DP cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions. The potential for this will depend partly on borehole or pit spacing and sampling frequency;
- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

If these occur, DP will be pleased to assist with investigations or advice to resolve the matter.

About this Report

Site Anomalies

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, DP requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.

Information for Contractual Purposes

Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. DP would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

Site Inspection

The company will always be pleased to provide engineering inspection services for geotechnical and environmental aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.

Appendix B

Laboratory Summary Tables B1 to B7 (DP, 2022)

Douglas Partners
Geotechnics / Environment / Groundwater

Table B1: Summary of Laboratory Results – Metals, TRH, BTEX, PAH (Commercial/Industrial Land Use Comparison - HIL D / HSL D / EIL D / ESL D)

			Metals - Standard									Metals - Additional										
			Arsenic	Cadmium	Total Chromium	Copper	Lead	Manganese	Mercury (inorganic)	Nickel	Zinc	Aluminium	Antimony	Barium	Beryllium	Boron	Cobalt	Iron	Magnesium	Molybdenum	Selenium (Total)	Tin (inorganic, Sn(V))
		PQL	4	0.4	1	1	1	1	0.1	1	1	10	7	1	1	3	1	10	10	1	2	1
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Initial Investigation - October 2021																						
201	0.5 m	06/10/2021	**4**	<0.4	**7**	**9**	**10**	**550**	<0.1	**4**	**45**	-	<7	**110**	**1**	<3	**3**	-	-	<1	<2	<1
			3000 160	900 -	3600 540	240000 300	1500 1800	60000 -	730 -	6000 260	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
201	2 m	06/10/2021	<4	<0.4	**7**	**58**	**170**	**110**	**0.4**	**14**	**130**	-	<7	**93**	<1	**6**	**9**	-	-	<1	<2	**17**
			3000 160	900 -	3600 540	240000 85	1500 1800	60000 -	730 -	6000 260	400000 250	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
202	0.2 m	06/10/2021	<4	<0.4	**6**	**26**	**63**	**1600**	<0.1	**16**	**57**	-	<7	**130**	<1	**20**	**4**	-	-	<1	<4	**2**
			3000 160	900 -	3600 540	240000 300	1500 1800	60000 -	730 -	6000 260	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
D1/JRK	-	06/10/2021	<4	<0.4	**6**	**37**	**85**	**240**	**0.1**	**21**	**82**	-	<7	**130**	<1	**30**	**4**	-	-	**1**	<2	**4**
			3000 160	900 -	3600 540	240000 300	1500 1800	60000 -	730 -	6000 260	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
202	3.5 m	06/10/2021	<4	<0.4	**2**	<1	**1**	**4**	<0.1	**1**	**2**	-	<7	**2**	<1	<3	<1	-	-	<1	<2	<1
			3000 160	900 -	3600 540	240000 85	1500 1800	60000 -	730 -	6000 260	400000 250	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
203	0.5 m	06/10/2021	<4	**0.4**	**14**	**93**	**470**	**360**	**0.2**	**15**	**230**	-	<7	**100**	<1	**5**	**6**	-	-	<1	<2	**12**
			3000 160	900 -	3600 540	240000 300	1500 1800	60000 -	730 -	6000 260	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
204	0.2 m	06/10/2021	**6**	<0.4	**5**	**7**	**9**	**280**	<0.1	**4**	**17**	-	<7	**26**	<1	<3	**3**	-	-	<1	<2	**1**
			3000 160	900 -	3600 540	240000 300	1500 1800	60000 -	730 -	6000 260	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
204	4 m	06/10/2021	**4**	<0.4	**2**	<1	**1**	**8**	<0.1	**2**	**3**	-	<7	**3**	<1	<3	**2**	-	-	<1	<2	<1
			3000 160	900 -	3600 540	240000 85	1500 1800	60000 -	730 -	6000 260	400000 250	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
205	0.5 m	06/10/2021	<4	<0.4	**2**	**7**	**14**	**56**	<0.1	**1**	**18**	-	<7	**12**	<1	<3	**9**	-	-	<1	<2	<1
			3000 160	900 -	3600 540	240000 300	1500 1800	60000 -	730 -	6000 260	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
301	0.1 - 0.2 m	9/10/2021	**5**	<0.4	**5**	**3**	**20**	**370**	<0.1	**3**	**27**	-	<7	**34**	<1	<3	**3**	-	-	<1	<2	<1
			3000 160	900 -	3600 540	240000 300	1500 1800	60000 -	730 -	6000 260	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
302	0.5 - 0.6 m	9/10/2021	<4	<0.4	**3**	**44**	**190**	**230**	**0.1**	**6**	**160**	-	<7	**89**	<1	**3**	**2**	-	-	<1	<2	**7**
			3000 160	900 -	3600 540	240000 300	1500 1800	60000 -	730 -	6000 260	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
D1/DEW	-	9/10/2021	<4	<0.4	**6**	**29**	**140**	**330**	**0.1**	**4**	**100**	-	<7	**60**	<1	<3	**2**	-	-	<1	<2	**5**
			3000 160	900 -	3600 540	240000 300	1500 1800	60000 -	730 -	6000 260	400000 250	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
302	1.4 - 1.5 m	9/10/2021	<4	<0.4	<1	**10**	**4**	**5**	<0.1	<1	**4**	-	<7	**9**	<1	<3	<1	-	-	<1	<2	<1
			3000 160	900 -	3600 540	240000 300	1500 1800	60000 -	730 -	6000 260	400000 250	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
303	0.6 - 0.7 m	9/10/2021	<4	<0.4	**5**	**25**	**130**	**160**	**0.1**	**3**	**84**	-	<7	**41**	<1	<3	**1**	-	-	<1	<2	**2**
			3000 160	900 -	3600 540	240000 300	1500 1800	60000 -	730 -	6000 260	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
304	0.5 - 0.6 m	9/10/2021	<4	<0.4	**1**	<1	**3**	**33**	<0.1	<1	**4**	-	<7	**4**	<1	<3	<1	-	-	<1	<2	<1
			3000 160	900 -	3600 540	240000 300	1500 1800	60000 -	730 -	6000 260	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
305	0.2 - 0.3 m	9/10/2021	**4**	<0.4	**6**	**88**	**1100**	**180**	**0.3**	**12**	**260**	-	<7	**96**	<1	**9**	**13**	-	-	<1	<2	**9**
			3000 160	900 -	3600 540	240000 300	1500 1800	60000 -	730 -	6000 260	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
305	0.55 m	9/10/2021	<4	<0.4	**4**	**50**	**580**	**180**	**0.2**	**7**	**150**	-	<7	**130**	<1	**6**	**3**	-	-	<1	<2	**7**
			3000 160	900 -	3600 540	240000 300	1500 1800	60000 -	730 -	6000 260	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
306	0.25 - 0.35 m	9/10/2021	<4	<0.4	**7**	**60**	**310**	**410**	**0.3**	**9**	**300**	-	<7	**100**	<1	**5**	**5**	-	-	<1	<2	**17**
			3000 160	900 -	3600 540	240000 300	1500 1800	60000 -	730 -	6000 260	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
307	0.2 - 0.3 m	9/10/2021	**5**	<0.4	**6**	**9**	**6**	**170**	<0.1	**9**	**29**	-	<7	**8**	<1	<3	**10**	-	-	<1	<2	<1
			3000 160	900 -	3600 540	240000 300	1500 1800	60000 -	730 -	6000 260	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
Additional Investigation - March 2022																						
401	1.0 m	13/03/2022	<4	<0.4	**7**	**150**	**120**	**180**	**0.3**	**17**	**210**	**4100**	<7	-	-	**5**	**8**	**13000**	**2100**	-	<2	**8**
			3000 160	900 -	3600 670	240000 300	1500 1800	60000 -	730 -	6000 60	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
401	2.0 m	13/03/2022	<4	<0.4	**8**	**230**	**65**	**140**	**0.2**	**21**	**68**	**5100**	<7	-	-	<3	**12**	**20000**	**3300**	-	<2	**4**
			3000 160	900 -	3600 670	240000 85	1500 1800	60000 -	730 -	6000 60	400000 250	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
401	3.5 m	13/03/2022	<4	<0.4	**1**	<1	**2**	**3**	<0.1	**1**	**2**	**910**	<7	-	-	<3	<1	**440**	**90**	-	**3**	<1
			3000 160	900 -	3600 670	240000 85	1500 1800	60000 -	730 -	6000 60	400000 250	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
402	2.0 m	13/03/2022	<4	<0.4	**7**	**52**	**160**	**68**	**0.5**	**25**	**240**	**11000**	<7	-	-	**7**	**18**	**4900**	**740**	-	<2	**15**
			3000 160	900 -	3600 670	240000 85	1500 1800	60000 -	730 -	6000 60	400000 250	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
402	3.5 m	13/03/2022	<4	<0.4	<1	<1	<1	**4**	<0.1	**1**	**2**	**830**	<7	-	-	<3	<1	**810**	**60**	-	<2	<1
			3000 160	900 -	3600 670	240000 85	1500 1800	60000 -	730 -	6000 60	400000 250	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
403	0.3 m	13/03/2022	<4	<0.4	**5**	**16**	**58**	**200**	<0.1	**3**	**50**	**3300**	<7	-	-	<3	**2**	**4900**	**900**	-	<2	**3**
			3000 160	900 -	3600 670	240000 300	1500 1800	60000 -	730 -	6000 60	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
403	1.5 m	13/03/2022	**23**	<0.4	**7**	**16**	**97**	**280**	**0.1**	**5**	**360**	**4000**	<7	-	-	<3	**2**	**8500**	**1100**	-	<2	**2**
			3000 160	900 -	3600 670	240000 300	1500 1800	60000 -	730 -	6000 60	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
403	4.0 m	13/03/2022	<4	<0.4	**1**	<1	**1**	**4**	<0.1	<1	**1**	**890**	<7	-	-	<3	<1	**350**	**90**	-	<2	<1
			3000 160	900 -	3600 670	240000 85	1500 1800	60000 -	730 -	6000 60	400000 250	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
404	0.5 m	13/03/2022	<4	<0.4	**44**	**71**	**73**	**94**	**0.2**	**5**	**170**	**2800**	<7	-	-	**7**	**3**	**4500**	**430**	-	<2	**5**
			3000 160	900 -	3600 670	240000 300	1500 1800	60000 -	730 -	6000 60	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
404	3.5 m	13/03/2022	<4	<0.4	<1	<1	<1	**2**	<0.1	<1	<1	**600**	<7	-	-	<3	<1	**280**	**60**	-	<2	<1
			3000 160	900 -	3600 670	240000 85	1500 1800	60000 -	730 -	6000 60	400000 250	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
501	0.4-0.7 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			3000 160	900 -	3600 670	240000 300	1500 1800	60000 -	730 -	6000 60	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
501	0.5 m	13/03/2022	**5**	<0.4	**7**	**27**	**180**	**130**	**0.2**	**7**	**150**	**3900**	<7	NT	NT	**7**	**2**	**6200**	**490**	-	<2	**6**
			3000 160	900 -	3600 670	240000 300	1500 1800	60000 -	730 -	6000 60	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
D9/JPS	-	13/03/2022	**5**	<0.4	**8**	**26**	**150**	**150**	**0.1**	**6**	**130**	**4300**	<7	NT	NT	**7**	**2**	**5200**	**500**	-	<2	**7**
			3000 160	900 -	3600 670	240000 300	1500 1800	60000 -	730 -	6000 60	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
502	0.3 m	13/03/2022	<4	**0.9**	**8**	**66**	**750**	**210**	**0.5**	**14**	**450**	**5300**	<7	-	-	**10**	**4**	**6300**	**560**	-	<2	**17**
			3000 160	900 -	3600 670	240000 300	1500 1800	60000 -	730 -	6000 60	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
502	0.3-1.2 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			3000 160	900 -	3600 670	240000 300	1500 1800	60000 -	730 -	6000 60	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
503	0.2-1.0 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			3000 160	900 -	3600 670	240000 300	1500 1800	60000 -	730 -	6000 60	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
503	0.7 m	13/03/2022	<4	<0.4	**7**	**53**	**140**	**250**	**0.1**	**23**	**170**	**4600**	**8**	-	-	**38**	**7**	**10000**	**520**	-	<2	**49**
			3000 160	900 -	3600 670	240000 300	1500 1800	60000 -	730 -	6000 60	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
503	1.2 m	13/03/2022	<4	**1**	**9**	**89**	**290**	**590**	**0.4**	**25**	**460**	**6200**	<7	-	-	**30**	**5**	**11000**	**830**	-	<2	**14**
			3000 160	900 -	3600 670	240000 300	1500 1800	60000 -	730 -	6000 60	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
503	1.2-2.0 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			3000 160	900 -	3600 670	240000 300	1500 1800	60000 -	730 -	6000 60	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
503F	1.2-2.0	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			3000 160	900 -	3600 670	240000 300	1500 1800	60000 -	730 -	6000 60	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
504	0.1-0.15	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			3000 160	900 -	3600 670	240000 300	1500 1800	60000 -	730 -	6000 60	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
504	0.3-1.0	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			3000 160	900 -	3600 670	240000 300	1500 1800	60000 -	730 -	6000 60	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
504	0.5 m	13/03/2022	**4**	<0.4	**7**	**53**	**790**	**160**	**0.8**	**8**	**260**	**5000**	<7	-	-	**9**	**3**	**5600**	**650**	-	<2	**13**
			3000 160	900 -	3600 670	240000 300	1500 1800	60000 -	730 -	6000 60	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
504	1.2-1.3 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			3000 160	900 -	3600 670	240000 300	1500 1800	60000 -	730 -	6000 60	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
505	0.2-1.1 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			3000 160	900 -	3600 670	240000 300	1500 1800	60000 -	730 -	6000 60	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
505	0.8 m	13/03/2022	**4**	<0.4	**8**	**65**	**530**	**1500**	**0.6**	**6**	**170**	**6000**	<7	-	-	**5**	**3**	**39000**	**650**	-	**3**	**8**
			3000 160	900 -	3600 670	240000 300	1500 1800	60000 -	730 -	6000 60	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
505	1.25-1.35 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			3000 160	900 -	3600 670	240000 300	1500 1800	60000 -	730 -	6000 60	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
506	0.1-0.15 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			3000 160	900 -	3600 670	240000 300	1500 1800	60000 -	730 -	6000 60	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
506	0.3-0.7 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			3000 160	900 -	3600 670	240000 300	1500 1800	60000 -	730 -	6000 60	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
506	1-1.4 m	13/03/2022	z	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			3000 160	900 -	3600 670	240000 300	1500 1800	60000 -	730 -	6000 60	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
506F	1-1.4 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			3000 160	900 -	3600 670	240000 300	1500 1800	60000 -	730 -	6000 60	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
506	1.2 m	13/03/2022	<4	<0.4	**170**	**100**	**300**	**150**	**1**	**7**	**250**	**2900**	<7	NT	NT	<3	**3**	**7600**	**680**	-	<2	**7**
			3000 160	900 -	3600 670	240000 300	1500 1800	60000 -	730 -	6000 60	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
D1/JPS	-	13/03/2022	**6**	**0.7**	**90**	**65**	**400**	**98**	**0.3**	**9**	**1100**	**2000**	<7	NT	NT	<3	**4**	**20000**	**370**	-	<2	**4**
			3000 160	900 -	3600 670	240000 300	1500 1800	60000 -	730 -	6000 60	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
S1	0 - 0.05 m	9/10/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			3000 160	900 -	3600 540	240000 300	1500 1800	60000 -	730 -	6000 260	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
S1/F	0 m	9/10/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			3000 160	900 -	3600 670	240000 300	1500 1800	60000 -	730 -	6000 60	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -

Lab result
HIL/HSL value EIL/ESL value

HIL/HSL exceedance EIL/ESL exceedance HIL/HSL and EIL/ESL exceedance ML exceedance ML and HIL/HSL or EIL/
Indicates that asbestos has been detected by the lab, refer to the lab report **Blue** = DC exceedance HSL 0-<1 Exceedance
Bold = Lab detections - = Not tested or No HIL/HSL/EIL/ESL (as applicable) or Not applicable NL = Non limiting AD = Asbestos detected
HIL = Health investigation level HSL = Health screening level (excluding DC) EIL = Ecological investigation level ESL = Ecological screeni

Notes:

a QA/QC replicate of sample listed directly below the primary sample
b Reported naphthalene laboratory result obtained from BTEXN suite
c Criteria applies to DDT only

Site Assessment Criteria (SAC):

Refer to the SAC section of report for information of SAC sources and rationale. Summary information as follows:

Douglas Partners
Geotechnics | Environment | Groundwater

Table B1: Summary of Laboratory Results – Metals, TRH, BTEX, PAH (Commercial/Industrial Land Use Comparison - HIL D / HSL D / EIL D/ ESL D) - Continued

			TRH						BTEX				PAH			
			TRH C6 - C10	TRH >C10-C16	F1 ((C6-C10)-BTEX)	F2 (>C10-C16 less Naphthalene)	F3 (>C16-C34)	F4 (>C34-C40)	Benzene	Toluene	Ethylbenzene	Total Xylenes	Naphthalene [b]	Benzo(a)pyrene (BaP)	Benzo(a)pyrene TEQ	Total PAHs
		PQL	25	50	25	50	100	100	0.2	0.5	1	1	1	0.05	0.5	0.05
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Initial Investigation - October 2021																
201	0.5 m	06/10/2021	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	**0.72**
			- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
201	2 m	06/10/2021	<25	<50	<25	<50	**320**	<100	<0.2	<0.5	<1	<1	<1	**0.3**	<0.5	**4.7**
			- -	- 170	630 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	NL 180	NL 370	- 33	40 -	4000 -
202	0.2 m	06/10/2021	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.4**	<0.5	**3.8**
			- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
D1/JRK	-	06/10/2021	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.5**	**0.7**	**5.8**
			- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
202	3.5 m	06/10/2021	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			- -	- 170	630 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	NL 180	NL 370	- 33	40 -	4000 -
203	0.5 m	06/10/2021	<25	<50	<25	<50	**220**	<100	<0.2	<0.5	<1	<1	<1	**4.2**	**7.2**	**69**
			- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
204	0.2 m	06/10/2021	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
204	4 m	06/10/2021	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			- -	- 170	NL 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	NL 180	NL 370	- 33	40 -	4000 -
205	0.5 m	06/10/2021	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
301	0.1 - 0.2 m	9/10/2021	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
302	0.5 - 0.6 m	9/10/2021	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.3**	<0.5	**2.8**
			- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
D1/DEW	-	9/10/2021	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.2**	<0.5	**2.4**
			- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
302	1.4 - 1.5 m	9/10/2021	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.1**	<0.5	**0.72**
			- -	- 170	370 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	NL 180	NL 370	- 33	40 -	4000 -
303	0.6 - 0.7 m	9/10/2021	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.2**	<0.5	**1.8**
			- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
304	0.5 - 0.6 m	9/10/2021	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
305	0.2 - 0.3 m	9/10/2021	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.53**	**0.8**	**5.5**
			- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
305	0.55 m	9/10/2021	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.4**	**0.7**	**5.4**
			- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
306	0.25 - 0.35 m	9/10/2021	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.77**	**1.2**	**6.8**
			- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
307	0.2 - 0.3 m	9/10/2021	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
Additional Investigation - March 2022																
401	1.0 m	13/03/2022	<25	<50	<25	<50	**170**	<100	<0.2	<0.5	<1	<1	**0.1**	**0.93**	**1.4**	**10**
			- -	- 170	370 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	NL 180	NL 370	- 33	40 -	4000 -
401	2.0 m	13/03/2022	<25	<50	<25	<50	**120**	<100	<0.2	<0.5	<1	<1	**0.2**	**0.99**	**1.5**	**13**
			- -	- 170	630 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	NL 180	NL 370	- 33	40 -	4000 -
401	3.5 m	13/03/2022	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
			- -	- 170	630 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	NL 180	NL 370	- 33	40 -	4000 -
402	2.0 m	13/03/2022	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	**0.1**
			- -	- 170	630 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	NL 180	NL 370	- 33	40 -	4000 -
402	3.5 m	13/03/2022	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
			- -	- 170	630 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	NL 180	NL 370	- 33	40 -	4000 -
403	0.3 m	13/03/2022	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	**0.1**	<0.5	**1.1**
			- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
403	1.5 m	13/03/2022	<25	<50	<25	<50	**110**	<100	<0.2	<0.5	<1	<1	<0.1	**0.07**	<0.5	**1.8**
			- -	- 170	370 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	NL 180	NL 370	- 33	40 -	4000 -
403	4.0 m	13/03/2022	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
			- -	- 170	630 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	NL 180	NL 370	- 33	40 -	4000 -
404	0.5 m	13/03/2022	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	**0.3**	<0.5	**3.5**
			- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
404	3.5 m	13/03/2022	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
			- -	- 170	630 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	NL 180	NL 370	- 33	40 -	4000 -
501	0.4-0.7 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
501	0.5 m	13/03/2022	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	**0.71**	**1.1**	**11**
			- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
D9/JPS	-	13/03/2022	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	**0.5**	**0.7**	**7**
			- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
502	0.3 m	13/03/2022	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	**0.3**	<0.5	**4.3**
			- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
502	0.3-1.2 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
503	0.2-1.0 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
503	0.7 m	13/03/2022	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	**0.69**	**1**	**9.5**
			- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
503	1.2 m	13/03/2022	<25	<50	<25	<50	**240**	<100	<0.2	<0.5	<1	<1	<0.1	**1.1**	**1.7**	**15**
			- -	- 170	370 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	NL 180	NL 370	- 33	40 -	4000 -
503	1.2-2.0 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	- 170	370 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	NL 180	NL 370	- 33	40 -	4000 -
503F	1.2-2.0	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	- 170	370 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	NL 180	NL 370	- 33	40 -	4000 -
504	0.1-0.15	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
504	0.3-1.0	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
504	0.5 m	13/03/2022	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	**0.3**	<0.5	**3.9**
			- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
504	1.2-1.3 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	- 170	370 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	NL 180	NL 370	- 33	40 -	4000 -
505	0.2-1.1 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
505	0.8 m	13/03/2022	<25	<50	<25	<50	**130**	<100	<0.2	<0.5	<1	<1	<0.1	**1.3**	**1.9**	**16**
			- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
505	1.25-1.35 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	- 170	370 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	NL 180	NL 370	- 33	40 -	4000 -
506	0.1-0.15 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
506	0.3-0.7 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
506	1-1.4 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	- 170	370 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	NL 180	NL 370	- 33	40 -	4000 -
506F	1-1.4 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	- 170	370 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	NL 180	NL 370	- 33	40 -	4000 -
506	1.2 m	13/03/2022	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	**0.83**	**1.3**	**10**
			- -	- 170	370 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	NL 180	NL 370	- 33	40 -	4000 -
D1/JPS	-	13/03/2022	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	**0.59**	**0.9**	**6.9**
			- -	- 170	370 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
S1	0 - 0.05 m	9/10/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
S1/F	0 m	9/10/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -

Lab result
HIL/HSL value EIL/ESL value

HIL/HSL exceedance EIL/ESL exceedance HIL/HSL and EIL/ESL exceedance ML exceedance ML and HIL/HSL or EIL
Indicates that asbestos has been detected by the lab, refer to the lab report **Blue** = DC exceedance HSL 0-<1 Exceedance
Bold = Lab detections - = Not tested or No HIL/HSL/EIL/ESL (as applicable) or Not applicable NL = Non limiting AD = Asbestos detecte
HIL = Health investigation level HSL = Health screening level (excluding DC) EIL = Ecological investigation level ESL = Ecological screer

Notes:

a QA/QC replicate of sample listed directly below the primary sample
b Reported naphthalene laboratory result obtained from BTEXN suite
c Criteria applies to DDT only

Site Assessment Criteria (SAC):

Refer to the SAC section of report for information of SAC sources and rationale. Summary information as follows:

Table B2: Summary of Laboratory Results – OCP, OPP, PCB, Asbestos (Commercial/Industrial Land Use Comparison- HIL D / HSL D / EIL D / ESL D)

			OCP											OPP	PCB							
			DDD	DDT+DDE+DDD [c]	DDE	DDT	Aldrin & Dieldrin	Total Chlordane	Endrin	Total Endosulfan	Heptachlor	Hexachlorobenzene	Methoxychlor	Chlorpyriphos	Arochlor 1016	Total PCB	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260
		PQL	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Initial Investigation - October 2021																						
201	0.5 m	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
201	2 m	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
202	0.2 m	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
D1/JRK	-	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
203	0.5 m	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
204	0.2 m	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
205	0.2 m	06/10/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
205	0.5 m	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
301	0.1 - 0.2 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
302	0.5 - 0.6 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
D1/DEW	-	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
302	1.4 - 1.5 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
303	0.6 - 0.7 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
304	0.5 - 0.6 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
305	0.2 - 0.3 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
305	0.55 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
305/F	0.55 m	9/10/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
306	0.25 - 0.35 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
307	0.2 - 0.3 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
Additional Investigation - March 2022																						
401	1.0 m	13/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
401	2.0 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
401	3.5 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
402	2.0 m	13/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
402	3.5 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
402	0.3 m	13/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
403	1.5 m	13/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
403	4.0 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
404	0.5 m	13/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
404	3.5 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
501	0.4-0.7	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
501	0.5 m	13/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
D9/JPS	-	13/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
502	0.3 m	13/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
502	0.3-1.2m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
503	0.2-1.0 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
503	0.7m	13/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
503	1.2 m	13/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
503	1.2-2.0 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
503	1.0-2.0 F	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
504	0.1-0.15 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
504	0.3-1.0 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
504	0.5 m	13/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
504	1.2-1.3	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
505	0.2-1.1	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
505	0.8	13/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
505	1.25-1.35	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
506	0.1-0.15	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
506	0.3-0.7	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
506	1-1.4	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
506	1-1.4F	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
506	1.2 m	13/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
D1/JPS	-	13/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
S1	0 - 0.05 m	9/10/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
S1/F	0 m	9/10/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -

Lab result
HIL/HSL value EIL/ESL value

HIL/HSL exceedance EIL/ESL exceedance HIL/HSL and EIL/ESL exceedance ML exceedance ML
Indicates that asbestos has been detected by the lab, refer to the lab report **Blue** = DC exceedance HSL 0-<1 Ex
Bold = Lab detections - = Not tested or No HIL/HSL/EIL/ESL (as applicable) or Not applicable NL = Non limiting AD =
HIL = Health investigation level HSL = Health screening level (excluding DC) EIL = Ecological investigation level ESL =

Notes:

a QA/QC replicate of sample listed directly below the primary sample

b Reported naphthalene laboratory result obtained from BTEXN suite

c Criteria applies to DDT only

Site Assessment Criteria (SAC):

Refer to the SAC section of report for information of SAC sources and rationale. Summary information as follows:

Table B2: Summary of Laboratory Results – OCP, OPP, PCB, Asbestos (Commercial/Industrial Land Use Comparison- HIL D / HSL D / EIL D / ESL D) - Continued

			Asbestos			Asbestos						
			Asbestos ID in soil >0.1g/kg	Trace Analysis	Asbestos (50 g)	Asbestos ID in soil >0.1g/kg	Trace Analysis	Asbestos ID in soil <0.1g/kg	ACM >7mm Estimation	FA and AF Estimation	FA and AF Estimation	Asbestos (500 ml)
		PQL									<0.001	0.001
Sample ID	Depth	Sample Date	-	-	-	-	-	-	g	g	%(w/w)	-
Initial Investigation - October 2021												
201	0.5 m	06/10/2021	-	-	-	-	-	-	-	-	-	-
201	2 m	06/10/2021	-	-	-	-	-	-	-	-	-	-
202	0.2 m	06/10/2021	-	-	-	-	-	-	-	-	-	-
D1/JRK	-	06/10/2021	-	-	-	-	-	-	-	-	-	-
203	0.5 m	06/10/2021	-	-	-	-	-	-	-	-	-	-
204	0.2 m	06/10/2021	-	-	-	-	-	-	-	-	-	-
205	0.2 m	06/10/2021	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD
205	0.5 m	06/10/2021	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD
301	0.1 - 0.2 m	9/10/2021	-	-	-	-	-	-	-	-	-	-
302	0.5 - 0.6 m	9/10/2021	-	-	-	-	-	-	-	-	-	-
D1/DEW	-	9/10/2021	-	-	-	-	-	-	-	-	-	-
302	1.4 - 1.5 m	9/10/2021	-	-	-	-	-	-	-	-	-	-
303	0.6 - 0.7 m	9/10/2021	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD
304	0.5 - 0.6 m	9/10/2021	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD
305	0.2 - 0.3 m	9/10/2021	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD
305	0.55 m	9/10/2021	-	-	-	NAD	NAD	**AD**	NT	**0.033**	**0.0049**	NAD
305/F	0.55 m	9/10/2021	-	**AD**	**AD**	-	-	-	-		-	-
306	0.25 - 0.35 m	9/10/2021	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD
307	0.2 - 0.3 m	9/10/2021	-	-	-	-	-	-	-	-	-	-
Additional Investigation - March 2022												
401	1.0 m	13/03/2022	NAD	NAD	NAD	-	-	-	-	-	-	-
401	2.0 m	13/03/2022	-	-	-	-	-	-	-	-	-	-
401	3.5 m	13/03/2022	-	-	-	-	-	-	-	-	-	-
402	2.0 m	13/03/2022	NAD	NAD	NAD	-	-	-	-	-	-	-
402	3.5 m	13/03/2022	-	-	-	-	-	-	-	-	-	-
402	0.3 m	13/03/2022	NAD	NAD	NAD	-	-	-	-	-	-	-
403	1.5 m	13/03/2022	NAD	NAD	NAD	-	-	-	-	-	-	-
403	4.0 m	13/03/2022	-	-	-	-	-	-	-	-	-	-
404	0.5 m	13/03/2022	NAD	NAD	NAD	-	-	-	-	-	-	-
404	3.5 m	13/03/2022	-	-	-	-	-	-	-	-	-	-
501	0.4-0.7	13/03/2022	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD
501	0.5 m	13/03/2022	-	-	-	-	-	-	-	-	-	-
D9/JPS	-	13/03/2022	-	-	-	-	-	-	-	-	-	-
502	0.3 m	13/03/2022	-	-	-	-	-	-	-	-	-	-
502	0.3-1.2m	13/03/2022	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD
503	0.2-1.0 m	13/03/2022	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD
503	0.7m	13/03/2022	-	-	-	-	-	-	-	-	-	-
503	1.2 m	13/03/2022	-	-	-	-	-	-	-	-	-	-
503	1.2-2.0 m	13/03/2022	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD
503	1.0-2.0 F	13/03/2022	-	**AD**	**AD**	-	-	-	-	-	-	-
504	0.1-0.15 m	13/03/2022	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD
504	0.3-1.0 m	13/03/2022	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD
504	0.5 m	13/03/2022	-	-	-	-	-	-	-	-	-	-
504	1.2-1.3	13/03/2022	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD
505	0.2-1.1	13/03/2022	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD
505	0.8	13/03/2022	-	-	-	-	-	-	-	-	-	-
505	1.25-1.35	13/03/2022	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD
506	0.1-0.15	13/03/2022	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD
506	0.3-0.7	13/03/2022	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD
506	1-1.4	13/03/2022	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD
506	1-1.4F	13/03/2022	-	**AD**	**AD**	-	-	-	-	-	-	-
506	1.2 m	13/03/2022	-	-	-	-	-	-	-	-	-	-
D1/JPS	-	13/03/2022	-	-	-	-	-	-	-	-	-	-
S1	0 - 0.05 m	9/10/2021	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD
S1/F	0 m	9/10/2021	-	**AD**	**AD**	-	-	-	-	-	-	-

Lab result
HIL/HSL value EIL/ESL value

HIL/HSL exceedance EIL/ESL exceedance HIL/HSL and EIL/ESL exceedance ML exceedance ML and HIL/HSL or EIL/ESL
Indicates that asbestos has been detected by the lab, refer to the lab report **Blue** = DC exceedance HSL 0-<1 Exceedance
Bold = Lab detections - = Not tested or No HIL/HSL/EIL/ESL (as applicable) or Not applicable NL = Non limiting AD = Asbestos detected N
HIL = Health investigation level HSL = Health screening level (excluding DC) EIL = Ecological investigation level ESL = Ecological screening l

Notes:

a QA/QC replicate of sample listed directly below the primary sample

b Reported naphthalene laboratory result obtained from BTEXN suite

c Criteria applies to DDT only

Site Assessment Criteria (SAC):

Refer to the SAC section of report for information of SAC sources and rationale. Summary information as follows:

Table B3: Summary of Laboratory Results – VOC (Commercial/Industrial Land Use Comparison - HIL D / HSL D / EIL D)

| | | | VOC | | |

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Table B4: Summary of Laboratory Results in Soil (Waste Classification Comparison)

			Metals																		TRH					BTEX					
			Arsenic	Aluminium	Antimony	Barium	Beryllium	Boron	Cadmium	Total Chromium	TCLP Total Chromium	Cobalt	Copper	Lead	TCLP Lead	Manganese	Mercury (inorganic)	Molybdenum	Nickel	Selenium (Total)	Tin (inorganic, SnIV)	Zinc	TRH C6 - C9	TRH C10 - C14	TRH C15 - C28	TRH C29 - C36	C10-C36 recoverable hydrocarbons	Benzene	Toluene	Ethylbenzene	m+p-Xylene	o-Xylene	Xylenes (total)
		PQL	4	10	7	1	1	3	0.4	1		1	1	1	0.03	1	0.1	1	1	2	1	1	25	50	100	100	50	0.2	0.5	1	2	1	3
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/L	mg/kg	mg/kg	mg/kg	mg/L	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
201	0.5 m	06/10/2021	**4**	-	<7	**110**	**1**	<3	<0.4	**7**	-	**3**	**9**	**10**	-	**550**	<0.1	<1	**4**	<2	<1	**45**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3
201	2 m	06/10/2021	<4	-	<7	**93**	<1	**6**	<0.4	**7**	-	**9**	**58**	**170**	<0.03	**110**	**0.4**	<1	**14**	<2	**17**	**130**	<25	<50	**260**	**100**	**360**	<0.2	<0.5	<1	<2	<1	<3
202	0.2 m	06/10/2021	<4	-	<7	**130**	<1	**20**	<0.4	**6**	-	**4**	**26**	**63**	-	**1600**	<0.1	<1	**16**	<4	**2**	**57**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3
D1/JRK	0 m	06/10/2021	<4	-	<7	**130**	<1	**30**	<0.4	**6**	-	**4**	**37**	**85**	-	**240**	**0.1**	**1**	**21**	<2	**4**	**82**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3
202	3.5 m	06/10/2021	<4	-	<7	**2**	<1	<3	<0.4	**2**	-	<1	<1	**1**	-	**4**	<0.1	<1	**1**	<2	<1	**2**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3
203	0.5 m	06/10/2021	<4	-	<7	**100**	<1	**5**	**0.4**	**14**	-	**6**	**93**	**470**	**0.2**	**360**	**0.2**	<1	**15**	<2	**12**	**230**	<25	<50	**130**	**120**	**250**	<0.2	<0.5	<1	<2	<1	<3
204	0.2 m	06/10/2021	**6**	-	<7	**26**	<1	<3	<0.4	**5**	-	**3**	**7**	**9**	-	**280**	<0.1	<1	**4**	<2	**1**	**17**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3
204	4 m	06/10/2021	**4**	-	<7	**3**	<1	<3	<0.4	**2**	-	**2**	<1	**1**	-	**8**	<0.1	<1	**2**	<2	<1	**3**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3
205	0.2 m	06/10/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
205	0.5 m	06/10/2021	<4	-	<7	**12**	<1	<3	<0.4	**2**	-	**9**	**7**	**14**	-	**56**	<0.1	<1	**1**	<2	<1	**18**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3
301	0.1 - 0.2 m	9/10/2021	**5**	-	<7	**34**	<1	<3	<0.4	**5**	-	**3**	**3**	**20**	-	**370**	<0.1	<1	**3**	<2	<1	**27**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3
302	0.5 - 0.6 m	9/10/2021	<4	-	<7	**89**	<1	**3**	<0.4	**3**	-	**2**	**44**	**190**	**0.07**	**230**	**0.1**	<1	**6**	<2	**7**	**160**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3
D1/DEW	-	9/10/2021	<4	-	<7	**60**	<1	<3	<0.4	**6**	-	**2**	**29**	**140**	-	**330**	**0.1**	<1	**4**	<2	**5**	**100**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3
302	1.4 - 1.5 m	9/10/2021	<4	-	<7	**9**	<1	<3	<0.4	<1	-	<1	**10**	**4**	-	**5**	<0.1	<1	<1	<2	<1	**4**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3
303	0.6 - 0.7 m	9/10/2021	<4	-	<7	**41**	<1	<3	<0.4	**5**	-	**1**	**25**	**130**	**0.2**	**160**	**0.1**	<1	**3**	<2	**2**	**84**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3
304	0.5 - 0.6 m	9/10/2021	<4	-	<7	**4**	<1	<3	<0.4	**1**	-	<1	<1	**3**	-	**33**	<0.1	<1	<1	<2	<1	**4**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3
305	0.2 - 0.3 m	9/10/2021	**4**	-	<7	**96**	<1	**9**	<0.4	**6**	-	**13**	**88**	**1100**	**0.77**	**180**	**0.3**	<1	**12**	<2	**9**	**260**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3
305	0.55 m	9/10/2021	<4	-	<7	**130**	<1	**6**	<0.4	**4**	-	**3**	**50**	**580**	-	**180**	**0.2**	<1	**7**	<2	**7**	**150**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3
306	0.25 - 0.35 m	9/10/2021	<4	-	<7	**100**	<1	**5**	<0.4	**7**	-	**5**	**60**	**310**	**0.2**	**410**	**0.3**	<1	**9**	<2	**17**	**300**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3
307	0.2 - 0.3 m	9/10/2021	**5**	-	<7	**8**	<1	<3	<0.4	**6**	-	**10**	**9**	**6**	-	**170**	<0.1	<1	**9**	<2	<1	**29**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3
401	1 m	13/03/2022	<4	**4100**	<7	-	-	**5**	<0.4	**7**	-	**8**	**150**	**120**	**0.05**	**180**	**0.3**	-	**17**	**<2**	**8**	**210**	<25	<50	**120**	<100	**120**	<0.2	<0.5	<1	<2	<1	<1
401	2 m	13/03/2022	<4	**5100**	<7	-	-	<3	<0.4	**8**	-	**12**	**230**	**65**	-	**140**	**0.2**	-	**21**	**<2**	**4**	**68**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1
401	3.5 m	13/03/2022	<4	**910**	<7	-	-	<3	<0.4	**1**	-	**<1**	<1	**2**	-	**3**	<0.1	-	**1**	**3**	**<1**	**2**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1
402	2 m	13/03/2022	<4	**11000**	<7	-	-	**7**	<0.4	**7**	-	**18**	**52**	**160**	<0.03	**68**	**0.5**	-	**25**	**<2**	**15**	**240**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1
402	3.5 m	13/03/2022	<4	**830**	<7	-	-	<3	<0.4	<1	-	<1	<1	<1	-	**4**	<0.1	-	**1**	**<2**	**<1**	**2**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1
403	0.3 m	13/03/2022	<4	**3300**	<7	-	-	<3	<0.4	**5**	-	**2**	**16**	**58**	-	**200**	<0.1	-	**3**	**<2**	**3**	**50**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1
403	1.5 m	13/03/2022	**23**	**4000**	<7	-	-	<3	<0.4	**7**	-	**2**	**16**	**97**	-	**280**	**0.1**	-	**5**	**<2**	**2**	**360**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1
403	4 m	13/03/2022	<4	**890**	<7	-	-	<3	<0.4	**1**	-	**<1**	<1	**1**	-	**4**	<0.1	-	<1	<2	<1	**1**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1
404	0.5 m	13/03/2022	<4	**2800**	<7	-	-	**7**	<0.4	**44**	-	**3**	**71**	**73**	-	**94**	**0.2**	-	**5**	**<2**	**5**	**170**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1
404	3.5 m	13/03/2022	<4	**600**	<7	-	-	<3	<0.4	<1	-	<1	<1	<1	-	<1	<0.1	-	<1	<2	<1	<1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1
501	0.5 m	13/03/2022	**5**	**3900**	<7	-	-	**7**	<0.4	**7**	-	**2**	**27**	**180**	**0.07**	**130**	**0.2**	-	**7**	**<2**	**6**	**150**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1
D9/JPS	D9/JPS	13/03/2022	**5**	**4300**	<7	-	-	**7**	<0.4	**8**	-	**2**	**26**	**150**	-	**150**	**0.1**	-	**6**	**<2**	**7**	**130**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1
502	0.3 m	13/03/2022	<4	**5300**	<7	-	-	**10**	**0.9**	**8**	-	**4**	**66**	**750**	**0.4**	**210**	**0.5**	-	**14**	**<2**	**17**	**450**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1
503	0.7 m	13/03/2022	<4	**4600**	**8**	-	-	**38**	<0.4	**7**	-	**7**	**53**	**140**	**0.2**	**250**	**0.1**	-	**23**	**<2**	**49**	**170**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1
503	1.2 m	13/03/2022	<4	**6200**	<7	-	-	**30**	**1**	**9**	-	**5**	**89**	**290**	**0.04**	**590**	**0.4**	-	**25**	**<2**	**14**	**460**	<25	**52**	**140**	**120**	**320**	<0.2	<0.5	<1	<2	<1	<1
504	0.5 m	13/03/2022	**4**	**5000**	<7	-	-	**9**	<0.4	**7**	-	**3**	**53**	**790**	**0.3**	**160**	**0.8**	-	**8**	**<2**	**13**	**260**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1
505	0.8 m	13/03/2022	**4**	**6000**	<7	-	-	**5**	<0.4	**8**	-	**3**	**65**	**530**	**0.38**	**1500**	**0.6**	-	**6**	**3**	**8**	**170**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1
506	1.2 m	13/03/2022	<4	**2900**	<7	-	-	<3	<0.4	**170**	**0.08**	**3**	**100**	**300**	**0.2**	**150**	**1**	-	**7**	**<2**	**7**	**250**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1
D1/JPS	-	13/03/2022	**6**	**2000**	<7	-	-	<3	**0.7**	**90**	-	**4**	**65**	**400**	-	**98**	**0.3**	-	**9**	**<2**	**4**	**1100**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1
501	0.4-0.7 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
502	0.3-1.2 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
503	0.2-1.0 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
503	1.2-2.0 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
504	0.1-0.15 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
504	0.3-1.0	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
504	1.2-1.3 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
505	0.2-1.1 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
505	1.25-1.35 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
506	0.1-0.15 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
506	0.3-0.7 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
506	1-1.4 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
506	1-1.4F	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
503	1.2-2.0F	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CT1			100	NC	NC	NC	20	NC	20	100	-	NC	NC	100	-	NC	4	100	40	20	NC	NC	650	NC	NC	NC	10000	10	288	600	NC	NC	1000
SCC1			500	NC	NC	NC	100	NC	100	1900	1900	NC	NC	1500	1500	NC	50	1000	1050	50	NC	NC	650	NC	NC	NC	10000	18	518	1080	NC	NC	1800
TCLP1			N/A	NC	NC	NC	N/A	NC	N/A	N/A	5	NC	NC	N/A	5	NC	N/A	N/A	N/A	N/A	NC	NC	N/A	NC	NC	NC	N/A	N/A	N/A	N/A	NC	NC	N/A
CT2			400	NC	NC	NC	80	NC	80	400	-	NC	NC	400	-	NC	16	400	160	80	NC	NC	2600	NC	NC	NC	40000	40	1152	2400	NC	NC	4000
SCC2			2000	NC	NC	NC	400	NC	400	7600	7600	NC	NC	6000	6000	NC	200	4000	4200	200	NC	NC	2600	NC	NC	NC	40000	72	2073	4320	NC	NC	7200
TCLP2			N/A	NC	NC	NC	N/A	NC	N/A	N/A	20	NC	NC	N/A	20	NC	N/A	N/A	N/A	N/A	NC	NC	N/A	NC	NC	NC	N/A	N/A	N/A	N/A	NC	NC	N/A

CT1 exceedance | TCLP1 and/or SCC1 exceedance | CT2 exceedance | TCLP2 and/or SCC2 exceedance | Asbestos detection

NT = Not tested NL = Non limiting NC = No criteria NA = Not applicable

Notes:

a QA/QC replicate of sample listed directly below the primary sample

b Total chromium used as initial screen for chromium(VI).

c Total recoverable hydrocarbons (TRH) used as an initial screen for total petroleum hydrocarbons (TPH)

d Criteria for scheduled chemicals used as an initial screen

e Criteria for Chlorpyrifos used as initial screen

f All criteria are in the same units as the reported results

PQL Practical quantitation limit

CT1 NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values of specific contaminant concentration (SCC) for classification without TCLP: General solid waste

SCC1 NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: General solid waste

TCLP1 NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: General solid waste

CT2 NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values of specific contaminant concentration (SCC) for classification without TCLP: Restricted solid waste

SCC2 NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: Restricted solid waste

TCLP2 NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: Restricted solid waste

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Table B4: Summary of Laboratory Results in Soil (Waste Classification Comparison) - Continued

			PAH																												OCP		OPP
			Benzo(a)pyrene (BaP)	TCLP Benzo(a)pyrene (BaP)	Acenaphthene	TCLP Acenaphthene	Acenaphthylene	TCLP Acenaphthylene	Anthracene	TCLP Anthracene	Benzo(a)anthracene	TCLP Benzo(a)anthracene	Benzo(b,j+k)fluoranthene	TCLP Benzo(b,j+k)fluoranthene	Benzo(g,h,i)perylene	TCLP Benzo(g,h,i)perylene	Chrysene	TCLP Chrysene	Dibenzo(a,h)anthracene	TCLP Dibenzo(a,h)anthracene	Fluoranthene	TCLP Fluoranthene	Fluorene	TCLP Fluorene	Indeno(1,2,3-c,d)pyrene	TCLP Indeno(1,2,3-c,d)pyrene	Naphthalene	TCLP Naphthalene	Phenanthrene	TCLP Phenanthrene	Pyrene	TCLP Pyrene	Total PAHs	TCLP Total PAHs	Total Endosulfan	Total Analysed OCP	Total Analysed OPP
		PQL	0.05	0.001	0.1	0.001	0.1	0.001	0.1	0.001	0.1	0.001	0.2	0.002	0.1	0.001	0.1	0.001	0.1	0.001	0.1	0.001	0.1	0.001	0.1	0.001	1	0.001	0.1	0.001	0.1	0.001	0.05	0.001	0.1	0.1	0.1
Sample ID	Depth	Sample Date	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/kg	mg/kg
Initial Investigation - October 2021																																					
201	0.5 m	06/10/2021	<0.05	-	<0.1	-	<0.1	-	<0.1	-	**0.1**	-	<0.2	-	<0.1	-	**0.2**	-	**0.4**	-	<0.1	-	**0.1**	-	**0.5**	-	<0.1	-	<0.1	-	**0.4**	-	**0.1**	-	**0.72**	-	<0.1	<0.1	<0.1
201	2 m	06/10/2021	**0.3**	-	<0.1	-	<0.1	-	**0.1**	-	**0.9**	-	**0.6**	-	**0.2**	-	**0.4**	-	<0.1	-	**0.5**	-	<0.1	-	**0.1**	-	<1	-	**0.9**	-	**0.5**	-	**4.7**	-	<0.1	<0.1	<0.1
202	0.2 m	06/10/2021	**0.4**	-	<0.1	-	<0.1	-	<0.1	-	**0.4**	-	**0.5**	-	**0.3**	-	**0.3**	-	<0.1	-	**0.8**	-	<0.1	-	**0.2**	-	<1	-	**0.2**	-	**0.8**	-	**3.8**	-	<0.1	<0.1	<0.1
D1/JRK	0 m	06/10/2021	**0.5**	-	<0.1	-	<0.1	-	<0.1	-	**0.7**	-	**0.8**	-	**0.4**	-	**0.4**	-	<0.1	-	**1.2**	-	<0.1	-	**0.3**	-	<1	-	**0.4**	-	**1.2**	-	**5.8**	-	<0.1	<0.1	<0.1
202	3.5 m	06/10/2021	<0.05	-	<0.1	-	<0.1	-	<0.1	-	<0.2	-	<0.2	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<1	-	<0.1	-	<0.1	-	<0.05	-	-	-	-
203	0.5 m	06/10/2021	**4.2**	<0.001	<0.1	<0.001	**0.2**	<0.001	**1.2**	<0.001	**6.2**	<0.001	**15**	<0.002	**3.8**	<0.001	**3.8**	<0.001	**0.6**	<0.001	**13**	<0.001	<0.1	<0.001	**2.5**	<0.001	<1	<0.001	**4.2**	<0.001	**14**	<0.001	**69**	<0.001	<0.1	<0.1	<0.1
204	0.2 m	06/10/2021	<0.05	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.2	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<1	-	<0.1	-	<0.1	-	<0.05	-	<0.1	<0.1	<0.1
204	4 m	06/10/2021	<0.05	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.2	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<1	-	<0.1	-	<0.1	-	<0.05	-	-	-	-
205	0.2 m	06/10/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
205	0.5 m	06/10/2021	<0.05	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.2	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<1	-	<0.1	-	<0.1	-	<0.05	-	<0.1	<0.1	<0.1
301	0.1 - 0.2 m	9/10/2021	<0.05	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.2	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<1	-	<0.1	-	<0.1	-	<0.05	-	<0.1	<0.1	<0.1
302	0.5 - 0.6 m	9/10/2021	**0.3**	-	<0.1	-	<0.1	-	<0.1	-	**0.3**	-	**0.7**	-	**0.2**	-	**0.2**	-	<0.1	-	**0.4**	-	<0.1	-	**0.2**	-	<1	-	**0.2**	-	**0.4**	-	**2.8**	-	<0.1	<0.1	<0.1
D1/DEW	-	9/10/2021	**0.2**	-	<0.1	-	<0.1	-	<0.1	-	**0.2**	-	**0.6**	-	**0.2**	-	**0.2**	-	<0.1	-	**0.4**	-	<0.1	-	**0.1**	-	<1	-	<0.1	-	**0.4**	-	**2.4**	-	<0.1	<0.1	<0.1
302	1.4 - 1.5 m	9/10/2021	**0.1**	-	<0.1	-	<0.1	-	<0.1	-	**0.3**	-	**0.3**	-	<0.1	-	<0.1	-	<0.1	-	**0.2**	-	<0.1	-	<0.1	-	<1	-	<0.1	-	**0.1**	-	**0.72**	-	<0.1	<0.1	<0.1
303	0.6 - 0.7 m	9/10/2021	**0.2**	-	<0.1	-	<0.1	-	<0.1	-	**0.2**	-	**0.4**	-	**0.1**	-	**0.1**	-	<0.1	-	**0.3**	-	<0.1	-	**0.1**	-	<1	-	**0.1**	-	**0.2**	-	**1.8**	-	<0.1	<0.1	<0.1
304	0.5 - 0.6 m	9/10/2021	<0.05	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.2	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<1	-	<0.1	-	<0.1	-	<0.05	-	<0.1	<0.1	<0.1
305	0.2 - 0.3 m	9/10/2021	**0.53**	-	<0.1	-	<0.1	-	<0.1	-	**0.6**	-	**1**	-	**0.4**	-	**0.4**	-	<0.1	-	**0.8**	-	<0.1	-	**0.3**	-	<1	-	**0.4**	-	**0.8**	-	**5.5**	-	<0.1	<0.1	<0.1
305	0.55 m	9/10/2021	**0.4**	-	<0.1	-	<0.1	-	**0.1**	-	**0.6**	-	**1**	-	**0.3**	-	**0.4**	-	<0.1	-	**0.9**	-	<0.1	-	**0.2**	-	<1	-	**0.3**	-	**0.8**	-	**5.4**	-	<0.1	<0.1	<0.1
306	0.25 - 0.35 m	9/10/2021	**0.77**	-	<0.1	-	<0.1	-	<0.1	-	**0.7**	-	**2**	-	**0.6**	-	**0.5**	-	**0.1**	-	**0.7**	-	<0.1	-	**0.5**	-	<1	-	**0.2**	-	**0.7**	-	**6.8**	-	<0.1	<0.1	<0.1
307	0.2 - 0.3 m	9/10/2021	<0.05	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.2	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<1	-	<0.1	-	<0.1	-	<0.05	-	<0.1	<0.1	<0.1
Additional Field Work - March 2022																																					
401	1 m	13/03/2022	**0.93**	<0.001	<0.1	<0.001	**0.2**	<0.001	**0.2**	<0.001	**1.6**	<0.001	**2**	<0.002	**0.6**	<0.001	**0.9**	<0.001	**0.1**	<0.001	**1.4**	<0.001	<0.1	<0.001	**0.4**	<0.001	**0.1**	<0.001	**0.7**	<0.001	**1.4**	<0.001	**10**	<0.001	<0.1	<0.1	<0.1
401	2 m	13/03/2022	**0.99**	<0.001	<0.1	<0.001	**0.3**	<0.001	**0.4**	<0.001	**2.2**	<0.001	**2.1**	<0.002	**0.6**	<0.001	**1**	<0.001	<0.1	<0.001	**1.9**	<0.001	<0.1	<0.001	**0.4**	<0.001	**0.2**	<0.001	**1**	<0.001	**1.8**	<0.001	**13**	<0.001	-	-	-
401	3.5 m	13/03/2022	<0.05	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.2	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.05	-	-	-	-
402	2 m	13/03/2022	<0.05	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.2	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	**0.1**	-	<0.1	<0.1	<0.1
402	3.5 m	13/03/2022	<0.05	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.2	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.05	-	-	-	-
403	0.3 m	13/03/2022	**0.1**	-	<0.1	-	<0.1	-	<0.1	-	**0.1**	-	**0.3**	-	**0.1**	-	**0.1**	-	<0.1	-	**0.2**	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	**0.2**	-	**1.1**	-	<0.1	<0.1	<0.1
403	1.5 m	13/03/2022	**0.07**	-	<0.1	-	<0.1	-	<0.1	-	**0.2**	-	**0.2**	-	<0.1	-	**0.2**	-	<0.1	-	**0.3**	-	<0.1	-	<0.1	-	<0.1	-	**0.5**	-	**0.3**	-	**1.8**	-	<0.1	<0.1	<0.1
403	4 m	13/03/2022	<0.05	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.2	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.05	-	-	-	-
404	0.5 m	13/03/2022	**0.3**	-	<0.1	-	<0.1	-	<0.1	-	**0.4**	-	**0.7**	-	**0.3**	-	**0.4**	-	<0.1	-	**0.6**	-	<0.1	-	**0.2**	-	<0.1	-	**0.1**	-	**0.6**	-	**3.5**	-	<0.1	<0.1	<0.1
404	3.5 m	13/03/2022	<0.05	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.2	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.05	-	-	-	-
501	0.5 m	13/03/2022	**0.71**	-	<0.1	-	**0.1**	-	**0.3**	-	**1.5**	-	**2**	NT	**0.4**	-	**0.8**	-	<0.1	-	**2.1**	-	<0.1	-	**0.3**	-	<0.1	-	**1.3**	-	**1.9**	-	**11**	-	<0.1	<0.1	<0.1
D9/JPS	D9/JPS	13/03/2022	**0.5**	-	<0.1	-	<0.1	-	**0.2**	-	**0.8**	-	**1**	NT	**0.3**	-	**0.5**	-	<0.1	-	**1.3**	-	<0.1	-	**0.2**	-	<0.1	-	**0.8**	-	**1.2**	-	**7**	-	<0.1	<0.1	<0.1
502	0.3 m	13/03/2022	**0.3**	-	<0.1	-	<0.1	-	**0.5**	-	**0.8**	-	**0.3**	-	**0.4**	-	<0.1	-	**0.8**	-	<0.1	-	**0.2**	-	<0.1	-	**0.3**	-	**0.8**	-	**4.3**	-	<0.1	<0.1	<0.1
503	0.7 m	13/03/2022	**0.69**	-	<0.1	-	<0.1	-	**0.2**	-	**0.8**	-	**1**	-	**0.6**	-	**0.8**	-	<0.1	-	**1.9**	-	<0.1	-	**0.4**	-	<0.1	-	**0.8**	-	**1.8**	-	**9.5**	-	<0.1	<0.1	<0.1
503	1.2 m	13/03/2022	**1.1**	<0.001	<0.1	<0.001	**0.1**	<0.001	**0.2**	<0.001	**1.6**	<0.001	**2.4**	<0.002	**0.9**	<0.001	**1.2**	<0.001	**0.1**	<0.001	**2.8**	<0.001	<0.1	<0.001	**0.6**	<0.001	<0.1	<0.001	**1.1**	<0.001	**2.8**	<0.001	**15**	<0.001	<0.1	<0.1	<0.1
504	0.5 m	13/03/2022	**0.3**	-	<0.1	-	**0.1**	-	**0.7**	-	**1.6**	-	**0.7**	-	**0.2**	-	**0.3**	-	<0.1	-	**0.5**	-	<0.1	-	**0.2**	-	<0.1	-	**0.2**	-	**0.6**	-	**3.9**	-	<0.1	<0.1	<0.1
505	0.8 m	13/03/2022	**1.3**	<0.001	<0.1	<0.001	**0.2**	<0.001	**0.4**	<0.001	**2.2**	<0.001	**2.4**	<0.002	**0.7**	<0.001	**1.4**	<0.001	**0.1**	<0.001	**2.6**	<0.001	**0.1**	<0.001	**0.5**	<0.001	<0.1	<0.001	**1**	<0.001	**2.6**	<0.001	**16**	<0.001	<0.1	<0.1	<0.1
506	1.2 m	13/03/2022	**0.83**	<0.001	<0.1	<0.001	**0.1**	<0.001	**0.2**	<0.001	**1.4**	<0.001	**2**	<0.002	**0.5**	<0.001	**0.9**	<0.001	**0.1**	<0.001	**1.7**	<0.001	<0.1	<0.001	**0.4**	<0.001	<0.1	<0.001	**0.6**	<0.001	**1.7**	<0.001	**10**	<0.001	<0.1	<0.1	<0.1
D1/JPS	-	13/03/2022	**0.59**	-	<0.1	-	**0.1**	-	**0.1**	-	**1**	-	**1**	-	**0.4**	-	**0.6**	-	<0.1	-	**1.1**	-	<0.1	-	**0.3**	-	<0.1	-	**0.3**	-	**1.1**	-	**6.9**	-	<0.1	<0.1	<0.1
501	0.4-0.7 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
502	0.3-1.2 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
503	0.2-1.0 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
503	1.2-2.0 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
504	0.1-0.15 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
504	0.3-1.0	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
504	1.2-1.3 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
505	0.2-1.1 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
505	1.25-1.35 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
506	0.1-0.15 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
506	0.3-0.7 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
506	1-1.4 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
506	1-1.4F	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
503	1.2-2.0F	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Waste Classification Criteria [f]																																					
CT1			0.8	0.8	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	200	200	60	<50	4
SCC1			10	10	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	200	200	108	<50	7.5
TCLP1			N/A	N/A	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	N/A	N/A	N/A	N/A	N/A
CT2			3.2	3.2	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	800	800	240	<50	16
SCC2			23	23	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	800	800	432	<50	30
TCLP2			N/A	N/A	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	N/A	N/A	N/A	N/A	N/A

CT1 exceedance | TCLP1 and/or SCC1 exceedance | CT2 exceedance | TCLP2 and/or SCC2 exceedance | Asbestos detection

NT = Not tested NL = Non limiting NC = No criteria NA = Not applicable

Notes:

a QA/QC replicate of sample listed directly below the primary sample

b Total chromium used as initial screen for chromium(VI).

c Total recoverable hydrocarbons (TRH) used as an initial screen for total petroleum hydrocarbons (TPH)

d Criteria for scheduled chemicals used as an initial screen

e Criteria for Chlorpyrifos used as initial screen

f All criteria are in the same units as the reported results

PQL Practical quantitation limit

CT1 NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values of specific contaminant concentration (SCC) for classification without TCLP: General solid waste

SCC1 NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: General solid waste

TCLP1 NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: General solid waste

CT2 NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values of specific contaminant concentration (SCC) for classification without TCLP: Restricted solid waste

SCC2 NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: Restricted solid waste

TCLP2 NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: Restricted solid waste

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Table B4: Summary of Laboratory Results in Soil (Waste Classification Comparison) - Continued

			PCB								Asbestos										VOC													
			Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	Total PCB	Asbestos ID in soil >0.1g/kg	Trace Analysis	Asbestos ID in soil >0.1g/kg	Asbestos ID in soil <0.1g/kg	Trace Analysis	ACM >7mm Estimation	FA and AF Estimation	FA and AF Estimation	Total Asbestos#1	Asbestos ID in materials	Total Asbestos	carbon tetrachloride	Monochlorobenzene	Chloroform	1,2-dichlorobenzene	1,4-dichlorobenzene	1,2-dichloroethane	1,1-Dichloroethene	Styrene (vinylbenzene)	1,1,1,2-tetrachloroethane	1,1,2,2-tetrachloroethane	tetrachloroethene	1,1,1-trichloroethane	1,1,2-trichloroethane	1,1,2-trichloroethylene	Vinyl Chloride
		PQL	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1							<0.001	<0.1		0.001	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	-	-	-	-	-	g	g	%(w/w)	g/kg	-	-	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
201	0.5 m	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
201	2 m	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
202	0.2 m	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
D1/JRK	0 m	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
202	3.5 m	06/10/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
203	0.5 m	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
204	0.2 m	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
204	4 m	06/10/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
205	0.2 m	06/10/2021	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD	-	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-
205	0.5 m	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	NAD	NAD	NAD	NT	NT	-	NAD	-	NAD	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
301	0.1 - 0.2 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
302	0.5 - 0.6 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
D1/DEW	-	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
302	1.4 - 1.5 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
303	0.6 - 0.7 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	NAD	NAD	NAD	NT	NT	-	NAD	-	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-
304	0.5 - 0.6 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	NAD	NAD	NAD	NT	NT	-	NAD	-	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-
305	0.2 - 0.3 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	NAD	NAD	NAD	NT	NT	-	NAD	-	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-
305	0.55 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	NAD	AD	NAD	NT	0.0328	0.0049	NAD	-	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-
306	0.25 - 0.35 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	NAD	NAD	NAD	NT	NT	-	NAD	-	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-
307	0.2 - 0.3 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
401	1 m	13/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	-	-	-	-	-	-	-	-	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-
401	2 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
401	3.5 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
402	2 m	13/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	-	-	-	-	-	-	-	-	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-
402	3.5 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
403	0.3 m	13/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	-	-	-	-	-	-	-	-	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-
403	1.5 m	13/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	-	-	-	-	-	-	-	-	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-
403	4 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
404	0.5 m	13/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	-	-	-	-	-	-	-	-	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-
404	3.5 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
501	0.5 m	13/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
D9/JPS	D9/JPS	13/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
502	0.3 m	13/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
503	0.7 m	13/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
503	1.2 m	13/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
504	0.5 m	13/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
505	0.8 m	13/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
506	1.2 m	13/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
D1/JPS	-	13/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
501	0.4-0.7 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD	-	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-
502	0.3-1.2 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD	-	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-
503	0.2-1.0 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD	-	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-
503	1.2-2.0 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD	-	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-
504	0.1-0.15 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD	-	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-
504	0.3-1.0	13/03/2022	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD	-	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-
504	1.2-1.3 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD	-	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-
505	0.2-1.1 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD	-	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-
505	1.25-1.35 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD	-	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-
506	0.1-0.15 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD	-	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-
506	0.3-0.7 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD	-	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-
506	1-1.4 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD	-	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-
506	1-1.4F	13/03/2022	-	-	-	-	-	-	-	-	-	[NT]	-	-	-	-	-	-	-	AD	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-
503	1.2-2.0F	13/03/2022	-	-	-	-	-	-	-	-	-	[NT]	-	-	-	-	-	-	-	AD	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-
CT1			NC	NC	NC	NC	NC	NC	NC	<50	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	10	2000	120	86	150	10	14	60	200	26	14	600	24	10	4
SCC1			NC	NC	NC	NC	NC	NC	NC	<50	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	18	3600	126	4.3	7.5	0.5	0.7	108	360	46.8	25.2	1080	43.2	18	7.2
TCLP1			NC	NC	NC	NC	NC	NC	NC	N/A	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
CT2			NC	NC	NC	NC	NC	NC	NC	<50	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	40	8000	480	344	600	40	56	240	800	104	56	2400	96	40	16
SCC2			NC	NC	NC	NC	NC	NC	NC	<50	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	72	14400	864	620	1080	72	100	432	1440	187.2	100.8	4320	172.8	72	28.8
TCLP2			NC	NC	NC	NC	NC	NC	NC	N/A	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

CT1 exceedance | TCLP1 and/or SCC1 exceedance | CT2 exceedance | TCLP2 and/or SCC2 exceedance | Asbestos detection

NT = Not tested NL = Non limiting NC = No criteria NA = Not applicable

Notes:

a QA/QC replicate of sample listed directly below the primary sample

b Total chromium used as initial screen for chromium(VI).

c Total recoverable hydrocarbons (TRH) used as an initial screen for total petroleum hydrocarbons (TPH)

d Criteria for scheduled chemicals used as an initial screen

e Criteria for Chlorpyrifos used as initial screen

f All criteria are in the same units as the reported results

PQL Practical quantitation limit

CT1 NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values of specific contaminant concentration (SCC) for classification without TCLP: General solid waste

SCC1 NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: General solid waste

TCLP1 NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: General solid waste

CT2 NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values of specific contaminant concentration (SCC) for classification without TCLP: Restricted solid waste

SCC2 NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: Restricted solid waste

TCLP2 NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: Restricted solid waste

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Table B5: Results of Asbestos Field Screening and Laboratory Testing for Asbestos in Soil (500 mL samples)

Bore	Sample Depth (m)	Soil Description	Soil Mass (kg)	No. Fragments	Fragment Condition	Fibro Size Range (mm)	Fibro Mass (g)	Fibro Mass (kg)	% Asbestos Content	Laboratory Analysis Results - Soil (500 mL)										Laboratory Analysis Results - Soil (40 g)
									Assumed 15% Asbestos	Sample Mass (g)	Description	Asbestos ID in Soil >0.1 g/kg	Trace Analysis	Total Asbestos (g/kg)	Asbestos ID in soil <0.1g/kg*	ACM >7mm Estimation (g)	FA and AF Estimation (g)	FA and AF Estimation (%w/w)	Asbestos ID in Soil
Initial Investigation - October 2021																				
205	0.2	Fill / Sandy gravel	*Not subject to field sieving*							776.54	Brown coarse- grained soil & rocks	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	-	-	<0.001	NT
205	0.5	Fill / Silty sand	*Not subject to field sieving*							720.26	Brown coarse- grained soil & rocks	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	-	-	<0.001	NT
303	0.6-0.7	Fill / Sand	*Not subject to field sieving*							721.4	Grey fine-grained soil & rocks	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	-	-	<0.001	NT
304	0.5-0.6	Fill / Sand	*Not subject to field sieving*							718.67	Grey fine-grained soil & rocks	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	-	-	<0.001	NT
305	0.2-0.3	Fill / Sand	*Not subject to field sieving*							707.74	Grey fine-grained soil & rocks	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	-	-	<0.001	NT
305	0.55	Fill / Sand	*Not subject to field sieving*							674.58	Grey fine-grained soil & rocks	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	**Chrysotile Amosite Crocidolite**	-	0.0328	**0.0049**	NT
306	0.25-0.35	Fill / Sand	*Not subject to field sieving*							417.63	Grey fine-grained soil & rocks	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	-	-	<0.001	NT
S1	0-0.05	Fill / Silty sand	*Not subject to field sieving*							827.26	Grey fine-grained soil & rocks	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	-	-	<0.001	NT
Additional Investigation - March 2022																				
401	1.0	Fill / Sand	*Not subject to field sieving*							NT	NT	NT	NT	NT	NT	NT	NT	NT	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected
402	2.0	Fill / Sand	*Not subject to field sieving*							NT	NT	NT	NT	NT	NT	NT	NT	NT	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected
403	0.3	Fill / Sand	*Not subject to field sieving*							NT	NT	NT	NT	NT	NT	NT	NT	NT	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected
403	1.5	Fill / Sand	*Not subject to field sieving*							NT	NT	NT	NT	NT	NT	NT	NT	NT	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected
404	0.5	Fill / Sand	*Not subject to field sieving*							NT	NT	NT	NT	NT	NT	NT	NT	NT	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected
501	0.15-0.25	Fill / Sand	10.1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NT
	0.4-0.7	Fill / Sand	10.1	0	-	-	-	-	-	731.32	Brown coarse- grained soil & rocks	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	-	-	<0.001	NT
502	0.3-1.2	Fill / Sand	10.2	0	-	-	-	-	-	537.82	Brown fine- grained soil & rocks	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	-	-	<0.001	NT
503	0.2-1.0	Fill / Sand	10.2	0	-	-	-	-	-	534.80	Brown coarse- grained soil & rocks	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	-	-	<0.001	NT
	1.2 - 2.0	Fill / Sand	10.3	1	Good	20	13.79	0.014	0.020%	508.47	Brown coarse- grained soil & rocks	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	-	-	<0.001	NT
504	0.1-0.15	Fill / Sand	10.1	0	-	-	-	-	-	765.18	Brown coarse- grained soil & rocks	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	-	-	<0.001	NT
	0.3-1.0	Fill / Sand	10.2	0	-	-	-	-	-	570.33	Brown coarse- grained soil & rocks	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	-	-	<0.001	NT
	1.2-1.3	Fill / Sand	10.3	0	-	-	-	-	-	630.31	Brown sandy soil	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	-	-	<0.001	NT
505	0.2-1.1	Fill / Sand	10	0	-	-	-	-	-	867.73	Brown coarse- grained soil & rocks	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	-	-	<0.001	NT
	1.25-1.35	Fill / Sand	10	0	-	-	-	-	-	550.49	Brown sandy soil and rocks	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	-	-	<0.001	NT
506	0.1-0.15	Fill / Sand	10.1	0	-	-	-	-	-	939.10	Brown coarse-grained soil & rocks	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	-	-	<0.001	NT
	0.3-0.7	Fill / Sand	10.2	0	-	-	-	-	-	810.56	Brown sandy soil and rocks	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	-	-	<0.001	NT
	1.0-1.4	Fill / Sand	10.2	1	Good	20	10.15	0.010	0.015%	630.31	Brown sandy soil and rocks	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	-	-	<0.001	NT
Criteria									Commercial / Industrial 0.05% w/w asbestos for ACM									**0.001%**	

Notes:
Criteria for all site uses is 0.001% asbestos for Friable asbestos or Asbestos Fines
ACM - Asbestos Containing Material
w/w - weight/weight
NT - Not Tested
NA - Not Applicable

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Table B6: Summary of Laboratory Results – Acid Sulfate Soils

Bore ID	Ground Surface RL (AHD)	Sample Depth (m)	Sample RL (AHD)	Sample Description	Screening Test Results				pH_{KCL}	S_{KCL}	Scr %S	s-TAA %S	S_{NAS} %S	s-ANC_{BT} %S	Net Acidity[c] %S	Existing and Potential Acidity %S
					pH											
					pH_F	pH_{FOX}	pH_F - pH_{FOX}	Strength of Reaction								
Initial Investigation - November 2021																
201	3.89	**3.5**	**0.4**	SAND, brown to pale brown	4.0	**2.7**	**1.3**	Low reaction	-	-	-	-	-	-	-	-
		4.5	**-0.6**	SAND, brown to pale brown	5.8	5.5	0.3	Low reaction	-	-	-	-	-	-	-	-
202	3.37	1.5	1.9	SILTY SAND, grey	5.4	5.0	0.4	Low reaction	-	-	-	-	-	-	-	-
		2.5	0.9	SAND, pale brown	5.8	5.0	0.8	Low reaction	-	-	-	-	-	-	-	-
203	3.10	**4.0**	**-0.9**	SAND, trace gravels, brown	5.8	4.3	**1.5**	Low reaction	-	-	-	-	-	-	-	-
		5.0	**-1.9**	SAND, trace gravels, brown	5.4	5.0	0.4	Low reaction	-	-	-	-	-	-	-	-
204	3.27	2.0	1.3	SAND, pale brown	7.0	5.9	**1.1**	Low reaction	-	-	-	-	-	-	-	-
		3.1	**0.2**	SAND, trace gravels, brown	4.7	**1.9**	**2.8**	Volcanic reaction	4.0	0.091	0.26	0.06	0.010	-	0.32	0.33
205	3.40	1.5	1.9	SAND, pale brown	6.5	5.4	**1.1**	Low reaction	6.7	<0.005	<0.005	<0.01	-	<0.05	<0.005	<0.05
		2.5	0.9	SAND, pale brown	4.5	**1.8**	**2.7**	Volcanic reaction	-	-	-	-	-	-	-	-
301	2.99	1.5-1.6	1.39-1.49	SAND, with silt, brown	7.3	5.7	**1.6**	Low reaction	6.8	-	<0.005	<0.01	-	<0.05	<0.005	<0.015
		2.1-2.2	0.79-0.89	SAND, with silt, pale brown	7.2	4.7	**2.5**	Low reaction	-	-	-	-	-	-	-	-
		2.7-2.9	**0.09-0.29**	SAND, with silt, pale brown	6.9	**1.9**	**5.0**	Medium reaction	-	-	-	-	-	-	-	-
302	3.24	2.0-2.1	1.14-1.24	SAND, with silt, brown	7.3	5.8	**1.5**	Low reaction	-	-	-	-	-	-	-	-
		2.5-2.6	0.64-0.74	SAND, with silt, brown	7.3	5.6	**1.7**	Low reaction	-	-	-	-	-	-	-	-
		2.9-3.0	**0.24-0.34**	SAND, with silt, brown	6.6	**2.1**	**4.5**	Extreme reaction	-	-	-	-	-	-	-	-
305	3.25	1.35-1.4	1.85-1.9	SAND, with silt, brown	7.3	5.7	**1.6**	Low reaction	-	-	-	-	-	-	-	-
306	3.42	2.0-2.1	1.32-1.42	SAND, with silt, brown	7.3	5.8	**1.5**	Low reaction	6.8	-	<0.005	<0.01	-	<0.05	<0.005	<0.015
		2.5-2.6	0.82-0.92	SAND, with silt, brown	7.3	5.7	**1.6**	Low reaction	-	-	-	-	-	-	-	-
		2.9-3.0	**0.42-0.52**	SAND, with silt, grey	6.3	**1.8**	**4.5**	Volcanic reaction	4.3	0.055	0.36	0.02	0.024	-	0.40	0.40
Additional investigation - March 2022																
401	4.07	2.5	1.57	SILTY CLAY	6.7	3.7	**3.0**	Medium reaction	-	-	-	-	-	-	-	-
		3.0	**1.07**	SILTY CLAY	7.0	5.0	**2.0**	Low reaction	-	-	-	-	-	-	-	-
		4.0	**0.07**	SAND	6.5	5.3	**1.2**	Low reaction	-	-	-	-	-	-	-	-
		4.5	**-0.43**	SAND	6.9	5.1	**1.8**	Low reaction	-	-	-	-	-	-	-	-
		5.0	**-0.93**	SAND	6.6	3.5	**3.1**	High reaction	-	-	-	-	-	-	-	-
403	3.96	2.5	1.46	SILTY CLAY	6.0	**1.5**	**4.5**	High reaction	6.0	-	0.09	<0.01	-	-	0.09	0.09
		3.0	**0.96**	SILTY CLAY	6.6	**1.8**	**4.8**	Extreme reaction	5.3	-	0.23	<0.01	-	-	0.23	0.23
		3.5	**0.46**	SILTY CLAY	6.8	**1.7**	**5.1**	Volcanic reaction	-	-	-	-	-	-	-	-
		4.5	**-0.54**	SAND	6.1	5.7	0.4	Low reaction	-	-	-	-	-	-	-	-
		5.0	**-1.04**	SAND	6.5	5.8	0.7	Low reaction	-	-	-	-	-	-	-	-
404	3.39	2.5	0.89	SAND	5.2	**1.6**	**3.6**	Medium reaction	-	-	-	-	-	-	-	-
		3.0	**0.39**	SAND	6.0	**2.2**	**3.8**	Medium reaction	-	-	-	-	-	-	-	-
		4.5	**-1.11**	SAND	6.2	3.6	**2.6**	Low reaction	-	-	-	-	-	-	-	-
		5.0	**-1.61**	SAND	6.3	**2.7**	**3.6**	Medium reaction	-	-	-	-	-	-	-	-
502	3.35	1.4	1.95	SAND	7.5	5.6	**1.9**	High reaction	-	-	-	-	-	-	-	-
		1.7	1.65	SAND	7.6	5.7	**1.9**	Low reaction	-	-	-	-	-	-	-	-
503	3.74	2.4	1.34	SAND	7.0	5.7	**1.3**	Low reaction	6.2	-	<0.005	<0.01	-	-	<0.005	<0.015
504	3.29	1.7	1.59	SAND	6.6	5.6	1.0	Low reaction	-	-	-	-	-	-	-	-
505	3.39	1.7	1.69	SAND	6.5	5.4	**1.1**	Low reaction	-	-	-	-	-	-	-	-
Guideline					**<4[d]**	**<3.5[e]**	**≥1[e]**	-	Coarse sands, poorly buffered							0.01
									Coarse sands to loamy sands and peats							0.03
									Medium sandy loams to light clays							0.06[f]/0.03[g]
									Fine medium to heavy clays & silty clays							0.1[f]/0.03[g]

Notes to Table B6:

a Depth below ground surface

b Strength of Reaction
- 1 denotes no or slight reaction
- 2 denotes moderate reaction
- 3 denotes high reaction
- 4 denotes very vigorous reaction
- F denotes bubbling/frothy reaction indicative of organics
- V denotes vapours generated
- B denotes bubbles generated
- H denotes heat generated

c Calculated by the laboratory based on the ABA equation in ASS Laboratory Methods Guidelines

d For actual acid sulphate soils (ASS)

e Indicative value only for Potential Acid Sulphate Soils (PASS)

f QASSIT Action Criteria for disturbance of 1-1000 tonnes of material

g QASSIT Action Criteria for disturbance of more than 1000 tonnes of material

Bold results indicative of ASS/PASS

Shaded results indicate an exceedence of QASSIT action criteria

Blue results indicate sample collected from below the groundwater table at time of sampling

pH_F - Soil pH Test (1:5 soil:distilled water)

pH_{FOX} - Soil Peroxide pH Test (1:4 soil:distilled water following oxidation of soil with 30% hydrogen peroxide (H_2O_2))

*Laboratory methods used to quantify ANC are likely to overestimate environmental effectiveness

- indicates not tested

Table B7: Summary of Laboratory Results – Groundwater

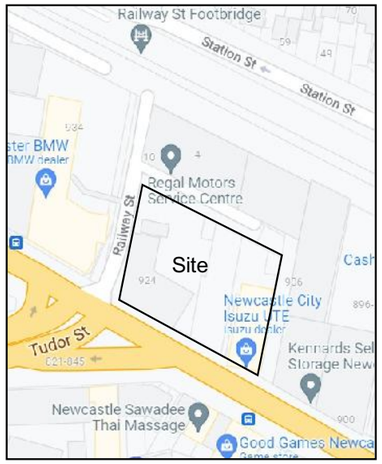
					Well ID	GW1	GW3	203	204	Replicate GWD1 (204)	401	402	403	404
					Sampled Date	7/10/2021	7/10/2021	12/10/2021	12/10/2021	12/10/2021	24/03/2022	24/03/2022	24/03/2022	24/03/2022
Analyte		Units	PQL	ANZG (2018) Marine water 95% toxicant DGVs, slightly to moderately distubed	NEPM 2013 Table 1A(4) Comm/Ind HSL D GW for Vapour Intrusion, Sand									
					2-4m									
Metals (filtered)	Antimony	mg/L	0.001			0.001	0.001	0.004	0.004	0.004	0.003	0.001	<0.001	0.003
	Arsenic	mg/L	0.001			0.004	<0.001	<0.001	0.002	0.002	<0.001	0.001	<0.001	<0.001
	Barium	mg/L	0.001			0.005	0.002	0.016	0.029	0.031	NT	NT	NT	NT
	Beryllium	mg/L	0.0005			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	NT	NT	NT	NT
	Boron	mg/L	0.02			0.1	0.1	0.04	0.27	0.28	0.09	0.04	0.03	0.1
	Cadmium	mg/L	0.0001	0.0007		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.001	<0.001
	Chromium (III+VI)	mg/L	0.001	0.0044		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001
	Cobalt	mg/L	0.001	0.001		<0.001	<0.001	<0.001	0.001	0.001	<0.001	<0.001	<0.001	0.002
	Copper	mg/L	0.001	0.0013		0.001	0.007	0.003	0.002	0.002	<0.001	0.006	0.001	0.002
	Lead	mg/L	0.001	0.0044		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Manganese	mg/L	0.005			<0.005	0.093	0.006	0.036	0.036	0.058	0.027	0.025	0.067
	Mercury	mg/L	0.00005	0.0004		<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
	Molybdenum	mg/L	0.001			0.002	0.001	0.002	0.01	0.011	0.002	<0.001	<0.001	0.004
	Nickel	mg/L	0.001	0.07		0.013	0.024	0.008	0.004	0.004	0.005	0.004	0.005	0.005
	Selenium	mg/L	0.001			<0.001	<0.001	<0.001	0.003	0.003	<0.001	<0.001	<0.001	0.002
	Tin	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	Zinc	mg/L	0.001	0.008		0.017	0.045	0.32	0.28	0.29	0.051	0.15	0.39	0.028
TPH	C6-C10 less BTEX (F1)	mg/L	0.01		6	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	C6-C10	mg/L	0.01			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	C10-C16	mg/L	0.05			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	C16-C34	mg/L	0.1			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	C34-C40	mg/L	0.1			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	F2-NAPHTHALENE	mg/L	0.05		NL	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	C6 - C9	mg/L	0.01			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	C10 - C14	mg/L	0.05			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	C15 - C28	mg/L	0.1			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	C29-C36	mg/L	0.1			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	+C10 - C36 (Sum of total)	mg/L	0.05			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	C10 - C40 (Sum of total)	mg/L	0.05			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
BTEX	Benzene	mg/L	0.001	0.7	5	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Ethylbenzene	mg/L	0.001	0.08	NL	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Toluene	mg/L	0.001	0.18	NL	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Xylene (m & p)	mg/L	0.002	0.075		<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
	Xylene (o)	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
MAH	1,2,4-trimethylbenzene	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	1,3,5-trimethylbenzene	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	Isopropylbenzene	mg/L	0.001	0.03		<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	n-butylbenzene	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	n-propylbenzene	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	p-isopropyltoluene	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	sec-butylbenzene	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	Styrene	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	tert-butylbenzene	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
Chlorinated Hydrocarbons	1,1,1,2-tetrachloroethane	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	1,1,1-trichloroethane	mg/L	0.001	0.27		<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	1,1,2,2-tetrachloroethane	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	1,1,2-trichloroethane	mg/L	0.001	1.9		<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	1,1-dichloroethane	mg/L	0.001	19		<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	1,1-dichloroethene	mg/L	0.001	0.08		<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	1,1-dichloropropene	mg/L	0.001	0.9		<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	1,2,3-trichloropropane	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	1,2-dibromo-3-chloropropane	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	1,2-dichloroethane	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	1,2-dichloropropane	mg/L	0.001	0.9		<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	1,3-dichloropropane	mg/L	0.001	1.1		<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	2,2-dichloropropane	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	Bromochloromethane	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	Bromodichloromethane	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	Bromoform	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	Carbon tetrachloride	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	Chlorodibromomethane	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	Chloroethane	mg/L	0.01			<0.01	<0.01	<0.01	<0.01	<0.01	NT	NT	NT	NT
	Chloroform	mg/L	0.001	0.37		<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	Chloromethane	mg/L	0.01			<0.01	<0.01	<0.01	<0.01	<0.01	NT	NT	NT	NT
	cis-1,2-dichloroethene	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	cis-1,3-dichloropropene	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	Dibromomethane	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	Hexachlorobutadiene	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	Trichloroethene	mg/L	0.001	0.07		<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	Tetrachloroethene	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	trans-1,2-dichloroethene	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	trans-1,3-dichloropropene	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	Vinyl chloride	mg/L	0.01	0.1		<0.01	<0.01	<0.01	<0.01	<0.01	NT	NT	NT	NT
Halogenated Hydrocarbons	1,2-dibromoethane	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	Bromomethane	mg/L	0.01			<0.01	<0.01	<0.01	<0.01	<0.01	NT	NT	NT	NT
	Dichlorodifluoromethane	mg/L	0.01			<0.01	<0.01	<0.01	<0.01	<0.01	NT	NT	NT	NT
	Trichlorofluoromethane	mg/L	0.01			<0.01	<0.01	<0.01	<0.01	<0.01	NT	NT	NT	NT
Halogenated Benzenes	1,2,3-trichlorobenzene	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	1,2,4-trichlorobenzene	mg/L	0.001	0.08		<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	1,2-dichlorobenzene	mg/L	0.001	0.16		<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	1,3-dichlorobenzene	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	1,4-dichlorobenzene	mg/L	0.001	0.06		<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	2-chlorotoluene	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	4-chlorotoluene	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	Bromobenzene	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	Chlorobenzene	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
Solvents	Cyclohexane	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
PAH	Total Positive PAHs	mg/L	0.0001			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Acenaphthene	mg/L	0.0001			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Acenaphthylene	mg/L	0.0001			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Anthracene	mg/L	0.0001	0.00001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Benz(a)anthracene	mg/L	0.0001			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Benzo(a) pyrene	mg/L	0.0001			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Benzo(g,h,i)perylene	mg/L	0.0001			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Chrysene	mg/L	0.0001			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Dibenz(a,h)anthracene	mg/L	0.0001			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Fluoranthene	mg/L	0.0001	0.001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Fluorene	mg/L	0.0001			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Indeno(1,2,3-c,d)pyrene	mg/L	0.0001			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Naphthalene	mg/L	0.0002	0.05	NL	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	Phenanthrene	mg/L	0.0001	0.0006		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Pyrene	mg/L	0.0001			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Benzo(a)pyrene TEQ	mg/L	0.0005			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	Benzo(b,j+k)fluoranthene	mg/L	0.0002			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

PQL - Practical Quantitation Limit

GWD1 - field replicate of Bore 204

Appendix C

About this Report
Drawing 1 – Test Location Plan and Site Features
Douglas Partners (1995) – Test Location Plan
CKDS – Proposed Development Plans



Site Location

Drawing adapted from MetroMap Image dated 06.06.2021.

Legend

- Additional Groundwater Wells / Bores (current investigation)
- Large Diameter Bores (current investigation)
- (W) Groundwater Monitoring Well (current investigation)
- Borehole Location (Drilling Rig) (current investigation)
- Borehole Location (Hand Auger) (current investigation)
- Surface Sampling Location (current investigation)
- Geotechnical Borehole Location (Drilling Rig) (DP, 1995)
- Previous CPT Location (DP, 2020)
- Site Boundary
- Approx UST Location (based on GPR Survey)
- Approx Location of Former DFC Buildings / Structures based on Title Plans
- Existing Groundwater Monitoring Well (by others, date unknown)
- Lot Boundaries

Douglas Partners
Geotechnics | Environment | Groundwater

CLIENT:	Thirdi Dairy Farmers Pty Ltd	
OFFICE:	Newcastle	DRAWN BY: PLH
SCALE:	1:500 @ A3	DATE: 20.April.2022

TITLE: **Test Location Plan and Site Features**
Proposed Apartments
924 Hunter Street, Newcastle

N

PROJECT No:	102077.02
DRAWING No:	1
REVISION:	3

1 Ground
SCALE 1:200 @ A1

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issue	description	date	verified
01	Issue for Review	20/7/21	01
02	Issue for Review	10/8/21	02
03	Issue for Coordination	7/9/21	03
04	Issue for Pre-DA	16/9/21	04
05	Issue for Pre-DA	27/9/21	05
06	Issue for Draft DA	1/10/21	06
07	Issue for DRAFT DA	8/10/21	07
A	Issue for Development Application	20/10/21	A

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project

Dairy Farmers Corner

924 Hunter Street 2/DP445736
Newcastle West NSW 2302

drawing title

General Arrangement Plans
Ground Floor Plan

drawing scale	drawn	verified	date
AS SHOWN		SC	20/10/21

project #	drawing #	issue
21014	A-1101	A

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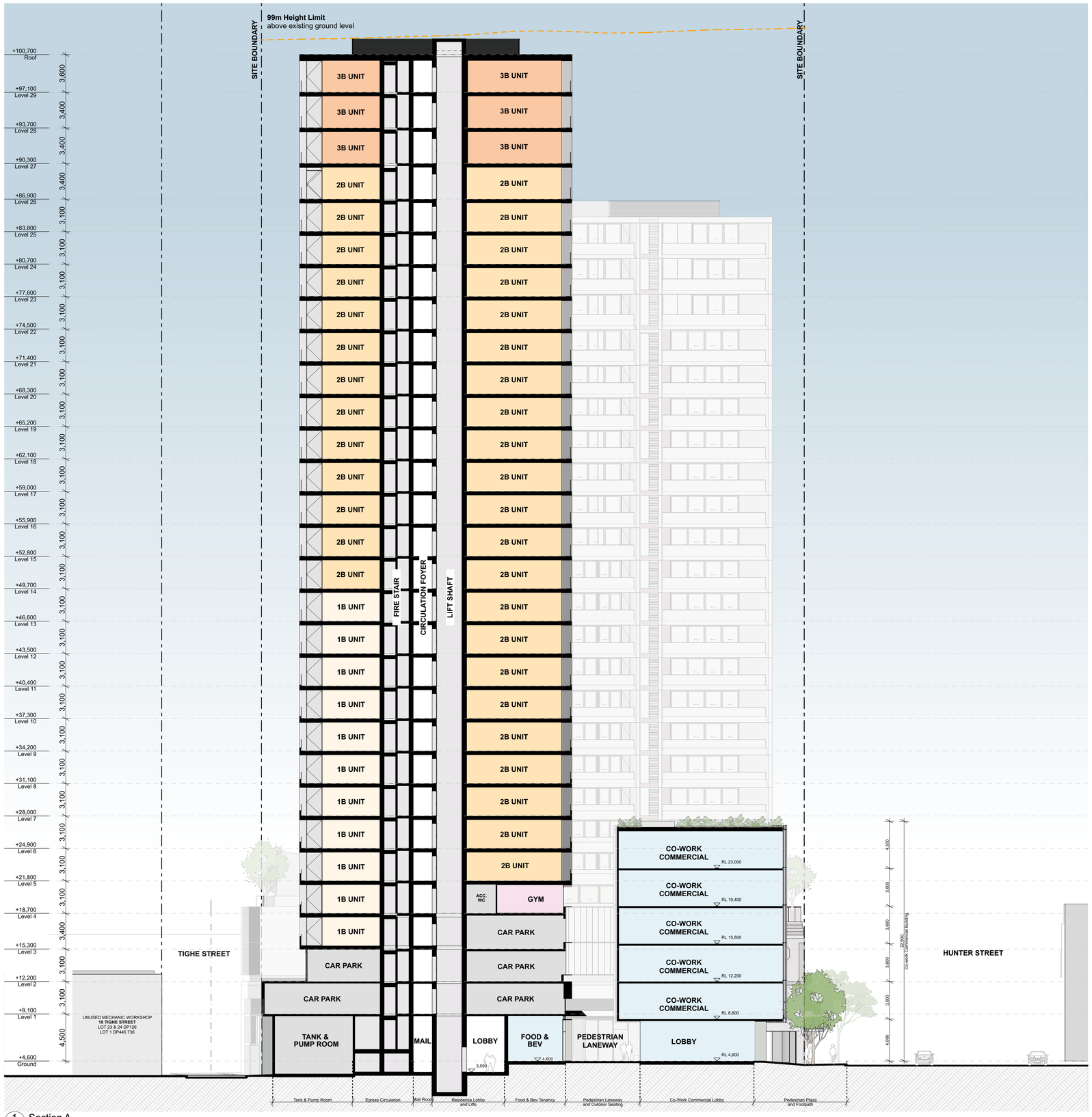

1 Section A
SCALE 1:200 @ A1

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project

Dairy Farmers Corner

924 Hunter Street 2/DP445736
Newcastle West NSW 2302

drawing title

Sections
Section A

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AS SHOWN		SC	20/10/21

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Photograph 3

Photograph 4

Photograph 5

Photograph 6

Photograph 7

Photograph 8

Photograph 9

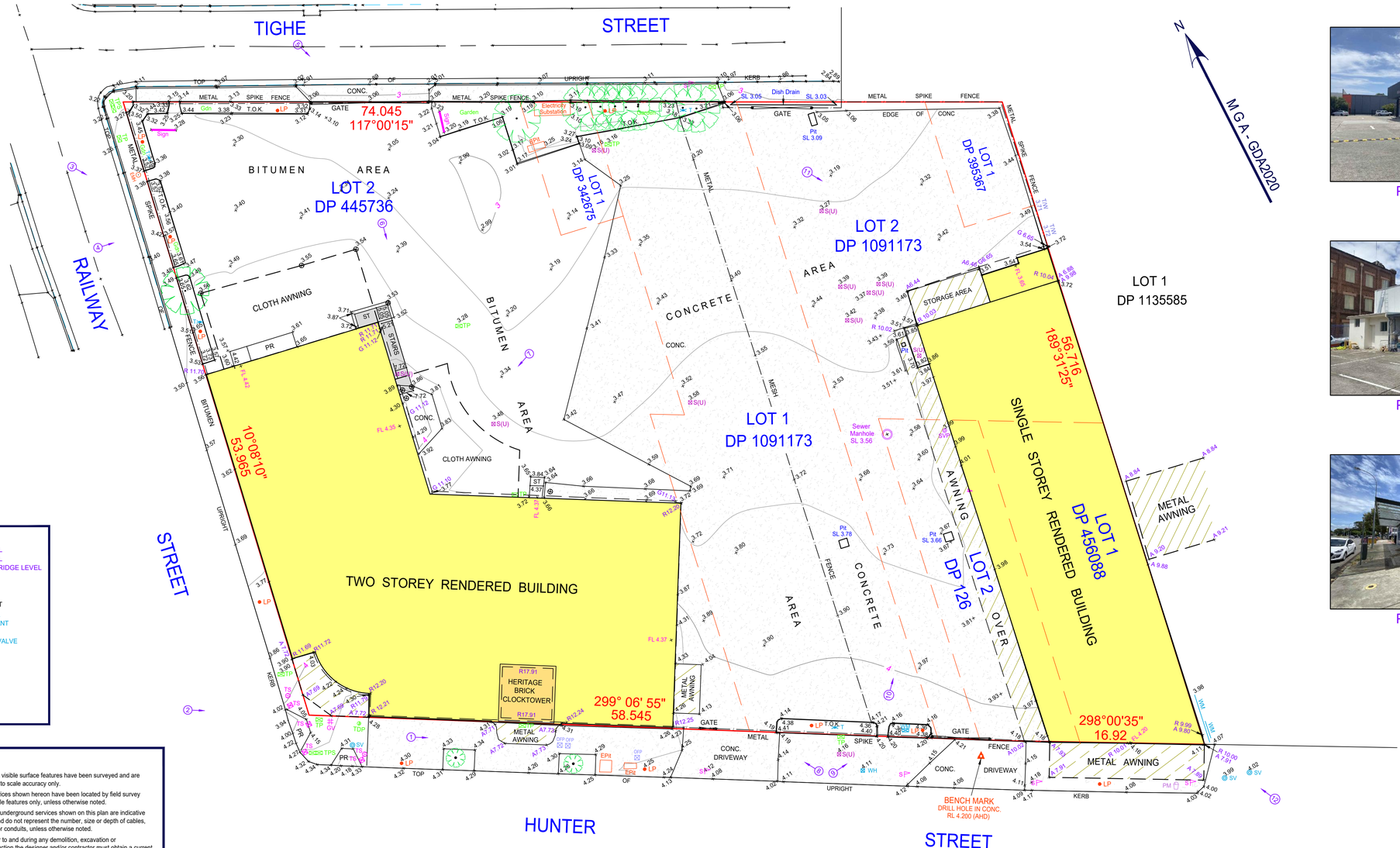
Photograph 2

Photograph 10

Photograph 1

Photograph 11

Photograph 12



LEGEND

- CONTOUR (Major)
- FENCING
- BOUNDARY
- BOUNDARY (INTERNAL)
- S(U) - SERVICE (UNKNOWN TYPE)
- EPI - ELECTRICITY PIT
- EMH - ELECTRICITY MANHOLE
- LP - LIGHT POLE
- SVP - SEWER VENT PIPE
- GV - GAS VALVE BOX
- S - STREET SIGN
- TS - TRAFFIC SIGNAL
- OFP - OPTICAL FIBRE PIT
- PM - PARKING METER
- TDP - TELSTRA DISTRIBUTION PILLAR
- TP - TELSTRA PIT
- TPS - TWIN TELSTRA PITS
- APPROXIMATE PHOTO LOCATION & DIRECTION
- TREE

A6.85 - AWNING LEVEL
G7.53 - GUTTER LEVEL
R7.47 - ROOF / ROOF RIDGE LEVEL
FL 4.54 - FLOOR LEVEL
PR - PRAM RAMP
T/W - TOP OF WALL
P - SUPPORT POST
WM - WATER METER
WH - WATER HYDRANT
T - WATER TAP
SV - WATER STOP VALVE

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TITLE: PLAN SHOWING DETAIL & LEVELS OVER LOT 2 DP 445736, LOT 1 DP 342675, LOTS 1 & 2 DP 1091173, LOT 1 DP 395367, LOT 2 DP 126 AND LOT 1 DP 456088

LOCATION: Nº 924 HUNTER STREET, NEWCASTLE

CLIENT: LJM Architecture Pty Ltd - c/o Luke Mahaffey

POSITIVE SURVEY SOLUTIONS

Amendment	Description	Date
A	INITIAL ISSUE	9.3.2021
B	ADDITIONAL DETAIL INFORMATION	9.6.2021
C		
D		

SCALE: 1 : 200 (A1) 1 : 400 (A3)
DATE: 9.3.2021
DATUM: GDA2020 / AHD
ORIGIN: PM 9888 - RL 3.868
CONTOUR INTERVAL: 0.25 m
SURVEYOR: BM DRAWN: SD

JOB No: 21194

SHEET 1 OF 2

DRAWING REF: 21194_DET_B.dwg
REVISION: B

Photograph 13

Photograph 14

Photograph 15

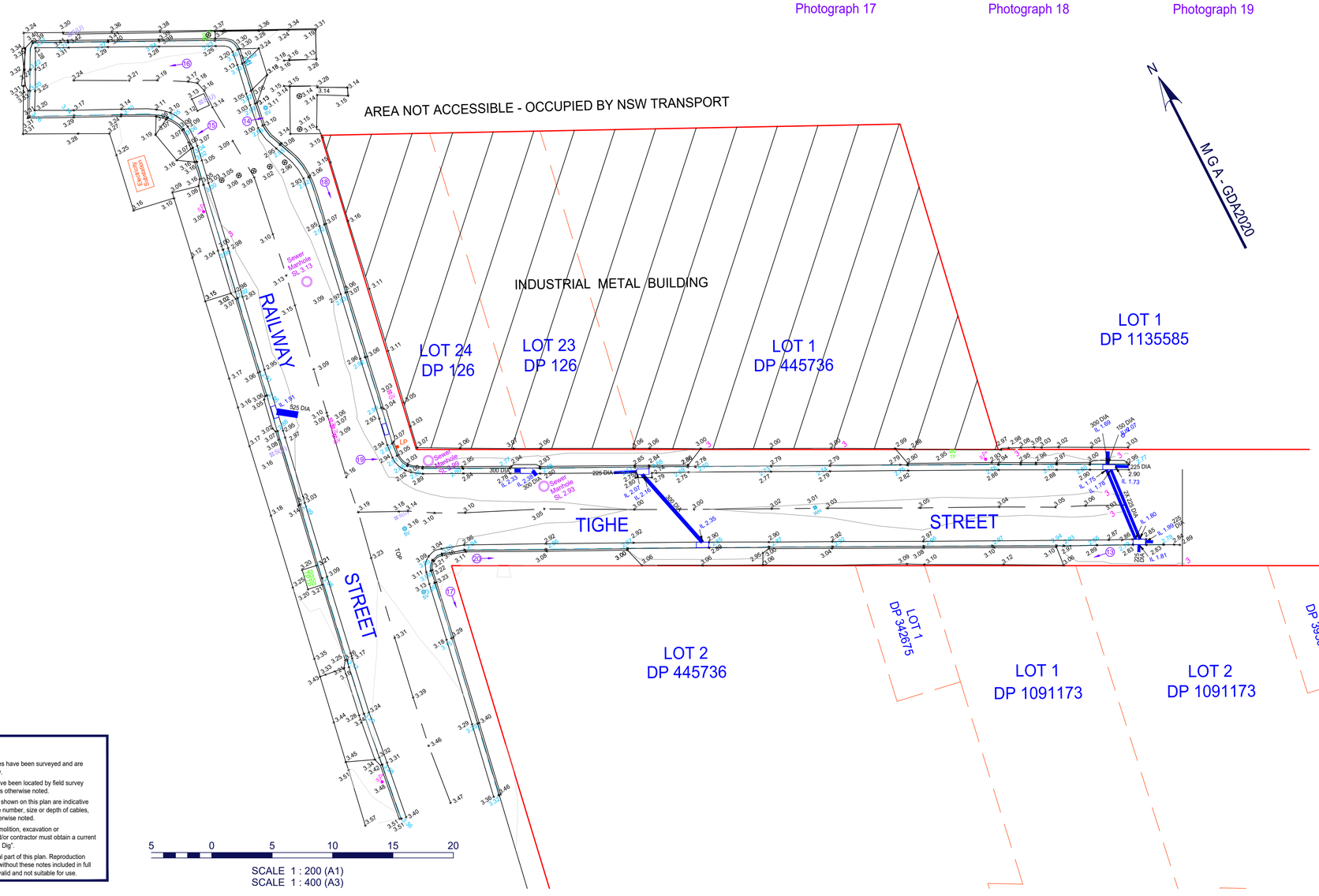
Photograph 16

Photograph 17

Photograph 18

Photograph 19

Photograph 20



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A	INITIAL ISSUE	9.3.2021
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C		
D		

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CONTOUR INTERVAL: 0.25 m
SURVEYOR: BM DRAWN: SD

JOB No: 21194

SHEET 2 OF 2

DRAWING REF: 21194_DET_B.dwg
REVISION: B

Douglas Partners
Geotechnics / Environment / Groundwater

Integrated Practical Solutions

Report on
Preliminary Site Investigation (PSI) and Preliminary Contamination Testing

Proposed Mixed Use Multi-Storey Development
924 Hunter Street, Newcastle West

Prepared for
Thirdi Dairy Farmers Pty Ltd

Project 102077.02
April 2022

Douglas Partners
Geotechnics / Environment / Groundwater

Document History

Document details

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Site address	924 Hunter Street, Newcastle West		
Report prepared for	Thirdi Dairy Farmers Pty Ltd		
File name	102077.02.R.001.Rev2.PSI.docx		

Document status and review

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Revision 2	1	0	Luke Griffiths, Catalyst Project Consulting Pty Ltd

The undersigned, on behalf of Douglas Partners Pty Ltd, confirm that this document and all attached drawings, logs and test results have been checked and reviewed for errors, omissions and inaccuracies.

	Signature	Date
Author	Dana Wilson	28 April 2022
Reviewer	MBlackert	28 April 2022

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Executive Summary

This report presents the results of a preliminary site investigation (PSI) and preliminary contamination testing undertaken for the proposed mixed use multi-storey development at 924 Hunter Street, Newcastle West (the site).

The site comprised existing buildings (Dairy Farmers Corner building and separate commercial building) and a bitumen and concrete sealed carparking area as shown on Drawing 1 in Appendix H.

It is understood that the proposed development of the site includes two towers for residential apartments with ground floor carparking and commercial offices at ground level. No basement is proposed. Conceptual plans of the proposed development are shown in Appendix H. It is understood that initial ground works will require removal of upper fill materials to allow for construction of an imported engineered fill platform to facilitate drilling of piles. Based on information provided by the client, the proposed excavation RL is 1.5 AHD which is about 1.5 m to 2.5 m below current site levels. The depth of upper excavation is to be confirmed following further geotechnical assessment.

The objective of the PSI was to assess the potential for contamination at the site based on past and present land uses and to comment on the need for further investigation and/or remediation/management with regard to the proposed development. The PSI included intrusive investigation at accessible locations to provide a preliminary assessment of potential areas of environmental concern and contaminant concentrations at the site.

This PSI report has been updated as Revision 3 following completion of additional field investigations in March 2022 to further assess site conditions.

The PSI comprised a review of available published information, previous investigations by DP, brief site history review, site walkover, discussions with site personnel, preparation of a conceptual site model, drilling boreholes, installation of groundwater wells, field screening/sieving of fill for asbestos and laboratory analysis of selected soil and groundwater samples for potential contaminants of concern.

The site history information suggested a range of potentially contaminating activities associated with various former and current site uses. This included demolition of former residential / commercial buildings / structures, a possible former blacksmiths, commercial milk processing and distribution by the Dairy Farmers' Co-operative Milk Company Limited (about 50 years), followed by use as a car dealership (30 years to present). Four known underground fuel storage tanks (USTs) remain present at the site (redundant). Three of these USTs were identified in searches following completion of the initial investigation and were subsequently targeted in March 2022 site work. On the basis of the limited site history information available and unclear records, additional fuel storage tanks may be present at the site.

The preliminary subsurface investigation focused on accessible areas of the site with the highest risk of contamination based on the site history and current site condition. In total, 22 boreholes were drilled (Bores 201 to 205; 301 to 307; 401 to 404; 501 to 506) including limited field screening/sieving for asbestos, eight groundwater monitoring wells were sampled (two of which were existing wells) and surface sampling was conducted at one location (S1).

The results of the assessment indicated the general absence of gross contamination at the test locations and depths assessed based on field observations and laboratory testing of selected soil and groundwater samples.

Variable fill was identified at the site to depths of 1.0 m to 2.3 m, however, was typically less than 1.5 m and included building materials (potential source of HBM including ACM).

Most soil contaminant concentrations were within the adopted human health and ecological investigation / screening levels and site assessment criteria (SAC) for a generic commercial/industrial land use (scenario 'D'). Minor exceedances comprised:

- Exceedance of EIL D at 401/2.0 m (copper) and 506/1.2 m (zinc in replicate sample). EIL exceedances are not considered to be significant as discussed below;
- Friable asbestos as asbestos fines (AF) in the fill at Bore 305/0.55 m comprising cement material (< 7 mm in size). The percentage of asbestos fines, being less than 7 mm, exceeded the adopted criterion for industrial / commercial land use based on NEPC (2013);
- Owing to the presence of fill at the site, and widespread presence of building materials in fill, there is a risk of hazardous building materials (HBM) including asbestos in unobserved or untested parts including UST backfill materials.

Preliminary waste classification indicated soils subject to leachability testing were classified as 'General Solid Waste' (GSW), noting that site soils with ACM impact would be classified as 'Special Waste – Asbestos'. This classification is based on low leachability results and inferred classification of similar material types (i.e. TCLP testing not undertaken on all samples with elevated results). Natural soils which are not ASS (i.e. natural soils above the water table, excluding localised silty clays/clayey sands above this level), could possibly be classified as virgin excavated natural material (VENM).

Further assessment at the time of construction (following building and pavement removal) could be conducted to confirm waste classification of fill/soil and opportunities for re-use to minimise disposal costs. ACM containing soils would not be suitable for beneficial re-use or a resource recover order at another site.

The contaminant concentrations in groundwater were generally low and suggests the absence of significant hydrocarbon impact to groundwater from the USTs and associated infrastructure. The groundwater conditions encountered at the site, are generally consistent with similar nearby sites within the Newcastle central business district which often have slightly elevated heavy metals, in particular copper and zinc.

Preliminary testing for acid sulfate soils (ASS) indicated the presence of potential ASS for natural soils below the groundwater table (i.e. below about 2.3 m) as well as silty clay/clayey sand soils above/below the groundwater table. A site-specific acid sulfate soil management plan (ASSMP) will be required for the proposed development.

Based on the PSI findings, remediation would be required to render the site suitable for the proposed development from a contamination perspective, due to the bonded and friable ACM impacts in fill materials and possible residual impacts in the vicinity of underground fuel infrastructure. Remediation should be detailed in a site-specific RAP for the development and integrate with the development stages.

Remediation is required for ACM impacts in fill and potential residual impacts associated with underground fuel infrastructure.

As outlined in Section 2 and 16, it is understood that construction will require removal of upper fill materials to an RL of 1.5 AHD. This will remove the majority of site fill to depths of 1.5 m to 2.5 m below current site levels, including the identified ACM impacted soils, for construction of a piling platform. Localised deeper excavations may be required for UST removal.

Subject to inspection and validation to be detailed in a site-specific RAP, removal of fill would render the site suitable from a contamination perspective and would negate the requirement for on-site management/capping.

It is noted that further detailed investigations must be undertaken following removal of upper bulk fill to assess the suitability of any fill materials remaining to stay on-site. This process should be outlined in the RAP.

Further details are provided in this report.

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Report on Preliminary Site Investigation (PSI) and Preliminary Contamination Testing (Contamination)

Proposed Mixed Use Multi-Storey Development

924 Hunter Street, Newcastle West

1. Introduction

Douglas Partners Pty Ltd (DP) has been engaged by Thirdi Dairy Farmers Pty Ltd to complete this preliminary site investigation (PSI) and preliminary contamination testing for the proposed mixed use multi-storey development at 924 Hunter Street, Newcastle West (the site).

The objective of the PSI was to assess the potential for contamination at the site based on past and present land uses and to comment on the need for further investigation and/or remediation/management with regard to the proposed development. The PSI included intrusive investigation at accessible locations to provide a preliminary assessment of potential areas of environmental concern and contaminant concentrations at the site and acid sulfate soil (ASS) conditions.

The site comprised existing buildings (Dairy Farmers Corner building and separate commercial building) and a bitumen and concrete sealed carparking area as shown on Drawing 1 in Appendix H.

It is understood that the proposed development of the site includes two towers for residential apartments with ground floor carparking and commercial offices at ground level. No basement is proposed. The proposed development is considered mixed use.

This PSI report has been updated as Revision 2 following completion of additional field investigations in March 2022 to further assess site conditions.

The following key guidelines were consulted in the preparation of this report:

- NEPC *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]* (NEPC, 2013); and
- NSW EPA *Guidelines for Consultants Reporting on Contaminated Land* (NSW EPA, 2020).

This report should be read in conjunction with all appendices including the notes provided in Appendix A.

2. Proposed Development

It is understood that the proposed development of the site comprises two main towers of 80 m and 99 m in height. The lower levels will consist of a mixture of carparking and commercial offices. The upper levels are proposed for residential units. No basement is proposed. Conceptual plans of the proposed development are shown in Appendix H.

It is understood that initial ground works will require removal of upper fill materials to allow for construction of an imported engineered fill platform to facilitate drilling of piles. Based on information provided by the client, a proposed excavation level of RL 1.5 (AHD) is proposed which is about 1.5 m to 2.5 m below current site levels. The depth of upper excavation is to be confirmed following further geotechnical assessment.

3. Scope of Work

The investigation comprised the following:

- Review of available published information on the site including geological, topographical, ASS and soil landscape maps and search of registered groundwater bores in the area;
- Review of geotechnical investigations by DP at the site (DP, 1995; 2020);
- Brief site history review to assess the potential for contamination comprising a review of aerial photographs, Safe Work NSW search, NSW EPA register searches, title deeds search, review of Section 10.7 planning certificate and council record searches;
- Site inspection by a senior environmental engineer to identify areas of potential contamination and assess current site condition;
- Preparation of a conceptual site model (CSM) for the site, which defines the potential contaminant sources, potential receptors and exposure pathways;
- Service locating to clear test locations and estimate the location of underground fuel storage tank (UST) and fuel infrastructure in the north eastern part of the site;
- Ground penetrating radar (GPR) survey of potential UST locations as well as a general scan of the accessible surface areas (March 2022);
- Investigation of soils via:
    - Collection of one fibro material sample at the surface (S1/F1) and underlying soil sample (S1/0-0.05 m) for asbestos identification testing;
    - Drilling of seven boreholes (Bores 301 to 307) to depths of 0.5 m to 3.0 m below ground level by hand auger (central and western part of the site);
    - Nine boreholes to a depth of 5 m below ground level using a track mounted drilling rig with continuous push tube as follows:
        - Bores 201 to 205 were drilled within the north eastern part of the site near underground fuel infrastructure known at the time of fieldwork. Groundwater monitoring wells were installed in Bores 203 and 204;
        - Bores 401 to 403 were drilled within the southern part of the site near underground fuel infrastructure. Groundwater monitoring wells were installed in Bores 401 to 403. Bore 401 was also considered for the assessment of upgradient sources south of Hunter Street;
        - Bore 404 was drilled in the north-western part of the site to assess conditions from upgradient sites. A groundwater monitoring well was installed in Bores 404;
    - Drilling of bores using an excavator equipped with a 300 mm diameter auger for sampling of upper fill and collection of bulk fill samples for sieving;
    - Collection of soil samples from the bores at regular depth intervals for identification and testing purposes under contamination sampling protocols;

- Investigation of groundwater via:
  - Groundwater level gauging of all site wells using an oil-water interface meter;
  - Purging and sampling of groundwater from six new groundwater wells (Bores 203, 204 and 401 to 404) and two existing wells (GW1 and GW3);
- Inspection of the fill / dip point for the central UST with accessible surface infrastructure;
- Screening of soil samples, groundwater and groundwater well headspace for volatile organic compounds (VOC) using a photoionisation detector (PID);
- Laboratory testing on selected soil samples retrieved from the bores for potential contaminants of concern and ASS conditions;
- Laboratory testing for potential contaminants in groundwater;
- Update of the CSM for the site on the basis of the investigation;
- Preparation of this report presenting the findings of the preliminary site investigation.

4. Site Information

Site Address	924 Hunter Street, Newcastle West	
Legal Description	Lot 1 D.P.342675 Lot 1 D.P.1091173 Lot 2 D.P.126 Lot 2 D.P.1091173	Lot 2 D.P.445736 Lot 1 D.P.395367 Lot 1 D.P.456088
Area	3950 m^2	
Local Council Area	Newcastle City Council	
Zoning	B3 Commercial under NCC Local Environmental Plan 2012	
Current Use	Commercial: Car dealership (central and western portion); Fitness / health centre (eastern portion).	
Surrounding Uses	North – Tighe Street, then commercial developments (vehicle service centre) and railway line; East – Commercial developments (self-storage units and retail); West – Railway Street, then mixed-use developments (car dealerships and possible servicing); South – Hunter Street / Maitland Road / Tudor Street, then mixed-use developments (car dealership, car hire, general business, church and shop top residential).	

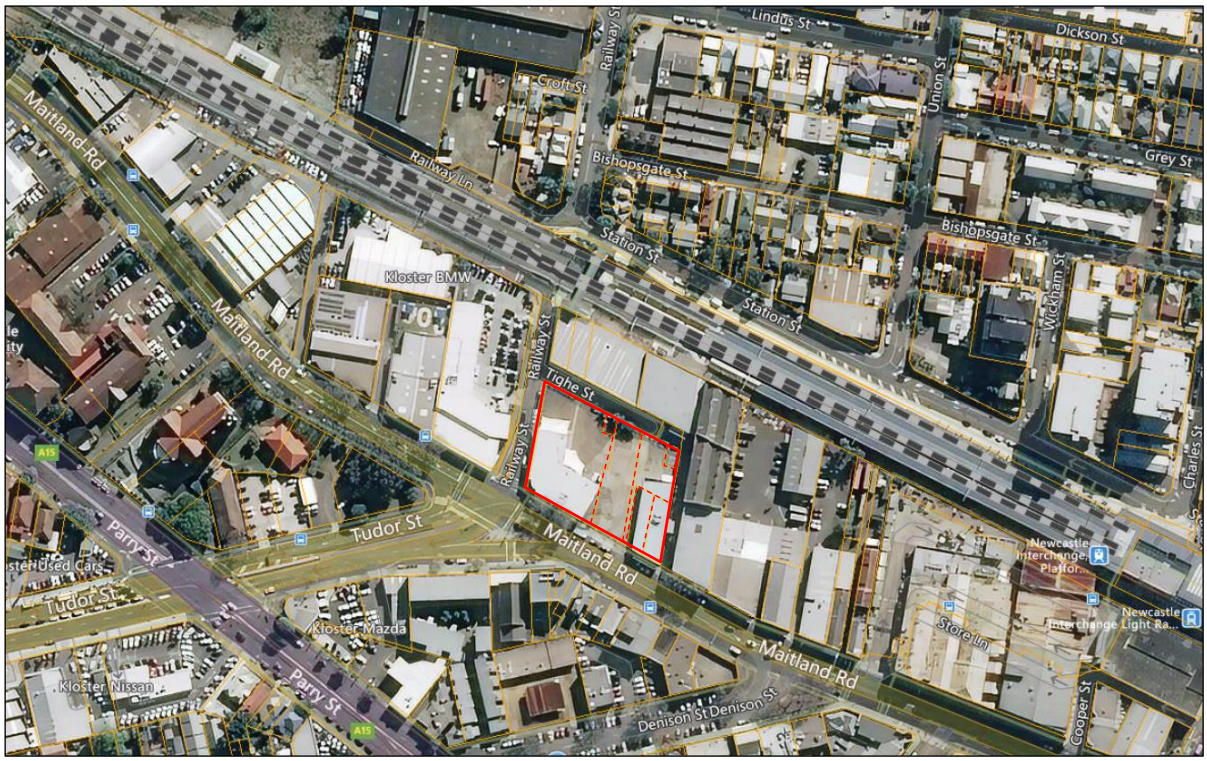

Figure 1: Site Location (Source Map: Metro Map 2020)

Figure 2: Lot layout

5. Environmental Setting

5.1 Overview

Site and Regional Topography	A survey plan provided by the client (refer Appendix H) indicates that site levels range from RL4.2 on the southern boundary and slopes to about RL 3.4 on the northern boundary. More regionally, the surrounding area slopes from RL< 10 to RL1-2 to the north-east towards coastal areas of the Hunter River and Throsby Creek.
Soil Landscape	Reference to the Newcastle 1:100,000 Soil Landscapes Sheet indicates West the site is located within the Hamilton soil landscape comprising residual soils. This group comprises 'deep' soils (>15cm), well-drained weak Podzols with some 'deep' (>100cm) well-drained Brown Podzolic Soils on fans. Limitations include wind erosion hazard, ground water pollution hazard, strong acidity, non-cohesive soils.
Geology	Reference to the Newcastle Coalfields Surface Geology Sheet, published by BHP, indicates that the site is underlain by the Quaternary aged alluvium. Based on previous investigations by DP, these alluvial soils are underlain by rocks belonging to the lower parts of the Lambton subgroup of the Newcastle Coal Measures. The Newcastle Coal Measures are of Permian age and typically comprises sandstone, conglomerate, siltstone, claystone, coal and tuff. Information suggests that the site and adjacent sites are not undermined.
Acid Sulfate Soils	Reference to NSW ASS mapping indicates that the site is mapped as a low probability occurrence of ASS at depths greater than 3 m below the ground surface. An area of high probability occurrence of ASS within 1 to 3 m of ground surface is located near the northern boundary of the site (approx 10 m to 30 m from lot boundary).
Surface Water	No surface water bodies / courses were identified on site or directly adjacent to the site. The Hunter River is located about 450 m north-east and downgradient of the site. The Hunter River is an estuarine (marine) and tidal environment, and also receives surface water runoff from Throsby Creek about 600 m to the east, fresh water flows from land runoff and freshwater flows from the upgradient Hunter River.
Groundwater	Groundwater is expected at approximately 3 m to 5 m depth based on previous investigations in the area. Groundwater flows are expected to the north-east towards the Hunter River. Refer Section 5.2.

5.2 Groundwater Bores

A search of the publicly available registered groundwater bore database indicated that there are several registered groundwater bores within 500 m of the site as shown in Figure 3. Relevant bores details are summarised in Table 1.

Figure 3: Mapped Groundwater Bores within approx 500 m radius of the site

Table 1: Summary of Available Information from Nearby Registered Groundwater Bores

Bore ID Authorised Purpose	Location Relative to Site	Final Depth (m)	Standing Water Level (m bgl)	Water Quality
GW054766 General use	260 m south west	6.5	-	Salinity 0-500 ppm
GW202915 Domestic	280 m south west	9.0	4.0	-
GW201711 Monitoring bore	290 m east	6.0	1.26	-
GW201710 Monitoring bore	310 m east	3.5	-	-
GW200855 Test bore	300 m south east	6.0	1.5	-
GW201875 Monitoring bore	485 m south-east (possibly upgradient)	6.0	-	-
GW056149 Unknown	300 m south-south-east	7.2	-	-
GW058805 Domestic	350 m south	6.0	-	-
GW200144-GW200150 Test bores	360-400 m- south-west to south-south-west	-	-	

Based on the regional topography, the anticipated flow direction of groundwater beneath the site is to the north east, towards the Hunter River, the likely receiving surface water body for the groundwater flow path.

It is noted that the published records provided limited information only. Based on the shallow depth of installation for the registered bores and regional geology, bores would predominantly be installed in the upper soil (alluvial) profile. Groundwater in the aquifer is expected to be generally fresh to brackish.

Although the bores are registered for a variety of purposes, beneficial use of groundwater in the Newcastle area for irrigation and potable uses is expected to be minimal. This is based on the urban setting, availability of potable sources and information published in the Water Sharing Plan for the North Coastal Sands Groundwater Sources 2016. Accordingly, significant potential beneficial uses of the groundwater near the site are unlikely.

5.3 Hazardous Ground Gases – Former Mine Workings

Desktop review in conjunction with on-going geotechnical investigations for the site by DP suggests that the site and adjacent sites are not undermined. Given the absence of coal seams beneath the site and associated underground mining, the risk of potential hazardous ground gases (HGG) from this source at the site is considered to be negligible.

6. Previous Investigations

6.1 Geotechnical Investigation - Douglas Partners (DP, 1995)

DP has previously undertaken a *Geotechnical Investigation* at the site for proposed car showrooms in the south-western and south-eastern corners of the site (i.e. the current site buildings). The investigation also included a proposed workshop to the north on Tighe Street.

The geotechnical investigation was undertaken to provide information on the subsurface conditions and provide recommendations for foundation design and construction practices. One borehole (B2) was drilled near the south-western corner of the site, targeted to the area of the extended building location (i.e. extended upon existing DFC building). Subsurface investigation was therefore limited.

Key information from the 1995 investigation relevant to this assessment is as follows:

- The site had been previously developed and “contains several masonry buildings with the remainder of the area being paved concrete”;
- The existing pavement on the southern portion of the site was to be retained, with the northern pavement to be reconstructed;
- No history was obtained regarding the previous placement of filling;
- Proposed building slabs were to be constructed on 900 mm of controlled filling (material source unknown);
- Subsurface conditions were noted to comprise variable fill materials. Subsurface conditions at Bore 2, comprised:
    - Concrete slab to 0.15 m; underlain by
    - Filling, sand with some medium gravel to 2.0 m; underlain by
    - Sand, slightly clayey from 2.5 to termination at 5.5 m.

- Groundwater was estimated at 2.5 m based on saturated conditions during the investigation. It should be noted that groundwater levels are affected by climatic conditions and soil permeability and will therefore vary with time.

It is noted that the investigation report was limited to geotechnical assessment and details regarding potential contaminants (e.g. staining, odours etc) or anthropogenic inclusions were not recorded or differentiated on the logs at the time of the investigation.

6.2 Geotechnical Investigation - Douglas Partners (DP, 2020)

DP has previously drilled three cone penetration tests (CPTs) at the site in 2020 as part of a geotechnical investigation for proposed development of the site. CPT101 to CPT103 are shown on Drawing 1 in Appendix H. It is noted that field investigations were completed, however, formal assessment and reporting of the results was not completed in 2020. The data will be used in future geotechnical investigation.

Key pertinent information from the CPTs is as follows:

- The profile of the upper 1 m was not recorded as the CPT used a non-instrumented dummy cone to penetrate the upper pavement materials;
- The natural soil profile predominantly comprised sand with interbedded silt / clay lenses to a depth of about 3 m to 4 m overlying a sand unit to a depth of about 9 m to 9.5 m;
- Clay / silty clay with local band of sand underlying sand unit to termination depth of up to 29.9 m where CPT refusal was recorded at one test. The CPT refusal indicates the top of weathered rock although this has not been confirmed by drilling;
- Groundwater was measured at between 2.7 m and 3.0 m depth following withdrawal of the CPT rod at the completion of the test.

6.3 Geo-environmental investigations – Approx 2020

Based on observations of a number of infilled boreholes observed during the site walkover (refer Section 8), it is understood that additional geotechnical and / or environmental investigations may have been undertaken by others in 2020 following on from DP (2020). Three groundwater monitoring wells, which have been assigned by DP as ‘GW1’ to ‘GW3’, were also located in the eastern part of the site near the location of the underground fuel tank and former bowser. The monitoring well locations are shown on Drawing 1 in Appendix H.

Details regarding the previous subsurface investigation and GW1 to GW3 well construction are unknown. Given the proximity of GW1 to GW3 to the underground fuel storage tank and former bowser location, DP has assumed that the purpose of the wells was to assess groundwater conditions near the tank. The wells may also be related to possible Underground Petroleum Storage Systems (UPSS) compliance requirements (i.e. three wells near USTs).

Information regarding the observed well condition and depths based on water level gauging and sampling by DP as part of this investigation are included in Section 11.4.

7. Site History

7.1 Overview of 'Dairy Farmers Corner'

The investigation site and properties to the north across Tighe Street were formerly known as 'Dairy Farmers Corner' (DFC) based on the former use of the land by the Dairy Farmers' Co-operative Milk Company Limited from 1938. The current building (façade) fronting the south-western corner on Hunter Street is part of the original DFC development. The eastern building may also have been associated with former DFC activities.

A brief review of online information was undertaken to inform general site activities related to former site activities. Information from O'Sullivan (2014) on the history of Dairy Farmers Corner' is summarised as follows:

- The DFC block bounded by Hunter, Railway and Tighe Streets building was developed from 1938/1939. This included a building for administration offices fronting Hunter Street as well as numerous other site buildings used for the 'receiving, handling, bottling and distribution of bulk milk'. The facility included a bottling plant for washing and sterilisation of 4000 bottles daily, powered by "two colonial type boilers";
- The western two-storey DFC building was built in 1938/1939. The building housed administration offices;
- The facility included a loading dock for constant truck distribution;
- The facility operated at the site for about 50 years (1939 to 1991);
- Redevelopment of the site was undertaken from about 1995. This included Regal Motors car dealership and administration building within the current investigation site, and the vehicle servicing / parts storage warehouse on the northern property across Tighe Street. The redevelopment work involved the demolition of the former milk distribution area. The original DFC administration building fronting the south-western corner on Hunter Street remained in place and the building area was extended in the 1990s (discussed further in Section 7.3 based on aerial photos).

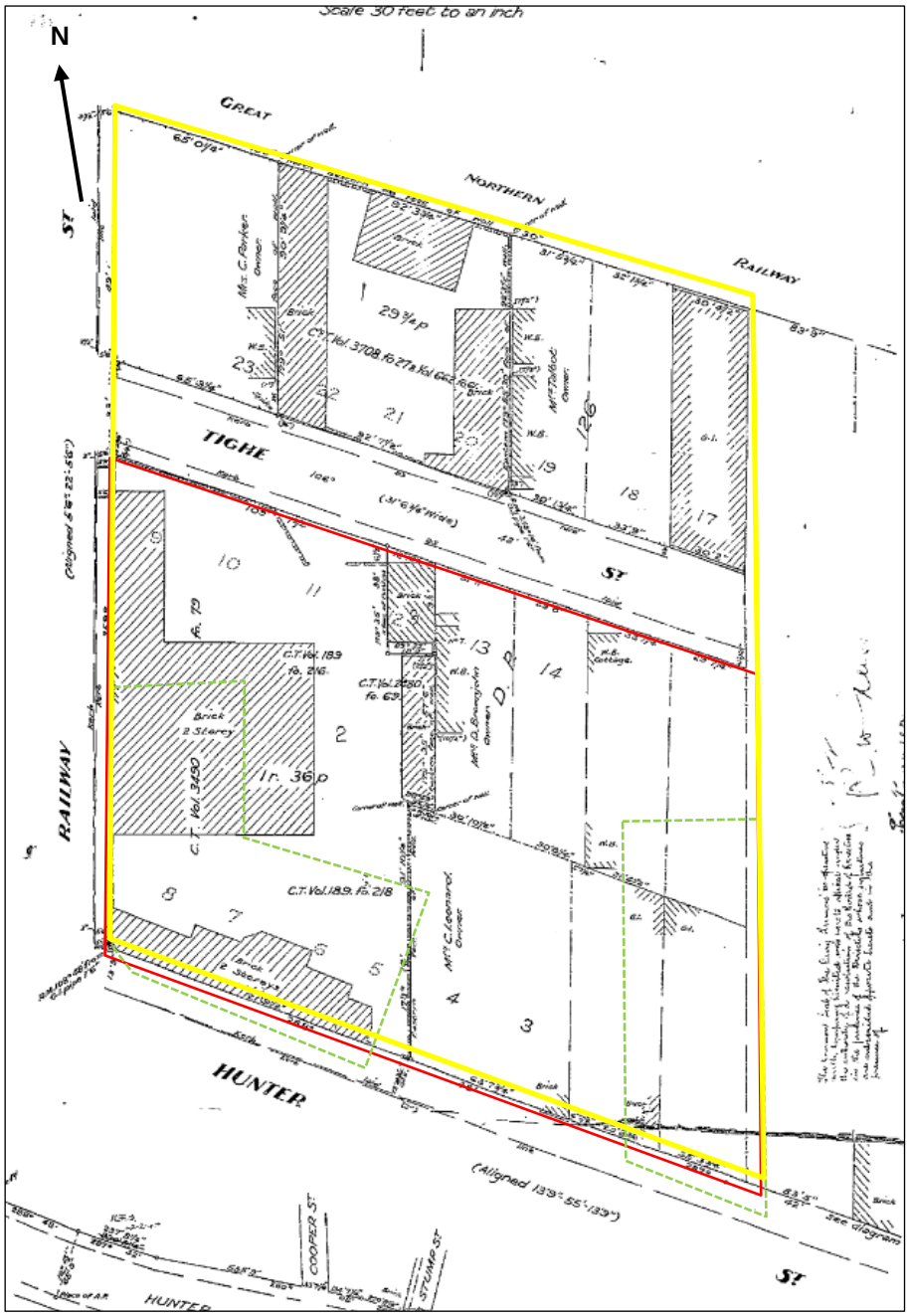

Figure 4: Former layout for overall DFC site (yellow), current site investigation boundary (red), approx location of current building outline (green) - Source: Title Deeds (Appendix C, estimated date about 1950)

7.2 Title Deeds

A historical title deeds search was used to obtain ownership and occupancy information including company names and the occupations of individuals that have historically possessed the title. The title information can assist in the identification of previous land uses by the company names/site owners and can therefore, assist in establishing whether there were potentially contaminating activities occurring at the site.

A historic title deeds search was undertaken for the lots by InfoTrack Pty Ltd which is included in Appendix C. It is noted that the historic lot layout varied from the current layout, comprising a number of smaller areas. Table 2 presents a generalised summary of findings of the titles search related to the current lot layout in Figure 2 in Section 4 and Drawing 1 in Appendix H.

Table 2: Historical Title Deeds

Date	Registered Proprietor(s) & Occupations	Inferred Land Use
Lot 2 D.P. 445736 – Main DFC site (western lot)		
Periods between 1913-1930	Various owners of smaller subsections (builder, railway employee, business manager, commercial traveller, widow)	-
1923/1937 to 1994	The Dairy Farmers' Co-Operative Milk Company Limited Then Dairy Farmers Co-Operative Limited Now Australian Co-Operative Foods Limited	Commercial milk processing and distribution
1994-2019	Zutor Pty. Ltd	Commercial / car dealership
2019-present	# McCloy Newcastle West Pty Limited	Commercial / car dealership
Leases:	Various leases between 2012-2020 (not investigated) Current lease to Manning Valley Motor Holding Pty Ltd	Commercial / car dealership
Lots 1 & 2 D.P. 1091173		
1911/1918-1953/1954	Various owners of smaller subsections (railway guard, miner, labourer), Blacksmith (1914-1952) and pattern maker (1952-1953) in north-east corner of Lot 2 D.P.1091173	Blacksmith
1953/1954 to 1993	The Dairy Farmers' Co-Operative Milk Company Limited Then Dairy Farmers Co-Operative Limited Now Australian Co-Operative Foods Limited	Commercial milk processing and distribution
1994-2019	Zutor Pty. Ltd	Commercial / car dealership
2019-present	# McCloy Newcastle West Pty Limited	Commercial / car dealership
Leases:	Leases between 1918-1954 to The Newcastle Co-Operative Milk Society Limited and The Berrima District Farm and Dairy Company Limited Various leases between 2012-2020 (not investigated) Current lease to Manning Valley Motor Holding Pty Ltd Current leases (2020 to 2024) to Manning Valley Motor Holding Pty Ltd, Lease to Air Locker Training Newcastle Pty Ltd Lease to Barre Effect Pty Ltd	Commercial / car dealership

Date	Registered Proprietor(s) & Occupations	Inferred Land Use
Lot 1 D.P. 395367		
1914-1952	Arthur William Spurr (Blacksmith)	Blacksmith
1952-1953	Edward Spurr (Pattern Maker)	Pattern maker
1953-1956	The Dairy Farmers' Co-Operative Milk Company Limited Then Dairy Farmers Co-Operative Limited Now Australian Co-Operative Foods Limited	Commercial milk processing and distribution
1956-1997	The Council of the City of Newcastle Then Intervening Name Changes Now Energy Australia	Electricity easement
1994-2019	Zutor Pty. Ltd	Commercial / car dealership
2019-present	# McCloy Newcastle West Pty Limited	Commercial / car dealership
Leases:	Various leases between 2012-2020 (not investigated) Current lease to Manning Valley Motor Holding Pty Ltd	Commercial / car dealership
Lot 2 D.P. 126 & Lot 1 D.P. 456088		
1877-1927	Catherine Leonard (married woman)	-
1927-1959	Mary Leonard (Spinster) Elizabeth Minogue (Married woman)	-
1959	Public Trustee	
1959-1993	The Dairy Farmers' Co-Operative Milk Company Limited Then Dairy Farmers Co-Operative Limited Now Australian Co-Operative Foods Limited	Commercial milk processing and distribution
1994-2019	Zutor Pty. Ltd	Commercial / car dealership
2019-present	# McCloy Newcastle West Pty Limited	Commercial / car dealership
Leases:	Various leases between 2012-2020 (not investigated) Current leases (2020 to present) to Lease to Air Locker Training Newcastle Pty Ltd Lease to Barre Effect Pty Ltd	Commercial / car dealership

7.3 Historical Aerial Photography

Several historical aerial photographs were obtained from public databases. Extracts of the aerial photographs are included in Appendix C. A summary of key features observed for the site and surrounding land is presented in Table 3.

Table 3: Summary of Historical Aerial Photographs

Year	Appx C Figure	Site Observations	Surrounding Land Use
1954 (B/W)	C1	• The site developed comprising several structures across all lots, but difficult to ascertain due to the quality of aerial imagery.	• The surrounding area is fully developed at this time. • Hunter Street, Railway and Tighe Street border the site to the north, south and west. • Given the size of structures surrounding the site, the inferred land use is commercial / industrial. • The railway is present to the north at this time.
1966 (B/W)	C2	• Possible new structure(s) present in the south eastern corner of the site area. • The current south-eastern building seems present. • No other significant changes noted during this time.	• There are no obvious changes to surrounding site features since the previous aerial photo. • Surrounding area appears relatively unchanged.
1976 (Colour)	C3	• No obvious changes to the site since the previous aerial photo. • Suggests vehicle parking / storage across the site. Access road west of eastern building.	• Possible demolition of former structure to the west of the site. Former building footprint now used as possible parking / storage area. • The rest of the surrounding area appears to have no significant changes since the previous aerial image.
1984 (B/W)	C4	• The site appears relatively unchanged since the previous aerial photo. • No obvious changes to site structures but difficult to ascertain due to the quality of aerial imagery.	• Demolition / construction work has taken place north of the site on the opposite side of the railway. • Possible new structure present to the west of the site. Previous area for parking / storage at the time of the previous aerial now has a solid structure present. • No other significant changes to immediately adjacent lots.
1986 (orthophoto)	C5	• The site appears relatively unchanged since the previous aerial photo.	• Generally as per 1984.
1990 (Colour)	C6	• There are no obvious changes to the site since the previous aerial image. • No changes to site structures or other features. • Several cars now parked across the site.	• No obvious changes to the immediately surrounding area. • Cleared area now present to the north of the site.
2001 (Colour)	C8	• The site has been redeveloped since the time of the previous aerial image. • Apparent demotion of old buildings in the south western corner and northern areas of the site. Now replaced with visibly newer buildings. • There are an abundance of cars parked at the site during this time. • The aerial photograph suggests that the site is being used as a car dealership during this time. • Building in the south eastern corner of the site has also been either redeveloped or demolition and replaced (possible asbestos roofing removal).	• There are no obvious changes to the immediately adjacent lots to the west and east since the previous aerial image. • The cleared area to the north of the site now appears to have new structures present.
2016	C9	• Generally as per 2011. No obvious site activities (no vehicle parking etc).	• Generally as per 1984.
2021	Refer Drawing 1	• Generally as per 2016.	• Generally as per 2016.

Note to Table 3: B/W- black and white image

7.4 Historical Maps

A brief review of available online historical maps was undertaken to inform possible site uses and development prior to the DFC development established from about 1938. Maps dated 1897 and 1910 are shown in Figure 5 and Figure 6. The maps indicate that a number of former buildings / structures were present prior to 1938, possibly residential dwellings or commercial buildings. The plan also indicates the water tanks shown as circles and groundwater wells as squares, which may have been subsequently infilled. A tramline was also mapped on Hunter Street to the south of the site. Further detailed review around this time has not been undertaken.

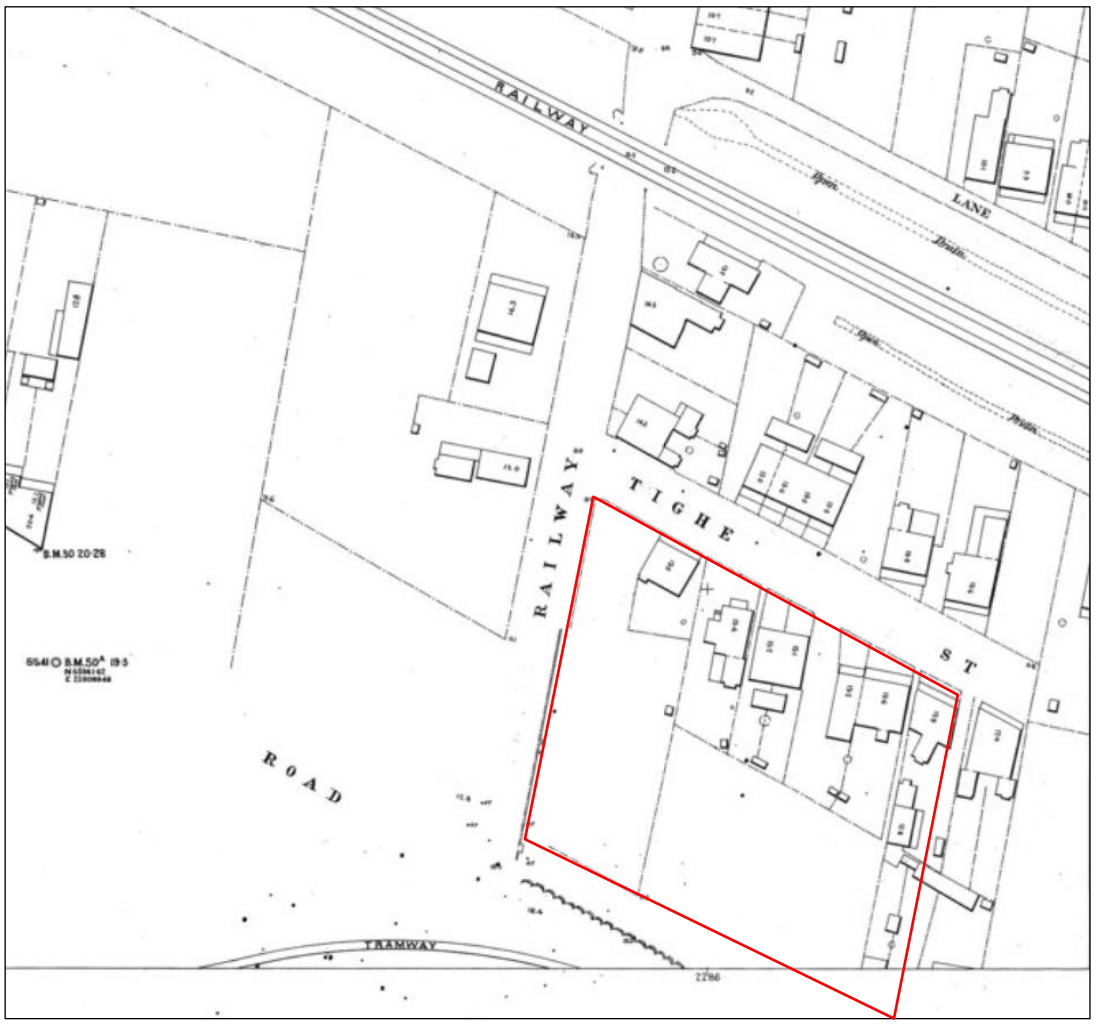

Figure 5: Department of Public Works – Sewage Plan, 1897

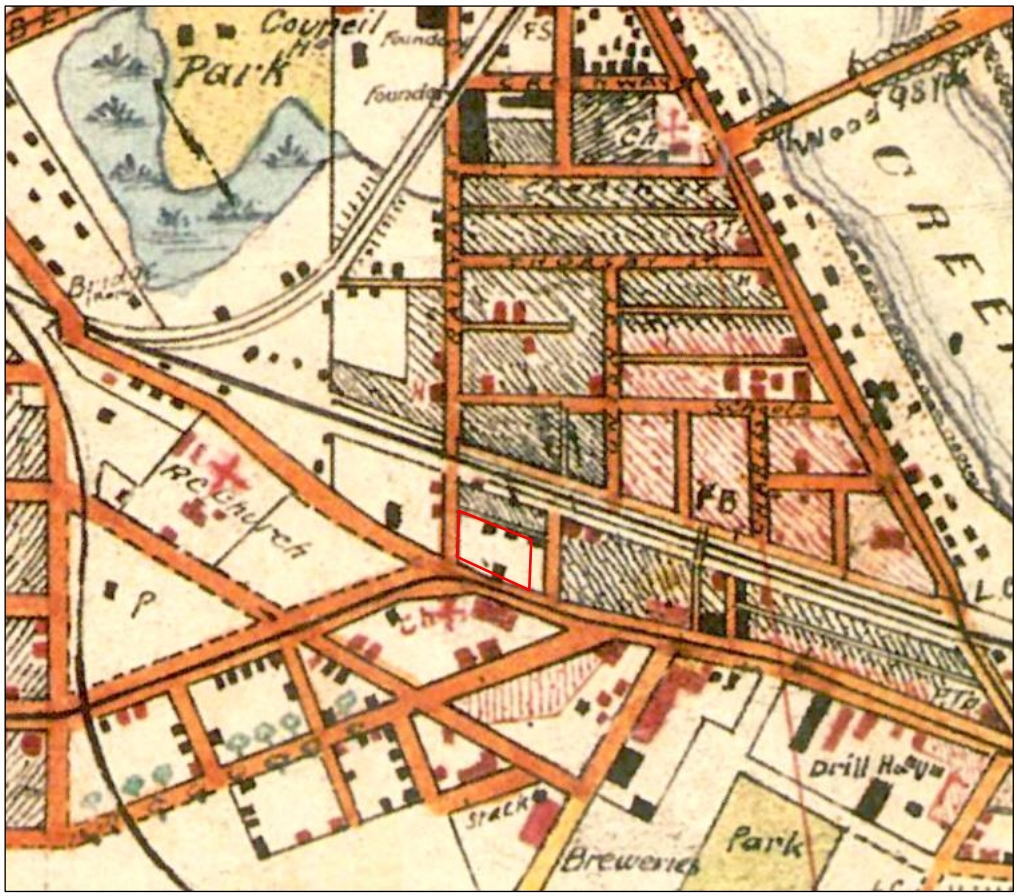

Figure 6: Map of Newcastle, 1910

7.5 Recent Photography

Information relating to the period of underground fuel storage tank operation was not available from the current owner (purchased 2019) or tenant (as of 2020).

It is possible that the known UST located in the north-eastern portion of the site was initially installed around 1994-1995 associated with DA1994/0517 "… Part of Former Factory as a Transport Terminal (Coach Depot - Maintenance and Parking Facility Only)" or BA1996/2014 for a "a Motor Vehicle Sales and Service Centre".

A brief review of Google Streetview images indicates that the bowser remained in place on the north-western corner of the eastern site building in images until about May 2018. The bowser is no longer in place in an image dated August 2019. Site observations (refer section 8) suggest all underground fuel infrastructure remains in place (ie USTs and pipework) and only the bowser was removed. The UST vent pipe remains in place as discussed in Section 8.

Whilst the location of this tank is similar to WorkCover search records (refer Section 7.6), the volume of this tank was 900 L compared to the estimated size of 10,000 L that remain in ground in the central area of the site.

Google street view images showing the tank and general site use from 2010 to 2019 and are shown in Figure 7 to Figure 12.

Figure 7: Google Streetview Image from Hunter Street – January 2010

Figure 8: Google Streetview Image from Tighe Street – January 2010

Figure 9: Google Streetview Image from Tighe Street – January 2010

Figure 10: Google Streetview Image from Hunter Street – June 2015

Figure 11: Google Streetview Image from Hunter Street – February 2017

Figure 12: Google Streetview Image from Hunter Street – August 2019

7.6 Public Registers

EPA Notices available under Section 58 of the Contaminated Lands Management Act (CLM Act) (1)	No notices issued under the Protection of the Environment Operations Act 1997 (POEO) on the site or on surrounding sites; accessed 6 August 2021.
Sites notified to EPA under Section 60 of the CLM Act (1)	The site is not listed as a notified contaminated site. There were four listed sites within a 500 m distance of the site as follows: • 113 Parry St, Newcastle West (Former Mobil Service Station), located approximately 200 m south of the site. • 10 Dangar St, Wickham (Former Warehouse), located approximately 300 m east of the site. • 2 Holland St, Wickham (Fuchs Lubricants), located approximately 220 m north of the site. • 50 Railway St, Wickham (Railcorp Wickham), located approximately 280 m north west of the site.
NSW EPA PFAS Investigation Sites (1)	The site and surrounding properties are not listed as per- and polyfluoroalkyl substances (PFAS) investigation sites. The closest listed site was Fuchs site at 2 Holland St, Wickham located about 300 north north-west of the site. This site is not considered to be upgradient.
SafeWork NSW	A SafeWork NSW Hazardous Chemicals on Premises Search (included in Appendix C) was undertaken for the subject site and the broader former DFC property area (i.e. 924 Hunter Street and 4 Tighe Street). The search result indicated a number of records for underground fuel tank storage (UST) for the property search area. The records and plans suggest that most USTs were located on the subject investigation site (i.e. main DFC property), comprising as a minimum: • Three 7500-10,000 L USTs (two diesel and one leaded petrol) located adjacent to Hunter Street; • One 900 L UST in the central area of 924 Hunter Street. This tank is approximately near the approx 10,000 L UST which remains in place at this site but not identified by the Safe Work search records. It is noted that the number of tanks and records of the locations were difficult to ascertain based on the plans provided. The locations identified by the search and confirmed by the GPR are shown on Drawing 1 in Appendix H. The search did not identify any plans to confirm the presence of tanks for the northern property (4 Tighe Street). However, the documentation suggests the following may have been present at the adjacent property in approx 1940 based on a description of the site address (2,4,6,8 Tighe Street) and “garage” activities: • One 950 L (250 gallon) UST; • One 1900 L (500 gallon) UST. The northerly adjacent property is expected to be downgradient of the subject investigation site. The 1938 (signed 1941) record also indicates buildings on the northern property were constructed from brick walls, asbestos with wooden girders roof and concrete floors. There is a potential for additional underground fuel infrastructure on the site and/or former hazardous chemical storage/use on the site not identified or clear in the search report. Note: A GPR survey of the investigation site was undertaken in March 2022 prior to additional drilling of Bores 401 to 404. Further details are provided in Section 8.2.

Notes: (1) Database search dated 6 August 2021

7.7 Council Planning Records

A review of the Council Section 10.7 Planning Certificates for each of the lots, copies of which are included in Appendix C, indicated the following:

- Is not within a proclaimed mine subsidence district;
- The lots have not been listed on the loose-fill asbestos insulation register;
- Regarding land contamination matters under section 59(2) of the *Contaminated Land Management Act 1997*:
    - For Lot 1 D.P. 1091173, Lot 2 D.P. 445736, Lot 2 D.P. 1091173, Lot 1 D.P. 456088 and Lot 2 D.P. 126, Council records indicate that (1) engine works and (2) fuel/oil storage, being potentially contaminating land uses, may have been carried out;
    - For Lot 1 D.P. 456088 and Lot 1 D.P. 342675, there are no prescribed contamination matters to be disclosed.

An online search of Newcastle City Council (NCC) planning records relating to development applications (DA), building applications (BAs) was undertaken on 31 May 2021. The search was undertaken for 924 Hunter Street, Newcastle, the associated address for all lots, with results summarised in Table 4.

Table 4: Records of Approved Development Applications - 924 Hunter Street, Newcastle West

Reference [1]	Description	NCC Record of Lots	Relevance
'BA1989/0999	Cool Room	Lots 23-24 D.P. 126 & Lot 1 D.P. 445736	Off-site (north)
DA1994/0517	The Use of Part of Former Factory Premises as a Transport Terminal (to Uring Coach Depot - Maintenance and Parking Facility Only).	Lots 23-24 D.P. 126 & Lot 1 D.P. 445736	Off-site (north) [3]
BA1996/2014	Establish a Motor Vehicle Sales and Service Centre Incorporating Servicing Workshop & Spare Part Sales and Associated Business Administration NS Functions	Lots 23-24 D.P. 126 & Lot 1 D.P. 445736	Mostly off-site (north), with **exception of sales and administration services assumed on site**
DA1995/0315	Proposed Motor Vehicle Sales & Service Complex	Lots 23-24 D.P. 126 & Lot 1 D.P. 445736	Mostly off-site (north), with **exception of sales and administration services assumed on site**
DA1998/2684	Alterations to building	Lots 23-24 D.P. 126 & Lot 1 D.P. 445736	Off-site (north)
DA2000/0914	Advertising sign	Lots 23-24 D.P. 126 & Lot 1 D.P. 445736	Off-site (north)
DA2004/0644	Alterations & additions to showroom (awning)	Lots 23-24 D.P. 126 & Lot 1 D.P. 445736	**Assumed on-site (incorrect record of lots)**
DA2010/0023	Membrane awnings to rear of existing motor dealership building	Lots 23-24 D.P. 126 & Lot 1 D.P. 445736	**Assumed on-site (incorrect record of lots)**
DA2010/0421	Advertising signs	Lots 23-24 D.P. 126 & Lot 1 D.P. 445736	Off-site (north) or on-site (?)
DA2019/00579	Change of use to recreation facility (indoor)	Assumed eastern lots	**On-site**
DA2020/01160	Signage	Lots 23-24 D.P. 126 & Lot 1 D.P. 445736	Off-site (north) or on-site (?)

Notes to Table 4:

(1) Council development application (DA) reference

(2) "Various Lots & D.P.s No 924 Hunter Street Newcastle West"

(3) Correspondence with Council confirmed DA related to site to the north on Tighe Street

DP completed a further request to Council for available plans or reports to assist in the review of potential contaminating activities.

Council indicated that an environmental audit of 924 Hunter Street Newcastle was completed in December 1994 which indicated the presence of an "*abandoned underground fuel tank, storage of disused/open drums, chemical storage".* In response to this, Australian Scenic Coaches Pty Ltd, indicated the following:

- The depot was for maintenance and parking only;
- Maintenance / workshop activities were limited to minor mechanical repairs and cleaning;
- All major mechanical works and spray painting etc were undertaken off-site;
- Product storage on the premises included:
    - *Tyre black;*

- *410 L oil;*
- *205 L kerosene;*
- *Cleaning materials (205 L truck wash, biodegradable cleaning materials kept in a drip trayed area – clean etc);*

- Wastes from bus toilets are disposed to sewer.

It is unclear whether the inspection and information above pertains to the current investigation site and/or the property to the north which is also registered by Council under the same address.

Council also provided the notice of determination for DA1994/0517 dated 10 February 1995 which is included in Appendix C. This mostly relates to environmental management requirements for the proposed construction of the commercial servicing building on the northern property across Tighe Street, as well as general requirements for parking / vehicle movement on the subject investigation site.

Information provided by Council is included in Appendix B.

7.8 Site History Integrity Assessment

The information used to establish the history of the site was sourced from reputable and reliable reference documents, many of which were official records held by Government departments/agencies. The databases maintained by various Government agencies potentially can contain high quality information, but some of these do not contain any data at all.

In particular, aerial photographs provide high quality information that is generally independent of memory or documentation. They are only available at intervals of several years, so some gaps exist in the information from this source. The observed site features are open to different interpretations and can be affected by the time of day and/or year at which they were taken, as well as specific events, such as flooding. Care has been taken to consider different possible interpretations of aerial photographs and to consider them in conjunction with other lines of evidence.

7.9 Summary of Site History

It is noted that site personnel or representatives were not available to provide information on current or former site activities, noting that current lease tenants have only been at the site since 2020.

The site history information suggests the following:

- Prior to 1930/1940s, site use is unconfirmed. The site comprised a number of smaller lots with various land owners and as such may have been a mix of residential, business or commercial / industrial use. Blacksmith use may have occurred for the central and eastern part of the site (Lot 1-2 D.P. 1091173);
- From 1930s the site included construction of a number of buildings / sheds for commercial milk processing and distribution (i.e. bottling of milk, return of bottles, washing, transport of milk and administration). The facility also extended to the north, outside the current investigation area;
- Details about the use of buildings, furnaces, fuel storage etc during these times are unknown. Aerial photos were often of low resolution to confirm site details;

- Records do not suggest animals were kept on site during dairy production site use;
- WorkCover records indicated that:
  - One 900 L UST was installed in the central area of 924 Hunter Street in about 1936. The tank was approximately near the ~10,000 L UST which remains in place (not identified by the Safe Work search records).
  - Three 7500-10,000 L USTs (two diesel and one leaded petrol) were installed on the southern boundary, located adjacent to Hunter Street in about 1950 associated with the DFC operations;
- Most site buildings were demolished around mid-1990s with the exception of the south-western corner building still in place (DFC administration building – façade area only) and the eastern site building;
- From about 1995, the site included additions to the original DFC building to form the Regal Motors car dealership showroom, with this building current presently. Internal areas of buildings, including the eastern site building were used as showrooms. Records do not suggest that on site vehicle servicing has occurred, rather this was undertaken for the site to the north of Tighe Street in conjunction with the Regal Motors site operations;
- The ~10,000 L UST on the eastern side of the site may have been installed around 1995 for refuelling of vehicles which was common at the time. Records to confirm UST installation and cessation of use have not been located at this time. The bowser was removed between mid-2018 and mid-2019;
- It is also possible that the known UST located in the north-eastern portion of the site was initially installed around 1994-1995 associated with a former Coach Depot (maintenance and parking), however, site history details have not been conclusive;
- Car sales and showroom operations continued to present, noting that images suggest a period in 2019-2020 where the site was unoccupied/untenanted;
- The eastern part of the site has more recently been tenanted for fitness / health clubs;
- The site is surrounded by industrial and commercial premises and include several service stations, factories (including former Steggles factory), car dealerships and servicing centres, some of which may be upgradient of the site.

8. Site Walkover

8.1 General Condition

A site walkover was undertaken by an environmental engineer from DP on 8 October 2021. The general site topography was generally consistent with that described in Section 4. The site layout appears to be consistent with the 6 June 2021 aerial shown on Drawing 1 in Appendix H. Key site photos are included in Appendix C.

The following key site features pertinent to the PSI are as follows:

- The building in the south-western corner of the site (two-storey) comprised a vehicle showroom, administration area, offices and amenities;

- The eastern side building (not accessible) comprised two lease areas:
  - Northern – Barre Effect (Pilates / gym);
  - Southern – Airlocker (gym / fitness club).
- The majority of the site was concrete of asphalt paved;
- A UST was located on the eastern side of the site, with the location of the former bowser near the north-western corner of the eastern building. Fill / dip points were observed and were serviceable (refer Section 8.2). One tank vent pipe was located on the northern side of the building;
- A covered awning on the northern side of the building contained an air conditioner unit and water pump;
- No chemical storage was observed;
- One fibro cement sheet / pipe (confirmed as asbestos-containing material (ACM)) was observed at the surface of the perimeter garden bed on the north-western corner. The material and underlying soil was sampled as S1 as discussed in later sections of this report.

With the exception of S1, there were no observations of potential ACM at the surface, noting that non-sealed areas of the site were limited (i.e. garden beds on the north-eastern, northern and southern perimeters, or part thereof). ACM materials may be present in site buildings which have not been assessed / sampled as part of this assessment.

There were no obvious indications of pesticide spraying or distressed vegetation.

It is noted that inspection of the southern part of the site fronting Hunter Street did not identify any surface indicators such as fill/dip points or areas of upgraded concrete to indicate the presence of the three USTs. Further information on USTs and GPR survey is provided in Section 8.2 below.

Key site features and observations are annotated on Drawing 1 Appendix H.

8.2 UST Inspection and Ground Penetrating Radar (GPR)

Inspection of the known underground fuel tank was undertaken on 12 October 2021 in conjunction with groundwater well gauging and sampling. The following was noted:

- The fill / dip point was in good order. There were no observations to suggest surface water runoff may migrate into the tank;
- The base level of the tank was estimated at a depth of 2.75 m below ground level;
- Approximately 0.25 m of fuel, likely petrol, was present in the bottom of the tank based on inspection via a disposable bailer. Observations suggested the absence of water obvious ingress into the tank (i.e. tank liquid is not suggested to be a mix of water and fuel).

Groundwater level gauging at the time (refer Section 11.4) indicated that groundwater level was at a similar level to the base of the tank (i.e. about 2.8 m below ground level).

There were no other indicators on the ground surface to suggest the presence of other USTs, noting that surface pavements may have been upgraded.

In response to identification of addition USTs at the site within WorkCover records , a GPR survey was conducted on 10 March 2022 and prior to additional subsurface investigation (Bores 401 to 404 and 501 to 506). The survey was undertaken in conjunction with service location for borehole set out and was limited to accessible hardstand areas of the site. Scanning was not undertaken within buildings or garden beds. It is noted that the site included numerous parked vehicles which were temporarily moved to allow access to the southern and central areas of mapped USTs, however precluded a detailed grid based survey of the pavement area.

Key findings of the GPR survey were as follows:

- Southern USTs
  - Three USTs remain in ground near to the Hunter Street boundary. These are generally commensurate with the location as suggested on WorkCover Plans, with the exception of being slightly north of the southern boundary (further within the lot boundary)
  - The presence of remaining fuel lines or vent pipes could not be ascertained by the GPR;
- Central UST:
  - One UST was located corresponding to the observed fill/dip point. The GPR indicated the tank was smaller than previously estimated as part of the initial site investigation works in October 2021;
- General site:
  - No other potential USTs were located for areas of the site available for scanning.

The estimated location of the USTs are shown on Drawing 1 in Appendix H.

It should be noted that GPR can be subject to interference from other buried structures, such as underground services, drains, footings, as well as the presence of varying concrete surfaces. There is a therefore a potential for other tanks to be present that were not identified by the GPR.

9. Preliminary Conceptual Site Model

A conceptual site model (CSM) is a representation of site-related information regarding contamination sources, receptors and exposure pathways between those sources and receptors. The CSM provides the framework for identifying how the site became contaminated and how potential receptors may be exposed to contamination either in the present or the future ie: it enables an assessment of the potential source – pathway – receptor linkages (complete pathways).

Potential Sources

Based on the current investigation, the following potential sources of contamination and associated contaminants of potential concern (COPC) have been identified.

- S1: Fill (source unknown): Associated with site filling / levelling, fill / waste generated on site.
  - COPC include metals, total recoverable hydrocarbons (TRH), benzene, toluene, ethylbenzene, xylene (BTEX), polycyclic aromatic hydrocarbons (PAH), polychlorinated biphenyls (PCB), organochlorine pesticides (OCP), organophosphorus pesticides (OPP) and asbestos, synthetic mineral fibres (SMF), lead (in paint) and PCB.
- S2: Former structures: Associated with site former buildings on the site, demolition, building wastes.
  - COPC include asbestos, synthetic mineral fibres (SMF), lead (in paint) and PCB.
- S3: Possible blacksmiths: Associated with site former buildings on the site, demolition, building wastes.
  - COPC include TRH, PAH, BTEX, metals, VOC, cyanide.
- S4: UST and associated pipework and bowser.
  - COPC include heavy metals (namely lead), TRH, BTEX, PAH and volatile organic compounds (VOC);
- S5: Former commercial / industrial use as DFC (milk processing, bottling), possible furnace, storage of fuels, chemicals, drips/spills, carparking, waste placement;
  - COPC include metals, TRH, BTEX, PAH, PAH, OCP, OPP, ACM, SMF;
- S6: Possible storage of oils / automotive goods if servicing was conducted on site:
  - COPC include TRH, BTEX, PAH, metals, solvents.
- S7: Carparking, drips / spills leaks (possible former unsealed carpark areas?):
  - COPC include TRH, BTEX, PAH, metals, PCB.
- S8: Adjacent/upgradient commercial developments to the west and south (car yards, service stations, tram line etc).
  - COPC include TRH, BTEX, PAH, metals and VOC.

Potential Receptors

The following potential human receptors have been identified:

- R1: Current users [commercial users and customers];
- R2: Construction and maintenance workers;
- R3: End users [ground floor commercial users and residential occupants]; and
- R4: Adjacent site users [commercial users].

The following potential environmental receptors have been identified:

- R5: Surface water [The Hunter River; a marine / estuarine environment];
- R6: Groundwater; and
- R7: Terrestrial ecology.

Potential Pathways

The following potential pathways have been identified:

- P1: Ingestion and dermal contact;
- P2: Inhalation of dust and/or vapours;
- P3: Surface water run-off;
- P4: Lateral migration of groundwater providing base flow to water bodies;
- P5: Leaching of contaminants and vertical migration into groundwater; and
- P6: Contact with terrestrial ecology;
- P7: Inhalation, ingestion and absorption.

Summary of Potentially Complete Exposure Pathways

A 'source–pathway–receptor' approach has been used to assess the potential risks of harm being caused to human or environmental receptors from contamination sources on or in the vicinity of the site, via exposure pathways (potential complete pathways). The possible pathways between the above sources (S1 to S8) and receptors (R1 to R7) are provided in below Table 5.

Table 5: Summary of Potentially Complete Exposure Pathways

Source and COPC	Transport Pathway	Receptor	Risk Management Action
S1: Fill : metals, TRH, BTEX, PAH, PCB, OCP, OPP, PCB, asbestos, SMF, lead in paint. S2: Former structures : asbestos, SMF, lead in paint, S3: Blacksmiths: TRH, PAH, BTEX, metals, VOC, cyanide S4: DFC industrial use: metals, TRH, BTEX, PAH, PAH, OCP, OPP, ACM, SMF	P1: Ingestion and dermal contact; P2: Inhalation of dust and/or vapours.	R1: Current users [commercial users and customers] R2: Construction and maintenance workers; R3: End users [ground floor commercial users and residential occupants];	An intrusive investigation is recommended to assess possible contamination including testing of the soils and groundwater.
	P2: Inhalation of dust and/or vapours	R4: Adjacent site users [commercial].	
	P3: Surface water and sediment run-off; P4: Lateral migration of groundwater providing base flow to water bodies	R5: Surface water [Hunter River]	
	P5: Leaching of contaminants and vertical migration into groundwater	R6: Groundwater	
	P6: Contact with terrestrial ecology P7: Inhalation, ingestion and absorption	R7: Terrestrial ecosystems	
S2: UST lead, TRH, BTEX, PAH, VOC S6: Possible storage of oils / automotive goods: TRH, BTEX, PAH, metals, solvents.	P1: Ingestion and dermal contact P2: Inhalation of dust and/or vapours;	R1: Current users [commercial users and customers] R2: Maintenance workers; R3: End users [ground floor commercial users and residential occupants];	
	P2: Inhalation of dust and/or vapours	R4: Adjacent site users [industrial].	
	P3: Surface water and sediment run-off; P4: Lateral migration of groundwater providing base flow to water bodies	R5: Surface water [Hunter River]	
	P5: Leaching of contaminants and vertical migration into groundwater	R6: Groundwater	
	P6: Contact with terrestrial ecology P7: Inhalation, ingestion and absorption	R7: Terrestrial ecosystems	
S7: Carparking: TRH, BTEX, PAH, metals, PCB.	P1: Ingestion and dermal contact P2: Inhalation of dust and/or vapours	R1: Current users [commercial users and customers] R2: Maintenance workers; R3: End users [ground floor commercial users and residential occupants];	
	P3: Surface water and sediment run-off P4: Lateral migration of groundwater providing base flow to water bodies;	R5: Surface water [Hunter River]	
	P5: Leaching of contaminants and vertical migration into groundwater	R6: Groundwater	
	P7: Inhalation, ingestion and absorption.	R7: Terrestrial ecosystems	
S8: Adjacent/upgradient developments: TRH, BTEX, PAH, metals and VOC.	P2: Inhalation of dust and/or vapours.	R1: Current users [commercial users and customers] R3: End users [ground floor commercial users and residential occupants]	
	P1: Ingestion and dermal contact P2: Inhalation of dust and/or vapours	R2: Construction and maintenance workers	
	P7: Inhalation, ingestion and absorption.	R7: Terrestrial ecosystems	

10. Sampling and Analysis Quality Plan

10.1 Data Quality Objectives

The preliminary investigation was devised with reference to the seven-step data quality objective process which is provided in Appendix D Schedule B2, NEPC (2013). The DQO process is outlined in Appendix D.

10.2 Soil Sampling Rationale

Based on the CSM and DQO the following sampling rationale was adopted.

A judgemental sampling strategy to determine borehole locations was adopted for the PSI. Locations were based on site history information received at the time, access and the CSM with the rationale provided below. Borehole locations are shown on Drawing 1 in Appendix H.

Bores 202 to 204	Assess soil / fill conditions near and downgradient of UST as well as general soil and fill conditions, including locations of former buildings. Bores 203 and 204 to assess for possible off site hydrocarbon migration (i.e. downgradient of tank and at site boundary).
Bores 201, 301 to 307	Assess general soil and fill conditions, including locations of former buildings.
Bores 401 to 403	Assess soil and fill conditions near and downgradient of USTs to assess for hydrocarbon impact, general soil/fill conditions near and downgradient of USTs and potential migration of contamination onto site (Bore 401).
Bores 404	Assess for hydrocarbon impact and general soil/fill conditions from the main DFC building location as well as off-site sources (i.e. groundwater flow approximate to the north-east)
Bores 501 to 506	Further assess general soil and fill conditions and presence/concentrations of ACM, including locations of former buildings.
S1	Surface sampling at observed potential ACM fragment.

It is noted that at the time of the investigation October 2021 field investigation, the SafeWork NSW Dangerous Goods search for the site had yet to be received. Investigation in the southern part of the site to assess the presence of USTs and potential impact to soils and groundwater in this area was undertaken in March 2022 (Bores 401 to 403).

Soil samples were collected from each borehole at the surface and approximately 0.5 m thereafter, and changes in lithology or signs of contamination. At this stage a soil vapour sampling and testing has not been undertaken for the site (i.e. to assess S2, S6 or S8), however, the preliminary assessment included PID screening of soil samples from the boreholes and groundwater wells and preliminary VOC testing in soil and groundwater.

The general sampling methods are described in the field work methodology, included in Appendix E.

10.3 Groundwater Sampling Rationale

In order to assess the current groundwater contamination status downgradient of the USTs, evaluate whether the previous USTs use have impacted on groundwater and assess potential groundwater impacts migrating onto the site from upgradient sources, sampling from two existing monitoring wells (GW1 and GW3) and six new well installations (Bores 203, 204, 401 to 404) was undertaken using low-flow (MicroPurge) sampling techniques.

Well GW1 and Bores 203 and 204 were located north of the central fuel tank and bowser, with Bore 202 and GW3 to the west.

Bores 402 and403 were located in close proximity and approximately downgradient (as permitted by limited access and underground services) to the USTs identified in the southern portion of the site. Bore 401 was located upgradient of these USTs and in close proximity to the southern site boundary to assess potential impact from off-site sources.

The test locations provided data on the concentration of contaminants in groundwater in close proximity to USTs upgradient and downgradient of UST infrastructure at the site.

Bore 404 was positioned to assess for possible hydrocarbon impact from the main DFC building location as well as off-site sources.

The general sampling methods are described in the field work methodology, included in Appendix E.

11. Field Work Results

11.1 Subsurface Conditions

The subsurface conditions encountered in the bores are presented in detail in the borehole logs in Appendix A. The logs should be read in conjunction with the accompanying notes in Appendix A which explain the descriptive terms and classification methods used in the logs.

A generalised geotechnical model of the subsurface profile encountered at the test locations is summarised as follows:

FILL (Unit 1A): Asphalt, spray seal or concrete surfacing, overlying predominantly brown sandy gravel (crushed natural rock) with trace clay (i.e. subgrade material). This unit was encountered in Bores 301 to 304, 307, 401 to 404, 504 and 506 to typical depths of 0.2 m to 0.4 m. The full depth was not determined at Bore 307 (refusal).

FILL (Unit 1B): Asphalt, spray seal or concrete surfacing, overlying predominantly granular fill to a depth ranging from 1.0 m to 2.3 m. This layer was also identified underlying Unit 1A where identified. Anthropogenic inclusions including ash, brick, ceramic, coal, coal reject, fibro, glass, metal, slag gravel and black intermixed sand were observed within fill (refer to potential contamination observations in Section 11.2).

SAND (Unit 2) Sand, generally brown and grey to a depth ranging from 2.0 m (limit of investigation) to 5.0 m (limit of investigation). Silty clay/clayey sand bands were observed within Unit 2 in Bores 201, 203-204 and 401-403 from 2.3 m / 2.8 m to 3.2 m / 3.6 m below ground level of thickness of 0.2 m to 1.3 m (variable and non-continuous layers).

The approximate depth and level of fill based on drilling is summarised in Table 6.

Table 6: Estimated Depth of Fill

Bore	Ground level (AHD)	Estimated Depth of Fill – Combined Units 1A and 1B (m bgl)	Estimated Base RL of Fill (AHD)
201	3.89	2.3	1.59
202	3.37	1	2.37
203	3.10	1.3	1.80
204	3.27	1.3	1.97
205	3.40	1.4	2.00
301	2.99	1.3	1.69
302	3.24	1.6	1.64
303	3.57	>0.8	<2.77
304	3.48	>1	<2.48
305	3.25	1.3	1.95
306	3.42	1.6	1.82
307	3.93	>0.5	<3.43
401	4.07	1.7	2.37
402	3.70	2.2	1.50
403	4.00	2.3	1.70
404	3.40	2.1	1.30
501	3.4	>0.8	<2.6
502	3.4	1.3	2.10
503	3.4	2.1	1.30
504	3.2	1.4	1.80
505	3.5	1.4	2.10
506	3.3	1.5	1.80

Notes to Table 6:

DOI – depth of investigation

m bgl – metres below ground level

Free groundwater observations during drilling are summarised in Table 7.

Table 7: Groundwater Observations within Bores During Drilling

Bore	Date	Groundwater Level (m below ground level)	Groundwater Reduced Level (AHD)
201	6/10/2021	3.2	0.7
202		3.2	0.2
203		2.8	0.3
204		2.8	0.5
205		3.0	0.4
301	9/10/2021	2.7	0.3
302		2.9	0.3
303		Not encountered	<2.9
304		Not encountered	<2.5
305		Not encountered	<1.3
306		2.9	0.5
307		Not encountered	<3.4
401	13/3/2022	3.1	1.0
402		2.8	0.9
403		2.9	1.1
404		2.5	0.9
501		Not encountered	<2.6
502		Not encountered	<1.6
503		Not encountered	<1.3
504		Not encountered	<1.4
505		Not encountered	<1.4
506		Not encountered	<1.4

Notes to Table 7:

DOI – depth of investigation

It should be noted that groundwater levels are variable and can be affected by such factors as soil permeability, recent weather conditions and possible tidal influences.

Results of groundwater purging and sampling are shown in Section 11.4.

11.2 Contaminant Observations in Soil

There were no visual or olfactory observations (e.g. staining, odours, free phase product) to suggest the presence of gross contamination within the soils or groundwater observed in the investigation.

Observations of potential contamination are shown in Table 8.

Table 8: Summary of Observations of Potential Contamination in Subsurface Investigation

Potential Contamination Observation	Locations and Depths (m)
Fill[1]	All bores. Bore 201/0.11-2.3, 202/0.155-1.0, 203/0.18-1.3, 204/0.12-1.7, 202/0.115-1.4, 301/0.05-1.3), 302/0.03-1.6, 303/0.03-0.7[(2)], 304/0.03-1.0[(2)], 305/0.18-1.3, 306/0.19-1.6, 307/0.16-0.5[(2)], 401/0.1-1.7, 402/0.15-2.2, 403/0.21-2.3, 404/0.03-2.1, 501/0.12-0.8[(2)], 502/0.2-1.3, 503/0.12-2.1, 504/0.05-1.4, 505/0.05-1.4, 506/0.05-1.5
Fibro Fragments (Potential ACM)	Bore 305 (0.55 m) and surface sample (S1), 503/1.1-2.1, 506/0.8-1.5 – refer to logs in Appendix A for details
Hazardous building material (HBM) indicators	Bore 201/0.11-1.6 (brick), 202/0.15-1.0, 203/0.18-1.3 (brick / ceramic), 204/0.12-1.3 (brick), 301/0.3-0.8 (brick), 302/0.4-1.3 (brick), 303/0.3->0.7[(2)] (brick), 306/0.8-1.6 (brick), 402/0.9-1.2 (brick), 403/0.4-2.3 (brick), 404/0.4-2.1, 501/0.3-0.8 (brick / concrete / timber / metal), 502/0.2-1.3 (brick / glass), 503/0.15-2.1 (brick / glass / metal), 504/ 0.2-1.1 (brick), 505/0.05-1.2 (brick concrete), 506/0.8-1.5 (brick / glass)
Coal / coal reject	Bore 201/0.11-1.6 (trace), 201/0.6-2.3, 202/0.155-1.0, 204/0.12-1.3, 301/0.3-0.8, 302/0.4-1.3, 303/0.3->0.7[(2)] (trace), 304/0.4->1.0[(2)] (trace), 305/0.18-1.1 (trace/some), 306/0.19-0.8 (trace), 306/0.8-1.6, 401/0.3-1.7, 402/0.3-2.2, 403/ 0.4-2.3, 502/0.2-1.3, 503/1.1-2.1, 506/0.8-1.5
Slag (blast furnace)	Bore 201/0.11-1.6, 303/0.3->0.7[(2)] (trace), 304/0.4->1.0[(2)] (trace), 305/0.18-1.1 (trace/some), 306/0.19-0.8 (trace), 501/0.3-0.8 (trace), 502/0.2-1.3 (trace), 503/0.15-1.1, 504/0.2-1.1, 505/0.05-1.2, 506/0.8-1.5
Black sand (trace / intermixed)	Bore 202/0.155-1.0 (trace), 305/0.18-1.1 (trace), 306/0.19-0.8 (trace)
Ash	Bore 202/0.155-1.0, 205/0.115-1.4, 401/0.3-1.7, 402/0.3-2.2, 403/0.4-2.3, 404/0.4-2.1, 501/0.3-0.8, 502/0.2-1.3, 503/0.15-2.1, 504/ 0.2-1.1, 505/0.05-1.2, 506/0.8-1.5

Notes to Table 8:

1 - Potential presence of a range of contaminants due to unknown source of imported fill

2 – Limit of investigation

The PID screening indicated the absence of significant volatile impacts at the test locations and to the depths investigated, with all recorded values of less than 1 ppm.

11.3 Asbestos Field Screening (bonded ACM in soil)

Field screening / sieving was conducted on fill samples collected from large diameter boreholes (Bores 501 to 506) which permitted collection of bulk soil samples (10L). Screening / sieving was conducted for the presence of ACM with reference to the relevant guidelines (WA DoH, 2021) and (NEPC, 2013). Twelve fill samples were screened/sieved.

Potential ACM (fibro cement sheeting fragments) were encountered in two of the twelve bulk soil samples screened. At Bores 503/1.2-2.0 m and 506/1.0-1.4 m one fragments was identified in fill and these were submitted to the laboratory which confirmed the presence of asbestos in these fragments. The results are summarised in the tables in Appendix B.

The field screening results were used to estimate the concentration of asbestos-containing material (ACM) in filling. An exceedance criteria of 0.05% w/w was adopted as recommended in WA DoH (2021) and NEPC (2013) for commercial / industrial land use as detailed in the SAC in Section 13 and Appendix G.

Calculations were made on bulk fill samples that contained asbestos fragments using Equation 1.

$$\% \text{ Asbestos} = \frac{\% \text{ Asbestos Content x ACM (kg)}}{\text{Soil Volume (L) x Soil Density (kg/L)}} \quad \text{[Equation 1]}$$

where it is assumes that:

- % Asbestos Content (within asbestos cement materials) = 15%
- Soil density = 1.65 kg/L

Asbestos calculations were made based on estimates of 15% asbestos content with reference to NEPC (2013) for fibre cement materials. The results of field screening are presented in Table B4 in Appendix B.

The results indicate the asbestos concentration in Bores 503/1.2-2.0 m and 506/1.0-1.4 m were within the 0.05% health-based criteria for commercial / industrial land use.

11.4 Groundwater Sampling and Contaminant Observations

The results of groundwater level gauging, field parameters and observations during purging and sampling on 7 and 12 October 2021 and 24 March 2022 are shown in Table 9.

Table 9: Results of Groundwater Purging And Sampling – 7 and 12 October 2021 and 24 March 2022

Well ID	Easting	Northing	Ground RL (AHD)	TOC RL (AHD) (3)	Well Depth (m bgl)	Date	Depth to Groundwater Below TOC (m)*	Depth to Groundwater (m bgl)*	RL GW Head (AHD)*	PID Well Headspace (2) (ppm)	PID GW Headspace (2) (ppm)	Thickness of Free Product by Oil-Water Interface Meter (1) (mm)	pH	EC (mS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Temp. (°C)	Volume Purged (L)	Comments
GW1	383738.6	6356497.2	3.28	3.23	5.13	7/10/2021	2.79	2.84	0.44	<1	<1	<1	6.3	0.23	118	0.3	140	20.6	8	Brown, slightly turbid, no obvious odour
						12/10/2021	2.81	2.86	0.42	<1	-	<1	-	-	-	-	-	-	-	Water level gauging only
						24/03/2022	2.34	2.39	0.89	<1	-	<1	-	-	-	-	-	-	-	Water level gauging only
GW2	383737.1	6356490.7	3.39	3.344	TBC	12/10/2021	2.80	2.85	0.54	<1	-	<1	-	-	-	-	-	-	-	Water level gauging only
						24/03/2022	2.39	2.44	0.96	<1	-	<1	-	-	-	-	-	-	-	Water level gauging only
GW3	383736.4	6356488.0	3.42	3.37	5.35	7/10/2021	2.69	2.74	0.68	<1	<1	<1	5.7	0.23	130	0.2	160	20.4	14	Brown, slightly turbid, no obvious odour
						12/10/2021	2.71	2.76	0.66	<1	-	<1	-	-	-	-	-	-	-	Water level gauging only
						24/03/2022	2.45	2.50	0.92	<1	-	<1	-	-	-	-	-	-	-	Water level gauging only
203	383740.4	6356504.8	3.10	3.04	5.00	12/10/2021	2.58	2.64	0.46	7	<1	<1	5.8	0.20	170	4.3	>1000	20.8	8	Brown, highly turbid, no obvious odour
						24/03/2022	2.20	2.26	0.84	<1	-	<1	-	-	-	-	-	-	-	Water level gauging only
204	383750.2	6356499.3	3.27	3.24	5.00	12/10/2021	2.80	2.83	0.44	<1	<1	<1	6.7	0.60	55	1.7	>1000	20.0	8	Brown, highly turbid, no obvious odour
						24/03/2022	2.42	2.45	0.82	<1	-	<1	-	-	-	-	-	-	-	Water level gauging only
401	383728.0	6356455.8	4.09	4.01	4.00	24/03/2022	2.98	3.07	1.03	<1	<1	<1	5.7	0.23	87	1.0	252	22.5	10	Brown, moderately turbid, no obvious odour
402	383729.0	6356462.0	3.87	3.81	4.07	24/03/2022	2.78	2.83	1.04	<1	<1	<1	5.8	0.16	175	1.7	92	21.6	8	Grey, slightly turbid, no obvious odour
403	383722.0	6356466.9	3.89	3.74	4.00	24/03/2022	2.71	2.86	1.03	7	7	<1	5.5	0.13	180	1.8	203	21.8	9	Pale brown, slightly turbid, no odour
404	383693.0	6356521.8	3.34	3.24	4.34	24/03/2022	2.39	2.49	0.86	<1	<1	<1	6.4	0.51	57	0.9	502	22.8	12	Brown, highly turbid, no obvious odour

The results of field testing indicate the following for groundwater for wells:

- The pH was slightly acidic;
- The electrical conductivity values are typical of fresh water as would be expected of the quaternary alluvium;
- Redox potential (Eh) indicates oxidising conditions;
- The dissolved oxygen levels indicated generally aerobic conditions.

No staining, odours or light non-aqueous phase liquid (LNAPL) was observed during drilling or groundwater sampling. A PID well headspace of 7 ppm was noted for Bore 203 and 403 during sampling, however, there was no obvious odour.

The results of groundwater level gauging indicated reduced groundwater levels (piezometric head) varying from RL 0.4 to RL 1.0. Gauging of all eight monitoring wells on 24 March 2022 indicated a slightly north-easterly flow direction as shown in Figure 13, noting that limited data points were located in the western part of the investigation site. A possible perched groundwater table may be present near GW3 which may be associated with the nearby underground stormwater drains.

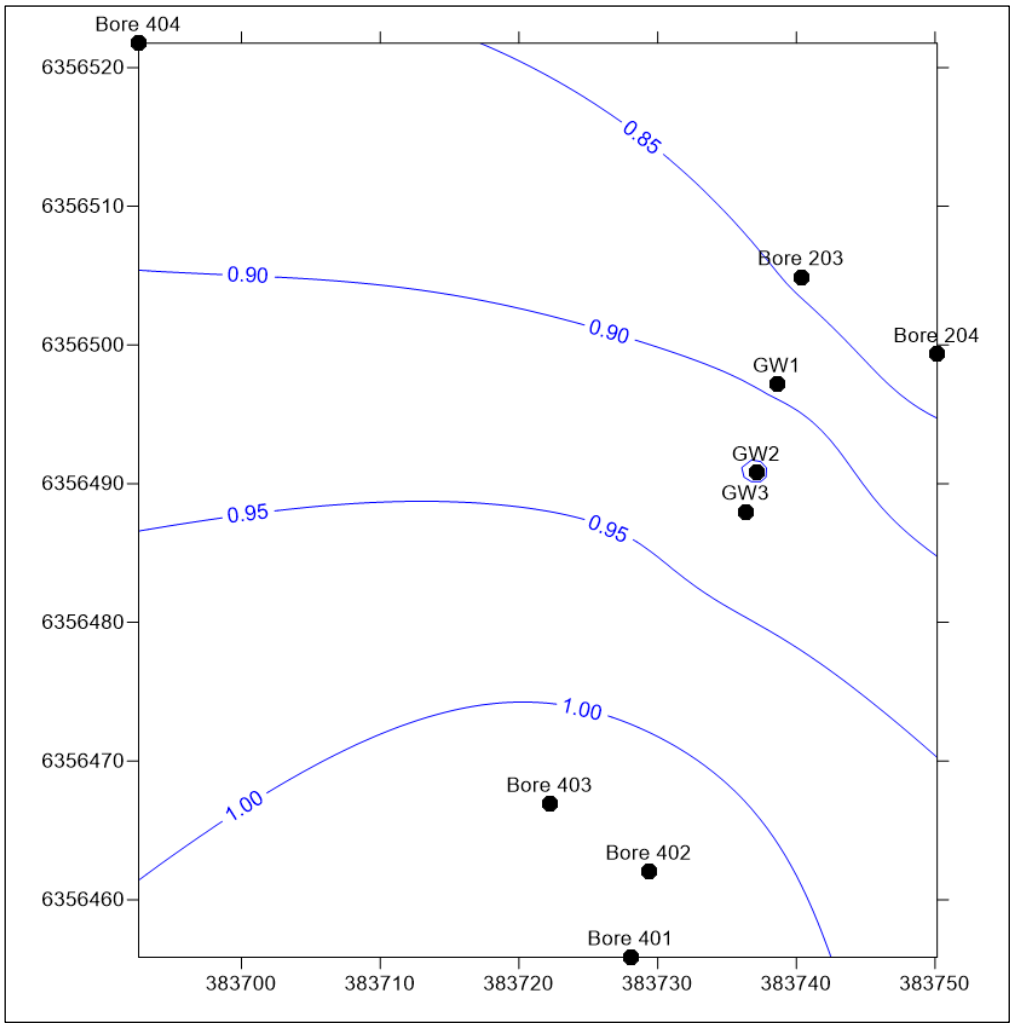

Figure 13: Inferred contours of groundwater piezometric head (AHD) – 24 March 2022

In general a groundwater flow direction to the north-north-east is expected. Bores 204 and 402 are therefore considered downgradient of the USTs and associated infrastructure.

12. Laboratory Testing

12.1 Program

12.1.1 Contamination

Laboratory testing was undertaken for selected soil samples for the main potential contaminants of concern outlined in the preliminary CSM in Section 9 and sampling and analysis plan in Section 10. The analytical program for the current assessment is summarised in Table 10.

Table 10: Summary of Analytical Program

Media	Analytes Tested	No. Primary Samples Tested	No. Replicate Samples Tested	No. Trip Spikes / Blanks	No. Equipment Rinsates
Soil	Metals (1), TRH, BTEX, PAH,	34	4	-	-
	OCP, OPP, PCB	27	4	-	-
	VOC	2	1	-	-
	Asbestos ID (500 mL)	20	-	-	-
	Asbestos ID (40 g) (3)	5	-	-	-
	TCLP lead	14	-	-	-
	TCLP chromium	1	-	-	-
	TCLP PAH	7	-	-	-
	pH (2)	3	-	-	-
	CEC	1	-	-	-
Material (Fibro)	Asbestos ID in material	4	N/A	-	-
Groundwater	Metals (1), TRH, BTEX, PAH	8	1	-	-
	VOC	4	1	-	-
	Trip spike / blank and rinsate	2	-	2	1

Notes to Table 10:
CEC – cation exchange capacity
Metals:
(1) arsenic (As), cadmium (Cd), chromium (Cr), copper (Cu), mercury (Hg), nickel (Ni), lead (Pb), zinc (Zn),), manganese (Mn), Beryllium (Be), Boron (B), Cobalt (Co), selenium (Se), antimony (Sb), tin (Sn)
(2) Additional pH testing in water was undertaken for natural soils for the ASS assessment (refer Section 12.1.2)
(3) Asbestos 40g analysis undertaken where limited sample was available
OCP - organochlorine pesticides
OPP - organophosphorus pesticides
PAH - polycyclic aromatic hydrocarbons
PCB - polychlorinated biphenyls
TRH - total recoverable hydrocarbons
TCLP - toxicity characteristic leaching procedure
BTEX – benzene, toluene, ethyl benzene, xylenes

TCLP testing was also undertaken for two soil samples for acid leachable lead and one sample for acid leachable PAH to assist with preliminary waste classification.

The laboratory testing was undertaken by Envirolab Services Pty Ltd, a NATA registered laboratory. Analytical methods used are shown in the laboratory report sheets in Appendix B.

The results of chemical analysis undertaken on soils samples are summarised in Tables B1 to B5 in Appendix B.

12.1.2 Acid Sulfate Soils

Laboratory testing comprised 39 ASS screening tests for pH in water (pH_F) and pH following oxidation with hydrogen peroxide (pH_{FOX}) using a calibrated pH meter. The ASS screening test results were compared to the adopted acceptance criteria outlined in ASSMAC guidelines (Stone, Ahern, & Blunden, 1998) and QASSIT Manual (Dear, et al., 2014).

Based on the results of the screening tests, eight soil samples were selected for detailed laboratory testing, comprising the full chromium suite in accordance with (Dear, et al., 2014), (Stone, Ahern, & Blunden, 1998) and Ahern et al (2014).

The results of the screening tests and detailed chromium testing on selected samples are summarised in Table B5 in Appendix B.

12.2 Results

The results of laboratory analysis and summary tables are included in Appendix B as follows:

- Table B1: Summary of Laboratory Results – Metals, TRH, BTEX, PAH (Commercial/Industrial Land Use Comparison - HIL D / HSL D / EIL/D / ESL D);
- Table B2: Summary of Laboratory Results – OCP, OPP, PCB, Asbestos (Commercial/Industrial Land Use Comparison- HIL D / HSL D / EIL D / ESL D);
- Table B3: Summary of Laboratory Results – VOC (Commercial/Industrial Land Use Comparison - HIL D / HSL D / EIL D);
- Table B4: Summary of Laboratory Results in Soil (Waste Classification Comparison);
- Table B5: Results of Asbestos Field Screening and Laboratory Testing for Asbestos in Soil (500 mL samples):
- Table B6: Summary of Laboratory Results – Acid Sulfate Soils;
- Table B7: Summary of Laboratory Results – Groundwater.

Chain of custody and sample receipt information are included in Appendix F.

13. Site Assessment Criteria

The site assessment criteria (SAC) applied in the current investigation are informed by the CSM (Section 9) which identified human and environmental receptors to potential contamination on the site. Analytical results are assessed (as a Tier 1 assessment) against the SAC comprising primarily the investigation and screening levels of Schedule B1 of NEPC (2013).

The investigation and screening levels applied in the current investigation comprise levels adopted for a generic commercial / industrial land use scenario, given the proposed commercial ground floor use at the site and with reference to NEPC (2013). The derivation of the SAC is included in Appendix G and the adopted SAC are listed on the summary analytical results tables in Appendix B.

14. Discussion

14.1 Soils

14.1.1 Contamination Testing

A total of 41 soil samples were analysed to provide a preliminary assessment of contaminant concentrations in soil for the identified potential contaminants of concern with reference to the CSM. The preliminary soil testing generally confirmed the absence of gross contamination at the test locations and depths investigated.

The results of the laboratory testing indicated the following:

- VOC, BTEX, OCP, OPP and PCB were not detected above the laboratory reporting limits;
- PAH concentrations were identified in 27 soil samples. Contaminant concentrations were highest in upper fill materials (i.e. upper 1 m);
- TRH was identified slightly in excess of laboratory reporting limits at five locations (Bore 201/2.0 m, 203/0.5 m, 401/1.0 m 401/2.0 m, 403/1.5 m, 5.5/0.8 m), mostly in fill in the southern and northern parts of the site;
- Bonded asbestos was identified in four fibro sheeting fragments; one each for fibro in filling at Bore 305/0.55 m, 503/1.2-2.0 m, 506/1.0-1.4 m and one at the surface of garden bed material (S1/F). This included field screening / sieving of upper fill at Bores 501 to 506. Bonded ACM concentrations within the bulk 10 L samples tested (Bores 501 to 506) were within the industrial / commercial land use criteria based on NEPC (2013)
- Of the 20 soil samples tested for 500 mL asbestos in soil identification, asbestos fines / friable asbestos was identified only in the fill at Bore 305/0.55 m. The result comprised fibre cement material (< 7 mm in size) i.e. friable. The percentage of asbestos fines, being less than 7 mm, exceeded the adopted criterion for industrial / commercial land use based on NEPC (2013). Bonded ACM containing fill at 503/1.2-2.0 m and 506/1.0-1.4 m also contained asbestos fines/friable fines concentrations below laboratory reporting limits and therefore within the commercial / industrial land use criteria.

Most soils contaminant concentrations measured were within the adopted site assessment criteria (SAC). A summary of the generally minor exceedances are shown in Table 11. The remainder of analytes not listed in the table were below the SAC.

Table 11: Summary of Soil Analysis Results that Exceeded the Site Assessment Criteria (SAC)

Analyte	SAC	No. Primary Samples	No. Test Locations	No. Exceedances	No. Exceedances >2.5 x SAC	Summary of Bore Locations / Depth (m)
Asbestos in material at surface	HIL D	1	1	1	N/A	S1
Asbestos in soil < 7mm (AF/FA)	HIL D	20	12	1	N/A	305/0.55 m
Copper	EIL D	34	23	1	1	401/2.0 m
Zinc	EIL D	34	23	3	0	506/1.2 m (D1/JPS)

Notes to Table 11:
HIL D – health investigation level, commercial / industrial
EIL D – ecological investigation level, commercial / industrial
ESL D – ecological screening level, commercial / industrial

A brief review of the highest PAH against known PAH sources (www.pahsourceanalyst.com.au), indicates that the samples with the highest contaminant concentrations are generally indicative of coke materials, which are notably visually similar to coal materials which were observed in fill. The profiles are also similar to ash materials arising from coal. Coke, coal and/or ash therefore may be present in trace amounts intermixed in fill.

With the exception of minor garden beds near the perimeter of the site, the majority of site soils is covered by pavements or buildings. The risk of direct contact with soils based on the current and proposed land use is therefore considered to be low for human receptors other than for maintenance/construction workers.

The site is significantly altered by fill (identified between 1.0 m to 2.3 m depth), is largely covered by pavements and buildings at present and for the proposed development and is surrounded by commercial and industrial land use. As such the site is not considered to be an ecologically significant site. The ecological exceedances are therefore not considered to be significant for the current or proposed land use which will result in the majority of the site being paved or with limited access to soil.

Based on the results, the tested soils are generally considered to be suitable to remain on site from a contamination perspective with the exception of the identified bonded and friable asbestos impacts.

It is noted that a detailed assessment of asbestos in soil was not conducted for the preliminary investigation as instructed by the client, given the presence of site buildings, existing pavements and limited access due to current site uses. The identification of ACM in soil did not appear to be localised to a portion of the site. Furthermore, the fill materials with ACM impact were not dissimilar to other general fill. There is a therefore a high risk of further asbestos materials to be present within upper fill materials across the site.

Detailed asbestos investigation would be required to confirm the extent and concentrations of asbestos across the site, however, it is understood that most fill, if not all is currently proposed for off-site disposal. A detailed asbestos assessment for the purpose of retaining fill would require screening/sieving of soils to at least double NSW EPA (1995) density for the site area as per WA DoH (2021) requirements.

14.1.2 Waste Classification

The results of preliminary total contaminant testing in soil, together with selected leachability testing, indicated that the upper fill materials tested are classified 'General Solid Waste' (GSW) based on total and leachable (SCC1/TCLP1) concentration (EPA, 2014). This classification is based on low leachability results and inferred classification of similar material types (i.e. TCLP testing not undertaken on all samples with elevated results).

The presence of bonded/friable asbestos impacts within fill at Bore 305/0.55 m, Bores 503/1.2-2.0 m and 506/1.0-1.4 m and surface fill at sample S1 indicated that soil at these locations would be classified GSW with trace asbestos 'Special Waste – Asbestos'. Similarly, if ACM is present in other site soils, they would require consideration of both the chemical classification and ACM status.

The classification of underlying natural soils will need to consider ASS conditions as discussed further in Section 14.1.3. Natural soils which are potential ASS would be classified as GSW / ASS and would require treatment / neutralisation prior to disposal.

Natural soils which are not ASS (i.e. natural soils above the water table), could possibly be classified as virgin excavated natural material (VENM) subject to confirmation of chemical contaminant concentrations.

Further assessment at the time of construction (following building and pavement removal) could be conducted to confirm waste classification of fill/soil and opportunities for re-use to minimise disposal costs. Due to the preliminary nature of the testing conducted, further testing is recommended at the time of construction (building and pavement removal) and prior to disposal to confirm waste classification of fill/soil and opportunities for re-use to minimise disposal costs.

It should be noted that NSW EPA does not permit the resource recovery of soils containing asbestos and as such re-use opportunities for fill may be limited.

14.1.3 Acid Sulfate Soils

Dear, et al (2014) suggest that a soil pH<4 in water (pH_F) is an indicator of actual ASS. The results of screening tests therefore suggest the absence of actual ASS at the locations and depths tested. One sample (Bore 201/3.5 m) returned a soil pH=4 in water.

Dear, et al (2014) also suggest that indicators of potential acid sulfate soils (PASS) include the following:

- Soil pH <3.5 in H_2O_2 (i.e. pH_{FOX});
- Drop of 1 pH unit or more between pH_F and pH_{FOX}.

Of the 39 soil samples subject to ASS screening tests:

- 32 exhibited a drop in pH greater than one;
- 12 exhibited a soil pH following oxidation (pH_{FOX}) of less than 3.5.

It is noted that the above test method is a qualitative method only and gives an indication of the intensity of total acidification (pH). Stone, Ahern, & Blunden (1998) indicate that peroxide may also oxidise organic matter (in addition to pyrite) to produce acids which are unlikely to form under natural conditions, thus giving falsely high indication of acid sulfate potential.

The results of the detailed chromium suite testing indicate that the existing and potential acidity results exceeded the QASSIT action criteria for four of the eight samples tested (Bore 204/3.1 m, Bore 306/2.9-3.0 m, 403/2.5 m and 403/3.0 m).

On the basis of preliminary ASS testing conducted, the following conditions could be inferred:

- General absence of ASS conditions in natural sands above the water table (i.e. above about 2.3 m depth / RL 1.26);
- Presence of potential ASS for:
    - Natural silty clays/clayey sands both above and below the water table. Silty clays clayey sands were not identified in all bores, but where encountered were below about 2.3 m depth and below RL 1.7 AHD;
    - Natural sand soils below the water table (i.e. below about 2.6 m and RL 1 AHD).

Based on the above results, however, it is recommended that disturbance of soils at the site are undertaken with reference to a site-specific acid sulfate soil management plan (ASSMP). The recommended approach would involve lime application to neutralise the acidity in the soils which have been largely identified as PASS.

Bulk excavation of fill to RL 1.5 as proposed for piling platform construction is generally not expected to disturb PASS, with the exception of natural silty clay soils which were locally as shallow as RL 1.26 at Bore 403.

Disturbance of soils may be encountered for deeper excavations comprising localised excavation of USTs, dewatering for installation of services. The drilling of piles and return of pile spoil to the surface may also disturb / intermix with PASS depending on the pile installation method.

14.2 Groundwater

Eight water samples were analysed from the monitoring wells at the site to provide a preliminary assessment of contaminant concentrations in groundwater in the vicinity and downgradient of the USTs and at targeted areas of the site to assess possible upgradient groundwater contamination. The results of the laboratory testing indicated the following:

- VOC were not detected above laboratory reporting limits (tested in Bores 203, 204, GW1 and GW2 only);
- PAH, TRH, BTEX were not detected above laboratory reporting limits;
- The tested groundwater was within the following guidelines:
    - NEPC (2013) health screening levels (HSL) for commercial / industrial land use (HSL D) for vapour intrusion in sand at depths of 2-4 m;
- Most groundwater results were within ANZG (2018) marine toxicant default guideline values for slightly to moderately disturbed systems except for slightly elevated dissolved copper in all wells (except GW1, Bore 401 and 402) and dissolved zinc in all wells. Slightly elevated dissolved cobalt was also identified for groundwater at Bore 404.

Groundwater conditions in the north-eastern part of the site suggest generally low contaminant concentrations.

On the basis of the preliminary testing conducted, the results suggest the absence of hydrocarbon impact to groundwater from the redundant USTs and associated infrastructure (i.e. hydrocarbons not detected in groundwater above laboratory reporting limits).

The testing also suggests the absence of hydrocarbon migration in groundwater off-site based on the general inferred north-east groundwater flow direction, as well as the absence of hydrocarbon migration onto the site from Bore 401 and 404.

It is noted that copper, zinc and cobalt are not typical contaminants associated with underground fuel storage, and as such the exceedances may be associated with general site conditions. Elevated metals in groundwater are not uncommon in the Newcastle area, in particular copper and zinc, and may be representative of background / urban environments or associated with prior commercial / industrial use.

We note that the groundwater testing was preliminary and a basement is not part of the proposed development at the site. Further groundwater assessment would be recommended if a basement is proposed to assess the suitability of groundwater conditions for basement construction and for due diligence purposes.

14.3 Data Quality Assurance and Quality Control

The data quality assurance and quality control (QA/QC) results are included in Appendix F. Based on the results of the field QA and field and laboratory QC, and evaluation against the data quality indicators (DQI) it is concluded that the field and laboratory test data obtained are reliable and useable for this assessment.

15. Revised Conceptual Model

The data collected for this preliminary assessment has generally confirmed that certain potential contaminant sources outlined in the CSM outlined in Section 9 pose a potentially complete pathway to the identified receptor(s) whilst others do not. Groundwater data suggests that some slightly elevated contaminants (i.e. cobalt and zinc) are likely to be representative of the background / urban environments area of Newcastle. This is summarised in Table 12.

Table 12: Updated Summary of Potentially Complete Exposure Pathways for Proposed Commercial / Industrial Land Use

Source and COPC	Transport Pathway	Receptor	Remediation Action Required
S1: Fill: metals, TRH, BTEX, PAH, PCB, OCP, OPP, PCB, asbestos, SMF, lead in paint. S2: Former structures : asbestos, SMF, lead in paint, S3: Blacksmiths: TRH, PAH, BTEX, metals, VOC, cyanide S4: DFC industrial use: metals, TRH, BTEX, PAH, PAH, OCP, OPP, ACM, SMF	P1: Ingestion and dermal contact; P2: Inhalation of dust and/or vapours.	R1: Current users [commercial users and customers] R2: Construction and maintenance workers; R3: End users [ground floor commercial users and residential occupants];	Preliminary site investigation indicates the absence of gross chemical contamination to soils and groundwater. Chemical contaminant concentrations within commercial/industrial land use criteria. ACM (bonded and friable) impacts identified in soil at four test locations. Owing to the presence of fill at the site, history of building demolition and presence of building waste within fill across the site there is a high risk of further ACM to be present within upper fill materials. Remediation is required for ACM impacted fill to render the site suitable for the proposed development from a contamination perspective. Further detailed asbestos investigations would be required to further assess upper fill to remain on-site (and confirm ACM concentrations are within the SAC) if the development and corresponding remediation approach is not to remove all fill. It is recommended that the RAP incorporate a procedure for this as a contingency.
	P2: Inhalation of dust and/or vapours	R4: Adjacent site users [commercial].	
	P3: Surface water and sediment run-off; P4: Lateral migration of groundwater providing base flow to water bodies	R5: Surface water [Hunter River]	
	P5: Leaching of contaminants and vertical migration into groundwater	R6: Groundwater	
	P6: Contact with terrestrial ecology P7: Inhalation, ingestion and absorption	R7: Terrestrial ecosystems	
S2: UST lead, TRH, BTEX, PAH, VOC	-	-	Testing of soil and groundwater indicates the absence of hydrocarbon impacts near and downgradient of known USTs. USTs should be appropriately removed and validated with reference to a site specific remediation action plan (RAP) with reference to NSW EPA (2014c).
S8: Adjacent/upgradient developments: TRH, BTEX, PAH, metals and VOC.	-	-	Testing of soil and groundwater indicates that contaminants associated with adjacent land uses do not appear to be significantly impacting the site.

16. Conclusions and Recommendations

The PSI and preliminary soil and groundwater testing was undertaken to assess the potential for contamination at the site based on past and present land uses and to comment and the need for further investigation and/or remediation/management with regard to the proposed development.

The preliminary subsurface investigation focused on the main identified contamination risk areas within the site, most notably the potential for contamination associated with fill materials and USTs no longer in use.

In total 22 boreholes (Bores 201 to 205; 301 to 307; 401 to 404; 501 to 506) were drilled to permit soil sampling for contamination, field sieving/screening for asbestos (limited boreholes) and ASS testing. Six groundwater monitoring wells were installed (Bores 203, 204, 401 to 404) for groundwater sampling. Two existing groundwater monitoring wells were also sampled (GW1 and GW3).

The results of the assessment indicated the following:

Site Conditions

- Presence of fill across the site to depths of 1.0 m to 2.3 m (denoted Unit 1A and 1B). The average fill depth was generally less than 1.5 m, with observations suggesting possible deeper fill areas were associated with UST backfill;
- Upper fill materials (Unit 1A) comprising sandy gravel fill (subgrade) was also identified beneath pavements to depths of 0.2 m to 0.4 m, however, was not continuous across the site;
- Upper fill materials were variable based on observations during drilling and the results of testing of selected soils and indicated building materials were present within fill across the site (potential source of HBM including ACM).

Soil Contamination

- The results of testing indicate the general absence of gross contamination at the test locations and depths assessed based on field observations and laboratory testing of selected soil samples. This included areas downgradient of the USTs no longer in use;
- Most soil contamination concentrations were within the adopted human health and ecological investigation / screening levels and site assessment criteria (SAC) for a generic commercial land use (scenario ‘D’). Minor exceedances were as follows:
    - Exceedance of EIL D at 401/2.0 m (copper) and 506/1.2 m (zinc);
    - Asbestos in soil at Bore 305/0.55 m (bonded and friable ACM), and bonded ACM at the surface at S1.
- Given the current and proposed limited access to soils (pavements and buildings), the risk of direct contact with soils is considered to be low for human receptors other than for maintenance/construction workers;
- The ecological exceedances are not considered to be significant due to the current land use and proposed land use which will result in the majority of the site being paved or with limited access to soil;

- Bonded asbestos was identified in four fibro fragments; one each for fibro in filling at Bore 305/0.55 m, 503/1.2-2.0 m, 506/1.0-1.4 m and one at the surface of garden bed material (S1/F). Friable asbestos as asbestos fines (AF) was identified in the fill at Bore 305/0.55 m comprising fibre cement material (< 7 mm in size). The percentage of asbestos fines, being less than 7 mm, exceeded the adopted criterion for industrial / commercial land use based on NEPC (2013). Bonded ACM containing fill at 503/1.2-2.0 m and 506/1.0-1.4 m also contained asbestos fines/friable fines concentrations below laboratory reporting limits and therefore within the commercial / industrial land use criteria
- Owing to the presence of fill at the site, and widespread presence of building materials in fill, there is a risk of hazardous building materials (HBM) including asbestos in unobserved or untested parts including UST backfill materials;
- Hydrocarbon impact to soil was not identified within bores near the USTs, noting that bores were necessarily limited by the underground infrastructure and safe set back distances. Residual impacts may be present in the vicinity of underground fuel tank and associated infrastructure (i.e. tank backfill, fuel/service lines). This may include residual impacts to soil and possible localised impacts to groundwater, if present;
- It is noted that there is a potential for additional underground fuel infrastructure on the site and/or former hazardous chemical storage/use on the site. It is anticipated that these could be dealt under the remediation action plan (RAP) and unexpected finds protocol (UFP) discussed below.

Waste Classification

- Preliminary waste classification testing on upper fill materials indicated a General Solid Waste (GSW) (SCC1/TCLP1) classification with reference to NSW EPA (2014a) based on total and leachable contamination concentrations. This classification is based on low leachability results and inferred classification of similar material types (i.e. TCLP testing not undertaken on all samples with elevated results). Due to the observed presence of bonded ACM in upper fill materials, the preliminary classification of upper fill is GSW containing asbestos waste (Special Waste);
- The classification of underlying natural soils will need to consider ASS conditions as discussed further in Section 14.1.3. Natural soils which are not ASS, could possibly be classified as virgin excavated natural material (VENM) subject to confirmation of contaminant concentrations;
- Further testing could be undertaken at the time of construction (building and pavement removal) to confirm waste classification prior to disposal of soils from the site which may allow for classification of some materials as GSW only and disposal of some natural (non ASS) soils as VENM. Some materials may also be suitable for classification under a general or specific resource recovery exemption.

Acid Sulfate Soils

- The preliminary ASS assessment indicated:
  - The absence of potential ASS for sands above the groundwater table (i.e. upper 2.6 m and above RL 1);
  - Presence of potential ASS for natural silty clay/clayey sands both above and below the water table (i.e. below about 2.3 m depth and below RL 1.7 AHD for some bores only);

  - o Presence of potential ASS for natural sand soils below the water table (i.e. below about 2.6 m and RL 1 AHD).
- Bulk excavation of fill to RL 1.5 as proposed for piling platform construction is generally not expected to disturb PASS.
- A site-specific acid sulfate soil management plan (ASSMP), however, will be required for the site. The ASSMP should consider excavation and disturbance for removal of USTs, dewatering for installation of services and drilling of piles and return of pile spoil.

Groundwater

- The contaminant concentrations in groundwater were generally low and suggests the absence of significant hydrocarbon impact to groundwater from the USTs and associated infrastructure. The groundwater conditions encountered at the site, are generally consistent with similar nearby sites within the Newcastle central business district which often have slightly elevated heavy metals, in particular copper and zinc.

Remediation

Based on the PSI findings, remediation would be required to render the site suitable for the proposed development from a contamination perspective, due to the bonded and friable ACM impacts in fill materials and possible residual impacts in the vicinity of underground fuel infrastructure. Remediation should be detailed in a site-specific RAP.

As outlined in Section 2, it is understood that construction will require removal of upper fill materials to an RL of 1.5 AHD. This will remove the majority of site fill to depths of 1.5 m to 2.5 m below current site levels, including the identified ACM impacted soils for construction of a piling platform. Localised deeper excavations may be required for UST removal.

It is noted that further detailed investigations must be undertaken following removal of upper bulk fill to assess the suitability of any fill materials remaining to stay on-site. This process should be outlined in the RAP.

It is noted that further detailed investigations must be undertaken at the time of construction to demonstrate the suitability of fill below 1.5 AHD or other fill above this level to remain on site (e.g. re-instatement of UST excavations). Such further assessment would require further sieving of bulk samples to meet the sampling density commensurate with the risk rating as outlined in WA DoH (2021) and NEPC (2013). The RAP should incorporate this procedure.

The proposed removal of fill would render the site suitable from a contamination perspective, subject to inspection and validation to be detailed in a site-specific RAP. It is also noted that removal of all contaminated fill would avoid the requirement for on-site management/capping of contamination and may minimise the potential for cross contamination of natural soils brought to the surface by the piling process.

It is noted that the feasibility of excavating all fill should be considered from a practical, cost-effective and time-effective perspective based on discussions with the client/developer.

Concluding Remarks

In summary, the site is considered to be suitable for the proposed mixed use multi-storey development, subject to appropriate remediation via a site-specific RAP and validation of contamination as discussed above.

The following supporting documents will be required to facilitate development:

- Remediation action plan detailing the development stages and remediation requirements to render the site suitable from a contamination perspective. The RAP should include requirements for further inspection/testing, contingencies and an UFP and be prepared with reference to NSW EPA (2014c);
- Site specific acid sulfate soil management plan.

17. References

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18. Limitations

Douglas Partners (DP) has prepared this report for this project at 924 Hunter Street, Newcastle West in accordance with DP's proposal 102077.01.P.001.Rev0 dated 4 August 2021 and email proposal dated 14 February 2022 and acceptance received from Thirdi Dairy Farmers Pty Ltd and its representatives. The work was carried out under DP's Conditions of Engagement. This report is provided for the exclusive use of Thirdi Dairy Farmers Pty Ltd for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of DP, does so entirely at its own risk and without recourse to DP for any loss or damage. In preparing this report DP has necessarily relied upon information provided by the client and/or their agents.

The results provided in the report are indicative of the sub-surface conditions on the site only at the specific sampling and/or testing locations, and then only to the depths investigated and at the time the work was carried out. Sub-surface conditions can change abruptly due to variable geological processes and also as a result of human influences. Such changes may occur after DP's field testing has been completed.

DP's advice is based upon the conditions encountered during this investigation. The accuracy of the advice provided by DP in this report may be affected by undetected variations in ground conditions across the site between and beyond the sampling and/or testing locations. The advice may also be limited by budget constraints imposed by others or by site accessibility.

The assessment of atypical safety hazards arising from this advice is restricted to the environmental / groundwater components set out in this report and based on known project conditions and stated design advice and assumptions. While some recommendations for safe controls may be provided, detailed 'safety in design' assessment is outside the current scope of this report and requires additional project data and assessment.

This report must be read in conjunction with all of the attached and should be kept in its entirety without separation of individual pages or sections. DP cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion stated in this report.

This report, or sections from this report, should not be used as part of a specification for a project, without review and agreement by DP. This is because this report has been written as advice and opinion rather than instructions for construction.

Asbestos has been detected by observation and by laboratory analysis, on the surface of the site and in filling materials at selected test locations sampled and analysed. Building demolition materials, such as concrete, brick, metal, glass, ceramic tile, were located in filling across the site, and these are considered as indicative of the possible presence of other hazardous building materials (HBM), including asbestos.

Although the sampling plan adopted for this investigation is considered appropriate to achieve the stated project objectives, there are necessarily parts of the site that have not been sampled and analysed. This is either due to undetected variations in ground conditions or to budget constraints (as discussed above), or to parts of the site being inaccessible and not available for inspection/sampling. It is therefore considered possible that HBM, including asbestos, may be present in unobserved or untested parts of the site, between and beyond sampling locations, and hence no warranty can be given that asbestos is not present.

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Appendix A

About This Report
Sampling Methods
Soil Descriptions
Symbols and Abbreviations
Borehole Logs (Bores 201 to 205, 301 to 307, 401 to 404, 501 to 506)

About this Report

Douglas Partners

Introduction

These notes have been provided to amplify DP's report in regard to classification methods, field procedures and the comments section. Not all are necessarily relevant to all reports.

DP's reports are based on information gained from limited subsurface excavations and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

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This report is the property of Douglas Partners Pty Ltd. The report may only be used for the purpose for which it was commissioned and in accordance with the Conditions of Engagement for the commission supplied at the time of proposal. Unauthorised use of this report in any form whatsoever is prohibited.

Borehole and Test Pit Logs

The borehole and test pit logs presented in this report are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will provide the most reliable assessment, but this is not always practicable or possible to justify on economic grounds. In any case the boreholes and test pits represent only a very small sample of the total subsurface profile.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes or pits, the frequency of sampling, and the possibility of other than 'straight line' variations between the test locations.

Groundwater

Where groundwater levels are measured in boreholes there are several potential problems, namely:

- In low permeability soils groundwater may enter the hole very slowly or perhaps not at all during the time the hole is left open;
- A localised, perched water table may lead to an erroneous indication of the true water table;
- Water table levels will vary from time to time with seasons or recent weather changes. They may not be the same at the time of construction as are indicated in the report; and
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water measurements are to be made.

More reliable measurements can be made by installing standpipes which are read at intervals over several days, or perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from a perched water table.

Reports

The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, the information and interpretation may not be relevant if the design proposal is changed. If this happens, DP will be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical and environmental aspects, and recommendations or suggestions for design and construction. However, DP cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions. The potential for this will depend partly on borehole or pit spacing and sampling frequency;
- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

If these occur, DP will be pleased to assist with investigations or advice to resolve the matter.

About this Report

Site Anomalies

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, DP requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.

Information for Contractual Purposes

Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. DP would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

Site Inspection

The company will always be pleased to provide engineering inspection services for geotechnical and environmental aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.

Sampling Methods

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Sampling

Sampling is carried out during drilling or test pitting to allow engineering examination (and laboratory testing where required) of the soil or rock.

Disturbed samples taken during drilling provide information on colour, type, inclusions and, depending upon the degree of disturbance, some information on strength and structure.

Undisturbed samples are taken by pushing a thin-walled sample tube into the soil and withdrawing it to obtain a sample of the soil in a relatively undisturbed state. Such samples yield information on structure and strength, and are necessary for laboratory determination of shear strength and compressibility. Undisturbed sampling is generally effective only in cohesive soils.

Test Pits

Test pits are usually excavated with a backhoe or an excavator, allowing close examination of the in-situ soil if it is safe to enter into the pit. The depth of excavation is limited to about 3 m for a backhoe and up to 6 m for a large excavator. A potential disadvantage of this investigation method is the larger area of disturbance to the site.

Large Diameter Augers

Boreholes can be drilled using a rotating plate or short spiral auger, generally 300 mm or larger in diameter commonly mounted on a standard piling rig. The cuttings are returned to the surface at intervals (generally not more than 0.5 m) and are disturbed but usually unchanged in moisture content. Identification of soil strata is generally much more reliable than with continuous spiral flight augers, and is usually supplemented by occasional undisturbed tube samples.

Continuous Spiral Flight Augers

The borehole is advanced using 90-115 mm diameter continuous spiral flight augers which are withdrawn at intervals to allow sampling or in-situ testing. This is a relatively economical means of drilling in clays and sands above the water table. Samples are returned to the surface, or may be collected after withdrawal of the auger flights, but they are disturbed and may be mixed with soils from the sides of the hole. Information from the drilling (as distinct from specific sampling by SPTs or undisturbed samples) is of relatively low reliability, due to the remoulding, possible mixing or softening of samples by groundwater.

Non-core Rotary Drilling

The borehole is advanced using a rotary bit, with water or drilling mud being pumped down the drill rods and returned up the annulus, carrying the drill cuttings. Only major changes in stratification can be determined from the cuttings, together with some information from the rate of penetration. Where drilling mud is used this can mask the cuttings and reliable identification is only possible from separate sampling such as SPTs.

Continuous Core Drilling

A continuous core sample can be obtained using a diamond tipped core barrel, usually with a 50 mm internal diameter. Provided full core recovery is achieved (which is not always possible in weak rocks and granular soils), this technique provides a very reliable method of investigation.

Standard Penetration Tests

Standard penetration tests (SPT) are used as a means of estimating the density or strength of soils and also of obtaining a relatively undisturbed sample. The test procedure is described in Australian Standard 1289, Methods of Testing Soils for Engineering Purposes - Test 6.3.1.

The test is carried out in a borehole by driving a 50 mm diameter split sample tube under the impact of a 63 kg hammer with a free fall of 760 mm. It is normal for the tube to be driven in three successive 150 mm increments and the 'N' value is taken as the number of blows for the last 300 mm. In dense sands, very hard clays or weak rock, the full 450 mm penetration may not be practicable and the test is discontinued.

The test results are reported in the following form.

- In the case where full penetration is obtained with successive blow counts for each 150 mm of, say, 4, 6 and 7 as:

  4,6,7
  N=13

- In the case where the test is discontinued before the full penetration depth, say after 15 blows for the first 150 mm and 30 blows for the next 40 mm as:

  15, 30/40 mm

The results of the SPT tests can be related empirically to the engineering properties of the soils.

Dynamic Cone Penetrometer Tests / Perth Sand Penetrometer Tests

Dynamic penetrometer tests (DCP or PSP) are carried out by driving a steel rod into the ground using a standard weight of hammer falling a specified distance. As the rod penetrates the soil the number of blows required to penetrate each successive 150 mm depth are recorded. Normally there is a depth limitation of 1.2 m, but this may be extended in certain conditions by the use of extension rods. Two types of penetrometer are commonly used.

- Perth sand penetrometer - a 16 mm diameter flat ended rod is driven using a 9 kg hammer dropping 600 mm (AS 1289, Test 6.3.3). This test was developed for testing the density of sands and is mainly used in granular soils and filling.
- Cone penetrometer - a 16 mm diameter rod with a 20 mm diameter cone end is driven using a 9 kg hammer dropping 510 mm (AS 1289, Test 6.3.2). This test was developed initially for pavement subgrade investigations, and correlations of the test results with California Bearing Ratio have been published by various road authorities.

Description and Classification Methods

The methods of description and classification of soils and rocks used in this report are generally based on Australian Standard AS1726:2017, Geotechnical Site Investigations. In general, the descriptions include strength or density, colour, structure, soil or rock type and inclusions.

Soil Types

Soil types are described according to the predominant particle size, qualified by the grading of other particles present:

Type	Particle size (mm)
Boulder	>200
Cobble	63 - 200
Gravel	2.36 - 63
Sand	0.075 - 2.36
Silt	0.002 - 0.075
Clay	<0.002

The sand and gravel sizes can be further subdivided as follows:

Type	Particle size (mm)
Coarse gravel	19 - 63
Medium gravel	6.7 - 19
Fine gravel	2.36 – 6.7
Coarse sand	0.6 - 2.36
Medium sand	0.21 - 0.6
Fine sand	0.075 - 0.21

Definitions of grading terms used are:

- Well graded - a good representation of all particle sizes
- Poorly graded - an excess or deficiency of particular sizes within the specified range
- Uniformly graded - an excess of a particular particle size
- Gap graded - a deficiency of a particular particle size with the range

The proportions of secondary constituents of soils are described as follows:

In fine grained soils (>35% fines)

Term	Proportion of sand or gravel	Example
And	Specify	Clay (60%) and Sand (40%)
Adjective	>30%	Sandy Clay
With	15 – 30%	Clay with sand
Trace	0 - 15%	Clay with trace sand

In coarse grained soils (>65% coarse)
- with clays or silts

Term	Proportion of fines	Example
And	Specify	Sand (70%) and Clay (30%)
Adjective	>12%	Clayey Sand
With	5 - 12%	Sand with clay
Trace	0 - 5%	Sand with trace clay

In coarse grained soils (>65% coarse)
- with coarser fraction

Term	Proportion of coarser fraction	Example
And	Specify	Sand (60%) and Gravel (40%)
Adjective	>30%	Gravelly Sand
With	15 - 30%	Sand with gravel
Trace	0 - 15%	Sand with trace gravel

The presence of cobbles and boulders shall be specifically noted by beginning the description with ‘Mix of Soil and Cobbles/Boulders’ with the word order indicating the dominant first and the proportion of cobbles and boulders described together.

Soil Descriptions

Cohesive Soils

Cohesive soils, such as clays, are classified on the basis of undrained shear strength. The strength may be measured by laboratory testing, or estimated by field tests or engineering examination. The strength terms are defined as follows:

Description	Abbreviation	Undrained shear strength (kPa)
Very soft	VS	<12
Soft	S	12 - 25
Firm	F	25 - 50
Stiff	St	50 - 100
Very stiff	VSt	100 - 200
Hard	H	>200
Friable	Fr	-

Cohesionless Soils

Cohesionless soils, such as clean sands, are classified on the basis of relative density, generally from the results of standard penetration tests (SPT), cone penetration tests (CPT) or dynamic penetrometers (PSP). The relative density terms are given below:

Relative Density	Abbreviation	Density Index (%)
Very loose	VL	<15
Loose	L	15-35
Medium dense	MD	35-65
Dense	D	65-85
Very dense	VD	>85

Soil Origin

It is often difficult to accurately determine the origin of a soil. Soils can generally be classified as:

- Residual soil - derived from in-situ weathering of the underlying rock;
- Extremely weathered material – formed from in-situ weathering of geological formations. Has soil strength but retains the structure or fabric of the parent rock;
- Alluvial soil – deposited by streams and rivers;
- Estuarine soil – deposited in coastal estuaries;
- Marine soil – deposited in a marine environment;
- Lacustrine soil – deposited in freshwater lakes;
- Aeolian soil – carried and deposited by wind;
- Colluvial soil – soil and rock debris transported down slopes by gravity;
- Topsoil – mantle of surface soil, often with high levels of organic material.
- Fill – any material which has been moved by man.

Moisture Condition – Coarse Grained Soils

For coarse grained soils the moisture condition should be described by appearance and feel using the following terms:

- Dry (D) Non-cohesive and free-running.
- Moist (M) Soil feels cool, darkened in colour.
  Soil tends to stick together.
  Sand forms weak ball but breaks easily.
- Wet (W) Soil feels cool, darkened in colour.
  Soil tends to stick together, free water forms when handling.

Moisture Condition – Fine Grained Soils

For fine grained soils the assessment of moisture content is relative to their plastic limit or liquid limit, as follows:

- ‘Moist, dry of plastic limit’ or ‘w <PL’ (i.e. hard and friable or powdery).
- ‘Moist, near plastic limit’ or ‘w ≈ PL (i.e. soil can be moulded at moisture content approximately equal to the plastic limit).
- ‘Moist, wet of plastic limit’ or ‘w >PL’ (i.e. soils usually weakened and free water forms on the hands when handling).
- ‘Wet’ or ‘w ≈LL’ (i.e. near the liquid limit).
- ‘Wet’ or ‘w >LL’ (i.e. wet of the liquid limit).

Rock Strength

Rock strength is defined by the Unconfined Compressive Strength and it refers to the strength of the rock substance and not the strength of the overall rock mass, which may be considerably weaker due to defects.

The Point Load Strength Index $Is_{(50)}$ is commonly used to provide an estimate of the rock strength and site specific correlations should be developed to allow UCS values to be determined. The point load strength test procedure is described by Australian Standard AS4133.4.1-2007. The terms used to describe rock strength are as follows:

Strength Term	Abbreviation	Unconfined Compressive Strength MPa	Point Load Index * $Is_{(50)}$ MPa
Very low	VL	0.6 - 2	0.03 - 0.1
Low	L	2 - 6	0.1 - 0.3
Medium	M	6 - 20	0.3 - 1.0
High	H	20 - 60	1 - 3
Very high	VH	60 - 200	3 - 10
Extremely high	EH	>200	>10

* Assumes a ratio of 20:1 for UCS to $Is_{(50)}$. It should be noted that the UCS to $Is_{(50)}$ ratio varies significantly for different rock types and specific ratios should be determined for each site.

Degree of Weathering

The degree of weathering of rock is classified as follows:

Term	Abbreviation	Description
Residual Soil	RS	Material is weathered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are no longer visible, but the soil has not been significantly transported.
Extremely weathered	XW	Material is weathered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are still visible
Highly weathered	HW	The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognisable. Rock strength is significantly changed by weathering. Some primary minerals have weathered to clay minerals. Porosity may be increased by leaching, or may be decreased due to deposition of weathering products in pores.
Moderately weathered	MW	The whole of the rock material is discoloured , usually by iron staining or bleaching to the extent that the colour of the original rock is not recognisable, but shows little or no change of strength from fresh rock.
Slightly weathered	SW	Rock is partially discoloured with staining or bleaching along joints but shows little or no change of strength from fresh rock.
Fresh	FR	No signs of decomposition or staining.
Note: If HW and MW cannot be differentiated use DW (see below)		
Distinctly weathered	DW	Rock strength usually changed by weathering. The rock may be highly discoloured, usually by iron staining. Porosity may be increased by leaching or may be decreased due to deposition of weathered products in pores.

Rock Descriptions

Degree of Fracturing

The following classification applies to the spacing of natural fractures in diamond drill cores. It includes bedding plane partings, joints and other defects, but excludes drilling breaks.

Term	Description
Fragmented	Fragments of <20 mm
Highly Fractured	Core lengths of 20-40 mm with occasional fragments
Fractured	Core lengths of 30-100 mm with occasional shorter and longer sections
Slightly Fractured	Core lengths of 300 mm or longer with occasional sections of 100-300 mm
Unbroken	Core contains very few fractures

Rock Quality Designation

The quality of the cored rock can be measured using the Rock Quality Designation (RQD) index, defined as:

$$\text{RQD \%} = \frac{\text{cumulative length of 'sound' core sections > 100 mm long}}{\text{total drilled length of section being assessed}}$$

where 'sound' rock is assessed to be rock of low strength or stronger. The RQD applies only to natural fractures. If the core is broken by drilling or handling (i.e. drilling breaks) then the broken pieces are fitted back together and are not included in the calculation of RQD.

Stratification Spacing

For sedimentary rocks the following terms may be used to describe the spacing of bedding partings:

Term	Separation of Stratification Planes
Thinly laminated	< 6 mm
Laminated	6 mm to 20 mm
Very thinly bedded	20 mm to 60 mm
Thinly bedded	60 mm to 0.2 m
Medium bedded	0.2 m to 0.6 m
Thickly bedded	0.6 m to 2 m
Very thickly bedded	> 2 m

Symbols & Abbreviations

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Introduction

These notes summarise abbreviations commonly used on borehole logs and test pit reports.

Drilling or Excavation Methods

C	Core drilling
R	Rotary drilling
SFA	Spiral flight augers
NMLC	Diamond core - 52 mm dia
NQ	Diamond core - 47 mm dia
HQ	Diamond core - 63 mm dia
PQ	Diamond core - 81 mm dia

Water

▷	Water seep
▽	Water level

Sampling and Testing

A	Auger sample
B	Bulk sample
D	Disturbed sample
E	Environmental sample
U_{50}	Undisturbed tube sample (50mm)
W	Water sample
pp	Pocket penetrometer (kPa)
PID	Photo ionisation detector
PL	Point load strength Is(50) MPa
S	Standard Penetration Test
V	Shear vane (kPa)

Description of Defects in Rock

The abbreviated descriptions of the defects should be in the following order: Depth, Type, Orientation, Coating, Shape, Roughness and Other. Drilling and handling breaks are not usually included on the logs.

Defect Type

B	Bedding plane
Cs	Clay seam
Cv	Cleavage
Cz	Crushed zone
Ds	Decomposed seam
F	Fault
J	Joint
Lam	Lamination
Pt	Parting
Sz	Sheared Zone
V	Vein

Orientation

The inclination of defects is always measured from the perpendicular to the core axis.

h	horizontal
v	vertical
sh	sub-horizontal
sv	sub-vertical

Coating or Infilling Term

cln	clean
co	coating
he	healed
inf	infilled
stn	stained
ti	tight
vn	veneer

Coating Descriptor

ca	calcite
cbs	carbonaceous
cly	clay
fe	iron oxide
mn	manganese
slt	silty

Shape

cu	curved
ir	irregular
pl	planar
st	stepped
un	undulating

Roughness

po	polished
ro	rough
sl	slickensided
sm	smooth
vr	very rough

Other

fg	fragmented
bnd	band
qtz	quartz

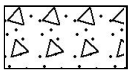
Symbols & Abbreviations

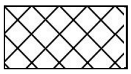
Graphic Symbols for Soil and Rock

General

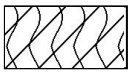
Asphalt

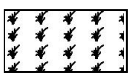
Road base

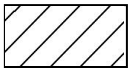

Concrete

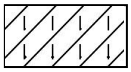

Filling

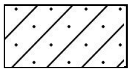
Soils


Topsoil

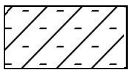

Peat

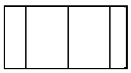

Clay

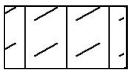

Silty clay

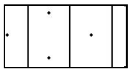

Sandy clay

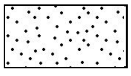
Gravelly clay

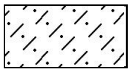

Shaly clay

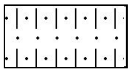

Silt


Clayey silt


Sandy silt

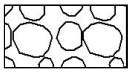

Sand

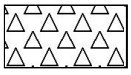

Clayey sand


Silty sand

Gravel

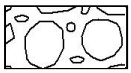
Sandy gravel


Cobbles, boulders

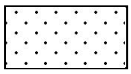

Talus

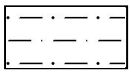
Sedimentary Rocks

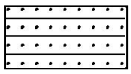
Boulder conglomerate

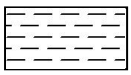

Conglomerate

Conglomeratic sandstone

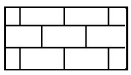

Sandstone


Siltstone

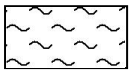

Laminite

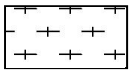

Mudstone, claystone, shale

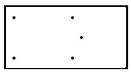
Coal


Limestone

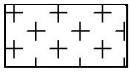
Metamorphic Rocks

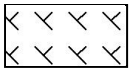

Slate, phyllite, schist

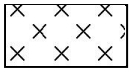

Gneiss

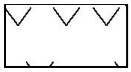

Quartzite

Igneous Rocks


Granite


Dolerite, basalt, andesite


Dacite, epidote


Tuff, breccia

Porphyry

BOREHOLE LOG

CLIENT: Thirdi Dairy Farmers Pty Ltd
PROJECT: Proposed Apartments
LOCATION: 924 Hunter Street, Newcastle

SURFACE LEVEL: 3.89 AHD
EASTING: 383730.5
NORTHING: 6356459.8
DIP/AZIMUTH: 90°/--

BORE No: 201
PROJECT No: 102077.02
DATE: 6/10/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.11	CONCRETE							
		FILL / SILTY GRAVELLY SAND (SP) - Fine to medium grained, grey-brown with fine to medium subangular to subrounded gravel (crushed natural rock), trace brick, coal reject, slag, moist		D	0.2	E	PID <1		
				D	0.5	E	PID <1		
	1			D	1.0	E	PID <1		
				D	1.5	E	PID <1		
	1.6	FILL / SILTY SAND (SP) - Fine to medium grained, dark grey with coal reject, moist							
	2			D	2.0	E	PID <1		
	2.3	SAND (SP) - Fine to medium grained, pale brown, trace fine to medium rounded to subrounded gravels, moist		D	2.5	E	PID <1		
	2.8	SILTY CLAY (CL) - Low plasticity, brown-grey, trace fine to medium grained sand, organics, W<PL		D	3.0	E	PID <1	▼	
	3.2	SAND (SP) - Fine to medium grained, brown to pale brown, trace fine rounded gravels, wet							
				D	3.5	E	PID <1		
	4			D	4.0	E	PID <1		
				D	4.5	E	PID <1		
	5	5.0		D	5.0	E	PID <1		
		Bore discontinued at 5.0m, limit of investigation							
	6								

RIG: Geoprobe 7822DT **DRILLER:** Warren (Terratest) **LOGGED:** Kramer **CASING:** Uncased
TYPE OF BORING: Concrete core to 0.11m, push tube to 5m
WATER OBSERVATIONS: Free groundwater observed at 3.2m
REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Thirdi Dairy Farmers Pty Ltd
PROJECT: Proposed Apartments
LOCATION: 924 Hunter Street, Newcastle

SURFACE LEVEL: 3.37 AHD
EASTING: 383737.1
NORTHING: 6356493.8
DIP/AZIMUTH: 90°/--

BORE No: 202
PROJECT No: 102077.02
DATE: 6/10/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.155	CONCRETE							
		FILL / SILTY SAND (SP) - Fine to medium grained, grey to dark grey, trace fine to medium subangular to subrounded gravels, brick, coal reject, ash and black slag, moist		D	0.2	E	PID <1		
				D	0.5	E	PID <1		
	1.0	SILTY SAND (SP) - Fine to medium grained, grey, moist		D	1.1	E	PID <1		
				D	1.5	E	PID <1		
		From 1.6m, brown							
	1.8	SAND (SP) - Fine to medium grained, pale brown, moist		D	2.0	E	PID <1		
				D	2.5	E	PID <1		
		From approximately 3m to 3.2m, wet		D	3.0	E	PID <1	▼	
		From 3.2m, trace fine rounded to subrounded gravels		D	3.5	E	PID <1		
				D	4.0	E	PID <1		
				D	4.5	E	PID <1		
	5.0	Bore discontinued at 5.0m, limit of investigation		D	5.0	E	PID <1		

RIG: Geoprobe 7822DT **DRILLER:** Warren (Terratest) **LOGGED:** Kramer **CASING:** Uncased
TYPE OF BORING: Concrete core to 0.155m, push tube to 5m
WATER OBSERVATIONS: Free groundwater observed at 3.0m to 3.2m
REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Thirdi Dairy Farmers Pty Ltd
PROJECT: Proposed Apartments
LOCATION: 924 Hunter Street, Newcastle

SURFACE LEVEL: 3.10 AHD
EASTING: 383740.4
NORTHING: 6356504.8
DIP/AZIMUTH: 90°/--

BORE No: 203
PROJECT No: 102077.02
DATE: 6/10/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.18	CONCRETE							Gatic Cover From 0m to 0.2m, concrete
		FILL / SILTY SAND (SP) - Fine to medium grained, grey to dark grey, trace fine to medium subangular to subrounded gravels (crushed natural rock), ceramic brick, moist		D	0.2	E	PID <1		
				D	0.5	E	PID <1		From 0.2m to 0.7m, backfill
	1			D	1.0	E	PID <1		1
		From 1.1m to 1.2m, increased drilling resistance							From 0m to 2m, blank 50mm diameter Class 18 PVC From 0.7m to 1.5m, bentonite
	1.3	SAND (SP) - Fine to medium grained, brown, moist		D	1.5	E	PID <1		
	2			D	2.0	E	PID <1		2
				D	2.5	E	PID <1		
	2.8	CLAYEY SAND (SP) - Fine to medium grained, grey, trace fine crushed rounded gravels, wet						▼	
	3			D	3.0	E	PID <1		3
	3.2	SAND (SP) - Fine to medium grained, brown, trace fine rounded gravels, wet							From 1.5m to 5m, 5/2mm gravel
				D	3.5	E	PID <1		From 2m to 5m, 50mm diameter Class 18 machine slotted PVC screen
		At approximately 3.6m, coal piece							
	4			D	4.0	E	PID <1		4
				D	4.5	E	PID <1		
	5								End cap
	5.0	Bore discontinued at 5.0m, limit of investigation		D	5.0	E	PID <1		5
	6								6

RIG: Geoprobe 7822DT **DRILLER:** Warren (Terratest) **LOGGED:** Kramer **CASING:** Uncased

TYPE OF BORING: Concrete core to 0.18m, push tube to 5m

WATER OBSERVATIONS: Free groundwater observed at 2.8m

REMARKS: Top of PVC Casing level 3.04 AHD

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Thirdi Dairy Farmers Pty Ltd
PROJECT: Proposed Apartments
LOCATION: 924 Hunter Street, Newcastle

SURFACE LEVEL: 3.27 AHD
EASTING: 383750.2
NORTHING: 6356499.3
DIP/AZIMUTH: 90°/--

BORE No: 204
PROJECT No: 102077.02
DATE: 6/10/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.12	CONCRETE							Gatic Cover From 0m to 0.2m, concrete
		FILL / SILTY SAND (SP) - Fine to medium grained, grey-brown, trace fine to medium subangular to subrounded gravels, (crushed natural rock), coal, reject, brick, moist		D	0.2	E	PID <1		
				D	0.5	E	PID<1		From 0.2m to 0.7m, backfill
				D	1.0	E	PID <1		From 0m to 2m, blank 50mm diameter Class 18 PVC
	1.3	SILTY SAND (SP) - Fine to medium grained, dark brown, moist		D	1.5	E	PID <1		From 0.7m to 1.5m, bentonite
	1.7	From 1.6m, brown SAND (SP) - Fine to medium grained, pale brown, moist		D	2.0	E	PID <1		
				D	2.5	E	PID <1	▼	
	3.0	SANDY CLAY (CL) - Low plasticity, grey with fine to medium grained sand, W>PL		D	3.1	E	PID <1		
	3.2	SAND (SP) - Fine to medium grained, brown, trace rounded gravels, wet							From 1.5m to 5m, 5/2mm gravel
				D	3.5	E	PID <1		From 2m to 5m, 50mm diameter Class 18 machine slotted PVC screen
				D	4.0	E	PID <1		
				D	4.5	E	PID <1		
	5.0	Bore discontinued at 5.0m, limit of investigation		D	5.0	E	PID <1		End cap

RIG: Geoprobe 7822DT **DRILLER:** Warren (Terratest) **LOGGED:** Kramer **CASING:** Uncased

TYPE OF BORING: Concrete core to 0.12m, push tube to 5m

WATER OBSERVATIONS: Free groundwater observed at 2.8m

REMARKS: Top of PVC Casing level 3.24 AHD

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Thirdi Dairy Farmers Pty Ltd
PROJECT: Proposed Apartments
LOCATION: 924 Hunter Street, Newcastle

SURFACE LEVEL: 3.40 AHD
EASTING: 383743.7
NORTHING: 6356490
DIP/AZIMUTH: 90°/--

BORE No: 205
PROJECT No: 102077.02
DATE: 6/10/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.115	CONCRETE							
		FILL / SILTY SAND (SP) - Fine to medium grained, brown-grey, trace fine to medium subangular to subrounded gravels, brick, ash, moist		D	0.2	E	PID <1		
				D	0.5	E	PID <1		
	1			D	1.0	E	PID <1		1
		From 1.2m to 1.3m, increased drilling resistance							
	1.4	SAND (SP) - Fine to medium grained, brown to pale brown, moist		D	1.5	E	PID <1		
	2			D	2.0	E	PID <1		2
				D	2.5	E	PID <1		
	3	From 3m to 3.1m, wet		D	3.0	E	PID <1	▼	3
				D	3.5	E	PID <1		
	4			D	4.0	E	PID <1		4
				D	4.5	E	PID <1		
	5	5.0 Bore discontinued at 5.0m, limit of investigation		D	5.0	E	PID <1		5
	6								6

RIG: Geoprobe 7822DT **DRILLER:** Warren (Terratest) **LOGGED:** Kramer **CASING:** Uncased
TYPE OF BORING: Concrete core to 0.15m, hand auger to 1m, push tube to 5m
WATER OBSERVATIONS: Free groundwater observed at 3.0m
REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
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BOREHOLE LOG

CLIENT: Thirdi Dairy Farmers Pty Ltd
PROJECT: Proposed Apartments
LOCATION: 924 Hunter Street, Newcastle

SURFACE LEVEL: 2.99 AHD
EASTING: 383715.6
NORTHING: 6356512.9
DIP/AZIMUTH: 90°/--

BORE No: 301
PROJECT No: 102077.02
DATE: 9/10/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.05	ASPHALT		A	0.02	E	PID <1		
				A	0.1	E	PID <1		
	0.3	FILL / SANDY GRAVEL (GP) - Generally comprising brown gravel, subangular to subrounded rock, fine to medium sized, sand is fine to coarse grained, dry			0.2				
				A	0.35	E	PID <1		
					0.45				
		FILL / SILTY SAND (SM) - Generally comprising dark grey, sand is fine to medium grained with coal, occasional brick, (30mm), moist		A	0.5	E	PID <1		
	0.8	From 0.6m, grey			0.6				
2	1			A	0.9	E	PID <1		1
		FILL / SILTY SAND - Grey and pale grey, fine to medium grained, trace rootlets, moist			1.0				
	1.3	SAND (SP) - Brown, fine to medium grained with silt, moist							
				A	1.5	E	PID <1		
					1.6				
1	2	From 2.05m, pale brown, fine to coarse grained		A	2.1	E	PID <1		2
					2.2				
		From 2.6m, wet						▼	
				A	2.7	E	PID <1		
	2.9	Bore discontinued at 2.9m, limit of investigation / collapse			2.9				
0	3								3
-1	4								4
-2	5								5
-3	6								6

RIG: Hand Tools **DRILLER:** Lambert **LOGGED:** Wilson **CASING:** Uncased

TYPE OF BORING: 80mm diameter hand auger

WATER OBSERVATIONS: Free groundwater observed at 2.7m during drilling

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Thirdi Dairy Farmers Pty Ltd
PROJECT: Proposed Apartments
LOCATION: 924 Hunter Street, Newcastle

SURFACE LEVEL: 3.24 AHD
EASTING: 383695
NORTHING: 6356527.3
DIP/AZIMUTH: 90°/--

BORE No: 302
PROJECT No: 102077.02
DATE: 9/10/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.03	ASPHALT							
		FILL / SANDY GRAVEL (GP) - Generally comprising brown gravel, subangular to subrounded rock, fine to medium sized, sand is fine to coarse grained, dry		A	0.1 0.3	E	PID <1		
	0.4	FILL / SILTY SAND (SM) - Generally comprising dark grey, sand is fine to medium grained with coal, occasional brick, (30mm), moist		A	0.5 0.6	E	PID <1		
	1			A	1.0 1.1	E	PID <1		1
	1.3	FILL / SILTY SAND - Grey and pale grey, fine to medium grained, trace rootlets, moist		A	1.4 1.5	E	PID <1		
	1.6	SAND (SP) - Brown, fine to medium grained with silt, moist		A	2.0 2.1	E	PID <1		2
				A	2.5 2.6	E	PID <1		
		From 2.8m, wet		A	2.9	E	PID <1	▼	
	3 3.0	Bore discontinued at 3.0m, limit of investigation			3.0				3

RIG: Hand Tools **DRILLER:** Lambert **LOGGED:** Wilson **CASING:** Uncased

TYPE OF BORING: 80mm diameter hand auger

WATER OBSERVATIONS: Free groundwater observed at 2.9m during drilling

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Thirdi Dairy Farmers Pty Ltd
PROJECT: Proposed Apartments
LOCATION: 924 Hunter Street, Newcastle

SURFACE LEVEL: 3.57 AHD
EASTING: 383688.7
NORTHING: 6356511.4
DIP/AZIMUTH: 90°/--

BORE No: 303
PROJECT No: 102077.02
DATE: 9/10/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.03	ASPHALT							
		FILL / SANDY GRAVEL (GP) - Generally comprising brown gravel, subangular to subrounded rock, fine to medium sized, sand is fine to coarse grained, dry		A	0.1 0.2	E	PID <1		
	0.3	FILL / SAND - Generally comprising pale brown, fine to medium grained with gravel, fine to medium sized gravel (rock), occasional brick, moist		A	0.5	E	PID <1		
		At 0.6m, with some brick fragments, trace coal and slag gravel		A	0.6	E	PID <1		
	0.7	At 0.65m, ceramic fragment (50mm x 30mm x 15mm)			0.7				
		Bore discontinued at 0.7m, refusal on fill							

RIG: Hand Tools **DRILLER:** Lambert **LOGGED:** Wilson **CASING:** Uncased
TYPE OF BORING: 80mm diameter hand auger
WATER OBSERVATIONS: No free groundwater observed
REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Thirdi Dairy Farmers Pty Ltd
PROJECT: Proposed Apartments
LOCATION: 924 Hunter Street, Newcastle

SURFACE LEVEL: 3.48 AHD
EASTING: 383703.5
NORTHING: 6356502.3
DIP/AZIMUTH: 90°/--

BORE No: 304
PROJECT No: 102077.02
DATE: 9/10/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.03	ASPHALT		D	0.0				
		FILL / SANDY GRAVEL (GP) - Generally comprising brown gravel, subangular to subrounded rock, fine to medium sized, sand is fine to coarse grained, dry		A	0.02 0.1 0.2	E	PID <1		
	0.4	FILL / SAND - Generally comprising pale brown, fine to medium grained, trace gravel, subrounded to subangular (natural), moist		A	0.5 0.6	E	PID <1		
		From 0.65m to 0.7m, intermixed silty clay lense							
	1.0	From 0.75m, with gravel, fine to medium sized, subrounded to subangular, trace slag, gravel and coal		A	0.9 1.0	E	PID <1		
		Bore discontinued at 1.0m, refusal							

RIG: Hand Tools **DRILLER:** Lambert **LOGGED:** Wilson **CASING:** Uncased
TYPE OF BORING: 80mm diameter hand auger
WATER OBSERVATIONS: No free groundwater observed
REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Thirdi Dairy Farmers Pty Ltd
PROJECT: Proposed Apartments
LOCATION: 924 Hunter Street, Newcastle

SURFACE LEVEL: 3.25 AHD
EASTING: 383728.5
NORTHING: 6356507.3
DIP/AZIMUTH: 90°/--

BORE No: 305
PROJECT No: 102077.02
DATE: 9/10/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.18	CONCRETE							
		FILL / SAND - Grey, fine to medium grained with gravel, gravel is fine to medium sized, trace slag, gravel and black slag, occasional glass		A	0.2 0.3	E	PID <1		
		At 0.55m, fibro fragment (30mm x 25mm)		A	0.5 0.6	E	PID <1		
		From 0.7m, some slag gravel, occasional glass, metal (bolt)							
	1.1	FILL / SAND - Possible natural, pale grey, fine to medium grained, trace gravel subrounded, trace roots, moist		A	1.0 1.1	E	PID <1		
	1.3	SAND (SP) - Brown, fine to medium grained with silt, moist		A	1.2 1.25	E	PID <1		
		From 1.5m, pale brown		A	1.35 1.4	E	PID <1		
	2.0	Bore discontinued at 2.0m, limit of investigation		A	1.9 2.0	E	PID <1		

RIG: Hand Tools **DRILLER:** Lambert **LOGGED:** Wilson **CASING:** Uncased
TYPE OF BORING: 80mm diameter hand auger
WATER OBSERVATIONS: No free groundwater observed
REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Thirdi Dairy Farmers Pty Ltd
PROJECT: Proposed Apartments
LOCATION: 924 Hunter Street, Newcastle

SURFACE LEVEL: 3.42 AHD
EASTING: 383717.2
NORTHING: 6356494.2
DIP/AZIMUTH: 90°/--

BORE No: 306
PROJECT No: 102077.02
DATE: 9/10/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.19	CONCRETE							
		FILL / SAND - Grey, fine to medium grained with gravel, gravel is fine to medium sized, trace coal, slag, gravel and black slag, occasional glass		A	0.25 0.35	E	PID <1		
	0.8	From 0.7m, intermixed pale grey							
	1	FILL / SILTY SAND (SM) - Generally comprising dark grey, sand is fine to medium grained with coal, occasional brick, (30mm), moist From 1.2m, pale brown		A	0.9 1.0	E	PID <1		
	1.6	SAND (SP) - Brown, fine to medium grained with silt, moist		A	1.5 1.6	E	PID <1		
	2			A	2.0 2.1	E	PID <1		
				A	2.5 2.6	E	PID <1		
	2.9			A	2.9	E	PID <1	▼	
	3	SAND (SP) - Grey, fine to coarse grained sand with silt, wet			3.0				
	3.0	Bore discontinued at 3.0m, limit of investigation							

RIG: Hand Tools **DRILLER:** Lambert **LOGGED:** Wilson **CASING:** Uncased
TYPE OF BORING: 80mm diameter hand auger
WATER OBSERVATIONS: Free groundwater observed at 2.9m during drilling
REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U$_x$	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Thirdi Dairy Farmers Pty Ltd
PROJECT: Proposed Apartments
LOCATION: 924 Hunter Street, Newcastle

SURFACE LEVEL: 3.93 AHD
EASTING: 383714.1
NORTHING: 6356469.7
DIP/AZIMUTH: 90°/--

BORE No: 307
PROJECT No: 102077.02
DATE: 9/10/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.16	CONCRETE							
		FILL / SANDY GRAVEL - Generally comprising brown, gravel is fine to medium subrounded to subangular (natural), fine to medium grained sand, trace clay, moist		A	0.2 0.3	E	PID <1		
	0.5	Bore discontinued at 0.5m, refusal on fill (possible metal or ceramic pipe)							

RIG: Hand Tools **DRILLER:** Lambert **LOGGED:** Wilson **CASING:** Uncased
TYPE OF BORING: 80mm diameter hand auger
WATER OBSERVATIONS: No free groundwater observed
REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Thirdi Dairy Farmers Pty Ltd
PROJECT: Proposed Apartments
LOCATION: 924 Hunter Street, Newcastle

SURFACE LEVEL: 4.07 AHD
EASTING: 383728.1
NORTHING: 6356455.9
DIP/AZIMUTH: 90°/--

BORE No: 401
PROJECT No: 102077.02
DATE: 13/3/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.1	CONCRETE							Stickup = -0.12 From 0m to 0.1m, concrete
	0.3	FILL / SANDY GRAVEL (GP) - Brown / pale brown gravel is fine to medium sized subangular to subrounded (natural rock), sand is fine to medium grained, moist		D	0.2	E	PID<1		
		FILL / SILTY SAND (SP) - Dark grey, sand is fine to medium grained, with fine to medium sized subangular gravel (rock, coal, ash), moist		D	0.5	E	PID=1		From 0.1m to 0.9m, bentonite From 0m to 1.2m, blank 50mm diameter Class 18 PVC
3	1			D	1.0	E	PID=2		1
				D	1.5	E	PID=1		
	1.7	SILTY SAND (SP) - Brown / dark brown, medium grained, moist							
2	2			D	2.0	E	PID=1		2
	2.4	SILTY CLAY (CH) - Medium plasticity, dark brown, trace rootlets, (moderate sulfur odour), W=PL		D	2.5	E	PID<1		From 0.9m to 4.2m, 5/2mm gravel From 1.2m to 4.2m, 50mm diameter Class 18 machine slotted PVC screen
1	3			D	3.0	E	PID=2	▼	3
	3.4	SAND - (SP) - Pale brown, fine to medium grained, wet		D	3.5	E	PID=3		
0	4			D	4.0	E	PID<1		4 End cap
				D	4.5	E	PID<1		
-1	5	5.0 Bore discontinued at 5.0m, limit of investigation		D	5.0	E	PID<1		5

RIG: Geoprobe 7822DT **DRILLER:** Warren (Terratest) **LOGGED:** Lambert **CASING:** Dual Tube

TYPE OF BORING: Concrete core to 0-0.1m, push tube to 5.0m

WATER OBSERVATIONS: Free groundwater observed at 3.1m

REMARKS: Ground level interpolated from survey plan provided by client (Ref 21194_Det_B)

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Thirdi Dairy Farmers Pty Ltd
PROJECT: Proposed Apartments
LOCATION: 924 Hunter Street, Newcastle

SURFACE LEVEL: 3.7 AHD
EASTING: 383729.4
NORTHING: 6356461.9
DIP/AZIMUTH: 90°/--

BORE No: 402
PROJECT No: 102077.02
DATE: 13/3/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.15	CONCRETE							Stickup = -0.05 From 0m to 0.1m, concrete
	0.3	FILL / SANDY GRAVEL (GP) - Pale brown, gravel is fine to medium sized subangular to subrounded (natural rock), sand is fine to medium grained, moist		D	0.2	E	PID<1		
		FILL / SILTY SAND (SP) - Dark grey, sand is fine to medium grained, with fine to medium sized subangular gravel (brick, coal, ash), moist		D	0.5	E	PID<1		From 0.1m to 1.0m, bentonite From 0m to 1.4m, blank 50mm diameter Class 18 PVC
	1	From 0.9m to 1.2m, bricks							1
		From 1.7m, no gravel		D	1.5	E	PID=1		
	2			D	2.0	E	PID<1		2
	2.2	SILTY SAND (SP) - Brown, fine to medium grained, moist							
	2.4	SILTY CLAY (CH) - High plasticity, dark brown, trace rootlets, (moderate sulfur odour), W=PL		D	2.5	E	PID<1		
								▼	From 1.0m to 4.4m, 5/2mm gravel From 1.4m to 4.4m, 50mm diameter Class 18 machine slotted PVC screen
	3			D	3.0	E	PID<1		3
	3.3	SAND (SP) - Pale brown, fine to medium grained sand, wet		D	3.5	E	PID<1		
	4			D	4.0	E	PID<1		4 End cap
				D	4.5	E	PID<1		
	5	5.0 Bore discontinued at 5.0m, limit of investigation		D	5.0	E	PID<1		5

RIG: Geoprobe 7822DT **DRILLER:** Warren (Terratest) **LOGGED:** Lambert **CASING:** Dual Tube

TYPE OF BORING: Concrete core to 0 to 0.11m, push tube to 0.11m to 5.0m

WATER OBSERVATIONS: Free groundwater observed at 2.8m

REMARKS: Ground level interpolated from survey plan provided by client (Ref 21194_Det_B)

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Thirdi Dairy Farmers Pty Ltd
PROJECT: Proposed Apartments
LOCATION: 924 Hunter Street, Newcastle

SURFACE LEVEL: 4.0 AHD
EASTING: 383722.4
NORTHING: 6356465.9
DIP/AZIMUTH: 90°/--

BORE No: 403
PROJECT No: 102077.02
DATE: 13/3/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
									Stickup = -0.12
		CONCRETE							From 0m to 0.1m, concrete
	0.21								
		FILL / SANDY GRAVEL (SP) - Brown gravel is fine to medium sized, subangular to subrounded (rock), sand is fine to medium grained, moist		D	0.3	E	PID=4		
	0.4			D	0.5	E	PID<1		From 0.1m to 0.8m, bentonite
		FILL / SILTY SAND (SM) - Dark grey, fine to medium grained, with fine to medium sized subangular gravel (rock, coal, ash, brick)							From 0m to 1.2m, blank 50mm diameter Class 18 PVC
3	1			D	1.0	E	PID<1		1
				D	1.5	E	PID<1		
		From 1.8m, no gravel							
2	2								2
	2.3								
		SILTY CLAY (CH) - High plasticity, dark brown, trace rootlets, (moderate sulfur odour), W=PL		D	2.5	E	PID<1		From 0.8m to 4.2m, 5/2mm gravel
								▼	From 1.2m to 4.2m, 50mm diameter Class 18 machine slotted PVC screen
1	3			D	3.0	E	PID<1		3
				D	3.5	E	PID<1		
	3.6								
		SAND (SP) - Pale brown, fine to medium grained, wet							
0	4			D	4.0	E	PID<1		4
									End cap
				D	4.5	E	PID<1		
-1	5								5
	5.0	Bore discontinued at 5.0m, limit of investigation		D	5.0	E	PID<1		

RIG: Geoprobe 7822DT **DRILLER:** Warren (Terratest) **LOGGED:** Lambert **CASING:** Dual Tube

TYPE OF BORING: Concrete core to 0 to 0.21m, push tube to 0.21m to 5.0m

WATER OBSERVATIONS: Free groundwater observed at 2.9m

REMARKS: Ground level interpolated from survey plan provided by client (Ref 21194_Det_B)

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Thirdi Dairy Farmers Pty Ltd
PROJECT: Proposed Apartments
LOCATION: 924 Hunter Street, Newcastle

SURFACE LEVEL: 3.4 AHD
EASTING: 383692.6
NORTHING: 6356521.7
DIP/AZIMUTH: 90°/--

BORE No: 404
PROJECT No: 102077.02
DATE: 13/3/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.03	ASPHALT - Black		D	0.0		PID<1		Stickup = -0.1
				D	0.03	E	PID<1		From 0m to 0.1m, concrete
	0.2	FILL / SANDY GRAVEL (GP) - Brown, gravel is fine to medium sized, subangular (pale sand) is fine to medium grained, moist			0.1				
				D	0.3	E	PID<1		
	0.4	FILL / SAND (SP) - Brown, fine to medium grained, moist		D	0.5	E	PID<1		
		FILL / SILTY SAND (SP) - Dark brown, sand is fine to medium grained, trace fine to medium sized subangular to subrounded gravel (rock, brick, ash), moist							From 0.1m to 1.2m, bentonite
									From 0m to 1.6m, blank 50mm diameter Class 18 PVC
	1			D	1.0	E	PID<1		1
		From 1.3m, no gravel							
				D	1.5	E	PID<1		
	2			D	2.0	E	PID<1		2
	2.1	SAND (SP) - Brown / pale brown, fine to medium grained, trace fine to medium sized, subrounded gravel (natural rock), moist							
		From 2.5m, wet		D	2.5	E	PID<1	▼	
	3			D	3.0	E	PID<1		3 From 1.2m to 4.6m, 5/2mm gravel
									From 1.6m to 4.6m, 50mm diameter Class 18 machine slotted PVC screen
				D	3.5	E	PID<1		
	4								4
				D	4.5	E	PID<1		End cap
	5	5.0 Bore discontinued at 5.0m, limit of investigation		D	5.0	E	PID<1		5

RIG: Geoprobe 7822DT **DRILLER:** Warren (Terratest) **LOGGED:** Lambert **CASING:** Dual Tube

TYPE OF BORING: Concrete core to 0 to 0.03m, push tube to 0.03m to 5.0m

WATER OBSERVATIONS: Free groundwater observed at 2.5m

REMARKS: Ground level interpolated from survey plan provided by client (Ref 21194_Det_B)

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Thirdi Dairy Farmers Pty Ltd
PROJECT: Proposed Apartments
LOCATION: 924 Hunter Street, Newcastle

SURFACE LEVEL: 3.4 AHD
EASTING: 383748.3
NORTHING: 6356488.7
DIP/AZIMUTH: 90°/--

BORE No: 501
PROJECT No: 102077.02
DATE: 13/3/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
		CONCRETE							
	0.12	SAND / FILL - Generally comprising pale brown fine to medium grained, trace gravel (crushed natural rock), moist		D	0.15	E	PID<1		
				D	0.15	E	PID<1		
					0.2		PID<1		
	0.3	SILTY SAND / FILL - Generally comprising dark brown, fine to medium grained, with red brick, trace concrete, slag, ash, timber, metal, moist			0.25				
3					0.4				
				D	0.5	E	PID<1		
				B		E	PID<1		
				D	0.7	E	PID<1		
	0.8	At 0.8m, concrete (possible slab, cobble or boulder) Bore discontinued at 0.8m, refusal							
	1								1
2									
	2								2
1									

RIG: 5 Tonne Excavator **DRILLER:** A. Clark (Tutt Bryant) **LOGGED:** Lambert **CASING:** None

TYPE OF BORING: 300mm diameter solid flight auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Ground level interpolated from survey plan provided by client (Ref 21194_Det_B)

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Thirdi Dairy Farmers Pty Ltd
PROJECT: Proposed Apartments
LOCATION: 924 Hunter Street, Newcastle

SURFACE LEVEL: 3.4 AHD
EASTING: 383730.4
NORTHING: 6356496.1
DIP/AZIMUTH: 90°/--

BORE No: 502
PROJECT No: 102077.02
DATE: 13/3/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
		CONCRETE							
	0.2	SILTY SAND / FILL - Generally comprising dark brown, fine to medium grained, with cream bricks, trace glass, slag, ash, coal fines, moist		D	0.3	E	PID<1		
		From 0.6m, trace brick		B D	0.8	E	PID<1		
	1								1
					1.2				
	1.3	SAND - Grey and dark brown, fine to medium grained, moist		D	1.4	E	PID<1		
		From 1.6m, grading to red / brown, indurated sand		D	1.7	E	PID<1		
	1.8	Bore discontinued at 1.8m, limit of investigation							
	2								2

RIG: 5 Tonne Excavator **DRILLER:** A. Clark (Tutt Bryant) **LOGGED:** Sebastian **CASING:** None

TYPE OF BORING: 300mm diameter solid flight auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Ground level interpolated from survey plan provided by client (Ref 21194_Det_B)

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Thirdi Dairy Farmers Pty Ltd
PROJECT: Proposed Apartments
LOCATION: 924 Hunter Street, Newcastle

SURFACE LEVEL: 3.4 AHD
EASTING: 383724.8
NORTHING: 6356477.9
DIP/AZIMUTH: 90°/--

BORE No: 503
PROJECT No: 102077.02
DATE: 13/3/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.12	CONCRETE							
	0.15	SAND / FILL - Generally comprising pale brown sand (bedding sand)		D	0.2	E	PID<1		
		GRAVELLY SILTY SAND / FILL - Generally comprising brown, fine to medium grained, with gravel (natural rock), slag, ash, brick, ceramic, glass, metal, moist			0.2				
				B		E			
				D	0.7	E	PID<1		
	1				1.0				1
	1.1	SILTY SAND / FILL - Generally comprising dark grey, fine to medium grained, with ash, coal fines, brick, fibro, moist		D	1.2	E	PID<1		
				B					
				D	1.8	E	PID<1		
	2				2.0				2
	2.1	SAND - Brown, fine to medium grained, moist							
				D	2.4	E	PID<1		
	2.5	Bore discontinued at 2.5m, limit of investigation							

RIG: 5 Tonne Excavator **DRILLER:** A. Clark (Tutt Bryant) **LOGGED:** Sebastian **CASING:** None

TYPE OF BORING: 300mm diameter solid flight auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Ground level interpolated from survey plan provided by client (Ref 21194_Det_B)

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Thirdi Dairy Farmers Pty Ltd
PROJECT: Proposed Apartments
LOCATION: 924 Hunter Street, Newcastle

SURFACE LEVEL: 3.2 AHD
EASTING: 383717.8
NORTHING: 6356501.6
DIP/AZIMUTH: 90°/--

BORE No: 504
PROJECT No: 102077.02
DATE: 13/3/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.05	ASPHALT							
		FILL / SANDY GRAVEL - Pale brown, fine to medium grained subangular gravel (natural rock), moist		D	0.1	E	PID<1		
				B	0.15				
3	0.2	FILL / SILTY SAND - Generally comprising dark grey, fine to medium grained, with brick, concrete, gravel (natural rock), slag, ash			0.3				
				D	0.5	E	PID<1		
				B		E			
	1			D	1.0	E	PID<1		1
	1.1	FILL / SAND - Generally comprising grey sand, moist (possible natural)							
2				B	1.2	E			
				D	1.3	E	PID<1		
	1.4	SAND - Brown, fine to medium grained, moist							
		From 1.7m, grading to indurated sand		D	1.7	E	PID<1		
	2								2
	2.0	Bore discontinued at 2.0m, limit of investigation							
1									

RIG: 5 Tonne Excavator **DRILLER:** A. Clark (Tutt Bryant) **LOGGED:** Sebastian **CASING:** None

TYPE OF BORING: 300mm diameter solid flight auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Ground level interpolated from survey plan provided by client (Ref 21194_Det_B)

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Thirdi Dairy Farmers Pty Ltd
PROJECT: Proposed Apartments
LOCATION: 924 Hunter Street, Newcastle

SURFACE LEVEL: 3.5 AHD
EASTING: 383707.1
NORTHING: 6356497.2
DIP/AZIMUTH: 90°/--

BORE No: 505
PROJECT No: 102077.02
DATE: 13/3/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.05	ASPHALT		D	0.01	E	PID<1		
		FILL / SILTY SAND - Generally comprising brown fine to medium grained, trace brick gravel (natural rock), slag and ash and concrete cobbles, moist			0.1				
				B		E	PID<1		
				D	0.2	E	PID<1		
		From 0.6m, abundant brick and concrete		D	0.8	E	PID<1		
	1.2	FILL / SAND - Dark brown, fine to medium grained, moist (possible natural)			1.25				
				B	1.3	E	PID<1		
				D	1.35		PID<1		
	1.4	SAND - Brown, fine to medium grained, moist							
		From 1.6m, red / brown, possible grading to indurated		D	1.75	E	PID<1		
	2.0	Bore discontinued at 2.0m, limit of investigation							

RIG: 5 Tonne Excavator **DRILLER:** A. Clark (Tutt Bryant) **LOGGED:** Sebastian **CASING:** None

TYPE OF BORING: 300mm diameter solid flight auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Ground level interpolated from survey plan provided by client (Ref 21194_Det_B). Plastic conduit struck with cables (redundant) 1m west of bore

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Thirdi Dairy Farmers Pty Ltd
PROJECT: Proposed Apartments
LOCATION: 924 Hunter Street, Newcastle

SURFACE LEVEL: 3.3 AHD
EASTING: 383704.4
NORTHING: 6356516.6
DIP/AZIMUTH: 90°/--

BORE No: 506
PROJECT No: 102077.02
DATE: 13/3/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.05	ASPHALT							
		FILL / SANDY GRAVEL - Generally comprising brown, fine to medium grained subangular, (roadbase), dry		D	0.1	E	PID<1		
				D	0.1	B			
	0.2				0.15				
3		FILL / SAND - Pale brown, fine to medium grained, trace subangular gravel (natural rock) and shell fragments, dry		D	0.3	E	PID<1		
					0.31				
				D		B			
				D	0.7	E	PID<1		
	0.8								
		FILL / SILTY SAND - Generally comprising dark grey, fine to medium grained, trace sandstone cobbles, glass, ash, slag, brick and coal fragments, fibro, moist							
	1				1.0				1
				D		B			
2				D	1.25	E	PID<1		
					1.4				
	1.5								
		SAND - Brown, fine to medium grained, moist							
				D	1.8	E	PID<1		
	2	2.0							2
1		Bore discontinued at 2.0m, limit of investigation							

RIG: 5 Tonne Excavator **DRILLER:** A. Clark (Tutt Bryant) **LOGGED:** Sebastian **CASING:** None

TYPE OF BORING: 300mm diameter solid flight auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Ground level interpolated from survey plan provided by client (Ref 21194_Det_B)

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Appendix B

Laboratory Summary Tables B1 to B7

Laboratory Reports (Envirolab Reports 279939, 279939-A, 279939-B, 280135, 280135-A, 280242, 291865, 290972, 290972-A)

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Table B1: Summary of Laboratory Results – Metals, TRH, BTEX, PAH (Commercial/Industrial Land Use Comparison - HIL D / HSL D / EIL D / ESL D)

			Metals - Standard									Metals - Additional										
			Arsenic	Cadmium	Total Chromium	Copper	Lead	Manganese	Mercury (inorganic)	Nickel	Zinc	Aluminium	Antimony	Barium	Beryllium	Boron	Cobalt	Iron	Magnesium	Molybdenum	Selenium (Total)	Tin (inorganic, Sn(V))
		PQL	4	0.4	1	1	1	1	0.1	1	1	10	7	1	1	3	1	10	10	1	2	1
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Initial Investigation - October 2021																						
201	0.5 m	06/10/2021	**4**	<0.4	**7**	**9**	**10**	**550**	<0.1	**4**	**45**	-	<7	**110**	**1**	<3	**3**	-	-	<1	<2	<1
			3000 160	900 -	3600 540	240000 300	1500 1800	60000 -	730 -	6000 260	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
201	2 m	06/10/2021	<4	<0.4	**7**	**58**	**170**	**110**	**0.4**	**14**	**130**	-	<7	**93**	<1	**6**	**9**	-	-	<1	<2	**17**
			3000 160	900 -	3600 540	240000 85	1500 1800	60000 -	730 -	6000 260	400000 250	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
202	0.2 m	06/10/2021	<4	<0.4	**6**	**26**	**63**	**1600**	<0.1	**16**	**57**	-	<7	**130**	<1	**20**	**4**	-	-	<1	<4	**2**
			3000 160	900 -	3600 540	240000 300	1500 1800	60000 -	730 -	6000 260	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
D1/JRK	-	06/10/2021	<4	<0.4	**6**	**37**	**85**	**240**	**0.1**	**21**	**82**	-	<7	**130**	<1	**30**	**4**	-	-	**1**	<2	**4**
			3000 160	900 -	3600 540	240000 300	1500 1800	60000 -	730 -	6000 260	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
202	3.5 m	06/10/2021	<4	<0.4	**2**	<1	**1**	**4**	<0.1	**1**	**2**	-	<7	**2**	<1	<3	<1	-	-	<1	<2	<1
			3000 160	900 -	3600 540	240000 85	1500 1800	60000 -	730 -	6000 260	400000 250	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
203	0.5 m	06/10/2021	<4	**0.4**	**14**	**93**	**470**	**360**	**0.2**	**15**	**230**	-	<7	**100**	<1	**5**	**6**	-	-	<1	<2	**12**
			3000 160	900 -	3600 540	240000 300	1500 1800	60000 -	730 -	6000 260	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
204	0.2 m	06/10/2021	**6**	<0.4	**5**	**7**	**9**	**280**	<0.1	**4**	**17**	-	<7	**26**	<1	<3	**3**	-	-	<1	<2	**1**
			3000 160	900 -	3600 540	240000 300	1500 1800	60000 -	730 -	6000 260	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
204	4 m	06/10/2021	**4**	<0.4	**2**	<1	**1**	**8**	<0.1	**2**	**3**	-	<7	**3**	<1	<3	**2**	-	-	<1	<2	<1
			3000 160	900 -	3600 540	240000 85	1500 1800	60000 -	730 -	6000 260	400000 250	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
205	0.5 m	06/10/2021	<4	<0.4	**2**	**7**	**14**	**56**	<0.1	**1**	**18**	-	<7	**12**	<1	<3	**9**	-	-	<1	<2	<1
			3000 160	900 -	3600 540	240000 300	1500 1800	60000 -	730 -	6000 260	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
301	0.1 - 0.2 m	9/10/2021	**5**	<0.4	**5**	**3**	**20**	**370**	<0.1	**3**	**27**	-	<7	**34**	<1	<3	**3**	-	-	<1	<2	<1
			3000 160	900 -	3600 540	240000 300	1500 1800	60000 -	730 -	6000 260	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
302	0.5 - 0.6 m	9/10/2021	<4	<0.4	**3**	**44**	**190**	**230**	**0.1**	**6**	**160**	-	<7	**89**	<1	**3**	**2**	-	-	<1	<2	**7**
			3000 160	900 -	3600 540	240000 300	1500 1800	60000 -	730 -	6000 260	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
D1/DEW	-	9/10/2021	<4	<0.4	**6**	**29**	**140**	**330**	**0.1**	**4**	**100**	-	<7	**60**	<1	<3	**2**	-	-	<1	<2	**5**
			3000 160	900 -	3600 540	240000 300	1500 1800	60000 -	730 -	6000 260	400000 250	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
302	1.4 - 1.5 m	9/10/2021	<4	<0.4	<1	**10**	**4**	**5**	<0.1	<1	**4**	-	<7	**9**	<1	<3	<1	-	-	<1	<2	<1
			3000 160	900 -	3600 540	240000 300	1500 1800	60000 -	730 -	6000 260	400000 250	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
303	0.6 - 0.7 m	9/10/2021	<4	<0.4	**5**	**25**	**130**	**160**	**0.1**	**3**	**84**	-	<7	**41**	<1	<3	**1**	-	-	<1	<2	**2**
			3000 160	900 -	3600 540	240000 300	1500 1800	60000 -	730 -	6000 260	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
304	0.5 - 0.6 m	9/10/2021	<4	<0.4	**1**	<1	**3**	**33**	<0.1	<1	**4**	-	<7	**4**	<1	<3	<1	-	-	<1	<2	<1
			3000 160	900 -	3600 540	240000 300	1500 1800	60000 -	730 -	6000 260	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
305	0.2 - 0.3 m	9/10/2021	**4**	<0.4	**6**	**88**	**1100**	**180**	**0.3**	**12**	**260**	-	<7	**96**	<1	**9**	**13**	-	-	<1	<2	**9**
			3000 160	900 -	3600 540	240000 300	1500 1800	60000 -	730 -	6000 260	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
305	0.55 m	9/10/2021	<4	<0.4	**4**	**50**	**580**	**180**	**0.2**	**7**	**150**	-	<7	**130**	<1	**6**	**3**	-	-	<1	<2	**7**
			3000 160	900 -	3600 540	240000 300	1500 1800	60000 -	730 -	6000 260	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
306	0.25 - 0.35 m	9/10/2021	<4	<0.4	**7**	**60**	**310**	**410**	**0.3**	**9**	**300**	-	<7	**100**	<1	**5**	**5**	-	-	<1	<2	**17**
			3000 160	900 -	3600 540	240000 300	1500 1800	60000 -	730 -	6000 260	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
307	0.2 - 0.3 m	9/10/2021	**5**	<0.4	**6**	**9**	**6**	**170**	<0.1	**9**	**29**	-	<7	**8**	<1	<3	**10**	-	-	<1	<2	<1
			3000 160	900 -	3600 540	240000 300	1500 1800	60000 -	730 -	6000 260	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
Additional Investigation - March 2022																						
401	1.0 m	13/03/2022	<4	<0.4	**7**	**150**	**120**	**180**	**0.3**	**17**	**210**	**4100**	<7	-	-	**5**	**8**	**13000**	**2100**	-	<2	**8**
			3000 160	900 -	3600 670	240000 300	1500 1800	60000 -	730 -	6000 60	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
401	2.0 m	13/03/2022	<4	<0.4	**8**	**230**	**65**	**140**	**0.2**	**21**	**68**	**5100**	<7	-	-	<3	**12**	**20000**	**3300**	-	<2	**4**
			3000 160	900 -	3600 670	240000 85	1500 1800	60000 -	730 -	6000 60	400000 250	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
401	3.5 m	13/03/2022	<4	<0.4	**1**	<1	**2**	**3**	<0.1	**1**	**2**	**910**	<7	-	-	<3	<1	**440**	**90**	-	**3**	<1
			3000 160	900 -	3600 670	240000 85	1500 1800	60000 -	730 -	6000 60	400000 250	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
402	2.0 m	13/03/2022	<4	<0.4	**7**	**52**	**160**	**68**	**0.5**	**25**	**240**	**11000**	<7	-	-	**7**	**18**	**4900**	**740**	-	<2	**15**
			3000 160	900 -	3600 670	240000 85	1500 1800	60000 -	730 -	6000 60	400000 250	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
402	3.5 m	13/03/2022	<4	<0.4	<1	<1	<1	**4**	<0.1	**1**	**2**	**830**	<7	-	-	<3	<1	**810**	**60**	-	<2	<1
			3000 160	900 -	3600 670	240000 85	1500 1800	60000 -	730 -	6000 60	400000 250	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
403	0.3 m	13/03/2022	<4	<0.4	**5**	**16**	**58**	**200**	<0.1	**3**	**50**	**3300**	<7	-	-	<3	**2**	**4900**	**900**	-	<2	**3**
			3000 160	900 -	3600 670	240000 300	1500 1800	60000 -	730 -	6000 60	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
403	1.5 m	13/03/2022	**23**	<0.4	**7**	**16**	**97**	**280**	**0.1**	**5**	**360**	**4000**	<7	-	-	<3	**2**	**8500**	**1100**	-	<2	**2**
			3000 160	900 -	3600 670	240000 300	1500 1800	60000 -	730 -	6000 60	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
403	4.0 m	13/03/2022	<4	<0.4	**1**	<1	**1**	**4**	<0.1	<1	**1**	**890**	<7	-	-	<3	<1	**350**	**90**	-	<2	<1
			3000 160	900 -	3600 670	240000 85	1500 1800	60000 -	730 -	6000 60	400000 250	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
404	0.5 m	13/03/2022	<4	<0.4	**44**	**71**	**73**	**94**	**0.2**	**5**	**170**	**2800**	<7	-	-	**7**	**3**	**4500**	**430**	-	<2	**5**
			3000 160	900 -	3600 670	240000 300	1500 1800	60000 -	730 -	6000 60	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
404	3.5 m	13/03/2022	<4	<0.4	<1	<1	<1	**2**	<0.1	<1	<1	**600**	<7	-	-	<3	<1	**280**	**60**	-	<2	<1
			3000 160	900 -	3600 670	240000 85	1500 1800	60000 -	730 -	6000 60	400000 250	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
501	0.4-0.7 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			3000 160	900 -	3600 670	240000 300	1500 1800	60000 -	730 -	6000 60	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
501	0.5 m	13/03/2022	**5**	<0.4	**7**	**27**	**180**	**130**	**0.2**	**7**	**150**	**3900**	<7	NT	NT	**7**	**2**	**6200**	**490**	-	<2	**6**
			3000 160	900 -	3600 670	240000 300	1500 1800	60000 -	730 -	6000 60	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
D9/JPS	-	13/03/2022	**5**	<0.4	**8**	**26**	**150**	**150**	**0.1**	**6**	**130**	**4300**	<7	NT	NT	**7**	**2**	**5200**	**500**	-	<2	**7**
			3000 160	900 -	3600 670	240000 300	1500 1800	60000 -	730 -	6000 60	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
502	0.3 m	13/03/2022	<4	**0.9**	**8**	**66**	**750**	**210**	**0.5**	**14**	**450**	**5300**	<7	-	-	**10**	**4**	**6300**	**560**	-	<2	**17**
			3000 160	900 -	3600 670	240000 300	1500 1800	60000 -	730 -	6000 60	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
502	0.3-1.2 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			3000 160	900 -	3600 670	240000 300	1500 1800	60000 -	730 -	6000 60	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
503	0.2-1.0 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			3000 160	900 -	3600 670	240000 300	1500 1800	60000 -	730 -	6000 60	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
503	0.7 m	13/03/2022	<4	<0.4	**7**	**53**	**140**	**250**	**0.1**	**23**	**170**	**4600**	**8**	-	-	**38**	**7**	**10000**	**520**	-	<2	**49**
			3000 160	900 -	3600 670	240000 300	1500 1800	60000 -	730 -	6000 60	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
503	1.2 m	13/03/2022	<4	**1**	**9**	**89**	**290**	**590**	**0.4**	**25**	**460**	**6200**	<7	-	-	**30**	**5**	**11000**	**830**	-	<2	**14**
			3000 160	900 -	3600 670	240000 300	1500 1800	60000 -	730 -	6000 60	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
503	1.2-2.0 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			3000 160	900 -	3600 670	240000 300	1500 1800	60000 -	730 -	6000 60	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
503F	1.2-2.0	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			3000 160	900 -	3600 670	240000 300	1500 1800	60000 -	730 -	6000 60	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
504	0.1-0.15	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			3000 160	900 -	3600 670	240000 300	1500 1800	60000 -	730 -	6000 60	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
504	0.3-1.0	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			3000 160	900 -	3600 670	240000 300	1500 1800	60000 -	730 -	6000 60	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
504	0.5 m	13/03/2022	**4**	<0.4	**7**	**53**	**790**	**160**	**0.8**	**8**	**260**	**5000**	<7	-	-	**9**	**3**	**5600**	**650**	-	<2	**13**
			3000 160	900 -	3600 670	240000 300	1500 1800	60000 -	730 -	6000 60	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
504	1.2-1.3 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			3000 160	900 -	3600 670	240000 300	1500 1800	60000 -	730 -	6000 60	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
505	0.2-1.1 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			3000 160	900 -	3600 670	240000 300	1500 1800	60000 -	730 -	6000 60	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
505	0.8 m	13/03/2022	**4**	<0.4	**8**	**65**	**530**	**1500**	**0.6**	**6**	**170**	**6000**	<7	-	-	**5**	**3**	**39000**	**650**	-	**3**	**8**
			3000 160	900 -	3600 670	240000 300	1500 1800	60000 -	730 -	6000 60	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
505	1.25-1.35 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			3000 160	900 -	3600 670	240000 300	1500 1800	60000 -	730 -	6000 60	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
506	0.1-0.15 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			3000 160	900 -	3600 670	240000 300	1500 1800	60000 -	730 -	6000 60	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
506	0.3-0.7 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			3000 160	900 -	3600 670	240000 300	1500 1800	60000 -	730 -	6000 60	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
506	1-1.4 m	13/03/2022	z	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			3000 160	900 -	3600 670	240000 300	1500 1800	60000 -	730 -	6000 60	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
506F	1-1.4 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			3000 160	900 -	3600 670	240000 300	1500 1800	60000 -	730 -	6000 60	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
506	1.2 m	13/03/2022	<4	<0.4	**170**	**100**	**300**	**150**	**1**	**7**	**250**	**2900**	<7	NT	NT	<3	**3**	**7600**	**680**	-	<2	**7**
			3000 160	900 -	3600 670	240000 300	1500 1800	60000 -	730 -	6000 60	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
D1/JPS	-	13/03/2022	**6**	**0.7**	**90**	**65**	**400**	**98**	**0.3**	**9**	**1100**	**2000**	<7	NT	NT	<3	**4**	**20000**	**370**	-	<2	**4**
			3000 160	900 -	3600 670	240000 300	1500 1800	60000 -	730 -	6000 60	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
S1	0 - 0.05 m	9/10/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			3000 160	900 -	3600 540	240000 300	1500 1800	60000 -	730 -	6000 260	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -
S1/F	0 m	9/10/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			3000 160	900 -	3600 670	240000 300	1500 1800	60000 -	730 -	6000 60	400000 730	- -	- -	- -	500 -	300000 -	4000 -	- -	- -	- -	10000 -	- -

Lab result
HIL/HSL value EIL/ESL value

HIL/HSL exceedance EIL/ESL exceedance HIL/HSL and EIL/ESL exceedance ML exceedance ML and HIL/HSL or EIL/
Indicates that asbestos has been detected by the lab, refer to the lab report **Blue** = DC exceedance HSL 0-<1 Exceedance
Bold = Lab detections - = Not tested or No HIL/HSL/EIL/ESL (as applicable) or Not applicable NL = Non limiting AD = Asbestos detected
HIL = Health investigation level HSL = Health screening level (excluding DC) EIL = Ecological investigation level ESL = Ecological screeni

Notes:

a QA/QC replicate of sample listed directly below the primary sample
b Reported naphthalene laboratory result obtained from BTEXN suite
c Criteria applies to DDT only

Site Assessment Criteria (SAC):

Refer to the SAC section of report for information of SAC sources and rationale. Summary information as follows:

Douglas Partners
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Table B1: Summary of Laboratory Results – Metals, TRH, BTEX, PAH (Commercial/Industrial Land Use Comparison - HIL D / HSL D / EIL D/ ESL D) - Continued

			TRH						BTEX				PAH			
			TRH C6 - C10	TRH >C10-C16	F1 ((C6-C10)-BTEX)	F2 (>C10-C16 less Naphthalene)	F3 (>C16-C34)	F4 (>C34-C40)	Benzene	Toluene	Ethylbenzene	Total Xylenes	Naphthalene [b]	Benzo(a)pyrene (BaP)	Benzo(a)pyrene TEQ	Total PAHs
		PQL	25	50	25	50	100	100	0.2	0.5	1	1	1	0.05	0.5	0.05
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Initial Investigation - October 2021																
201	0.5 m	06/10/2021	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	**0.72**
			- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
201	2 m	06/10/2021	<25	<50	<25	<50	**320**	<100	<0.2	<0.5	<1	<1	<1	**0.3**	<0.5	**4.7**
			- -	- 170	630 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	NL 180	NL 370	- 33	40 -	4000 -
202	0.2 m	06/10/2021	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.4**	<0.5	**3.8**
			- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
D1/JRK	-	06/10/2021	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.5**	**0.7**	**5.8**
			- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
202	3.5 m	06/10/2021	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			- -	- 170	630 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	NL 180	NL 370	- 33	40 -	4000 -
203	0.5 m	06/10/2021	<25	<50	<25	<50	**220**	<100	<0.2	<0.5	<1	<1	<1	**4.2**	**7.2**	**69**
			- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
204	0.2 m	06/10/2021	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
204	4 m	06/10/2021	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			- -	- 170	NL 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	NL 180	NL 370	- 33	40 -	4000 -
205	0.5 m	06/10/2021	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
301	0.1 - 0.2 m	9/10/2021	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
302	0.5 - 0.6 m	9/10/2021	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.3**	<0.5	**2.8**
			- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
D1/DEW	-	9/10/2021	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.2**	<0.5	**2.4**
			- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
302	1.4 - 1.5 m	9/10/2021	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.1**	<0.5	**0.72**
			- -	- 170	370 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	NL 180	NL 370	- 33	40 -	4000 -
303	0.6 - 0.7 m	9/10/2021	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.2**	<0.5	**1.8**
			- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
304	0.5 - 0.6 m	9/10/2021	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
305	0.2 - 0.3 m	9/10/2021	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.53**	**0.8**	**5.5**
			- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
305	0.55 m	9/10/2021	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.4**	**0.7**	**5.4**
			- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
306	0.25 - 0.35 m	9/10/2021	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.77**	**1.2**	**6.8**
			- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
307	0.2 - 0.3 m	9/10/2021	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
Additional Investigation - March 2022																
401	1.0 m	13/03/2022	<25	<50	<25	<50	**170**	<100	<0.2	<0.5	<1	<1	**0.1**	**0.93**	**1.4**	**10**
			- -	- 170	370 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	NL 180	NL 370	- 33	40 -	4000 -
401	2.0 m	13/03/2022	<25	<50	<25	<50	**120**	<100	<0.2	<0.5	<1	<1	**0.2**	**0.99**	**1.5**	**13**
			- -	- 170	630 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	NL 180	NL 370	- 33	40 -	4000 -
401	3.5 m	13/03/2022	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
			- -	- 170	630 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	NL 180	NL 370	- 33	40 -	4000 -
402	2.0 m	13/03/2022	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	**0.1**
			- -	- 170	630 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	NL 180	NL 370	- 33	40 -	4000 -
402	3.5 m	13/03/2022	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
			- -	- 170	630 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	NL 180	NL 370	- 33	40 -	4000 -
403	0.3 m	13/03/2022	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	**0.1**	<0.5	**1.1**
			- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
403	1.5 m	13/03/2022	<25	<50	<25	<50	**110**	<100	<0.2	<0.5	<1	<1	<0.1	**0.07**	<0.5	**1.8**
			- -	- 170	370 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	NL 180	NL 370	- 33	40 -	4000 -
403	4.0 m	13/03/2022	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
			- -	- 170	630 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	NL 180	NL 370	- 33	40 -	4000 -
404	0.5 m	13/03/2022	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	**0.3**	<0.5	**3.5**
			- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
404	3.5 m	13/03/2022	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
			- -	- 170	630 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	NL 180	NL 370	- 33	40 -	4000 -
501	0.4-0.7 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
501	0.5 m	13/03/2022	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	**0.71**	**1.1**	**11**
			- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
D9/JPS	-	13/03/2022	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	**0.5**	**0.7**	**7**
			- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
502	0.3 m	13/03/2022	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	**0.3**	<0.5	**4.3**
			- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
502	0.3-1.2 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
503	0.2-1.0 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
503	0.7 m	13/03/2022	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	**0.69**	**1**	**9.5**
			- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
503	1.2 m	13/03/2022	<25	<50	<25	<50	**240**	<100	<0.2	<0.5	<1	<1	<0.1	**1.1**	**1.7**	**15**
			- -	- 170	370 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	NL 180	NL 370	- 33	40 -	4000 -
503	1.2-2.0 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	- 170	370 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	NL 180	NL 370	- 33	40 -	4000 -
503F	1.2-2.0	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	- 170	370 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	NL 180	NL 370	- 33	40 -	4000 -
504	0.1-0.15	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
504	0.3-1.0	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
504	0.5 m	13/03/2022	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	**0.3**	<0.5	**3.9**
			- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
504	1.2-1.3 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	- 170	370 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	NL 180	NL 370	- 33	40 -	4000 -
505	0.2-1.1 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
505	0.8 m	13/03/2022	<25	<50	<25	<50	**130**	<100	<0.2	<0.5	<1	<1	<0.1	**1.3**	**1.9**	**16**
			- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
505	1.25-1.35 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	- 170	370 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	NL 180	NL 370	- 33	40 -	4000 -
506	0.1-0.15 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
506	0.3-0.7 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
506	1-1.4 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	- 170	370 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	NL 180	NL 370	- 33	40 -	4000 -
506F	1-1.4 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	- 170	370 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	NL 180	NL 370	- 33	40 -	4000 -
506	1.2 m	13/03/2022	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	**0.83**	**1.3**	**10**
			- -	- 170	370 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	NL 180	NL 370	- 33	40 -	4000 -
D1/JPS	-	13/03/2022	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	**0.59**	**0.9**	**6.9**
			- -	- 170	370 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
S1	0 - 0.05 m	9/10/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
S1/F	0 m	9/10/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -

Lab result
HIL/HSL value EIL/ESL value

HIL/HSL exceedance EIL/ESL exceedance HIL/HSL and EIL/ESL exceedance ML exceedance ML and HIL/HSL or EIL
Indicates that asbestos has been detected by the lab, refer to the lab report **Blue** = DC exceedance HSL 0-<1 Exceedance
Bold = Lab detections - = Not tested or No HIL/HSL/EIL/ESL (as applicable) or Not applicable NL = Non limiting AD = Asbestos detecte
HIL = Health investigation level HSL = Health screening level (excluding DC) EIL = Ecological investigation level ESL = Ecological screer

Notes:

a QA/QC replicate of sample listed directly below the primary sample
b Reported naphthalene laboratory result obtained from BTEXN suite
c Criteria applies to DDT only

Site Assessment Criteria (SAC):

Refer to the SAC section of report for information of SAC sources and rationale. Summary information as follows:

Table B2: Summary of Laboratory Results – OCP, OPP, PCB, Asbestos (Commercial/Industrial Land Use Comparison- HIL D / HSL D / EIL D / ESL D)

			OCP											OPP	PCB							
			DDD	DDT+DDE+DDD [c]	DDE	DDT	Aldrin & Dieldrin	Total Chlordane	Endrin	Total Endosulfan	Heptachlor	Hexachlorobenzene	Methoxychlor	Chlorpyriphos	Arochlor 1016	Total PCB	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260
		PQL	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Initial Investigation - October 2021																						
201	0.5 m	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
201	2 m	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
202	0.2 m	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
D1/JRK	-	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
203	0.5 m	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
204	0.2 m	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
205	0.2 m	06/10/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
205	0.5 m	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
301	0.1 - 0.2 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
302	0.5 - 0.6 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
D1/DEW	-	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
302	1.4 - 1.5 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
303	0.6 - 0.7 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
304	0.5 - 0.6 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
305	0.2 - 0.3 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
305	0.55 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
305/F	0.55 m	9/10/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
306	0.25 - 0.35 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
307	0.2 - 0.3 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
Additional Investigation - March 2022																						
401	1.0 m	13/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
401	2.0 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
401	3.5 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
402	2.0 m	13/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
402	3.5 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
402	0.3 m	13/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
403	1.5 m	13/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
403	4.0 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
404	0.5 m	13/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
404	3.5 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
501	0.4-0.7	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
501	0.5 m	13/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
D9/JPS	-	13/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
502	0.3 m	13/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
502	0.3-1.2m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
503	0.2-1.0 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
503	0.7m	13/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
503	1.2 m	13/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
503	1.2-2.0 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
503	1.0-2.0 F	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
504	0.1-0.15 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
504	0.3-1.0 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
504	0.5 m	13/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
504	1.2-1.3	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
505	0.2-1.1	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
505	0.8	13/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
505	1.25-1.35	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
506	0.1-0.15	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
506	0.3-0.7	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
506	1-1.4	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
506	1-1.4F	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
506	1.2 m	13/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
D1/JPS	-	13/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
S1	0 - 0.05 m	9/10/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -
S1/F	0 m	9/10/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -

Lab result
HIL/HSL value EIL/ESL value

HIL/HSL exceedance EIL/ESL exceedance HIL/HSL and EIL/ESL exceedance ML exceedance ML
Indicates that asbestos has been detected by the lab, refer to the lab report **Blue** = DC exceedance HSL 0-<1 Ex
Bold = Lab detections - = Not tested or No HIL/HSL/EIL/ESL (as applicable) or Not applicable NL = Non limiting AD =
HIL = Health investigation level HSL = Health screening level (excluding DC) EIL = Ecological investigation level ESL =

Notes:

a QA/QC replicate of sample listed directly below the primary sample

b Reported naphthalene laboratory result obtained from BTEXN suite

c Criteria applies to DDT only

Site Assessment Criteria (SAC):

Refer to the SAC section of report for information of SAC sources and rationale. Summary information as follows:

Table B2: Summary of Laboratory Results – OCP, OPP, PCB, Asbestos (Commercial/Industrial Land Use Comparison- HIL D / HSL D / EIL D / ESL D) - Continued

			Asbestos			Asbestos						
			Asbestos ID in soil >0.1g/kg	Trace Analysis	Asbestos (50 g)	Asbestos ID in soil >0.1g/kg	Trace Analysis	Asbestos ID in soil <0.1g/kg	ACM >7mm Estimation	FA and AF Estimation	FA and AF Estimation	Asbestos (500 ml)
		PQL									<0.001	0.001
Sample ID	Depth	Sample Date	-	-	-	-	-	-	g	g	%(w/w)	-
Initial Investigation - October 2021												
201	0.5 m	06/10/2021	-	-	-	-	-	-	-	-	-	-
201	2 m	06/10/2021	-	-	-	-	-	-	-	-	-	-
202	0.2 m	06/10/2021	-	-	-	-	-	-	-	-	-	-
D1/JRK	-	06/10/2021	-	-	-	-	-	-	-	-	-	-
203	0.5 m	06/10/2021	-	-	-	-	-	-	-	-	-	-
204	0.2 m	06/10/2021	-	-	-	-	-	-	-	-	-	-
205	0.2 m	06/10/2021	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD
205	0.5 m	06/10/2021	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD
301	0.1 - 0.2 m	9/10/2021	-	-	-	-	-	-	-	-	-	-
302	0.5 - 0.6 m	9/10/2021	-	-	-	-	-	-	-	-	-	-
D1/DEW	-	9/10/2021	-	-	-	-	-	-	-	-	-	-
302	1.4 - 1.5 m	9/10/2021	-	-	-	-	-	-	-	-	-	-
303	0.6 - 0.7 m	9/10/2021	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD
304	0.5 - 0.6 m	9/10/2021	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD
305	0.2 - 0.3 m	9/10/2021	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD
305	0.55 m	9/10/2021	-	-	-	NAD	NAD	**AD**	NT	**0.033**	**0.0049**	NAD
305/F	0.55 m	9/10/2021	-	**AD**	**AD**	-	-	-	-		-	-
306	0.25 - 0.35 m	9/10/2021	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD
307	0.2 - 0.3 m	9/10/2021	-	-	-	-	-	-	-	-	-	-
Additional Investigation - March 2022												
401	1.0 m	13/03/2022	NAD	NAD	NAD	-	-	-	-	-	-	-
401	2.0 m	13/03/2022	-	-	-	-	-	-	-	-	-	-
401	3.5 m	13/03/2022	-	-	-	-	-	-	-	-	-	-
402	2.0 m	13/03/2022	NAD	NAD	NAD	-	-	-	-	-	-	-
402	3.5 m	13/03/2022	-	-	-	-	-	-	-	-	-	-
402	0.3 m	13/03/2022	NAD	NAD	NAD	-	-	-	-	-	-	-
403	1.5 m	13/03/2022	NAD	NAD	NAD	-	-	-	-	-	-	-
403	4.0 m	13/03/2022	-	-	-	-	-	-	-	-	-	-
404	0.5 m	13/03/2022	NAD	NAD	NAD	-	-	-	-	-	-	-
404	3.5 m	13/03/2022	-	-	-	-	-	-	-	-	-	-
501	0.4-0.7	13/03/2022	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD
501	0.5 m	13/03/2022	-	-	-	-	-	-	-	-	-	-
D9/JPS	-	13/03/2022	-	-	-	-	-	-	-	-	-	-
502	0.3 m	13/03/2022	-	-	-	-	-	-	-	-	-	-
502	0.3-1.2m	13/03/2022	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD
503	0.2-1.0 m	13/03/2022	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD
503	0.7m	13/03/2022	-	-	-	-	-	-	-	-	-	-
503	1.2 m	13/03/2022	-	-	-	-	-	-	-	-	-	-
503	1.2-2.0 m	13/03/2022	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD
503	1.0-2.0 F	13/03/2022	-	**AD**	**AD**	-	-	-	-	-	-	-
504	0.1-0.15 m	13/03/2022	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD
504	0.3-1.0 m	13/03/2022	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD
504	0.5 m	13/03/2022	-	-	-	-	-	-	-	-	-	-
504	1.2-1.3	13/03/2022	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD
505	0.2-1.1	13/03/2022	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD
505	0.8	13/03/2022	-	-	-	-	-	-	-	-	-	-
505	1.25-1.35	13/03/2022	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD
506	0.1-0.15	13/03/2022	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD
506	0.3-0.7	13/03/2022	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD
506	1-1.4	13/03/2022	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD
506	1-1.4F	13/03/2022	-	**AD**	**AD**	-	-	-	-	-	-	-
506	1.2 m	13/03/2022	-	-	-	-	-	-	-	-	-	-
D1/JPS	-	13/03/2022	-	-	-	-	-	-	-	-	-	-
S1	0 - 0.05 m	9/10/2021	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD
S1/F	0 m	9/10/2021	-	**AD**	**AD**	-	-	-	-	-	-	-

Lab result
HIL/HSL value EIL/ESL value

HIL/HSL exceedance EIL/ESL exceedance HIL/HSL and EIL/ESL exceedance ML exceedance ML and HIL/HSL or EIL/ESL
Indicates that asbestos has been detected by the lab, refer to the lab report **Blue** = DC exceedance HSL 0-<1 Exceedance
Bold = Lab detections - = Not tested or No HIL/HSL/EIL/ESL (as applicable) or Not applicable NL = Non limiting AD = Asbestos detected N
HIL = Health investigation level HSL = Health screening level (excluding DC) EIL = Ecological investigation level ESL = Ecological screening l

Notes:

a QA/QC replicate of sample listed directly below the primary sample

b Reported naphthalene laboratory result obtained from BTEXN suite

c Criteria applies to DDT only

Site Assessment Criteria (SAC):

Refer to the SAC section of report for information of SAC sources and rationale. Summary information as follows:

Table B3: Summary of Laboratory Results – VOC (Commercial/Industrial Land Use Comparison - HIL D / HSL D / EIL D)

| | | | VOC | | |

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Table B4: Summary of Laboratory Results in Soil (Waste Classification Comparison)

			Metals																		TRH					BTEX					
			Arsenic	Aluminium	Antimony	Barium	Beryllium	Boron	Cadmium	Total Chromium	TCLP Total Chromium	Cobalt	Copper	Lead	TCLP Lead	Manganese	Mercury (inorganic)	Molybdenum	Nickel	Selenium (Total)	Tin (inorganic, SnIV)	Zinc	TRH C6 - C9	TRH C10 - C14	TRH C15 - C28	TRH C29 - C36	C10-C36 recoverable hydrocarbons	Benzene	Toluene	Ethylbenzene	m+p-Xylene	o-Xylene	Xylenes (total)
		PQL	4	10	7	1	1	3	0.4	1		1	1	1	0.03	1	0.1	1	1	2	1	1	25	50	100	100	50	0.2	0.5	1	2	1	3
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/L	mg/kg	mg/kg	mg/kg	mg/L	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
201	0.5 m	06/10/2021	**4**	-	<7	**110**	**1**	<3	<0.4	**7**	-	**3**	**9**	**10**	-	**550**	<0.1	<1	**4**	<2	<1	**45**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3
201	2 m	06/10/2021	<4	-	<7	**93**	<1	**6**	<0.4	**7**	-	**9**	**58**	**170**	<0.03	**110**	**0.4**	<1	**14**	<2	**17**	**130**	<25	<50	**260**	**100**	**360**	<0.2	<0.5	<1	<2	<1	<3
202	0.2 m	06/10/2021	<4	-	<7	**130**	<1	**20**	<0.4	**6**	-	**4**	**26**	**63**	-	**1600**	<0.1	<1	**16**	<4	**2**	**57**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3
D1/JRK	0 m	06/10/2021	<4	-	<7	**130**	<1	**30**	<0.4	**6**	-	**4**	**37**	**85**	-	**240**	**0.1**	**1**	**21**	<2	**4**	**82**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3
202	3.5 m	06/10/2021	<4	-	<7	**2**	<1	<3	<0.4	**2**	-	<1	<1	**1**	-	**4**	<0.1	<1	**1**	<2	<1	**2**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3
203	0.5 m	06/10/2021	<4	-	<7	**100**	<1	**5**	**0.4**	**14**	-	**6**	**93**	**470**	**0.2**	**360**	**0.2**	<1	**15**	<2	**12**	**230**	<25	<50	**130**	**120**	**250**	<0.2	<0.5	<1	<2	<1	<3
204	0.2 m	06/10/2021	**6**	-	<7	**26**	<1	<3	<0.4	**5**	-	**3**	**7**	**9**	-	**280**	<0.1	<1	**4**	<2	**1**	**17**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3
204	4 m	06/10/2021	**4**	-	<7	**3**	<1	<3	<0.4	**2**	-	**2**	<1	**1**	-	**8**	<0.1	<1	**2**	<2	<1	**3**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3
205	0.2 m	06/10/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
205	0.5 m	06/10/2021	<4	-	<7	**12**	<1	<3	<0.4	**2**	-	**9**	**7**	**14**	-	**56**	<0.1	<1	**1**	<2	<1	**18**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3
301	0.1 - 0.2 m	9/10/2021	**5**	-	<7	**34**	<1	<3	<0.4	**5**	-	**3**	**3**	**20**	-	**370**	<0.1	<1	**3**	<2	<1	**27**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3
302	0.5 - 0.6 m	9/10/2021	<4	-	<7	**89**	<1	**3**	<0.4	**3**	-	**2**	**44**	**190**	**0.07**	**230**	**0.1**	<1	**6**	<2	**7**	**160**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3
D1/DEW	-	9/10/2021	<4	-	<7	**60**	<1	<3	<0.4	**6**	-	**2**	**29**	**140**	-	**330**	**0.1**	<1	**4**	<2	**5**	**100**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3
302	1.4 - 1.5 m	9/10/2021	<4	-	<7	**9**	<1	<3	<0.4	<1	-	<1	**10**	**4**	-	**5**	<0.1	<1	<1	<2	<1	**4**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3
303	0.6 - 0.7 m	9/10/2021	<4	-	<7	**41**	<1	<3	<0.4	**5**	-	**1**	**25**	**130**	**0.2**	**160**	**0.1**	<1	**3**	<2	**2**	**84**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3
304	0.5 - 0.6 m	9/10/2021	<4	-	<7	**4**	<1	<3	<0.4	**1**	-	<1	<1	**3**	-	**33**	<0.1	<1	<1	<2	<1	**4**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3
305	0.2 - 0.3 m	9/10/2021	**4**	-	<7	**96**	<1	**9**	<0.4	**6**	-	**13**	**88**	**1100**	**0.77**	**180**	**0.3**	<1	**12**	<2	**9**	**260**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3
305	0.55 m	9/10/2021	<4	-	<7	**130**	<1	**6**	<0.4	**4**	-	**3**	**50**	**580**	-	**180**	**0.2**	<1	**7**	<2	**7**	**150**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3
306	0.25 - 0.35 m	9/10/2021	<4	-	<7	**100**	<1	**5**	<0.4	**7**	-	**5**	**60**	**310**	**0.2**	**410**	**0.3**	<1	**9**	<2	**17**	**300**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3
307	0.2 - 0.3 m	9/10/2021	**5**	-	<7	**8**	<1	<3	<0.4	**6**	-	**10**	**9**	**6**	-	**170**	<0.1	<1	**9**	<2	<1	**29**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3
401	1 m	13/03/2022	<4	**4100**	<7	-	-	**5**	<0.4	**7**	-	**8**	**150**	**120**	**0.05**	**180**	**0.3**	-	**17**	**<2**	**8**	**210**	<25	<50	**120**	<100	**120**	<0.2	<0.5	<1	<2	<1	<1
401	2 m	13/03/2022	<4	**5100**	<7	-	-	<3	<0.4	**8**	-	**12**	**230**	**65**	-	**140**	**0.2**	-	**21**	**<2**	**4**	**68**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1
401	3.5 m	13/03/2022	<4	**910**	<7	-	-	<3	<0.4	**1**	-	**<1**	<1	**2**	-	**3**	<0.1	-	**1**	**3**	**<1**	**2**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1
402	2 m	13/03/2022	<4	**11000**	<7	-	-	**7**	<0.4	**7**	-	**18**	**52**	**160**	<0.03	**68**	**0.5**	-	**25**	**<2**	**15**	**240**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1
402	3.5 m	13/03/2022	<4	**830**	<7	-	-	<3	<0.4	<1	-	<1	<1	<1	-	**4**	<0.1	-	**1**	**<2**	**<1**	**2**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1
403	0.3 m	13/03/2022	<4	**3300**	<7	-	-	<3	<0.4	**5**	-	**2**	**16**	**58**	-	**200**	<0.1	-	**3**	**<2**	**3**	**50**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1
403	1.5 m	13/03/2022	**23**	**4000**	<7	-	-	<3	<0.4	**7**	-	**2**	**16**	**97**	-	**280**	**0.1**	-	**5**	**<2**	**2**	**360**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1
403	4 m	13/03/2022	<4	**890**	<7	-	-	<3	<0.4	**1**	-	**<1**	<1	**1**	-	**4**	<0.1	-	<1	<2	<1	**1**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1
404	0.5 m	13/03/2022	<4	**2800**	<7	-	-	**7**	<0.4	**44**	-	**3**	**71**	**73**	-	**94**	**0.2**	-	**5**	**<2**	**5**	**170**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1
404	3.5 m	13/03/2022	<4	**600**	<7	-	-	<3	<0.4	<1	-	<1	<1	<1	-	<1	<0.1	-	<1	<2	<1	<1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1
501	0.5 m	13/03/2022	**5**	**3900**	<7	-	-	**7**	<0.4	**7**	-	**2**	**27**	**180**	**0.07**	**130**	**0.2**	-	**7**	**<2**	**6**	**150**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1
D9/JPS	D9/JPS	13/03/2022	**5**	**4300**	<7	-	-	**7**	<0.4	**8**	-	**2**	**26**	**150**	-	**150**	**0.1**	-	**6**	**<2**	**7**	**130**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1
502	0.3 m	13/03/2022	<4	**5300**	<7	-	-	**10**	**0.9**	**8**	-	**4**	**66**	**750**	**0.4**	**210**	**0.5**	-	**14**	**<2**	**17**	**450**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1
503	0.7 m	13/03/2022	<4	**4600**	**8**	-	-	**38**	<0.4	**7**	-	**7**	**53**	**140**	**0.2**	**250**	**0.1**	-	**23**	**<2**	**49**	**170**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1
503	1.2 m	13/03/2022	<4	**6200**	<7	-	-	**30**	**1**	**9**	-	**5**	**89**	**290**	**0.04**	**590**	**0.4**	-	**25**	**<2**	**14**	**460**	<25	**52**	**140**	**120**	**320**	<0.2	<0.5	<1	<2	<1	<1
504	0.5 m	13/03/2022	**4**	**5000**	<7	-	-	**9**	<0.4	**7**	-	**3**	**53**	**790**	**0.3**	**160**	**0.8**	-	**8**	**<2**	**13**	**260**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1
505	0.8 m	13/03/2022	**4**	**6000**	<7	-	-	**5**	<0.4	**8**	-	**3**	**65**	**530**	**0.38**	**1500**	**0.6**	-	**6**	**3**	**8**	**170**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1
506	1.2 m	13/03/2022	<4	**2900**	<7	-	-	<3	<0.4	**170**	**0.08**	**3**	**100**	**300**	**0.2**	**150**	**1**	-	**7**	**<2**	**7**	**250**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1
D1/JPS	-	13/03/2022	**6**	**2000**	<7	-	-	<3	**0.7**	**90**	-	**4**	**65**	**400**	-	**98**	**0.3**	-	**9**	**<2**	**4**	**1100**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1
501	0.4-0.7 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
502	0.3-1.2 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
503	0.2-1.0 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
503	1.2-2.0 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
504	0.1-0.15 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
504	0.3-1.0	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
504	1.2-1.3 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
505	0.2-1.1 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
505	1.25-1.35 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
506	0.1-0.15 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
506	0.3-0.7 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
506	1-1.4 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
506	1-1.4F	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
503	1.2-2.0F	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CT1			100	NC	NC	NC	20	NC	20	100	-	NC	NC	100	-	NC	4	100	40	20	NC	NC	650	NC	NC	NC	10000	10	288	600	NC	NC	1000
SCC1			500	NC	NC	NC	100	NC	100	1900	1900	NC	NC	1500	1500	NC	50	1000	1050	50	NC	NC	650	NC	NC	NC	10000	18	518	1080	NC	NC	1800
TCLP1			N/A	NC	NC	NC	N/A	NC	N/A	N/A	5	NC	NC	N/A	5	NC	N/A	N/A	N/A	N/A	NC	NC	N/A	NC	NC	NC	N/A	N/A	N/A	N/A	NC	NC	N/A
CT2			400	NC	NC	NC	80	NC	80	400	-	NC	NC	400	-	NC	16	400	160	80	NC	NC	2600	NC	NC	NC	40000	40	1152	2400	NC	NC	4000
SCC2			2000	NC	NC	NC	400	NC	400	7600	7600	NC	NC	6000	6000	NC	200	4000	4200	200	NC	NC	2600	NC	NC	NC	40000	72	2073	4320	NC	NC	7200
TCLP2			N/A	NC	NC	NC	N/A	NC	N/A	N/A	20	NC	NC	N/A	20	NC	N/A	N/A	N/A	N/A	NC	NC	N/A	NC	NC	NC	N/A	N/A	N/A	N/A	NC	NC	N/A

CT1 exceedance | TCLP1 and/or SCC1 exceedance | CT2 exceedance | TCLP2 and/or SCC2 exceedance | Asbestos detection

NT = Not tested NL = Non limiting NC = No criteria NA = Not applicable

Notes:

a QA/QC replicate of sample listed directly below the primary sample

b Total chromium used as initial screen for chromium(VI).

c Total recoverable hydrocarbons (TRH) used as an initial screen for total petroleum hydrocarbons (TPH)

d Criteria for scheduled chemicals used as an initial screen

e Criteria for Chlorpyrifos used as initial screen

f All criteria are in the same units as the reported results

PQL Practical quantitation limit

CT1 NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values of specific contaminant concentration (SCC) for classification without TCLP: General solid waste

SCC1 NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: General solid waste

TCLP1 NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: General solid waste

CT2 NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values of specific contaminant concentration (SCC) for classification without TCLP: Restricted solid waste

SCC2 NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: Restricted solid waste

TCLP2 NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: Restricted solid waste

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Table B4: Summary of Laboratory Results in Soil (Waste Classification Comparison) - Continued

			PAH																												OCP		OPP
			Benzo(a)pyrene (BaP)	TCLP Benzo(a)pyrene (BaP)	Acenaphthene	TCLP Acenaphthene	Acenaphthylene	TCLP Acenaphthylene	Anthracene	TCLP Anthracene	Benzo(a)anthracene	TCLP Benzo(a)anthracene	Benzo(b,j+k)fluoranthene	TCLP Benzo(b,j+k)fluoranthene	Benzo(g,h,i)perylene	TCLP Benzo(g,h,i)perylene	Chrysene	TCLP Chrysene	Dibenzo(a,h)anthracene	TCLP Dibenzo(a,h)anthracene	Fluoranthene	TCLP Fluoranthene	Fluorene	TCLP Fluorene	Indeno(1,2,3-c,d)pyrene	TCLP Indeno(1,2,3-c,d)pyrene	Naphthalene	TCLP Naphthalene	Phenanthrene	TCLP Phenanthrene	Pyrene	TCLP Pyrene	Total PAHs	TCLP Total PAHs	Total Endosulfan	Total Analysed OCP	Total Analysed OPP
		PQL	0.05	0.001	0.1	0.001	0.1	0.001	0.1	0.001	0.1	0.001	0.2	0.002	0.1	0.001	0.1	0.001	0.1	0.001	0.1	0.001	0.1	0.001	0.1	0.001	1	0.001	0.1	0.001	0.1	0.001	0.05	0.001	0.1	0.1	0.1
Sample ID	Depth	Sample Date	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/kg	mg/kg
Initial Investigation - October 2021																																					
201	0.5 m	06/10/2021	<0.05	-	<0.1	-	<0.1	-	<0.1	-	**0.1**	-	<0.2	-	<0.1	-	**0.2**	-	**0.4**	-	<0.1	-	**0.1**	-	**0.5**	-	<0.1	-	<0.1	-	**0.4**	-	**0.1**	-	**0.72**	-	<0.1	<0.1	<0.1
201	2 m	06/10/2021	**0.3**	-	<0.1	-	<0.1	-	**0.1**	-	**0.9**	-	**0.6**	-	**0.2**	-	**0.4**	-	<0.1	-	**0.5**	-	<0.1	-	**0.1**	-	<1	-	**0.9**	-	**0.5**	-	**4.7**	-	<0.1	<0.1	<0.1
202	0.2 m	06/10/2021	**0.4**	-	<0.1	-	<0.1	-	<0.1	-	**0.4**	-	**0.5**	-	**0.3**	-	**0.3**	-	<0.1	-	**0.8**	-	<0.1	-	**0.2**	-	<1	-	**0.2**	-	**0.8**	-	**3.8**	-	<0.1	<0.1	<0.1
D1/JRK	0 m	06/10/2021	**0.5**	-	<0.1	-	<0.1	-	<0.1	-	**0.7**	-	**0.8**	-	**0.4**	-	**0.4**	-	<0.1	-	**1.2**	-	<0.1	-	**0.3**	-	<1	-	**0.4**	-	**1.2**	-	**5.8**	-	<0.1	<0.1	<0.1
202	3.5 m	06/10/2021	<0.05	-	<0.1	-	<0.1	-	<0.1	-	<0.2	-	<0.2	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<1	-	<0.1	-	<0.1	-	<0.05	-	-	-	-
203	0.5 m	06/10/2021	**4.2**	<0.001	<0.1	<0.001	**0.2**	<0.001	**1.2**	<0.001	**6.2**	<0.001	**15**	<0.002	**3.8**	<0.001	**3.8**	<0.001	**0.6**	<0.001	**13**	<0.001	<0.1	<0.001	**2.5**	<0.001	<1	<0.001	**4.2**	<0.001	**14**	<0.001	**69**	<0.001	<0.1	<0.1	<0.1
204	0.2 m	06/10/2021	<0.05	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.2	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<1	-	<0.1	-	<0.1	-	<0.05	-	<0.1	<0.1	<0.1
204	4 m	06/10/2021	<0.05	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.2	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<1	-	<0.1	-	<0.1	-	<0.05	-	-	-	-
205	0.2 m	06/10/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
205	0.5 m	06/10/2021	<0.05	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.2	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<1	-	<0.1	-	<0.1	-	<0.05	-	<0.1	<0.1	<0.1
301	0.1 - 0.2 m	9/10/2021	<0.05	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.2	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<1	-	<0.1	-	<0.1	-	<0.05	-	<0.1	<0.1	<0.1
302	0.5 - 0.6 m	9/10/2021	**0.3**	-	<0.1	-	<0.1	-	<0.1	-	**0.3**	-	**0.7**	-	**0.2**	-	**0.2**	-	<0.1	-	**0.4**	-	<0.1	-	**0.2**	-	<1	-	**0.2**	-	**0.4**	-	**2.8**	-	<0.1	<0.1	<0.1
D1/DEW	-	9/10/2021	**0.2**	-	<0.1	-	<0.1	-	<0.1	-	**0.2**	-	**0.6**	-	**0.2**	-	**0.2**	-	<0.1	-	**0.4**	-	<0.1	-	**0.1**	-	<1	-	<0.1	-	**0.4**	-	**2.4**	-	<0.1	<0.1	<0.1
302	1.4 - 1.5 m	9/10/2021	**0.1**	-	<0.1	-	<0.1	-	<0.1	-	**0.3**	-	**0.3**	-	<0.1	-	<0.1	-	<0.1	-	**0.2**	-	<0.1	-	<0.1	-	<1	-	<0.1	-	**0.1**	-	**0.72**	-	<0.1	<0.1	<0.1
303	0.6 - 0.7 m	9/10/2021	**0.2**	-	<0.1	-	<0.1	-	<0.1	-	**0.2**	-	**0.4**	-	**0.1**	-	**0.1**	-	<0.1	-	**0.3**	-	<0.1	-	**0.1**	-	<1	-	**0.1**	-	**0.2**	-	**1.8**	-	<0.1	<0.1	<0.1
304	0.5 - 0.6 m	9/10/2021	<0.05	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.2	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<1	-	<0.1	-	<0.1	-	<0.05	-	<0.1	<0.1	<0.1
305	0.2 - 0.3 m	9/10/2021	**0.53**	-	<0.1	-	<0.1	-	<0.1	-	**0.6**	-	**1**	-	**0.4**	-	**0.4**	-	<0.1	-	**0.8**	-	<0.1	-	**0.3**	-	<1	-	**0.4**	-	**0.8**	-	**5.5**	-	<0.1	<0.1	<0.1
305	0.55 m	9/10/2021	**0.4**	-	<0.1	-	<0.1	-	**0.1**	-	**0.6**	-	**1**	-	**0.3**	-	**0.4**	-	<0.1	-	**0.9**	-	<0.1	-	**0.2**	-	<1	-	**0.3**	-	**0.8**	-	**5.4**	-	<0.1	<0.1	<0.1
306	0.25 - 0.35 m	9/10/2021	**0.77**	-	<0.1	-	<0.1	-	<0.1	-	**0.7**	-	**2**	-	**0.6**	-	**0.5**	-	**0.1**	-	**0.7**	-	<0.1	-	**0.5**	-	<1	-	**0.2**	-	**0.7**	-	**6.8**	-	<0.1	<0.1	<0.1
307	0.2 - 0.3 m	9/10/2021	<0.05	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.2	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<1	-	<0.1	-	<0.1	-	<0.05	-	<0.1	<0.1	<0.1
Additional Field Work - March 2022																																					
401	1 m	13/03/2022	**0.93**	<0.001	<0.1	<0.001	**0.2**	<0.001	**0.2**	<0.001	**1.6**	<0.001	**2**	<0.002	**0.6**	<0.001	**0.9**	<0.001	**0.1**	<0.001	**1.4**	<0.001	<0.1	<0.001	**0.4**	<0.001	**0.1**	<0.001	**0.7**	<0.001	**1.4**	<0.001	**10**	<0.001	<0.1	<0.1	<0.1
401	2 m	13/03/2022	**0.99**	<0.001	<0.1	<0.001	**0.3**	<0.001	**0.4**	<0.001	**2.2**	<0.001	**2.1**	<0.002	**0.6**	<0.001	**1**	<0.001	<0.1	<0.001	**1.9**	<0.001	<0.1	<0.001	**0.4**	<0.001	**0.2**	<0.001	**1**	<0.001	**1.8**	<0.001	**13**	<0.001	-	-	-
401	3.5 m	13/03/2022	<0.05	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.2	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.05	-	-	-	-
402	2 m	13/03/2022	<0.05	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.2	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	**0.1**	-	<0.1	<0.1	<0.1
402	3.5 m	13/03/2022	<0.05	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.2	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.05	-	-	-	-
403	0.3 m	13/03/2022	**0.1**	-	<0.1	-	<0.1	-	<0.1	-	**0.1**	-	**0.3**	-	**0.1**	-	**0.1**	-	<0.1	-	**0.2**	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	**0.2**	-	**1.1**	-	<0.1	<0.1	<0.1
403	1.5 m	13/03/2022	**0.07**	-	<0.1	-	<0.1	-	<0.1	-	**0.2**	-	**0.2**	-	<0.1	-	**0.2**	-	<0.1	-	**0.3**	-	<0.1	-	<0.1	-	<0.1	-	**0.5**	-	**0.3**	-	**1.8**	-	<0.1	<0.1	<0.1
403	4 m	13/03/2022	<0.05	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.2	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.05	-	-	-	-
404	0.5 m	13/03/2022	**0.3**	-	<0.1	-	<0.1	-	<0.1	-	**0.4**	-	**0.7**	-	**0.3**	-	**0.4**	-	<0.1	-	**0.6**	-	<0.1	-	**0.2**	-	<0.1	-	**0.1**	-	**0.6**	-	**3.5**	-	<0.1	<0.1	<0.1
404	3.5 m	13/03/2022	<0.05	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.2	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.05	-	-	-	-
501	0.5 m	13/03/2022	**0.71**	-	<0.1	-	**0.1**	-	**0.3**	-	**1.5**	-	**2**	NT	**0.4**	-	**0.8**	-	<0.1	-	**2.1**	-	<0.1	-	**0.3**	-	<0.1	-	**1.3**	-	**1.9**	-	**11**	-	<0.1	<0.1	<0.1
D9/JPS	D9/JPS	13/03/2022	**0.5**	-	<0.1	-	<0.1	-	**0.2**	-	**0.8**	-	**1**	NT	**0.3**	-	**0.5**	-	<0.1	-	**1.3**	-	<0.1	-	**0.2**	-	<0.1	-	**0.8**	-	**1.2**	-	**7**	-	<0.1	<0.1	<0.1
502	0.3 m	13/03/2022	**0.3**	-	<0.1	-	<0.1	-	**0.5**	-	**0.8**	-	**0.3**	-	**0.4**	-	<0.1	-	**0.8**	-	<0.1	-	**0.2**	-	<0.1	-	**0.3**	-	**0.8**	-	**4.3**	-	<0.1	<0.1	<0.1
503	0.7 m	13/03/2022	**0.69**	-	<0.1	-	<0.1	-	**0.2**	-	**0.8**	-	**1**	-	**0.6**	-	**0.8**	-	<0.1	-	**1.9**	-	<0.1	-	**0.4**	-	<0.1	-	**0.8**	-	**1.8**	-	**9.5**	-	<0.1	<0.1	<0.1
503	1.2 m	13/03/2022	**1.1**	<0.001	<0.1	<0.001	**0.1**	<0.001	**0.2**	<0.001	**1.6**	<0.001	**2.4**	<0.002	**0.9**	<0.001	**1.2**	<0.001	**0.1**	<0.001	**2.8**	<0.001	<0.1	<0.001	**0.6**	<0.001	<0.1	<0.001	**1.1**	<0.001	**2.8**	<0.001	**15**	<0.001	<0.1	<0.1	<0.1
504	0.5 m	13/03/2022	**0.3**	-	<0.1	-	**0.1**	-	**0.7**	-	**1.6**	-	**0.7**	-	**0.2**	-	**0.3**	-	<0.1	-	**0.5**	-	<0.1	-	**0.2**	-	<0.1	-	**0.2**	-	**0.6**	-	**3.9**	-	<0.1	<0.1	<0.1
505	0.8 m	13/03/2022	**1.3**	<0.001	<0.1	<0.001	**0.2**	<0.001	**0.4**	<0.001	**2.2**	<0.001	**2.4**	<0.002	**0.7**	<0.001	**1.4**	<0.001	**0.1**	<0.001	**2.6**	<0.001	**0.1**	<0.001	**0.5**	<0.001	<0.1	<0.001	**1**	<0.001	**2.6**	<0.001	**16**	<0.001	<0.1	<0.1	<0.1
506	1.2 m	13/03/2022	**0.83**	<0.001	<0.1	<0.001	**0.1**	<0.001	**0.2**	<0.001	**1.4**	<0.001	**2**	<0.002	**0.5**	<0.001	**0.9**	<0.001	**0.1**	<0.001	**1.7**	<0.001	<0.1	<0.001	**0.4**	<0.001	<0.1	<0.001	**0.6**	<0.001	**1.7**	<0.001	**10**	<0.001	<0.1	<0.1	<0.1
D1/JPS	-	13/03/2022	**0.59**	-	<0.1	-	**0.1**	-	**0.1**	-	**1**	-	**1**	-	**0.4**	-	**0.6**	-	<0.1	-	**1.1**	-	<0.1	-	**0.3**	-	<0.1	-	**0.3**	-	**1.1**	-	**6.9**	-	<0.1	<0.1	<0.1
501	0.4-0.7 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
502	0.3-1.2 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
503	0.2-1.0 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
503	1.2-2.0 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
504	0.1-0.15 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
504	0.3-1.0	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
504	1.2-1.3 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
505	0.2-1.1 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
505	1.25-1.35 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
506	0.1-0.15 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
506	0.3-0.7 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
506	1-1.4 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
506	1-1.4F	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
503	1.2-2.0F	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Waste Classification Criteria [f]																																					
CT1			0.8	0.8	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	200	200	60	<50	4
SCC1			10	10	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	200	200	108	<50	7.5
TCLP1			N/A	N/A	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	N/A	N/A	N/A	N/A	N/A
CT2			3.2	3.2	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	800	800	240	<50	16
SCC2			23	23	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	800	800	432	<50	30
TCLP2			N/A	N/A	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	N/A	N/A	N/A	N/A	N/A

CT1 exceedance | TCLP1 and/or SCC1 exceedance | CT2 exceedance | TCLP2 and/or SCC2 exceedance | Asbestos detection

NT = Not tested NL = Non limiting NC = No criteria NA = Not applicable

Notes:

a QA/QC replicate of sample listed directly below the primary sample

b Total chromium used as initial screen for chromium(VI).

c Total recoverable hydrocarbons (TRH) used as an initial screen for total petroleum hydrocarbons (TPH)

d Criteria for scheduled chemicals used as an initial screen

e Criteria for Chlorpyrifos used as initial screen

f All criteria are in the same units as the reported results

PQL Practical quantitation limit

CT1 NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values of specific contaminant concentration (SCC) for classification without TCLP: General solid waste

SCC1 NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: General solid waste

TCLP1 NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: General solid waste

CT2 NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values of specific contaminant concentration (SCC) for classification without TCLP: Restricted solid waste

SCC2 NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: Restricted solid waste

TCLP2 NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: Restricted solid waste

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Table B4: Summary of Laboratory Results in Soil (Waste Classification Comparison) - Continued

			PCB								Asbestos										VOC													
			Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	Total PCB	Asbestos ID in soil >0.1g/kg	Trace Analysis	Asbestos ID in soil >0.1g/kg	Asbestos ID in soil <0.1g/kg	Trace Analysis	ACM >7mm Estimation	FA and AF Estimation	FA and AF Estimation	Total Asbestos#1	Asbestos ID in materials	Total Asbestos	carbon tetrachloride	Monochlorobenzene	Chloroform	1,2-dichlorobenzene	1,4-dichlorobenzene	1,2-dichloroethane	1,1-Dichloroethene	Styrene (vinylbenzene)	1,1,1,2-tetrachloroethane	1,1,2,2-tetrachloroethane	tetrachloroethene	1,1,1-trichloroethane	1,1,2-trichloroethane	1,1,2-trichloroethylene	Vinyl Chloride
		PQL	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1							<0.001	<0.1		0.001	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	-	-	-	-	-	g	g	%(w/w)	g/kg	-	-	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
201	0.5 m	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
201	2 m	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
202	0.2 m	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
D1/JRK	0 m	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
202	3.5 m	06/10/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
203	0.5 m	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
204	0.2 m	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
204	4 m	06/10/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
205	0.2 m	06/10/2021	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD	-	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-
205	0.5 m	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	NAD	NAD	NAD	NT	NT	-	NAD	-	NAD	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
301	0.1 - 0.2 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
302	0.5 - 0.6 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
D1/DEW	-	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
302	1.4 - 1.5 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
303	0.6 - 0.7 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	NAD	NAD	NAD	NT	NT	-	NAD	-	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-
304	0.5 - 0.6 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	NAD	NAD	NAD	NT	NT	-	NAD	-	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-
305	0.2 - 0.3 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	NAD	NAD	NAD	NT	NT	-	NAD	-	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-
305	0.55 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	NAD	AD	NAD	NT	0.0328	0.0049	NAD	-	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-
306	0.25 - 0.35 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	NAD	NAD	NAD	NT	NT	-	NAD	-	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-
307	0.2 - 0.3 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
401	1 m	13/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	-	-	-	-	-	-	-	-	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-
401	2 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
401	3.5 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
402	2 m	13/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	-	-	-	-	-	-	-	-	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-
402	3.5 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
403	0.3 m	13/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	-	-	-	-	-	-	-	-	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-
403	1.5 m	13/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	-	-	-	-	-	-	-	-	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-
403	4 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
404	0.5 m	13/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	-	-	-	-	-	-	-	-	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-
404	3.5 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
501	0.5 m	13/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
D9/JPS	D9/JPS	13/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
502	0.3 m	13/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
503	0.7 m	13/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
503	1.2 m	13/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
504	0.5 m	13/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
505	0.8 m	13/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
506	1.2 m	13/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
D1/JPS	-	13/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
501	0.4-0.7 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD	-	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-
502	0.3-1.2 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD	-	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-
503	0.2-1.0 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD	-	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-
503	1.2-2.0 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD	-	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-
504	0.1-0.15 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD	-	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-
504	0.3-1.0	13/03/2022	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD	-	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-
504	1.2-1.3 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD	-	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-
505	0.2-1.1 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD	-	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-
505	1.25-1.35 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD	-	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-
506	0.1-0.15 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD	-	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-
506	0.3-0.7 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD	-	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-
506	1-1.4 m	13/03/2022	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD	-	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-
506	1-1.4F	13/03/2022	-	-	-	-	-	-	-	-	-	[NT]	-	-	-	-	-	-	-	AD	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-
503	1.2-2.0F	13/03/2022	-	-	-	-	-	-	-	-	-	[NT]	-	-	-	-	-	-	-	AD	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-
CT1			NC	NC	NC	NC	NC	NC	NC	<50	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	10	2000	120	86	150	10	14	60	200	26	14	600	24	10	4
SCC1			NC	NC	NC	NC	NC	NC	NC	<50	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	18	3600	126	4.3	7.5	0.5	0.7	108	360	46.8	25.2	1080	43.2	18	7.2
TCLP1			NC	NC	NC	NC	NC	NC	NC	N/A	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
CT2			NC	NC	NC	NC	NC	NC	NC	<50	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	40	8000	480	344	600	40	56	240	800	104	56	2400	96	40	16
SCC2			NC	NC	NC	NC	NC	NC	NC	<50	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	72	14400	864	620	1080	72	100	432	1440	187.2	100.8	4320	172.8	72	28.8
TCLP2			NC	NC	NC	NC	NC	NC	NC	N/A	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

CT1 exceedance | TCLP1 and/or SCC1 exceedance | CT2 exceedance | TCLP2 and/or SCC2 exceedance | Asbestos detection

NT = Not tested NL = Non limiting NC = No criteria NA = Not applicable

Notes:

a QA/QC replicate of sample listed directly below the primary sample

b Total chromium used as initial screen for chromium(VI).

c Total recoverable hydrocarbons (TRH) used as an initial screen for total petroleum hydrocarbons (TPH)

d Criteria for scheduled chemicals used as an initial screen

e Criteria for Chlorpyrifos used as initial screen

f All criteria are in the same units as the reported results

PQL Practical quantitation limit

CT1 NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values of specific contaminant concentration (SCC) for classification without TCLP: General solid waste

SCC1 NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: General solid waste

TCLP1 NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: General solid waste

CT2 NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values of specific contaminant concentration (SCC) for classification without TCLP: Restricted solid waste

SCC2 NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: Restricted solid waste

TCLP2 NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: Restricted solid waste

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Table B5: Results of Asbestos Field Screening and Laboratory Testing for Asbestos in Soil (500 mL samples)

Bore	Sample Depth (m)	Soil Description	Soil Mass (kg)	No. Fragments	Fragment Condition	Fibro Size Range (mm)	Fibro Mass (g)	Fibro Mass (kg)	% Asbestos Content	Laboratory Analysis Results - Soil (500 mL)										Laboratory Analysis Results - Soil (40 g)
									Assumed 15% Asbestos	Sample Mass (g)	Description	Asbestos ID in Soil >0.1 g/kg	Trace Analysis	Total Asbestos (g/kg)	Asbestos ID in soil <0.1g/kg*	ACM >7mm Estimation (g)	FA and AF Estimation (g)	FA and AF Estimation (%w/w)	Asbestos ID in Soil
Initial Investigation - October 2021																				
205	0.2	Fill / Sandy gravel	*Not subject to field sieving*							776.54	Brown coarse- grained soil & rocks	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	-	-	<0.001	NT
205	0.5	Fill / Silty sand	*Not subject to field sieving*							720.26	Brown coarse- grained soil & rocks	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	-	-	<0.001	NT
303	0.6-0.7	Fill / Sand	*Not subject to field sieving*							721.4	Grey fine-grained soil & rocks	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	-	-	<0.001	NT
304	0.5-0.6	Fill / Sand	*Not subject to field sieving*							718.67	Grey fine-grained soil & rocks	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	-	-	<0.001	NT
305	0.2-0.3	Fill / Sand	*Not subject to field sieving*							707.74	Grey fine-grained soil & rocks	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	-	-	<0.001	NT
305	0.55	Fill / Sand	*Not subject to field sieving*							674.58	Grey fine-grained soil & rocks	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	**Chrysotile Amosite Crocidolite**	-	0.0328	**0.0049**	NT
306	0.25-0.35	Fill / Sand	*Not subject to field sieving*							417.63	Grey fine-grained soil & rocks	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	-	-	<0.001	NT
S1	0-0.05	Fill / Silty sand	*Not subject to field sieving*							827.26	Grey fine-grained soil & rocks	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	-	-	<0.001	NT
Additional Investigation - March 2022																				
401	1.0	Fill / Sand	*Not subject to field sieving*							NT	NT	NT	NT	NT	NT	NT	NT	NT	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected
402	2.0	Fill / Sand	*Not subject to field sieving*							NT	NT	NT	NT	NT	NT	NT	NT	NT	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected
403	0.3	Fill / Sand	*Not subject to field sieving*							NT	NT	NT	NT	NT	NT	NT	NT	NT	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected
403	1.5	Fill / Sand	*Not subject to field sieving*							NT	NT	NT	NT	NT	NT	NT	NT	NT	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected
404	0.5	Fill / Sand	*Not subject to field sieving*							NT	NT	NT	NT	NT	NT	NT	NT	NT	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected
501	0.15-0.25	Fill / Sand	10.1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NT
	0.4-0.7	Fill / Sand	10.1	0	-	-	-	-	-	731.32	Brown coarse- grained soil & rocks	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	-	-	<0.001	NT
502	0.3-1.2	Fill / Sand	10.2	0	-	-	-	-	-	537.82	Brown fine- grained soil & rocks	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	-	-	<0.001	NT
503	0.2-1.0	Fill / Sand	10.2	0	-	-	-	-	-	534.80	Brown coarse- grained soil & rocks	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	-	-	<0.001	NT
	1.2 - 2.0	Fill / Sand	10.3	1	Good	20	13.79	0.014	0.020%	508.47	Brown coarse- grained soil & rocks	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	-	-	<0.001	NT
504	0.1-0.15	Fill / Sand	10.1	0	-	-	-	-	-	765.18	Brown coarse- grained soil & rocks	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	-	-	<0.001	NT
	0.3-1.0	Fill / Sand	10.2	0	-	-	-	-	-	570.33	Brown coarse- grained soil & rocks	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	-	-	<0.001	NT
	1.2-1.3	Fill / Sand	10.3	0	-	-	-	-	-	630.31	Brown sandy soil	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	-	-	<0.001	NT
505	0.2-1.1	Fill / Sand	10	0	-	-	-	-	-	867.73	Brown coarse- grained soil & rocks	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	-	-	<0.001	NT
	1.25-1.35	Fill / Sand	10	0	-	-	-	-	-	550.49	Brown sandy soil and rocks	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	-	-	<0.001	NT
506	0.1-0.15	Fill / Sand	10.1	0	-	-	-	-	-	939.10	Brown coarse-grained soil & rocks	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	-	-	<0.001	NT
	0.3-0.7	Fill / Sand	10.2	0	-	-	-	-	-	810.56	Brown sandy soil and rocks	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	-	-	<0.001	NT
	1.0-1.4	Fill / Sand	10.2	1	Good	20	10.15	0.010	0.015%	630.31	Brown sandy soil and rocks	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	-	-	<0.001	NT
Criteria									Commercial / Industrial 0.05% w/w asbestos for ACM									**0.001%**	

Notes:
Criteria for all site uses is 0.001% asbestos for Friable asbestos or Asbestos Fines
ACM - Asbestos Containing Material
w/w - weight/weight
NT - Not Tested
NA - Not Applicable

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Table B6: Summary of Laboratory Results – Acid Sulfate Soils

Bore ID	Ground Surface RL (AHD)	Sample Depth (m)	Sample RL (AHD)	Sample Description	Screening Test Results				pH_{KCL}	S_{KCL}	Scr %S	s-TAA %S	S_{NAS} %S	s-ANC_{BT} %S	Net Acidity[c] %S	Existing and Potential Acidity %S
					pH											
					pH_F	pH_{FOX}	pH_F - pH_{FOX}	Strength of Reaction								
Initial Investigation - November 2021																
201	3.89	**3.5**	**0.4**	SAND, brown to pale brown	4.0	**2.7**	**1.3**	Low reaction	-	-	-	-	-	-	-	-
		4.5	**-0.6**	SAND, brown to pale brown	5.8	5.5	0.3	Low reaction	-	-	-	-	-	-	-	-
202	3.37	1.5	1.9	SILTY SAND, grey	5.4	5.0	0.4	Low reaction	-	-	-	-	-	-	-	-
		2.5	0.9	SAND, pale brown	5.8	5.0	0.8	Low reaction	-	-	-	-	-	-	-	-
203	3.10	**4.0**	**-0.9**	SAND, trace gravels, brown	5.8	4.3	**1.5**	Low reaction	-	-	-	-	-	-	-	-
		5.0	**-1.9**	SAND, trace gravels, brown	5.4	5.0	0.4	Low reaction	-	-	-	-	-	-	-	-
204	3.27	2.0	1.3	SAND, pale brown	7.0	5.9	**1.1**	Low reaction	-	-	-	-	-	-	-	-
		3.1	**0.2**	SAND, trace gravels, brown	4.7	**1.9**	**2.8**	Volcanic reaction	4.0	0.091	0.26	0.06	0.010	-	0.32	0.33
205	3.40	1.5	1.9	SAND, pale brown	6.5	5.4	**1.1**	Low reaction	6.7	<0.005	<0.005	<0.01	-	<0.05	<0.005	<0.05
		2.5	0.9	SAND, pale brown	4.5	**1.8**	**2.7**	Volcanic reaction	-	-	-	-	-	-	-	-
301	2.99	1.5-1.6	1.39-1.49	SAND, with silt, brown	7.3	5.7	**1.6**	Low reaction	6.8	-	<0.005	<0.01	-	<0.05	<0.005	<0.015
		2.1-2.2	0.79-0.89	SAND, with silt, pale brown	7.2	4.7	**2.5**	Low reaction	-	-	-	-	-	-	-	-
		2.7-2.9	**0.09-0.29**	SAND, with silt, pale brown	6.9	**1.9**	**5.0**	Medium reaction	-	-	-	-	-	-	-	-
302	3.24	2.0-2.1	1.14-1.24	SAND, with silt, brown	7.3	5.8	**1.5**	Low reaction	-	-	-	-	-	-	-	-
		2.5-2.6	0.64-0.74	SAND, with silt, brown	7.3	5.6	**1.7**	Low reaction	-	-	-	-	-	-	-	-
		2.9-3.0	**0.24-0.34**	SAND, with silt, brown	6.6	**2.1**	**4.5**	Extreme reaction	-	-	-	-	-	-	-	-
305	3.25	1.35-1.4	1.85-1.9	SAND, with silt, brown	7.3	5.7	**1.6**	Low reaction	-	-	-	-	-	-	-	-
306	3.42	2.0-2.1	1.32-1.42	SAND, with silt, brown	7.3	5.8	**1.5**	Low reaction	6.8	-	<0.005	<0.01	-	<0.05	<0.005	<0.015
		2.5-2.6	0.82-0.92	SAND, with silt, brown	7.3	5.7	**1.6**	Low reaction	-	-	-	-	-	-	-	-
		2.9-3.0	**0.42-0.52**	SAND, with silt, grey	6.3	**1.8**	**4.5**	Volcanic reaction	4.3	0.055	0.36	0.02	0.024	-	0.40	0.40
Additional investigation - March 2022																
401	4.07	2.5	1.57	SILTY CLAY	6.7	3.7	**3.0**	Medium reaction	-	-	-	-	-	-	-	-
		3.0	**1.07**	SILTY CLAY	7.0	5.0	**2.0**	Low reaction	-	-	-	-	-	-	-	-
		4.0	**0.07**	SAND	6.5	5.3	**1.2**	Low reaction	-	-	-	-	-	-	-	-
		4.5	**-0.43**	SAND	6.9	5.1	**1.8**	Low reaction	-	-	-	-	-	-	-	-
		5.0	**-0.93**	SAND	6.6	3.5	**3.1**	High reaction	-	-	-	-	-	-	-	-
403	3.96	2.5	1.46	SILTY CLAY	6.0	**1.5**	**4.5**	High reaction	6.0	-	0.09	<0.01	-	-	0.09	0.09
		3.0	**0.96**	SILTY CLAY	6.6	**1.8**	**4.8**	Extreme reaction	5.3	-	0.23	<0.01	-	-	0.23	0.23
		3.5	**0.46**	SILTY CLAY	6.8	**1.7**	**5.1**	Volcanic reaction	-	-	-	-	-	-	-	-
		4.5	**-0.54**	SAND	6.1	5.7	0.4	Low reaction	-	-	-	-	-	-	-	-
		5.0	**-1.04**	SAND	6.5	5.8	0.7	Low reaction	-	-	-	-	-	-	-	-
404	3.39	2.5	0.89	SAND	5.2	**1.6**	**3.6**	Medium reaction	-	-	-	-	-	-	-	-
		3.0	**0.39**	SAND	6.0	**2.2**	**3.8**	Medium reaction	-	-	-	-	-	-	-	-
		4.5	**-1.11**	SAND	6.2	3.6	**2.6**	Low reaction	-	-	-	-	-	-	-	-
		5.0	**-1.61**	SAND	6.3	**2.7**	**3.6**	Medium reaction	-	-	-	-	-	-	-	-
502	3.35	1.4	1.95	SAND	7.5	5.6	**1.9**	High reaction	-	-	-	-	-	-	-	-
		1.7	1.65	SAND	7.6	5.7	**1.9**	Low reaction	-	-	-	-	-	-	-	-
503	3.74	2.4	1.34	SAND	7.0	5.7	**1.3**	Low reaction	6.2	-	<0.005	<0.01	-	-	<0.005	<0.015
504	3.29	1.7	1.59	SAND	6.6	5.6	1.0	Low reaction	-	-	-	-	-	-	-	-
505	3.39	1.7	1.69	SAND	6.5	5.4	**1.1**	Low reaction	-	-	-	-	-	-	-	-
Guideline					**<4[d]**	**<3.5[e]**	**≥1[e]**	-	Coarse sands, poorly buffered							0.01
									Coarse sands to loamy sands and peats							0.03
									Medium sandy loams to light clays							0.06[f]/0.03[g]
									Fine medium to heavy clays & silty clays							0.1[f]/0.03[g]

Notes to Table B6:

a Depth below ground surface

b Strength of Reaction
- 1 denotes no or slight reaction
- 2 denotes moderate reaction
- 3 denotes high reaction
- 4 denotes very vigorous reaction
- F denotes bubbling/frothy reaction indicative of organics
- V denotes vapours generated
- B denotes bubbles generated
- H denotes heat generated

c Calculated by the laboratory based on the ABA equation in ASS Laboratory Methods Guidelines

d For actual acid sulphate soils (ASS)

e Indicative value only for Potential Acid Sulphate Soils (PASS)

f QASSIT Action Criteria for disturbance of 1-1000 tonnes of material

g QASSIT Action Criteria for disturbance of more than 1000 tonnes of material

Bold results indicative of ASS/PASS

Shaded results indicate an exceedence of QASSIT action criteria

Blue results indicate sample collected from below the groundwater table at time of sampling

pH_F - Soil pH Test (1:5 soil:distilled water)

pH_{FOX} - Soil Peroxide pH Test (1:4 soil:distilled water following oxidation of soil with 30% hydrogen peroxide (H_2O_2))

*Laboratory methods used to quantify ANC are likely to overestimate environmental effectiveness

- indicates not tested

Table B7: Summary of Laboratory Results – Groundwater

					Well ID	GW1	GW3	203	204	Replicate GWD1 (204)	401	402	403	404
					Sampled Date	7/10/2021	7/10/2021	12/10/2021	12/10/2021	12/10/2021	24/03/2022	24/03/2022	24/03/2022	24/03/2022
Analyte		Units	PQL	ANZG (2018) Marine water 95% toxicant DGVs, slightly to moderately distubed	NEPM 2013 Table 1A(4) Comm/Ind HSL D GW for Vapour Intrusion, Sand									
					2-4m									
Metals (filtered)	Antimony	mg/L	0.001			0.001	0.001	0.004	0.004	0.004	0.003	0.001	<0.001	0.003
	Arsenic	mg/L	0.001			0.004	<0.001	<0.001	0.002	0.002	<0.001	0.001	<0.001	<0.001
	Barium	mg/L	0.001			0.005	0.002	0.016	0.029	0.031	NT	NT	NT	NT
	Beryllium	mg/L	0.0005			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	NT	NT	NT	NT
	Boron	mg/L	0.02			0.1	0.1	0.04	0.27	0.28	0.09	0.04	0.03	0.1
	Cadmium	mg/L	0.0001	0.0007		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.001	<0.001
	Chromium (III+VI)	mg/L	0.001	0.0044		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001
	Cobalt	mg/L	0.001	0.001		<0.001	<0.001	<0.001	0.001	0.001	<0.001	<0.001	<0.001	0.002
	Copper	mg/L	0.001	0.0013		0.001	0.007	0.003	0.002	0.002	<0.001	0.006	0.001	0.002
	Lead	mg/L	0.001	0.0044		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Manganese	mg/L	0.005			<0.005	0.093	0.006	0.036	0.036	0.058	0.027	0.025	0.067
	Mercury	mg/L	0.00005	0.0004		<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
	Molybdenum	mg/L	0.001			0.002	0.001	0.002	0.01	0.011	0.002	<0.001	<0.001	0.004
	Nickel	mg/L	0.001	0.07		0.013	0.024	0.008	0.004	0.004	0.005	0.004	0.005	0.005
	Selenium	mg/L	0.001			<0.001	<0.001	<0.001	0.003	0.003	<0.001	<0.001	<0.001	0.002
	Tin	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	Zinc	mg/L	0.001	0.008		0.017	0.045	0.32	0.28	0.29	0.051	0.15	0.39	0.028
TPH	C6-C10 less BTEX (F1)	mg/L	0.01		6	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	C6-C10	mg/L	0.01			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	C10-C16	mg/L	0.05			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	C16-C34	mg/L	0.1			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	C34-C40	mg/L	0.1			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	F2-NAPHTHALENE	mg/L	0.05		NL	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	C6 - C9	mg/L	0.01			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	C10 - C14	mg/L	0.05			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	C15 - C28	mg/L	0.1			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	C29-C36	mg/L	0.1			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	+C10 - C36 (Sum of total)	mg/L	0.05			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	C10 - C40 (Sum of total)	mg/L	0.05			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
BTEX	Benzene	mg/L	0.001	0.7	5	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Ethylbenzene	mg/L	0.001	0.08	NL	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Toluene	mg/L	0.001	0.18	NL	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Xylene (m & p)	mg/L	0.002	0.075		<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
	Xylene (o)	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
MAH	1,2,4-trimethylbenzene	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	1,3,5-trimethylbenzene	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	Isopropylbenzene	mg/L	0.001	0.03		<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	n-butylbenzene	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	n-propylbenzene	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	p-isopropyltoluene	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	sec-butylbenzene	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	Styrene	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	tert-butylbenzene	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
Chlorinated Hydrocarbons	1,1,1,2-tetrachloroethane	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	1,1,1-trichloroethane	mg/L	0.001	0.27		<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	1,1,2,2-tetrachloroethane	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	1,1,2-trichloroethane	mg/L	0.001	1.9		<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	1,1-dichloroethane	mg/L	0.001	19		<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	1,1-dichloroethene	mg/L	0.001	0.08		<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	1,1-dichloropropene	mg/L	0.001	0.9		<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	1,2,3-trichloropropane	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	1,2-dibromo-3-chloropropane	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	1,2-dichloroethane	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	1,2-dichloropropane	mg/L	0.001	0.9		<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	1,3-dichloropropane	mg/L	0.001	1.1		<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	2,2-dichloropropane	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	Bromochloromethane	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	Bromodichloromethane	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	Bromoform	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	Carbon tetrachloride	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	Chlorodibromomethane	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	Chloroethane	mg/L	0.01			<0.01	<0.01	<0.01	<0.01	<0.01	NT	NT	NT	NT
	Chloroform	mg/L	0.001	0.37		<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	Chloromethane	mg/L	0.01			<0.01	<0.01	<0.01	<0.01	<0.01	NT	NT	NT	NT
	cis-1,2-dichloroethene	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	cis-1,3-dichloropropene	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	Dibromomethane	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	Hexachlorobutadiene	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	Trichloroethene	mg/L	0.001	0.07		<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	Tetrachloroethene	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	trans-1,2-dichloroethene	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	trans-1,3-dichloropropene	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	Vinyl chloride	mg/L	0.01	0.1		<0.01	<0.01	<0.01	<0.01	<0.01	NT	NT	NT	NT
Halogenated Hydrocarbons	1,2-dibromoethane	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	Bromomethane	mg/L	0.01			<0.01	<0.01	<0.01	<0.01	<0.01	NT	NT	NT	NT
	Dichlorodifluoromethane	mg/L	0.01			<0.01	<0.01	<0.01	<0.01	<0.01	NT	NT	NT	NT
	Trichlorofluoromethane	mg/L	0.01			<0.01	<0.01	<0.01	<0.01	<0.01	NT	NT	NT	NT
Halogenated Benzenes	1,2,3-trichlorobenzene	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	1,2,4-trichlorobenzene	mg/L	0.001	0.08		<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	1,2-dichlorobenzene	mg/L	0.001	0.16		<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	1,3-dichlorobenzene	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	1,4-dichlorobenzene	mg/L	0.001	0.06		<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	2-chlorotoluene	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	4-chlorotoluene	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	Bromobenzene	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
	Chlorobenzene	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
Solvents	Cyclohexane	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	NT	NT	NT	NT
PAH	Total Positive PAHs	mg/L	0.0001			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Acenaphthene	mg/L	0.0001			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Acenaphthylene	mg/L	0.0001			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Anthracene	mg/L	0.0001	0.00001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Benz(a)anthracene	mg/L	0.0001			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Benzo(a) pyrene	mg/L	0.0001			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Benzo(g,h,i)perylene	mg/L	0.0001			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Chrysene	mg/L	0.0001			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Dibenz(a,h)anthracene	mg/L	0.0001			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Fluoranthene	mg/L	0.0001	0.001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Fluorene	mg/L	0.0001			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Indeno(1,2,3-c,d)pyrene	mg/L	0.0001			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Naphthalene	mg/L	0.0002	0.05	NL	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	Phenanthrene	mg/L	0.0001	0.0006		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Pyrene	mg/L	0.0001			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Benzo(a)pyrene TEQ	mg/L	0.0005			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	Benzo(b,j+k)fluoranthene	mg/L	0.0002			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

PQL - Practical Quantitation Limit

GWD1 - field replicate of Bore 204

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CERTIFICATE OF ANALYSIS 279939

Client Details

Client	Douglas Partners Newcastle
Attention	Joshua Kramer
Address	Box 324 Hunter Region Mail Centre, Newcastle, NSW, 2310

Sample Details

Your Reference	**102077.02, Newcastle**
Number of Samples	20 Soil, 5 Water
Date samples received	08/10/2021
Date completed instructions received	08/10/2021

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	13/10/2021
Date of Issue	13/10/2021

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Asbestos Approved By
Analysed by Asbestos Approved Analyst: Nyovan Moonean
Authorised by Asbestos Approved Signatory: Lucy Zhu

Results Approved By
Diego Bigolin, Inorganics Supervisor
Dragana Tomas, Senior Chemist
Hannah Nguyen, Metals Supervisor
Lucy Zhu, Asbestos Supervisor

Authorised By

Nancy Zhang, Laboratory Manager

VOCs in soil				
Our Reference		279939-3	279939-9	279939-10
Your Reference	UNITS	202	205	D1/JRK
Depth		0.2	0.5	-
Date Sampled		06/10/2021	06/10/2021	06/10/2021
Type of sample		Soil	Soil	Soil
Date extracted	-	11/10/2021	11/10/2021	11/10/2021
Date analysed	-	12/10/2021	12/10/2021	12/10/2021
Dichlorodifluoromethane	mg/kg	<1	<1	<1
Chloromethane	mg/kg	<1	<1	<1
Vinyl Chloride	mg/kg	<1	<1	<1
Bromomethane	mg/kg	<1	<1	<1
Chloroethane	mg/kg	<1	<1	<1
Trichlorofluoromethane	mg/kg	<1	<1	<1
1,1-Dichloroethene	mg/kg	<1	<1	<1
trans-1,2-dichloroethene	mg/kg	<1	<1	<1
1,1-dichloroethane	mg/kg	<1	<1	<1
cis-1,2-dichloroethene	mg/kg	<1	<1	<1
bromochloromethane	mg/kg	<1	<1	<1
chloroform	mg/kg	<1	<1	<1
2,2-dichloropropane	mg/kg	<1	<1	<1
1,2-dichloroethane	mg/kg	<1	<1	<1
1,1,1-trichloroethane	mg/kg	<1	<1	<1
1,1-dichloropropene	mg/kg	<1	<1	<1
Cyclohexane	mg/kg	<1	<1	<1
carbon tetrachloride	mg/kg	<1	<1	<1
Benzene	mg/kg	<0.2	<0.2	<0.2
dibromomethane	mg/kg	<1	<1	<1
1,2-dichloropropane	mg/kg	<1	<1	<1
trichloroethene	mg/kg	<1	<1	<1
bromodichloromethane	mg/kg	<1	<1	<1
trans-1,3-dichloropropene	mg/kg	<1	<1	<1
cis-1,3-dichloropropene	mg/kg	<1	<1	<1
1,1,2-trichloroethane	mg/kg	<1	<1	<1
Toluene	mg/kg	<0.5	<0.5	<0.5
1,3-dichloropropane	mg/kg	<1	<1	<1
dibromochloromethane	mg/kg	<1	<1	<1
1,2-dibromoethane	mg/kg	<1	<1	<1
tetrachloroethene	mg/kg	<1	<1	<1
1,1,1,2-tetrachloroethane	mg/kg	<1	<1	<1
chlorobenzene	mg/kg	<1	<1	<1

VOCs in soil				
Our Reference		279939-3	279939-9	279939-10
Your Reference	UNITS	202	205	D1/JRK
Depth		0.2	0.5	-
Date Sampled		06/10/2021	06/10/2021	06/10/2021
Type of sample		Soil	Soil	Soil
Ethylbenzene	mg/kg	<1	<1	<1
bromoform	mg/kg	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2
styrene	mg/kg	<1	<1	<1
1,1,2,2-tetrachloroethane	mg/kg	<1	<1	<1
o-Xylene	mg/kg	<1	<1	<1
1,2,3-trichloropropane	mg/kg	<1	<1	<1
isopropylbenzene	mg/kg	<1	<1	<1
bromobenzene	mg/kg	<1	<1	<1
n-propyl benzene	mg/kg	<1	<1	<1
2-chlorotoluene	mg/kg	<1	<1	<1
4-chlorotoluene	mg/kg	<1	<1	<1
1,3,5-trimethyl benzene	mg/kg	<1	<1	<1
tert-butyl benzene	mg/kg	<1	<1	<1
1,2,4-trimethyl benzene	mg/kg	<1	<1	<1
1,3-dichlorobenzene	mg/kg	<1	<1	<1
sec-butyl benzene	mg/kg	<1	<1	<1
1,4-dichlorobenzene	mg/kg	<1	<1	<1
4-isopropyl toluene	mg/kg	<1	<1	<1
1,2-dichlorobenzene	mg/kg	<1	<1	<1
n-butyl benzene	mg/kg	<1	<1	<1
1,2-dibromo-3-chloropropane	mg/kg	<1	<1	<1
1,2,4-trichlorobenzene	mg/kg	<1	<1	<1
hexachlorobutadiene	mg/kg	<1	<1	<1
1,2,3-trichlorobenzene	mg/kg	<1	<1	<1
Surrogate Dibromofluorometha	%	99	99	99
Surrogate aaa-Trifluorotoluene	%	85	87	82
Surrogate Toluene-d_8	%	98	99	98
Surrogate 4-Bromofluorobenzene	%	105	105	102

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		279939-1	279939-2	279939-3	279939-4	279939-5
Your Reference	UNITS	201	201	202	202	203
Depth		0.5	2.0	0.2	3.5	0.5
Date Sampled		06/10/2021	06/10/2021	06/10/2021	06/10/2021	06/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	11/10/2021	11/10/2021	11/10/2021	11/10/2021	11/10/2021
Date analysed	-	12/10/2021	12/10/2021	12/10/2021	12/10/2021	12/10/2021
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<3	<3	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	88	81	85	87	85

vTRH(C6-C10)/BTEXN in Soil					
Our Reference		279939-6	279939-7	279939-9	279939-10
Your Reference	UNITS	204	204	205	D1/JRK
Depth		0.2	4.0	0.5	-
Date Sampled		06/10/2021	06/10/2021	06/10/2021	06/10/2021
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	11/10/2021	11/10/2021	11/10/2021	11/10/2021
Date analysed	-	12/10/2021	12/10/2021	12/10/2021	12/10/2021
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<3	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	94	87	87	82

svTRH (C10-C40) in Soil						
Our Reference		279939-1	279939-2	279939-3	279939-4	279939-5
Your Reference	UNITS	201	201	202	202	203
Depth		0.5	2.0	0.2	3.5	0.5
Date Sampled		06/10/2021	06/10/2021	06/10/2021	06/10/2021	06/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	11/10/2021	11/10/2021	11/10/2021	11/10/2021	11/10/2021
Date analysed	-	11/10/2021	11/10/2021	11/10/2021	11/10/2021	11/10/2021
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	260	<100	<100	130
TRH C_{29} - C_{36}	mg/kg	<100	100	<100	<100	120
Total +ve TRH (C10-C36)	mg/kg	<50	360	<50	<50	250
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	320	<100	<100	220
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	320	<50	<50	220
Surrogate o-Terphenyl	%	87	100	93	91	93

svTRH (C10-C40) in Soil					
Our Reference		279939-6	279939-7	279939-9	279939-10
Your Reference	UNITS	204	204	205	D1/JRK
Depth		0.2	4.0	0.5	-
Date Sampled		06/10/2021	06/10/2021	06/10/2021	06/10/2021
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	11/10/2021	11/10/2021	11/10/2021	11/10/2021
Date analysed	-	11/10/2021	11/10/2021	11/10/2021	11/10/2021
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50	<50
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50
Surrogate o-Terphenyl	%	92	92	89	89

PAHs in Soil						
Our Reference		279939-1	279939-2	279939-3	279939-4	279939-5
Your Reference	UNITS	201	201	202	202	203
Depth		0.5	2.0	0.2	3.5	0.5
Date Sampled		06/10/2021	06/10/2021	06/10/2021	06/10/2021	06/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	11/10/2021	11/10/2021	11/10/2021	11/10/2021	11/10/2021
Date analysed	-	12/10/2021	12/10/2021	12/10/2021	12/10/2021	12/10/2021
Naphthalene	mg/kg	<0.1	0.1	<0.1	<0.1	0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.2
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.4	0.9	0.2	<0.1	4.2
Anthracene	mg/kg	<0.1	0.1	<0.1	<0.1	1.2
Fluoranthene	mg/kg	0.1	0.5	0.8	<0.1	13
Pyrene	mg/kg	0.1	0.5	0.8	<0.1	14
Benzo(a)anthracene	mg/kg	0.1	0.9	0.4	<0.1	6.2
Chrysene	mg/kg	<0.1	0.4	0.3	<0.1	3.8
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	0.6	0.5	<0.2	15
Benzo(a)pyrene	mg/kg	<0.05	0.3	0.4	<0.05	4.2
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	0.1	0.2	<0.1	2.5
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.6
Benzo(g,h,i)perylene	mg/kg	<0.1	0.2	0.3	<0.1	3.8
Total +ve PAH's	mg/kg	0.72	4.7	3.8	<0.05	69
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	7.2
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	0.5	0.5	<0.5	7.2
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	0.6	0.6	<0.5	7.2
Surrogate p-Terphenyl-d14	%	109	105	116	124	109

PAHs in Soil					
Our Reference		279939-6	279939-7	279939-9	279939-10
Your Reference	UNITS	204	204	205	D1/JRK
Depth		0.2	4.0	0.5	-
Date Sampled		06/10/2021	06/10/2021	06/10/2021	06/10/2021
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	11/10/2021	11/10/2021	11/10/2021	11/10/2021
Date analysed	-	12/10/2021	12/10/2021	12/10/2021	12/10/2021
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	0.4
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	1.2
Pyrene	mg/kg	<0.1	<0.1	<0.1	1.2
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	0.7
Chrysene	mg/kg	<0.1	<0.1	<0.1	0.4
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	0.8
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	0.5
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	0.3
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	0.4
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	5.8
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	0.7
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	0.7
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	0.8
Surrogate p-Terphenyl-d14	%	130	118	115	109

Organochlorine Pesticides in soil						
Our Reference		279939-1	279939-2	279939-3	279939-5	279939-6
Your Reference	UNITS	201	201	202	203	204
Depth		0.5	2.0	0.2	0.5	0.2
Date Sampled		06/10/2021	06/10/2021	06/10/2021	06/10/2021	06/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	11/10/2021	11/10/2021	11/10/2021	11/10/2021	11/10/2021
Date analysed	-	12/10/2021	12/10/2021	12/10/2021	12/10/2021	12/10/2021
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	103	96	110	103	112

Organochlorine Pesticides in soil			
Our Reference		279939-9	279939-10
Your Reference	UNITS	205	D1/JRK
Depth		0.5	-
Date Sampled		06/10/2021	06/10/2021
Type of sample		Soil	Soil
Date extracted	-	11/10/2021	11/10/2021
Date analysed	-	12/10/2021	12/10/2021
alpha-BHC	mg/kg	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1
Surrogate TCMX	%	105	107

Organophosphorus Pesticides in Soil						
Our Reference		279939-1	279939-2	279939-3	279939-5	279939-6
Your Reference	UNITS	201	201	202	203	204
Depth		0.5	2.0	0.2	0.5	0.2
Date Sampled		06/10/2021	06/10/2021	06/10/2021	06/10/2021	06/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	11/10/2021	11/10/2021	11/10/2021	11/10/2021	11/10/2021
Date analysed	-	12/10/2021	12/10/2021	12/10/2021	12/10/2021	12/10/2021
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	103	96	110	103	112

Organophosphorus Pesticides in Soil			
Our Reference		279939-9	279939-10
Your Reference	UNITS	205	D1/JRK
Depth		0.5	-
Date Sampled		06/10/2021	06/10/2021
Type of sample		Soil	Soil
Date extracted	-	11/10/2021	11/10/2021
Date analysed	-	12/10/2021	12/10/2021
Dichlorvos	mg/kg	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1
Surrogate TCMX	%	105	107

PCBs in Soil						
Our Reference		279939-1	279939-2	279939-3	279939-5	279939-6
Your Reference	UNITS	201	201	202	203	204
Depth		0.5	2.0	0.2	0.5	0.2
Date Sampled		06/10/2021	06/10/2021	06/10/2021	06/10/2021	06/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	11/10/2021	11/10/2021	11/10/2021	11/10/2021	11/10/2021
Date analysed	-	12/10/2021	12/10/2021	12/10/2021	12/10/2021	12/10/2021
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	103	96	110	103	112

PCBs in Soil			
Our Reference		279939-9	279939-10
Your Reference	UNITS	205	D1/JRK
Depth		0.5	-
Date Sampled		06/10/2021	06/10/2021
Type of sample		Soil	Soil
Date extracted	-	11/10/2021	11/10/2021
Date analysed	-	12/10/2021	12/10/2021
Aroclor 1016	mg/kg	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1
Surrogate TCMX	%	105	107

Acid Extractable metals in soil						
Our Reference		279939-1	279939-2	279939-3	279939-4	279939-5
Your Reference	UNITS	201	201	202	202	203
Depth		0.5	2.0	0.2	3.5	0.5
Date Sampled		06/10/2021	06/10/2021	06/10/2021	06/10/2021	06/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	13/10/2021	13/10/2021	13/10/2021	13/10/2021	13/10/2021
Date analysed	-	13/10/2021	13/10/2021	13/10/2021	13/10/2021	13/10/2021
Arsenic	mg/kg	4	<4	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	0.4
Chromium	mg/kg	7	7	6	2	14
Copper	mg/kg	9	58	26	<1	93
Lead	mg/kg	10	170	63	1	470
Mercury	mg/kg	<0.1	0.4	<0.1	<0.1	0.2
Nickel	mg/kg	4	14	16	1	15
Zinc	mg/kg	45	130	57	2	230
Boron	mg/kg	<3	6	20	<3	5
Barium	mg/kg	110	93	130	2	100
Beryllium	mg/kg	1	<1	<1	<1	<1
Cobalt	mg/kg	3	9	4	<1	6
Manganese	mg/kg	550	110	1,600	4	360
Molybdenum	mg/kg	<1	<1	<1	<1	<1
Antimony	mg/kg	<7	<7	<7	<7	<7
Selenium	mg/kg	<2	<2	<4	<2	<2
Tin	mg/kg	<1	17	2	<1	12

Acid Extractable metals in soil						
Our Reference		279939-6	279939-7	279939-9	279939-10	279939-26
Your Reference	UNITS	204	204	205	D1/JRK	202 - [TRIPLICATE]
Depth		0.2	4.0	0.5	-	0.2
Date Sampled		06/10/2021	06/10/2021	06/10/2021	06/10/2021	06/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	13/10/2021	13/10/2021	13/10/2021	13/10/2021	13/10/2021
Date analysed	-	13/10/2021	13/10/2021	13/10/2021	13/10/2021	13/10/2021
Arsenic	mg/kg	6	4	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	5	2	2	6	4
Copper	mg/kg	7	<1	7	37	21
Lead	mg/kg	9	1	14	85	51
Mercury	mg/kg	<0.1	<0.1	<0.1	0.1	<0.1
Nickel	mg/kg	4	2	1	21	15
Zinc	mg/kg	17	3	18	82	46
Boron	mg/kg	<3	<3	<3	30	20
Barium	mg/kg	26	3	12	130	110
Beryllium	mg/kg	<1	<1	<1	<1	<1
Cobalt	mg/kg	3	2	9	4	3
Manganese	mg/kg	280	8	56	240	470
Molybdenum	mg/kg	<1	<1	<1	1	<1
Antimony	mg/kg	<7	<7	<7	<7	<7
Selenium	mg/kg	<2	<2	<2	<2	<2
Tin	mg/kg	1	<1	<1	4	2

Moisture						
Our Reference		279939-1	279939-2	279939-3	279939-4	279939-5
Your Reference	UNITS	201	201	202	202	203
Depth		0.5	2.0	0.2	3.5	0.5
Date Sampled		06/10/2021	06/10/2021	06/10/2021	06/10/2021	06/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	11/10/2021	11/10/2021	11/10/2021	11/10/2021	11/10/2021
Date analysed	-	12/10/2021	12/10/2021	12/10/2021	12/10/2021	12/10/2021
Moisture	%	8.1	18	17	15	13

Moisture					
Our Reference		279939-6	279939-7	279939-9	279939-10
Your Reference	UNITS	204	204	205	D1/JRK
Depth		0.2	4.0	0.5	-
Date Sampled		06/10/2021	06/10/2021	06/10/2021	06/10/2021
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	11/10/2021	11/10/2021	11/10/2021	11/10/2021
Date analysed	-	12/10/2021	12/10/2021	12/10/2021	12/10/2021
Moisture	%	7.5	16	11	19

Asbestos ID - soils NEPM			
Our Reference		279939-8	279939-9
Your Reference	UNITS	205	205
Depth		0.2	0.5
Date Sampled		06/10/2021	06/10/2021
Type of sample		Soil	Soil
Date analysed	-	13/10/2021	13/10/2021
Sample mass tested	g	776.54	720.26
Sample Description	-	Brown coarse-grained soil & rocks	Brown fine-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected
Total Asbestos[#1]	g/kg	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	–	–
FA and AF Estimation*	g	–	–
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001

sPOCAS field test						
Our Reference		279939-16	279939-17	279939-18	279939-19	279939-20
Your Reference	UNITS	201	201	202	202	203
Depth		3.5	4.5	1.5	2.5	4
Date Sampled		06/10/2021	06/10/2021	06/10/2021	06/10/2021	06/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	11/10/2021	11/10/2021	11/10/2021	11/10/2021	11/10/2021
Date analysed	-	11/10/2021	11/10/2021	11/10/2021	11/10/2021	11/10/2021
pH_F (field pH test)*	pH Units	4.0	5.8	5.4	5.8	5.8
pH_{FOX} (field peroxide test)*	pH Units	2.7	5.5	5.0	5.0	4.3
Reaction Rate*	-	Low reaction	Low reaction	Low reaction	Low reaction	Low reaction

sPOCAS field test						
Our Reference		279939-21	279939-22	279939-23	279939-24	279939-25
Your Reference	UNITS	203	204	204	205	205
Depth		5	2	3.1	1.5	2.5
Date Sampled		06/10/2021	06/10/2021	06/10/2021	06/10/2021	06/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	11/10/2021	11/10/2021	11/10/2021	11/10/2021	11/10/2021
Date analysed	-	11/10/2021	11/10/2021	11/10/2021	11/10/2021	11/10/2021
pH_F (field pH test)*	pH Units	5.4	7.0	4.7	6.5	4.5
pH_{FOX} (field peroxide test)*	pH Units	5.0	5.9	1.9	5.4	1.8
Reaction Rate*	-	Low reaction	Low reaction	Volcanic reaction	Low reaction	Volcanic reaction

VOCs in water				
Our Reference		279939-11	279939-12	279939-13
Your Reference	UNITS	GW1	GW3	R1
Depth		-	-	-
Date Sampled		07/10/2021	07/10/2021	07/10/2021
Type of sample		Water	Water	Water
Date extracted	-	11/10/2021	11/10/2021	11/10/2021
Date analysed	-	12/10/2021	12/10/2021	12/10/2021
Dichlorodifluoromethane	µg/L	<10	<10	<10
Chloromethane	µg/L	<10	<10	<10
Vinyl Chloride	µg/L	<10	<10	<10
Bromomethane	µg/L	<10	<10	<10
Chloroethane	µg/L	<10	<10	<10
Trichlorofluoromethane	µg/L	<10	<10	<10
1,1-Dichloroethene	µg/L	<1	<1	<1
Trans-1,2-dichloroethene	µg/L	<1	<1	<1
1,1-dichloroethane	µg/L	<1	<1	<1
Cis-1,2-dichloroethene	µg/L	<1	<1	<1
Bromochloromethane	µg/L	<1	<1	<1
Chloroform	µg/L	<1	<1	<1
2,2-dichloropropane	µg/L	<1	<1	<1
1,2-dichloroethane	µg/L	<1	<1	<1
1,1,1-trichloroethane	µg/L	<1	<1	<1
1,1-dichloropropene	µg/L	<1	<1	<1
Cyclohexane	µg/L	<1	<1	<1
Carbon tetrachloride	µg/L	<1	<1	<1
Benzene	µg/L	<1	<1	<1
Dibromomethane	µg/L	<1	<1	<1
1,2-dichloropropane	µg/L	<1	<1	<1
Trichloroethene	µg/L	<1	<1	<1
Bromodichloromethane	µg/L	<1	<1	<1
trans-1,3-dichloropropene	µg/L	<1	<1	<1
cis-1,3-dichloropropene	µg/L	<1	<1	<1
1,1,2-trichloroethane	µg/L	<1	<1	<1
Toluene	µg/L	<1	<1	<1
1,3-dichloropropane	µg/L	<1	<1	<1
Dibromochloromethane	µg/L	<1	<1	<1
1,2-dibromoethane	µg/L	<1	<1	<1
Tetrachloroethene	µg/L	<1	<1	<1
1,1,1,2-tetrachloroethane	µg/L	<1	<1	<1
Chlorobenzene	µg/L	<1	<1	<1

VOCs in water				
Our Reference		279939-11	279939-12	279939-13
Your Reference	UNITS	GW1	GW3	R1
Depth		-	-	-
Date Sampled		07/10/2021	07/10/2021	07/10/2021
Type of sample		Water	Water	Water
Ethylbenzene	µg/L	<1	<1	<1
Bromoform	µg/L	<1	<1	<1
m+p-xylene	µg/L	<2	<2	<2
Styrene	µg/L	<1	<1	<1
1,1,2,2-tetrachloroethane	µg/L	<1	<1	<1
o-xylene	µg/L	<1	<1	<1
1,2,3-trichloropropane	µg/L	<1	<1	<1
Isopropylbenzene	µg/L	<1	<1	<1
Bromobenzene	µg/L	<1	<1	<1
n-propyl benzene	µg/L	<1	<1	<1
2-chlorotoluene	µg/L	<1	<1	<1
4-chlorotoluene	µg/L	<1	<1	<1
1,3,5-trimethyl benzene	µg/L	<1	<1	<1
Tert-butyl benzene	µg/L	<1	<1	<1
1,2,4-trimethyl benzene	µg/L	<1	<1	<1
1,3-dichlorobenzene	µg/L	<1	<1	<1
Sec-butyl benzene	µg/L	<1	<1	<1
1,4-dichlorobenzene	µg/L	<1	<1	<1
4-isopropyl toluene	µg/L	<1	<1	<1
1,2-dichlorobenzene	µg/L	<1	<1	<1
n-butyl benzene	µg/L	<1	<1	<1
1,2-dibromo-3-chloropropane	µg/L	<1	<1	<1
1,2,4-trichlorobenzene	µg/L	<1	<1	<1
Hexachlorobutadiene	µg/L	<1	<1	<1
1,2,3-trichlorobenzene	µg/L	<1	<1	<1
Surrogate Dibromofluoromethane	%	108	108	107
Surrogate toluene-d8	%	95	96	95
Surrogate 4-BFB	%	87	87	86

BTEX in Water			
Our Reference		279939-14	279939-15
Your Reference	UNITS	TS	TB
Depth		-	-
Date Sampled		07/10/2021	07/10/2021
Type of sample		Water	Water
Date extracted	-	11/10/2021	11/10/2021
Date analysed	-	12/10/2021	12/10/2021
Benzene	µg/L	96%	<1
Toluene	µg/L	93%	<1
Ethylbenzene	µg/L	102%	<1
m+p-xylene	µg/L	99%	<2
o-xylene	µg/L	105%	<1
Surrogate Dibromofluoromethane	%	108	108
Surrogate toluene-d8	%	97	96
Surrogate 4-BFB	%	97	85

HM in water - dissolved				
Our Reference		279939-11	279939-12	279939-13
Your Reference	UNITS	GW1	GW3	R1
Depth		-	-	-
Date Sampled		07/10/2021	07/10/2021	07/10/2021
Type of sample		Water	Water	Water
Date prepared	-	13/10/2021	13/10/2021	13/10/2021
Date analysed	-	13/10/2021	13/10/2021	13/10/2021
Arsenic-Dissolved	µg/L	4	<1	<1
Cadmium-Dissolved	µg/L	<0.1	<0.1	<0.1
Chromium-Dissolved	µg/L	<1	<1	<1
Copper-Dissolved	µg/L	1	7	<1
Lead-Dissolved	µg/L	<1	<1	<1
Mercury-Dissolved	µg/L	<0.05	<0.05	<0.05
Nickel-Dissolved	µg/L	13	24	<1
Zinc-Dissolved	µg/L	17	45	5
Boron-Dissolved	µg/L	100	100	<20
Barium-Dissolved	µg/L	5	2	<1
Beryllium-Dissolved	µg/L	<0.5	<0.5	<0.5
Cobalt-Dissolved	µg/L	<1	<1	<1
Manganese-Dissolved	µg/L	<5	93	<5
Molybdenum-Dissolved	µg/L	2	1	<1
Antimony-Dissolved	µg/L	1	1	<1
Selenium-Dissolved	µg/L	<1	<1	<1
Tin-Dissolved	µg/L	<1	<1	<1

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
ASB-001	Asbestos ID - Identification of asbestos in soil samples using Polarised Light Microscopy and Dispersion Staining Techniques. Minimum 500mL soil sample was analysed as recommended by "National Environment Protection (Assessment of site contamination) Measure, Schedule B1 and "The Guidelines from the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia - May 2009" with a reporting limit of 0.1g/kg (0.01% w/w) as per Australian Standard AS4964-2004. Results reported denoted with * are outside our scope of NATA accreditation. **NOTE** #1 Total Asbestos g/kg was analysed and reported as per Australian Standard AS4964 (This is the sum of ACM >7mm, <7mm and FA/AF) **NOTE** #2 The screening level of 0.001% w/w asbestos in soil for FA and AF only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres. Estimation = Estimated asbestos weight Results reported with "--" is equivalent to no visible asbestos identified using Polarised Light microscopy and Dispersion Staining Techniques.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Inorg-063	pH- measured using pH meter and electrode. Soil is oxidised with Hydrogen Peroxide or extracted with water. Based on section H, Acid Sulfate Soils Laboratory Methods Guidelines, Version 2.1 - June 2004. To ensure accurate results these tests are recommended to be done in the field as pH may change with time thus these results may not be representative of true field conditions.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Metals-022	Determination of various metals by ICP-MS.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.

Method ID	Methodology Summary
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-022	Determination of VOCs sampled onto coconut shell charcoal sorbent tubes, that can be desorbed using carbon disulphide, and analysed by GC-MS.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.
Org-022/025	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-MS/GC-MSMS. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS and/or GC-MS/MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ PQL'values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero'values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL'values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-023	Water samples are analysed directly by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

QUALITY CONTROL: VOCs in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	279939-9
Date extracted	-			11/10/2021	3	11/10/2021	11/10/2021		11/10/2021	11/10/2021
Date analysed	-			12/10/2021	3	12/10/2021	12/10/2021		12/10/2021	12/10/2021
Dichlorodifluoromethane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Chloromethane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Vinyl Chloride	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Bromomethane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Chloroethane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Trichlorofluoromethane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,1-Dichloroethene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
trans-1,2-dichloroethene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,1-dichloroethane	mg/kg	1	Org-023	<1	3	<1	<1	0	89	80
cis-1,2-dichloroethene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
bromochloromethane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
chloroform	mg/kg	1	Org-023	<1	3	<1	<1	0	91	79
2,2-dichloropropane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,2-dichloroethane	mg/kg	1	Org-023	<1	3	<1	<1	0	84	78
1,1,1-trichloroethane	mg/kg	1	Org-023	<1	3	<1	<1	0	83	75
1,1-dichloropropene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Cyclohexane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
carbon tetrachloride	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-023	<0.2	3	<0.2	<0.2	0	[NT]	[NT]
dibromomethane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,2-dichloropropane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
trichloroethene	mg/kg	1	Org-023	<1	3	<1	<1	0	78	72
bromodichloromethane	mg/kg	1	Org-023	<1	3	<1	<1	0	91	84
trans-1,3-dichloropropene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
cis-1,3-dichloropropene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,1,2-trichloroethane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-023	<0.5	3	<0.5	<0.5	0	[NT]	[NT]
1,3-dichloropropane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
dibromochloromethane	mg/kg	1	Org-023	<1	3	<1	<1	0	88	81
1,2-dibromoethane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
tetrachloroethene	mg/kg	1	Org-023	<1	3	<1	<1	0	87	79
1,1,1,2-tetrachloroethane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
chlorobenzene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
bromoform	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-023	<2	3	<2	<2	0	[NT]	[NT]
styrene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,1,2,2-tetrachloroethane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]

QUALITY CONTROL: VOCs in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	279939-9
o-Xylene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,2,3-trichloropropane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
isopropylbenzene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
bromobenzene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
n-propyl benzene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
2-chlorotoluene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
4-chlorotoluene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,3,5-trimethyl benzene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
tert-butyl benzene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,2,4-trimethyl benzene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,3-dichlorobenzene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
sec-butyl benzene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,4-dichlorobenzene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
4-isopropyl toluene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,2-dichlorobenzene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
n-butyl benzene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,2-dibromo-3-chloropropane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,2,4-trichlorobenzene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
hexachlorobutadiene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,2,3-trichlorobenzene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluorometha	%		Org-023	99	3	99	98	1	100	99
Surrogate aaa-Trifluorotoluene	%		Org-023	102	3	85	79	7	97	87
Surrogate Toluene-d_8	%		Org-023	99	3	98	98	0	99	98
Surrogate 4-Bromofluorobenzene	%		Org-023	105	3	105	103	2	103	107

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	279939-9
Date extracted	-			11/10/2021	3	11/10/2021	11/10/2021		11/10/2021	11/10/2021
Date analysed	-			12/10/2021	3	12/10/2021	12/10/2021		12/10/2021	12/10/2021
TRH C_6 - C_9	mg/kg	25	Org-023	<25	3	<25	<25	0	100	94
TRH C_6 - C_{10}	mg/kg	25	Org-023	<25	3	<25	<25	0	100	94
Benzene	mg/kg	0.2	Org-023	<0.2	3	<0.2	<0.2	0	89	81
Toluene	mg/kg	0.5	Org-023	<0.5	3	<0.5	<0.5	0	90	83
Ethylbenzene	mg/kg	1	Org-023	<1	3	<1	<1	0	108	102
m+p-xylene	mg/kg	2	Org-023	<2	3	<2	<2	0	107	102
o-Xylene	mg/kg	1	Org-023	<1	3	<1	<1	0	105	98
naphthalene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	102	3	85	79	7	97	87

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	279939-9
Date extracted	-			11/10/2021	3	11/10/2021	11/10/2021		11/10/2021	11/10/2021
Date analysed	-			11/10/2021	3	11/10/2021	11/10/2021		11/10/2021	11/10/2021
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	3	<50	<50	0	97	99
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	3	<100	<100	0	86	97
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	3	<100	<100	0	79	88
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	3	<50	<50	0	97	99
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	3	<100	<100	0	86	97
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	3	<100	<100	0	79	88
Surrogate o-Terphenyl	%		Org-020	94	3	93	91	2	113	124

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	279939-9
Date extracted	-			11/10/2021	3	11/10/2021	11/10/2021		11/10/2021	11/10/2021
Date analysed	-			12/10/2021	3	12/10/2021	12/10/2021		12/10/2021	12/10/2021
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	118	113
Acenaphthylene	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	107	97
Fluorene	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	111	93
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	3	0.2	0.2	0	133	124
Anthracene	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	<0.1	3	0.8	0.9	12	112	114
Pyrene	mg/kg	0.1	Org-022/025	<0.1	3	0.8	0.9	12	123	117
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	<0.1	3	0.4	0.5	22	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	<0.1	3	0.3	0.4	29	91	83
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	<0.2	3	0.5	0.6	18	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	<0.05	3	0.4	0.4	0	128	122
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	<0.1	3	0.2	0.2	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	<0.1	3	0.3	0.3	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	130	3	116	109	6	120	91

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	279939-9
Date extracted	-			11/10/2021	3	11/10/2021	11/10/2021		11/10/2021	11/10/2021
Date analysed	-			12/10/2021	3	12/10/2021	12/10/2021		12/10/2021	12/10/2021
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	120	114
HCB	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	117	106
gamma-BHC	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	109	107
delta-BHC	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	124	120
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	122	110
gamma-Chlordane	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	121	115
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	130	118
Endrin	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	74	109
Endosulfan II	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	112	104
Endrin Aldehyde	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	100	70
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	103	3	110	112	2	116	87

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	279939-9
Date extracted	-			11/10/2021	3	11/10/2021	11/10/2021		11/10/2021	11/10/2021
Date analysed	-			12/10/2021	3	12/10/2021	12/10/2021		12/10/2021	12/10/2021
Dichlorvos	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	89	77
Dimethoate	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	124	114
Fenitrothion	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	97	83
Malathion	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	120	114
Chlorpyriphos	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	128	122
Parathion	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	97	87
Bromophos-ethyl	mg/kg	0.1	Org-022	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	92	86
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	103	3	110	112	2	116	87

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	279939-9
Date extracted	-			11/10/2021	3	11/10/2021	11/10/2021		11/10/2021	11/10/2021
Date analysed	-			12/10/2021	3	12/10/2021	12/10/2021		12/10/2021	12/10/2021
Aroclor 1016	mg/kg	0.1	Org-021	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	<0.1	3	<0.1	<0.1	0	120	120
Aroclor 1260	mg/kg	0.1	Org-021	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	103	3	110	112	2	116	87

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	279939-9
Date prepared	-			13/10/2021	3	13/10/2021	13/10/2021		13/10/2021	13/10/2021
Date analysed	-			13/10/2021	3	13/10/2021	13/10/2021		13/10/2021	13/10/2021
Arsenic	mg/kg	4	Metals-020	<4	3	<4	<4	0	100	100
Cadmium	mg/kg	0.4	Metals-020	<0.4	3	<0.4	<0.4	0	96	93
Chromium	mg/kg	1	Metals-020	<1	3	6	10	50	97	98
Copper	mg/kg	1	Metals-020	<1	3	26	22	17	99	118
Lead	mg/kg	1	Metals-020	<1	3	63	52	19	98	81
Mercury	mg/kg	0.1	Metals-021	<0.1	3	<0.1	<0.1	0	94	115
Nickel	mg/kg	1	Metals-020	<1	3	16	15	6	100	100
Zinc	mg/kg	1	Metals-020	<1	3	57	54	5	97	75
Boron	mg/kg	3	Metals-020	<3	3	20	31	43	99	97
Barium	mg/kg	1	Metals-020	<1	3	130	130	0	104	103
Beryllium	mg/kg	1	Metals-020	<1	3	<1	<1	0	101	101
Cobalt	mg/kg	1	Metals-020	<1	3	4	3	29	98	125
Manganese	mg/kg	1	Metals-020	<1	3	1600	1600	0	99	#
Molybdenum	mg/kg	1	Metals-020	<1	3	<1	3	100	95	99
Antimony	mg/kg	7	Metals-020	<7	3	<7	<7	0	91	93
Selenium	mg/kg	2	Metals-020	<2	3	<4	<4	0	96	95
Tin	mg/kg	1	Metals-020	<1	3	2	2	0	93	96

QUALITY CONTROL: sPOCAS field test						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	[NT]
Date prepared	-			11/10/2021	16	11/10/2021	11/10/2021		11/10/2021	[NT]
Date analysed	-			11/10/2021	16	11/10/2021	11/10/2021		11/10/2021	[NT]
pH_F (field pH test)*	pH Units		Inorg-063	[NT]	16	4.0	3.9	3	100	[NT]
pH_{FOX} (field peroxide test)*	pH Units		Inorg-063	[NT]	16	2.7	2.7	0	100	[NT]

QUALITY CONTROL: VOCs in water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
Date extracted	-			11/10/2021	11	11/10/2021	12/10/2021		11/10/2021	[NT]
Date analysed	-			12/10/2021	11	12/10/2021	13/10/2021		12/10/2021	[NT]
Dichlorodifluoromethane	µg/L	10	Org-023	<10	11	<10	<10	0	[NT]	[NT]
Chloromethane	µg/L	10	Org-023	<10	11	<10	<10	0	[NT]	[NT]
Vinyl Chloride	µg/L	10	Org-023	<10	11	<10	<10	0	[NT]	[NT]
Bromomethane	µg/L	10	Org-023	<10	11	<10	<10	0	[NT]	[NT]
Chloroethane	µg/L	10	Org-023	<10	11	<10	<10	0	[NT]	[NT]
Trichlorofluoromethane	µg/L	10	Org-023	<10	11	<10	<10	0	[NT]	[NT]
1,1-Dichloroethene	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
Trans-1,2-dichloroethene	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
1,1-dichloroethane	µg/L	1	Org-023	<1	11	<1	<1	0	109	[NT]
Cis-1,2-dichloroethene	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
Bromochloromethane	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
Chloroform	µg/L	1	Org-023	<1	11	<1	<1	0	113	[NT]
2,2-dichloropropane	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
1,2-dichloroethane	µg/L	1	Org-023	<1	11	<1	<1	0	112	[NT]
1,1,1-trichloroethane	µg/L	1	Org-023	<1	11	<1	<1	0	101	[NT]
1,1-dichloropropene	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
Cyclohexane	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
Carbon tetrachloride	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
Benzene	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
Dibromomethane	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
1,2-dichloropropane	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
Trichloroethene	µg/L	1	Org-023	<1	11	<1	<1	0	125	[NT]
Bromodichloromethane	µg/L	1	Org-023	<1	11	<1	<1	0	106	[NT]
trans-1,3-dichloropropene	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
cis-1,3-dichloropropene	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
1,1,2-trichloroethane	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
Toluene	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
1,3-dichloropropane	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
Dibromochloromethane	µg/L	1	Org-023	<1	11	<1	<1	0	98	[NT]
1,2-dibromoethane	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
Tetrachloroethene	µg/L	1	Org-023	<1	11	<1	<1	0	95	[NT]
1,1,1,2-tetrachloroethane	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
Chlorobenzene	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
Bromoform	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
m+p-xylene	µg/L	2	Org-023	<2	11	<2	<2	0	[NT]	[NT]
Styrene	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
1,1,2,2-tetrachloroethane	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]

QUALITY CONTROL: VOCs in water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
o-xylene	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
1,2,3-trichloropropane	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
Isopropylbenzene	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
Bromobenzene	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
n-propyl benzene	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
2-chlorotoluene	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
4-chlorotoluene	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
1,3,5-trimethyl benzene	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
Tert-butyl benzene	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
1,2,4-trimethyl benzene	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
1,3-dichlorobenzene	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
Sec-butyl benzene	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
1,4-dichlorobenzene	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
4-isopropyl toluene	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
1,2-dichlorobenzene	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
n-butyl benzene	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
1,2-dibromo-3-chloropropane	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
1,2,4-trichlorobenzene	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
Hexachlorobutadiene	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
1,2,3-trichlorobenzene	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	110	11	108	109	1	108	[NT]
Surrogate toluene-d8	%		Org-023	98	11	95	70	30	95	[NT]
Surrogate 4-BFB	%		Org-023	85	11	87	96	10	108	[NT]

QUALITY CONTROL: BTEX in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
Date extracted	-			11/10/2021	[NT]	[NT]	[NT]	[NT]	11/10/2021	[NT]
Date analysed	-			12/10/2021	[NT]	[NT]	[NT]	[NT]	12/10/2021	[NT]
Benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	113	[NT]
Toluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	111	[NT]
m+p-xylene	µg/L	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	120	[NT]
o-xylene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	116	[NT]
Surrogate Dibromofluoromethane	%		Org-023	110	[NT]	[NT]	[NT]	[NT]	108	[NT]
Surrogate toluene-d8	%		Org-023	98	[NT]	[NT]	[NT]	[NT]	95	[NT]
Surrogate 4-BFB	%		Org-023	85	[NT]	[NT]	[NT]	[NT]	108	[NT]

QUALITY CONTROL: HM in water - dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date prepared	-			13/10/2021	[NT]	[NT]	[NT]	[NT]	13/10/2021	[NT]
Date analysed	-			13/10/2021	[NT]	[NT]	[NT]	[NT]	13/10/2021	[NT]
Arsenic-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Cadmium-Dissolved	µg/L	0.1	Metals-022	<0.1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Chromium-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Copper-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Lead-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Mercury-Dissolved	µg/L	0.05	Metals-021	<0.05	[NT]	[NT]	[NT]	[NT]	105	[NT]
Nickel-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Zinc-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Boron-Dissolved	µg/L	20	Metals-022	<20	[NT]	[NT]	[NT]	[NT]	96	[NT]
Barium-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Beryllium-Dissolved	µg/L	0.5	Metals-022	<0.5	[NT]	[NT]	[NT]	[NT]	97	[NT]
Cobalt-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Manganese-Dissolved	µg/L	5	Metals-022	<5	[NT]	[NT]	[NT]	[NT]	102	[NT]
Molybdenum-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Antimony-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	90	[NT]
Selenium-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	97	[NT]
Tin-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	98	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Report Comments

Asbestos-ID in soil: NEPM
This report is consistent with the reporting recommendations in the National Environment Protection (Assessment of Site Contamination) Measure, Schedule B1, May 2013. This is reported outside our scope of NATA accreditation.

Acid Extractable Metals in Soil:
- The laboratory RPD acceptance criteria has been exceeded for 279939-3 for Cr. Therefore a triplicate result has been issued as laboratory sample number 279939-26.
- The PQL for Se has been raised due to interferences from analytes (other than those being tested) in sample 279939-3.
- # Percent recovery is not possible to report due to the inhomogeneous nature of the element/s in the sample/s. However an acceptable recovery was obtained for the LCS.

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CERTIFICATE OF ANALYSIS 279939-A

Client Details

Client	Douglas Partners Newcastle
Attention	Dana Wilson
Address	Box 324 Hunter Region Mail Centre, Newcastle, NSW, 2310

Sample Details

Your Reference	**102077.02, Newcastle**
Number of Samples	additional analysis
Date samples received	08/10/2021
Date completed instructions received	13/10/2021

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

Date results requested by	15/10/2021
Date of Issue	15/10/2021

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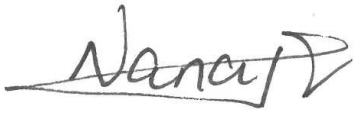
Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

Results Approved By
Dragana Tomas, Senior Chemist

Authorised By



Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Water				
Our Reference		279939-A-11	279939-A-12	279939-A-13
Your Reference	UNITS	GW1	GW3	R1
Depth		-	-	-
Date Sampled		07/10/2021	07/10/2021	07/10/2021
Type of sample		Water	Water	Water
Date extracted	-	11/10/2021	11/10/2021	11/10/2021
Date analysed	-	12/10/2021	12/10/2021	12/10/2021
TRH C_6 - C_9	µg/L	<10	<10	<10
TRH C_6 - C_{10}	µg/L	<10	<10	<10
TRH C_6 - C_{10} less BTEX (F1)	µg/L	<10	<10	<10
Benzene	µg/L	<1	<1	<1
Toluene	µg/L	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	<1
m+p-xylene	µg/L	<2	<2	<2
o-xylene	µg/L	<1	<1	<1
Naphthalene	µg/L	<1	<1	<1
Surrogate Dibromofluoromethane	%	108	108	107
Surrogate toluene-d8	%	95	96	95
Surrogate 4-BFB	%	87	87	86

svTRH (C10-C40) in Water				
Our Reference		279939-A-11	279939-A-12	279939-A-13
Your Reference	UNITS	GW1	GW3	R1
Depth		-	-	-
Date Sampled		07/10/2021	07/10/2021	07/10/2021
Type of sample		Water	Water	Water
Date extracted	-	14/10/2021	14/10/2021	14/10/2021
Date analysed	-	14/10/2021	14/10/2021	14/10/2021
TRH C_{10} - C_{14}	µg/L	<50	<50	<50
TRH C_{15} - C_{28}	µg/L	<100	<100	<100
TRH C_{29} - C_{36}	µg/L	<100	<100	<100
Total +ve TRH (C10-C36)	µg/L	<50	<50	<50
TRH >C_{10} - C_{16}	µg/L	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	µg/L	<50	<50	<50
TRH >C_{16} - C_{34}	µg/L	<100	<100	<100
TRH >C_{34} - C_{40}	µg/L	<100	<100	<100
Total +ve TRH (>C10-C40)	µg/L	<50	<50	<50
Surrogate o-Terphenyl	%	94	80	81

PAHs in Water - Low Level				
Our Reference	UNITS	279939-A-11	279939-A-12	279939-A-13
Your Reference		GW1	GW3	R1
Depth		-	-	-
Date Sampled		07/10/2021	07/10/2021	07/10/2021
Type of sample		Water	Water	Water
Date extracted	-	14/10/2021	14/10/2021	14/10/2021
Date analysed	-	14/10/2021	14/10/2021	14/10/2021
Naphthalene	µg/L	<0.2	<0.2	<0.2
Acenaphthylene	µg/L	<0.1	<0.1	<0.1
Acenaphthene	µg/L	<0.1	<0.1	<0.1
Fluorene	µg/L	<0.1	<0.1	<0.1
Phenanthrene	µg/L	<0.1	<0.1	<0.1
Anthracene	µg/L	<0.1	<0.1	<0.1
Fluoranthene	µg/L	<0.1	<0.1	<0.1
Pyrene	µg/L	<0.1	<0.1	<0.1
Benzo(a)anthracene	µg/L	<0.1	<0.1	<0.1
Chrysene	µg/L	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	µg/L	<0.2	<0.2	<0.2
Benzo(a)pyrene	µg/L	<0.1	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	µg/L	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	µg/L	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ	µg/L	<0.5	<0.5	<0.5
Total +ve PAH's	µg/L	<0.1	<0.1	<0.1
Surrogate p-Terphenyl-d14	%	79	77	79

Method ID	Methodology Summary
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Org-023	Water samples are analysed directly by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			11/10/2021	11	11/10/2021	12/10/2021		11/10/2021	[NT]
Date analysed	-			12/10/2021	11	12/10/2021	13/10/2021		12/10/2021	[NT]
TRH C_6 - C_9	µg/L	10	Org-023	<10	11	<10	<10	0	114	[NT]
TRH C_6 - C_{10}	µg/L	10	Org-023	<10	11	<10	<10	0	114	[NT]
Benzene	µg/L	1	Org-023	<1	11	<1	<1	0	113	[NT]
Toluene	µg/L	1	Org-023	<1	11	<1	<1	0	104	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	11	<1	<1	0	111	[NT]
m+p-xylene	µg/L	2	Org-023	<2	11	<2	<2	0	120	[NT]
o-xylene	µg/L	1	Org-023	<1	11	<1	<1	0	116	[NT]
Naphthalene	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	110	11	108	109	1	108	[NT]
Surrogate toluene-d8	%		Org-023	98	11	95	70	30	95	[NT]
Surrogate 4-BFB	%		Org-023	85	11	87	96	10	108	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			14/10/2021	11	14/10/2021	14/10/2021		14/10/2021	[NT]
Date analysed	-			14/10/2021	11	14/10/2021	14/10/2021		14/10/2021	[NT]
TRH C_{10} - C_{14}	µg/L	50	Org-020	<50	11	<50	<50	0	99	[NT]
TRH C_{15} - C_{28}	µg/L	100	Org-020	<100	11	<100	<100	0	93	[NT]
TRH C_{29} - C_{36}	µg/L	100	Org-020	<100	11	<100	<100	0	91	[NT]
TRH >C_{10} - C_{16}	µg/L	50	Org-020	<50	11	<50	<50	0	99	[NT]
TRH >C_{16} - C_{34}	µg/L	100	Org-020	<100	11	<100	<100	0	93	[NT]
TRH >C_{34} - C_{40}	µg/L	100	Org-020	<100	11	<100	<100	0	91	[NT]
Surrogate o-Terphenyl	%		Org-020	81	11	94	80	16	83	[NT]

QUALITY CONTROL: PAHs in Water - Low Level						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			14/10/2021	11	14/10/2021	14/10/2021		14/10/2021	[NT]
Date analysed	-			14/10/2021	11	14/10/2021	14/10/2021		14/10/2021	[NT]
Naphthalene	µg/L	0.2	Org-022/025	<0.2	11	<0.2	<0.2	0	83	[NT]
Acenaphthylene	µg/L	0.1	Org-022/025	<0.1	11	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	µg/L	0.1	Org-022/025	<0.1	11	<0.1	<0.1	0	73	[NT]
Fluorene	µg/L	0.1	Org-022/025	<0.1	11	<0.1	<0.1	0	82	[NT]
Phenanthrene	µg/L	0.1	Org-022/025	<0.1	11	<0.1	<0.1	0	104	[NT]
Anthracene	µg/L	0.1	Org-022/025	<0.1	11	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	µg/L	0.1	Org-022/025	<0.1	11	<0.1	<0.1	0	74	[NT]
Pyrene	µg/L	0.1	Org-022/025	<0.1	11	<0.1	<0.1	0	75	[NT]
Benzo(a)anthracene	µg/L	0.1	Org-022/025	<0.1	11	<0.1	<0.1	0	[NT]	[NT]
Chrysene	µg/L	0.1	Org-022/025	<0.1	11	<0.1	<0.1	0	64	[NT]
Benzo(b,j+k)fluoranthene	µg/L	0.2	Org-022/025	<0.2	11	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	µg/L	0.1	Org-022/025	<0.1	11	<0.1	<0.1	0	96	[NT]
Indeno(1,2,3-c,d)pyrene	µg/L	0.1	Org-022/025	<0.1	11	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	0.1	Org-022/025	<0.1	11	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	0.1	Org-022/025	<0.1	11	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	78	11	79	77	3	80	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
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Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
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LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
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Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

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Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

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Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Envirolab Services Pty Ltd
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customerservice@envirolab.com.au
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INTERIM REPORT 279939-B

Client Details

Client	Douglas Partners Newcastle
Attention	Dana Wilson
Address	Box 324 Hunter Region Mail Centre, Newcastle, NSW, 2310

Sample Details

Your Reference	**102077.02, Newcastle**
Number of Samples	additional analysis
Date samples received	08/10/2021
Date completed instructions received	13/10/2021

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	18/10/2021
Interim Report Date	18/10/2021

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Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

Misc Inorg - Soil				
Our Reference		279939-B-1	279939-B-5	279939-B-6
Your Reference	UNITS	201	203	204
Depth		0.5	0.5	0.2
Date Sampled		06/10/2021	06/10/2021	06/10/2021
Type of sample		Soil	Soil	Soil
Date prepared	-	15/10/2021	15/10/2021	15/10/2021
Date analysed	-	15/10/2021	15/10/2021	15/10/2021
pH 1:5 soil:water	pH Units	8.3	8.1	8.7

CEC		
Our Reference		279939-B-5
Your Reference	UNITS	203
Depth		0.5
Date Sampled		06/10/2021
Type of sample		Soil
Date prepared	-	18/10/2021
Date analysed	-	18/10/2021
Exchangeable Ca	meq/100g	8.9
Exchangeable K	meq/100g	0.2
Exchangeable Mg	meq/100g	0.4
Exchangeable Na	meq/100g	<0.1
Cation Exchange Capacity	meq/100g	9.6

TCLP Preparation - Acid			
Our Reference		279939-B-2	279939-B-5
Your Reference	UNITS	201	203
Depth		2.0	0.5
Date Sampled		06/10/2021	06/10/2021
Type of sample		Soil	Soil
pH of soil for fluid# determ.	pH units	8.4	8.3
pH of soil TCLP (after HCl)	pH units	1.9	1.8
Extraction fluid used	-	1	1
pH of final Leachate	pH units	4.9	4.9

PAHs in TCLP (USEPA 1311)		
Our Reference		279939-B-5
Your Reference	UNITS	203
Depth		0.5
Date Sampled		06/10/2021
Type of sample		Soil
Date extracted	-	15/10/2021
Date analysed	-	15/10/2021
Naphthalene in TCLP	mg/L	<0.001
Acenaphthylene in TCLP	mg/L	<0.001
Acenaphthene in TCLP	mg/L	<0.001
Fluorene in TCLP	mg/L	<0.001
Phenanthrene in TCLP	mg/L	<0.001
Anthracene in TCLP	mg/L	<0.001
Fluoranthene in TCLP	mg/L	<0.001
Pyrene in TCLP	mg/L	<0.001
Benzo(a)anthracene in TCLP	mg/L	<0.001
Chrysene in TCLP	mg/L	<0.001
Benzo(bjk)fluoranthene in TCLP	mg/L	<0.002
Benzo(a)pyrene in TCLP	mg/L	<0.001
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	<0.001
Dibenzo(a,h)anthracene in TCLP	mg/L	<0.001
Benzo(g,h,i)perylene in TCLP	mg/L	<0.001
Total +ve PAH's	mg/L	NIL (+)VE
Surrogate p-Terphenyl-d14	%	96

Metals from Leaching Fluid pH 2.9 or 5			
Our Reference		279939-B-2	279939-B-5
Your Reference	UNITS	201	203
Depth		2.0	0.5
Date Sampled		06/10/2021	06/10/2021
Type of sample		Soil	Soil
Date extracted	-	18/10/2021	18/10/2021
Date analysed	-	18/10/2021	18/10/2021
Lead	mg/L	<0.03	0.2

Chromium Suite			
Our Reference		279939-B-23	279939-B-24
Your Reference	UNITS	204	205
Depth		3.1	1.5
Date Sampled		06/10/2021	06/10/2021
Type of sample		Soil	Soil
Date prepared	-		
Date analysed	-		
pH $_{kcl}$	pH units		
s-TAA pH 6.5	%w/w S		
TAA pH 6.5	moles H^+ /t		
Chromium Reducible Sulfur	%w/w		
a-Chromium Reducible Sulfur	moles H^+ /t		
S_{HCl}	%w/w S		
S_{KCl}	%w/w S		
S_{NAS}	%w/w S		
ANC_{BT}	% $CaCO_3$		
s-ANC_{BT}	%w/w S		
s-Net Acidity	%w/w S		
a-Net Acidity	moles H^+ /t		
Liming rate	kg $CaCO_3$ /t		
a-Net Acidity without ANCE	moles H^+ /t		
Liming rate without ANCE	kg $CaCO_3$ /t		
s-Net Acidity without ANCE	%w/w S		

Method ID	Methodology Summary
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
INORG-004	Toxicity Characteristic Leaching Procedure (TCLP) using Zero Headspace Extraction (zHE) using AS4439 and USEPA 1311.
Inorg-004	Toxicity Characteristic Leaching Procedure (TCLP) using AS 4439 and USEPA 1311. Please note that the mass used may be scaled down from default based on sample mass available. Samples are stored at 2-6oC before and after leachate preparation.
Inorg-068	Chromium Reducible Sulfur - Hydrogen Sulfide is quantified by iodometric titration after distillation to determine potential acidity.
Metals-020	Determination of various metals by ICP-AES following buffer determination as per USEPA 1311 and hence AS 4439.3. Extraction Fluid 1 refers to the pH 5.0 buffer and Extraction Fluid 2 is the pH 2.9 buffer.
Metals-020	Determination of exchangeable cations and cation exchange capacity in soils using 1M Ammonium Chloride exchange and ICP-AES analytical finish.
Org-022/025	Leachates are extracted with Dichloromethane and analysed by GC-MS/GC-MSMS.

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			15/10/2021	1	15/10/2021	15/10/2021		15/10/2021	[NT]
Date analysed	-			15/10/2021	1	15/10/2021	15/10/2021		15/10/2021	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	1	8.3	8.4	1	101	[NT]

QUALITY CONTROL: CEC						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			18/10/2021	[NT]	[NT]	[NT]	[NT]	18/10/2021	[NT]
Date analysed	-			18/10/2021	[NT]	[NT]	[NT]	[NT]	18/10/2021	[NT]
Exchangeable Ca	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	110	[NT]
Exchangeable K	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Exchangeable Mg	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Exchangeable Na	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	116	[NT]

QUALITY CONTROL: PAHs in TCLP (USEPA 1311)					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
Date extracted	-			15/10/2021	[NT]	[NT]	[NT]	[NT]	15/10/2021	[NT]
Date analysed	-			15/10/2021	[NT]	[NT]	[NT]	[NT]	15/10/2021	[NT]
Naphthalene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	102	[NT]
Acenaphthylene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	88	[NT]
Fluorene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	98	[NT]
Phenanthrene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	122	[NT]
Anthracene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	88	[NT]
Pyrene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	88	[NT]
Benzo(a)anthracene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	78	[NT]
Benzo(bjk)fluoranthene in TCLP	mg/L	0.002	Org-022/025	<0.002	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	88	[NT]
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	109	[NT]	[NT]	[NT]	[NT]	111	[NT]

QUALITY CONTROL: Metals from Leaching Fluid pH 2.9 or 5					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			18/10/2021	[NT]	[NT]	[NT]	[NT]	18/10/2021	[NT]
Date analysed	-			18/10/2021	[NT]	[NT]	[NT]	[NT]	18/10/2021	[NT]
Lead	mg/L	0.03	Metals-020	<0.03	[NT]	[NT]	[NT]	[NT]	97	[NT]

QUALITY CONTROL: Chromium Suite					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-				[NT]	[NT]	[NT]	[NT]		[NT]
Date analysed	-				[NT]	[NT]	[NT]	[NT]		[NT]
pH $_{kcl}$	pH units		Inorg-068		[NT]	[NT]	[NT]	[NT]		[NT]
s-TAA pH 6.5	%w/w S	0.01	Inorg-068		[NT]	[NT]	[NT]	[NT]		[NT]
TAA pH 6.5	moles H^+ /t	5	Inorg-068		[NT]	[NT]	[NT]	[NT]		[NT]
Chromium Reducible Sulfur	%w/w	0.005	Inorg-068		[NT]	[NT]	[NT]	[NT]		[NT]
a-Chromium Reducible Sulfur	moles H^+ /t	3	Inorg-068		[NT]	[NT]	[NT]	[NT]		[NT]
S_{HCl}	%w/w S	0.005	Inorg-068		[NT]	[NT]	[NT]	[NT]		[NT]
S_{KCl}	%w/w S	0.005	Inorg-068		[NT]	[NT]	[NT]	[NT]		[NT]
S_{NAS}	%w/w S	0.005	Inorg-068		[NT]	[NT]	[NT]	[NT]		[NT]
ANC_{BT}	% $CaCO_3$	0.05	Inorg-068		[NT]	[NT]	[NT]	[NT]		[NT]
s-ANC_{BT}	%w/w S	0.05	Inorg-068		[NT]	[NT]	[NT]	[NT]		[NT]
s-Net Acidity	%w/w S	0.005	Inorg-068		[NT]	[NT]	[NT]	[NT]		[NT]
a-Net Acidity	moles H^+ /t	5	Inorg-068		[NT]	[NT]	[NT]	[NT]		[NT]
Liming rate	kg $CaCO_3$ /t	0.75	Inorg-068		[NT]	[NT]	[NT]	[NT]		[NT]
a-Net Acidity without ANCE	moles H^+ /t	5	Inorg-068		[NT]	[NT]	[NT]	[NT]		[NT]
Liming rate without ANCE	kg $CaCO_3$ /t	0.75	Inorg-068		[NT]	[NT]	[NT]	[NT]		[NT]
s-Net Acidity without ANCE	%w/w S	0.005	Inorg-068		[NT]	[NT]	[NT]	[NT]		[NT]

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Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

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When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Report Comments

pH
Samples were out of the recommended holding time for this analysis.

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CERTIFICATE OF ANALYSIS 279939-B

Client Details

Client	Douglas Partners Newcastle
Attention	Dana Wilson
Address	Box 324 Hunter Region Mail Centre, Newcastle, NSW, 2310

Sample Details

Your Reference	**102077.02, Newcastle**
Number of Samples	additional analysis
Date samples received	08/10/2021
Date completed instructions received	13/10/2021

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	19/10/2021
Date of Issue	19/10/2021
Reissue Details	This report replaces R00 created on 19/10/2021 due to: revised report with Chromium Suite results amended.

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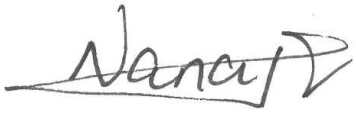
Results Approved By
Dragana Tomas, Senior Chemist
Hannah Nguyen, Metals Supervisor
Priya Samarawickrama, Senior Chemist

Authorised By



Nancy Zhang, Laboratory Manager

Misc Inorg - Soil				
Our Reference		279939-B-1	279939-B-5	279939-B-6
Your Reference	UNITS	201	203	204
Depth		0.5	0.5	0.2
Date Sampled		06/10/2021	06/10/2021	06/10/2021
Type of sample		Soil	Soil	Soil
Date prepared	-	15/10/2021	15/10/2021	15/10/2021
Date analysed	-	15/10/2021	15/10/2021	15/10/2021
pH 1:5 soil:water	pH Units	8.3	8.1	8.7

CEC		
Our Reference		279939-B-5
Your Reference	UNITS	203
Depth		0.5
Date Sampled		06/10/2021
Type of sample		Soil
Date prepared	-	18/10/2021
Date analysed	-	18/10/2021
Exchangeable Ca	meq/100g	8.9
Exchangeable K	meq/100g	0.2
Exchangeable Mg	meq/100g	0.4
Exchangeable Na	meq/100g	<0.1
Cation Exchange Capacity	meq/100g	9.6

TCLP Preparation - Acid			
Our Reference		279939-B-2	279939-B-5
Your Reference	UNITS	201	203
Depth		2.0	0.5
Date Sampled		06/10/2021	06/10/2021
Type of sample		Soil	Soil
pH of soil for fluid# determ.	pH units	8.4	8.3
pH of soil TCLP (after HCl)	pH units	1.9	1.8
Extraction fluid used	-	1	1
pH of final Leachate	pH units	4.9	4.9

PAHs in TCLP (USEPA 1311)		
Our Reference		279939-B-5
Your Reference	UNITS	203
Depth		0.5
Date Sampled		06/10/2021
Type of sample		Soil
Date extracted	-	15/10/2021
Date analysed	-	15/10/2021
Naphthalene in TCLP	mg/L	<0.001
Acenaphthylene in TCLP	mg/L	<0.001
Acenaphthene in TCLP	mg/L	<0.001
Fluorene in TCLP	mg/L	<0.001
Phenanthrene in TCLP	mg/L	<0.001
Anthracene in TCLP	mg/L	<0.001
Fluoranthene in TCLP	mg/L	<0.001
Pyrene in TCLP	mg/L	<0.001
Benzo(a)anthracene in TCLP	mg/L	<0.001
Chrysene in TCLP	mg/L	<0.001
Benzo(bjk)fluoranthene in TCLP	mg/L	<0.002
Benzo(a)pyrene in TCLP	mg/L	<0.001
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	<0.001
Dibenzo(a,h)anthracene in TCLP	mg/L	<0.001
Benzo(g,h,i)perylene in TCLP	mg/L	<0.001
Total +ve PAH's	mg/L	NIL (+)VE
Surrogate p-Terphenyl-d14	%	96

Metals from Leaching Fluid pH 2.9 or 5			
Our Reference		279939-B-2	279939-B-5
Your Reference	UNITS	201	203
Depth		2.0	0.5
Date Sampled		06/10/2021	06/10/2021
Type of sample		Soil	Soil
Date extracted	-	18/10/2021	18/10/2021
Date analysed	-	18/10/2021	18/10/2021
Lead	mg/L	<0.03	0.2

Chromium Suite			
Our Reference		279939-B-23	279939-B-24
Your Reference	UNITS	204	205
Depth		3.1	1.5
Date Sampled		06/10/2021	06/10/2021
Type of sample		Soil	Soil
Date prepared	-	15/10/2021	15/10/2021
Date analysed	-	15/10/2021	15/10/2021
pH $_{kcl}$	pH units	4.0	6.7
s-TAA pH 6.5	%w/w S	0.06	<0.01
TAA pH 6.5	moles H^+ /t	36	<5
Chromium Reducible Sulfur	%w/w	0.26	<0.005
a-Chromium Reducible Sulfur	moles H^+ /t	160	<3
S_{HCl}	%w/w S	0.10	[NT]
S_{KCl}	%w/w S	0.091	[NT]
S_{NAS}	%w/w S	0.010	[NT]
ANC_{BT}	% $CaCO_3$	[NT]	0.15
s-ANC_{BT}	%w/w S	[NT]	<0.05
s-Net Acidity	%w/w S	0.32	<0.005
a-Net Acidity	moles H^+ /t	200	<5
Liming rate	kg $CaCO_3$ /t	15	<0.75
a-Net Acidity without ANCE	moles H^+ /t	200	<5
Liming rate without ANCE	kg $CaCO_3$ /t	15	<0.75
s-Net Acidity without ANCE	%w/w S	0.32	<0.005

Method ID	Methodology Summary
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
INORG-004	Toxicity Characteristic Leaching Procedure (TCLP) using Zero Headspace Extraction (zHE) using AS4439 and USEPA 1311.
Inorg-004	Toxicity Characteristic Leaching Procedure (TCLP) using AS 4439 and USEPA 1311. Please note that the mass used may be scaled down from default based on sample mass available. Samples are stored at 2-6oC before and after leachate preparation.
Inorg-068	Chromium Reducible Sulfur - Hydrogen Sulfide is quantified by iodometric titration after distillation to determine potential acidity.
Metals-020	Determination of various metals by ICP-AES following buffer determination as per USEPA 1311 and hence AS 4439.3. Extraction Fluid 1 refers to the pH 5.0 buffer and Extraction Fluid 2 is the pH 2.9 buffer.
Metals-020	Determination of exchangeable cations and cation exchange capacity in soils using 1M Ammonium Chloride exchange and ICP-AES analytical finish.
Org-022/025	Leachates are extracted with Dichloromethane and analysed by GC-MS/GC-MSMS.

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			15/10/2021	1	15/10/2021	15/10/2021		15/10/2021	[NT]
Date analysed	-			15/10/2021	1	15/10/2021	15/10/2021		15/10/2021	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	1	8.3	8.4	1	101	[NT]

QUALITY CONTROL: CEC						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			18/10/2021	[NT]	[NT]	[NT]	[NT]	18/10/2021	[NT]
Date analysed	-			18/10/2021	[NT]	[NT]	[NT]	[NT]	18/10/2021	[NT]
Exchangeable Ca	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	110	[NT]
Exchangeable K	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Exchangeable Mg	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Exchangeable Na	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	116	[NT]

QUALITY CONTROL: PAHs in TCLP (USEPA 1311)					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
Date extracted	-			15/10/2021	[NT]	[NT]	[NT]	[NT]	15/10/2021	[NT]
Date analysed	-			15/10/2021	[NT]	[NT]	[NT]	[NT]	15/10/2021	[NT]
Naphthalene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	102	[NT]
Acenaphthylene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	88	[NT]
Fluorene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	98	[NT]
Phenanthrene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	122	[NT]
Anthracene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	88	[NT]
Pyrene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	88	[NT]
Benzo(a)anthracene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	78	[NT]
Benzo(bjk)fluoranthene in TCLP	mg/L	0.002	Org-022/025	<0.002	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	88	[NT]
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	109	[NT]	[NT]	[NT]	[NT]	111	[NT]

QUALITY CONTROL: Metals from Leaching Fluid pH 2.9 or 5					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			18/10/2021	[NT]	[NT]	[NT]	[NT]	18/10/2021	[NT]
Date analysed	-			18/10/2021	[NT]	[NT]	[NT]	[NT]	18/10/2021	[NT]
Lead	mg/L	0.03	Metals-020	<0.03	[NT]	[NT]	[NT]	[NT]	97	[NT]

QUALITY CONTROL: Chromium Suite						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			15/10/2021	[NT]	[NT]	[NT]	[NT]	15/10/2021	[NT]
Date analysed	-			15/10/2021	[NT]	[NT]	[NT]	[NT]	15/10/2021	[NT]
pH $_{kcl}$	pH units		Inorg-068	[NT]	[NT]	[NT]	[NT]	[NT]	97	[NT]
s-TAA pH 6.5	%w/w S	0.01	Inorg-068	<0.01	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
TAA pH 6.5	moles H^+ /t	5	Inorg-068	<5	[NT]	[NT]	[NT]	[NT]	97	[NT]
Chromium Reducible Sulfur	%w/w	0.005	Inorg-068	<0.005	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
a-Chromium Reducible Sulfur	moles H^+ /t	3	Inorg-068	<3	[NT]	[NT]	[NT]	[NT]	108	[NT]
S_{HCl}	%w/w S	0.005	Inorg-068	<0.005	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
S_{KCl}	%w/w S	0.005	Inorg-068	<0.005	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
S_{NAS}	%w/w S	0.005	Inorg-068	<0.005	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
ANC_{BT}	% $CaCO_3$	0.05	Inorg-068	<0.05	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
s-ANC_{BT}	%w/w S	0.05	Inorg-068	<0.05	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
s-Net Acidity	%w/w S	0.005	Inorg-068	<0.005	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
a-Net Acidity	moles H^+ /t	5	Inorg-068	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Liming rate	kg $CaCO_3$ /t	0.75	Inorg-068	<0.75	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
a-Net Acidity without ANCE	moles H^+ /t	5	Inorg-068	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Liming rate without ANCE	kg $CaCO_3$ /t	0.75	Inorg-068	<0.75	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
s-Net Acidity without ANCE	%w/w S	0.005	Inorg-068	<0.005	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Report Comments

pH
Samples were out of the recommended holding time for this analysis.

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CERTIFICATE OF ANALYSIS 280135

Client Details

Client	Douglas Partners Newcastle
Attention	Dana Wilson
Address	Box 324 Hunter Region Mail Centre, Newcastle, NSW, 2310

Sample Details

Your Reference	**102077.02, Newcastle**
Number of Samples	21 Soil, 2 Material
Date samples received	12/10/2021
Date completed instructions received	12/10/2021

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	15/10/2021
Date of Issue	15/10/2021

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Asbestos Approved By
Analysed by Asbestos Approved Analyst: Ridwan Wijaya, Wonnie Condos
Authorised by Asbestos Approved Signatory: Lucy Zhu

Results Approved By
Dragana Tomas, Senior Chemist
Hannah Nguyen, Metals Supervisor
Josh Williams, LC Supervisor
Lucy Zhu, Asbestos Supervisor
Priya Samarawickrama, Senior Chemist

Authorised By

Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		280135-1	280135-2	280135-3	280135-4	280135-5
Your Reference	UNITS	301	302	302	303	304
Depth		0.1-0.2	0.5-0.6	1.4-1.5	0.6-0.7	0.5-0.6
Date Sampled		9/10/2021	9/10/2021	9/10/2021	9/10/2021	9/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	13/10/2021	13/10/2021	13/10/2021	13/10/2021	13/10/2021
Date analysed	-	14/10/2021	14/10/2021	14/10/2021	14/10/2021	14/10/2021
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<3	<3	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	104	95	97	99	82

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		280135-6	280135-7	280135-8	280135-9	280135-10
Your Reference	UNITS	305	305	306	307	D1/DEW
Depth		0.2-0.3	0.55	0.25-0.35	0.2-0.3	-
Date Sampled		9/10/2021	9/10/2021	9/10/2021	9/10/2021	9/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	13/10/2021	13/10/2021	13/10/2021	13/10/2021	13/10/2021
Date analysed	-	14/10/2021	14/10/2021	14/10/2021	14/10/2021	14/10/2021
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<3	<3	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	106	93	99	98	97

svTRH (C10-C40) in Soil						
Our Reference		280135-1	280135-2	280135-3	280135-4	280135-5
Your Reference	UNITS	301	302	302	303	304
Depth		0.1-0.2	0.5-0.6	1.4-1.5	0.6-0.7	0.5-0.6
Date Sampled		9/10/2021	9/10/2021	9/10/2021	9/10/2021	9/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	13/10/2021	13/10/2021	13/10/2021	13/10/2021	13/10/2021
Date analysed	-	14/10/2021	14/10/2021	14/10/2021	14/10/2021	14/10/2021
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	101	98	101	99	100

svTRH (C10-C40) in Soil						
Our Reference		280135-6	280135-7	280135-8	280135-9	280135-10
Your Reference	UNITS	305	305	306	307	D1/DEW
Depth		0.2-0.3	0.55	0.25-0.35	0.2-0.3	-
Date Sampled		9/10/2021	9/10/2021	9/10/2021	9/10/2021	9/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	13/10/2021	13/10/2021	13/10/2021	13/10/2021	13/10/2021
Date analysed	-	14/10/2021	14/10/2021	14/10/2021	14/10/2021	14/10/2021
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	101	88	97	100	89

PAHs in Soil						
Our Reference		280135-1	280135-2	280135-3	280135-4	280135-5
Your Reference	UNITS	301	302	302	303	304
Depth		0.1-0.2	0.5-0.6	1.4-1.5	0.6-0.7	0.5-0.6
Date Sampled		9/10/2021	9/10/2021	9/10/2021	9/10/2021	9/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	13/10/2021	13/10/2021	13/10/2021	13/10/2021	13/10/2021
Date analysed	-	13/10/2021	13/10/2021	13/10/2021	13/10/2021	13/10/2021
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	0.2	<0.1	0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	0.4	0.2	0.3	<0.1
Pyrene	mg/kg	<0.1	0.4	0.1	0.2	<0.1
Benzo(a)anthracene	mg/kg	<0.1	0.3	<0.1	0.2	<0.1
Chrysene	mg/kg	<0.1	0.2	<0.1	0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	0.7	0.3	0.4	<0.2
Benzo(a)pyrene	mg/kg	<0.05	0.3	0.1	0.2	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	0.2	<0.1	0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	0.2	<0.1	0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	2.8	0.72	1.8	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	134	115	117	119	121

PAHs in Soil						
Our Reference		280135-6	280135-7	280135-8	280135-9	280135-10
Your Reference	UNITS	305	305	306	307	D1/DEW
Depth		0.2-0.3	0.55	0.25-0.35	0.2-0.3	-
Date Sampled		9/10/2021	9/10/2021	9/10/2021	9/10/2021	9/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	13/10/2021	13/10/2021	13/10/2021	13/10/2021	13/10/2021
Date analysed	-	13/10/2021	13/10/2021	13/10/2021	13/10/2021	13/10/2021
Naphthalene	mg/kg	<0.1	<0.1	0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.4	0.3	0.2	<0.1	<0.1
Anthracene	mg/kg	<0.1	0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.8	0.9	0.7	<0.1	0.4
Pyrene	mg/kg	0.8	0.8	0.7	<0.1	0.4
Benzo(a)anthracene	mg/kg	0.6	0.6	0.7	<0.1	0.2
Chrysene	mg/kg	0.4	0.4	0.5	<0.1	0.2
Benzo(b,j+k)fluoranthene	mg/kg	1	1	2	<0.2	0.6
Benzo(a)pyrene	mg/kg	0.53	0.4	0.77	<0.05	0.2
Indeno(1,2,3-c,d)pyrene	mg/kg	0.3	0.2	0.5	<0.1	0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	0.4	0.3	0.6	<0.1	0.2
Total +ve PAH's	mg/kg	5.5	5.4	6.8	<0.05	2.4
Benzo(a)pyrene TEQ calc (zero)	mg/kg	0.8	0.7	1.2	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	0.8	0.7	1.2	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	0.9	0.8	1.2	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	122	103	117	116	104

Organochlorine Pesticides in soil						
Our Reference		280135-1	280135-2	280135-3	280135-4	280135-5
Your Reference	UNITS	301	302	302	303	304
Depth		0.1-0.2	0.5-0.6	1.4-1.5	0.6-0.7	0.5-0.6
Date Sampled		9/10/2021	9/10/2021	9/10/2021	9/10/2021	9/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	13/10/2021	13/10/2021	13/10/2021	13/10/2021	13/10/2021
Date analysed	-	13/10/2021	13/10/2021	13/10/2021	13/10/2021	13/10/2021
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	128	110	115	120	122

Organochlorine Pesticides in soil						
Our Reference		280135-6	280135-7	280135-8	280135-9	280135-10
Your Reference	UNITS	305	305	306	307	D1/DEW
Depth		0.2-0.3	0.55	0.25-0.35	0.2-0.3	-
Date Sampled		9/10/2021	9/10/2021	9/10/2021	9/10/2021	9/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	13/10/2021	13/10/2021	13/10/2021	13/10/2021	13/10/2021
Date analysed	-	13/10/2021	13/10/2021	13/10/2021	13/10/2021	13/10/2021
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	112	100	109	115	99

Organophosphorus Pesticides in Soil						
Our Reference		280135-1	280135-2	280135-3	280135-4	280135-5
Your Reference	UNITS	301	302	302	303	304
Depth		0.1-0.2	0.5-0.6	1.4-1.5	0.6-0.7	0.5-0.6
Date Sampled		9/10/2021	9/10/2021	9/10/2021	9/10/2021	9/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	13/10/2021	13/10/2021	13/10/2021	13/10/2021	13/10/2021
Date analysed	-	13/10/2021	13/10/2021	13/10/2021	13/10/2021	13/10/2021
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	128	110	115	120	122

Organophosphorus Pesticides in Soil						
Our Reference		280135-6	280135-7	280135-8	280135-9	280135-10
Your Reference	UNITS	305	305	306	307	D1/DEW
Depth		0.2-0.3	0.55	0.25-0.35	0.2-0.3	-
Date Sampled		9/10/2021	9/10/2021	9/10/2021	9/10/2021	9/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	13/10/2021	13/10/2021	13/10/2021	13/10/2021	13/10/2021
Date analysed	-	13/10/2021	13/10/2021	13/10/2021	13/10/2021	13/10/2021
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	112	100	109	115	99

PCBs in Soil						
Our Reference		280135-1	280135-2	280135-3	280135-4	280135-5
Your Reference	UNITS	301	302	302	303	304
Depth		0.1-0.2	0.5-0.6	1.4-1.5	0.6-0.7	0.5-0.6
Date Sampled		9/10/2021	9/10/2021	9/10/2021	9/10/2021	9/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	13/10/2021	13/10/2021	13/10/2021	13/10/2021	13/10/2021
Date analysed	-	13/10/2021	13/10/2021	13/10/2021	13/10/2021	13/10/2021
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	128	110	115	120	122

PCBs in Soil						
Our Reference		280135-6	280135-7	280135-8	280135-9	280135-10
Your Reference	UNITS	305	305	306	307	D1/DEW
Depth		0.2-0.3	0.55	0.25-0.35	0.2-0.3	-
Date Sampled		9/10/2021	9/10/2021	9/10/2021	9/10/2021	9/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	13/10/2021	13/10/2021	13/10/2021	13/10/2021	13/10/2021
Date analysed	-	13/10/2021	13/10/2021	13/10/2021	13/10/2021	13/10/2021
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	112	100	109	115	99

Acid Extractable metals in soil						
Our Reference		280135-1	280135-2	280135-3	280135-4	280135-5
Your Reference	UNITS	301	302	302	303	304
Depth		0.1-0.2	0.5-0.6	1.4-1.5	0.6-0.7	0.5-0.6
Date Sampled		9/10/2021	9/10/2021	9/10/2021	9/10/2021	9/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	13/10/2021	13/10/2021	13/10/2021	13/10/2021	13/10/2021
Date analysed	-	14/10/2021	14/10/2021	14/10/2021	14/10/2021	14/10/2021
Arsenic	mg/kg	5	<4	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	5	3	<1	5	1
Copper	mg/kg	3	44	10	25	<1
Lead	mg/kg	20	190	4	130	3
Mercury	mg/kg	<0.1	0.1	<0.1	0.1	<0.1
Nickel	mg/kg	3	6	<1	3	<1
Zinc	mg/kg	27	160	4	84	4
Boron	mg/kg	<3	3	<3	<3	<3
Barium	mg/kg	34	89	9	41	4
Beryllium	mg/kg	<1	<1	<1	<1	<1
Cobalt	mg/kg	3	2	<1	1	<1
Manganese	mg/kg	370	230	5	160	33
Molybdenum	mg/kg	<1	<1	<1	<1	<1
Antimony	mg/kg	<7	<7	<7	<7	<7
Selenium	mg/kg	<2	<2	<2	<2	<2
Tin	mg/kg	<1	7	<1	2	<1

Acid Extractable metals in soil						
Our Reference		280135-6	280135-7	280135-8	280135-9	280135-10
Your Reference	UNITS	305	305	306	307	D1/DEW
Depth		0.2-0.3	0.55	0.25-0.35	0.2-0.3	-
Date Sampled		9/10/2021	9/10/2021	9/10/2021	9/10/2021	9/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	13/10/2021	13/10/2021	13/10/2021	13/10/2021	13/10/2021
Date analysed	-	14/10/2021	14/10/2021	14/10/2021	14/10/2021	14/10/2021
Arsenic	mg/kg	4	<4	<4	5	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	6	4	7	6	6
Copper	mg/kg	88	50	60	9	29
Lead	mg/kg	1,100	580	310	6	140
Mercury	mg/kg	0.3	0.2	0.3	<0.1	0.1
Nickel	mg/kg	12	7	9	9	4
Zinc	mg/kg	260	150	300	29	100
Boron	mg/kg	9	6	5	<3	<3
Barium	mg/kg	96	130	100	8	60
Beryllium	mg/kg	<1	<1	<1	<1	<1
Cobalt	mg/kg	13	3	5	10	2
Manganese	mg/kg	180	180	410	170	330
Molybdenum	mg/kg	<1	<1	<1	<1	<1
Antimony	mg/kg	<7	<7	<7	<7	<7
Selenium	mg/kg	<2	<2	<2	<2	<2
Tin	mg/kg	9	7	17	<1	5

Acid Extractable metals in soil		
Our Reference		280135-24
Your Reference	UNITS	301 - [TRIPLICATE]
Depth		0.1-0.2
Date Sampled		9/10/2021
Type of sample		Soil
Date prepared	-	13/10/2021
Date analysed	-	14/10/2021
Arsenic	mg/kg	4
Cadmium	mg/kg	<0.4
Chromium	mg/kg	3
Copper	mg/kg	2
Lead	mg/kg	17
Mercury	mg/kg	<0.1
Nickel	mg/kg	2
Zinc	mg/kg	25
Boron	mg/kg	<3
Barium	mg/kg	29
Beryllium	mg/kg	<1
Cobalt	mg/kg	2
Manganese	mg/kg	300
Molybdenum	mg/kg	<1
Antimony	mg/kg	<7
Selenium	mg/kg	<2
Tin	mg/kg	<1

Moisture						
Our Reference		280135-1	280135-2	280135-3	280135-4	280135-5
Your Reference	UNITS	301	302	302	303	304
Depth		0.1-0.2	0.5-0.6	1.4-1.5	0.6-0.7	0.5-0.6
Date Sampled		9/10/2021	9/10/2021	9/10/2021	9/10/2021	9/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	13/10/2021	13/10/2021	13/10/2021	13/10/2021	13/10/2021
Date analysed	-	14/10/2021	14/10/2021	14/10/2021	14/10/2021	14/10/2021
Moisture	%	5.6	6.9	17	6.5	2.1

Moisture						
Our Reference		280135-6	280135-7	280135-8	280135-9	280135-10
Your Reference	UNITS	305	305	306	307	D1/DEW
Depth		0.2-0.3	0.55	0.25-0.35	0.2-0.3	-
Date Sampled		9/10/2021	9/10/2021	9/10/2021	9/10/2021	9/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	13/10/2021	13/10/2021	13/10/2021	13/10/2021	13/10/2021
Date analysed	-	14/10/2021	14/10/2021	14/10/2021	14/10/2021	14/10/2021
Moisture	%	13	9.7	13	4.4	9.7

Asbestos ID - soils NEPM						
Our Reference		280135-4	280135-5	280135-6	280135-7	280135-8
Your Reference	UNITS	303	304	305	305	306
Depth		0.6-0.7	0.5-0.6	0.2-0.3	0.55	0.25-0.35
Date Sampled		9/10/2021	9/10/2021	9/10/2021	9/10/2021	9/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	15/10/2021	15/10/2021	15/10/2021	15/10/2021	15/10/2021
Sample mass tested	g	721.4	718.67	707.74	674.58	417.63
Sample Description	-	Grey fine-grained soil & rocks	Grey fine-grained soil & rocks	Grey fine-grained soil & rocks	Grey fine-grained soil & rocks	Grey fine-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected
Total Asbestos[#1]	g/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	Chrysotile Amosite Crocidolite	No visible asbestos detected
ACM >7mm Estimation*	g	–	–	–	–	–
FA and AF Estimation*	g	–	–	–	0.0328	–
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	0.0049	<0.001

Asbestos ID - soils NEPM		
Our Reference		280135-22
Your Reference	UNITS	S1
Depth		0-0.05
Date Sampled		9/10/2021
Type of sample		Soil
Date analysed	-	15/10/2021
Sample mass tested	g	827.26
Sample Description	-	Grey fine-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected
Total Asbestos[#1]	g/kg	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected
ACM >7mm Estimation*	g	–
FA and AF Estimation*	g	–
FA and AF Estimation*#2	%(w/w)	<0.001

sPOCAS field test						
Our Reference		280135-3	280135-11	280135-12	280135-13	280135-14
Your Reference	UNITS	302	301	301	301	302
Depth		1.4-1.5	1.5-16	2.1-2.2	2.7-2.9	2-2.1
Date Sampled		9/10/2021	9/10/2021	9/10/2021	9/10/2021	9/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	13/10/2021	13/10/2021	13/10/2021	13/10/2021	13/10/2021
Date analysed	-	13/10/2021	13/10/2021	13/10/2021	13/10/2021	13/10/2021
pH_F (field pH test)*	pH Units	7.3	7.3	7.2	6.9	7.3
pH_{FOX} (field peroxide test)*	pH Units	5.7	5.7	4.7	1.9	5.8
Reaction Rate*	-	Low reaction	Low reaction	Low reaction	Medium reaction	Low reaction

sPOCAS field test						
Our Reference		280135-15	280135-16	280135-17	280135-18	280135-19
Your Reference	UNITS	302	302	306	305	306
Depth		2.5-2.6	2.9-3	2-2.1	1.35-1.4	2.5-2.6
Date Sampled		9/10/2021	9/10/2021	9/10/2021	9/10/2021	9/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	13/10/2021	13/10/2021	13/10/2021	13/10/2021	13/10/2021
Date analysed	-	13/10/2021	13/10/2021	13/10/2021	13/10/2021	13/10/2021
pH_F (field pH test)*	pH Units	7.3	6.6	7.3	7.3	7.3
pH_{FOX} (field peroxide test)*	pH Units	5.6	2.1	5.8	5.7	5.7
Reaction Rate*	-	Low reaction	Extreme reaction	Low reaction	Low reaction	Low reaction

sPOCAS field test		
Our Reference		280135-20
Your Reference	UNITS	306
Depth		2.9-3
Date Sampled		9/10/2021
Type of sample		Soil
Date prepared	-	13/10/2021
Date analysed	-	13/10/2021
pH_F (field pH test)*	pH Units	6.3
pH_{FOX} (field peroxide test)*	pH Units	1.8
Reaction Rate*	-	Volcanic reaction

Asbestos ID - materials			
Our Reference		280135-21	280135-23
Your Reference	UNITS	305/F	S1/F
Depth		-	-
Date Sampled		9/10/2021	9/10/2021
Type of sample		Material	Material
Date analysed	-	14/10/2021	14/10/2021
Mass / Dimension of Sample	-	30x25x4mm	230x110x10mm
Sample Description	-	Grey fibre cement material	Grey compressed fibre cement material
Asbestos ID in materials	-	Chrysotile asbestos detected Amosite asbestos detected Crocidolite asbestos detected	Chrysotile asbestos detected Amosite asbestos detected
Trace Analysis	-	[NT]	[NT]

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
ASB-001	Asbestos ID - Identification of asbestos in soil samples using Polarised Light Microscopy and Dispersion Staining Techniques. Minimum 500mL soil sample was analysed as recommended by "National Environment Protection (Assessment of site contamination) Measure, Schedule B1 and "The Guidelines from the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia - May 2009" with a reporting limit of 0.1g/kg (0.01% w/w) as per Australian Standard AS4964-2004. Results reported denoted with * are outside our scope of NATA accreditation. **NOTE** #1 Total Asbestos g/kg was analysed and reported as per Australian Standard AS4964 (This is the sum of ACM >7mm, <7mm and FA/AF) **NOTE** #2 The screening level of 0.001% w/w asbestos in soil for FA and AF only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres. Estimation = Estimated asbestos weight Results reported with "--" is equivalent to no visible asbestos identified using Polarised Light microscopy and Dispersion Staining Techniques.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Inorg-063	pH- measured using pH meter and electrode. Soil is oxidised with Hydrogen Peroxide or extracted with water. Based on section H, Acid Sulfate Soils Laboratory Methods Guidelines, Version 2.1 - June 2004. To ensure accurate results these tests are recommended to be done in the field as pH may change with time thus these results may not be representative of true field conditions.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.

Method ID	Methodology Summary
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-022	Determination of VOCs sampled onto coconut shell charcoal sorbent tubes, that can be desorbed using carbon disulphide, and analysed by GC-MS.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.
Org-022/025	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-MS/GC-MSMS. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS and/or GC-MS/MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ PQL'values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero'values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL'values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			13/10/2021	1	13/10/2021	13/10/2021		13/10/2021	[NT]
Date analysed	-			14/10/2021	1	14/10/2021	14/10/2021		14/10/2021	[NT]
TRH C_6 - C_9	mg/kg	25	Org-023	<25	1	<25	<25	0	71	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-023	<25	1	<25	<25	0	71	[NT]
Benzene	mg/kg	0.2	Org-023	<0.2	1	<0.2	<0.2	0	73	[NT]
Toluene	mg/kg	0.5	Org-023	<0.5	1	<0.5	<0.5	0	72	[NT]
Ethylbenzene	mg/kg	1	Org-023	<1	1	<1	<1	0	71	[NT]
m+p-xylene	mg/kg	2	Org-023	<2	1	<2	<2	0	69	[NT]
o-Xylene	mg/kg	1	Org-023	<1	1	<1	<1	0	71	[NT]
naphthalene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	100	1	104	95	9	110	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			13/10/2021	1	13/10/2021	13/10/2021		13/10/2021	[NT]
Date analysed	-			13/10/2021	1	14/10/2021	14/10/2021		13/10/2021	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	1	<50	<50	0	91	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	1	<100	<100	0	83	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	1	<100	<100	0	89	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	1	<50	<50	0	91	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	1	<100	<100	0	83	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	1	<100	<100	0	89	[NT]
Surrogate o-Terphenyl	%		Org-020	89	1	101	108	7	129	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			13/10/2021	1	13/10/2021	13/10/2021		13/10/2021	[NT]
Date analysed	-			13/10/2021	1	13/10/2021	13/10/2021		13/10/2021	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	116	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	103	[NT]
Fluorene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	116	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	114	[NT]
Anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	108	[NT]
Pyrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	109	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	73	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	<0.05	1	<0.05	<0.05	0	110	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	120	1	134	124	8	89	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			13/10/2021	1	13/10/2021	13/10/2021		13/10/2021	[NT]
Date analysed	-			13/10/2021	1	13/10/2021	13/10/2021		13/10/2021	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	104	[NT]
HCB	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	96	[NT]
gamma-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	109	[NT]
delta-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	113	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	114	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	109	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	114	[NT]
Endrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	121	[NT]
Endosulfan II	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	120	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	118	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	114	1	128	118	8	80	[NT]

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			13/10/2021	1	13/10/2021	13/10/2021		13/10/2021	[NT]
Date analysed	-			13/10/2021	1	13/10/2021	13/10/2021		13/10/2021	[NT]
Dichlorvos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	103	[NT]
Dimethoate	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	118	[NT]
Fenitrothion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	113	[NT]
Malathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	114	[NT]
Chlorpyriphos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	120	[NT]
Parathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	113	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-022	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	104	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	114	1	128	118	8	80	[NT]

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			13/10/2021	1	13/10/2021	13/10/2021		13/10/2021	[NT]
Date analysed	-			13/10/2021	1	13/10/2021	13/10/2021		13/10/2021	[NT]
Aroclor 1016	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	122	[NT]
Aroclor 1260	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	114	1	128	118	8	80	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			13/10/2021	1	13/10/2021	13/10/2021		13/10/2021	[NT]
Date analysed	-			14/10/2021	1	14/10/2021	14/10/2021		14/10/2021	[NT]
Arsenic	mg/kg	4	Metals-020	<4	1	5	<4	22	107	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	104	[NT]
Chromium	mg/kg	1	Metals-020	<1	1	5	3	50	102	[NT]
Copper	mg/kg	1	Metals-020	<1	1	3	2	40	106	[NT]
Lead	mg/kg	1	Metals-020	<1	1	20	14	35	108	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	1	<0.1	<0.1	0	94	[NT]
Nickel	mg/kg	1	Metals-020	<1	1	3	2	40	110	[NT]
Zinc	mg/kg	1	Metals-020	<1	1	27	19	35	106	[NT]
Boron	mg/kg	3	Metals-020	<3	1	<3	<3	0	109	[NT]
Barium	mg/kg	1	Metals-020	<1	1	34	25	31	107	[NT]
Beryllium	mg/kg	1	Metals-020	<1	1	<1	<1	0	103	[NT]
Cobalt	mg/kg	1	Metals-020	<1	1	3	2	40	103	[NT]
Manganese	mg/kg	1	Metals-020	<1	1	370	210	55	105	[NT]
Molybdenum	mg/kg	1	Metals-020	<1	1	<1	<1	0	100	[NT]
Antimony	mg/kg	7	Metals-020	<7	1	<7	<7	0	98	[NT]
Selenium	mg/kg	2	Metals-020	<2	1	<2	<2	0	102	[NT]
Tin	mg/kg	1	Metals-020	<1	1	<1	<1	0	99	[NT]

QUALITY CONTROL: sPOCAS field test						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			13/10/2021	11	13/10/2021	13/10/2021		13/10/2021	[NT]
Date analysed	-			13/10/2021	11	13/10/2021	13/10/2021		13/10/2021	[NT]
pH_F (field pH test)*	pH Units		Inorg-063	[NT]	11	7.3	7.2	1	100	[NT]
pH_{FOX} (field peroxide test)*	pH Units		Inorg-063	[NT]	11	5.7	5.7	0	100	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

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Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

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Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

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When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Report Comments

Acid Extractable Metals in Soil: The laboratory RPD acceptance criteria has been exceeded for 280135-1 for Mn. Therefore a triplicate result has been issued as laboratory sample number 280135-24.

Asbestos-ID in soil: NEPM
This report is consistent with the reporting recommendations in the National Environment Protection (Assessment of Site Contamination) Measure, Schedule B1, May 2013. This is reported outside our scope of NATA accreditation.

Factual description of asbestos identified in the soil samples: NEPM
Sample 280135-7; Chrysotile, Amosite and Crocidolite asbestos identified in 0.2189g of fibre cement material <7mm

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CERTIFICATE OF ANALYSIS 280135-A

Client Details

Client	Douglas Partners Newcastle
Attention	Dana Wilson
Address	Box 324 Hunter Region Mail Centre, Newcastle, NSW, 2310

Sample Details

Your Reference	**102077.02, Newcastle**
Number of Samples	additional analysis
Date samples received	12/10/2021
Date completed instructions received	21/10/2021

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

Date results requested by	28/10/2021
Date of Issue	28/10/2021

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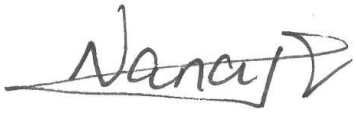
Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

Results Approved By
Hannah Nguyen, Metals Supervisor
Priya Samarawickrama, Senior Chemist

Authorised By



Nancy Zhang, Laboratory Manager

Metals from Leaching Fluid pH 2.9 or 5					
Our Reference		280135-A-2	280135-A-4	280135-A-6	280135-A-8
Your Reference	UNITS	302	303	305	306
Depth		0.5-0.6	0.6-0.7	0.2-0.3	0.25-0.35
Date Sampled		9/10/2021	9/10/2021	9/10/2021	9/10/2021
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	28/10/2021	28/10/2021	28/10/2021	28/10/2021
Date analysed	-	28/10/2021	28/10/2021	28/10/2021	28/10/2021
pH of soil for fluid# determ.	pH units	7.8	8.1	7.6	8.1
pH of soil TCLP (after HCl)	pH units	1.2	1.3	1.2	1.4
Extraction fluid used	-	1	1	1	1
pH of final Leachate	pH units	5.0	5.3	5.4	5.0
Lead	mg/L	0.07	0.2	0.77	0.2

Chromium Suite				
Our Reference		280135-A-11	280135-A-17	280135-A-20
Your Reference	UNITS	301	306	306
Depth		1.5-16	2-2.1	2.9-3
Date Sampled		9/10/2021	9/10/2021	9/10/2021
Type of sample		Soil	Soil	Soil
Date prepared	-	22/10/2021	22/10/2021	22/10/2021
Date analysed	-	22/10/2021	22/10/2021	22/10/2021
pH $_{kcl}$	pH units	6.8	6.6	4.3
s-TAA pH 6.5	%w/w S	<0.01	<0.01	0.02
TAA pH 6.5	moles H^+ /t	<5	<5	14
Chromium Reducible Sulfur	%w/w	<0.005	<0.005	0.36
a-Chromium Reducible Sulfur	moles H^+ /t	<3	<3	220
S_{HCl}	%w/w S	[NT]	[NT]	0.078
S_{KCl}	%w/w S	[NT]	[NT]	0.055
S_{NAS}	%w/w S	[NT]	[NT]	0.024
ANC_{BT}	% $CaCO_3$	<0.05	<0.05	[NT]
s-ANC_{BT}	%w/w S	<0.05	<0.05	[NT]
s-Net Acidity	%w/w S	<0.005	<0.005	0.40
a-Net Acidity	moles H^+ /t	<5	<5	250
Liming rate	kg $CaCO_3$ /t	<0.75	<0.75	19
a-Net Acidity without ANCE	moles H^+ /t	<5	<5	250
Liming rate without ANCE	kg $CaCO_3$ /t	<0.75	<0.75	19
s-Net Acidity without ANCE	%w/w S	<0.005	<0.005	0.40

Method ID	Methodology Summary
INORG-004	Toxicity Characteristic Leaching Procedure (TCLP) using Zero Headspace Extraction (zHE) using AS4439 and USEPA 1311.
Inorg-004	Toxicity Characteristic Leaching Procedure (TCLP) using AS 4439 and USEPA 1311. Please note that the mass used may be scaled down from default based on sample mass available. Samples are stored at 2-6oC before and after leachate preparation.
Inorg-068	Chromium Reducible Sulfur - Hydrogen Sulfide is quantified by iodometric titration after distillation to determine potential acidity.
Metals-020	Determination of various metals by ICP-AES following buffer determination as per USEPA 1311 and hence AS 4439.3. Extraction Fluid 1 refers to the pH 5.0 buffer and Extraction Fluid 2 is the pH 2.9 buffer.

QUALITY CONTROL: Metals from Leaching Fluid pH 2.9 or 5						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	280135-A-4
Date extracted	-			28/10/2021	2	28/10/2021	28/10/2021		28/10/2021	28/10/2021
Date analysed	-			28/10/2021	2	28/10/2021	28/10/2021		28/10/2021	28/10/2021
Lead	mg/L	0.03	Metals-020	<0.03	2	0.07	0.06	15	97	101

QUALITY CONTROL: Chromium Suite						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			22/10/2021	[NT]	[NT]	[NT]	[NT]	22/10/2021	[NT]
Date analysed	-			22/10/2021	[NT]	[NT]	[NT]	[NT]	22/10/2021	[NT]
pH $_{kcl}$	pH units		Inorg-068	[NT]	[NT]	[NT]	[NT]	[NT]	98	[NT]
s-TAA pH 6.5	%w/w S	0.01	Inorg-068	<0.01	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
TAA pH 6.5	moles H^+ /t	5	Inorg-068	<5	[NT]	[NT]	[NT]	[NT]	98	[NT]
Chromium Reducible Sulfur	%w/w	0.005	Inorg-068	<0.005	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
a-Chromium Reducible Sulfur	moles H^+ /t	3	Inorg-068	<3	[NT]	[NT]	[NT]	[NT]	110	[NT]
S_{HCl}	%w/w S	0.005	Inorg-068	<0.005	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
S_{KCl}	%w/w S	0.005	Inorg-068	<0.005	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
S_{NAS}	%w/w S	0.005	Inorg-068	<0.005	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
ANC_{BT}	% $CaCO_3$	0.05	Inorg-068	<0.05	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
s-ANC_{BT}	%w/w S	0.05	Inorg-068	<0.05	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
s-Net Acidity	%w/w S	0.005	Inorg-068	<0.005	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
a-Net Acidity	moles H^+ /t	5	Inorg-068	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Liming rate	kg $CaCO_3$ /t	0.75	Inorg-068	<0.75	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
a-Net Acidity without ANCE	moles H^+ /t	5	Inorg-068	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Liming rate without ANCE	kg $CaCO_3$ /t	0.75	Inorg-068	<0.75	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
s-Net Acidity without ANCE	%w/w S	0.005	Inorg-068	<0.005	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]

Result Definitions

NT	Not tested
NA	Test not required
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Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

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Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

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CERTIFICATE OF ANALYSIS 280242

Client Details

Client	Douglas Partners Newcastle
Attention	Dana Wilson
Address	Box 324 Hunter Region Mail Centre, Newcastle, NSW, 2310

Sample Details

Your Reference	**102077.02, Newcastle**
Number of Samples	3 Water
Date samples received	13/10/2021
Date completed instructions received	13/10/2021

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

Date results requested by	18/10/2021
Date of Issue	18/10/2021

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Results Approved By
Dragana Tomas, Senior Chemist
Giovanni Agosti, Group Technical Manager

Authorised By

Nancy Zhang, Laboratory Manager

VOCs in water				
Our Reference		280242-1	280242-2	280242-3
Your Reference	UNITS	203	204	GWD1
Date Sampled		12/10/2021	12/10/2021	12/10/2021
Type of sample		Water	Water	Water
Date extracted	-	14/10/2021	14/10/2021	14/10/2021
Date analysed	-	15/10/2021	15/10/2021	15/10/2021
Dichlorodifluoromethane	µg/L	<10	<10	<10
Chloromethane	µg/L	<10	<10	<10
Vinyl Chloride	µg/L	<10	<10	<10
Bromomethane	µg/L	<10	<10	<10
Chloroethane	µg/L	<10	<10	<10
Trichlorofluoromethane	µg/L	<10	<10	<10
1,1-Dichloroethene	µg/L	<1	<1	<1
Trans-1,2-dichloroethene	µg/L	<1	<1	<1
1,1-dichloroethane	µg/L	<1	<1	<1
Cis-1,2-dichloroethene	µg/L	<1	<1	<1
Bromochloromethane	µg/L	<1	<1	<1
Chloroform	µg/L	<1	<1	<1
2,2-dichloropropane	µg/L	<1	<1	<1
1,2-dichloroethane	µg/L	<1	<1	<1
1,1,1-trichloroethane	µg/L	<1	<1	<1
1,1-dichloropropene	µg/L	<1	<1	<1
Cyclohexane	µg/L	<1	<1	<1
Carbon tetrachloride	µg/L	<1	<1	<1
Benzene	µg/L	<1	<1	<1
Dibromomethane	µg/L	<1	<1	<1
1,2-dichloropropane	µg/L	<1	<1	<1
Trichloroethene	µg/L	<1	<1	<1
Bromodichloromethane	µg/L	<1	<1	<1
trans-1,3-dichloropropene	µg/L	<1	<1	<1
cis-1,3-dichloropropene	µg/L	<1	<1	<1
1,1,2-trichloroethane	µg/L	<1	<1	<1
Toluene	µg/L	<1	<1	<1
1,3-dichloropropane	µg/L	<1	<1	<1
Dibromochloromethane	µg/L	<1	<1	<1
1,2-dibromoethane	µg/L	<1	<1	<1
Tetrachloroethene	µg/L	<1	<1	<1
1,1,1,2-tetrachloroethane	µg/L	<1	<1	<1
Chlorobenzene	µg/L	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	<1

VOCs in water				
Our Reference	UNITS	280242-1	280242-2	280242-3
Your Reference		203	204	GWD1
Date Sampled		12/10/2021	12/10/2021	12/10/2021
Type of sample		Water	Water	Water
Bromoform	µg/L	<1	<1	<1
m+p-xylene	µg/L	<2	<2	<2
Styrene	µg/L	<1	<1	<1
1,1,2,2-tetrachloroethane	µg/L	<1	<1	<1
o-xylene	µg/L	<1	<1	<1
1,2,3-trichloropropane	µg/L	<1	<1	<1
Isopropylbenzene	µg/L	<1	<1	<1
Bromobenzene	µg/L	<1	<1	<1
n-propyl benzene	µg/L	<1	<1	<1
2-chlorotoluene	µg/L	<1	<1	<1
4-chlorotoluene	µg/L	<1	<1	<1
1,3,5-trimethyl benzene	µg/L	<1	<1	<1
Tert-butyl benzene	µg/L	<1	<1	<1
1,2,4-trimethyl benzene	µg/L	<1	<1	<1
1,3-dichlorobenzene	µg/L	<1	<1	<1
Sec-butyl benzene	µg/L	<1	<1	<1
1,4-dichlorobenzene	µg/L	<1	<1	<1
4-isopropyl toluene	µg/L	<1	<1	<1
1,2-dichlorobenzene	µg/L	<1	<1	<1
n-butyl benzene	µg/L	<1	<1	<1
1,2-dibromo-3-chloropropane	µg/L	<1	<1	<1
1,2,4-trichlorobenzene	µg/L	<1	<1	<1
Hexachlorobutadiene	µg/L	<1	<1	<1
1,2,3-trichlorobenzene	µg/L	<1	<1	<1
Surrogate Dibromofluoromethane	%	98	98	99
Surrogate toluene-d8	%	99	98	99
Surrogate 4-BFB	%	106	108	108

vTRH(C6-C10)/BTEXN in Water				
Our Reference	UNITS	280242-1	280242-2	280242-3
Your Reference		203	204	GWD1
Date Sampled		12/10/2021	12/10/2021	12/10/2021
Type of sample		Water	Water	Water
Date extracted	-	14/10/2021	14/10/2021	14/10/2021
Date analysed	-	15/10/2021	15/10/2021	15/10/2021
TRH C_6 - C_9	µg/L	<10	<10	<10
TRH C_6 - C_{10}	µg/L	<10	<10	<10
TRH C_6 - C_{10} less BTEX (F1)	µg/L	<10	<10	<10
Benzene	µg/L	<1	<1	<1
Toluene	µg/L	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	<1
m+p-xylene	µg/L	<2	<2	<2
o-xylene	µg/L	<1	<1	<1
Naphthalene	µg/L	<1	<1	<1
Surrogate Dibromofluoromethane	%	98	98	99
Surrogate toluene-d8	%	99	98	99
Surrogate 4-BFB	%	106	108	108

svTRH (C10-C40) in Water				
Our Reference	UNITS	280242-1	280242-2	280242-3
Your Reference		203	204	GWD1
Date Sampled		12/10/2021	12/10/2021	12/10/2021
Type of sample		Water	Water	Water
Date extracted	-	14/10/2021	14/10/2021	14/10/2021
Date analysed	-	15/10/2021	15/10/2021	15/10/2021
TRH C_{10} - C_{14}	µg/L	<50	<50	<50
TRH C_{15} - C_{28}	µg/L	<100	<100	<100
TRH C_{29} - C_{36}	µg/L	<100	<100	<100
Total +ve TRH (C10-C36)	µg/L	<50	<50	<50
TRH >C_{10} - C_{16}	µg/L	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	µg/L	<50	<50	<50
TRH >C_{16} - C_{34}	µg/L	<100	<100	<100
TRH >C_{34} - C_{40}	µg/L	<100	<100	<100
Total +ve TRH (>C10-C40)	µg/L	<50	<50	<50
Surrogate o-Terphenyl	%	78	98	97

PAHs in Water - Low Level				
Our Reference	UNITS	280242-1	280242-2	280242-3
Your Reference		203	204	GWD1
Date Sampled		12/10/2021	12/10/2021	12/10/2021
Type of sample		Water	Water	Water
Date extracted	-	14/10/2021	14/10/2021	14/10/2021
Date analysed	-	14/10/2021	14/10/2021	14/10/2021
Naphthalene	µg/L	<0.2	<0.2	<0.2
Acenaphthylene	µg/L	<0.1	<0.1	<0.1
Acenaphthene	µg/L	<0.1	<0.1	<0.1
Fluorene	µg/L	<0.1	<0.1	<0.1
Phenanthrene	µg/L	<0.1	<0.1	<0.1
Anthracene	µg/L	<0.1	<0.1	<0.1
Fluoranthene	µg/L	<0.1	<0.1	<0.1
Pyrene	µg/L	<0.1	<0.1	<0.1
Benzo(a)anthracene	µg/L	<0.1	<0.1	<0.1
Chrysene	µg/L	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	µg/L	<0.2	<0.2	<0.2
Benzo(a)pyrene	µg/L	<0.1	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	µg/L	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	µg/L	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ	µg/L	<0.5	<0.5	<0.5
Total +ve PAH's	µg/L	<0.1	<0.1	<0.1
Surrogate p-Terphenyl-d14	%	75	82	76

All metals in water-dissolved				
Our Reference	UNITS	280242-1	280242-2	280242-3
Your Reference		203	204	GWD1
Date Sampled		12/10/2021	12/10/2021	12/10/2021
Type of sample		Water	Water	Water
Date prepared	-	14/10/2021	14/10/2021	14/10/2021
Date analysed	-	14/10/2021	14/10/2021	14/10/2021
Arsenic-Dissolved	µg/L	<1	2	2
Boron-Dissolved	µg/L	40	270	280
Barium-Dissolved	µg/L	16	29	31
Beryllium-Dissolved	µg/L	<0.5	<0.5	<0.5
Cadmium-Dissolved	µg/L	<0.1	0.1	0.1
Chromium-Dissolved	µg/L	<1	<1	<1
Copper-Dissolved	µg/L	3	2	2
Cobalt-Dissolved	µg/L	<1	1	1
Mercury-Dissolved	µg/L	<0.05	<0.05	<0.05
Manganese-Dissolved	µg/L	6	36	36
Molybdenum-Dissolved	µg/L	2	10	11
Nickel-Dissolved	µg/L	8	4	4
Lead-Dissolved	µg/L	<1	<1	<1
Antimony-Dissolved	µg/L	4	4	4
Selenium-Dissolved	µg/L	<1	3	3
Tin-Dissolved	µg/L	<1	<1	<1
Zinc-Dissolved	µg/L	320	280	290

Method ID	Methodology Summary
Metals-021	Determination of Mercury by Cold Vapour AAS.
Metals-022	Determination of various metals by ICP-MS.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Org-023	Water samples are analysed directly by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.

QUALITY CONTROL: VOCs in water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			14/10/2021	1	14/10/2021	15/10/2021		14/10/2021	[NT]
Date analysed	-			15/10/2021	1	15/10/2021	18/10/2021		15/10/2021	[NT]
Dichlorodifluoromethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Chloromethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Vinyl Chloride	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Bromomethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Chloroethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Trichlorofluoromethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
1,1-Dichloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Trans-1,2-dichloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,1-dichloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	92	[NT]
Cis-1,2-dichloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Bromochloromethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Chloroform	µg/L	1	Org-023	<1	1	<1	<1	0	100	[NT]
2,2-dichloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2-dichloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	93	[NT]
1,1,1-trichloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	91	[NT]
1,1-dichloropropene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Cyclohexane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Carbon tetrachloride	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Dibromomethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2-dichloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Trichloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	97	[NT]
Bromodichloromethane	µg/L	1	Org-023	<1	1	<1	<1	0	92	[NT]
trans-1,3-dichloropropene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
cis-1,3-dichloropropene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,1,2-trichloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Toluene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,3-dichloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Dibromochloromethane	µg/L	1	Org-023	<1	1	<1	<1	0	91	[NT]
1,2-dibromoethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Tetrachloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	101	[NT]
1,1,1,2-tetrachloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Chlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Bromoform	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
m+p-xylene	µg/L	2	Org-023	<2	1	<2	<2	0	[NT]	[NT]
Styrene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,1,2,2-tetrachloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]

QUALITY CONTROL: VOCs in water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
o-xylene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2,3-trichloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Isopropylbenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Bromobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
n-propyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
2-chlorotoluene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
4-chlorotoluene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,3,5-trimethyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Tert-butyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2,4-trimethyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,3-dichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Sec-butyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,4-dichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
4-isopropyl toluene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2-dichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
n-butyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2-dibromo-3-chloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2,4-trichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Hexachlorobutadiene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2,3-trichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	97	1	98	99	1	120	[NT]
Surrogate toluene-d8	%		Org-023	99	1	99	98	1	117	[NT]
Surrogate 4-BFB	%		Org-023	105	1	106	102	4	105	[NT]

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			14/10/2021	1	14/10/2021	15/10/2021		14/10/2021	[NT]
Date analysed	-			15/10/2021	1	15/10/2021	18/10/2021		15/10/2021	[NT]
TRH C_6 - C_9	µg/L	10	Org-023	<10	1	<10	<10	0	97	[NT]
TRH C_6 - C_{10}	µg/L	10	Org-023	<10	1	<10	<10	0	97	[NT]
Benzene	µg/L	1	Org-023	<1	1	<1	<1	0	97	[NT]
Toluene	µg/L	1	Org-023	<1	1	<1	<1	0	99	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	1	<1	<1	0	97	[NT]
m+p-xylene	µg/L	2	Org-023	<2	1	<2	<2	0	97	[NT]
o-xylene	µg/L	1	Org-023	<1	1	<1	<1	0	95	[NT]
Naphthalene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	97	1	98	99	1	120	[NT]
Surrogate toluene-d8	%		Org-023	99	1	99	98	1	117	[NT]
Surrogate 4-BFB	%		Org-023	105	1	106	102	4	105	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			14/10/2021	[NT]	[NT]	[NT]	[NT]	14/10/2021	[NT]
Date analysed	-			14/10/2021	[NT]	[NT]	[NT]	[NT]	14/10/2021	[NT]
TRH C_{10} - C_{14}	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	109	[NT]
TRH C_{15} - C_{28}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	104	[NT]
TRH C_{29} - C_{36}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	94	[NT]
TRH >C_{10} - C_{16}	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	109	[NT]
TRH >C_{16} - C_{34}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	104	[NT]
TRH >C_{34} - C_{40}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	94	[NT]
Surrogate o-Terphenyl	%		Org-020	79	[NT]	[NT]	[NT]	[NT]	87	[NT]

QUALITY CONTROL: PAHs in Water - Low Level						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			14/10/2021	[NT]	[NT]	[NT]	[NT]	14/10/2021	[NT]
Date analysed	-			14/10/2021	[NT]	[NT]	[NT]	[NT]	14/10/2021	[NT]
Naphthalene	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	83	[NT]
Acenaphthylene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	73	[NT]
Fluorene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	82	[NT]
Phenanthrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Anthracene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	74	[NT]
Pyrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	75	[NT]
Benzo(a)anthracene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	64	[NT]
Benzo(b,j+k)fluoranthene	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Indeno(1,2,3-c,d)pyrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	78	[NT]	[NT]	[NT]	[NT]	80	[NT]

QUALITY CONTROL: All metals in water-dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			14/10/2021	[NT]	[NT]	[NT]	[NT]	14/10/2021	[NT]
Date analysed	-			14/10/2021	[NT]	[NT]	[NT]	[NT]	14/10/2021	[NT]
Arsenic-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Boron-Dissolved	µg/L	20	Metals-022	<20	[NT]	[NT]	[NT]	[NT]	101	[NT]
Barium-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Beryllium-Dissolved	µg/L	0.5	Metals-022	<0.5	[NT]	[NT]	[NT]	[NT]	101	[NT]
Cadmium-Dissolved	µg/L	0.1	Metals-022	<0.1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Chromium-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Copper-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Cobalt-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Mercury-Dissolved	µg/L	0.05	Metals-021	<0.05	[NT]	[NT]	[NT]	[NT]	102	[NT]
Manganese-Dissolved	µg/L	5	Metals-022	<5	[NT]	[NT]	[NT]	[NT]	99	[NT]
Molybdenum-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Nickel-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Lead-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Antimony-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Selenium-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Tin-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	97	[NT]
Zinc-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	99	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

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CERTIFICATE OF ANALYSIS 291865

Client Details

Client	Douglas Partners Newcastle
Attention	Lachlan Helbig, Dana Wilson
Address	Box 324 Hunter Region Mail Centre, Newcastle, NSW, 2310

Sample Details

Your Reference	**102077.02, Newcastle West**
Number of Samples	6 Water
Date samples received	25/03/2022
Date completed instructions received	25/03/2022

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

Date results requested by	01/04/2022
Date of Issue	01/04/2022

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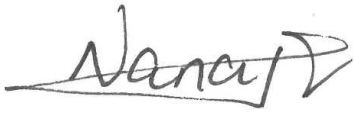
Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

Results Approved By
Dragana Tomas, Senior Chemist
Greta Petzold, Senior Report Coordinator

Authorised By



Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Water						
Our Reference		291865-1	291865-2	291865-3	291865-4	291865-5
Your Reference	UNITS	401	402	403	404	Trip Spike
Date Sampled		24/03/2022	24/03/2022	24/03/2022	24/03/2022	22/03/2022
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	26/03/2022	26/03/2022	26/03/2022	26/03/2022	26/03/2022
Date analysed	-	26/03/2022	26/03/2022	26/03/2022	26/03/2022	26/03/2022
TRH C_6 - C_9	µg/L	<10	<10	<10	<10	[NA]
TRH C_6 - C_{10}	µg/L	<10	<10	<10	<10	[NA]
TRH C_6 - C_{10} less BTEX (F1)	µg/L	<10	<10	<10	<10	[NA]
Benzene	µg/L	<1	<1	<1	<1	113%
Toluene	µg/L	<1	<1	<1	<1	114%
Ethylbenzene	µg/L	<1	<1	<1	<1	112%
m+p-xylene	µg/L	<2	<2	<2	<2	108%
o-xylene	µg/L	<1	<1	<1	<1	111%
Naphthalene	µg/L	<1	<1	<1	<1	[NA]
Surrogate Dibromofluoromethane	%	95	95	94	91	93
Surrogate toluene-d8	%	114	94	94	91	97
Surrogate 4-BFB	%	103	115	109	102	99

vTRH(C6-C10)/BTEXN in Water		
Our Reference		291865-6
Your Reference	UNITS	Trip blank
Date Sampled		22/03/2022
Type of sample		Water
Date extracted	-	26/03/2022
Date analysed	-	26/03/2022
TRH C_6 - C_9	µg/L	<10
TRH C_6 - C_{10}	µg/L	<10
TRH C_6 - C_{10} less BTEX (F1)	µg/L	<10
Benzene	µg/L	<1
Toluene	µg/L	<1
Ethylbenzene	µg/L	<1
m+p-xylene	µg/L	<2
o-xylene	µg/L	<1
Naphthalene	µg/L	<1
Surrogate Dibromofluoromethane	%	83
Surrogate toluene-d8	%	82
Surrogate 4-BFB	%	104

svTRH (C10-C40) in Water					
Our Reference		291865-1	291865-2	291865-3	291865-4
Your Reference	UNITS	401	402	403	404
Date Sampled		24/03/2022	24/03/2022	24/03/2022	24/03/2022
Type of sample		Water	Water	Water	Water
Date extracted	-	30/03/2022	30/03/2022	30/03/2022	30/03/2022
Date analysed	-	31/03/2022	31/03/2022	31/03/2022	31/03/2022
TRH C_{10} - C_{14}	µg/L	<50	<50	<50	<50
TRH C_{15} - C_{28}	µg/L	<100	<100	<100	<100
TRH C_{29} - C_{36}	µg/L	<100	<100	<100	<100
Total +ve TRH (C10-C36)	µg/L	<50	<50	<50	<50
TRH >C_{10} - C_{16}	µg/L	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	µg/L	<50	<50	<50	<50
TRH >C_{16} - C_{34}	µg/L	<100	<100	<100	<100
TRH >C_{34} - C_{40}	µg/L	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	µg/L	<50	<50	<50	<50
Surrogate o-Terphenyl	%	93	93	88	90

PAHs in Water - Low Level					
Our Reference		291865-1	291865-2	291865-3	291865-4
Your Reference	UNITS	401	402	403	404
Date Sampled		24/03/2022	24/03/2022	24/03/2022	24/03/2022
Type of sample		Water	Water	Water	Water
Date extracted	-	30/03/2022	30/03/2022	30/03/2022	30/03/2022
Date analysed	-	30/03/2022	30/03/2022	30/03/2022	30/03/2022
Naphthalene	µg/L	<0.2	<0.2	<0.2	<0.2
Acenaphthylene	µg/L	<0.1	<0.1	<0.1	<0.1
Acenaphthene	µg/L	<0.1	<0.1	<0.1	<0.1
Fluorene	µg/L	<0.1	<0.1	<0.1	<0.1
Phenanthrene	µg/L	<0.1	<0.1	<0.1	<0.1
Anthracene	µg/L	<0.1	<0.1	<0.1	<0.1
Fluoranthene	µg/L	<0.1	<0.1	<0.1	<0.1
Pyrene	µg/L	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	µg/L	<0.1	<0.1	<0.1	<0.1
Chrysene	µg/L	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	µg/L	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	µg/L	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	µg/L	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	µg/L	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ	µg/L	<0.5	<0.5	<0.5	<0.5
Total +ve PAH's	µg/L	<0.1	<0.1	<0.1	<0.1
Surrogate p-Terphenyl-d14	%	75	77	73	72

All metals in water-dissolved					
Our Reference		291865-1	291865-2	291865-3	291865-4
Your Reference	UNITS	401	402	403	404
Date Sampled		24/03/2022	24/03/2022	24/03/2022	24/03/2022
Type of sample		Water	Water	Water	Water
Date prepared	-	28/03/2022	28/03/2022	28/03/2022	28/03/2022
Date analysed	-	28/03/2022	28/03/2022	28/03/2022	28/03/2022
Silver-Dissolved	µg/L	<1	<1	<1	<1
Aluminium-Dissolved	µg/L	20	<10	<10	40
Arsenic-Dissolved	µg/L	<1	1	<1	<1
Boron-Dissolved	µg/L	90	40	30	100
Cadmium-Dissolved	µg/L	<0.1	<0.1	<0.1	<0.1
Cobalt-Dissolved	µg/L	<1	<1	<1	2
Chromium-Dissolved	µg/L	<1	<1	<1	1
Copper-Dissolved	µg/L	<1	6	1	2
Mercury-Dissolved	µg/L	<0.05	<0.05	<0.05	<0.05
Manganese-Dissolved	µg/L	58	27	25	67
Molybdenum-Dissolved	µg/L	2	<1	<1	4
Nickel-Dissolved	µg/L	5	4	5	5
Lead-Dissolved	µg/L	<1	<1	<1	<1
Antimony-Dissolved	µg/L	3	1	<1	3
Selenium-Dissolved	µg/L	<1	<1	<1	2
Thallium-Dissolved	µg/L	<1	<1	<1	<1
Vanadium-Dissolved	µg/L	6	1	<1	2
Zinc-Dissolved	µg/L	51	150	390	28

Method ID	Methodology Summary
Metals-021	Determination of Mercury by Cold Vapour AAS.
Metals-022	Determination of various metals by ICP-MS.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Org-023	Water samples are analysed directly by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
Date extracted	-			26/03/2022	1	26/03/2022	29/03/2022		26/03/2022	[NT]
Date analysed	-			26/03/2022	1	26/03/2022	29/03/2022		26/03/2022	[NT]
TRH C_6 - C_9	µg/L	10	Org-023	<10	1	<10	<10	0	95	[NT]
TRH C_6 - C_{10}	µg/L	10	Org-023	<10	1	<10	<10	0	95	[NT]
Benzene	µg/L	1	Org-023	<1	1	<1	<1	0	99	[NT]
Toluene	µg/L	1	Org-023	<1	1	<1	<1	0	97	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	1	<1	<1	0	92	[NT]
m+p-xylene	µg/L	2	Org-023	<2	1	<2	<2	0	94	[NT]
o-xylene	µg/L	1	Org-023	<1	1	<1	<1	0	106	[NT]
Naphthalene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	90	1	95	94	1	104	[NT]
Surrogate toluene-d8	%		Org-023	91	1	114	123	8	115	[NT]
Surrogate 4-BFB	%		Org-023	99	1	103	97	6	102	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	291865-2
Date extracted	-			30/03/2022	1	30/03/2022	30/03/2022		30/03/2022	30/03/2022
Date analysed	-			31/03/2022	1	31/03/2022	31/03/2022		31/03/2022	31/03/2022
TRH C_{10} - C_{14}	µg/L	50	Org-020	<50	1	<50	<50	0	75	70
TRH C_{15} - C_{28}	µg/L	100	Org-020	<100	1	<100	<100	0	70	70
TRH C_{29} - C_{36}	µg/L	100	Org-020	<100	1	<100	<100	0	78	92
TRH >C_{10} - C_{16}	µg/L	50	Org-020	<50	1	<50	<50	0	75	70
TRH >C_{16} - C_{34}	µg/L	100	Org-020	<100	1	<100	<100	0	70	70
TRH >C_{34} - C_{40}	µg/L	100	Org-020	<100	1	<100	<100	0	78	92
Surrogate o-Terphenyl	%		Org-020	82	1	93	97	4	72	82

QUALITY CONTROL: PAHs in Water - Low Level						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			30/03/2022	1	30/03/2022	30/03/2022		30/03/2022	[NT]
Date analysed	-			30/03/2022	1	30/03/2022	30/03/2022		30/03/2022	[NT]
Naphthalene	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	78	[NT]
Acenaphthylene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	77	[NT]
Fluorene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	72	[NT]
Phenanthrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	84	[NT]
Anthracene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	78	[NT]
Pyrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	79	[NT]
Benzo(a)anthracene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chrysene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	95	[NT]
Benzo(b,j+k)fluoranthene	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	76	[NT]
Indeno(1,2,3-c,d)pyrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	82	1	75	74	1	85	[NT]

QUALITY CONTROL: All metals in water-dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
Date prepared	-			28/03/2022	[NT]	[NT]	[NT]	[NT]	28/03/2022	[NT]
Date analysed	-			28/03/2022	[NT]	[NT]	[NT]	[NT]	28/03/2022	[NT]
Silver-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	82	[NT]
Aluminium-Dissolved	µg/L	10	Metals-022	<10	[NT]	[NT]	[NT]	[NT]	106	[NT]
Arsenic-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	93	[NT]
Boron-Dissolved	µg/L	20	Metals-022	<20	[NT]	[NT]	[NT]	[NT]	97	[NT]
Cadmium-Dissolved	µg/L	0.1	Metals-022	<0.1	[NT]	[NT]	[NT]	[NT]	93	[NT]
Cobalt-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	90	[NT]
Chromium-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	92	[NT]
Copper-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	92	[NT]
Mercury-Dissolved	µg/L	0.05	Metals-021	<0.05	[NT]	[NT]	[NT]	[NT]	115	[NT]
Manganese-Dissolved	µg/L	5	Metals-022	<5	[NT]	[NT]	[NT]	[NT]	93	[NT]
Molybdenum-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	89	[NT]
Nickel-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	91	[NT]
Lead-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	91	[NT]
Antimony-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	92	[NT]
Selenium-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	88	[NT]
Thallium-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	92	[NT]
Vanadium-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	92	[NT]
Zinc-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	93	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

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Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
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LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

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CERTIFICATE OF ANALYSIS 290972

Client Details

Client	Douglas Partners Newcastle
Attention	Dana Wilson
Address	Box 324 Hunter Region Mail Centre, Newcastle, NSW, 2310

Sample Details

Your Reference	**102077.02, Newcastle**
Number of Samples	51 Soil, 2 Material
Date samples received	15/03/2022
Date completed instructions received	15/03/2022

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	22/03/2022
Date of Issue	22/03/2022

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Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		290972-1	290972-2	290972-3	290972-4	290972-5
Your Reference	UNITS	501/0.5	502/0.3	503/0.7	503/1.2	504/0.5
Date Sampled		13/03/2022	13/03/2022	13/03/2022	13/03/2022	13/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/03/2022	16/03/2022	16/03/2022	16/03/2022	16/03/2022
Date analysed	-	18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	97	95	99	93	100

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		290972-6	290972-7	290972-8	290972-9	290972-10
Your Reference	UNITS	505/0.8	506/1.2	D1/JPS	D9/JPS	401/1.0
Date Sampled		13/03/2022	13/03/2022	13/03/2022	13/03/2022	13/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/03/2022	16/03/2022	16/03/2022	16/03/2022	16/03/2022
Date analysed	-	18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	100	104	101	100	98

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		290972-11	290972-12	290972-13	290972-14	290972-15
Your Reference	UNITS	402/2.0	403/0.3	403/1.5	404/0.5	401/2.0
Date Sampled		13/03/2022	13/03/2022	13/03/2022	13/03/2022	13/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/03/2022	16/03/2022	16/03/2022	16/03/2022	16/03/2022
Date analysed	-	18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	94	101	99	103	98

vTRH(C6-C10)/BTEXN in Soil					
Our Reference		290972-16	290972-17	290972-18	290972-19
Your Reference	UNITS	401/3.5	402/3.5	403/4.0	404/3.5
Date Sampled		13/03/2022	13/03/2022	13/03/2022	13/03/2022
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	16/03/2022	16/03/2022	16/03/2022	16/03/2022
Date analysed	-	18/03/2022	18/03/2022	18/03/2022	18/03/2022
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	97	94	95	93

svTRH (C10-C40) in Soil						
Our Reference		290972-1	290972-2	290972-3	290972-4	290972-5
Your Reference	UNITS	501/0.5	502/0.3	503/0.7	503/1.2	504/0.5
Date Sampled		13/03/2022	13/03/2022	13/03/2022	13/03/2022	13/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/03/2022	16/03/2022	16/03/2022	16/03/2022	16/03/2022
Date analysed	-	18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	52	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	140	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	120	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50	320	<50
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	240	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	240	<50
Surrogate o-Terphenyl	%	92	97	113	#	83

svTRH (C10-C40) in Soil						
Our Reference		290972-6	290972-7	290972-8	290972-9	290972-10
Your Reference	UNITS	505/0.8	506/1.2	D1/JPS	D9/JPS	401/1.0
Date Sampled		13/03/2022	13/03/2022	13/03/2022	13/03/2022	13/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/03/2022	16/03/2022	16/03/2022	16/03/2022	16/03/2022
Date analysed	-	18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	120
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50	<50	120
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	130	<100	<100	<100	170
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	130	<50	<50	<50	170
Surrogate o-Terphenyl	%	89	96	105	129	85

svTRH (C10-C40) in Soil						
Our Reference		290972-11	290972-12	290972-13	290972-14	290972-15
Your Reference	UNITS	402/2.0	403/0.3	403/1.5	404/0.5	401/2.0
Date Sampled		13/03/2022	13/03/2022	13/03/2022	13/03/2022	13/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/03/2022	16/03/2022	16/03/2022	16/03/2022	16/03/2022
Date analysed	-	18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	110	<100	120
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	110	<50	120
Surrogate o-Terphenyl	%	90	86	86	87	88

svTRH (C10-C40) in Soil					
Our Reference		290972-16	290972-17	290972-18	290972-19
Your Reference	UNITS	401/3.5	402/3.5	403/4.0	404/3.5
Date Sampled		13/03/2022	13/03/2022	13/03/2022	13/03/2022
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	16/03/2022	16/03/2022	16/03/2022	16/03/2022
Date analysed	-	18/03/2022	18/03/2022	18/03/2022	18/03/2022
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50	<50
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50
Surrogate o-Terphenyl	%	86	82	98	83

PAHs in Soil						
Our Reference		290972-1	290972-2	290972-3	290972-4	290972-5
Your Reference	UNITS	501/0.5	502/0.3	503/0.7	503/1.2	504/0.5
Date Sampled		13/03/2022	13/03/2022	13/03/2022	13/03/2022	13/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
Date analysed	-	18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1	<0.1	0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	1.3	0.3	0.8	1.1	0.2
Anthracene	mg/kg	0.3	<0.1	0.2	0.2	0.1
Fluoranthene	mg/kg	2.1	0.8	1.9	2.8	0.5
Pyrene	mg/kg	1.9	0.8	1.8	2.8	0.6
Benzo(a)anthracene	mg/kg	1.5	0.5	0.8	1.6	0.7
Chrysene	mg/kg	0.8	0.4	0.8	1.2	0.3
Benzo(b,j+k)fluoranthene	mg/kg	2	0.8	1	2.4	0.7
Benzo(a)pyrene	mg/kg	0.71	0.3	0.69	1.1	0.3
Indeno(1,2,3-c,d)pyrene	mg/kg	0.3	0.2	0.4	0.6	0.2
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	0.4	0.3	0.6	0.9	0.2
Total +ve PAH's	mg/kg	11	4.3	9.5	15	3.9
Benzo(a)pyrene TEQ calc (zero)	mg/kg	1.1	<0.5	1	1.7	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	1.1	0.5	1.0	1.7	0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	1.2	0.6	1.1	1.7	0.6
Surrogate p-Terphenyl-d14	%	102	101	99	101	98

PAHs in Soil						
Our Reference		290972-6	290972-7	290972-8	290972-9	290972-10
Your Reference	UNITS	505/0.8	506/1.2	D1/JPS	D9/JPS	401/1.0
Date Sampled		13/03/2022	13/03/2022	13/03/2022	13/03/2022	13/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
Date analysed	-	18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.1
Acenaphthylene	mg/kg	0.2	0.1	0.1	<0.1	0.2
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	1.0	0.6	0.3	0.8	0.7
Anthracene	mg/kg	0.4	0.2	0.1	0.2	0.2
Fluoranthene	mg/kg	2.6	1.7	1.1	1.3	1.4
Pyrene	mg/kg	2.6	1.7	1.1	1.2	1.4
Benzo(a)anthracene	mg/kg	2.2	1.4	1	0.8	1.6
Chrysene	mg/kg	1.4	0.9	0.6	0.5	0.9
Benzo(b,j+k)fluoranthene	mg/kg	2.4	2	1	1	2
Benzo(a)pyrene	mg/kg	1.3	0.83	0.59	0.5	0.93
Indeno(1,2,3-c,d)pyrene	mg/kg	0.5	0.4	0.3	0.2	0.4
Dibenzo(a,h)anthracene	mg/kg	0.1	0.1	<0.1	<0.1	0.1
Benzo(g,h,i)perylene	mg/kg	0.7	0.5	0.4	0.3	0.6
Total +ve PAH's	mg/kg	16	10	6.9	7.0	10
Benzo(a)pyrene TEQ calc (zero)	mg/kg	1.9	1.3	0.9	0.7	1.4
Benzo(a)pyrene TEQ calc(half)	mg/kg	1.9	1.3	0.9	0.8	1.4
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	1.9	1.3	1	0.8	1.4
Surrogate p-Terphenyl-d14	%	87	103	108	97	99

PAHs in Soil						
Our Reference		290972-11	290972-12	290972-13	290972-14	290972-15
Your Reference	UNITS	402/2.0	403/0.3	403/1.5	404/0.5	401/2.0
Date Sampled		13/03/2022	13/03/2022	13/03/2022	13/03/2022	13/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
Date analysed	-	18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.2
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.3
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	<0.1	0.5	0.1	1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.4
Fluoranthene	mg/kg	<0.1	0.2	0.3	0.6	1.9
Pyrene	mg/kg	<0.1	0.2	0.3	0.6	1.8
Benzo(a)anthracene	mg/kg	<0.1	0.1	0.2	0.4	2.2
Chrysene	mg/kg	<0.1	0.1	0.2	0.4	1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	0.3	0.2	0.7	2.1
Benzo(a)pyrene	mg/kg	<0.05	0.1	0.07	0.3	0.99
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	0.2	0.4
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	0.1	<0.1	0.3	0.6
Total +ve PAH's	mg/kg	0.1	1.1	1.8	3.5	13
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	1.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	1.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	0.5	1.6
Surrogate p-Terphenyl-d14	%	99	81	97	97	98

PAHs in Soil					
Our Reference		290972-16	290972-17	290972-18	290972-19
Your Reference	UNITS	401/3.5	402/3.5	403/4.0	404/3.5
Date Sampled		13/03/2022	13/03/2022	13/03/2022	13/03/2022
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	18/03/2022	18/03/2022	18/03/2022	18/03/2022
Date analysed	-	18/03/2022	18/03/2022	18/03/2022	18/03/2022
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	82	93	101	87

Organochlorine Pesticides in soil						
Our Reference		290972-1	290972-2	290972-3	290972-4	290972-5
Your Reference	UNITS	501/0.5	502/0.3	503/0.7	503/1.2	504/0.5
Date Sampled		13/03/2022	13/03/2022	13/03/2022	13/03/2022	13/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
Date analysed	-	18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	98	98	98	97	95

Organochlorine Pesticides in soil						
Our Reference		290972-6	290972-7	290972-8	290972-9	290972-10
Your Reference	UNITS	505/0.8	506/1.2	D1/JPS	D9/JPS	401/1.0
Date Sampled		13/03/2022	13/03/2022	13/03/2022	13/03/2022	13/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
Date analysed	-	18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	92	99	98	89	98

Organochlorine Pesticides in soil					
Our Reference		290972-11	290972-12	290972-13	290972-14
Your Reference	UNITS	402/2.0	403/0.3	403/1.5	404/0.5
Date Sampled		13/03/2022	13/03/2022	13/03/2022	13/03/2022
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	18/03/2022	18/03/2022	18/03/2022	18/03/2022
Date analysed	-	18/03/2022	18/03/2022	18/03/2022	18/03/2022
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	97	84	96	95

Organophosphorus Pesticides in Soil						
Our Reference		290972-1	290972-2	290972-3	290972-4	290972-5
Your Reference	UNITS	501/0.5	502/0.3	503/0.7	503/1.2	504/0.5
Date Sampled		13/03/2022	13/03/2022	13/03/2022	13/03/2022	13/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
Date analysed	-	18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	98	98	98	97	95

Organophosphorus Pesticides in Soil						
Our Reference		290972-6	290972-7	290972-8	290972-9	290972-10
Your Reference	UNITS	505/0.8	506/1.2	D1/JPS	D9/JPS	401/1.0
Date Sampled		13/03/2022	13/03/2022	13/03/2022	13/03/2022	13/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
Date analysed	-	18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	92	99	98	89	98

Organophosphorus Pesticides in Soil					
Our Reference		290972-11	290972-12	290972-13	290972-14
Your Reference	UNITS	402/2.0	403/0.3	403/1.5	404/0.5
Date Sampled		13/03/2022	13/03/2022	13/03/2022	13/03/2022
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	18/03/2022	18/03/2022	18/03/2022	18/03/2022
Date analysed	-	18/03/2022	18/03/2022	18/03/2022	18/03/2022
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	97	84	96	95

PCBs in Soil						
Our Reference		290972-1	290972-2	290972-3	290972-4	290972-5
Your Reference	UNITS	501/0.5	502/0.3	503/0.7	503/1.2	504/0.5
Date Sampled		13/03/2022	13/03/2022	13/03/2022	13/03/2022	13/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
Date analysed	-	18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	98	98	98	97	95

PCBs in Soil						
Our Reference		290972-6	290972-7	290972-8	290972-9	290972-10
Your Reference	UNITS	505/0.8	506/1.2	D1/JPS	D9/JPS	401/1.0
Date Sampled		13/03/2022	13/03/2022	13/03/2022	13/03/2022	13/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
Date analysed	-	18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	92	99	98	89	98

PCBs in Soil					
Our Reference		290972-11	290972-12	290972-13	290972-14
Your Reference	UNITS	402/2.0	403/0.3	403/1.5	404/0.5
Date Sampled		13/03/2022	13/03/2022	13/03/2022	13/03/2022
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	18/03/2022	18/03/2022	18/03/2022	18/03/2022
Date analysed	-	18/03/2022	18/03/2022	18/03/2022	18/03/2022
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	97	84	96	95

Acid Extractable metals in soil						
Our Reference		290972-1	290972-2	290972-3	290972-4	290972-5
Your Reference	UNITS	501/0.5	502/0.3	503/0.7	503/1.2	504/0.5
Date Sampled		13/03/2022	13/03/2022	13/03/2022	13/03/2022	13/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	16/03/2022	16/03/2022	16/03/2022	16/03/2022	16/03/2022
Date analysed	-	17/03/2022	17/03/2022	17/03/2022	17/03/2022	17/03/2022
Arsenic	mg/kg	5	<4	<4	<4	4
Cadmium	mg/kg	<0.4	0.9	<0.4	1	<0.4
Chromium	mg/kg	7	8	7	9	7
Copper	mg/kg	27	66	53	89	53
Lead	mg/kg	180	750	140	290	790
Mercury	mg/kg	0.2	0.5	0.1	0.4	0.8
Nickel	mg/kg	7	14	23	25	8
Zinc	mg/kg	150	450	170	460	260
Manganese	mg/kg	130	210	250	590	160
Iron	mg/kg	6,200	6,300	10,000	11,000	5,600
Aluminium	mg/kg	3,900	5,300	4,600	6,200	5,000
Selenium	mg/kg	<2	<2	<2	<2	<2
Tin	mg/kg	6	17	49	14	13
Antimony	mg/kg	<7	<7	8	<7	<7
Magnesium	mg/kg	490	560	520	830	650
Cobalt	mg/kg	2	4	7	5	3
Boron	mg/kg	7	10	38	30	9

Acid Extractable metals in soil						
Our Reference		290972-6	290972-7	290972-8	290972-9	290972-10
Your Reference	UNITS	505/0.8	506/1.2	D1/JPS	D9/JPS	401/1.0
Date Sampled		13/03/2022	13/03/2022	13/03/2022	13/03/2022	13/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	16/03/2022	16/03/2022	16/03/2022	16/03/2022	16/03/2022
Date analysed	-	17/03/2022	17/03/2022	17/03/2022	17/03/2022	17/03/2022
Arsenic	mg/kg	4	<4	6	5	<4
Cadmium	mg/kg	<0.4	<0.4	0.7	<0.4	<0.4
Chromium	mg/kg	8	170	90	8	7
Copper	mg/kg	65	100	65	26	150
Lead	mg/kg	530	300	400	150	120
Mercury	mg/kg	0.6	1.0	0.3	0.1	0.3
Nickel	mg/kg	6	7	9	6	17
Zinc	mg/kg	170	250	1,100	130	210
Manganese	mg/kg	1,500	150	98	150	180
Iron	mg/kg	39,000	7,600	20,000	5,200	13,000
Aluminium	mg/kg	6,000	2,900	2,000	4,300	4,100
Selenium	mg/kg	3	<2	<2	<2	<2
Tin	mg/kg	8	7	4	7	8
Antimony	mg/kg	<7	<7	<7	<7	<7
Magnesium	mg/kg	650	680	370	500	2,100
Cobalt	mg/kg	3	3	4	2	8
Boron	mg/kg	5	<3	<3	7	5

Acid Extractable metals in soil						
Our Reference		290972-11	290972-12	290972-13	290972-14	290972-15
Your Reference	UNITS	402/2.0	403/0.3	403/1.5	404/0.5	401/2.0
Date Sampled		13/03/2022	13/03/2022	13/03/2022	13/03/2022	13/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	16/03/2022	16/03/2022	16/03/2022	16/03/2022	16/03/2022
Date analysed	-	17/03/2022	17/03/2022	17/03/2022	17/03/2022	17/03/2022
Arsenic	mg/kg	<4	<4	23	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	7	5	7	44	8
Copper	mg/kg	52	16	16	71	230
Lead	mg/kg	160	58	97	73	65
Mercury	mg/kg	0.5	<0.1	0.1	0.2	0.2
Nickel	mg/kg	25	3	5	5	21
Zinc	mg/kg	240	50	360	170	68
Manganese	mg/kg	68	200	280	94	140
Iron	mg/kg	4,900	4,900	8,500	4,500	20,000
Aluminium	mg/kg	11,000	3,300	4,000	2,800	5,100
Selenium	mg/kg	<2	<2	<2	<2	<2
Tin	mg/kg	15	3	2	5	4
Antimony	mg/kg	<7	<7	<7	<7	<7
Magnesium	mg/kg	740	900	1,100	430	3,300
Cobalt	mg/kg	18	2	2	3	12
Boron	mg/kg	7	<3	<3	7	<3

Acid Extractable metals in soil						
Our Reference		290972-16	290972-17	290972-18	290972-19	290972-54
Your Reference	UNITS	401/3.5	402/3.5	403/4.0	404/3.5	501/0.5 - [TRIPLICATE]
Date Sampled		13/03/2022	13/03/2022	13/03/2022	13/03/2022	13/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	16/03/2022	16/03/2022	16/03/2022	16/03/2022	16/03/2022
Date analysed	-	17/03/2022	17/03/2022	17/03/2022	17/03/2022	17/03/2022
Arsenic	mg/kg	<4	<4	<4	<4	5
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	1	<1	1	<1	7
Copper	mg/kg	<1	<1	<1	<1	29
Lead	mg/kg	2	<1	1	<1	170
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	0.2
Nickel	mg/kg	1	1	<1	<1	7
Zinc	mg/kg	2	2	1	<1	150
Manganese	mg/kg	3	4	4	2	220
Iron	mg/kg	440	810	350	280	6,600
Aluminium	mg/kg	910	830	890	600	3,800
Selenium	mg/kg	3	<2	<2	<2	<2
Tin	mg/kg	<1	<1	<1	<1	6
Antimony	mg/kg	<7	<7	<7	<7	<7
Magnesium	mg/kg	90	60	90	60	530
Cobalt	mg/kg	<1	<1	<1	<1	2
Boron	mg/kg	<3	<3	<3	<3	9

Acid Extractable metals in soil		
Our Reference		290972-55
Your Reference	UNITS	402/2.0 - [TRIPLICATE]
Date Sampled		13/03/2022
Type of sample		Soil
Date prepared	-	16/03/2022
Date analysed	-	17/03/2022
Arsenic	mg/kg	<4
Cadmium	mg/kg	<0.4
Chromium	mg/kg	4
Copper	mg/kg	32
Lead	mg/kg	72
Mercury	mg/kg	0.4
Nickel	mg/kg	8
Zinc	mg/kg	97
Manganese	mg/kg	140
Iron	mg/kg	7,900
Aluminium	mg/kg	4,000
Selenium	mg/kg	<2
Tin	mg/kg	9
Antimony	mg/kg	<7
Magnesium	mg/kg	420
Cobalt	mg/kg	5
Boron	mg/kg	<3

Moisture						
Our Reference		290972-1	290972-2	290972-3	290972-4	290972-5
Your Reference	UNITS	501/0.5	502/0.3	503/0.7	503/1.2	504/0.5
Date Sampled		13/03/2022	13/03/2022	13/03/2022	13/03/2022	13/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	16/03/2022	16/03/2022	16/03/2022	16/03/2022	16/03/2022
Date analysed	-	17/03/2022	17/03/2022	17/03/2022	17/03/2022	17/03/2022
Moisture	%	10	17	14	17	13

Moisture						
Our Reference		290972-6	290972-7	290972-8	290972-9	290972-10
Your Reference	UNITS	505/0.8	506/1.2	D1/JPS	D9/JPS	401/1.0
Date Sampled		13/03/2022	13/03/2022	13/03/2022	13/03/2022	13/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	16/03/2022	16/03/2022	16/03/2022	16/03/2022	16/03/2022
Date analysed	-	17/03/2022	17/03/2022	17/03/2022	17/03/2022	17/03/2022
Moisture	%	4.7	6.9	5.7	4.8	15

Moisture						
Our Reference		290972-11	290972-12	290972-13	290972-14	290972-15
Your Reference	UNITS	402/2.0	403/0.3	403/1.5	404/0.5	401/2.0
Date Sampled		13/03/2022	13/03/2022	13/03/2022	13/03/2022	13/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	16/03/2022	16/03/2022	16/03/2022	16/03/2022	16/03/2022
Date analysed	-	17/03/2022	17/03/2022	17/03/2022	17/03/2022	17/03/2022
Moisture	%	13	11	15	7.3	15

Moisture					
Our Reference		290972-16	290972-17	290972-18	290972-19
Your Reference	UNITS	401/3.5	402/3.5	403/4.0	404/3.5
Date Sampled		13/03/2022	13/03/2022	13/03/2022	13/03/2022
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	16/03/2022	16/03/2022	16/03/2022	16/03/2022
Date analysed	-	17/03/2022	17/03/2022	17/03/2022	17/03/2022
Moisture	%	20	14	18	13

Asbestos ID - soils						
Our Reference		290972-10	290972-11	290972-12	290972-13	290972-14
Your Reference	UNITS	401/1.0	402/2.0	403/0.3	403/1.5	404/0.5
Date Sampled		13/03/2022	13/03/2022	13/03/2022	13/03/2022	13/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	22/03/2022	22/03/2022	22/03/2022	22/03/2022	22/03/2022
Sample mass tested	g	Approx 40g	Approx 40g	Approx 70g	Approx 45g	Approx 40g
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown sandy soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Asbestos comments	-	NO	NO	NO	NO	NO
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils NEPM						
Our Reference		290972-20	290972-21	290972-22	290972-23	290972-24
Your Reference	UNITS	501/0.4-0.7	502/0.3-1.2	503/0.2-1.0	503/1.2-2.0	504/0.1-0.15
Date Sampled		13/03/2022	13/03/2022	13/03/2022	13/03/2022	13/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
Sample mass tested	g	731.32	537.82	534.8	508.47	765.18
Sample Description	-	Brown coarse-grained soil & rocks	Brown fine-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected
Total Asbestos[#1]	g/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	–	–	–	–	–
FA and AF Estimation*	g	–	–	–	–	–
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	<0.001	<0.001

Asbestos ID - soils NEPM						
Our Reference		290972-25	290972-26	290972-27	290972-28	290972-29
Your Reference	UNITS	504/0.3-1.0	504/1.2-1.3	505/0.2-1.1	505/1.25-1.35	506/0.1-0.15
Date Sampled		13/03/2022	13/03/2022	13/03/2022	13/03/2022	13/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
Sample mass tested	g	570.33	630.31	867.73	550.49	939.1
Sample Description	-	Brown coarse-grained soil & rocks	Brown sandy soil	Brown coarse-grained soil & rocks	Brown sandy soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected
Total Asbestos[#1]	g/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	–	–	–	–	–
FA and AF Estimation*	g	–	–	–	–	–
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	<0.001	<0.001

Asbestos ID - soils NEPM			
Our Reference		290972-30	290972-31
Your Reference	UNITS	506/0.3-0.7	506/1-1.4
Date Sampled		13/03/2022	13/03/2022
Type of sample		Soil	Soil
Date analysed	-	18/03/2022	18/03/2022
Sample mass tested	g	810.56	630.31
Sample Description	-	Brown sandy soil & rocks	Brown sandy soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected
Total Asbestos[#1]	g/kg	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	–	–
FA and AF Estimation*	g	–	–
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001

sPOCAS field test						
Our Reference		290972-15	290972-16	290972-18	290972-19	290972-34
Your Reference	UNITS	401/2.0	401/3.5	403/4.0	404/3.5	401/2.5
Date Sampled		13/03/2022	13/03/2022	13/03/2022	13/03/2022	13/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	21/03/2022	21/03/2022	21/03/2022	21/03/2022	21/03/2022
Date analysed	-	21/03/2022	21/03/2022	21/03/2022	21/03/2022	21/03/2022
pH_F (field pH test)*	pH Units	7.0	7.6	7.4	6.5	6.7
pH_{FOX} (field peroxide test)*	pH Units	4.5	5.4	5.4	4.0	3.7
Reaction Rate*	-	Low reaction	Low reaction	Low reaction	Low reaction	Medium reaction

sPOCAS field test						
Our Reference		290972-35	290972-36	290972-37	290972-38	290972-39
Your Reference	UNITS	401/3.0	401/4.0	401/4.5	401/5.0	403/2.5
Date Sampled		13/03/2022	13/03/2022	13/03/2022	13/03/2022	13/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	21/03/2022	21/03/2022	21/03/2022	21/03/2022	21/03/2022
Date analysed	-	21/03/2022	21/03/2022	21/03/2022	21/03/2022	21/03/2022
pH_F (field pH test)*	pH Units	7.0	6.5	6.9	6.6	6.0
pH_{FOX} (field peroxide test)*	pH Units	5.0	5.3	5.1	3.5	1.5
Reaction Rate*	-	Low reaction	Low reaction	Low reaction	High reaction	High reaction

sPOCAS field test						
Our Reference		290972-40	290972-41	290972-42	290972-43	290972-44
Your Reference	UNITS	403/3.0	403/3.5	403/4.5	403/5.0	404/2.5
Date Sampled		13/03/2022	13/03/2022	13/03/2022	13/03/2022	13/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	21/03/2022	21/03/2022	21/03/2022	21/03/2022	21/03/2022
Date analysed	-	21/03/2022	21/03/2022	21/03/2022	21/03/2022	21/03/2022
pH_F (field pH test)*	pH Units	6.6	6.8	6.1	6.5	5.2
pH_{FOX} (field peroxide test)*	pH Units	1.8	1.7	5.7	5.8	1.6
Reaction Rate*	-	Extreme reaction	Volcanic reaction	Low reaction	Low reaction	Medium reaction

sPOCAS field test						
Our Reference		290972-45	290972-46	290972-47	290972-48	290972-49
Your Reference	UNITS	404/3.0	404/4.5	404/5.0	502/1.4	502/1.7
Date Sampled		13/03/2022	13/03/2022	13/03/2022	13/03/2022	13/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	21/03/2022	21/03/2022	21/03/2022	21/03/2022	21/03/2022
Date analysed	-	21/03/2022	21/03/2022	21/03/2022	21/03/2022	21/03/2022
pH_F (field pH test)*	pH Units	6.0	6.2	6.3	7.5	7.6
pH_{FOX} (field peroxide test)*	pH Units	2.2	3.6	2.7	5.6	5.7
Reaction Rate*	-	Medium reaction	Low reaction	Medium reaction	High reaction	Low reaction

sPOCAS field test				
Our Reference		290972-50	290972-51	290972-52
Your Reference	UNITS	503/2.4	504/1.7	505/1.7
Date Sampled		13/03/2022	13/03/2022	13/03/2022
Type of sample		Soil	Soil	Soil
Date prepared	-	21/03/2022	21/03/2022	21/03/2022
Date analysed	-	21/03/2022	21/03/2022	21/03/2022
pH_F (field pH test)*	pH Units	7.0	6.6	6.5
pH_{FOX} (field peroxide test)*	pH Units	5.7	5.6	5.4
Reaction Rate*	-	Low reaction	Low reaction	Low reaction

Asbestos ID - materials			
Our Reference	UNITS	290972-32	290972-33
Your Reference		506/1-1.4F	503/1.2-2.0F
Date Sampled		13/03/2022	13/03/2022
Type of sample		Material	Material
Date analysed	-	16/03/2022	16/03/2022
Mass / Dimension of Sample	-	30x20x4mm	45x23x5mm
Sample Description	-	Beige fibre cement material	Beige fibre cement material
Asbestos ID in materials	-	Chrysotile asbestos detected Amosite asbestos detected Organic fibres detected	Chrysotile asbestos detected Amosite asbestos detected Organic fibres detected
Trace Analysis	-	[NT]	[NT]

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
ASB-001	Asbestos ID - Identification of asbestos in soil samples using Polarised Light Microscopy and Dispersion Staining Techniques. Minimum 500mL soil sample was analysed as recommended by "National Environment Protection (Assessment of site contamination) Measure, Schedule B1 and "The Guidelines from the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia - May 2009" with a reporting limit of 0.1g/kg (0.01% w/w) as per Australian Standard AS4964-2004. Results reported denoted with * are outside our scope of NATA accreditation. **NOTE** #1 Total Asbestos g/kg was analysed and reported as per Australian Standard AS4964 (This is the sum of ACM >7mm, <7mm and FA/AF) **NOTE** #2 The screening level of 0.001% w/w asbestos in soil for FA and AF only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres. Estimation = Estimated asbestos weight Results reported with "--" is equivalent to no visible asbestos identified using Polarised Light microscopy and Dispersion Staining Techniques.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Inorg-063	pH- measured using pH meter and electrode. Soil is oxidised with Hydrogen Peroxide or extracted with water. Based on section H, Acid Sulfate Soils Laboratory Methods Guidelines, Version 2.1 - June 2004. To ensure accurate results these tests are recommended to be done in the field as pH may change with time thus these results may not be representative of true field conditions.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.

Method ID	Methodology Summary
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-022	Determination of VOCs sampled onto coconut shell charcoal sorbent tubes, that can be desorbed using carbon disulphide, and analysed by GC-MS.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.
Org-022/025	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-MS/GC-MSMS. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS and/or GC-MS/MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ PQL'values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero'values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL'values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-17	290972-2
Date extracted	-			16/03/2022	1	16/03/2022	16/03/2022		16/03/2022	16/03/2022
Date analysed	-			18/03/2022	1	18/03/2022	18/03/2022		18/03/2022	18/03/2022
TRH C_6 - C_9	mg/kg	25	Org-023	<25	1	<25	<25	0	96	87
TRH C_6 - C_{10}	mg/kg	25	Org-023	<25	1	<25	<25	0	96	87
Benzene	mg/kg	0.2	Org-023	<0.2	1	<0.2	<0.2	0	104	96
Toluene	mg/kg	0.5	Org-023	<0.5	1	<0.5	<0.5	0	96	85
Ethylbenzene	mg/kg	1	Org-023	<1	1	<1	<1	0	96	87
m+p-xylene	mg/kg	2	Org-023	<2	1	<2	<2	0	92	83
o-Xylene	mg/kg	1	Org-023	<1	1	<1	<1	0	105	95
Naphthalene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	100	1	97	102	5	105	96

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	11	16/03/2022	16/03/2022		[NT]	[NT]
Date analysed	-			[NT]	11	18/03/2022	18/03/2022		[NT]	[NT]
TRH C_6 - C_9	mg/kg	25	Org-023	[NT]	11	<25	<25	0	[NT]	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-023	[NT]	11	<25	<25	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-023	[NT]	11	<0.2	<0.2	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-023	[NT]	11	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-023	[NT]	11	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-023	[NT]	11	<2	<2	0	[NT]	[NT]
o-Xylene	mg/kg	1	Org-023	[NT]	11	<1	<1	0	[NT]	[NT]
Naphthalene	mg/kg	1	Org-023	[NT]	11	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	[NT]	11	94	98	4	[NT]	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-17	290972-2
Date extracted	-			16/03/2022	1	16/03/2022	16/03/2022		16/03/2022	16/03/2022
Date analysed	-			18/03/2022	1	18/03/2022	18/03/2022		18/03/2022	18/03/2022
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	1	<50	<50	0	94	85
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	1	<100	<100	0	88	108
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	1	<100	<100	0	103	131
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	1	<50	<50	0	94	85
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	1	<100	<100	0	88	108
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	1	<100	<100	0	103	131
Surrogate o-Terphenyl	%		Org-020	84	1	92	93	1	86	88

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	11	16/03/2022	16/03/2022		[NT]	[NT]
Date analysed	-			[NT]	11	18/03/2022	18/03/2022		[NT]	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-020	[NT]	11	<50	<50	0	[NT]	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-020	[NT]	11	<100	<100	0	[NT]	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-020	[NT]	11	<100	<100	0	[NT]	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	[NT]	11	<50	<50	0	[NT]	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	[NT]	11	<100	<100	0	[NT]	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	[NT]	11	<100	<100	0	[NT]	[NT]
Surrogate o-Terphenyl	%		Org-020	[NT]	11	90	93	3	[NT]	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	290972-2
Date extracted	-			18/03/2022	1	18/03/2022	18/03/2022		18/03/2022	18/03/2022
Date analysed	-			18/03/2022	1	18/03/2022	18/03/2022		18/03/2022	18/03/2022
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	93	102
Acenaphthylene	mg/kg	0.1	Org-022/025	<0.1	1	0.1	0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	91	111
Fluorene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	86	103
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	1	1.3	1.2	8	90	118
Anthracene	mg/kg	0.1	Org-022/025	<0.1	1	0.3	0.4	29	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	<0.1	1	2.1	2.2	5	82	99
Pyrene	mg/kg	0.1	Org-022/025	<0.1	1	1.9	2.1	10	85	104
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	<0.1	1	1.5	1.5	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	<0.1	1	0.8	0.9	12	81	83
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	<0.2	1	2	2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	<0.05	1	0.71	0.88	21	76	88
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	<0.1	1	0.3	0.4	29	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	<0.1	1	0.4	0.6	40	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	100	1	102	109	7	86	103

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	11	18/03/2022	18/03/2022		[NT]	[NT]
Date analysed	-			[NT]	11	18/03/2022	18/03/2022		[NT]	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	[NT]	11	0.1	0.1	0	[NT]	[NT]
Anthracene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Pyrene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	[NT]	11	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	[NT]	11	<0.05	<0.05	0	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	[NT]	11	99	109	10	[NT]	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	290972-2
Date extracted	-			18/03/2022	1	18/03/2022	18/03/2022		18/03/2022	18/03/2022
Date analysed	-			18/03/2022	1	18/03/2022	18/03/2022		18/03/2022	18/03/2022
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	82	94
HCB	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	82	96
gamma-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	79	97
delta-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	89	109
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	90	96
gamma-Chlordane	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	84	103
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	88	106
Endrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	94	103
Endosulfan II	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	86	104
Endrin Aldehyde	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	84	108
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	96	1	98	104	6	82	96

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	11	18/03/2022	18/03/2022		[NT]	[NT]
Date analysed	-			[NT]	11	18/03/2022	18/03/2022		[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
HCB	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
gamma-BHC	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
delta-BHC	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Endrin	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	[NT]	11	97	106	9	[NT]	[NT]

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	290972-2
Date extracted	-			18/03/2022	1	18/03/2022	18/03/2022		18/03/2022	18/03/2022
Date analysed	-			18/03/2022	1	18/03/2022	18/03/2022		18/03/2022	18/03/2022
Dichlorvos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	111	114
Dimethoate	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	77	93
Fenitrothion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	75	87
Malathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	110	114
Chlorpyriphos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	86	102
Parathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	72	84
Bromophos-ethyl	mg/kg	0.1	Org-022	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	80	105
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	96	1	98	104	6	82	96

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	11	18/03/2022	18/03/2022		[NT]	[NT]
Date analysed	-			[NT]	11	18/03/2022	18/03/2022		[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Fenitrothion	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Malathion	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Parathion	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-022	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	[NT]	11	97	106	9	[NT]	[NT]

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	290972-2
Date extracted	-			18/03/2022	1	18/03/2022	18/03/2022		18/03/2022	18/03/2022
Date analysed	-			18/03/2022	1	18/03/2022	18/03/2022		18/03/2022	18/03/2022
Aroclor 1016	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	90	100
Aroclor 1260	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	96	1	98	104	6	82	96

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	11	18/03/2022	18/03/2022		[NT]	[NT]
Date analysed	-			[NT]	11	18/03/2022	18/03/2022		[NT]	[NT]
Aroclor 1016	mg/kg	0.1	Org-021	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1260	mg/kg	0.1	Org-021	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	[NT]	11	97	106	9	[NT]	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-17	290972-2
Date prepared	-			16/03/2022	1	16/03/2022	16/03/2022		16/03/2022	16/03/2022
Date analysed	-			17/03/2022	1	17/03/2022	17/03/2022		17/03/2022	17/03/2022
Arsenic	mg/kg	4	Metals-020	<4	1	5	6	18	83	84
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	81	72
Chromium	mg/kg	1	Metals-020	<1	1	7	6	15	90	81
Copper	mg/kg	1	Metals-020	<1	1	27	27	0	85	94
Lead	mg/kg	1	Metals-020	<1	1	180	180	0	84	#
Mercury	mg/kg	0.1	Metals-021	<0.1	1	0.2	0.1	67	89	85
Nickel	mg/kg	1	Metals-020	<1	1	7	7	0	83	81
Zinc	mg/kg	1	Metals-020	<1	1	150	160	6	78	#
Manganese	mg/kg	1	Metals-020	<1	1	130	310	82	87	#
Iron	mg/kg	10	Metals-020	<10	1	6200	6200	0	86	#
Aluminium	mg/kg	10	Metals-020	<10	1	3900	3800	3	85	#
Selenium	mg/kg	2	Metals-020	<2	1	<2	<2	0	78	76
Tin	mg/kg	1	Metals-020	<1	1	6	6	0	86	120
Antimony	mg/kg	7	Metals-020	<7	1	<7	<7	0	87	75
Magnesium	mg/kg	10	Metals-020	<10	1	490	450	9	81	111
Cobalt	mg/kg	1	Metals-020	<1	1	2	2	0	82	78
Boron	mg/kg	3	Metals-020	<3	1	7	10	35	82	87

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	11	16/03/2022	16/03/2022		[NT]	[NT]
Date analysed	-			[NT]	11	17/03/2022	17/03/2022		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	11	<4	<4	0	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	11	<0.4	<0.4	0	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	11	7	7	0	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	11	52	59	13	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	11	160	130	21	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	11	0.5	0.7	33	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	11	25	15	50	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	11	240	170	34	[NT]	[NT]
Manganese	mg/kg	1	Metals-020	[NT]	11	68	260	117	[NT]	[NT]
Iron	mg/kg	10	Metals-020	[NT]	11	4900	15000	102	[NT]	[NT]
Aluminium	mg/kg	10	Metals-020	[NT]	11	11000	7100	43	[NT]	[NT]
Selenium	mg/kg	2	Metals-020	[NT]	11	<2	<2	0	[NT]	[NT]
Tin	mg/kg	1	Metals-020	[NT]	11	15	17	12	[NT]	[NT]
Antimony	mg/kg	7	Metals-020	[NT]	11	<7	<7	0	[NT]	[NT]
Magnesium	mg/kg	10	Metals-020	[NT]	11	740	850	14	[NT]	[NT]
Cobalt	mg/kg	1	Metals-020	[NT]	11	18	8	77	[NT]	[NT]
Boron	mg/kg	3	Metals-020	[NT]	11	7	3	80	[NT]	[NT]

QUALITY CONTROL: sPOCAS field test						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-17	[NT]
Date prepared	-			21/03/2022	16	21/03/2022	21/03/2022		21/03/2022	[NT]
Date analysed	-			21/03/2022	16	21/03/2022	21/03/2022		21/03/2022	[NT]
pH_F (field pH test)*	pH Units		Inorg-063	[NT]	16	7.6	7.2	5	100	[NT]
pH_{FOX} (field peroxide test)*	pH Units		Inorg-063	[NT]	16	5.4	5.6	4	100	[NT]

QUALITY CONTROL: sPOCAS field test						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	46	21/03/2022	21/03/2022		[NT]	[NT]
Date analysed	-			[NT]	46	21/03/2022	21/03/2022		[NT]	[NT]
pH_F (field pH test)*	pH Units		Inorg-063	[NT]	46	6.2	6.2	0	[NT]	[NT]
pH_{FOX} (field peroxide test)*	pH Units		Inorg-063	[NT]	46	3.6	3.8	5	[NT]	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Report Comments

TRH Soil C10-C40 NEPM - # Percent recovery for the surrogate spike is not possible to report as the high concentration of analytes in sample/s 290972-4 have caused interference.

Acid Extractable Metals in Soil:
-The laboratory RPD acceptance criteria has been exceeded for 290972-1 for Mn. Therefore a triplicate result has been issued as laboratory sample number 290972-54.
-The laboratory RPD acceptance criteria has been exceeded for 290972-11 for Ni,Mn,Al,Fe and Co. Therefore a triplicate result has been issued as laboratory sample number 290972-55.

Asbestos-ID in soil: NEPM
This report is consistent with the reporting recommendations in the National Environment Protection (Assessment of Site Contamination) Measure, Schedule B1, May 2013. This is reported outside our scope of NATA accreditation.

Asbestos: A portion of the supplied sample was sub-sampled for asbestos analysis according to Envirolab procedures.
We cannot guarantee that this sub-sample is indicative of the entire sample. Envirolab recommends supplying 40-50g of sample in its own container.
Note: Samples 290972-10 to 14 were sub-sampled from jars provided by the client.

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CERTIFICATE OF ANALYSIS 290972-A

Client Details

Client	Douglas Partners Newcastle
Attention	Dana Wilson
Address	Box 324 Hunter Region Mail Centre, Newcastle, NSW, 2310

Sample Details

Your Reference	**102077.02, Newcastle**
Number of Samples	additional analysis
Date samples received	15/03/2022
Date completed instructions received	29/03/2022

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

Date results requested by	05/04/2022
Date of Issue	05/04/2022

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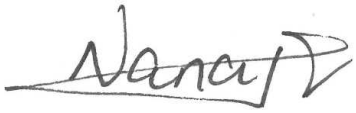
Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

Results Approved By
Dragana Tomas, Senior Chemist
Hannah Nguyen, Metals Supervisor
Priya Samarawickrama, Senior Chemist

Authorised By



Nancy Zhang, Laboratory Manager

TCLP Preparation - Acid						
Our Reference		290972-A-1	290972-A-2	290972-A-3	290972-A-4	290972-A-5
Your Reference	UNITS	501/0.5	502/0.3	503/0.7	503/1.2	504/0.5
Date Sampled		13/03/2022	13/03/2022	13/03/2022	13/03/2022	13/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
pH of soil for fluid# determ.	pH units	8.6	8.7	8.7	8.4	8.6
pH of soil TCLP (after HCl)	pH units	1.6	1.6	1.6	1.6	1.6
Extraction fluid used	-	1	1	1	1	1
pH of final Leachate	pH units	5.2	5.3	5.1	5.1	5.9

TCLP Preparation - Acid						
Our Reference		290972-A-6	290972-A-7	290972-A-10	290972-A-11	290972-A-15
Your Reference	UNITS	505/0.8	506/1.2	401/1.0	402/2.0	401/2.0
Date Sampled		13/03/2022	13/03/2022	13/03/2022	13/03/2022	13/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
pH of soil for fluid# determ.	pH units	8.7	8.7	8.9	8.5	8.4
pH of soil TCLP (after HCl)	pH units	1.6	1.6	1.6	1.6	1.6
Extraction fluid used	-	1	1	1	1	1
pH of final Leachate	pH units	5.8	5.1	5.5	5.0	5.0

PAHs in TCLP (USEPA 1311)						
Our Reference		290972-A-4	290972-A-6	290972-A-7	290972-A-10	290972-A-15
Your Reference	UNITS	503/1.2	505/0.8	506/1.2	401/1.0	401/2.0
Date Sampled		13/03/2022	13/03/2022	13/03/2022	13/03/2022	13/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	31/03/2022	31/03/2022	31/03/2022	31/03/2022	31/03/2022
Date analysed	-	31/03/2022	31/03/2022	31/03/2022	31/03/2022	31/03/2022
Naphthalene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Acenaphthylene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Acenaphthene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Fluorene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Phenanthrene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Anthracene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Fluoranthene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Pyrene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Benzo(a)anthracene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Chrysene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Benzo(bjk)fluoranthene in TCLP	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002
Benzo(a)pyrene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Dibenzo(a,h)anthracene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Benzo(g,h,i)perylene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Total +ve PAH's	mg/L	NIL (+)VE	NIL (+)VE	NIL (+)VE	NIL (+)VE	NIL (+)VE
Surrogate p-Terphenyl-d14	%	83	77	86	81	80

Metals from Leaching Fluid pH 2.9 or 5						
Our Reference		290972-A-1	290972-A-2	290972-A-3	290972-A-4	290972-A-5
Your Reference	UNITS	501/0.5	502/0.3	503/0.7	503/1.2	504/0.5
Date Sampled		13/03/2022	13/03/2022	13/03/2022	13/03/2022	13/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	31/03/2022	31/03/2022	31/03/2022	31/03/2022	31/03/2022
Date analysed	-	31/03/2022	31/03/2022	31/03/2022	31/03/2022	31/03/2022
Lead	mg/L	0.07	0.40	0.2	0.04	0.3

Metals from Leaching Fluid pH 2.9 or 5					
Our Reference		290972-A-6	290972-A-7	290972-A-10	290972-A-11
Your Reference	UNITS	505/0.8	506/1.2	401/1.0	402/2.0
Date Sampled		13/03/2022	13/03/2022	13/03/2022	13/03/2022
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	31/03/2022	31/03/2022	31/03/2022	31/03/2022
Date analysed	-	31/03/2022	31/03/2022	31/03/2022	31/03/2022
Chromium	mg/L	[NA]	0.08	[NA]	[NA]
Lead	mg/L	0.38	0.2	0.05	<0.03

Chromium Suite				
Our Reference	UNITS	290972-A-39	290972-A-40	290972-A-50
Your Reference		403/2.5	403/3.0	503/2.4
Date Sampled		13/03/2022	13/03/2022	13/03/2022
Type of sample		Soil	Soil	Soil
Date prepared	-	04/04/2022	04/04/2022	04/04/2022
Date analysed	-	04/04/2022	04/04/2022	04/04/2022
pH $_{kcl}$	pH units	6.0	5.3	6.2
s-TAA pH 6.5	%w/w S	<0.01	<0.01	<0.01
TAA pH 6.5	moles H^+ /t	<5	<5	<5
Chromium Reducible Sulfur	%w/w	0.09	0.23	<0.005
a-Chromium Reducible Sulfur	moles H^+ /t	56	140	<3
S_{HCl}	%w/w S	[NT]	[NT]	[NT]
S_{KCl}	%w/w S	[NT]	[NT]	[NT]
S_{NAS}	%w/w S	[NT]	[NT]	[NT]
ANC_{BT}	% $CaCO_3$	[NT]	[NT]	[NT]
s-ANC_{BT}	%w/w S	[NT]	[NT]	[NT]
s-Net Acidity	%w/w S	0.090	0.23	<0.005
a-Net Acidity	moles H^+ /t	56	140	<5
Liming rate	kg $CaCO_3$ /t	4	11	<0.75
a-Net Acidity without ANCE	moles H^+ /t	56	140	<5
Liming rate without ANCE	kg $CaCO_3$ /t	4.2	11	<0.75
s-Net Acidity without ANCE	%w/w S	0.090	0.23	<0.005

Method ID	Methodology Summary
INORG-004	Toxicity Characteristic Leaching Procedure (TCLP) using Zero Headspace Extraction (zHE) using AS4439 and USEPA 1311.
Inorg-004	Toxicity Characteristic Leaching Procedure (TCLP) using AS 4439 and USEPA 1311. Please note that the mass used may be scaled down from default based on sample mass available. Samples are stored at 2-6oC before and after leachate preparation.
Inorg-068	Chromium Reducible Sulfur - Hydrogen Sulfide is quantified by iodometric titration after distillation to determine potential acidity. Net acidity including ANC has a safety factor of 1.5 applied. Neutralising value (NV) of 100% is assumed for liming rate. Based on National acid sulfate soils identification and laboratory methods manual June 2018. The recommendation that the SHCL concentration be multiplied by a factor of 2 to ensure retained acidity is not underestimated, has not been applied in the SHCL results reported.
Metals-020	Determination of various metals by ICP-AES following buffer determination as per USEPA 1311 and hence AS 4439.3. Extraction Fluid 1 refers to the pH 5.0 buffer and Extraction Fluid 2 is the pH 2.9 buffer.
Org-022/025	Leachates are extracted with Dichloromethane and analysed by GC-MS/GC-MSMS.

QUALITY CONTROL: PAHs in TCLP (USEPA 1311)						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			31/03/2022	6	31/03/2022	31/03/2022		31/03/2022	[NT]
Date analysed	-			31/03/2022	6	31/03/2022	31/03/2022		31/03/2022	[NT]
Naphthalene in TCLP	mg/L	0.001	Org-022/025	<0.001	6	<0.001	<0.001	0	90	[NT]
Acenaphthylene in TCLP	mg/L	0.001	Org-022/025	<0.001	6	<0.001	<0.001	0	[NT]	[NT]
Acenaphthene in TCLP	mg/L	0.001	Org-022/025	<0.001	6	<0.001	<0.001	0	87	[NT]
Fluorene in TCLP	mg/L	0.001	Org-022/025	<0.001	6	<0.001	<0.001	0	88	[NT]
Phenanthrene in TCLP	mg/L	0.001	Org-022/025	<0.001	6	<0.001	<0.001	0	100	[NT]
Anthracene in TCLP	mg/L	0.001	Org-022/025	<0.001	6	<0.001	<0.001	0	[NT]	[NT]
Fluoranthene in TCLP	mg/L	0.001	Org-022/025	<0.001	6	<0.001	<0.001	0	86	[NT]
Pyrene in TCLP	mg/L	0.001	Org-022/025	<0.001	6	<0.001	<0.001	0	91	[NT]
Benzo(a)anthracene in TCLP	mg/L	0.001	Org-022/025	<0.001	6	<0.001	<0.001	0	[NT]	[NT]
Chrysene in TCLP	mg/L	0.001	Org-022/025	<0.001	6	<0.001	<0.001	0	85	[NT]
Benzo(bjk)fluoranthene in TCLP	mg/L	0.002	Org-022/025	<0.002	6	<0.002	<0.002	0	[NT]	[NT]
Benzo(a)pyrene in TCLP	mg/L	0.001	Org-022/025	<0.001	6	<0.001	<0.001	0	70	[NT]
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	0.001	Org-022/025	<0.001	6	<0.001	<0.001	0	[NT]	[NT]
Dibenzo(a,h)anthracene in TCLP	mg/L	0.001	Org-022/025	<0.001	6	<0.001	<0.001	0	[NT]	[NT]
Benzo(g,h,i)perylene in TCLP	mg/L	0.001	Org-022/025	<0.001	6	<0.001	<0.001	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	69	6	77	81	5	93	[NT]

QUALITY CONTROL: Metals from Leaching Fluid pH 2.9 or 5						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	290972-A-3
Date extracted	-			31/03/2022	1	31/03/2022	31/03/2022		31/03/2022	31/03/2022
Date analysed	-			31/03/2022	1	31/03/2022	31/03/2022		31/03/2022	31/03/2022
Chromium	mg/L	0.01	Metals-020	<0.01	[NT]	[NT]	[NT]	[NT]	100	113
Lead	mg/L	0.03	Metals-020	<0.03	1	0.07	0.07	0	100	113

QUALITY CONTROL: Chromium Suite						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			04/04/2022	[NT]	[NT]	[NT]	[NT]	04/04/2022	[NT]
Date analysed	-			04/04/2022	[NT]	[NT]	[NT]	[NT]	04/04/2022	[NT]
pH $_{kcl}$	pH units		Inorg-068	[NT]	[NT]	[NT]	[NT]	[NT]	98	[NT]
s-TAA pH 6.5	%w/w S	0.01	Inorg-068	<0.01	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
TAA pH 6.5	moles H^+ /t	5	Inorg-068	<5	[NT]	[NT]	[NT]	[NT]	82	[NT]
Chromium Reducible Sulfur	%w/w	0.005	Inorg-068	<0.005	[NT]	[NT]	[NT]	[NT]	114	[NT]
a-Chromium Reducible Sulfur	moles H^+ /t	3	Inorg-068	<3	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
S_{HCl}	%w/w S	0.005	Inorg-068	<0.005	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
S_{KCl}	%w/w S	0.005	Inorg-068	<0.005	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
S_{NAS}	%w/w S	0.005	Inorg-068	<0.005	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
ANC_{BT}	% $CaCO_3$	0.05	Inorg-068	<0.05	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
s-ANC_{BT}	%w/w S	0.05	Inorg-068	<0.05	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
s-Net Acidity	%w/w S	0.005	Inorg-068	<0.005	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
a-Net Acidity	moles H^+ /t	5	Inorg-068	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Liming rate	kg $CaCO_3$ /t	0.75	Inorg-068	<0.75	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
a-Net Acidity without ANCE	moles H^+ /t	5	Inorg-068	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Liming rate without ANCE	kg $CaCO_3$ /t	0.75	Inorg-068	<0.75	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
s-Net Acidity without ANCE	%w/w S	0.005	Inorg-068	<0.005	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Appendix C

Historical Aerial Photo Summary
Site Photos (Photoplates 1 to 9)
Title Deeds Search (InfoTrack Pty Ltd)
Section 10.7 Planning Certificates
Council Provided Information
Site Search for Schedule 11 - Hazardous Chemicals on Premises (SafeWork NSW)
Water NSW Work Summaries

Appendix C
Historical Aerial Photo Summary
924 Hunter Street, Newcastle West

Photo C1: 1954 aerial (Site in red outline)

Photo C2: 1966 aerial (Site in red outline)

Photo C3: 1976 aerial (Site in red outline)

Photo C3A: 1976 aerial (Site in red outline)

Photo C4: 1984 (Site in red outline)

Figure C5: 1986 orthophoto (Site in red outline)

Photo C6: 1990 aerial (Site in red outline)

Photo C7: 1998 aerial (site in red outline)

Photo C8: 2001 aerial (Site in red outline)

Douglas Partners Pty Ltd

Photo 1: Main building (showroom) in the SW corner (looking W)

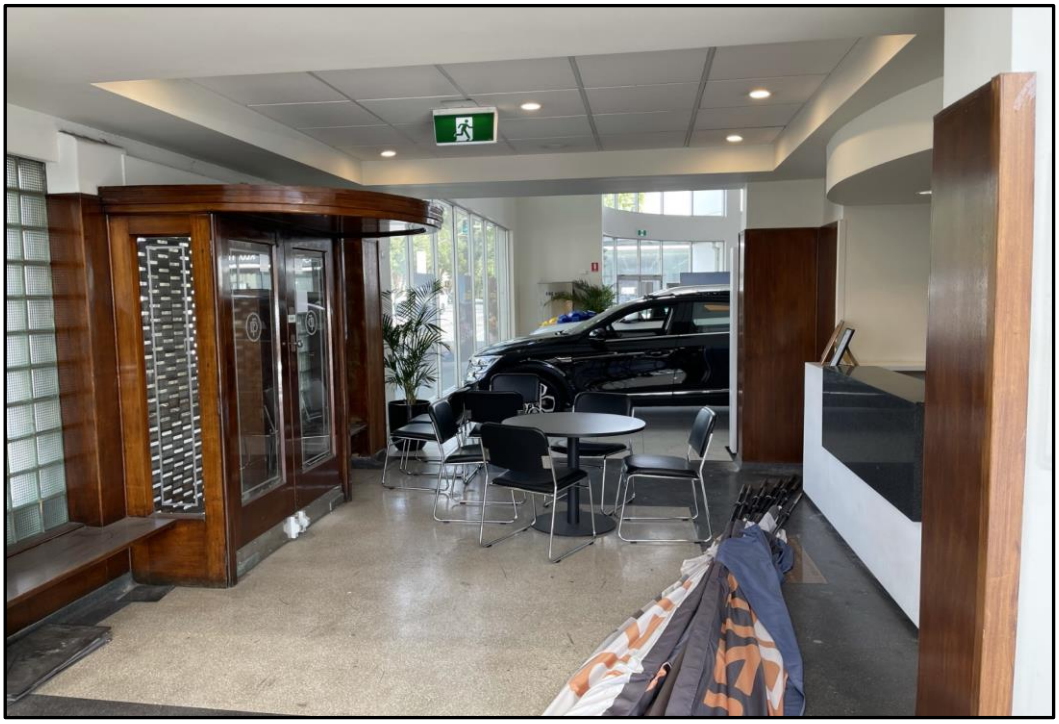


Photo 2: Main building (showroom) (looking W)

Douglas Partners Geotechnics / Environment / Groundwater	**Photoplates**	PROJECT:	102077.02
	924 Hunter Street	Plate	1
	Newcastle West	REV:	A
	Client: Thirdi Dairy Farmers Pty Ltd	DATE:	18-Oct-21

Photo 3: Main building (showroom and offices) (looking NW)

Photo 4: Western part of site for vehicle storage (looking NW)

Douglas Partners Geotechnics / Environment / Groundwater	**Photoplates**	PROJECT:	102077.02
	924 Hunter Street	Plate	2
	Newcastle West	REV:	A
	Client: Thirdi Dairy Farmers Pty Ltd	DATE:	18-Oct-21

Photo 5: Western part of site for vehicle storage (looking N)

Photo 6: Concrete pavements (cracked), tie down rings in pavement

Douglas Partners Geotechnics / Environment / Groundwater	**Photoplates**	PROJECT:	102077.02
	924 Hunter Street	Plate	3
	Newcastle West	REV:	A
	Client: Thirdi Dairy Farmers Pty Ltd	DATE:	18-Oct-21

Photo 7: Power substation in N part of site in garden (looking NE)

Photo 8: Eastern site building and concrete pavements (looking SE)

Douglas Partners Geotechnics / Environment / Groundwater	**Photoplates**	PROJECT:	102077.02
	924 Hunter Street	Plate	4
	Newcastle West	REV:	A
	Client: Thirdi Dairy Farmers Pty Ltd	DATE:	18-Oct-21

Photo 9: Awning N of E site building and former bowser location (looking E)

Photo 10: Eastern building - frontage to Hunter Street (looking E)

Douglas Partners Geotechnics / Environment / Groundwater	**Photoplates**	PROJECT:	102077.02
	924 Hunter Street	Plate	5
	Newcastle West	REV:	A
	Client: Thirdi Dairy Farmers Pty Ltd	DATE:	18-Oct-21

Photo 11: Eastern building from SW on Hunter Street (looking NW)

Photo 12: Eastern building from cnr Railway and Hunter Street (looking NE)

Douglas Partners Geotechnics / Environment / Groundwater	**Photoplates**	PROJECT:	102077.02
	924 Hunter Street	Plate	6
	Newcastle West	REV:	A
	Client: Thirdi Dairy Farmers Pty Ltd	DATE:	18-Oct-21

Photo 13: Eastern building - from cnr Railway and Hunter Street (looking N)

Photo 14: Western part of site from Railway Street (looking NE)

Douglas Partners Geotechnics / Environment / Groundwater	**Photoplates**	PROJECT:	102077.02
	924 Hunter Street	Plate	7
	Newcastle West	REV:	A
	Client: Thirdi Dairy Farmers Pty Ltd	DATE:	18-Oct-21

Photo 15: Western site building (two storey) (looking S)

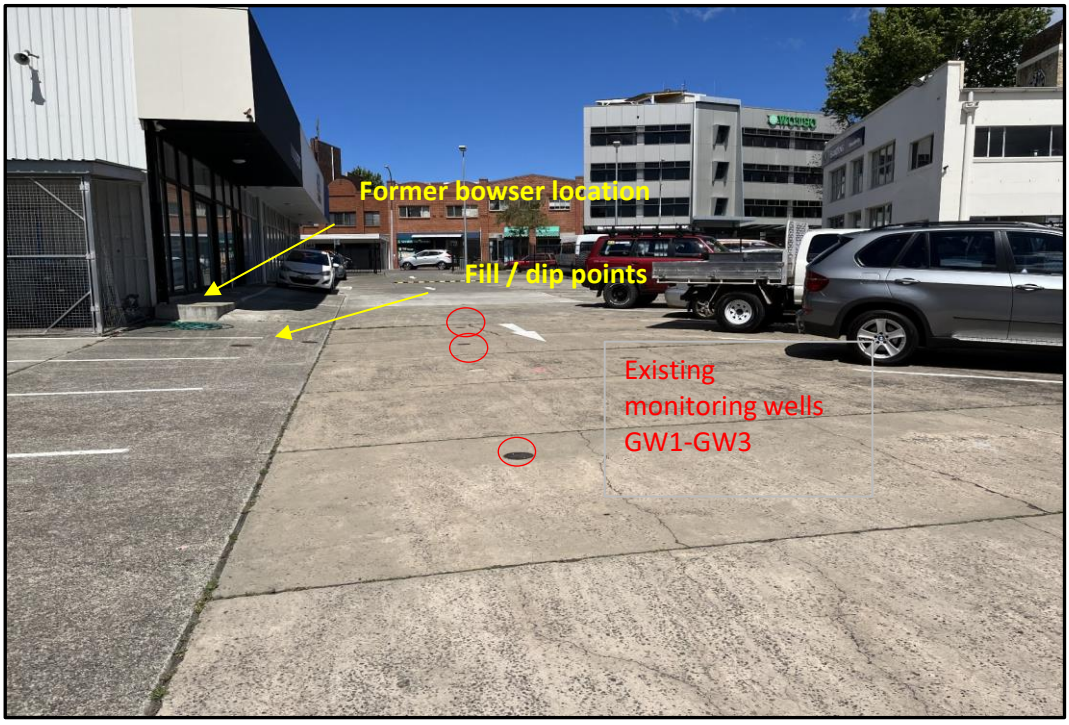


Photo 16: Location of former bowser near redundant UST (looking E)

Douglas Partners Geotechnics / Environment / Groundwater	**Photoplates**	PROJECT:	102077.02
	924 Hunter Street	Plate	8
	Newcastle West	REV:	A
	Client: Thirdi Dairy Farmers Pty Ltd	DATE:	18-Oct-21

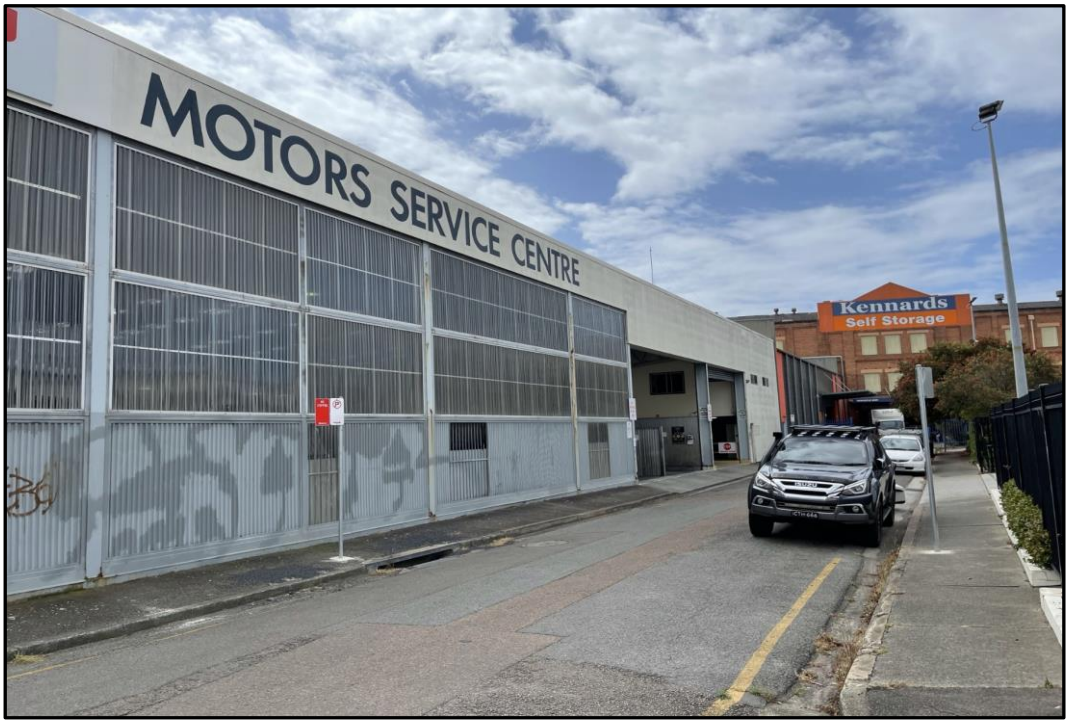


Photo 17: Vehicle service centre to the north (looking E)

Douglas Partners Geotechnics / Environment / Groundwater	**Photoplates**		PROJECT:	102077.02
	924 Hunter Street		Plate	9
	Newcastle West		REV:	A
	Client	Thirdi Dairy Farmers Pty Ltd	DATE:	18-Oct-21

ABN: 36 092 724 251
Ph: 02 9099 7400
(Ph: 0412 199 304)

Level 14, 135 King Street, Sydney
Sydney 2000
GPO Box 4103 Sydney NSW 2001
DX 967 Sydney

Summary of Owners Report

Address: 924 Hunter Street, Newcastle West, NSW 2302

Description: - Lot 2 D.P. 445736, Lot 1 D.P. 342675, Lots 1 & 2 D.P. 1091173, Lot 1 D.P. 456088, Lot 1 D.P. 395367 & Lot 2 D.P. 126

As regards to Lot 2 D.P. 445736: -

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
	As regards to the part numbered 1 on attached Cadastral Records Enquiry: -	
09.02.1912 (1912 to 1923)	Donald McNaughton (Builder)	Volume 2226 Folios 189 to 190
16.07.1923 (1923 to 1994)	The Dairy Farmers' Co-Operative Milk Company Limited Then Dairy Farmers Co-Operative Limited Now Australian Co-Operative Foods Limited	Volume 2226 Folios 189 to 190 Then Volume 3490 Folio 79 Then Volume 5161 Folio 181 Now 2/445736
	As regards to the part numbered 2 on attached Cadastral Records Enquiry: -	
13.03.1914 (1914 to 1918)	The Newcastle Co-Operative Milk Society Limited	Volume 189 Folio 218
26.06.1918 (1918 to 1994)	The Dairy Farmers' Co-Operative Milk Company Limited Then Dairy Farmers Co-Operative Limited Now Australian Co-Operative Foods Limited	Volume 189 Folio 218 Then Volume 5161 Folio 181 Now 2/445736
	As regards to the part numbered 3 on attached Cadastral Records Enquiry: -	
21.01.1899 (1899 to 1926)	Susan Pavey (Married Woman)	Volume 189 Folio 216
14.12.1926 (1926 to 1937)	Sarah Hindmarsh (Married Woman)	Volume 189 Folio 216
20.09.1937 (1937 to 1994)	The Dairy Farmers' Co-Operative Milk Company Limited Then Dairy Farmers Co-Operative Limited Now Australian Co-Operative Foods Limited	Volume 189 Folio 216 Then Volume 5161 Folio 181 Now 2/445736

Continued Over.

ABN: 36 092 724 251
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Sydney 2000
GPO Box 4103 Sydney NSW 2001
DX 967 Sydney

Date of Acquisition and term held	**Registered Proprietor(s) & Occupations where available**	**Reference to Title at Acquisition and sale**
	As regards to the part numbered 4 on attached Cadastral Records Enquiry: -	
31.03.1913 (1913 to 1925)	Thomas Wrightson (Railway Employee)	Volume 2480 Folio 69
03.06.1925 (1925 to 1927)	Charles Joseph Parker (Business Manager)	Volume 2480 Folio 69
28.06.1927 (1927 to 1930)	Edwin Knight Jacka (Commercial Traveller)	Volume 2480 Folio 69
12.02.1930 (1930 to 1937)	Elizabeth Jacka (Widow) (Transmission Application not investigated)	Volume 2480 Folio 69
20.09.1937 (1937 to 1994)	The Dairy Farmers' Co-Operative Milk Company Limited Then Dairy Farmers Co-Operative Limited Now Australian Co-Operative Foods Limited	Then Volume 5161 Folio 181 Now 2/445736
	Continued as to the whole: -	
06.12.1994 (1994 to 2019)	Zutor Pty. Ltd (Or Zutor Pty Ltd) (Or Zutor Pty. Limited)	2/445736
01.03.2019 (2019 to Date)	# McCloy Newcastle West Pty Limited	2/445736

 # Denotes current registered proprietor

Leases: -

- **Various leases were found between 19.10.2012 to 25.03.2020 that have since been surrendered or expired by effluxion of time. Not investigated.**
- 23.11.2020 (AQ502865): Lease to Manning Valley Motor Holding Pty Ltd of Tenancy 1, 924 Hunter Street and 4 Tighe Street, Newcastle West. Expires 15.05.2024.

Easements: -

- 06.06.1997 (3077496): Easement for underground electricity cables & access affecting the part shown so designated (C) in D.P. 267291.

ABN: 36 092 724 251
Ph: 02 9099 7400
(Ph: 0412 199 304)

Level 14, 135 King Street, Sydney
Sydney 2000
GPO Box 4103 Sydney NSW 2001
DX 967 Sydney

As regards to Lot 1 D.P. 342675, numbered 5 on Cadastral Records Enquiry: -

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
31.03.1913 (1913 to 1925)	Thomas Wrightson (Railway Employee)	Volume 2480 Folio 69
03.06.1925 (1925 to 1927)	Charles Joseph Parker (Business Manager)	Volume 2480 Folio 69
28.06.1927 (1927 to 1930)	Edwin Knight Jacka (Commercial Traveller)	Volume 2480 Folio 69
12.02.1930 (1930 to 1937)	Elizabeth Jacka (Widow) (Transmission Application not investigated)	Volume 2480 Folio 69
20.09.1937 (1937 to 1938)	The Dairy Farmers' Co-Operative Milk Company Limited	Volume 2480 Folio 69
08.08.1938 (1938 to 1956)	The Council of the City of Newcastle (Formerly styled The Council of the City of Greater Newcastle)	Volume 2480 Folio 69 (Part) Now Volume 5161 Folio 225
04.04.1956 (1956 to 1994)	The Dairy Farmers' Co-Operative Milk Company Limited Then Dairy Farmers Co-Operative Limited Now Australian Co-Operative Foods Limited	Volume 5161 Folio 225 Now 1/342675
06.12.1994 (1994 to 2019)	Zutor Pty. Ltd (Or Zutor Pty Ltd) (Or Zutor Pty. Limited)	1/342675
01.03.2019 (2019 to Date)	# McCloy Newcastle West Pty Limited	1/342675

 # Denotes current registered proprietor

Leases: -

- **Various leases were found between 19.10.2012 to 25.03.2020 that have since been surrendered or expired by effluxion of time. Not investigated.**
- 23.11.2020 (AQ502865): Lease to Manning Valley Motor Holding Pty Ltd of Tenancy 1, 924 Hunter Street and 4 Tighe Street, Newcastle West. Expires 15.05.2024.

Easements: -

- 06.06.1997 (3077496): Easement for underground electricity cables & access affecting the part shown so designated (B) in D.P. 267291.

ABN: 36 092 724 251
Ph: 02 9099 7400
(Ph: 0412 199 304)

Level 14, 135 King Street, Sydney
Sydney 2000
GPO Box 4103 Sydney NSW 2001
DX 967 Sydney

As regards to Auto Consol 7174-135 (Lots 1 & 2 D.P. 1091173): -

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
	As regards to the part numbered 6 on attached Cadastral Records Enquiry: -	
12.12.1911 (1911 to 1950)	Mary Leonard (Spinster)	Volume 2208 Folio 225
14.04.1950 (1950 to 1954)	Merle Winifred Gabriel (Married Woman) (Transmission Application not investigated)	Volume 2208 Folio 225
20.04.1954 (1954 to 1993)	The Dairy Farmers' Co-Operative Milk Company Limited Then Dairy Farmers Co-Operative Limited Now Australian Co-Operative Foods Limited	Volume 2208 Folio 225 Then Volume 6909 Folio 186 Now Volume 7174 Folio 135
	As regards to the part numbered 7 on attached Cadastral Records Enquiry: -	
01.05.1918 (1918 to 1922)	John Stevens (Railway Guard)	Volume 758 Folio 200
28.08.1922 (1922 to 1922)	Public Trustee) (Transmission Application not investigated)	Volume 758 Folio 200
03.10.1922 (1922 to 1926)	Sylvia Myra Sadler (Salvation Army Officer, Spinster)	Volume 758 Folio 200
17.06.1926 (1926 to 1927)	John Butler (Miner) Sara Butler (Married Woman)	Volume 758 Folio 200
30.09.1927 (1927 to 1929)	Charles Frederick Davies (Laborer) Emily Davies (Married Woman)	Volume 758 Folio 200 Now Volume 4326 Folio 12
08.08.1929 (1929 to 1954)	Ivy May Brownjohn (Married Woman)	Volume 4326 Folio 12
15.07.1954 (1954 to 1993)	The Dairy Farmers' Co-Operative Milk Company Limited Then Dairy Farmers Co-Operative Limited Now Australian Co-Operative Foods Limited	Volume 4326 Folio 12 Then Volume 6909 Folio 186 Now Volume 7174 Folio 135
	As regards to the part numbered 8 on attached Cadastral Records Enquiry: -	
01.05.1918 (1918 to 1926)	Lizzy Redding (Married Woman)	Volumes 336 Folio 77
01.09.1926 (1926 to 1953)	Elizabeth Duncan Shaw (Married Woman)	Volumes 336 Folio 77
01.07.1953 (1953 to 1993)	The Dairy Farmers' Co-Operative Milk Company Limited Then Dairy Farmers Co-Operative Limited Now Australian Co-Operative Foods Limited (Mortgagee Sale)	Volumes 336 Folio 77 Then Volume 6909 Folio 186 Now Volume 7174 Folio 135

Continued Over.

ABN: 36 092 724 251
Ph: 02 9099 7400
(Ph: 0412 199 304)

Level 14, 135 King Street, Sydney
Sydney 2000
GPO Box 4103 Sydney NSW 2001
DX 967 Sydney

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
	As regards to the part numbered 9 on attached Cadastral Records Enquiry: -	
30.04.1918 (1918 to 1953)	Edward Spurr (Pattern Maker)	Volume 192 Folio 236
06.01.1953 (1953 to 1993)	The Dairy Farmers' Co-Operative Milk Company Limited Then Dairy Farmers Co-Operative Limited Now Australian Co-Operative Foods Limited	Volume 192 Folio 236 Then Volume 6854 Folio 142 Then Volume 6909 Folio 186 Now Volume 7174 Folio 135
	As regards to the part numbered 10 on attached Cadastral Records Enquiry: - Lot 16	
14.07.1914 (1914 to 1952)	Arthur William Spurr (Blacksmith)	Volume 262 Folio 213
27.05.1952 (1952 to 1953)	Edward Spurr (Pattern Maker) (Transmission Application not investigated)	Volume 262 Folio 213
06.01.1953 (1953 to 1994)	The Dairy Farmers' Co-Operative Milk Company Limited Then Dairy Farmers Co-Operative Limited Now Australian Co-Operative Foods Limited	Volume 262 Folio 213 Then Volume 6854 Folio 142 Then Volume 6909 Folio 186 Now Volume 7174 Folio 135
	Continued as to the whole:	
06.12.1994 (1994 to 2019)	Zutor Pty. Ltd (Or Zutor Pty Ltd) (Or Zutor Pty. Limited)	Auto Consol 7174-135
01.03.2019 (2019 to Date)	# McCloy Newcastle West Pty Limited	Auto Consol 7174-135

 # Denotes current registered proprietor

Leases: -

- 16.09.1918 (A392996): Lease to The Newcastle Co-Operative Milk Society Limited of part of Lot 4 D.P. 126 of the land within described. Expired by effluxion of time 23.04.1954.
- 06.10.1921 (A747253): Lease to The Berrima District Farm and Dairy Company Limited of part of the land within described. Expired by effluxion of time 23.04.1954.
- **Various leases were found between 19.10.2012 to 25.03.2020 that have since been surrendered or expired by effluxion of time. Not investigated.**
- 23.11.2020 (AQ502865): Lease to Manning Valley Motor Holding Pty Ltd of Tenancy 1, 924 Hunter Street and 4 Tighe Street, Newcastle West. Expires 15.05.2024.
- 23.11.2020 (AQ502866): Lease to Air Locker Training Newcastle Pty Ltd of Tenancy 2, 924 Hunter Street, Newcastle West. Expires 21.04.2024.
- 23.11.2020 (AQ502867): Lease to Barre Effect Pty Ltd of Tenancy 3, Eastern Showroom, 924 Hunter Street, Newcastle West. Expires 21.05.2024.

Easements: -

- 06.06.1997 (3077496): Easement for underground cables of electricity and access affecting the part shown so designated (A) in D.P. 267291.

ABN: 36 092 724 251
Ph: 02 9099 7400
(Ph: 0412 199 304)

Level 14, 135 King Street, Sydney
Sydney 2000
GPO Box 4103 Sydney NSW 2001
DX 967 Sydney

As regards to Lot 1 D.P. 395367, numbered 11 on attached Cadastral Records Enquiry: -

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
14.07.1914 (1914 to 1952)	Arthur William Spurr (Blacksmith)	Volume 262 Folio 213
27.05.1952 (1952 to 1953)	Edward Spurr (Pattern Maker) (Transmission Application not investigated)	Volume 262 Folio 213
06.01.1953 (1953 to 1956)	The Dairy Farmers' Co-Operative Milk Company Limited Then Dairy Farmers Co-Operative Limited Now Australian Co-Operative Foods Limited	Volume 262 Folio 213 Then Volume 6854 Folio 142 Now Volume 6909 Folio 186
02.02.1956 (1956 to 1997)	The Council of the City of Newcastle Then **Intervening Name Changes** Now Energy Australia	Volume 6909 Folio 186 Now Volume 7174 Folio 134 Now 1/395367
04.09.1997 (1997 to 2019)	Zutor Pty. Ltd (Or Zutor Pty Ltd) (Or Zutor Pty. Limited)	1/395367
01.03.2019 (2019 to Date)	# McCloy Newcastle West Pty Limited	1/395367

 # Denotes current registered proprietor

Leases: -

- **Various leases were found between 19.10.2012 to 25.03.2020 that have since been surrendered or expired by effluxion of time. Not investigated.**
- 23.11.2020 (AQ502865): Lease to Manning Valley Motor Holding Pty Ltd of Tenancy 1, 924 Hunter Street and 4 Tighe Street, Newcastle West. Expires 15.05.2024.

Easements: - NIL

ABN: 36 092 724 251
Ph: 02 9099 7400
(Ph: 0412 199 304)

Level 14, 135 King Street, Sydney
Sydney 2000
GPO Box 4103 Sydney NSW 2001
DX 967 Sydney

As regards to Auto Consol 8377-233 (Lot 2 D.P. 126 & Lot 1 D.P. 456088): -

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
	As regards to the part numbered 12 on attached Cadastral Records Enquiry: -	
05.08.1902 (1902 to 1959)	Elizabeth Leonard (Spinster) Mary Leonard (Spinster) Bridget Leonard (Spinster now Widow)	Volume 710 Folio 91
09.06.1959 (1959 to 1959)	Bridget Harrison (Spinster now Widow) (Formerly Bridget Leonard) (Notice of Death - Surviving Proprietor)	Volume 710 Folio 91
01.08.1959 (1959 to 1993)	The Dairy Farmers' Co-Operative Milk Company Limited Then Dairy Farmers Co-Operative Limited Now Australian Co-Operative Foods Limited	Volume 710 Folio 91 Then Volume 7929 Folio 72 Now Volume 8377 Folio 233
	As regards to the part numbered 13 on attached Cadastral Records Enquiry: -	
27.08.1877 (1877 to 1927)	Catherine Leonard (Married Woman)	Volume 266 Folio 136
20.07.1927 (1927 to 1959)	Mary Leonard (Spinster) Elizabeth Minogue (Married woman) (Transmission Application not investigated)	Volume 266 Folio 136
09.06.1959 (1959 to 1959)	Public Trustee (Section 94 Application not investigated)	Volume 266 Folio 136
21.09.1959 (1959 to 1993)	The Dairy Farmers' Co-Operative Milk Company Limited Then Dairy Farmers Co-Operative Limited Now Australian Co-Operative Foods Limited	Volume 266 Folio 136 Then Volume 7929 Folio 72 Now Volume 8377 Folio 233
	Continued as to the whole: -	
23.09.1993 (1993 to 1994)	Australian Co-Operative Foods Limited	Volume 8377 Folio 233
06.12.1994 (1994 to 2019)	Zutor Pty. Ltd (Or Zutor Pty Ltd) (Or Zutor Pty. Limited)	Volume 8377 Folio 233 Now Auto Consol 8377-233
01.03.2019 (2019 to Date)	# McCloy Newcastle West Pty Limited	Auto Consol 8377-233

 # Denotes current registered proprietor

Leases: -

- **Various leases were found between 19.10.2012 to 25.03.2020 that have since been surrendered or expired by effluxion of time. Not investigated.**
- 23.11.2020 (AQ502866): Lease to Air Locker Training Newcastle Pty Ltd of Tenancy 2, 924 Hunter Street, Newcastle West. Expires 21.04.2024.
- 23.11.2020 (AQ502867): Lease to Barre Effect Pty Ltd of Tenancy 3, Eastern Showroom, 924 Hunter Street, Newcastle West. Expires 21.05.2024.

Easements: - NIL

ABN: 36 092 724 251
Ph: 02 9099 7400
(Ph: 0412 199 304)

Level 14, 135 King Street, Sydney
Sydney 2000
GPO Box 4103 Sydney NSW 2001
DX 967 Sydney

Yours Sincerely
Taylor Wilson
20th August 2021

Cadastral Records Enquiry Report : Lot 2 DP 445736

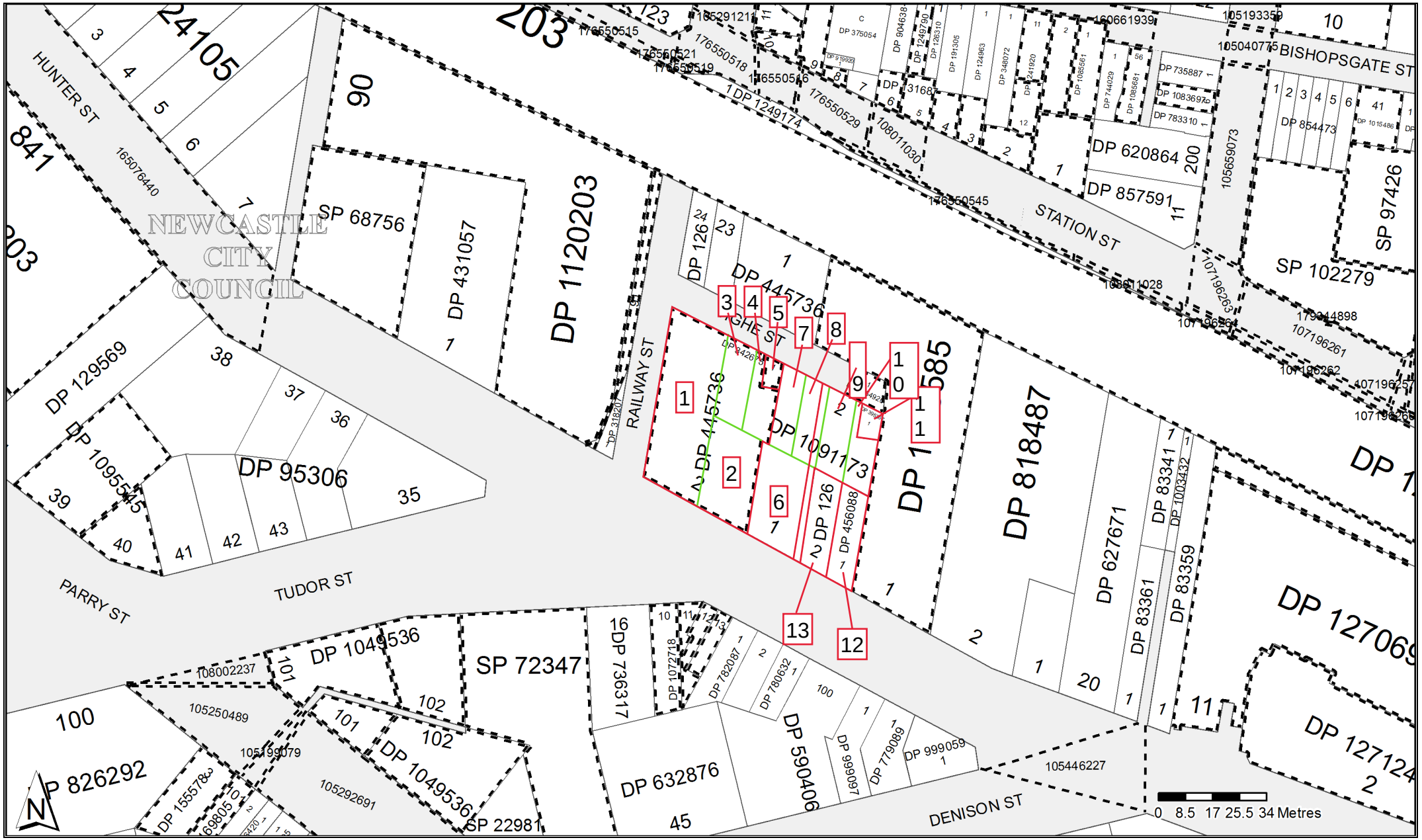
Ref : 924 Hunter Street, Newcastle West

Locality : NEWCASTLE WEST

Parish : NEWCASTLE

LGA : NEWCASTLE

County : NORTHUMBERLAND


HUNTER ST
STATION ST
BISHOPSGATE ST
RAILWAY ST
TUDOR ST
PARRY ST
DENISON ST
NEWCASTLE CITY COUNCIL
DP 1120203
DP 445736
DP 1091173
DP 1091585
DP 818487
DP 627671
DP 83341
DP 83361
DP 83359
DP 1003432
DP 1127069
DP 1127124
DP 620864
DP 857591
DP 854473
SP 68756
DP 431057
SP 97426
SP 102279
DP 129569
DP 1095545
DP 95306
DP 1049536
SP 72347
DP 736317
DP 632876
SP 22981
DP 590406
DP 826292
DP 1249174
DP 456088
DP 1072718
DP 782087
DP 780632
DP 779089
DP 999059
DP 999097
DP 1555781
DP 1169805
DP 1126310
DP 1249790
DP 904638
DP 375054
DP 919920
DP 1249963
DP 348072
DP 1241920
DP 1085661
DP 744029
DP 735887
DP 1083697
DP 783310
DP 1015486
DP 318207
DP 1126310
DP 191305
DP 1249790
DP 1249963
DP 348072
DP 1241920
DP 1085661
DP 744029
DP 1085661
DP 1083697
DP 783310
DP 854473
DP 1015486
DP 1126310
DP 1249790
DP 904638
DP 375054
DP 919920

	Status	Surv/Comp	Purpose
DP131687			
Lot(s): 9			
DP962038	HISTORICAL	SURVEY	UNRESEARCHED
Lot(s): 10			
DP961397	HISTORICAL	SURVEY	UNRESEARCHED
Lot(s): 3			
DP906983	HISTORICAL	COMPILATION	UNRESEARCHED
Lot(s): 8			
DP905574	HISTORICAL	COMPILATION	UNRESEARCHED
Lot(s): 5			
DP904793	HISTORICAL	COMPILATION	UNRESEARCHED
Lot(s): 6			
DP904362	HISTORICAL	COMPILATION	UNRESEARCHED
Lot(s): 2			
DP348072	HISTORICAL	SURVEY	UNRESEARCHED
Lot(s): 11			
DP314974	HISTORICAL	SURVEY	UNRESEARCHED
Lot(s): 1			
DP229361	HISTORICAL	SURVEY	SUBDIVISION
Lot(s): 4			
DP191305	HISTORICAL	SURVEY	UNRESEARCHED
DP155578			
Lot(s): 3			
CA91799 - LOT 3 DP155578			
DP342675			
Lot(s): 1			
DP267291	REGISTERED	SURVEY	EASEMENT
DP445736			
Lot(s): 2			
DP267291	REGISTERED	SURVEY	EASEMENT
DP1015486			
Lot(s): 41			
PA81159 - LOT 41 DP1015486			
DP1049536			
Lot(s): 101			
DP996163	HISTORICAL	COMPILATION	DEPARTMENTAL
DP996944	HISTORICAL	COMPILATION	DEPARTMENTAL
Lot(s): 101, 102			
DP782092	HISTORICAL	COMPILATION	DEPARTMENTAL
DP995963	HISTORICAL	COMPILATION	DEPARTMENTAL
DP1072718			
Lot(s): 10			
DP779670	HISTORICAL	COMPILATION	DEPARTMENTAL
Lot(s): 11, 12, 13			
DP217742	HISTORICAL	SURVEY	SUBDIVISION
DP1083697			
Lot(s): 6			
CA94668 - LOT 6 DP1083697			
DP1085561			
Lot(s): 1, 2			
DP229361	HISTORICAL	SURVEY	SUBDIVISION
DP1085681			
Lot(s): 56			
CA94666 - LOT 56 DP1085681			

Caution: This information is provided as a searching aid only. Whilst every endeavour is made the ensure that current map, plan and titling information is accurately reflected, the Registrar General cannot guarantee the information provided. For **ALL ACTIVITY PRIOR TO SEPTEMBER 2002** you must refer to the RGs Charting and Reference Maps.

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PLAN FORM 2

Plan Drawing only to appear in this space

*OFFICE USE ONLY

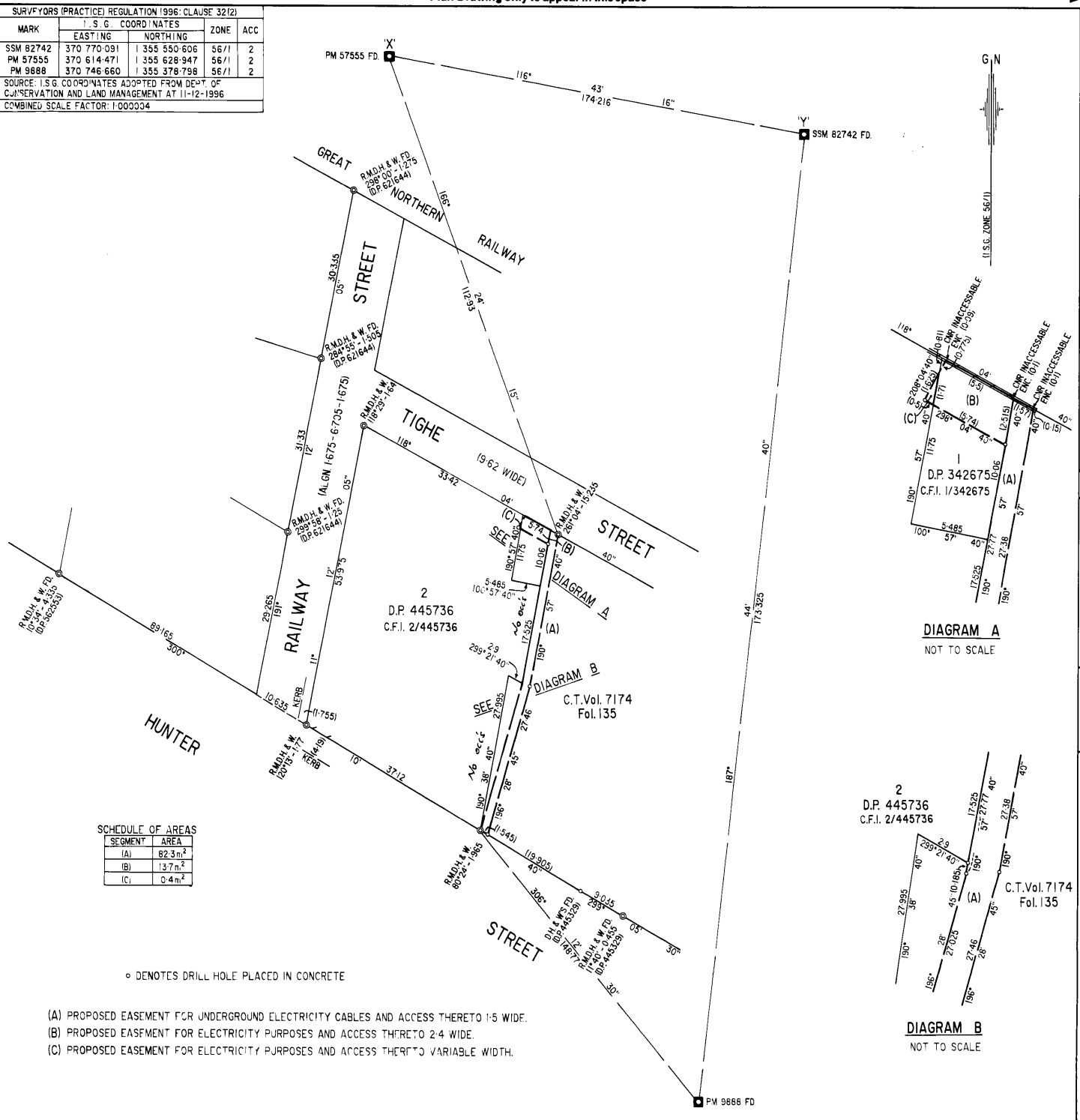
SIGNATURE AND SEALS ONLY.

SURVEYORS (PRACTICE) REGULATION 1996: CLAUSE 32(2)

MARK	I.S.G. COORDINATES EASTING	I.S.G. COORDINATES NORTHING	ZONE	ACC
SSM 82742	370 770·091	6 355 550·606	56/1	2
PM 57555	370 614·471	6 355 628·947	56/1	2
PM 9888	370 746·660	6 355 378·798	56/1	2

SOURCE: I.S.G. COORDINATES ADOPTED FROM DEPT. OF CONSERVATION AND LAND MANAGEMENT AT 11-12-1996

COMBINED SCALE FACTOR: 1·000004



SCHEDULE OF AREAS

SEGMENT	AREA
(A)	82·3m²
(B)	13·7m²
(C)	0·4m²

NOT TO SCALE

NOT TO SCALE

Crown Lands Office Approval

PLAN APPROVED .....
Authorised Officer
Land District .....
Paper No. .....
Field Book ..... pages .....

Council's Certificate

I hereby certify that –

(a) the requirements of the Local Government Act, 1919 (other than the requirements for the registration of plans), and

*(b) the requirements of † Part 3 Division 2 of the Water Board Act 1987, or † Part 5 Division 7 of the Hunter Water Board (Corporatisation) Act 1991.

have been complied with by the applicant in relation to the proposed.....
(Insert "new road", "subdivision" or "consolidated lot") set out herein

Subdivision No. .....

Date .....

(Signature) .....
General Manager/Authorised Person

Council File No. .....

*This part of certificate to be deleted where the application is only for a consolidated lot or the opening of a new road or where the land to be subdivided is wholly outside the areas of operations of the Water Board and the Hunter Water Corporation Ltd.

†Delete if inapplicable

SURVEYOR'S REFERENCE: 12315 CHECKLIST

DP 267291

Registered: 28-1-1997

C.A: —

Title System: TORRENS

Purpose: PROPOSED EASEMENT

Ref. Map: U6350-34

Last Plan: DP342675 DP445736

PLAN OF PROPOSED EASEMENT FOR UNDERGROUND ELECTRICITY CABLES AND ACCESS THERETO WITHIN LOT 2 D.P. 445736, LOT 1 D.P.342675 AND LAND IN C.T.Vol.7174 Fol.135.

Lengths are in metres. Reduction Ratio 1:500

LGA NEWCASTLE

Locality: NEWCASTLE WEST

Parish: NEWCASTLE

County: NORTHUMBERLAND

This is sheet 1 of my plan in ~~(Delete if inapplicable)~~ sheets

I, BRUCE PHILLIP GANDER

of C.R.HUTCHISON & CO. P/L - DX 7881 NEWCASTLE A.C.N. 001 747 182

a surveyor registered under the Surveyors Act 1929, hereby certify that the survey represented in this plan is accurate, has been made in accordance with the Survey Practice Regulation 1990 and was completed on 6/1/1997

(Signature) ..... Surveyor registered under the surveyors Act 1929

Datum Line of Azimuth

'X' - 'Y'

Plans used in preparation of survey/compilation

D.P.445736
D.P.342675
D.P.445329
D.P.562553
D.P.621644

PANEL FOR USE ONLY for statements of intention to dedicate public roads, to create public reserves, drainage reserves, easements, restrictions on the use of land or positive covenants.

10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 Table of mm 210 220 230 240 250 260 270 280 290 300 310 320 330 340 350 360 370 380 390

WARNING: CREASING OR FOLDING WILL LEAD TO REJECTION

DP 267291

InfoTrack
Req:R392129 /Doc:DP 0267291 P /Rev:30-Jan-1997 /NSW LRS /Pgs:ALL /Prt:20-Aug-2021 14:12 /Seq:1 of 1
© Office of the Registrar-General /Src:INFOTRACK /Ref:924 Hunter Street, Newcastle West

I, Bruce Richard Davies, Registrar General for New South Wales, certify that this negative is a photograph made as a permanent record of a PLAN IN REGISTRAR GENERAL'S OFFICE.

AMENDMENTS AND/OR ADDITIONS NOTED ON

~~364916~~ C922329

City of Greater Newcastle.

PLAN FP445736

showing re-survey for amendment of C^s.T.

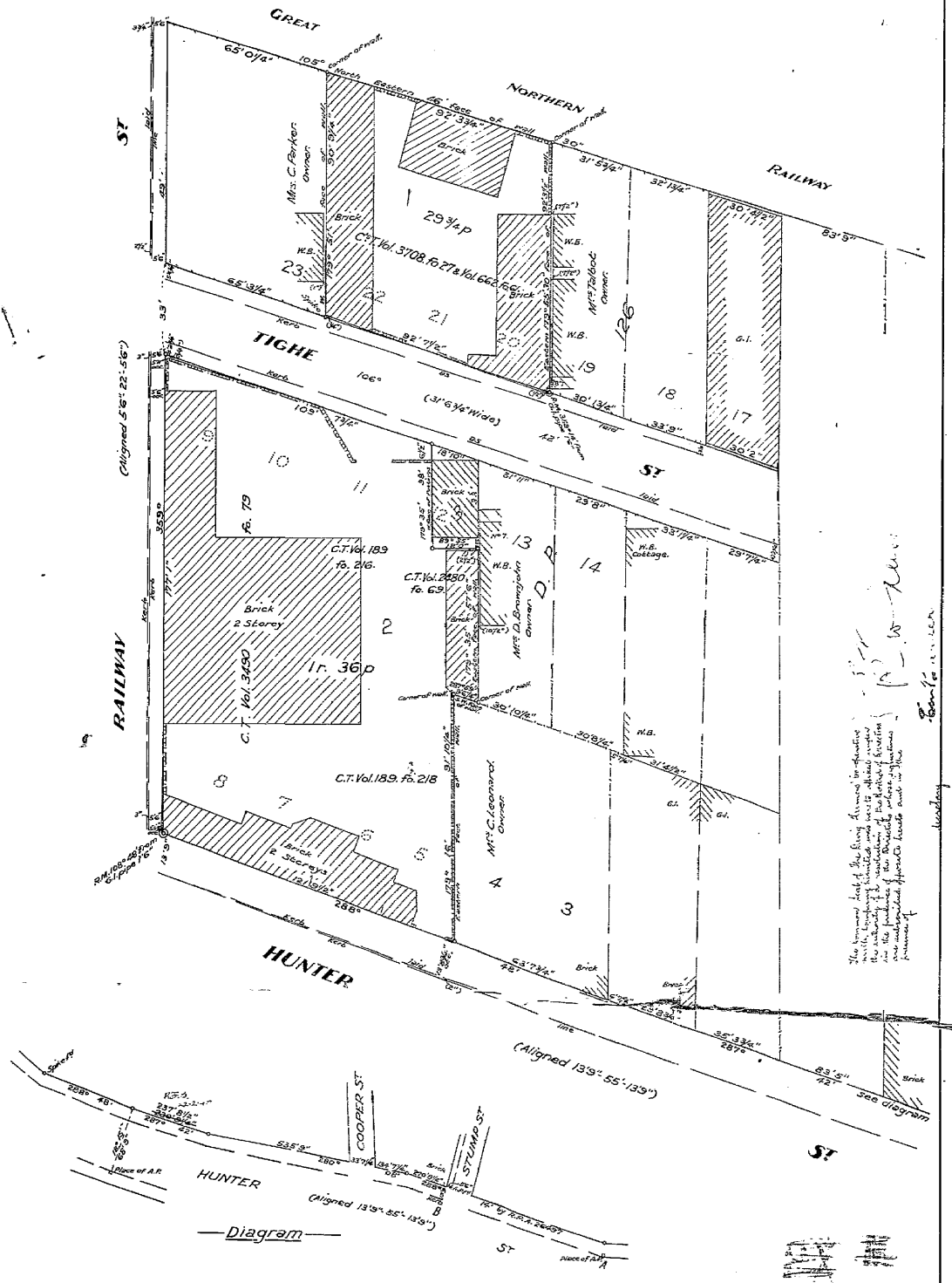
~~C.T.~~

Vol. 189. fol. 218, Vol. 3490. fol. 79, Vol. 189. fol. 216, Vol. 2480. fol. 69, Vol. 662. fol. 61 & Vol. 3708. fol. 27.

at Wickham.

Parish of Newcastle **County of Northumberland**

Scale 30 feet to an inch



CONVERSION TABLE ADDED IN DEPARTMENT OF LANDS

DP 445736

FEET	INCHES	METRES
–	0 1/4	0.006
–	0 1/2	0.013
–	0 3/4	0.019
–	0 7/8	0.022
–	1	0.025
–	2	0.051
–	2 1/2	0.064
–	2 7/8	0.073
–	3	0.076
–	3 3/4	0.095
–	7 1/2	0.191
–	7 3/4	0.197
–	8	0.203
–	10 1/2	0.267
1	6	0.457
4	2 3/4	1.289
5	4 3/4	1.645
5	5 3/4	1.670
5	6	1.676
5	7 1/4	1.708
5	11	1.803
6	–	1.829
6	7 1/2	2.019
6	7 3/4	2.026
9	6 1/8	2.899
9	6 1/4	2.902
10	11 3/8	3.337
13	8 1/4	4.172
13	8 3/4	4.185
13	9	4.191
18	–	5.486
18	10	5.740
22	–	6.706
29	7 1/4	9.023
29	8	9.042
29	8 3/4	9.061
30	1	9.169
30	1 3/4	9.188
30	2	9.195
30	4 1/2	9.258
30	8 1/4	9.354
30	10 1/4	9.404
31	4 1/2	9.563
31	5 3/4	9.595
31	6 3/4	9.620
31	11	9.728
32	1 3/4	9.798
33	–	10.058
33	1 1/4	10.090
33	7 1/4	10.243
33	9	10.287
35	3 3/4	10.763
35	3 7/8	10.766
38	6 1/2	11.748
55	–	16.764
57	6	17.526
60	2	18.339
63	7 3/4	19.399
65	0 1/4	19.818
65	3 1/4	19.895
68	9	20.955
83	5	25.425
83	9	25.527
90	9 1/4	27.667
91	10 1/4	27.997
92	3 1/4	28.124
92	3 1/2	28.131
92	3 3/4	28.137
92	7 1/2	28.232
92	7 3/4	28.238
109	7 3/4	33.420
121	9 1/2	37.122
134	7 1/4	41.027
177	1	53.975
230	8 1/4	70.314
237	8 1/2	72.454
237	8 3/4	72.460

CONVERSION TABLE ADDED IN DEPARTMENT OF LANDS CONTINUED

DP 445736

FEET	INCHES	METRES
270	7 7/8	82.496
270	8 1/4	82.506
330	–	100.584
490	–	149.352
535	9	163.297

AC	RD	P	SQ M
–	–	29 3/4	752.5
–	1	36	1922

Subscribed and declared before me at Newcastle this 28th day of July. 1939.

A. Bright J.P.

I, Reginald Frederick Bruyn, of Newcastle, a surveyor registered under the Surveyors Act, 1929, do hereby solemnly and sincerely declare, (a) that all boundaries and measurements shown on this plan are correct, (b) that all survey marks found and relevant physical objects on or adjacent to the boundaries are correctly represented, (c) that all physical objects indicated actually exist in the positions shown, (d) that the whole of the material facts in relation to the land are correctly represented, (e) that the survey represented in this plan has been made in accordance with the Survey Practice Regulations, 1933, by me, was completed on 17th July, 1939, and the reference marks have been placed as shown hereon. And I make this solemn declaration conscientiously believing the same to be true and by virtue of the provisions of the Oaths Act, 1900.

R.F. Bruyn

Surveyor registered under the Surveyors Act, 1929.

Datum line of Azimuth A-B.

Req:R38705B /Doc:DP 0445736 P /Rev:31-Dec-1992 /NSW LRS /Pgs:ALL /Prt:20-Aug-2021 09:32 /Seq:1 of 1
© Office of the Registrar-General /Src:INFOTRACK /Ref:924 Hunter Street, Newcastle West

C922328 [redacted]
~~C707453~~

F.P. 342675

City of Greater Newcastle

PLAN

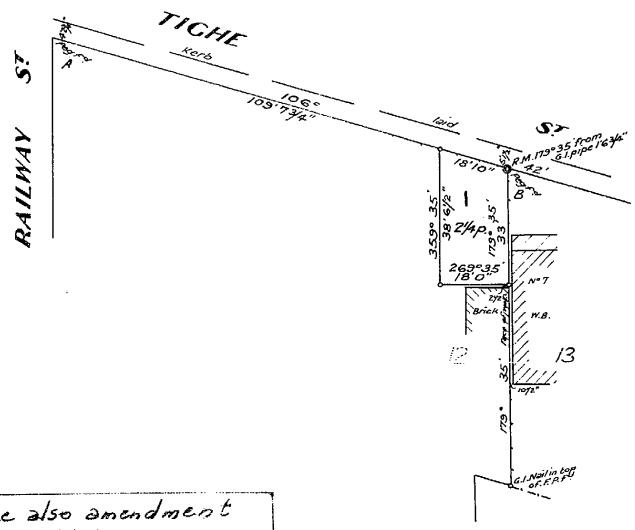
of part of Lot 12 D.P. 126.

Parish of Newcastle County of Northumberland

Scale 30 feet to an inch.

C922328

M P S (R.P.)
42675



See also amendment plan filed as F.P. 440917

RESUMPTION OF LAND

27 7 38 No 63 29 7 38

Registered

I, Reginald Frederick Bruyn, of Newcastle, a surveyor registered under the Surveyors Act, 1929, do hereby solemnly and sincerely declare (a) that all boundaries and measurements shown on this plan are correct, (b) that all survey marks found and relevant physical objects on or adjacent to the boundaries are correctly represented, (c) that all physical objects indicated actually exist in the positions shown, (d) that the whole of the material facts in relation to the land are correctly represented, (e) that the survey represented in this plan has been made in accordance with the Survey Practice Regulations, 1933, by me, was completed on 11th July, 1938, and the reference mark has been placed as shown hereon. And I make this solemn declaration conscientiously believing the same to be true, and by virtue of the provisions of the Oaths Act, 1900

R. F. Bruyn.

Surveyor registered under the Surveyors Act, 1929.

Subscribed and declared before me at Newcastle this 11th day of July 1938.

Datum line of Azimuth A-B.

LOT N° ADDED IN L.T.O. 20.3.1990.
This is the plan marked "A" referred to in the Transfer dated 8th August 1990

CONVERSION TABLE ADDED IN DEPARTMENT OF LANDS

DP 342675

FEET	INCHES	METRES
-	2 1/2	0.064
-	10 1/2	0.267
1	6 3/4	0.476
4	2 3/4	1.289
5	1 1/2	1.562
18	-	5.486
18	10	5.740
33	-	10.058
38	6 1/2	11.748
109	7 3/4	33.420

AC	RD	P	SQ M
-	-	2 1/4	56.9

AMENDMENTS AND/OR ADDITIONS MADE ON PLAN IN THE LAND TITLES OFFICE

10 20 30 40 50 60 70 Table of mm 110 120 130 140

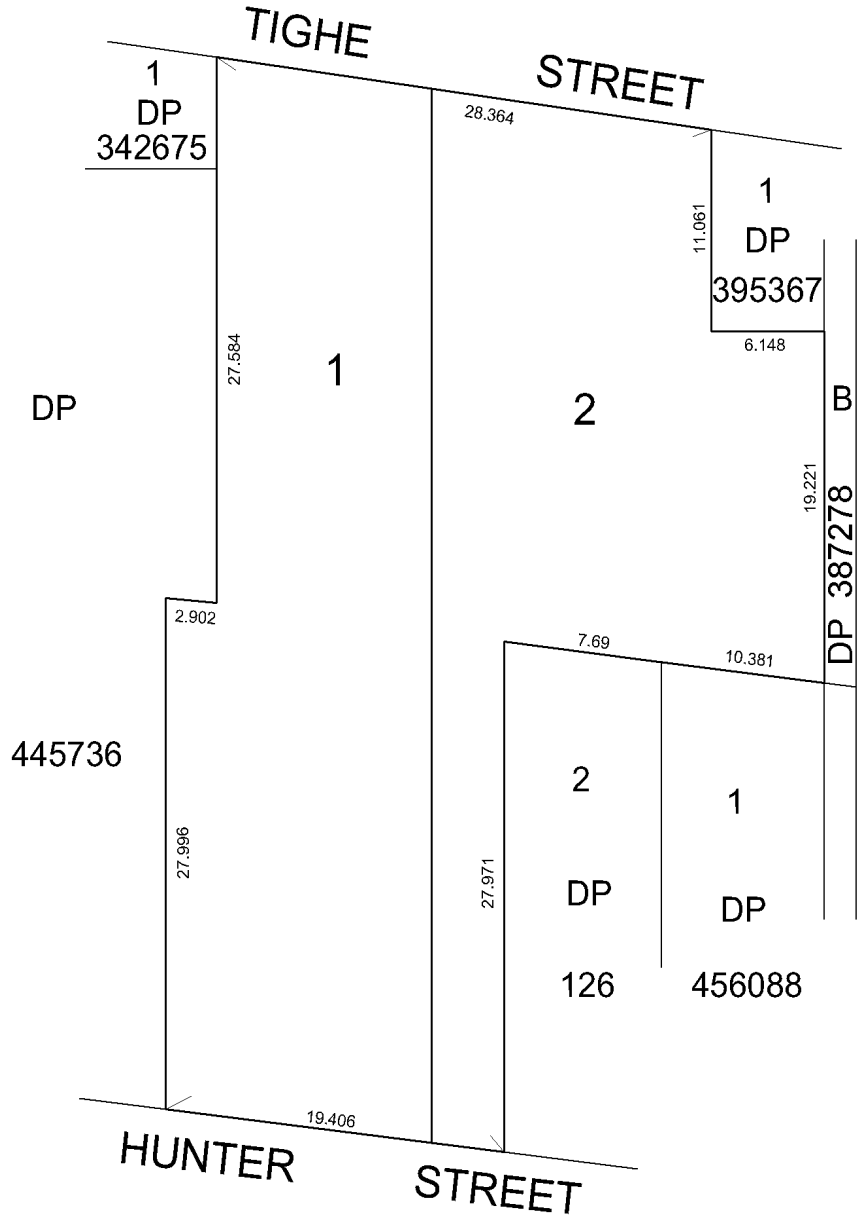
This negative is a photograph made as a permanent record of a document in the custody of the Registrar General this day. 22nd March, 1990

Req:R386956 /Doc:DP 0342675 P /Rev:03-Nov-1992 /NSW LRS /Pgs:ALL /Prt:20-Aug-2021 09:27 /Seq:1 of 1
© Office of the Registrar-General /Src:INFOTRACK /Ref:924 Hunter Street, Newcastle West

InfoTrack

e-departmental

Full dimensions and/or area(s) are not available for all lots. Any division of the lands herein may necessitate the lodgement of a plan of survey.



TOTAL AREA FOR LOTS 1 & 2: 1397 m²

DP 1091173

Registered : 22.11.2005

Title System : TORRENS

Purpose : DEPARTMENTAL

Ref. Map : U6350-34

Last Plan : DP126

PLAN OF PART OF PORS 198 & 199

COMPRISED IN VOL. 7174 FOL. 135

Lengths are in metres. Reduction Ratio - NTS

LPI Ref. : TCB 37/38

Sheet 1 of 1 sheet

L.G.A. : NEWCASTLE

LOCALITY : NEWCASTLE WEST

PARISH : NEWCASTLE

COUNTY : CUMBERLAND

LOT	PRIOR IDENTITY
1	PT POR. 198
2	PT POR. 199

THIS PLAN HAS BEEN PREPARED TO PROVIDE AN UNIQUE IDENTITY FOR THE LAND IN THE CERTIFICATE OF TITLE REFERRED TO ABOVE.

IT IS NOT A CURRENT PLAN IN THE TERMS OF 7A OF THE CONVEYANCING ACT, 1919.

Req:R361344 /Doc:DP 1091173 P /Rev:01-Dec-2005 /NSW LRS /Pgs:ALL /Prt:18-Aug-2021 12:17 /Seq:1 of 1
© Office of the Registrar-General /Src:INFOTRACK /Ref:924 Hunter Street, Newcastle West

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Req:R387380 /Doc:DP 0201679 P /Rev:05-Jun-1992 /NSW LRS /Pgs:ALL /Prt:20-Aug-2021 09:55 /Seq:1 of 1
© Office of the Registrar-General /Src:INFOTRACK /Ref:924 Hunter Street, Newcastle West

DP201679s

Plan Form No. 6 (for transfers, leases, etc.)

~~Municipality of~~
~~Shire of~~
City of Newcastle

PLAN

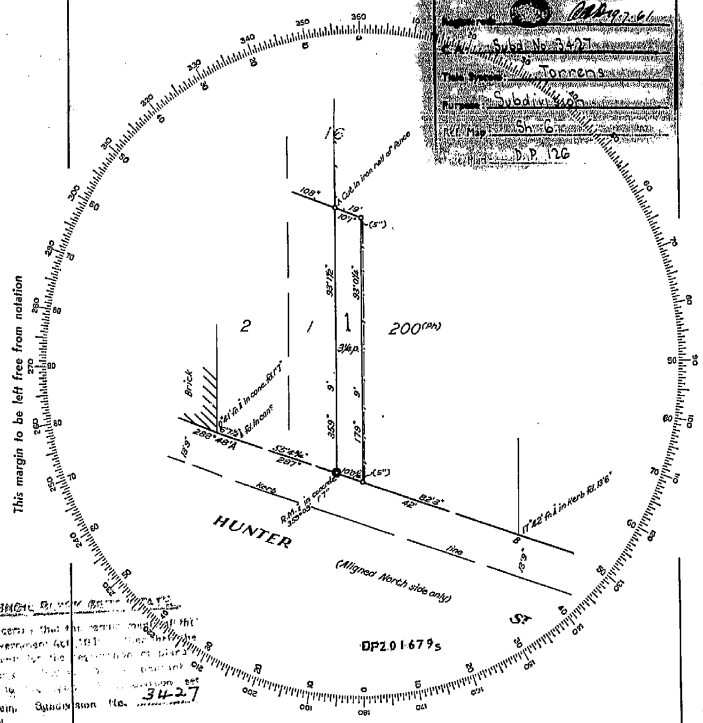
of part lot 1, D.P. 126

Parish of Newcastle County of Northumberland

Scale 30 feet to an inch.

DP201679 s

Registered: 9.7.61
Subd. No. 3427
Title System: Torrens
Purpose: Subdivision
Ref. Map: Sh. 6
Last Plan: D.P. 126



This margin to be left free from notation

Signatures of parties to be made in this margin.

COUNCIL BLOCK SECTION

I hereby certify that this [illegible] Local Government Act, 1919 [illegible] Subdivision No. 3427 approved 8th November 1960.

TOWN CLERK

Approved by the Council and Certified in accordance with the Provisions of Section 327 of the Local Government Act, 1919.

Subdivision No.

Council Clerk

Datum Line of Azimuth A-B. (Ste H322601)

I, Reginald Frederick Bruyn

of Newcastle

a surveyor registered under the Surveyors Act, 1929-1946, hereby certify that the survey represented in this plan is accurate and has been made * (1) by me ~~(2) under my immediate supervision~~ in accordance with the Survey Practice Regulations, 1933, and was completed on † 16th September 1960.

(Signature) R F Bruyn

Surveyor registered under the Surveyors Act, 1929-46.

* Strike out either (1) or (2). † Insert date of survey.

This is the plan marked " " referred to in.....

Dated.....

CONVERSION TABLE ADDED IN REGISTRAR GENERAL'S DEPARTMENT

DP 201679

FEET	INCHES	METRES
-	5	0.127
1	1	0.330
1	7	0.483
3	9	1.143
6	7 1/2	2.019
8	7	2.616
9	3 3/4	2.838
10	0 3/4	3.067
10	1	3.073
13	6	4.115
13	9	4.191
55	4 3/4	16.885
82	3	25.070
93	0 1/4	28.353
93	1 1/2	28.385

AC	RD	P	SQ M
-	-	3 1/4	82.2

I, Bruce Richard Davies, Registrar General for New South Wales, certify that this negative is a photograph made as a permanent record of a document in my custody this 14th day of February, 1977

Table of mm

Req:R359856 /Doc:DP 0000126 P /Rev:17-Feb-2015 /NSW LRS /Prt:18-Aug-2021 10:47 /Seq:1 of 1
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CONVERSION TABLE ADDED IN REGISTRAR GENERAL'S DEPARTMENT

DP 126

FEET	INCHES	METRES
29	6	8.99
29	9	9.07
29	10	9.095
30	-	9.145
30	1	9.17
30	2	9.195
33	-	10.06
80	2	24.435
87	6	26.67
87	9	26.745
87	11	26.795
88	3	26.9
88	4	26.925
88	9	27.05
89	2	27.18
89	3	27.205
89	7	27.305
89	9	27.355
90	1	27.455
90	3	27.51
90	6	27.585
90	9	27.66
91	-	27.735
91	3	27.815
91	9	27.965

AC	RD	P	SQ M
-	-	9 1/4	234
-	-	9 1/2	240.3
-	-	18	455.3
-	-	18 1/2	467.9
-	-	28	708.2
-	-	36 1/2	923.2
-	1	7	1189

DP 126

PLAN OF 24 ALLOTMENTS IN THE CITY OF at Wickham Pt. NEWCASTLE. Co. Northumberland

Scale 1 chain to 2 inches

Being Portions 197 198 & 199 suburban allotments as per Government plans of Newcastle, and now belonging to Clarence H. Hannell.

COPY MADE L. & P. 18.9.94
EXAMINED J. L. M. 16.10.94

GREAT NORTHERN RAILWAY

RESERVED ROAD

TICHE STREET

GREAT NORTHERN ROAD

T. 20048 18 per.
T. 12414 O. 1. 7
T. 17519 9½ per.
T. 12412 9¼ per.
T. 18362 9¼ per.
T. 26325 9¼ per.
T. 12669 9¼ per.
T. 19441 9¼ per.
T. 12609 36½ per.
T. 12609 28 per.
T. 12413 18½ per.
T. 19732 9¼ p.
T. 19733 9¼ p.

House. owner & occupier

Thomas Bryant. owner & occupier

197. 198. 199.

All granted to Clarence Hewson Hannell 3 Grants dated 14th Augst 1868
Portion 197. Vol. 72 fo. 250
do 198 " 73 " 1
do 199 " 73 " 2

No. 126

I certify that the above Diagram and Description are correct for the purposes of the accompanying Application of Clarence Hewson Hannell, under the Land Titles Act — D'Mahaiduane Lic. Surveyor

Sworn before me this 12th day of June 1874.
W. A. Scratton J.P

D'Mahaiduane Lic. Surveyor June 1874

Historical Title

NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE
18/8/2021 9:30AM

FOLIO: 2/445736

First Title(s): VOL 72 FOL 250 VOL 73 FOL 1
Prior Title(s): VOL 5161 FOL 181

Recorded	Number	Type of Instrument	C.T. Issue
18/12/1988		TITLE AUTOMATION PROJECT	LOT RECORDED FOLIO NOT CREATED
19/2/1990	Y746376	APPLICATION FOR REPLACEMENT CERTIFICATE OF TITLE	FOLIO CREATED EDITION 1
20/9/1993	I651038	CHANGE OF NAME	EDITION 2
10/12/1993	I760985	MORTGAGE	EDITION 3
6/12/1994	U840926	DISCHARGE OF MORTGAGE	
6/12/1994	U840927	TRANSFER	EDITION 4
28/1/1997	DP267291	DEPOSITED PLAN	
6/6/1997	3077496	TRANSFER GRANTING EASEMENT	EDITION 5
4/9/1997	3361314	MORTGAGE	EDITION 6
19/7/2000	6946978	VARIATION OF MORTGAGE	EDITION 7
23/10/2002	9045568	DISCHARGE OF MORTGAGE	
23/10/2002	9045569	MORTGAGE	EDITION 8
19/10/2012	AH287400	DISCHARGE OF MORTGAGE	
19/10/2012	AH287401	LEASE	EDITION 9
12/11/2014	AI999577	SURRENDER OF LEASE	
12/11/2014	AI999578	LEASE	EDITION 10
31/8/2016	AK715910	SURRENDER OF LEASE	EDITION 11
28/2/2019	AP90588	DEPARTMENTAL DEALING	
1/3/2019	AP94672	TRANSFER	EDITION 12
23/11/2020	AQ502865	LEASE	EDITION 13
5/2/2021	AQ779633	CAVEAT	

*** END OF SEARCH ***

924 Hunter Street, Newcastle West PRINTED ON 18/8/2021

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Received: 18/08/2021 09:30:41

Req:R382727 /Doc:DL I651038 /Rev:19-Apr-2010 /NSW LRS /Pgs:ALL /Prt:19-Aug-2021 16:23 /Seq:1 of 13
© Office of the Registrar-General /Src:INFOTRACK /Ref:924 Hunter Street, Newcastle West

RP33

[redacted]

Application to Record

CHANGE OF N

Real Property Act 1900
Crown Lands Consolidation Act 1900
Western Lands Act 1901

I
651038 N

B4002 16/9
E-RN
V-TZ 16/9

B

See copies A, B, C

(A) [redacted]
Show no more than 20 References to Title.

[redacted]

(B) **REGISTERED DEALING**
If applicable.

(C) **LODGED BY**

L.T.O. Box	Name, Address or DX and Telephone
92Q.	BAKER & McKENZIE DX 218 SYDNEY REFERENCE (max 15 characters):

(D) [redacted]
whose name is to be changed.

[redacted]

(E) [redacted]
In full.

CN	[redacted] (ARBN 010 308 068) S

(F) I, the Registered Proprietor, apply to have my New Name recorded in the Register in respect of the above **Land/~~Registered Dealing~~**.

(G) **STATUTORY DECLARATION BY THE APPLICANT** SEE ANNEXURE 'B'

~~I, *[New Name]* ....., solemnly and sincerely declare that~~

~~1. I am identical with the Registered Proprietor referred to above,~~

~~2. On ..... 199 ..... at .....~~

~~in the State of ..... I married .....;~~

~~3. .....~~

I make this solemn declaration conscientiously believing the same to be true and by virtue of the Oaths Act 1900, and I certify this application correct for the purposes of the Real Property Act 1900.

Made and subscribed at ..... in the State of .....

on ..... 199 ..... in the presence of

.....
Signature of Witness

.....
Name of Witness (BLOCK LETTERS)

.....
~~Address and Qualification of Witness~~

.....
~~Signature of Applicant~~

CHECKED BY (office use only) GLG

Cover

CT-92Q

Ausdoc Commercial and Law Stationers

Req:R382727 /Doc:DL I651038 /Rev:19-Apr-2010 /NSW LRS /Pgs:ALL /Prt:19-Aug-2021 16:23 /Seq:2 of 13
© Office of the Registrar-General /Src:INFOTRACK /Ref:924 Hunter Street, Newcastle West

THIS IS PAGE ONE OF THE ANNEXURE "A" REFERRED TO

IN THE CHANGE OF NAME (RP33)

Dated 9th July 1993

B

Torrens Title Reference

- ✓Folio Identifier 28/2067 878-114
- ✓Folio Identifier 1/601958 14100-27
- ✓Folio Identifier A/370276 6278-138
- ✓Folio Identifier 110/D/1195 4120-154
- ✓Auto Consol 6818-134
- ✓Folio Identifier 78/736042
- ✓Folio Identifier 11/787701
- ✓Folio Identifier 1/23241 9811-204
- ✓Volume 9501 Folio 192 - now 9/15/2780
- ✓Folio Identifier 1/534602 11047-41
- ✓Folio Identifier 22/240568
- ✓Volume 10943 Folio 151 - now 12/532025
- ✓Volume 10943 Folio 152 - now 13/532025
- ✓Volume 11106 Folio 213 - now 16/534579
- ✓Folio Identifier 18/240568
- ✓Volume 11551 Folio 116 - now 19/240568
- ✓Volume 11551 Folio 117 - now 20/240568
- ✓Volume 11551 Folio 118 - now 21/240568
- ✓Folio Identifier 21/738036
- ✓Folio Identifier 1/797024

gBrazell Jenkins (AP)

Req:R382727 /Doc:DL I651038 /Rev:19-Apr-2010 /NSW LRS /Pgs:ALL /Prt:19-Aug-2021 16:23 /Seq:3 of 13
© Office of the Registrar-General /Src:INFOTRACK /Ref:924 Hunter Street, Newcastle West

THIS IS PAGE TWO OF THE ANNEXURE "A" REFERRED TO
IN THE CHANGE OF NAME (RP33)
Dated 9th July 1993

B

Torrens Title Reference

Folio Identifier 2/797024
Folio Identifier 6/261968 14556 - 110
Folio Identifier 1/507180 10019 - 49
Folio Identifier 36/220788 9915 - 186
Folio Identifier 1/431958
Folio Identifier 1/532996
Folio Identifier 2/532996 10985 - 45
Volume 10738 Folio 38
Folio Identifier B/103432 10002 - 39
[redacted]
Folio Identifier 1/445736
[redacted]
Volume 8632 Folio 145 - auto consol.
Folio Identifier 12/569799 12461 - 228
Folio Identifier 21/263269 14874 - 108
Folio Identifier 22/263269 14874 - 109
Volume 13013 Folio 19 NOW BEING 1/582097
Volume 13013 Folio 20 2/582097
Folio Identifier 13/B/9140 9973 - 201
Folio Identifier 14/B/9140 9973 - 202

Req:R382727 /Doc:DL I651038 /Rev:19-Apr-2010 /NSW LRS /Pgs:ALL /Prt:19-Aug-2021 16:23 /Seq:4 of 13
© Office of the Registrar-General /Src:INFOTRACK /Ref:924 Hunter Street, Newcastle West

THIS IS PAGE THREE OF THE ANNEXURE "A" REFERRED TO

IN THE CHANGE OF NAME (RP33)

Dated 9th July 1993

B

Torrens Title Reference

Folio Identifier 15/B/9140 } 9973 - 203/204
Folio Identifier 16/B/9140 }
Folio Identifier 1/76938 - 3851 - 201
Volume 4237 Folio 132 auto consol
Volume 5865 Folio 194 now 12/3459
Volume 5865 Folio 195 NOW BEING 13/3459
Volume 12533 Folio 244 ϕ ϕ NOW BEING 14/571651
Folio Identifier 12/719715
Folio Identifier 38/10704 6393 - 108
Folio Identifier 37/10704 3462 - 240
Folio Identifier A/340379 5065 - 93
Folio Identifier 40/10704 3596 - 138

Req:R382727 /Doc:DL I651038 /Rev:19-Apr-2010 /NSW LRS /Pgs:ALL /Prt:19-Aug-2021 16:23 /Seq:5 of 13
© Office of the Registrar-General /Src:INFOTRACK /Ref:924 Hunter Street, Newcastle West

THIS IS THE ANNEXURE MARKED "B" REFERRED TO IN THE APPLICATION TO RECORD CHANGE OF NAME (RP33)

Dated 9th July 1993

B

STATUTORY DECLARATION

I, GEOFFREY DOUGLAS BOXSELL of 55 Chandos Street, St Leonards in the State of New South Wales, Company Secretary do solemnly and sincerely declare as follows:

1. I am the secretary of Australian Co-operative Foods Limited a co-operative society duly registered under the Co-operatives Act, 1992 (NSW) as amended.

2. I am duly authorised by Australian Co-operative Foods Limited to make this Statutory Declaration.

3. Dairy Farmers Co-operative Limited is recorded as the registered proprietor of the whole of the land contained in the Certificates of Title referred to in Annexure "A" of the Application to Record Change of Name (RP33).

4. On the 8th December 1989, the Registrar of Co-operative Societies recorded that Dairy Farmers Co-operative Limited had changed its name to Australian Co-operative Foods Limited. A copy of the Certificate of Incorporation following change of name is attached and marked "C".

And I make this solemn declaration conscientiously believing the same to be true and by virtue of the provisions of the Oaths Act, 1900 (as amended).

Subscribed and declared at)
Sydney this 9th)
day of July 1993)
Before me:)

GBoxsell
.....

.....

Req:R382727 /Doc:DL I651038 /Rev:19-Apr-2010 /NSW LRS /Pgs:ALL /Prt:19-Aug-2021 16:23 /Seq:6 of 13
© Office of the Registrar-General /Src:INFOTRACK /Ref:924 Hunter Street, Newcastle West

'C'

FORM 18
REGULATION 30

NEW SOUTH WALES

B

CO-OPERATION ACT

Certificate of Incorporation

(FOLLOWING CHANGE OF NAME)

I Certify that DAIRY FARMERS CO-OPERATIVE LIMITED

has registered a change of its name, and is now incorporated as a RURAL society under the name of AUSTRALIAN CO-OPERATIVE FOODS LIMITED

Dated this EIGHTH day of DECEMBER 19 89

Deputy Registrar of Co-operative Societies.

Req:R382727 /Doc:DL I651038 /Rev:19-Apr-2010 /NSW LRS /Pgs:ALL /Prt:19-Aug-2021 16:23 /Seq:7 of 13
© Office of the Registrar-General /Src:INFOTRACK /Ref:924 Hunter Street, Newcastle West

DATED 1993.

B

STATUTORY DECLARATION

of

GEOFFREY DOUGLAS BOXSELL

ADDISONS
Solicitors
7th Floor
Culwulla Chambers
67 Castlereagh Street
SYDNEY NSW 2000
DX 262 SYDNEY
Tel: (02) 233-4622
Ref: DB:AUS005/660:0717B/7

Req:R382727 /Doc:DL I651038 /Rev:19-Apr-2010 /NSW LRS /Pgs:ALL /Prt:19-Aug-2021 16:23 /Seq:8 of 13
© Office of the Registrar-General /Src:INFOTRACK /Ref:924 Hunter Street, Newcastle West

RP33

Application to Record

CHANGE OF N

Real Property Act 1900
Crown Lands Consolidation Act 190[illegible]
Western Lands Act 1901

I
651038 N A

R1/1

B4002 E-BM 16/9 V-KV 16/9

(A) **LAND**
Show no more than 20 References to Title.

SEE ANNEXURE **B**

(B) **REGISTERED DEALING**
If applicable.

(C) **LODGED BY**

L.T.O. Box	Name, Address or DX and Telephone
920	BAKER & McKENZIE DX 218 SYDNEY REFERENCE (max ~~15 characters~~):

(D) **REGISTERED PROPRIETOR**
whose name is to be changed.

DAIRY FARMERS CO-OPERATIVE LIMITED

(E) **NEW NAME**
In full.

CN AUSTRALIAN CO-OPERATIVE FOODS LIMITED
(ARBN 010 308 068)

(F) I, the Registered Proprietor, apply to have my New Name recorded in the Register in respect of the above ~~Land/Registered Dealing~~.

(G) **STATUTORY DECLARATION BY THE APPLICANT** SEE ANNEXURE 'B'

~~*1, [New Name]* ....., solemnly and sincerely declare that~~

~~*1. I am identical with the Registered Proprietor referred to above,*~~

~~*2. On ..... 199..... at .....*~~

~~*in the State of ..... I married .....*~~ ;

~~*3.* .....~~

.....

I make this solemn declaration conscientiously believing the same to be true and by virtue of the Oaths Act 1900, and I certify this application correct for the purposes of the Real Property Act 1900.

Made and subscribed at ..... in the State of .....

on ..... 199..... in the presence of

.....
Signature of Witness

.....
Name of Witness (BLOCK LETTERS)

.....
~~Address and Qualification of Witness~~

.....
~~Signature of Applicant~~

CHECKED BY (office use only) BLG

CT- 920

Req:R382727 /Doc:DL I651038 /Rev:19-Apr-2010 /NSW LRS /Pgs:ALL /Prt:19-Aug-2021 16:23 /Seq:9 of 13
© Office of the Registrar-General /Src:INFOTRACK /Ref:924 Hunter Street, Newcastle West

THIS IS PAGE ONE OF THE ANNEXURE REFERRED TO
IN THE CHANGE OF NAME (RP33)
Dated 9th July 1993

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✓Folio Identifier 11/787701
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✓Volume 9501 Folio 192 - now 9/15/2780
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✓Volume 11551 Folio 117 - now 20/240568
✓Volume 11551 Folio 118 - now 21/240568
✓Folio Identifier 21/738036
✓Folio Identifier 1/797024

[signature] [signature] (JP)

Req:R382727 /Doc:DL I651038 /Rev:19-Apr-2010 /NSW LRS /Pgs:ALL /Prt:19-Aug-2021 16:23 /Seq:10 of 13
© Office of the Registrar-General /Src:INFOTRACK /Ref:924 Hunter Street, Newcastle West

RP33

Application to Record

CHANGE OF N

Real Property Act 1900
Crown Lands Consolidation Act 190
Western Lands Act 1901

I
651038 N B

B4002 16/9
E-Bn 16/9
V-tz 16/9

R1/1

(A) **LAND**
Show no more than 20 References to Title.

SEE ANNEXURE **B**

(B) **REGISTERED DEALING**
If applicable.

(C) **LODGED BY**

L.T.O. Box	Name, Address or DX and Telephone
92D	BAKER & McKENZIE DX 218 SYDNEY REFERENCE (max ~~15 characters~~):

(D) **REGISTERED PROPRIETOR**
whose name is to be changed.

DAIRY FARMERS CO-OPERATIVE LIMITED

(E) **NEW NAME**
In full.

CN AUSTRALIAN CO-OPERATIVE FOODS LIMITED
(ARBN 010 308 068) S

(F) I, the Registered Proprietor, apply to have my New Name recorded in the Register in respect of the above ~~Land/Registered Dealing~~.

(G) **STATUTORY DECLARATION BY THE APPLICANT** SEE ANNEXURE 'B'

~~I, [New Name] ....., solemnly and sincerely declare that~~

~~1. I am identical with the Registered Proprietor referred to above;~~

~~2. On ..... 199..... at .....~~
~~in the State of ..... I married .....;~~

~~3. .....~~
.....

I make this solemn declaration conscientiously believing the same to be true and by virtue of the Oaths Act 1900, and I certify this application correct for the purposes of the Real Property Act 1900.

Made and subscribed at ..... in the State of .....

on ..... 199..... in the presence of

.....
Signature of Witness

.....
Name of Witness (BLOCK LETTERS)

.....
~~Address and Qualification of Witness~~

.....
~~Signature of Applicant~~

CHECKED BY (office use only) 926

CT-92D

Req:R382727 /Doc:DL I651038 /Rev:19-Apr-2010 /NSW LRS /Pgs:ALL /Prt:19-Aug-2021 16:23 /Seq:11 of 13
© Office of the Registrar-General /Src:INFOTRACK /Ref:924 Hunter Street, Newcastle West

THIS IS PAGE TWO OF THE ANNEXURE REFERRED TO
IN THE CHANGE OF NAME (RP33)
Dated 9th July 1993

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Torrens Title Reference

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Folio Identifier 6/261968 14556 - 110
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Folio Identifier B/103432 10002 - 39
Folio Identifier 2/445736
Folio Identifier 1/445736
Folio Identifier 1/342675
Volume 8632 Folio 145 - auto consol.
Folio Identifier 12/569799 12465 - 228
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Volume 13013 Folio 19 NOW BEING 1/582097
Volume 13013 Folio 20 2/582097
Folio Identifier 13/B/9140 9973 - 201
Folio Identifier 14/B/9140 9973 - 202

G Boosell [signature] (JP)

Req:R382727 /Doc:DL I651038 /Rev:19-Apr-2010 /NSW LRS /Pgs:ALL /Prt:19-Aug-2021 16:23 /Seq:12 of 13
© Office of the Registrar-General /Src:INFOTRACK /Ref:924 Hunter Street, Newcastle West

RP33

Application to Recorc

CHANGE OF N

Real Property Act 1900
Crown Lands Consolidation Act 190(
Western Lands Act 1901

I
651038 N C

R1/1

B4002 16/9
E-RN 16/9
V-tz 16/9

(A) **LAND**
Show no more than 20 References to Title.

SEE ANNEXURE **B**

(B) **REGISTERED DEALING**
If applicable.

(C) **LODGED BY**

L.T.O. Box	Name, Address or DX and Telephone
92Q	BAKER & McKENZIE DX 218 SYDNEY REFERENCE (max 15 characters):

(D) **REGISTERED PROPRIETOR**
whose name is to be changed.

DAIRY FARMERS CO-OPERATIVE LIMITED

(E) **NEW NAME**
In full.

CN AUSTRALIAN CO-OPERATIVE FOODS LIMITED
(ARBN 010 308 068) S

(F) I, the Registered Proprietor, apply to have my New Name recorded in the Register in respect of the above **Land/~~Registered Dealing~~**.

(G) **STATUTORY DECLARATION BY THE APPLICANT** SEE ANNEXURE 'B'

~~I, [New Name] ....., solemnly and sincerely declare that~~

~~1. I am identical with the Registered Proprietor referred to above;~~

~~2. On ..... 199 ..... at .....~~

~~in the State of ..... I married .....;~~

~~3. .....~~

I make this solemn declaration conscientiously believing the same to be true and by virtue of the Oaths Act 1900, and I certify this application correct for the purposes of the Real Property Act 1900.

Made and subscribed at ..... in the State of .....

on ..... 199 ..... in the presence of

.....
Signature of Witness

.....
Name of Witness (BLOCK LETTERS)

.....
~~Address and Qualification of Witness~~

.....
~~Signature of Applicant~~

CHECKED BY (office use only) 6/6

CT-92Q

Req:R382727 /Doc:DL I651038 /Rev:19-Apr-2010 /NSW LRS /Pgs:ALL /Prt:19-Aug-2021 16:23 /Seq:13 of 13
© Office of the Registrar-General /Src:INFOTRACK /Ref:924 Hunter Street, Newcastle West

THIS IS PAGE THREE OF THE ANNEXURE REFERRED TO

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Torrens Title Reference

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- Volume 5865 Folio 195 NOW BEING 13/3459
- Volume 12533 Folio 244 ϕ ϕ NOW BEING 14/571651
- Folio Identifier 12/719715
- Folio Identifier 38/10704 6393 - 108
- Folio Identifier 37/10704 3462 - 240
- Folio Identifier A/340379 5065 - 93
- Folio Identifier 40/10704 3596 - 138

Req:R359245 /Doc:DL U840927 /Rev:16-Mar-2010 /NSW LRS /Pgs:ALL /Prt:18-Aug-2021 09:51 /Seq:1 of 1
© Office of the Registrar-General /Src:INFOTRACK /Ref:924 Hunter Street, Newcastle West

97-01T

TRANSFER

Real Property Act, 1900

Land Titles Office use only

U 840927 B

(6)

Office

101194 2205 04 800438497/02

(A) [redacted]

Show no more than 20 References to Title.
If appropriate, specify the share transferred.

[redacted]

(B) **LODGED BY**

L.T.O. Box	Name, Address or DX and Telephone
35D	MORRIS, HAYES & EDGAR LAW STATIONERS 74 CASTLEREAGH ST., SYDNEY DX 420 232 2411 REFERENCE (max. 15 characters):

6A20694
Cleaves
Mollik
Gibbs

(C) [redacted]

[redacted]

[A.R.B.N. 010 308 068]

(D) acknowledges receipt of the consideration of $1,010,000.00

and as regards the land specified above transfers to the Transferee an estate in fee simple

(E) subject to the following **ENCUMBRANCES** 1. Nil 2. 3.

(F) [redacted]

(G)

T	S [redacted]
	TENANCY:

(H) We certify this dealing correct for the purposes of the Real Property Act, 1900.

Signed in my presence by the Transferor who is personally known to me.

Signature of Witness

L.W. Robinson

Name of Witness (BLOCK LETTERS)

168 Walker Street, North Sydney

Address of Witness

DATED 28 NOV 1994

AUSTRALIAN CO-OPERATIVE FOODS LIMITED by its Attorney ALAN RICHARD TOOTH who states that at the date of his execution hereof he has had no notice of the revocation of the Power of Attorney dated 14 June 1994 registered No. 674 Book 4061 under the authority of which he has executed this Transfer in the presence of:

Signature of Transferor

Signed in my presence by the Transferee who is personally known to

Signature of Witness

Name of Witness (BLOCK LETTERS)

Address of Witness

Solicitor for
JOHN McINTOSH CLEAVES

~~Signature of Transferee~~

INSTRUCTIONS FOR FILLING OUT THIS FORM ARE AVAILABLE FROM THE LAND TITLES OFFICE

CHECKED BY (office use only)

GOLD CT 35D

MDE prepared

Notice of sale 5/12/94

Req:R359108 /Doc:DL AP094672 /Rev:01-Mar-2019 /NSW LRS /Prt:18-Aug-2021 09:38 /Seq:1 of 2
© Office of the Registrar-General /Src:INFOTRACK /Ref:924 Hunter Street, Newcastle West

System Document Identification

Form Number: 01T-e
Template Number: T_nsw16
ELN Document ID: 9773888
ELN NOS ID: 9773889

TRANSFER

New South Wales
Real Property Act 1900

Land Registry Document Identification

AP94672

Stamp Duty: 9543087-001

PRIVACY NOTE: Section 31B of the Real Property Act 1900 (RP Act) authorises the Registrar General to collect the information required by this form for the establishment and maintenance of the Real Property Act Register. Section 96B RP Act requires that the Register is made available to any person for search upon payment of a fee, if any.

LODGED BY:

Responsible Subscriber: HALL & WILCOX ABN 58041376985
Address: Rialto South Tower
L11, 525 Collins ST
Melbourne 3000
Telephone:
PEXA Subscriber Number: 8120
Customer Account Number: 502209W
Document Collection Box: 1W
Client Reference: ACB:SLH:149901

LAND TITLE REFERENCE

8632-145
8377-233
1/342675
1/395367
2/445736
1/445736
7174-135

TRANSFEROR

ZUTOR PTY LTD ACN 001561379
Registered company

TRANSFEREE

MCCLOY NEWCASTLE WEST PTY LIMITED ACN 630410785
Registered company

Tenancy: Sole Proprietor

CONSIDERATION

The transferor acknowledges receipt of the consideration of $10,500,000.00

ESTATE TRANSFERRED

FEE SIMPLE

The Transferor transfers to the Transferee the Estate specified in this Instrument and acknowledges receipt of any Consideration shown.

SIGNING FOR TRANSFEROR

I certify that:

1. The Certifier has taken reasonable steps to ensure that this Registry Instrument or Document is correct and compliant with relevant legislation and any Prescribed Requirement.
2. The Certifier has retained the evidence supporting this Registry Instrument or Document.
3. The Certifier holds a properly completed Client Authorisation for the Conveyancing Transaction including this Registry Instrument or Document.
4. The Certifier has taken reasonable steps to verify the identity of the transferor.

Party Represented by Subscriber:

ZUTOR PTY LTD

Req:R359108 /Doc:DL AP094672 /Rev:01-Mar-2019 /NSW LRS /Prt:18-Aug-2021 09:38 /Seq:2 of 2
© Office of the Registrar-General /Src:INFOTRACK /Ref:924 Hunter Street, Newcastle West

Signed By: Leah Jean Reynolds
Signer Capacity: Practitioner Certifier
PEXA Signer Number: 70866
Digital Signing Certificate Number: 44467

Signed for Subscriber: O'HEARN LAWYERS PTY LIMITED ABN 94630101585

O'HEARN LAWYERS

Subscriber Capacity: Representative Subscriber
PEXA Subscriber Number: 25712
Customer Account Number: 504592
Date: 01/03/2019

SIGNING FOR TRANSFEREE

I certify that:

1. The Certifier has taken reasonable steps to ensure that this Registry Instrument or Document is correct and compliant with relevant legislation and any Prescribed Requirement.
2. The Certifier has retained the evidence supporting this Registry Instrument or Document.
3. The Certifier holds a properly completed Client Authorisation for the Conveyancing Transaction including this Registry Instrument or Document.
4. The Certifier has taken reasonable steps to verify the identity of the transferee.

Party Represented by Subscriber:

MCCLOY NEWCASTLE WEST PTY LIMITED

Signed By: Anna Zafira Bailey
Signer Capacity: Practitioner Certifier
PEXA Signer Number: 44712
Digital Signing Certificate Number: 22489

Signed for Subscriber: PARTNERS OF HALL & WILCOX ABN 58041376985

HALL & WILCOX

Subscriber Capacity: Representative Subscriber
PEXA Subscriber Number: 8120
Customer Account Number: 502209
Date: 01/03/2019

Title Search

NEW SOUTH WALES LAND REGISTRY SERVICES - TITLE SEARCH

FOLIO: 2/445736

SEARCH DATE	TIME	EDITION NO	DATE
18/8/2021	9:29 AM	13	23/11/2020

LAND

LOT 2 IN DEPOSITED PLAN 445736
AT WICKHAM
LOCAL GOVERNMENT AREA NEWCASTLE
PARISH OF NEWCASTLE COUNTY OF NORTHUMBERLAND
TITLE DIAGRAM DP445736

FIRST SCHEDULE

MCCLOY NEWCASTLE WEST PTY LIMITED (T AP94672)

SECOND SCHEDULE (4 NOTIFICATIONS)

1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
2 3077496 EASEMENT FOR UNDERGROUND ELECTRICITY CABLES & ACCESS AFFECTING THE PART SHOWN DESIGNATED (C) IN DP267291
3 AQ502865 LEASE TO MANNING VALLEY MOTOR HOLDING PTY LTD OF TENANCY 1, 924 HUNTER STREET AND 4 TIGHE STREET, NEWCASTLE WEST. EXPIRES: 15/5/2024.
* 4 AQ779633 CAVEAT BY THIRDI DAIRY FARMERS PTY LTD

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

* Any entries preceded by an asterisk do not appear on the current edition of the Certificate of Title. Warning: the information appearing under notations has not been formally recorded in the Register. InfoTrack an approved NSW Information Broker hereby certifies that the information contained in this document has been provided electronically by the Registrar General in accordance with Section 96B(2) of the Real Property Act 1900.

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Received: 18/08/2021 09:29:04

Historical Title

NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE
18/8/2021 9:30AM

FOLIO: 1/342675

First Title(s): VOL 73 FOL 1
Prior Title(s): VOL 5161 FOL 225

Recorded	Number	Type of Instrument	C.T. Issue
19/2/1990	Y746376	APPLICATION FOR REPLACEMENT CERTIFICATE OF TITLE	FOLIO CREATED EDITION 1
20/9/1993	I651038	CHANGE OF NAME	EDITION 2
10/12/1993	I760985	MORTGAGE	EDITION 3
6/12/1994	U840926	DISCHARGE OF MORTGAGE	
6/12/1994	U840927	TRANSFER	EDITION 4
28/1/1997	DP267291	DEPOSITED PLAN	
6/6/1997	3077496	TRANSFER GRANTING EASEMENT	EDITION 5
4/9/1997	3361314	MORTGAGE	EDITION 6
19/7/2000	6946978	VARIATION OF MORTGAGE	EDITION 7
23/10/2002	9045568	DISCHARGE OF MORTGAGE	
23/10/2002	9045569	MORTGAGE	EDITION 8
19/10/2012	AH287400	DISCHARGE OF MORTGAGE	
19/10/2012	AH287401	LEASE	EDITION 9
12/11/2014	AI999577	SURRENDER OF LEASE	
12/11/2014	AI999578	LEASE	EDITION 10
31/8/2016	AK715910	SURRENDER OF LEASE	EDITION 11
28/2/2019	AP90588	DEPARTMENTAL DEALING	
1/3/2019	AP94672	TRANSFER	EDITION 12
23/11/2020	AQ502865	LEASE	EDITION 13
5/2/2021	AQ779633	CAVEAT	

*** END OF SEARCH ***

924 Hunter Street, Newcastle West PRINTED ON 18/8/2021

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Received: 18/08/2021 09:30:40

LAND REGISTRY SERVICES Title Search

NEW SOUTH WALES LAND REGISTRY SERVICES - TITLE SEARCH

FOLIO: 1/342675

SEARCH DATE	TIME	EDITION NO	DATE
18/8/2021	9:29 AM	13	23/11/2020

LAND

LOT 1 IN DEPOSITED PLAN 342675
AT WICKHAM
LOCAL GOVERNMENT AREA NEWCASTLE
PARISH OF NEWCASTLE COUNTY OF NORTHUMBERLAND
TITLE DIAGRAM DP342675

FIRST SCHEDULE

MCCLOY NEWCASTLE WEST PTY LIMITED (T AP94672)

SECOND SCHEDULE (4 NOTIFICATIONS)

1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
2 3077496 EASEMENT FOR UNDERGROUND ELECTRICITY CABLES & ACCESS AFFECTING THE PART SHOWN DESIGNATED (B) IN DP267291
3 AQ502865 LEASE TO MANNING VALLEY MOTOR HOLDING PTY LTD OF TENANCY 1, 924 HUNTER STREET AND 4 TIGHE STREET, NEWCASTLE WEST. EXPIRES: 15/5/2024.
* 4 AQ779633 CAVEAT BY THIRDI DAIRY FARMERS PTY LTD

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

* Any entries preceded by an asterisk do not appear on the current edition of the Certificate of Title. Warning: the information appearing under notations has not been formally recorded in the Register. InfoTrack an approved NSW Information Broker hereby certifies that the information contained in this document has been provided electronically by the Registrar General in accordance with Section 96B(2) of the Real Property Act 1900.

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Historical Title

NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE
18/8/2021 9:30AM

FOLIO: AUTO CONSOL 7174-135

Recorded	Number	Type of Instrument	C.T. Issue
22/11/2005	DP1091173	DEPOSITED PLAN	
22/11/2005	AB928381	CONSOL HISTORY RECORD CREATED FOR AUTO CONSOL 7174-135	
		PARCELS IN CONSOL ARE: 1-2/1091173.	
19/10/2012	AH287400	DISCHARGE OF MORTGAGE	
19/10/2012	AH287401	LEASE	EDITION 1
12/11/2014	AI999577	SURRENDER OF LEASE	
12/11/2014	AI999578	LEASE	EDITION 2
31/8/2016	AK715910	SURRENDER OF LEASE	EDITION 3
1/3/2019	AP94672	TRANSFER	EDITION 4
25/3/2020	AP976757	LEASE	EDITION 5
23/11/2020	AQ502864	SURRENDER OF LEASE	
23/11/2020	AQ502865	LEASE	
23/11/2020	AQ502866	LEASE	
23/11/2020	AQ502867	LEASE	EDITION 6
5/2/2021	AQ779633	CAVEAT	

*** END OF SEARCH ***

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Received: 18/08/2021 09:30:33

Title Search

NEW SOUTH WALES LAND REGISTRY SERVICES - TITLE SEARCH

FOLIO: AUTO CONSOL 7174-135

SEARCH DATE	TIME	EDITION NO	DATE
18/8/2021	9:29 AM	6	23/11/2020

LAND

LAND DESCRIBED IN SCHEDULE OF PARCELS
AT NEWCASTLEWEST
LOCAL GOVERNMENT AREA NEWCASTLE
PARISH OF NEWCASTLE COUNTY OF NORTHUMBERLAND
TITLE DIAGRAM DP1091173

FIRST SCHEDULE

MCCLOY NEWCASTLE WEST PTY LIMITED (T AP94672)

SECOND SCHEDULE (6 NOTIFICATIONS)

1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
2 3077496 EASEMENT FOR UNDERGROUND CABLES OF ELECTRICITY AND ACCESS AFFECTING THE PART SHOWN DESIGNATED (A) IN DP267291
3 AQ502865 LEASE TO MANNING VALLEY MOTOR HOLDING PTY LTD OF TENANCY 1, 924 HUNTER STREET AND 4 TIGHE STREET, NEWCASTLE WEST. EXPIRES: 15/5/2024.
4 AQ502866 LEASE TO AIR LOCKER TRAINING NEWCASTLE PTY LTD OF TENANCY 2, 924 HUNTER STREET, NEWCASTLE WEST. EXPIRES: 21/5/2024.
5 AQ502867 LEASE TO BARRE EFFECT PTY LTD OF TENANCY 3, EASTERN SHOWROOM, 924 HUNTER STREET NEWCASTLE WEST. EXPIRES: 21/5/2024.
* 6 AQ779633 CAVEAT BY THIRDI DAIRY FARMERS PTY LTD

NOTATIONS

UNREGISTERED DEALINGS: NIL

SCHEDULE OF PARCELS

LOTS 1-2 IN DP1091173.

*** END OF SEARCH ***

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Historical Title

NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE
18/8/2021 9:30AM

FOLIO: 1/395367

First Title(s): VOL 6909 FOL 186
Prior Title(s): VOL 7174 FOL 134

Recorded	Number	Type of Instrument	C.T. Issue
21/4/1989		CONVERTED TO COMPUTER FOLIO	FOLIO CREATED CT NOT ISSUED
4/9/1997	3361313	TRANSFER	
4/9/1997	3361314	MORTGAGE	EDITION 1
19/7/2000	6946978	VARIATION OF MORTGAGE	EDITION 2
23/10/2002	9045568	DISCHARGE OF MORTGAGE	
23/10/2002	9045569	MORTGAGE	EDITION 3
19/10/2012	AH287400	DISCHARGE OF MORTGAGE	
19/10/2012	AH287401	LEASE	EDITION 4
12/11/2014	AI999577	SURRENDER OF LEASE	
12/11/2014	AI999578	LEASE	EDITION 5
31/8/2016	AK715910	SURRENDER OF LEASE	EDITION 6
28/2/2019	AP90588	DEPARTMENTAL DEALING	
1/3/2019	AP94672	TRANSFER	EDITION 7
25/3/2020	AP976757	LEASE	EDITION 8
23/11/2020	AQ502864	SURRENDER OF LEASE	
23/11/2020	AQ502865	LEASE	EDITION 9
5/2/2021	AQ779633	CAVEAT	

*** END OF SEARCH ***

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Received: 18/08/2021 09:30:33

Req:R359125 /Doc:DL 3361313 /Rev:12-Sep-1997 /NSW LRS /Pgs:ALL /Prt:18-Aug-2021 09:40 /Seq:1 of 3
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97-01T
006CN/0307/95

TRANSFER

Real Property Act, 1900

3361313 J

(1)

Office of State Revenue use only
OFFICE OF STATE REVENUE
1996/97 STAMP DUTY (NEWCASTLE REGISTRY) N4
DUTY $ 2-00 1ST FOLIO Boo 673071

(A) [redacted]D
Show no more than 20 References to Title.
If appropriate, specify the share transferred.

[redacted]7

(B) **LODGED BY**

L.T.O.Box	Name, Address or DX and Telephone
	BURKHART & COMPANY PTY LTD BOX 155S TEL: 9231 0122 FAX: 9262 1904 REFERENCE (max. 15 characters) DFM Incheape.

(C) [redacted]R [redacted]A

(D) acknowledges receipt of the consideration of $2,000.00

and as regards the land specified above transfers to the Transferee an estate in fee simple

(E) subject to the following **ENCUMBRANCES** 1 Nil 2 3

(F) [redacted]E

T TS (s713LGA) TW (Sheriff)	[redacted]J **TENANCY:**

(G)

(H) We certify this dealing correct for the purposes of the Real Property Act, 1900.

DATED 16.6.1997

Signed in my presence by the Transferor who is personally known to me.

.....
Signature of Witness

BRYCE SMITH
Name of Witness (BLOCK LETTERS)

4 MONITOR ST ADAMSTOWN HTS 2289
Address of Witness

SIGNED SEALED AND DELIVERED
For and on behalf of
energyAustralia by
PHIL GUDMUNSON
its duly constituted Attorney
pursuant to Power of Attorney
registered Book 4129 No. 872
who declares that he holds the
position set out beneath his
signature

Signature of Transferor

MANAGER-PROPERTY & INSURANCE

Witness

Signed in my presence by the Transferee who is personally known to me.

.....
Signature of Witness

.....
Name of Witness (BLOCK LETTERS)

.....
Address of Witness

J. Cleaves
Signature of Transferee

CHECKED BY (office use only)

$ Reg 80

Req:R359125 /Doc:DL 3361313 /Rev:12-Sep-1997 /NSW LRS /Pgs:ALL /Prt:18-Aug-2021 09:40 /Seq:2 of 3
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PLM
3361313

STATUTORY DECLARATION

I, BRIAN OAKLEY of Administration Centre, 145 Newcastle Road, Wallsend, in the State of New South Wales, Manager do hereby solemnly and sincerely declare as follows:-

1. I am the duly appointed Attorney for ENERGYAUSTRALIA and state that by my own knowledge I know the following facts to be true and correct and that I am authorised and qualified to make this declaration on behalf of ENERGYAUSTRALIA pursuant to Power of Attorney Book 4129 No 872..

2. I refer to Section 564B(1)(a) of the Local Government Act 1919 and I refer to proclamation dated 3rd July, 1957 published in the New South Wales Government Gazette No. 77 of 12th July, 1957. By the said proclamation inter alia the whole of the City of Newcastle was constituted as part of a county district for Local Government purposes under the name of the Shortland County Council District and the Shortland County Council was thereby constituted to exercise or perform for the benefit of the county district inter alia all the powers or duties under Section 382 of the Electricity Development Act, 1945-57 relating to the construction extension, production, maintenance, control and management of works for the supply of electricity and the supply and installation of electrical fittings and appliances.

3. The land in Certificate of Title Volume 7174 Folio 134 (Folio Identifier 1/395367) was acquired to be used for electrical purposes and was used for such purposes. No action apart from the effect of Section 564(1)(a) of the Local Government Act, 1919 and the said proclamation was taken to vest the said lands in the name of the Shortland County Council.

4. By virtue of the provisions of the Electricity (Amendment) Act 1993 the Shortland County Council became known as Shortland Electricity.

5. By proclamation published in Government Gazette No. 118 dated 27th September, 1995 Shortland Electricity was dissolved and MetNorth Energy was created pursuant to Section 6A of the Electricity Act, 1945, effective from 1st October, 1995.

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6. Apart from the vesting by law effected by Section 564(1)(a) of the Local Government Act, 1919 and the said proclamations dated 3rd July, 1957 and 27th September, 1995 there has not since that date been any dealings with any of the said land and there are no leases, tenancies, occupancies or mortgages over the said lands other than the occupancy of MetNorth Energy. There has been no trusts expressed or implied or constructive created in respect of the land and there has been no equitable interest created by contract or otherwise in respect of the land..

7. By virtue of Regulation pursuant to Section 12 of the Energy Services Corporations Act effective from 2 March 1996 Part 2 of Schedule 1 of that Act was amended by omitting the name MetNorth Energy and inserting the name EnergyAustralia.

AND I make this solemn declaration conscientiously believing the same to be true and by virtue of the provisions of the Oaths Act, 1900 (as amended).

SUBSCRIBED AND DECLARED at WALLSEND)
this 11 day of APRIL , 1997)
before me: BRUCE LESLIE SMITH)
4 MONITOR STREET
ADAMSTOWN HTS 2289
Reg N° 9500849

.....
A JUSTICE OF THE PEACE/~~SOLICITOR~~

PH:GLW:37377:003

Title Search

NEW SOUTH WALES LAND REGISTRY SERVICES - TITLE SEARCH

FOLIO: 1/395367

SEARCH DATE	TIME	EDITION NO	DATE
18/8/2021	9:29 AM	9	23/11/2020

LAND

LOT 1 IN DEPOSITED PLAN 395367
AT WICKHAM
LOCAL GOVERNMENT AREA NEWCASTLE
PARISH OF NEWCASTLE COUNTY OF NORTHUMBERLAND
TITLE DIAGRAM DP395367

FIRST SCHEDULE

MCCLOY NEWCASTLE WEST PTY LIMITED (T AP94672)

SECOND SCHEDULE (3 NOTIFICATIONS)

1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
2 AQ502865 LEASE TO MANNING VALLEY MOTOR HOLDING PTY LTD OF TENANCY 1, 924 HUNTER STREET AND 4 TIGHE STREET, NEWCASTLE WEST. EXPIRES: 15/5/2024.
* 3 AQ779633 CAVEAT BY THIRDI DAIRY FARMERS PTY LTD

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

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Historical Title

NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE
18/8/2021 9:33AM

FOLIO: AUTO CONSOL 8377-233

Recorded	Number	Type of Instrument	C.T. Issue
3/9/1997		CONSOL HISTORY RECORD CREATED FOR AUTO CONSOL 8377-233 PARCELS IN CONSOL ARE: 2/126, 1/456088.	
4/9/1997	3361314	MORTGAGE	EDITION 1
19/7/2000	6946978	VARIATION OF MORTGAGE	EDITION 2
23/10/2002	9045568	DISCHARGE OF MORTGAGE	
23/10/2002	9045569	MORTGAGE	EDITION 3
19/10/2012	AH287400	DISCHARGE OF MORTGAGE	
19/10/2012	AH287401	LEASE	EDITION 4
12/11/2014	AI999577	SURRENDER OF LEASE	
12/11/2014	AI999578	LEASE	EDITION 5
31/8/2016	AK715910	SURRENDER OF LEASE	EDITION 6
28/2/2019	AP90588	DEPARTMENTAL DEALING	
1/3/2019	AP94672	TRANSFER	EDITION 7
25/3/2020	AP976757	LEASE	EDITION 8
23/11/2020	AQ502864	SURRENDER OF LEASE	
23/11/2020	AQ502866	LEASE	
23/11/2020	AQ502867	LEASE	EDITION 9
5/2/2021	AQ779633	CAVEAT	

*** END OF SEARCH ***

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Received: 18/08/2021 09:33:02

Title Search

NEW SOUTH WALES LAND REGISTRY SERVICES - TITLE SEARCH

FOLIO: AUTO CONSOL 8377-233

SEARCH DATE	TIME	EDITION NO	DATE
18/8/2021	9:29 AM	9	23/11/2020

LAND

LAND DESCRIBED IN SCHEDULE OF PARCELS
LOCAL GOVERNMENT AREA NEWCASTLE
PARISH OF NEWCASTLE COUNTY OF NORTHUMBERLAND
TITLE DIAGRAM SEE SCHEDULE OF PARCELS

FIRST SCHEDULE

MCCLOY NEWCASTLE WEST PTY LIMITED (T AP94672)

SECOND SCHEDULE (4 NOTIFICATIONS)

1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
2 AQ502866 LEASE TO AIR LOCKER TRAINING NEWCASTLE PTY LTD OF TENANCY 2, 924 HUNTER STREET, NEWCASTLE WEST. EXPIRES: 21/5/2024.
3 AQ502867 LEASE TO BARRE EFFECT PTY LTD OF TENANCY 3, EASTERN SHOWROOM, 924 HUNTER STREET NEWCASTLE WEST. EXPIRES: 21/5/2024.
* 4 AQ779633 CAVEAT BY THIRDI DAIRY FARMERS PTY LTD

NOTATIONS

NOTE: DISPOSAL OF ANY LOTS IN DP456088 MAY REQUIRE REGISTRATION OF A DEPOSITED PLAN OF SURVEY PURSUANT TO SECTION 114 OF THE REAL PROPERTY ACT, 1900

UNREGISTERED DEALINGS: NIL

SCHEDULE OF PARCELS	TITLE DIAGRAM
LOT 2 IN DP126	DP126
LOT 1 IN DP456088	DP456088.

*** END OF SEARCH ***

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Received: 18/08/2021 09:29:08

Planning Certificate

Section 10.7, Environmental Planning and Assessment Act 1979

To: Douglas Partners Pty Ltd
15 Callistemon Close
Warabrook NSW 2304

Certificate No: PL2021/05204
Fees: $133.00
Receipt No(s): D002049823

Your Reference: Project 102077.02

Date of Issue: 17/09/2021

The Land: Lot 1 DP 395367
924 Hunter Street Newcastle West NSW 2302

Advice provided on this Certificate:

Advice under section 10.7(2): see items 1 – 21
Additional advice under section 10.7(5): see Items 22 – 28

IMPORTANT: Please read this certificate carefully

This certificate contains important information about the land.

Please check for any item which could be inconsistent with the proposed use or development of the land. If there is anything you do not understand, phone our **Customer Contact Centre** on (02) 4974 2000, or come in and see us.

The information provided in this certificate relates only to the land described above. If you need information about adjoining or nearby land, or about the City of Newcastle (CN) development policies for the general area, contact our **Customer Contact Centre**.

All information provided is correct as at 17/09/2021. However, it's possible for changes to occur within a short time. We recommend that you only rely upon a very recent certificate.

City of Newcastle

PO Box 489
NEWCASTLE 2300

Phone: (02) 4974 2000
Facsimile: (02) 4974 2222

Customer Contact Centre
Ground floor,
12 Stewart Avenue
Newcastle West NSW 2300

Office hours:
Mondays to Fridays 8.30 am to 5.00 pm

Planning Certificate

Section 10.7, Environmental Planning and Assessment Act 1979

To: Douglas Partners Pty Ltd
15 Callistemon Close
Warabrook NSW 2304

Certificate No: PL2021/05210
Fees: $133.00
Receipt No(s): D002049823

Your Reference: Project 102077.02

Date of Issue: 17/09/2021

The Land: Lot 2 DP 445736
924 Hunter Street Newcastle West NSW 2302

Advice provided on this Certificate:

Advice under section 10.7(2): see items 1 – 21
Additional advice under section 10.7(5): see Items 22 – 28

IMPORTANT: Please read this certificate carefully

This certificate contains important information about the land.

Please check for any item which could be inconsistent with the proposed use or development of the land. If there is anything you do not understand, phone our **Customer Contact Centre** on (02) 4974 2000, or come in and see us.

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All information provided is correct as at 17/09/2021. However, it's possible for changes to occur within a short time. We recommend that you only rely upon a very recent certificate.

City of Newcastle

PO Box 489
NEWCASTLE 2300

Phone: (02) 4974 2000
Facsimile: (02) 4974 2222

Customer Contact Centre
Ground floor,
12 Stewart Avenue
Newcastle West NSW 2300

Office hours:
Mondays to Fridays 8.30 am to 5.00 pm

Part 1:

Advice provided under section 10.7(2)

ATTENTION: The explanatory notes appearing in italic print within Part 1 are provided to assist understanding, but do not form part of the advice provided under section 10.7(2). These notes shall be taken as being advice provided under section 10.7(5).

1. Names of relevant planning instruments and DCPs

The following environmental planning instruments, proposed environmental planning instruments and development control plans apply to the land, either in full or in part.

State Environmental Planning Policy No. 1 - Development Standards

State Environmental Planning Policy No. 21 - Caravan Parks

State Environmental Planning Policy No. 33 - Hazardous and Offensive Development

State Environmental Planning Policy No. 36 - Manufactured Home Estates

State Environmental Planning Policy (Koala Habitat Protection) Amendment (Maps) 2020

State Environmental Planning Policy No. 50 - Canal Estate Development

State Environmental Planning Policy No. 55 - Remediation of Land

State Environmental Planning Policy No. 64 - Advertising and Signage

State Environmental Planning Policy No. 65 - Design Quality of Residential Flat Development

State Environmental Planning Policy No. 70 - Affordable Housing (Revised Schemes)

State Environmental Planning Policy (Housing For Seniors or People with a Disability) 2004

State Environmental Planning Policy (Building Sustainability Index:BASIX) 2004

State Environmental Planning Policy (State Significant Precincts) 2005

State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007

State Environmental Planning Policy (Miscellaneous Consent Provisions) 2007

State Environmental Planning Policy (Infrastructure) 2007

State Environmental Planning Policy (Exempt and Complying Development Codes) 2008

State Environmental Planning Policy (Urban Renewal) 2010

State Environmental Planning Policy (Affordable Rental Housing) 2009

State Environmental Planning Policy (State and Regional Development) 2011

State Environmental Planning Policy (Educational Establishments and Child Care Facilities) 2017

State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017

State Environmental Planning Policy (Concurrences) 2018

State Environmental Planning Policy (Coastal Management) 2018

State Environmental Planning Policy (Primary Production and Rural Development) 2019

Newcastle Local Environmental Plan 2012

Newcastle Development Control Plan 2012

2. Zoning and land use under relevant LEPs

Newcastle Local Environmental Plan 2012

Zoning: The Newcastle Local Environmental Plan 2012 identifies the land as being within the following zone(s):

Zone B3 Commercial Core

Note: Refer to www. newcastle.nsw.gov.au or www. legislation.nsw.gov.au website for LEP instrument and zoning maps.

The following is an extract from the zoning provisions contained in Newcastle Local Environmental Plan 2012:

Zone B3 Commercial Core

- **Objectives of zone**
  - To provide a wide range of retail, business, office, entertainment, community and other suitable land uses that serve the needs of the local and wider community.
  - To encourage appropriate employment opportunities in accessible locations.
  - To maximise public transport patronage and encourage walking and cycling.
  - To provide for commercial floor space within a mixed use development.
  - To strengthen the role of the Newcastle City Centre as the regional business, retail and cultural centre of the Hunter region.
  - To provide for the retention and creation of view corridors.
- **Permitted without consent**

  Environmental protection works; Home occupations
- **Permitted with consent**

  Car parks; Centre-based child care facilities; Commercial premises; Community facilities; Educational establishments; Entertainment facilities; Environmental facilities; Flood mitigation works; Function centres; Hotel or motel accommodation; Information and education facilities; Medical centres; Mortuaries; Oyster aquaculture; Passenger transport facilities; Places of public worship; Recreation areas; Recreation facilities (indoor); Registered clubs; Respite day care centres; Restricted premises; Roads; Sex services premises; Shop top housing; Signage; Tank-based aquaculture; Tourist and visitor accommodation; Transport depots
- **Prohibited**

  Pond-based aquaculture; Any development not specified in, permitted without consent or permitted with consent

Minimum land dimensions for erection of a dwelling-house: There are no minimum land dimensions for the erection of a dwelling-house that apply to this site.

Critical habitat: The land does not identify as including or comprising critical habitat.

Heritage conservation area: The land is situated within the Newcastle City Centre Heritage Conservation Area. Refer to the Newcastle Local Environmental Plan 2012 for provisions relating to development within a heritage conservation area.

Heritage items: A heritage item listed in the Newcastle Local Environmental Plan 2012 is situated on the land. Refer to the LEP for provisions relating to development involving a heritage item.

3. Complying development

Note Other requirements: *The advice below for all Complying Development Codes, is limited to identifying whether or not the* ***land****, the subject of the certificate, is land on which complying development may be carried out because of Clauses 1.17A(1)(c) to (e), (2), (3) & (4), 1.18 (1)(c3) and 1.19 of State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 (the Codes SEPP).*

To ascertain the extent to which the complying development may or may not be carried out on the land, maps are available on City of Newcastle (CN) web pages.

Housing Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by General land exemptions, being land that comprises, or on which there is, a Heritage Item.

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land within a Heritage Conservation Area or a Draft Heritage Conservation Area unless the development is for a detached outbuilding or swimming pool.

Rural Housing Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by General land exemptions, being land that comprises, or on which there is, a Heritage Item.

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land within a Heritage Conservation Area or a Draft Heritage Conservation Area unless the development is for a detached outbuilding or swimming pool.

Low Rise Housing Diversity Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by General land exemptions, being land that comprises, or on which there is, a Heritage Item.

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land within a Heritage Conservation Area or a Draft Heritage Conservation Area unless the development is for a detached outbuilding or swimming pool.

Greenfield Housing Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by General land exemptions, being land that comprises, or on which there is, a Heritage Item.

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land within a Heritage Conservation Area or a Draft Heritage Conservation Area unless the development is for a detached outbuilding or swimming pool.

Inland Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by General land exemptions, being land that comprises, or on which there is, a Heritage Item.

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land within a Heritage Conservation Area or a Draft Heritage Conservation Area unless the development is for a detached outbuilding or swimming pool.

Housing Alterations Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by General land exemptions, being land that comprises, or on which there is, a Heritage Item.

General Development Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by General land exemptions, being land that comprises, or on which there is, a Heritage Item.

Commercial and Industrial Alterations Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by General land exemptions, being land that comprises, or on which there is, a Heritage Item.

Commercial and Industrial (New Buildings and Additions) Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by General land exemptions, being land that comprises, or on which there is, a Heritage Item.

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land within a Heritage Conservation Area or a Draft Heritage Conservation Area.

Container Recycling Facilities Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by General land exemptions, being land that comprises, or on which there is, a Heritage Item.

Subdivision Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by General land exemptions, being land that comprises, or on which there is, a Heritage Item.

Demolition Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by General land exemptions, being land that comprises, or on which there is, a Heritage Item.

Fire Safety Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by General land exemptions, being land that comprises, or on which there is, a Heritage Item.

4B. Annual charges under Local Government Act 1993 for coastal protection services that relate to existing coastal protection works

The land IS NOT subject to an agreement for annual charges under section 496B of the Local Government Act 1993 for coastal protection services (within the meaning of section 553B of that Act).

5. Coal Mine Subsidence Compensation Act 2017

The land IS NOT WITHIN a Mine Subsidence District declared under section 20 of the Coal Mine Subsidence Compensation Act 2017.

NOTE: The above advice is provided to the extent that City of Newcastle (CN) has been notified by Subsidence Advisory NSW.

6. Road widening or realignment

NOTE: The Roads and Maritime Services (RMS) may have proposals that are not referred to in this item. For advice about affectation by RMS proposals, contact the Roads and Maritime Services, Locked Mail Bag 30 Newcastle 2300. Ph: 131 782.

The land IS NOT AFFECTED by any road widening or road realignment under Division 2 of Part 3 of the Roads Act 1993.

The land IS NOT AFFECTED by any road widening or road realignment under an environmental planning instrument.

The land IS NOT AFFECTED by road widening or road realignment under a resolution of the Council.

7. Policies on hazard risk restrictions

Except as stated below, the land is not affected by a policy referred to in Item 7 of Schedule 4 of the Environmental Planning and Assessment Regulation 2000 that restricts the development of the land because of the likelihood of land slip, bushfire, tidal inundation, subsidence, acid sulphate soils or any other risk (other than flooding).

Potential acid sulfate soils: Works carried out on the land must be undertaken in accordance with Clause 6.1 Acid sulfate soils of the Newcastle Local Environmental Plan 2012.

Land Contamination: We have land contamination information/records in relation to this property. Council has adopted a policy of restricting development or imposing conditions on properties affected by land contamination. Refer to Section 5.02 Land Contamination of Newcastle Development Control Plan 2012, which is available to view and download from City of Newcastle's website.

NOTE: The absence of a policy to restrict development of the land because of the likelihood of a particular risk does not imply that the land is free from that risk. City of Newcastle (CN) considers the likelihood of natural and man-made risks when determining development applications under section 4.15 of the Environmental Planning and Assessment Act 1979. Detailed investigation carried out in conjunction with the preparation or assessment of a development application may result in CN either refusing development consent or imposing conditions of consent on the basis of risks that are not identified above.

7A. Flood related development controls information

7A(1) Mapping information is not available and it is unknown if the land or part of the land is within the flood planning area.
7A(2) Mapping information is not available and it is unknown if the land or part of the land is between the flood planning area and the probable maximum flood.

Our information currently indicates that the property is, or contains, flood prone land as defined in the Floodplain Development Manual: the management of flood liable land, April 2005 published by the NSW Government.

Section 4.01 Flood Management of Newcastle Development Control Plan (DCP) 2012 provides guidelines with respect to all development of flood prone land. This includes development for the purpose of dwelling houses, dual occupancies, multi dwelling housing or residential flat buildings. The DCP may be viewed on our website, inspected or purchased at our Customer Contact Centre.

NOTE: More detailed flood information specific to the property is available on separate flooding certificate application through our Customer Contact Centre on (02) 4974 2000

8. Land reserved for acquisition

The land is not identified for acquisition by a public authority (as referred to in section 3.15 of the Act) by any environmental planning instrument or proposed environmental planning instrument applying to the land.

9. Contributions plans

The following contribution plan/s apply to the land.

Section 7.12 Newcastle Local Infrastructure Contributions Plan 2019: Effective 9 September 2019.

The Plan specifies section 7.12 contributions that may be imposed as a condition of development consent.

NOTE: Contributions plans are available on our website or may be inspected or purchased at our Customer Contact Centre.

9A. Biodiversity certified land

The land IS NOT biodiversity certified land under Part 8 of the Biodiversity Conservation Act 2016.

10. Biodiversity stewardship sites

The land IS NOT land (of which CN is aware) under a biodiversity stewardship agreement under Part 5 of the Biodiversity Conservation Act 2016.

10A. Native vegetation clearing set asides

The land IS NOT land (of which CN is aware) that contains a set aside area under section 60ZC of the Local Land Services Act 2013.

11. Bush fire prone land

The land IS NOT bush fire prone land for the purposes of the Environmental Planning and Assessment Act 1979.

12. Property vegetation plans

Not applicable. The Native Vegetation Act 2003 does not apply to the Newcastle local government area.

13. Orders under Trees (Disputes Between Neighbours) Act 2006

CN HAS NOT been notified that an order has been made under the Trees (Disputes between Neighbours) Act 2006 to carry out work in relation to a tree on the land.

14. Directions under Part 3A

The land IS NOT AFFECTED by a direction by the Minister in force under section 75P (2) (c1) of the Act.

15. Site compatibility certificates and conditions for seniors housing

(a) The land IS NOT AFFECTED by a current site compatibility certificate (of which CN is aware) issued under the State Environmental Planning Policy (Housing for Seniors and People with a Disability) 2004.

(b) The land IS NOT AFFECTED by any terms of kind referred to in clause 18(2) of the State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004, that have been imposed as a condition of consent to a development application granted after 11 October, 2007 in respect of the land.

16. Site compatibility certificates for infrastructure, schools or TAFE establishments

The land IS NOT AFFECTED by a valid site compatibility certificate (of which CN is aware) issued under the State Environmental Planning Policy (Infrastructure) 2007.

17. Site compatibility certificates and conditions for affordable rental housing

The land IS NOT AFFECTED by a valid site compatibility certificate (of which CN is aware) issued under the State Environmental Planning Policy (Affordable Rental Housing) 2009.

18. Paper subdivision information

The land IS NOT AFFECTED by any development plan that applies to the land or that is proposed to be subject to a consent ballot.

19. Site verification certificates

The land IS NOT AFFECTED by a current site verification certificate (of which CN is aware) issued under the State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007.

20. Loose-fill asbestos insulation

CN HAS NOT been notified that the land includes any residential premises (within the meaning of Division 1A of Part 8 of the Home Building Act 1989) that are listed on the register of loose-fill asbestos insulation, that is required to be maintained under that Division.

21. Affected building notices and building product rectification orders

The land IS NOT AFFECTED by any affected building notice of which CN is aware that is in force in respect of the land.

The land IS NOT AFFECTED by any building product rectification order that has not been fully complied with, of which CN is aware that is in force in respect of the land.

The land IS NOT AFFECTED by an outstanding notice of intention to make a building product rectification order of which CN is aware.

An affected building notice has the same meaning as in Part 4 of the Building Products (Safety) Act 2017.
Building product rectification order has the same meaning as in the Building Products (Safety) Act 2017.

Note: *There are no matters prescribed by section 59(2) of the Contaminated Land Management Act 1997 to be disclosed, however if other contamination information is held by the Council this may be provided under a section 10.7(5) certificate.*

Part 2:

Advice provided under section 10.7(5)

ATTENTION: Section 10.7(6) of the Act states that a Council shall not incur any liability in respect of advice provided in good faith pursuant to sub-section 10.7(5).

22. Outstanding Notices and Orders issued by City of Newcastle (CN).

This Certificate does not include any advice regarding outstanding notices or orders issued under the Environmental Planning and Assessment Act 1979, the Local Government Act 1993 or any other relevant legislation. To obtain advice regarding these matters, it is recommended you lodge an application for a Certificate as to Outstanding Notices and Orders (accompanied by the appropriate fee). For further information, please contact the Customer Contact Centre on (02) 4974 2000.

23. Draft development control plans.

A draft development control plan DOES NOT APPLY to the land. The draft plans are exhibited pursuant to Part 3 of the Environmental Planning and Assessment Regulation 2000.

24. Heritage Act 1977.

The land IS NOT AFFECTED by a listing on the State Heritage Register or an Interim Heritage Order that is in force under the Heritage Act 1977.

NOTE: The above advice is provided to the extent that CN has been notified by the Heritage Council of NSW. For up-to-date details, contact the Office of Environment and Heritage, PO Box A290, South Sydney NSW 1232 Ph: (02) 9995 5000.

25. Listing by National Trust of Australia.

The land IS AFFECTED by a listing of the National Trust of Australia (NSW).

NOTE: The above advice is provided to the extent that CN has been notified by the National Trust of Australia (NSW). For up-to-date details, contact the National Trust Ph 02 9258 0123.

26. Australian Heritage Database.

The land IS NOT AFFECTED by a listing on the Australian Heritage Database.

NOTE: The above advice is provided to the extent that CN has been notified by the Department of the Environment. For up-to-date details, contact the Department of the Environment, Heritage, King Edward Terrace, Parkes ACT 2600. Ph (02) 6274 1111.

27. Environment Protection & Biodiversity Conservation Act 1999 (Cth)

Under the (Commonwealth) Environment Protection and Biodiversity Conservation Act 1999, actions which have, may have or are likely to have, a significant impact on a matter of national environmental significance may be taken only with the approval of the Commonwealth Minister for the Environment.

Approval is also required for actions that have a significant effect on the environment of Commonwealth land. These actions may be on Commonwealth land or other land.

This approval is in addition to any approvals under the (NSW) Environmental Planning and Assessment Act 1979 or other NSW legislation.

Matters of national environmental significance are:

- declared World Heritage areas
- declared Ramsar wetlands
- listed threatened species and ecological communities
- listed migratory species
- nuclear actions
- the environment of Commonwealth marine areas.

Locations within the City of Newcastle that are a declared Ramsar wetland include Kooragang Nature Reserve and Shortland Wetlands. Listed threatened species and listed migratory species are known to occur within the City of Newcastle.

28. Other matters

The land is affected by the following:

Newcastle earthquake

Earthquakes occurred in the vicinity of Newcastle on 28th December 1989 and 6 August 1994. Buildings on the land may have suffered damage as a consequence of the earthquakes. Prospective purchasers are advised to make their own enquiries as to whether the property is affected by any damage.

Further consent requirements under the Newcastle Local Environmental Plan 2012.

The following provisions of the Newcastle Local Environmental Plan 2012 affect the carrying out of development on the land. These provisions are in addition to those required to be disclosed at Item 2 of this Certificate.

Refer to clause 3.1 Exempt Development of the Newcastle Local Environmental Plan 2012

Refer to clause 3.2 Complying Development of the Newcastle Local Environmental Plan 2012

Local Strategic Planning Statement

The Local Strategic Planning Statement (LSPS) was adopted by council on 26 May 2020 and replaces the Local Planning Strategy. The LSPS is taken into account when CN assesses development applications and amendments to the Newcastle Local Environmental Plan 2012.

Note: Refer to our website to view the document. www.newcastle.nsw.gov.au

Hunter Regional Plan 2036

The Hunter Regional Plan has been prepared by the Department of Planning and Environment. The contents of the strategy will be taken into account when CN assesses development applications and amendments to the Newcastle Local Environmental Plan 2012.

Note: Refer to the Department of Planning and Environment's website to view the document. www.planning.nsw.gov.au

Newcastle City-Wide Floodplain Risk Management Study and Plan (2012)

The Newcastle City-wide Floodplain Risk Management Study and Plan addresses flood management for the City of Newcastle. The Study and Plan will be taken into account when CN assesses development applications and amendments to the Newcastle Local Environmental Plan 2012.

Note: Refer to our *website to view the document. www.newcastle.nsw.gov.au*

Greater Newcastle Metropolitan Plan 2036

The Greater Newcastle Metropolitan Plan 2036 has been prepared by the Department of Planning and Environment. The Plan will be taken into account when CN assesses development applications and amendments to the Newcastle Local Environmental Plan 2012.

Parking permit policy

This property is within the Permit Exclusion Area of the City Centre Parking Strategy adopted by Council on 25 June 2002 and updated on 16 May 2005. Residents within the Permit Exclusion Area are not eligible for resident parking permit stickers. For further information please contact Parking Services Coordinator Michael Heather on 4974 5008.

Contaminated land information

Council records indicate the following potentially contaminating landuse(s) may have been carried out on the land:

1. engine works
2. fuel/oil storage

Persons relying on the certificate are advised to make their own investigations as to whether the land is affected by elevated concentrations of soil or groundwater contaminants in relation to proposed purchase or use of land.

Issued without alterations or additions, 17/09/21
Authorised by

JEREMY BATH
CHIEF EXECUTIVE OFFICER

Planning Certificate

Section 10.7, Environmental Planning and Assessment Act 1979

To: Douglas Partners Pty Ltd
15 Callistemon Close
Warabrook NSW 2304

Certificate No: PL2021/05215
Fees: $133.00
Receipt No(s): D002049823

Your Reference: Project 102077.02

Date of Issue: 17/09/2021

The Land: Lot 1 DP 1091173
924 Hunter Street Newcastle West NSW 2302

Advice provided on this Certificate:

Advice under section 10.7(2): see items 1 – 21
Additional advice under section 10.7(5): see Items 22 – 28

IMPORTANT: Please read this certificate carefully

This certificate contains important information about the land.

Please check for any item which could be inconsistent with the proposed use or development of the land. If there is anything you do not understand, phone our **Customer Contact Centre** on (02) 4974 2000, or come in and see us.

The information provided in this certificate relates only to the land described above. If you need information about adjoining or nearby land, or about the City of Newcastle (CN) development policies for the general area, contact our **Customer Contact Centre**.

All information provided is correct as at 17/09/2021. However, it's possible for changes to occur within a short time. We recommend that you only rely upon a very recent certificate.

City of Newcastle

PO Box 489
NEWCASTLE 2300

Phone: (02) 4974 2000
Facsimile: (02) 4974 2222

Customer Contact Centre
Ground floor,
12 Stewart Avenue
Newcastle West NSW 2300

Office hours:
Mondays to Fridays 8.30 am to 5.00 pm

Part 1:

Advice provided under section 10.7(2)

ATTENTION: The explanatory notes appearing in italic print within Part 1 are provided to assist understanding, but do not form part of the advice provided under section 10.7(2). These notes shall be taken as being advice provided under section 10.7(5).

1. Names of relevant planning instruments and DCPs

The following environmental planning instruments, proposed environmental planning instruments and development control plans apply to the land, either in full or in part.

State Environmental Planning Policy No. 1 - Development Standards

State Environmental Planning Policy No. 21 - Caravan Parks

State Environmental Planning Policy No. 33 - Hazardous and Offensive Development

State Environmental Planning Policy No. 36 - Manufactured Home Estates

State Environmental Planning Policy (Koala Habitat Protection) Amendment (Maps) 2020

State Environmental Planning Policy No. 50 - Canal Estate Development

State Environmental Planning Policy No. 55 - Remediation of Land

State Environmental Planning Policy No. 64 - Advertising and Signage

State Environmental Planning Policy No. 65 - Design Quality of Residential Flat Development

State Environmental Planning Policy No. 70 - Affordable Housing (Revised Schemes)

State Environmental Planning Policy (Housing For Seniors or People with a Disability) 2004

State Environmental Planning Policy (Building Sustainability Index:BASIX) 2004

State Environmental Planning Policy (State Significant Precincts) 2005

State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007

State Environmental Planning Policy (Miscellaneous Consent Provisions) 2007

State Environmental Planning Policy (Infrastructure) 2007

State Environmental Planning Policy (Exempt and Complying Development Codes) 2008

State Environmental Planning Policy (Urban Renewal) 2010

State Environmental Planning Policy (Affordable Rental Housing) 2009

State Environmental Planning Policy (State and Regional Development) 2011

State Environmental Planning Policy (Educational Establishments and Child Care Facilities) 2017

State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017

State Environmental Planning Policy (Concurrences) 2018

State Environmental Planning Policy (Coastal Management) 2018

State Environmental Planning Policy (Primary Production and Rural Development) 2019

Newcastle Local Environmental Plan 2012

Newcastle Development Control Plan 2012

2. Zoning and land use under relevant LEPs

Newcastle Local Environmental Plan 2012

Zoning: The Newcastle Local Environmental Plan 2012 identifies the land as being within the following zone(s):

Zone B3 Commercial Core

Note: Refer to www. newcastle.nsw.gov.au or www. legislation.nsw.gov.au website for LEP instrument and zoning maps.

The following is an extract from the zoning provisions contained in Newcastle Local Environmental Plan 2012:

Zone B3 Commercial Core

- **Objectives of zone**
    - To provide a wide range of retail, business, office, entertainment, community and other suitable land uses that serve the needs of the local and wider community.
    - To encourage appropriate employment opportunities in accessible locations.
    - To maximise public transport patronage and encourage walking and cycling.
    - To provide for commercial floor space within a mixed use development.
    - To strengthen the role of the Newcastle City Centre as the regional business, retail and cultural centre of the Hunter region.
    - To provide for the retention and creation of view corridors.
- **Permitted without consent**

  Environmental protection works; Home occupations
- **Permitted with consent**

  Car parks; Centre-based child care facilities; Commercial premises; Community facilities; Educational establishments; Entertainment facilities; Environmental facilities; Flood mitigation works; Function centres; Hotel or motel accommodation; Information and education facilities; Medical centres; Mortuaries; Oyster aquaculture; Passenger transport facilities; Places of public worship; Recreation areas; Recreation facilities (indoor); Registered clubs; Respite day care centres; Restricted premises; Roads; Sex services premises; Shop top housing; Signage; Tank-based aquaculture; Tourist and visitor accommodation; Transport depots
- **Prohibited**

  Pond-based aquaculture; Any development not specified in, permitted without consent or permitted with consent

Minimum land dimensions for erection of a dwelling-house: There are no minimum land dimensions for the erection of a dwelling-house that apply to this site.

Critical habitat: The land does not identify as including or comprising critical habitat.

Heritage conservation area: The land is situated within the Newcastle City Centre Heritage Conservation Area. Refer to the Newcastle Local Environmental Plan 2012 for provisions relating to development within a heritage conservation area.

Heritage items: There are no heritage items listed in the Newcastle Local Environmental Plan 2012 situated on the land.

3. Complying development

Note Other requirements: *The advice below for all Complying Development Codes, is limited to identifying whether or not the* ***land****, the subject of the certificate, is land on which complying development may be carried out because of Clauses 1.17A(1)(c) to (e), (2), (3) & (4), 1.18 (1)(c3) and 1.19 of State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 (the Codes SEPP).*

To ascertain the extent to which the complying development may or may not be carried out on the land, maps are available on City of Newcastle (CN) web pages.

Housing Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land within a Heritage Conservation Area or a Draft Heritage Conservation Area unless the development is for a detached outbuilding or swimming pool.

Rural Housing Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land within a Heritage Conservation Area or a Draft Heritage Conservation Area unless the development is for a detached outbuilding or swimming pool.

Low Rise Housing Diversity Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land within a Heritage Conservation Area or a Draft Heritage Conservation Area unless the development is for a detached outbuilding or swimming pool.

Greenfield Housing Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land within a Heritage Conservation Area or a Draft Heritage Conservation Area unless the development is for a detached outbuilding or swimming pool.

Inland Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land within a Heritage Conservation Area or a Draft Heritage Conservation Area unless the development is for a detached outbuilding or swimming pool.

Housing Alterations Code

Complying development under the Housing Alterations Code MAY be carried out on this land.

General Development Code

Complying development under the General Development Code MAY be carried out on this land.

Commercial and Industrial Alterations Code

Complying development under the Commercial and Industrial Code MAY be carried out on this land.

Commercial and Industrial (New Buildings and Additions) Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land within a Heritage Conservation Area or a Draft Heritage Conservation Area.

Container Recycling Facilities Code

Complying development under the Container Recycling Facilities Code MAY be carried out on this land.

Subdivision Code

Complying development under the Subdivision Code MAY be carried out on this land.

Demolition Code

Complying development under the Demolition Code MAY be carried out on this land.

Fire Safety Code

Complying development under the Fire Safety Code MAY be carried out on this land.

4B. Annual charges under Local Government Act 1993 for coastal protection services that relate to existing coastal protection works

The land IS NOT subject to an agreement for annual charges under section 496B of the Local Government Act 1993 for coastal protection services (within the meaning of section 553B of that Act).

5. Coal Mine Subsidence Compensation Act 2017

The land IS NOT WITHIN a Mine Subsidence District declared under section 20 of the Coal Mine Subsidence Compensation Act 2017.

NOTE: The above advice is provided to the extent that City of Newcastle (CN) has been notified by Subsidence Advisory NSW.

6. Road widening or realignment

NOTE: The Roads and Maritime Services (RMS) may have proposals that are not referred to in this item. For advice about affectation by RMS proposals, contact the Roads and Maritime Services, Locked Mail Bag 30 Newcastle 2300. Ph: 131 782.

The land IS NOT AFFECTED by any road widening or road realignment under Division 2 of Part 3 of the Roads Act 1993.

The land IS NOT AFFECTED by any road widening or road realignment under an environmental planning instrument.

The land IS NOT AFFECTED by road widening or road realignment under a resolution of the Council.

7. Policies on hazard risk restrictions

Except as stated below, the land is not affected by a policy referred to in Item 7 of Schedule 4 of the Environmental Planning and Assessment Regulation 2000 that restricts the development of the land because of the likelihood of land slip, bushfire, tidal inundation, subsidence, acid sulphate soils or any other risk (other than flooding).

Potential acid sulfate soils: Works carried out on the land must be undertaken in accordance with Clause 6.1 Acid sulfate soils of the Newcastle Local Environmental Plan 2012.

Land Contamination: We have land contamination information/records in relation to this property. Council has adopted a policy of restricting development or imposing conditions on properties affected by land contamination. Refer to Section 5.02 Land Contamination of Newcastle Development Control Plan 2012, which is available to view and download from City of Newcastle's website.

NOTE: The absence of a policy to restrict development of the land because of the likelihood of a particular risk does not imply that the land is free from that risk. City of Newcastle (CN) considers the likelihood of natural and man-made risks when determining development applications under section 4.15 of the Environmental Planning and Assessment Act 1979. Detailed investigation carried out in conjunction with the preparation or assessment of a development application may result in CN either refusing development consent or imposing conditions of consent on the basis of risks that are not identified above.

7A. Flood related development controls information

7A(1) Mapping information is not available and it is unknown if the land or part of the land is within the flood planning area.
7A(2) Mapping information is not available and it is unknown if the land or part of the land is between the flood planning area and the probable maximum flood.

Our information currently indicates that the property is, or contains, flood prone land as defined in the Floodplain Development Manual: the management of flood liable land, April 2005 published by the NSW Government.

Section 4.01 Flood Management of Newcastle Development Control Plan (DCP) 2012 provides guidelines with respect to all development of flood prone land. This includes development for the purpose of dwelling houses, dual occupancies, multi dwelling housing or residential flat buildings. The DCP may be viewed on our website, inspected or purchased at our Customer Contact Centre.

NOTE: More detailed flood information specific to the property is available on separate flooding certificate application through our Customer Contact Centre on (02) 4974 2000

8. Land reserved for acquisition

The land is not identified for acquisition by a public authority (as referred to in section 3.15 of the Act) by any environmental planning instrument or proposed environmental planning instrument applying to the land.

9. Contributions plans

The following contribution plan/s apply to the land.

Section 7.12 Newcastle Local Infrastructure Contributions Plan 2019: Effective 9 September 2019.

The Plan specifies section 7.12 contributions that may be imposed as a condition of development consent.

NOTE: Contributions plans are available on our website or may be inspected or purchased at our Customer Contact Centre.

9A. Biodiversity certified land

The land IS NOT biodiversity certified land under Part 8 of the Biodiversity Conservation Act 2016.

10. Biodiversity stewardship sites

The land IS NOT land (of which CN is aware) under a biodiversity stewardship agreement under Part 5 of the Biodiversity Conservation Act 2016.

10A. Native vegetation clearing set asides

The land IS NOT land (of which CN is aware) that contains a set aside area under section 60ZC of the Local Land Services Act 2013.

11. Bush fire prone land

The land IS NOT bush fire prone land for the purposes of the Environmental Planning and Assessment Act 1979.

12. Property vegetation plans

Not applicable. The Native Vegetation Act 2003 does not apply to the Newcastle local government area.

13. Orders under Trees (Disputes Between Neighbours) Act 2006

CN HAS NOT been notified that an order has been made under the Trees (Disputes between Neighbours) Act 2006 to carry out work in relation to a tree on the land.

14. Directions under Part 3A

The land IS NOT AFFECTED by a direction by the Minister in force under section 75P (2) (c1) of the Act.

15. Site compatibility certificates and conditions for seniors housing

(a) The land IS NOT AFFECTED by a current site compatibility certificate (of which CN is aware) issued under the State Environmental Planning Policy (Housing for Seniors and People with a Disability) 2004.

(b) The land IS NOT AFFECTED by any terms of kind referred to in clause 18(2) of the State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004, that have been imposed as a condition of consent to a development application granted after 11 October, 2007 in respect of the land.

16. Site compatibility certificates for infrastructure, schools or TAFE establishments

The land IS NOT AFFECTED by a valid site compatibility certificate (of which CN is aware) issued under the State Environmental Planning Policy (Infrastructure) 2007.

17. Site compatibility certificates and conditions for affordable rental housing

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18. Paper subdivision information

The land IS NOT AFFECTED by any development plan that applies to the land or that is proposed to be subject to a consent ballot.

19. Site verification certificates

The land IS NOT AFFECTED by a current site verification certificate (of which CN is aware) issued under the State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007.

20. Loose-fill asbestos insulation

CN HAS NOT been notified that the land includes any residential premises (within the meaning of Division 1A of Part 8 of the Home Building Act 1989) that are listed on the register of loose-fill asbestos insulation, that is required to be maintained under that Division.

21. Affected building notices and building product rectification orders

The land IS NOT AFFECTED by any affected building notice of which CN is aware that is in force in respect of the land.

The land IS NOT AFFECTED by any building product rectification order that has not been fully complied with, of which CN is aware that is in force in respect of the land.

The land IS NOT AFFECTED by an outstanding notice of intention to make a building product rectification order of which CN is aware.

An affected building notice has the same meaning as in Part 4 of the Building Products (Safety) Act 2017. Building product rectification order has the same meaning as in the Building Products (Safety) Act 2017.

Note: *There are no matters prescribed by section 59(2) of the Contaminated Land Management Act 1997 to be disclosed, however if other contamination information is held by the Council this may be provided under a section 10.7(5) certificate.*

Part 2:

Advice provided under section 10.7(5)

ATTENTION: Section 10.7(6) of the Act states that a Council shall not incur any liability in respect of advice provided in good faith pursuant to sub-section 10.7(5).

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This Certificate does not include any advice regarding outstanding notices or orders issued under the Environmental Planning and Assessment Act 1979, the Local Government Act 1993 or any other relevant legislation. To obtain advice regarding these matters, it is recommended you lodge an application for a Certificate as to Outstanding Notices and Orders (accompanied by the appropriate fee). For further information, please contact the Customer Contact Centre on (02) 4974 2000.

23. Draft development control plans.

A draft development control plan DOES NOT APPLY to the land. The draft plans are exhibited pursuant to Part 3 of the Environmental Planning and Assessment Regulation 2000.

24. Heritage Act 1977.

The land IS NOT AFFECTED by a listing on the State Heritage Register or an Interim Heritage Order that is in force under the Heritage Act 1977.

NOTE: The above advice is provided to the extent that CN has been notified by the Heritage Council of NSW. For up-to-date details, contact the Office of Environment and Heritage, PO Box A290, South Sydney NSW 1232 Ph: (02) 9995 5000.

25. Listing by National Trust of Australia.

The land IS NOT AFFECTED by a listing of the National Trust of Australia (NSW).

NOTE: The above advice is provided to the extent that CN has been notified by the National Trust of Australia (NSW). For up-to-date details, contact the National Trust Ph 02 9258 0123.

26. Australian Heritage Database.

The land IS NOT AFFECTED by a listing on the Australian Heritage Database.

NOTE: The above advice is provided to the extent that CN has been notified by the Department of the Environment. For up-to-date details, contact the Department of the Environment, Heritage, King Edward Terrace, Parkes ACT 2600. Ph (02) 6274 1111.

27. Environment Protection & Biodiversity Conservation Act 1999 (Cth)

Under the (Commonwealth) Environment Protection and Biodiversity Conservation Act 1999, actions which have, may have or are likely to have, a significant impact on a matter of national environmental significance may be taken only with the approval of the Commonwealth Minister for the Environment.

Approval is also required for actions that have a significant effect on the environment of Commonwealth land. These actions may be on Commonwealth land or other land.

This approval is in addition to any approvals under the (NSW) Environmental Planning and Assessment Act 1979 or other NSW legislation.

Matters of national environmental significance are:

- declared World Heritage areas
- declared Ramsar wetlands
- listed threatened species and ecological communities
- listed migratory species
- nuclear actions
- the environment of Commonwealth marine areas.

Locations within the City of Newcastle that are a declared Ramsar wetland include Kooragang Nature Reserve and Shortland Wetlands. Listed threatened species and listed migratory species are known to occur within the City of Newcastle.

28. Other matters

The land is affected by the following:

Newcastle earthquake

Earthquakes occurred in the vicinity of Newcastle on 28th December 1989 and 6 August 1994. Buildings on the land may have suffered damage as a consequence of the earthquakes. Prospective purchasers are advised to make their own enquiries as to whether the property is affected by any damage.

Further consent requirements under the Newcastle Local Environmental Plan 2012.

The following provisions of the Newcastle Local Environmental Plan 2012 affect the carrying out of development on the land. These provisions are in addition to those required to be disclosed at Item 2 of this Certificate.

Refer to clause 3.1 Exempt Development of the Newcastle Local Environmental Plan 2012

Refer to clause 3.2 Complying Development of the Newcastle Local Environmental Plan 2012

Local Strategic Planning Statement

The Local Strategic Planning Statement (LSPS) was adopted by council on 26 May 2020 and replaces the Local Planning Strategy. The LSPS is taken into account when CN assesses development applications and amendments to the Newcastle Local Environmental Plan 2012.

Note: Refer to our website to view the document. www.newcastle.nsw.gov.au

Hunter Regional Plan 2036

The Hunter Regional Plan has been prepared by the Department of Planning and Environment. The contents of the strategy will be taken into account when CN assesses development applications and amendments to the Newcastle Local Environmental Plan 2012.

Note: Refer to the Department of Planning and Environment's website to view the document. www.planning.nsw.gov.au

Newcastle City-Wide Floodplain Risk Management Study and Plan (2012)

The Newcastle City-wide Floodplain Risk Management Study and Plan addresses flood management for the City of Newcastle. The Study and Plan will be taken into account when CN assesses development applications and amendments to the Newcastle Local Environmental Plan 2012.

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Greater Newcastle Metropolitan Plan 2036

The Greater Newcastle Metropolitan Plan 2036 has been prepared by the Department of Planning and Environment. The Plan will be taken into account when CN assesses development applications and amendments to the Newcastle Local Environmental Plan 2012.

Parking permit policy

This property is within the Permit Exclusion Area of the City Centre Parking Strategy adopted by Council on 25 June 2002 and updated on 16 May 2005. Residents within the Permit Exclusion Area are not eligible for resident parking permit stickers. For further information please contact Parking Services Coordinator Michael Heather on 4974 5008.

Contaminated land information

Council records indicate the following potentially contaminating landuse(s) may have been carried out on the land:

1. engine works
2. fuel/oil storage

Persons relying on the certificate are advised to make their own investigations as to whether the land is affected by elevated concentrations of soil or groundwater contaminants in relation to proposed purchase or use of land.

Issued without alterations or additions, 17/09/21
Authorised by

JEREMY BATH
CHIEF EXECUTIVE OFFICER

Planning Certificate

Section 10.7, Environmental Planning and Assessment Act 1979

To: Douglas Partners Pty Ltd
15 Callistemon Close
Warabrook NSW 2304

Certificate No: PL2021/05216
Fees: $133.00
Receipt No(s): D002049823

Your Reference: Project 102077.02

Date of Issue: 17/09/2021

The Land: Lot 2 DP 1091173
924 Hunter Street Newcastle West NSW 2302

Advice provided on this Certificate:

Advice under section 10.7(2): see items 1 – 21
Additional advice under section 10.7(5): see Items 22 – 28

IMPORTANT: Please read this certificate carefully

This certificate contains important information about the land.

Please check for any item which could be inconsistent with the proposed use or development of the land. If there is anything you do not understand, phone our **Customer Contact Centre** on (02) 4974 2000, or come in and see us.

The information provided in this certificate relates only to the land described above. If you need information about adjoining or nearby land, or about the City of Newcastle (CN) development policies for the general area, contact our **Customer Contact Centre**.

All information provided is correct as at 17/09/2021. However, it's possible for changes to occur within a short time. We recommend that you only rely upon a very recent certificate.

City of Newcastle

PO Box 489
NEWCASTLE 2300

Phone: (02) 4974 2000
Facsimile: (02) 4974 2222

Customer Contact Centre
Ground floor,
12 Stewart Avenue
Newcastle West NSW 2300

Office hours:
Mondays to Fridays 8.30 am to 5.00 pm

Part 1:

Advice provided under section 10.7(2)

ATTENTION: The explanatory notes appearing in italic print within Part 1 are provided to assist understanding, but do not form part of the advice provided under section 10.7(2). These notes shall be taken as being advice provided under section 10.7(5).

1. Names of relevant planning instruments and DCPs

The following environmental planning instruments, proposed environmental planning instruments and development control plans apply to the land, either in full or in part.

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State Environmental Planning Policy No. 21 - Caravan Parks

State Environmental Planning Policy No. 33 - Hazardous and Offensive Development

State Environmental Planning Policy No. 36 - Manufactured Home Estates

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Newcastle Local Environmental Plan 2012

Newcastle Development Control Plan 2012

2. Zoning and land use under relevant LEPs

Newcastle Local Environmental Plan 2012

Zoning: The Newcastle Local Environmental Plan 2012 identifies the land as being within the following zone(s):

Zone B3 Commercial Core

Note: Refer to www. newcastle.nsw.gov.au or www. legislation.nsw.gov.au website for LEP instrument and zoning maps.

The following is an extract from the zoning provisions contained in Newcastle Local Environmental Plan 2012:

Zone B3 Commercial Core

- **Objectives of zone**
  - To provide a wide range of retail, business, office, entertainment, community and other suitable land uses that serve the needs of the local and wider community.
  - To encourage appropriate employment opportunities in accessible locations.
  - To maximise public transport patronage and encourage walking and cycling.
  - To provide for commercial floor space within a mixed use development.
  - To strengthen the role of the Newcastle City Centre as the regional business, retail and cultural centre of the Hunter region.
  - To provide for the retention and creation of view corridors.
- **Permitted without consent**

  Environmental protection works; Home occupations
- **Permitted with consent**

  Car parks; Centre-based child care facilities; Commercial premises; Community facilities; Educational establishments; Entertainment facilities; Environmental facilities; Flood mitigation works; Function centres; Hotel or motel accommodation; Information and education facilities; Medical centres; Mortuaries; Oyster aquaculture; Passenger transport facilities; Places of public worship; Recreation areas; Recreation facilities (indoor); Registered clubs; Respite day care centres; Restricted premises; Roads; Sex services premises; Shop top housing; Signage; Tank-based aquaculture; Tourist and visitor accommodation; Transport depots
- **Prohibited**

  Pond-based aquaculture; Any development not specified in, permitted without consent or permitted with consent

Minimum land dimensions for erection of a dwelling-house: There are no minimum land dimensions for the erection of a dwelling-house that apply to this site.

Critical habitat: The land does not identify as including or comprising critical habitat.

Heritage conservation area: The land is situated within the Newcastle City Centre Heritage Conservation Area. Refer to the Newcastle Local Environmental Plan 2012 for provisions relating to development within a heritage conservation area.

Heritage items: There are no heritage items listed in the Newcastle Local Environmental Plan 2012 situated on the land.

3. Complying development

Note Other requirements: *The advice below for all Complying Development Codes, is limited to identifying whether or not the* ***land****, the subject of the certificate, is land on which complying development may be carried out because of Clauses 1.17A(1)(c) to (e), (2), (3) & (4), 1.18 (1)(c3) and 1.19 of State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 (the Codes SEPP).*

To ascertain the extent to which the complying development may or may not be carried out on the land, maps are available on City of Newcastle (CN) web pages.

Housing Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land within a Heritage Conservation Area or a Draft Heritage Conservation Area unless the development is for a detached outbuilding or swimming pool.

Rural Housing Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land within a Heritage Conservation Area or a Draft Heritage Conservation Area unless the development is for a detached outbuilding or swimming pool.

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Container Recycling Facilities Code

Complying development under the Container Recycling Facilities Code MAY be carried out on this land.

Subdivision Code

Complying development under the Subdivision Code MAY be carried out on this land.

Demolition Code

Complying development under the Demolition Code MAY be carried out on this land.

Fire Safety Code

Complying development under the Fire Safety Code MAY be carried out on this land.

4B. Annual charges under Local Government Act 1993 for coastal protection services that relate to existing coastal protection works

The land IS NOT subject to an agreement for annual charges under section 496B of the Local Government Act 1993 for coastal protection services (within the meaning of section 553B of that Act).

5. Coal Mine Subsidence Compensation Act 2017

The land IS NOT WITHIN a Mine Subsidence District declared under section 20 of the Coal Mine Subsidence Compensation Act 2017.

NOTE: The above advice is provided to the extent that City of Newcastle (CN) has been notified by Subsidence Advisory NSW.

6. Road widening or realignment

NOTE: The Roads and Maritime Services (RMS) may have proposals that are not referred to in this item. For advice about affectation by RMS proposals, contact the Roads and Maritime Services, Locked Mail Bag 30 Newcastle 2300. Ph: 131 782.

The land IS NOT AFFECTED by any road widening or road realignment under Division 2 of Part 3 of the Roads Act 1993.

The land IS NOT AFFECTED by any road widening or road realignment under an environmental planning instrument.

The land IS NOT AFFECTED by road widening or road realignment under a resolution of the Council.

7. Policies on hazard risk restrictions

Except as stated below, the land is not affected by a policy referred to in Item 7 of Schedule 4 of the Environmental Planning and Assessment Regulation 2000 that restricts the development of the land because of the likelihood of land slip, bushfire, tidal inundation, subsidence, acid sulphate soils or any other risk (other than flooding).

Potential acid sulfate soils: Works carried out on the land must be undertaken in accordance with Clause 6.1 Acid sulfate soils of the Newcastle Local Environmental Plan 2012.

Land Contamination: We have land contamination information/records in relation to this property. Council has adopted a policy of restricting development or imposing conditions on properties affected by land contamination. Refer to Section 5.02 Land Contamination of Newcastle Development Control Plan 2012, which is available to view and download from City of Newcastle's website.

NOTE: The absence of a policy to restrict development of the land because of the likelihood of a particular risk does not imply that the land is free from that risk. City of Newcastle (CN) considers the likelihood of natural and man-made risks when determining development applications under section 4.15 of the Environmental Planning and Assessment Act 1979. Detailed investigation carried out in conjunction with the preparation or assessment of a development application may result in CN either refusing development consent or imposing conditions of consent on the basis of risks that are not identified above.

7A. Flood related development controls information

7A(1) Mapping information is not available and it is unknown if the land or part of the land is within the flood planning area.
7A(2) Mapping information is not available and it is unknown if the land or part of the land is between the flood planning area and the probable maximum flood.

Our information currently indicates that the property is, or contains, flood prone land as defined in the Floodplain Development Manual: the management of flood liable land, April 2005 published by the NSW Government.

Section 4.01 Flood Management of Newcastle Development Control Plan (DCP) 2012 provides guidelines with respect to all development of flood prone land. This includes development for the purpose of dwelling houses, dual occupancies, multi dwelling housing or residential flat buildings. The DCP may be viewed on our website, inspected or purchased at our Customer Contact Centre.

NOTE: More detailed flood information specific to the property is available on separate flooding certificate application through our Customer Contact Centre on (02) 4974 2000

8. Land reserved for acquisition

The land is not identified for acquisition by a public authority (as referred to in section 3.15 of the Act) by any environmental planning instrument or proposed environmental planning instrument applying to the land.

9. Contributions plans

The following contribution plan/s apply to the land.

Section 7.12 Newcastle Local Infrastructure Contributions Plan 2019: Effective 9 September 2019.

The Plan specifies section 7.12 contributions that may be imposed as a condition of development consent.

NOTE: Contributions plans are available on our website or may be inspected or purchased at our Customer Contact Centre.

9A. Biodiversity certified land

The land IS NOT biodiversity certified land under Part 8 of the Biodiversity Conservation Act 2016.

10. Biodiversity stewardship sites

The land IS NOT land (of which CN is aware) under a biodiversity stewardship agreement under Part 5 of the Biodiversity Conservation Act 2016.

10A. Native vegetation clearing set asides

The land IS NOT land (of which CN is aware) that contains a set aside area under section 60ZC of the Local Land Services Act 2013.

11. Bush fire prone land

The land IS NOT bush fire prone land for the purposes of the Environmental Planning and Assessment Act 1979.

12. Property vegetation plans

Not applicable. The Native Vegetation Act 2003 does not apply to the Newcastle local government area.

13. Orders under Trees (Disputes Between Neighbours) Act 2006

CN HAS NOT been notified that an order has been made under the Trees (Disputes between Neighbours) Act 2006 to carry out work in relation to a tree on the land.

14. Directions under Part 3A

The land IS NOT AFFECTED by a direction by the Minister in force under section 75P (2) (c1) of the Act.

15. Site compatibility certificates and conditions for seniors housing

(a) The land IS NOT AFFECTED by a current site compatibility certificate (of which CN is aware) issued under the State Environmental Planning Policy (Housing for Seniors and People with a Disability) 2004.

(b) The land IS NOT AFFECTED by any terms of kind referred to in clause 18(2) of the State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004, that have been imposed as a condition of consent to a development application granted after 11 October, 2007 in respect of the land.

16. Site compatibility certificates for infrastructure, schools or TAFE establishments

The land IS NOT AFFECTED by a valid site compatibility certificate (of which CN is aware) issued under the State Environmental Planning Policy (Infrastructure) 2007.

17. Site compatibility certificates and conditions for affordable rental housing

The land IS NOT AFFECTED by a valid site compatibility certificate (of which CN is aware) issued under the State Environmental Planning Policy (Affordable Rental Housing) 2009.

18. Paper subdivision information

The land IS NOT AFFECTED by any development plan that applies to the land or that is proposed to be subject to a consent ballot.

19. Site verification certificates

The land IS NOT AFFECTED by a current site verification certificate (of which CN is aware) issued under the State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007.

20. Loose-fill asbestos insulation

CN HAS NOT been notified that the land includes any residential premises (within the meaning of Division 1A of Part 8 of the Home Building Act 1989) that are listed on the register of loose-fill asbestos insulation, that is required to be maintained under that Division.

21. Affected building notices and building product rectification orders

The land IS NOT AFFECTED by any affected building notice of which CN is aware that is in force in respect of the land.

The land IS NOT AFFECTED by any building product rectification order that has not been fully complied with, of which CN is aware that is in force in respect of the land.

The land IS NOT AFFECTED by an outstanding notice of intention to make a building product rectification order of which CN is aware.

An affected building notice has the same meaning as in Part 4 of the Building Products (Safety) Act 2017. Building product rectification order has the same meaning as in the Building Products (Safety) Act 2017.

Note: *There are no matters prescribed by section 59(2) of the Contaminated Land Management Act 1997 to be disclosed, however if other contamination information is held by the Council this may be provided under a section 10.7(5) certificate.*

Part 2:

Advice provided under section 10.7(5)

ATTENTION: Section 10.7(6) of the Act states that a Council shall not incur any liability in respect of advice provided in good faith pursuant to sub-section 10.7(5).

22. Outstanding Notices and Orders issued by City of Newcastle (CN).

This Certificate does not include any advice regarding outstanding notices or orders issued under the Environmental Planning and Assessment Act 1979, the Local Government Act 1993 or any other relevant legislation. To obtain advice regarding these matters, it is recommended you lodge an application for a Certificate as to Outstanding Notices and Orders (accompanied by the appropriate fee). For further information, please contact the Customer Contact Centre on (02) 4974 2000.

23. Draft development control plans.

A draft development control plan DOES NOT APPLY to the land. The draft plans are exhibited pursuant to Part 3 of the Environmental Planning and Assessment Regulation 2000.

24. Heritage Act 1977.

The land IS NOT AFFECTED by a listing on the State Heritage Register or an Interim Heritage Order that is in force under the Heritage Act 1977.

NOTE: The above advice is provided to the extent that CN has been notified by the Heritage Council of NSW. For up-to-date details, contact the Office of Environment and Heritage, PO Box A290, South Sydney NSW 1232 Ph: (02) 9995 5000.

25. Listing by National Trust of Australia.

The land IS NOT AFFECTED by a listing of the National Trust of Australia (NSW).

NOTE: The above advice is provided to the extent that CN has been notified by the National Trust of Australia (NSW). For up-to-date details, contact the National Trust Ph 02 9258 0123.

26. Australian Heritage Database.

The land IS NOT AFFECTED by a listing on the Australian Heritage Database.

NOTE: The above advice is provided to the extent that CN has been notified by the Department of the Environment. For up-to-date details, contact the Department of the Environment, Heritage, King Edward Terrace, Parkes ACT 2600. Ph (02) 6274 1111.

27. Environment Protection & Biodiversity Conservation Act 1999 (Cth)

Under the (Commonwealth) Environment Protection and Biodiversity Conservation Act 1999, actions which have, may have or are likely to have, a significant impact on a matter of national environmental significance may be taken only with the approval of the Commonwealth Minister for the Environment.

Approval is also required for actions that have a significant effect on the environment of Commonwealth land. These actions may be on Commonwealth land or other land.

This approval is in addition to any approvals under the (NSW) Environmental Planning and Assessment Act 1979 or other NSW legislation.

Matters of national environmental significance are:

- declared World Heritage areas
- declared Ramsar wetlands
- listed threatened species and ecological communities
- listed migratory species
- nuclear actions
- the environment of Commonwealth marine areas.

Locations within the City of Newcastle that are a declared Ramsar wetland include Kooragang Nature Reserve and Shortland Wetlands. Listed threatened species and listed migratory species are known to occur within the City of Newcastle.

28. Other matters

The land is affected by the following:

Newcastle earthquake

Earthquakes occurred in the vicinity of Newcastle on 28th December 1989 and 6 August 1994. Buildings on the land may have suffered damage as a consequence of the earthquakes. Prospective purchasers are advised to make their own enquiries as to whether the property is affected by any damage.

Further consent requirements under the Newcastle Local Environmental Plan 2012.

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CHIEF EXECUTIVE OFFICER

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Complying development under the Subdivision Code MAY be carried out on this land.

Demolition Code

Complying development under the Demolition Code MAY be carried out on this land.

Fire Safety Code

Complying development under the Fire Safety Code MAY be carried out on this land.

4B. Annual charges under Local Government Act 1993 for coastal protection services that relate to existing coastal protection works

The land IS NOT subject to an agreement for annual charges under section 496B of the Local Government Act 1993 for coastal protection services (within the meaning of section 553B of that Act).

5. Coal Mine Subsidence Compensation Act 2017

The land IS NOT WITHIN a Mine Subsidence District declared under section 20 of the Coal Mine Subsidence Compensation Act 2017.

NOTE: The above advice is provided to the extent that City of Newcastle (CN) has been notified by Subsidence Advisory NSW.

6. Road widening or realignment

NOTE: The Roads and Maritime Services (RMS) may have proposals that are not referred to in this item. For advice about affectation by RMS proposals, contact the Roads and Maritime Services, Locked Mail Bag 30 Newcastle 2300. Ph: 131 782.

The land IS NOT AFFECTED by any road widening or road realignment under Division 2 of Part 3 of the Roads Act 1993.

The land IS NOT AFFECTED by any road widening or road realignment under an environmental planning instrument.

The land IS NOT AFFECTED by road widening or road realignment under a resolution of the Council.

7. Policies on hazard risk restrictions

Except as stated below, the land is not affected by a policy referred to in Item 7 of Schedule 4 of the Environmental Planning and Assessment Regulation 2000 that restricts the development of the land because of the likelihood of land slip, bushfire, tidal inundation, subsidence, acid sulphate soils or any other risk (other than flooding).

Potential acid sulfate soils: Works carried out on the land must be undertaken in accordance with Clause 6.1 Acid sulfate soils of the Newcastle Local Environmental Plan 2012.

Land Contamination: We have land contamination information/records in relation to this property. Council has adopted a policy of restricting development or imposing conditions on properties affected by land contamination. Refer to Section 5.02 Land Contamination of Newcastle Development Control Plan 2012, which is available to view and download from City of Newcastle's website.

NOTE: The absence of a policy to restrict development of the land because of the likelihood of a particular risk does not imply that the land is free from that risk. City of Newcastle (CN) considers the likelihood of natural and man-made risks when determining development applications under section 4.15 of the Environmental Planning and Assessment Act 1979. Detailed investigation carried out in conjunction with the preparation or assessment of a development application may result in CN either refusing development consent or imposing conditions of consent on the basis of risks that are not identified above.

7A. Flood related development controls information

7A(1) Mapping information is not available and it is unknown if the land or part of the land is within the flood planning area.
7A(2) Mapping information is not available and it is unknown if the land or part of the land is between the flood planning area and the probable maximum flood.

Our information currently indicates that the property is, or contains, flood prone land as defined in the Floodplain Development Manual: the management of flood liable land, April 2005 published by the NSW Government.

Section 4.01 Flood Management of Newcastle Development Control Plan (DCP) 2012 provides guidelines with respect to all development of flood prone land. This includes development for the purpose of dwelling houses, dual occupancies, multi dwelling housing or residential flat buildings. The DCP may be viewed on our website, inspected or purchased at our Customer Contact Centre.

NOTE: More detailed flood information specific to the property is available on separate flooding certificate application through our Customer Contact Centre on (02) 4974 2000

8. Land reserved for acquisition

The land is not identified for acquisition by a public authority (as referred to in section 3.15 of the Act) by any environmental planning instrument or proposed environmental planning instrument applying to the land.

9. Contributions plans

The following contribution plan/s apply to the land.

Section 7.12 Newcastle Local Infrastructure Contributions Plan 2019: Effective 9 September 2019.

The Plan specifies section 7.12 contributions that may be imposed as a condition of development consent.

NOTE: Contributions plans are available on our website or may be inspected or purchased at our Customer Contact Centre.

9A. Biodiversity certified land

The land IS NOT biodiversity certified land under Part 8 of the Biodiversity Conservation Act 2016.

10. Biodiversity stewardship sites

The land IS NOT land (of which CN is aware) under a biodiversity stewardship agreement under Part 5 of the Biodiversity Conservation Act 2016.

10A. Native vegetation clearing set asides

The land IS NOT land (of which CN is aware) that contains a set aside area under section 60ZC of the Local Land Services Act 2013.

11. Bush fire prone land

The land IS NOT bush fire prone land for the purposes of the Environmental Planning and Assessment Act 1979.

12. Property vegetation plans

Not applicable. The Native Vegetation Act 2003 does not apply to the Newcastle local government area.

13. Orders under Trees (Disputes Between Neighbours) Act 2006

CN HAS NOT been notified that an order has been made under the Trees (Disputes between Neighbours) Act 2006 to carry out work in relation to a tree on the land.

14. Directions under Part 3A

The land IS NOT AFFECTED by a direction by the Minister in force under section 75P (2) (c1) of the Act.

15. Site compatibility certificates and conditions for seniors housing

(a) The land IS NOT AFFECTED by a current site compatibility certificate (of which CN is aware) issued under the State Environmental Planning Policy (Housing for Seniors and People with a Disability) 2004.

(b) The land IS NOT AFFECTED by any terms of kind referred to in clause 18(2) of the State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004, that have been imposed as a condition of consent to a development application granted after 11 October, 2007 in respect of the land.

16. Site compatibility certificates for infrastructure, schools or TAFE establishments

The land IS NOT AFFECTED by a valid site compatibility certificate (of which CN is aware) issued under the State Environmental Planning Policy (Infrastructure) 2007.

17. Site compatibility certificates and conditions for affordable rental housing

The land IS NOT AFFECTED by a valid site compatibility certificate (of which CN is aware) issued under the State Environmental Planning Policy (Affordable Rental Housing) 2009.

18. Paper subdivision information

The land IS NOT AFFECTED by any development plan that applies to the land or that is proposed to be subject to a consent ballot.

19. Site verification certificates

The land IS NOT AFFECTED by a current site verification certificate (of which CN is aware) issued under the State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007.

20. Loose-fill asbestos insulation

CN HAS NOT been notified that the land includes any residential premises (within the meaning of Division 1A of Part 8 of the Home Building Act 1989) that are listed on the register of loose-fill asbestos insulation, that is required to be maintained under that Division.

21. Affected building notices and building product rectification orders

The land IS NOT AFFECTED by any affected building notice of which CN is aware that is in force in respect of the land.

The land IS NOT AFFECTED by any building product rectification order that has not been fully complied with, of which CN is aware that is in force in respect of the land.

The land IS NOT AFFECTED by an outstanding notice of intention to make a building product rectification order of which CN is aware.

An affected building notice has the same meaning as in Part 4 of the Building Products (Safety) Act 2017. Building product rectification order has the same meaning as in the Building Products (Safety) Act 2017.

Note: *There are no matters prescribed by section 59(2) of the Contaminated Land Management Act 1997 to be disclosed, however if other contamination information is held by the Council this may be provided under a section 10.7(5) certificate.*

Part 2:

Advice provided under section 10.7(5)

ATTENTION: Section 10.7(6) of the Act states that a Council shall not incur any liability in respect of advice provided in good faith pursuant to sub-section 10.7(5).

22. Outstanding Notices and Orders issued by City of Newcastle (CN).

This Certificate does not include any advice regarding outstanding notices or orders issued under the Environmental Planning and Assessment Act 1979, the Local Government Act 1993 or any other relevant legislation. To obtain advice regarding these matters, it is recommended you lodge an application for a Certificate as to Outstanding Notices and Orders (accompanied by the appropriate fee). For further information, please contact the Customer Contact Centre on (02) 4974 2000.

23. Draft development control plans.

A draft development control plan DOES NOT APPLY to the land. The draft plans are exhibited pursuant to Part 3 of the Environmental Planning and Assessment Regulation 2000.

24. Heritage Act 1977.

The land IS NOT AFFECTED by a listing on the State Heritage Register or an Interim Heritage Order that is in force under the Heritage Act 1977.

NOTE: The above advice is provided to the extent that CN has been notified by the Heritage Council of NSW. For up-to-date details, contact the Office of Environment and Heritage, PO Box A290, South Sydney NSW 1232 Ph: (02) 9995 5000.

25. Listing by National Trust of Australia.

The land IS NOT AFFECTED by a listing of the National Trust of Australia (NSW).

NOTE: The above advice is provided to the extent that CN has been notified by the National Trust of Australia (NSW). For up-to-date details, contact the National Trust Ph 02 9258 0123.

26. Australian Heritage Database.

The land IS NOT AFFECTED by a listing on the Australian Heritage Database.

NOTE: The above advice is provided to the extent that CN has been notified by the Department of the Environment. For up-to-date details, contact the Department of the Environment, Heritage, King Edward Terrace, Parkes ACT 2600. Ph (02) 6274 1111.

27. Environment Protection & Biodiversity Conservation Act 1999 (Cth)

Under the (Commonwealth) Environment Protection and Biodiversity Conservation Act 1999, actions which have, may have or are likely to have, a significant impact on a matter of national environmental significance may be taken only with the approval of the Commonwealth Minister for the Environment.

Approval is also required for actions that have a significant effect on the environment of Commonwealth land. These actions may be on Commonwealth land or other land.

This approval is in addition to any approvals under the (NSW) Environmental Planning and Assessment Act 1979 or other NSW legislation.

Matters of national environmental significance are:

- declared World Heritage areas
- declared Ramsar wetlands
- listed threatened species and ecological communities
- listed migratory species
- nuclear actions
- the environment of Commonwealth marine areas.

Locations within the City of Newcastle that are a declared Ramsar wetland include Kooragang Nature Reserve and Shortland Wetlands. Listed threatened species and listed migratory species are known to occur within the City of Newcastle.

28. Other matters

The land is affected by the following:

Newcastle earthquake

Earthquakes occurred in the vicinity of Newcastle on 28th December 1989 and 6 August 1994. Buildings on the land may have suffered damage as a consequence of the earthquakes. Prospective purchasers are advised to make their own enquiries as to whether the property is affected by any damage.

Further consent requirements under the Newcastle Local Environmental Plan 2012.

The following provisions of the Newcastle Local Environmental Plan 2012 affect the carrying out of development on the land. These provisions are in addition to those required to be disclosed at Item 2 of this Certificate.

Refer to clause 3.1 Exempt Development of the Newcastle Local Environmental Plan 2012

Refer to clause 3.2 Complying Development of the Newcastle Local Environmental Plan 2012

Local Strategic Planning Statement

The Local Strategic Planning Statement (LSPS) was adopted by council on 26 May 2020 and replaces the Local Planning Strategy. The LSPS is taken into account when CN assesses development applications and amendments to the Newcastle Local Environmental Plan 2012.

Note: Refer to our website to view the document. www.newcastle.nsw.gov.au

Hunter Regional Plan 2036

The Hunter Regional Plan has been prepared by the Department of Planning and Environment. The contents of the strategy will be taken into account when CN assesses development applications and amendments to the Newcastle Local Environmental Plan 2012.

Note: Refer to the Department of Planning and Environment's website to view the document. www.planning.nsw.gov.au

Newcastle City-Wide Floodplain Risk Management Study and Plan (2012)

The Newcastle City-wide Floodplain Risk Management Study and Plan addresses flood management for the City of Newcastle. The Study and Plan will be taken into account when CN assesses development applications and amendments to the Newcastle Local Environmental Plan 2012.

Note: Refer to our *website to view the document. www.newcastle.nsw.gov.au*

Greater Newcastle Metropolitan Plan 2036

The Greater Newcastle Metropolitan Plan 2036 has been prepared by the Department of Planning and Environment. The Plan will be taken into account when CN assesses development applications and amendments to the Newcastle Local Environmental Plan 2012.

Parking permit policy

This property is within the Permit Exclusion Area of the City Centre Parking Strategy adopted by Council on 25 June 2002 and updated on 16 May 2005. Residents within the Permit Exclusion Area are not eligible for resident parking permit stickers. For further information please contact Parking Services Coordinator Michael Heather on 4974 5008.

Contaminated land information

Council records indicate the following potentially contaminating landuse(s) may have been carried out on the land:

1. engine works
2. fuel/oil storage

Persons relying on the certificate are advised to make their own investigations as to whether the land is affected by elevated concentrations of soil or groundwater contaminants in relation to proposed purchase or use of land.

Issued without alterations or additions, 17/09/21
Authorised by

JEREMY BATH
CHIEF EXECUTIVE OFFICER

Planning Certificate

Section 10.7, Environmental Planning and Assessment Act 1979

To: Douglas Partners Pty Ltd
15 Callistemon Close
Warabrook NSW 2304

Certificate No: PL2021/05218
Fees: $133.00
Receipt No(s): D002049823

Your Reference: Project 102077.02

Date of Issue: 17/09/2021

The Land: Lot 1 DP 395367
924 Hunter Street Newcastle West NSW 2302

Advice provided on this Certificate:

Advice under section 10.7(2): see items 1 – 21
Additional advice under section 10.7(5): see Items 22 – 28

IMPORTANT: Please read this certificate carefully

This certificate contains important information about the land.

Please check for any item which could be inconsistent with the proposed use or development of the land. If there is anything you do not understand, phone our **Customer Contact Centre** on (02) 4974 2000, or come in and see us.

The information provided in this certificate relates only to the land described above. If you need information about adjoining or nearby land, or about the City of Newcastle (CN) development policies for the general area, contact our **Customer Contact Centre**.

All information provided is correct as at 17/09/2021. However, it's possible for changes to occur within a short time. We recommend that you only rely upon a very recent certificate.

City of Newcastle

PO Box 489
NEWCASTLE 2300

Phone: (02) 4974 2000
Facsimile: (02) 4974 2222

Customer Contact Centre
Ground floor,
12 Stewart Avenue
Newcastle West NSW 2300

Office hours:
Mondays to Fridays 8.30 am to 5.00 pm

Part 1:

Advice provided under section 10.7(2)

ATTENTION: The explanatory notes appearing in italic print within Part 1 are provided to assist understanding, but do not form part of the advice provided under section 10.7(2). These notes shall be taken as being advice provided under section 10.7(5).

1. Names of relevant planning instruments and DCPs

The following environmental planning instruments, proposed environmental planning instruments and development control plans apply to the land, either in full or in part.

State Environmental Planning Policy No. 1 - Development Standards

State Environmental Planning Policy No. 21 - Caravan Parks

State Environmental Planning Policy No. 33 - Hazardous and Offensive Development

State Environmental Planning Policy No. 36 - Manufactured Home Estates

State Environmental Planning Policy (Koala Habitat Protection) Amendment (Maps) 2020

State Environmental Planning Policy No. 50 - Canal Estate Development

State Environmental Planning Policy No. 55 - Remediation of Land

State Environmental Planning Policy No. 64 - Advertising and Signage

State Environmental Planning Policy No. 65 - Design Quality of Residential Flat Development

State Environmental Planning Policy No. 70 - Affordable Housing (Revised Schemes)

State Environmental Planning Policy (Housing For Seniors or People with a Disability) 2004

State Environmental Planning Policy (Building Sustainability Index:BASIX) 2004

State Environmental Planning Policy (State Significant Precincts) 2005

State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007

State Environmental Planning Policy (Miscellaneous Consent Provisions) 2007

State Environmental Planning Policy (Infrastructure) 2007

State Environmental Planning Policy (Exempt and Complying Development Codes) 2008

State Environmental Planning Policy (Urban Renewal) 2010

State Environmental Planning Policy (Affordable Rental Housing) 2009

State Environmental Planning Policy (State and Regional Development) 2011

State Environmental Planning Policy (Educational Establishments and Child Care Facilities) 2017

State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017

State Environmental Planning Policy (Concurrences) 2018

State Environmental Planning Policy (Coastal Management) 2018

State Environmental Planning Policy (Primary Production and Rural Development) 2019

Newcastle Local Environmental Plan 2012

Newcastle Development Control Plan 2012

2. Zoning and land use under relevant LEPs

Newcastle Local Environmental Plan 2012

Zoning: The Newcastle Local Environmental Plan 2012 identifies the land as being within the following zone(s):

Zone B3 Commercial Core

Note: Refer to www. newcastle.nsw.gov.au or www. legislation.nsw.gov.au website for LEP instrument and zoning maps.

The following is an extract from the zoning provisions contained in Newcastle Local Environmental Plan 2012:

Zone B3 Commercial Core

- **Objectives of zone**
  - To provide a wide range of retail, business, office, entertainment, community and other suitable land uses that serve the needs of the local and wider community.
  - To encourage appropriate employment opportunities in accessible locations.
  - To maximise public transport patronage and encourage walking and cycling.
  - To provide for commercial floor space within a mixed use development.
  - To strengthen the role of the Newcastle City Centre as the regional business, retail and cultural centre of the Hunter region.
  - To provide for the retention and creation of view corridors.
- **Permitted without consent**

  Environmental protection works; Home occupations
- **Permitted with consent**

  Car parks; Centre-based child care facilities; Commercial premises; Community facilities; Educational establishments; Entertainment facilities; Environmental facilities; Flood mitigation works; Function centres; Hotel or motel accommodation; Information and education facilities; Medical centres; Mortuaries; Oyster aquaculture; Passenger transport facilities; Places of public worship; Recreation areas; Recreation facilities (indoor); Registered clubs; Respite day care centres; Restricted premises; Roads; Sex services premises; Shop top housing; Signage; Tank-based aquaculture; Tourist and visitor accommodation; Transport depots
- **Prohibited**

  Pond-based aquaculture; Any development not specified in, permitted without consent or permitted with consent

Minimum land dimensions for erection of a dwelling-house: There are no minimum land dimensions for the erection of a dwelling-house that apply to this site.

Critical habitat: The land does not identify as including or comprising critical habitat.

Heritage conservation area: The land is situated within the Newcastle City Centre Heritage Conservation Area. Refer to the Newcastle Local Environmental Plan 2012 for provisions relating to development within a heritage conservation area.

Heritage items: There are no heritage items listed in the Newcastle Local Environmental Plan 2012 situated on the land.

3. Complying development

Note Other requirements: *The advice below for all Complying Development Codes, is limited to identifying whether or not the* ***land****, the subject of the certificate, is land on which complying development may be carried out because of Clauses 1.17A(1)(c) to (e), (2), (3) & (4), 1.18 (1)(c3) and 1.19 of State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 (the Codes SEPP).*

To ascertain the extent to which the complying development may or may not be carried out on the land, maps are available on City of Newcastle (CN) web pages.

Housing Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land within a Heritage Conservation Area or a Draft Heritage Conservation Area unless the development is for a detached outbuilding or swimming pool.

Rural Housing Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land within a Heritage Conservation Area or a Draft Heritage Conservation Area unless the development is for a detached outbuilding or swimming pool.

Low Rise Housing Diversity Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land within a Heritage Conservation Area or a Draft Heritage Conservation Area unless the development is for a detached outbuilding or swimming pool.

Greenfield Housing Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land within a Heritage Conservation Area or a Draft Heritage Conservation Area unless the development is for a detached outbuilding or swimming pool.

Inland Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land within a Heritage Conservation Area or a Draft Heritage Conservation Area unless the development is for a detached outbuilding or swimming pool.

Housing Alterations Code

Complying development under the Housing Alterations Code MAY be carried out on this land.

General Development Code

Complying development under the General Development Code MAY be carried out on this land.

Commercial and Industrial Alterations Code

Complying development under the Commercial and Industrial Code MAY be carried out on this land.

Commercial and Industrial (New Buildings and Additions) Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land within a Heritage Conservation Area or a Draft Heritage Conservation Area.

Container Recycling Facilities Code

Complying development under the Container Recycling Facilities Code MAY be carried out on this land.

Subdivision Code

Complying development under the Subdivision Code MAY be carried out on this land.

Demolition Code

Complying development under the Demolition Code MAY be carried out on this land.

Fire Safety Code

Complying development under the Fire Safety Code MAY be carried out on this land.

4B. Annual charges under Local Government Act 1993 for coastal protection services that relate to existing coastal protection works

The land IS NOT subject to an agreement for annual charges under section 496B of the Local Government Act 1993 for coastal protection services (within the meaning of section 553B of that Act).

5. Coal Mine Subsidence Compensation Act 2017

The land IS NOT WITHIN a Mine Subsidence District declared under section 20 of the Coal Mine Subsidence Compensation Act 2017.

NOTE: The above advice is provided to the extent that City of Newcastle (CN) has been notified by Subsidence Advisory NSW.

6. Road widening or realignment

NOTE: The Roads and Maritime Services (RMS) may have proposals that are not referred to in this item. For advice about affectation by RMS proposals, contact the Roads and Maritime Services, Locked Mail Bag 30 Newcastle 2300. Ph: 131 782.

The land IS NOT AFFECTED by any road widening or road realignment under Division 2 of Part 3 of the Roads Act 1993.

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7. Policies on hazard risk restrictions

Except as stated below, the land is not affected by a policy referred to in Item 7 of Schedule 4 of the Environmental Planning and Assessment Regulation 2000 that restricts the development of the land because of the likelihood of land slip, bushfire, tidal inundation, subsidence, acid sulphate soils or any other risk (other than flooding).

Potential acid sulfate soils: Works carried out on the land must be undertaken in accordance with Clause 6.1 Acid sulfate soils of the Newcastle Local Environmental Plan 2012.

Land Contamination: Council has adopted a policy of restricting development or imposing conditions on properties affected by Land Contamination. Refer to the Newcastle Development Control Plan 2012, which is available to view and download from City of Newcastle's website.

NOTE: The absence of a policy to restrict development of the land because of the likelihood of a particular risk does not imply that the land is free from that risk. City of Newcastle (CN) considers the likelihood of natural and man-made risks when determining development applications under section 4.15 of the Environmental Planning and Assessment Act 1979. Detailed investigation carried out in conjunction with the preparation or assessment of a development application may result in CN either refusing development consent or imposing conditions of consent on the basis of risks that are not identified above.

7A. Flood related development controls information

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7A(2) Mapping information is not available and it is unknown if the land or part of the land is between the flood planning area and the probable maximum flood.

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NOTE: More detailed flood information specific to the property is available on separate flooding certificate application through our Customer Contact Centre on (02) 4974 2000

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9. Contributions plans

The following contribution plan/s apply to the land.

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NOTE: Contributions plans are available on our website or may be inspected or purchased at our Customer Contact Centre.

9A. Biodiversity certified land

The land IS NOT biodiversity certified land under Part 8 of the Biodiversity Conservation Act 2016.

10. Biodiversity stewardship sites

The land IS NOT land (of which CN is aware) under a biodiversity stewardship agreement under Part 5 of the Biodiversity Conservation Act 2016.

10A. Native vegetation clearing set asides

The land IS NOT land (of which CN is aware) that contains a set aside area under section 60ZC of the Local Land Services Act 2013.

11. Bush fire prone land

The land IS NOT bush fire prone land for the purposes of the Environmental Planning and Assessment Act 1979.

12. Property vegetation plans

Not applicable. The Native Vegetation Act 2003 does not apply to the Newcastle local government area.

13. Orders under Trees (Disputes Between Neighbours) Act 2006

CN HAS NOT been notified that an order has been made under the Trees (Disputes between Neighbours) Act 2006 to carry out work in relation to a tree on the land.

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(a) The land IS NOT AFFECTED by a current site compatibility certificate (of which CN is aware) issued under the State Environmental Planning Policy (Housing for Seniors and People with a Disability) 2004.

(b) The land IS NOT AFFECTED by any terms of kind referred to in clause 18(2) of the State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004, that have been imposed as a condition of consent to a development application granted after 11 October, 2007 in respect of the land.

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21. Affected building notices and building product rectification orders

The land IS NOT AFFECTED by any affected building notice of which CN is aware that is in force in respect of the land.

The land IS NOT AFFECTED by any building product rectification order that has not been fully complied with, of which CN is aware that is in force in respect of the land.

The land IS NOT AFFECTED by an outstanding notice of intention to make a building product rectification order of which CN is aware.

An affected building notice has the same meaning as in Part 4 of the Building Products (Safety) Act 2017. Building product rectification order has the same meaning as in the Building Products (Safety) Act 2017.

Note: *There are no matters prescribed by section 59(2) of the Contaminated Land Management Act 1997 to be disclosed, however if other contamination information is held by the Council this may be provided under a section 10.7(5) certificate.*

Part 2:

Advice provided under section 10.7(5)

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A draft development control plan DOES NOT APPLY to the land. The draft plans are exhibited pursuant to Part 3 of the Environmental Planning and Assessment Regulation 2000.

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The land IS NOT AFFECTED by a listing on the State Heritage Register or an Interim Heritage Order that is in force under the Heritage Act 1977.

NOTE: The above advice is provided to the extent that CN has been notified by the Heritage Council of NSW. For up-to-date details, contact the Office of Environment and Heritage, PO Box A290, South Sydney NSW 1232 Ph: (02) 9995 5000.

25. Listing by National Trust of Australia.

The land IS NOT AFFECTED by a listing of the National Trust of Australia (NSW).

NOTE: The above advice is provided to the extent that CN has been notified by the National Trust of Australia (NSW). For up-to-date details, contact the National Trust Ph 02 9258 0123.

26. Australian Heritage Database.

The land IS NOT AFFECTED by a listing on the Australian Heritage Database.

NOTE: The above advice is provided to the extent that CN has been notified by the Department of the Environment. For up-to-date details, contact the Department of the Environment, Heritage, King Edward Terrace, Parkes ACT 2600. Ph (02) 6274 1111.

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Under the (Commonwealth) Environment Protection and Biodiversity Conservation Act 1999, actions which have, may have or are likely to have, a significant impact on a matter of national environmental significance may be taken only with the approval of the Commonwealth Minister for the Environment.

Approval is also required for actions that have a significant effect on the environment of Commonwealth land. These actions may be on Commonwealth land or other land.

This approval is in addition to any approvals under the (NSW) Environmental Planning and Assessment Act 1979 or other NSW legislation.

Matters of national environmental significance are:

- declared World Heritage areas
- declared Ramsar wetlands
- listed threatened species and ecological communities
- listed migratory species
- nuclear actions
- the environment of Commonwealth marine areas.

Locations within the City of Newcastle that are a declared Ramsar wetland include Kooragang Nature Reserve and Shortland Wetlands. Listed threatened species and listed migratory species are known to occur within the City of Newcastle.

28. Other matters

The land is affected by the following:

Newcastle earthquake

Earthquakes occurred in the vicinity of Newcastle on 28th December 1989 and 6 August 1994. Buildings on the land may have suffered damage as a consequence of the earthquakes. Prospective purchasers are advised to make their own enquiries as to whether the property is affected by any damage.

Further consent requirements under the Newcastle Local Environmental Plan 2012.

The following provisions of the Newcastle Local Environmental Plan 2012 affect the carrying out of development on the land. These provisions are in addition to those required to be disclosed at Item 2 of this Certificate.

Refer to clause 3.1 Exempt Development of the Newcastle Local Environmental Plan 2012

Refer to clause 3.2 Complying Development of the Newcastle Local Environmental Plan 2012

Local Strategic Planning Statement

The Local Strategic Planning Statement (LSPS) was adopted by council on 26 May 2020 and replaces the Local Planning Strategy. The LSPS is taken into account when CN assesses development applications and amendments to the Newcastle Local Environmental Plan 2012.

Note: Refer to our website to view the document. www.newcastle.nsw.gov.au

Hunter Regional Plan 2036

The Hunter Regional Plan has been prepared by the Department of Planning and Environment. The contents of the strategy will be taken into account when CN assesses development applications and amendments to the Newcastle Local Environmental Plan 2012.

Note: Refer to the Department of Planning and Environment's website to view the document. www.planning.nsw.gov.au

Newcastle City-Wide Floodplain Risk Management Study and Plan (2012)

The Newcastle City-wide Floodplain Risk Management Study and Plan addresses flood management for the City of Newcastle. The Study and Plan will be taken into account when CN assesses development applications and amendments to the Newcastle Local Environmental Plan 2012.

Note: Refer to our *website to view the document. www.newcastle.nsw.gov.au*

Greater Newcastle Metropolitan Plan 2036

The Greater Newcastle Metropolitan Plan 2036 has been prepared by the Department of Planning and Environment. The Plan will be taken into account when CN assesses development applications and amendments to the Newcastle Local Environmental Plan 2012.

Parking permit policy

This property is within the Permit Exclusion Area of the City Centre Parking Strategy adopted by Council on 25 June 2002 and updated on 16 May 2005. Residents within the Permit Exclusion Area are not eligible for resident parking permit stickers. For further information please contact Parking Services Coordinator Michael Heather on 4974 5008.

Issued without alterations or additions, 17/09/21
Authorised by

JEREMY BATH
CHIEF EXECUTIVE OFFICER

Planning Certificate

Section 10.7, Environmental Planning and Assessment Act 1979

To: Douglas Partners Pty Ltd
15 Callistemon Close
Warabrook NSW 2304

Certificate No: PL2021/05219
Fees: $133.00
Receipt No(s): D002049823

Your Reference: Project 102077.02

Date of Issue: 17/09/2021

The Land: Lot 2 DP 126
924 Hunter Street Newcastle West NSW 2302

Advice provided on this Certificate:

Advice under section 10.7(2): see items 1 – 21
Additional advice under section 10.7(5): see Items 22 – 28

IMPORTANT: Please read this certificate carefully

This certificate contains important information about the land.

Please check for any item which could be inconsistent with the proposed use or development of the land. If there is anything you do not understand, phone our **Customer Contact Centre** on (02) 4974 2000, or come in and see us.

The information provided in this certificate relates only to the land described above. If you need information about adjoining or nearby land, or about the City of Newcastle (CN) development policies for the general area, contact our **Customer Contact Centre**.

All information provided is correct as at 17/09/2021. However, it's possible for changes to occur within a short time. We recommend that you only rely upon a very recent certificate.

City of Newcastle

PO Box 489
NEWCASTLE 2300

Phone: (02) 4974 2000
Facsimile: (02) 4974 2222

Customer Contact Centre
Ground floor,
12 Stewart Avenue
Newcastle West NSW 2300

Office hours:
Mondays to Fridays 8.30 am to 5.00 pm

Part 1:

Advice provided under section 10.7(2)

ATTENTION: The explanatory notes appearing in italic print within Part 1 are provided to assist understanding, but do not form part of the advice provided under section 10.7(2). These notes shall be taken as being advice provided under section 10.7(5).

1. Names of relevant planning instruments and DCPs

The following environmental planning instruments, proposed environmental planning instruments and development control plans apply to the land, either in full or in part.

State Environmental Planning Policy No. 1 - Development Standards

State Environmental Planning Policy No. 21 - Caravan Parks

State Environmental Planning Policy No. 33 - Hazardous and Offensive Development

State Environmental Planning Policy No. 36 - Manufactured Home Estates

State Environmental Planning Policy (Koala Habitat Protection) Amendment (Maps) 2020

State Environmental Planning Policy No. 50 - Canal Estate Development

State Environmental Planning Policy No. 55 - Remediation of Land

State Environmental Planning Policy No. 64 - Advertising and Signage

State Environmental Planning Policy No. 65 - Design Quality of Residential Flat Development

State Environmental Planning Policy No. 70 - Affordable Housing (Revised Schemes)

State Environmental Planning Policy (Housing For Seniors or People with a Disability) 2004

State Environmental Planning Policy (Building Sustainability Index:BASIX) 2004

State Environmental Planning Policy (State Significant Precincts) 2005

State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007

State Environmental Planning Policy (Miscellaneous Consent Provisions) 2007

State Environmental Planning Policy (Infrastructure) 2007

State Environmental Planning Policy (Exempt and Complying Development Codes) 2008

State Environmental Planning Policy (Urban Renewal) 2010

State Environmental Planning Policy (Affordable Rental Housing) 2009

State Environmental Planning Policy (State and Regional Development) 2011

State Environmental Planning Policy (Educational Establishments and Child Care Facilities) 2017

State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017

State Environmental Planning Policy (Concurrences) 2018

State Environmental Planning Policy (Coastal Management) 2018

State Environmental Planning Policy (Primary Production and Rural Development) 2019

Newcastle Local Environmental Plan 2012

Newcastle Development Control Plan 2012

2. Zoning and land use under relevant LEPs

Newcastle Local Environmental Plan 2012

Zoning: The Newcastle Local Environmental Plan 2012 identifies the land as being within the following zone(s):

Zone B3 Commercial Core

Note: Refer to www. newcastle.nsw.gov.au or www. legislation.nsw.gov.au website for LEP instrument and zoning maps.

The following is an extract from the zoning provisions contained in Newcastle Local Environmental Plan 2012:

Zone B3 Commercial Core

- **Objectives of zone**
  - To provide a wide range of retail, business, office, entertainment, community and other suitable land uses that serve the needs of the local and wider community.
  - To encourage appropriate employment opportunities in accessible locations.
  - To maximise public transport patronage and encourage walking and cycling.
  - To provide for commercial floor space within a mixed use development.
  - To strengthen the role of the Newcastle City Centre as the regional business, retail and cultural centre of the Hunter region.
  - To provide for the retention and creation of view corridors.
- **Permitted without consent**

  Environmental protection works; Home occupations
- **Permitted with consent**

  Car parks; Centre-based child care facilities; Commercial premises; Community facilities; Educational establishments; Entertainment facilities; Environmental facilities; Flood mitigation works; Function centres; Hotel or motel accommodation; Information and education facilities; Medical centres; Mortuaries; Oyster aquaculture; Passenger transport facilities; Places of public worship; Recreation areas; Recreation facilities (indoor); Registered clubs; Respite day care centres; Restricted premises; Roads; Sex services premises; Shop top housing; Signage; Tank-based aquaculture; Tourist and visitor accommodation; Transport depots
- **Prohibited**

  Pond-based aquaculture; Any development not specified in, permitted without consent or permitted with consent

Minimum land dimensions for erection of a dwelling-house: There are no minimum land dimensions for the erection of a dwelling-house that apply to this site.

Critical habitat: The land does not identify as including or comprising critical habitat.

Heritage conservation area: The land is situated within the Newcastle City Centre Heritage Conservation Area. Refer to the Newcastle Local Environmental Plan 2012 for provisions relating to development within a heritage conservation area.

Heritage items: There are no heritage items listed in the Newcastle Local Environmental Plan 2012 situated on the land.

3. Complying development

Note Other requirements: *The advice below for all Complying Development Codes, is limited to identifying whether or not the* ***land****, the subject of the certificate, is land on which complying development may be carried out because of Clauses 1.17A(1)(c) to (e), (2), (3) & (4), 1.18 (1)(c3) and 1.19 of State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 (the Codes SEPP).*

To ascertain the extent to which the complying development may or may not be carried out on the land, maps are available on City of Newcastle (CN) web pages.

Housing Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land within a Heritage Conservation Area or a Draft Heritage Conservation Area unless the development is for a detached outbuilding or swimming pool.

Rural Housing Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land within a Heritage Conservation Area or a Draft Heritage Conservation Area unless the development is for a detached outbuilding or swimming pool.

Low Rise Housing Diversity Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land within a Heritage Conservation Area or a Draft Heritage Conservation Area unless the development is for a detached outbuilding or swimming pool.

Greenfield Housing Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land within a Heritage Conservation Area or a Draft Heritage Conservation Area unless the development is for a detached outbuilding or swimming pool.

Inland Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land within a Heritage Conservation Area or a Draft Heritage Conservation Area unless the development is for a detached outbuilding or swimming pool.

Housing Alterations Code

Complying development under the Housing Alterations Code MAY be carried out on this land.

General Development Code

Complying development under the General Development Code MAY be carried out on this land.

Commercial and Industrial Alterations Code

Complying development under the Commercial and Industrial Code MAY be carried out on this land.

Commercial and Industrial (New Buildings and Additions) Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land within a Heritage Conservation Area or a Draft Heritage Conservation Area.

Container Recycling Facilities Code

Complying development under the Container Recycling Facilities Code MAY be carried out on this land.

Subdivision Code

Complying development under the Subdivision Code MAY be carried out on this land.

Demolition Code

Complying development under the Demolition Code MAY be carried out on this land.

Fire Safety Code

Complying development under the Fire Safety Code MAY be carried out on this land.

4B. Annual charges under Local Government Act 1993 for coastal protection services that relate to existing coastal protection works

The land IS NOT subject to an agreement for annual charges under section 496B of the Local Government Act 1993 for coastal protection services (within the meaning of section 553B of that Act).

5. Coal Mine Subsidence Compensation Act 2017

The land IS NOT WITHIN a Mine Subsidence District declared under section 20 of the Coal Mine Subsidence Compensation Act 2017.

NOTE: The above advice is provided to the extent that City of Newcastle (CN) has been notified by Subsidence Advisory NSW.

6. Road widening or realignment

NOTE: The Roads and Maritime Services (RMS) may have proposals that are not referred to in this item. For advice about affectation by RMS proposals, contact the Roads and Maritime Services, Locked Mail Bag 30 Newcastle 2300. Ph: 131 782.

The land IS NOT AFFECTED by any road widening or road realignment under Division 2 of Part 3 of the Roads Act 1993.

The land IS NOT AFFECTED by any road widening or road realignment under an environmental planning instrument.

The land IS NOT AFFECTED by road widening or road realignment under a resolution of the Council.

7. Policies on hazard risk restrictions

Except as stated below, the land is not affected by a policy referred to in Item 7 of Schedule 4 of the Environmental Planning and Assessment Regulation 2000 that restricts the development of the land because of the likelihood of land slip, bushfire, tidal inundation, subsidence, acid sulphate soils or any other risk (other than flooding).

Potential acid sulfate soils: Works carried out on the land must be undertaken in accordance with Clause 6.1 Acid sulfate soils of the Newcastle Local Environmental Plan 2012.

Land Contamination: We have land contamination information/records in relation to this property. Council has adopted a policy of restricting development or imposing conditions on properties affected by land contamination. Refer to Section 5.02 Land Contamination of Newcastle Development Control Plan 2012, which is available to view and download from City of Newcastle's website.

NOTE: The absence of a policy to restrict development of the land because of the likelihood of a particular risk does not imply that the land is free from that risk. City of Newcastle (CN) considers the likelihood of natural and man-made risks when determining development applications under section 4.15 of the Environmental Planning and Assessment Act 1979. Detailed investigation carried out in conjunction with the preparation or assessment of a development application may result in CN either refusing development consent or imposing conditions of consent on the basis of risks that are not identified above.

7A. Flood related development controls information

7A(1) Mapping information is not available and it is unknown if the land or part of the land is within the flood planning area.
7A(2) Mapping information is not available and it is unknown if the land or part of the land is between the flood planning area and the probable maximum flood.

Our information currently indicates that the property is, or contains, flood prone land as defined in the Floodplain Development Manual: the management of flood liable land, April 2005 published by the NSW Government.

Section 4.01 Flood Management of Newcastle Development Control Plan (DCP) 2012 provides guidelines with respect to all development of flood prone land. This includes development for the purpose of dwelling houses, dual occupancies, multi dwelling housing or residential flat buildings. The DCP may be viewed on our website, inspected or purchased at our Customer Contact Centre.

NOTE: More detailed flood information specific to the property is available on separate flooding certificate application through our Customer Contact Centre on (02) 4974 2000

8. Land reserved for acquisition

The land is not identified for acquisition by a public authority (as referred to in section 3.15 of the Act) by any environmental planning instrument or proposed environmental planning instrument applying to the land.

9. Contributions plans

The following contribution plan/s apply to the land.

Section 7.12 Newcastle Local Infrastructure Contributions Plan 2019: Effective 9 September 2019.

The Plan specifies section 7.12 contributions that may be imposed as a condition of development consent.

NOTE: Contributions plans are available on our website or may be inspected or purchased at our Customer Contact Centre.

9A. Biodiversity certified land

The land IS NOT biodiversity certified land under Part 8 of the Biodiversity Conservation Act 2016.

10. Biodiversity stewardship sites

The land IS NOT land (of which CN is aware) under a biodiversity stewardship agreement under Part 5 of the Biodiversity Conservation Act 2016.

10A. Native vegetation clearing set asides

The land IS NOT land (of which CN is aware) that contains a set aside area under section 60ZC of the Local Land Services Act 2013.

11. Bush fire prone land

The land IS NOT bush fire prone land for the purposes of the Environmental Planning and Assessment Act 1979.

12. Property vegetation plans

Not applicable. The Native Vegetation Act 2003 does not apply to the Newcastle local government area.

13. Orders under Trees (Disputes Between Neighbours) Act 2006

CN HAS NOT been notified that an order has been made under the Trees (Disputes between Neighbours) Act 2006 to carry out work in relation to a tree on the land.

14. Directions under Part 3A

The land IS NOT AFFECTED by a direction by the Minister in force under section 75P (2) (c1) of the Act.

15. Site compatibility certificates and conditions for seniors housing

(a) The land IS NOT AFFECTED by a current site compatibility certificate (of which CN is aware) issued under the State Environmental Planning Policy (Housing for Seniors and People with a Disability) 2004.

(b) The land IS NOT AFFECTED by any terms of kind referred to in clause 18(2) of the State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004, that have been imposed as a condition of consent to a development application granted after 11 October, 2007 in respect of the land.

16. Site compatibility certificates for infrastructure, schools or TAFE establishments

The land IS NOT AFFECTED by a valid site compatibility certificate (of which CN is aware) issued under the State Environmental Planning Policy (Infrastructure) 2007.

17. Site compatibility certificates and conditions for affordable rental housing

The land IS NOT AFFECTED by a valid site compatibility certificate (of which CN is aware) issued under the State Environmental Planning Policy (Affordable Rental Housing) 2009.

18. Paper subdivision information

The land IS NOT AFFECTED by any development plan that applies to the land or that is proposed to be subject to a consent ballot.

19. Site verification certificates

The land IS NOT AFFECTED by a current site verification certificate (of which CN is aware) issued under the State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007.

20. Loose-fill asbestos insulation

CN HAS NOT been notified that the land includes any residential premises (within the meaning of Division 1A of Part 8 of the Home Building Act 1989) that are listed on the register of loose-fill asbestos insulation, that is required to be maintained under that Division.

21. Affected building notices and building product rectification orders

The land IS NOT AFFECTED by any affected building notice of which CN is aware that is in force in respect of the land.

The land IS NOT AFFECTED by any building product rectification order that has not been fully complied with, of which CN is aware that is in force in respect of the land.

The land IS NOT AFFECTED by an outstanding notice of intention to make a building product rectification order of which CN is aware.

An affected building notice has the same meaning as in Part 4 of the Building Products (Safety) Act 2017. Building product rectification order has the same meaning as in the Building Products (Safety) Act 2017.

Note: *There are no matters prescribed by section 59(2) of the Contaminated Land Management Act 1997 to be disclosed, however if other contamination information is held by the Council this may be provided under a section 10.7(5) certificate.*

Part 2:

Advice provided under section 10.7(5)

ATTENTION: Section 10.7(6) of the Act states that a Council shall not incur any liability in respect of advice provided in good faith pursuant to sub-section 10.7(5).

22. Outstanding Notices and Orders issued by City of Newcastle (CN).

This Certificate does not include any advice regarding outstanding notices or orders issued under the Environmental Planning and Assessment Act 1979, the Local Government Act 1993 or any other relevant legislation. To obtain advice regarding these matters, it is recommended you lodge an application for a Certificate as to Outstanding Notices and Orders (accompanied by the appropriate fee). For further information, please contact the Customer Contact Centre on (02) 4974 2000.

23. Draft development control plans.

A draft development control plan DOES NOT APPLY to the land. The draft plans are exhibited pursuant to Part 3 of the Environmental Planning and Assessment Regulation 2000.

24. Heritage Act 1977.

The land IS NOT AFFECTED by a listing on the State Heritage Register or an Interim Heritage Order that is in force under the Heritage Act 1977.

NOTE: The above advice is provided to the extent that CN has been notified by the Heritage Council of NSW. For up-to-date details, contact the Office of Environment and Heritage, PO Box A290, South Sydney NSW 1232 Ph: (02) 9995 5000.

25. Listing by National Trust of Australia.

The land IS NOT AFFECTED by a listing of the National Trust of Australia (NSW).

NOTE: The above advice is provided to the extent that CN has been notified by the National Trust of Australia (NSW). For up-to-date details, contact the National Trust Ph 02 9258 0123.

26. Australian Heritage Database.

The land IS NOT AFFECTED by a listing on the Australian Heritage Database.

NOTE: The above advice is provided to the extent that CN has been notified by the Department of the Environment. For up-to-date details, contact the Department of the Environment, Heritage, King Edward Terrace, Parkes ACT 2600. Ph (02) 6274 1111.

27. Environment Protection & Biodiversity Conservation Act 1999 (Cth)

Under the (Commonwealth) Environment Protection and Biodiversity Conservation Act 1999, actions which have, may have or are likely to have, a significant impact on a matter of national environmental significance may be taken only with the approval of the Commonwealth Minister for the Environment.

Approval is also required for actions that have a significant effect on the environment of Commonwealth land. These actions may be on Commonwealth land or other land.

This approval is in addition to any approvals under the (NSW) Environmental Planning and Assessment Act 1979 or other NSW legislation.

Matters of national environmental significance are:

- declared World Heritage areas
- declared Ramsar wetlands
- listed threatened species and ecological communities
- listed migratory species
- nuclear actions
- the environment of Commonwealth marine areas.

Locations within the City of Newcastle that are a declared Ramsar wetland include Kooragang Nature Reserve and Shortland Wetlands. Listed threatened species and listed migratory species are known to occur within the City of Newcastle.

28. Other matters

The land is affected by the following:

Newcastle earthquake

Earthquakes occurred in the vicinity of Newcastle on 28th December 1989 and 6 August 1994. Buildings on the land may have suffered damage as a consequence of the earthquakes. Prospective purchasers are advised to make their own enquiries as to whether the property is affected by any damage.

Further consent requirements under the Newcastle Local Environmental Plan 2012.

The following provisions of the Newcastle Local Environmental Plan 2012 affect the carrying out of development on the land. These provisions are in addition to those required to be disclosed at Item 2 of this Certificate.

Refer to clause 3.1 Exempt Development of the Newcastle Local Environmental Plan 2012

Refer to clause 3.2 Complying Development of the Newcastle Local Environmental Plan 2012

Local Strategic Planning Statement

The Local Strategic Planning Statement (LSPS) was adopted by council on 26 May 2020 and replaces the Local Planning Strategy. The LSPS is taken into account when CN assesses development applications and amendments to the Newcastle Local Environmental Plan 2012.

Note: Refer to our website to view the document. www.newcastle.nsw.gov.au

Hunter Regional Plan 2036

The Hunter Regional Plan has been prepared by the Department of Planning and Environment. The contents of the strategy will be taken into account when CN assesses development applications and amendments to the Newcastle Local Environmental Plan 2012.

Note: Refer to the Department of Planning and Environment's website to view the document. www.planning.nsw.gov.au

Newcastle City-Wide Floodplain Risk Management Study and Plan (2012)

The Newcastle City-wide Floodplain Risk Management Study and Plan addresses flood management for the City of Newcastle. The Study and Plan will be taken into account when CN assesses development applications and amendments to the Newcastle Local Environmental Plan 2012.

Note: Refer to our *website to view the document. www.newcastle.nsw.gov.au*

Greater Newcastle Metropolitan Plan 2036

The Greater Newcastle Metropolitan Plan 2036 has been prepared by the Department of Planning and Environment. The Plan will be taken into account when CN assesses development applications and amendments to the Newcastle Local Environmental Plan 2012.

Parking permit policy

This property is within the Permit Exclusion Area of the City Centre Parking Strategy adopted by Council on 25 June 2002 and updated on 16 May 2005. Residents within the Permit Exclusion Area are not eligible for resident parking permit stickers. For further information please contact Parking Services Coordinator Michael Heather on 4974 5008.

Contaminated land information

Council records indicate the following potentially contaminating landuse(s) may have been carried out on the land:

1. engine works
2. fuel/oil storage

Persons relying on the certificate are advised to make their own investigations as to whether the land is affected by elevated concentrations of soil or groundwater contaminants in relation to proposed purchase or use of land.

Issued without alterations or additions, 17/09/21
Authorised by

JEREMY BATH
CHIEF EXECUTIVE OFFICER

Part 1:

Advice provided under section 10.7(2)

ATTENTION: The explanatory notes appearing in italic print within Part 1 are provided to assist understanding, but do not form part of the advice provided under section 10.7(2). These notes shall be taken as being advice provided under section 10.7(5).

1. Names of relevant planning instruments and DCPs

The following environmental planning instruments, proposed environmental planning instruments and development control plans apply to the land, either in full or in part.

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State Environmental Planning Policy No. 21 - Caravan Parks

State Environmental Planning Policy No. 33 - Hazardous and Offensive Development

State Environmental Planning Policy No. 36 - Manufactured Home Estates

State Environmental Planning Policy (Koala Habitat Protection) Amendment (Maps) 2020

State Environmental Planning Policy No. 50 - Canal Estate Development

State Environmental Planning Policy No. 55 - Remediation of Land

State Environmental Planning Policy No. 64 - Advertising and Signage

State Environmental Planning Policy No. 65 - Design Quality of Residential Flat Development

State Environmental Planning Policy No. 70 - Affordable Housing (Revised Schemes)

State Environmental Planning Policy (Housing For Seniors or People with a Disability) 2004

State Environmental Planning Policy (Building Sustainability Index:BASIX) 2004

State Environmental Planning Policy (State Significant Precincts) 2005

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State Environmental Planning Policy (Miscellaneous Consent Provisions) 2007

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State Environmental Planning Policy (Concurrences) 2018

State Environmental Planning Policy (Coastal Management) 2018

State Environmental Planning Policy (Primary Production and Rural Development) 2019

Newcastle Local Environmental Plan 2012

Newcastle Development Control Plan 2012

2. Zoning and land use under relevant LEPs

Newcastle Local Environmental Plan 2012

Zoning: The Newcastle Local Environmental Plan 2012 identifies the land as being within the following zone(s):

Zone B3 Commercial Core

Note: Refer to www. newcastle.nsw.gov.au or www. legislation.nsw.gov.au website for LEP instrument and zoning maps.

The following is an extract from the zoning provisions contained in Newcastle Local Environmental Plan 2012:

Zone B3 Commercial Core

- **Objectives of zone**
    - To provide a wide range of retail, business, office, entertainment, community and other suitable land uses that serve the needs of the local and wider community.
    - To encourage appropriate employment opportunities in accessible locations.
    - To maximise public transport patronage and encourage walking and cycling.
    - To provide for commercial floor space within a mixed use development.
    - To strengthen the role of the Newcastle City Centre as the regional business, retail and cultural centre of the Hunter region.
    - To provide for the retention and creation of view corridors.
- **Permitted without consent**

  Environmental protection works; Home occupations
- **Permitted with consent**

  Car parks; Centre-based child care facilities; Commercial premises; Community facilities; Educational establishments; Entertainment facilities; Environmental facilities; Flood mitigation works; Function centres; Hotel or motel accommodation; Information and education facilities; Medical centres; Mortuaries; Oyster aquaculture; Passenger transport facilities; Places of public worship; Recreation areas; Recreation facilities (indoor); Registered clubs; Respite day care centres; Restricted premises; Roads; Sex services premises; Shop top housing; Signage; Tank-based aquaculture; Tourist and visitor accommodation; Transport depots
- **Prohibited**

  Pond-based aquaculture; Any development not specified in, permitted without consent or permitted with consent

Minimum land dimensions for erection of a dwelling-house: There are no minimum land dimensions for the erection of a dwelling-house that apply to this site.

Critical habitat: The land does not identify as including or comprising critical habitat.

Heritage conservation area: The land is situated within the Newcastle City Centre Heritage Conservation Area. Refer to the Newcastle Local Environmental Plan 2012 for provisions relating to development within a heritage conservation area.

Heritage items: There are no heritage items listed in the Newcastle Local Environmental Plan 2012 situated on the land.

3. Complying development

Note Other requirements: *The advice below for all Complying Development Codes, is limited to identifying whether or not the* ***land****, the subject of the certificate, is land on which complying development may be carried out because of Clauses 1.17A(1)(c) to (e), (2), (3) & (4), 1.18 (1)(c3) and 1.19 of State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 (the Codes SEPP).*

To ascertain the extent to which the complying development may or may not be carried out on the land, maps are available on City of Newcastle (CN) web pages.

Housing Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land within a Heritage Conservation Area or a Draft Heritage Conservation Area unless the development is for a detached outbuilding or swimming pool.

Rural Housing Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land within a Heritage Conservation Area or a Draft Heritage Conservation Area unless the development is for a detached outbuilding or swimming pool.

Low Rise Housing Diversity Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land within a Heritage Conservation Area or a Draft Heritage Conservation Area unless the development is for a detached outbuilding or swimming pool.

Greenfield Housing Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land within a Heritage Conservation Area or a Draft Heritage Conservation Area unless the development is for a detached outbuilding or swimming pool.

Inland Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land within a Heritage Conservation Area or a Draft Heritage Conservation Area unless the development is for a detached outbuilding or swimming pool.

Housing Alterations Code

Complying development under the Housing Alterations Code MAY be carried out on this land.

General Development Code

Complying development under the General Development Code MAY be carried out on this land.

Commercial and Industrial Alterations Code

Complying development under the Commercial and Industrial Code MAY be carried out on this land.

Commercial and Industrial (New Buildings and Additions) Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land within a Heritage Conservation Area or a Draft Heritage Conservation Area.

Container Recycling Facilities Code

Complying development under the Container Recycling Facilities Code MAY be carried out on this land.

Subdivision Code

Complying development under the Subdivision Code MAY be carried out on this land.

Demolition Code

Complying development under the Demolition Code MAY be carried out on this land.

Fire Safety Code

Complying development under the Fire Safety Code MAY be carried out on this land.

4B. Annual charges under Local Government Act 1993 for coastal protection services that relate to existing coastal protection works

The land IS NOT subject to an agreement for annual charges under section 496B of the Local Government Act 1993 for coastal protection services (within the meaning of section 553B of that Act).

5. Coal Mine Subsidence Compensation Act 2017

The land IS NOT WITHIN a Mine Subsidence District declared under section 20 of the Coal Mine Subsidence Compensation Act 2017.

NOTE: The above advice is provided to the extent that City of Newcastle (CN) has been notified by Subsidence Advisory NSW.

6. Road widening or realignment

NOTE: The Roads and Maritime Services (RMS) may have proposals that are not referred to in this item. For advice about affectation by RMS proposals, contact the Roads and Maritime Services, Locked Mail Bag 30 Newcastle 2300. Ph: 131 782.

The land IS NOT AFFECTED by any road widening or road realignment under Division 2 of Part 3 of the Roads Act 1993.

The land IS NOT AFFECTED by any road widening or road realignment under an environmental planning instrument.

The land IS NOT AFFECTED by road widening or road realignment under a resolution of the Council.

7. Policies on hazard risk restrictions

Except as stated below, the land is not affected by a policy referred to in Item 7 of Schedule 4 of the Environmental Planning and Assessment Regulation 2000 that restricts the development of the land because of the likelihood of land slip, bushfire, tidal inundation, subsidence, acid sulphate soils or any other risk (other than flooding).

Potential acid sulfate soils: Works carried out on the land must be undertaken in accordance with Clause 6.1 Acid sulfate soils of the Newcastle Local Environmental Plan 2012.

Land Contamination: Council has adopted a policy of restricting development or imposing conditions on properties affected by Land Contamination. Refer to the Newcastle Development Control Plan 2012, which is available to view and download from City of Newcastle's website.

NOTE: The absence of a policy to restrict development of the land because of the likelihood of a particular risk does not imply that the land is free from that risk. City of Newcastle (CN) considers the likelihood of natural and man-made risks when determining development applications under section 4.15 of the Environmental Planning and Assessment Act 1979. Detailed investigation carried out in conjunction with the preparation or assessment of a development application may result in CN either refusing development consent or imposing conditions of consent on the basis of risks that are not identified above.

7A. Flood related development controls information

7A(1) Mapping information is not available and it is unknown if the land or part of the land is within the flood planning area.
7A(2) Mapping information is not available and it is unknown if the land or part of the land is between the flood planning area and the probable maximum flood.

Our information currently indicates that the property is, or contains, flood prone land as defined in the Floodplain Development Manual: the management of flood liable land, April 2005 published by the NSW Government.

Section 4.01 Flood Management of Newcastle Development Control Plan (DCP) 2012 provides guidelines with respect to all development of flood prone land. This includes development for the purpose of dwelling houses, dual occupancies, multi dwelling housing or residential flat buildings. The DCP may be viewed on our website, inspected or purchased at our Customer Contact Centre.

NOTE: More detailed flood information specific to the property is available on separate flooding certificate application through our Customer Contact Centre on (02) 4974 2000

8. Land reserved for acquisition

The land is not identified for acquisition by a public authority (as referred to in section 3.15 of the Act) by any environmental planning instrument or proposed environmental planning instrument applying to the land.

9. Contributions plans

The following contribution plan/s apply to the land.

Section 7.12 Newcastle Local Infrastructure Contributions Plan 2019: Effective 9 September 2019.

The Plan specifies section 7.12 contributions that may be imposed as a condition of development consent.

NOTE: Contributions plans are available on our website or may be inspected or purchased at our Customer Contact Centre.

9A. Biodiversity certified land

The land IS NOT biodiversity certified land under Part 8 of the Biodiversity Conservation Act 2016.

10. Biodiversity stewardship sites

The land IS NOT land (of which CN is aware) under a biodiversity stewardship agreement under Part 5 of the Biodiversity Conservation Act 2016.

10A. Native vegetation clearing set asides

The land IS NOT land (of which CN is aware) that contains a set aside area under section 60ZC of the Local Land Services Act 2013.

11. Bush fire prone land

The land IS NOT bush fire prone land for the purposes of the Environmental Planning and Assessment Act 1979.

12. Property vegetation plans

Not applicable. The Native Vegetation Act 2003 does not apply to the Newcastle local government area.

13. Orders under Trees (Disputes Between Neighbours) Act 2006

CN HAS NOT been notified that an order has been made under the Trees (Disputes between Neighbours) Act 2006 to carry out work in relation to a tree on the land.

14. Directions under Part 3A

The land IS NOT AFFECTED by a direction by the Minister in force under section 75P (2) (c1) of the Act.

15. Site compatibility certificates and conditions for seniors housing

(a) The land IS NOT AFFECTED by a current site compatibility certificate (of which CN is aware) issued under the State Environmental Planning Policy (Housing for Seniors and People with a Disability) 2004.

(b) The land IS NOT AFFECTED by any terms of kind referred to in clause 18(2) of the State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004, that have been imposed as a condition of consent to a development application granted after 11 October, 2007 in respect of the land.

16. Site compatibility certificates for infrastructure, schools or TAFE establishments

The land IS NOT AFFECTED by a valid site compatibility certificate (of which CN is aware) issued under the State Environmental Planning Policy (Infrastructure) 2007.

17. Site compatibility certificates and conditions for affordable rental housing

The land IS NOT AFFECTED by a valid site compatibility certificate (of which CN is aware) issued under the State Environmental Planning Policy (Affordable Rental Housing) 2009.

18. Paper subdivision information

The land IS NOT AFFECTED by any development plan that applies to the land or that is proposed to be subject to a consent ballot.

19. Site verification certificates

The land IS NOT AFFECTED by a current site verification certificate (of which CN is aware) issued under the State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007.

20. Loose-fill asbestos insulation

CN HAS NOT been notified that the land includes any residential premises (within the meaning of Division 1A of Part 8 of the Home Building Act 1989) that are listed on the register of loose-fill asbestos insulation, that is required to be maintained under that Division.

21. Affected building notices and building product rectification orders

The land IS NOT AFFECTED by any affected building notice of which CN is aware that is in force in respect of the land.

The land IS NOT AFFECTED by any building product rectification order that has not been fully complied with, of which CN is aware that is in force in respect of the land.

The land IS NOT AFFECTED by an outstanding notice of intention to make a building product rectification order of which CN is aware.

An affected building notice has the same meaning as in Part 4 of the Building Products (Safety) Act 2017. Building product rectification order has the same meaning as in the Building Products (Safety) Act 2017.

Note: *There are no matters prescribed by section 59(2) of the Contaminated Land Management Act 1997 to be disclosed, however if other contamination information is held by the Council this may be provided under a section 10.7(5) certificate.*

Part 2:

Advice provided under section 10.7(5)

ATTENTION: Section 10.7(6) of the Act states that a Council shall not incur any liability in respect of advice provided in good faith pursuant to sub-section 10.7(5).

22. Outstanding Notices and Orders issued by City of Newcastle (CN).

This Certificate does not include any advice regarding outstanding notices or orders issued under the Environmental Planning and Assessment Act 1979, the Local Government Act 1993 or any other relevant legislation. To obtain advice regarding these matters, it is recommended you lodge an application for a Certificate as to Outstanding Notices and Orders (accompanied by the appropriate fee). For further information, please contact the Customer Contact Centre on (02) 4974 2000.

23. Draft development control plans.

A draft development control plan DOES NOT APPLY to the land. The draft plans are exhibited pursuant to Part 3 of the Environmental Planning and Assessment Regulation 2000.

24. Heritage Act 1977.

The land IS NOT AFFECTED by a listing on the State Heritage Register or an Interim Heritage Order that is in force under the Heritage Act 1977.

NOTE: The above advice is provided to the extent that CN has been notified by the Heritage Council of NSW. For up-to-date details, contact the Office of Environment and Heritage, PO Box A290, South Sydney NSW 1232 Ph: (02) 9995 5000.

25. Listing by National Trust of Australia.

The land IS NOT AFFECTED by a listing of the National Trust of Australia (NSW).

NOTE: The above advice is provided to the extent that CN has been notified by the National Trust of Australia (NSW). For up-to-date details, contact the National Trust Ph 02 9258 0123.

26. Australian Heritage Database.

The land IS NOT AFFECTED by a listing on the Australian Heritage Database.

NOTE: The above advice is provided to the extent that CN has been notified by the Department of the Environment. For up-to-date details, contact the Department of the Environment, Heritage, King Edward Terrace, Parkes ACT 2600. Ph (02) 6274 1111.

27. Environment Protection & Biodiversity Conservation Act 1999 (Cth)

Under the (Commonwealth) Environment Protection and Biodiversity Conservation Act 1999, actions which have, may have or are likely to have, a significant impact on a matter of national environmental significance may be taken only with the approval of the Commonwealth Minister for the Environment.

Approval is also required for actions that have a significant effect on the environment of Commonwealth land. These actions may be on Commonwealth land or other land.

This approval is in addition to any approvals under the (NSW) Environmental Planning and Assessment Act 1979 or other NSW legislation.

Matters of national environmental significance are:

- declared World Heritage areas
- declared Ramsar wetlands
- listed threatened species and ecological communities
- listed migratory species
- nuclear actions
- the environment of Commonwealth marine areas.

Locations within the City of Newcastle that are a declared Ramsar wetland include Kooragang Nature Reserve and Shortland Wetlands. Listed threatened species and listed migratory species are known to occur within the City of Newcastle.

28. Other matters

The land is affected by the following:

Newcastle earthquake

Earthquakes occurred in the vicinity of Newcastle on 28th December 1989 and 6 August 1994. Buildings on the land may have suffered damage as a consequence of the earthquakes. Prospective purchasers are advised to make their own enquiries as to whether the property is affected by any damage.

Further consent requirements under the Newcastle Local Environmental Plan 2012.

The following provisions of the Newcastle Local Environmental Plan 2012 affect the carrying out of development on the land. These provisions are in addition to those required to be disclosed at Item 2 of this Certificate.

Refer to clause 3.1 Exempt Development of the Newcastle Local Environmental Plan 2012

Refer to clause 3.2 Complying Development of the Newcastle Local Environmental Plan 2012

Local Strategic Planning Statement

The Local Strategic Planning Statement (LSPS) was adopted by council on 26 May 2020 and replaces the Local Planning Strategy. The LSPS is taken into account when CN assesses development applications and amendments to the Newcastle Local Environmental Plan 2012.

Note: Refer to our website to view the document. www.newcastle.nsw.gov.au

Hunter Regional Plan 2036

The Hunter Regional Plan has been prepared by the Department of Planning and Environment. The contents of the strategy will be taken into account when CN assesses development applications and amendments to the Newcastle Local Environmental Plan 2012.

Note: Refer to the Department of Planning and Environment's website to view the document. www.planning.nsw.gov.au

Newcastle City-Wide Floodplain Risk Management Study and Plan (2012)

The Newcastle City-wide Floodplain Risk Management Study and Plan addresses flood management for the City of Newcastle. The Study and Plan will be taken into account when CN assesses development applications and amendments to the Newcastle Local Environmental Plan 2012.

Note: Refer to our *website to view the document. www.newcastle.nsw.gov.au*

Greater Newcastle Metropolitan Plan 2036

The Greater Newcastle Metropolitan Plan 2036 has been prepared by the Department of Planning and Environment. The Plan will be taken into account when CN assesses development applications and amendments to the Newcastle Local Environmental Plan 2012.

Parking permit policy

This property is within the Permit Exclusion Area of the City Centre Parking Strategy adopted by Council on 25 June 2002 and updated on 16 May 2005. Residents within the Permit Exclusion Area are not eligible for resident parking permit stickers. For further information please contact Parking Services Coordinator Michael Heather on 4974 5008.

Issued without alterations or additions, 17/09/21
Authorised by

JEREMY BATH
CHIEF EXECUTIVE OFFICER

WaterNSW
Work Summary

GW054766

Licence: **Licence Status:**

Authorised Purpose(s):
Intended Purpose(s): GENERAL USE

Work Type: Spear
Work Status:
Construct.Method: Jetted
Owner Type: Private

Commenced Date: **Final Depth:** 6.50 m
Completion Date: 01/11/1980 **Drilled Depth:**

Contractor Name: (None)
Driller:
Assistant Driller:

Property: **Standing Water Level (m):**
GWMA: **Salinity Description:** 0-500 ppm
GW Zone: **Yield (L/s):**

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	NORTHUMBERLAND	NEWCA	L12 (268)
Licensed:			

Region: 20 - Hunter **CMA Map:** 9232-2S
River Basin: 210 - HUNTER RIVER **Grid Zone:** **Scale:**
Area/District:

Elevation: 0.00 m (A.H.D.) **Northing:** 6356268.000 **Latitude:** 32°55'32.3"S
Elevation Source: (Unknown) **Easting:** 383520.000 **Longitude:** 151°45'15.1"E

GS Map: - **MGA Zone:** 56 **Coordinate Source:** GD.,ACC.MAP

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1	1	Casing	P.V.C.	0.00	0.00	30			
1	1	Opening	Screen	6.00	6.50			1	

Remarks

01/11/1983: LOT 12 SECTION B HAMILTON

***** End of GW054766 *****

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is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

WaterNSW
Work Summary

GW202915

Licence: **Licence Status:**

Authorised Purpose(s):
Intended Purpose(s): DOMESTIC

Work Type: Spear
Work Status: Supply Obtained
Construct.Method: Auger - Hollow
Owner Type: Private

Commenced Date: **Final Depth:** 9.00 m
Completion Date: 16/12/2012 **Drilled Depth:** 9.00 m

Contractor Name: (None)
Driller: Michael James Lindsay
Assistant Driller:

Property: **Standing Water Level (m):** 4.000
GWMA: **Salinity Description:**
GW Zone: **Yield (L/s):**

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	NORTHUMBERLAND	NEWCA	200//834090
Licensed:			

Region: 20 - Hunter **CMA Map:** 9232-2S
River Basin: 210 - HUNTER RIVER **Grid Zone:** **Scale:**
Area/District:

Elevation: 0.00 m (A.H.D.) **Northing:** 6356231.000 **Latitude:** 32°55'33.5"S
Elevation Source: Unknown **Easting:** 383545.000 **Longitude:** 151°45'16.0"E

GS Map: - **MGA Zone:** 56 **Coordinate Source:** GIS - Geogra

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	9.00	50			Auger - Hollow Flight
1		Annulus	Bentonite	0.00	1.00	50	50		
1		Annulus	Drill Cuttings	1.00	7.50	50	50		
1		Annulus	Crushed Aggregate	7.50	9.00	50	50		Ungraded, PL:Poured/Shovelled
1	1	Casing	Pvc Class 12	0.00	9.00	50	42		Seated, Glued, S: 8.90-9.00m
1	1	Opening	Screen - Round Wire	7.90	8.90	50		0	Aluminium, Glued, A: 74.00mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
4.00	9.00	5.00	Unknown	4.00	1.00			03:00:00	

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments

0.00	0.50	0.50	Gravel	Gravel	
0.50	2.00	1.50	Sand; black	Sand	
2.00	4.00	2.00	Sand; yellow	Sand	
4.00	9.00	5.00	Sand; brown, coarse	Sand	

Remarks

16/12/2012: Form A Remarks:
Nat Carling, 24-Mar-2014; Coordinates based on location map provided with the Form-A.

***** End of GW202915 *****

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WaterNSW
Work Summary

GW201711

Licence: **Licence Status:**

Authorised Purpose(s):
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status: Equipped
Construct.Method: Auger - Solid
Owner Type: Private

Commenced Date: **Final Depth:** 6.00 m
Completion Date: 15/06/2011 **Drilled Depth:** 6.00 m

Contractor Name: SGA Environmental
Driller: Dahmon Sorongan
Assistant Driller: David Gouge

Property: **Standing Water Level (m):** 1.260
GWMA: **Salinity Description:**
GW Zone: **Yield (L/s):**

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	NORTHUMBERLAND	NEWCA	30//635397
Licensed:			

Region: 20 - Hunter **CMA Map:** 9232-2S
River Basin: 210 - HUNTER RIVER **Grid Zone:** **Scale:**
Area/District:

Elevation: 0.00 m (A.H.D.) **Northing:** 6356503.000 **Latitude:** 32°55'24.9"S
Elevation Source: Unknown **Easting:** 384023.000 **Longitude:** 151°45'34.5"E

GS Map: - **MGA Zone:** 56 **Coordinate Source:** GPS - Global

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	6.00	90			Auger - Solid Flight
1		Annulus	Cement Grout	0.00	0.40	90	50		PL:Poured/Shovelled
1		Annulus	Bentonite	0.40	1.50	90	50		PL:Poured/Shovelled
1		Annulus	Waterworn/Rounded	1.50	6.00	90	50		Graded, PL:Poured/Shovelled
1	1	Casing	Pvc Class 12	0.00	2.00	50	44		Seated on Bottom, Other
1	1	Opening	Slots - Diagonal	2.00	4.00	50		0	Casing - Hand Sawn Slot, PVC Class 12, Other, SL: 40.0mm, A: 5.00mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
1.30	6.00	4.70	Unknown	1.26					5337.00

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.20	0.20	Fill; loose, black/dark grey silty sand,	Fill	

			building rubble fragments		
0.20	0.70	0.50	Sand, silty; loose, light grey	Sand	
0.70	1.10	0.40	Sand, silty; grading to mdoerately dense, brown	Sand	
1.10	1.25	0.15	Sand, silty; as above, grading to dark brown	Sand	
1.25	1.70	0.45	Sand; dense, light brown, marine deposits	Sand	
1.70	2.50	0.80	Sand, silty; dense, grey	Sand	
2.50	2.60	0.10	Sand, silty; dense, grey, with gravel	Sand	
2.60	3.50	0.90	Sand, silty; dense, brown	Sand	
3.50	6.00	2.50	Sand; moderately dense, grey	Sand	

Remarks

15/06/2011: Form A Remarks:
Nat Carling, 3-May-2012; GPS provided by driller/consultant.

***** End of GW201711 *****

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WaterNSW
Work Summary

GW201710

Licence: | **Licence Status:**

Authorised Purpose(s):
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status: Equipped
Construct.Method: Auger - Solid
Owner Type: Private

Commenced Date:
Completion Date: 15/06/2011
Final Depth: 3.50 m
Drilled Depth: 3.50 m

Contractor Name: SGA Environmental
Driller: Dahmon Sorongan
Assistant Driller: David Gouge

Property:
GWMA:
GW Zone:
Standing Water Level (m):
Salinity Description:
Yield (L/s): 1.190

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	NORTHUMBERLAND	NEWCA	30//635397
Licensed:			

Region: 20 - Hunter
River Basin: 210 - HUNTER RIVER
Area/District:
CMA Map: 9232-2S
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6356447.000
Easting: 384044.000
Latitude: 32°55'26.7"S
Longitude: 151°45'35.3"E

GS Map: -
MGA Zone: 56
Coordinate Source: GPS - Global

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	3.50	90			Auger - Solid Flight
1		Annulus	Cement Grout	0.00	0.40	90	50		PL:Poured/Shovelled
1		Annulus	Bentonite	0.40	1.00	90	50		PL:Poured/Shovelled
1		Annulus	Waterworn/Rounded	1.00	3.00	90	50		Graded, PL:Poured/Shovelled
1	1	Casing	Pvc Class 12	0.00	1.40	50	44		Seated on Bottom, Other
1	1	Opening	Slots - Diagonal	1.40	3.00	50		0	Casing - Hand Sawn Slot, PVC Class 12, Other, SL: 40.0mm, A: 5.00mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
1.40	3.50	2.10	Unknown	1.19					941.00

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.20	0.20	Fill; loose yellow, fine sand, some brown	Fill	

			sandy clay		
0.20	0.50	0.30	Fill; soft dark brown/black silty sand, some gravel & ceramic fragments, possible charcoal	Fill	
0.50	0.80	0.30	Sand, loose, brown, minor silt	Sand	
0.80	3.50	2.70	Sand, silty, loose, soft, grey	Sand	

Remarks

15/06/2011: Form A Remarks:
Nat Carling, 3-May-2012; GPS provided by driller/consultant.

***** End of GW201710 *****

Warning To Clients: This raw data has been supplied to the NSW Office of Water by drillers, licensees and other sources. The NOW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

WaterNSW
Work Summary

GW200855

Licence: | **Licence Status:**

Authorised Purpose(s):
Intended Purpose(s): TEST BORE

Work Type: Spear
Work Status: Supply Obtained
Construct.Method: Auger - Hollow
Owner Type: Private

Commenced Date:
Completion Date: 01/06/2010
Final Depth: 6.00 m
Drilled Depth: 6.00 m

Contractor Name: (None)
Driller: Michael James Lindsay
Assistant Driller:

Property:
GWMA:
GW Zone:
Standing Water Level (m): 1.500
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	NORTHUMBERLAND	NEWCA	1//861729
Licensed:			

Region: 20 - Hunter
River Basin: 210 - HUNTER RIVER
Area/District:
CMA Map: 9232-2S
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6356222.000
Easting: 383920.000
Latitude: 32°55'34.0"S
Longitude: 151°45'30.4"E

GS Map: -
MGA Zone: 56
Coordinate Source: GIS - Geogra

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	6.00	50			Auger - Hollow Flight
1		Annulus	Waterworn/Rounded	4.00	6.00	50	50		Graded, PL:Poured/Shovelled
1		Backfill	Sand	5.90	6.00	50			
1	1	Casing	Pvc Class 9	0.00	6.00	50			Seated, Glued, S: 5.90-6.00m
1	1	Opening	Slots - Diagonal	4.90	5.90	50		0	Casing - Drilled Holes, PVC Class 9, Other, SL: 25.0mm, A: 25.00mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
1.50	6.00	4.50	Unknown	1.50	2.00			01:00:00	

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.50	0.50	Sand, brown	Sand	
0.50	2.00	1.50	Sand, grey	Sand	

2.00	2.50	0.50	Mud, black	Mud	
2.50	2.80	0.30	Mud, grey	Mud	
2.80	3.20	0.40	Sand, grey	Sand	
3.20	3.50	0.30	Mud, grey	Mud	
3.50	4.50	1.00	Sand, grey	Sand	
4.50	4.80	0.30	Mud, grey	Mud	
4.80	6.00	1.20	Sand, grey	Sand	

Remarks

01/06/2010: Form A Remarks:
Nat Carling, 29-Oct-2010: Coordinates based on location map provided with the Form-A.

***** End of GW200855 *****

Warning To Clients: This raw data has been supplied to the NSW Office of Water by drillers, licensees and other sources. The NOW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

WaterNSW
Work Summary

GW201875

Licence: | **Licence Status:**

Authorised Purpose(s):
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status: Equipped
Construct.Method: Auger - Hollow
Owner Type: Local Govt

Commenced Date: | **Final Depth:** 6.00 m
Completion Date: 05/08/2011 | **Drilled Depth:** 6.00 m

Contractor Name: Total Drilling
Driller: Ben Kiernan
Assistant Driller: Geoff Curry

Property: | **Standing Water Level (m):**
GWMA: | **Salinity Description:**
GW Zone: | **Yield (L/s):** 3.500

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	NORTHUMBERLAND	NEWCA	RD ADJ 1//744738
Licensed:			

Region: 20 - Hunter | **CMA Map:** 9232-2S
River Basin: 210 - HUNTER RIVER | **Grid Zone:** | **Scale:**
Area/District:

Elevation: 0.00 m (A.H.D.) | **Northing:** 6356310.000 | **Latitude:** 32°55'30.8"S
Elevation Source: Unknown | **Easting:** 383235.000 | **Longitude:** 151°45'04.1"E

GS Map: - | **MGA Zone:** 56 | **Coordinate Source:** GIS - Geogra

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	6.00	110			Auger - Hollow Flight
1		Annulus	Cement	0.00	1.00	110	60		PL:Poured/Shovelled
1		Annulus	Bentonite	1.00	2.00	110	60		PL:Poured/Shovelled
1		Annulus	Waterworn/Rounded	2.00	6.00	110	60		Graded, PL:Poured/Shovelled
1	1	Casing	Pvc Class 18	0.00	3.00	60	50		Seated on Bottom, Screwed
1	1	Opening	Slots - Horizontal	3.00	6.00	60		0	Mechanically Slotted, PVC Class 18, Screwed, SL: 50.0mm, A: 1.00mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
3.50	6.00	2.50	Unknown	3.50					

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.30	0.30	Topsoil; silty sand, fine-medium, dark	Topsoil	

			brown		
0.30	2.50	2.20	Silty Sand; fine-medium, dark grey	Silty Sand	
2.50	3.50	1.00	Silty Sand; as above, becoming yellow	Silty Sand	
3.50	6.00	2.50	Silty Sand; as above, becoming light brown, wet	Silty Sand	

Remarks

05/08/2011: Form A Remarks:
Nat Carling, 10-May-2012; Coordinates based on location map provided with the Form-A. Lithology taken from consultants log.

***** End of GW201875 *****

Warning To Clients: This raw data has been supplied to the NSW Office of Water by drillers, licensees and other sources. The NOW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

WaterNSW
Work Summary

GW056149

Licence:
Licence Status:

Authorised Purpose(s):
Intended Purpose(s): NOT KNOWN

Work Type: Spear
Work Status:
Construct.Method:
Owner Type: Other Govt

Commenced Date:
Completion Date: 01/11/1981
Final Depth: 7.20 m
Drilled Depth: 7.20 m

Contractor Name: (None)
Driller:
Assistant Driller:

Property:
GWMA:
GW Zone:
Standing Water Level (m):
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	NORTHUMBERLAND	NEWCA	L1 DP584429 (268)
Licensed:			

Region: 20 - Hunter
River Basin: 210 - HUNTER RIVER
Area/District:
CMA Map: 9232-2S
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: (Unknown)
Northing: 6356148.000
Easting: 383756.000
Latitude: 32°55'36.3"S
Longitude: 151°45'24.1"E

GS Map: -
MGA Zone: 56
Coordinate Source: GD.,ACC.MAP

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1	1	Casing	P.V.C.	0.00	7.20	40			Seated on Bottom

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	7.20	7.20	Sand Water Supply	Sand	

***** End of GW056149 *****

Warning To Clients: This raw data has been supplied to the NSW Office of Water by drillers, licensees and other sources. The NOW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

WaterNSW
Work Summary

GW058805

Licence:
Licence Status:

Authorised Purpose(s):
Intended Purpose(s): DOMESTIC

Work Type: Spear
Work Status:
Construct.Method: Hand Dug
Owner Type: Private

Commenced Date:
Completion Date: 01/12/1982
Final Depth: 6.00 m
Drilled Depth: 6.00 m

Contractor Name: (None)
Driller:
Assistant Driller:

Property:
GWMA:
GW Zone:
Standing Water Level (m):
Salinity Description: 0-500 ppm
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	NORTHUMBERLAND	NEWCA	L25 (268)
Licensed:			

Region: 20 - Hunter
River Basin: 210 - HUNTER RIVER
Area/District:
CMA Map: 9232-2S
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: (Unknown)
Northing: 6356116.000
Easting: 383704.000
Latitude: 32°55'37.3"S
Longitude: 151°45'22.1"E

GS Map: -
MGA Zone: 56
Coordinate Source: GD.,ACC.MAP

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1	1	Opening	Screen	-100.00	0.00			1	
1	1	Casing	P.V.C.	0.00	5.00	100			Driven into Hole

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
0.30	5.00	4.70	Unconsolidated			0.50			

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.30	0.30	Topsoil	Topsoil	
0.30	5.00	4.70	Sand Water Supply	Sand	
5.00	6.00	1.00		(Unknown)	

Remarks

01/11/1985: TDS = 50 MG/L

***** End of GW058805 *****

Warning To Clients: This raw data has been supplied to the NSW Office of Water by drillers, licensees and other sources. The NOW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

WaterNSW
Work Summary

GW200144

Licence: 20BL169531 **Licence Status:** ACTIVE

Authorised Purpose(s): TEST BORE
Intended Purpose(s):

Work Type: Bore
Work Status:
Construct.Method:
Owner Type:

Commenced Date: **Final Depth:**
Completion Date: 15/12/2004 **Drilled Depth:**

Contractor Name: (None)
Driller:
Assistant Driller:

Property: N/A 113-125 Parry St And 41 Denison St NEWCASTLE WEST 2302 NSW
GWMA: -
GW Zone: -
Standing Water Level (m):
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	NORTHUMBERLAND	NEWCA	13//456092
Licensed:	NORTHUMBERLAND	NEWCASTLE	Whole Lot 2//1203405

Region: 20 - Hunter
River Basin: - Unknown
Area/District:
CMA Map:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6356080.000
Easting: 383591.000
Latitude: 32°55'38.4"S
Longitude: 151°45'17.7"E

GS Map: -
MGA Zone: 56
Coordinate Source: Map Interpre

Remarks

15/12/2004: Form A Remarks:
Bore location map received
No. Form A received
05/11/2009: Updated coordinates as per existing Eastings and Northings.

***** End of GW200144 *****

Warning To Clients: This raw data has been supplied to the NSW Office of Water by drillers, licensees and other sources. The NOW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

WaterNSW
Work Summary

GW200145

Licence: 20BL169530 **Licence Status:** ACTIVE

Authorised Purpose(s): TEST BORE
Intended Purpose(s):

Work Type: Bore
Work Status:
Construct.Method:
Owner Type:

Commenced Date: **Final Depth:**
Completion Date: 15/12/2004 **Drilled Depth:**

Contractor Name: (None)
Driller:
Assistant Driller:

Property: N/A 113-125 Parry St And 41 Denison St NEWCASTLE WEST 2302 NSW
Standing Water Level (m):
GWMA: -
Salinity Description:
GW Zone: -
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	NORTHUMBERLAND	NEWCA	1//551981
Licensed:	NORTHUMBERLAND	NEWCASTLE	Whole Lot 2//1203405

Region: 20 - Hunter **CMA Map:**
River Basin: - Unknown **Grid Zone:** **Scale:**
Area/District:

Elevation: 0.00 m (A.H.D.) **Northing:** 6356095.000 **Latitude:** 32°55'37.9"S
Elevation Source: Unknown **Easting:** 383540.000 **Longitude:** 151°45'15.8"E

GS Map: - **MGA Zone:** 56 **Coordinate Source:** Map Interpre

Remarks

15/12/2004: Form A Remarks:
Bore Location map received
No Form A received
Licence Holder Bore Number MW01
05/11/2009: Updated coordinates as per existing Eastings and Northings.

***** End of GW200145 *****

Warning To Clients: This raw data has been supplied to the NSW Office of Water by drillers, licensees and other sources. The NOW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

WaterNSW
Work Summary

GW200146

Licence:
Licence Status:
Authorised Purpose(s):
Intended Purpose(s):

Work Type: Bore
Work Status:
Construct.Method:
Owner Type:

Commenced Date:
Completion Date: 15/12/2004
Final Depth:
Drilled Depth:

Contractor Name: (None)
Driller:
Assistant Driller:

Property:
GWMA:
GW Zone:
Standing Water Level (m):
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	NORTHUMBERLAND	NEWCA	10//456092
Licensed:			

Region: 20 - Hunter
River Basin: - Unknown
Area/District:
CMA Map:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6356093.000
Easting: 383575.000
Latitude: 32°55'38.0"S
Longitude: 151°45'17.1"E

GS Map: -
MGA Zone: 56
Coordinate Source: Map Interpre

Remarks

15/12/2004: Form A Remarks:
Bore Location map received
No Form A received
Licence holder bore number MW07
05/11/2009: Updated coordinates as per existing Eastings and Northings.

***** End of GW200146 *****

Warning To Clients: This raw data has been supplied to the NSW Office of Water by drillers, licensees and other sources. The NOW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

WaterNSW
Work Summary

GW200147

Licence: 20BL169529 **Licence Status:** ACTIVE

Authorised Purpose(s): TEST BORE
Intended Purpose(s):

Work Type: Bore
Work Status:
Construct.Method:
Owner Type:

Commenced Date: **Final Depth:**
Completion Date: 15/12/2004 **Drilled Depth:**

Contractor Name: (None)
Driller:
Assistant Driller:

Property: N/A 113-125 Parry St And 41 Denison St NEWCASTLE WEST 2302 NSW
Standing Water Level (m):
GWMA: -
Salinity Description:
GW Zone: -
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	NORTHUMBERLAND	NEWCA	10/456092
Licensed:	NORTHUMBERLAND	NEWCASTLE	Whole Lot 2//1203405

Region: 20 - Hunter **CMA Map:**
River Basin: - Unknown **Grid Zone:** **Scale:**
Area/District:

Elevation: 0.00 m (A.H.D.) **Northing:** 6356076.000 **Latitude:** 32°55'38.6"S
Elevation Source: Unknown **Easting:** 383566.000 **Longitude:** 151°45'16.8"E

GS Map: - **MGA Zone:** 56 **Coordinate Source:** Map Interpre

Remarks

15/12/2004: Form A Remarks:
Bore location map received
No Form A received
Licence holder Bore No. MW12
05/11/2009: Updated coordinates as per existing Eastings and Northings.

***** End of GW200147 *****

Warning To Clients: This raw data has been supplied to the NSW Office of Water by drillers, licensees and other sources. The NOW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

WaterNSW
Work Summary

GW200148

Licence:		**Licence Status:**	
		Authorised Purpose(s):	
		Intended Purpose(s):	
Work Type:	Bore		
Work Status:			
Construct.Method:			
Owner Type:			
Commenced Date:		**Final Depth:**	
Completion Date:	15/12/2004	**Drilled Depth:**	
Contractor Name:	(None)		
Driller:			
Assistant Driller:			
Property:		**Standing Water Level (m):**	
GWMA:		**Salinity Description:**	
GW Zone:		**Yield (L/s):**	

Site Details

Site Chosen By:

		County	**Parish**	**Cadastre**
	Form A:	NORTHUMBERLAND	NEWCA	11//456092
	Licensed:			
Region:	20 - Hunter	**CMA Map:**		
River Basin:	- Unknown	**Grid Zone:**	**Scale:**	
Area/District:				
Elevation:	0.00 m (A.H.D.)	**Northing:**	6356097.000	**Latitude:** 32°55'37.9"S
Elevation Source:	Unknown	**Easting:**	383579.000	**Longitude:** 151°45'17.3"E
GS Map:	-	**MGA Zone:**	56	**Coordinate Source:** Map Interpre

Remarks

15/12/2004: Form A Remarks:
Bore Location map received - bore actually located in Parry Street opposite Lot 10 DP 456092
No Form A received
Licence Holder Bore No. MW20 - Test Bore
05/11/2009: Updated coordinates as per existing Eastings and Northings.

***** End of GW200148 *****

Warning To Clients: This raw data has been supplied to the NSW Office of Water by drillers, licensees and other sources. The NOW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

WaterNSW
Work Summary

GW200150

Licence: 20BL169528
Licence Status: ACTIVE

Authorised Purpose(s): TEST BORE
Intended Purpose(s):

Work Type: Bore
Work Status:
Construct.Method:
Owner Type:

Commenced Date:
Completion Date: 15/12/2004
Final Depth:
Drilled Depth:

Contractor Name: (None)
Driller:
Assistant Driller:

Property: N/A 113-125 Parry St And 41 Denison St NEWCASTLE WEST 2302 NSW
GWMA: -
GW Zone: -
Standing Water Level (m):
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	NORTHUMBERLAND	NEWCA	11//456092
Licensed:	NORTHUMBERLAND	NEWCASTLE	LAND ADJACENT TO 2//1203405

Region: 20 - Hunter
River Basin: - Unknown
Area/District:
CMA Map:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6356105.000
Easting: 383606.000
Latitude: 32°55'37.6"S
Longitude: 151°45'18.3"E

GS Map: -
MGA Zone: 56
Coordinate Source: Map Interpre

Remarks

15/12/2004: Form A Remarks:
Bore location map received
No. Form A received
Licence Holder Bore Number MW22
Bore actually located in Parry Street, opposite Lot 1 1035070
05/11/2009: Updated coordinates as per existing Eastings and Northings.

***** End of GW200150 *****

Warning To Clients: This raw data has been supplied to the NSW Office of Water by drillers, licensees and other sources. The NOW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

Appendix D

Data Quality Objectives

Appendix D
Data Quality Objectives
924 Hunter Street, Newcastle

D1.0 Data Quality Objectives

The DSI has been devised broadly in accordance with the seven-step data quality objective (DQO) process which is provided in Appendix B, Schedule B2 of NEPC *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]* (NEPC, 2013).

Step	Summary
1: State the problem	The objective of the investigation was to assess the contamination status of the site with respect to the proposed land use. The report is being undertaken as the land is to be developed The requirements of the regulator, Newcastle City Council, will also be considered by consulting their Development Control Plan (DCP), Local Environment Plan (LEP) and any other requirements based on our recent experience with Council on similar sites. A preliminary conceptual site model (CSM) has been prepared (Section 9) for the proposed development. The project team consisted of experienced environmental engineers and scientists working in the roles of Project Principal, Project Reviewer, Project Manager, field staff. It is noted that access and ability for subsurface drilling using mechanical means was limited on the western part of the site due to current tenancy. Investigation was restricted to hand tools only.
2: Identify the decisions / goal of the study	The site history has identified possible contaminating current and previous land uses which are identified in the CSM (Section 9). The CSM identifies the associated contaminants of potential concern (COPC) and the likely impacted media. The site assessment criteria (SAC) for each of the COPC are detailed in Appendix G. The decision is to establish whether or not the results fall below the SAC or whether or not the 95% upper confidence limit of the sample population falls below the SAC. On this basis, an assessment of the site's suitability from a contamination perspective and whether (or not) further assessment and / or remediation will be derived.
3: Identify the information inputs	Inputs to the investigation will be the results of analysis of samples to measure the concentrations of COPC identified in the CSM (Section 9) at the site using NATA accredited laboratories and methods, where possible. The SAC for each of the COPC are detailed in Appendix G. A photoionization detector (PID) will be used on-site to screen soils for VOC. PID readings will be used to inform sample selection for laboratory analysis. An oil water interface meter will be used to assess for the presence of possible floating / free phase product. A multi parameter meter will be used to measure groundwater quality parameters during sampling.

Step	Summary
4: Define the study boundaries	The lateral boundaries of the investigation area are shown on Drawing 1, Appendix H. The vertical boundaries are to the extent of contamination impact as determined from the site history assessment and site observations. The assessment is limited to the timeframe over which the field investigation was undertaken. Constraints to the assessment are identified and discussed in the conclusions of the report, Section 16.
5: Develop the analytical approach (or decision rule)	The decision rule is to compare all analytical results with SAC (Appendix G, based on NEPC (2013)). Where guideline values are absent, other sources of guideline values accepted by NEPC (2013) shall be adopted where possible. Where a sample result exceeds the adopted criterion, a further site-specific assessment will be made as to the risk posed by the presence of that contaminant(s). Initial comparisons will be with individual results then, where required, summary statistics (including mean, standard deviation and 95% upper confidence limit (UCL) of the arithmetic mean (95% UCL)) to assess potential risks posed by the site contamination. Quality control results are to be assessed according to their relative percent difference (RPD) values. For field duplicates, triplicates and laboratory results, RPDs should generally be below 30%; for field blanks and rinsates, results should be at or less than the limits of reporting (NEPC, 2013). The field and laboratory quality assurance assessment is included in Appendix F.
6: Specify the performance or acceptance criteria	Baseline condition: Contaminants at the site and/or statistical analysis of data (in line with NEPC (2013)) exceed human health and environmental SAC and pose a potentially unacceptable risk to receptors (null hypothesis). Alternative condition: Contaminants at the site and statistical analysis of data (in line with NEPC (2013)) comply with human health and environmental SAC and as such, do not pose a potentially unacceptable risk to receptors (alternative hypothesis). Unless conclusive information from the collected data is sufficient to reject the null hypothesis, it is assumed that the baseline condition is true. Uncertainty that may exist due to the above potential decision errors shall be mitigated as follows: • As well as a primary screening exercise, the use of the 95% UCL as per NEPC (2013) may be applied, i.e.: 95% is the defined confidence level associated with the UCL on the geometric mean for contaminant data. The resultant 95%UCL shall subsequently be screened against the corresponding SAC. • The statistical assessment will only be able to be applied to certain data-sets, such as those obtained via systematic sampling. Identification of areas for targeted sampling will be via professional judgement and errors will not be able to have a probability assigned to them.
7: Optimise the design for obtaining data	As the purpose of the sampling program is to assess for potential contamination across the site, the sampling program is reliant on professional judgement to identify and sample the potentially affected areas. Further details regarding the proposed sampling plan and limitations associated with site access are presented in Section 10.

Reference

NEPC. (2013). *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM].* Australian Government Publishing Services Canberra: National Environment Protection Council.

Douglas Partners Pty Ltd

Appendix E

Field Work Methodology

Appendix E
Field Work Methodology
924 Hunter Street, Newcastle West

E1.0 Guidelines

The following key guidelines were consulted for the field work methodology:

- NEPC *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]* (NEPC, 2013).

E2.0 Soil Sampling

Soil sampling is carried out in accordance with DP standard operating procedures. The general sampling and sample management procedures comprise:

- Collect soil samples directly from each 1 m length of push tube sleeve at the nominated sample depth or from the hand auger flights. Care was taken to remove any extraneous material prior to sampling;
- Collect near surface samples using stainless hand tools;
- Transfer samples in laboratory-prepared glass jars with Teflon lined lids by hand, capping immediately and minimising headspace within the sample jar;
- Collect replicate samples in zip-lock bags for PID screening;
- Collect ~500 ml samples for FA and AF analysis;
- Collect bulk (~10 L) soil samples for ACM field sieve test;
- Collect ~40 g to 50 g samples in zip-lock bags for asbestos (presence / absence) analysis;
- Wear a new disposable nitrile glove for each sample point thereby minimising potential for cross-contamination;
- Collect 10% replicate samples for QC purposes;
- Label sample containers with individual and unique identification details, including project number, sample location and sample depth (where applicable);
- Place samples into a cooled, insulated and sealed container for transport to the laboratory; and
- Use chain of custody documentation.

E2.1 Field Testing

Field testing is carried out in accordance with DP standard operating procedures. The general sampling and sample management procedures comprise:

PID Field Test

- Calibrate the PID with isobutylene gas at 100 ppm and with fresh air prior to commencement of each successive day's field work;
- Allow the headspace in the PID zip-lock bag samples to equilibrate; and
- Screen using the PID.

E3.0 Groundwater Sampling

E3.1 Monitoring Well Installation

Monitoring wells are constructed using class 18 uPVC machine slotted screen and blank sections with screw threaded joints. The screened section of each well is backfilled with a washed sand filter pack to approximately 0.5 m above the screened interval. Each well is completed with a hydrated bentonite plug of at least 0.5 m thick, finished with cast iron road-box set in a concrete plinth.

E3.2 Monitoring Well Development

Groundwater monitoring wells are developed as soon as practicable following well installation. The purpose of well development is to remove sediments and/or drilling fluid introduced to the well during drilling and to facilitate connection of the monitoring well to the aquifer. The wells are developed by pumping / bailing to remove a minimum of five well volumes, or until dry.

E3.3 Groundwater Sampling

Bladder Pump

Groundwater sampling is carried out in accordance with DP standard operating procedures. Groundwater samples are collected using a positive displacement low flow bladder pump via the micro-purge (minimal drawdown) method. The method minimises aeration of the sample and disturbance to the water column thereby enhancing the quality of results for oxygen sensitive analytes.

The sampling method is described as follows:

- Measure the static water level using an electronic interface probe and record the thickness of any LNAPL (if encountered);
- Decontaminate the interface probe and cable between monitoring wells by rinsing in a diluted Liquinox solution and then rinsing in demineralised water;
- Fit the pump with a well-dedicated bladder and tubing. Lower the pump into the well then clamp at a level estimated to be 1 m below the top of the water column (provided the depth of the pump is within the screened section) or to the approximate mid-point of the well screen;
- Set the pump at the lowest rate possible that could produce laminar flow to minimise drawdown of the water column;
- Measure physical parameters by continuously passing the purged water through a flow cell; and

- Following stabilisation of the field parameters, collect samples in laboratory-prepared bottles minimising headspace within the sample bottle and cap immediately.

Decontaminate the interface probe, pump and cable between monitoring wells by rinsing in a diluted Liquinox solution and then rinsing in demineralised water.

Sample Handling

The general groundwater sample handling and management procedures comprise:

- Collect 10% replicate samples for QC purposes;
- Collect equipment rinsate for QC purposes;
- Label sample containers with individual and unique identification details, including project number and sample location;
- Place the sample bottles into a cooled, insulated and sealed container for transport to the laboratory; and
- Use chain of custody documentation.

E4.0 Reference

NEPC. (2013). *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM].* Australian Government Publishing Services Canberra: National Environment Protection Council.

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Appendix F

Quality Assurance and Quality Control Report
Chain of Custody (Field and Despatch)
Laboratory Sample Receipts

Appendix F
Quality Assurance / Quality Control Report
924 Hunter Street, Newcastle

F1.0 Field and Laboratory Data Quality Assurance and Quality Control

The field and laboratory data quality assurance and quality control (QA/QC) procedures and results are summarised in the following Table 1. Reference should be made to the field work methodology and the laboratory results / certificates of analysis for further details. The relative percentage difference (RPD) results, along with the other filed QC samples are included in Table QA1 and QA2 end of this appendix.

Table 1: Field and Laboratory Quality Control

Item	Evaluation / Acceptance Criteria	Compliance
Analytical laboratories used	NATA accreditation	C
Holding times	Various based on type of analysis	C
Intra-laboratory replicates	10% of primary samples; <30% RPD	PC
Trip Spikes	1 per field work program; 60-140% recovery	C
Trip Blanks	1 per field work program event; <PQL	C
Rinsates	1 per sampling round; <PQL	PC
Laboratory Duplicates	1 per batch; Duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.	C
Laboratory / Reagent Blanks	1 per batch; <PQL	C
Matrix Spikes	1 per lab batch; 70-130% recovery (inorganics); 60-140% recovery (organics)	C
Surrogate Spikes	All organics analysis; 70-130% recovery (inorganics); 60-140% recovery (organics)	C
Control Samples	1 per lab batch; 70-130% recovery (inorganics); 60-140% recovery (organics)	C
Standard Operating Procedures (SOP)	Adopting SOP for all aspects of the sampling field work	C

Notes to Table 1:
C = compliance; PC = partial compliance; NC = non-compliance

The RPD results were all within the acceptable range, with the exception of those indicated in Table QA1 (Soil Samples). The exceedances are not, however, considered to be of concern given that:

- The typically low actual differences in the concentrations of the replicate pairs where some RPD exceedances occurred, particularly for groundwater;
- The number of replicate pairs being collected from fill soils which by its nature is heterogeneous;
- Replicates, rather than homogenised duplicates, were used to minimise risk of volatile loss, hence greater variability can be expected;
- Most of the recorded concentrations being relatively close to the PQL;
- The majority of RPDs within a replicate pair being within the acceptable limits;
- All other QA/QC parameters met the DQIs.

Rinsate testing below laboratory PQLs, with the exception of trace dissolved zinc. Concentrations were an order of magnitude less than those detected in the groundwater samples and are therefore considered acceptable.

In summary, the QC data is determined to be of sufficient quality to be considered acceptable for the assessment.

F2.0 Data Quality Indicators

The reliability of field procedures and analytical results was assessed against the following data quality indicators (DQIs) as outlined in NEPC *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]* (NEPC, 2013):

- Completeness: a measure of the amount of usable data from a data collection activity;
- Comparability: the confidence (qualitative) that data may be considered to be equivalent for each sampling and analytical event;
- Representativeness: the confidence (qualitative) of data representativeness of media present on-site;
- Precision: a measure of variability or reproducibility of data; and
- Accuracy: a measure of closeness of the data to the 'true' value.

Table 2: Data Quality Indicators

Data Quality Indicator	Method(s) of Achievement
Completeness	Systematic and selected target locations sampled.
	Preparation of borehole logs, sample location plan and chain of custody records.
	Preparation of field groundwater sampling sheets.
	Laboratory sample receipt information received confirming receipt of samples intact and appropriateness of the chain of custody.
	Samples analysed for contaminants of potential concern (COPC) identified in the Conceptual Site Model (CSM).
	Completion of chain of custody (COC) documentation.
	NATA accredited laboratory results certificates provided by the laboratory.
	Satisfactory frequency and results for field and laboratory quality control (QC) samples as discussed in Section 1.
Comparability	Using appropriate techniques for sample recovery, storage and transportation, which were the same for the duration of the project.
	Experienced samplers used.
	Use of NATA registered laboratories, with test methods the same or similar between laboratories.
	Satisfactory results for field and laboratory QC samples.
Representativeness	Target media sampled.
	Sample numbers recovered and analysed are considered to be representative of the target media and complying with DQOs.
	Samples were extracted and analysed within holding times.
	Samples were analysed in accordance with the COC.
Precision	Field staff followed standard operating procedures.
	Acceptable RPD between original samples and replicates.
	Satisfactory results for all other field and laboratory QC samples.
Accuracy	Field staff followed standard operating procedures.
	Satisfactory results for all field and laboratory QC samples.

Based on the above, it is considered that the DQIs have been complied with.

F3.0 Conclusion

Based on the results of the field QA and field and laboratory QC, and evaluation against the DQIs it is concluded that the field and laboratory test data obtained are reliable and useable for this assessment.

F4.0 Reference

NEPC. (2013). *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM].* Australian Government Publishing Services Canberra: National Environment Protection Council.

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CHAIN OF CUSTODY FIELD SHEET

Project No:	102077.02	**Client Project Name:**	Newcastle West, 924 Hunter Street, PSI
Client:	Thirdi Dairy Farmers Pty Ltd	**Location:**	924 Hunter Street, Newcastle
Project Manager:	Dana Wilson	**DP Lab Received**	By: Date:

Do samples contain 'potential' HBM? Yes ☑ No ☐ (If YES, then handle, transport and store in accordance with FPM HAZID)

Field									DP Lab	For Despatch to			Notes
Sample ID	Depth (m)	Duplicate Sample	Sample Type S - soil W - water	Container Type G - glass P - plastic	ASS Samples	Sampling By	Sampling Date	Sampling Time	Storage Locn *	Envirolab Services 7/10/21	Lab 2 [B] Date	Lab 3 [C] Date	
201/0.2	0.2		S	G,P	✓	JRK	6/10/21	8:45	Fridge/				
201/0.5	0.5				✓				freezer 5	✓			
201/1.0	1.0				✓								
201/1.5	1.5				✓								
201/2.0	2.0	D3/JRK			✓					✓			
201/2.5	2.5				✓								
201/3.0	3.0				✓								
201/3.5	3.5				✓					✓			
201/4.0	4.0				✓								
201/4.5	4.5				✓					✓			
201/5.0	5.0				✓								
202/0.2	0.2	D1/JRK			✓					✓			
202/0.5	0.5				✓								
202/1.1	1.1				✓								
202/1.5	1.5				✓					✓			
202/2.0	2.0				✓								
202/2.5	2.5		↓	↓	✓	↓	↓	13:30		✓			

* **Default storage:** glass containers in fridge, plastic containers shelved, ASS in freezer, water samples in fridge

A Envirolab Services

B Provide name of Lab 2

C Provide name of Lab 3

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CHAIN OF CUSTODY FIELD SHEET

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Field									DP Lab	For Despatch to			Notes
Sample ID	Depth (m)	Duplicate Sample	Sample Type S - soil W - water	Container Type G - glass P - plastic	ASS Samples	Sampling By	Sampling Date	Sampling Time	Storage Locn *	Envirolab Services 7/10/21	Lab 2 [B] Date	Lab 3 [C] Date	
202/3.0	3.0		S	G,P	✓	JRK	6/10/21	8:45	Fridge/				
202/3.5	3.5		↓	↓	✓	↓	↓	↓	Freezer S	✓			
202/4.0	4.0				✓								
202/4.5	4.5				✓								
202/5.0	5.0				✓								
203/0.2	0.2				✓								
203/0.5	0.5				✓					✓			
203/1.0	1.0				✓								
203/1.5	1.5	D4/JRK			✓								
203/2.0	2.0				✓								
203/2.5	2.5				✓								
203/3.0	3.0				✓					✓			
203/3.5	3.5				✓								
203/4.0	4.0				✓					✓			
203/4.5	4.5				✓								
203/5.0	5.0				✓					✓			
204/0.2	0.2		↓	↓	✓	↓	↓	13:30		✓			

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CHAIN OF CUSTODY FIELD SHEET

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Project Manager:	Dana Wilson	**DP Lab Received**	By: Date:

Do samples contain 'potential' HBM? Yes ☑ No ☐ (If YES, then handle, transport and store in accordance with FPM HAZID)

Field									DP Lab	For Despatch to			Notes
Sample ID	Depth (m)	Duplicate Sample	Sample Type S - soil W - water	Container Type G - glass P - plastic	ASS Samples	Sampling By	Sampling Date	Sampling Time	Storage Locn *	Envirolab Services 7/10/21	Lab 2 [B] Date	Lab 3 [C] Date	
204/0.5	0.5		S	G, P	✓	JRK	6/10/21	8:45	Fridge/				
204/1.0	1.0				✓				freezer S				
204/1.5	1.5				✓								
204/2.0	2.0				✓					✓			
204/2.5	2.5				✓								
204/3.1	3.1				✓					✓			
204/3.5	3.5				✓								
204/4.0	4.0				✓					✓			
204/4.5	4.5				✓								
204/5.0	5.0				✓								
205/0.2	0.2				✓					✓			
205/0.5	0.5	D2/JRK			✓					✓			
205/1.0	1.0				✓								
205/1.5	1.5				✓					✓			
205/2.0	2.0				✓								
205/2.5	2.5				✓					✓			
205/3.0	3.0				✓			13:30					

* **Default storage:** glass containers in fridge, plastic containers shelved, ASS in freezer, water samples in fridge

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CHAIN OF CUSTODY FIELD SHEET

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Client:	Thirdi Dairy Farmers Pty Ltd	**Location:**	924 Hunter Street, Newcastle
Project Manager:	Dana Wilson	**DP Lab Received**	By: Date:

Do samples contain 'potential' HBM? Yes ☑ No ☐ (If YES, then handle, transport and store in accordance with FPM HAZID)

Field									DP Lab	For Despatch to			Notes
Sample ID	Depth (m)	Duplicate Sample	Sample Type S - soil W - water	Container Type G - glass P - plastic	ASS Samples	Sampling By	Sampling Date	Sampling Time	Storage Locn *	Envirolab Services	Lab 2 [B] Date	Lab 3 [C] Date	
205/3.5	3.5		S	G.P	✓	JRK	6/10/21	8:45	Fridge/				
205/4.0	4.0		↓	↓	✓	↓	↓	↓	Freezer 5				
205/4.5	4.5		↓	↓	✓	↓	↓	↓					
205/5.0	5.0		↓	↓	✓	↓	↓	13:30					

* **Default storage: glass containers in fridge, plastic containers shelved, ASS in freezer, water samples in fridge**

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CHAIN OF CUSTODY FIELD SHEET

Project No: 102077.02	**Client Project Name:** Newcastle West, 924 Hunter Street, PSI
Client: Thirdi Dairy Farmers Pty Ltd	**Location:** 924 Hunter Street, Newcastle
Project Manager: Dana Wilson	**DP Lab Received** By: Date:

Do samples contain 'potential' HBM? Yes ☐ No ☐ (If YES, then handle, transport and store in accordance with FPM HAZID)

Field									DP Lab	For Despatch to			Notes
Sample ID	Depth (m)	Duplicate Sample	Sample Type S - soil W - water	Container Type G - glass P - plastic	ASS Samples	Sampling By	Sampling Date	Sampling Time	Storage Locn *	Envirolab Services 7/10/21	Lab 2 [B] Date	Lab 3 [C] Date	
GW1			W	G,P		JL	7.10.21	0830		✓			
GW3			↓	↓		↓	↓	↓		✓			
R1			↓	↓		↓	↓	1000		✓			
TS | TB			W	G,P		JL	7.10.21	1000		✓			

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CHAIN OF CUSTODY FIELD SHEET

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Client:	Thirdi Dairy Farmers Pty Ltd	**Location:**	924 Hunter Street, Newcastle
Project Manager:	Dana Wilson	**DP Lab Received**	By: Date:

Do samples contain 'potential' HBM? Yes ☐ No ☐ (If YES, then handle, transport and store in accordance with FPM HAZID)

Field									DP Lab	For Despatch to			Notes
Sample ID	Depth (m)	Duplicate Sample	Sample Type S - soil W - water	Container Type G - glass P - plastic	ASS Samples	Sampling By	Sampling Date	Sampling Time	Storage Locn *	Envirolab Services 11/10/21	Lab 2 [B] Date	Lab 3 [C] Date	
303	0.6-0.7	-	S	G,P	✓	DEW	9.10.21			✓			
304	0.0-0.02				✓								
	0.1-0.2				✓					✓			
	0.5-0.6	D2(DEW			✓								
	0.9-1.0	-			✓					✓			
305	0.2-0.3	-			✓								
	0.5-0.6	-		G,P	✓								
	1.0-1.1	-			✓								
	1.2-1.25	-			✓								
	1.35-1.4	-			✓								
	1.9-2.0	-			✓					//			
	0.55/F	-	filter	P	✓					✓			
306	0.25-0.35		S	G,P	✓								
	0.9-1.0				✓								
	1.5-1.6				✓								
	2.0-2.1				✓								
	2.5-2.6				✓								

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Client:	Thirdi Dairy Farmers Pty Ltd	**Location:**	924 Hunter Street, Newcastle
Project Manager:	Dana Wilson	**DP Lab Received**	By: Date:

Do samples contain 'potential' HBM? Yes ☐ No ☐ (If YES, then handle, transport and store in accordance with FPM HAZID)

Field									DP Lab	For Despatch to			Notes
Sample ID	Depth (m)	Duplicate Sample	Sample Type S - soil W - water	Container Type G - glass P - plastic	ASS Samples	Sampling By	Sampling Date	Sampling Time	Storage Locn *	Envirolab Services 11/10/21	Lab 2 [B] Date	Lab 3 [C] Date	
301	0-0.2	–	ASB sheet	P		DEW/JCL	9.10.21						
	0.1-0.2	–	S	G,P	✓					11/10/21			
	0.35-0.45	–			✓								
	0.5-0.6	–			✓								
	0.9-1.0	–			✓								
	1.5-1.6	–			✓								
	2.1-2.2	–			✓								
	2.7-2.9	–			✓								
302	0.1-0.3	–	S	G,P	✓					//			
	0.5-0.6	DI DEW			✓								
	1.0-1.1	–			✓					/			
	1.4-1.5	–			✓								
	2.0-2.1	–			✓								
	2.5-2.6	–			✓								
	2.9-3.0	–			✓								
303	0.1-0.2	–	S	G,P	✓								
	0.5-0.6	–			✓								

* **Default storage:** **glass containers in fridge, plastic containers shelved, ASS in freezer, water samples in fridge**

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CHAIN OF CUSTODY FIELD SHEET

Project No:	102077.02	**Client Project Name:**	Newcastle West, 924 Hunter Street, PSI
Client:	Thirdi Dairy Farmers Pty Ltd	**Location:**	924 Hunter Street, Newcastle
Project Manager:	Dana Wilson	**DP Lab Received**	By: Date:

Do samples contain 'potential' HBM? Yes ☐ No ☐ (If YES, then handle, transport and store in accordance with FPM HAZID)

Field									DP Lab	For Despatch to			Notes
Sample ID	Depth (m)	Duplicate Sample	Sample Type (S - soil, W - water)	Container Type (G - glass, P - plastic)	ASS Samples	Sampling By	Sampling Date	Sampling Time	Storage Locn *	Envirolab Services	Lab 2 [B]	Lab 3 [C]	
										Initials	Date	Date	
306	2.9-3.0	-	S	G,P	✓	DEW	9.10.21						
307	0.2-0.3	-	S	G,P	-	↓	↓			✓			
S1	-		FIBRO	P		DEW	9.10.21			✓			
S1	0-0.05		S	G,P		↓	↓			✓			

* **Default storage:** glass containers in fridge, plastic containers shelved, ASS in freezer, water samples in fridge

A Envirolab Services B Provide name of Lab 2 C Provide name of Lab 3

Douglas Partners
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CHAIN OF CUSTODY FIELD SHEET

Project No:	102077.02	**Client Project Name:**	Newcastle West, 924 Hunter Street, PSI
Client:	Thirdi Dairy Farmers Pty Ltd	**Location:**	924 Hunter Street, Newcastle
Project Manager:	Dana Wilson		

Do samples contain 'potential' HBM? Yes ☐ No ☐ (If YES, then handle, transport and store in accordance with FPM HAZID)

DP Lab Received By: Date:

Field										DP Lab	For Despatch to			Notes
Sample ID	Depth (m)	Duplicate Sample	Sample Type S - soil W - water	Container Type G - glass P - plastic	ASS Samples	Sampling By	Sampling Date	Sampling Time		Storage Locn *	Envirolab Services	Lab 2 [B] Date	Lab 3 [C] Date	
401	—	—	W	G P	—	LAH	24/3/22	10:00						
402	↓	↓	↓	↓	↓	↓	↓	↓						
403														
404														
TS														

* **Default storage:** **glass containers in fridge, plastic containers shelved, ASS in freezer, water samples in fridge**

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C Provide name of Lab 3

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CHAIN OF CUSTODY FIELD SHEET

Project No:	102077.02	**Client Project Name:**	Newcastle West, 924 Hunter Street, PSI
Client:	Thirdi Dairy Farmers Pty Ltd	**Location:**	924 Hunter Street, Newcastle
Project Manager:	Dana Wilson	**DP Lab Received**	By: [illegible] Date: 13/3/22

Do samples contain 'potential' HBM? Yes x No ☐ (If YES, then handle, transport and store in accordance with FPM HAZID)

Field									DP Lab	For Despatch to			Notes
Sample ID	Depth (m)	Duplicate Sample	Sample Type S - soil W - water	Container Type G - glass P - plastic	ASS Samples	Sampling By	Sampling Date	Sampling Time	Storage Locn *	Envirolab Services 14/3/22	Lab 2 [B] Date	Lab 3 [C] Date	
501	0.2		S	G,P		JPS	13/3/22	8	Esky/Fridge				
	0.15-0.25			B									
	0.5	D9/JPS		G,P						✓			
	0.4-0.7									✓			
	0.7												
502	0.3	D8/JPS								✓			
	0.3-1.2			B						✓			
	1.4			G,P						✓			
	1.7									✓			
	0.8												
503	0.2												
	0.2-1.0			B						✓			
	0.7	D6/JPS		G,P						✓			
	1.2	D7/JPS								✓			
	1.2-2.0			B						✓			
	1.8			G,P									
	2.4							3		✓			

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CHAIN OF CUSTODY FIELD SHEET

Project No:	102077.02	**Client Project Name:**	Newcastle West, 924 Hunter Street, PSI
Client:	Thirdi Dairy Farmers Pty Ltd	**Location:**	924 Hunter Street, Newcastle
Project Manager:	Dana Wilson	**DP Lab Received** By:	JCC Date: 13/3/22

Do samples contain 'potential' HBM? Yes x No ☐ (If YES, then handle, transport and store in accordance with FPM HAZID)

Field									DP Lab	For Despatch to			Notes
Sample ID	Depth (m)	Duplicate Sample	Sample Type S - soil W - water	Container Type G - glass P - plastic	ASS Samples	Sampling By	Sampling Date	Sampling Time	Storage Locn *	Envirolab Services 14/3/22	Lab 2 [B] Date	Lab 3 [C] Date	
504	0.1	D4/JBS	S	G,P		JPS	13/3/22	8	Esky/Fridge				
	0.1-0.15		↓	↓		↓	↓	↓	↓	✓			
	0.3-1.0			B						✓			
	0.5	D5/JBS		G,P						✓			
	1.0			↓									
	1.2-1.3			B						✓			
	1.3			G,P									
	1.7			↓						✓			
505	0.01			↓									
	0.2-1.1			B						✓			
	0.2	D2/JBS		G,P									
	0.8	D3/JBS		↓						✓			
	1.25-1.35			B						✓			
	1.3			G,P									
	1.7			↓						✓			
506	0.1			↓				↓					
	0.1-0.15		↓	B		↓	↓	3	↓	✓			

*** Default storage:** glass containers in fridge, plastic containers shelved, ASS in freezer, water samples in fridge

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CHAIN OF CUSTODY FIELD SHEET

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Client:	Thirdi Dairy Farmers Pty Ltd	**Location:**	924 Hunter Street, Newcastle
Project Manager:	Dana Wilson	**DP Lab Received**	By: Date:

Do samples contain 'potential' HBM? Yes x No ☐ (If YES, then handle, transport and store in accordance with FPM HAZID)

Field									DP Lab	For Despatch to			Notes
Sample ID	Depth (m)	Duplicate Sample	Sample Type S - soil W - water	Container Type G - glass P - plastic	ASS Samples	Sampling By	Sampling Date	Sampling Time	Storage Locn *	Envirolab Services	Lab 2 [B]	Lab 3 [C]	
										14/3/22	Date	Date	
506	0.3		S	G,P		JBS	13/3/22	8	Esky/fridge				
	0.3-0.7		↓	B		↓	↓	↓	↓	✓			
	0.7			G,B									
	1.2	D1/JBS		↓						✓✓			
	1-1.4			B						✓			
	1.8		↓	G,P		↓	↓	3	↓				

* **Default storage: glass containers in fridge, plastic containers shelved, ASS in freezer, water samples in fridge**

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CHAIN OF CUSTODY DESPATCH SHEET

Project No: 102077.02	**Suburb:** Newcastle		**To:** *Envirolab Services*
Project Manager: Dana Wilson	**Order Number:** 159090	**Sampler:** JRK/JCL	*12 Ashley St, Chatswood NSW 2067*
Email: Dana.Wilson@douglaspartners.com.au, Joshua.Kramer@douglaspartners.com.au			**Attn:** *Sample Receipt*
Turnaround time: ☐ Standard ☑ 72 hour ☐ 48 hour ☐ 24 hour ☐ Same day			**Contact:** *(02) 9910 6200 samplereceipt@envirolab.com.au*
Prior Storage: ☑ Fridge ☑ Freezer ☐ Shelf	**Do samples contain 'potential' HBM?** ☐ No ☑ Yes (If YES, then handle, transport and store in accordance with FPM HAZID)		

Lab ID	Sample ID: Location / Other ID	Sample ID: Depth From	Sample ID: Depth To	Date Sampled	Sample Type: S - soil W - water	Container Type: G - glass P - plastic	Analytes: Metals (17)	TRH, BTEX	PAH	OCP, OPP, PCB	VOC	Asbestos 500mL	Acid Sulfate Soil Screening	Detailed Chromium Suite	TCLP	Trip Spike	Trip Blank	Notes/ Preservation/ Additional Requirements
1	201	0.5	0.5	6/10/21	S	G	✓	✓	✓	✓								Combo 6
2	201	2.0	2.0	6/10/21	S	G	✓	✓	✓	✓								Combo 6
3	202	0.2	0.2	6/10/21	S	G	✓	✓	✓	✓	✓							Combo 6 + VOC
4	202	3.5	3.5	6/10/21	S	G	✓	✓	✓									Combo 3
5	203	0.5	0.5	6/10/21	S	G	✓	✓	✓	✓								Combo 6
6	204	0.2	0.2	6/10/21	S	G	✓	✓	✓	✓								Combo 6
7	204	4.0	4.0	6/10/21	S	G	✓	✓	✓									Combo 3
8	205	0.2	0.2	6/10/21	S	P						✓						Asbestos 500 mL
9	205	0.5	0.5	6/10/21	S	G,P	✓	✓	✓	✓	✓	✓						Combo 6 + VOC + 500mL
10	D1/JRK	-	-	6/10/21	S	G	✓	✓	✓	✓	✓							Combo 6 + VOC
11	GW1	-	-	7/10/21	W	G,P	✓				✓							Metals + VOC
12	GW3	-	-	7/10/21	W	G,P	✓				✓							Metals + VOC
13	R1	-	-	7/10/21	W	G,P	✓				✓							Metals + VOC
14	TS	-	-	7/10/21	W	G										✓		Trip Spike

Metals to analyse: 17- As, B, Ba, Be, Cd, Cr, Cu, Co, Hg, Mn, Mo, Ni, Pb, Sb, Se, Sn, Zn			**LAB RECEIPT**
Number of samples in container: 23	**Transported to laboratory by:** TOLL Courier		**Lab Ref. No:** 279939
Send results to: Douglas Partners Pty Ltd			**Received by:** NS McK SARLAMI
Address: 15 Callistemon Close, Warabrook NSW 2304	**Phone:** (02) 4960 9600		**Date & Time:**
Relinquished by: JRK	**Date:** 7/10/2021	**Signed:**	**Signed:**

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CHAIN OF CUSTODY DESPATCH SHEET

Project No:	102077.02	**Suburb:**	Newcastle	**To:**	*Envirolab Services*
Project Manager:	Dana Wilson	**Order Number:**		**Dispatch date:**	07/10/2021
					12 Ashley St, Chatswood NSW 2067

Lab ID	Sample ID			Date Sampled	Sample Type	Container Type	Analytes											Notes/ Preservation/ Additional Requirements
	Location / Other ID	Depth From	Depth To		S - soil W - water	G - glass P - plastic	Metals (17)	TRH, BTEX	PAH	OCP, OPP, PCB	VOC	Asbestos 500mL	Acid Sulfate Soil Screening	Detailed Chromium Suite	TCLP	Trip Spike	Trip Blank	
15	TB	-	-	7/10/21	W	G											✓	Trip Blank
16	201	3.5	3.5	6/10/21	S	P							✓					Acid Sulfate Soil Screening
17	201	4.5	4.5	6/10/21	S	P							✓					Acid Sulfate Soil Screening
18	202	1.5	1.5	6/10/21	S	P							✓					Acid Sulfate Soil Screening
19	202	2.5	2.5	6/10/21	S	P							✓					Acid Sulfate Soil Screening
20	203	4	4	6/10/21	S	P							✓					Acid Sulfate Soil Screening
21	203	5	5	6/10/21	S	P							✓					Acid Sulfate Soil Screening
22	204	2	2	6/10/21	S	P							✓					Acid Sulfate Soil Screening
23	204	3.1	3.1	6/10/21	S	P							✓					Acid Sulfate Soil Screening
24	205	1.5	1.5	6/10/21	S	P							✓					Acid Sulfate Soil Screening
25	205	2.5	2.5	6/10/21	S	P							✓					Acid Sulfate Soil Screening

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102077.02 - A request

CHAIN OF CUSTODY DESPATCH SHEET

Project No: 102077.02	**Suburb:** Newcastle		**To:** Envirolab Services
Project Manager: Dana Wilson	**Order Number:** 159090	**Sampler:** JRK/JCL	12 Ashley St, Chatswood NSW 2067
Email: Dana.Wilson@douglaspartners.com.au, Joshua.Kramer@douglaspartners.com.au			**Attn:** Sample Receipt
Turnaround time: ☐ Standard ☑ 72 hour ☐ 48 hour ☐ 24 hour ☐ Same day			**Contact:** (02) 9910 6200 samplereceipt@envirolab.com.au
Prior Storage: ☑ Fridge ☑ Freezer ☐ Shelf	**Do samples contain 'potential' HBM?** ☐ No ☑ Yes (If YES, then handle, transport and store in accordance with FPM HAZID)		

Lab ID	Sample ID: Location / Other ID	Sample ID: Depth From	Sample ID: Depth To	Date Sampled	Sample Type: S - soil W - water	Container Type: G - glass P - plastic	Analytes: Metals (17)	TRH, BTEX	PAH	OCP, OPP, PCB	VOC	Asbestos 500mL	Acid Sulfate Soil Screening	Detailed Chromium Suite	TCLP	Trip Spike	Trip Blank	Notes/ Preservation/ Additional Requirements
1	201	0.5	0.5	6/10/21	S	G	✓	✓	✓	✓								Combo 6
2	201	2.0	2.0	6/10/21	S	G	✓	✓	✓	✓								Combo 6
3	202	0.2	0.2	6/10/21	S	G	✓	✓	✓	✓	✓							Combo 6 + VOC
4	202	3.5	3.5	6/10/21	S	G	✓	✓	✓									Combo 3
5	203	0.5	0.5	6/10/21	S	G	✓	✓	✓	✓								Combo 6
6	204	0.2	0.2	6/10/21	S	G	✓	✓	✓	✓								Combo 6
7	204	4.0	4.0	6/10/21	S	G	✓	✓	✓									Combo 3
8	205	0.2	0.2	6/10/21	S	P						✓						Asbestos 500 mL
9	205	0.5	0.5	6/10/21	S	G,P	✓	✓	✓	✓	✓	✓						Combo 6 + VOC + 500mL
10	D1/JRK	-	-	6/10/21	S	G	✓	✓	✓	✓	✓							Combo 6 + VOC
11	GW1	-	-	7/10/21	W	G,P	✓	X	X	low level PAH								Metals + VOC
12	GW3	-	-	7/10/21	W	G,P	✓	X	X	low level PAH								Metals + VOC
13	R1	-	-	7/10/21	W	G,P	✓	X	X	low level PAH								Metals + VOC
14	TS	-	-	7/10/21	W	G										✓		Trip Spike

Metals to analyse: 17- As, B, Ba, Be, Cd, Cr, Cu, Co, Hg, Mn, Mo, Ni, Pb, Sb, Se, Sn, Zn			**LAB RECEIPT** 279939-A.
Number of samples in container: 23	**Transported to laboratory by:** TOLL Courier		**Lab Ref. No:** 279939
Send results to: Douglas Partners Pty Ltd			**Received by:** NS NICK SARLAMIS
Address: 15 Callistemon Close, Warabrook NSW 2304	**Phone:** (02) 4960 9600		**Date & Time:**
Relinquished by: JRK	**Date:** 7/10/2021	**Signed:**	**Signed:**

TAT: 2 days.
Due: 15/10/2021 MT.

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CHAIN OF CUSTODY DESPATCH SHEET

Project No:	102077.02	**Suburb:**	Newcastle	**To:**	*Envirolab Services*
Project Manager:	Dana Wilson	**Order Number:**		**Dispatch date:**	07/10/2021
					12 Ashley St, Chatswood NSW 2067

Lab ID	Sample ID			Date Sampled	Sample Type	Container Type	Analytes											Notes/ Preservation/ Additional Requirements
	Location / Other ID	Depth From	Depth To		S - soil W - water	G - glass P - plastic	Metals (17)	TRH, BTEX	PAH	OCP, OPP, PCB	VOC	Asbestos 500mL	Acid Sulfate Soil Screening	Detailed Chromium Suite	TCLP	Trip Spike	Trip Blank	
15	TB	-	-	7/10/21	W	G											✓	Trip Blank
16	201	3.5	3.5	6/10/21	S	P							✓					Acid Sulfate Soil Screening
17	201	4.5	4.5	6/10/21	S	P							✓					Acid Sulfate Soil Screening
18	202	1.5	1.5	6/10/21	S	P							✓					Acid Sulfate Soil Screening
19	202	2.5	2.5	6/10/21	S	P							✓					Acid Sulfate Soil Screening
20	203	4	4	6/10/21	S	P							✓					Acid Sulfate Soil Screening
21	203	5	5	6/10/21	S	P							✓					Acid Sulfate Soil Screening
22	204	2	2	6/10/21	S	P							✓					Acid Sulfate Soil Screening
23	204	3.1	3.1	6/10/21	S	P							✓					Acid Sulfate Soil Screening
24	205	1.5	1.5	6/10/21	S	P							✓					Acid Sulfate Soil Screening
25	205	2.5	2.5	6/10/21	S	P							✓					Acid Sulfate Soil Screening

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CHAIN OF CUSTODY DESPATCH SHEET

Project No:	102077.02	**Suburb:**	Newcastle	**To:**	*Envirolab Services*
Project Manager:	Dana Wilson	**Order Number:**	159101	**Sampler:**	JRK
					12 Ashley St, Chatswood NSW 2067
Email:	Dana.Wilson@douglaspartners.com.au, Joshua.Kramer@douglaspartners.com.au			**Attn:**	*Sample Receipt*
Turnaround time:	☐ Standard ☑ 72 hour ☐ 48 hour ☐ 24 hour ☐ Same day			**Contact:**	*(02) 9910 6200 samplereceipt@envirolab.com.au*
Prior Storage:	☑ Fridge ☐ Freezer ☐ Shelf	**Do samples contain 'potential' HBM?**	☑ No ☐ Yes (If YES, then handle, transport and store in accordance with FPM HAZID)		

Lab ID	Sample ID: Location / Other ID	Sample ID: Depth From	Sample ID: Depth To	Date Sampled	Sample Type: S - soil W - water	Container Type: G - glass P - plastic	Analytes: Metals (17)	Analytes: VOC										Notes/ Preservation/ Additional Requirements
1	203	-	-	12/10/21	W	G,P	✓	✓										Metals + VOC
2	204	-	-	12/10/21	W	G,P	✓	✓										Metals + VOC
3	GWD1	-	-	12/10/21	W	G,P	✓	✓										Metals + VOC
																		72 hour turnaround on laboratory results

Metals to analyse:	17- As, B, Ba, Be, Cd, Cr, Cu, Co, Hg, Mn, Mo, Ni, Pb, Sb, Se, Sn, Zn			**LAB RECEIPT**	180242
Number of samples in container:	3	**Transported to laboratory by:**	TOLL Courier	**Lab Ref. No:**	
Send results to:	Douglas Partners Pty Ltd			**Received by:**	CMcLenna
Address:	15 Callistemon Close, Warabrook NSW 2304	**Phone:**	(02) 4960 9600	**Date & Time:**	12/10/21 9:00
Relinquished by:	JRK	**Date:**	12/10/2021	**Signed:**	
				Signed:	CM

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CHAIN OF CUSTODY DESPATCH SHEET

Project No: 102077.02	**Suburb:** Newcastle		**To:** *Envirolab Services*
Project Manager: Dana Wilson	**Order Number:** 159090	**Sampler:** JRK/JCL	*12 Ashley St, Chatswood NSW 2067*
Email: Dana.Wilson@douglaspartners.com.au, Joshua.Kramer@douglaspartners.com.au			**Attn:** *Sample Receipt*
Turnaround time: ☐ Standard ☑ 72 hour ☐ 48 hour ☐ 24 hour ☐ Same day			**Contact:** *(02) 9910 6200 samplereceipt@envirolab.com.au*
Prior Storage: ☑ Fridge ☑ Freezer ☐ Shelf	**Do samples contain 'potential' HBM?** ☐ No ☑ Yes (If YES, then handle, transport and store in accordance with FPM HAZID)		

Lab ID	Sample ID: Location / Other ID	Sample ID: Depth From	Sample ID: Depth To	Date Sampled	Sample Type: S - soil W - water	Container Type: G - glass P - plastic	Analytes: Metals (17)	TRH, BTEX	PAH	OCP, OPP, PCB	VOC	Asbestos 500mL	Acid Sulfate Soil Screening	Detailed Chromium Suite	TCLP	pH	CEC	Notes/ Preservation/ Additional Requirements
1	201	0.5	0.5	6/10/21	S	G	✓	✓	✓	✓						pH		Combo 6
2	201	2.0	2.0	6/10/21	S	G	✓	✓	✓	✓					Pb			Combo 6
3	202	0.2	0.2	6/10/21	S	G	✓	✓	✓	✓	✓							Combo 6 + VOC
4	202	3.5	3.5	6/10/21	S	G	✓	✓	✓									Combo 3
5	203	0.5	0.5	6/10/21	S	G	✓	✓	✓	✓					Pb/PAH	pH	CEC	Combo 6
6	204	0.2	0.2	6/10/21	S	G	✓	✓	✓	✓						pH		Combo 6
7	204	4.0	4.0	6/10/21	S	G	✓	✓	✓									Combo 3
8	205	0.2	0.2	6/10/21	S	P						✓						Asbestos 500 mL
9	205	0.5	0.5	6/10/21	S	G,P	✓	✓	✓	✓	✓	✓						Combo 6 + VOC + 500mL
10	D1/JRK	-	-	6/10/21	S	G	✓	✓	✓	✓	✓							Combo 6 + VOC
11	GW1	-	-	7/10/21	W	G,P	✓				✓							Metals + VOC
12	GW3	-	-	7/10/21	W	G,P	✓				✓							Metals + VOC
13	R1	-	-	7/10/21	W	G,P	✓				✓							Metals + VOC
14	TS	-	-	7/10/21	W	G										✓		Trip Spike

Metals to analyse: 17- As, B, Ba, Be, Cd, Cr, Cu, Co, Hg, Mn, Mo, Ni, Pb, Sb, Se, Sn, Zn			**LAB RECEIPT** 279939-B
Number of samples in container: 23	**Transported to laboratory by:** TOLL Courier		**Lab Ref. No:** 279939
Send results to: Douglas Partners Pty Ltd			**Received by:** NS MCK SARLAMI
Address: 15 Callistemon Close, Warabrook NSW 2304	**Phone:** (02) 4960 9600		**Date & Time:**
Relinquished by: JRK	**Date:** 7/10/2021	**Signed:**	**Signed:**

Due: 18-19/10/2021.

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CHAIN OF CUSTODY DESPATCH SHEET

Project No:	102077.02	**Suburb:**	Newcastle	**To:**	*Envirolab Services*
Project Manager:	Dana Wilson	**Order Number:**		**Dispatch date:**	07/10/2021
					12 Ashley St, Chatswood NSW 2067

Lab ID	Sample ID: Location / Other ID	Depth From	Depth To	Date Sampled	Sample Type: S - soil W - water	Container Type: G - glass P - plastic	Analytes: Metals (17)	TRH, BTEX	PAH	OCP, OPP, PCB	VOC	Asbestos 500mL	Acid Sulfate Soil Screening	Detailed Chromium Suite	TCLP	Trip Spike	Trip Blank	Notes/ Preservation/ Additional Requirements
15	TB	-	-	7/10/21	W	G											✓	Trip Blank
16	201	3.5	3.5	6/10/21	S	P							✓					Acid Sulfate Soil Screening
17	201	4.5	4.5	6/10/21	S	P							✓					Acid Sulfate Soil Screening
18	202	1.5	1.5	6/10/21	S	P							✓					Acid Sulfate Soil Screening
19	202	2.5	2.5	6/10/21	S	P							✓					Acid Sulfate Soil Screening
20	203	4	4	6/10/21	S	P							✓					Acid Sulfate Soil Screening
21	203	5	5	6/10/21	S	P							✓					Acid Sulfate Soil Screening
22	204	2	2	6/10/21	S	P							✓					Acid Sulfate Soil Screening
23	204	3.1	3.1	6/10/21	S	P							✓	☒				Acid Sulfate Soil Screening
24	205	1.5	1.5	6/10/21	S	P							✓	☒				Acid Sulfate Soil Screening
25	205	2.5	2.5	6/10/21	S	P							✓					Acid Sulfate Soil Screening
																		279939-B.

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CHAIN OF CUSTODY DESPATCH SHEET

Project No:	102077.02	**Suburb:**	Newcastle West	**To:**	Envirolab Services
Project Name:	924 Hunter Street, PSI	**Order Number**	230463		12 Ashley St, Chatswood NSW 2067
Project Manager:	Dana Wilson	**Sampler:**	LAH	**Attn:**	Sample Receipt
Emails:	dana.wilson@douglaspartners.com.au	lachlan.helbig@douglaspartners.com.au		**Phone:**	(02) 9910 6200
Date Required:	Same day ☐ 24 hours ☐ 48 hours ☐ 72 hours ☐ Standard x			**Email:**	samplereceipt@envirolab.com.au
Prior Storage:	x Esky ☐ Fridge ☐ Shelved	Do samples contain 'potential' HBM?. Yes ☐		No x	(If YES, then handle, transport and store in accordance with FPM HAZID)

Sample ID	Lab ID	Date Sampled	Sample Type (S - soil, W - water)	Container Type (G - glass, P - plastic)	Analytes									Notes/preservation
						Metals (17)	TRH and BTEX	PAH (low level)	Trip spike / blank					
1 401	1	24/03/22	W	G,P		x	x	x						**COMBO 3L**
2 402	2	24/03/22	W	G,P		x	x	x						**COMBO 3L**
3 403	3	24/03/22	W	G,P		x	x	x						**COMBO 3L**
4 404	4	24/03/22	W	G,P		x	x	x						**COMBO 3L**
5 TB2/TB2	5	22/03/22	W	G,P		X			X					**Trip spike / blank for v**
														(5) (6)
PQL (S) mg/kg														**ANZECC PQLs req'd for all water analytes** ☐

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Lab No: 291865
Date Received: 25/03/22
Time Received: 1045
Received By: CH
Temp: Cool/Ambient
Cooling: Ice/Ice pack
Security: Intact/Broken/None

PQL = practical quantitation limit. If none given, default to Laboratory Method Detection Limit

Metals to Analyse: 8HM unless specified here Al, Sb, As, B, Cd, Cr, Co, Cu, Pb, Mn, Hg, Mo, Ni, Se, Ag, Tl, V, Zn

Lab Report/Reference No:

Total number of samples in container: 5 **Relinquished by:** LAH **Transported to laboratory by:** TNT

Send Results to: Douglas Partners Pty Ltd **Address:** **Phone:** **Fax:**

Signed: **Received by:** Christine GLSTP **Date & Time:** 1045 25/03/22 8°C.

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CHAIN OF CUSTODY DESPATCH SHEET (2)

Project No: 102077.02	**Suburb/Town: Newcastle**	**To: Envirolab Services Pty Ltd**	
DP Order No: NC230427	**DP Contact Person:** Dana Wilson / Paulo Sebastian	**12 Ashley Street, CHATSWOOD NSW 2067**	
Prior Storage: Esky X Fridge X Shelved ☐		**Ph: (02) 9910 6200**	**Attn: Jacinta Hurst**
Do samples contain 'potential' HBM? Yes ☑ No ☐ (If YES, then handle, transport and store in accordance with FPM HAZID)			

	Sample				Analytes								Notes
	DP ID	Date Sampled	Type S-soil W-water	Lab ID	TRH / BTEX	PAH	Metals (8) (17)	OPP / OCP / PCB	Asbestos I.D (40g)	Asbestos I.D (500 mL)	Asbestos I.D (fragment)	Acid Sulfate Soil screening test	
1	501/0.5	13/3/22	S		✓	✓	✓	✓					Combo 6
2	502/0.3	↓	↓		↓	↓	↓	↓					↓
3	503/0.7												
4	503/1.2												
5	504/0.5												
6	505/0.8												
7	506/1.2												
8	D1/JPS												
9	D9/JPS												
10	401/1.0	↓	↓		↓	↓	↓	↓	✓				Combo 6a
	PQL (S) mg/kg												
	PQL (W) mg/L	ANZECC PQLs req'd for all water analytes ☐											

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 290972
Date Received: 15/03/2022
Time Received: 10:30
Received By: [illegible]
Temp: Cool/Ambient 4°
Cooling: Ice/Icepack
Security: Intact/Broken/None

PQL = practical quantitation limit. If none given, default to Laboratory Method Detection Limit

*~~Metals to~~ Analyse (Please circle) As, Cd, Cr, Cu, Pb, Zn, Hg, Ni, Mn, Fe, Al, Se, Sn, Sb, Mg, Co, B

Total number of samples in container: 57

Date relinquished: 14/3/22

Results required by.....

☐ Same day ☐ 24 hours ☐ 48 hours ☐ 72 hours X Standard

SAMPLES RECEIVED BY LAB
Please sign and date to acknowledge receipt of samples and return by email

Signature: Nancy Zhang

Date: 15/03/2022 10:30

Lab Ref: 290972

Send results to:
Douglas Partners Pty Ltd
Email: paulo.sebastian@douglaspartners.com.au
dana.wilson@douglaspartners.com.au

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CHAIN OF CUSTODY DESPATCH SHEET (2)

Project No: 102077.02	**Suburb/Town: Newcastle**	**To: Envirolab Services Pty Ltd**
DP Order No: NC230427	**DP Contact Person:** Dana Wilson / Paulo Sebastian	**12 Ashley Street, CHATSWOOD NSW 2067**
Prior Storage: Esky X Fridge X Shelved ☐		**Ph: (02) 9910 6200** **Attn: Jacinta Hurst**

Do samples contain 'potential' HBM? Yes ☑ No ☐ (If YES, then handle, transport and store in accordance with FPM HAZID)

	Sample				Analytes								Notes
	DP ID	Date Sampled	Type S-soil W-water	Lab ID	TRH / BTEX	PAH	Metals (8) (17)	OPP / OCP / PCB	Asbestos I.D (40g)	Asbestos I.D (500 mL)	Asbestos I.D (fragment)	Acid Sulfate Soil screening test	
11	402/2.0	13/3/22	S		✓	✓	✓	✓	✓				Combo 6a
12	403/0.3	↓	↓		↓	↓	↓	↓	✓				↓
13	403/1.5								✓				
14	404/0.5				↓	↓	↓	↓	✓				
15	401/2.0				✓	✓	✓						Combo 3
16	401/3.5				↓	↓	↓						↓
17	402/3.5												
18	403/4.0												
19	404/3.5	↓	↓		↓	↓	↓						
PQL (S) mg/kg													
PQL (W) mg/L	ANZECC PQLs req'd for all water analytes ☐												

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 290972
Date Received: 15/03/2022
Time Received: 10:30
Received By:
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

PQL = practical quantitation limit. If none given, default to Laboratory Method Detection Limit

*~~Metals to~~ Analyse (Please circle) As, Cd, Cr, Cu, Pb, Zn, Hg, Ni, Mn, Fe, Al, Se, Sn, Sb, Mg, Co, B,

Total number of samples in container: 57

Date relinquished: 14/3/22

Results required by:
☐ Same day ☐ 24 hours ☐ 48 hours ☐ 72 hours X Standard

SAMPLES RECEIVED BY LAB
Please sign and date to acknowledge receipt of samples and return by email

Signature: Nancy Zhang
Date: 15/03/2022 10:30
Lab Ref: 290972

Send results to:
Douglas Partners Pty Ltd
Email: paulo.sebastian@douglaspartners.com.au
dana.wilson@douglaspartners.com.au

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CHAIN OF CUSTODY DESPATCH SHEET (2)

Project No: 102077.02	**Suburb/Town: Newcastle**	**To: Envirolab Services Pty Ltd**
DP Order No: NC230427	**DP Contact Person:** Dana Wilson / Paulo Sebastian	**12 Ashley Street, CHATSWOOD NSW 2067**
Prior Storage: Esky X Fridge X Shelved ☐		**Ph: (02) 9910 6200** **Attn: Jacinta Hurst**
Do samples contain 'potential' HBM? Yes ☑ No ☐ (If YES, then handle, transport and store in accordance with FPM HAZID)		

	Sample				Analytes								Notes
	DP ID	Date Sampled	Type S-soil W-water	Lab ID	TRH / BTEX	PAH	Metals (8)	OPP / OCP / PCB	Asbestos I.D (40g)	Asbestos I.D (500 mL)	Asbestos I.D (fragment)	Acid Sulfate Soil screening test	
20	501/0.4-0.7	13/3/22	S							✓			
21	502/0.3-1.2	↓	↓							✓			
22	503/0.2-1.0									✓			
23	503/1.2-2.0									✓			
24	504/0.1-0.15									✓			
25	504/0.3-1.0									✓			
26	504/1.2-1.3									✓			
27	505/0.2-1.1									✓			
28	505/1.25-1.35									✓			
29	506/0.1-0.15	↓	↓							✓			
	PQL (S) mg/kg									✓			
	PQL (W) mg/L	ANZECC PQLs req'd for all water analytes ☐											

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 290972
Date Received: 15/03/2022
Time Received: 10:30
Received By: NZ
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

PQL = practical quantitation limit. If none given, default to Laboratory Method Detection Limit

*Metals to Analyse (Please circle) As, Cd, Cr, Cu, Pb, Zn, Hg, Ni, Mn, Fe, Al, Se, Sn, Sb, Mg, Co, B,

Total number of samples in container: 57

Date relinquished: 14/3/22

Results required by.....

☐ Same day ☐ 24 hours ☐ 48 hours ☐ 72 hours X Standard

SAMPLES RECEIVED BY LAB
Please sign and date to acknowledge receipt of samples and return by email

Signature: Nancy Zhang

Date: 15/03/2022 10:30

Lab Ref: 290972

Send results to:
Douglas Partners Pty Ltd
Email: paulo.sebastian@douglaspartners.com.au
dana.wilson@douglaspartners.com.au

Douglas Partners
Geotechnics | Environment | Groundwater

69 4 of 6

CHAIN OF CUSTODY DESPATCH SHEET (2)

Project No: 102077.02	**Suburb/Town: Newcastle**	**To: Envirolab Services Pty Ltd**	
DP Order No: NC230427	**DP Contact Person:** Dana Wilson / Paulo Sebastian	**12 Ashley Street, CHATSWOOD NSW 2067**	
Prior Storage: Esky X Fridge X Shelved ☐		**Ph: (02) 9910 6200**	**Attn: Jacinta Hurst**
Do samples contain 'potential' HBM? Yes ☐ No ☐ (If YES, then handle, transport and store in accordance with FPM HAZID)			

	Sample				Analytes									Notes
	DP ID	Date Sampled	Type S-soil W-water	Lab ID	TRH / BTEX	PAH	Metals (8)	OPP / OCP / PCB	Asbestos I.D (40g)	Asbestos I.D (500 mL)	Asbestos I.D (fragment)	Acid Sulfate Soil screening test		
30	506 / 0.3-0.7	13/3/22	S							✓				
31	506 / 1-1.4	↓	S							✓				
32	506 / 1-1.4 F		Material								✓			
33	503 / 1.2-2.0 F	↓	"								✓			
15	401 / 2.0		S									✓		
34	401 / 2.5		↓									✓		
35	401 / 3.0											✓		
16	401 / 3.5											✓		
36	401 / 4.0											✓		
37	401 / 4.5	↓	↓									✓		
	PQL (S) mg/kg													
	PQL (W) mg/L	ANZECC PQLs req'd for all water analytes ☐												

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 290972
Date Received: 15/3/22
Time Received: EV 10:30
By:
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

PQL = practical quantitation limit. If none given, default to Laboratory Method Detection Limit

*Metals to Analyse (Please circle) As, Cd, Cr, Cu, Pb, Zn, Hg, Ni, Mn, Fe, Al, Se, Sn, Sb, Mg, Co, B,

Total number of samples in container: 57

Date relinquished: 14/3/22

Results required by.....

☐ Same day ☐ 24 hours ☐ 48 hours ☐ 72 hours X Standard

SAMPLES RECEIVED BY LAB
Please sign and date to acknowledge receipt of samples and return by email

Signature: Nancy Zhang

Date: 15/03/2022 10:30

Lab Ref: 290972

Send results to:
Douglas Partners Pty Ltd
Email: paulo.sebastian@douglaspartners.com.au
dana.wilson@douglaspartners.com.au

Douglas Partners
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pg 5 of 6

CHAIN OF CUSTODY DESPATCH SHEET (2)

Project No: 102077.02	**Suburb/Town: Newcastle**	**To: Envirolab Services Pty Ltd**
DP Order No: NC230427	**DP Contact Person:** Dana Wilson / Paulo Sebastian	**12 Ashley Street, CHATSWOOD NSW 2067**
Prior Storage: Esky X Fridge X Shelved ☐		**Ph: (02) 9910 6200** **Attn: Jacinta Hurst**

Do samples contain 'potential' HBM? Yes ☐ No ☐ (If YES, then handle, transport and store in accordance with FPM HAZID)

	Sample				Analytes								Notes
	DP ID	Date Sampled	Type S-soil W-water	Lab ID	TRH / BTEX	PAH	Metals (8)	OPP / OCP / PCB	Asbestos I.D (40g)	Asbestos I.D (500 mL)	Asbestos I.D (fragment)	Acid Sulfate Soil screening test	
38	401/5.0	13/3/22	S									✓	
39	403/2.5											✓	
40	403/3.0											✓	
41	403/3.5											✓	
18 ⊗	~~404~~ 403/4.0											✓	
42	403/4.5											✓	
43	403/5.0											✓	
44	404/2.5											✓	
45	404/3.0											✓	
19 ⊗	404/3.5	↓	↓									✓	
	PQL (S) mg/kg												
	PQL (W) mg/L	ANZECC PQLs req'd for all water analytes ☐											

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 230972
Date Received: 15/03/22
Time Received: 10:30
Received By: NZ
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

PQL = practical quantitation limit. If none given, default to Laboratory Method Detection Limit

*Metals to Analyse (Please circle) As, Cd, Cr, Cu, Pb, Zn, Hg, Ni, Mn, Fe, Al, Se, Sn, Sb, Mg, Co, B,

Total number of samples in container: 57

Date relinquished: 14/3/22

Results required by:
☐ Same day ☐ 24 hours ☐ 48 hours ☐ 72 hours X Standard

SAMPLES RECEIVED BY LAB
Please sign and date to acknowledge receipt of samples and return by email

Signature: Nancy Zhang
Date: 15/03/2022 10:30
Lab Ref: 230972

Send results to:
Douglas Partners Pty Ltd
Email: paulo.sebastian@douglaspartners.com.au
dana.wilson@douglaspartners.com.au

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CHAIN OF CUSTODY DESPATCH SHEET (2)

Project No: 102077.02	**Suburb/Town: Newcastle**	**To: Envirolab Services Pty Ltd**
DP Order No: NC230427	**DP Contact Person:** Dana Wilson / Paulo Sebastian	**12 Ashley Street, CHATSWOOD NSW 2067**
Prior Storage: Esky X Fridge X Shelved ☐		**Ph: (02) 9910 6200** **Attn: Jacinta Hurst**
Do samples contain 'potential' HBM? Yes ☐ No ☐ (If YES, then handle, transport and store in accordance with FPM HAZID)		

Sample				Analytes								Notes
DP ID	Date Sampled	Type S-soil W-water	Lab ID	TRH / BTEX	PAH	Metals (8)	OPP / OCP / PCB	Asbestos I.D (40g)	Asbestos I.D (500 mL)	Asbestos I.D (fragment)	Acid Sulfate Soil screening test	
~~404/4.0~~	15/3/22	S									✓	
46 404/4.5	↓	↓									✓	
47 404/5.0											✓	
48 502/1.4											✓	
49 502/1.7											✓	
50 503/2.4											✓	
51 504/1.7											✓	
52 505/1.7											✓	
53 501/0.15-0.25		S ↓bag only										
PQL (S) mg/kg												
PQL (W) mg/L	ANZECC PQLs req'd for all water analytes ☐											

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200
Job No: 290772
Date Received: 15/3/22
Time Received: 10:30
Received By: WT
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

PQL = practical quantitation limit. If none given, default to Laboratory Method Detection Limit

*Metals to Analyse (Please circle) As, Cd, Cr, Cu, Pb, Zn, Hg, Ni, Mn, Fe, Al, Se, Sn, Sb, Mg, Co, B,

Total number of samples in container: 57

Date relinquished: 14/3/22

Results required by.....

☐ Same day ☐ 24 hours ☐ 48 hours ☐ 72 hours X Standard

SAMPLES RECEIVED BY LAB
Please sign and date to acknowledge receipt of samples and return by email

Signature: Nanay Zhang

Date: 15/03/2022 10:30

Lab Ref: 290772

Send results to:
Douglas Partners Pty Ltd
Email: paulo.sebastian@douglaspartners.com.au
dana.wilson@douglaspartners.com.au

Douglas Partners
Geotechnics I Environment I Groundwater

Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au

PURCHASE ORDER

Date	14/03/2022
PO No.	NC230427

Vendor/Subcontractor:
Envirolab Services
Contact Name: Aileen Hie / Simon Song

Deliver To:
Douglas Partners Pty Ltd
15 Callistemon Close, Warabrook
Requisitioner: Josh Kramer

This order covers the supply of goods, materials or services shown here, subject to the terms and conditions of this purchase order. **PO number or Project number** and **Requisitioner** should always be quoted in your invoice.

This PO should be attached to your invoice and emailed to **apinvoices@douglaspartners.com.au** in PDF format.

Item	Description	Quantity	Unit Price	Total	Project No. & G/L Code
	Lab testing as per COC				102077.02
				SUBTOTAL	
				GST/TAX	
				SHIPPING/ OTHER	
				TOTAL	

Comments or Special Instructions

290972

Douglas Partners
Geotechnics / Environment / Groundwater

Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
96 Hermitage Road
West Ryde NSW 2114
PO Box 472
West Ryde NSW 1685
Phone (02) 9809 0666

Dear Supplier,

We are implementing a new Accounts Payable Invoice Automation System to help reduce the administrative time around invoice processing and ultimately, to enable us to pay your invoices more efficiently.

IMPORTANT NOTICE: From Tuesday, 20 October, all invoices will need to be emailed to **apinvoices@douglaspartners.com.au** in PDF format.

To avoid any potential payment delays please include the following information on all your invoices:

- Banking details;
- Our Project number; or
- Purchase Order number; or
- Full name of the Douglas Partners employee who placed the order.

All Accounts Payables enquiries and Statements should continue to be emailed to accounts@douglaspartners.com.au

This new Accounts Payable Invoice Automation System applies to both subsidiaries in the Douglas Group:

- Douglas Partners Pty Ltd - ABN: 75 053 980 117
- Ground Test Pty Ltd - ABN: 62 000 940 858

We have attached a list of our branch addresses and contact details for your reference.

Our Accounts Payable Team is also contactable by phone on (02) 9809 0666, we are always available to assist should you have any questions or concerns.

Thank you for your co-operation.

Kind regards

Carrie Wang

Company Accountant

Ming To

Subject: FW: Results for Registration 290972 102077.02, Newcastle

Ref: 290972-A
TAT: Standard.
Due: 05/04/2022
MT

290972-A

From: Dana Wilson <Dana.Wilson@douglaspartners.com.au>
Sent: Tuesday, 29 March 2022 12:45 PM
To: Aileen Hie <AHie@envirolab.com.au>
Cc: Paulo Sebastian <Paulo.Sebastian@douglaspartners.com.au>; Joshua Kramer <Joshua.Kramer@douglaspartners.com.au>
Subject: RE: Results for Registration 290972 102077.02, Newcastle

CAUTION: This email originated from outside of the organisation. Do not act on instructions, click links or open attachments unless you recognise the sender and know the content is authentic and safe.

Hi Aileen

Could you please commence additional testing as below.

290972-1	1	501/0.5	TCLP Pb
290972-2	2	502/0.3	TCLP Pb
290972-3	3	503/0.7	TCLP Pb
290972-4	4	503/1.2	TCLP Pb, PAH
290972-5	5	504/0.5	TCLP Pb
290972-6	6	505/0.8	TCLP Pb, PAH
290972-7	7	506/1.2	TCLP Pb, PAH, Cr
290972-10	10	401/1.0	TCLP Pb, PAH
290972-15	15	401/2.0	TCLP PAH
290972-11	11	402/2.0	TCLP Pb
290972-39	39	403/2.5	Chromium suite
290972-40	40	403/3.0	Chromium suite
290972-50	50	503/2.4	Chromium suite

Kind regards,

Dana Wilson | Senior Associate
Douglas Partners Pty Ltd | ABN 75 053 980 117 |
www.douglaspartners.com.au
15 Callistemon Close Warabrook NSW 2304 | Box 324 Hunter Region Mail Centre NSW 2310
P: 02 4960 9600 | M: +61 402 057 144 | E: Dana.Wilson@douglaspartners.com.au

CLIENT CHOICE AWARDS 2021 winner BEST PROVIDER TO PROPERTY
CLIENT CHOICE 202 win BEST PROVI GOVERNM COMMUN

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

SAMPLE RECEIPT ADVICE

Client Details

Client	Douglas Partners Newcastle
Attention	Joshua Kramer

Sample Login Details

Your reference	102077.02, Newcastle
Envirolab Reference	279939
Date Sample Received	08/10/2021
Date Instructions Received	08/10/2021
Date Results Expected to be Reported	15/10/2021

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	20 Soil, 5 Water
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	8
Cooling Method	Ice
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	**Phone: 02 9910 6200**
Fax: 02 9910 6201	**Fax: 02 9910 6201**
Email: ahie@envirolab.com.au	**Email: jhurst@envirolab.com.au**

Analysis Underway, details on the following page:

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

Sample ID	VOCs in soil	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides in Soil	PCBsin Soil	Acid Extractable metalsin soil	Asbestos ID - soils NEPM	sPOCAS field test	VOCs in water	BTEX in Water	HM in water - dissolved
201-0.5		✓	✓	✓	✓	✓	✓	✓					
201-2.0		✓	✓	✓	✓	✓	✓	✓					
202-0.2	✓	✓	✓	✓	✓	✓	✓	✓					
202-3.5		✓	✓	✓				✓					
203-0.5		✓	✓	✓	✓	✓	✓	✓					
204-0.2		✓	✓	✓	✓	✓	✓	✓					
204-4.0		✓	✓	✓				✓					
205-0.2									✓				
205-0.5	✓	✓	✓	✓	✓	✓	✓	✓	✓				
D1/JRK	✓	✓	✓	✓	✓	✓	✓	✓					
GW1											✓		✓
GW3											✓		✓
R1											✓		✓
TS												✓	
TB												✓	
201-3.5										✓			
201-4.5										✓			
202-1.5										✓			
202-2.5										✓			
203-4										✓			
203-5										✓			
204-2										✓			
204-3.1										✓			
205-1.5										✓			
205-2.5										✓			

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.
Requests for longer term sample storage must be received in writing.
Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.
TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

Envirolab Services Pty Ltd
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ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

SAMPLE RECEIPT ADVICE

Client Details

Client	Douglas Partners Newcastle
Attention	Dana Wilson

Sample Login Details

Your reference	102077.02, Newcastle
Envirolab Reference	279939-A
Date Sample Received	08/10/2021
Date Instructions Received	13/10/2021
Date Results Expected to be Reported	15/10/2021

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	additional analysis
Turnaround Time Requested	2 days
Temperature on Receipt (°C)	8
Cooling Method	Ice
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	**Phone: 02 9910 6200**
Fax: 02 9910 6201	**Fax: 02 9910 6201**
Email: ahie@envirolab.com.au	**Email: jhurst@envirolab.com.au**

Analysis Underway, details on the following page:

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Sample ID	vTRH(C6-C10)/BTEXN in Water	svTRH (C10-C40) in Water	PAHs in Water - Low Level	On Hold
201-0.5				✓
201-2.0				✓
202-0.2				✓
202-3.5				✓
203-0.5				✓
204-0.2				✓
204-4.0				✓
205-0.2				✓
205-0.5				✓
D1/JRK				✓
GW1	✓	✓	✓	
GW3	✓	✓	✓	
R1	✓	✓	✓	
TS				✓
TB				✓
201-3.5				✓
201-4.5				✓
202-1.5				✓
202-2.5				✓
203-4				✓
203-5				✓
204-2				✓
204-3.1				✓
205-1.5				✓
205-2.5				✓
202 - [TRIPLICATE]-0.2				✓

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Envirolab Services Pty Ltd
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ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.
Requests for longer term sample storage must be received in writing.
Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.
TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

SAMPLE RECEIPT ADVICE

Client Details

Client	Douglas Partners Newcastle
Attention	Dana Wilson

Sample Login Details

Your reference	102077.02, Newcastle
Envirolab Reference	279939-B
Date Sample Received	08/10/2021
Date Instructions Received	13/10/2021
Date Results Expected to be Reported	18/10/2021

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	additional analysis
Turnaround Time Requested	2 days
Temperature on Receipt (°C)	8
Cooling Method	Ice
Sampling Date Provided	YES

Comments

Chromium suite ready 19/10/21

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	**Phone: 02 9910 6200**
Fax: 02 9910 6201	**Fax: 02 9910 6201**
Email: ahie@envirolab.com.au	**Email: jhurst@envirolab.com.au**

Analysis Underway, details on the following page:

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

Sample ID	Misc Inorg - Soil	CEC	TCLP Preparation - Acid	Naphthalene in TCLP	Acenaphthylene in TCLP	Acenaphthene in TCLP	Fluorene in TCLP	Phenanthrene in TCLP	Anthracene in TCLP	Fluoranthene in TCLP	Pyrene in TCLP	Benzo(a)anthracene in TCLP	Chrysene in TCLP	Benzo(bjk)fluoranthene in TCLP	Benzo(a)pyrene in TCLP	Indeno(1,2,3-c,d)pyrene - TCLP	Dibenzo(a,h)anthracene in TCLP	Benzo(g,h,i)perylene in TCLP	Total +vePAH's	Surrogate p-Terphenyl-d14	Lead	Chromium Suite	On Hold
201-0.5	✓																						
201-2.0			✓																		✓		
202-0.2																							✓
202-3.5																							✓
203-0.5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
204-0.2	✓																						
204-4.0																							✓
205-0.2																							✓
205-0.5																							✓
D1/JRK																							✓
GW1																							✓
GW3																							✓
R1																							✓
TS																							✓
TB																							✓
201-3.5																							✓
201-4.5																							✓
202-1.5																							✓
202-2.5																							✓
203-4																							✓

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

Sample ID	Misc Inorg - Soil	CEC	TCLP Preparation - Acid	Naphthalene in TCLP	Acenaphthylene in TCLP	Acenaphthene in TCLP	Fluorene in TCLP	Phenanthrene in TCLP	Anthracene in TCLP	Fluoranthene in TCLP	Pyrene in TCLP	Benzo(a)anthracene in TCLP	Chrysene in TCLP	Benzo(bjk)fluoranthene in TCLP	Benzo(a)pyrene in TCLP	Indeno(1,2,3-c,d)pyrene - TCLP	Dibenzo(a,h)anthracene in TCLP	Benzo(g,h,i)perylene in TCLP	Total +vePAH's	Surrogate p-Terphenyl-d14	Lead	Chromium Suite	On Hold
203-5																							✓
204-2																							✓
204-3.1																						✓	
205-1.5																						✓	
205-2.5																							✓
202 - [TRIPLICATE]-0.2																							✓

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.

Requests for longer term sample storage must be received in writing.

Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.

TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

SAMPLE RECEIPT ADVICE

Client Details

Client	Douglas Partners Newcastle
Attention	Dana Wilson

Sample Login Details

Your reference	102077.02, Newcastle
Envirolab Reference	280242
Date Sample Received	13/10/2021
Date Instructions Received	13/10/2021
Date Results Expected to be Reported	18/10/2021

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	3 Water
Turnaround Time Requested	3 days
Temperature on Receipt (°C)	10
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	**Phone: 02 9910 6200**
Fax: 02 9910 6201	**Fax: 02 9910 6201**
Email: ahie@envirolab.com.au	**Email: jhurst@envirolab.com.au**

Analysis Underway, details on the following page:

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

Sample ID	VOCs in water	All metals in water-dissolved
203	✓	✓
204	✓	✓
GWD1	✓	✓

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.
Requests for longer term sample storage must be received in writing.
Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.
TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

SAMPLE RECEIPT ADVICE

Client Details

Client	Douglas Partners Newcastle
Attention	Lachlan Helbig, Dana Wilson

Sample Login Details

Your reference	102077.02, Newcastle West
Envirolab Reference	291865
Date Sample Received	25/03/2022
Date Instructions Received	25/03/2022
Date Results Expected to be Reported	01/04/2022

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	6 Water
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	8
Cooling Method	Ice
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	**Phone: 02 9910 6200**
Fax: 02 9910 6201	**Fax: 02 9910 6201**
Email: ahie@envirolab.com.au	**Email: jhurst@envirolab.com.au**

Analysis Underway, details on the following page:

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12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

Sample ID	vTRH(C6-C10)/BTEXN in Water	svTRH (C10-C40) in Water	PAHs in Water - Low Level	All metals in water-dissolved
401	✓	✓	✓	✓
402	✓	✓	✓	✓
403	✓	✓	✓	✓
404	✓	✓	✓	✓
405	✓			
406	✓			

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.
Requests for longer term sample storage must be received in writing.
Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.
TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

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SAMPLE RECEIPT ADVICE

Client Details

Client	Douglas Partners Newcastle
Attention	Dana Wilson

Sample Login Details

Your reference	102077.02, Newcastle
Envirolab Reference	290972
Date Sample Received	15/03/2022
Date Instructions Received	15/03/2022
Date Results Expected to be Reported	22/03/2022

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	51 Soil, 2 Material
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	4
Cooling Method	Ice
Sampling Date Provided	YES

Comments

extra sample received 501/0.5-0.25

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	**Phone: 02 9910 6200**
Fax: 02 9910 6201	**Fax: 02 9910 6201**
Email: ahie@envirolab.com.au	**Email: jhurst@envirolab.com.au**

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Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides in Soil	PCBsin Soil	Acid Extractable metalsin soil	Asbestos ID - soils	Asbestos ID - soils NEPM	sPOCAS field test	Asbestos ID - materials	On Hold
501/0.5	✓	✓	✓	✓	✓	✓	✓					
502/0.3	✓	✓	✓	✓	✓	✓	✓					
503/0.7	✓	✓	✓	✓	✓	✓	✓					
503/1.2	✓	✓	✓	✓	✓	✓	✓					
504/0.5	✓	✓	✓	✓	✓	✓	✓					
505/0.8	✓	✓	✓	✓	✓	✓	✓					
506/1.2	✓	✓	✓	✓	✓	✓	✓					
D1/JPS	✓	✓	✓	✓	✓	✓	✓					
D9/JPS	✓	✓	✓	✓	✓	✓	✓					
401/1.0	✓	✓	✓	✓	✓	✓	✓	✓				
402/2.0	✓	✓	✓	✓	✓	✓	✓	✓				
403/0.3	✓	✓	✓	✓	✓	✓	✓	✓				
403/1.5	✓	✓	✓	✓	✓	✓	✓	✓				
404/0.5	✓	✓	✓	✓	✓	✓	✓	✓				
401/2.0	✓	✓	✓				✓			✓		
401/3.5	✓	✓	✓				✓			✓		
402/3.5	✓	✓	✓				✓					
403/4.0	✓	✓	✓				✓			✓		
404/3.5	✓	✓	✓				✓			✓		
501/0.4-0.7									✓			
502/0.3-1.2									✓			
503/0.2-1.0									✓			
503/1.2-2.0									✓			
504/0.1-0.15									✓			
504/0.3-1.0									✓			
504/1.2-1.3									✓			
505/0.2-1.1									✓			
505/1.25-1.35									✓			
506/0.1-0.15									✓			
506/0.3-0.7									✓			
506/1-1.4									✓			
506/1-1.4F											✓	

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Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides in Soil	PCBsin Soil	Acid Extractable metalsin soil	Asbestos ID - soils	Asbestos ID - soils NEPM	sPOCAS field test	Asbestos ID - materials	On Hold
503/1.2-2.0F											✓	
401/2.5										✓		
401/3.0										✓		
401/4.0										✓		
401/4.5										✓		
401/5.0										✓		
403/2.5										✓		
403/3.0										✓		
403/3.5										✓		
403/4.5										✓		
403/5.0										✓		
404/2.5										✓		
404/3.0										✓		
404/4.5										✓		
404/5.0										✓		
502/1.4										✓		
502/1.7										✓		
503/2.4										✓		
504/1.7										✓		
505/1.7										✓		
501/0.15-0.25												✓

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.
Requests for longer term sample storage must be received in writing.
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TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

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SAMPLE RECEIPT ADVICE

Client Details

Client	Douglas Partners Newcastle
Attention	Dana Wilson

Sample Login Details

Your reference	102077.02, Newcastle
Envirolab Reference	290972-A
Date Sample Received	15/03/2022
Date Instructions Received	29/03/2022
Date Results Expected to be Reported	05/04/2022

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	additional analysis
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	4
Cooling Method	Ice
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	**Phone: 02 9910 6200**
Fax: 02 9910 6201	**Fax: 02 9910 6201**
Email: ahie@envirolab.com.au	**Email: jhurst@envirolab.com.au**

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Sample ID	TCLP Preparation - Acid	Naphthalene in TCLP	Acenaphthylene in TCLP	Acenaphthene in TCLP	Fluorene in TCLP	Phenanthrene in TCLP	Anthracene in TCLP	Fluoranthene in TCLP	Pyrene in TCLP	Benzo(a)anthracene in TCLP	Chrysene in TCLP	Benzo(bjk)fluoranthene in TCLP	Benzo(a)pyrene in TCLP	Indeno(1,2,3-c,d)pyrene - TCLP	Dibenzo(a,h)anthracene in TCLP	Benzo(g,h,i)perylene in TCLP	Total +vePAH's	Surrogate p-Terphenyl-d14	Chromium	Lead	Chromium Suite	On Hold
501/0.5	✓																			✓		
502/0.3	✓																			✓		
503/0.7	✓																			✓		
503/1.2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓		
504/0.5	✓																			✓		
505/0.8	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓		
506/1.2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
D1/JPS																						✓
D9/JPS																						✓
401/1.0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓		
402/2.0	✓																			✓		
403/0.3																						✓
403/1.5																						✓
404/0.5																						✓
401/2.0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
401/3.5																						✓
402/3.5																						✓
403/4.0																						✓
404/3.5																						✓
501/0.4-0.7																						✓

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Sample ID	TCLP Preparation - Acid	Naphthalene in TCLP	Acenaphthylene in TCLP	Acenaphthene in TCLP	Fluorene in TCLP	Phenanthrene in TCLP	Anthracene in TCLP	Fluoranthene in TCLP	Pyrene in TCLP	Benzo(a)anthracene in TCLP	Chrysene in TCLP	Benzo(bjk)fluoranthene in TCLP	Benzo(a)pyrene in TCLP	Indeno(1,2,3-c,d)pyrene - TCLP	Dibenzo(a,h)anthracene in TCLP	Benzo(g,h,i)perylene in TCLP	Total +vePAH's	Surrogate p-Terphenyl-d14	Chromium	Lead	Chromium Suite	On Hold
502/0.3-1.2																						✓
503/0.2-1.0																						✓
503/1.2-2.0																						✓
504/0.1-0.15																						✓
504/0.3-1.0																						✓
504/1.2-1.3																						✓
505/0.2-1.1																						✓
505/1.25-1.35																						✓
506/0.1-0.15																						✓
506/0.3-0.7																						✓
506/1-1.4																						✓
506/1-1.4F																						✓
503/1.2-2.0F																						✓
401/2.5																						✓
401/3.0																						✓
401/4.0																						✓
401/4.5																						✓
401/5.0																						✓
403/2.5																					✓	
403/3.0																					✓	

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Sample ID	TCLP Preparation - Acid	Naphthalene in TCLP	Acenaphthylene in TCLP	Acenaphthene in TCLP	Fluorene in TCLP	Phenanthrene in TCLP	Anthracene in TCLP	Fluoranthene in TCLP	Pyrene in TCLP	Benzo(a)anthracene in TCLP	Chrysene in TCLP	Benzo(bjk)fluoranthene in TCLP	Benzo(a)pyrene in TCLP	Indeno(1,2,3-c,d)pyrene - TCLP	Dibenzo(a,h)anthracene in TCLP	Benzo(g,h,i)perylene in TCLP	Total +vePAH's	Surrogate p-Terphenyl-d14	Chromium	Lead	Chromium Suite	On Hold
403/3.5																						✓
403/4.5																						✓
403/5.0																						✓
404/2.5																						✓
404/3.0																						✓
404/4.5																						✓
404/5.0																						✓
502/1.4																						✓
502/1.7																						✓
503/2.4																					✓	
504/1.7																						✓
505/1.7																						✓
501/0.15-0.25																						✓
501/0.5 - [TRIPLICATE]																						✓
402/2.0 - [TRIPLICATE]																						✓

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

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Additional Info

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TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

Appendix G

Site Assessment Criteria

Appendix G
Site Assessment Criteria
924 Hunter Street, Newcastle West

G1.0 Introduction

G1.1 Guidelines

The following key guidelines were consulted for deriving the site assessment criteria (SAC):

- NEPC *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]* (NEPC, 2013).
- CRC CARE *Health screening levels for petroleum hydrocarbons in soil and groundwater* (CRC CARE, 2011).
- ANZG *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZG, 2018).
- NHMRC, NRMMC *Australian Drinking Water Guidelines 6 2011, Version 3.2* (NHMRC, NRMMC, 2016).
- ANZECC *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZECC, 2000).

G1.2 General

The SAC applied in the current investigation are informed by the CSM which identified human and environmental receptors to potential contamination at the site. Analytical results are assessed (as a Tier 1 assessment) against the SAC comprising primarily the investigation and screening levels of Schedule B1 of NEPC (2013).

The following inputs are relevant to the selection and/or derivation of the SAC:

- Land use: commercial / industrial based on proposed ground floor land use with reference to NEPC (2013).Corresponding to land use category 'D', commercial / industrial such as shops, offices, factories and industrial sites.
- Soil type: sand being the predominant soil type.

G2.0 Soils

G2.1 Health Investigation and Screening Levels

The generic health investigation levels (HIL) and health screening levels (HSL) are considered to be appropriate for the assessment of human health risk via all relevant pathways of exposure associated with contamination at the site. The adopted soil HIL and HSL for the contaminants of concern are in Table 1 and Table 2.

Table 1: Health Investigation Levels (mg/kg)

Contaminant	HIL-D
Metals	
Arsenic	3000
Beryllium	500
Boron	300 000
Cadmium	900
Chromium (VI)	3600
Cobalt	4000
Copper	240 000
Lead	1500
Manganese	60 000
Mercury (inorganic)	730
Methyl mercury	180
Nickel	6000
Selenium	10 000
Zinc	400 000
Barium	NC
Molybdenum	NC
Antimony	NC
Selenium	NC
Tin	NC
PAH	
B(a)P TEQ	40
Total PAH	4000
OCP	
DDT+DDE+DDD	3600
Aldrin and dieldrin	45
Chlordane	530
Endosulfan	2000
Endrin	100
Heptachlor	50
HCB	80
Methoxychlor	2500
OPP	
Chlorpyrifos	2000
PCB	
PCB	7
VOC (various analytes)	-

Table 2: Health Screening Levels (mg/kg)

Contaminant	HSL-D	HSL-D	HSL-D
SAND	**0 m to <1 m**	**1 m to <2 m**	**2 m to <4 m**
Benzene	3	3	3
Toluene	NL	NL	NL
Ethylbenzene	NL	NL	NL
Xylenes	230	NL	NL
Naphthalene	NL	NL	NL
TRH F1	260	370	630
TRH F2	NL	NL	NL

Notes to Table 2:

TRH F1 is TRH C_6-C_{10} minus BTEX

TRH F2 is TRH >C_{10}-C_{16} minus naphthalene

The soil saturation concentration (Csat) is defined as the soil concentration at which the porewater phase cannot dissolve any more of an individual chemical. The soil vapour that is in equilibrium with the porewater will be at its maximum. If the derived soil HSL exceeds Csat, a soil vapour source concentration for a petroleum mixture could not exceed a level that would results in the maximum allowable vapour risk for the given scenario. For these scenarios, no HSL is presented for these chemicals and the HSL is shown as 'not limiting' or 'NL'

The HSL for direct contact derived from CRC CARE (2011) are in Table 3.

Table 3: Health Screening Levels for Direct Contact (mg/kg)

Contaminant	DC HSL-D	DC HSL-IMW
Benzene	430	1100
Toluene	99 000	120 000
Ethylbenzene	27 000	85 000
Xylenes	81 000	130 000
Naphthalene	11 000	29 000
TRH F1	26 000	82 000
TRH F2	20 000	62 000
TRH F3	27 000	85 000
TRH F4	38 000	120 000

Notes to Table 3:

TRH F1 is TRH C_6-C_{10} minus BTEX

TRH F2 is TRH >C_{10}-C_{16} minus naphthalene

IMW intrusive maintenance worker

G2.2 Asbestos in Soil

Based on the CSM and/or current site access limitations, a detailed asbestos assessment was not considered to be warranted/feasible at this stage.

The HSL for asbestos in soil are based on likely exposure levels for different scenarios published in NEPC (2013) for the following forms of asbestos:

- Bonded asbestos containing material (ACM); and
- Fibrous asbestos and asbestos fines (FA and AF).

The HSL are in Table 4.

Table 4: Health Screening Levels for Asbestos

Form of Asbestos	HSL-D
ACM	0.05%
FA and AF	0.001%
FA and AF and ACM	No visible asbestos for surface soil *

Notes to Table 4:

Surface soils defined as top 10 cm.

* Based on site observations during the site walkover and at the sampling points and the analytical results of surface samples.

G2.3 Ecological Investigation Levels

Ecological investigation levels (EIL) and added contaminant limits (ACL), where appropriate, have been derived in NEPC (2013) for arsenic, copper, chromium (III), nickel, lead, zinc, DDT and naphthalene. The adopted EIL, derived using the interactive (excel) calculation spreadsheet on the NEPM toolbox website are shown in Table 6, with inputs into their derivation shown in Table 5.

Table 5: Inputs to the Derivation of the Ecological Investigation Levels

Variable	Input	Rationale
Age of contaminants	"Aged" (>2 years)	Potentially contaminating activities > 2 years
pH	pH 8.0 for coarse / fill material	Testing of selected upper fill samples pH 8.1-8.7
	pH 4.0 for sand / natural soils	Testing of selected natural soil samples pH 4.0-7.3 based on ASS screening tests
CEC	9.6 $cmol_c/kg$	Limited testing of CEC indicated 9.6 $cmol_c/kg$
Clay content	5%	Assumed (conservative)
Traffic volumes	High	High traffic locality
State / Territory	NSW	Locality

Table 6: Ecological Investigation Levels (mg/kg)

Contaminant	Soil type	EIL-D
Metals	Coarse / fill	
Arsenic	Coarse / fill	160
Copper	Coarse / fill	300
Nickel	Coarse / fill	260
Chromium III	Coarse / fill	540
Lead	Coarse / fill	1800
Zinc	Coarse / fill	730
PAH	Coarse / fill	
Naphthalene	Coarse / fill	370
OCP	Coarse / fill	
DDT	Coarse / fill	640
Metals	Sand / natural	
Arsenic	Sand / natural	160
Copper	Sand / natural	85
Nickel	Sand / natural	260
Chromium III	Sand / natural	540
Lead	Sand / natural	1800
Zinc	Sand / natural	250
PAH	Sand / natural	
Naphthalene	Sand / natural	370
OCP	Sand / natural	
DDT	Sand / natural	640

Notes to Table 6:

EIL-AES area of ecological significance

EIL-A-B-C urban residential and public open space

G2.4 Ecological Screening Levels

Ecological screening levels (ESL) are used to assess the risk of selected petroleum hydrocarbon compounds, BTEX and benzo(a)pyrene to terrestrial ecosystems. The adopted ESL are shown in Table 7.

Table 7: Ecological Screening Levels (mg/kg)

Contaminant	Soil Type	EIL-D
Benzene	Coarse	75
Toluene	Coarse	135
Ethylbenzene	Coarse	165
Xylenes	Coarse	180
TRH F1	Coarse/ Fine	215*
TRH F2	Coarse/ Fine	170*
TRH F3	Coarse	1700
TRH F4	Coarse	3300
B(a)P	Coarse	(1.4) 33 (refer below)

Notes to Table 7:
ESL are of low reliability except where indicated by * which indicates that the ESL is of moderate reliability
TRH F1 is TRH C_6-C_{10} minus BTEX
TRH F2 is TRH >C_{10}-C_{16} including naphthalene
EIL-A-B-C urban residential and public open space

The NEPM (2013) ESL of 0.7 mg/kg for benzo(a)pyrene (B(a)P) is understood to be based on a single invertebrate species referenced in the Canadian Soil Quality Guidelines (1999, since updated) and is considered conservative in the Australian context. These guidelines were updated in 2010 and now suggest a B(a)P concentration of 20 mg/kg for the protection of environmental health based on the soil contact exposure pathway.

It is also noted that the B(a)P ESL is a low reliability value. Higher reliability screening levels have been published in CRC CARE (2017), Risk-based Management and Remediation Guidance for Benzo(a)pyrene, CRC CARE Technical Report No. 39. The high reliability value of 33 mg/kg for fresh contamination recommended in CRC CARE (2017) has therefore been adopted.

G2.5 Management Limits

In addition to appropriate consideration and application of the HSL and ESL, there are additional considerations which reflect the nature and properties of petroleum hydrocarbons, including:

- Formation of observable light non-aqueous phase liquids (LNAPL);
- Fire and explosion hazards;
- Effects on buried infrastructure eg: penetration of, or damage to, in-ground services.

The adopted management limits are in Table 8.

Table 8: Management Limits (mg/kg)

Contaminant	Soil Type	ML-D
TRH F1	Coarse	700
TRH F2	Coarse	1000
TRH F3	Coarse	3500
TRH F4	Coarse	10 000

Notes to Table 8:
TRH F1 is TRH C_6-C_{10} including BTEX
TRH F2 is TRH >C_{10}-C_{16} including naphthalene
ML-A-B-C residential, parkland and public open space

G3.0 Groundwater

G3.1 Introduction

The groundwater investigation levels (GIL) used for interpretation of the groundwater data (as a Tier 1 assessment) have been selected based on the potential risks posed from contamination sourced from the site to receptors at or down-gradient of the site, as identified by the conceptual site model (CSM). The receptors, exposure points and pathways are summarised in Table 9.

Table 9: Summary of Potential Receptors and Potential Risks

Receptor	Location	Exposure Point	Exposure Pathway
Surface water aquatic ecosystem	Down-gradient from site	Receiving surface water body at the groundwater discharge point	Exposure to contaminants
Occupants of buildings	On site and down-gradient from site	Enclosed buildings (existing and proposed)	Inhalation of VOC (including TRH and BTEX) overlying VOC impacted groundwater via the vapour intrusion pathway

The rationale for the selection of GIL is in Table 10.

Table 10: Groundwater Investigation Level Rationale

Receptor / Beneficial Use	GIL	Source	Comments / Rationale
Aquatic ecosystem	DGV	ANZG (2018)	Marine water 99% LOP for bioaccumulative contaminants 95% LOP for non-bioaccumulative contaminants
Building occupants (vapour intrusion)	HSL	NEPC (2013)	2 m to <4 m

Notes to Table 10:
DGV default guideline value
% LOP percentage level of protection of species
HSL health screening level
GV guideline value
LTV long term value (up to 100 years)
STV short term value (up to 20 years)

G3.2 Groundwater Investigation Levels for Aquatic Ecosystems

The DGV for the protection of aquatic ecosystems derived from ANZG (2018) are in Table 11.

Table 11: Groundwater Investigation Levels for Protection of Aquatic Ecosystems (mg/L)

Contaminant	Marine Water 95% protection DGV
Metals	**-**
Arsenic	-
Beryllium	-
Boron	-
Cadmium	0.0007
Chromium (VI)	0.0044
Cobalt	0.001
Copper	0.0013
Lead	0.0044
Manganese	0.08 (LOSP unknown)
Mercury (inorganic)	0.0004
Methyl mercury	-
Nickel	0.07
Selenium	-
Zinc	0.008
PAH	
B(a)P	0.0001
Anthracene	0.00001
Fluoranthene	0.001
Naphthalene	0.05
Phenanthrene	0.0006
Total PAH	-
BTEX	
Benzene	0.7
Ethylbenzene	0.08
m-Xylene	0.075
Toluene	0.18
VOCs	
1,1,2-trichloroethane	1.9
Isopropylbenzene	0.03
1,1,1-trichloroethane	0.27
1,1-dichloroethane	19
1,2,4-trichlorobenzene	0.08
TRH	NC

Notes to Table 11:

Where the contaminant does not have a % LOP, the 'unknown' LOP has been adopted

LOSP – level of species protection

G3.3 Health Screening Levels for Vapour Intrusion

The HSL to evaluate potential vapour intrusion risks derived from NEPC (2013) are in Table 13.

Table 12: Groundwater Health Screening Levels for Vapour Intrusion (µg/L)

Contaminant	HSL-D	Solubility Limit
SAND	**2 m to <4 m**	**-**
Benzene	5000	59 000
Toluene	NL	61 000
Ethylbenzene	NL	3900
Xylenes	NL	21 000
Naphthalene	NL	170
TRH F1	6000	9000
TRH F2	NL	3000

Notes to Table 12:

TRH F1 is TRH C_6-C_{10} minus BTEX

TRH F2 is TRH >C_{10}-C_{16} minus naphthalene

The solubility limit is defined as the groundwater concentration at which the water cannot dissolve any more of an individual chemical based on a petroleum mixture. The soil vapour that is in equilibrium with the groundwater will be at its maximum. If the derived groundwater HSL exceeds the water solubility limit, a soil vapour source concentration for a petroleum mixture could not exceed a level that would result in the maximum allowable vapour risk for the given scenario. For these scenarios, no HSL is presented for these chemicals and the HSL is shown as 'not limiting' or 'NL'.

G4.0 References

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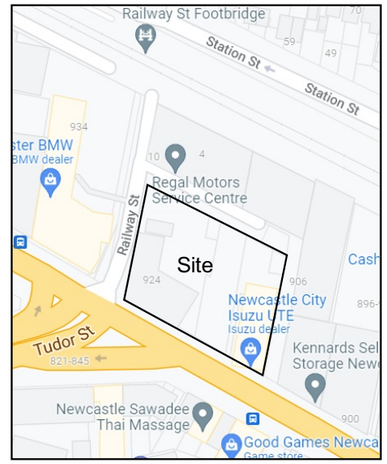
Appendix H

Drawing 1 – Test Location Plan and Site Features
Douglas Partners (1995) – Test Location Plan
CKDS – Proposed Development Plans
Positive Survey Solutions (2021) – Survey Plan (Ref 21194_Det_B)

Drawing adapted from MetroMap Image dated 06.06.2021.



Site Location

Legend

- Additional Groundwater Wells / Bores (current investigation)
- Large Diameter Bores (current investigation)
- (W) Groundwater Monitoring Well (current investigation)
- Borehole Location (Drilling Rig) (current investigation)
- Borehole Location (Hand Auger) (current investigation)
- Surface Sampling Location (current investigation)
- Geotechnical Borehole Location (Drilling Rig) (DP, 1995)
- Previous CPT Location (DP, 2020)
- Site Boundary
- Approx UST Location (based on GPR Survey)
- Approx Location of Former DFC Buildings / Structures based on Title Plans
- Existing Groundwater Monitoring Well (by others, date unknown)
- Lot Boundaries

Douglas Partners
Geotechnics / Environment / Groundwater

CLIENT: Thirdi Dairy Farmers Pty Ltd		
OFFICE: Newcastle	DRAWN BY: PLH	
SCALE: 1:500 @ A3	DATE: 20.April.2022	

TITLE: **Test Location Plan and Site Features**
Proposed Apartments
924 Hunter Street, Newcastle

PROJECT No:	102077.02
DRAWING No:	1
REVISION:	3

PROPOSED
WORKSHOP

B1

PROPOSED
SPARE PARTS

TIGHE STREET

RAILWAY STREET

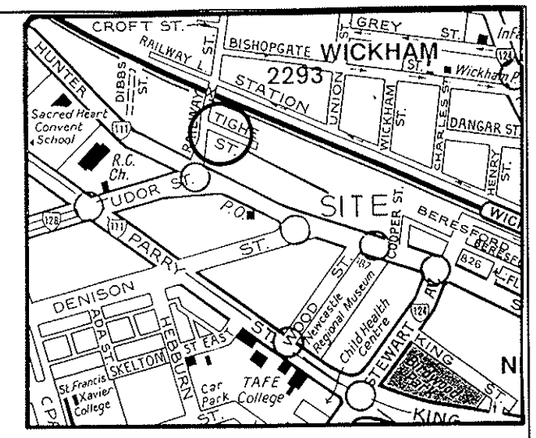
PROPOSED
SHOWROOM

B2

PROPOSED
SHOWROOM

HUNTER STREET

N



LOCALITY PLAN

DRAWING ADAPTED FROM DRAWING NO 7497/01 SUPPLIED BY RODD HAY & CRAIG ASSOCIATES PTY LTD

LEGEND

TEST BORE LOCATION

Douglas Partners
Geotechnics • Environment • Groundwater

Sydney, Newcastle, Brisbane, Melbourne, Perth, Wyong, Singleton, Campbelltown, Townsville, Cairns, Darwin.

TITLE: TEST LOCATION PLAN
PROPOSED SHOWROOM & WORKSHOPS
HUNTER STREET
NEWCASTLE WEST

CLIENT: HTL REINHOLD PTY LTD			
DRAWN BY: PA	SCALE: 1:400	PROJECT No.: 18402	OFFICE: NEWCASTLE
APPROVED BY:		DATE: 19.10.95	DRAWING No.: 1

1 Ground
SCALE 1:200 @ A1

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02	Issue for Review	10/8/21	02
03	Issue for Coordination	7/9/21	03
04	Issue for Pre-DA	16/9/21	04
05	Issue for Pre-DA	27/9/21	05
06	Issue for Draft DA	1/10/21	06
07	Issue for DRAFT DA	8/10/21	07
A	Issue for Development Application	20/10/21	A

key plan

North Point

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project

Dairy Farmers Corner

924 Hunter Street 2/DP445736
Newcastle West NSW 2302

drawing title

General Arrangement Plans
Ground Floor Plan

drawing scale	drawn	verified	date
AS SHOWN		SC	20/10/21

project #	drawing #	issue
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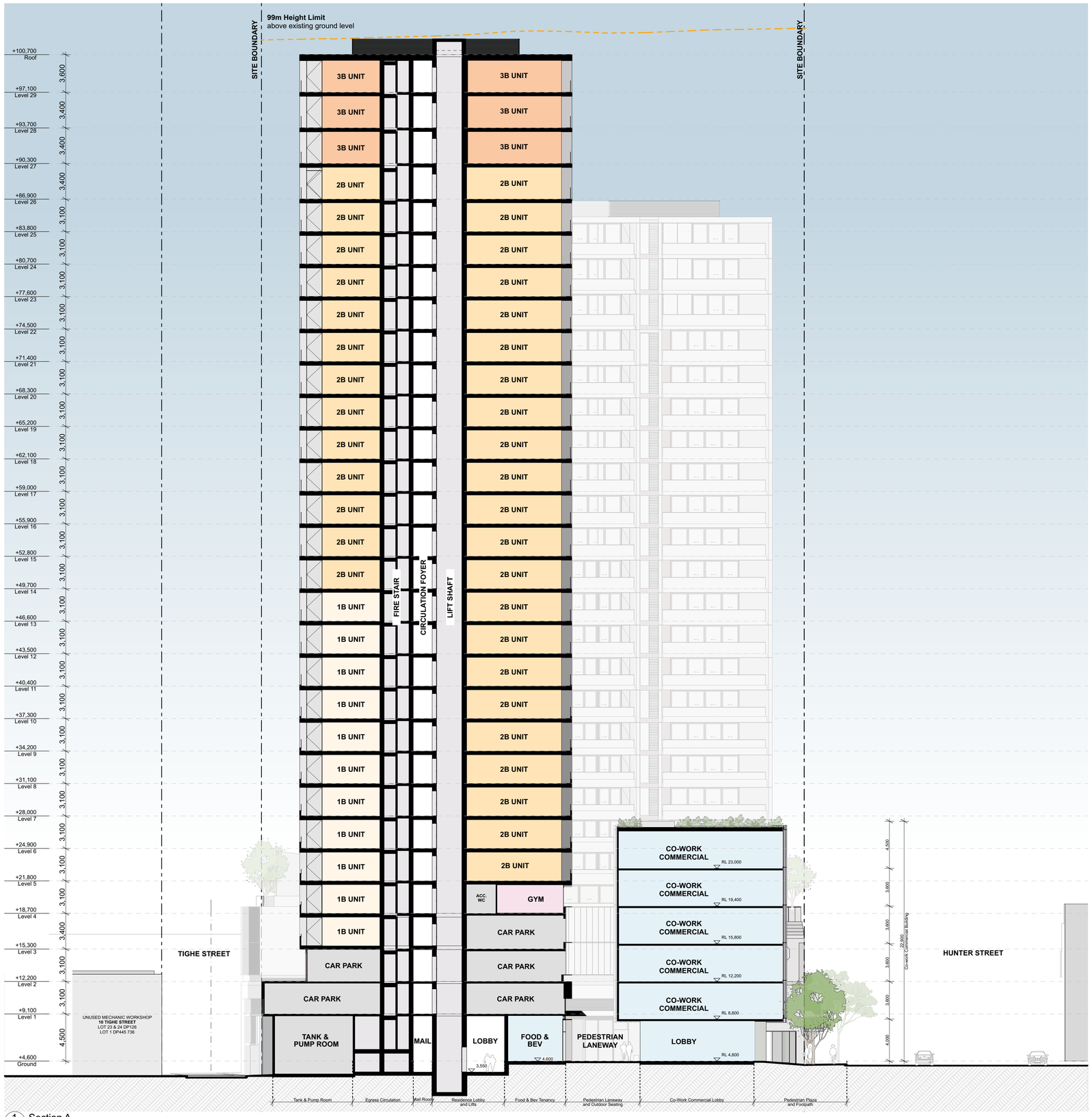

1 Section A
SCALE 1:200 @ A1

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A	Issue for Development Application	20/10/21	A

key plan

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project

Dairy Farmers Corner

924 Hunter Street 2/DP445736
Newcastle West NSW 2302

drawing title

Sections
Section A

drawing scale	drawn	verified	date
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project #	drawing #	issue
21014	A-3001	A

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Photograph 3

Photograph 4

Photograph 5

Photograph 6

Photograph 7

Photograph 8

Photograph 9

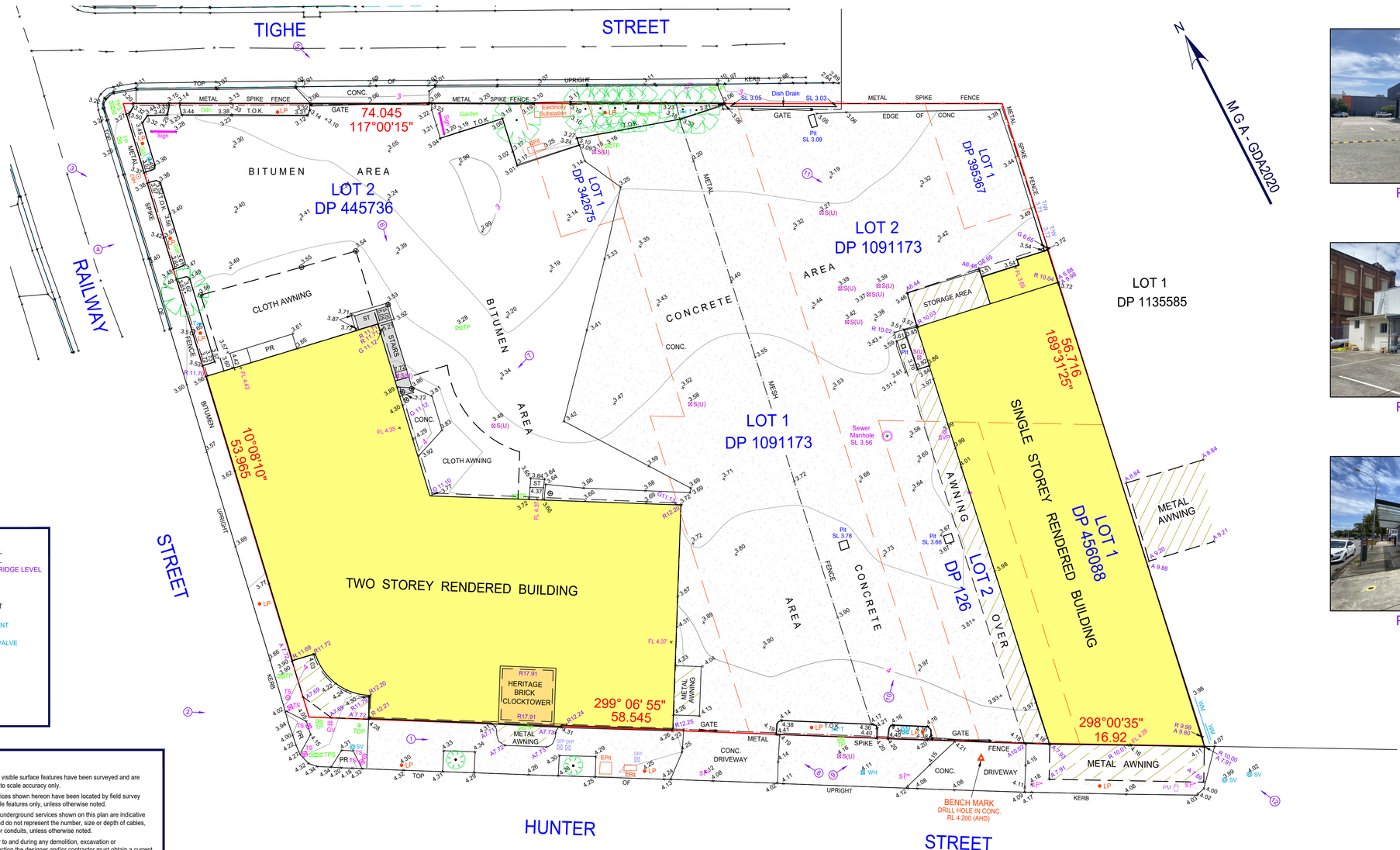
Photograph 2

Photograph 10

Photograph 1

Photograph 11

Photograph 12



LOT 1
DP 1135585

LEGEND

- CONTOUR (Major)
- FENCING
- BOUNDARY
- BOUNDARY (INTERNAL)
- S(U) - SERVICE (UNKNOWN TYPE)
- EPI - ELECTRICITY PIT
- EMH - ELECTRICITY MANHOLE
- LP - LIGHT POLE
- SVP - SEWER VENT PIPE
- GV - GAS VALVE BOX
- S - STREET SIGN
- TS - TRAFFIC SIGNAL
- OFP - OPTICAL FIBRE PIT
- PM - PARKING METER
- TDP - TELSTRA DISTRIBUTION PILLAR
- TP - TELSTRA PIT
- TPS - TWIN TELSTRA PITS
- APPROXIMATE PHOTO LOCATION & DIRECTION

A6.85 - AWNING LEVEL
G7.53 - GUTTER LEVEL
R7.47 - ROOF / ROOF RIDGE LEVEL
FL 4.54 - FLOOR LEVEL
PR - PRAM RAMP
T/W - TOP OF WALL
P - SUPPORT POST
WM - WATER METER
WH - WATER HYDRANT
T - WATER TAP
SV - WATER STOP VALVE
TREE

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5 0 5 10 15 20

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SCALE 1 : 400 (A3)

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DIAL 1100 BEFORE YOU DIG

TITLE: PLAN SHOWING DETAIL & LEVELS OVER LOT 2 DP 445736, LOT 1 DP 342675, LOTS 1 & 2 DP 1091173, LOT 1 DP 395367, LOT 2 DP 126 AND LOT 1 DP 456088

LOCATION: Nº 924 HUNTER STREET, NEWCASTLE

CLIENT: LJM Architecture Pty Ltd - c/o Luke Mahaffey

POSITIVE SURVEY SOLUTIONS

Amendment	Description	Date
A	INITIAL ISSUE	9.3.2021
B	ADDITIONAL DETAIL INFORMATION	9.6.2021
C		
D		

SCALE: 1 : 200 (A1) 1 : 400 (A3)
DATE: 9.3.2021
DATUM: GDA2020 / AHD
ORIGIN: PM 9888 - RL 3.868
CONTOUR INTERVAL: 0.25 m
SURVEYOR: BM DRAWN: SD

JOB No: 21194

SHEET 1 OF 2

DRAWING REF: 21194_DET_B.dwg
REVISION: B

TRAFFIC & PARKING ASSESSMENT

MIXED USE DEVELOPMENT

LOT 2 IN DP 445736, LOT 1 IN DP 342675, LOTS 1 & 2 IN DP 1091173, LOT 2 IN DP 126, LOT 1 IN DP 456088 AND LOT 1 IN DP 395367

924 HUNTER STREET, NEWCASTLE WEST

PREPARED FOR: THIRDI DAIRY FARMERS PTY LTD

AMENDED MAY 2022

21/163

TRAFFIC & PARKING ASSESSMENT
THIRDI DAIRY FARMERS PTY LTD

MIXED USE DEVELOPMENT
LOT 2 IN DP 445736, LOT 1 IN DP 342675, LOTS 1 & 2 IN DP 1091173, LOT 2 IN DP 126, LOT 1 IN DP 456088 AND LOT 1 IN DP 395367
924 HUNTER STREET, NEWCASTLE WEST

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Issue	Date	Description	By
A	24/09/21	Draft	PA
B	06/10/21	Edit	JG
C	14/10/21	Final Proof/Client Amendments	JG
D	14/10/21	Approved	JG
E	26/05/22	Additional comment ramps / Approved	JG

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Date 26th May 2022

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1.0 INTRODUCTION

Intersect Traffic Pty Ltd has been engaged by Thirdi Dairy Farmers Pty Ltd to prepare a traffic and parking assessment report for a Mixed Use Development on Lot 2 in DP 445736, Lot 1 in DP 342675, Lots 1 & 2 in DP 1091173, Lot 2 in DP 126, Lot 1 in DP 456088 and Lot 1 in DP 395367, 924 Hunter Street, Newcastle West. The proposed development requires the demolition of the two commercial buildings on the site and the construction of a commercial and residential complex containing a 30 level retail / residential tower, a 25 storey retail commercial / residential tower, and a 6 level commercial tower with 4 levels of associated car parking. The development concept plans are shown in ***Attachment A***.

The site has frontage to Hunter Street, Railway Street and Tighe Street with vehicular access proposed from Tighe Street via a new combined entry / exit driveway west of the eastern boundary of the development. This report is required to support a development application to Newcastle City Council and allow the Council to assess the proposal in respect of its impact on the local road network.

This report presents the findings of the traffic assessment and includes the following:

1. An outline of the existing situation in the vicinity of the site.
2. An assessment of the traffic impacts of the proposed development including the predicted traffic generation and its impact on existing road and intersection capacities.
3. A review of parking, public transport, pedestrian, and cycle way requirements for the proposed development, including assessment against Council, Transport for NSW (TfNSW) and Australian Standards requirements.
4. A presentation of conclusions and recommendations.

2.0 SITE DESCRIPTION

The subject site currently contains a 2 storey commercial building located on the corner of Hunter Street and Railway Street and a single storey commercial building at its south eastern corner. The site is located within the western end of the 'Newcastle City Centre' area, in Newcastle West, adjacent to the suburbs of Newcastle and Hamilton. The property adjoins Hunter Street, Railway Street and Tighe Street at its southern, western and northern boundaries, respectively and adjoins a commercial development at its eastern boundary. The NSW's TrainLink Newcastle & Central Coast Hunter Line train services rail corridor is located approximately 40 metres north of the site at the end of Railway Street with the Newcastle Transport Interchange Wickham being approximately 300 metres east of the site. The site, within the context of surrounding buildings, land and transport corridors is shown in the location plan provided as ***Figure 1***, below.

Figure 1 – Site Location

The site contains the following property descriptors:

- Formal land titles:
  - Lot 2 in DP 445736,
  - Lot 1 in DP 342675,
  - Lots 1 & 2 in DP 1091173,
  - Lot 2 in DP 126,
  - Lot 1 in DP 456088, and
  - Lot 1 in DP 395367;
- Street address of 924 Hunter Street, Newcastle West;
- Site area of approximately 4,000 m^2; and
- Land zoning of B3 – Commercial Core in accordance with Newcastle LEP (2012).

The site currently has two vehicular accesses via Hunter Street (13 metres wide in total) and two via Tighe Street (18 metres wide in total). ***Photographs 1 & 2*** show some of the site's existing development and existing vehicular accesses.

Photograph 1 – Development site corner Hunter Street and Railway Street

Photograph 2 – An existing driveway in Hunter Street

3.0 EXISTING ROAD NETWORK

3.1 Hunter Street

Hunter Street fronting the development site is a regional road (RR 464) and under a functional road hierarchy classification it is a sub-arterial road. It is under the care and control of Newcastle City Council with partial funding for its maintenance provided by TfNSW. It is a major transport route and runs northwest – southeast connecting the Newcastle East CBD area to the sub-arterial road network (SH 10) Hannell Street / (SH 10) Stewart Avenue and via Maitland Road (RR 464) providing connection to the suburbs of Wickham, Hamilton, Islington, Tighes Hill, Mayfield and Warabrook to the west where it again connects to the sub-arterial road network (MR 316) Industrial Drive / Maitland Road (SH 10). It also provides connections to the Newcastle beaches and foreshore areas of the Hunter River along the northern side of the Newcastle CBD.

In the vicinity of the site, Hunter Street is a four lane two-way sealed urban road with parking lanes on both sides of the road. The carriageway is 17 metres wide (approx.) with concrete kerb and gutter and longitudinal drainage along its outer edges and centre, lane and edge line markings. A 60 km/h speed limit applies to this section of road. The on-street parking along Hunter Street is 'pay for parking' time restricted 2 hour periods between 9am – 5pm Monday to Friday and 9am – 1pm Saturday.

At the time of inspection Hunter Street was observed to be in good condition. ***Photograph 3*** below shows Hunter Street adjoining the site.

Photograph 3 – Hunter Street adjoining the site

3.2 Tudor Street

Tudor Street is an urban Regional Road (RR 604) and is under the care and control of the Newcastle City Council who receives some funding from TfNSW for maintenance works. Under a functional road hierarchy, it would be considered a sub-arterial road. It connects a series of streets to the west and to the east to the arterial and sub-arterial road network at Lambton Road, Parry Street and Hunter Street. Near the site Tudor Street is a two way four lane sealed road, except where additional turning lanes are provided at intersections, with kerb and gutter, drainage and parking on both sides of the road and a central median island separating the traffic travel directions.

With a carriageway of approximately 23 metres in width it has travel lanes approximately 3.4 metres wide and parking lanes approximately 3.0 metres wide. Where permitted, parking on Tudor Street near the site is 'pay for parking' 2 hour time restricted between 9am – 5pm Monday to Friday and 9am – 1pm Saturday. A 60 km/h speed limit applies to this section of road and at the time of inspection Tudor Street was observed to be in good condition. ***Photograph 4*** shows Tudor Street, Newcastle West near the site.

Photograph 4 – Tudor Street near the site

3.2 Railway Street

Railway Street is a local urban road and is under the care and control of the City of Newcastle. It is approximately 90 metres long between Hunter Street and a dead-end at the rail corridor and connects to Tighe Street. Near the site Railway Street is a two way two lane sealed road with kerb and gutter and parking on alternate sides of the road. With a carriageway of generally 8.5 metres in width it has travel lanes approximately 3.2 metres wide and a parking lane approximately 2.0 metres wide. A 50 km/h speed limit applies to this section of road and at the time of inspection Tudor Street was observed to be in good condition. ***Photograph 5*** shows Railway Street near the site southwest of Hunter Street.

Photograph 5 – Railway Street adjoining the site

3.4 Tighe Street

Tighe Street is a local urban road under the care and control of the City of Newcastle. It is approximately 60 metres long between Railway Street and a dead-end at its eastern end. Near the site Railway Street is a two way two lane sealed road with kerb and gutter and parking on alternate sides of the road. With a carriageway of 7.5 metres wide it has travel lanes approximately 2.4 metres wide and a parking lane approximately 1.8 metres wide. A 50 km/h speed limit applies to this section of road and at the time of inspection Tighe Street was observed to be in good condition as seen in ***Photograph 6*** below.

Photograph 6 – Tighe Street adjoining the site

4.0 ROAD NETWORK IMPROVEMENTS

The proposed and constructed road works for the Newcastle Light Rail and the proposed and implemented public bus and train Newcastle Interchange are operating well at present. Since their implementation there have been no further road network changes proposed that will improve the traffic flow conditions near the site.

5.0 TRAFFIC VOLUMES

For this assessment previous 2019 and 2029 peak hour traffic volumes determined for the Hunter Street / Tudor Street / Railway Street intersection have been utilised. GHD have provided the data sourced from their Paramics model for the road network in this location, which was utilised for the recent assessment of the Newcastle Transport Interchange at Wickham and includes a simulated prediction of traffic at the intersection. It has been accepted by Newcastle City Council and TfNSW and is considered relevant for use for analysis of the traffic impacts of the proposed development.

The GHD traffic data provided is presented in ***Attachment B***.

The 2019 two-way mid-block peak hour traffic volumes determined from the traffic data were:

- Hunter Street – west of Railway Street - 962 vtph AM and 993 PM,
- Hunter Street – east of Railway Street – 1,262 vtph AM and 1,251 PM,
- Tudor Street – southwest of Railway Street - 701 vtph AM and 625 PM, and
- Railway Street – north of Hunter Street - 79 vtph AM and 39 PM

The 2029 two-way mid-block peak hour traffic volumes determined from the traffic data were:

- Hunter Street – west of Railway Street – 1,143 vtph AM and 1,127 PM,
- Hunter Street – east of Railway Street – 1,409 vtph AM and 1,286 PM,
- Tudor Street – southwest of Railway Street - 796 vtph AM and 728 PM, and
- Railway Street – north of Hunter Street - 95 vtph AM and 49 PM

The 2019 and 2029 volumes have each been increased by a 2.0% per annum background traffic growth rate for a further 2 years to determine the 2021 and 2031 AM and PM peak traffic volumes and have been presented in ***Table 1*** below. It is noted this is 0.5 % per annum higher than the background traffic growth used by TfNSW in their lower Hunter traffic modelling therefore is considered a conservative assumption for traffic impact analysis.

Table 1 – Predicted 2021 and 2031 mid-block peak hour traffic volumes

Road	Section	2021 AM peak vtph	2021 PM peak vtph	2031 AM peak vtph	2031 PM peak vtph
Hunter Street west	west of Railway Street	1001	1033	1189	1173
Hunter Street east	east of Railway Street	1313	1302	1466	1338
Tudor Street	southwest of Railway Street	729	650	828	757
Railway Street	north of Hunter Street	82	41	95	51

For the purposes of the assessment the 2021 and 2031 peak hour traffic volumes in Tighe Street are assumed to be the 30 vehicles less than Railway Street volumes which again is considered a conservative estimate.

The volumes as presented above in ***Table 1*** are considered relevant for the report and are utilised for the assessment.

6.0 ROAD CAPACITY

The capacity of the road network is generally determined by the capacity of intersections. However, the *RTA's Guide to Traffic Generating Developments* provides some guidance on mid-block capacities and likely levels of service. For urban roads *Table 4.3* of the *RTA's Guide to Traffic Generating Developments*, reproduced below, provides guidance on mid-block capacities for a LoS C.

Table 4.3
Typical mid-block capacities for urban roads with interrupted flow

Type of Road	One-Way Mid-block Lane Capacity (pcu/hr)	
Median or inner lane:	Divided Road	1,000
	Undivided Road	900
Outer or kerb lane:	With Adjacent Parking Lane	900
	Clearway Conditions	900
	Occasional Parked Cars	600
4 lane undivided:	Occasional Parked Cars	1,500
	Clearway Conditions	1,800
4 lane divided:	Clearway Conditions	1,900

Source: - RTA's Guide to Traffic Generating Developments (2002).

Noting that Hunter Street and Tudor Street in this location are four-lane two-way roads with parking lanes therefore would have a one-way mid-block capacity of at least 1,800 vtph and a two-way mid-block capacity of 3,600 vtph for a LoS C from the above table. Similarly, Railway Street and Tighe Street as two-lane two way roads with limited on-street car parking would have a one-way mid-block capacity of at least 600 vtph and a two-way mid-block capacity of 1,200 vtph for a LoS C from the above table.

From the traffic data sourced and calculated in ***Section 5*** and noting the likely technical two-way mid-block road capacity of Hunter Street, Tudor Street, Railway Street and Tighe Street are well in excess of the 2021 peak hour traffic volumes and predicted 2031 peak hour traffic volumes on the road network, it is considered that the adjacent road network is operating within its technical capacity and has scope to cater for additional traffic generated by some new development.

Therefore, the mid-block road capacity of 3,600 vtph for Hunter Street and Tudor Street, as two-way four-lane urban roads and 1,200 vtph for Railway Street and Tighe Street, as two-way two-lane urban roads with on-street car parking constraints, have been adopted for this assessment.

7.0 ALTERNATE TRANSPORT MODES

Newcastle Transport (Keolis Downer) operates bus, rail, light rail and ferry public transport, for Newcastle Transport, in the Hunter and Lake Macquarie. The Newcastle Transport Interchange, utilised for rail, light rail and bus services is located within convenient walking distance from the development site, approximately 300 metres east of the site. In addition, bus stops, one for westbound services is located 20 metres opposite the site on the southern side of Hunter Street and another for eastbound services is located 60 metres west of the site on the northern side of Hunter Street, respectively. These services provide access to many commercial areas, educational and medical centres and residential areas within the Newcastle and regional areas.

An extract of the public transport services routes map is shown in ***Figure 2*** below, and the bus stop opposite the site frontage on the southern side of Hunter Street is also shown below in ***Photograph 7***.

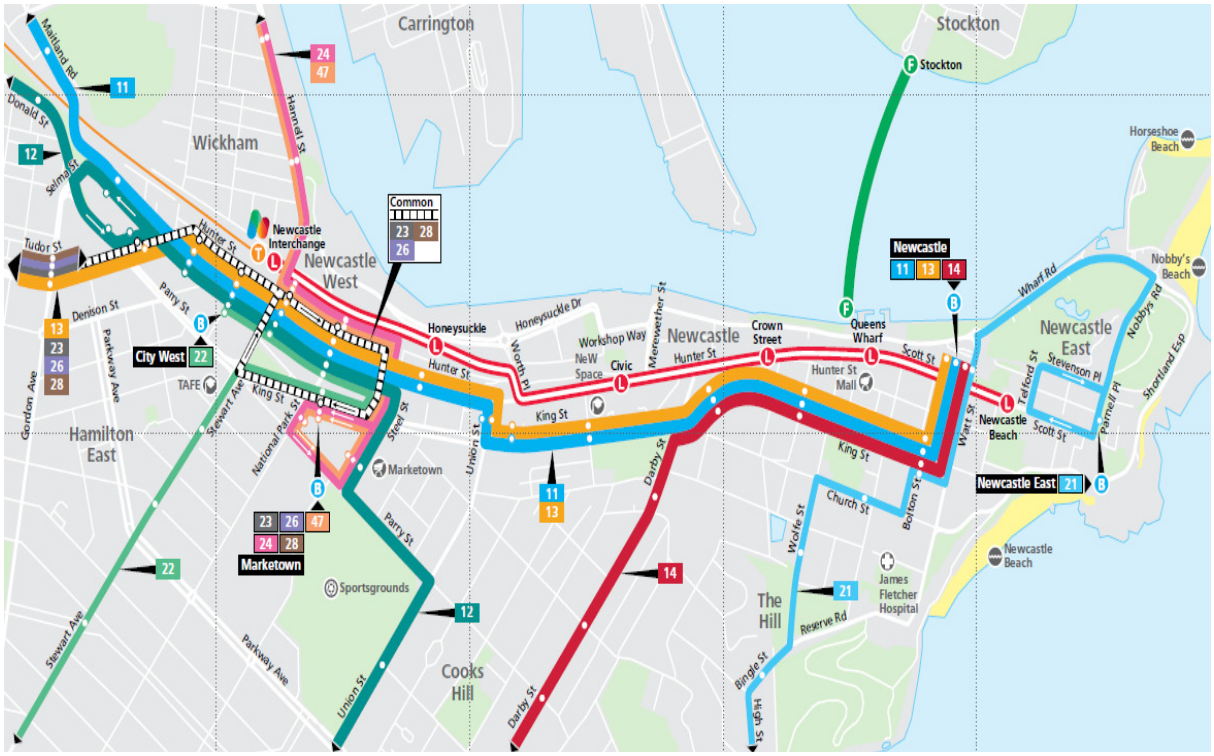


Figure 2 – Keolis Downer bus routes

Photograph 7 – Bus Stop(and footpath) south side of Hunter Street opposite to the site

A review of the route maps and timetables for the bus services indicates that the site is provided with excellent access to public transport. Bus Routes 11 (Newcastle East – Newcastle – Newcastle West – Wickham – Islington – Mayfield – Callaghan – Jesmond – Lambton – New Lambton Heights – Charlestown), 12 (Newcastle East – Newcastle – Newcastle West – Wickham – Hamilton – Georgetown – Waratah – North Lambton – Wallsend) and 13 (Newcastle East – Newcastle – Newcastle West –– Hamilton – Broadmeadow New Lambton – New Lambton Heights – Cardiff Heights – Cardiff – Glendale) travel past the site along Hunter Street. The services also provide access to other bus services, which connect to various suburbs throughout Newcastle, the Newcastle Airport, and the Stockton ferry service at Queens Wharf.

As shown in the above ***Photograph 7***, a full width concrete / brick paver surface footpath approximately 3.7 metres exists opposite the development site on Hunter Street whilst ***Photograph 8*** shows the full width concrete footpath on the north side of Hunter Street fronting the development. The Hunter Street footpaths connect to a network of pedestrian footpaths further east and west along Hunter Street and to a number of cross streets including Tudor Street, Railway Street via kerb ramps, signalised and / or marked road crossings near and adjacent to the site. These pedestrian footways and crossings facilitate safe crossing of Hunter Street, Tudor Street and Railway Street providing pedestrian access to the bus stops and other local retail and commercial areas. A number of these are shown in ***Photographs 9 and 10*** below.

The nearest on-road cycleways are 280 metres southeast of the site on both sides of Stewart Avenue at its intersection with Hunter Street connecting north and south of the intersection to on-road cycleways at the Stewart Avenue signalised intersection with Honeysuckle Drive and King Street, respectively. The cycleways connect to the Newcastle Harbour Foreshore off-road cycleways at Honeysuckle Drive, which connect north running parallel to Hannell Street and east running parallel to Honeysuckle Drive. The off-road cycleway provides connection to the Newcastle foreshore and beaches and other western suburbs of Newcastle through the Newcastle cycle path network. The cycleways together with the footpaths, road crossing facilities, bus, and train transport services provide the site with excellent alternate transport modes of travel infrastructure and services.

Photograph 8 – Pedestrian footpath- Hunter Street - fronting the site

Photograph 9 – Marked and signalised crossings – Hunter Street and Tudor Street

Photograph 10 – Signalised crossing – Railway Street at Hunter Street

8.0 DEVELOPMENT PROPOSAL

The proposal involves the demolition of the existing site buildings and the construction of a multi-level commercial / residential complex comprising a 30 storey retail commercial / residential tower, a 25 storey retail commercial / residential tower, and a 6 storey office commercial tower with associated parking.

The development concept plans are shown in ***Attachment A***.

Specifically, the development involves:

- The demolition of the two existing commercial buildings and associated earthworks,
- A 349 bedroom residential development comprising:
  - 36 – 1 bedroom apartments,
  - 128 – 2 bedroom apartments,
  - 19 – 3 bedroom apartments, and
- A total commercial development comprising:
  - 1,944 m^2 of retail and office commercial area.
- Car parking of 237 car spaces over five levels (Ground to Level 4),
- Resident bike and storage areas of 350 m^2 on Levels 1 and 2,
- The construction of a single combined entry / exit vehicular access 6 metres wide via Tighe Street at the northern side of the site; and
- The construction of drainage and landscaping.

9.0 TRAFFIC GENERATION

The *RTA's Guide to Traffic Generating Development's* provides specific advice on the traffic generation potential of various land uses. However, regarding high density residential flat buildings, the then RMS issued a Technical Direction TDT 2013/04 in May 2013 that provided updated traffic generation rates for certain development types including residential flat buildings.

Therefore, the relevant land use traffic generation rates applied in this assessment are:

Residential Flat Buildings

Weekday Rates	Sydney Average	Sydney Range	Regional Average	Regional Range
AM peak (1 hour) vehicle trips per unit	0.19	0.07-0.32	0.53	0.39-0.67
AM peak (1 hour) vehicle trips per car space	0.15	0.09-0.29	0.35	0.32-0.37
AM peak (1 hour) vehicle trips per bedroom	0.09	0.03-0.13	0.21	0.20-0.22
PM peak (1 hour) vehicle trips per unit	0.15	0.06-0.41	0.32	0.22-0.42
PM peak (1hour) vehicle trips per car space	0.12	0.05-0.28	0.26	0.11-0.40
PM peak (1 hour) vehicle trips per bedroom	0.07	0.03-0.17	0.15	0.07-0.22
Daily vehicle trips per unit	1.52	0.77-3.14	4.58	4.37-4.78
Daily vehicle trips per car space	1.34	0.56-2.16	3.22	2.26-4.18
Daily vehicle trips per bedroom	0.72	0.35-1.29	1.93	1.59-2.26

Café / Restaurants

- *Daily vehicle trips – 60 per 100 m^2 GFA and evening peak hour – 5 per 100 m^2 GFA.*

Commercial Developments

- *Daily vehicle trips – 10 per 100 m^2 GFA and evening peak hour – 2 per 100 m^2 GFA.*

Therefore, the following peak hour traffic generation calculations can be undertaken for the proposed development noting traffic impact assessment is based on peak hour traffic volumes and average regional rates are used due to the site being within the Newcastle City Centre area with excellent access to existing and future public transport.

Commercial & Café / Restaurant space (AM & PM) = 580 m^2 / 100 m^2 x 5 vtph + 1364 m^2 / 100 m^2 x 2 vtph = 57 vtph;

Residential apartments (AM) = 349 x 0.21 = 74 vtph; and

Residential apartments (PM) = 349 x 0.15 = 53 vtph.

Therefore, the total peak hour traffic volumes generated by the proposed development are;

Peak hour traffic generation (AM) = 74 + 57 = **131 vtph** (rounded up)

Peak hour traffic generation (PM) = 57 + 53 = **110 vtph** (rounded up).

10.0 TRIP DISTRIBUTION

Before carrying out any traffic assessment the additional peak hour traffic generated by the development needs to be distributed through the adjoining road network. This involves making assumptions as to distribution patterns to and from the development based on likely origin / destinations and trip making decision making. In this case the traffic distribution from the development has been determined as follows:

- In the AM peak 80% outbound and 20% inbound trips will occur for the residential component, which is mirrored for the commercial component.
- In the PM peak 30% outbound and 70% inbound trips will occur for the residential component, which is also mirrored for the commercial component.
- This equates to 50% inbound and 50% outbound trips for both the AM and PM peak hour period.
- Inbound AM traffic will have origins 45% Hunter Street west, 25% Hunter Street east and 30% southwest of Railway Street, which will be mirrored for the outbound PM traffic,
- Inbound PM traffic will have destinations 35% Hunter Street west, 50% Hunter Street east and 15% southwest of Railway Street, which will be mirrored for the outbound AM peak.

Some variations to the traffic movement assumptions may occur however their impact on the analysis is considered insignificant. Based on the assumptions listed above the resulting predicted peak hour trip distributions for traffic generated by the development is as shown below in ***Figure 3***.

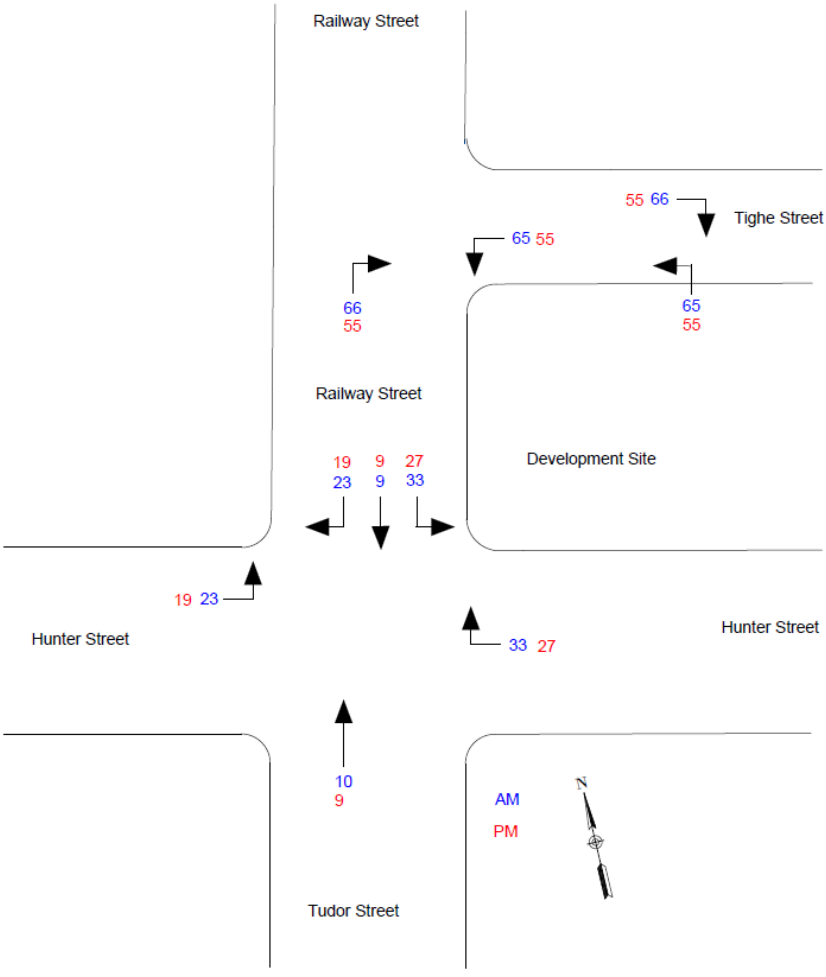


Figure 3 – Development Traffic Trip Distribution

11.0 TRAFFIC IMPACTS OF DEVELOPMENT

The traffic impacts that the development will have on the local road network will include:

- The impact of the additional traffic generated by the development on the capacity of the road network;
- The road safety issues associated with the proposed access to the development; and
- The parking demand generated by the development.

11.1 Road Network Mid-Block Capacity

It has previously been shown in ***Section 6*** of this report that the local and state road network is currently operating within its technical road capacities. The development is likely to generate the addition of up to 154 AM peak hour vehicle trips and 132 PM peak hour vehicle trips. Based on the trip distributions shown in ***Figure 3*** the proposed development is likely to generate the following maximum additional traffic on the local road network.

- Hunter Street west – 46 vtph in the AM and 38 vtph in the PM peak,
- Hunter Street east – 66 vtph in the AM and 54 vtph in the PM peak,
- Tudor Street southwest – 19 vtph in the AM and 18 vtph in the PM peak, and
- Railway Street and Tighe Street – 131 vtph in the AM peak and 110 in the PM peak.

With the addition of this development traffic to the 2021 and 2031 network volumes these road capacity thresholds are not reached. This is demonstrated in ***Table 2*** below.

Table 2 - Road Capacity Assessment

Road	Section	Capacity vtph	2021 AM peak vtph	2021 PM peak vtph	2031 AM peak vtph	2031 PM peak vtph	Development AM	Development PM
Hunter Street west	west of Railway Street	3600	1047	1071	1235	1211	46	38
Hunter Street east	east of Railway Street	3600	1379	1356	1532	1392	66	54
Tudor Street	southwest of Railway Street	3600	748	668	847	775	19	18
Railway Street	north of Hunter Street	1200	213	151	226	161	131	110

Therefore, subject to satisfactory intersection performance this additional traffic will not increase mid-block traffic congestion on the surrounding road network. As such the development will not adversely impact on the mid-block road capacity of Hunter Street, Tudor Street, Railway Street and Tighe Street.

11.2 Intersection Capacity

In assessing intersection performance, the impacts of the development are best assessed using the SIDRA intersection modelling software. This software package predicts likely delays, queue lengths and thus levels of service that will occur at intersections.

For the Hunter Street / Tudor Street / Railway Street Signalised intersection the following assumptions are made in the modelling:

- The intersection layout will remain as per current conditions.
- 2019 and 2029 traffic volumes used in the modelling were as provided by GHD for the Newcastle Transport Interchange development.
- 2021 & 2031 traffic volumes have been predicted from the GHD data using a 2% per annum background traffic growth rate on all roads.
- Traffic generated by the development is distributed as per ***Figure 3.***

Assessment is then based on the level of service requirements of TfNSW as shown below:

Table 4.2
Level of service criteria for intersections

Level of Service	Average Delay per Vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way & Stop Signs
A	< 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays & spare capacity	Acceptable delays & spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity & accident study required
E	57 to 70	At capacity; at signals, incidents will cause excessive delays Roundabouts require other control mode	At capacity, requires other control mode

Source RTA's Guide to Traffic Generating Developments (2002)

The results of the modelling for the intersection are summarised in ***Tables 3 & 4*** below. For signalised intersection models, the Sidra results summary table shows the intersection average delay and level of service and the worst movement degree of saturation and back of queue lengths. The Sidra Movement Summary Tables, showing the parameters for all movements for the models, are provided in ***Attachment C***.

Table 3 – Hunter St / Tudor St / Railway St Intersection AM Sidra Modelling – Results Summary

Model Scenario	Degree of Saturation (v/c)	Average Delay (s)	Average LoS	95% Back of Queue Length (cars)
2021 AM + 60 sec prac. time	0.710	26.0	B	8.7
2021 AM + 80 sec cycle time	0.510	27.7	B	9.9
2021 AM +DEV 60 sec prac. time	0.782	27.9	B	10.3
2021 AM + DEV 80 sec cycle time	0.568	29.2	C	11.2
2031 AM + DEV 60 sec prac. time	0.870	30.6	C	13.6
2031 AM + DEV 80 sec cycle time	0.625	29.4	C	13.1

Table 4 – Hunter St / Tudor St / Railway St Intersection – PM Sidra Modelling – Results Summary

Model Scenario	Degree of Saturation (v/c)	Average Delay (s)	Average LoS	95% Back of Queue Length (cars)
2021 PM + 60 sec prac. time	0.591	22.4	B	7.3
2021 PM + 80 sec cycle time	0.462	25.0	B	9.0
2021 PM +DEV 60 sec prac. time	0.658	23.7	B	8.9
2021 PM + DEV 80 sec cycle time	0.514	26.2	B	10.4
2031 PM + DEV 60 sec prac. time	0.709	23.6	B	9.5
2031 PM + DEV 80 sec cycle time	0.552	26.3	B	11.1

The modelling shows that the Hunter Street / Tudor Street / Railway Street signalised intersection would continue to operate satisfactorily with the development traffic in 2021 and through to 2031 in both the AM and PM peak periods. The intersection operates at a LoS B or LoS C, with approximately a 4 second increase in intersection average delay and up to 4 vehicles increase in queue lengths for any movements, for all modelling cases.

It is concluded that the modelling demonstrates, that with the additional development traffic of the proposal there is a small increase in the key parameters analysed in the Sidra modelling. Therefore, as the development causes minor impacts at the Hunter Street / Tudor Street / Railway Street Signalised T-intersection no upgrade works are warranted and it is reasonable to conclude the development does not adversely impact on the operation of the intersection.

To assess the performance of the Railway Street / Tighe Street T-intersection and the Tighe Street car park access the below table taken from Austroads *Guide to Traffic Management – Part 6 – Intersections, Interchanges & Crossings (2009)* for which the guide states a detailed analysis to demonstrate adequate capacity is available is unlikely to be necessary as uninterrupted flow conditions would prevail, is utilised.

Major road type[1]	Major road flow (vph)[2]	Minor road flow (vph)[3]
Two-lane	400	250
	500	200
	650	100
Four-lane	1000	100
	1500	50
	2000	25

Notes:

1. Major road is through road (i.e. has priority).
2. Major road flow includes all major road traffic with priority over minor road traffic.
3. Minor road design volumes include through and turning volumes.

Source: - Austroads Guide to Traffic Management – Part 6 – Intersections, Interchanges & Crossings (2009)

The maximum 2031 post development two-way traffic on each of the streets at the two intersections are as follows:

- Railway Street / Tighe Street – 226 vtph / 161 vtph, and
- Tighe Street car park access – 226 vtph / 131 vtph.

The volumes for each of the intersections are all within the thresholds in the table and therefore both intersections will operate with uninterrupted flow conditions. Therefore, the constructed standard BAR / BAL road T-intersections will be satisfactory, and the proposed property access can be constructed as a normal private property urban access, subject to Australian Standards *AS2890.1-2004 Parking facilities – Part 1 - Off-street car parking* requirements described below.

Overall, it can be concluded that the proposed development will not adversely impact on the operation of intersections on the adjoining local and state road network and no upgrades to any other intersections which are all constructed with a high level of intersection control in place will be required due to the development.

Therefore, the proposed development will not adversely impact on the efficiency or effectiveness of the local / state road network.

11.3 Access

The on-site car parks for this development will be accessed via a new combined entry and exit access crossing 6.0 metres wide at Tighe Street to be located approximately 20 metres west of the eastern boundary of the site. Car parking is to be provided on five levels. It is noted a security gate for the car park is proposed suitably set back from the boundary line in Tighe Street.

The car park will provide a total of 233 car spaces. Under Table 3.1 of Australian Standard *AS2890.1-2004 Parking facilities – Part 1 - Off-street car parking* a car park between 101 and 300 parking spaces accessed via a local road providing residential, domestic and employee parking (Class 1A) is required to have a Category 2 access facility. A Category 2 access facility requires a combined entry / exit driveway between 6m and 9 m wide. Currently the access is proposed as a combined entry / exit driveway 6 metres wide therefore complies with the minimum requirements of the Australian Standard (AS2890.1-2004).

The provision of a category 2 access as described above will also ensure suitable pedestrian and vehicular sight lines in accordance with the Australian Standard (AS2890.1-2004) exists for exiting vehicles. Vehicular sight lines from the proposed access have been observed to be in excess of the AS2890.1-2004 requirement of a minimum of 45 metres within a 50 km/h speed zone (*Figure 3.2 of AS2890.1-2004*).

It is noted that in the upper levels of the car park the ramps are not fully compliant with the width requirements of AS2890.1-2004 when vehicle clearances are considered for vehicles passing at the top and bottom of ramps as well as mid ramp. As traffic volumes in the upper levels are significantly less and therefore the risk of vehicles passing each other is low it is considered a minor variation to AS2890.1 – 2004 requirements is acceptable.

It is therefore concluded the proposed car park access arrangements are suitable to service the development and complies with Newcastle City Council and Australian Standard requirements.

11.4 On-site Parking

With regard to on-site parking the proposal is generally required to comply with *Chapter 7.03 Traffic Parking and Access* of Newcastle City Council's DCP (2012). The assessment is to be undertaken on the Newcastle City Centre as the site is within the Newcastle City Centre area identified within the Newcastle LEP (2012). The peak parking demand rates applicable to this development as residential, retail and commercial premises specified within Council's DCP are as follows:

Residential Flats

Car parking	*0.6 spaces per dwelling – small (<75 m^2 or 1 bedroom);*
	0.9 spaces per dwelling – medium (75 m^2 – 100 m2 or 2 bedrooms);
	1.4 spaces per dwelling – large (>100 m^2 or 3 bedrooms);
	1 space for the first 3 dwellings plus 1 for every 5 thereof for visitors.
Bike parking	*1 space per dwelling + 1 space per 10 dwellings (Class 3) for visitors.*
Motorbike parking	*1 space per 20 car spaces.*

Except for residential development

Car parking for development in the Newcastle City Centre is provided at the rate of:

	1 spaces per 60 m^2 gross floor area.
Bike parking	*1 space per 20 staff (Class 2).*
Motorbike parking	*1 space per 20 car spaces.*

Using the above rates, the following car parking requirement for the proposed development can be calculated as shown below:

Residential car parking spaces	*36 x 0.6 +128 x 0.9 +19 x1.4*		*= 163.4*
Visitor parking spaces	*1 (first 3 units) + 36 (180 units / 5)*		*= 37*
Commercial parking spaces	*1944 m^2 / 60*		*= 32.4*
		Total	*= 232.8 (say 233)*
Residents bike parking spaces	*183 dwellings / 1*		*= 183*
Visitor bike parking spaces	*183 dwellings / 10*		*= 18.3*
Commercial bike parking spaces	*40 staff / 20*		*= 2*
Motorbike parking spaces	*233 / 20*		*= 11.65*

The proposed development provides 237 on-site car parking spaces as below:

- Ground floor level - 30 car parking spaces including 2 access spaces plus 5 motorcycle spaces and 7 bike capacity bicycle racks;
- 1st floor level - 36 car parking spaces, 3 motorcycle spaces and 12 bike capacity bike racks;
- Second floor level – 60 car parking spaces, 2 motorcycle spaces and 15 bike capacity bike racks;
- Third floor level – 56 car parking spaces, 3 motorcycle spaces and 14 bike capacity bike racks; and
- Fourth floor level - 55 car parking spaces, 3 motorcycle spaces and 15 bike capacity bike racks

The total off-street parking spaces provided in the development therefore is compliant with the DCP representing a small 4 space excess on DCP requirements. The proposal also provides 16 motorcycle spaces which is 4 spaces in excess of the DCP requirement while the development is also considered to provide sufficient bicycle parking with storage areas provided for residents to store bicycles and up to 63 secure bike racks for use by visitors, commercial tenancies and some residents.

It is noted that the number of residential visitor spaces and the commercial spaces required are 37 and 33 respectively. Given the majority of residential visitor parking would occur in the evenings, when not all the commercial and retail tenancies of the development are operating there will be opportunity to share some of the commercial parking and visitor car parking (residential visitor parking between 6 pm and 8 am) as has been approved by Council previously in a number of similar developments in the City Centre area. The visitor car parking and commercial / retail parking is to be provided on the ground level and the 8 stacked spaces on level 1, with the stacked spacing being assigned to a single tenancy for staff parking. This means a total of 16 spaces will be full-time commercial parking. The remaining 22 spaces on ground level will be assigned as follows;

- 2 accessible spaces – commercial visitor car parking
- 10 spaces – full-time residential visitor car parking; and
- 10 spaces – shared commercial and residential visitor car parking.

This allows a total of 28 commercial parking spaces (staff and visitor) and 10 residential visitor car parking to be available between 8 am and 6 pm and 18 commercial parking spaces (staff and visitors) and 20 residential visitor car parking spaces to be available between 6pm and 8am. Therefore at peak parking demand times this represents a small deficiency on commercial parking (15%) as well as a residential visitor car parking deficiency of 46%. Council has previously set precedent in the Newcastle City Centre area by allowing a number of residential developments with large residential visitor car parking requirements to reduce their visitor car parking requirements by up to 50 % as a way of encouraging public transport use by residential visitors. The residential visitor car parking deficiency in this development is less than 50 % with the car park sharing arrangement therefore is consistent with previous development approvals by Council for similar developments in the area.

It is also important in considering the merits of the proposed car parking allocation to consider the development will also result in the removal of a number of existing redundant kerb cross-overs in both Hunter Street and Railway Street which would be expected to increase on-street car parking availability by up to 4 car spaces likely to benefit commercial and residential visitors of the development. This reduces the deficiencies within the development by assigning 2 each of these parks to commercial and residential visitors to 9 % and 40 %. Overall it is concluded that sufficient on-site car parking is provided within the development. The applicant for this development is also proposing to construct a multi-storey public car park on the property between Tighe Street and the railway line (4 Tighe Street) with work on the design and DA documentation currently underway. Should Council require additional commercial staff or residential visitor car parking for this mixed use development it can be provided on the ground floor of the future public car park on 4 Tighe Street.

Physical on-site construction / layout parking and manoeuvrability should comply with Australian Standard *AS2890.1-2004 Parking facilities – Part 1 - Off-street car parking* and Newcastle City Council's DCP (2012). In regard to the Newcastle DCP this document requires the following;
*Residential Parking area dimensions and parking layout shall comply with Australian Standard 2890.1-2004 User Class 1A - **Bays at 90 degrees** - being 2.4 metres wide (plus 0.3 metres for each side obstructed) and 5.4 metres long, a minimum aisle width of 5.8 metres and a blind aisle 1.0 metres wide shall be provided. Commercial parking requirements would require a minimum car park width of 2.5 metres.* It is noted from the development plans that parking spaces appear to comply with these requirements.

Therefore, a review of the plans indicates the proposed on-site car parking areas can comply with the requirements of *Australian Standard AS2890.1-2004 Parking facilities – Part 1 - Off-street car parking* and therefore the *Newcastle DCP (2012).*

11.5 Servicing

The development has been designed for collection of waste by private contractor. The collection driver will wheel the waste bin(s) from the waste storage area to the separate MRV on-site loading bay accessed via Tighe Street. Emptying will be completed within 10 minutes. Waste collection will be programmed to ensure it is carried out during non-peak traffic generating periods for the development so as not to coincide with large vehicle commercial or retail deliveries. Servicing of the commercial / retail premises is only likely to be infrequent and undertaken by up to small rigid vehicles typically courier vans or medium rigid vehicles with short turnover periods. It is expected they would be able to use the available on-site loading bay or off-street parking supply for deliveries.

It is considered that the waste collection and commercial / retail servicing arrangements proposed for the development are satisfactory and suitable for the development.

11.6 Pedestrian Facilities

The proposed development will generate additional pedestrian traffic as residents and visitors access the site from nearby on-street car parking, bus stops, and shopping areas. A substantial and suitable concrete footpath network, with crossing facilities, already exist within this area therefore it is concluded that no nexus exists for additional pedestrian facilities as a result of this development though Council may require reinstatement of vehicular driveway crossings and upgrading of the footpaths along parts of the frontage of the site.

11.7 Alternative Transport Mode Facilities

The proposed development is likely to generate an increase in patronage of the existing public transport system (buses and rail). It is noted however that the site already has excellent access to public transport with suitably frequent bus routes passing the site with connection to other bus routes and the Newcastle and Hunter rail transport system. Existing bus stops are already located close to the development therefore it is concluded that the existing public transport services and infrastructure near the site is suitable for the development.

The development may generate some increase in bicycle traffic however the small increase in demand generated by this development would not be sufficient for a nexus to exist for the provision of additional external bicycle infrastructure.

12.0 CONCLUSIONS

This traffic and parking assessment for the proposed mixed use development on Lot 2 in DP 445736, Lot 1 in DP 342675, Lots 1 & 2 in DP 1091173, Lot 2 in DP 126, Lot 1 in DP 456088 and Lot 1 in DP 395367, 924 Hunter Street, Newcastle West, has determined the following;

- The proposed development is likely to generate an additional 131 vtph in the AM peak period and 110 vtph in the PM peak period during normal weekdays.
- The local road network around the site has sufficient spare capacity to cater for the development without the need for any upgrading of the road network.
- The increase in traffic generated by the development will not adversely impact on the operation of Hunter Street / Tudor Street / Railway Street intersection and other major intersections near the site.
- The Railway Street / Tighe Street intersection and the Tighe Street development access T will operate with uninterrupted flow conditions.
- The proposed development does not adversely impact on the local or state road network.
- The proposed vehicular access to the site is suitable and complies with *AS2890.1 – 2004 Parking facilities – Part 1 Off street car parking.*
- The proposed development is considered to comply with the requirements of Section 7.03 of Newcastle Council's DCP (2012) in regard to the supply of on-site car parking subject to Council supporting a small deficiency in commercial parking (9%) and a deficiency of 40 % on the provision of residential visitor car parking as a variation to its DCP requirements which is consistent with previous approvals by Council for similar developments in the area. This is considered a valid strategy to encourage the use of public transport travel for staff and customers of the commercial tenancies and visitors to the residential development.
- Suitable bicycle and motorcycle parking areas are provided within the development to meet the requirements of the Newcastle DCP (2012).
- The proposed on-site car parking layout complies with both Australian Standard *AS2890.1 – 2004 Parking facilities – Part 1 Off street car parking* and *Newcastle City Council's Development Control Plan (DCP) No. 12.*
- Garbage collection servicing and commercial servicing arrangements proposed for the development are satisfactory and suitable for use with the development.
- Excellent public transport services already exist to the site and no additional services or infrastructure are required.
- A suitable concrete footpath network with crossing facilities already exists within the vicinity of the development. It is not considered that the external pedestrian traffic generated by the development would be significant enough as to provide a nexus for the provision of additional external pedestrian facilities to the site as the existing infrastructure in the vicinity of the site is considered satisfactory for the scale of development proposed.
- The development may generate some increase in bicycle traffic however the small increase in demand generated by this development would not be sufficient for a nexus to exist for the provision of additional external bicycle infrastructure.

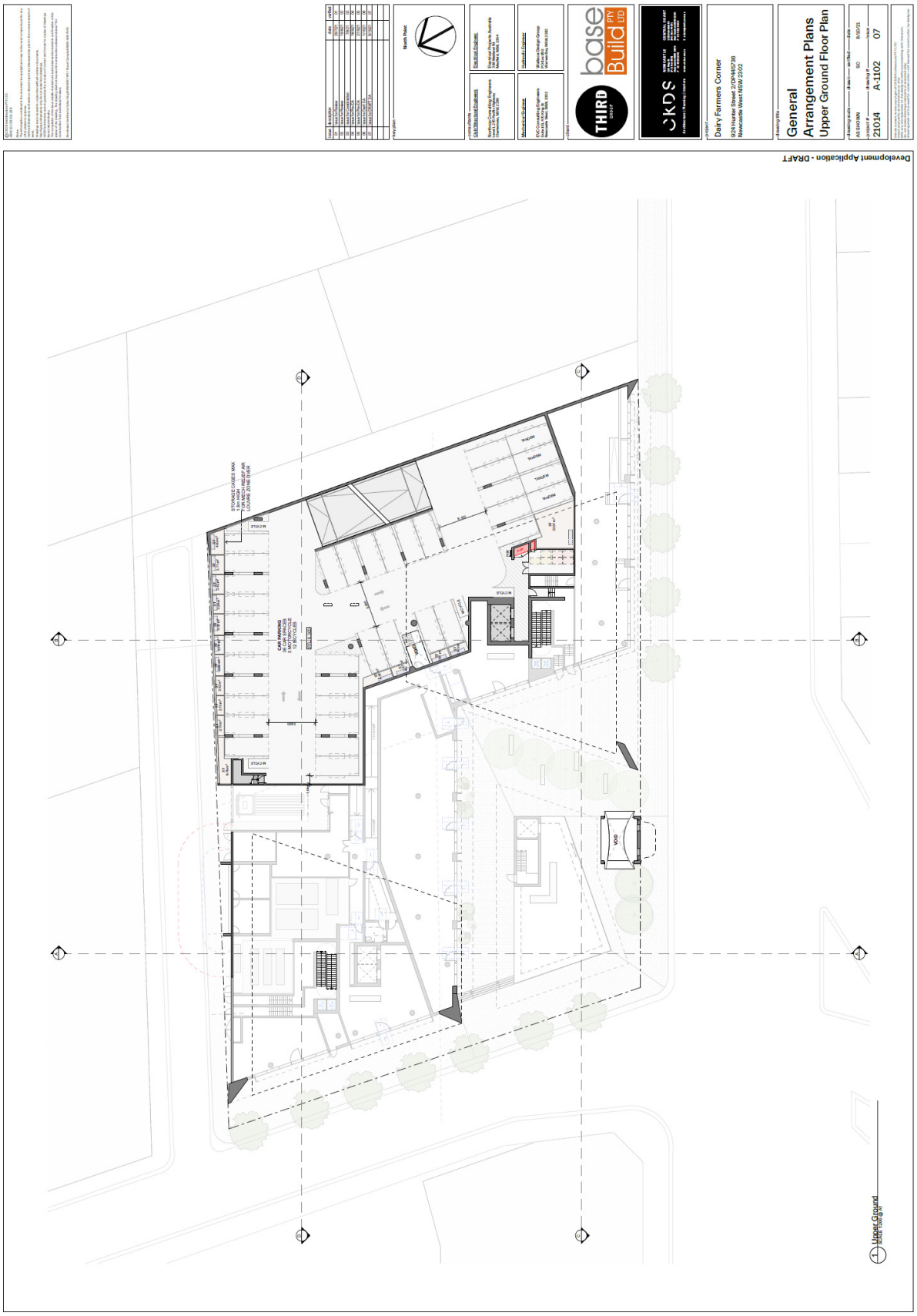
13.0 RECOMMENDATION

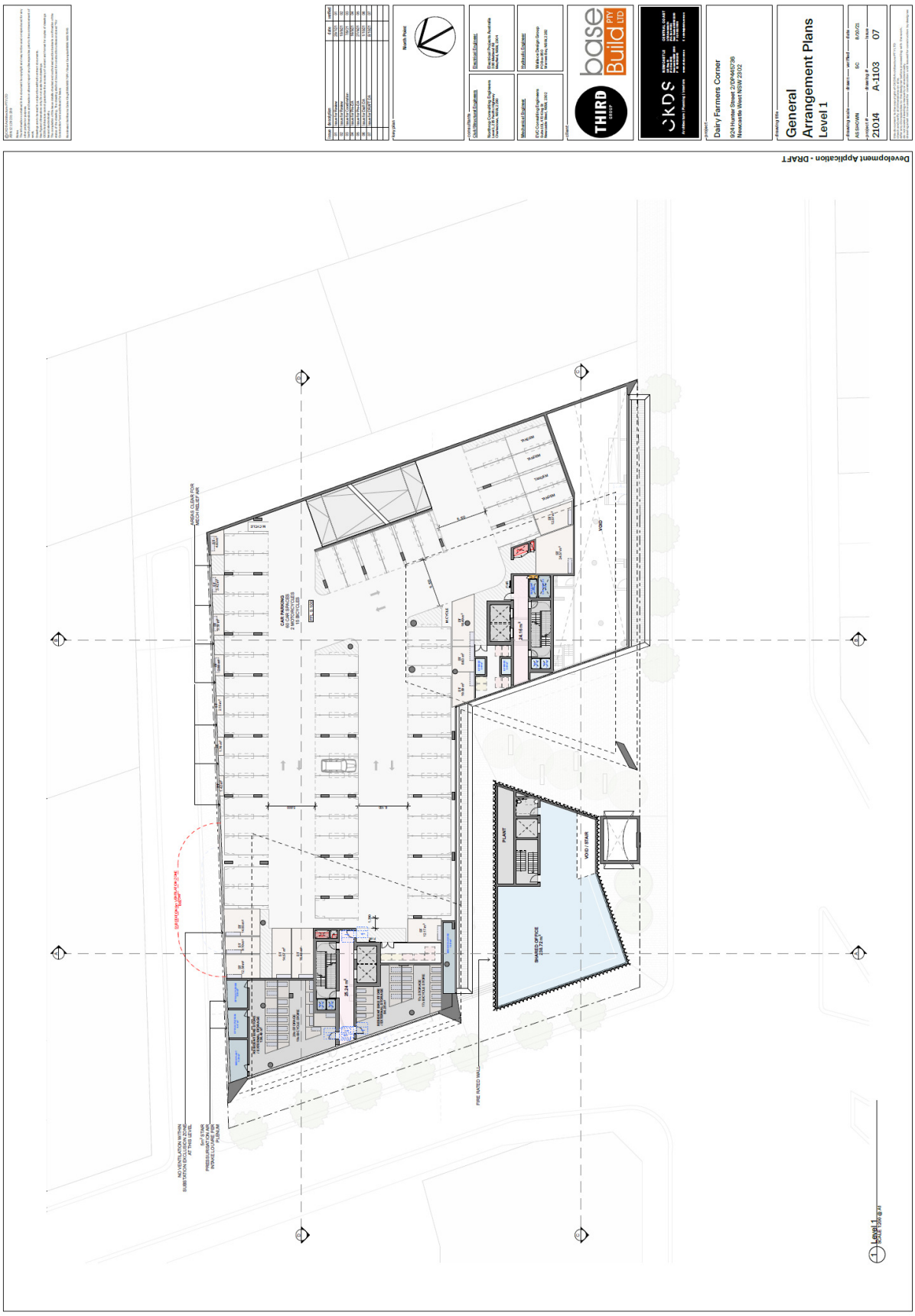
Having carried out this parking assessment for the proposed mixed use development on Lot 2 in DP 445736, Lot 1 in DP 342675, Lots 1 & 2 in DP 1091173, Lot 2 in DP 126, Lot 1 in DP 456088 and Lot 1 in DP 395367, 924 Hunter Street, Newcastle West, it is recommended that the proposal can be supported from a traffic perspective as it will not adversely impact on the local and state road network and complies with the relevant requirements of Newcastle City Council, TfNSW and Australian Standards.

JR Garry BE (Civil), Masters of Traffic
Director
Intersect Traffic Pty Ltd

ATTACHMENT A
DEVELOPMENT PLANS

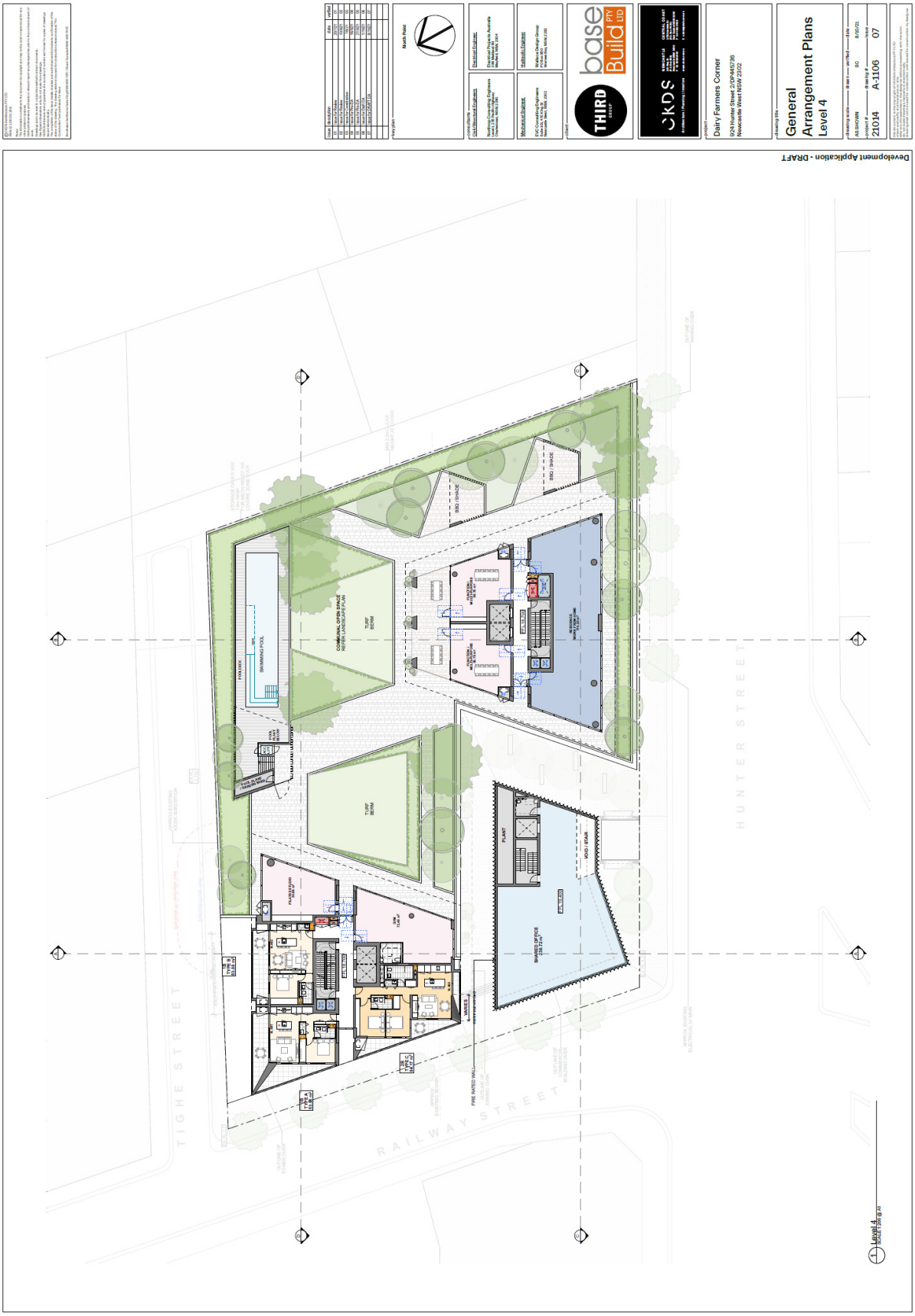
Development Application - DRAFT
TIGHE STREET
RAILWAY STREET
HUNTER STREET
Dairy Farmers Corner
924 Hunter Street 2.09/445736
Newcastle West NSW 2302
General
Arrangement Plans
Ground Floor Plan
21014
A-1101
07

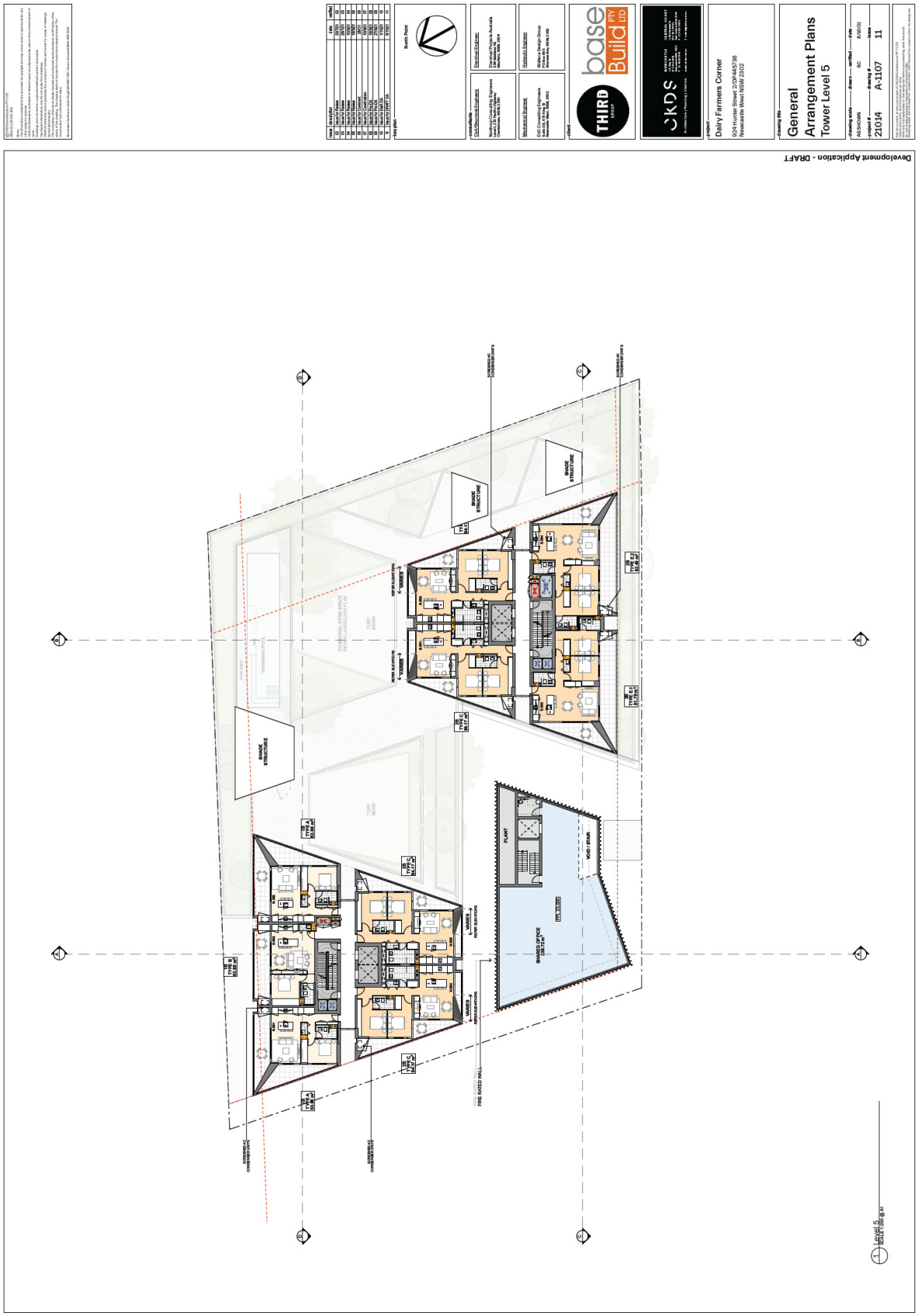

Development Application - DRAFT
Dairy Farmers Corner
924 Hunter Street 2/DP445736
Newcastle West NSW 2302
General
Arrangement Plans
Upper Ground Floor Plan
21014
A-1102
07
Upper Ground

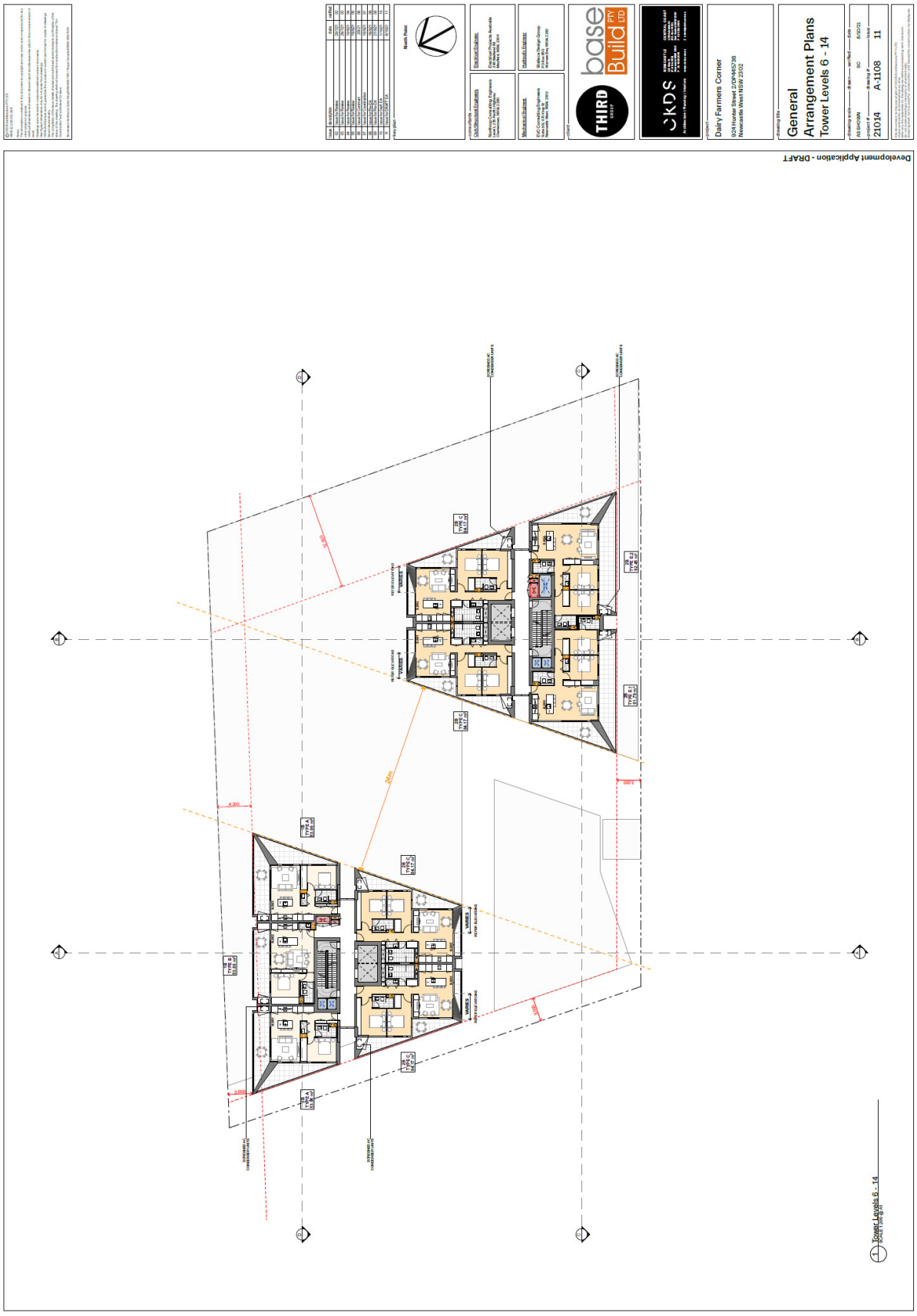

Development Application - DRAFT
General Arrangement Plans
Level 1
Dairy Farmers Corner
924 Hunter Street 2/DP845736
Newcastle West NSW 2302
21014
A-1103
07
Level 1

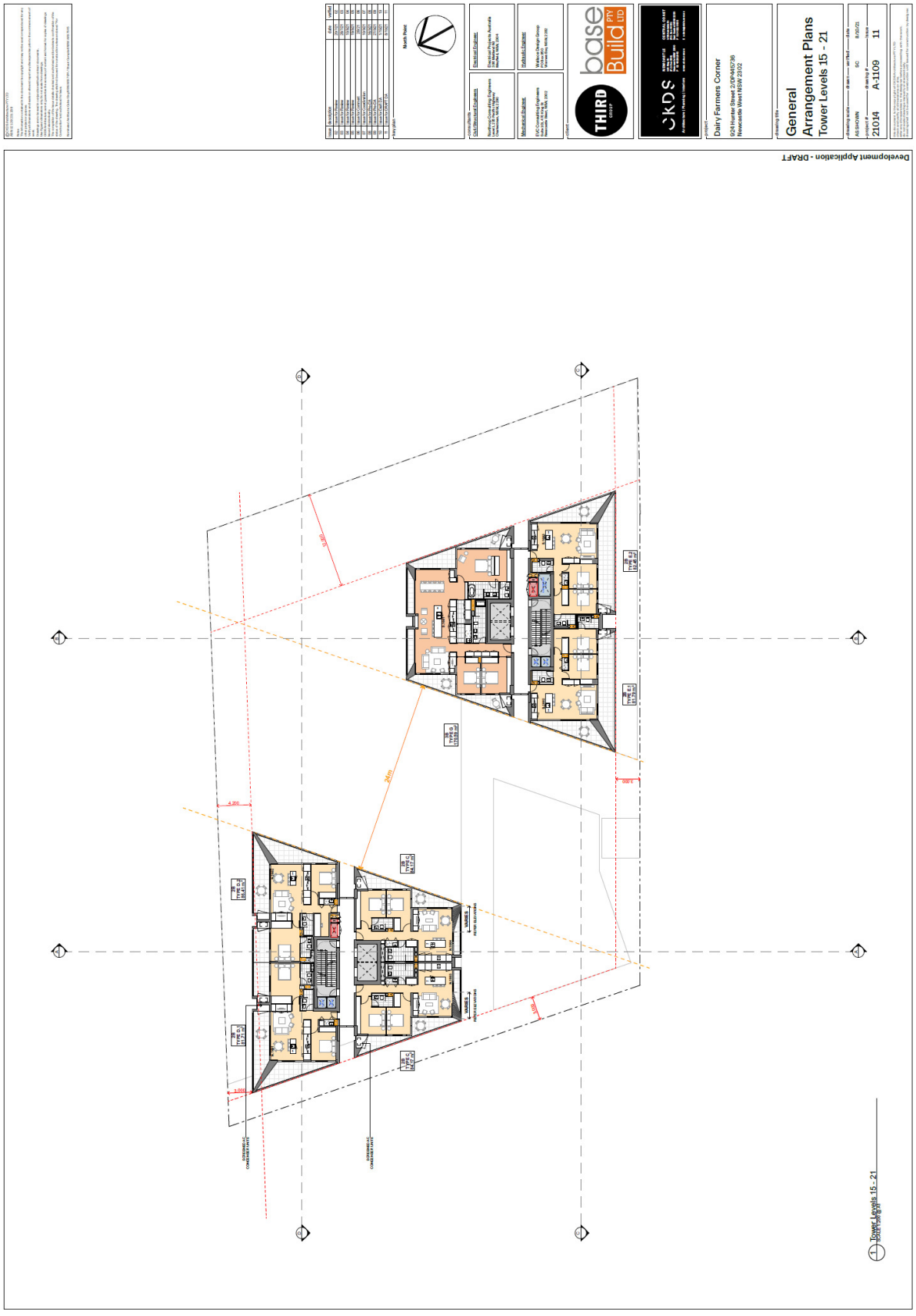
Development Application - DRAFT
Dairy Farmers Corner
924 Hunter Street 2/DP646726
Newcastle West NSW 2302
General Arrangement Plans
Level 2
21014
A-1104
07
Level 2

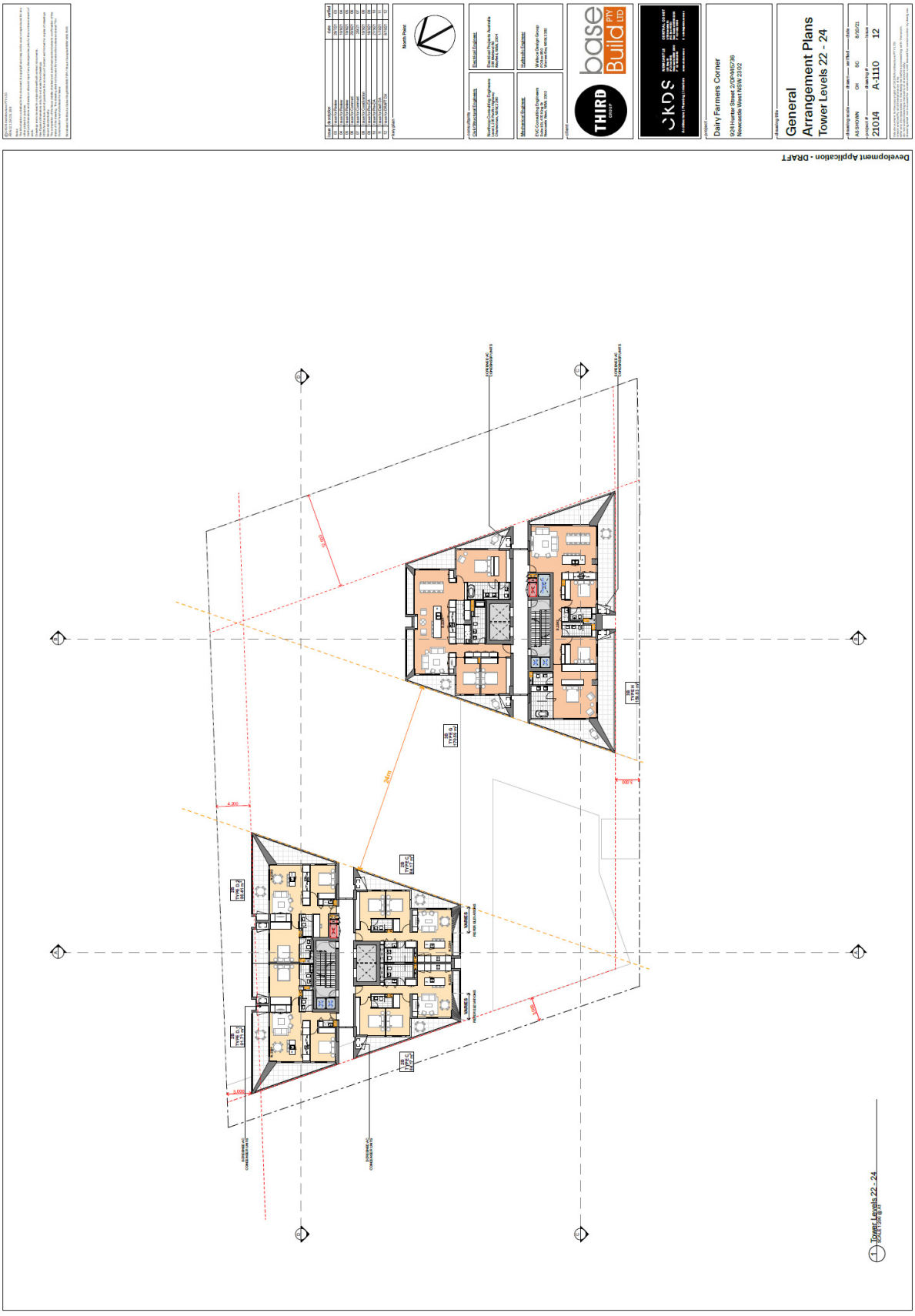
Development Application - DRAFT
Dairy Farmers Corner
924 Hunter Street 2/DP460736
Newcastle West NSW 2302
General Arrangement Plans
Level 3
21014
A-1105
07
CAR PARKING
SHARED OFFICE
PLANT
STORAGE CAGES
FIRE RATED WALL
Level 3

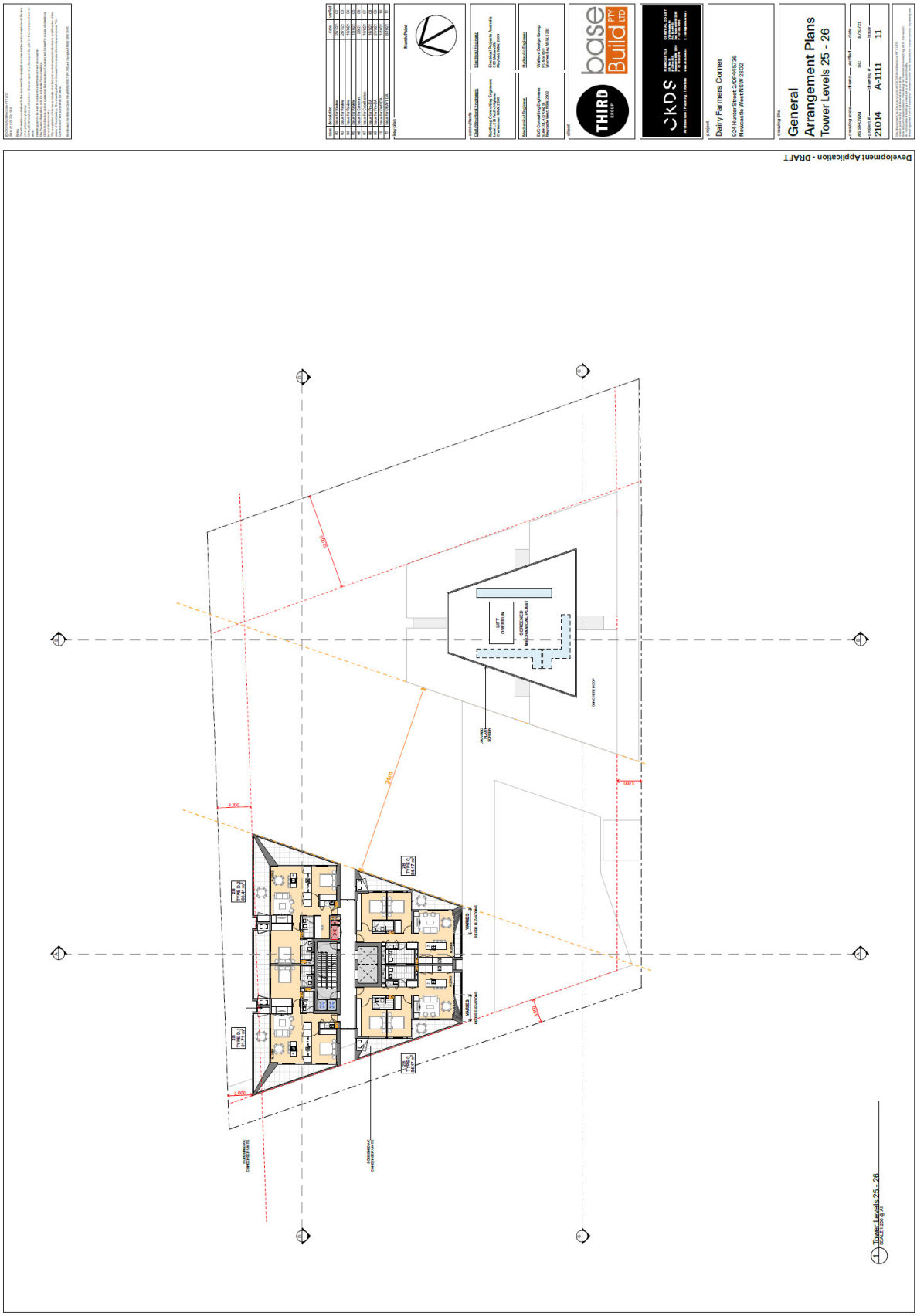

Development Application - DRAFT
General Arrangement Plans
Level 4
Dairy Farmers Corner
924 Hunter Street 2/DP945736
Newcastle West NSW 2302
21014
A-1106
07
HUNTER STREET
RAILWAY STREET
TIGHE STREET
COMMUNAL OPEN SPACE
SWIMMING POOL
TURF BERM
BBQ / SHADE
PLANT
VOID / STAIR
SHARED OFFICE
FIRE RATED WALL
Level 4

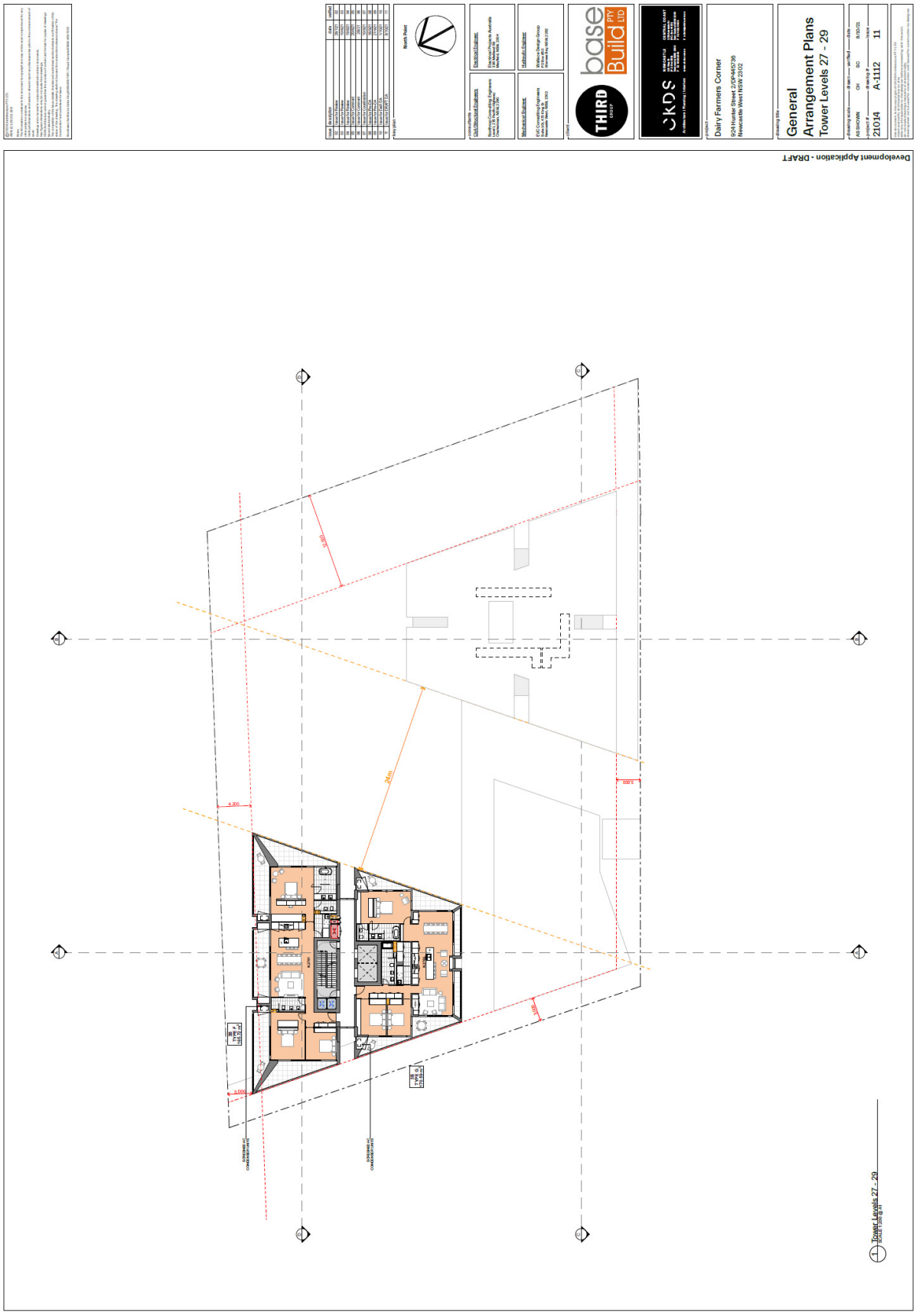

Development Application - DRAFT
General Arrangement Plans
Tower Level 5
Dairy Farmers Corner
924 Hunter Street 2/DP445796
Newcastle West NSW 2302
21014
A-1107
11
Level 5
SCALE 1:100 @ A1

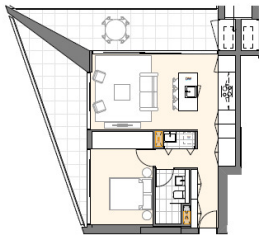

Development Application - DRAFT
General Arrangement Plans
Tower Levels 6 - 14
Dairy Farmers Corner
924 Hunter Street 2/DP845736
Newcastle West NSW 2302
21014
A-1108
11
Tower Levels 6 - 14


Development Application - DRAFT
Dairy Farmers Corner
924 Hunter Street 2/DP465736
Newcastle West NSW 2302
General Arrangement Plans
Tower Levels 15 - 21
AS SHOWN
21014
A-1109
11
Tower Levels 15 - 21

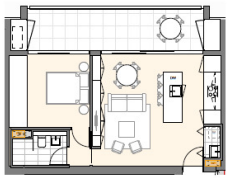

Development Application - DRAFT
Dairy Farmers Corner
924 Hunter Street 2/DP445736
Newcastle West NSW 2302
General
Arrangement Plans
Tower Levels 22 - 24
21014
A-1110
12
Tower Levels 22 - 24


Development Application - DRAFT
Tower Levels 25 - 26
Dairy Farmers Corner
924 Hunter Street 2/DP945736
Newcastle West NSW 2302
General
Arrangement Plans
Tower Levels 25 - 26
21014
A-1111
11
LIFT OVERRUN
SCREENED MECHANICAL PLANT
24m

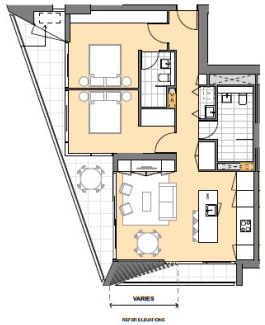

Development Application - DRAFT
Dairy Farmers Corner
924 Hunter Street 2/DP445736
Newcastle West NSW 2302
General
Arrangement Plans
Tower Levels 27 - 29
21014
A-1112
11
Tower Levels 27 - 29



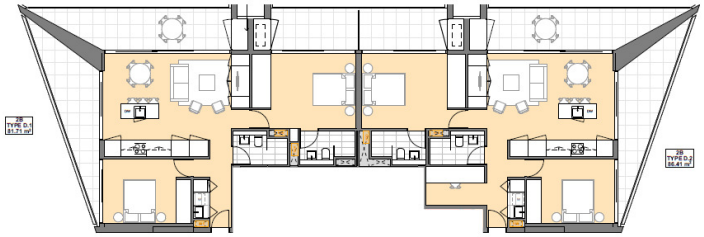
1 UNIT TYPE A - 1B TOWER
SCALE 1:100 @ A1



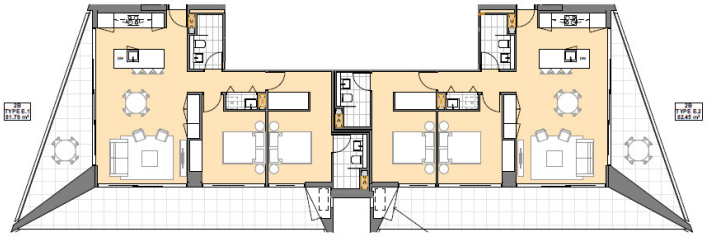
2 UNIT TYPE B - 1B TOWER
SCALE 1:100 @ A1



3 UNIT TYPE C - 2B TOWER
SCALE 1:100 @ A1
LHA SILVER LEVEL UNIT



4 UNIT TYPE D.1 & D.2 - 2B TOWER
SCALE 1:100 @A1



5 UNIT TYPE E.1 & E.2 - 2B TOWER
SCALE 1:100 @ A1

Development Application - DRAFT

issue	description	date	verified
02	Issue for Review	28/7/21	02
03	Issue for Review	10/8/21	03
04	Issue for Review	13/8/21	04
05	Issue for Comment	23/8/21	05
06	Issue for Comment	26/8/21	06
07	Issue for Coordination	10/9/21	07
08	Issue for Pre-DA	16/9/21	08
09	Issue for Pre-DA	27/9/21	09
10	Issue for Draft DA	1/10/21	10
11	Issue for DRAFT DA	8/10/21	11

key plan

consultants

Civil/Structural Engineers
Northrop Consulting Engineers
Level 1, 2 Pacific Highway
Charlestown, NSW, 2290

Electrical Engineer
Electrical Projects Australia
246 Maitland Rd
Mayfield, NSW, 2304

Mechanical Engineer
IVC Consulting Engineers
Suite 2/6, 410 King St
Newcastle West, NSW, 2302

Hydraulic Engineer
Wallace Design Group
PO Box 853
Warners Bay, NSW, 2282

client

THIRD GROUP
base Build PTY LTD

CKDS Architecture | Planning | Interiors
NEWCASTLE
CENTRAL COAST

project
Dairy Farmers Corner
924 Hunter Street 2/DP445736
Newcastle West NSW 2302

drawing title
Unit Plans
Unit Type A - E

drawing scale	drawn	verified	date
AS SHOWN	CH	SC	8/10/21
project #	drawing #		issue
21014	A-1201		11

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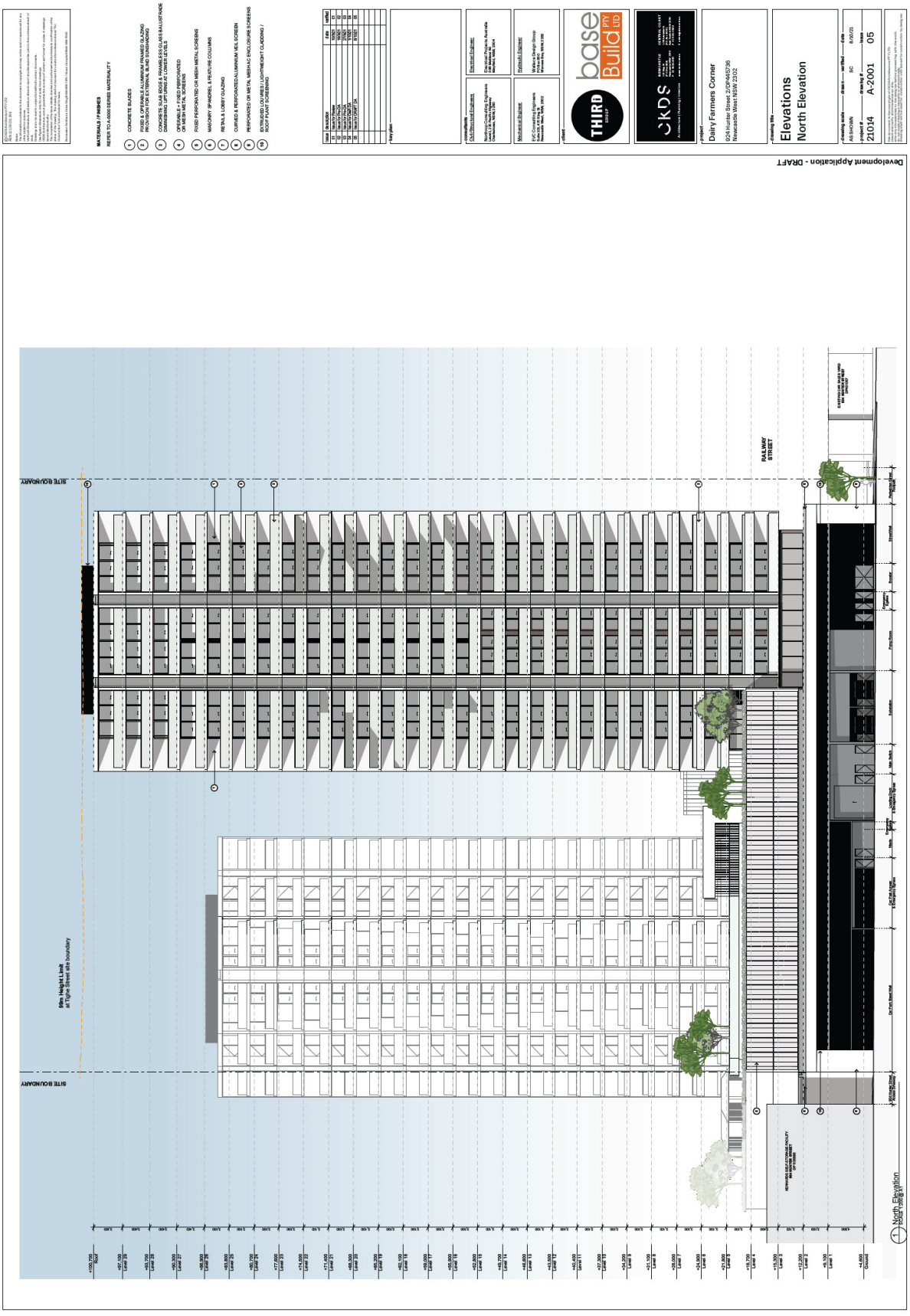
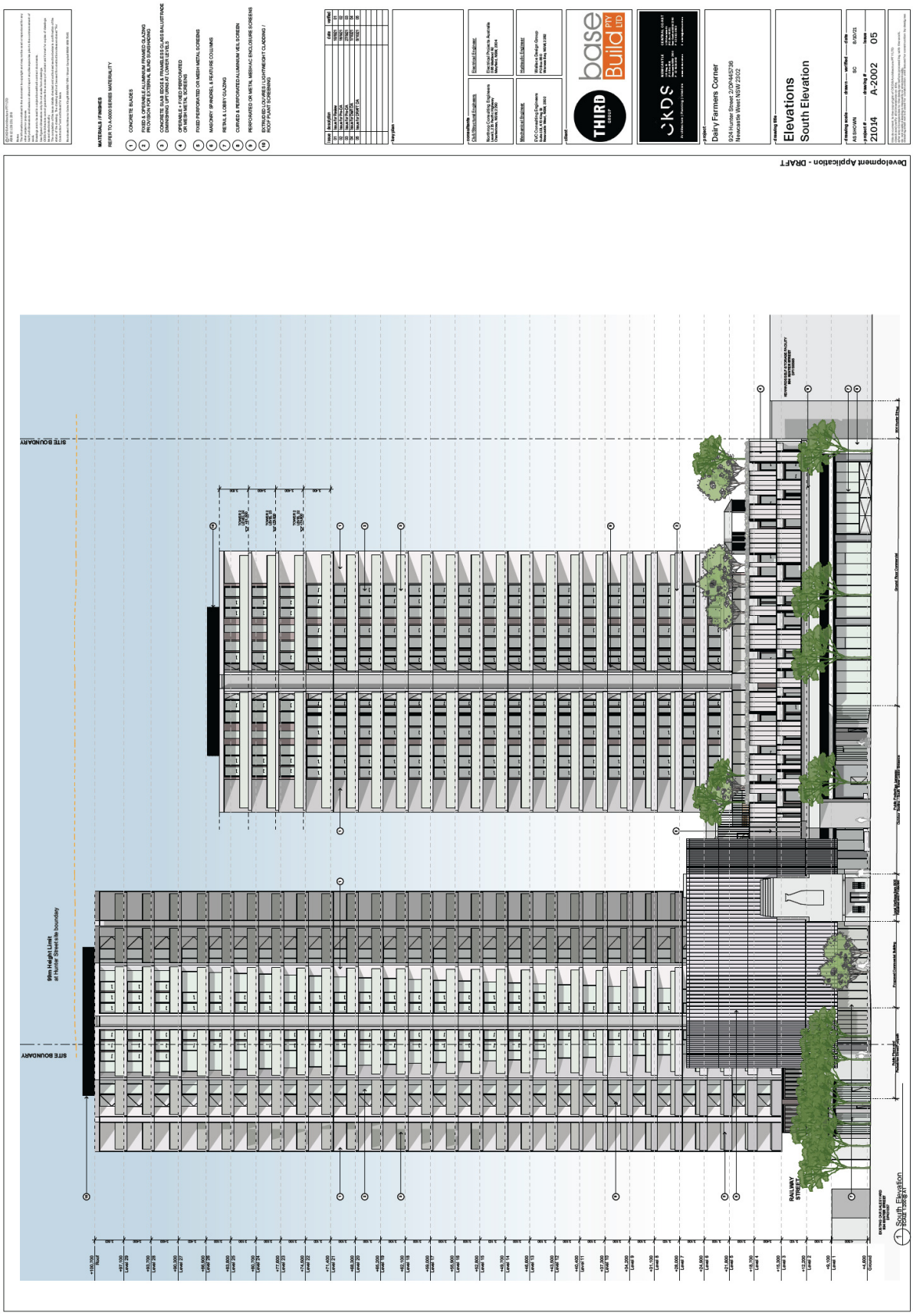
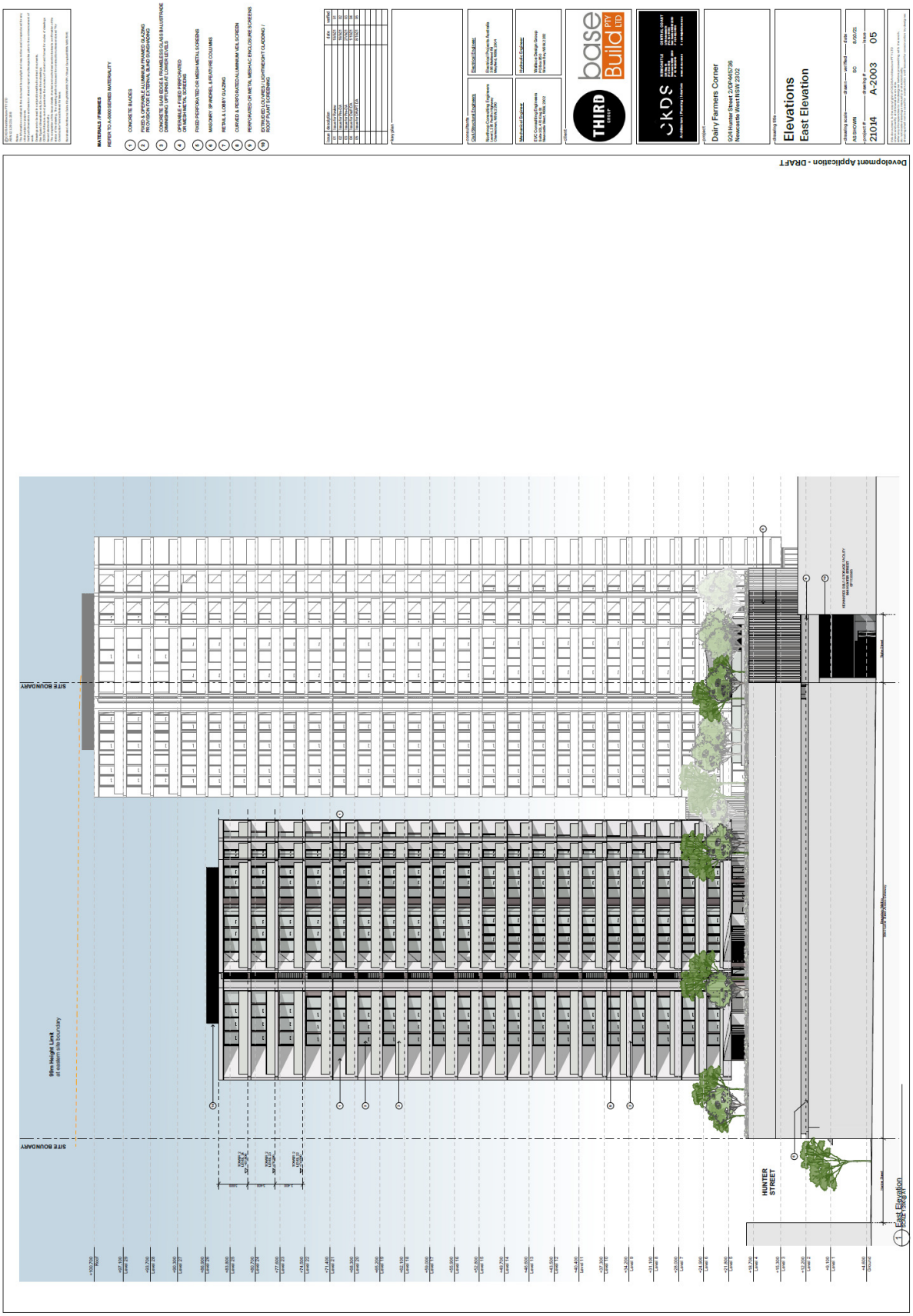
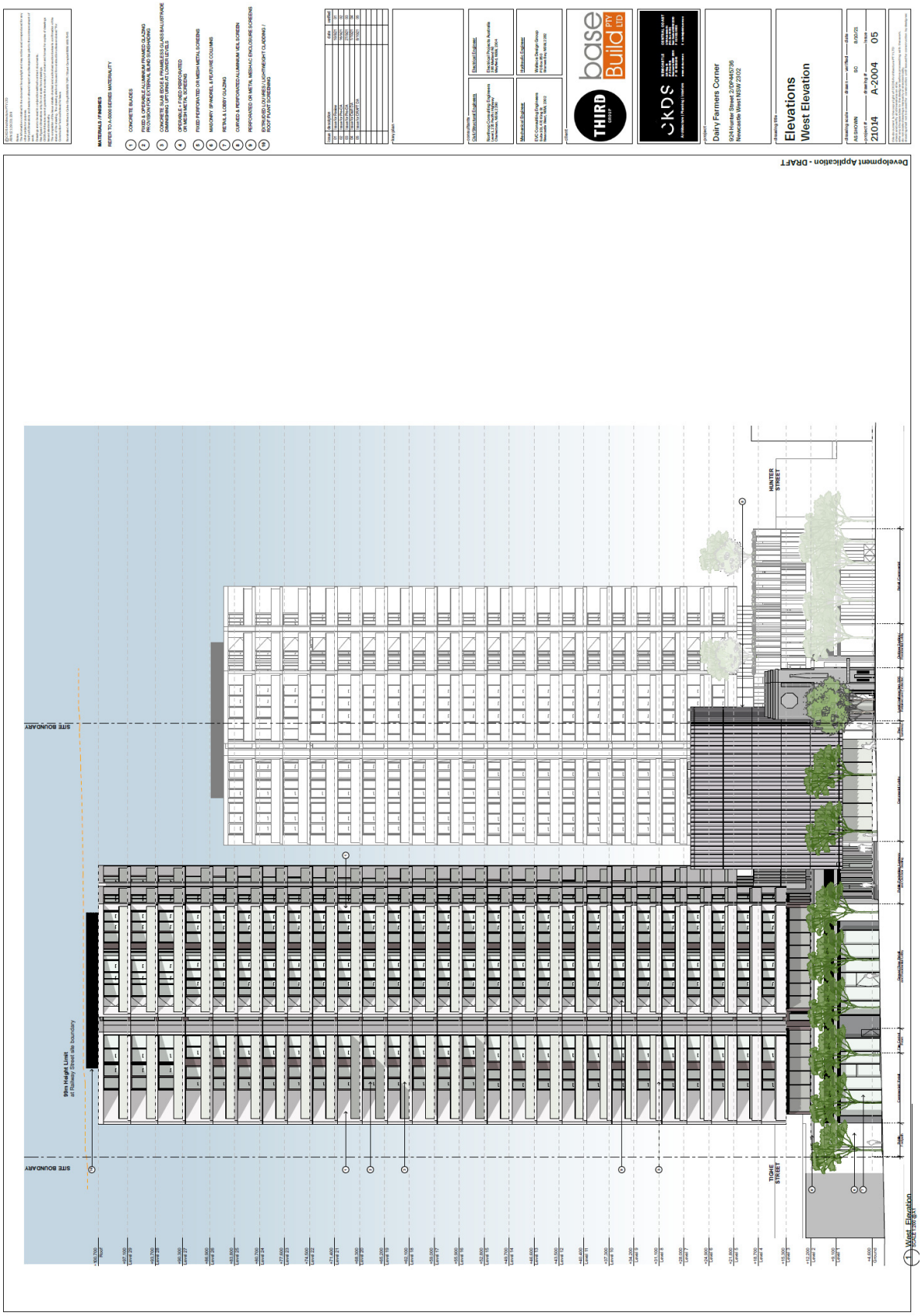
check and verify all dimensions on site
refer any discrepancies to the design on before proceeding with the work
this drawing is to be read in conjunction with all relevant
drawing signed not to scale for consultation only developing

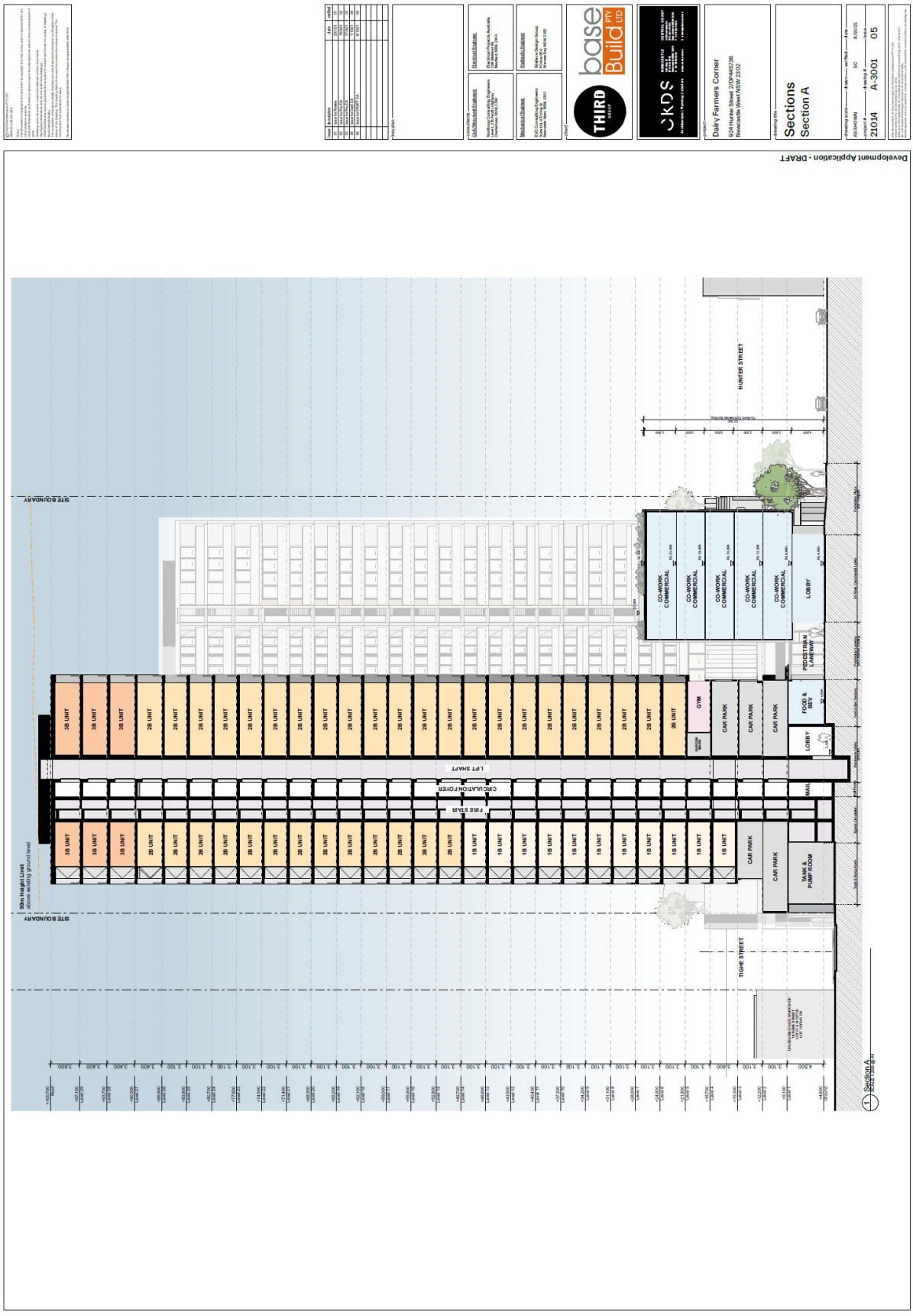
Development Application - DRAFT
Dairy Farmers Corner
924 Hunter Street 2/DP945736
Newcastle West NSW 2302
Unit Plans
Unit Type F - K
2014
A-1202
06
1 UNIT TYPE F - 3B PENTHOUSE
2 UNIT TYPE G - 3B PENTHOUSE
3 UNIT TYPE H - 3B PENTHOUSE
4 UNIT TYPE I - 2B PODIUM
5 UNIT TYPE J - 1B PODIUM
6 UNIT TYPE K - 2B PODIUM

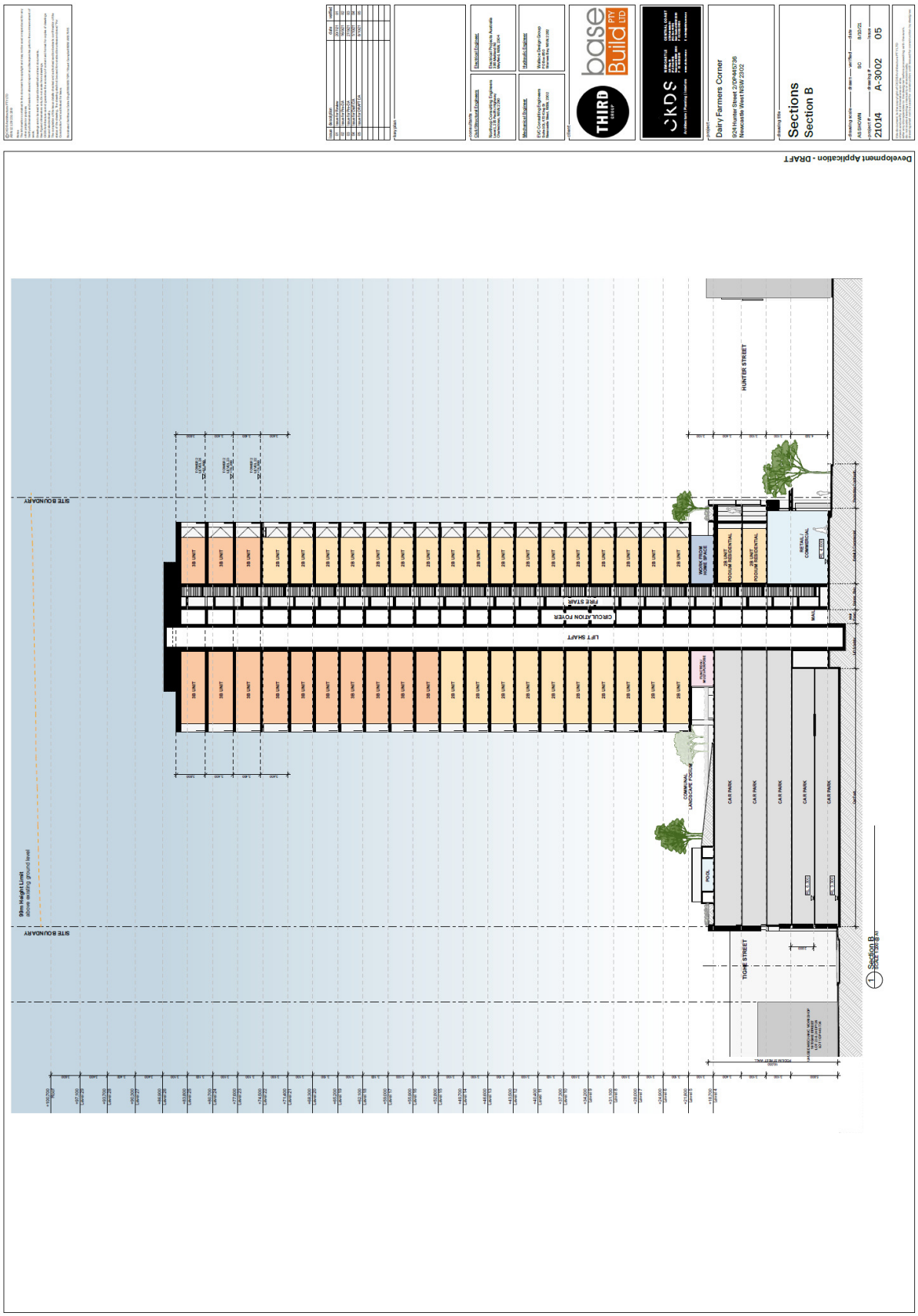

Development Application - DRAFT
MATERIALS / FINISHES
REFER TO A-5000 SERIES MATERIALITY
CONCRETE BLADES
FIXED & OPERABLE ALUMINIUM FRAMED GLAZING
PRECAST CONCRETE PANELS WITH TEXTURE
CONCRETE SLAB EDGE & FRAMELESS GLASS BALUSTRADE
DARKENING UNIT LINE AT LOWER LEVELS
OPERABLE + FIXED PERFORATED
OR MESH METAL SCREENS
FIXED PERFORATED OR MESH METAL SCREENS
MASONRY SPANDREL & FEATURE COLUMNS
RETAIL & LOBBY GLAZING
CURVED & PERFORATED ALUMINIUM MESH SCREEN
PERFORATED OR METAL MESH ENCLOSURE SCREENS
EXTRUDED LOUVRES / LIGHTWEIGHT CLADDING /
ROOF PLANT SCREENING
Rev Description Date Verified
C Issue for Review 02/06/23 SC
B Issue for DA 01/06/23 SC
A Issue for RFI 31/05/23 SC
D Issue for DA 08/09/23 SC
Key plan
Consultants
Civil Structural Engineers
Northrop Consulting Engineers
Hamilton, NSW 2303
Electrical Engineer
Electrical Projects Australia
Mayfield West, NSW 2304
Hydraulic Engineer
Wattle to Design Group
Hollow Bro Wales 2322
Mechanical Engineer
EAC Consulting Engineers
Newcastle, NSW 2300
client
THIRD EDGE
base Build PTY LTD
project
Dairy Farmers Corner
924 Hunter Street 3/DP645736
Newcastle West NSW 2302
drawing title
Elevations
North Elevation
drawing scale AS SHOWN
drawn SC
verified
date 8/09/23
project # 21014
drawing # A-2001
issue 05
SITE BOUNDARY
SITE BOUNDARY
RAILWAY STREET
Site Height Limit
at Tighe Street site boundary
1 North Elevation
1:200
+110.700 Roof
+107.100 Level 29
+103.700 Level 28
+100.300 Level 27
+96.900 Level 26
+93.500 Level 25
+90.700 Level 24
+87.900 Level 23
+84.100 Level 22
+81.400 Level 21
+78.300 Level 20
+75.100 Level 19
+72.100 Level 18
+69.000 Level 17
+65.800 Level 16
+62.800 Level 15
+59.700 Level 14
+56.600 Level 13
+53.500 Level 12
+50.400 Level 11
+47.300 Level 10
+44.200 Level 9
+41.100 Level 8
+38.000 Level 7
+34.900 Level 6
+31.800 Level 5
+28.700 Level 4
+25.300 Level 3
+22.200 Level 2
+19.100 Level 1
+14.600 Ground

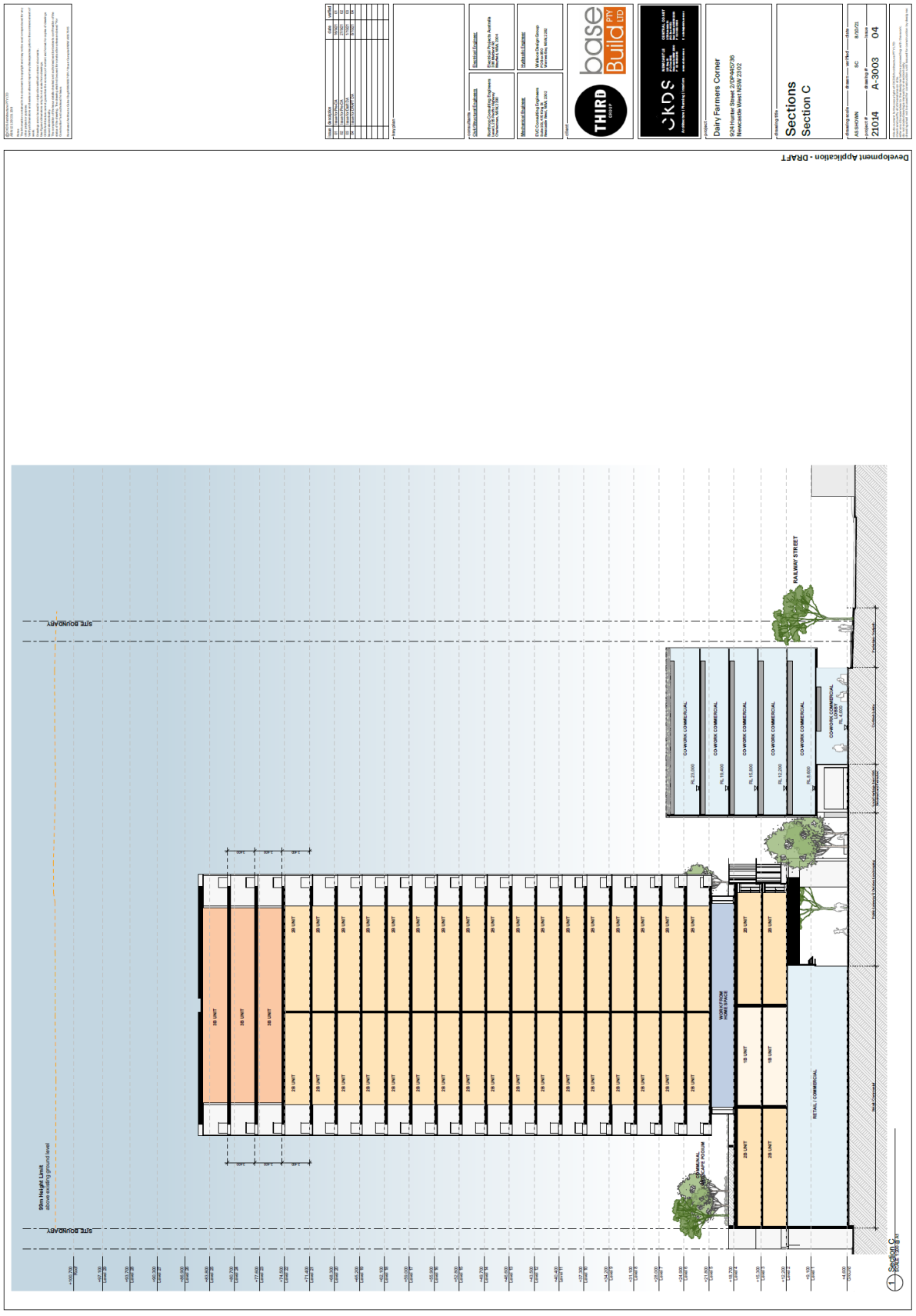

Development Application - DRAFT
MATERIALS / FINISHES
REFER TO A-5000 SERIES MATERIALITY
CONCRETE BLADES
FIXED & OPERABLE ALUMINIUM FRAMED GLAZING
PROVISION FOR EXTERNAL BLIND SUNSHADING
CONCRETE SLAB EDGE & FRAMELESS GLASS BALUSTRADE
DIMINISHING UP/LIMNS AT LOWER LEVELS
OPERABLE / FIXED PERFORATED
ALUMINIUM PANELS
FIXED PERFORATED OR MESH METAL SCREENS
MASONRY SPANDREL & FEATURE COLUMNS
RETAIL & LOBBY GLAZING
CURVED & PERFORATED ALUMINIUM VEIL SCREEN
PERFORATED OR METAL MESH/AC ENCLOSURE SCREENS
STEP/GRADED WIRE / LOUVRE/HEIGHT CLADDING /
ROOF PLANT SCREENING
Issue Amendment Date Verified
01 Issue for Review 10/4/23 SC
02 Issue for DA 9/5/23 SC
03 Issue for DA 9/5/23 SC
04 Issue for DA 9/5/23 SC
05 Issue for DA 9/5/23 SC
Keyplan
Client
base Build PTY LTD
THIRD GROUP
Architect
Landscape Architect
Structural Engineer
Electrical Engineer
Mechanical Engineer
Hydraulic Engineer
project
Dairy Farmers Corner
924 Hunter Street 270/-945736
Newcastle West NSW 2302
drawing title
Elevations
South Elevation
drawing scale drawn verified date
AS SHOWN SC 8/5/23
project # drawing # issue
21014 A-2002 05
1 South Elevation
1:200 scale @ A1
SITE BOUNDARY
SITE BOUNDARY
RAILWAY STREET
90m Height Limit
as shown on Newcastle LEP 2012 Height of Buildings Map
Street Tree Concept
Public Domain
Public Plaza
Hunter Street Plaza
Paved/Communal Area

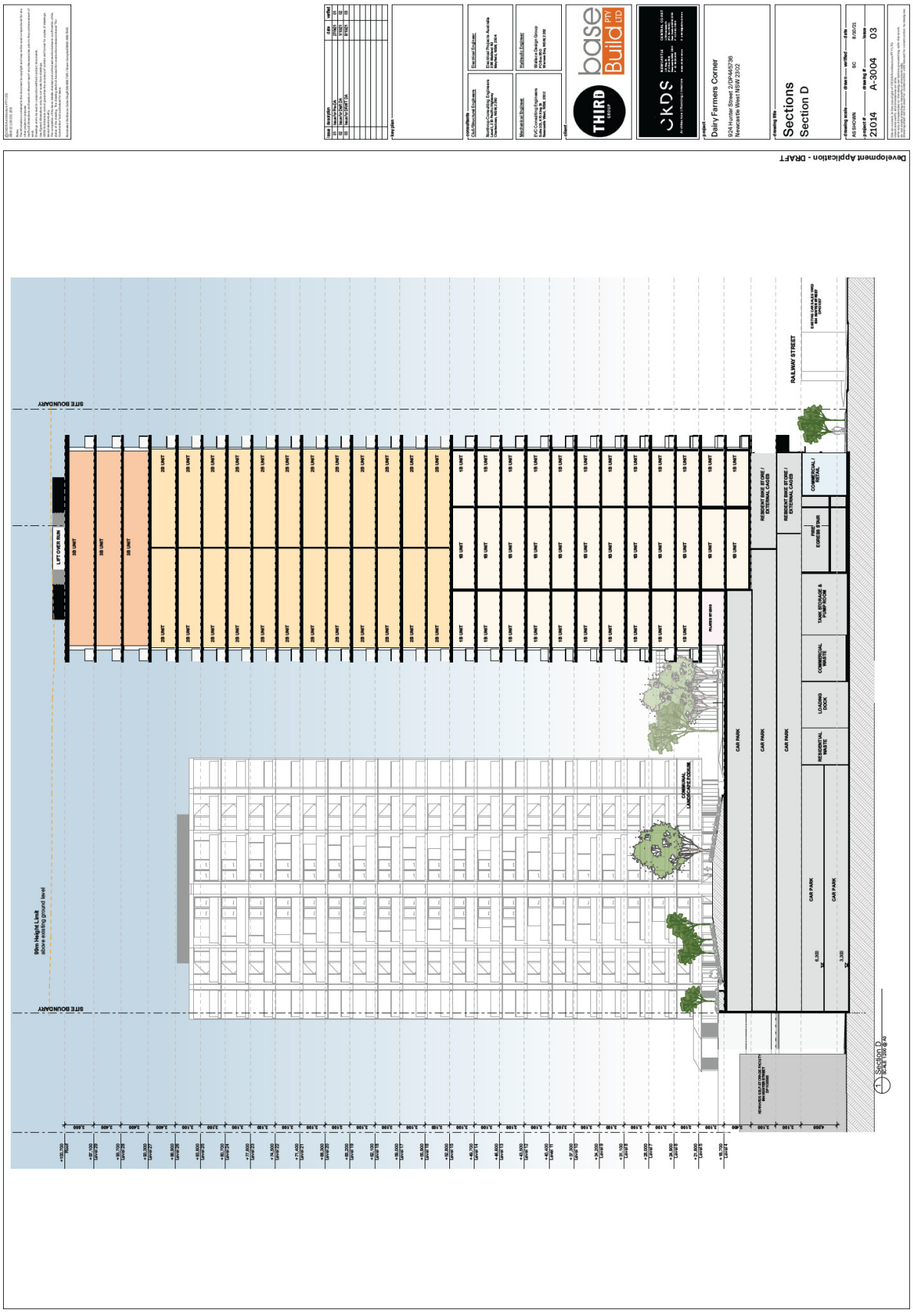

Development Application - DRAFT
Dairy Farmers Corner
924 Hunter Street 2/DP945736
Newcastle West NSW 2302
Elevations
East Elevation
21014
A-2003
05
SITE BOUNDARY
SITE BOUNDARY
HUNTER STREET
1 East Elevation


Development Application - DRAFT
Dairy Farmers Corner
924 Hunter Street 2/DP445236
Newcastle West NSW 2302
Elevations
West Elevation
21014
A-2004
05
HUNTER STREET
TRONE STREET
SITE BOUNDARY
SITE BOUNDARY
RL 90.700 Roof
RL 87.100 Level 28
RL 83.700 Level 27
RL 80.300 Level 26
RL 76.900 Level 25
RL 73.500 Level 24
RL 70.100 Level 23
RL 66.700 Level 22
RL 63.300 Level 21
RL 59.900 Level 20
RL 56.500 Level 19
RL 53.100 Level 18
RL 49.700 Level 17
RL 46.300 Level 16
RL 42.900 Level 15
RL 39.500 Level 14
RL 36.100 Level 13
RL 32.700 Level 12
RL 29.300 Level 11
RL 25.900 Level 10
RL 22.500 Level 9
RL 19.100 Level 8
RL 15.700 Level 7
RL 12.300 Level 6
RL 8.900 Level 5
RL 5.500 Level 4
RL 2.100 Level 3
RL -1.300 Level 2
RL -4.700 Level 1
RL -8.100 Level G
RL -11.500 Level B1
RL -14.900 Level B2
RL -18.300 Level B3
RL -21.700 Level B4
RL -25.100 Level B5
RL -28.500 Level B6
RL -31.900 Level B7
RL -35.300 Level B8
RL -38.700 Level B9
RL -42.100 Level B10
RL


Development Application - DRAFT
Dairy Farmers Corner
924 Hunter Street 2/DP465736
Newcastle West NSW 2302
Sections
Section A
21014
A-3001
05
HUNTER STREET
TIGHE STREET
SITE BOUNDARY
99m Height Limit
above existing ground level
CO-WORK COMMERCIAL
LOBBY
PEDESTRIAN LANEWAY
GYM
CAR PARK
FOOD & BEV
MAIL
TANK & PUMP ROOM
LIFT SHAFT
CIRCULATION FOYER
FIRE STAIR
3B UNIT
2B UNIT
1B UNIT
Section A


Development Application - DRAFT
Dairy Farmers Corner
924 Hunter Street 2/DP845736
Newcastle West NSW 2302
Sections
Section B
2104
A-3002
05
HUNTER STREET
TIGHES STREET
SITE BOUNDARY
99m Height Limit
above existing ground level
LIFT SHAFT
CIRCULATION FOYER
FIRE STAIR
CAR PARK
POOL
RETAIL COMMERCIAL
WORK FROM HOME SPACE
Section B


Development Application - DRAFT
Dairy Farmers Corner
924 Hunter Street 2/DP445736
Newcastle West NSW 2302
Sections
Section C
21014
A-3003
04
RAILWAY STREET
SITE BOUNDARY
99m Height Limit
above existing ground level
CO-WORK COMMERCIAL
RETAIL / COMMERCIAL
WORK FROM HOME SPACE
28 UNIT
18 UNIT
Section C
1:200 @ A1


Dairy Farmers Corner
924 Hunter Street 2/DP445736
Newcastle West NSW 2302
Sections
Section D
21014
A-3004
03
Development Application - DRAFT
SITE BOUNDARY
RAILWAY STREET
LIFT OVER RUN
CAR PARK
Section D

Development Application - DRAFT
Sections
Laneway Sections
Dairy Farmers Corner
924 Hunter Street 2/DP445738
Newcastle West NSW 2302
21014
A-3005
04
Laneway Section A
Laneway Section B
RAILWAY STREET
HUNTER STREET
TIGHE STREET

Summary

	DCP / LEP	Concept Proposed	
FSR	5.5 :1	5.4 :1	
GFA	21674.07 m²	21460 m²	214
1B		36 units	19.7%
2B		128 units	69.9%
3B		19 units	10.4%
Total Units		183 units	

Solar approx 1hr	N/A	64.7%
Solar min 2hr	70% total	73.8%
'No Sun'	15% total	14.2%
Cross Vent First 9 floors	60%	79.2%
Cross Vent Total	N/A	91.3%

Car Parking	232.4 spaces	237 spaces
Bike Parking	212.0 spaces	126 spaces
Motorbike Parking	9.8 spaces	16 spaces

NOTES:
- BASE FSR 5:1 UNDER LEP CLAUSE 7.10
- FSR & HEIGHT ASSUME 10% DESIGN EXCELLENCE BONUS

Area Schedule

		RL (m)	Floor Height	1B	2B	3B	Parking Spaces	Res GFA m² (1)	Comm GFA m² (1)
	Lift Overrun	100.90							
	Roof / Plant	99.90	1						
	Level 29	96.30	3.6			2		375	
	Level 28	92.90	3.4			2		375	
	Level 27	89.50	3.4			2		375	
	Level 26	86.40	3.1		4			380	
	Level 25	83.30	3.1		4			380	
	Level 24	80.20	3.1		4	2		760	
	Level 23	77.10	3.1		4	2		760	
	Level 22	74.00	3.1		4	2		760	
	Level 21	70.90	3.1		6	1		760	
	Level 20	67.80	3.1		6	1		760	
	Level 19	64.70	3.1		6	1		760	
	Level 18	61.60	3.1		6	1		760	
	Level 17	58.50	3.1		6	1		760	
	Level 16	55.40	3.1		6	1		760	
	Level 15	52.30	3.1		6	1		760	
	Level 14	49.20	3.1	3	6			760	
	Level 13	46.10	3.1	3	6			760	
	Level 12	43.00	3.1	3	6			760	
	Level 11	39.90	3.1	3	6			760	
	Level 10	36.80	3.1	3	6			760	
	Level 09	33.70	3.1	3	6			760	
TOWER	Level 08	30.60	3.1	3	6			760	
	Level 07	27.50	3.1	3	6			760	
	Level 06	24.40	3.1	3	6			760	
	Level 05	21.30	3.1	3	6			760	240
	Level 04	18.20	3.1	2	1			690	240
PODIUM	Level 03	15.10	3.1	3	3		65	595	240
	Level 02	12.00	3.1	1	2		66	575	240
	Level 01	8.90	3.1				60	230	240
	Ground / Upper Ground	4.8	4.30				66	340	745
	Totals			36	128	19	237	19618	1945

Analysis

'No Sun'	Solar 1hr	Solar 2hr	Cross Vent
	2	2	2
	2	2	2
	2	2	2
1	3	3	4
1	3	3	4
1	5	4	6
1	5	4	6
1	5	4	6
1	6	5	7
1	6	5	7
1	6	5	7
1	6	5	7
1	6	5	7
1	6	5	7
1	6	7	8
1	6	7	8
1	6	7	8
1	6	7	8
1	6	7	8
1	6	7	8
1	6	7	8
1	6	7	8
1	6	7	8
2	3	3	2
2	3	3	3
			1
14.2%	64.7%	73.8%	91.3%

Parking Calculations

	Car Parking			Bike Parking			Motorbike Parking			
	Rate		Spaces Required	Rate		Spaces Required	Rate			Spaces Required
Residential	Spaces per 1B	0.60	21.6	Residential	1 per unit	183.0	1 space per	20 car spaces		8.2
	Spaces per 2B	0.90	115.2	Visitor	1 per 10 units	18.3				
	Spaces per 3B / 4B	1.40	26.6							
	Visitor	1 per 5	36.6							
Commercial / Retail	1 space per	60 m²	32.4	1 space per	200 m² commercial	9.7	1 space per	20 car spaces		1.6
				1 space per	20 Retail staff					
			232.4			212.0				9.8

Development Application - DRAFT

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Nominated Architect: Greta Clough NSW 8939 | VIC Board Complied NSW ARB 8939

issue	description	date	verified
01	Issue for Review	15/7/21	01
02	Issue for Review	20/7/21	02
03	Issue for Pre-DA	16/8/21	03
04	Issue for Pre-DA	27/8/21	04
05	Issue for DeR DA	1/10/21	05
06	Issue for DRAFT DA	8/10/21	06

key plan

consultants

Civil/Structural Engineers
Northrop Consulting Engineers
Level 2, 23 Pacific Highway
Charlestown, NSW, 2290

Electrical Engineer
Electrical Projects Australia
3/85 Maitland Rd
Mayfield, NSW, 2304

Mechanical Engineer
EVC Consulting Engineers
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Newcastle West, NSW, 2302

Hydraulic Engineer
Wallace Design Group
PO Box 6910
Wamwa Bay, NSW, 2282

client

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project

Dairy Farmers Corner

924 Hunter Street 2/DP445736
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drawing title

Schedules
Yield Schedule

drawing scale	drawn	verified	date
AS SHOWN		SC	8/10/21

project #	drawing #	issue
21014	A-7001	06

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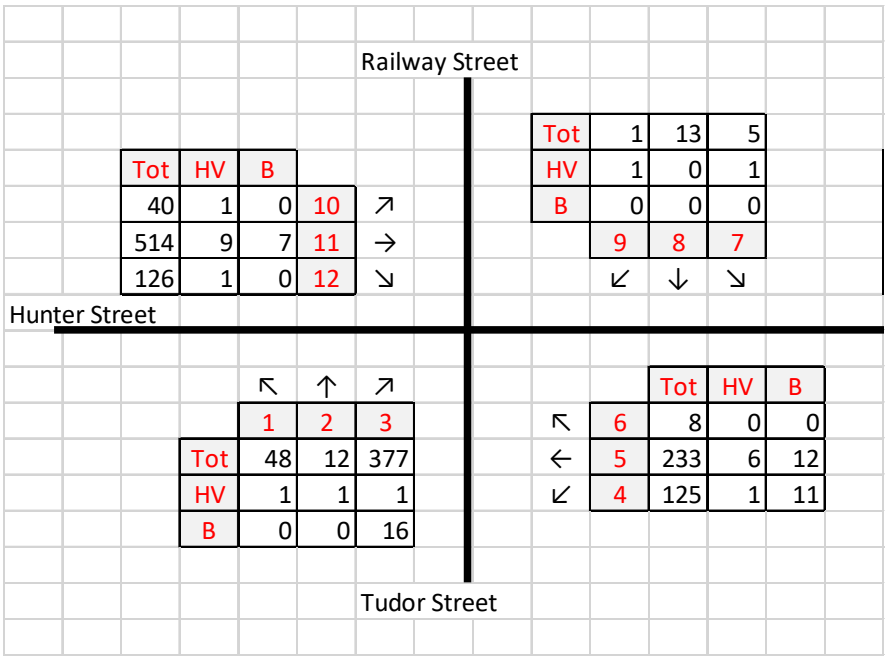
ATTACHMENT B
TRAFFIC DATA

GHD TRAFFIC DATA

2019 AM with Interchange



Tot	HV	B		
40	1	0	10	↗
514	9	7	11	→
126	1	0	12	↘

Tot	1	13	5
HV	1	0	1
B	0	0	0
	9	8	7
	↙	↓	↘

	↖	↑	↗
	1	2	3
Tot	48	12	377
HV	1	1	1
B	0	0	16

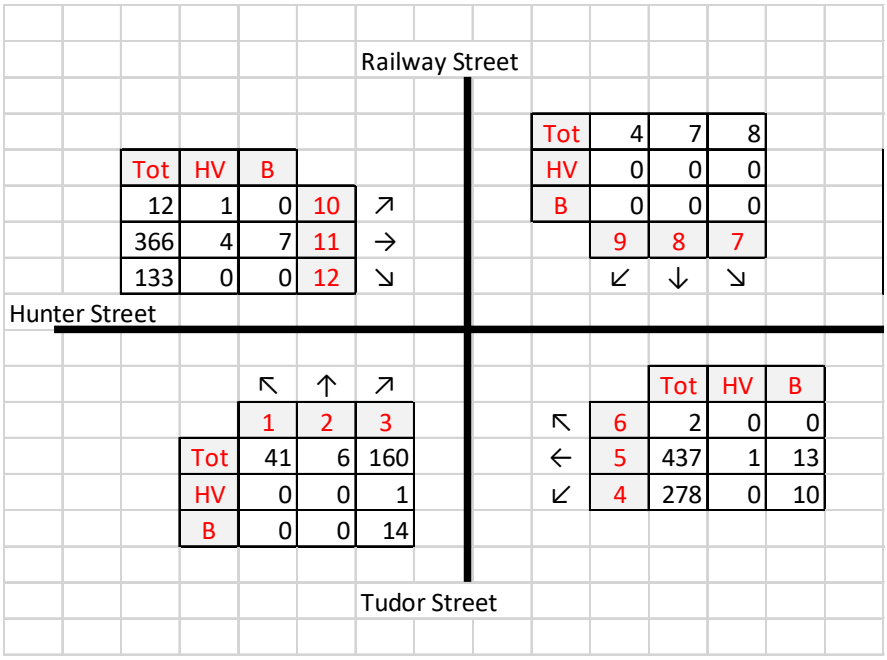
		Tot	HV	B
↖	6	8	0	0
←	5	233	6	12
↙	4	125	1	11

Total = Light vehicles + Heavy vehicles + buses

HV – Heavy Vehicles

B – Buses

2019 PM with interchange



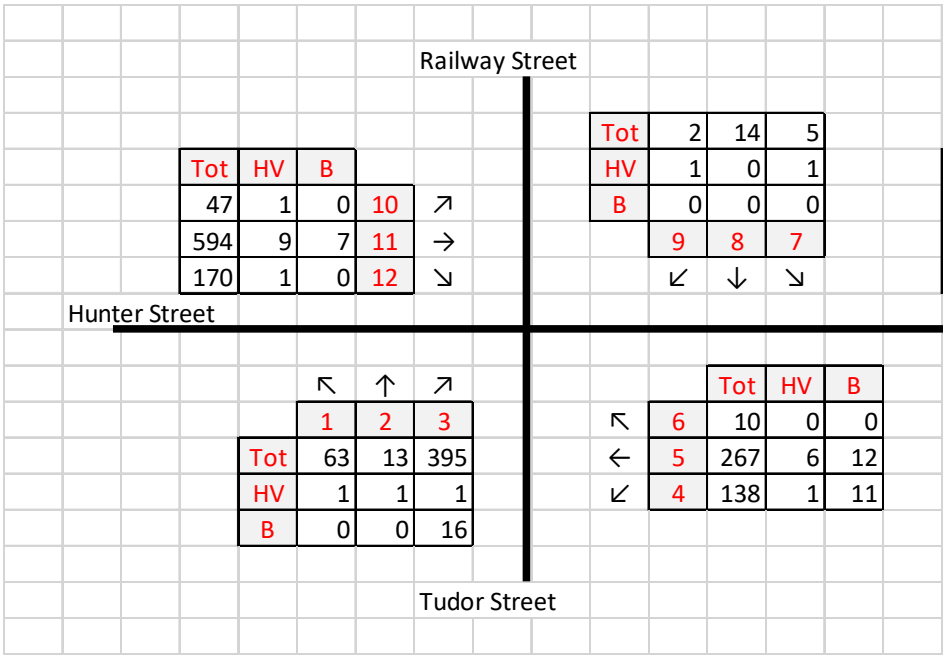
Tot	HV	B		
12	1	0	10	↗
366	4	7	11	→
133	0	0	12	↘

Tot	4	7	8
HV	0	0	0
B	0	0	0
	9	8	7
	↙	↓	↘

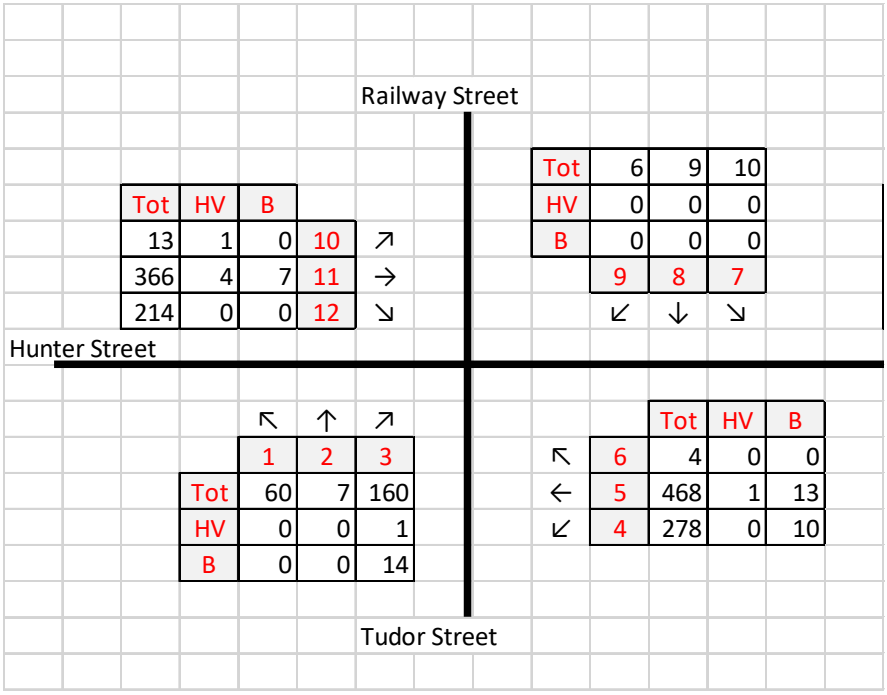
	↖	↑	↗
	1	2	3
Tot	41	6	160
HV	0	0	1
B	0	0	14

		Tot	HV	B
↖	6	2	0	0
←	5	437	1	13
↙	4	278	0	10

2029AM with Interchange



2029 PM with Interchange



ATTACHMENT C
SIDRA MOVEMENT SUMMARY TABLES

AM MOVEMENT TABLES

MOVEMENT SUMMARY

Site: 101 [2021AM (Site Folder: General)]

Mixed Use Development
Hunter Street/Tudor Street/Railway Street Signalised Intersection
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 60 seconds (Site Practical Cycle Time)
Design Life Analysis (Final Year): Results for 2 years

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Tudor Street														
1	L2	48	1	53	2.1	0.041	6.7	LOS A	0.2	1.7	0.27	0.61	0.27	50.1
2	T1	12	1	13	8.3	*0.710	29.7	LOS C	6.5	47.5	1.00	0.89	1.15	17.1
3	R2	377	17	413	4.5	0.710	34.1	LOS C	6.5	47.5	1.00	0.88	1.15	21.4
Approach		437	19	479	4.3	0.710	31.0	LOS C	6.5	47.5	0.92	0.85	1.05	24.0
East: Hunter Street														
4	L2	125	12	137	9.6	0.113	8.8	LOS A	1.3	9.8	0.34	0.63	0.34	41.2
5	T1	233	18	255	7.7	0.435	25.5	LOS B	3.7	27.9	0.94	0.75	0.94	37.2
6	R2	8	0	9	0.0	*0.435	31.1	LOS C	3.6	26.7	0.94	0.75	0.94	22.6
Approach		366	30	401	8.2	0.435	20.0	LOS B	3.7	27.9	0.74	0.71	0.74	37.7
North: Railway Street														
7	L2	5	1	5	20.0	0.058	32.5	LOS C	0.3	2.2	0.93	0.65	0.93	19.4
8	T1	13	0	14	0.0	*0.058	27.8	LOS B	0.3	2.2	0.93	0.64	0.93	19.3
9	R2	1	1	1	100.0	0.058	32.9	LOS C	0.3	2.2	0.93	0.63	0.93	29.7
Approach		19	2	21	10.5	0.058	29.3	LOS C	0.3	2.2	0.93	0.64	0.93	20.2
West: Hunter Street														
10	L2	40	1	44	2.5	0.683	30.0	LOS C	8.6	62.1	0.97	0.85	1.04	34.3
11	T1	514	16	563	3.1	*0.683	24.4	LOS B	8.7	62.6	0.97	0.85	1.04	37.7
12	R2	126	1	138	0.8	0.448	31.2	LOS C	3.8	27.1	0.94	0.78	0.94	32.7
Approach		680	18	745	2.6	0.683	26.0	LOS B	8.7	62.6	0.96	0.84	1.02	36.6
All Vehicles		1502	69	1645	4.6	0.710	26.0	LOS B	8.7	62.6	0.89	0.81	0.96	33.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [2021AM 80 sec cycle time (Site Folder: General)]

Mixed Use Development
Hunter Street/Tudor Street/Railway Street Signalised Intersection
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site User-Given Cycle Time)
Design Life Analysis (Final Year): Results for 2 years

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Tudor Street														
1	L2	48	1	53	2.1	0.040	6.6	LOS A	0.3	1.9	0.22	0.60	0.22	50.3
2	T1	12	1	13	8.3	*0.498	30.4	LOS C	7.4	53.8	0.91	0.80	0.91	16.8
3	R2	377	17	413	4.5	0.498	34.8	LOS C	7.4	53.8	0.91	0.80	0.91	21.1
Approach		437	19	479	4.3	0.498	31.5	LOS C	7.4	53.8	0.84	0.78	0.84	23.8
East: Hunter Street														
4	L2	125	12	137	9.6	0.102	8.0	LOS A	1.3	9.7	0.26	0.60	0.26	42.3
5	T1	233	18	255	7.7	0.405	31.1	LOS C	4.7	35.1	0.91	0.73	0.91	34.4
6	R2	8	0	9	0.0	*0.405	37.4	LOS C	4.7	35.1	0.92	0.74	0.92	19.8
Approach		366	30	401	8.2	0.405	23.4	LOS B	4.7	35.1	0.69	0.69	0.69	35.5
North: Railway Street														
7	L2	5	1	5	20.0	0.078	43.9	LOS D[11]	0.4	3.0	0.96	0.66	0.96	15.9
8	T1	13	0	14	0.0	*0.078	39.2	LOS C	0.4	3.1	0.96	0.65	0.96	15.3
9	R2	1	1	1	100.0	0.078	44.3	LOS D[11]	0.4	3.1	0.96	0.65	0.96	25.7
Approach		19	2	21	10.5	0.078	40.7	LOS C	0.4	3.1	0.96	0.65	0.96	16.2
West: Hunter Street														
10	L2	40	1	44	2.5	0.510	30.1	LOS C	9.8	70.3	0.87	0.75	0.87	34.2
11	T1	514	16	563	3.1	*0.510	24.5	LOS B	9.9	70.8	0.87	0.74	0.87	37.6
12	R2	126	1	138	0.8	0.399	37.3	LOS C	4.9	34.4	0.92	0.78	0.92	30.1
Approach		680	18	745	2.6	0.510	27.2	LOS B	9.9	70.8	0.88	0.75	0.88	35.9
All Vehicles		1502	69	1645	4.6	0.510	27.7	LOS B	9.9	70.8	0.82	0.74	0.82	32.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [2021AM+DEV 80 sec cycle time (Site Folder: General)]

Mixed Use Development
Hunter Street/Tudor Street/Railway Street Signalised Intersection
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Tudor Street														
1	L2	53	1	56	1.9	0.043	7.1	LOS A	0.4	2.6	0.26	0.61	0.26	49.8
2	T1	36	1	38	2.8	*0.549	30.8	LOS C	8.3	60.4	0.93	0.81	0.93	16.9
3	R2	413	17	435	4.1	0.549	35.2	LOS C	8.3	60.4	0.93	0.81	0.93	21.1
Approach		502	19	528	3.8	0.549	31.9	LOS C	8.3	60.4	0.86	0.79	0.86	23.4
East: Hunter Street														
4	L2	137	12	144	8.8	0.106	8.0	LOS A	1.4	10.2	0.26	0.60	0.26	42.4
5	T1	255	18	268	7.1	0.506	31.5	LOS C	5.6	41.2	0.92	0.74	0.92	34.1
6	R2	28	0	29	0.0	*0.506	40.8	LOS C	5.1	37.1	0.97	0.78	0.97	18.3
Approach		420	30	442	7.1	0.506	24.4	LOS B	5.6	41.2	0.71	0.70	0.71	34.4
North: Railway Street														
7	L2	44	1	46	2.3	0.450	45.4	LOS D	2.0	14.5	0.99	0.74	0.99	15.4
8	T1	25	0	26	0.0	*0.450	40.8	LOS C	2.0	14.6	0.99	0.73	0.99	14.4
9	R2	28	1	29	3.6	0.450	45.3	LOS D	2.0	14.6	0.99	0.73	0.99	26.2
Approach		97	2	102	2.1	0.450	44.2	LOS D	2.0	14.6	0.99	0.73	0.99	18.9
West: Hunter Street														
10	L2	79	1	83	1.3	0.568	30.7	LOS C	11.1	79.6	0.89	0.78	0.89	33.6
11	T1	563	16	593	2.8	*0.568	25.1	LOS B	11.2	80.6	0.89	0.77	0.89	37.2
12	R2	138	1	145	0.7	0.484	39.7	LOS C	5.4	37.8	0.96	0.79	0.96	29.2
Approach		780	18	821	2.3	0.568	28.3	LOS B	11.2	80.6	0.90	0.77	0.90	35.2
All Vehicles		1799	69	1894	3.8	0.568	29.2	LOS C	11.2	80.6	0.85	0.76	0.85	31.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [2021AM+DEV 80 sec cycle time (Site Folder: General)]

Mixed Use Development
Hunter Street/Tudor Street/Railway Street Signalised Intersection
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Tudor Street														
1	L2	53	1	56	1.9	0.043	7.1	LOS A	0.4	2.6	0.26	0.61	0.26	49.8
2	T1	36	1	38	2.8	*0.549	30.8	LOS C	8.3	60.4	0.93	0.81	0.93	16.9
3	R2	413	17	435	4.1	0.549	35.2	LOS C	8.3	60.4	0.93	0.81	0.93	21.1
Approach		502	19	528	3.8	0.549	31.9	LOS C	8.3	60.4	0.86	0.79	0.86	23.4
East: Hunter Street														
4	L2	137	12	144	8.8	0.106	8.0	LOS A	1.4	10.2	0.26	0.60	0.26	42.4
5	T1	255	18	268	7.1	0.506	31.5	LOS C	5.6	41.2	0.92	0.74	0.92	34.1
6	R2	28	0	29	0.0	*0.506	40.8	LOS C	5.1	37.1	0.97	0.78	0.97	18.3
Approach		420	30	442	7.1	0.506	24.4	LOS B	5.6	41.2	0.71	0.70	0.71	34.4
North: Railway Street														
7	L2	44	1	46	2.3	0.450	45.4	LOS D	2.0	14.5	0.99	0.74	0.99	15.4
8	T1	25	0	26	0.0	*0.450	40.8	LOS C	2.0	14.6	0.99	0.73	0.99	14.4
9	R2	28	1	29	3.6	0.450	45.3	LOS D	2.0	14.6	0.99	0.73	0.99	26.2
Approach		97	2	102	2.1	0.450	44.2	LOS D	2.0	14.6	0.99	0.73	0.99	18.9
West: Hunter Street														
10	L2	79	1	83	1.3	0.568	30.7	LOS C	11.1	79.6	0.89	0.78	0.89	33.6
11	T1	563	16	593	2.8	*0.568	25.1	LOS B	11.2	80.6	0.89	0.77	0.89	37.2
12	R2	138	1	145	0.7	0.484	39.7	LOS C	5.4	37.8	0.96	0.79	0.96	29.2
Approach		780	18	821	2.3	0.568	28.3	LOS B	11.2	80.6	0.90	0.77	0.90	35.2
All Vehicles		1799	69	1894	3.8	0.568	29.2	LOS C	11.2	80.6	0.85	0.76	0.85	31.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [2031AM+DEV (Site Folder: General)]

Mixed Use Development
Hunter Street/Tudor Street/Railway Street Signalised Intersection
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 60 seconds (Site Practical Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Tudor Street														
1	L2	69	1	73	1.4	0.059	7.1	LOS A	0.4	2.9	0.31	0.62	0.31	49.7
2	T1	37	1	39	2.7	*0.818	33.1	LOS C	8.2	59.3	1.00	0.98	1.34	16.1
3	R2	433	17	456	3.9	0.818	37.5	LOS C	8.2	59.3	1.00	0.98	1.34	20.2
Approach		539	19	567	3.5	0.818	33.3	LOS C	8.2	59.3	0.91	0.93	1.21	23.1
East: Hunter Street														
4	L2	151	12	159	7.9	0.129	8.9	LOS A	1.5	11.4	0.35	0.63	0.35	41.3
5	T1	292	18	307	6.2	0.617	27.1	LOS B	5.1	37.2	0.97	0.81	1.04	36.2
6	R2	30	0	32	0.0	*0.617	33.3	LOS C	5.1	37.2	0.98	0.82	1.05	21.2
Approach		473	30	498	6.3	0.617	21.7	LOS B	5.1	37.2	0.77	0.75	0.82	36.3
North: Railway Street														
7	L2	44	1	46	2.3	0.281	33.6	LOS C	1.5	10.8	0.96	0.73	0.96	18.9
8	T1	26	0	27	0.0	*0.281	29.0	LOS C	1.5	10.9	0.96	0.73	0.96	18.0
9	R2	29	1	31	3.4	0.281	33.5	LOS C	1.5	10.9	0.96	0.73	0.96	30.6
Approach		99	2	104	2.0	0.281	32.4	LOS C	1.5	10.9	0.96	0.73	0.96	23.0
West: Hunter Street														
10	L2	86	1	91	1.2	0.870	38.5	LOS C	13.5	96.3	1.00	1.07	1.40	30.0
11	T1	651	16	685	2.5	*0.870	32.9	LOS C	13.6	97.3	1.00	1.07	1.40	33.4
12	R2	186	1	196	0.5	0.635	32.7	LOS C	5.8	40.5	0.98	0.84	1.05	32.0
Approach		923	18	972	2.0	0.870	33.4	LOS C	13.6	97.3	1.00	1.02	1.33	32.8
All Vehicles		2034	69	2141	3.4	0.870	30.6	LOS C	13.6	97.3	0.92	0.92	1.16	30.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [2031AM+DEV 80 sec cycle time (Site Folder: General)]

Mixed Use Development
Hunter Street/Tudor Street/Railway Street Signalised Intersection
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Tudor Street														
1	L2	69	1	73	1.4	0.057	7.1	LOS A	0.5	3.4	0.26	0.61	0.26	49.8
2	T1	37	1	39	2.7	*0.606	32.0	LOS C	9.0	64.8	0.95	0.82	0.95	16.4
3	R2	433	17	456	3.9	0.606	36.5	LOS C	9.0	64.8	0.95	0.82	0.95	20.6
Approach		539	19	567	3.5	0.606	32.4	LOS C	9.0	64.8	0.86	0.79	0.86	23.5
East: Hunter Street														
4	L2	151	12	159	7.9	0.117	8.0	LOS A	1.5	11.3	0.26	0.61	0.26	42.4
5	T1	292	18	307	6.2	0.577	32.0	LOS C	6.1	45.1	0.93	0.76	0.94	33.8
6	R2	30	0	32	0.0	*0.577	41.2	LOS C	6.1	44.5	0.98	0.79	0.98	18.2
Approach		473	30	498	6.3	0.577	24.9	LOS B	6.1	45.1	0.72	0.71	0.72	34.3
North: Railway Street														
7	L2	44	1	46	2.3	0.465	45.4	LOS D	2.1	14.8	0.99	0.74	0.99	15.4
8	T1	26	0	27	0.0	*0.465	40.8	LOS C	2.1	14.9	0.99	0.74	0.99	14.3
9	R2	29	1	31	3.4	0.465	45.4	LOS D	2.1	14.9	0.99	0.73	0.99	26.2
Approach		99	2	104	2.0	0.465	44.2	LOS D	2.1	14.9	0.99	0.74	0.99	19.0
West: Hunter Street														
10	L2	86	1	91	1.2	0.625	30.5	LOS C	12.9	92.3	0.90	0.79	0.90	33.7
11	T1	651	16	685	2.5	*0.625	25.0	LOS B	13.1	93.4	0.90	0.78	0.90	37.3
12	R2	186	1	196	0.5	0.605	39.7	LOS C	7.3	51.7	0.97	0.81	0.98	29.2
Approach		923	18	972	2.0	0.625	28.5	LOS B	13.1	93.4	0.92	0.79	0.92	35.1
All Vehicles		2034	69	2141	3.4	0.625	29.4	LOS C	13.1	93.4	0.86	0.77	0.86	31.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

PM MOVEMENT TABLES

MOVEMENT SUMMARY

Site: 101 [2021PM (Site Folder: General)]

Mixed Use Development
Hunter Street/Tudor Street/Railway Street Signalised Intersection
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 60 seconds (Site Practical Cycle Time)
Design Life Analysis (Final Year): Results for 2 years

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Tudor Street														
1	L2	41	0	45	0.0	0.040	7.5	LOS A	0.3	2.1	0.34	0.62	0.34	49.3
2	T1	6	0	7	0.0	*0.520	31.4	LOS C	2.8	20.9	0.99	0.78	1.01	16.5
3	R2	160	15	175	9.4	0.520	35.8	LOS C	2.8	20.9	0.99	0.78	1.01	20.6
Approach		207	15	227	7.2	0.520	30.1	LOS C	2.8	20.9	0.86	0.74	0.88	25.4
East: Hunter Street														
4	L2	278	0	304	0.0	0.234	9.1	LOS A	3.2	22.3	0.38	0.66	0.38	41.5
5	T1	437	14	479	3.2	*0.553	20.6	LOS B	7.3	52.6	0.89	0.74	0.89	40.2
6	R2	2	0	2	0.0	0.553	26.6	LOS B	7.3	52.6	0.91	0.76	0.91	25.4
Approach		717	14	785	2.0	0.553	16.2	LOS B	7.3	52.6	0.69	0.71	0.69	40.5
North: Railway Street														
7	L2	8	0	9	0.0	0.055	32.3	LOS C	0.3	2.0	0.93	0.66	0.93	19.5
8	T1	7	0	8	0.0	*0.055	27.7	LOS B	0.3	2.1	0.93	0.65	0.93	18.8
9	R2	4	0	4	0.0	0.055	32.3	LOS C	0.3	2.1	0.93	0.64	0.93	31.5
Approach		19	0	21	0.0	0.055	30.6	LOS C	0.3	2.1	0.93	0.65	0.93	22.6
West: Hunter Street														
10	L2	12	0	13	0.0	0.591	31.1	LOS C	5.9	42.0	0.96	0.80	0.98	34.0
11	T1	366	11	401	3.0	0.591	25.5	LOS B	5.9	42.1	0.96	0.80	0.98	37.2
12	R2	133	0	146	0.0	*0.588	34.0	LOS C	4.3	30.3	0.99	0.81	1.03	31.5
Approach		511	11	560	2.2	0.591	27.9	LOS B	5.9	42.1	0.97	0.80	1.00	35.5
All Vehicles		1454	40	1592	2.8	0.591	22.4	LOS B	7.3	52.6	0.82	0.74	0.83	36.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [2021PM 80 sec cycle time (Site Folder: General)]

Mixed Use Development
Hunter Street/Tudor Street/Railway Street Signalised Intersection
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site User-Given Cycle Time)
Design Life Analysis (Final Year): Results for 2 years

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Tudor Street														
1	L2	41	0	45	0.0	0.040	7.4	LOS A	0.3	2.4	0.28	0.61	0.28	49.5
2	T1	6	0	7	0.0	*0.462	39.1	LOS C	3.5	26.6	0.98	0.77	0.98	14.3
3	R2	160	15	175	9.4	0.462	43.6	LOS D[11]	3.5	26.6	0.98	0.77	0.98	18.1
Approach		207	15	227	7.2	0.462	36.3	LOS C	3.5	26.6	0.84	0.74	0.84	22.8
East: Hunter Street														
4	L2	278	0	304	0.0	0.212	8.2	LOS A	3.1	22.0	0.29	0.63	0.29	42.8
5	T1	437	14	479	3.2	0.452	22.0	LOS B	9.0	64.4	0.81	0.68	0.81	39.4
6	R2	2	0	2	0.0	*0.452	28.1	LOS B	9.0	64.4	0.83	0.71	0.83	24.5
Approach		717	14	785	2.0	0.452	16.6	LOS B	9.0	64.4	0.61	0.66	0.61	40.1
North: Railway Street														
7	L2	8	0	9	0.0	0.073	43.6	LOS D[11]	0.4	2.8	0.96	0.66	0.96	16.0
8	T1	7	0	8	0.0	*0.073	39.0	LOS C	0.4	2.8	0.96	0.66	0.96	15.0
9	R2	4	0	4	0.0	0.073	43.6	LOS D[11]	0.4	2.8	0.96	0.65	0.96	27.1
Approach		19	0	21	0.0	0.073	41.9	LOS C	0.4	2.8	0.96	0.66	0.96	18.6
West: Hunter Street														
10	L2	12	0	13	0.0	0.456	34.3	LOS C	7.1	50.6	0.90	0.75	0.90	32.3
11	T1	366	11	401	3.0	*0.456	28.7	LOS C	7.1	50.8	0.90	0.75	0.90	35.5
12	R2	133	0	146	0.0	0.448	38.5	LOS C	5.3	36.9	0.94	0.79	0.94	29.7
Approach		511	11	560	2.2	0.456	31.4	LOS C	7.1	50.8	0.91	0.76	0.91	33.8
All Vehicles		1454	40	1592	2.8	0.462	25.0	LOS B	9.0	64.4	0.75	0.70	0.75	34.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [2021PM+DEV (Site Folder: General)]

Mixed Use Development
Hunter Street/Tudor Street/Railway Street Signalised Intersection
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 60 seconds (Site Practical Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Tudor Street														
1	L2	45	0	47	0.0	0.044	8.0	LOS A	0.4	2.5	0.38	0.63	0.38	48.8
2	T1	17	0	18	0.0	*0.572	31.7	LOS C	3.1	23.3	1.00	0.80	1.06	16.6
3	R2	175	15	184	8.6	0.572	36.2	LOS C	3.1	23.3	1.00	0.80	1.06	20.6
Approach		237	15	249	6.3	0.572	30.5	LOS C	3.1	23.3	0.88	0.77	0.93	25.0
East: Hunter Street														
4	L2	304	0	320	0.0	0.246	9.1	LOS A	3.4	23.7	0.39	0.66	0.39	41.5
5	T1	479	14	504	2.9	*0.658	21.9	LOS B	8.9	64.0	0.91	0.79	0.97	39.2
6	R2	35	0	37	0.0	0.658	27.9	LOS B	8.9	64.0	0.94	0.82	0.98	24.3
Approach		818	14	861	1.7	0.658	17.4	LOS B	8.9	64.0	0.72	0.75	0.76	39.2
North: Railway Street														
7	L2	25	0	26	0.0	0.231	33.3	LOS C	1.3	8.9	0.96	0.72	0.96	19.6
8	T1	28	0	29	0.0	*0.231	28.7	LOS C	1.3	8.9	0.96	0.72	0.96	18.1
9	R2	30	0	32	0.0	0.231	33.3	LOS C	1.3	8.8	0.96	0.72	0.96	30.4
Approach		83	0	87	0.0	0.231	31.7	LOS C	1.3	8.9	0.96	0.72	0.96	24.1
West: Hunter Street														
10	L2	36	0	38	0.0	0.657	32.0	LOS C	6.7	47.8	0.98	0.84	1.05	33.2
11	T1	401	11	422	2.7	0.657	26.4	LOS B	6.7	48.3	0.98	0.84	1.05	36.6
12	R2	146	0	154	0.0	*0.621	34.4	LOS C	4.6	32.3	0.99	0.83	1.07	31.3
Approach		583	11	614	1.9	0.657	28.8	LOS C	6.7	48.3	0.98	0.84	1.06	35.0
All Vehicles		1721	40	1812	2.3	0.658	23.7	LOS B	8.9	64.0	0.84	0.78	0.89	34.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [2021PM+DEV 80 sec cycle time (Site Folder: General)]

Mixed Use Development
Hunter Street/Tudor Street/Railway Street Signalised Intersection
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Tudor Street														
1	L2	45	0	47	0.0	0.043	7.9	LOS A	0.4	2.8	0.31	0.62	0.31	49.0
2	T1	17	0	18	0.0	*0.509	39.4	LOS C	4.0	29.5	0.98	0.78	0.98	14.4
3	R2	175	15	184	8.6	0.509	43.9	LOS D	4.0	29.5	0.98	0.78	0.98	18.2
Approach		237	15	249	6.3	0.509	36.7	LOS C	4.0	29.5	0.86	0.75	0.86	22.5
East: Hunter Street														
4	L2	304	0	320	0.0	0.222	8.2	LOS A	3.3	23.4	0.29	0.63	0.29	42.8
5	T1	479	14	504	2.9	*0.514	22.1	LOS B	10.4	74.1	0.82	0.70	0.82	39.1
6	R2	35	0	37	0.0	0.514	28.7	LOS C	10.4	74.1	0.85	0.74	0.85	23.8
Approach		818	14	861	1.7	0.514	17.2	LOS B	10.4	74.1	0.62	0.67	0.62	39.3
North: Railway Street														
7	L2	25	0	26	0.0	0.330	45.0	LOS D	1.7	12.1	0.98	0.73	0.98	15.9
8	T1	28	0	29	0.0	*0.330	40.5	LOS C	1.7	12.1	0.98	0.73	0.98	14.4
9	R2	30	0	32	0.0	0.330	45.0	LOS D	1.7	12.1	0.98	0.73	0.98	26.1
Approach		83	0	87	0.0	0.330	43.5	LOS D	1.7	12.1	0.98	0.73	0.98	19.9
West: Hunter Street														
10	L2	36	0	38	0.0	0.507	34.7	LOS C	7.9	56.7	0.92	0.77	0.92	31.9
11	T1	401	11	422	2.7	0.507	29.1	LOS C	8.0	57.2	0.92	0.76	0.92	35.2
12	R2	146	0	154	0.0	*0.509	39.8	LOS C	5.7	39.9	0.96	0.80	0.96	29.2
Approach		583	11	614	1.9	0.509	32.2	LOS C	8.0	57.2	0.93	0.77	0.93	33.4
All Vehicles		1721	40	1812	2.3	0.514	26.2	LOS B	10.4	74.1	0.78	0.72	0.78	33.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [2031PM+DEV (Site Folder: General)]

Mixed Use Development
Hunter Street/Tudor Street/Railway Street Signalised Intersection
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 60 seconds (Site Practical Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Tudor Street														
1	L2	66	0	69	0.0	0.066	8.4	LOS A	0.6	4.0	0.40	0.64	0.40	48.5
2	T1	18	0	19	0.0	*0.575	31.7	LOS C	3.2	23.4	1.00	0.80	1.07	16.6
3	R2	175	15	184	8.6	0.575	36.2	LOS C	3.2	23.4	1.00	0.80	1.07	20.6
Approach		259	15	273	5.8	0.575	28.8	LOS C	3.2	23.4	0.84	0.76	0.90	26.6
East: Hunter Street														
4	L2	304	10	320	3.3	0.252	9.2	LOS A	3.4	24.5	0.39	0.66	0.39	41.2
5	T1	513	14	540	2.7	*0.669	21.3	LOS B	9.5	68.0	0.91	0.80	0.97	39.6
6	R2	37	0	39	0.0	0.669	27.3	LOS B	9.5	68.0	0.94	0.83	0.98	24.6
Approach		854	24	899	2.8	0.669	17.2	LOS B	9.5	68.0	0.72	0.75	0.76	39.4
North: Railway Street														
7	L2	27	0	28	0.0	0.262	33.4	LOS C	1.4	10.1	0.96	0.72	0.96	19.6
8	T1	30	0	32	0.0	*0.262	28.9	LOS C	1.4	10.1	0.96	0.72	0.96	18.0
9	R2	37	0	39	0.0	0.262	33.4	LOS C	1.4	10.0	0.96	0.73	0.96	30.2
Approach		94	0	99	0.0	0.262	32.0	LOS C	1.4	10.1	0.96	0.72	0.96	24.4
West: Hunter Street														
10	L2	37	1	39	2.7	0.659	32.1	LOS C	6.7	48.1	0.98	0.84	1.06	33.1
11	T1	401	11	422	2.7	0.659	26.5	LOS B	6.8	48.5	0.98	0.84	1.06	36.6
12	R2	146	0	154	0.0	*0.709	36.6	LOS C	4.8	33.9	1.00	0.87	1.20	30.4
Approach		584	12	615	2.1	0.709	29.4	LOS C	6.8	48.5	0.98	0.85	1.09	34.7
All Vehicles		1791	51	1885	2.8	0.709	23.6	LOS B	9.5	68.0	0.84	0.78	0.90	35.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [2031PM+DEV 80 sec cycle (Site Folder: General)]

Mixed Use Development
Hunter Street/Tudor Street/Railway Street Signalised Intersection
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Tudor Street														
1	L2	66	0	69	0.0	0.065	8.2	LOS A	0.6	4.5	0.33	0.63	0.33	48.7
2	T1	18	0	19	0.0	*0.511	39.4	LOS C	4.0	29.7	0.98	0.78	0.98	14.4
3	R2	175	15	184	8.6	0.511	43.9	LOS D	4.0	29.7	0.98	0.78	0.98	18.2
Approach		259	15	273	5.8	0.511	34.5	LOS C	4.0	29.7	0.82	0.74	0.82	24.1
East: Hunter Street														
4	L2	304	10	320	3.3	0.228	8.3	LOS A	3.4	24.2	0.29	0.63	0.29	42.5
5	T1	513	14	540	2.7	*0.532	21.5	LOS B	11.1	79.3	0.82	0.70	0.82	39.5
6	R2	37	0	39	0.0	0.532	28.1	LOS B	11.1	79.3	0.85	0.74	0.85	24.1
Approach		854	24	899	2.8	0.532	17.1	LOS B	11.1	79.3	0.63	0.67	0.63	39.5
North: Railway Street														
7	L2	27	0	28	0.0	0.414	45.2	LOS D	2.0	13.8	0.99	0.73	0.99	15.9
8	T1	30	0	32	0.0	*0.414	40.7	LOS C	2.0	13.8	0.99	0.73	0.99	14.3
9	R2	37	0	39	0.0	0.414	45.2	LOS D	2.0	13.8	0.99	0.73	0.99	25.9
Approach		94	0	99	0.0	0.414	43.8	LOS D	2.0	13.8	0.99	0.73	0.99	20.2
West: Hunter Street														
10	L2	37	1	39	2.7	0.537	35.8	LOS C	8.1	58.1	0.93	0.78	0.93	31.3
11	T1	401	11	422	2.7	0.537	30.2	LOS C	8.2	58.6	0.93	0.78	0.93	34.7
12	R2	146	0	154	0.0	*0.552	41.0	LOS C	5.8	40.7	0.97	0.80	0.97	28.7
Approach		584	12	615	2.1	0.552	33.3	LOS C	8.2	58.6	0.94	0.78	0.94	32.9
All Vehicles		1791	51	1885	2.8	0.552	26.3	LOS B	11.1	79.3	0.78	0.72	0.78	33.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
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Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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NEWCASTLE

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E: admin@ckds.com.au
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Date: 30/03/2022

Damian Jaeger
Principal Development Officer (Planning)
City of Newcastle

Dear Damian,

RE: DA2021/01459 – 924 Hunter Street, Newcastle West

Please find below a response to each of the items raised in Council's UDRP Report.

1. *Additional informal fixed seating be integrated in the open spaces of the ground plane.*

We have been working closely with Xeriscapes, the landscape architect engaged for the project, to provide additional informal seating and landscaped elements to the ground plane. An updated ground level plan has been provided as part of the resubmission.

2. *Practical considerations in respect to the proposed interpretive heritage treatment and public artwork; including structural fixing points for lighting and other components of the work(s), cleaning and maintenance.*

Requirements for fixing points, lighting, and maintenance are subject to design development of the artwork by the artist.

This item, and the public artworks in general, are proposed to be developed through detailed design post-DA in collaboration and coordination with the artist, heritage consultant, and relevant consultants including structural engineers.

3. *Carparking security points should be designated. Allocated and visitor car parks should be identified, and workable operational procedures set out to guide visitors to residential lobby spaces.*

Refer new drawings A-7010 & A-7011 clarifying proposed movement and access through ground & upper ground floors.

4. *Potential light spill impact from the proposed interpretive heritage treatment and public artwork upon adjacent residential apartments should be addressed.*

Subject to development of public artwork by artist. Refer updated drawing A-8003 with additional concept information on the proposed heritage 'immersive' public artwork. The installation is proposed to be contained within the clock tower to prevent excessive light spill.

5. *Further consideration of how access between the residential visitor car park and the residential lobby spaces would work.*

Refer new drawings A-7010 & A-7011 clarifying proposed movement and access through ground & upper ground floors.

6. *Provision of performance glass and double-glazing, as well as thermally broken window and (glazed) door frames, in some locations at least, to address the solar loads on glazing which have the potentially to be considerable.*

Refer BASIX report for proposed minimum glazing specifications.

7. *A suitable standard of interior blind system options be offered for the building – selected to block glare and to provide some assistance with thermal insulation. This would also be of assistance to the aesthetic presentation of the building - to achieve some consistency and provide a reasonably uniform aesthetic as viewed from the exterior.*

The client has confirmed internal roller blinds are being included in the sales package of the apartments to provide glare management, some thermal performance, improved acoustics, and a consistent external aesthetic in the base building.

8. *Additional informal fixed seating be integrated in the open spaces of the ground plane. Defining the movement corridors to allow seating and garden areas to occupy the interface between the building and the ground plane. Opportunities for capitalising on deep soil areas facing Hunter Street should also be considered, in the context of the significance of the view towards Dairy Farmers Corner from Tudor Street. Narrowing the stairway on Railway Street would assist in freeing up areas on the building edge.*

Refer to updated ground plane landscape plan.

9. *The opportunity exists to better integrate the commercial ground floor foyer with the external landscape areas and minimise hard, dead areas between the foyer and the clocktower.*

Refer to updated ground plane landscape plan.

10. *Reducing the extent of hard surface at the ground plane.*

Refer to updated ground plane landscape plan.

11. *Coordination between the landscape design, structural and hydraulic design be considered and demonstrated as part of the submitted DA to ensure that nominated soil volumes can be adequately supported by the structures below and that required penetrations in the slabs for rooftop drainage are included in calculations.*

Service consultants have been engaged pre-DA and their input, including input on soil volumes, coordinated into the architectural and landscape plans. Refer to Northrop Consulting Engineer's letter in regard to this item.

12. *Further consideration of a reasonable level of presentation will be achieved in respect to the public views to balconies and any items stored or located there, given the extent of clear glazed balustrades on balconies.*

The architectural design will bring an elegant yet dynamic presence to the Newcastle streetscape and skyline. It has been subject to extensive external design review, and has a considered material palette that considers aesthetics, durability, maintenance, and response to heritage.

Glass balustrades at the higher tower levels provide unobstructed access to sunlight and view, with the introduction of 'diminishing' solid elements to the balustrades at lower levels for privacy and level of presentation to the public.

The diminishing solid balcony elements are applied to the bottom third of each tower, blocking the view to residential balconies from the immediate public domain. From more distant vantage points, a combination of reflections on the glass balustrades at upper levels and purely the distance to a third of the way up the tower, it is considered that a reasonable level of presentation will be maintained from the public domain with the proposed scheme.

13. *Identifying the locations for signage, including retail, commercial and residential signage (i.e. a site signage strategy should be prepared). Likewise, all infrastructure locations and connections, including services, HVAC, fire booster pumps, tanks and related pipework, electrical substations*

and metering should be documented, so as not to detract from the appearance of the completed development.

Refer to new drawings A-8004, A-8005, A-8006 for proposed signage strategy.

The development application scheme has been reviewed and coordinated to accommodate spatial inputs from services consultants including structural, civil, electrical, ASP3, hydraulic, mechanical, BASIX. Fire booster pumps, tanks, substations and meters are all sized by relevant consultants and locations nominated on the GA plans.

Should you have any further queries regarding this matter, please contact me at scampbell@ckds.com.au or on 02) 4929 1843.

Kind Regards,

Stuart Campbell
Director
Registered Architect ARBN 7545

Thirdi Dairy Farmers Corner Pty Ltd
RFI response material – social planning

Demographic profile

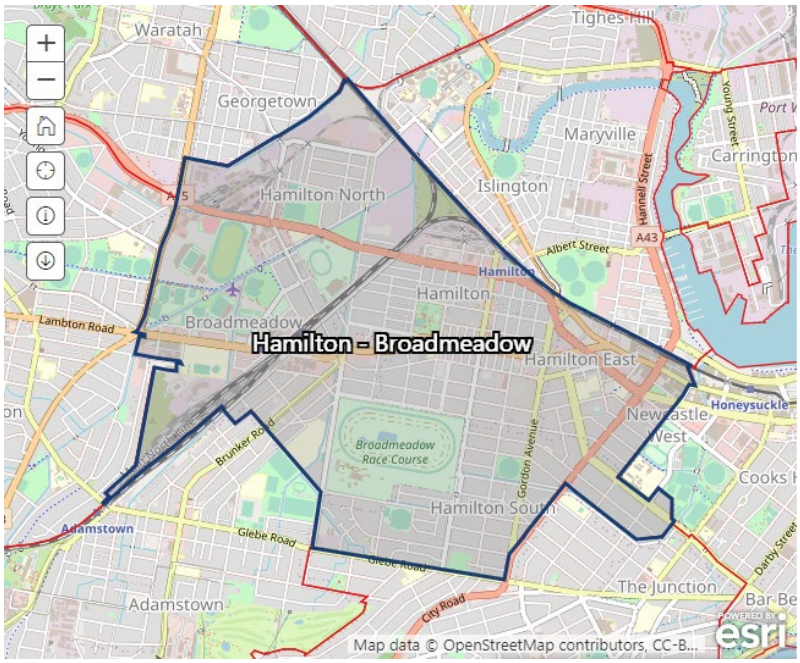
Australian Bureau of Statistics (ABS) demographic data for the immediate and surrounding areas are presented below. These areas are defined as the Hamilton East State Suburb (SSC), and the Hamilton - Broadmeadow Statistical Area Level 2 (SA2). These are compared with corresponding data for the LGA. The data reported are drawn from the ABS 2016 Census[1], unless otherwise stated.

Figure 1 Hamilton East SSC

Source: ABS 2022

[1] The release of data from the 2021 Census commences from June 2022.

Figure 2: Hamilton – Broadmeadow SA2



Source: ABS 2022

Table 1: Population characteristics, SSC, SA2 & LGA (2016 Census)[2]			
	SSC (count)	**SA2 (count)**	**LGA (count)**
Population	983	11,848	155,411
Total private dwellings	398	5,771	68,827
Median age (years)	42	39	37
Average people per household	2.6	2.3	2.4
	SSC (%)	**SA2 (%)**	**LGA (%)**
Male	50.7	49.6	49.3
Female	49.3	50.4	50.7
Single/lone person household	24.5	33.7	29.2
Couple family without children[3]	40.7	39.3	38.4
Couple family with children	47.1	38.4	41.7
One parent family	9.5	19.7	18.4
Dwelling structure – separate dwelling	88.4	63.1	71.1
Household income < $650 gross/week	14.9	25.8	22.2
Household income > $3000 gross/week	26.7	16.6	14.6

Observations on population, housing and income characteristics

The following observations must be considered in the context of the small population of Hamilton East (8.3% and 0.6% of the SA2 and LGA populations respectively). This implies that a relatively small absolute difference in counts can result in an amplified proportional difference as compared with the larger populations.

[2] < https://www.abs.gov.au/census >
[3] This data point relates to 'families', as distinct from 'households' as per the preceding data point.

Local population features

Differences between the SSC and SA2 populations, and that of the CN LGA more broadly are as follows:

- The localised SSC population is generally older than the two larger populations, as defined by median age.
- There is a higher proportion of male than female residents, which is approximately inverse to the two larger populations.
- Average household size for the SSC is larger than for the SA2 and LGA, which on the evidence presented is apparently a function of the combination of SSC population characteristics, including the smaller proportion of single/lone person households, higher proportion of couple families with children and most evidently, the much lower proportion of one parent families.

Collectively the population data suggest a comparatively high representation of somewhat older, family households residing in the SSC.

The data on the proportion of low and high income households also demonstrate that the immediate community has significantly greater economic resources than the larger SA2 and LGA communities. In this respect, it can be considered as likely that additional dwellings will be of comparatively high value, and generally will be attractive to households with higher incomes, which would be consistent with the immediate population and housing profiles. This is further emphasised by comparing the ABS Socioeconomic Indexes for Australia (SEIFA) for the three populations[4]. Two SEIFA indexes, the Index of Relative Social Disadvantage (IRSD) and the Index of Relative Socioeconomic Advantage and Disadvantage (IRSAD) are presented in Table 2. These two indexes are reported as they provide broadly based summary measures of socioeconomic status (SES).

Table 2: SEIFA (ABS Census 2016)

	IRSD		IRSAD	
	Score	**Decile**	**Score**	**Decile**
SSC	1067	9	1085	10
SA2	982	4	996	5
LGA	997	7	996	8

The indexes substantiate the income data presented in Table 1. The immediate suburb of Hamilton East is one of the least disadvantaged/most advantaged suburbs, nationally. The LGA is also relatively less disadvantaged, whereas the SA2 falls within the middle of the range with respect to relative disadvantage/advantage. The presence of higher levels of disadvantage in the SA2 supports the case for consideration of provision of some of the proposed dwellings as suitable for affordable housing or for members of vulnerable groups in the community. This addressed subsequently in this material.

[4] < https://www.abs.gov.au/ausstats/abs@.nsf/mf/2033.0.55.001 >

Population projections

Population projections published by Transport for NSW (TfNSW) are presented in Table 3. The projections are for the Hamilton – Broadmeadow SA2, and the immediate Travel Zone (TZ) of Hamilton East, in which the site is located, noting that the TZ may not necessarily completely align with the SSC boundaries used by ABS.

Table 3: Total population projections TZ & SA2

	2016	2021	2026	2031	2036	2041	Δ (%) 2016-41	Δ (%) 2021-41
Total pop. TZ	2,181	2,337	2,414	2,504	2,570	2,648	21.4	13.35
Total pop. SA2	12,046	12,797	13,204	13,685	14,032	14,447	19.9	12.90

Data source: TfNSW 2022[5]

NSW Department of Planning, Industry and Environment (DPIE) projections for the LGA are presented in Figure 3[6]. These indicate a greater growth rate for the LGA, of 24.3% (2016-2041) and 15.8% (2021-2022), when compared with the smaller and more constrained local areas. As the localised population increases are likely to be of lesser magnitude than those for the LGA, it is assumed that state, regional and LGA planning strategies would have capacity to accommodate these additional residents, and to absorb the increases in demand for infrastructure and services that these residents would be presumed to generate in these smaller areas.

Figure 3

Key Indicators: Projected Population, Households and Dwellings - all data at 30th June

	2016	2021	2026	2031	2036	2041
Total Population	160,700	172,500	179,200	186,900	192,800	199,700
2016 Population Projection	165,050	174,400	183,450	192,250	198,350	
Total Households	66,200	71,600	74,800	78,500	81,550	84,950
Household Size*	2.36	2.34	2.33	2.31	2.29	2.27
Implied Dwelling Projection**	73,100	79,050	82,600	86,650	90,050	93,800

*Average persons resident per occupied private dwelling

**Dwellings required if the population forms households in the same ways as in 2016

Population change

	2016-21	2021-26	2026-31	2031-36	2036-41	2016-41 (25-year change)
Population change	11,800	6,700	7,700	5,900	6,900	**39,000**
Average annual growth rate	1.4%	0.8%	0.8%	0.6%	0.7%	**0.9%**
Births	10,000	11,100	11,250	11,250	11,300	**54,900**
Deaths	6,200	6,300	6,500	6,900	7,450	**33,350**
Natural change	3,800	4,800	4,750	4,350	3,850	**21,550**
Net Migration (all)	8,000	1,850	2,950	1,550	3,000	**17,350**

Source: DPIE 2019

Increase in population attributable to the proposed development

Based on current planning, the proposed development will comprise 183 units of various configurations, being of one, two and three bedrooms. As a stand-alone housing development, the proposed residential project differs substantially from the existing housing

[5] < https://opendata.transport.nsw.gov.au/search/type/dataset >
[6] < https://www.planning.nsw.gov.au/Research-and-Demography/Population-projections/Projections >

stock in Hamilton East, the SA2 and the LGA. Each of these areas feature a predominance of separate houses, compared with other structure types. The result is relatively larger household sizes than may be expected for the units as proposed.

A more valid comparison is considered to be with the neighbouring suburb of Newcastle West, which has a substantial concentration of housing forms similar to that as proposed (91.6% of dwellings described as flats or apartments), with average household size (2016 Census) of 1.6 people per household. Applying this estimate to the proposed dwellings results in an estimated 293 residents. Based on the 2026 population estimates, this would result in the proportional contributions as presented in Table 4. The TfNSW TZ ERP is assumed for Hamilton East.

Table 4: Proportional population increase attributable to project (2026 ERPs[7])

Area	% 2026 ERP
Hamilton East	12.1%
SA2	2.2%
LGA	0.2%

The development would notionally create a relatively large population increase at the immediate suburb level. The effects as the reference area is expanded are likely to be immaterial, in terms of the broader populations. It is also noted that, as the capacity of the dwellings in the development will remain static, over time the proportion of the population that these residents represent, will naturally decline.

With respect to the SSC/TZ populations, the principal consideration from the perspective of social impacts is whether the additional residents would detrimentally affect the capacity of other residents to, for example, maintain their current lifestyles, levels of amenity, and access to the infrastructure and services required to achieve these ends.

Access to services and facilities

Transport

The site is very well located with respect to public transport and to major roads for vehicular access, to service occupants of the building. Specifically:

- The site is approximately 300 metres[8] of the Newcastle Interchange (trains and trams).
- Is within 100 metres of the nearest bus stops in either direction, on Hunter Street/Pacific Highway; approximately 150 metres from the nearest north/eastbound bus stop on Tudor Street; and approximately 400 metres from the nearest westbound bus stop on Tudor Street.

[7] Estimated Resident Population
[8] All reported distances are linear unless otherwise stated.

- Is approximately 2.3 kilometres from the Newcastle Ferry Terminal, which is accessible via tram from the interchange.
- Is located at the intersection of Hunter Street and Tudor Street, which provides direct access;
    - Via Tudor Street and Donald Street/Griffiths Road to suburbs to the west and south.
    - Via Hunter Street towards the eastern end of the CBD and neighbouring suburbs.
    - Via Pacific Highway/Maitland Road to suburbs immediately northwest and to the Pacific Highway north and southwards.
- The site is also located approximately 300 metres from the major road junction of Stewart Avenue, Hunter Street and Hannell Street, providing access:
    - Via Stewart Avenue/City Road/Pacific Highway to suburbs south of the CBD.
    - Via Hannell Street/Industrial Drive to suburbs and areas west and north of the CBD, including north to Newcastle Airport (Williamtown, approximately 24 kilometres by road).

Health and essential/emergency services

Access to major transport routes is a key consideration in this respect. As has been established, the proposed development site is favourably located in respect of major transport routes, and as a result access to, for example, public hospitals. Proximity to selected major health infrastructure and essential/emergency services, such as NSW Ambulance, are summarised in Table 5.

Table 5: Access to major health and essential/emergency services

Facility/service	Distance by road (km)[9]
John Hunter Hospital, New Lambton Heights	6.5km
Calvary Mater Hospital, Waratah	5.4km
NSW Ambulance Service, Hamilton	0.5km
Fire & Rescue NSW, Newcastle Station	1.5km
NSW Police Force, Newcastle Station	3.0km

In other respects, access to medical and other essential and ancillary health practitioners is assumed as being of the comparatively high standard that would be expected of the location of the development in the City of Newcastle, and in the broader regional conurbation of the Newcastle – Lake Macquarie SA4 and other contiguous LGAs.

Educational facilities

The proposed development site is in near or reasonable proximity to a range of primary, secondary, vocational and tertiary education providers. A selection of these include;

- Tighes Hill Public School (zoned public primary school).
- Callaghan College Waratah (zoned public secondary school).
- St Francis Xavier College (Catholic secondary).

[9] Assumes most direct route. Source: Google Maps 2022 < https://www.google.com.au/maps/ >

- St Josephs Primary School, Merewether (Catholic primary)
- Newcastle Grammar School.
- TAFE NSW Hamilton, Hunter Street and Tighes Hill.
- University of Newcastle, Hunter Street and Callaghan campuses

There are various other schools, campuses and private educational providers that are also located accessibly within the LGA.

Essential retail access

Convenient access to the most essential forms of retail, including supermarkets and pharmacies, will be available to residents of the proposed development. A non-exhaustive, indicative summary of relevant nearby facilities is presented in Table 6.

Table 6: Access to essential retail

Facility/service	Distance by road (km)
Coles supermarket, Marketown Shopping Centre	0.8 km
Woolworths supermarket, Marketown Shopping Centre	1.0km
Aldi supermarket, Hamilton & Cooks Hill	1.5km
Ron Elliott Pharmacy Care, Marketown Shopping Centre	0.8km
Four (4) pharmacies, Beaumont Street, Hamilton[10]	0.9km – 1.5km

As is the case with access to health services, there are numerous options available to potential residents in relation to essential and discretionary retail providers in the immediate area and across the LGA and SA4 more broadly.

It is noted that there several retail commercial tenancies provided for at ground level within the development. The eventual commercial occupants may also provide conveniently accessible services, that are likely to be supplementary to the essential retail providers identified above.

Access to other services

The proposed development site is favourably located in terms of access to leisure, recreation, and social and sports participation and event opportunities. The site is within one (1) kilometre (linear) of the western end of the Honeysuckle precinct, and the related access to public domain. This is also available through convenient access to various parks, playing fields and other open space domain within reasonably near proximity.

The site is within relatively close proximity of all three of the LGA's major entertainment and hospitality centres (Beaumont Street, Darby Street, and Newcastle CBD/ Foreshore/ Honeysuckle areas). The site is also within convenient public transport or private vehicle access of the major regional sporting facilities at New Lambton, including Hunter Stadium and Newcastle Entertainment Centre.

[10] Chemist Warehouse; Piggott's Pharmacy; Terry White Chemmart; Priceline Pharmacy.

Summary comments on potential effects on access

It is submitted that the level and capacity of infrastructure and services available to current and future residents is such that the proposed development would impose no material effects on third parties. This conclusion is substantiated by the significant capacity available within the local, LGA and broader regional areas, and by the comparatively small contribution to additional population that the proposed residential development would create.

Effects on supply of affordable housing, and housing for vulnerable groups

As has been previously noted, the development site is located in a suburb and extended local area (SA2) that both have relatively large proportions of separate or stand-alone dwellings. As a consequence, the proposed dwellings will clearly contribute to diversification of local housing stock. This diversification will extend to the distribution of dwellings within the development itself, with its proposed range of one, two and three bedroom units.

Most recently published data from the NSW Department of Family and Community Services (FACS) Sales and Rental Dashboard[11] are presented in Table 7, for the 2303 postal area (POA), in which the development is located, and the CN LGA. Rental data are reported for the December 2021 quarter, and sales data for the September 2021 quarter. The data substantiate the ABS Census data in respect of the concentration of separate houses in the immediate area (counts for separate houses in the POA rental tables are included in brackets [ ]).

As may be expected given its inner-city location, Hamilton East is characterised by relatively high property prices in terms of sales (as a proxy for owner-occupied properties) and rental properties. This is consistent with the income and SES measures previously observed. In this environment, and with the capital cost of a project of the scale of that proposed, there is limited scope to provide a significant number of dwellings in the development that would be considered as affordable in the regional context, or under the definitions of affordability contained in the Housing SEPP (2021).

However, in terms of local housing cost relativities, the increase in the number of smaller scale dwellings will notionally increase the number of more relatively affordable dwellings. The data also further substantiate that the project will also clearly contribute to diversification in terms of housing structure and size, as previously noted.

At present, the project proposal also includes provision for a minimum of five (5) dwellings suitable for accommodating NDIS clients. This is a minimum of 2.7% of the dwellings as proposed. These units will achieve the dual purposes of providing dwellings for vulnerable groups, and providing affordable housing to these residents. It is also noted that the

[11] < https://www.facs.nsw.gov.au/resources/statistics/rent-and-sales/dashboard >

locational advantages in terms of access to transport and essential services are also likely make these dwelling units particularly fit for this purpose.

Table 7: FACS sales & rental data, 2303 POA and LGA

Dwelling/sale type	2303 POA $'000s		CN LGA $'000s	
	Median	Mean	Median	Mean
Total	1,150	1,191	760	823
Non-strata	1,258	1,327	800	881
Strata	nr	nr	635	705

Dwelling/rental type	2303 POA		CN LGA	
	Median $/week	Total bonds held	Median $/week	Total bonds held
All dwellings	550	1,124	490	21,382
All – 1 bedroom	285	186 [32]	300	4,188
All – 2 bedrooms	480	389 [134]	470	6,774
All – 3 bedrooms	620	376 [298]	560	7,254
All – 4+ bedrooms	900	102 [92]	650	2,025
House (all)	600	567	530	9,903
Flat/unit (all)	420	351	420	6,694
Townhouse (all)	nr	95	550	2,287
Other (all)	nr	111	210	2,498

Summary comments on social impact issues

The proposed development will ultimately result in a relatively small increase in population, from the SA2 and LGA perspectives. The increase will be more material at local (SSC/TZ) level. However, the location of the development site is such that the additional residents are unlikely to impede the ability of other current and future residents to maintain their lifestyles, amenity and access to the infrastructure and services required to support these. Similarly, prospective residents will have access to the same broad range of infrastructure and services, as may be expected given the site location within the CN LGA and the larger conurbation/s of which it forms part.

The proposed development will also increase diversity of housing stock in the immediate area. It is also planned to include a proportion of units for vulnerable community members, which also by necessity would be considered as providing a contribution towards affordable housing. This is particularly important in the context of an immediate local area which is characterised by relatively high housing costs.

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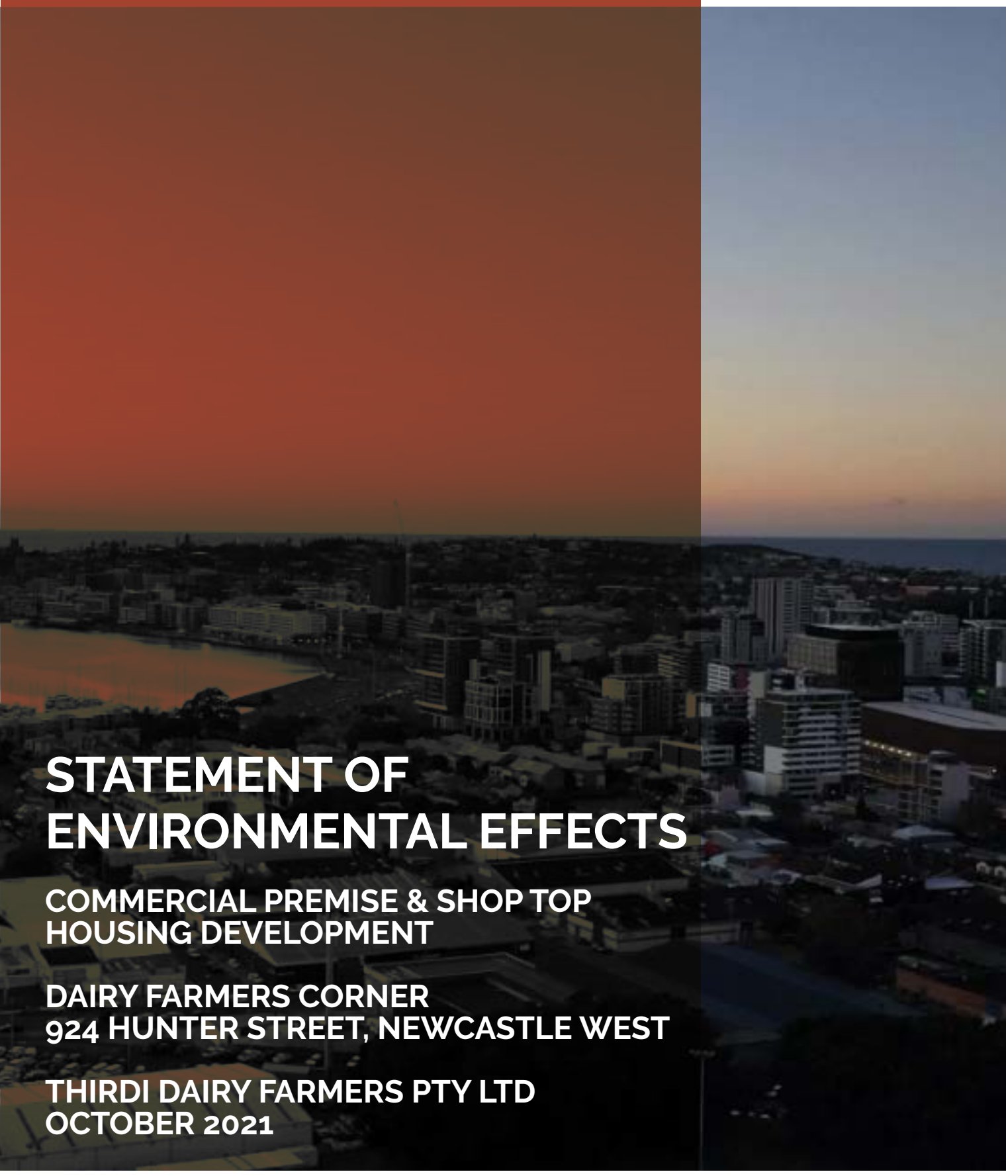
30 March 2022



STATEMENT OF ENVIRONMENTAL EFFECTS

COMMERCIAL PREMISE & SHOP TOP HOUSING DEVELOPMENT

DAIRY FARMERS CORNER
924 HUNTER STREET, NEWCASTLE WEST

THIRDI DAIRY FARMERS PTY LTD
OCTOBER 2021

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Document Control Sheet

Issue No.	Amendment	Date	Prepared By	Reviewed By
A	Draft	22nd October 2021	LDW	CM
B	Final	26th October 2021	LDW	CM

Limitations Statement

This report has been prepared in accordance with and for the purposes outlined in the scope of services agreed between ADW Johnson Pty Ltd and the Client. It has been prepared based on the information supplied by the Client, as well as investigation undertaken by ADW Johnson and the sub-consultants engaged by the Client for the project.

Unless otherwise specified in this report, information and advice received from external parties during the course of this project was not independently verified. However, any such information was, in our opinion, deemed to be current and relevant prior to its use. Whilst all reasonable skill, diligence and care have been taken to provide accurate information and appropriate recommendations, it is not warranted or guaranteed and no responsibility or liability for any information, opinion or commentary contained herein or for any consequences of its use will be accepted by ADW Johnson or by any person involved in the preparation of this assessment and report.

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The Client should be aware that this report does not guarantee the approval of any application by any Council, Government agency or any other regulatory authority.

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1.0 Introduction

1.1 INTRODUCTION

ADW Johnson Pty Ltd has been commissioned by Thirdi Dairy Farmers Pty Ltd to prepare a Development Application (DA) and accompanying Statement of Environmental Effects (SOEE) for a proposed commercial premise and shop top housing development at 924 Hunter Street, Newcastle West. The development comprises a five (5) level podium that predominately provides for commercial spaces and car parking, with two (2) residential apartment towers above. The estimated cost of the proposed development is $100,125,230.

1.2 DEVELOPMENT APPLICATION DETAILS

STATEMENT OF ENVIRONMENTAL EFFECTS PREPARED BY:	
Name:	ADW Johnson Pty Ltd Unit 7, 335 Hillsborough Road WARNERS BAY NSW 2282
Contact:	Craig Marler Principal Planner Ph: (02) 4978 5100 Fax: (02) 4978 5199 Email: craigm@adwjohnson.com.au Website: www.adwjohnson.com.au
PROJECT DETAILS:	
Applicant Name:	Thirdi Dairy Farmers Pty Ltd
Applicant Address:	3 Harold Street, Floraville NSW 2282
Property Description:	Dairy Farmers Corner 924 Hunter Street, Newcastle West Lot 2 DP 445736, Lot 1 DP 342675, Lots 1 & 2 DP 1091173, Lot 2 DP 126, Lot 1 DP 456088 & Lot 1 DP 395367
Project Description:	Commercial Premises and Shop Top Housing
PROJECT TEAM:	
Proponent:	Thirdi Dairy Farmers Pty Ltd
Project Manager:	Catalyst Project Consulting
Architect:	CKDS Architecture
Survey:	Positive Fix Solutions
Civil Engineering:	Northrop Consulting Engineers
Town Planning:	ADW Johnson
Landscaping:	CKDS Architecture
Heritage:	Heritas Architecture
Traffic:	Intersect Traffic
BASIX & BCA:	Credwell Consulting
Acoustic:	Muller Acoustic Consulting

Access:	Lindsay Perry Access
Geotechnical:	Douglas Partners
Wind:	ARUP Group
Quantity Surveyors:	Napier & Blakeley
Waste Management:	Waste Audit and Consultancy Services

1.3 BRIEF OVERVIEW OF THE PROPOSAL

The subject site has a street address of 924 Hunter Street, Newcastle West, and contains multiple lots. The site is commonly known to the public as "Dairy Farmers Corner". The site has a total area of approximately 3,941m^2 and is a corner lot with an approximate frontage of 75m to Hunter Street, 54m to Railway Street, and 74m to Tighe Street.

The site is currently occupied by a two-storey vacant car dealership fronting the Hunter Street and Railway Street intersection, and a single storey gym ("Air Locker") along the eastern boundary. The remainder of the site is used as a car park.

The site is owned by McCloy Newcastle West Pty Ltd (the Certificate of Title and Deposited Plan are attached at **Appendix A** of this report). Landowner's consent has also been provided for the lodgement of the development application.

The proposal comprises:

- A five (5) level podium predominantly commercial space and carparking;
- Podium level communal space;
- Six (6) level communal building; and
- Two (2) residential towers extending from the podium.

The subject site is zoned B3 Commercial Core Zone under the *Newcastle Local Environmental Plan 2012*. Commercial premises and Shop Top Housing are both permissible uses within the B3 Zone, with the consent of Council.

The proposed development will provide a significant contribution to an increased supply of housing stock within the Newcastle City Centre, whilst integrating appropriate commercial and retail space to support the commercial objectives of the zone and as consistent with the desired character of the area.

The central location of the site and the nature of the proposal will place people in the City Centre day and night and contribute towards the overall revitalisation of Newcastle West and the City Centre.

The development is a significant in the city and will provide shorter term construction jobs, opportunities for employment long term within the commercial as well as benefits from a substantial number of new residences.

The development has been designed by award winning architects CKDS and has been and required by a Design review panel process. This has resulted in a development that exhibits design excellence (refer **Figure 1** below).

Figure 1: Photomontage of the Proposed Development.

Figure 2 below shows the location of the site in the local context of Newcastle West.

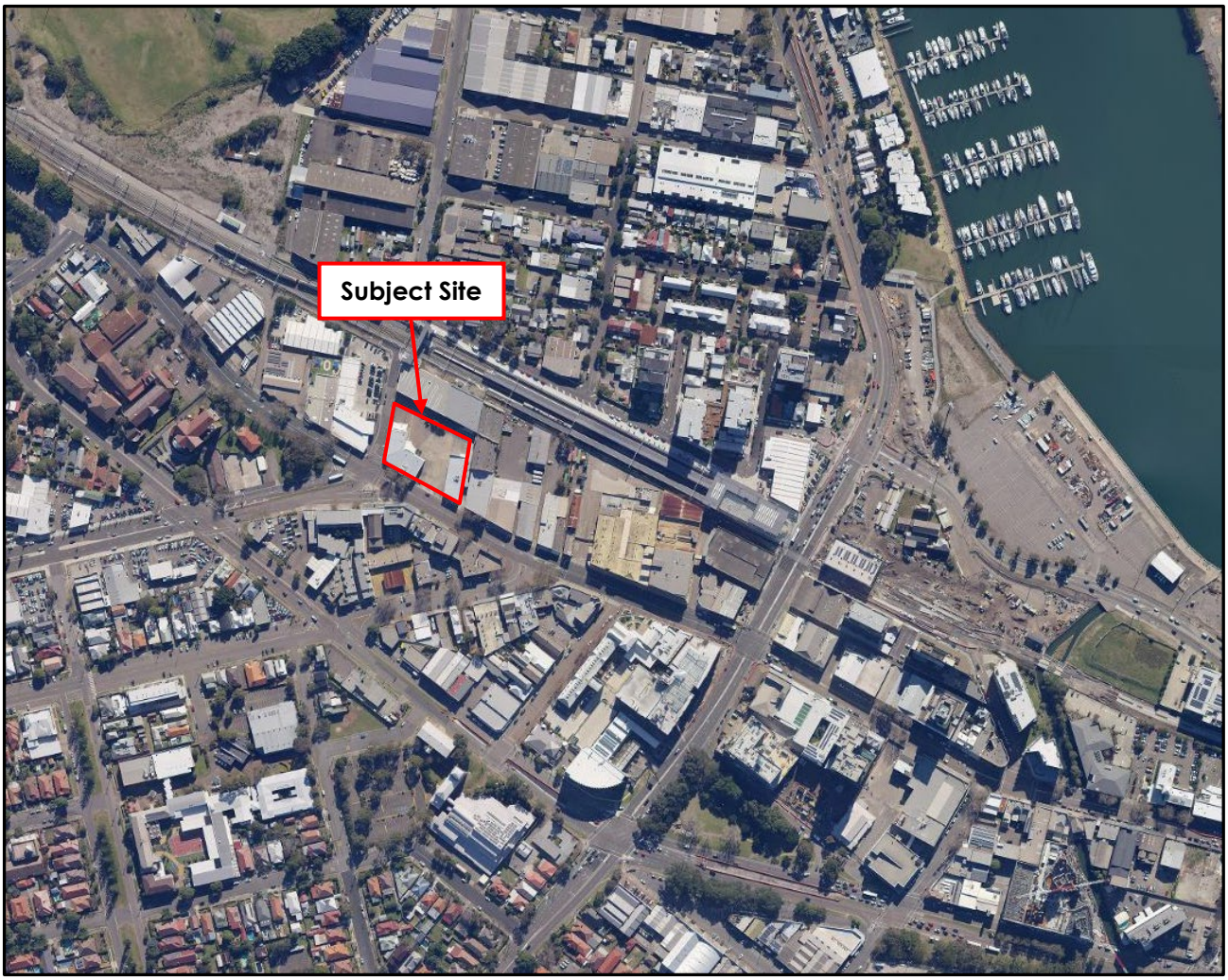

Figure 2: Site Locality Plan.

1.4 PURPOSE OF THE REPORT

This Statement of Environmental Effects (SoEE) has been prepared pursuant to Section 4.12(9) of the *Environmental Planning and Assessment Act 1979* and accompanying Regulation. Its purpose is to:

- Describe the proposed development;
- Identify and summarise the relevant controls which guide assessment of the proposal;
- Provide information on the site and its context; and
- Review the key issues associated with the proposal to aid in assessment by the Consent Authority and other relevant authorities.

Consideration has been given to the Council's guidelines in preparing this Statement of Environmental Effects as well as the full range of other relevant legislation and development guidelines, and the advice provided at two (2) UDRP Meetings held on 30th June 2021 and 25th August 2021. Copies of these meeting minutes are included at **Appendix P** of this report.

1.5 CONSULTATION

The proposed development has been designed by CKDS Architecture, with due consideration being given to the site's context, opportunities and constraints as well as the relevant legislation and guidelines. A design competition waiver has been issued by the Government Architect for this proposal on the basis that the proposal is reviewed by Newcastle City Council's UDRP. A copy of the waiver is provided within **Appendix O.**

Consistent with the recommendation of the Government Architect waiver the plans have been referred to Newcastle Council's Urban Design Consultative Group (UDCG) for consideration on 30th June 2021 and 25th August 2021. The design has taken into consideration comments from the UDCG. A copy of the UDCG Meeting Minutes is provided within **Appendix P.**

Further opportunity for involvement of both authorities and the community will occur during the notification and referral phase of the assessment.

2.0 Proposed Development

2.1 OBJECTIVES OF THE PROPOSAL

The objective of the proposal is to provide an architecturally designed building that exhibits significant design excellence and contributes to an increase in housing supply and commercial space within the Newcastle City Centre consistent with strategy planning policies for the locality.

The development aims to capitalise on the site's key location within the City Centre, being within close proximity to public transport, Marketown shopping centre, National Park, University of Newcastle City Campus, Hunter TAFE Campus, the light rail interchange, the emerging Wickham precinct, and the Honeysuckle and Newcastle Harbour precinct. The development will incorporate adequate on-site parking, ground floor commercial / retail premises, five (5) levels of shared commercial space, and upper-level apartments as shop top housing. The development will activate the streetscape through the provision of ground floor retail premises fronting both Hunter Street and Railway Street, and an internal pedestrian thoroughfare connecting these two street frontages.

The proposed development represents an opportunity to make a significant improvement to the public realm and contribution to the revitalisation of the city centre. The development will satisfy the desired, co-ordinated and integrated transformation of the west end of the Newcastle City Centre.

The development aligns with the objectives and principles contained within the *Hunter Regional Plan*, the *Greater Newcastle Metropolitan Plan*, and the *Local Strategic Planning Statement*, overall reinforcing the city's role and its desired identity as it undergoes revitalisation and renewal.

2.2 DESCRIPTION OF PROPOSED DEVELOPMENT

The proposed development involves the following components:

Demolition

The proposal will include demolition of the existing commercial buildings located on the site with the expectation of the Dairy Farmers Clock tower which has been heritage value:

Construction

The proposed development is conceived as a package of three (3) towers, varying in height and scale, which includes:

- Five (5) level podium predominantly incorporating commercial space and car parking;
- Podium level communal space;
- Six (6) level commercial building;
- Two (2) residential towers extending from the podium to heights of 100.7m (RL) and 86.9m (RL), with a maximum height above ground of 99m; and
- Associated infrastructure, landscaping and stormwater management works.

This provides for 183 residential apartments with a GFA of 19,515m^2 and a total commercial GFA of 1,945m^2.

Figure 3 below is photomontage from the Architectural Plans in **Appendix C**, providing a visualisation of the proposed development in the context of the surrounding built form.

Figure 3: Photomontage of the Proposed Development.

Table 1 below provides a detailed breakdown of residential and commercial space as well as proposed car parking, motorbike parking and bike parking.

Table 1: Schedule of Proposed Retail and Commercial Premises, and Residential Apartments.

Floor Level	1B	2B	3B	Parking Spaces	Residential GFA	Commercial GFA
Ground & Upper Ground				66	340m²	745m²
Level 1				60	230m²	240m²
Level 2	1	2		56	575m²	240m²
Level 3	3	3		55	595m²	240m²
Level 4	2	1			690m²	240m²
Level 5	3	6			760m²	240m²
Levels 6-14	27	54			6,840m²	
Levels 15-21		42	7		5,320m²	
Levels 22-24		12	6		2,280m²	
Levels 25-26		8			760m²	
Levels 27-29			6		1,125m²	
Totals	**36**	**128**	**19**	**237**	**19,515m²**	**1,945m²**

Access to the car parking facilities is a combined entry and exit point off Tighe Street.

A range of pedestrian access points have been provided from the street frontages and from within the ground level open space areas.

A separate loading dock with access off Tighe Street has also been provided for.

Facilities for the storage and collection of waste have been incorporated into the ground level.

Residential storage facilities have been included into the development at levels 1 and 2.

Substantial communal above at the podium level provides for both active and passive recreation space and included landscaping, seating, swimming pool, BBQ facilities, shade facilities and multipurpose/function rooms, gym and palates studio. In addition, a residence work from home space is provided at this level.

2.3 DOCUMENTATION

The following documentation has been provided to support the proposed development and includes the following:

- Certificate of Title and Deposited Plan – **Appendix A;**
- Detail Survey Plan (Positive Survey Solutions) – **Appendix B**;
- Architectural Plans (CKDS Architecture) – **Appendix C;**
- Landscape Plans (Xeriscapes) **– Appendix D;**
- SEPP 65 Architectural Design Quality Statement (CKDS Architecture) – **Appendix E;**
- BASIX Certificate – **Appendix F**;
- Concept Civil and Stormwater Management Plan (Northrop) – **Appendix G**;
- Geotechnical Assessment (Douglas Partners) – **Appendix H**;
- Statement of Heritage Impact – (Heritas Architecture) – **Appendix I**;
- Noise Assessment (Muller Acoustic Consulting) – **Appendix J**:
- Traffic and Parking Assessment (Intersect Traffic) – **Appendix K**;
- Access Report (Lindsay Perry Access) – **Appendix L**;
- Wind Assessment (ARUP Group) – **Appendix M**;
- NCC Assessment Report (Credwell Consulting) – **Appendix N**;
- Design Competition Waiver – **Appendix O**;
- UDCG Meeting Minutes – **Appendix P**;
- Quantity Surveyor Report (Napier & Blakeley) – **Appendix Q**;
- Flood Information Certificate – **Appendix R**; and
- Operational and Demolition Waste Management Plan (Waste Audit and Consultancy Services) – **Appendix S**.

3.0 Project Context

3.1 SITE

The subject site is known publicly as "Dairy Farmers Corner", and has a street address of 924 Hunter Street, Newcastle West, comprising the following lots:

- Lot 2 DP 445736;
- Lot 1 DP 342675;
- Lots 1 & 2 DP 1091173;
- Lot 2 DP 126;
- Lot 1 DP 456088;
- Lot 1 DP 395367.

The subject site has an area of 3,941m^2, and is a corner lot with an approximate frontage of 75m to Hunter Street, 54m to Railway Street, and 74m to Tighe Street. The subject site is owned by McCloy Newcastle West Pty Ltd (the Certificate of Title and Deposited Plan are attached at **Appendix A** of this report, and the Detail Survey Plan is attached at **Appendix B**).

The site is located within the Newcastle City Centre, within walking distance to the Honeysuckle Precinct, the Light Rail Interchange, Marketown Shopping Centre, National Park, Hunter TAFE (King St campus) and Newcastle University "New Space" Campus.

3.2 LOCALITY

The subject site is located in the suburb of Newcastle West, being south of Wickham, east of Hamilton, north of Hamilton South and west of Newcastle.

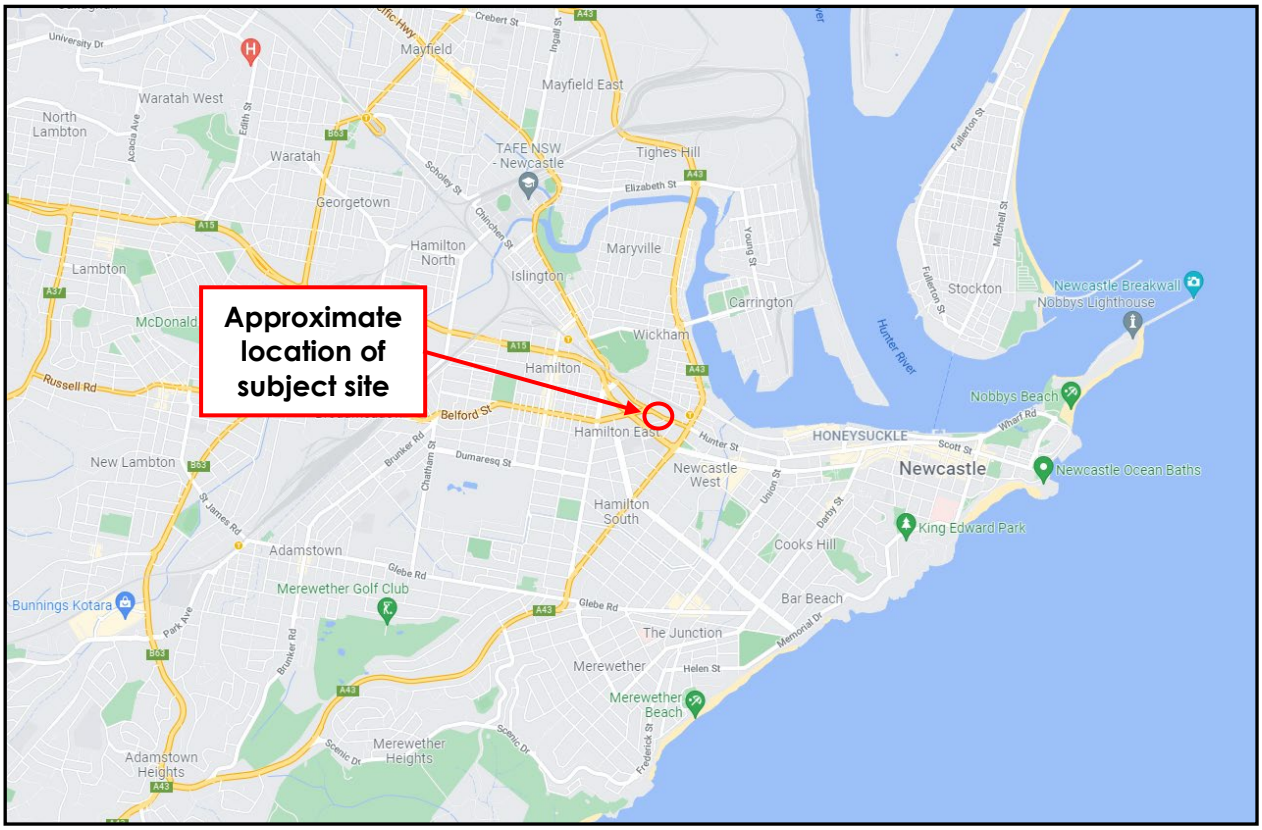

Figure 4: Locality Map of Site within the Broader Context of Newcastle.

The following plan shows the location of the subject site within the local context of Newcastle West.

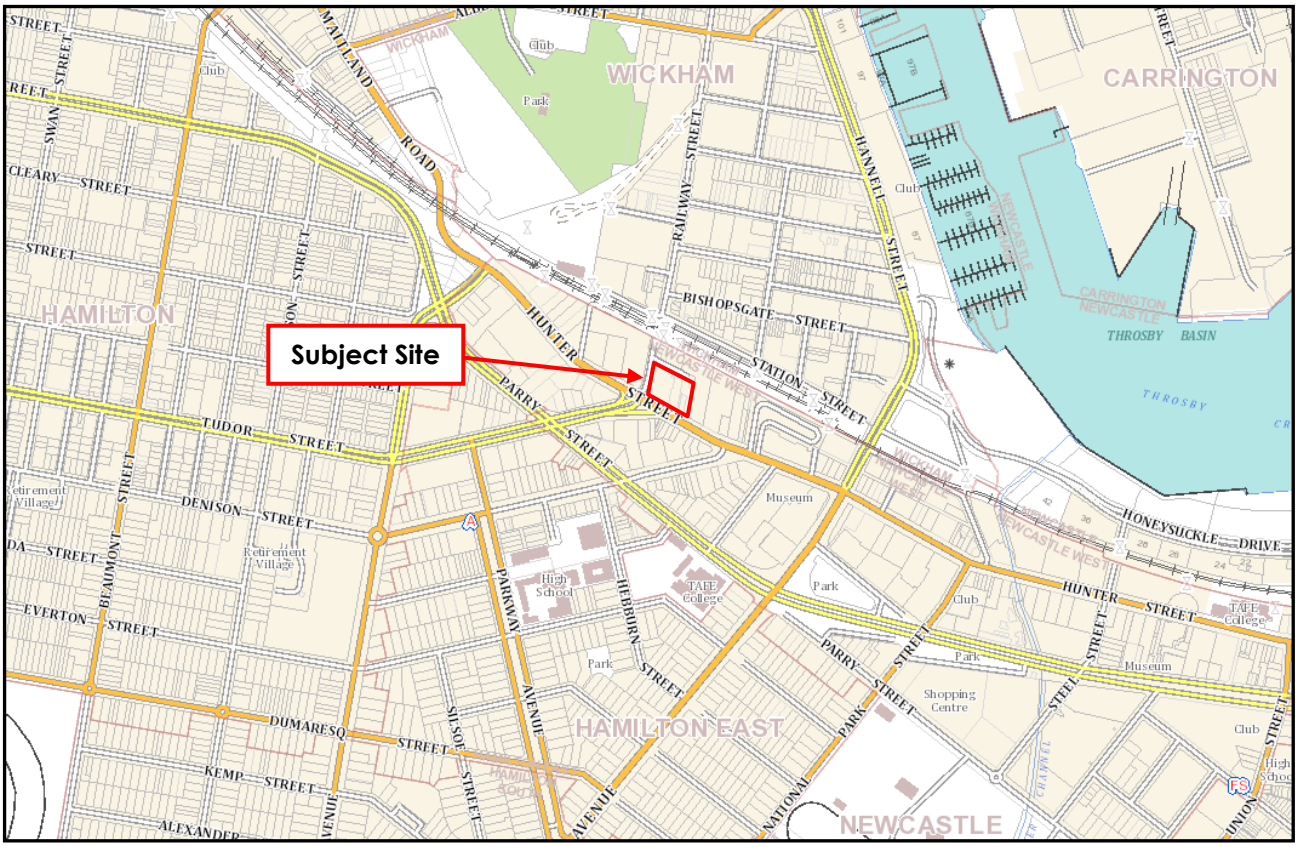

Figure 5: Locality Map of the Site within the Local Context of Newcastle West.

3.3 LANDUSES LOCALLY, AS WELL AS CURRENT AND PREVIOUS USES ON THE SITE

The site is currently occupied by a number of uses including a vacant two-storey car dealership fronting Hunter Street and Railway Street, a single storey gym along the site's eastern boundary, and a street level car park which occupies the remainder of the site.

The site is bound on three (3) sides by roads (Hunter Street, Railway Street and Tighe Street) and adjoining to the east is a three (3) storey self-storage facility "Kennards".

On the opposite side of Railway Street to the west land is used as a car dealership "BMW". The north side of Tighe Street is occupied by a single level building used as an automotive repair workshop and further north is the inner city rail line. The southern side of Hunter Street is occupied by various commercial premises of varying heights (2-4 storeys). 815 Hunter Street has been approved for a shop top housing development up to 56m (not yet constructed).

The following aerial photos give an appreciation of the subject site and surrounding pattern of development.

Figure 6: Aerial Photograph showing the Site and Surrounding Development.

Figure 7: Aerial Photograph showing the Site and Surrounding Development.

The following photos show the existing site in the context of the surrounding locality.

Photo 1: View of existing car dealership on the subject site looking east along Hunter Street, *(Google Maps, 2021)*.

Photo 2: View of existing single storey "Air Locker" gym on the subject site looking north from Hunter Street, *(Google Maps, 2021)*.

Photo 3: View of existing car park on the subject site looking west along Tighe Street, *(Google Maps, 2021).*

Photo 4: View of the former Dairy Farmers Clock Tower looking north from Hunter Street, *(Google Maps, 2021).*

Photo 5: View of the car dealership development on the opposite side of Railway Street to the west of the subject site, *(Google Maps, 2021)*.

Photo 6: View of the self-storage development to the east of the subject site *(Google Maps, 2021)*.

Photo 7: View of the existing streetscape on the southern side of Hunter Street, to the south of the subject site *(Google Maps, 2021)*.

Photo 8: View of the existing streetscape on the northern side of Tighe Street, to the north of the subject site *(Google Maps, 2021)*.

Photo 9: Photomontage of approved development at 815 Hunter Street *(CoN Application Tracker, 2021).*

3.4 TOPOGRAPHY, DRAINAGE AND FLOODING

The 1:25,000 Topographic Map for Newcastle shows the site as being situated in a low-lying area to the west of Newcastle.

The subject site slopes gently in a consistent manner at an average grade of 1.8% to the north-west, with levels ranging from 4.31m AHD along the site's northern boundary to 3.06m AHD along the northern boundary (refer to Detail Survey Plan attached at **Appendix B**).

The site is subject to a low to very low risk of flooding, being identified as a Flood Control Lot on the Newcastle Council Flood Information Certificate (FL2019/00248 – refer to **Appendix R** of this report).

The site is identified on the Flood Information Certificate as requiring a minimum habitable floor levels of 4.6m AHD (Hunter Street frontage) and 3.4m AHD (northern frontage) for new development.

Flooding is addressed further within **Section 5** of this report.

3.5 CONTAMINATION AND GEOTECHNICAL CHARACTERISTICS

3.5.1 Contamination

The subject site is identified as containing potentially contaminated land associated with various former and current site uses. These included a possible former blacksmiths, commercial milk processes and distribution by the Dairy Farmers Co-operative Milk Company, followed by use as a car dealership. One (1) underground fuel storage tank remains present at the site (redundant) based on site observations and history findings within the Preliminary Geotechnical Assessment provided in **Appendix H**.

The assessment concluded that the site is considered to be suitable for the proposed development, subject to appropriate remediation / management of contamination and regulatory approvals.

Contamination is addressed in further detail within **Section 5** of this report and within the Preliminary Geotechnical and Contamination Assessment is provided within **Appendix H**.

3.5.2 Mine Subsidence

The subject site is not identified as being located within a proclaimed mine subsidence district (refer **Figure 8** below). As such, the proposal does not require referral to *Subsidence Advisory NSW*.

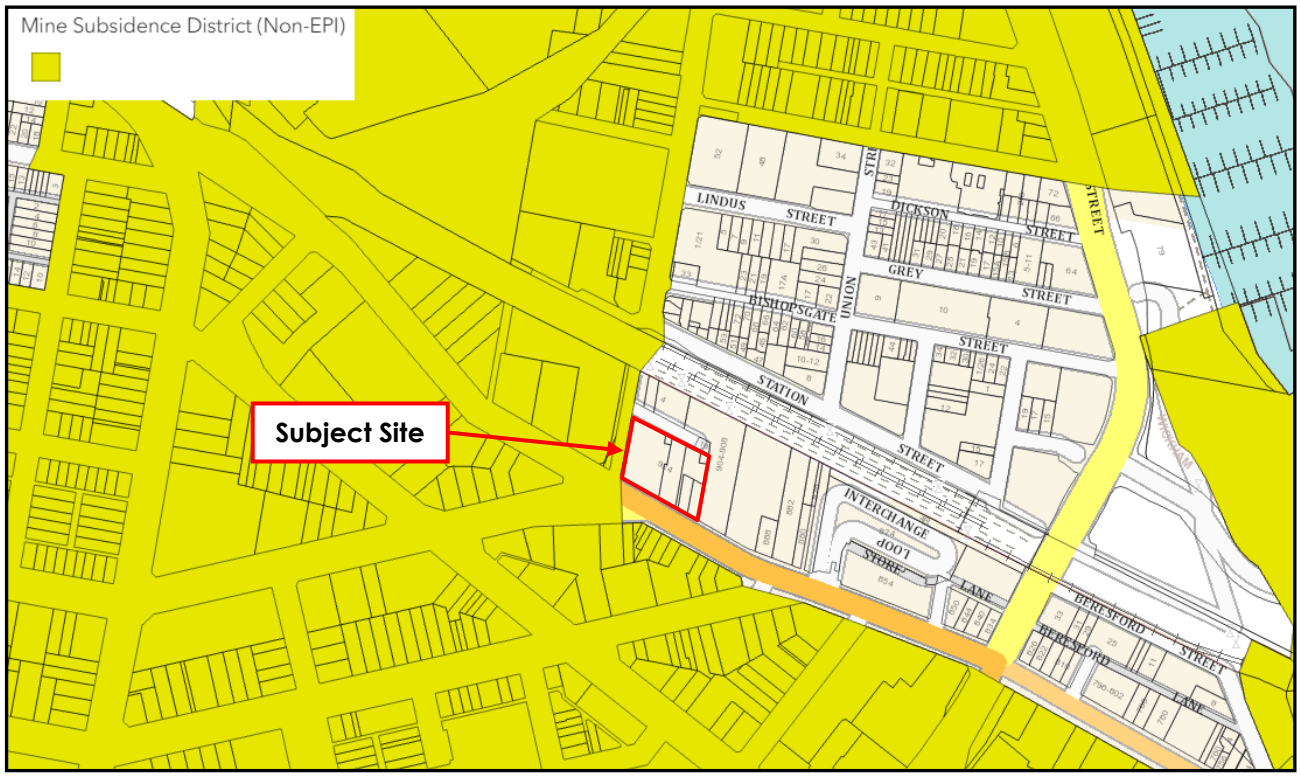

Figure 8: Extract from Planning Portal Mine Subsidence District Layer.

It is noted however, that the location of the subject site has previously comprised underground coal mining (refer **Figure 9** below). The *Subsidence Advisory NSW* website indicates that not all underground coal mining presents the risk of subsidence damage to development. As a result, there are some areas where mining has occurred that *Subsidence Advisory NSW* does not consider necessary to proclaim within districts. These areas include those where:

- There is limited development;
- The underground mining is unlikely to create subsidence risks; and
- The method used to extract coal means there are unlikely to be any ongoing subsidence risks.

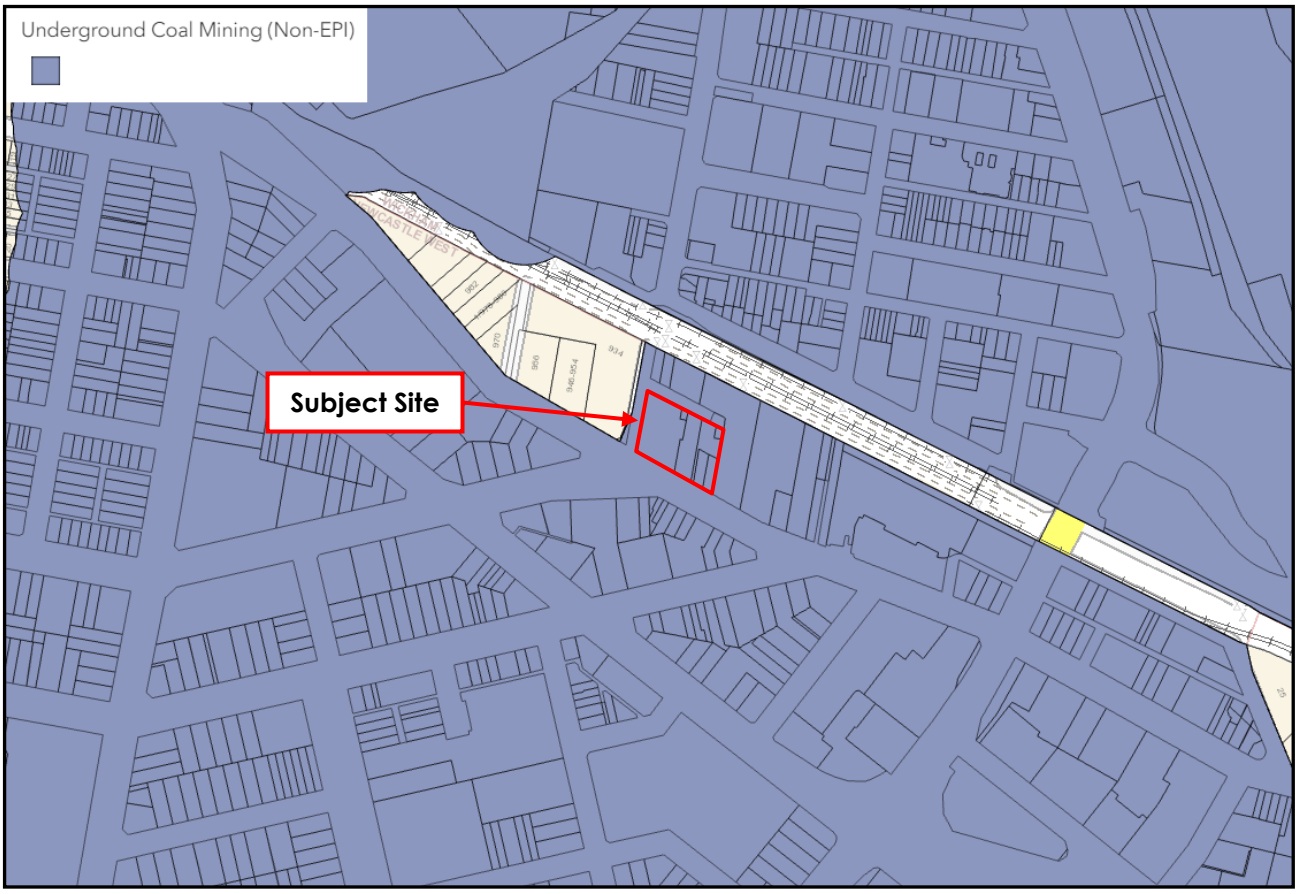

Figure 9: Extract from Planning Portal Underground Coal Mining Layer.

The mine subsidence study within the Preliminary Geotechnical Assessment in **Appendix H** of this report found that the site and adjacent sites are not undermined. Given the absence of coal seams beneath the site and associated underground mining, the risk of potential hazardous ground gases (HGG) from this source at the site is considered to be negligible.

3.6 ACID SULFATE SOILS

The subject site is identified on the Newcastle LEP 2012 Acid Sulphate Soils map as containing Class 4 Acid Sulphate Soils (refer **Figure 10** overleaf).

Acid Sulphate Soils are addressed further within **Sections 4** and **5** of this report and the Preliminary Geotechnical Assessment provided within **Appendix H**.

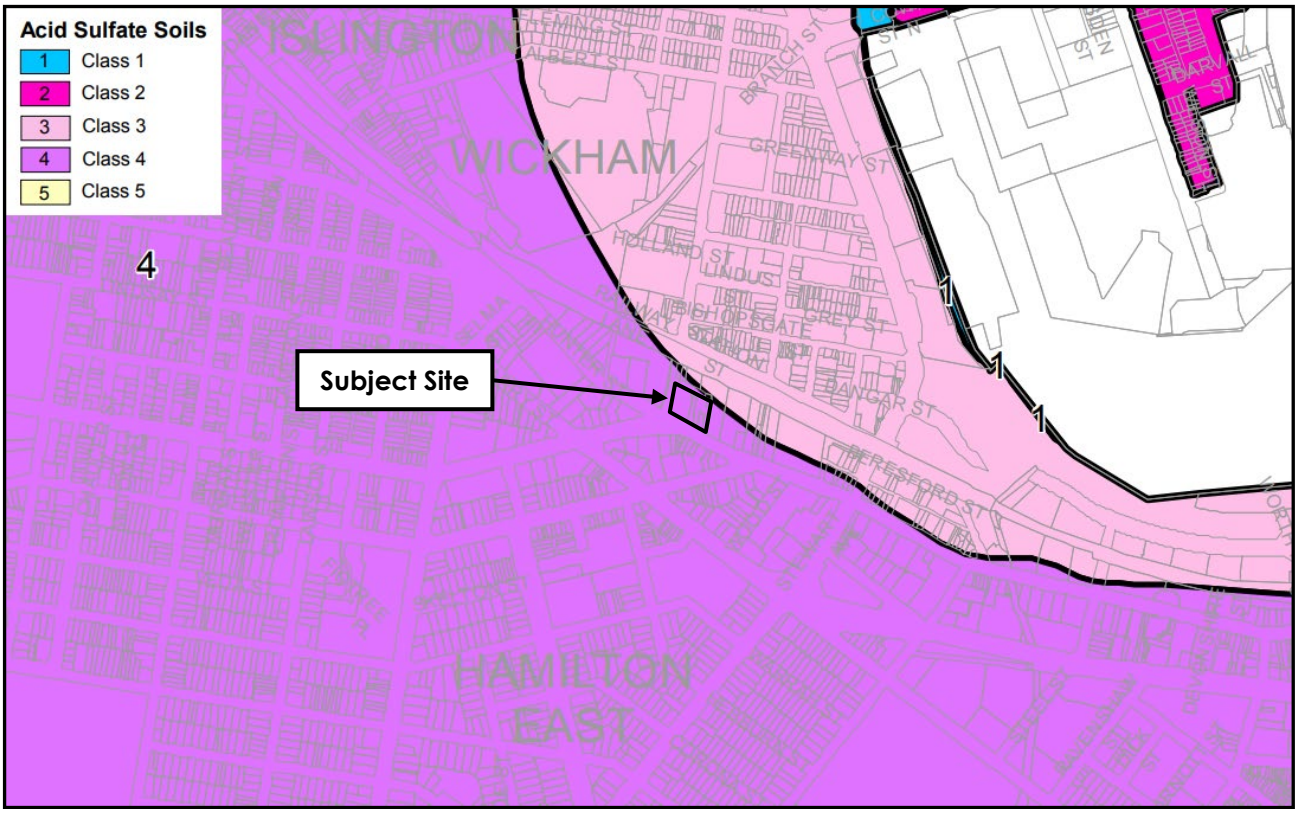

Figure 10: Extract from Newcastle LEP 2012 Acid Sulfate Soils Map.

3.7 VEGETATION

The subject site is devoid of significant vegetation, being substantially developed to the boundaries.

The development proposes the removal of the existing remnant vegetation on the site that will be impacted by the demolition of the existing buildings or will conflict with the proposed development, and the removal of some existing street trees on the Hunter Street and Railway Street road reserves. Proposed tree removal and replacement landscaping is addressed further within **Sections 4** and **5** of this report, and proposed landscaping is also shown in the Landscaping Plans at **Appendix D**.

3.8 BUSHFIRE

The subject site is not identified on the Newcastle Bushfire Prone Land map as being bushfire prone land, and as such bushfire is not addressed further in this report (refer **Figure 11** overleaf).

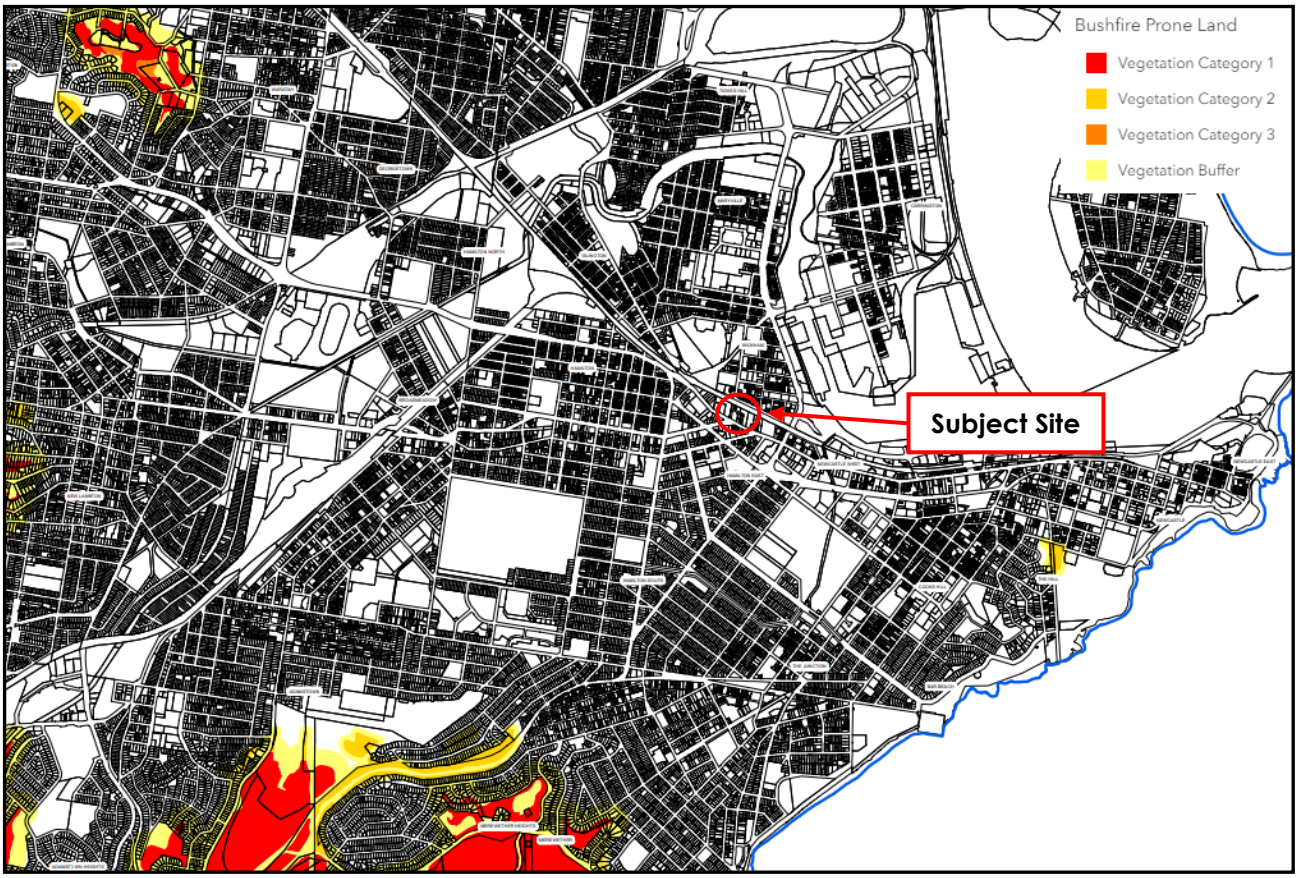

Figure 11: Extract from the Newcastle Bushfire Prone Land Map.

3.9 TRAFFIC, ACCESS AND ROAD NETWORK

The subject site adjoins Hunter Street to the south, Railway Street to the west, Tighe Street to the north, and adjoins a commercial development at its eastern boundary. The site currently has two (2) vehicular access points via Hunter Street (13m wide in total) and two (2) via Tighe Street (18m wide in total).

Hunter Street fronting the site is a regional road and under a functional road hierarchy classification it is a sub-arterial road. It is under the care and control of CoN with partial funding for its maintenance provided by TfNSW. It is a major transport route and runs northwest to southeast connecting Newcastle East to the sub-arterial road network Hannell Street / Stewart Avenue and via Maitland Road providing connection to the suburbs of Wickham, Hamilton, Islington, Tighes Hill, Mayfield and Warabrook to the west where it again connects to the sub-arterial road network Industrial Drive / Maitland Road. It also provides connections to the Newcastle beaches and foreshore areas of the Hunter River along the northern side of the Newcastle City Centre.

In the vicinity of the site, Hunter Street is a four (4) lane two-way sealed urban road with parking lanes on both sides of the road. The carriageway is approximately 17m wide with concrete kerb and gutter and longitudinal drainage along its outer edges and centre, lane and edge line markings. A 60km/h speed limit applies to this section of road. The on-street parking along Hunter Street is 'pay for parking' time restricted two (2) hour periods between 9am to 5pm Monday to Friday and 9am to 1pm Saturday.

Railway Street is a local urban road and is under the care and control of CoN. It is approximately 90m long between Hunter Street and a dead-end at the rail corridor and connects to Tighe Street.

Near the site, Railway Street is a two-way two (2) lane sealed road with kerb and gutter and parking on alternate sides of the road. Railway Street has a carriageway of generally 8.5m in width, with travel lanes approximately 3.2m wide and a parking lane approximately 2m wide. A 50 km/h speed limit applies to this section of road.

Tighe Street is a local urban road under the care and control of CoN. It is approximately 60m long between Railway Street and a dead-end at its eastern end. Near the site Railway Street is a two-way two (2) lane sealed road with kerb and gutter and parking on alternate sides of the road. With a carriageway of 7.5m wide it has travel lanes approximately 2.4m wide and a parking lane approximately 1.8m wide. A 50 km/h speed limit applies to this section of road.

The subject site has excellent access to public transport, with Newcastle Buses running regular public bus services in the area. Routes 11, 12, 13, 26, 28, 55N, 130, 131, 138, 140, 160 and 266 runs past the site providing access to the Newcastle City Centre and through connections with other bus services to the wider Newcastle region.

Additionally, the Newcastle Interchange is located 300m east of the subject site, which provides a light rail service to the Newcastle CBD and train services to Maitland and Sydney, via the wider Newcastle region.

A Traffic and Parking Assessment for the proposed development has been prepared by Intersect Traffic (attached at **Appendix K**). Traffic, access and parking associated with the development are addressed further in **Section 5** of this report.

3.10 HERITAGE

The subject site is identified as being located in the Newcastle City Centre Heritage Conservation Area on the Newcastle LEP 2012 Heritage map (refer **Figure 12** below). The Conservation Area boundary is long and narrow, paralleling the harbour foreshore and therefore takes in numerous pockets of historical city development. The 1938 Dairy Farmers building dates to the very end of the Key Period of Significance, noted in the HCA Statement of Significance as 1801-1940. The building (the clock tower) contributes to the Inter-War character of the city's west end and is a social and physical landmark for Novocastrians.

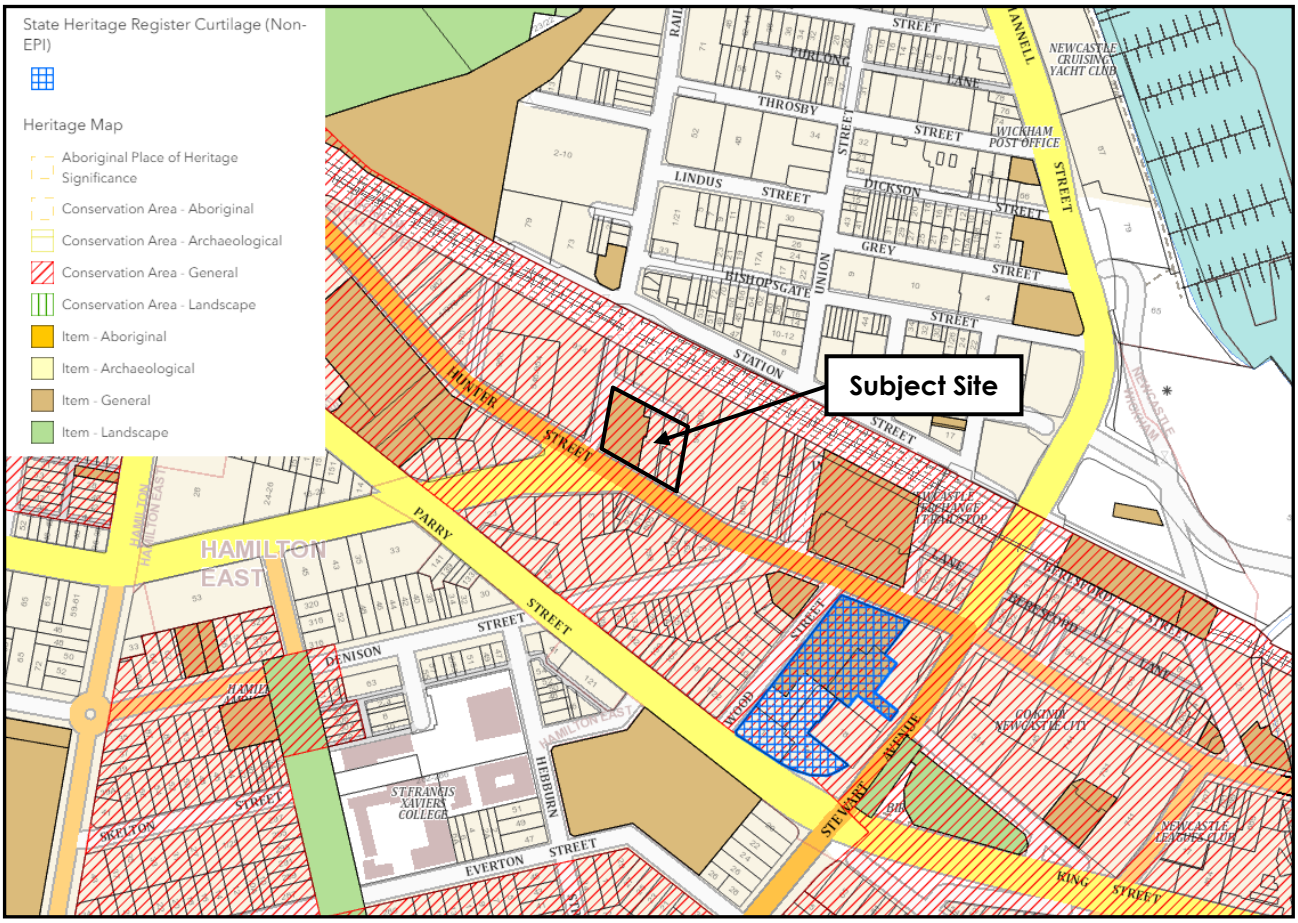

Figure 12: Extract from Newcastle LEP Heritage Map.

The western portion of the site also contains an item of local heritage significance, being the Dairy Farmers Building (item I505) on Lot 2 DP 445736. The site is in the vicinity of the State Heritage Register item, Castlemaine Brewery (former), located at 787 Hunter Street, and a number of other local heritage items including the Cambridge Hotel (item I502), St Joseph's Convent and Sacred Heart Church and School (item I503), the Former Newcastle Co-operative Store (item I504), and the Lass O'Gowrie Hotel (item I691) (refer **Figure 13** overleaf).

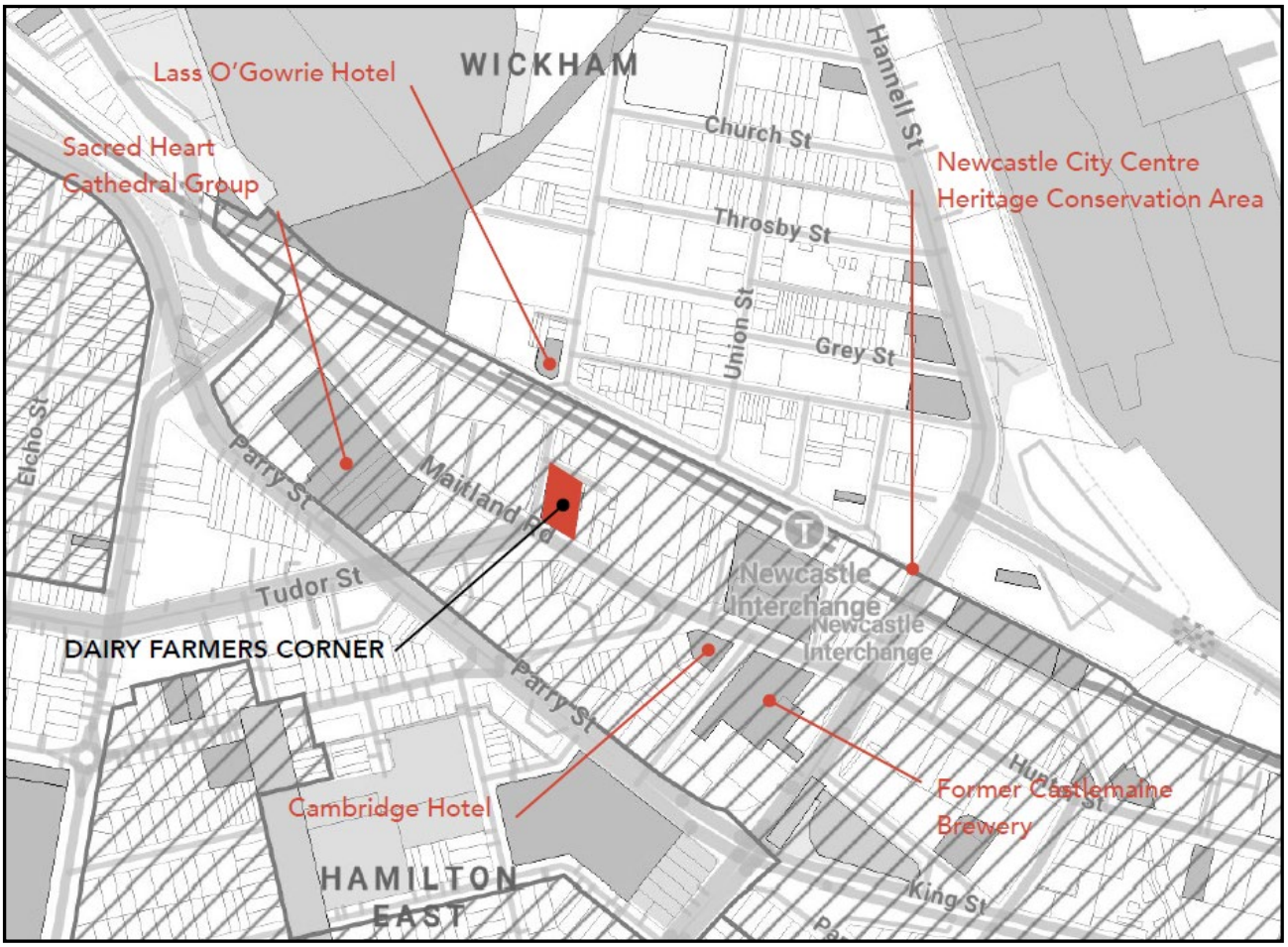

Figure 13: Extract from the Statement of Heritage Impact.

A Heritage Impact Statement has been prepared by Heritas Architecture and is included as **Appendix I**. Heritage is also addressed further in **Section 5** of this report.

Given the highly disturbed nature of the site and the minimal excavation proposed for the development, it is unlikely that the site contains any items of Aboriginal heritage significance.

3.11 COASTAL ZONE

The subject site is identified as being partially located within the Coastal Environment Area under *State Environmental Planning Policy (coastal Management) 2018* (refer **Figure 14** overleaf).

The site is not located in the Coastal Use Area under the SEPP (refer **Figure 15** overleaf).

State Environmental Planning Policy (coastal Management) 2018 is addressed further in **Section 4** of this report.

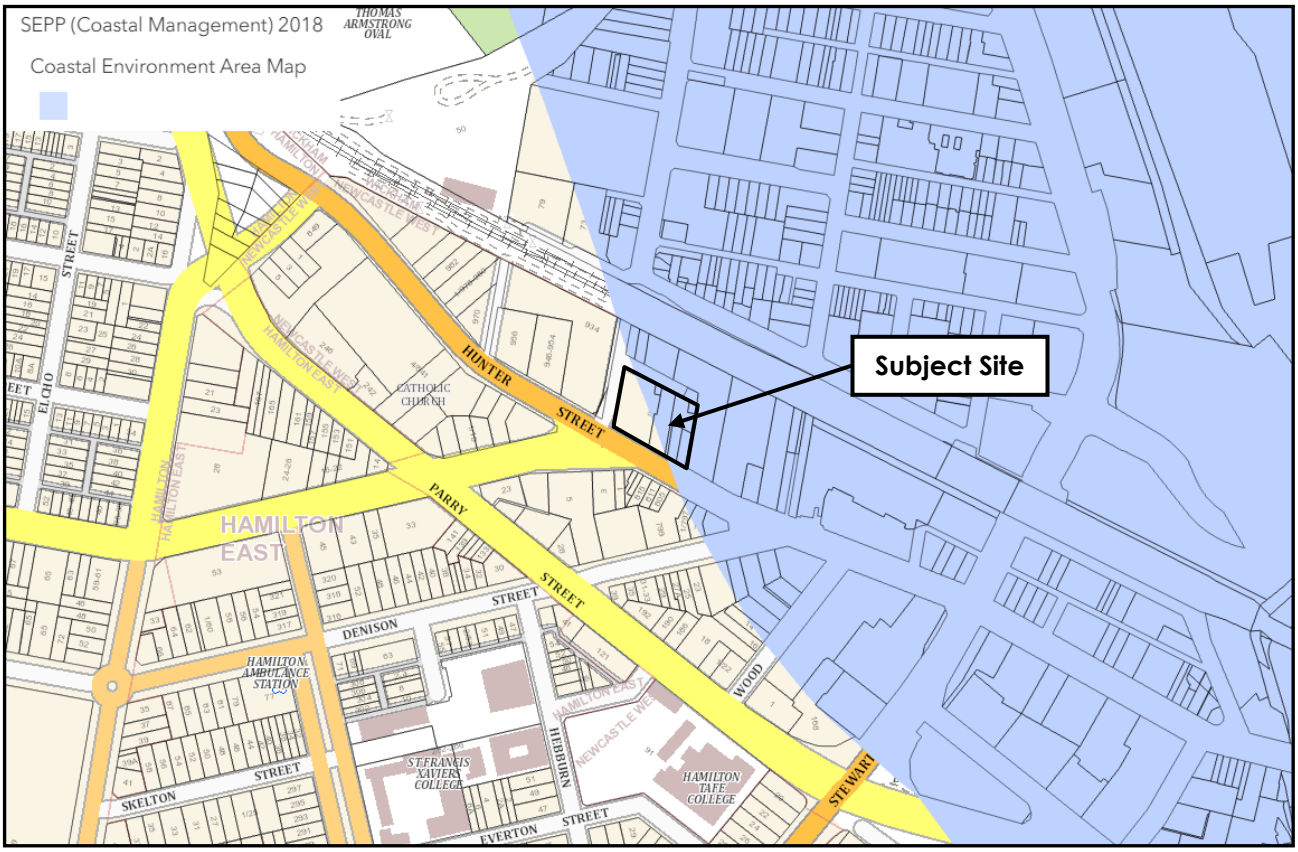

Figure 14: Extract from the SEPP (Coastal Management) 2018 Coastal Environment Map.

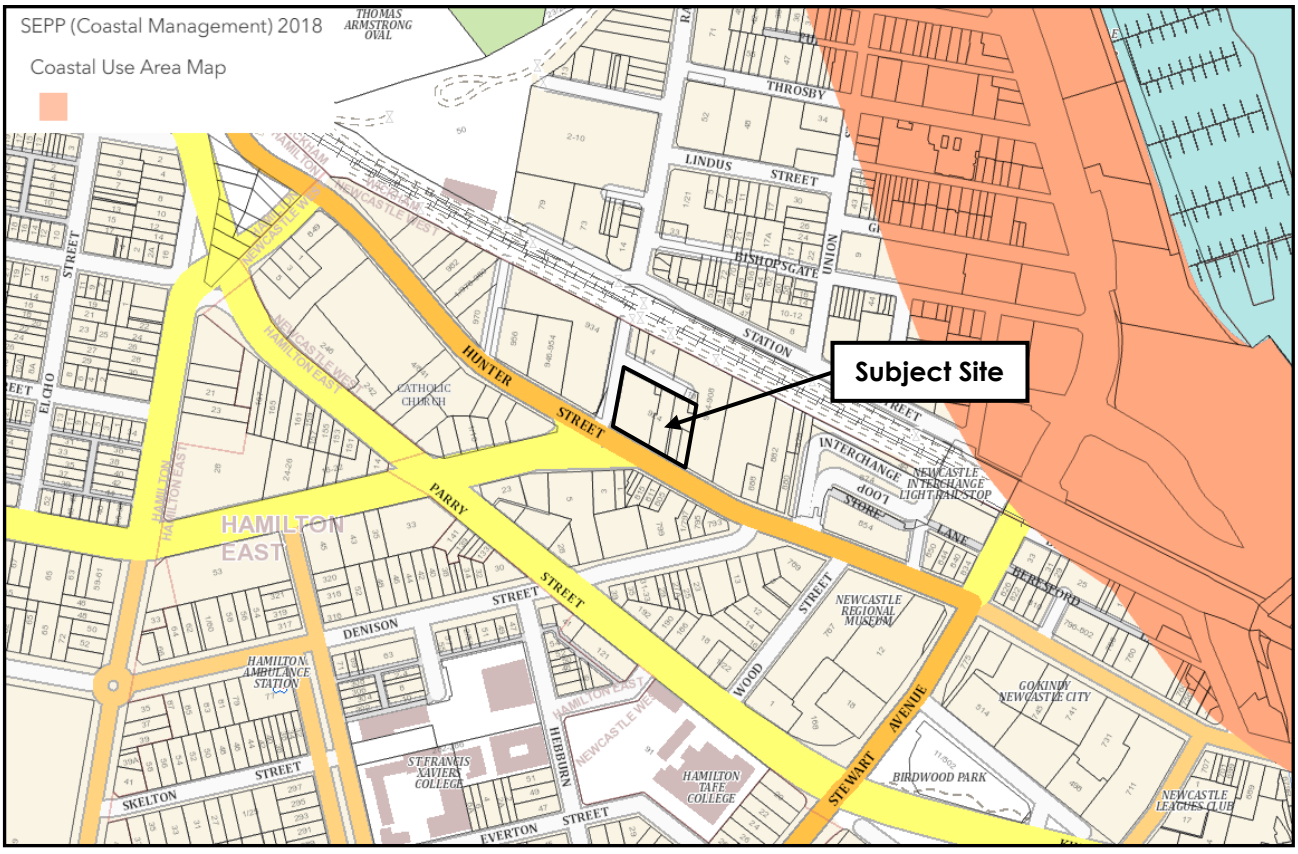

Figure 15: Extract from the SEPP (Coastal Management) 2018 Coastal Use Map.

3.12 UTILITY SERVICES

Public utility services including reticulated water and sewer, electricity, gas and telecommunications are available to the site.

3.13 OBSERVATIONS FROM THE SITE CHARACTERISTICS AND LOCALITY

The site is ideally located to provide for the higher densities proposed, exhibiting excellent access to public transport (bus, rail and light rail) and being centrally located with respect to the city and its opportunities for employment, education establishments, services, and retail and recreation spaces that will promote walking and cycling as alternate modes of transport.

With its recognised design excellence, the proposal presents an opportunity to make a positive contribution to the local streetscape and revitalisation of the west end of the Newcastle City Centre. The proposed development also presents an opportunity to create an integrated public domain element that celebrates the heritage item on the site and enhances the streetscape.

4.0 Planning Controls

4.1 RELEVANT LEGISLATION

4.1.1 Environmental Planning and Assessment Act 1979 & Regulation 2000

The EP&A Act 1979 and the EP&A Regulation 2000 constitute the principle planning legislation in NSW and provide the statutory framework for the assessment of the proposed retirement village.

Consideration has been given to the objectives of the EP&A Act 1979 and these are addressed below:

(a) To encourage:

- *(i) The proper management, development and conservation of natural and artificial resources, including agricultural land, natural areas, forests, minerals, water, cities, towns and villages for the purpose of promoting the social and economic welfare of the community and a better environment,*
- *(ii) The promotion and co-ordination of the orderly and economic use and development of land,*
- *(iii) The protection, provision and co-ordination of communication and utility services,*
- *(iv) The provision of land for public purposes,*
- *(v) The provision and co-ordination of community services and facilities, and*
- *(vi) The protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats, and*
- *(vii) Ecologically sustainable development, and*
- *(viii) The provision and maintenance of affordable housing, and*

(b) To promote the sharing of the responsibility for environmental planning between the different levels of government in the State, and

(c) To provide increased opportunity for public involvement and participation in environmental planning and assessment.

The proposed development is consistent with the objectives of the EP&A Act 1979, in particular objectives (a)(i) and (a)(ii), in that the proposed development represents an orderly and economic infill development of an existing site within the Newcastle City Centre.

The proposal is for a higher density of development, incorporating both commercial and residential uses. The proposed development provides a diversity of additional housing resources in a central location to promote and support the growth and development of Newcastle as a regional city. The increased use of the site also contributes to the vibrancy and viability of the city centre, promoting and supporting the social and economic welfare of the community.

Section 4.5 – Regional Planning Panels (RPP)

The application is referred to the Hunter and Central Coast Regional Planning Panel in accordance with Schedule 7 of the State Environmental Planning Policy (State and Regional Development) 2011, as the development has a capital investment value of more than $30 million and falls under Clause (2) *General Development over $30 Million.*

4.2 STATE PLANNING CONTROLS

4.2.1 SEPP 55 - Remediation of Land

SEPP No. 55 aims to promote the remediation of land for the purpose of reducing the risk of harm to human health or any other aspect of the environment.

This SEPP is applicable to the assessment of the proposed development.

This Policy indicates that a consent authority must not consent to the carrying out of any development on land unless it has considered whether the land is contaminated, and if the land is contaminated, it is satisfied that the land is suitable in its contaminated state (or will be suitable, after remediation) for the purpose for which the development is proposed to be carried out. If the land requires remediation to be made suitable for the purpose for which the development is proposed to be carried out, the consent authority must also be satisfied that the land will be remediated before the land is used for that purpose.

Based on the Preliminary Geotechnical Assessment findings, remediation / management would be required to render the site suitable for the proposed development from a contamination perspective, due to the bonded and friable asbestos-containing material (ACM) impacts in fill materials and potentially as a result of the presence of polycylic aromatic hydrocarbons (PAH) and total recoverable hydrocarbons (TRH) impacts in fill. Remediation should be detailed in a site-specific remediation action plan (RAP) for the development.

It is understood that construction may require removal of upper fill materials to a depth of 0.5m to 0.6m, and as such, remediation may include removal of impacted soils and/or on-site management.

Management of the ACM impacted fill / soil materials under a suitable capping layer to prevent access/exposure from a contamination perspective could be considered at the site. Given the proposed development is likely to comprise buildings with concrete slabs and concrete pavements across the majority of the site (i.e. minimal landscaping), the proposed development could be considered to manage site soil contamination subject to regulatory approval and the results of additional investigation.

The adopted remediation approach should be aligned with the proposed development detailed in a site-specific RAP. It is noted that on-site management of contamination will also attract a notice on the site Section 10.7 planning certificate and would require enforceable controls to ensure the contaminated soils are appropriately managed into the future via a long-term site management plan (SMP).

In summary, the site is considered to be suitable for the proposed development, subject to appropriate remediation / management of contamination and regulatory approvals.

A Preliminary Geotechnical Assessment is provided within **Appendix H** and is addressed further in **Section 5** of this report.

4.2.2 SEPP 65 – Design Quality of Residential Apartment Development

This SEPP raises the design quality of residential apartment development across the state through the application of a series of design principles. It provides for the establishment of Design Review Panels to provide independent expert advice to councils on the merit of residential flat development. The accompanying regulation requires the involvement of a qualified designer throughout the design, approval and construction stages.

This SEPP applies to the erection of a new shop top housing development that is at least three (3) or more storeys, and contains at least four (4) or more dwellings.

The proposed development is consistent with the above criteria and has been designed in accordance with the requirements of the SEPP and the accompanying Apartment Design Guide (ADG). A design competition waiver has been issued by the Government Architect for this proposal on the basis that the proposal is reviewed by Newcastle City Council UDRP prior to lodgement.

In line with the recommendation of the Government Architect waiver the plans have been referred to Newcastle Council's Urban Design Consultative Group (UDCG) for consideration on 30th June 2021 and 25th August 2021 for consideration prior to lodgement of the Development Application. Copies of the meeting minutes are included at **Appendix D** of this report. Issues raised have been taken into consideration in the preparation of the final Architectural Plans.

A SEPP 65 Architectural Design Verification Statement has been prepared by CKDS Architecture and is included at **Appendix E** of this report.

The SEPP 65 report provides comments of this proposal against the nine (9) design principles, and also provides consideration and assessment of the proposal against the Apartment Design Guide). In summary it confirms that the proposal achieves the nine (9) design principles and the objectives of the ADG.

4.2.3 SEPP (Coastal Management) 2018

The aim of this Policy is to promote an integrated and co-ordinated approach to land use planning in the coastal zone in a manner consistent with the objects of the *Coastal Management Act 2016*. The SEPP seeks to manage development in the coastal zone and the environmental assets of the coast by employing different management techniques to areas within the coastal zone.

As mentioned in **Section 3** of this report, the development site has been partially mapped within the Coastal Environment Area under the SEPP. The applicable clause of the SEPP has been addressed below.

Clause 13 Coastal Environment Area

(1) Development consent must not be granted to development on land that is within the coastal environment area unless the consent authority has considered whether the proposed development is likely to cause an adverse impact on the following:

(a) the integrity and resilience of the biophysical, hydrological (surface and groundwater) and ecological environment,
(b) coastal environmental values and natural coastal processes,
(c) the water quality of the marine estate (within the meaning of the Marine Estate Management Act 2014), in particular, the cumulative impacts of the proposed development on any of the sensitive coastal lakes identified in Schedule 1,
(d) marine vegetation, native vegetation and fauna and their habitats, undeveloped headlands and rock platforms,
(e) existing public open space and safe access to and along the foreshore, beach, headland or rock platform for members of the public, including persons with a disability
(f) Aboriginal cultural heritage, practices and place,
(g) the use of the surf zone.

Comment: The development site has negligible ecological values and the proposal will not adversely impact the integrity and resilience of the biophysical environment. Contemporary stormwater management techniques will be employed to ensure stormwater drainage is of a suitable quality before leaving the site. The proposal is unlikely to impact coastal processes, Aboriginal heritage or use of the surf zone.

(2) Development consent must not be granted to development on land to which this clause applies unless the consent authority is satisfied that:

(a) the development is designed, sited and will be managed to avoid an adverse impact referred to in subclause (1), or
(b) if that impact cannot be reasonably avoided—the development is designed, sited and will be managed to minimise that impact, or
(c) if that impact cannot be minimised—the development will be managed to mitigate that impact.

Comment: The development site is spatially separated from significant coastal processes and the proposal is not likely to cause adverse impact to the functioning of the coastal zone.

Clause 13 Development in coastal zone generally—development not to increase risk of coastal hazards

Development consent must not be granted to development on land within the coastal zone unless the consent authority is satisfied that the proposed development is not likely to cause increased risk of coastal hazards on that land or other land.

Comment: The site is spatially separated from significant coastal processes and the proposal is not likely to cause adverse impact to the functioning of the coastal zone.

4.2.4 SEPP (Building Sustainable Index: BASIX) 2004

The general aim of this Policy is to ensure consistency in the implementation of the BASIX scheme throughout the State. This Policy achieves its aim by overriding provisions of other environmental planning instruments and development control plans that would otherwise add to, subtract from or modify any obligations arising under the BASIX scheme.

A BASIX certificate has been issued for the proposed development and is included as **Appendix F** of this report.

4.2.5 SEPP (Infrastructure) 2007

This SEPP provides a consistent planning regime for infrastructure and the provision of services across NSW, along with providing for consultation with relevant public authorities during the assessment process. The SEPP supports greater flexibility in the location of infrastructure and service facilities along with improved regulatory certainty and efficiency.

Division 15 Railways

Clause 85 applies to development on land that is in or immediately adjacent to a rail corridor, if the development:

"(a) is likely to have an adverse effect on rail safety, or
(b) involves the placing of a metal finish on a structure and the rail corridor concerned is used by electric trains, or
(c) involves the use of a crane in air space above any rail corridor.
(d) is located within 5 metres of an exposed overhead electricity power line that is used for the purpose of railways or rail infrastructure facilities".

Note: Land is adjacent to a rail corridor for the purpose of this clause even if it is separated from the rail corridor by a road or road related area within the meaning of the Road Transport Act 2013.

The subject site is separated from the railway corridor by Lots 23 and 24 DP 126, Lot 1 DP 445736 and Tighe Street. As such, the proposal does not written notice to be provided to the chief executive of the rail authority for the rail corridor in accordance with this clause.

Clause 86 applies to:

"development that involves the penetration of ground to a depth of at least 2m below ground level (existing) on land—
(a) within, below or above a rail corridor, or
(b) within 25m (measured horizontally) of a rail corridor, or
(b1) within 25m (measured horizontally) of the ground directly below a rail corridor, or
(c) within 25m (measured horizontally) of the ground directly above an underground rail corridor".

The subject site is located in excess of 35m from the boundary of the railway corridor. As such, the proposal does not written notice to be provided to the chief executive of the rail authority for the rail corridor in accordance with this clause.

Division 17 Roads and Traffic

Clause 101 refers to development with frontage to a classified road. The subject site has frontage to Hunter Street which is identified as a classified road.

The objectives of Clause 101 are to ensure that new development does not compromise the effective and ongoing operation and function of classified roads, and to prevent or reduce the potential impact of traffic noise and vehicle emission on development adjacent to classified roads.
In order to grant consent, the consent authority must be satisfied that where practicable,

vehicular access to the land is provided by a road other than the classified road, that the safety, efficiency and ongoing operation of the classified road will not be adversely affected by the development as a result of the design of the vehicular access to the land, or the emission of smoke or dust from the development, or the nature, volume or frequency of vehicles using the classified road to gain access to the land, and that the development is of a type that is not sensitive to traffic noise or vehicle emissions, or is appropriately located and designed, or includes measures to ameliorate potential traffic noise or vehicle emissions within the site of the development arising from the adjacent classified road.

Vehicle access is proposed to be provided off Tighe Street, with no driveways proposed along the site's Hunter Street frontage. The proposal includes the removal of two (2) driveways off Hunter Street, reducing the number of driveways from two (2) to zero (0).

Clause 104 and Schedule 3 of this SEPP also identify traffic generating developments that require referral to the RMS. The proposed development is identified as traffic generating development, incorporating 75 or more dwellings with an access within 90m of a connection to a classified road (Hunter Street). It is understood that the proposal will be referred to the RMS as traffic generating development.

A Traffic and Parking Assessment has been prepared by Intersect Traffic and is attached at **Appendix K** of this report. Traffic, access and parking are also addressed further within **Section 5**.

4.2.6 SEPP (State and Regional Development) 2011

The aims of this Policy are to identify development that is State significant development, State significant infrastructure and critical State significant infrastructure; and to confer functions on Joint Regional Planning Panels to determine development applications that are deemed 'Regional Development'.

Schedule 1 of the SEPP includes various triggers for development to be classified as State Significant Development. The proposed development does not meet any of the criteria for State Significant Development under Schedule 1.

As outlined within the Quantity Survey Report provided within **Appendix Q** the proposal will have a capital investment value of more than $30 Million and in accordance with Schedule 7 of the EP&A Act 1979, will trigger 'Regional Development'. As such, the City of Newcastle will be responsible for the environmental assessment of the Development Application, with the application determined by the Hunter and Central Coast Reginal Planning Panel.

4.3 REGIONAL PLANNING CONTROLS

4.3.1 Hunter Regional Plan 2036

The NSW Government has developed the *Hunter Regional Plan 2036* as an overarching framework to guide land use planning priorities and infrastructure funding decisions in the Hunter region over the next 20 years.

The Plan sets priorities and provides a direction for regional planning decisions. It focuses on new housing and jobs, and targets growth in strategic centres and renewal corridors close to transport to deliver social and economic benefits.

It sets in place line-of-sight land use planning for the region, regional districts like the Greater

Newcastle metropolitan area and each Council area.

The vision of the Hunter Regional Plan 2036 is for the Hunter to be the leading regional economy in Australia with a vibrant new metropolitan city at its heart. To achieve this vision, the NSW Government has acknowledged the growing importance of Greater Newcastle and set the following regionally focused goals:

- The leading regional economy in Australia;
- A biodiversity-rich natural environment;
- Thriving communities; and
- Greater housing choice and jobs.

Figure 16 below provides the indicative boundaries of the Greater Newcastle area and identifies the location of the subject site within the Newcastle area.

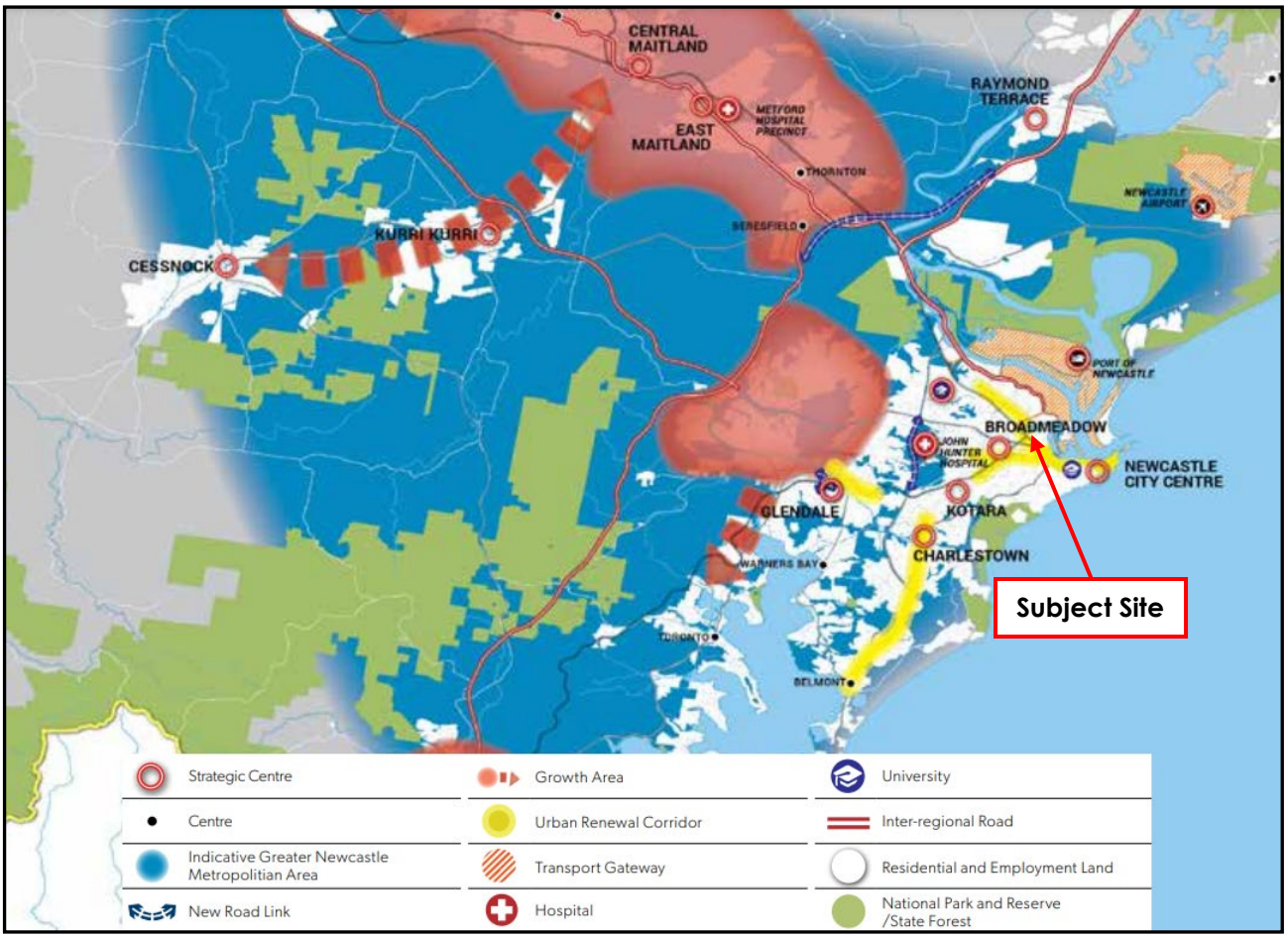

Figure 16: Extract from Hunter Regional Plan 2036.

The proposed development is consistent with the above goals identified to achieve the vision of the Plan. In particular, the proposed development contributes to supporting robust regional communities, by promoting housing growth within Hunter City. The proposed development provides an infill development on established urban land, within a central location within the city centre that comprises existing infrastructure and service networks. The proposed development will contribute to an increase in people living within an existing centre, ensuring existing services and facilities remain viable.

More specifically, the proposed development is entirely consistent with the following directions within the Plan:

- Goal 4, Direction 21 – Create a compact settlement;
- Goal 4, Direction 22 – Promote housing diversity; and
- Goal 4, Direction 23 – Grow centres and renewal corridors.

Goal 4, Direction 21 – Create a Compact Settlement

The proposed development is located on an under developed site in Newcastle West, with existing access to all required servicing and infrastructure. The site is ideally located, with good access to shops, services, public transport, schools, and recreation spaces, to facilitate the proposed redevelopment of the site.

Goal 4, Direction 22 – Promote Housing Diversity

The residential component of the proposed development will encourage housing diversity in the Newcastle City Centre through the incorporation of a range of apartment sizes, from 1x bedroom to 3x bedroom dwellings. This aligns with the forecasted changes in household sizes within the *Hunter Regional Plan 2036*.

Goal 4, Direction 23 – Grow Centres and Renewal Corridors

The subject site is located within an urban renewal corridor identified within the Plan. The proposed development will facilitate the urban renewal of the site to support economic and population growth and a mix of uses. Further, the commercial component of the development is appropriately located with good access to public transport and other retail and commercial centres such as Marketown, Beaumont Street, and the Newcastle City Centre.

It is considered that the proposal is entirely consistent with the relevant Direction and Actions within the *Hunter Regional Plan 2036*.

4.3.2 Greater Newcastle Metropolitan Plan 2036

The *Greater Newcastle Metropolitan Plan 2036* is a priority action of the above referenced *Hunter Regional Plan 2036*. The vision set out for the greater Newcastle area in the plan is:

> *Australia's newest and emerging economic and lifestyle city, connected with northern NSW and acknowledged globally as:*
>
> - *dynamic and entrepreneurial, with a globally competitive economy and the excitement of the inner city and green suburban communities;*
> - *offering great lifestyles minutes from beaches or bushland, the airport or universities, and from the port to the lake; and*
> - *a national leader in the new economy, with smarter cities and carbon neutral initiatives, and with collaborative governance that makes it a model to others in creating and adapting to change.*

The Plan sets out strategies and actions that will drive sustainable growth across Cessnock City, Lake Macquarie City, Maitland City, Newcastle City and Port Stephens communities, which together make up Greater Newcastle.

The site is identified in Figure 10 of the *Greater Newcastle Metropolitan Plan 2036* as being located within the 'West End Precinct' in the Newcastle City Centre Catalyst Area, as shown below in **Figure 17.**

Figure 17: Extract from Greater Newcastle Metropolitan Plan 2036.

The Plan identifies the site as being located within the West End Precinct, where Newcastle City Council is to align local plans to increase commercial and residential floor space surrounding the Newcastle Interchange. The proposed development achieves this by providing a commercial and residential tower development within the 800m walking catchment surrounding the Interchange.

It is considered that the proposed development is compatible with the aims and objectives of the *Greater Newcastle Metropolitan Plan 2036*.

4.4 LOCAL PLANNING CONTROLS

4.4.1 Newcastle Local Environmental Plan 2012

The proposed development is subject to the provisions of the *Newcastle Local Environmental Plan* 2012 (NLEP 2012).

The subject site is located within the B3 Commercial Core Zone under the NLEP 2012. The objectives of the B3 zone are as follows:

- *To provide a wide range of retail, business, office, entertainment, community and other suitable land uses that serve the needs of the local and wider community.*
- *To encourage appropriate employment opportunities in accessible locations.*
- *To maximise public transport patronage and encourage walking and cycling.*
- *To provide for commercial floor space within a mixed-use development.*
- *To strengthen the role of the Newcastle City Centre as the regional business, retail and cultural centre of the Hunter region.*
- *To provide for the retention and creation of view corridors.*

The proposed development is consistent with the objectives of the B3 Commercial Core zone in that the proposal will provide a development that will strengthen the role of Newcastle as a regional centre, and its future development and growth.

The proposal will provide a high density commercial and residential development that will contribute to the overall vibrancy and viability of the city through an increase in population and patronage within the locality. The development will also provide commercial space within a mixed-use development, which will ensure both continued and new employment and business opportunities and encourage appropriate employment opportunities in accessible locations. The subject site is well located within the city centre, with excellent access to public transport, Hunter Street, the Honeysuckle precinct, and the emerging Wickham precinct to promote walking and cycling as alternative transport.

Figure 18 is an extract from the NLEP 2012 zoning map and illustrates the zoning of the site in the context of the surrounding locality. Land adjoining immediately to the north and east of the site is also zoned B3 Commercial Core, and land adjoining directly to the south and west is zoned B4 Mixed Use zone.

Figure 18: Extract from the NLEP 2012 Zoning Map.

4.4.2 Land Use Definitions and Permissibility

The applicable land use definitions for the proposed development, based on definitions from the Newcastle LEP 2012, is *'commercial premises'* and *'shop top housing'* which are defined as follows:

Commercial premises *means any of the following:*

(a) Business premises,
(b) Office premises,
(c) Retail premises.

Commercial premises are permissible land uses in the B3 zone with consent.

> ***shop top housing*** *means one or more dwellings located above ground floor retail premises or business premises.*
>
> ***Note.*** *Shop top housing is a type of* ***residential accommodation****.*

Shop top housing by definition, also includes retail and business premises which are defined as:

> ***retail premises*** *means a building or place used for the purpose of selling items by retail, or hiring or displaying items for the purpose of selling them or hiring them out, whether the items are goods or materials (or whether also sold by wholesale), and includes any of the following:*
>
> *(a) bulky goods premises,*
> *(b) cellar door premises,*
> *(c) food and drink premises,*
> *(d) garden centres,*
> *(e) hardware and building supplies,*
> *(f) kiosks,*
> *(g) landscaping material supplies,*
> *(h) markets,*
> *(i) plant nurseries,*
> *(j) roadside stalls,*
> *(k rural supplies,*
> *(l) shops,*
> *(m) timber yards,*
> *(n) vehicle sales or hire premises,*
> *but does not include highway service centres, service stations, industrial retail outlets or restricted premises.*
>
> ***Note.*** *Retail premises are a type of* ***commercial premises****.*
>
> ***business premises*** *means a building or place at or on which:*
>
> *(a) an occupation, profession or trade (other than an industry) is carried on for the provision of services directly to members of the public on a regular basis, or*

(b) *a service is provided directly to members of the public on a regular basis, and includes a funeral home and, without limitation, premises such as banks, post offices, hairdressers, dry cleaners, travel agencies, internet access facilities, betting agencies and the like, but does not include an entertainment facility, home business, home occupation, home occupation (sex services), medical centre, restricted premises, sex services premises or veterinary hospital.*

Note. *Business premises are a type of* ***commercial premises****.*

'Commercial premises' and 'shop top housing' are both permissible land uses within the B3 zone with Council consent.

4.4.3 Specific Newcastle LEP 2012 Clauses

Clause 2.7 – Demolition requires Development Approval

This clause requires development approval to be obtained for demolition works.

The proposed development application seeks approval for demolition of the existing commercial buildings on the site (except the Dairy Farmers 'Clock Tower').

Clause 4.3 – Height of Buildings

This clause applies to development on land identified on the NLEP 2012 Building Heights map as having a prescribed maximum building height and requires that development is not to exceed the maximum height shown for the land on the Height of buildings map.

The subject site is identified on the Newcastle LEP 2012 Maximum Building Height Map as having a prescribed maximum building height of 90m (refer **Figure 19** below).

The proposed development has a maximum building height of 99m. Clause 7.5(6) of NLEP 2012 permits the erection of a building to which that clause applies that has a height of not more than 10% greater than that allowed by Clause 4.3, but only if the design of the building has been reviewed by a design review panel.

In accordance with Clause 7.5(6), the design of the development has been reviewed by Council's Urban Design Review Panel. The minutes to the UDRP meetings are attached at **Appendix P**).

The proposed development exhibits design excellence, and having been through a design review process a building height of 99m is permitted and so the development complies with the maximum permitted height.

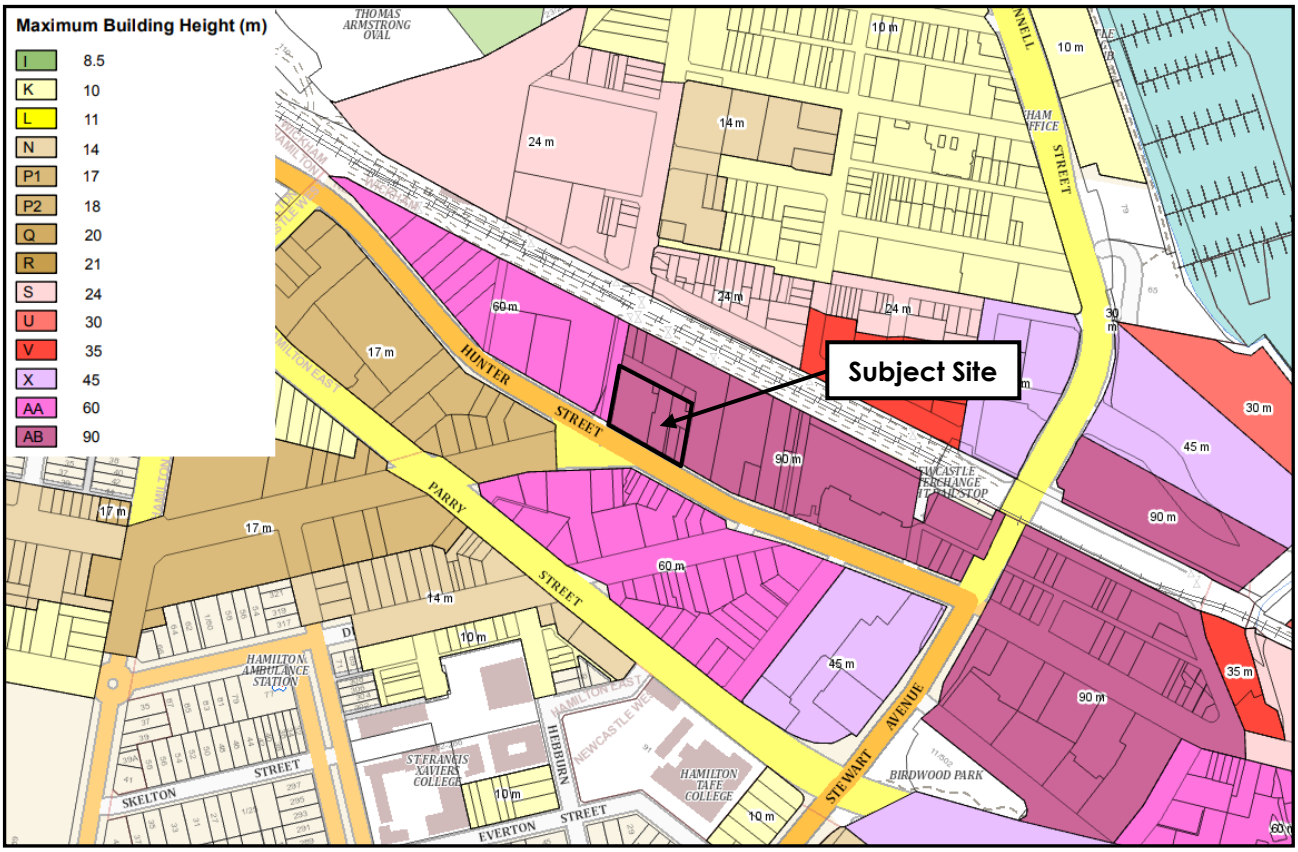

Figure 19: Extract from the NLEP 2012 Maximum Building Height Map.

Clause 4.4 – Floor Space Ratio

This clause applies to development on land identified on the NLEP 2012 Floor Space Ratio map as having a maximum floor space ratio, and requires that development is not to exceed the maximum floor space ratio shown for the land on the Floor Space Ratio map.

The subject site is identified on the Newcastle LEP 2012 Floor Space Ratio Map as having a prescribed floor space ratio of 8:1 (refer **Figure 20** below).

However, Clause 7.10 of NLEP 2012 details additional provisions relating to development within "Area A" on the FSR Map, identifying an alternate maximum FSR of 5:1 for the subject site.

Notwithstanding, Clause 7.5(6) of NLEP 2012 also permits the erection of a building to which the clause applies resulting in an FSR of not more than 10% greater than that allowed by Clause 7.10, but only if the design of the building has been reviewed by a design review panel. The design of the building has been reviewed by Council's Urban Design Consultative Group and therefore the 10% bonus provision can be applied resulting in a maximum FSR for the site of 5.5:1.

The proposed development has a FSR of 5.4:1, which does not exceed the maximum FSR prescribed for the site.

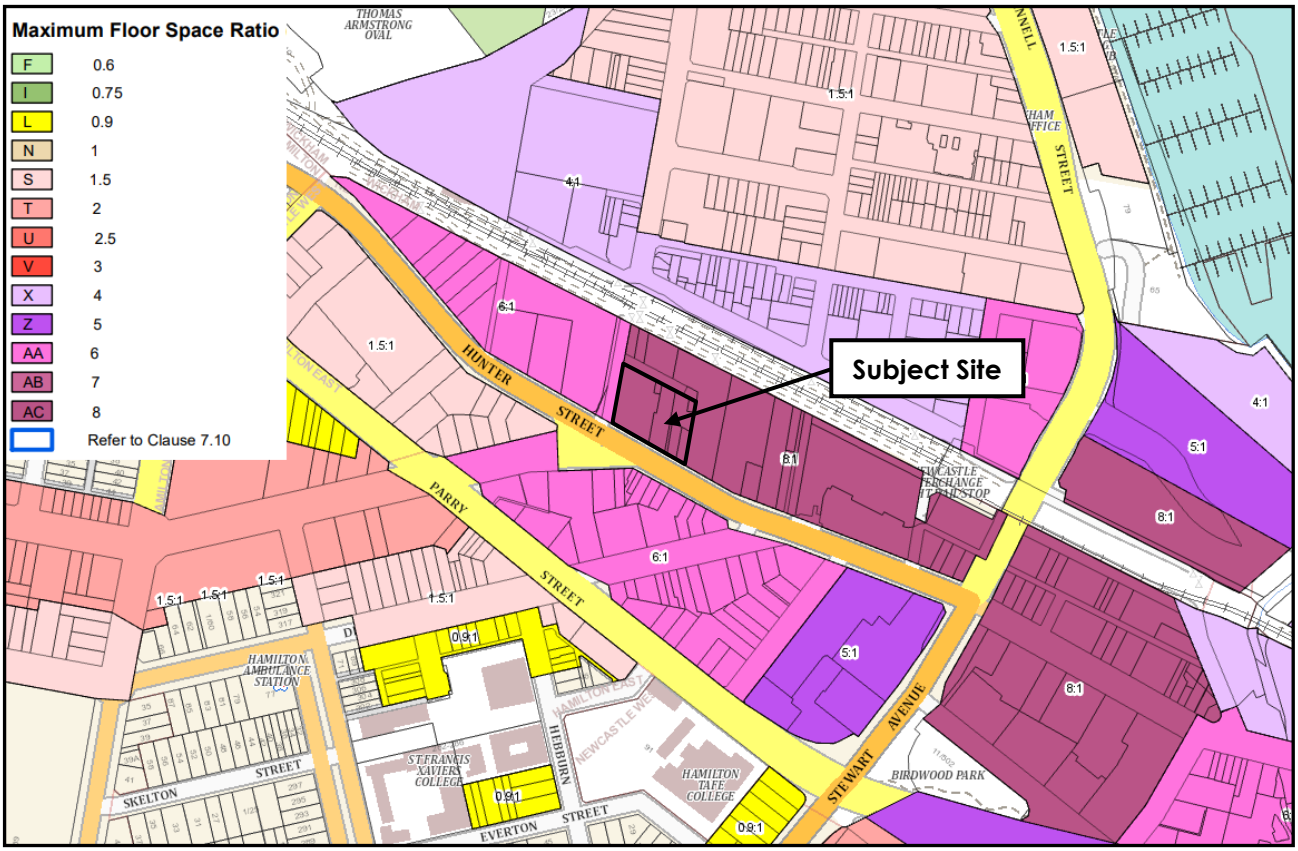

Figure 20: Extract from the NLEP 2012 Floor Space Ratio Map.

Clause 4.5 – Calculation of Floor Space Ratio and Site Areas

The purpose of this clause is to define *'floor space ratio'* and provide the parameters for calculating floor space ratio.

Clause 4.5 defines floor space ratio as:

> *The **floor space ratio** of buildings on a site is the ratio of the gross floor area of all buildings within the site to the site area.*

The proposed development has a GFA of 21,460m^2, while the site has an area of 3,941m^2 resulting in a FSR of 5.4:1 (please refer to the Development Plans provided with the **Appendix C** of this report).

This FSR has been calculated in accordance with Clause 4.5 of the Newcastle LEP 2012.

Clause 5.10 – Heritage Conservation

The site known as Dairy Farmers Corner is located within the boundary of the Newcastle City Centre Heritage Conservation Area (HCA) and is an individual heritage item of local significance under the Newcastle Local Environmental Plan 2012.

The site is in the vicinity of the State Heritage Register item, Castlemaine Brewery, and a number of other local heritage items including the Cambridge Hotel, St Joseph's Convent and Sacred Heart Church and School, the Former Newcastle Co-operative Store, and the Lass O'Gowrie Hotel.

In accordance with Clause 5.10(5), a Heritage Impact Statement has been prepared by Heritas Architecture and is included as **Appendix I** of this report. Heritage is also addressed further in **Section 5** of this report.

Clause 5.21 – Flood Planning

The main objective of this clause is to minimise the flood risk to life and property associated with the use of land.

The site is subject to a low to very low risk of flooding, being identified as a Flood Control Lot on the Newcastle Council Flood Information Certificate (FL2019/00248 – refer to **Appendix R** of this report).

The site is identified on the Flood Information Certificate as requiring a minimum habitable floor levels of 4.6m AHD (Hunter Street frontage) and 3.4m AHD (northern frontage) for new development. The minimum floor levels defined above provide a 300mm freeboard above the 1% AEP storm event. During maximum flood events, the site is expected to remain above 4.4m AHD at the Hunter Street frontage and 3.2m AHD along the northern frontage, which are the probable maximum flood levels defined in the flood certificate.

The minimum floor levels specified are for occupiable rooms. CON DCP (Section 4.01.03) specifies that garage levels can be lowered below the 1% AEP event if there are vehicular access constraints. To comply with the maximum driveway grades specified in the DCP and to ensure a maximum 4% grade within the loading dock, the finished floor level in the loading dock and carpark has been lowered to 3.3m AHD (100mm below the flood hazard level). As such, during the 1% AEP event, the carpark and loading dock areas would have an expected freeboard of 200mm to the peak flood level.

Clause 6.1 - Acid Sulfate Soils

The objective of this clause is to ensure that development does not disturb, expose or drain acid sulfate soils and cause environmental damage.

As outlined in **Section 3** the subject site is identified as containing Class 4 potential acid sulfate soils.

Clause 6.1(2) defines works for Class 4 potential Acid Sulfate Soils to be:

> *'Works more than 2 metre below the natural ground surface. Works by which the watertable is likely to be lowered more than 2 metres below the natural ground surface.'*

The Preliminary Contamination Assessment attached at **Appendix H** of this report, indicated the possible presence of acid sulfate soil conditions in natural sands below the water table (below about 2.6 m). The assessment recommends that the proposed disturbance of soils below the water table, if any, are undertaken with reference to a site-specific acid sulfate soil management plan (ASSMP).

Clause 6.2 – Earthworks

The objective of this clause is to ensure that earthworks for which development consent is required will not have a detrimental impact on environmental functions and processes, neighbouring uses, cultural or heritage items or features of the surrounding land.

The proposed excavation works for the building foundations will be unlikely to have a detrimental impact on any environmental functions and processes, neighbouring uses, cultural or heritage items, or features of the surrounding land.

Clause 7.2 – Land to which this Part applies

The subject site is identified as being located within the city centre on the NLEP 2012 City Centre Map (refer **Figure 21** below). Accordingly, the relevant Clauses in Part 7 of the LEP need to be considered.

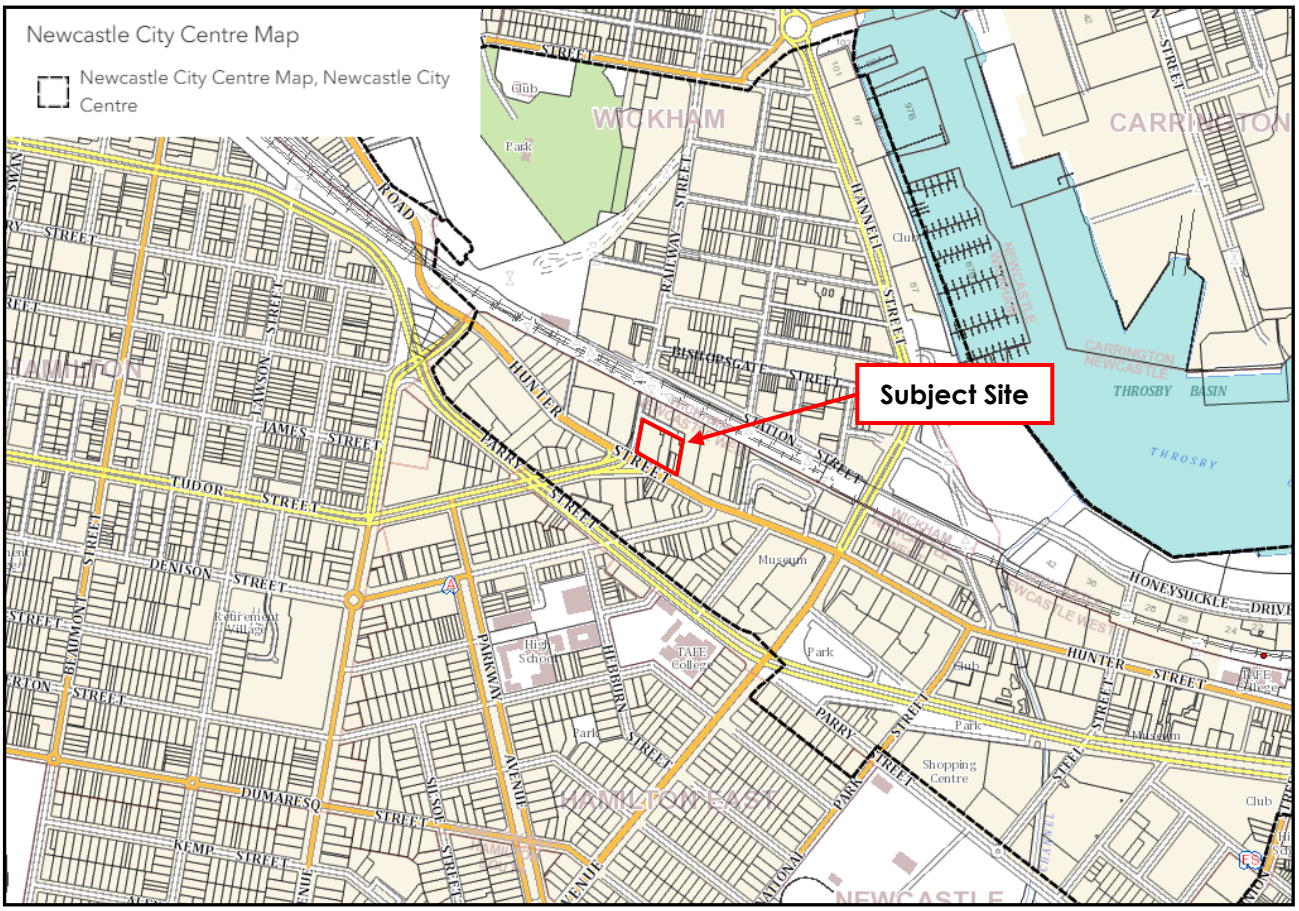

Figure 21: Extract from NLEP 2012 City Centre Map.

Clause 7.3 – Minimum Building Street Frontage

This CLAUSE requires that a building erected on land in the B3 Commercial Core zone must have at least one street frontage of at least 20m.

The proposed development is consistent with this standard, having frontages greater than 20m to both Hunter Street and Railway Street.

Clause 7.4 – Building Separation

This CLAUSE requires that a building on land within the City Centre must be erected so that the distance from the building to any other building is not less than 24m at 45m or higher above ground level.

The proposed development is consistent with this standard, and will have a separation of at least 24m from any proposed or future towers.

Clause 7.5 – Design Excellence

Under this clause, development consent must not be granted for development to which this clause applies unless the consent authority considers that the development exhibits design excellence.

The proposed development is considered to be consistent with this clause, resulting in a development that is of a high architectural standard and that also respects the heritage character of the area.

The proposed development will have a height greater than 48m and as such, Clause 7.5(4)(b) calls up the requirement for an architectural design competition.

Notwithstanding the above, Clause 7.5(5) states that subclause (4) does not apply if the Director-General certifies in writing that the development is one for which an architectural design competition is not required.

A request to waive the requirement for an architectural design competition was made to the Department of Planning and Environment, and subsequently granted on 21st July 2021. A copy of this waiver is provided within **Appendix O**. The waiver required that the proposed development be considered by Council's Design Review Panel. The Urban Design Review Panel considered the proposed development at two (2) design review meetings held on 30th June 2021 and 25th August 2021 (refer to meeting minutes attached at **Appendix P**).

It is also noted that Clause 7.5(6) permits the erection of a building to which this clause applies that has a height of not more than 10% greater than that allowed by Clause 4.3 (being 90m), but only if the design of the building has been reviewed by a design review panel.

Under Clause 7.5(6) the proposed development seeks a maximum height of 99m applying the10% bonus provision in accordance with this clause, as the design of the development has been reviewed by Council's Urban Design Review Panel.

As previously mentioned, Clause 7.5(6) also permits the erection of a building that has an FSR of not more than 10% greater than that allowed by Clause 7.10 (5:1), but only if the design of the building has been reviewed by a design review panel. The design of the building has been reviewed and approved by Council's Urban Design Review Panel and therefore the 10% bonus provision can be applied resulting in a maximum FSR for the site of 5.5:1.

The proposed development results in a FSR of 5.4:1, which does not exceed the maximum FSR prescribed for the site.

Clause 7.6 – Active Street Frontages in Zone B3 Commercial Core

The objective of this clause is to promote uses that attract pedestrian traffic along street frontages in Zone B3 Commercial Core.

The proposed development is consistent with this clause and provides active street frontages with ground floor retail space (refer to **Section 4.4.4**), and a glazed façade that promotes pedestrian activity, visual connectivity between the street and the land use as well as casual surveillance.

The proposed development will be a significant improvement in terms of active street frontage compared to the existing development.

Clause 7.9 – Height of Buildings

This clause applies to "Area A" and "Area B" on the Height of Buildings Map, and given that the site is not identified within "Area A" or "Area B" on the HOB Map, this clause is not applicable to the proposed development.

Clause 7.10 – Floor Space Ratio for certain development in Area A

This clause applies to land identified in "Area A" on the Floor Space Ratio Map, and as such is applicable to this development.

This clause prescribes the maximum FSR for a building, other than a commercial building, on land with a site area of 1,500m^2 or more, and an identified FSR of 6:1 (or greater) on the FSR Map as 5:1.

The identified FSR for the site on the FSR Map is 8:1, as such, under Clause 7.10(2)(a) the site has a prescribed maximum FSR of 5:1. A bonus 0.5:1 FSR is available for the development that is proposed as per Clause 7.5(6).

The proposed development results in an FSR of 5.4:1, and is therefore compliant.

4.4.4 Newcastle Development Control Plan 2012

Newcastle Development Control Plan 2012 (DCP 2012) applies to the proposed development. The purpose of DCP 2012 is to provide detailed provisions relating to matters of environmental planning significance for Newcastle to be taken into consideration by CoN when exercising its environmental assessment and planning functions under the *Environmental Planning and Assessment Act 1979*.

DCP 2012 has been reviewed and the following elements are relevant for consideration:

Section 3.03 Residential Development

The aims of this section are to ensure the efficient use of land for residential purposes, and to encourage increased residential development in areas in proximity to services and transport, whilst encouraging innovation and diversification.

This section of the DCP is not applicable to shop top housing. The design of the proposal has been developed in accordance with the requirements of SEPP 65 and the provisions of the Apartment Design Guide.

Building design is addressed further in **Section 5** of this report, and a SEPP 65 Design Verification Statement has been provided at **Appendix E** of this report.

Section 3.10 Commercial Uses

The aims of this Section are:

- *To enhance the economic viability of commercial centres; and*
- *To encourage commercial development that has a positive contribution to surrounding development.*

The development is consistent with the aims and objectives of this section of the DCP based on the following:

- The proposal will see the establishment of a new architecturally designed Commercial Premises, providing an increase in floor space that will contribute to the viability of the Newcastle City Centre; and
- The proposed commercial premises will result in a positive contribution to the surrounding development, including through the provision of active street frontages

The retail and commercial uses and lobby areas shield the proposed on-site car park, and the design includes glazing presentation to the street with pedestrian walkways and awnings, ramps to access the building, and landscape plantings for amenity.

Building design is addressed further in **Section 5** of this report.

Section 4.01 Flood Management

The aim of this section of the DCP is to guide the development of flood prone land, applying balanced strategies to economically, socially and environmentally manage risk to life and property.

Flooding has been addressed in the relevant sections above and is also addressed further within **Section 5**. A Flood Information Certificate is provided within **Appendix R** of this report.

Section 4.04 Safety and Security

The aims of this Section are:

- *To ensure safe and activated places that are used by people day and night; and*
- *To encourage a built environment that maintains and enhances our sense of identity.*

The proposed development is consistent with this section of DCP 2012 and is addressed further in **Section 5** of this report.

Section 4.05 Social Impact

This section applies to any development as required under Council's *Social Impact Assessment Policy for Development Applications, 1999*.
The aims of this Section are:

- *To provide clear guidelines as to the level of assessment required for a development application;*
- *To consider both positive and negative social impacts in achieving socially sustainable development through an evidence based approach;*

- *To ensure consultation is undertaken with the community, stakeholders and relevant groups to identify public values and concerns; and*
- *To consider how potential social impacts of change can be best managed and mitigated.*

Social impact is addressed further in **Section 5**, in compliance with Council's *Social Impact Assessment Policy for Development Applications, 1999*.

Section 5.01 Soil Management

The aims of this section of the DCP are:

- *To prevent export of sediments from the site during construction;*
- *To prevent litter, sediment, nutrients and oils from entering waterways; and*
- *To minimise potential for landslip on sloping sites.*

Erosion and Sediment Control Plans have been prepared by Northrop Consulting Engineers and are attached at **Appendix G** of this report.

Section 5.02 Land Contamination

The aims of this section of the DCP are:

- *To ensure that the likelihood of land contamination is considered as early as possible in the planning and development process;*
- *To ensure that planning and development decisions take into account available information relating to the likelihood of land contamination;*
- *To ensure that any development of contaminated land will not result in unacceptable levels of risk to human health or the environment;*
- *To ensure that site investigations and remediation work are carried out in a satisfactory manner, and where appropriate, are independently verified by site audits;*
- *To ensure that Council exercises its functions relating to the development of contaminated land with a reasonable standard of care and diligence;*
- *To facilitate the provision of consistent and reliable information to the public about land contamination;*
- *To ensure that ongoing responsibility for management and monitoring of contaminated land is clearly and legally assigned; and*
- *To ensure the community is not unduly disadvantaged by increased health and environmental risks or increased management costs when accepting the dedication of public assets.*

Contamination is addressed further within **Section 5**, and a Preliminary Geotechnical Assessment has been prepared by Douglas Partners and is provided within **Appendix H** of this report.

Section 5.03 Vegetation Management

The aims of this section of the DCP are:

- *To identify declared vegetation under State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017;*

- *To achieve the objectives of the Newcastle Urban Forest Policy 2008 for development on private land;*
- *To ensure existing vegetation on a development site and surrounding sites is considered in the design of the development;*
- *To ensure that tree canopy cover is considered in the design of development;*
- *To promote the retention of existing vegetation and provide opportunities for appropriate tree growth; and*
- *To provide guidelines for the management of trees.*

The proposed development seeks consent for removal of the existing vegetation on the site that will be impacted by the demolition of the existing buildings, or will conflict with the proposed development. All trees proposed for removal will be replaced by substantial new landscaping and planting.

Landscape design is addressed further within **Section 5**, and landscape plans are provided at **Appendix D** of this report.

Section 5.05 Heritage Items

This section of DCP 2012 applies to land shown as a heritage item, or land in the vicinity of a heritage item, on the Heritage Map of Newcastle LEP 2012 and described in Schedule E of the Newcastle LEP 2012.

The subject site contains one heritage item, being the 'Dairy Farmers Clock Tower', and this has been incorporated into the proposed development in accordance with this section of DCP 2012.

5.05.01 General Principles

The proposal meets the objectives and controls of this section by retaining the heritage item in a way that highlights the significance to the public, by removing unsympathetic additions, and being open to reinstating missing original elements such as identifying signage.

5.05.02 Integrating Heritage Items into New Developments

The proposal meets the objectives of this section by ensuring the heritage research and subsequent confirmation of significance is guiding the design development, by providing a modern, refined and simple material palette for new adjacent works, and by providing for the long term conservation of the Dairy Farmers tower through its incorporation into the development.

The proposal meets the controls of this section by ensuring the tower is conserved, and retaining a suitable setting for the tower.

A Heritage Impact Statement has been provided at **Appendix I** of this report, and heritage is addressed further in detail within **Section 5** of this report.

Section 6.01 Newcastle City Centre

This Section applies to land located in the City Centre, as identified by the NLEP 2012 City Centre map, and as such is applicable to this development application.

6.01.01 Introduction

The aims of this section are:

- *To implement the Newcastle Urban Renewal Strategy.*
- *To integrate planning for Newcastle East, Honeysuckle and Newcastle West.*
- *To provide a comprehensive set of planning and design guidelines based on the characteristic of distinct areas within the city centre.*

The proposal is consistent with this section of the DCP, having been developed with regard to the requirements of NLEP 2012, SEPP 65, and SEPP BASIX, and in consultation with Newcastle Council's Urban Design Review Panel.

6.01.02 Character Areas

This section of the DCP divides the city centre into a number of areas with distinct characteristics and attributes, including topography, landscape, heritage, streetscape, land uses and built form.

The subject site is located within the 'West End' character area. *The DCP describes the West End area as:*

> *This area is the western gateway to Newcastle's city centre and is an area of unrealised potential. It currently has showroom and bulky goods facilities, retail, car dealerships and self-storage. The predominance of larger consolidated land holdings and fewer environmental and heritage constraints make this precinct ideally suited to become the future CBD of Newcastle.*
>
> *This precinct has fewer public domain assets. Improvement of public open space is needed to ensure the precinct is well-served as it evolves into a commercial precinct. Public domain opportunities include improvements to Birdwood Park, the Cottage Creek corridor and connections to the river foreshore. Public domain improvements should be in accordance with any adopted public domain plan of Council.*

The DCP outlines the following principles for development in the 'West End' area:

1. *New public spaces are created to meet the demands of the future CBD and existing public open spaces are improved, such as Birdwood Park and Cottage Creek. Opportunities for new publicly accessible spaces are identified.*

The proposed development is consistent with this principle, incorporating the creation of a new public pedestrian thoroughfare through the site.

2. *Birdwood Park is recognised as an important element in the public domain network and as the western 'gateway' to the city centre.*

The proposal is consistent with this principle and will not detract from Birdwood Park being the western 'gateway' to the city centre.

3. *New development fronting Birdwood Park addresses the park edge and promotes a sense of enclosure by being built to the street alignment. Any new development ensures adequate midwinter lunch time sun access to Birdwood Park.*

The proposed development does not front Birdwood Park, and will not adversely impact on midwinter sun access to Birdwood Park. The proposed development is therefore consistent with this principle.

4. *Development along the rail corridor, Cottage Creek, lanes or through-site links provide a building address to encourage activity, pedestrian and cycleway movement, and improve safety.*

The proposed development is consistent with this principle, providing a through-site pedestrian link that is bordered on either side by commercial and retail uses. The proposed ground level retail premises' will encourage activity and pedestrian movement and incorporate appropriate measures to improve safety in the area.

5. *Building entries are inviting with activate frontages that allow visual permeability from the street to within the building.*

The proposed development is consistent with this principle, providing building entries to both the commercial / retail premises and the residential foyers that are inviting and result in active frontages with visual permeability from the street to within the building.

6. *Distinctive early industrial, warehouse and retail buildings that contribute to the character of the area are retained and re-purposed.*

The proposed development is consistent with this principle, retaining the heritage listed clock tower. The Statement of Heritage Impact provided in **Appendix I** provides further detail in this regard.

7. *Heritage items and their setting are protected.*

The proposed development is consistent with this principle, as the design takes into consideration the heritage item on the site and the location of the site within a heritage conservation area. The proposed development will retain the 'Dairy Farmers Clock Tower' heritage item on the site as public art, thus ensuring its long-term protection. The Statement of Heritage Impact prepared by Heritas within **Appendix I** provides additional detail on the aspects of the proposal that enhance or respect the heritage significance of the area.

6.01.03 General Controls

This section describes development controls for built form and the public domain for development in the City Centre.

The following comments address the relevant development controls:

A. Building Form

A1. Street Wall Heights

The DCP nominates a Street Wall height along Hunter Street of 8m and then 16m otherwise. The proposed development seeks an alternative solution outcome that has been worked up through the Design Review Panel Process.

The proposed podium building has a street wall height of approximately 14.1m to Hunter Street.

Whilst this exceeds the 8m street wall height identified by the DCP, the non-compliance is considered acceptable as the proposed height is not out of proportion with the surrounding developments.

A2. Building Setbacks

This section of the DCP indicates that new buildings are to have a front setback of 6m between street wall height and 45m, and a setback of 12m for the building above 45m.

Whilst the proposed setbacks are not strictly compliant with the above DCP requirements, Council's Urban Design Review Panel were supportive of the proposed setbacks at the meeting dated 30th June 2021, stating "The Group is generally supportive of the height, geometry, setbacks, and character of the podium and towers" (refer to the Meeting Minutes attached at **Appendix P** of this report).

The proposed development complies with the area objectives of the DCP.

A3. Building Separation

This section of the DCP indicates that buildings should achieve a minimum building separation of 0m (or 6m for a building with a link) up to 16m, 9m up to 45m and 21m above 45m.

The separation distance between the two (2) residential towers is 24m which exceeds the DCP requirement, and is consistent with the requirements of the ADG.

A4. Building Depth and Bulk

This section of the DCP indicates that the maximum GFA per floor for a residential tower above street wall height is 900m^2, and the maximum building depth is 18m.

The proposed development complies with the maximum floor plate areas.

A5. Building exteriors

This section of the DCP indicates materials and finishes should feature high quality design with robust materials and finishes, make a positive contribution to the streetscape and public domain, be designed to ensure a positive contribution to streets and public spaces, and respond to adjoining buildings.

Materials and finishes are provided on the architectural development plans provided within **Appendix C** of this report, and achieve the desired DCP outcomes.

A6. Heritage Buildings

This section of the City Centre DCP indicates that development, including infill development, is required to conserve and enhance the cultural significance of heritage items and their settings, alterations and additions respond appropriately to heritage fabric and items' cultural significance, new building elements support future evolution of the heritage item, employ interpretation treatments when altering, adapting or adding to a heritage item, and encourage new uses for heritage buildings.

Heritage is addressed in further detail within **Section 5** of this report, and a Heritage Impact Statement has been prepared by Heritas and is included at **Appendix I** of this report.

A7. Awnings

This section requires that continuous street frontage awnings or weather protection to entrances are provided for all new developments in areas requiring an active frontage on the relevant map in the DCP. Design of awnings, addressing the streetscape, are to provide a consistent street frontage and should generally be flat, or near flat and similar to any prevailing awnings within the streetscape.

The subject site is not included as requiring an active frontage, however awnings in line with this section of the DCP have been provided regardless. The proposed awnings have been designed to comply with the requirements of DCP 2012 and are generally flat in design (as shown on the architectural plans provided within **Appendix C** of this report.

A8. Design of Parking Structures

This section of the DCP indicates that proposed at-grade or above-ground parking structures, whether free standing or part of larger developments in the city centre, are to be reviewed and endorsed by Council's Urban Design Consultative Group prior to being lodged for development consent as fulfilling the requirements of DCP 2012 Section 7.03.04 Clause B Parking areas and structures. Parking structures are required to be well designed and well-integrated with the streetscape and ground plane of the site and minimise their visual impact. All parking is to be provided within the building footprint, with access to above-ground car parking being located in side or rear streets or lanes, and at-grade, or above-ground parking being screened from view from public spaces. The finished floor level in the loading dock and carpark has been lowered to 3.3m AHD (100mm below the flood hazard level). as such, during the 1% AEP event, the carpark and loading dock areas would have an expected freeboard of 200mm to the peak flood level.

In accordance with this section of DCP 2012, the proposed car park has been designed to be internal to the development (excluding the driveway) in order to mitigate any visual impact.

The car parking is not visible from Hunter Street and Railway Street, and is appropriately screened from Tighe Street with architectural perforated or mesh metal screens.

Access to the proposed car park will be from Tighe Street, allowing for the activation of Hunter Street and Railway Street for retail / commercial purposes.

It is also confirmed that the proposed development, including the proposed car park, has been reviewed and endorsed by Council's Urban Design Review Panel at meetings held on 30 June 2021 and 25 August 2021 (refer to meeting minutes attached at **Appendix P**).

A9. Landscaping

This section of the DCP ensures that new development incorporates landscaping and communal open space that respects the desired character of the streetscape, adjoining land and public spaces.

The Landscaping Plans prepared by Xeriscapes in **Appendix D** demonstrate compliance with this section of the DCP.

Landscaping is addressed in further detail in **Section 5** of this report.

B. Public Domain

B1. Access Network

This section of the DCP requires improved and new pedestrian connections to be provided as shown in the relevant figure of the DCP and designed in accordance with the DCP and the City Centre Technical Manual.

Whilst the subject site is not identified on the relevant figure in this section of DCP 2012 as requiring an improved or new pedestrian connection, the proposed development does incorporate a new pedestrian laneway through the site, linking Hunter Street with Railway Street and providing activation to the proposed food and drink premises.

B2. Views and Vistas

This section of the City Centre DCP requires new development to protect the views nominated in the relevant figure of DCP 2012, and new development should be aligned to maximise and frame view corridors between buildings, taking into account topography, vegetation and surrounding development.

The proposed development will not impact on any of the nominated views identified in the relevant figure within this section of DCP 2012, and the upper levels of the development have been designed as two (2) narrow, and angled, towers to break up building bulk and ensure optimal views between and around the buildings.

B3. Active Street Frontages

This section of the DCP indicates that active frontages should be a minimum of 70% of the primary street frontage, and they should have transparent glazing to allow unobstructed views from the adjacent footpath to at least a depth of 6m within the building. Active frontages are to be provided in activity nodes as shown in the relevant figure of DCP 2012.

The subject site not identified in the relevant figure as requiring an active frontage. Regardless, the proposed development incorporates active frontages along both the Hunter Street and Railway Street frontages, utilising transparent glazing to allow unobstructed views from the adjacent footpaths to a depth of at least 6m within the building. Appropriate pedestrian entrances and retention of existing heritage item will also contribute to an active street frontage as a result of the proposal.

B4. Addressing the Street

This section of the DCP relates to all development outside the "active frontage areas". Under this section, buildings must positively address streets, footpaths, lanes, and other public spaces, and mitigate flood risk while ensuring accessibility and a positive relationship to the public domain.

The proposed development successfully addresses Hunter Street and Railway Street, as well as the internal pedestrian laneway, through the provision of commercial and retail uses with multiple entrances along the street frontage. Ground floor internal uses are clearly visible from the street and are at a level that ensures equitable and safe access.

B5. Public Artwork

This section of the DCP requires that developments over 45m in height allocate 1% of the capital cost of development towards public artwork for development, and that Council is consulted on the location and proposal for public art. Artworks in new buildings are to be located so they can be appreciated from streets and public spaces, and public artworks are to be used to interpret heritage components or recognise former uses of large development sites.

The reinstatement of the Dairy Farmers Clock Tower heritage item was discussed with Council's Urban Design Review Panel at meetings dated 30th June 2021 and 25th August 2021. Its use as a freestanding piece of public art was supported at the meeting dated 25th August 2021. The Clock Tower is located at the site's prominent Hunter Street frontage and will be restored and backlit to showcase the site's historical use.

B6. Sun Access to Public Spaces

This section of the DCP indicates that sunlight access is to be provided to significant public spaces for at least two (2) hours during mid-winter between 9am and 3pm, demonstrated by shadow diagrams.

The site is not in proximity to any public spaces listed under this section of the DCP and no unreasonable level of overshadowing will result. Shadow diagrams have been prepared as part of the Architectural Plans included within the application.

Section 6.02 Heritage Conservation Areas

This section applies to all development on land shown as 'Heritage Conservation Area' on the NLEP 2012 heritage map.

The subject site is located in the Newcastle City Centre Heritage Conservation Area and therefore this section of the DCP applies to the proposed development. The western portion of the site also contains an item of local heritage significance, being the Dairy Farmers Building (item I505) on Lot 2 DP 445736.

The reinstatement of the Dairy Farmers Clock Tower heritage item was discussed with Council's Urban Design Review Panel at meetings dated 30th June 2021 and 25th August 2021. Its use as a freestanding piece of public art was supported at the meeting dated 25th August 2021. The Clock Tower is located at the site's prominent Hunter Street frontage and will be restored and backlit to showcase the site's historical use.

6.02.01 Alterations and Additions in Heritage Conservation Areas

The proposal meets the objectives of this section by retaining the heritage item and relieving it of unsympathetic earlier additions.

The objectives of this section of the DCP are not aligned with the Council's West End development strategy however, and are more aligned with general residential development. For instance, the architectural style of the host building (1938 tower) is deliberately not reflected in the design of the additions (commercial and residential towers) and is considered an inappropriate design approach.

6.02.02 Materials and Details in Heritage Conservation Areas

The proposal meets the objectives and controls of this section by reflecting significance of the tower and its original materials in the material choices for the new construction, proving a materiality and colour palette that is sympathetic to the heritage item and to the context of the heritage conservation area, and by not painting original face brickwork.

6.02.03 Accommodating Vehicles in Heritage Conservation Areas

The proposal meets the objectives and controls of this section by providing vehicle accommodation away from public view and that doesn't interfere with the street presentation or interpretation of the 1938 tower.

6.02.06 Subdividing or Amalgamating Land in Heritage Conservation Areas

The proposal meets the objectives and controls of this section by respecting the historical use of the greater site by Dairy Farmers as one use despite a number of individual land parcels.

Although the proposal will amalgamate the existing lots on the site, it is not considered to have a detrimental impact on the extant heritage fabric of the tower or on the heritage conservation area, as from its original development in the early 20th century the entire greater site has been used by Dairy Farmers. The public interpretation would not have been of several different sites. The proposal respects the historical development of the site related to its significance as the Newcastle branch of Dairy Farmers.

6.02.07 Infill Development in Heritage Conservation Areas

The proposed development is based on a rigorous assessment of the immediate context (both existing and approved) which has informed the scale, setbacks and form. The proposal is respectful of the existing and approved character of the west end, and will set a suitable precedent for future character in conjunction with a heritage item. This is essentially the existing character of the west end – larger lots, commercial uses, with small pockets containing heritage items. Although the height of the proposal is greater than any currently existing, it is within Council's planning control and comparable to recently approved developments, which will result in a scale that is comfortable for the future west end form.

The immediate context of the site is a mix of non-contributory, neutral and contributory two (2) items, with the western junction of Tudor Street and Maitland Road being noted as a contributory 1 landscape item.

The materials and details of the new work are sympathetic through their rawness and simplicity, reflecting the history, use a materiality of the site, and by not attempting to replicate the Art Deco detailing of the clock tower.

Heritage is addressed further in detail within **Section 5** and a Heritage Impact Statement has been provided within **Appendix I** of this report.

Section 7.02 Landscape, Open Space and Visual Amenity

This section applies to all new buildings on land under NLEP 2012, and as such, is applicable to the proposed development.

The aims of this section are:

- *To create public places that strengthen our social connections;*
- *To ensure public places provide for diverse leisure opportunities;*
- *To ensure landscaping is integrated into the design of the development;*
- *To improve stormwater quality and reduce quantity;*
- *To provide habitat for native plants and animals;*
- *To improve the microclimate and solar performance within the development;*
- *To improve urban air quality;*
- *To plan and implement significant development with provision for open space, in scale with the development that can be linked to a local open space network;*
- *To encourage development that respects landscape opportunities, conserves significant and useful landscape elements and does not detract from the local environment; and*
- *To ensure buildings and structures do not detract from the character of rural areas.*

Landscaping, stormwater management, social and economic impacts, BASIX and sustainability are all addressed in detail in **Section 5**. Landscape Plans are provided at **Appendix D** of this report.

Section 7.03 Traffic, Parking and Access

The aims of this section are:

- *To ensure that parking and service provision is adequate relative to the likely demand;*
- *To encourage measures to reduce motor vehicle dependency and increase the use of public transport, walking and cycling;*
- *To ensure that the design of parking, access and servicing areas is in accordance with best practice standards; and*
- *To provide adequate and safe vehicle access to sites without compromising pedestrian access and streetscape qualities.*

Figure 22 below provides the required car, bicycle, and motorbike parking rates for the proposed development.

	Car Parking			Bike Parking			Motorbike Parking		
	Rate		Spaces Required	Rate		Spaces Required	Rate		Spaces Required
Residential	Spaces per 1B	0.60	21.6	Residential	1 per unit	183.0	1 space per	20 car spaces	8.2
	Spaces per 2B	0.90	115.2	Visitor	1 per 10 units	18.3			
	Spaces per 3B / 4B	1.40	26.6						
	Visitor	1 per 5	36.6						
Commercial / Retail	1 space per	60 m^2	32.4	1 space per	200 m^2 commercial	9.7	1 space per	20 car spaces	1.6
				1 space per	20 Retail staff				
			232.4			**212.0**			**9.8**

Figure 22: Extract from Architectural Plans – Required Parking Rates.

Traffic, parking and access are addressed in further detail in **Section 5** and a Traffic and Parking Assessment is attached at **Appendix K** of this report.

Section 7.04 Movement Networks

This section of DCP 2012 applies to all development involving new movement networks or modifications to existing movement networks, including roads, and pedestrian or cycle paths, and as such, applies to the proposed development.

The aims of this section are:

- *To ensure the movement network has clear structure and that street blocks facilitate safe and efficient internal and external pedestrian, cyclist and vehicular movements.*
- *To ensure that road design: reflects the functions of the road and the needs of road users; is based on sound engineering practices; meets relevant Australian Standards, Austroads publications and RTA design guidelines as appropriate.*

The proposed pedestrian thoroughfare has been designed in accordance with this section of the DCP. Movement networks are addressed further in **Section 5**.

Section 7.05 Energy Efficiency

This section applies to all development subject to the provisions of the NLEP 2012 and as such, is applicable to the proposed development.

The aims of this section are:

- *To encourage sustainable development.*
- *To encourage the innovation of energy efficient technologies and processes.*
- *To encourage efficient use of resources and the use of recycled materials.*
- *To promote best practice energy use.*
- *To improve the efficiency of energy use and reduce the long term energy consumption for residential, business and industrial uses.*
- *To restrict the reflection of sunlight from buildings onto surrounding areas and buildings.*

The development has been architecturally designed to meet the relevant energy efficiency criteria of SEPP 65, the accompanying Apartment Design Guide, and BASIX requirements. Energy Efficiency is addressed further within **Section 5** of this report, and a BASIX Certificate and SEPP 65 Design Verification Statement are attached at **Appendix E** of this report.

Section 7.06 Stormwater

This section applies to all development in the Newcastle LGA and as such, is applicable to the proposed development.

The aims of this section are:

- *To outline Council's requirement for stormwater management for development;*
- *To adopt a whole of water cycle approach to development; and*
- *To ensure an appropriate quality and quantity of water enters waterways.*

Stormwater Management is addressed further in **Section 5**, and a Stormwater Management Plan has been prepared by Northrop Consulting Engineers and is included as **Appendix G** of this report.

Section 7.07 Water Efficiency

This section applies to all development subject to the provisions of the NLEP 2012 and as such, is applicable to this application.

The aims of this section are:

- *To assist in efficient use of mains water.*
- *To encourage sustainable development.*
- *To utilise rainwater within developments.*
- *To minimise the consumption of potable water and discharge of wastewater.*

Water efficiency is addressed in further detail in **Section 5** of this report, and a BASIX Certificate is provided at **Appendix F**.

Section 7.08 Waste Management

The aims of this section are:

- *To facilitate sustainable waste management within the local government area in a manner consistent with the principles of ESD;*
- *To assist applicants in planning for sustainable waste management, through the preparation of a site waste minimisation and management plan;*
- *To assist applicants to develop systems for waste management that ensure waste is transported and disposed of in a lawful manner; and*
- *To provide guidance in regards to space, storage, amenity and management of waste management facilities for new development.*

Waste management is addressed further in **Section 5**, and an Operational and Demolition Waste Management Plan has been prepared by Waste Audit Consultancy Services and is included as **Appendix S** of this report.

Section 7.10 Street Awnings and Balconies

This section of the DCP 2012 applies to all development consisting of awnings or balconies over the road reserve. The development proposes awnings over the road reserve and as such, this section is applicable to the proposed development.

The awnings proposed as part of the development have been architecturally designed taking into consideration Council's design requirements, aesthetic presentation, functionality, structural integrity and safety.

The proposed awnings will not interfere with the new street trees proposed as part of the landscape plan, public utilities, traffic signs or signals, or vehicle or pedestrian circulation. The proposed awnings have also been designed to complement the streetscape, and take into consideration the surrounding built environment and heritage context of the area.

The awnings proposed are presented on the architectural plans provided within **Appendix C** of this report.

4.4.5 Other Relevant Policies, Strategies & Controls

Newcastle 2030 – Community Strategic Plan

The *Newcastle 2030 – Community Strategic Plan* (CSP) identifies the main priorities and aspirations of the community and aims to integrate principles of equity, access, participation and rights, and addresses social, environmental, economic and governance matters into Newcastle's future development. The plan identifies seven (7) strategic directions developed to attain these goals.

The strategic directions within the CSP that are applicable to the proposed development include:

- *Vibrant, Safe and Active Public Places – A city of great public places and neighbourhoods promoting people's health, happiness and wellbeing; and*
- *Liveable Built Environment – An attractive city that is built around people and reflects our sense of identity*

The proposed development is consistent with the CSP as it provides an attractive mixed-use development and diverse housing options in proximity to public and active transport networks. Further, the ground floor retail / commercial spaces, along with the internal pedestrian thoroughfare and renewal of the Dairy Farmers Clock Tower, provides the site with vibrant, safe and active public space.

It is considered that the proposed development is compatible with the provisions of *Newcastle 2030 – Community Strategic Plan*.

Newcastle Local Strategic Planning Statement

The *Local Strategic Planning Statement* has been adopted by CoN as a means of providing direction to future development patterns throughout the City of Newcastle. The comprehensive land use strategy aims to guide the future growth and development of Newcastle.

The Strategy implements the land use directions from the *Newcastle 2030 – Community Strategic* Plan and underpins the NLEP 2012, providing a land use planning platform to move towards a smarter, more liveable and sustainable Newcastle.

The Planning Priorities relevant to the proposed development are outlined below.

Planning Priority 8 – Plan for growth and change in Catalyst Areas, Strategic Centres, Urban Renewal Corridors and Housing Release Areas

Planning Priority 8 seeks to Plan for growth and change in Catalyst Areas, Strategic Centres, Urban Renewal Corridors and Housing Release Areas. The proposed development is consistent with the intent of this planning priority as the proposed tower development will provide a mix of commercial, retail, and residential uses in the West End of Newcastle. The proposal ensures greater choice in housing and jobs, with good access to the existing active and public transport networks.

Further, the proposed development aligns with the principles of this planning priority, particularly facilitating the concentration of commercial development in the West End.

Planning Priority 9 – Sustainable, healthy and inclusive streets, neighbourhoods and local centres

This Planning Priority focuses on the important elements of neighbourhood character, and the role of the street in fostering opportunities for all community members to strengthen social connections.

The proposed development incorporates an internal pedestrian thoroughfare, which traverses around the 'Dairy Farmers Clock Tower' heritage item. This ensures that the residents, workers and visitors are connected to the site and its rich history, and facilitates social connections and interactions.

Planning Priority 10 – Development responds to the desired local character of our communities

Planning Priority 10 aims to protect communities from new development that is not compatible with the desired local character of the area.

The proposed development complies with the various planning controls relevant for the site.

Planning Priority 11 – Protect and celebrate our heritage

The Heritage Impact Assessment undertaken by Heritas and provided within **Appendix I** demonstrates that the proposed development successfully protects and celebrates the heritage values of the subject site. Heritage is addressed further in **Section 5**.

Planning Priority 12 – Sustainable, affordable and inclusive housing

Planning Priority 12 outlines that access to secure, appropriate and affordable housing is not only a basic requirement for all people, it is an essential component of an inclusive, dynamic and sustainable city.

The residential component of the proposed development aligns with Planning Priority 12 as it provides a range of apartment types, from one (1) bedroom units to three (3) bedroom penthouse style apartments that have good access to the public transport network.

Additionally, the 'lived experience' of residents has been considered through the range of amenities available to residents, particularly those provided on the podium rooftop. This area includes communal open space, a gym, Pilates studio, swimming pool, two (2) function / multi-purpose rooms, a communal work from home space, and barbeque / shading facilities.

The proposal is consistent with the Closer Settlement Policy to help achieve ESD outcomes and complies with BASIX requirements.

Newcastle Local Housing Strategy

The Newcastle Local Housing Strategy 2020 sets a framework for the provision of housing across the Newcastle Local Government Area over the next 20 years.

Based on the projected population growth, future household composition, and the number of dwelling vacancies, it is estimated that there will be a demand for 19,450 new dwellings in the Newcastle LGA by 2041.

Priority 1 of the strategy seeks to maintain and encourage housing supply in appropriate locations. The subject site is located in the West End of the Newcastle City Centre, where adequate infrastructure, jobs, services, public open space and reliable public transport are located.

The proposal seeks to provide 183 residential dwelling across a range of apartment types in a location suitable for the development.

Priority 2 of the strategy seeks to ensure the provision of a mix of dwelling types across the LGA to provide for a range of housing needs that support a diverse community. As stated above, the proposed development incorporates a range of dwelling types, from 54m² one (1) bedroom units to 170m² penthouse style apartments. As such, the proposed development is considered to align with Priority 2 of the Newcastle Housing Strategy.

The proposal is consistent with the Newcastle Local Housing Strategy and will contribute to the delivery of diverse housing opportunities within a suitable location.

Section 7.12 Newcastle Local Infrastructure Contributions Plan 2019

The purpose of the plan is to identify the demand for facilities and services as a result of the development and to assess the contribution required to provide these public services and facilities. The services and facilities included in the Plan are only those provided through local government and not those provided by other levels of government.

It is understood that Section B of the Contributions Plan is applicable to the City Centre of Newcastle, and therefore to the proposed development. Under this section, a contribution of 3% of the estimated cost of development will be applied as the proposed cost of the development is greater than $250,000.

4.5 SECTION 4.46 OF THE EP&A ACT 1979

The proposed development is not considered to be integrated development under Section 4.46 of the *Environmental Planning and Assessment Act* 1979.

5.0 Development Issues

5.1 ZONE OBJECTIVES, USE CHARACTERISATION & PERMISSIBILITY

As indicated in **Section 4** of this report, the subject site is zoned B3 Commercial Core Zone under the Newcastle LEP 2012 and '*commercial premises*' and '*shop top housing*', are permissible land uses in the B3 Zone, with the consent of Council.

The proposed development is generally consistent with the objectives of the B3 Zone, providing a development that will strengthen the role of Newcastle as a regional centre, and its future development and growth. The proposal will provide a high density residential and commercial / retail development that will contribute to the overall vibrancy and viability of the city through an increase in population and patronage within the locality. The development will also provide commercial and retail floor space, which will ensure both continued and new employment and business opportunities. The subject site is well located within the city centre, with excellent access to public transport, Hunter Street and the Honeysuckle precinct to promote walking and cycling as alternative transport.

5.2 BUILDING DESIGN CONSIDERATIONS

The proposed development has been architecturally designed by CKDS Architecture (please refer to the SEPP 65 Design Quality Statement at **Appendix E** of this report).

The design has been developed with extensive consultation with Council's Urban Design Review Panel, appointed by the Government architect's office as the design excellence panel for the scheme, and is considered a response to the scale and character of the site and the areas evolving urbanity.

5.2.1 Design Approach

A series of rigorous options testing against the key design principles of SEPP 65 informed the proposed outcome for built form and scale.

The proposed development is conceived as a package of three towers, varying in height and scale. The collection of building forms creates a 'scalable' built form relating to the 'micro' human scale of Hunter Street, while transitioning to the taller 'macro' scale of the evolving Newcastle skyline.

The podium form defines the street wall to Hunter and Railway Streets. The public domain is driven deep into the site, cutting the corner to create an activated pedestrian laneway that incorporates public art and landscape, and provides a welcoming refuge from the busy street intersection.

The corner commercial building responds directly to the retention and celebration of the heritage 'milk bottle' and clock tower building. The impression on the built form to 'cradle' the tower, while allowing it to stand alone, retains key vistas and draws attention to the only original remaining built elements of the iconic 'Dairy Farmers Corner.'

The tower forms sit within the 12m ADG side setback to the east, with 3m tower setbacks proposed to Hunter, Railway and Tighe Streets, consistent with 'The Store' approved scheme further east along Hunter Street. Separation between the two (2) towers complies with ADG 24m separation at this height.

5.2.2 Height of Buildings

Clause 4.3 of NLEP 2012 prescribes a maximum building height of 90m for the subject site.

The proposed development results in a maximum building height of 99m. Clause 7.5(6) of NLEP 2012 permits the erection of a building to which that clause applies that has a height of not more than 10% greater than that allowed by Clause 4.3 (being 90m), but only if the design of the building has been reviewed by a design review panel.

In accordance with Clause 7.5(6), the proposed development seeks a maximum height of 99m applying the10% bonus provision in accordance with this clause, as the design of the development has been reviewed by Council's Urban Design Review Panel. No issues were raised with the proposed 99m height of the development by Council's Urban Design Consultative Group.

A variation in height between the towers ranging from 99m at the north to 84m at the south creates a visual contrast in the skyline, with horizontal roof plates expressing the dynamic forms in a dynamic way when viewed from different vantage points.

5.2.3 Floor Space Ratio

Clause 4.4 of Newcastle LEP 2012 identifies a maximum Floor Space Ratio of 8:1 for the subject site. However, Clause 7.10 of NLEP 2012 details additional provisions relating to development within "Area A" on the FSR Map, identifying an alternate maximum FSR of 5:1 for the subject site.

Notwithstanding the above, Clause 7.5(6) of NLEP 2012 also permits the erection of a building to which that clause applies that has an FSR of not more than 10% greater than that allowed by Clause 7.10 (being 5:1), but only if the design of the building has been reviewed by a design review panel. The design of the building has been reviewed by Council's Urban Design Consultative Group Panel as well as a Design Excellence Panel, and therefore the maximum FSR for the site is 5.5:1.

The proposal development is consistent with LEP FSR controls applying the 10% bonus provision. The proposed development results in an FSR of 5.4:1, which does not exceed the maximum FSR prescribed for the site.

The proposal contains 183 new residential apartments that provide a mix of accommodation which cater for contemporary requirements and comply with current standards. The mix includes no studios, 36 x 1 bed (19.7%), 128 x 2 bed (69.9%), and 19 x 3 bed (10.4%).

In addition to the apartments above, retail and commercial spaces at the lower levels and dedicated corner commercial building diversify the use of the site and offer potential for live / work and shopping opportunities.

The proposed density and mix will be appropriate in such a well-served urban context. The site is ideal for a contemporary mixed-use / residential apartment proposal given the proximity to transport, schools, the harbourfront, parks, and the CBD itself.

5.2.4 Street Presentation, Setbacks and Street Wall Heights

The proposed street presentation, inclusive of the pedestrian laneway, presents well to the street through its response to the fine grain existing and future streetscape patterns along Hunter Street. The site book ends the western edge of the city block that starts with 'The Store' redevelopment at the Wickham Interchange.

The pedestrian laneway extends the public domain into the site, and incorporates interpretive public art and landscaping to provide a welcoming refuge from the busy street corner and invite the public to reconnect with the remaining heritage 'milk bottle' clock tower on Dairy Farmers Corner.

Street presentation is further enhanced through the horizontal layering of façade treatments and materiality, which provides a clear expression of active ground floor retail/commercial, lobbies, screened podium residential, and tower residential above.

The DCP specifies for this site an 8m street wall height to Hunter Street and then a 6m setback up to the allowable height under the LEP. Streets generally within the CBD otherwise require a 16m street wall height.

The proposed development complies with the objectives of the street wall height but does propose some variation to it in order to respond to the context and to the heritage listed clock tower.

The corner of Hunter and Railway Street is celebrated with a commercial building above the street wall height but that is provided with a ground level setback providing for public open space and landscaping opportunity. The Hunter Street podium is of a height generally consistent with street wall heights in Hunter Street and then the tower element which is of slender design is setback.

Railway Street and Tighe Street are secondary streets with no strong street wall height established, nonetheless the podium design provides a base to the built form that considers a pedestrian scale street wall height.

5.2.5 Building Separation

The separation between the residential towers is compliant with the Apartment Design Guide and relevant DCP controls, being 24m. Additionally, an ADG compliant 12m side setback to the neighbouring property to the east is proposed to the full height of the towers above street wall height.

5.2.6 Private Open Space

All dwellings have well-proportioned internal living spaces that open directly to private balconies.

All dwellings have generous private outdoor spaces in the form of balconies that are generally compliant with Council's DCP controls for private open space. Areas comply and typically far exceed ADG minimum total sizes per unit.

Depths vary above and below the minimums in some areas of balcony. Multiple balconies per apartment are generally provided, with the relationship of balconies to living room spaces allowing the balconies in most instances to serve as an extension to the living space.

Splayed blade walls are provided to the corners to create wind breaks, frame views and provide multiple balcony options for corner apartments.

A large common open space area on the north facing level 4 podium roof is also provided with the intent to create a generous private 'urban park' for the residents.

5.2.7 Ventilation

All habitable rooms are naturally ventilated, and many have multiple windows in different facades. Majority of the small percentage of single aspect units are north facing, featuring generous glazing and openings.

The vast majority of units are corner units with dual aspect and cross ventilation:

- 79.2% of dwellings in the first nine (9) floors are cross ventilated;
- 91.3% of total dwellings in the proposal are cross ventilated.

All habitable rooms have ceiling heights of ≥ 2.7m.

All non-habitable rooms have ceiling heights of ≥ 2.4m.

All tower common lobbies are day-lit and naturally ventilated from two (2) sides.

5.2.8 Solar Access

The proposed development is provided with appropriate solar access.

Beyond compliance with BASIX's numerical standards, the site planning and building design maximise the benefits of passive solar design to the dwellings, exceeding ADG minimum standards. Generous wrap around balconies provides shade to all residential unit glazing.

Solar analysis indicates 84.7% of units receive at least one (1) hour of sun between 9am and 3pm mid-winter, with 73.8% receiving minimum two (2) hours. 14.2% of apartments receive 'no sun' – with the exception of 4x units in the podium, these 'no sun' units are all corner units with dual aspect and generous provision of glazing and wrap around balconies.

All living rooms open directly to balconies, which offer protection from direct sun to interiors in summer. 91.3% of units are dual aspect and cross ventilated, with the majority receiving access to harbour views. In accordance with the guidance contained in the ADG, sun scarce exterior and interior spaces have been given light coloured finishes, and large window bays to provide large amounts of ambient light.

All tower common lobbies are day-lit and naturally ventilated from two (2) sides.

5.2.9 Overshadowing

Shadow diagrams have been provided with the architectural development plans at **Appendix C** of this report.

The height of the towers complies with the LEP height limit with the 10% design excellence bonus applied. Directly to the east and west of the site are existing commercial buildings, and the four (4) lane width of Hunter Street provides a buffer to future residential proposals across the road to the south of the site.

Due to the tower's relative slenderness, adverse overshadowing of other properties is minimised during mid-winter. The UDRP noted the overshadowing impacts as appearing acceptable.

5.3 LANDSCAPING AND OPEN SPACE

Landscape Plans and a Landscape Report have been prepared by Xeriscapes and are included as **Appendix D** of this report.

Even constrained urban sites can have evocative landscapes, and this site's landscape strategy is a centrepiece of the site planning, with significant public domain and communal landscape initiatives.

The landscape design provides a high-quality street frontage with improved public domain and increased activation to Hunter Street to create a vibrant civic public place that provides access and activation. The design also incorporates a common open space area for the residents on the podium rooftop. This space creates an 'urban park' that includes tree planting, lawn areas, and recreation and activity spaces that take advantage of its northern aspect.

The Landscaped areas of the site comprise the following:

AREA CALCULATIONS		
Total Public Domain Area (Gr. Floor)	**1,038m²**	**26%**
Total Soft Landscape Areas	30m²	0.8%
Total Hard Landscape Areas	983m²	25.2%
Total Common Open Space Area (L4)	**1,932m²**	**49%**
Total Soft Landscape Areas	919m²	23%
Total Hard Landscape Areas	1,013m²	26%

Ground Floor Public Domain

The public domain areas have been designed to provide street activation for the proposed ground floor commercial and retail tenancies. The design intent is to provide a public lane way from Railway and Hunter Streets that provide generous forecourt spaces whilst being respectful to the retained heritage brick clock tower. It is intended that a public art installation will be implemented within this clock tower.

Although this site is located outside the parameters as identified in the *City of Newcastle CBD Public Domain Technical Manual,* some of the principles in this manual have been referred to in the landscape design. These principles include proposed street tree planting, planting in pavements, implementation of feature stone paving, banded unit paving, external lighting and street furniture such as seating, bike racks and bins.

Off-form concrete benches have been strategically placed though the lane way to provide a sculptural seating element and to also act as a 'bollard' against possible ram-raiding or terrorist threats.

The widening of the public footpaths on Hunter and Railway Streets will allow space for new street tree planting which will in accordance with the *City of Newcastle 'Urban Forest Technical Manual for Public Trees'* and the *'Street Tree Selection Manual'*.

Feature trees within paving using a strata-vault system will define the laneway, provide shade and will assist in softening the extent of hard-paved areas.

Where new tree planting is not practical within pavements, large GRC planters with mass planted shrubs and groundcovers have been proposed within this area to provide visual amenity.

Common Open Space Areas

The common open space areas of this development will be located on the level 4 podium. This north facing podium level open space will receive lots of sunlight as well as taking advantage of the views.

The landscape design intent for this level was to create a podium level small 'urban' park that can be used and enjoyed by all residents.

Extensive tree planting in raised planters that are intended to provide seasonal colour, shade and amenity.

Mown turf areas will be on a slight incline or berm are intended for passive recreation activities such as individual meditation, outdoor Yoga or Tai-chi.

A communal swimming pool with equitable access on an elevated pool deck will take advantage of the uninhibited views.

Paved break-out spaces for near the work-from-home hub, function rooms and the gym can be used for smaller group activities or private functions.

External fixed shade structures with communal table, bench settings and BBQs have been located so as to provide some privacy and separation. Other external fixtures will include bench seats, external lighting, outdoor fitness equipment, and games activities such as outdoor table tennis.

Raised garden beds around the periphery of this podium level will ensure that there are adequate soil depths required for different sizes of planting on structure as well as reducing potential structural load on the building. These raised garden beds will also provide a physical separation between spaces, so a level of privacy, screening and intimacy of these smaller spaces is maintained.

Common open space areas to include raised planters on structure. All raised planters to include minimum suitable soil media in relation to trees, shrubs and groundcovers to promote optimum plant growth and in accordance with *NSW Planning & Environment; Apartment Design Guide; Part 4P, Planting on Structures*.

Planting Design Strategy

The planting design strategy for this residential flat building development includes the following:

- Street Tree planting at ground level to assist in reducing within appropriate deep soil zones to reduce bulk and scale of the development;
- Evergreen tree planting to provide shade & amenity;
- Deciduous tree planting to allow for solar access & seasonal change;

- A broad planting palette to include a variety native species and exotic species to provide colour, texture, aroma and form; and
- Implementation of some indigenous species to encourage canopy corridor links and biodiversity.

With the proposed landscape design for this development, the following safety planting initiatives are recommended:

- Avoid planting tree species that are prone to potential limb drop;
- Avoid planting species close to paths and hard paved areas that are known for excessive flower, foliage and fruit drop that may cause potential slip hazards;
- Avoid planting species that are known for invasive root structure that may cause damage to existing infrastructure and damage paths and hard paved areas and which may cause potential trip hazards; and
- Avoid planting species that are known to be toxic or may cause respiratory, allergy and/or skin irritations.

All proposed plant species selections have been considered in terms of soil types, species hardiness and on-going watering maintenance requirements. Predominantly low water use species (both native and exotic) have been grouped in regard to watering requirements and to reduce reliance on use of potable water.

All raised planters are to include minimum suitable soil media in relation to trees, shrubs and groundcovers to promote optimum plant growth and in accordance with *NSW Planning & Environment; Apartment Design Guide; Part 4P, Planting on Structures*.

5.4 STORMWATER MANAGEMENT & FLOODING

Stormwater Management Plans have been prepared by Northrop Consulting Engineers and are attached at **Appendix G** of this report. The NCC Flood Information Certificate (FL2019/00248) is also attached at **Appendix R**.

All roof water will be collected and diverted to an underground rainwater reuse tank. The tank will be located below the ground floor car park and have a storage capacity of 15kL. The total capacity of the storage tank has been sized in accordance with BASIX requirements (refer to Stormwater Plans at **Appendix G** for calculations).

Overflow from the reuse tank and podium level runoff will be directed to an 85kL detention tank to mitigate stormwater flows off site. Captured water from the south-western hardstand area will also be directed to the detention tank. The total capacity of the detention tank aligns with the requirements of NDCP 2012 (refer to Stormwater Plans at **Appendix G** for calculations).

Detention tank overflow will be connected to the Council stormwater network via an existing stormwater pit in Tighe Street. Seven (7) SpelFilters (or equivalent) are proposed to be installed within the detention tank to remove sediment, gross pollutants and chemicals such a phosphorus, and nitrogen from the stormwater prior to discharging from the site.

Approximately 165m^2 (4%) of external pathway surrounding the building is proposed to bypass the treatment network and enter Council's stormwater system in Railway Street via sheet flow.

The subject site is identified as a Flood Control Lot. The site is not affected by a floodway or a flood storage area.

The Flood Information Certificate (FL2019/00248) attached at **Appendix R** estimates that the site has a Probable Maximum Flood Level of 3.4m AHD from ocean flooding, and a Probable Maximum Flood Level of 4.4m AHD (Hunter Street frontage) and 3.2m AHD (northern frontage) from local catchment flooding. The minimum floor level for occupiable rooms as prescribed by the Flood Information Certificate is 4.6m AHD (Hunter Street frontage) and 3.4m AHD (northern frontage).

All occupiable floor levels will be located above the Flood Planning Level, being 3.4m AHD at the northern frontage and 4.6m AHD at the Hunter Street frontage. Vehicular access and ground floor parking will be provided at 3.3m AHD to inhibit flood waters from entering during the 1% AEP flood event, which is estimated to be 3.1m AHD at the Tighe Street frontage.

Electrical fixtures such as power points, light fittings and switches, are located above the Flood Planning Level.

Runoff from the site will be conveyed by formal drainage infrastructure, being below ground pipes and through road carriageway for overland flow. As such, it is expected that this development will not cause stream erosion, destruction of riparian vegetation or a reduction in the stability of river banks or watercourses.

The proposed development is consistent with the provisions of NDCP 2012 and the *Newcastle City-wide Floodplain Risk Management Study and Plan* with respect to occupiable flood levels, vehicular access and on-site refuge.

5.5 GEOTECHNICAL AND CONTAMINATION

A Preliminary Geotechnical Assessment inclusive of Preliminary Contamination Testing has been prepared by Douglas Partners and is attached at **Appendix H** of this report.

The site history information suggested a range of potentially contaminating activities associated with various former and current site uses. These included a possible former blacksmith, commercial milk processing and distribution by the Dairy Farmers' Co-operative Milk Company Limited (about 50 years), followed by use as a car dealership (30 years to present). One (1) underground fuel storage tank (UST) remains present at the site (redundant) based on site observations and site history findings.

The objective of the assessment was to assess the potential for contamination at the site based on past and present land uses and to comment on the need for further investigation and/or management with regard to the proposed development. It included limited intrusive investigation at accessible locations to provide a preliminary assessment of potential areas of environmental concern and contaminant concentrations at the site.

The preliminary subsurface investigation focused on the main identified contamination risk areas within the developed area of the site, most notably the potential for contamination associated with fill materials and a redundant known UST no longer in use. 12 boreholes were drilled to permit soil sampling for contamination and ASS testing. Two (2) groundwater monitoring wells were installed for groundwater sampling. Two (2) existing groundwater monitoring wells were also sampled. The results of the assessment indicated the following:

Site Conditions

- Presence of fill across the site to depths of 1m to 2.3m. the average fill depth was less than 1.5m, with observations suggesting possible deeper fill areas were associated with UST backfill; and
- Upper fill materials were variable based on observations during drilling and the results of testing of selected soils and indicated widespread building materials were present within fill across the site (potential source of HBM including ACM);

Soil Contamination

- The general absence of gross contamination at the test locations and depths assessed based on field observations and laboratory testing of selected soil samples. This included areas downgradient of the redundant UST;
- Most soil contamination concentrations were within the adopted human health and ecological investigation / screening levels and site assessment criteria (SAC). This considered both a generic commercial land use (scenario 'D') and high residential land use within minimal soil access (scenario 'B') given the possibility for communal areas of open space at ground level. Minor exceedances were as follows:
  - Elevated Benzo(a)pyrene TEQ (PAH) exceeding HIL B at 203/0.5m;
  - Elevated TRH F3 (>C16-C34) exceeding ESL B at 201/2.0m; and
  - Asbestos in soil at Bore 305/0.55m (bonded and friable ACM) and bonded ACM at the surface at S1.
- Given the current and proposed limited access to soils (pavements and buildings), the risk of direct contact with soils is considered to be low;
- The ecological exceedances are not considered to be significant due to the current land use and proposed land use which will result in the majority of the site being paved or with limited access to soil;
- Asbestos was identified in two (2) fragments; one (1) located in filling at Bore 305/0.55m and one (1) at the surface of garden bed material (S1/F). Friable asbestos as asbestos fines (AF) was identified in the fill at Bore 305/0.55m comprising fibre cement material (< 7mm in size). The percentage of asbestos fines, being less than 7mm, exceeded the adopted criterion for residential land use but was within the industrial / commercial land use based on NEPC (2013). Owing to the presence of fill at the site, and widespread presence of building materials in fill, there is a risk of hazardous building materials (HBM) including asbestos in unobserved or untested parts including UST backfill materials; and
- Hydrocarbon impact to soil was not identified within bores near the redundant UST, noting that bores were necessarily limited by the known underground infrastructure and safe set back distances. Residual impacts may be present in the vicinity of underground fuel tanks and associated infrastructure (i.e. tank backfill, fuel /service lines). This may include residual impacts to soil and possible impacts to groundwater, if present.

Waste Classification

- Preliminary waste classification testing on upper fill materials indicated a General Solid Waste (GSW) classification with reference to NSW EPA (2014a) based on total and leachable contamination concentrations. A number of samples also returned Hazardous Waste (HW) or Restricted Solid Waste (RSW) classification, with pending confirmation of leach results. Due to the observed presence of bonded ACM in upper fill materials, the preliminary classification of upper fill is GSW containing asbestos waste (Special Waste).

The classification of underlying natural soils will need to consider ASS conditions. Due to the preliminary nature of the testing conducted, further testing is recommended to confirm waste classification prior to disposal of soils from the site.

Acid Sulfate Soils

- The preliminary ASS assessment indicated the possible presence of ASS conditions in natural sands below the water table (below about 2.6m). Proposed disturbance of soils below the water table should be undertaken with reference to a site-specific ASSMP. Further testing however is recommended to confirm the depth and extent of ASS conditions within the site to inform the ASSMP and waste classification of site soils

Groundwater

- The contaminant concentrations in groundwater were generally low and suggests the absence of significant hydrocarbon impact to groundwater from the known redundant UST, including the absence of off-site hydrocarbon migration in the vicinity of this UST. The groundwater conditions encountered at the site, are generally consistent with similar nearby sites within the Newcastle central business district which often have slightly elevated heavy metals, in particular copper and zinc.

Based on the assessment findings, remediation / management would be required to render the site suitable for the proposed development from a contamination perspective, due to the bonded and friable ACM impacts in fill materials and potentially as a result of the presence of PAH and TRH impacts in fill. Remediation should be detailed in a site-specific RAP for the development.

It is understood that construction may require removal of upper fill materials to a depth of 0.5m to 0.6m and as such, remediation may include removal of impacted soils and/or on-site management.

Management of the ACM impacted fill / soil materials under a suitable capping layer to prevent access/exposure from a contamination perspective could be considered at the site. Given the proposed development is likely to comprise buildings with concrete slabs and concrete pavements across the majority of the site (i.e. minimal landscaping), the proposed development could be considered to manage site soil contamination subject to regulatory approval and the results of additional investigation.

The adopted remediation approach should be aligned with the proposed development detailed in a site-specific RAP. It is noted that on-site management of contamination will also attract a notice on the site Section 10.7 Planning Certificate and would require enforceable controls to ensure the contaminated soils are appropriately managed into the future via a long-term site management plan (SMP).

In summary, the site is considered to be suitable for the proposed development, subject to appropriate remediation / management of contamination and regulatory approvals. The assessment has considered generic residential (minimal access to soils) and commercial / industrial (ground floor) land use scenarios on the basis of the proposed development.

The following comments and recommendations are provided within the assessment:

- Additional investigation and testing is recommended to further confirm:

- ASS conditions across the site to inform a site specific ASSMP and confirm waste classification of soils for materials likely to require off-site disposal (extent to be confirmed);
- The extent and concentration of asbestos impacts across the site to inform the remediation methodology and feasibility;
- The potential presence of additional USTs and fuel infrastructure across the site. This may also be triggered by the SafeWork NSW Dangerous Goods search results if additional fuel infrastructure or storage of hazardous chemicals are identified. This may include GPR survey of the site and targeted soil and groundwater sampling and testing as required;

- Additional inspection, sampling and testing (where required) is recommended following site demolition activities within building footprints to assess areas that were not readily accessible during the PSI;
- A site specific RAP will be required, which will also require a remediation procedure which sets out the methods and objectives to remove the USTs with reference to NSW EPA (2014c) *Technical Note: Investigation of Service Station Sites*; and
- Waste classification testing is recommended to confirm the waste classification of soils prior to disposal of soils from the site, if proposed. This should be conducted prior to RAP preparation to ensure the proposed remediation approach adopted is feasible for the development.

5.6 HERITAGE

A Statement of Heritage Impact has been prepared by Heritas Architecture and is included in **Appendix I** of this report.

The Statement of Heritage Impact has been undertaken in accordance with the requirements of the Australia ICOMOS Burra Charter (2000), and more specifically the guidelines for Statements of Heritage Impact as issued by the NSW Heritage Office (1996 & 2001). These guidelines note that a Statement of Heritage Impact should address the following issues:

- Why the item is of heritage significance;
- What impact the proposed work will have on that significance; and
- What measures are proposed to mitigate negative impacts.

The Statement of Heritage Impact has provided the following assessment of the proposal:

	The following aspects of the proposal respect or enhance the heritage significance of the item/ area for the following reasons.
1	The proposal has no impact on the stated heritage values or significance of the Newcastle City Centre Heritage Conservation Area.
2	The existing fabric (excluding the clock tower) is not considered to be significant in its own right or as a streetscape element. The demolition of the 1990s fabric is not considered to have a detrimental impact on the existing heritage significance of the clock tower, or the stated values of the Newcastle City Centre Heritage Conservation Area.
3	The reduction in bulk achieved by breaking down the residential floor plate into two (2) towers is sympathetic to the context.

4	The respect of the streetscape achieved by the tower setbacks is sympathetic to the area. The built form of the West End is changing to reflect up to 90m height limits and existing and approved towers flank the subject site in Newcastle West as well as in Wickham.
5	The enhancement of the streetscape is achieved by provision of retail space, public art, and courtyard space at ground level – a sympathetic reuse of the Dairy Farmers use of the site as industrial with private commercial use abutting the Hunter Street boundary. Public engagement with the Dairy Farmers clock tower will be greatly enhanced.
6	Despite the proposed development being visible from many locations in the West End, any impact on nearby heritage items is not considered to be detrimental. The setting of heritage items is maintained. While the view of heritage items will be changed in some circumstances, depending on viewpoint, the distance between the proposed towers and nearby heritage items is sufficient to maintain the independence of the heritage items. Streetscape views to heritage items are mitigated by the tower setback.
7	The material palette responds to the large grained built form of the context with precast concrete louvre panels and glazing, while also introducing a finer grain through the use of face brickwork. As brickwork is a predominantly domestic building material, its use here invokes a gentler interface. The material choices complement the character of the western end of the conservation area. Materiality respects the existing clock tower by not replicating any of the existing original fabric.
8	The architectural style of the proposed development is complimentary to the existing and developing character of the West End, and will contribute positively to the existing diversity of built fabric in the conservation area. The modern fabric highlights the heritage fabric more effectively than mimicking a heritage style and therefore considered to be an appropriate response.
9	The proposal is consistent with the planning intent for a new high density centre at the western end of the city, in conjunction with the Newcastle Interchange, and achieves this with sensitivity to nearby heritage items. By confirmation of the allowable height limits in the area under DCP 2012, it must be interpreted that Council has already conceded altered skyline views in Newcastle West.
10	Although the entire site is heritage-listed, the clock tower is deemed to be the significant fabric. The redevelopment of the site in the 1990s effectively removed all other fabric related to the Dairy Farmers occupation.
11	Two (2) periods of major site disturbance – in the 1930s and 1990s – would have removed the probability of pre-1930s archaeological relics on the site.
12	The view of the clock tower on approach from Tudor Street is maintained.
13	The forms across the site are respectful to the clock tower, by reducing from the high point of the setback residential towers, to the mid-height commercial office, to the low-rise podium, to the existing clock tower. The graduation is reinforced by the materiality of the buildings, with the clock tower retaining its heritage detail, the commercial building providing a perforated, consistently simple curtain backdrop to the tower, and the repetitive simplicity of the residential towers beyond.

14	The form of the eastern tower podium is reflective of the former eastern wing of the Dairy Farmers building.
15	The clock tower is successfully embraced into the development without appearing disjointed yet without being subsumed by it. Allowing a minimum curtilage is respectful to the fabric, and allows for the heritage item to be better interpreted "in the round".
16	The intention to retain the original fabric of the clock tower is sympathetic to the structure and also to the heritage conservation area.
17	The adaptation of the ground level uses existing openings. The original floor plan for the building has not been found and therefore it is unclear what the original openings were. Adaptation of the existing openings with new reveals, using new materials, is a sympathetic response.
18	The indicative material and colour palette is sympathetic to the heritage item.
19	Established view corridors to nearby heritage items are not compromised.
20	The proposal is sympathetic to the principle of protecting heritage items and their setting, stated in NDCP 6.01.02 B(7).
21	The proposed lighting of the interior of the tower is consistent with its original intention.

The following elements should be further explored for inclusion within the development:

- Reconstruction of clock tower signage should be explored. Neon lighting was first demonstrated by Georges Claude at the 1910 Paris Motor Show, and Claude went on to further develop and patent this type of lighting in conjunction with his company Claude Neon. The entrance to the Paris Opera was lit with neon by 1919, and the style was readily taken up around the world. The Claude Neon company is still operating internationally, headquartered in France and with several locations in Australia. Claude Neon installed and still maintains the iconic Coca-Cola sign in Kings Cross, Sydney. Neon lighting has a strong historical connection with the Art Deco period, and its reconstruction at Dairy Farmers Corner should not be discounted. Modern neon flex material could be considered appropriate due to its sustainable properties and its distance from ground level making it essentially indistinguishable. This has been approved for use at numerous other heritage buildings in NSW.

- Internal lighting of the tower should be developed alongside further research. Oral history references the interior lighting within the tower, visible to the public, changed colour from time to time. This should be more fully researched prior to detailing a solution for internal lighting.

- Detailing of finishes to the clock tower, both internal and external, should be resolved in conjunction with a heritage architect with the goal to return the tower to its Art Deco glory. This could include confirming whether a paint layer covers the original faïence tiles on the south face (and subsequent removal of the paint layer), investigating the tower façade vertical detailing either side of the milk bottle (with the view to uncovering/reinstating this), reconstructing some terracotta detailing to the entrance canopy, reconstructing the glass brick infill to the milk bottle and entrance margin glazing, reconstructing the black entrance wall tiles, and exploring options for the reconstruction of neon signage.

Conclusion

The current character statement for the Newcastle City Centre Heritage Conservation Area is largely irrelevant when considering the West End. Newcastle DCP 6.01.02 acknowledges this by recognising 'the predominance of larger consolidated land holdings and fewer environmental and heritage constraints' making the area 'ideally suited to become the future CBD of Newcastle.' The City of Newcastle has also referred to the West End as having no definable or consistent heritage character. To maintain significance in the area, the DCP principles for development in this area include simply for heritage items and their settings to be protected.

New development in historical areas must be a reflection of our current culture. Development must endeavour to create a city that reflects the modern complexity of our culture, and represents the spirit of the city at the time. It should be unapologetically modern, while respectfully sympathetic. New architecture should continue the story of Newcastle alongside its history, not simply recount it.

The influx of additional new retail, commercial and residential spaces in the West End will bring increased population, which in turn will have a positive flow-on effect in retaining uses for heritage buildings, and consequently engaging the public in heritage places.

The Statement of Heritage Impact outlines that the proposal for Dairy Farmers Corner retains and conserves, and will further unveil, an iconic piece of Newcastle's history and should be fully supported on heritage grounds.

5.7 TRAFFIC, ACCESS AND PARKING

A Traffic and Parking Assessment has been prepared by Intersect Traffic and is included as **Appendix K** of this report.

Traffic

Road Network Mid-Block Capacity

The Traffic Impact Assessment has indicated that the local and state road network is currently operating within its technical road capacities. The development is likely to generate the addition of up to 154 AM peak hour vehicle trips and 132 PM peak hour vehicle trips.

With the addition of this development traffic to the 2021 and 2031 network volumes these road capacity thresholds are not reached.

Therefore, subject to satisfactory intersection performance this additional traffic will not increase mid-block traffic congestion on the surrounding road network. As such, the development will not adversely impact on the mid-block road capacity of Hunter Street, Tudor Street, Railway Street and Tighe Street.

Intersection Capacity

For the Hunter Street / Tudor Street / Railway Street Signalised intersection the following assumptions are made in the modelling:

- The intersection layout will remain as per current conditions;
- 2019 and 2029 traffic volumes used in the modelling were as provided by GHD for the

Newcastle Transport Interchange development;
- 2021 and 2031 traffic volumes have been predicted from the GHD data using a 2% per annum background traffic growth rate on all roads; and
- Traffic generated by the development is distributed.

The modelling shows that the Hunter Street / Tudor Street / Railway Street signalised intersection would continue to operate satisfactorily with the development traffic in 2021 and through to 2031 in both the AM and PM peak periods.

Austroads Guide to Traffic Management – Part 6 – Intersections, Interchanges & Crossings (2009) was used to assess the performance of the Railway Street / Tighe Street T-intersection and the Tighe Street car park access.

The volumes for each of the intersections are all within the relevant thresholds and therefore both intersections will operate with uninterrupted flow conditions. Therefore, the constructed standard BAR / BAL road T-intersections will be satisfactory, and the proposed property access can be constructed as a normal private property urban access, subject to *Australian Standards AS2890.1-2004 Parking facilities – Part 1 – Off-street car parking requirements*.

Overall, it can be concluded that the proposed development will not adversely impact on the operation of intersections on the adjoining local and state road network and no upgrades to any other intersections which are all constructed with a high level of intersection control in place will be required due to the development.

Therefore, the proposed development will not adversely impact on the efficiency or effectiveness of the local / state road network.

Access

The on-site car parks for this development will be accessed via a new combined entry and exit access crossing 6m wide at Tighe Street to be located approximately 20m west of the eastern boundary of the site. It is noted a security gate for the car park is proposed at the boundary line in Tighe Street. While not strictly compliant with Australian Standards which require control points at car park entrances to be located 6m within the site, the local conditions are such that this proposal can be supported on merit. In this regard, it is argued that whilst Tighe Street is a public road, it is a dead-end street that has a low traffic volume and basically only services 2-3 properties including the subject property. Traffic speeds are also low and pedestrian traffic in the area is light if not non-existent. Therefore, any short delay for cars queued in Tighe Street will have a negligible impact on traffic flows or the road safety environment.

Further, as the ground and first level of the proposed car park will provide car parking including customer car parking for the commercial and retail components of the development, this security gate will be fully open during business hours (i.e. 8am – 6pm), during which time no delays will be experienced in entering and exiting the site. Additional security for residents will be provided at the bottom of the ramp from level 1 to level 2.

Australian Standard AS2890.1-2004 Parking facilities – Part 1 - Off-street car parking states that a car park between 101 and 300 parking spaces accessed via a local road providing residential, domestic and employee parking is required to have a combined entry / exit driveway between 6m and 9 m wide.

The proposed access comprises a combined entry / exit driveway 6m wide and therefore complies with the minimum requirements of the Australian Standard (AS2890.1-2004).

It is therefore concluded the proposed car park access arrangements are suitable to service the development and complies with Newcastle City Council and Australian Standard requirements.

Parking

As outlined in **Section 4**, the proposed development will provide 237 onsite car parking spaces (including 66 spaces on the ground and upper ground floors for the commercial, retail and residential uses, and 171 additional spaces between levels 1 and 3 for the remaining residential premises), which is in excess of the parking demand generated by the development of 232.4 car parking spaces.

The proposed car park also provides 16 motorbike parking spaces, which is also in excess of the demand generated according to the Newcastle DCP parking rates, being 9.8 spaces.

The development is also considered to provide sufficient bicycle parking with storage areas provided for residents to store bicycles and up to 63 secure bike racks for use by visitors, commercial tenancies and some residents.

It is noted that the number of residential visitor spaces and the commercial spaces required are 37 and 33 respectively. Given the majority of residential visitor parking would occur in the evenings, when not all the commercial and retail tenancies of the development are operating there will be opportunity to share some of the commercial parking and visitor car parking (residential visitor parking between 6pm and 8am) as has been approved by Council previously in a number of similar developments in the City Centre. The visitor car parking and commercial / retail parking is to be provided on the ground level and the eight (8) stacked spaces on level 1, with the stacked spacing being assigned to a single tenancy for staff parking. This means a total of 16 spaces will be full-time commercial parking. The remaining 22 spaces on ground level will be assigned as follows:

- Two (2) accessible spaces – commercial visitor car parking;
- 10 spaces – full-time residential visitor car parking; and
- 10 spaces – shared commercial and residential visitor car parking.

This allows a total of 28 commercial parking spaces and 10 residential visitor car parking to be available between 8am and 6pm and 18 commercial parking spaces and 20 residential visitor car parking spaces to be available between 6pm and 8am. Therefore, at peak parking demand times this represents a small deficiency on commercial parking (15%) as well as a residential visitor car parking deficiency of 46%.

Council has previously set precedent in the Newcastle City Centre area by allowing a number of residential developments with large residential visitor car parking requirements to reduce their visitor car parking requirements by up to 50% as a way of encouraging public transport use by residential visitors.

The development will also result in the removal of a number of existing redundant kerb cross-overs in both Hunter Street and Railway Street which would be expected to increase on-street car parking availability by up to four (4) car spaces likely to benefit commercial and residential visitors.

Overall, it is concluded that sufficient on-site car parking is provided within the development, as the proposed on-site car parking areas can comply with the requirements of *Australian Standard AS2890.1-2004 Parking facilities – Part 1 - Off-street car parking* and therefore the Newcastle DCP (2012).

Servicing

The development has been designed for collection of waste by private contractor. The collection driver will wheel the waste bins from the waste storage area to the separate MRV on-site loading bay accessed via Tighe Street. Emptying will be completed within 10 minutes. Waste collection will be programmed to ensure it is carried out during non-peak traffic generating periods for the development so as not to coincide with large vehicle commercial or retail deliveries. Servicing of the commercial / retail premises is only likely to be infrequent and undertaken by up to small rigid vehicles typically courier vans or medium rigid vehicles with short turnover periods. It is expected they would be able to use the available on-site loading bay or off-street parking supply for deliveries.

It is considered that the waste collection and commercial / retail servicing arrangements proposed for the development are satisfactory and suitable for the development.

Pedestrian Facilities

The proposed development will generate additional pedestrian traffic as residents and visitors access the site from nearby on-street car parking, bus stops, and shopping areas. A substantial and suitable concrete footpath network, with crossing facilities, already exist within this area therefore it is concluded that no nexus exists for additional pedestrian facilities as a result of this development. It is noted however, that Council may require reinstatement of vehicular driveway crossings and upgrading of the footpaths along parts of the frontage of the site.

Alternative Transport Mode Facilities

The proposed development is likely to generate an increase in patronage of the existing public transport system (buses and rail). It is noted however, that the site already has excellent access to public transport with suitably frequent bus routes passing the site with connection to other bus routes and the Newcastle and Hunter rail transport system. Existing bus stops are already located close to the development therefore it is concluded that the existing public transport services and infrastructure near the site is suitable for the development.

The development may generate some increase in bicycle traffic, however the small increase in demand generated by this development would not be sufficient for a nexus to exist for the provision of additional external bicycle infrastructure.

The results of the Traffic Impact Assessment demonstrate that the proposed development can be supported from a traffic perspective as it will not adversely impact on the local and state road network, and complies with the relevant requirements of Newcastle City Council, TfNSW and Australian Standards.

5.8 ACOUSTIC MATTERS

A Noise Assessment of the potential noise impacts to and from the proposed development has been undertaken by Muller Acoustic Consulting Pty Ltd and is provided within **Appendix J** of this report.
Key acoustic elements addressed as part of this assessment include:

- Road/transportation noise intrusion (impacts to internal spaces within apartments);
- Rooftop emissions, including mechanical plant from the project to neighbouring receivers; and
- Emissions from ground floor food and beverage tenancies.

Given the acoustic aspects considered in this assessment, the following policies and guidelines have been adopted:

- NSW Environment Protection Authority (EPA), Noise Policy for Industry (NPI), 2017;
- Department of Planning (DPI), Development Near Rail Corridors and Busy Roads – Interim Guideline, 2008;
- NSW Environment Protection Authority (EPA), Road Noise Policy (RNP), 2011;
- NSW EPA's Noise Guide for Local Government (NGFLG), (2013);
- The Independent Liquor and Gaming Authority (ILGA) criteria related to licensed premises;
- Australian Standard AS 1055:2018 Acoustics – Description and measurement of environmental noise – General Procedures;
- Australian Standard AS 3671-1989, Acoustics – road traffic noise intrusion - building site and construction; and
- Australian Standard AS 2107:2016 Acoustics – Recommended design sound levels and reverberation times for building interiors.

Road Noise Recommendations

Standard domestic glass is usually acoustically inadequate and can reduce the attenuation performance of the overall building facade. Glazing improvement options include thicker laminated glass or double-glazed laminated windows with an air gap between panels. The frames and air gaps should be adequately sealed to optimise noise reduction.

As windows must remain closed for effective noise reduction, as such, relevant BCA requirements regarding ventilation should be noted.

The Noise Assessment recommends noise attenuation measure for the southern tower, which includes Category 3 glazing treatments for windows and doors from levels 2 to 18 on the tower's southern façade. Category 3 glazing requirements include operable windows and sliding doors with minimum 6.38mm laminated glass and full perimeter acoustic seals.

Operational Noise Recommendations

Recommendations to reduce operational emissions to the surrounding community for this project may include:

- Limiting use of the recreational podium to day and evening hours (i.e. 7am to 10pm) to minimise the potential impacts of maximum noise emissions to receivers; and
- Modelling did not include acoustic louvres/screens although this could be considered as an option to provide additional noise attenuation.

Construction Noise Recommendations

Recommendations for consideration during construction and demolition activities to reduce emissions to the surrounding community for this project may include:

- Implement any boundary fencing/hoarding as early as possible to maximise their attenuation benefits;
- Toolbox and induction of personnel prior to shift to discuss noise control measures that may be implemented to reduce noise emissions to the community;
- All plant should be shut down when not in use. Plant to be parked/started at farthest point from relevant assessment locations (i.e. northern boundary);
- Operating plant in a conservative manner (no over-revving);
- Selection of the quietest suitable machinery available for each activity;
- Avoidance of noisy plant/machinery working simultaneously where practicable;
- Minimisation of metallic impact noise;
- All plant are to utilise a broadband reverse alarm in lieu of the traditional hi frequency type reverse alarm; and
- Undertake letter box drops to notify receivers of potential works.

Complaints Handling

The handling of complaints for the construction phase of the proposed development should be undertaken by the contractor/proponent as follows:

- Provide a readily accessible contact point, for example, through a 24 hour toll-free information and complaints line and give complaints a fair hearing;
- Have a documented complaints process, including an escalation procedure so that if a complainant is not satisfied there is a clear path to follow;
- Records of all community complaints will be maintained on an up-to-date complaints register. The records will include:
  - Date and time of the complaint;
  - The means by which the complaint was made (telephone, mail or email);
  - Any personal details of the complainant that were provided, or if no details are provided, a note to that effect;
  - The nature of the complaint;
  - Any actions taken by the site supervisor/construction contractor in relation to the complaint, including any follow up contact with the complainant and the timing for implementing action;
  - If no action was taken by site supervisor/construction contractor in relation to the complaint, the reason why no action was taken;
- Community complaints will be allocated to a responsible contractor's representative immediately to facilitate the implementation of corrective actions. The details of the complaint will also be circulated to the applicable construction personnel for action, where required.

Conclusion

The assessment has quantified noise intrusion to the proposed development from transportation noise, and emissions from the development to surrounding receivers.

With respect to road noise attenuation and to protect the internal acoustic amenity of the development, it is recommended that the glazing component for the project be reviewed to contain minimum specifications outlined in Section 7.1 of the Noise Assessment.

Noise emission from the project including patrons from the ground floor tenancies, rooftop mechanical plant is demonstrated to remain below relevant criteria for all assessed receivers. Notwithstanding, it is recommended that consideration be given to provide screens/louvres to the rooftop mechanic plant to reduce residual noise emissions to residential tenancies below.

Maximum noise emissions satisfy relevant criteria. Tenant noise from this area (in particular yelling) are close to trigger levels. Hence, management of tenants using this space, particularly during the night time is recommended.

Construction noise emissions are identified to satisfy noise management levels, although, to minimise impacts recommendations have been provided in Section 7.3 of the Noise Assessment for consideration.

Based on the findings of the Noise Assessment provided within **Appendix J**, it is recommended Council approve the development based on noise control assumptions/recommendations and referenced architectural plans provided in this report.

5.9 WIND

A Wind Assessment for the proposed development has been undertaken by ARUP and is included as **Appendix M** of this report.

The purpose of the Wind Assessment was to provide qualitative advice on the impact of the proposed development on pedestrian wind comfort and safety in and around the site. The findings of this assessment are summarised below.

Integrating the expected wind conditions with the wind climate for all wind directions, the wind conditions along Railway and Hunter Streets would be expected to be classified as suitable for pedestrian walking type activities hence meeting the intended use of the space. Wind conditions along the laneway around the small commercial building in the south-west corner of the site are expected to be classified as suitable for pedestrian standing type activities such as window shopping requiring additional amelioration such as permanent or temporary barriers to improve the local wind conditions when necessary.

As one of the uses of the podium roof is to redirect downwash before reaching ground level, it is considered that wind conditions at the majority of locations on the Level 4 rooftop terrace would be classified as suitable for pedestrian walking type activities, meeting the wind speed associated with the outdoor sitting classification for about 75% of the time. With the range of prevailing incident wind directions, the size of the terrace with localised sheltered areas with the pool deck and barbeque areas, there is likely a location with calmer conditions.

It is ARUP's opinion that all locations within the proposed development would meet the safety criterion but would be approaching the criterion along Railway Street caused by winds from all directions.

5.10 ACCESSIBILITY

An Access Report of the proposed development has been undertaken by Lindsay Perry Access and is included as **Appendix M** of this report.

The review assesses the proposed development against the Deemed to Satisfy provisions of the Building Code of Australia 2019 (BCA2019) with respect to accessibility, as well as the SEPP 65 Apartment Design Guide requirements.

The review concludes that the drawings presented for assessment, for the purposes of a development application, generally comply with current statutory requirements.

5.11 BCA MATTERS

An NCC Assessment Report of the proposed development has been undertaken by Credwell Consulting and is included as **Appendix N** of this report.

The report assesses the proposed development against the Deemed to Satisfy clauses of the Building Code of Australia 2019 (BCA2019).

The assessment identifies that the design of the proposed development complies, or is capable of complying, with the relevant requirements of BCA2019 subject to the following being addressed:

- Within the ground floor of the podium/tower building there are multiple building classifications (Class 2, 6, 7a and 7b). Under the requirements of Clause C2.8 these differing classes are to either be separated with intricate firewalls or the whole floor is to have 240min FRLs applied to all elements that require fire resistance which in this instance is considered unnecessary as the building will be sprinkler protected;
- It is noted that the southern external wall of the podium/tower building is within 6m of the northern external wall of the commercial building. As such, NCC Clause C3.2 will require that any openings in these walls are required to be protected by a method specified in NCC Clause C3.4 (i.e. drenchers, fixed fire rated glass or shutter). It has been found that there are multiple openings in the external wall of this building spanning from levels 2 and above where the above protection provisions would need to be applied;
- On the ground floor of the podium/tower building the following areas have provided with only a single exit which is technically non-compliant:
  - Retail tenancy on the corner of Tighe Street;
  - Food and Beverage tenancy on Hunter Street;
  - North residential lobby;
  - Loading dock (MRV Delivery);
  - Main switch room;
  - Fire Pump Room;

  Under the requirements of this Clause as the building is sprinkler protected all areas of the building must be provided with two (2) required exits;
- The carpark exits on each floor (other than Ground Level) are deemed horizontal exits by BCA definition, in lieu of the horizontal exits being in addition to the minimum requirement of two (2) exits from each floor when the building has an effective height of greater than 25m;
- Within the level 4 external communal area the exit travel distance from the eastern part of the pool deck is measured to be approximately 34m which is non-compliant. Under the requirements of Clause D1.4, the maximum distance from area of a Class 2 part not within a sole occupancy unit must not exceed 20m;
- It is noted that the building will be provided with two (2) sets of scissor stairs. As scissors are separated from each other at each level with fire rated construction they are technically deemed as two (2) differing required exits.

As the doorways leading to these stairs at each level are within 9m (approx. 5m measured) a technical non-compliance with this Clause has been triggered;

- Occupants evacuating via the southern fire isolated stair will discharge to a covered area of the ground floor walkway. As these occupants will pass within 6m of openings in the external wall of the podium/tower building, then these openings will require protection by a method prescribed in Clause C3.4;
- Within the ground floor of the podium/tower building the food and beverage/retail tenancy in the middle of the allotment has multiple inward swing exit doors which is non-compliant. As this tenancy has a floor area that exceeds 200m^2 this Clause requires that the doors swing outward;
- It is noted that the fire hydrant booster required to serve the building will be located with the external wall of the ground floor retail tenancy at the Tighe Street frontage. As the fire hydrant booster will not be within sight of the building main entrances on Hunter and Railway Streets a technical non-compliance with AS2419.1-2005 has been triggered; and
- As the podium/tower building has an effective height that exceeds 50m it must be provided with a fire control room. As one of the doors to the fire control room does not open to a "public place" but rather the northern lobby a technical non-compliance with Specification E1.8 has been triggered.

These matters will be addressed through performance solutions within a Fire Safety Engineering Report under separate cover at CC stage.

5.12 ENERGY EFFICIENCY AND SUSTAINABILITY

As noted in **Section 4** of this report, the proposed development has been designed in accordance with SEPP 65, the associated Apartment Design Guide, and BASIX requirements to reduce energy and water consumption. A BASIX Certificate is attached at **Appendix F** of this report.

The SEPP 65 Design Verification Statement attached at **Appendix E** of this report also provides details of how the development achieves the sustainability principle of the SEPP 65 Apartment Design Guide.

The proposed development is located within walking distance of the Wickham Interchange consistent with a raft of planning policies and best planning practices, and promoting Compact City planning principles.

The site planning and building design also maximise the benefits of passive solar design to the dwellings, exceeding the Apartment Design Guide minimum standards.

As detailed within the SEPP 65 Design Verification Statement and shown on the architectural plans provided, the solar analysis indicates 84.7% of units receive at least one (1) hour of sun between 9am and 3pm mid-winter, with 73.8% receiving minimum two (2) hours.

All living rooms open directly to balconies, which offer protection from direct sun to interiors in summer, 91.3% of units are dual aspect and cross ventilated, with the majority receiving access to harbour views.

All tower common lobbies are day-lit and naturally ventilated from two (2) sides.

5.13 UTILITIES

The site has access to appropriate utilities to support the proposed development, including water, sewer, gas, electricity and telecommunications.

5.14 SOCIAL & ECONOMIC IMPACT

The proposed development will provide a mixed-use development that will provide employment opportunities and increased housing within a suitable location within the Newcastle City Centre and in close proximity to services and amenities.

The following further addresses the key social and economic considerations of the proposed development:

- The proposal will generate local employment opportunity during the construction and operational phases of the development;
- The proposal will provide a commercial and retail premises that will provide additional employment opportunities and street level activation for the site;
- Increased residential dwellings in the City Centre will help to increase housing supply in the area, and contribute to the renewal of the City Centre;
- Increased population associated with new dwellings would help provide demand for services and facilities in the City Centre;
- Increased demand associated with the project would help strengthen and expand neighbouring retail developments;
- The development will allow residents to easily access surrounding social, retail, and leisure facilities;
- Additional supply of housing will help to achieve wider housing affordability in the City Centre;
- Increased population will help sustain public transport viability and potential expansion of the network over time;
- Quality urban design will improve the energy of the city and attract street usage and activation; and
- Proposed retail and commercial spaces provide additional opportunities for job creation and investment needed to sustain ongoing growth in the City Centre.

As discussed in **Section 4** of this report, the proposed development is consistent with the strategic planning documents relating to the site, including Local Strategic Planning Statement, Greater Newcastle Metropolitan Plan 2036 and Hunter Regional Plan 2036.

The proposed development is considered to provide a net social and economic benefit.

5.15 CRIME RISK MANAGEMENT

As addressed in the Section on Planning Controls this proposal has been considered relative to the principles of surveillance; access control; territorial reinforcement; and space management as documented in the publication "Crime prevention and the assessment of development applications" published by the Department of Urban & Transport Planning.

Surveillance

The proposed development will result in the redevelopment of the site and will result in a permanent physical presence with 237 residential units provided as well as a commercial and retail premises and therefore improved casual surveillance over the entire site and surrounding area.

The proposal incorporates:

- Clear sightlines between public and private spaces;
- No landscaping that allows opportunity for offenders to hide or entrap victims; and
- Improved casual surveillance opportunities.

The proposed development incorporating apartments, commercial and retail spaces, will result in a significant increase in the use of the subject site, creating increased opportunities for casual surveillance of the Hunter Street and Railway Street frontages.

The proposal incorporates a new pedestrian laneway which cuts the corner between Hunter and Railway Streets and will be framed by the dynamic shared work space on the street corner and activated at the groundplane by retail and residential lobbies. This area will be well lit and utilised also incorporating appropriate CCTV.

Access Control

Appropriate access control has been incorporated into the development. The main residential entry to the site is clearly denoted and provides a secure access with full height doors linked to intercom access at the street. Access to the residential floors will be via a controlled swipe tag / card for the lift at all times.

Entry to all apartments is from clearly defined routes and each apartment door is clearly visible to the common space.

Lighting to the common stair voids and to the building entries will animate the façade at night.

Territorial Reinforcement

The design ensures a clear distinction as to what areas of the site / building are public versus private.

Entry to all apartments is from clearly defined routes and each apartment door is clearly visible to the common space, and the abovementioned access control measures ensure that the general public are aware of what areas of the building are private (residential) vs public.

Space Management

The physical spaces have been designed such that they are able to be maintained so that the building appears to be well kept and therefore deter crime.

The apartments, commercial and retail spaces will provide excellent animation and passive surveillance of the street and extended public domain. The main entry to the northern tower is clearly identifiable and accessed directly from Railway St.

The southern tower main entry lobby is directly visible from both Hunter and Railway Streets through the wide, open pedestrian laneways.

Common internal circulation means either tower is securely accessed by either lobby, meaning all residential dwellings can be accessed either directly from the street, or from within the highly visible laneway.

Overall the proposed development will not introduce any specific elements likely to encourage crime.

5.16 WASTE MANAGEMENT

An Operational and Demolition Waste Management Plan has been prepared by Waste Audit and Consultancy Services and is attached at **Appendix S** of this report.

Waste reduction will be achieved in accordance with the following hierarchy:

- Priority 1: Avoid and reduce waste;
- Priority 2: Reuse waste;
- Priority 3: Recycle waste;
- Priority 4: Recover energy;
- Priority 5: Treat waste; and
- Priority 6: Dispose of waste.

The above hierarchy has been applied to both the proposed demolition and development works and the proposed use of the building and the following comments are made in relation to each of these:

Demolition & Building Works

The production of waste will be minimised through the purchasing of pre-fabricated materials with minimal packaging where possible, and identifying all waste products that can be re-used on site.

Waste disposal will be minimised and will only be implemented if there is no other alternative. In this case, the contractor will ensure the chosen waste disposal facility complies with regulatory requirements, and will implement the regular collection of bins.

These measures are not only good environmental practice, but also a cost effective practice.

In terms of demolition materials, all waste contractors will be required to detail all intended disposal facilities to ensure that legislative and safety requirements are met, the guiding principles of the waste hierarchy are upheld, and maximum diversion from landfill is achieved.

Records will be required to be maintained by all contractors and made available to Council so as to validate management pathways.

The potential for reuse of materials on site will depend on the quality of the materials once demolition proceeds.

Building Use

Based on the nature of the development, the following waste streams are expected:

- General waste;
- Commingled recycling; and
- Paper/cardboard recycling.

Other wastes may be generated, but these would be in small volumes and irregular in terms of when generated. The management of the site will conduct a waste assessment once the site is operational to determine the additional types and quantities of wastes that may be generated. Following this, appropriate management systems will be implemented and where necessary generators advised of these management requirements.

It is not expected that significant quantities of garden organics will be generated. The appointed gardener will be required to manage this material by disposal at a composting facility.

Storage & Collection

Based on calculations within the report, it is estimated that the following space is required for the storage of waste and recyclables for each aspect of the development:

- 38m^2 residential; and
- 16m^2 commercial.

The proposed development has made the following waste storage allocations:

- 40.83m^2 residential (+14.19m^2 for residential bulky waste); and
- 171.46m^2 commercial.

Waste and recycling collection services will be provided by a commercial waste contractor. Utilising a commercial waste contractor affords the development greater flexibility regarding collection schedules and the appropriate collection frequencies will be determined in consultation with the waste contractor once appointed – however once operational, collection schedules may need to be adjusted accordingly depending on actual waste generation.

The appointed contractor will service the bins directly from the waste holding areas located on the Ground Floor.

Items such as furniture/whitegoods stored within the bulky waste storage room will be managed by building management. Appropriate collection organisations will be called to collect the items for recycling/reuse as required.

Residents and commercial tenants will also be provided with ad hoc recycling systems such as e-waste; batteries etc. Systems for these streams will be located back-of-house or in common areas or be available upon request from building management.

In keeping with best practice sustainability programs, all waste areas and waste and recycling bins will be clearly differentiated through appropriate signage and colour coding to Australia Standards to reflect the materials contained.

All waste and recycling bins that are located in the waste storage areas will be colour coded and clearly signed. Each stream will be located in a designated area. This will assist in easy identification of correct bins.

6.0 Conclusion

This Statement of Environmental Effects and supporting documentation demonstrates that the proposed commercial premises and shop top housing development, comprising a five (5) level podium that provides for commercial spaces and car parking, with two (2) residential apartment towers above is an appropriate and suitable development on the subject site when tested against the relevant heads of consideration detailed within Section 4.15 of the *Environmental Planning & Assessment Act 1979*.

The proposed development is permissible within the B3 Commercial Core Zone, with the consent of Council, and is consistent with the objectives of the zone and relevant development standards, providing a high quality, integrated high density residential, retail and commercial development within a city central location.

The proposed development is consistent with policy to encourage closer settlement and the resulting benefits, including having regard with the principles of ESD.

The design has been developed in consultation with Council's Urban Design Review panel, appointed by the Government architect's office as the design excellence panel for the scheme, and is considered a response to the scale and character of the site.

The former use of the site as the Dairy Farmer's Co-operative Milk Company has provided an important inspiration in developing the design. As a way of respecting the former complex of buildings and remaining heritage item, the stepped towers will create a transition in scale and density and embrace the remaining heritage item as an integrated element.

The site exhibits few constraints to development, and any identified constraints can be appropriately managed, representing an ideal opportunity for the proposed infill development to positively contribute to the gentrification of the locality. The position of the site is ideal to take full advantage of the transport, shopping, public places, and civic open spaces available in central Newcastle.

The overall design promotes a pleasant and private living environment, attractive and appropriately located retail and commercial spaces, good surveillance to the street, maximises access to daylight and solar access, and natural ventilation for each dwelling, delivers superior landscaping, provides both private and communal open space areas, and adequate parking.

Particular design attention has been given to the presentation of the development within the streetscape, building bulk, and street and building elevations, to provide an aesthetically pleasing streetscape that improves the amenity of the site and locality whilst responding to the established character of the area.

This statement has illustrated that the proposal will satisfy both statutory and merit-based planning considerations and that the proposal will make a positive contribution to the site and surrounding area. It is considered that there is no matter which should preclude the approval of the proposed development.

Appendix A

CERTIFICATE OF TITLE AND DEPOSITED PLAN

NEW SOUTH WALES LAND REGISTRY SERVICES - TITLE SEARCH

FOLIO: 1/342675

SEARCH DATE	TIME	EDITION NO	DATE
12/10/2021	11:12 AM	13	23/11/2020

LAND

LOT 1 IN DEPOSITED PLAN 342675
AT WICKHAM
LOCAL GOVERNMENT AREA NEWCASTLE
PARISH OF NEWCASTLE COUNTY OF NORTHUMBERLAND
TITLE DIAGRAM DP342675

FIRST SCHEDULE

MCCLOY NEWCASTLE WEST PTY LIMITED (T AP94672)

SECOND SCHEDULE (4 NOTIFICATIONS)

1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
2 3077496 EASEMENT FOR UNDERGROUND ELECTRICITY CABLES & ACCESS AFFECTING THE PART SHOWN DESIGNATED (B) IN DP267291
3 AQ502865 LEASE TO MANNING VALLEY MOTOR HOLDING PTY LTD OF TENANCY 1, 924 HUNTER STREET AND 4 TIGHE STREET, NEWCASTLE WEST. EXPIRES: 15/5/2024.
* 4 AQ779633 CAVEAT BY THIRDI DAIRY FARMERS PTY LTD

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

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NEW SOUTH WALES LAND REGISTRY SERVICES - TITLE SEARCH

FOLIO: 1/395367

SEARCH DATE	TIME	EDITION NO	DATE
12/10/2021	11:12 AM	9	23/11/2020

LAND

LOT 1 IN DEPOSITED PLAN 395367
AT WICKHAM
LOCAL GOVERNMENT AREA NEWCASTLE
PARISH OF NEWCASTLE COUNTY OF NORTHUMBERLAND
TITLE DIAGRAM DP395367

FIRST SCHEDULE

MCCLOY NEWCASTLE WEST PTY LIMITED (T AP94672)

SECOND SCHEDULE (3 NOTIFICATIONS)

1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
2 AQ502865 LEASE TO MANNING VALLEY MOTOR HOLDING PTY LTD OF TENANCY 1, 924 HUNTER STREET AND 4 TIGHE STREET, NEWCASTLE WEST. EXPIRES: 15/5/2024.
* 3 AQ779633 CAVEAT BY THIRDI DAIRY FARMERS PTY LTD

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

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NEW SOUTH WALES LAND REGISTRY SERVICES - TITLE SEARCH

FOLIO: AUTO CONSOL 8377-233

SEARCH DATE	TIME	EDITION NO	DATE
12/10/2021	11:12 AM	9	23/11/2020

LAND

LAND DESCRIBED IN SCHEDULE OF PARCELS
LOCAL GOVERNMENT AREA NEWCASTLE
PARISH OF NEWCASTLE COUNTY OF NORTHUMBERLAND
TITLE DIAGRAM SEE SCHEDULE OF PARCELS

FIRST SCHEDULE

MCCLOY NEWCASTLE WEST PTY LIMITED (T AP94672)

SECOND SCHEDULE (4 NOTIFICATIONS)

1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
2 AQ502866 LEASE TO AIR LOCKER TRAINING NEWCASTLE PTY LTD OF TENANCY 2, 924 HUNTER STREET, NEWCASTLE WEST. EXPIRES: 21/5/2024.
3 AQ502867 LEASE TO BARRE EFFECT PTY LTD OF TENANCY 3, EASTERN SHOWROOM, 924 HUNTER STREET NEWCASTLE WEST. EXPIRES: 21/5/2024.
* 4 AQ779633 CAVEAT BY THIRDI DAIRY FARMERS PTY LTD

NOTATIONS

NOTE: DISPOSAL OF ANY LOTS IN DP456088 MAY REQUIRE REGISTRATION OF A DEPOSITED PLAN OF SURVEY PURSUANT TO SECTION 114 OF THE REAL PROPERTY ACT, 1900

UNREGISTERED DEALINGS: NIL

SCHEDULE OF PARCELS	TITLE DIAGRAM
LOT 2 IN DP126	DP126
LOT 1 IN DP456088	DP456088.

*** END OF SEARCH ***

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NEW SOUTH WALES LAND REGISTRY SERVICES - TITLE SEARCH

FOLIO: AUTO CONSOL 7174-135

SEARCH DATE	TIME	EDITION NO	DATE
12/10/2021	11:12 AM	6	23/11/2020

LAND

LAND DESCRIBED IN SCHEDULE OF PARCELS
AT NEWCASTLEWEST
LOCAL GOVERNMENT AREA NEWCASTLE
PARISH OF NEWCASTLE COUNTY OF NORTHUMBERLAND
TITLE DIAGRAM DP1091173

FIRST SCHEDULE

MCCLOY NEWCASTLE WEST PTY LIMITED (T AP94672)

SECOND SCHEDULE (6 NOTIFICATIONS)

1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
2 3077496 EASEMENT FOR UNDERGROUND CABLES OF ELECTRICITY AND ACCESS AFFECTING THE PART SHOWN DESIGNATED (A) IN DP267291
3 AQ502865 LEASE TO MANNING VALLEY MOTOR HOLDING PTY LTD OF TENANCY 1, 924 HUNTER STREET AND 4 TIGHE STREET, NEWCASTLE WEST. EXPIRES: 15/5/2024.
4 AQ502866 LEASE TO AIR LOCKER TRAINING NEWCASTLE PTY LTD OF TENANCY 2, 924 HUNTER STREET, NEWCASTLE WEST. EXPIRES: 21/5/2024.
5 AQ502867 LEASE TO BARRE EFFECT PTY LTD OF TENANCY 3, EASTERN SHOWROOM, 924 HUNTER STREET NEWCASTLE WEST. EXPIRES: 21/5/2024.
* 6 AQ779633 CAVEAT BY THIRDI DAIRY FARMERS PTY LTD

NOTATIONS

UNREGISTERED DEALINGS: NIL

SCHEDULE OF PARCELS

LOTS 1-2 IN DP1091173.

*** END OF SEARCH ***

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NEW SOUTH WALES LAND REGISTRY SERVICES - TITLE SEARCH

FOLIO: AUTO CONSOL 8377-233

SEARCH DATE	TIME	EDITION NO	DATE
12/10/2021	11:12 AM	9	23/11/2020

LAND

LAND DESCRIBED IN SCHEDULE OF PARCELS
LOCAL GOVERNMENT AREA NEWCASTLE
PARISH OF NEWCASTLE COUNTY OF NORTHUMBERLAND
TITLE DIAGRAM SEE SCHEDULE OF PARCELS

FIRST SCHEDULE

MCCLOY NEWCASTLE WEST PTY LIMITED (T AP94672)

SECOND SCHEDULE (4 NOTIFICATIONS)

1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
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NOTATIONS

NOTE: DISPOSAL OF ANY LOTS IN DP456088 MAY REQUIRE REGISTRATION OF A DEPOSITED PLAN OF SURVEY PURSUANT TO SECTION 114 OF THE REAL PROPERTY ACT, 1900

UNREGISTERED DEALINGS: NIL

SCHEDULE OF PARCELS	TITLE DIAGRAM
LOT 2 IN DP126	DP126
LOT 1 IN DP456088	DP456088.

*** END OF SEARCH ***

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NEW SOUTH WALES LAND REGISTRY SERVICES - TITLE SEARCH

FOLIO: 2/445736

SEARCH DATE	TIME	EDITION NO	DATE
12/10/2021	11:12 AM	13	23/11/2020

LAND

LOT 2 IN DEPOSITED PLAN 445736
AT WICKHAM
LOCAL GOVERNMENT AREA NEWCASTLE
PARISH OF NEWCASTLE COUNTY OF NORTHUMBERLAND
TITLE DIAGRAM DP445736

FIRST SCHEDULE

MCCLOY NEWCASTLE WEST PTY LIMITED (T AP94672)

SECOND SCHEDULE (4 NOTIFICATIONS)

1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
2 3077496 EASEMENT FOR UNDERGROUND ELECTRICITY CABLES & ACCESS AFFECTING THE PART SHOWN DESIGNATED (C) IN DP267291
3 AQ502865 LEASE TO MANNING VALLEY MOTOR HOLDING PTY LTD OF TENANCY 1, 924 HUNTER STREET AND 4 TIGHE STREET, NEWCASTLE WEST. EXPIRES: 15/5/2024.
* 4 AQ779633 CAVEAT BY THIRDI DAIRY FARMERS PTY LTD

NOTATIONS

UNREGISTERED DEALINGS: NIL

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NEW SOUTH WALES LAND REGISTRY SERVICES - TITLE SEARCH

FOLIO: AUTO CONSOL 7174-135

SEARCH DATE	TIME	EDITION NO	DATE
12/10/2021	11:12 AM	6	23/11/2020

LAND

LAND DESCRIBED IN SCHEDULE OF PARCELS
AT NEWCASTLEWEST
LOCAL GOVERNMENT AREA NEWCASTLE
PARISH OF NEWCASTLE COUNTY OF NORTHUMBERLAND
TITLE DIAGRAM DP1091173

FIRST SCHEDULE

MCCLOY NEWCASTLE WEST PTY LIMITED (T AP94672)

SECOND SCHEDULE (6 NOTIFICATIONS)

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5 AQ502867 LEASE TO BARRE EFFECT PTY LTD OF TENANCY 3, EASTERN SHOWROOM, 924 HUNTER STREET NEWCASTLE WEST. EXPIRES: 21/5/2024.
* 6 AQ779633 CAVEAT BY THIRDI DAIRY FARMERS PTY LTD

NOTATIONS

UNREGISTERED DEALINGS: NIL

SCHEDULE OF PARCELS

LOTS 1-2 IN DP1091173.

*** END OF SEARCH ***

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CONVERSION TABLE ADDED IN REGISTRAR GENERAL'S DEPARTMENT

DP 126

FEET	INCHES	METRES
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29	10	9.095
30	-	9.145
30	1	9.17
30	2	9.195
33	-	10.06
80	2	24.435
87	6	26.67
87	9	26.745
87	11	26.795
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89	2	27.18
89	3	27.205
89	7	27.305
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90	1	27.455
90	3	27.51
90	6	27.585
90	9	27.66
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91	3	27.815
91	9	27.965

AC	RD	P	SQ M
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-	-	9 1/2	240.3
-	-	18	455.3
-	-	18 1/2	467.9
-	-	28	708.2
-	-	36 1/2	923.2
-	1	7	1189

DP 126

PLAN OF 24 ALLOTMENTS IN THE CITY OF at Wickham Pa NEWCASTLE. Co Northumberland

Scale 1 chain to 2 inches

Being Lots 197 198 & 199 Suburban allotments as per Government plans of Newcastle, and now belonging to Clarence H. Tannell.

GREAT NORTHERN RAILWAY

COPY MADE L. & P. 18.9.94
EXAMINED J. L. M. 16.10.94

DP 126

C922328 [redacted]
~~C707453~~

F.P. 342675

City of Greater Newcastle

PLAN

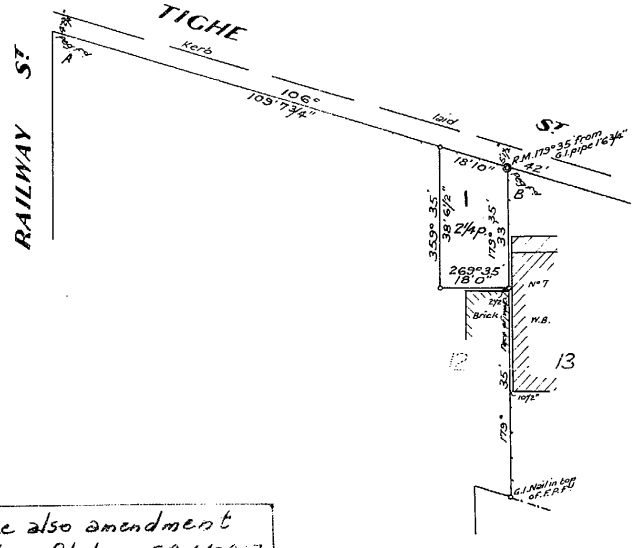
of part of Lot 12.D.P.126.

Parish of Newcastle County of Northumberland

Scale 30 feet to an inch.

C922328

M P S (R.P.)
42675



See also amendment plan filed as F.P. 440917

[illegible]
[illegible] ACT 1919
[illegible] OF LAND
[illegible] 27 7 38
Certificate No 63 29 7 38

Subscribed and declared before me at Newcastle this 11th day of July 1938.

[signature]

I, Reginald Frederick Bruyn, of Newcastle, a surveyor registered under the Surveyors Act, 1929, do hereby solemnly and sincerely declare, (a) that all boundaries and measurements shown on this plan are correct, (b) that all survey marks found and relevant physical objects on or adjacent to the boundaries are correctly represented, (c) that all physical objects indicated actually exist in the positions shown, (d) that the whole of the material facts in relation to the land are correctly represented, (e) that the survey represented in this plan has been made in accordance with the Survey Practice Regulations, 1933, by me, was completed on 11th July. 1938. and the reference mark has been placed as shown hereon. And I make this solemn declaration conscientiously believing the same to be true, and by virtue of the provisions of the Oaths Act, 1900

R. F. Bruyn.

Surveyor registered under the Surveyors Act, 1929.

Datum line of Azimuth. A-B.

LOT No. ADDED IN L.T.O. 20.3.1990.
This is the plan marked "A" referred to in [illegible]
[illegible]
Dated 8th August 1938.

CONVERSION TABLE ADDED IN DEPARTMENT OF LANDS

DP 342675

FEET	INCHES	METRES
-	2 1/2	0.064
-	10 1/2	0.267
1	6 3/4	0.476
4	2 3/4	1.289
5	1 1/2	1.562
18	-	5.486
18	10	5.740
33	-	10.058
38	6 1/2	11.748
109	7 3/4	33.420

AC	RD	P	SQ M
-	-	2 1/4	56.9

AMENDMENTS AND/OR ADDITIONS MADE ON PLAN IN THE LAND TITLES OFFICE

	10	20	30	40	50	60	70 Table of mm	110	120	130	140

This negative is a photograph made as a permanent record of a document in the custody of the Registrar General this day. 22nd March, 1990

Req:R693108 /Doc:DP 0342675 P /Rev:03-Nov-1992 /NSW LRS /Pgs:ALL /Prt:12-Oct-2021 11:15 /Seq:1 of 1
© Office of the Registrar-General /Src:INFOTRACK /Ref:240189

NEGATIVE FILM No.

G462499

B

G 462499

Plan Form No6 (for transfers, leases, etc.)

Municipality of
Shire of
City of Newcastle

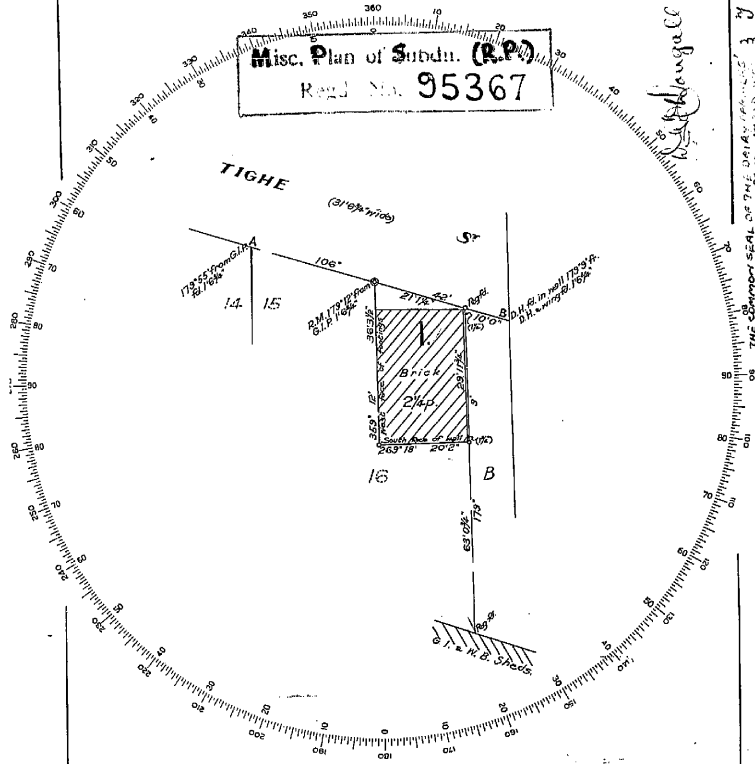
M.M. Areas under one acre are stated in this plan [illegible] PLAN [illegible]

# of part of Lot 16, D.P.126
Parish of Newcastle County of Northumberland

Scale 20 feet to an inch.

F.P. 395367

Misc. Plan of Subdn. (R.P.)
Regd No. 95367


TIGHE
(31'6"p.m.nicol)
S.P.
106°
21.18
42'
Brick
2½p
16
B
1
15
14
263°18'
20.2
63°04'
179'
Iron Peg
Iron Peg
Iron Peg

Req:R693107 /Doc:DP 0445736 P /Rev:31-Dec-1992 /NSW LRS /Pgs:ALL /Prt:12-Oct-2021 11:15 /Seq:1 of 1
© Office of the Registrar-General /Src:INFOTRACK /Ref:240189

Datum line of Adamuth A.B.

Surveyor registered under the Surveyors Act, 1929.

I, Reginald Frederick Brown, of Newcastle, a surveyor registered under the Surveyors Act, 1929, do hereby solemnly and sincerely declare, (a) that all boundaries and measurements shown on this plan are correct, (b) that all survey marks found and relevant physical objects on or adjacent to the boundaries are correctly figured, (c) that all physical objects indicated actually exist in the positions shown, (d) that the whole of the material facts in relation to the land are correctly represented, (e) that the survey represented in this plan has been made in accordance with the Survey Practice Regulations, 1933, by me, was completed on 17th July, 1933, and the reference marks have been placed as shown thereon, and finally the survey operations contemplated by carrying the same to be true, and by virtue of the provisions of the Oaths Act, 1900.

R.F. Brown.

Subscribed and declared before me at Newcastle this 28th day of July, 1933.

A.A. Jones J.P.

CONVERSION TABLE ADDED IN DEPARTMENT OF LANDS

DP 445736 CONTINUED

FEET	INCHES		METRES
270	7	7/8	82.496
270	8	1/4	82.506
330	-		100.584
490	-		149.352
535	9		163.297

AC	RD	P	SQ M
-	29	3/4	752.5
-	1	36	1922

CONVERSION TABLE ADDED IN DEPARTMENT OF LANDS

DP 445736

FEET	INCHES		METRES
-	0	1/4	0.006
-	0	1/2	0.013
-	0	3/4	0.019
-	0	7/8	0.022
-	1		0.025
-	2		0.051
-	2	1/2	0.064
-	2	7/8	0.073
-	3		0.076
-	3	3/4	0.095
-	7	1/2	0.191
-	7	3/4	0.197
-	8		0.203
-	10	1/2	0.267
-	14	6	0.457
1	4	2	3/4	1.289
1	5	4	3/4	1.645
1	5	5	3/4	1.670
1	5	6	1/4	1.676
1	5	7	1/4	1.708
1	5	11		1.803
1	6	-		1.829
2	6	7	1/2	2.019
2	6	7	3/4	2.026
2	6	8	1/8	2.899
2	6	9	1/4	2.902
2	6	11	3/8	3.337
2	7	8	1/4	4.172
2	7	8	3/4	4.185
2	7	9		4.191
2	7	10		5.740
2	7	-		6.706
2	7	8	1/4	9.023
2	7	8		9.042
2	7	8	3/4	9.061
3	0	1		9.169
3	0	1	3/4	9.188
3	0	2		9.195
3	0	4	1/2	9.258
3	0	8	1/4	9.354
3	0	10	1/4	9.404
3	1	4	1/2	9.563
3	1	5	3/4	9.595
3	1	6	3/4	9.620
3	1	11		9.728
3	2	1	3/4	9.798
3	3	-		10.058
3	3	1	1/4	10.090
3	3	7	1/4	10.243
3	3	9		10.287
3	3	9	3/4	10.763
3	3	7	1/8	10.766
3	6	1	1/2	11.748
3	6	-		16.764
3	6	7		17.526
3	6	2	3/4	18.339
3	6	5		25.425
3	6	9		25.527
3	9			20.955
3	9	3	1/4	19.895
3	7	0	1/4	19.818
3	7	3	3/4	19.399
3	9	7	1/4	27.667
3	10	1	1/4	27.997
3	3	1	1/4	28.124
3	3	1	1/2	28.131
3	3	3	3/4	28.137
3	7	1	1/2	28.232
3	7	3	3/4	28.238
3	7	7	3/4	33.420
3	9	1	1/2	37.122
3	7	1	1/4	41.027
3	1			53.975
3	8	1	1/4	70.314
3	8	1	1/2	72.454
3	8	3	1/4	72.460

Clay of Greater Newcastle.

C922329 ~~S69316~~

PLAN FP445736

~~S62191~~

showing re-survey for amendment of C.T.

Vol. 189, fol. 218, Vol. 3490, fol. 79, Vol. 189, fol. 216, Vol. 2480, fol. 69, Vol. 662, fol. 61 & Vol. 3708, fol. 27

at Wickham.

Parish of Newcastle County of Northumberland

Scale 30 feet to an inch

Diagram

(Aligned 139°, 55', 139°)

HUNTER

RAILWAY

TIGHE

NORTHERN

GREAT

COOPER ST.

STUMP ST.

(Aligned 5°, 6', 22', 5°)

(Aligned 139°, 55', 139°)

Mrs C. Leonard Owner

Mrs D. Brownjohn Owner

Mrs Tolhurst Owner

Mrs C. Parker Owner

C.T. Vol. 3490 fo. 79

C.T. Vol. 189 fo. 216

C.T. Vol. 2480 fo. 69

C.T. Vol. 3708, fo. 27 & Vol. 662 fo. 61

C.T. Vol. 189, fo. 218

Brick 2 Storey

Brick cottage

Brick

Weatherboard

Iron

Gl.

W.B.

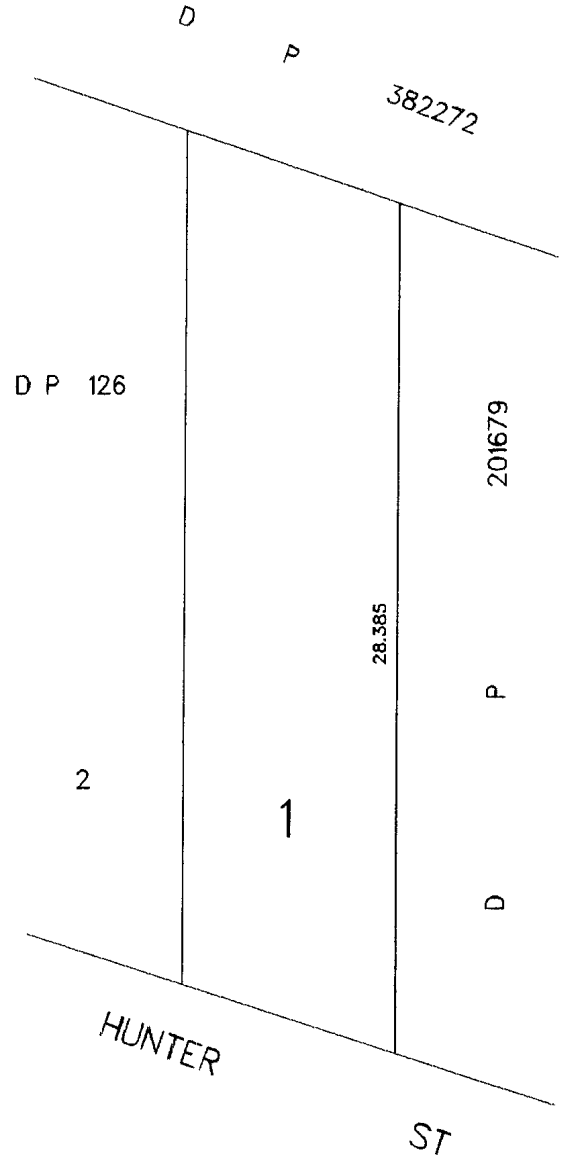
Br.

Ir.

AMENDMENTS AND/OR ADDITIONS NOTED ON PLAN IN REGISTRAR GENERAL'S OFFICE.

I, Bruce Richard Davies, Registrar General for New South Wales, certify that this negative is a photograph made as a permanent record of a

Full dimensions and/or area(s) are not available for all lots. Any division of the lands herein may necessitate the lodgement of a plan of survey



D P 456088

Registered: 2-9-1997

Title System: TORRENS

Purpose: DEPARTMENTAL

Ref. Map: U6350-34

Last Plan: DP126

THIS PLAN HAS BEEN CREATED TO PROVIDE UNIQUE IDENTIFIER(S) TO ENABLE THE ISSUE OF AN AUTO-CONSOL TITLE FOR THE LAND COMPRISED IN FOLIO OF THE REGISTER
VOLUME 8377 FOLIO 233

Lengths are in metres.
Reduction Ratio : NOT TO SCALE

L.G.A.: NEWCASTLE

LOCALITY: ,

PARISH: NEWCASTLE

COUNTY: NORTHUMBERLAND

LOTS	PRIOR IDENTITY
1	PT LOT 1 IN DP126

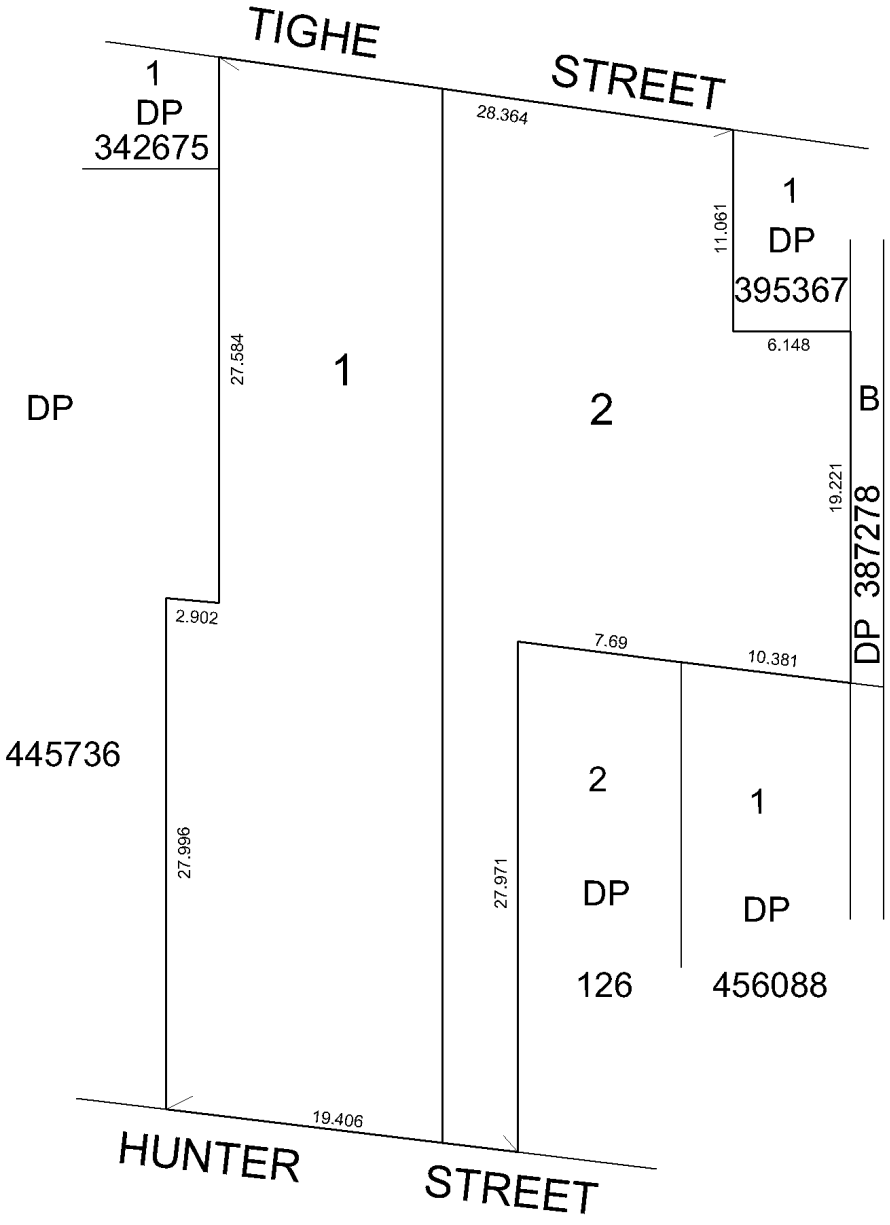
N O O 1 D 1 B

D.C.D.B.

Req:R693111 /Doc:DP 0456088 P /Rev:15-Sep-1997 /NSW LRS /Pgs:ALL /Prt:12-Oct-2021 11:15 /Seq:1 of 1
© Office of the Registrar-General /Src:INFOTRACK /Ref:240189

e-departmental

Full dimensions and/or area(s) are not available for all lots. Any division of the lands herein may necessitate the lodgement of a plan of survey.



TOTAL AREA FOR LOTS 1 & 2: 1397 m²

DP 1091173

Registered : 22.11.2005

Title System : TORRENS

Purpose : DEPARTMENTAL

Ref. Map : U6350-34

Last Plan : DP126

PLAN OF PART OF PORS 198 & 199

COMPRISED IN VOL. 7174 FOL. 135

Lengths are in metres. Reduction Ratio - NTS
LPI Ref. : TCB 37/38

Sheet 1 of 1 sheet

L.G.A. : NEWCASTLE

LOCALITY : NEWCASTLE WEST

PARISH : NEWCASTLE

COUNTY : CUMBERLAND

LOT	PRIOR IDENTITY
1	PT POR. 198
2	PT POR. 199

THIS PLAN HAS BEEN PREPARED TO PROVIDE AN UNIQUE IDENTITY FOR THE LAND IN THE CERTIFICATE OF TITLE REFERRED TO ABOVE.

IT IS NOT A CURRENT PLAN IN THE TERMS OF 7A OF THE CONVEYANCING ACT, 1919.

Req:R693109 /Doc:DP 1091173 P /Rev:01-Dec-2005 /NSW LRS /Pgs:ALL /Prt:12-Oct-2021 11:15 /Seq:1 of 1
© Office of the Registrar-General /Src:INFOTRACK /Ref:240189

Appendix B

DETAIL SURVEY PLAN (POSITIVE SURVEY SOLUTIONS)

51 GEORGETOWN ROAD
GEORGETOWN, NSW 2298
TEL: 61 2 4960 1111

BRETT WHITE
REGISTERED SURVEYOR
brett@psurveys.com.au
Mobile: 0425 288 179

NEWCASTLE OFFICE

PROJECT MANAGEMENT

SURVEYING

Photograph 3

Photograph 4

Photograph 5

Photograph 6

Photograph 7

Photograph 8

Photograph 9

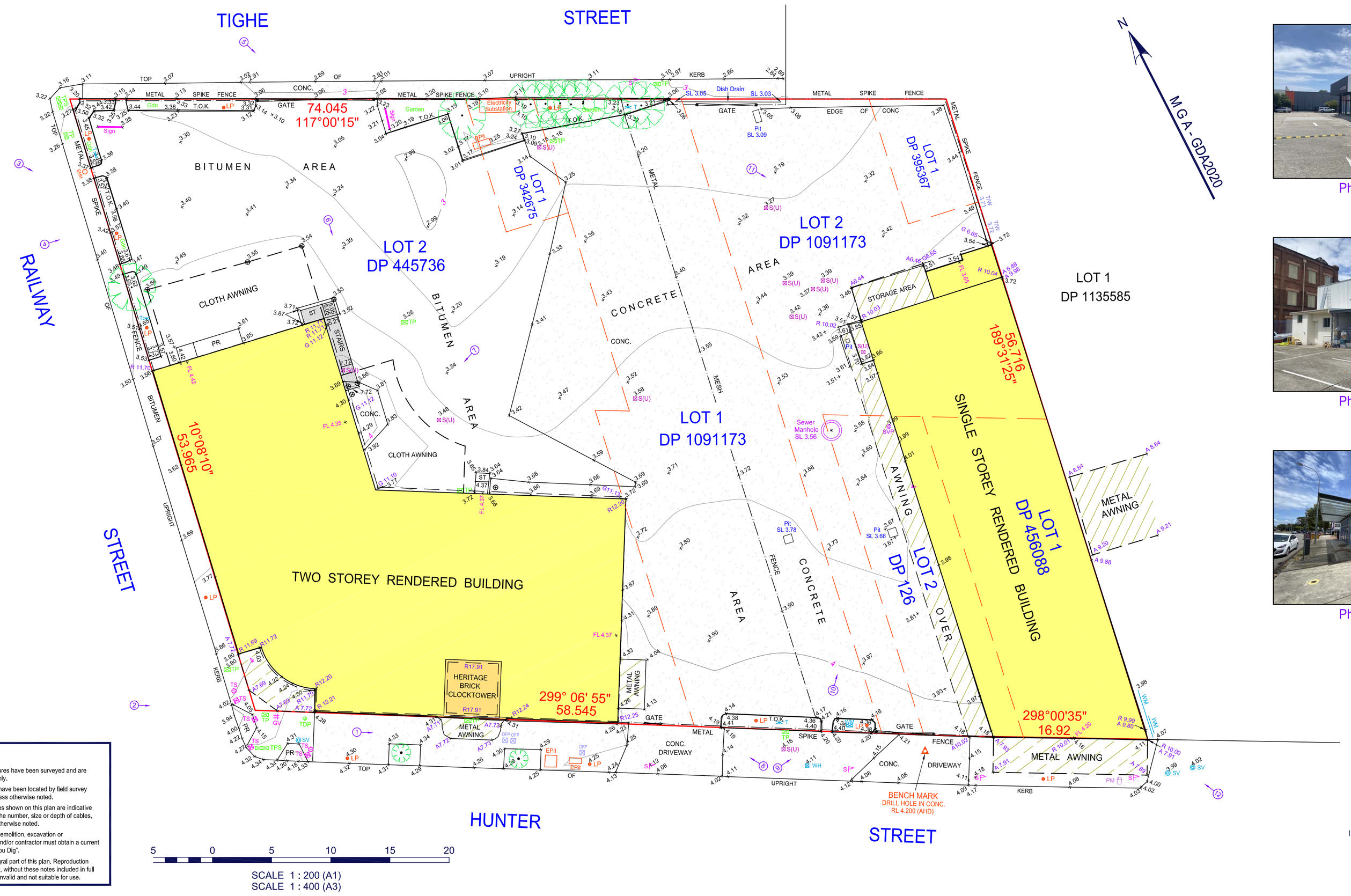
Photograph 2

Photograph 10

Photograph 1

Photograph 11

Photograph 12



LEGEND

- CONTOUR (Major)
- FENCING
- BOUNDARY
- BOUNDARY (INTERNAL)
- S(U) - SERVICE (UNKNOWN TYPE)
- EPit - ELECTRICITY PIT
- EMH - ELECTRICITY MANHOLE
- LP - LIGHT POLE
- SVP - SEWER VENT PIPE
- GV - GAS VALVE BOX
- S - STREET SIGN
- TS - TRAFFIC SIGNAL
- OFP - OPTICAL FIBRE PIT
- PM - PARKING METER
- TDP - TELSTRA DISTRIBUTION PILLAR
- TP - TELSTRA PIT
- TPS - TWIN TELSTRA PITS
- APPROXIMATE PHOTO LOCATION & DIRECTION
- A6,85 - AWNING LEVEL
- G7,53 - GUTTER LEVEL
- R7,47 - ROOF / ROOF RIDGE LEVEL
- FL 4,54 - FLOOR LEVEL
- PR - PRAM RAMP
- T/W - TOP OF WALL
- P - SUPPORT POST
- WM - WATER METER
- WH - WATER HYDRANT
- T - WATER TAP
- SV - WATER STOP VALVE
- TREE

NOTES :

1. The cadastre shown on this plan has been located to a standard of accuracy in accordance with Regulation 10 of the Surveying and Spatial Information Regulation 2017. The boundaries have not been marked by this survey.
2. Datum shown in the title block denotes the date of information sourced from SCIMS.
3. This plan displays information suitable for detailed planning and design at the scales stated only. The plan may not be used for any other purpose or at any scales other than those stated.
4. Spot levels and contours shown hereon are for design purposes only and may require confirmation prior to any excavation or construction. Contours have been derived from the spot levels shown and as such are indicative only.
5. Only visible surface features have been surveyed and are shown to scale accuracy only.
6. Services shown hereon have been located by field survey of visible features only, unless otherwise noted.
7. Any underground services shown on this plan are indicative only and do not represent the number, size or depth of cables, pipes or conduits, unless otherwise noted.
8. Prior to and during any demolition, excavation or construction the designer and/or contractor must obtain a current search from "Dial Before You Dig".
9. These notes are an integral part of this plan. Reproduction of this plan, or any part of it, without these notes included in full will render the information invalid and not suitable for use.

www.dialbeforeyoudig.au
DIAL 1100 BEFORE YOU DIG

TITLE: PLAN SHOWING DETAIL & LEVELS OVER LOT 2 DP 445736, LOT 1 DP 342675, LOTS 1 & 2 DP 1091173, LOT 1 DP 395367, LOT 2 DP 126 AND LOT 1 DP 456088

LOCATION: Nº 924 HUNTER STREET, NEWCASTLE

CLIENT: LJM Architecture Pty Ltd - c/o Luke Mahaffey

POSITIVE SURVEY SOLUTIONS

Amendment	Description	Date
A	INITIAL ISSUE	9.3.2021
B		
C		
D		

SCALE: 1 : 200 (A1) 1 : 400 (A3)
DATE: 9.3.2021
DATUM: GDA2020 / AHD
ORIGIN: PM 9888 - RL 3.868
CONTOUR INTERVAL: 0.25 m
SURVEYOR: BM DRAWN: SD

JOB No: 21194

SHEET 1 OF 1

DRAWING REF: 21194_DET_A.dwg
REVISION: A

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Appendix C

ARCHITECTURAL PLAN (CKDS ARCHITECTURE)

Dairy Farmers Corner

924 Hunter Street, Newcastle West, NSW, 2302

Location Map

Drawing List

A-00 Preliminary

A-0001	Cover Sheet
A-0002	Site History
A-0003	Site Context
A-0004	Street Character & Key Planning Controls
A-0005	Existing Site Conditions
A-0006	Residential Amenity Analysis
A-0007	Concept Development
A-0008	Concept Development

A-10 Site Plans

A-1001	Site Plan

A-11 General Arrangement Plans

A-1101	Ground Floor Plan
A-1102	Upper Ground Floor Plan
A-1103	Level 1
A-1104	Level 2
A-1105	Level 3
A-1106	Level 4
A-1107	Tower Level 5
A-1108	Tower Levels 6 - 14
A-1109	Tower Levels 15 - 21
A-1110	Tower Levels 22 - 24
A-1111	Tower Levels 25 - 26
A-1112	Tower Levels 27 - 29

A-12 Unit Plans

A-1201	Unit Type A - E
A-1202	Unit Type F - K

A-2 Elevations

A-2001	North Elevation
A-2002	South Elevation
A-2003	East Elevation
A-2004	West Elevation

A-3 Sections

A-3001	Section A
A-3002	Section B
A-3003	Section C
A-3004	Section D
A-3005	Laneway Sections

A-4 Shadow Diagrams

A-4001	Shadow Diagrams

A-5 Materiality

A-5001	Podium Materiality
A-5002	Tower Materiality

A-7 Schedules

A-7001	Yield Schedule
A-7002	GFA Calculations
A-7003	GFA Calculations
A-7004	ADG Solar & Cross Ventilation
A-7005	ADG Storage
A-7006	ADG Storage

A-8 Visualisation

A-8001	Perspective Views
A-8002	Long View Study

BASIX Specification

Suite 9.02, Level 9, 213 Castlereagh St
Sydney NSW 2000

CREDWELL

BASIX Certificate Summary

ASSESSOR DETAILS	
Name:	Parfrey Hardy
Direct Number:	0498 051 399
Email:	PARFREY@CREDWELL.COM.AU
CAN:	4003
Assessor Number:	103026
Project Name:	521134
Software:	BERSPro – v4.3.0.1
Date:	21/10/2021
Basix Certificate Number:	1235678
NatHERS Certificate Number:	0006669340
Client Name:	Dairy Farmers
Client Email:	-
Client Email:	-

Non-Conformances

Building complience is required to comply with the 'New South Wales Addition' to the NCC 2019: Volume 1.

- Building thermal construction in accordance with part 13.2
  - If metal, framed ceiling of R2.1 is required to roof and cladding as a thermal break
  - Loss of ceiling insulation is compensated for by increased roof insulation in accordance with Part J1.3(c)
  - Any roof lights, windows, doors and exhaust fans are sealed in accordance with Part J3
  - Any new air conditioning system is installed in accordance with Parts J5 (Sub J5-2(b), J5-2(c), J5-2(d), J5-2(f) & J5-2(g))
  - Any new mechanical ventilation system is installed in accordance with Part J5.3
  - Any new miscellaneous exhaust system is installed in accordance with Part J5.4.
  - Any new heated hot water system is installed in accordance with Part J7.2
  - Any new energy monitoring equipment is installed in accordance with Part J8.3.

Notes included in NatHERS / BERSPro certificate

- Medium coloured external walls
- Walls to common areas modelled as external with zero solar absorptance
- All ensuites are treated as conditioned
- Spaces without an openable window / door are included in the zone which they are accessed
- No mechanical heating or cooling appliances are modelled, including ceiling fans

Notes not included in NatHERS / BERSPro certificate (not shown/modelled)

- Models rated with no downlights
- Light coloured roof for temperate or cool climates
- Kitchens / wet areas tiled
- All other internal areas carpet
- Sealed vents to wet areas / laundry / kitchen
- Single story dwellings within 20m modelled as obstruction
- Double story dwellings within 20m modelled as obstruction
- Structures located at South are not modelled as obstruction

BASIX Certificate Commitments:

Water	Part I BASIX
Rainwater Tank:	Minimum 5,000L
Connected to:	Landscape
Water Taps:	5 star taps
Showerheads:	3 star (> 4.5 but ≤ 6 L/min)
Toilet Flusher:	4 star

Thermal Comfort	Part I	
Location	Element	Insulation / Tune
North Tower and South Tower	External Walls	R2.5
	Internal Walls	R2.5
	Floor	R2.5
	Ceiling to roof	R4.0
	Ceiling fans	N/A
	Roof	N/A
North Tower Plan Type A, D, & F, South Tower Plan Type C, G, H, I, J, K	Glazing	Uvalue 4.3, SHGC 0.53 - DG
		Uvalue 4.3, SHGC 0.47 - DG
North Tower Plan Type C, G units 2702,2802, South Plan Type: E,		Uvalue 6.1, SHGC 0.52-DG Low-E
		Uvalue 6.1, SHGC 0.47 -DG Low-E
North Tower unit-2902, South Tower unit-2402		Uvalue 3.1, SHGC 0.49 - thermally broken, DG
		Uvalue 3.1, SHGC 0.39 - thermally broken, DG

Notes
double hung, fixed, louvre, sliding windows or/and doors
awning, bifold casement tilt'n'turn windows or/and doors
double hung, fixed, louvre, sliding windows or/and doors
awning, bifold casement tilt'n'turn windows or/and doors
double hung, fixed, louvre, sliding windows or/and doors
awning, bifold casement tilt'n'turn windows or/and doors
Neighbour to neighbour walls, unit to common hallway walls
all units with basement carpark below and/or exterior below
All top floor levels
N/A
N/A

Heating	Part I BASIX	
Dwellings: all units	Hot Water	Central Hot Water- gas instantaneous
	Heating/Cooling	1 phase air conditioning 3.5 Star
	Lighting	Bathroom & Laundry fan interconnected to light.
	Ventilation	Kitchen fan ducted to façade with manual switch
	Appliances	electric cooktop & electric oven
	Fridge Space	Well ventilated
	Private outdoor clothesline	Yes
	Indoor clothesline	Yes

Tudor Street Perspective

Artists Impression Only

Development Application

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ABN 12 129 231 269

Notes
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The completion of the issue details checked and authorised section below is confirmation of the status of the drawing. The drawing shall not be used for construction unless endorsed "For Construction" and authorised for issue.

Nominated Architects: Caine King NSW ARB 7974 / Stuart Campbell NSW ARB 7545

issue	description	date	verified
01	Issue for Review	20/7/21	01
02	Issue for Pre-DA	16/9/21	02
03	Issue for Pre-DA	27/9/21	03
04	Issue for DRAFT DA	8/10/21	04
A	Issue for Development Application	21/10/21	A

key plan

consultants

Civil/Structural Engineers
Northrop Consulting Engineers
Level 1, 215 Pacific Highway
Charlestown, NSW, 2290

Electrical Engineer
Electrical Projects Australia
386 Maitland Rd
Mayfield, NSW, 2304

Mechanical Engineer
EVC Consulting Engineers
Suite 101, 470 King St
Newcastle West, NSW, 2302

Hydraulic Engineer
Wallace Design Group
PO Box 850
Warners Bay, NSW, 2282

client

THIRD GROUP

base Build PTY LTD

CKDS
Architecture | Planning | Interiors

NEWCASTLE
105 King St
PO Box 3030
Newcastle NSW 2300
P: 02 4929 1843
www.ckds.com.au

CENTRAL COAST
1/16 Adelaide St
PO Box 6063
East Gosford NSW 2250
P: 02 4321 0503
E: admin@ckds.com.au

project

Dairy Farmers Corner

924 Hunter Street 2/DP445736
Newcastle West NSW 2302

drawing title

Preliminary
Cover Sheet

drawing scale	drawn	verified	date
AS SHOWN		SC	21/10/21

project #	drawing #	issue
21014	A-0001	A

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check and verify all dimensions on site.
refer any discrepancies to the designer before proceeding with the work.
do not scale drawings manually or electronically.
drawing shall not be used for construction until issued for construction by designer.

Newcastle Indigenous History

The Awabakal and Worimi peoples are recognised as the traditional custodians of this area now known as Newcastle. Its Aboriginal naming is 'Muloobinba' (place of 'edible sea fern').

Whibay-gamba names the city's famous landmark, Nobbys. An Aboriginal dreaming story about Nobbys tells of a giant kangaroo that lives inside the island, and how he would sometimes shake his tail making the land tremble (a reference to the region's long history of seismological activity).

The Awabakal peoples were the first to discover and use coal in the Hunter. A dreaming story conveys that a volcanic eruption left a hole in the ground causing a darkness and quietness to descend over the land. The people thought they needed to cover up this darkness and fire to keep light and sound in the world. They placed foliage and rocks over the hole, and for generations after those who passed that spot would stamp the ground pressing the darkness and fire together creating 'nikkin', or coal. The volcanic plug near Redhead is the site of this dreaming and is called 'Kintirabin'.

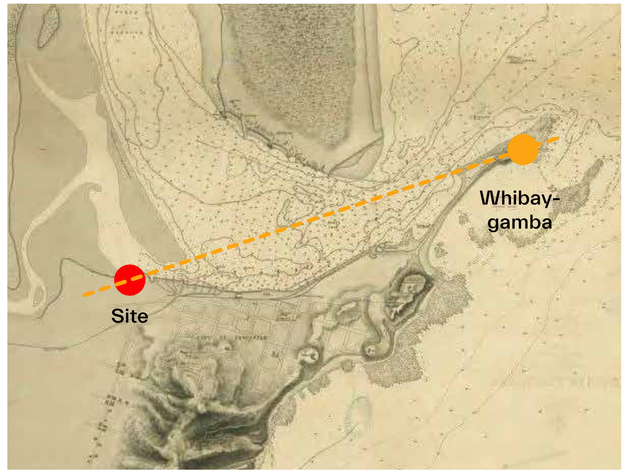
The Awabakal and Worimi traded with neighbouring groups and came together for corroborees, ceremonies and feastings. The locals enjoyed a varied diet of bush foods (including mulubin), fish, freshwater shellfish, bandicoots, possums, wallabies, kangaroos, emus and on occasions would invite neighbouring tribes to feast on beached whales.

As many as 100 campsites lined the Hunter coastline prior to European settlement. A burial site was located near Hunter Street in 1915; stone artefacts unearthed at the Convict Lumber Yard also provide evidence that large communal groups camped at Newcastle. Records noting the locations of significant sites such as bora grounds, ceremonial stone arrangements and carved trees add to the fabric of what was a rich and vibrant cultural life on the shores of the Coquun (Hunter River).

Online Source: Mrs McShane's Online Classroom
Newcastle - Aboriginal History
https://mrsmcshane.weebly.com/local-aboriginal-history.html

"evidence large communal groups camped at Newcastle."

Online Source: Map of Indigenous Australia
https://aiatsis.gov.au/explore/map-indigenous-australia



Online Source: 1867 Australia East Coast – New South Wales (NSW) Newcastle Harbour (Courtesy of the State Library of Victoria)
https://hunterlivinghistories.com/history/

Site Post Colonial History

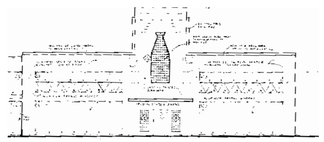
"In 1938–1939 one of Australia's key dairy producers, Dairy Farmer's Co-operative Milk Company Limited, built a distinctive premises in the West End, taking up a large block bounded by Hunter, Railway and Tighe streets. It was to house Dairy Farmers' administration offices and adjacent to it was a complex of buildings for the receiving, handling, bottling and distribution of bulk milk. A large loading dock catered for the army of trucks constantly moving in and out of the site and a state-of-the-art bottling plant washed and sterilised 4,000 bottles daily, with power coming from two on-site boilers. The administration offices faced Hunter Street and the building's façade featured an enormous milk bottle formed out of glass bricks relieved with coloured terracotta panels. This fanciful whimsy soon became the building's defining feature. Reputedly Joseph Likely, who was a member of the Dairy Farmers staff, was responsible for the building's unique look.

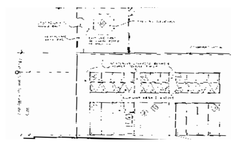
Inside, behind the iconic glass milk bottle, a staircase allows access to the top floor and to the building's two clock faces, one on the western side of the building and the other on the eastern. Originally these clocks were decorated with an illuminated advertising slogan reading: 'Dairy Farmers Milk. Precious as Time'. The whole Dairy Farmers' complex became so well-known that this part of Newcastle West was described as 'Dairy Farmers' Corner'.

The company stayed for over 30 years and in 1991, after they left the site, it was re-developed for Regal Motors. This meant demolishing the entire milk distribution area, but thankfully saving the delightful Dairy Farmers' administration building, complete with its iconic milk bottle. The Dairy Farmers' sign is still at the top of the building, the two clocks can still be seen from Hunter Street (albeit without their advertising slogans) and the building still has its original front door complete with the heavy glass panels etched 'D.F.M'. To Novocastrians, no matter who is there now, this part of the West End will always be 'Dairy Farmer's Corner'."

Online Source: Marvellous Milk - 6th January 2016
(West End Adventures)

Dairy Farmers Corner: "a complex of buildings"





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issue	description	date	verified
01	Issue for Pre-DA	16/9/21	01
02	Issue for DRAFT DA	8/10/21	02
A	Issue for Development Application	20/10/21	A

key plan

consultants

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Hydraulic Engineer
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E admin@ckds.com.au

project

Dairy Farmers Corner

924 Hunter Street 2/DP445736
Newcastle West NSW 2302

drawing title

Preliminary
Site History

drawing scale	drawn	verified	date
AS SHOWN		SC	20/10/21

project #	drawing #	issue
21014	A-0002	A

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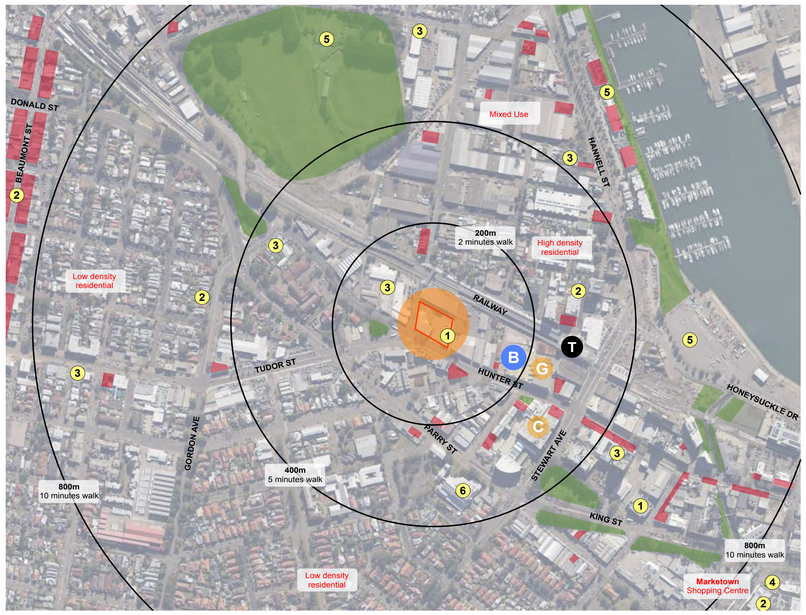
Development Application

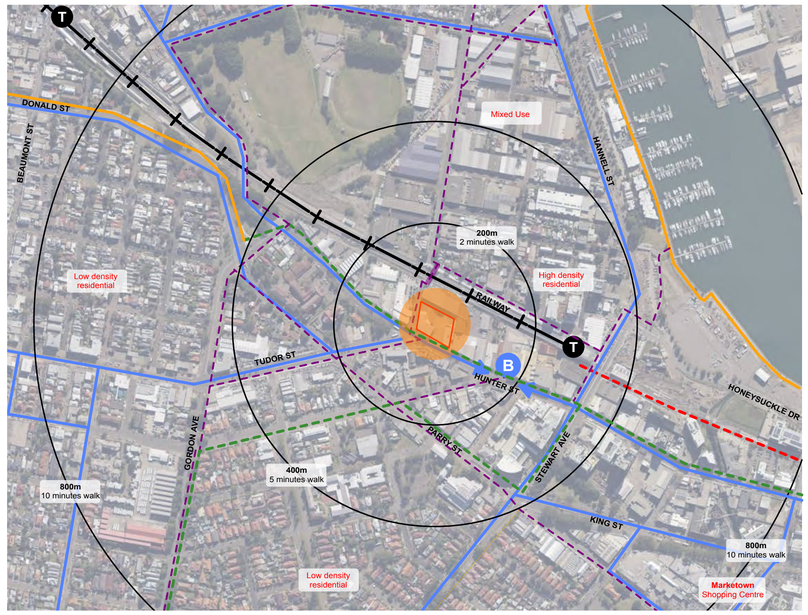
Site Location

Local Amenity



Site
Immediate context - local foot traffic
1 Gym
2 Doctors
3 Childcare
4 Marketown Shopping Centre
5 Public Amenities
6 Tafe
Recreation / Sporting Fields
Cafe' / Food
Newcastle Heavy Rail / Light Rail Interchange
Proposed Newcastle Bus Interchange
The Store. NSW State Government - 9,000sqm
Newcastle City Council

Connectivity



Site
Immediate context - local foot traffic
Newcastle Heavy Rail / Light Rail Interchange
Proposed Newcastle Bus Interchange
Heavy Rail
Light Rail
Bus
Separated Cycleway
Proposed Separated Cycleway
Other Cycle Routes
Heavy Rail Pedestrian Overpass

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A	Issue for Development Application	20/10/21	A

key plan

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project

Dairy Farmers Corner

924 Hunter Street 2/DP445736
Newcastle West NSW 2302

drawing title

Preliminary
Site Context

drawing scale	drawn	verified	date
AS SHOWN		SC	20/10/21

project #	drawing #	issue
21014	A-0003	A

Development Application

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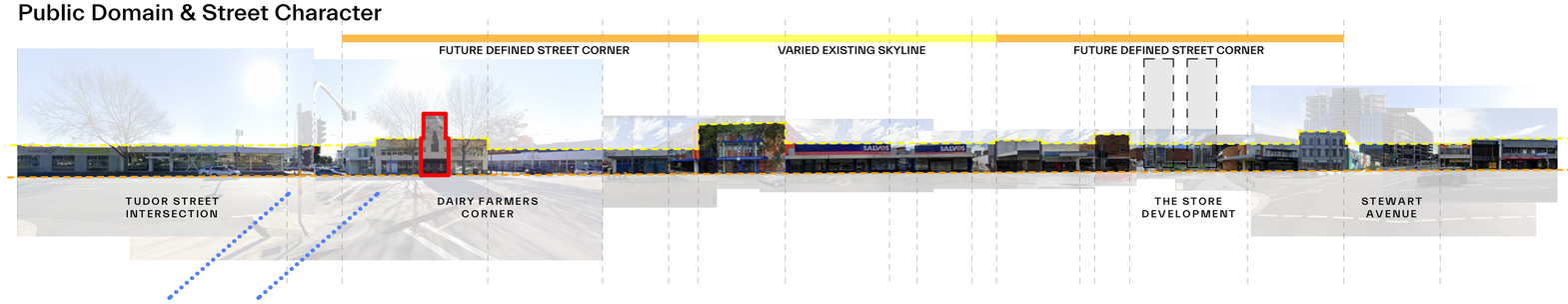
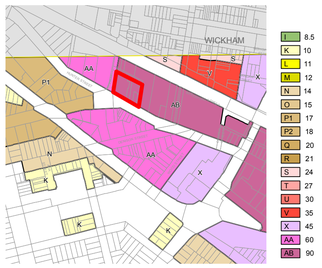
Public Domain & Street Character



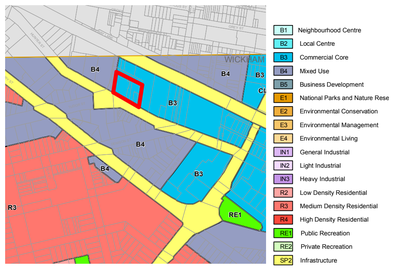
Key Planning Controls

LEP

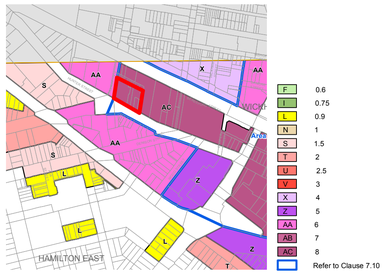
Height
90m



Zone
B3 Commercial Core



FSR
8:1 (5:1 for residential use under LEP clause 7.10)



Heritage
Conservation Zone & Item

DCP

West End Character Area

Figure 6.01-3: West End Character Area

Street Wall Height
16m Typical / 8m to Hunter St

Figure 6.01-12: Street wall heights plan

Setbacks
0m below street wall
6m above street wall to 45m height / 12m above 45m

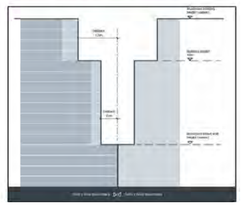


Figure 6.01-13 Section illustrating minimum side and rear setbacks

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key plan

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project

Dairy Farmers Corner

924 Hunter Street 2/DP445736
Newcastle West NSW 2302

drawing title

Preliminary
Street Character & Key Planning Controls

drawing scale	drawn	verified	date
AS SHOWN		SC	20/10/21

project #	drawing #	issue
21014	A-0004	A

Development Application

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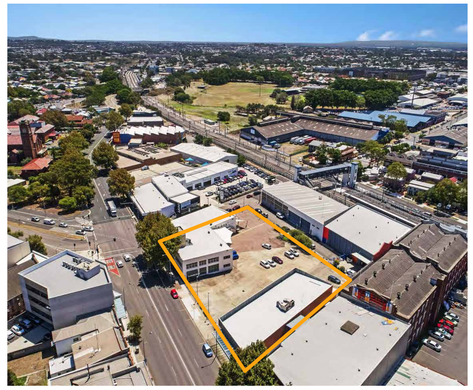
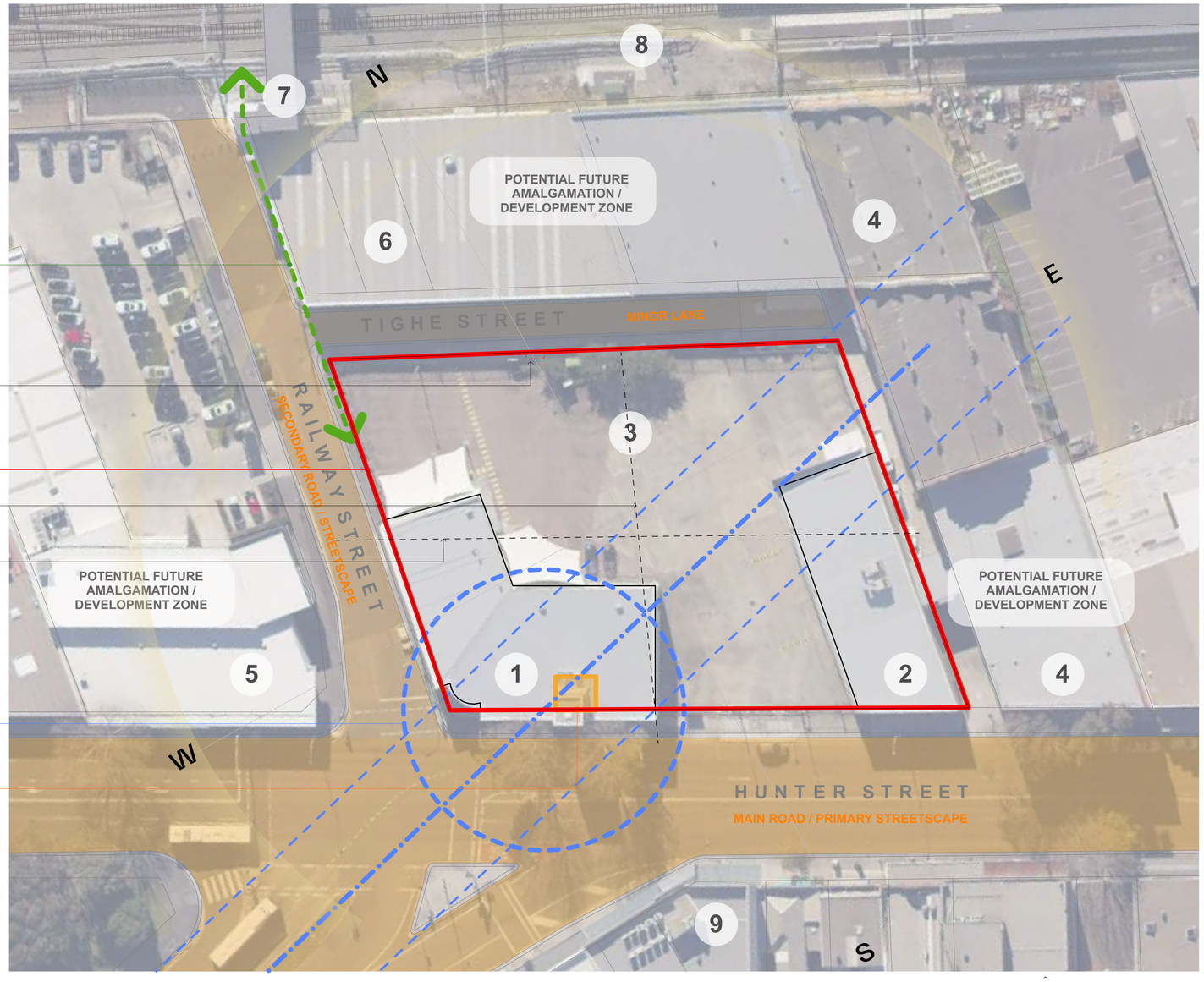
Existing Site Conditions





POTENTIAL FUTURE IMPROVED PEDESTRIAN OVERPASS UPGRADE CONNECTING HUNTER ST TO WICKHAM

APPROX EXISTING KIOSK SUBSTATION

SITE

APPROX EXISTING ELECTRICAL LV MAIN

APPROX EXISTING SEWER LINE

HIGH VISIBILITY CORNER ON TUDOR ST AXIS

LOCAL HERITAGE ITEM DAIRY FARMERS 'CLOCK TOWER'

1. Vacant car dealer
2. Gym
3. Car park
4. Kennards storage
5. Car dealer
6. Car service centre
7. Pedestrian overpass
8. Heavy rail line
9. Commercial / retail

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project

Dairy Farmers Corner

924 Hunter Street 2/DP445736
Newcastle West NSW 2302

drawing title

Preliminary
Existing Site Conditions

drawing scale	drawn	verified	date
AS SHOWN		SC	20/10/21

project #	drawing #	issue
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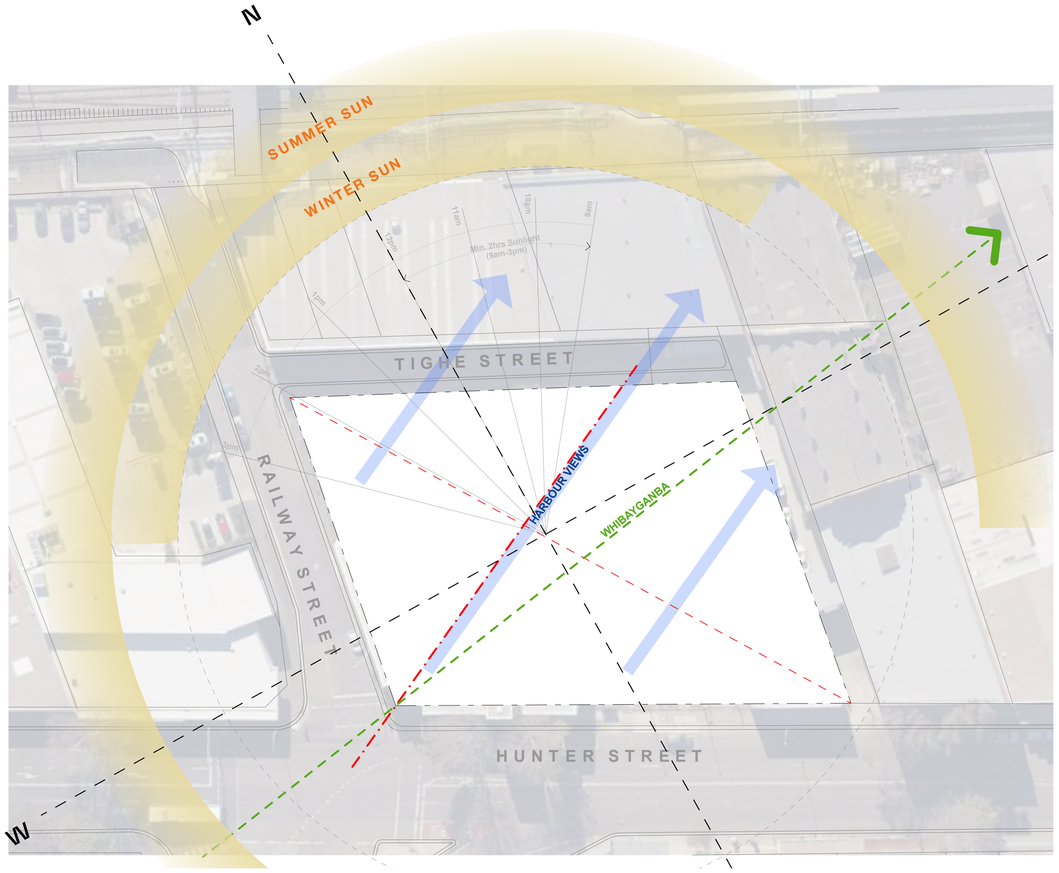
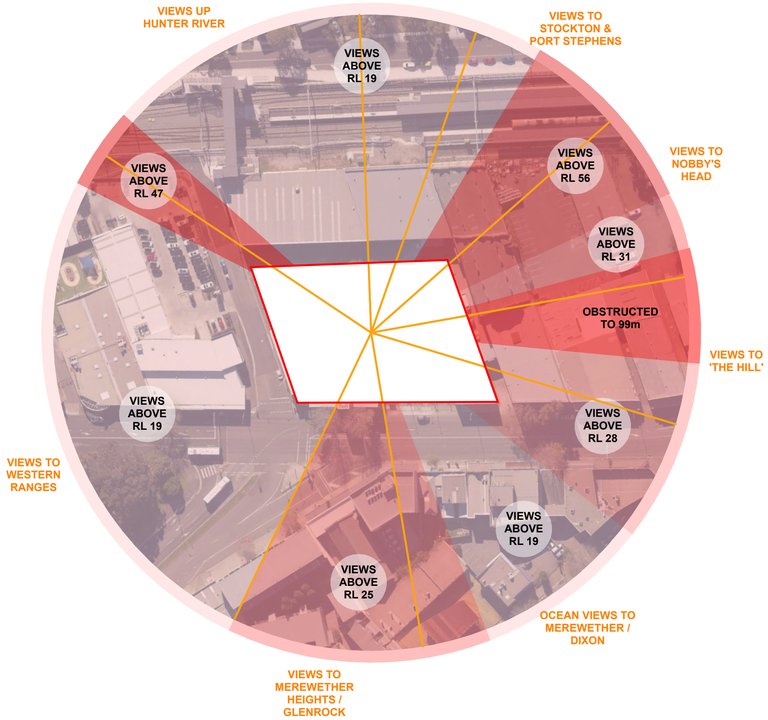
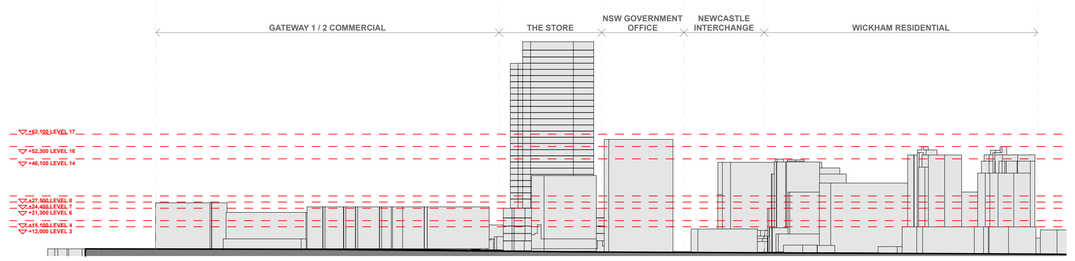
Residential Amenity
- Aspect & Orientation

Solar access
Orientation to Whibayganba
Key harbour views on North / East axis

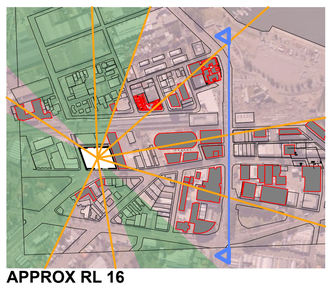


Residential Amenity - View Height Analysis

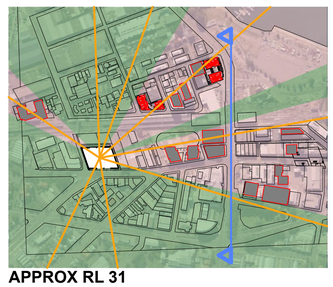




Section along Stewart Ave



APPROX RL 16



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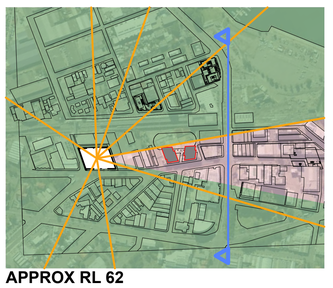

APPROX RL 62

Development Application

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key plan

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project

Dairy Farmers Corner

924 Hunter Street 2/DP445736
Newcastle West NSW 2302

drawing title

Preliminary
Residential Amenity Analysis

drawing scale	drawn	verified	date
AS SHOWN		SC	20/10/21

project #	drawing #	issue
21014	A-0006	A

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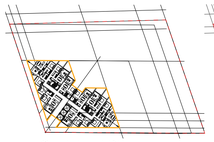
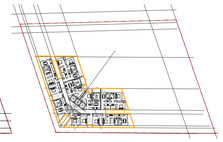
Design Competition Waiver Iterative Concept Analysis - Single Tower Schemes

Rigorous development & analysis of single tower schemes, measured against the key design principles

Initial planning & analysis



Conjoined Diamonds Diagonal

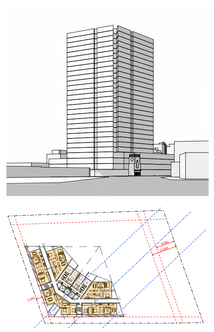


Conjoined Diamonds Orthogonal

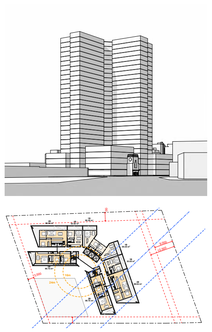
Conjoined Diamond Hybrid

Conjoined Diamond Hybrid

Further iterative analysis



Batman

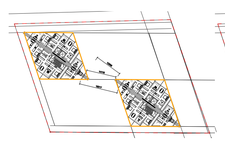


Batman Flipped

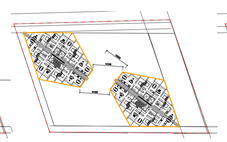
Design Competition Waiver Iterative Concept Analysis - Two Tower Schemes

Rigorous development & analysis of two tower schemes, measured against the key design principles

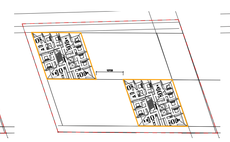
Initial planning & analysis



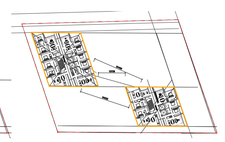
Twin Diamond Diagonal



Non-symmetrical diamonds

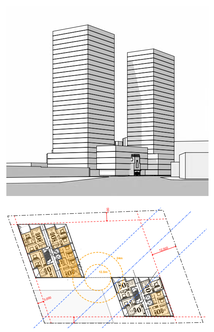


Twin Diamond Orthogonal

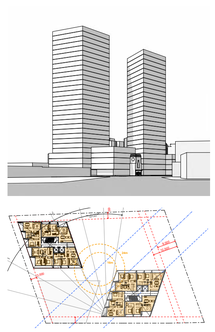


Unequal Diamond

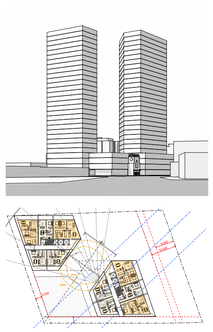
Further iterative analysis



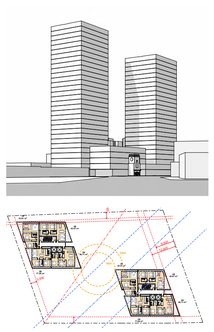
Major Minor



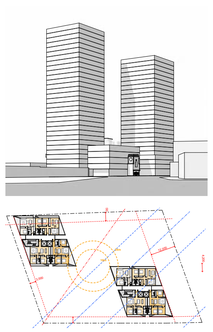
Twin Diamond Rotated



Overlapping diamonds



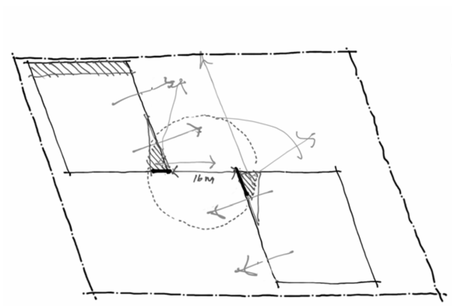
Twin Diamond Reduced Setback



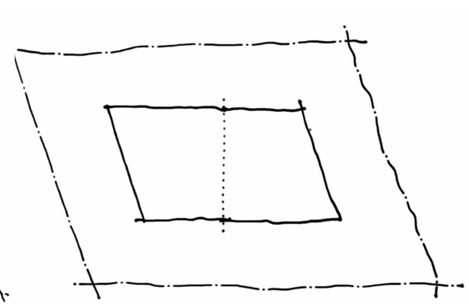
Twin Diamond Stretched Reduced Setback

Stop / Pause / Review

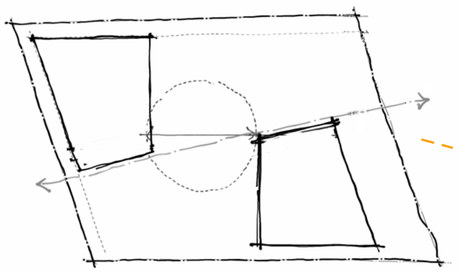
Critical Analysis of Two Tower Form



Critical analysis of two tower forms

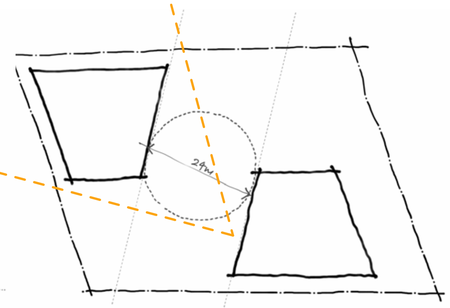


Address separation & setback issues, bulk & scale



Inverted geometry creates variation in urban form from all angles

Privacy benefits of offset towers



Maximise solar

Development Application

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A	Issue for Development Application	20/10/21	A

key plan

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client

project

Dairy Farmers Corner

924 Hunter Street 2/DP445736
Newcastle West NSW 2302

drawing title

Preliminary
Concept Development

drawing scale	drawn	verified	date
AS SHOWN		SC	20/10/21

project #	drawing #	issue
21014	A-0007	A

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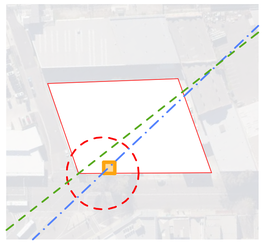
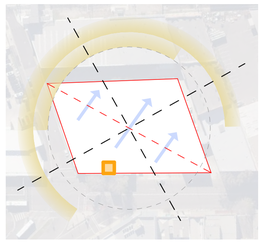
Dairy Farmers Corner Key Design Principles



Contribution to Place
Response to history & heritage
Local character
Fit with context

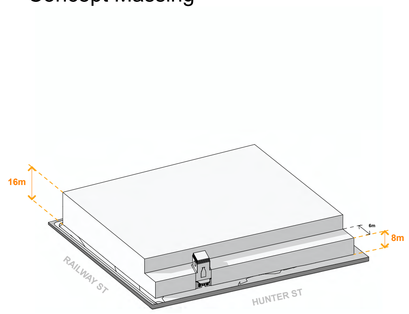
Public Domain
Public space
Connectivity
Diversity of uses & housing types



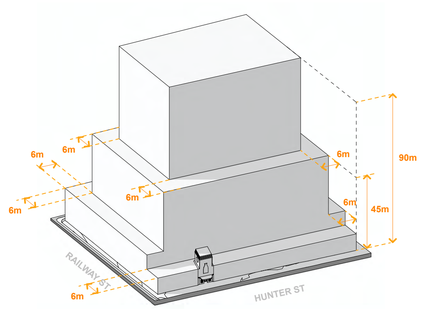
Residential Amenity
Solar access
Natural ventilation
Views & aspect
Sustainability
Functional layouts
Apartment Design Guide

Urban Form
Site geometry
Bulk, scale & proportions
Functional & efficient
Materiality

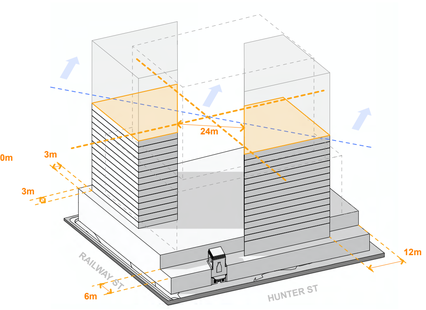
Concept Massing



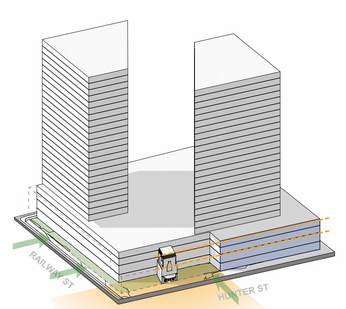
1. DCP Podium Envelope



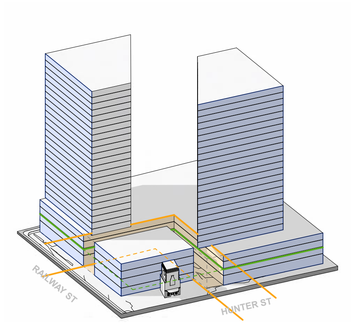
2. DCP Podium + Tower Envelope



3. Tower Form



4. Public Domain & Podium



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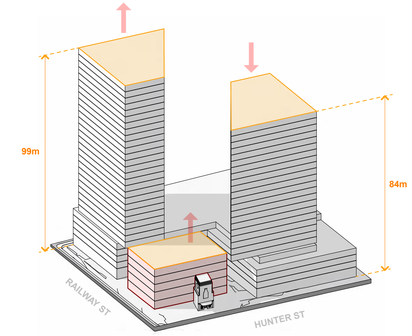
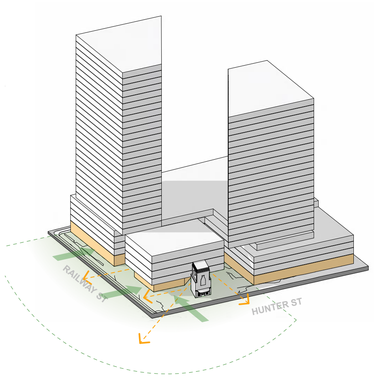


6. Urban Form



7. Public Domain & Podium

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A	Issue for Development Application	20/10/21	A

key plan

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project

Dairy Farmers Corner

924 Hunter Street 2/DP445736
Newcastle West NSW 2302

drawing title

Preliminary
Concept Development

drawing scale	drawn	verified	date
AS SHOWN		SC	20/10/21

project #	drawing #	issue
21014	A-0008	A

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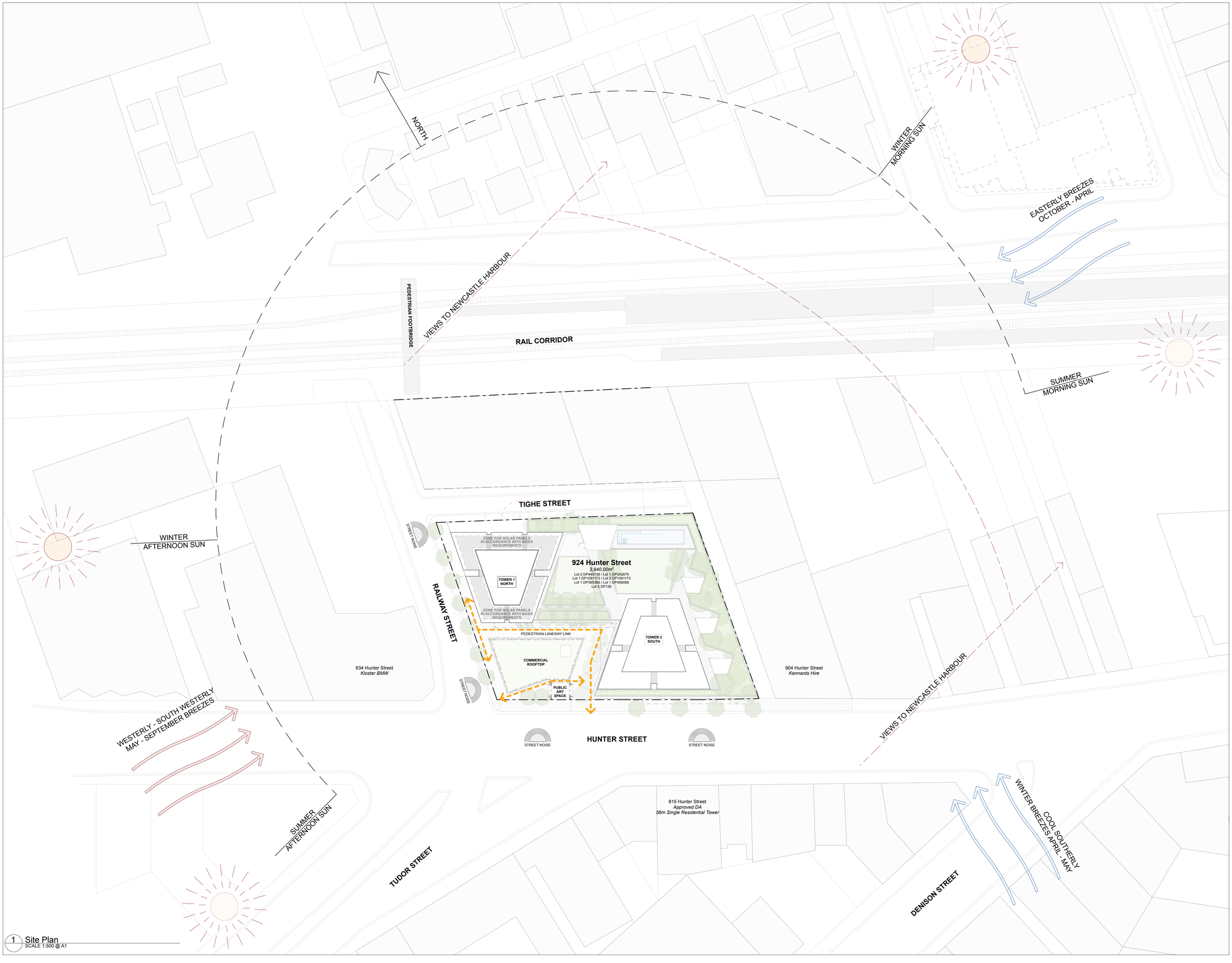

1 Site Plan
SCALE 1:500 @ A1

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key plan

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drawing title

Site Plans
Site Plan

0 5m 10m 15m
Scale 1:500 @A1

drawing scale	drawn	verified	date
AS SHOWN		SC	20/10/21

project #	drawing #	issue
21014	A-1001	A

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1 Ground
SCALE 1:200 @ A1

Development Application

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04	Issue for Pre-DA	16/9/21	04
05	Issue for Pre-DA	27/9/21	05
06	Issue for Draft DA	1/10/21	06
07	Issue for DRAFT DA	8/10/21	07
A	Issue for Development Application	20/10/21	A

key plan

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Dairy Farmers Corner

924 Hunter Street 2/DP445736
Newcastle West NSW 2302

drawing title

General Arrangement Plans
Ground Floor Plan

drawing scale	drawn	verified	date
AS SHOWN		SC	20/10/21

project #	drawing #	issue
21014	A-1101	A

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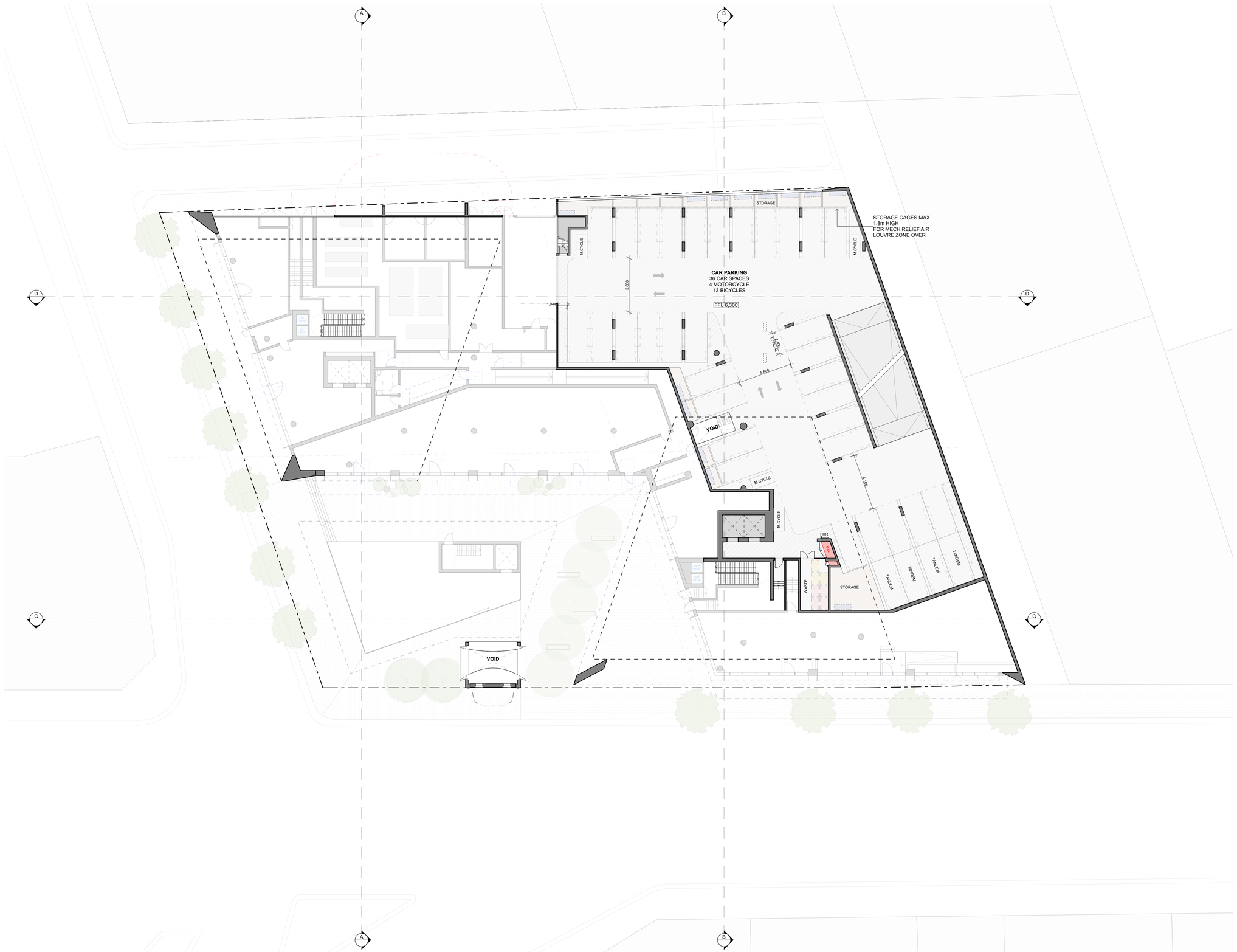

1 Upper Ground
SCALE 1:200 @ A1

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05	Issue for Pre-DA	27/9/21	05
06	Issue for Draft DA	1/10/21	06
07	Issue for DRAFT DA	8/10/21	07
A	Issue for Development Application	20/10/21	A

key plan

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Dairy Farmers Corner

924 Hunter Street 2/DP445736
Newcastle West NSW 2302

drawing title

General Arrangement Plans
Upper Ground Floor Plan

drawing scale	drawn	verified	date
AS SHOWN		SC	20/10/21

project #	drawing #	issue
21014	A-1102	A

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Development Application

1 Level 1
SCALE 1:200 @ A1

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A	Issue for Development Application	20/10/21	A

key plan

North Point

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project

Dairy Farmers Corner

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Newcastle West NSW 2302

drawing title

General Arrangement Plans
Level 1

drawing scale	drawn	verified	date
AS SHOWN		SC	20/10/21

project #	drawing #	issue
21014	A-1103	A

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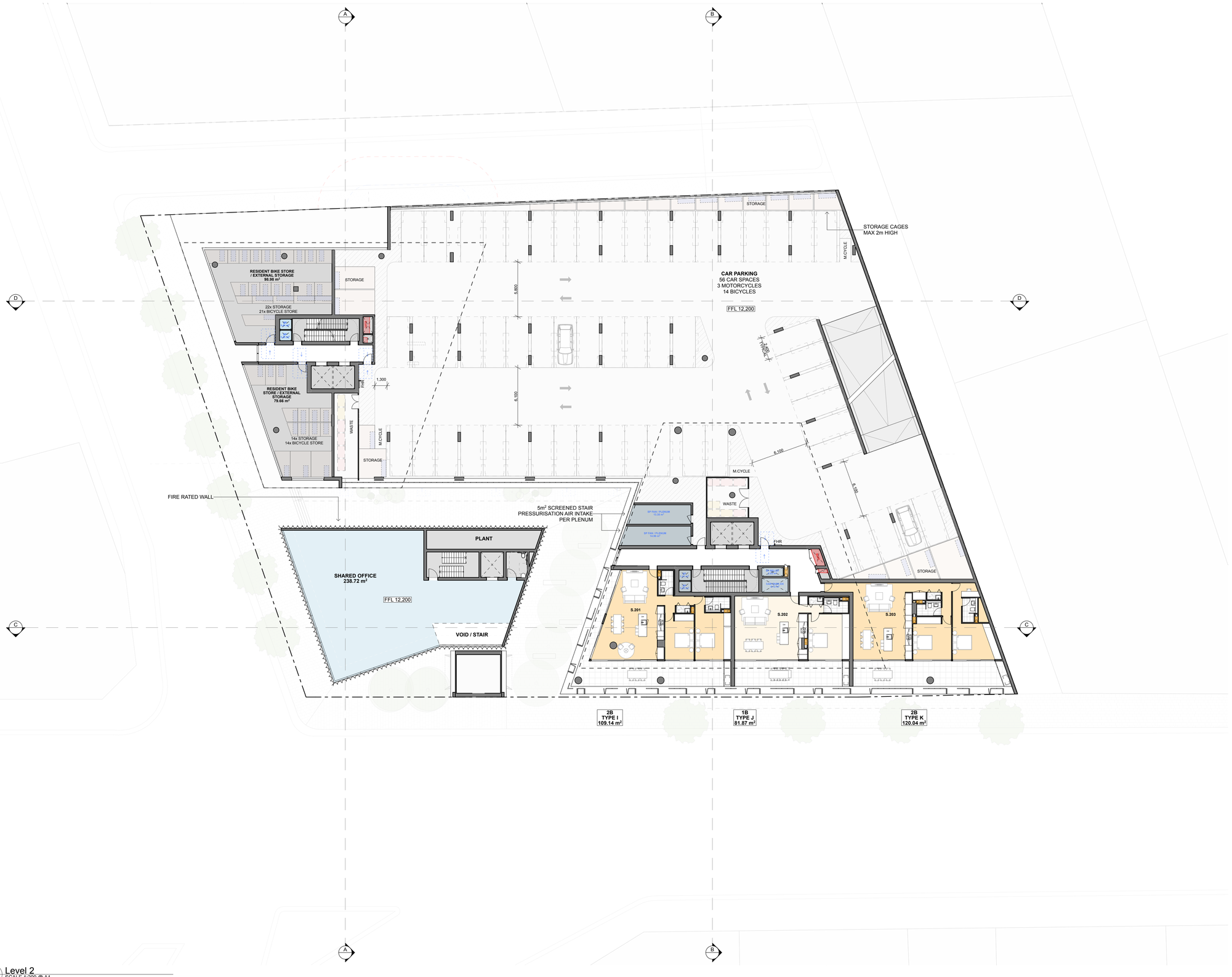

1 Level 2
SCALE 1:200 @ A1

issue	description	date	verified
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02	Issue for Review	10/8/21	02
03	Issue for Coordination	7/9/21	03
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07	Issue for DRAFT DA	8/10/21	07
A	Issue for Development Application	20/10/21	A

key plan

North Point

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project

Dairy Farmers Corner

924 Hunter Street 2/DP445736
Newcastle West NSW 2302

drawing title

General Arrangement Plans
Level 2

drawing scale	drawn	verified	date
AS SHOWN		SC	20/10/21

project #	drawing #	issue
21014	A-1104	A

Development Application

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Nominated Architects: Caine King NSW ARB 7974 / Stuart Campbell NSW ARB 7545

1 Level 3
SCALE 1:200 @ A1

issue	description	date	verified
01	Issue for Review	20/7/21	01
02	Issue for Review	10/8/21	02
03	Issue for Coordination	7/9/21	03
04	Issue for Pre-DA	16/9/21	04
05	Issue for Pre-DA	27/9/21	05
06	Issue for Draft DA	1/10/21	06
07	Issue for DRAFT DA	8/10/21	07
A	Issue for Development Application	20/10/21	A

key plan

North Point

consultants

Civil/Structural Engineers
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Dairy Farmers Corner

924 Hunter Street 2/DP445736
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drawing title

General Arrangement Plans
Level 3

drawing scale	drawn	verified	date
AS SHOWN		SC	20/10/21

project #	drawing #	issue
21014	A-1105	A

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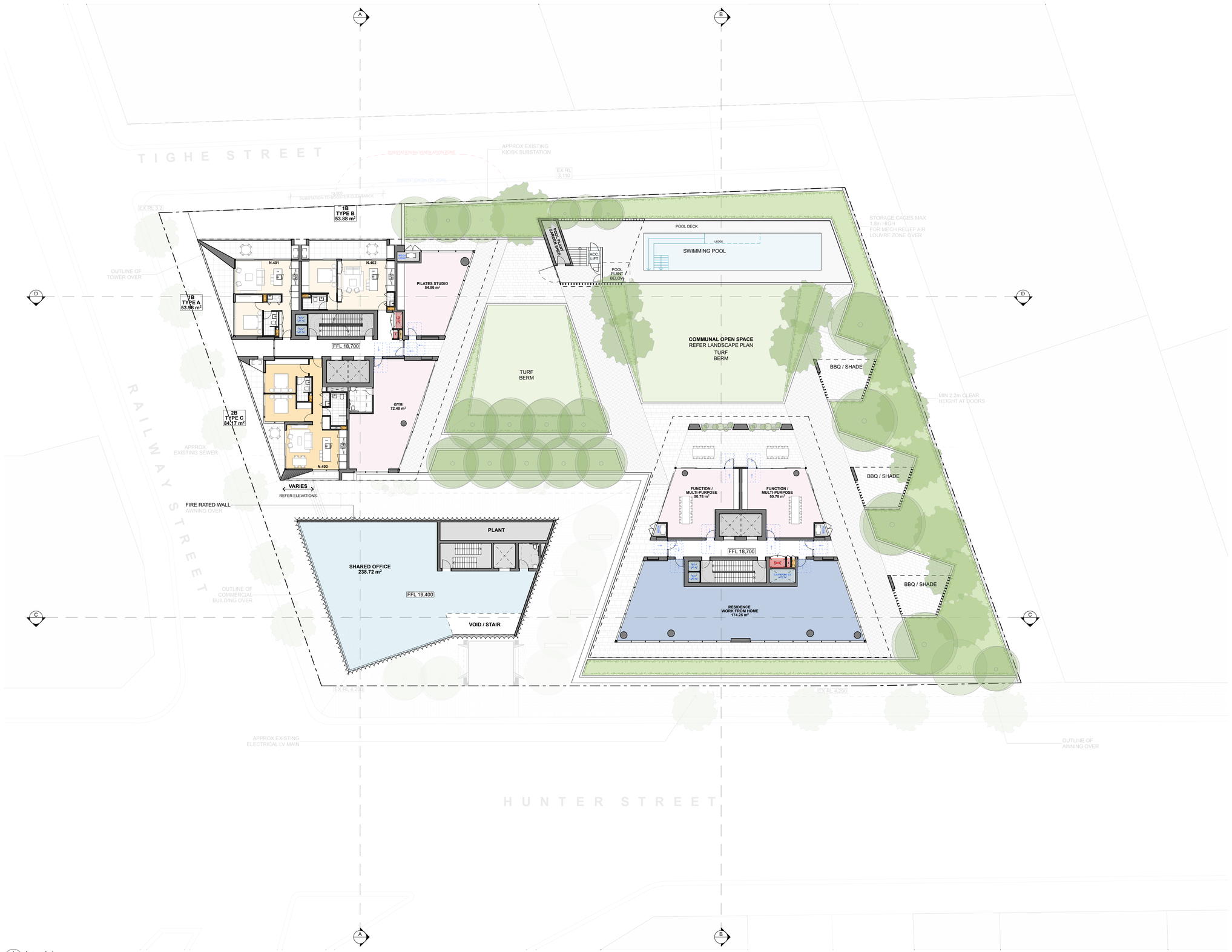

1 Level 4
SCALE 1:200 @ A1

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07	Issue for DRAFT DA	8/10/21	07
A	Issue for Development Application	20/10/21	A

key plan

North Point

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924 Hunter Street 2/DP445736
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drawing title

General Arrangement Plans
Level 4

drawing scale	drawn	verified	date
AS SHOWN		SC	20/10/21

project #	drawing #	issue
21014	A-1106	A

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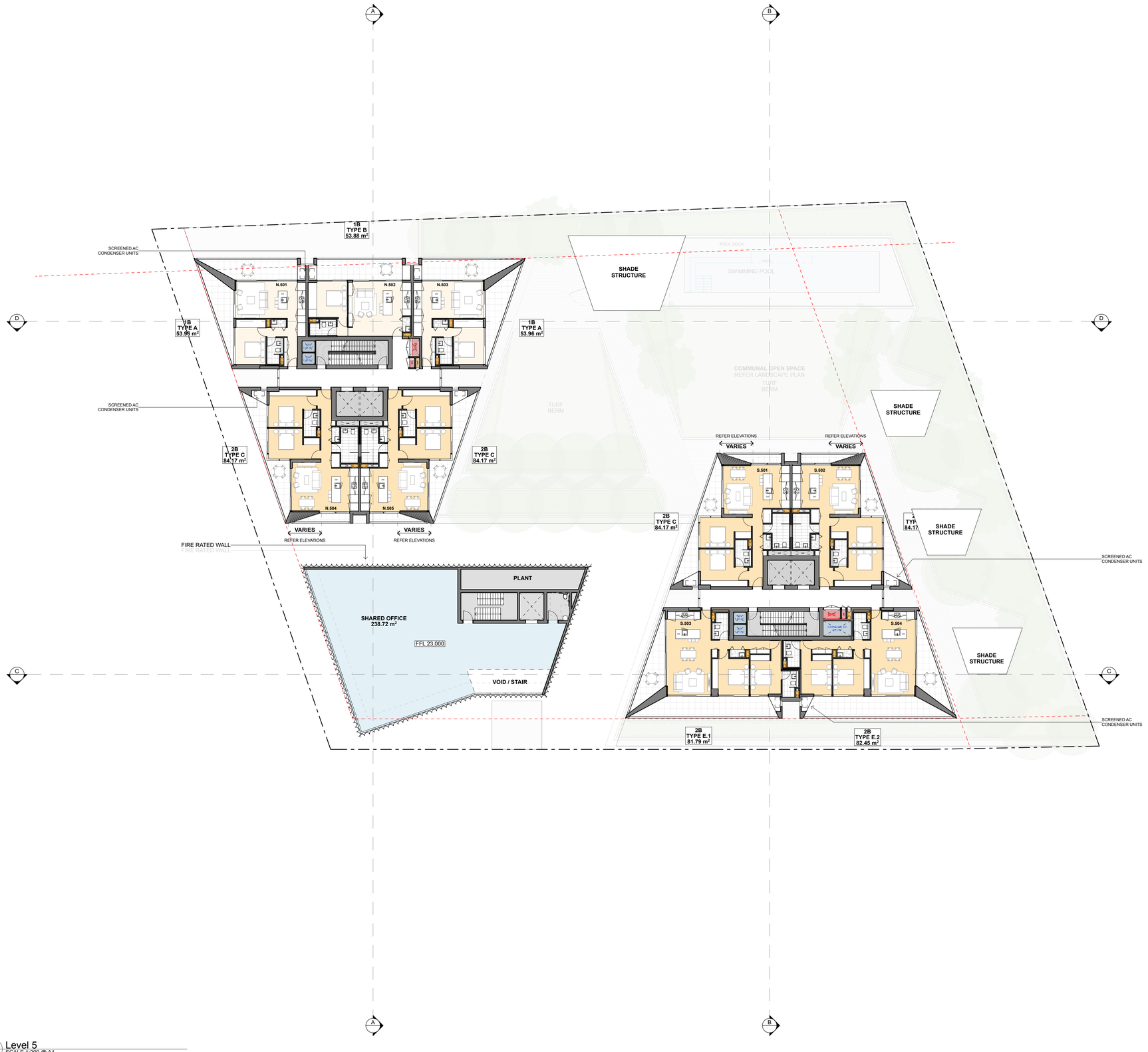

1 Level 5
SCALE 1:200 @ A1

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10	Issue for Draft DA	1/10/21	10
11	Issue for DRAFT DA	8/10/21	11
A	Issue for Development Application	20/10/21	A

key plan

North Point

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Dairy Farmers Corner

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Newcastle West NSW 2302

drawing title

General Arrangement Plans
Tower Level 5

drawing scale	drawn	verified	date
AS SHOWN		SC	20/10/21

project #	drawing #	issue
21014	A-1107	A

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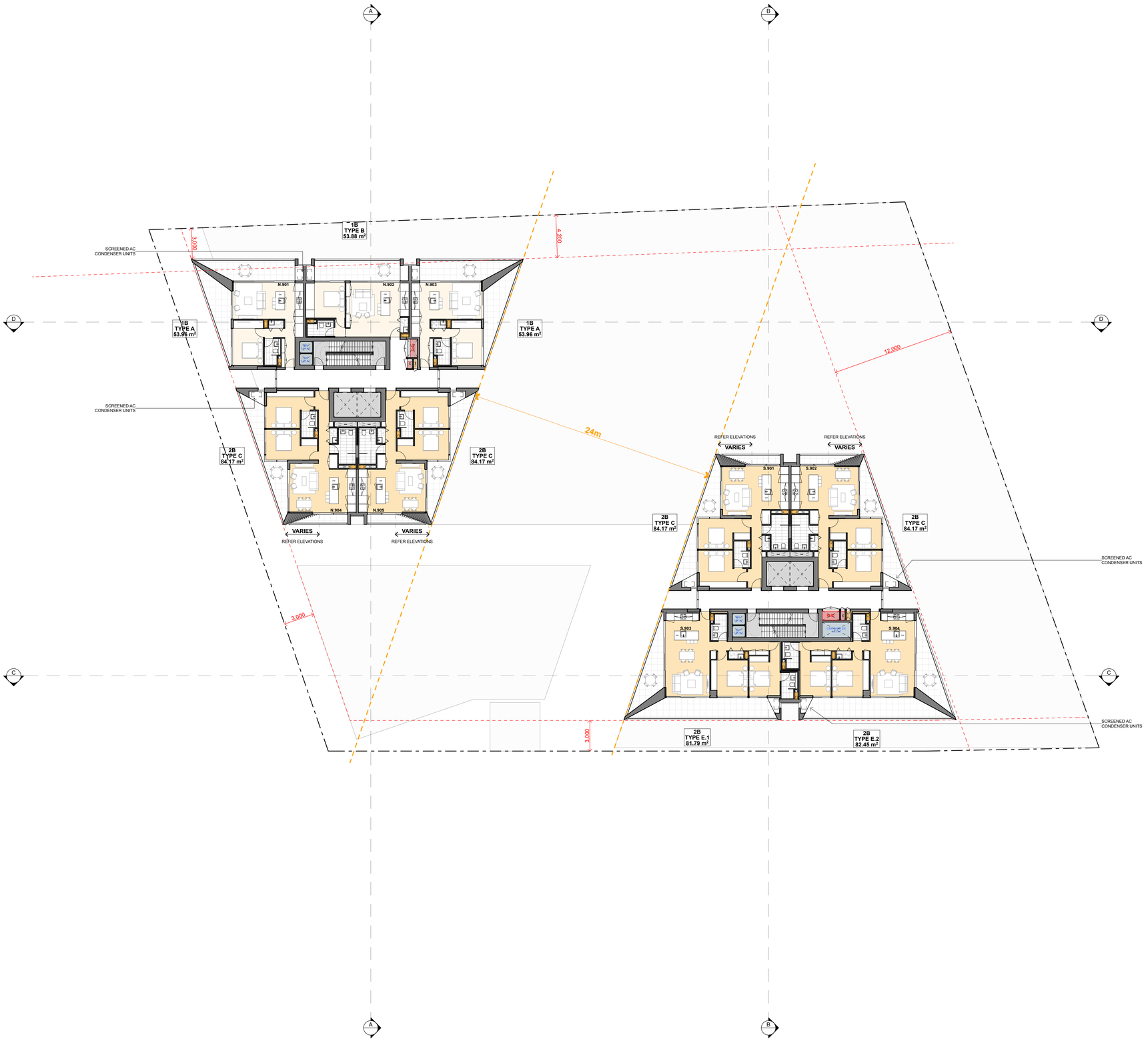

1 Tower Levels 6 - 14
SCALE 1:200 @ A1

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10	Issue for Draft DA	1/10/21	10
11	Issue for DRAFT DA	8/10/21	11
A	Issue for Development Application	20/10/21	A

key plan

North Point

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Dairy Farmers Corner

924 Hunter Street 2/DP445736
Newcastle West NSW 2302

drawing title

General Arrangement Plans
Tower Levels 6 - 14

drawing scale	drawn	verified	date
AS SHOWN		SC	20/10/21

project #	drawing #	issue
21014	A-1108	A

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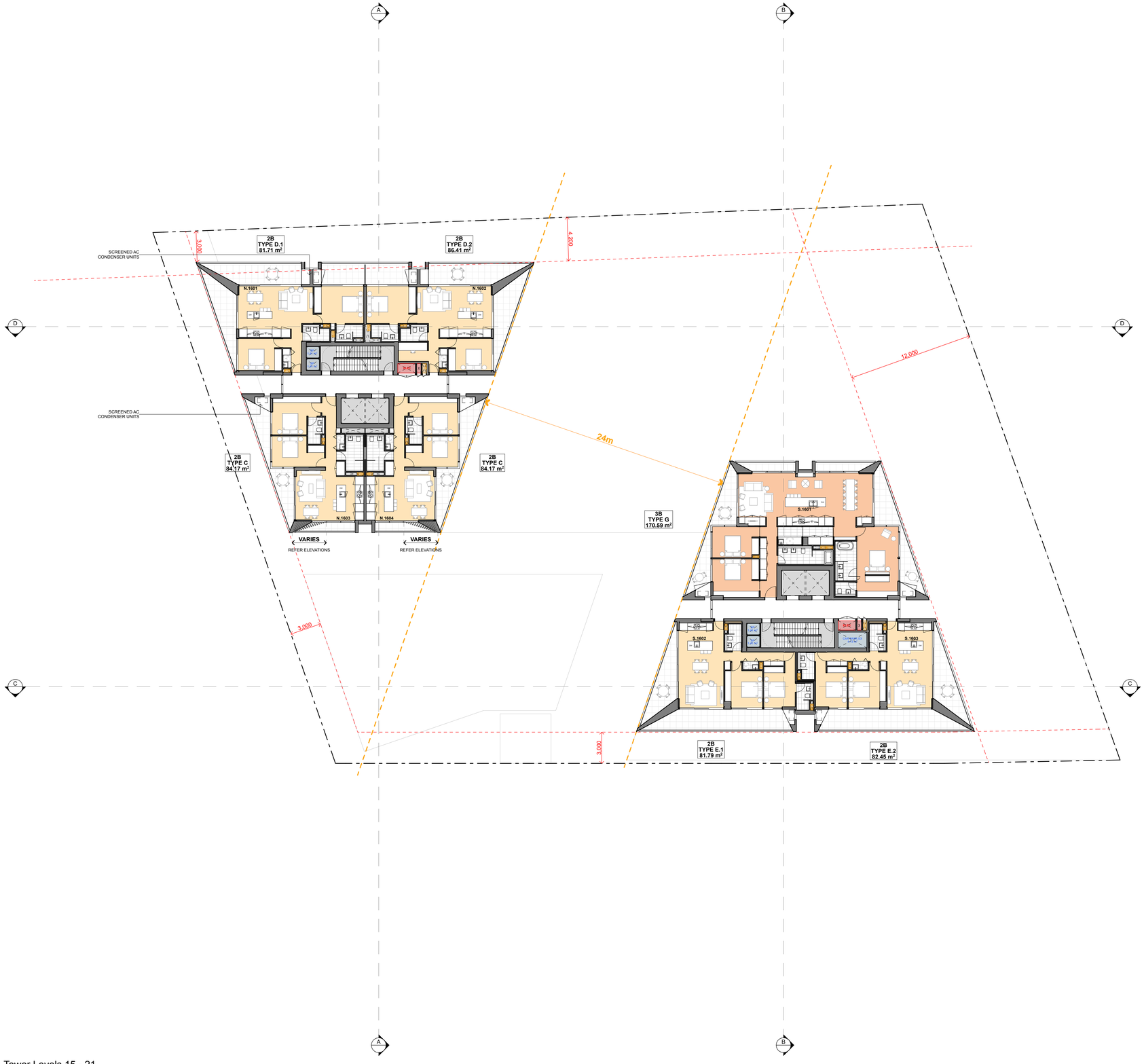

1 Tower Levels 15 - 21
SCALE 1:200 @ A1

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10	Issue for Draft DA	1/10/21	10
11	Issue for DRAFT DA	8/10/21	11
A	Issue for Development Application	20/10/21	A

key plan

North Point

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Dairy Farmers Corner

924 Hunter Street 2/DP445736
Newcastle West NSW 2302

drawing title

General Arrangement Plans
Tower Levels 15 - 21

drawing scale	drawn	verified	date
AS SHOWN		SC	20/10/21

project #	drawing #	issue
21014	A-1109	A

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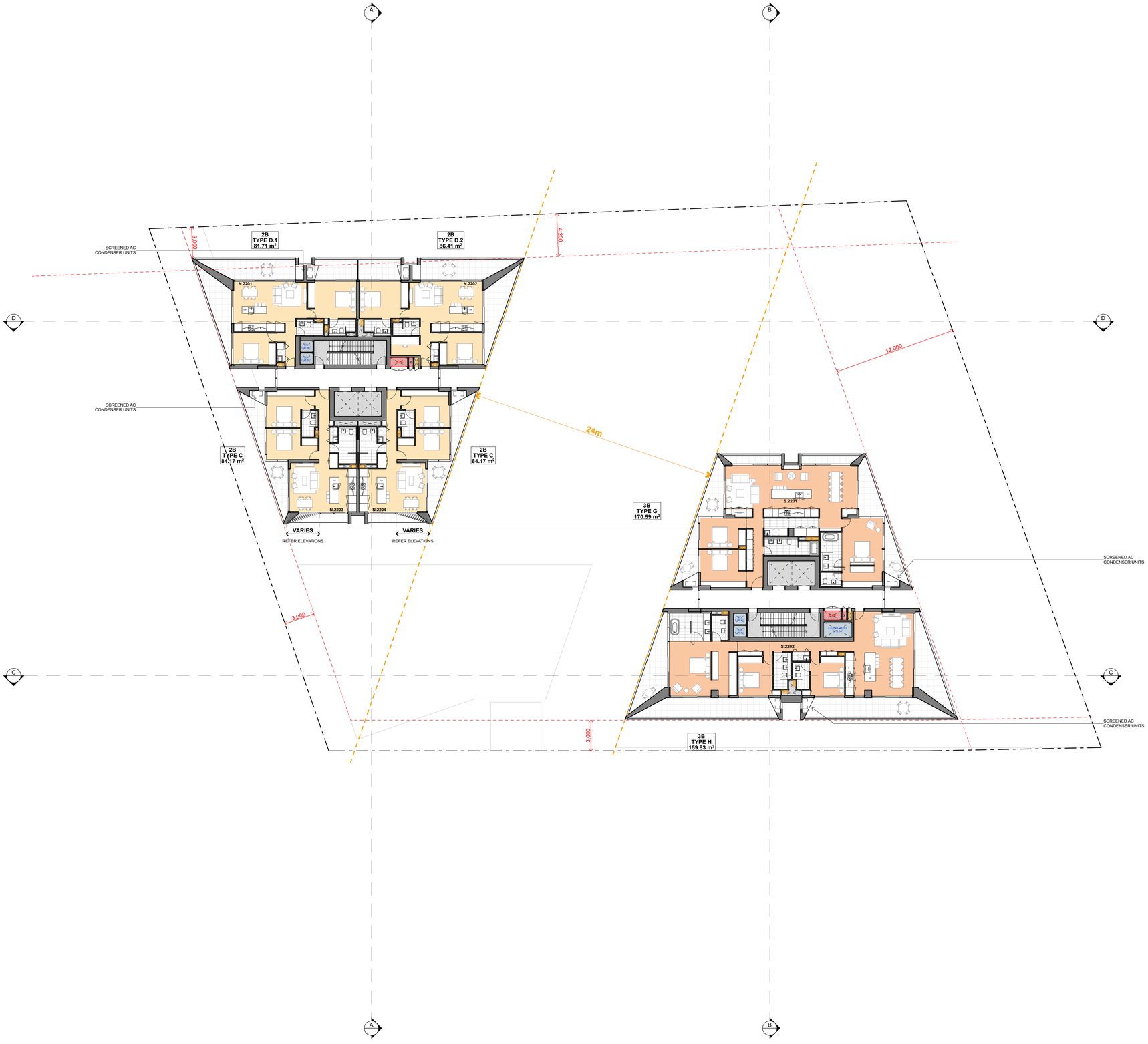

1 Tower Levels 22 - 24
SCALE 1:200 @ A1

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07	Issue for Comment	2/9/21	07
08	Issue for Coordination	10/9/21	08
09	Issue for Pre-DA	16/9/21	09
10	Issue for Pre-DA	27/9/21	10
11	Issue for Draft DA	1/10/21	11
12	Issue for DRAFT DA	8/10/21	12
A	Issue for Development Application	20/10/21	A

key plan

North Point

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924 Hunter Street 2/DP445736
Newcastle West NSW 2302

drawing title

General Arrangement Plans
Tower Levels 22 - 24

drawing scale	drawn	verified	date
AS SHOWN	CH	SC	20/10/21

project #	drawing #	issue
21014	A-1110	A

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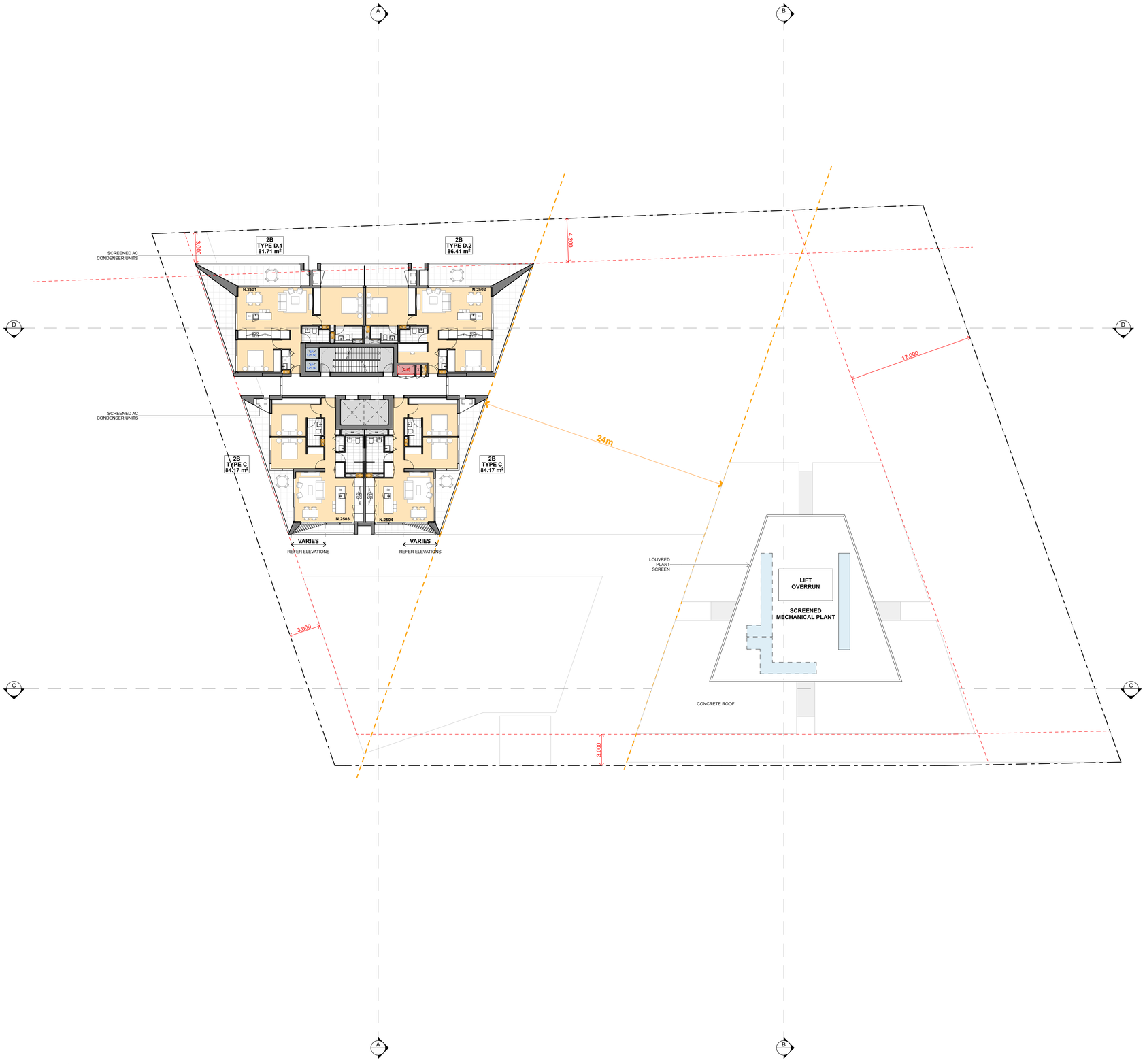

1 Tower Levels 25 - 26
SCALE 1:200 @ A1

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11	Issue for DRAFT DA	8/10/21	11
A	Issue for Development Application	20/10/21	A

key plan

North Point

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project

Dairy Farmers Corner

924 Hunter Street 2/DP445736
Newcastle West NSW 2302

drawing title

General Arrangement Plans
Tower Levels 25 - 26

drawing scale	drawn	verified	date
AS SHOWN		SC	20/10/21

project #	drawing #	issue
21014	A-1111	A

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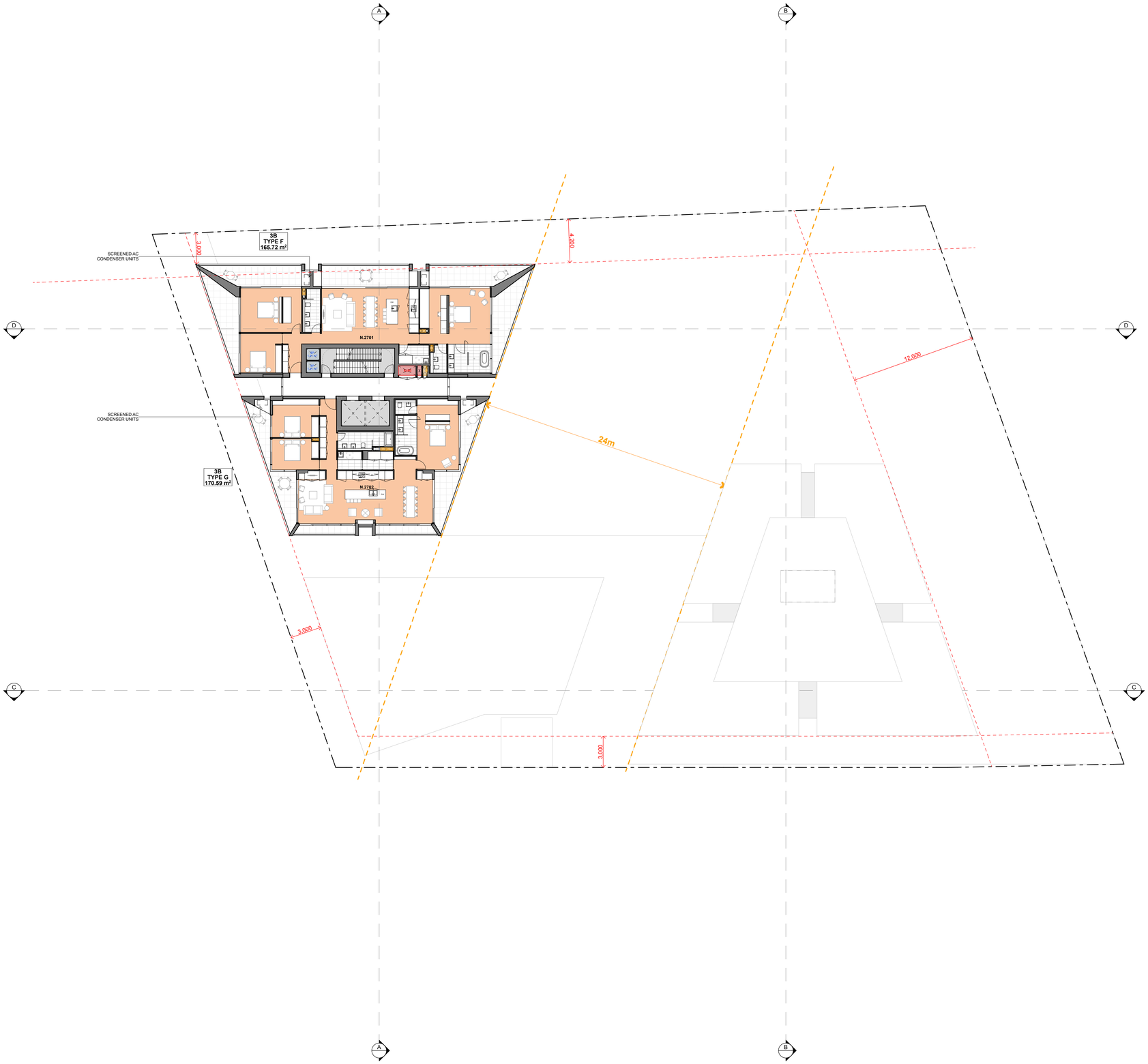

1 Tower Levels 27 - 29
SCALE 1:200 @ A1

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11	Issue for DRAFT DA	8/10/21	11
A	Issue for Development Application	20/10/21	A

key plan

North Point

consultants

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project

Dairy Farmers Corner

924 Hunter Street 2/DP445736
Newcastle West NSW 2302

drawing title

General Arrangement Plans
Tower Levels 27 - 29

drawing scale	drawn	verified	date
AS SHOWN	CH	SC	20/10/21

project #	drawing #	issue
21014	A-1112	A

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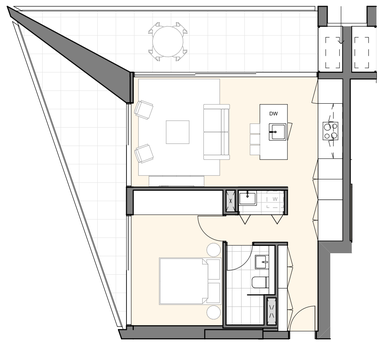
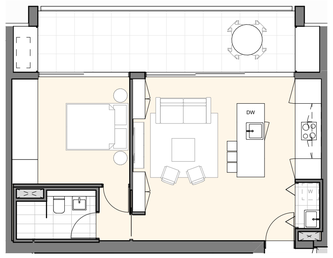
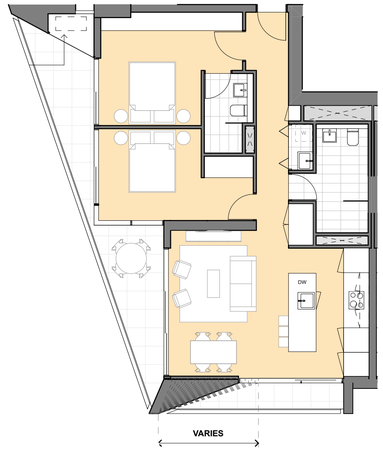


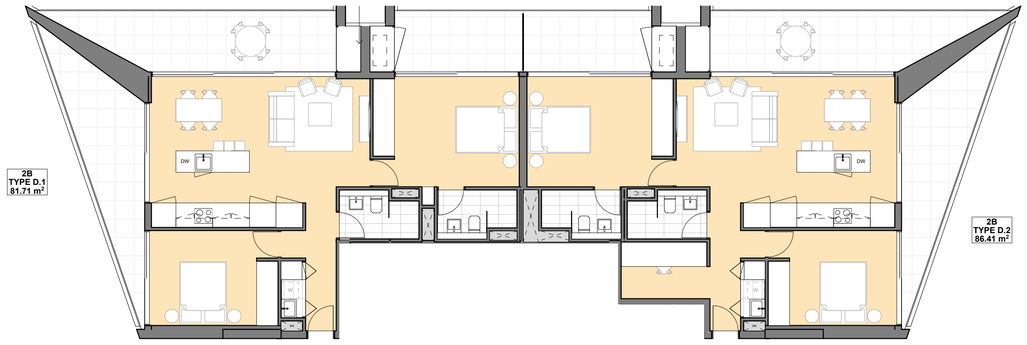
1 UNIT TYPE A - 1B TOWER
SCALE 1:100 @ A1



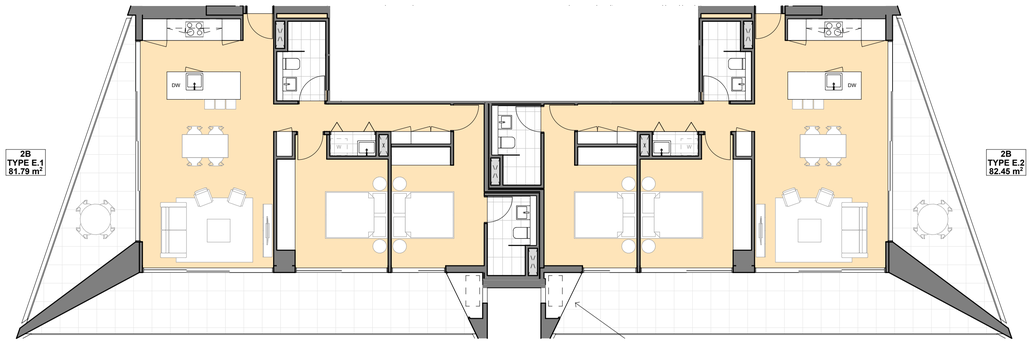
2 UNIT TYPE B - 1B TOWER
SCALE 1:100 @ A1



3 UNIT TYPE C - 2B TOWER
SCALE 1:100 @ A1
LHA SILVER LEVEL UNIT



4 UNIT TYPE D.1 & D.2 - 2B TOWER
SCALE 1:100 @ A1



5 UNIT TYPE E.1 & E.2 - 2B TOWER
SCALE 1:100 @ A1

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Nominated Architects: Caine King NSW ARB 7974 / Stuart Campbell NSW ARB 7545

issue	description	date	verified
03	Issue for Review	10/8/21	03
04	Issue for Review	19/8/21	04
05	Issue for Comment	20/8/21	05
06	Issue for Comment	2/9/21	06
07	Issue for Coordination	10/9/21	07
08	Issue for Pre-DA	16/9/21	08
09	Issue for Pre-DA	27/9/21	09
10	Issue for Draft DA	1/10/21	10
11	Issue for DRAFT DA	8/10/21	11
A	Issue for Development Application	20/10/21	A

key plan

consultants

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project

Dairy Farmers Corner

924 Hunter Street 2/DP445736
Newcastle West NSW 2302

drawing title

Unit Plans
Unit Type A - E

drawing scale	drawn	verified	date
AS SHOWN	CH	SC	20/10/21

project #	drawing #	issue
21014	A-1201	A

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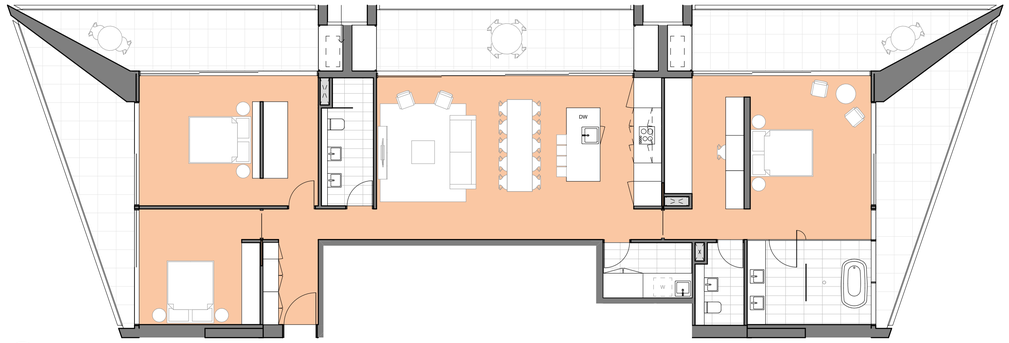
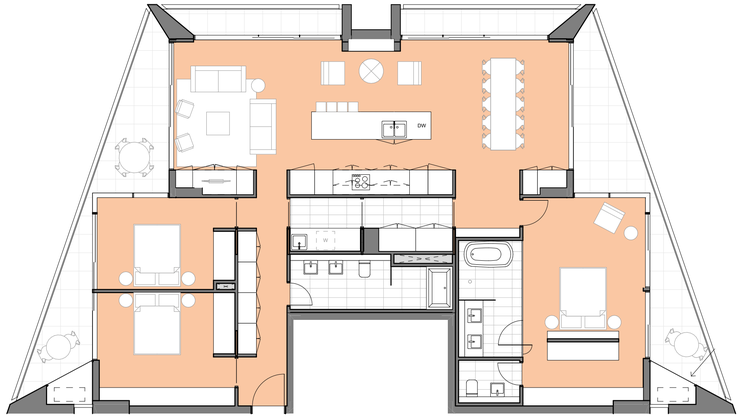
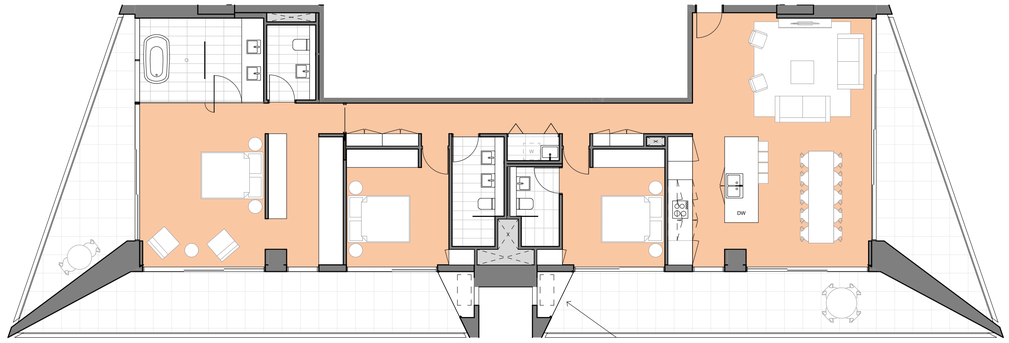


1 UNIT TYPE F - 3B PENTHOUSE
SCALE 1:100 @ A1



2 UNIT TYPE G - 3B PENTHOUSE
SCALE 1:100 @ A1



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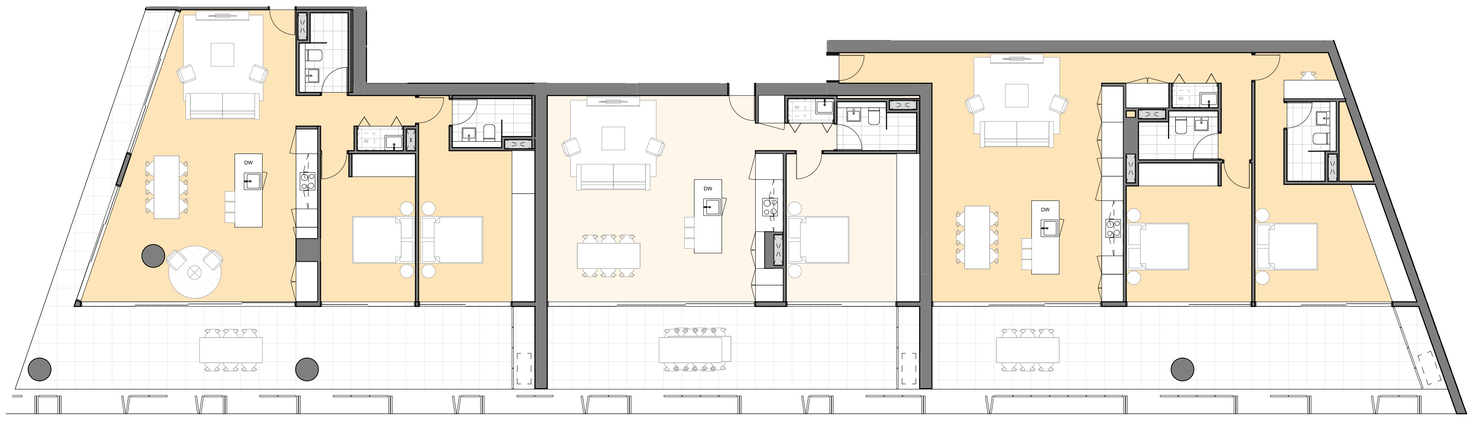
SCALE 1:100 @ A1



4 UNIT TYPE I - 2B PODIUM
SCALE 1:100 @ A1

5 UNIT TYPE J - 1B PODIUM
SCALE 1:100 @ A1

6 UNIT TYPE K - 2B PODIUM
SCALE 1:100 @ A1

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Nominated Architects: Caine King NSW ARB 7974 / Stuart Campbell NSW ARB 7545

issue	description	date	verified
01	Issue for Review	13/8/21	01
02	Issue for Coordination	10/9/21	02
03	Issue for Pre-DA	16/9/21	03
04	Issue for Pre-DA	27/9/21	04
05	Issue for Draft DA	1/10/21	05
06	Issue for DRAFT DA	8/10/21	06
A	Issue for Development Application	20/10/21	A

key plan

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project

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drawing title

Unit Plans
Unit Type F - K

drawing scale	drawn	verified	date
AS SHOWN		SC	20/10/21

project #	drawing #	issue
21014	A-1202	A

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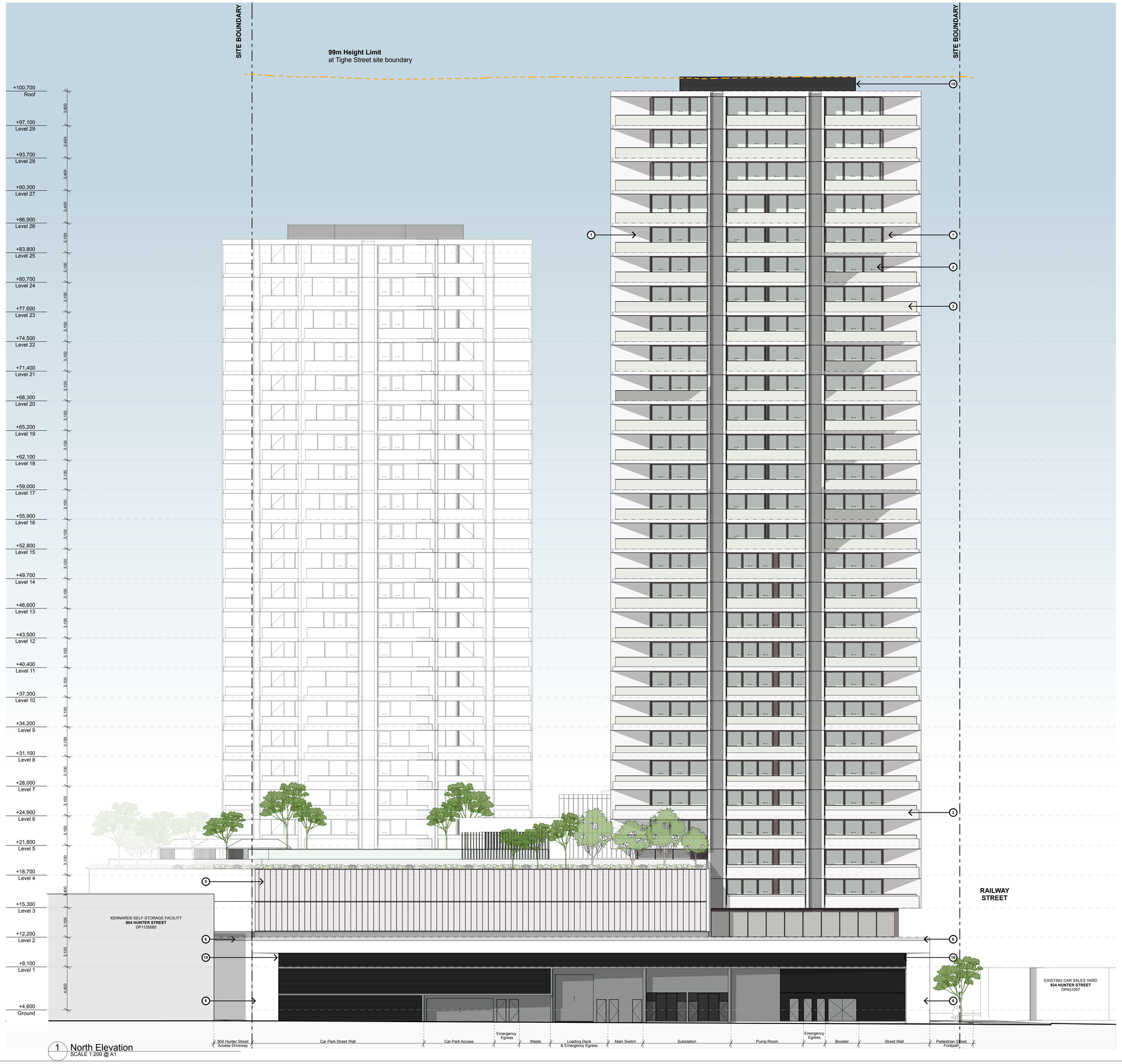
SITE BOUNDARY
SITE BOUNDARY
99m Height Limit
at Tighe Street site boundary
+100,700 Roof
+97,100 Level 29
+93,700 Level 28
+90,300 Level 27
+86,900 Level 26
+83,800 Level 25
+80,700 Level 24
+77,600 Level 23
+74,500 Level 22
+71,400 Level 21
+68,300 Level 20
+65,200 Level 19
+62,100 Level 18
+59,000 Level 17
+55,900 Level 16
+52,800 Level 15
+49,700 Level 14
+46,600 Level 13
+43,500 Level 12
+40,400 Level 11
+37,300 Level 10
+34,200 Level 9
+31,100 Level 8
+28,000 Level 7
+24,900 Level 6
+21,800 Level 5
+18,700 Level 4
+15,300 Level 3
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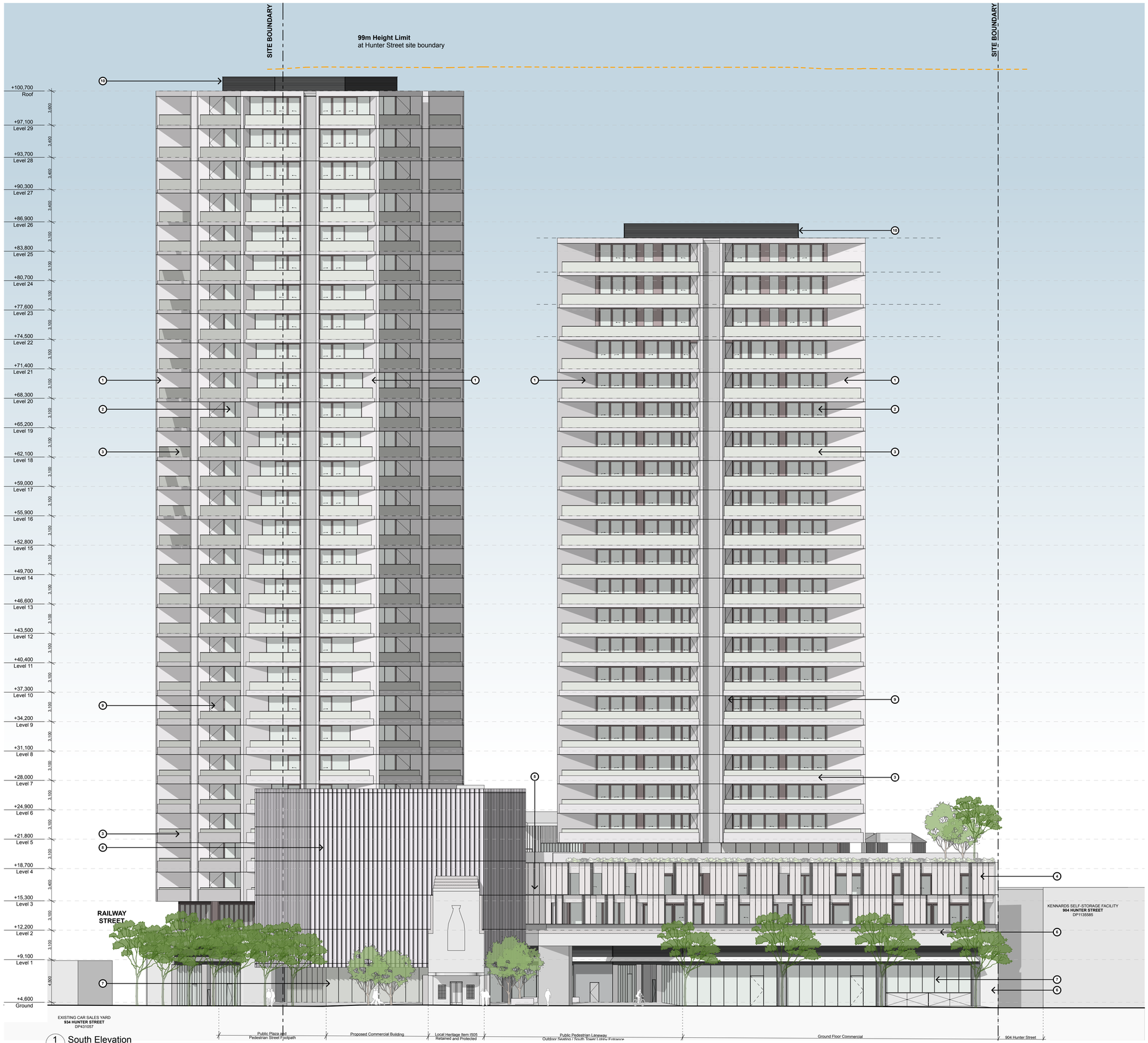

1 South Elevation
SCALE 1:200 @ A1

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7. RETAIL & LOBBY GLAZING
8. CURVED & PERFORATED ALUMINIUM VEIL SCREEN
9. PERFORATED OR METAL MESH AC ENCLOSURE SCREENS
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issue	description	date	verified
01	Issue for Review	10/8/21	01
02	Issue for Pre-DA	16/9/21	02
03	Issue for Pre-DA	27/9/21	03
04	Issue for Draft DA	1/10/21	04
05	Issue for DRAFT DA	8/10/21	05
A	Issue for Development Application	20/10/21	A

key plan

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project

Dairy Farmers Corner

924 Hunter Street 2/DP445736
Newcastle West NSW 2302

drawing title

Elevations
South Elevation

drawing scale	drawn	verified	date
AS SHOWN		SC	20/10/21

project #	drawing #	issue
21014	A-2002	A

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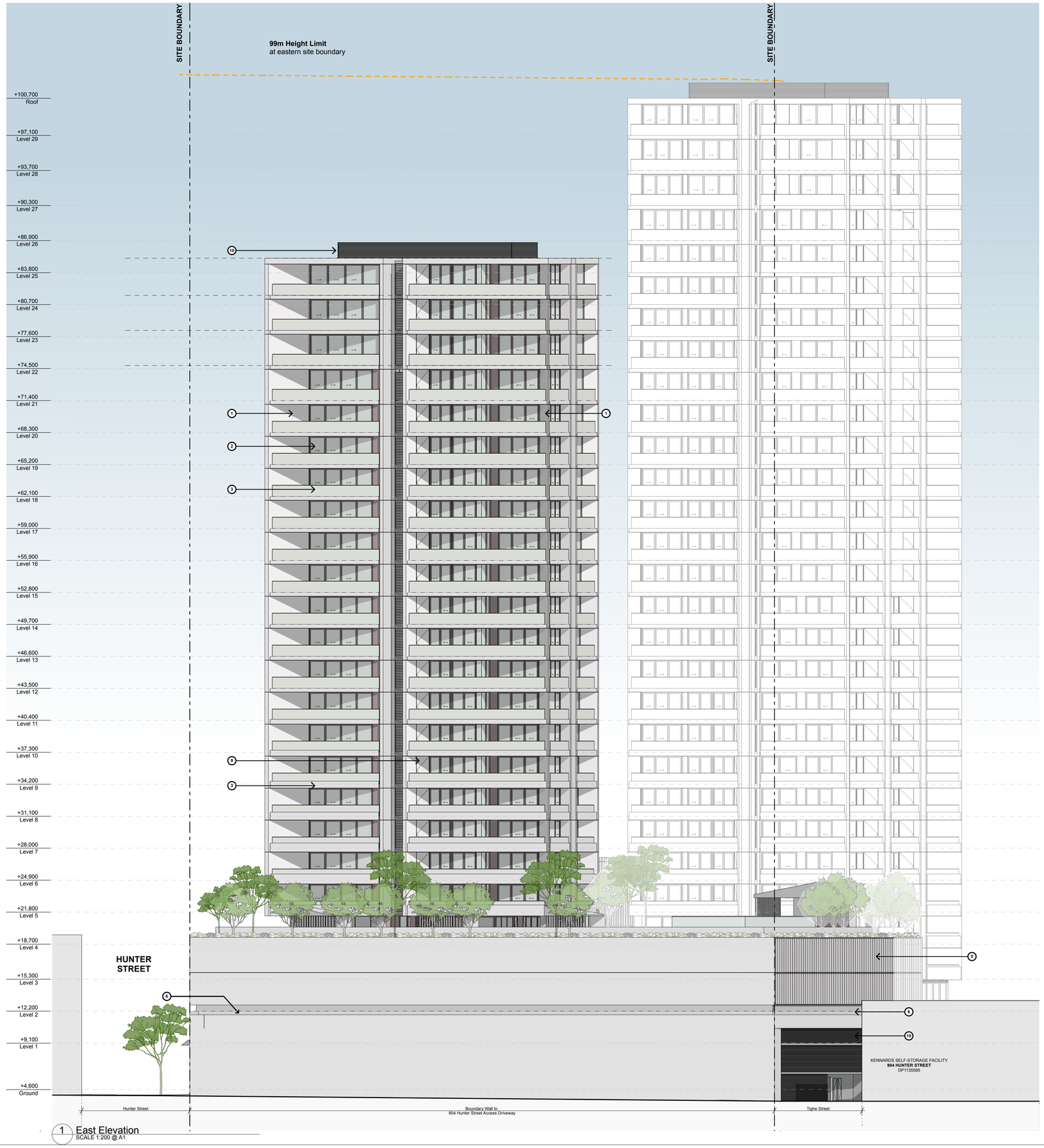

1 East Elevation
SCALE 1:200 @ A1

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5. FIXED PERFORATED OR MESH METAL SCREENS
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04	Issue for Draft DA	1/10/21	04
05	Issue for DRAFT DA	8/10/21	05
A	Issue for Development Application	20/10/21	A

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project

Dairy Farmers Corner

924 Hunter Street 2/DP445736
Newcastle West NSW 2302

drawing title

Elevations
East Elevation

drawing scale	drawn	verified	date
AS SHOWN		SC	20/10/21

project #	drawing #	issue
21014	A-2003	A

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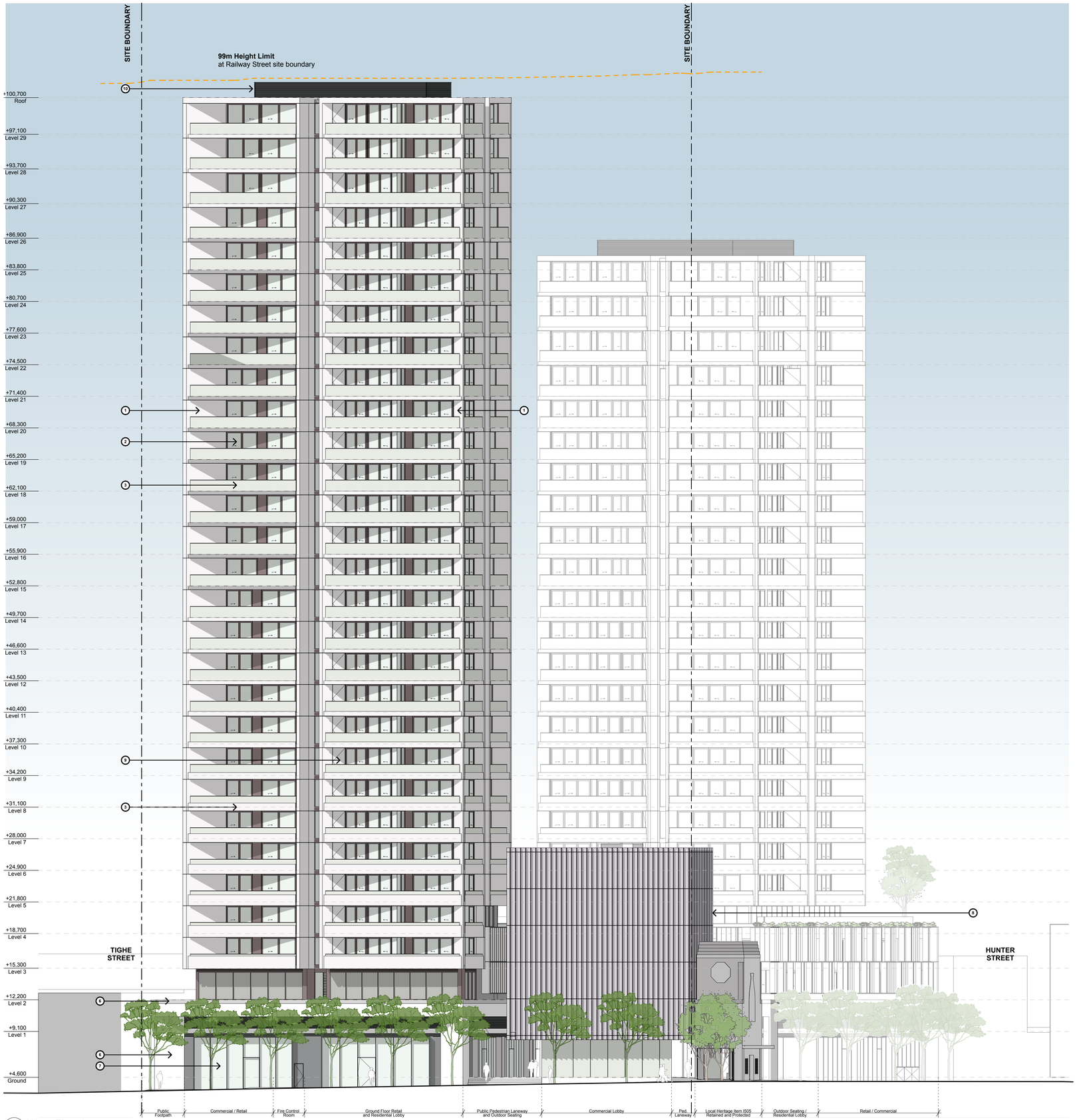

1 West Elevation
SCALE 1:200 @ A1

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03	Issue for Pre-DA	27/9/21	03
04	Issue for Draft DA	1/10/21	04
05	Issue for DRAFT DA	8/10/21	05
A	Issue for Development Application	20/10/21	A

key plan

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project

Dairy Farmers Corner

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Newcastle West NSW 2302

drawing title

Elevations
West Elevation

drawing scale	drawn	verified	date
AS SHOWN		SC	20/10/21

project #	drawing #	issue
21014	A-2004	A

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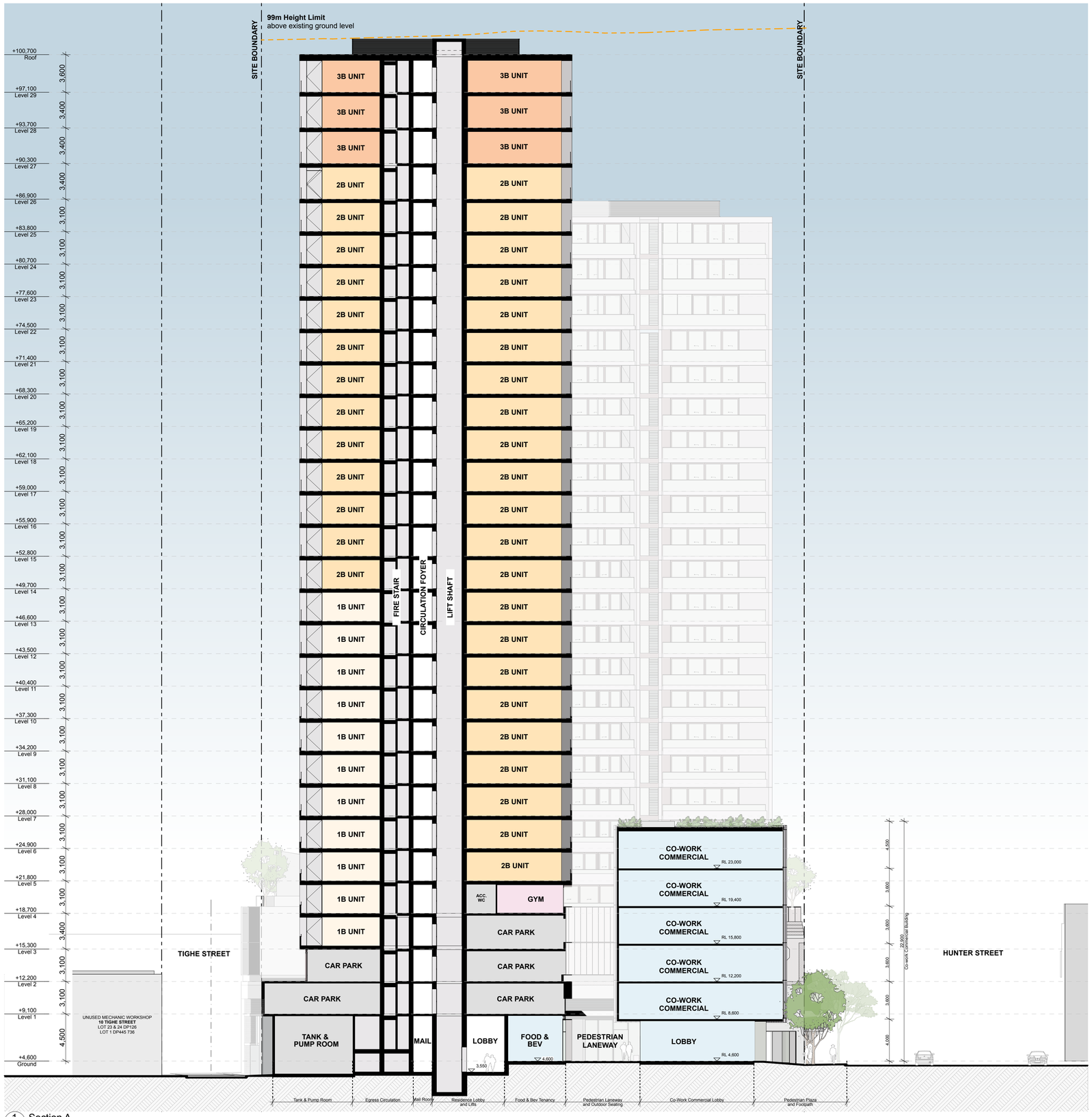

1 Section A
SCALE 1:200 @ A1

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A	Issue for Development Application	20/10/21	A

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project

Dairy Farmers Corner

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Newcastle West NSW 2302

drawing title

Sections
Section A

drawing scale	drawn	verified	date
AS SHOWN		SC	20/10/21

project #	drawing #	issue
21014	A-3001	A

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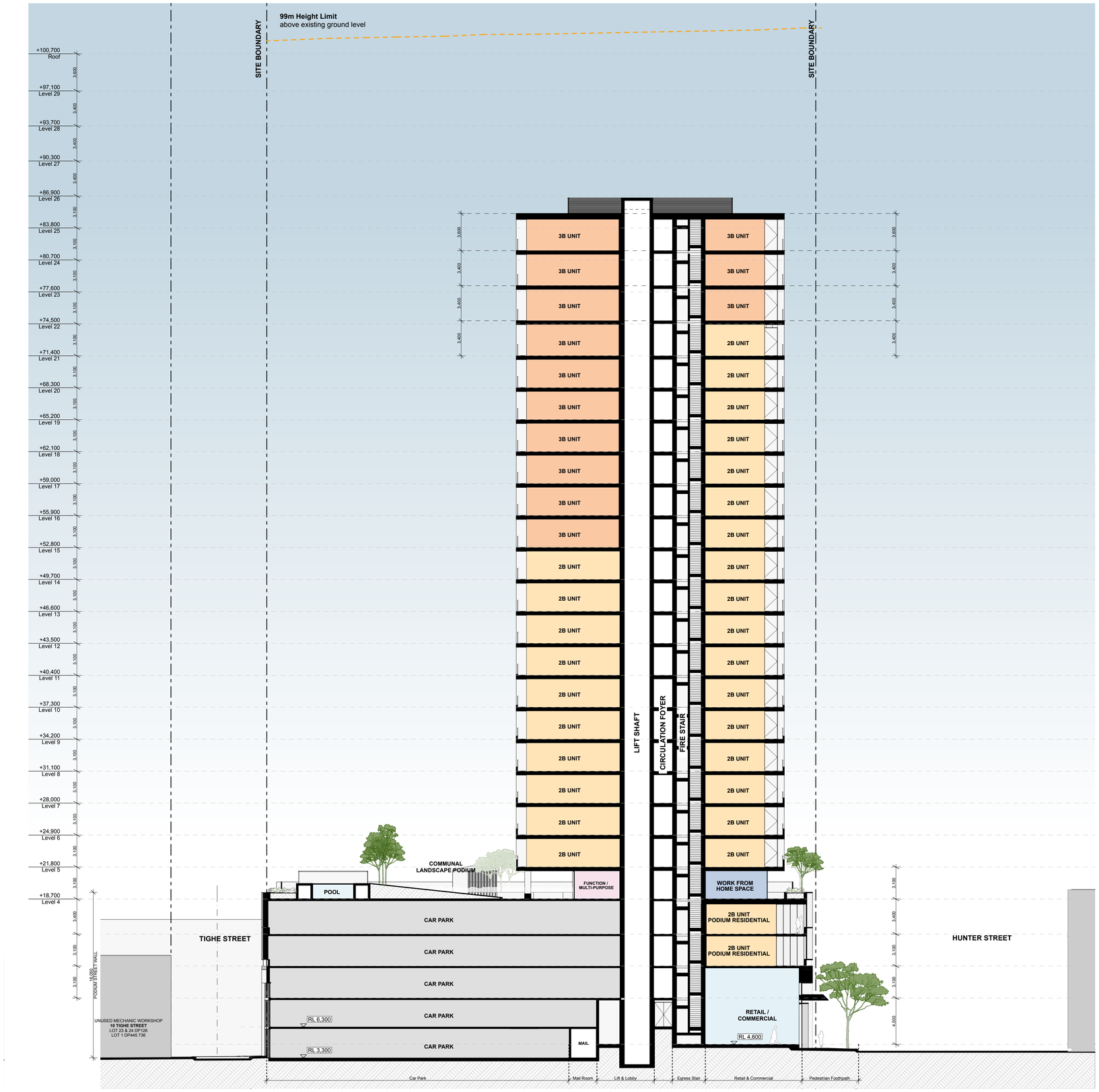

1 Section B
SCALE 1:200 @ A1

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05	Issue for DRAFT DA	8/10/21	05
A	Issue for Development Application	20/10/21	A

key plan

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project

Dairy Farmers Corner

924 Hunter Street 2/DP445736
Newcastle West NSW 2302

drawing title

Sections
Section B

drawing scale	drawn	verified	date
AS SHOWN		SC	20/10/21

project #	drawing #	issue
21014	A-3002	A

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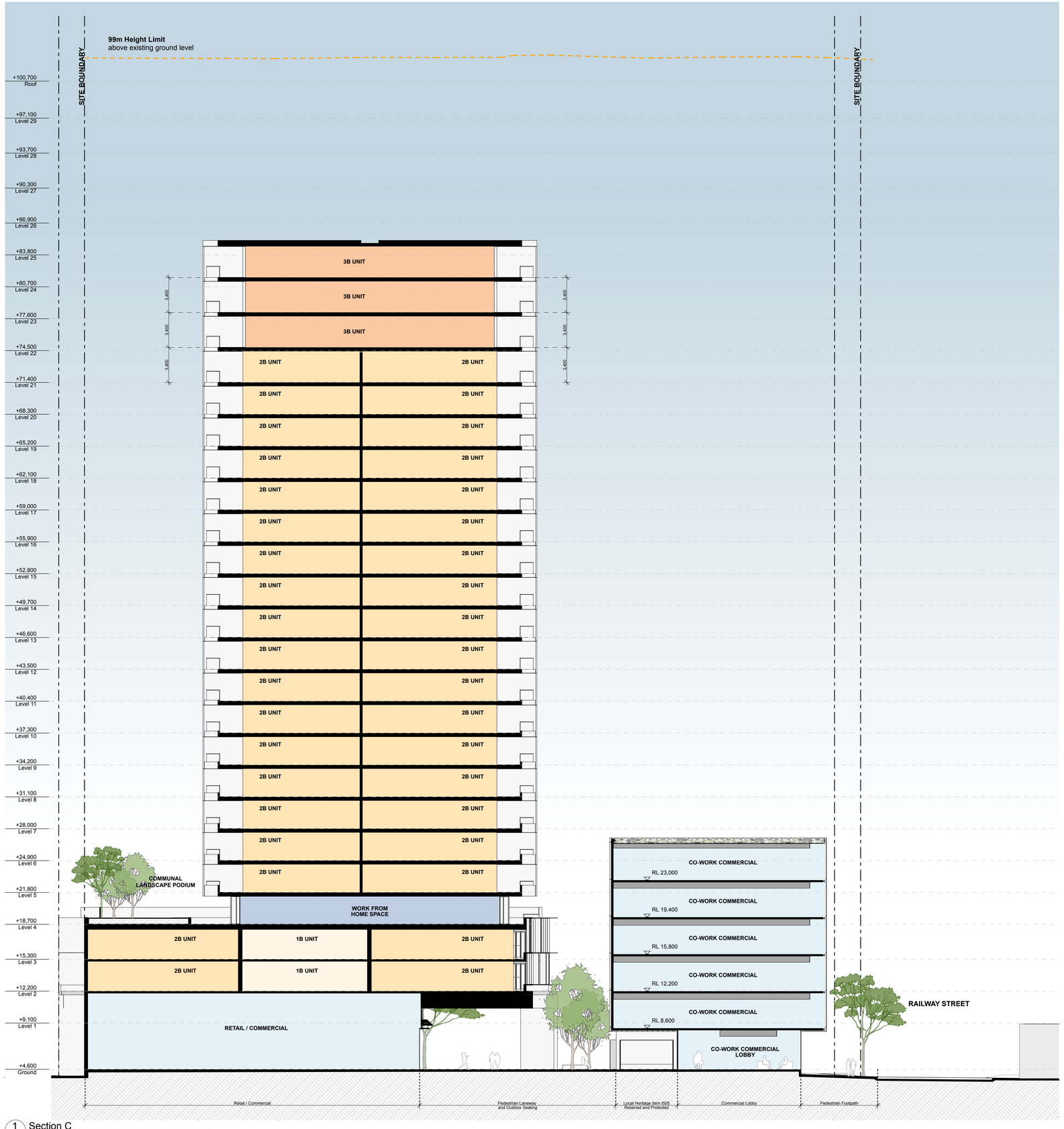

1 Section C
SCALE 1:200 @ A1

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03	Issue for Draft DA	1/10/21	03
04	Issue for DRAFT DA	8/10/21	04
A	Issue for Development Application	20/10/21	A

key plan

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E admin@ckds.com.au

project

Dairy Farmers Corner

924 Hunter Street 2/DP445736
Newcastle West NSW 2302

drawing title

Sections
Section C

drawing scale	drawn	verified	date
AS SHOWN		SC	20/10/21

project #	drawing #	issue
21014	A-3003	A

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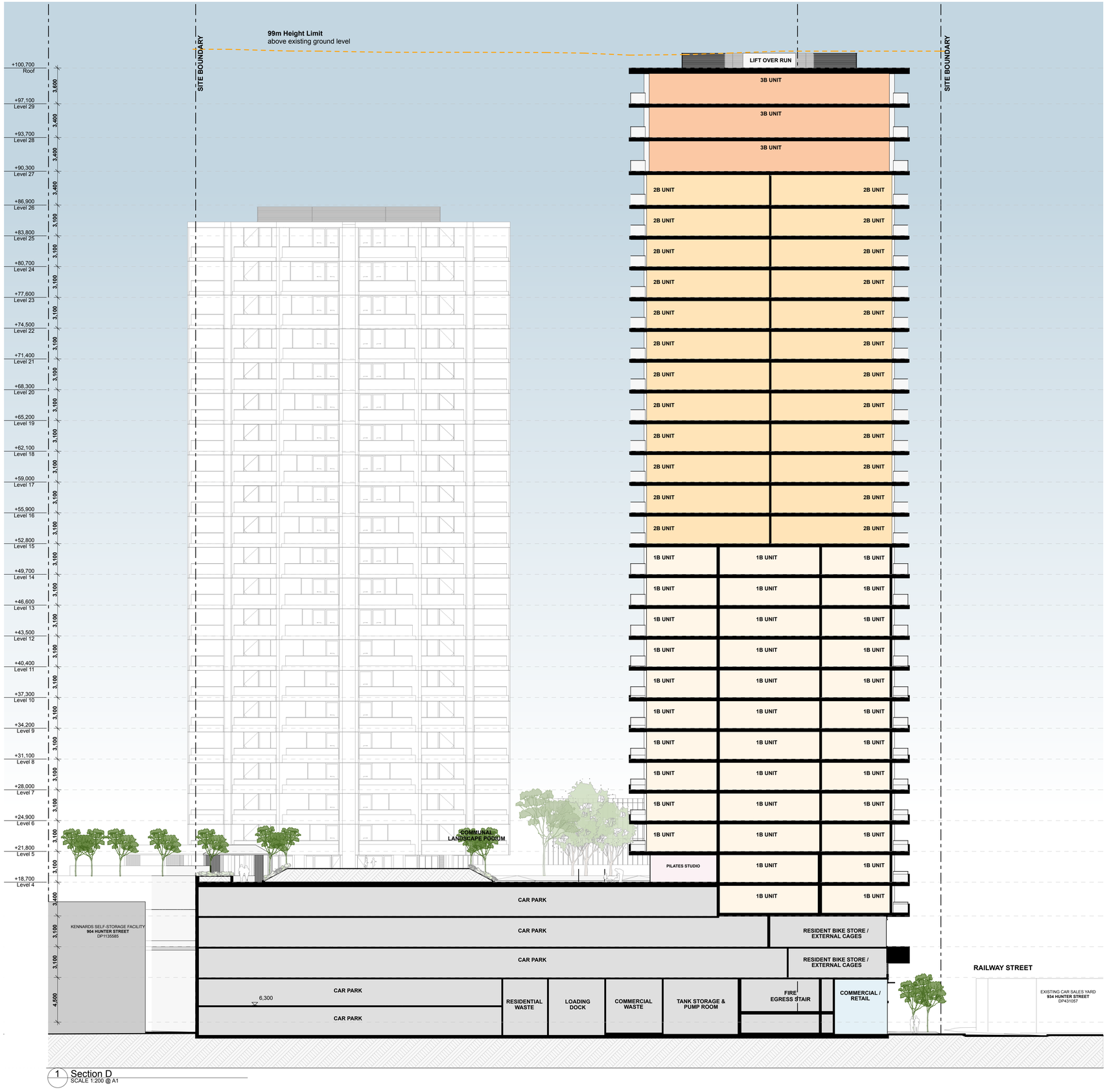

1 Section D
SCALE 1:200 @ A1

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drawing title

Sections
Section D

drawing scale	drawn	verified	date
AS SHOWN		SC	20/10/21

project #	drawing #	issue
21014	A-3004	A

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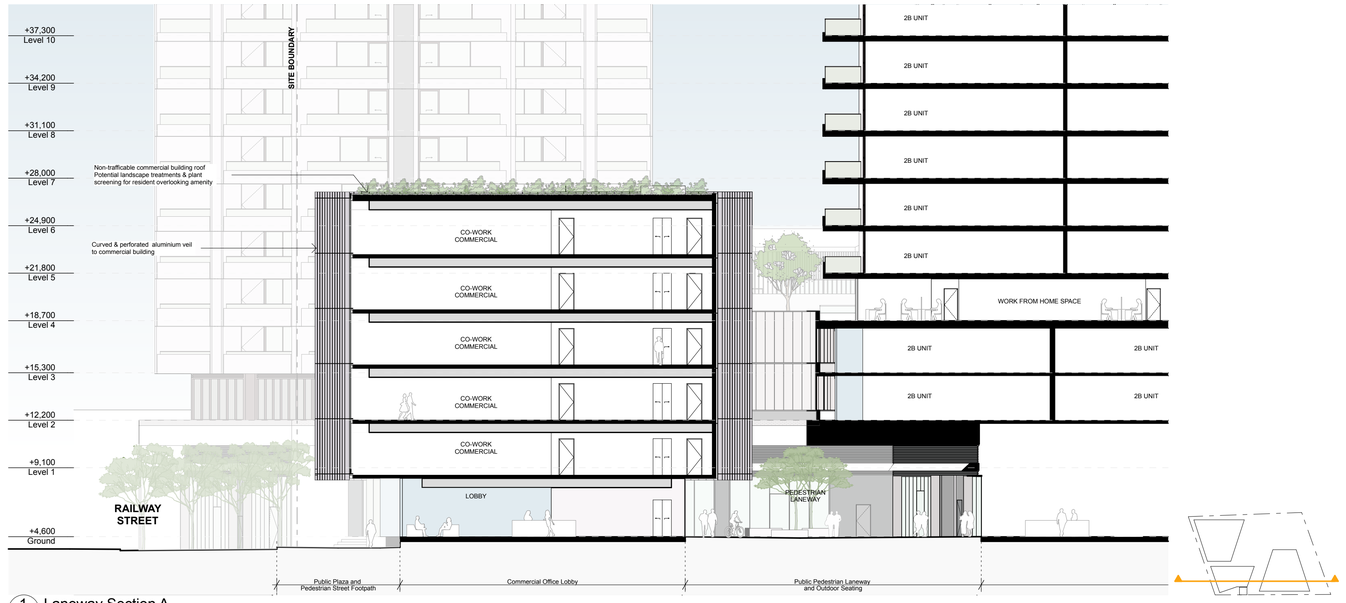
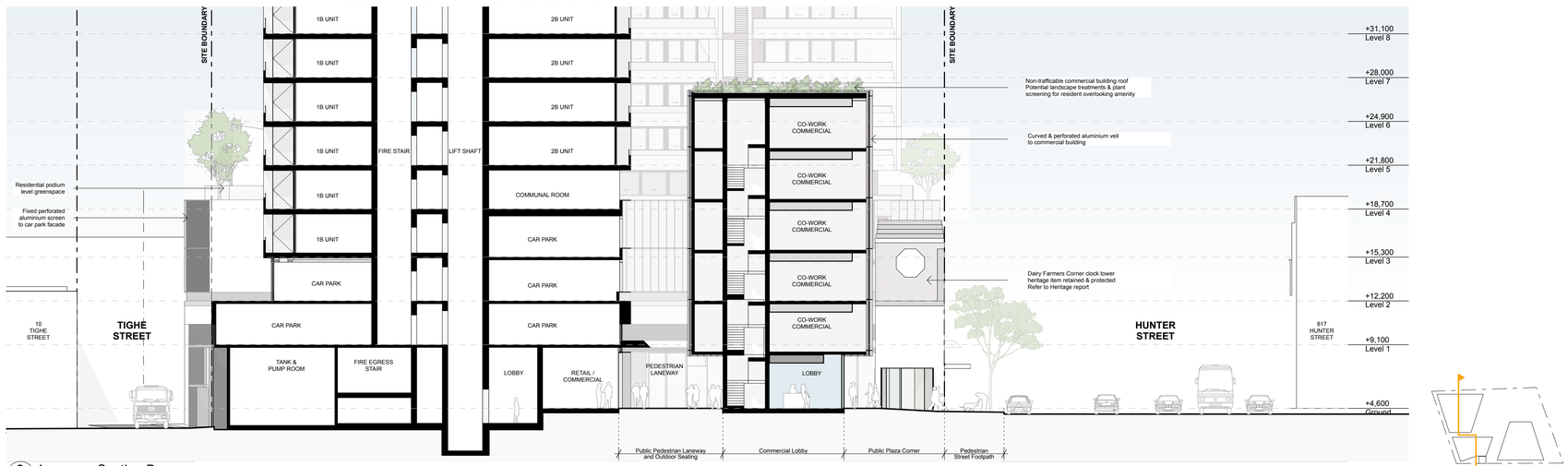


1 Laneway Section A
SCALE 1:200 @ A1



2 Laneway Section B
SCALE 1:200 @ A1

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drawing title

Sections
Laneway Sections

drawing scale	drawn	verified	date
AS SHOWN		SC	20/10/21

project #	drawing #	issue
21014	A-3005	A

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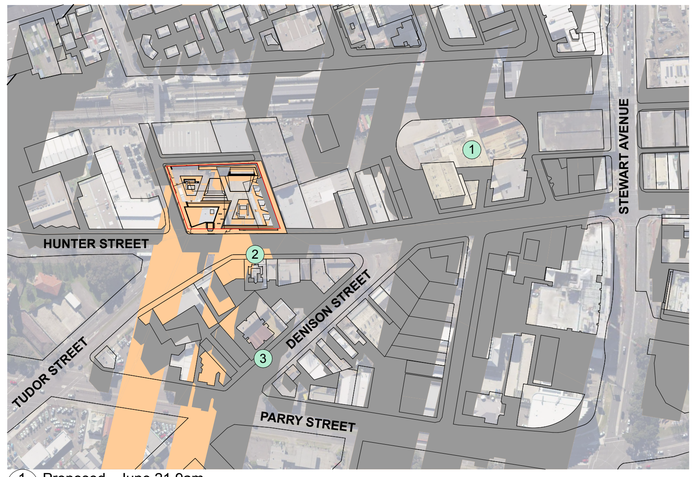
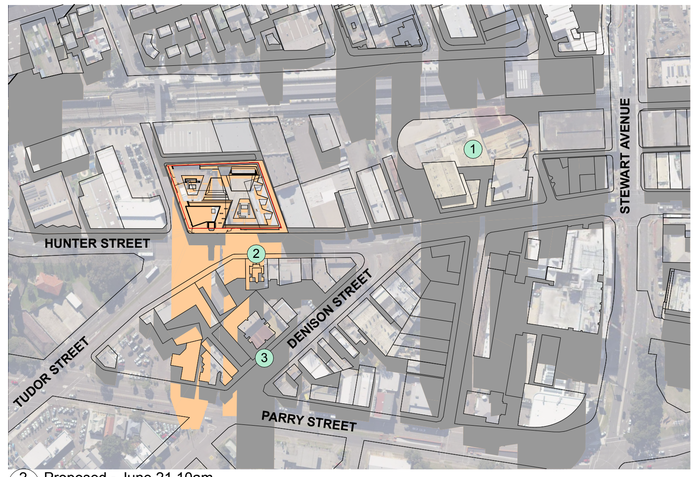


1 Proposed - June 21 9am
SCALE 1:2500 @ A1



2 Proposed - June 21 10am
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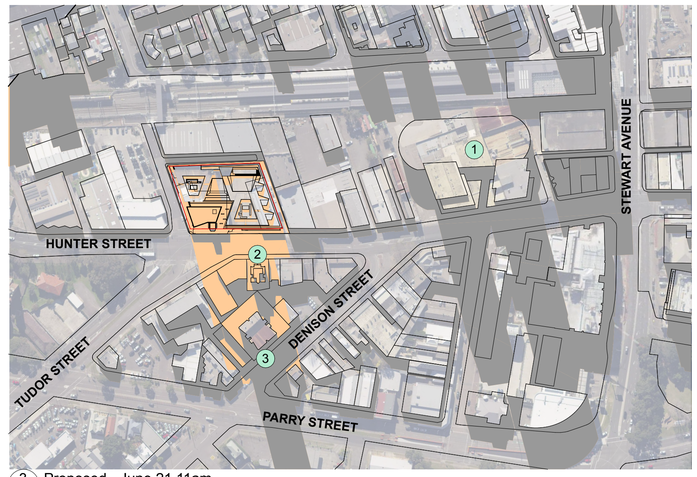
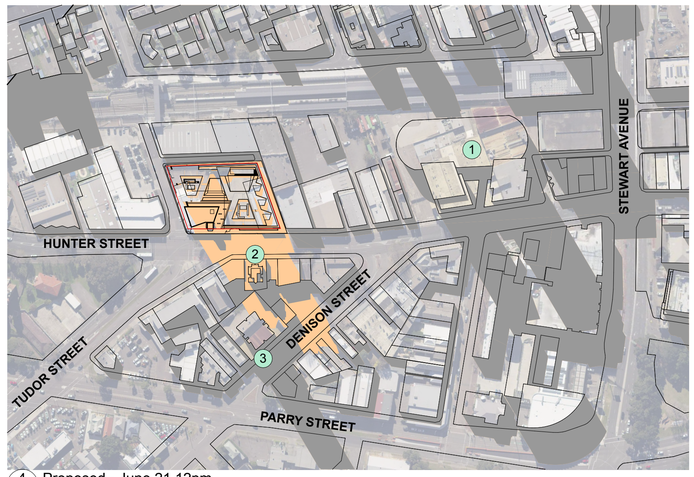
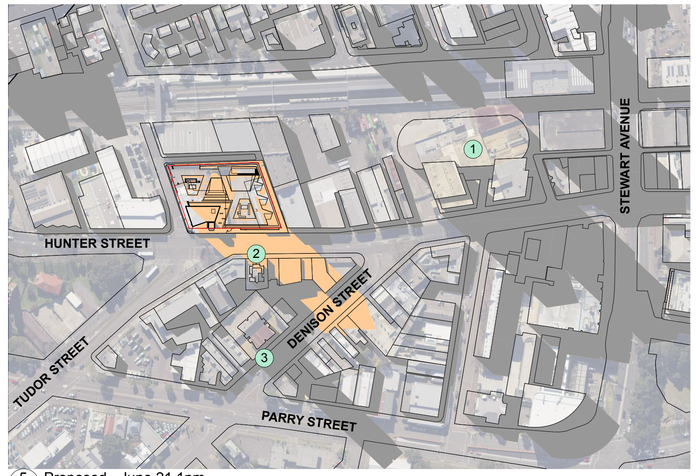


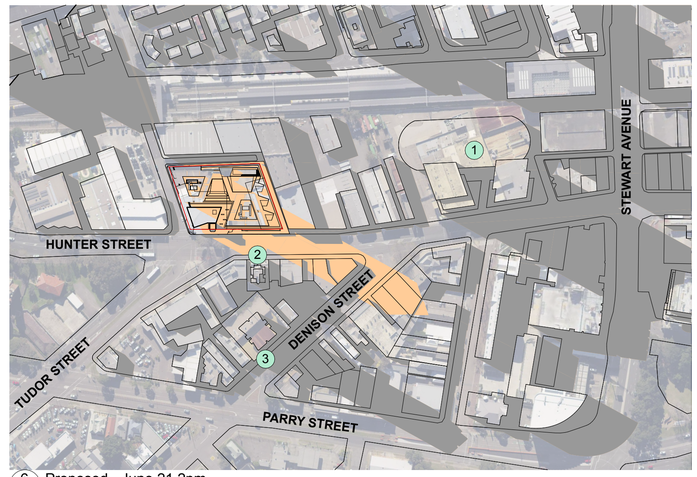
3 Proposed - June 21 11am
SCALE 1:2500 @ A1



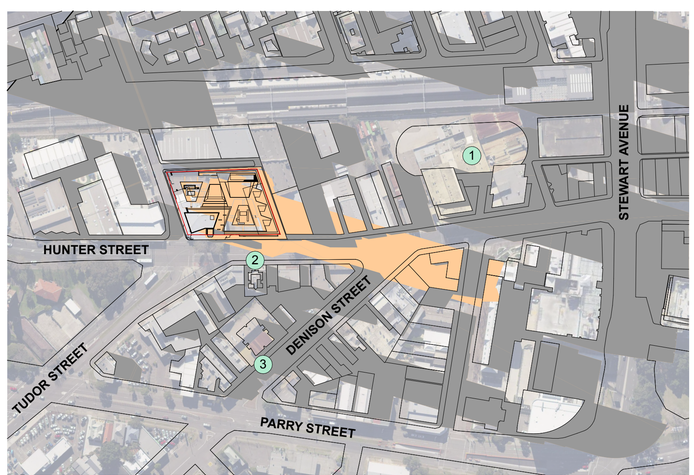
4 Proposed - June 21 12pm
SCALE 1:2500 @ A1



5 Proposed - June 21 1pm
SCALE 1:2500 @ A1



6 Proposed - June 21 2pm
SCALE 1:2500 @ A1



7 Proposed - June 21 3pm
SCALE 1:2500 @ A1

1 APPROVED DA - *THE STORE* - 90m
DUAL RESIDENTIAL APARTMENT TOWERS

2 APPROVED DA - *815 HUNTER STREET* - 56m
SINGLE RESIDENTIAL APARTMENT TOWER

3 APPROVED DA - *20 DENISON STREET* - 71m
SINGLE RESIDENTIAL APARTMENT TOWER

SITE BOUNDARY

APPROXIMATE EXISTING SHADOWS

APPROXIMATE ADDITIONAL SHADOWS CAST BY PROPOSAL

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A	Issue for Development Application	20/10/21	A

key plan

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project

Dairy Farmers Corner

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Newcastle West NSW 2302

drawing title

Shadow Diagrams
Shadow Diagrams

drawing scale	drawn	verified	date
AS SHOWN		SC	20/10/21

project #	drawing #	issue
21014	A-4001	A

Development Application

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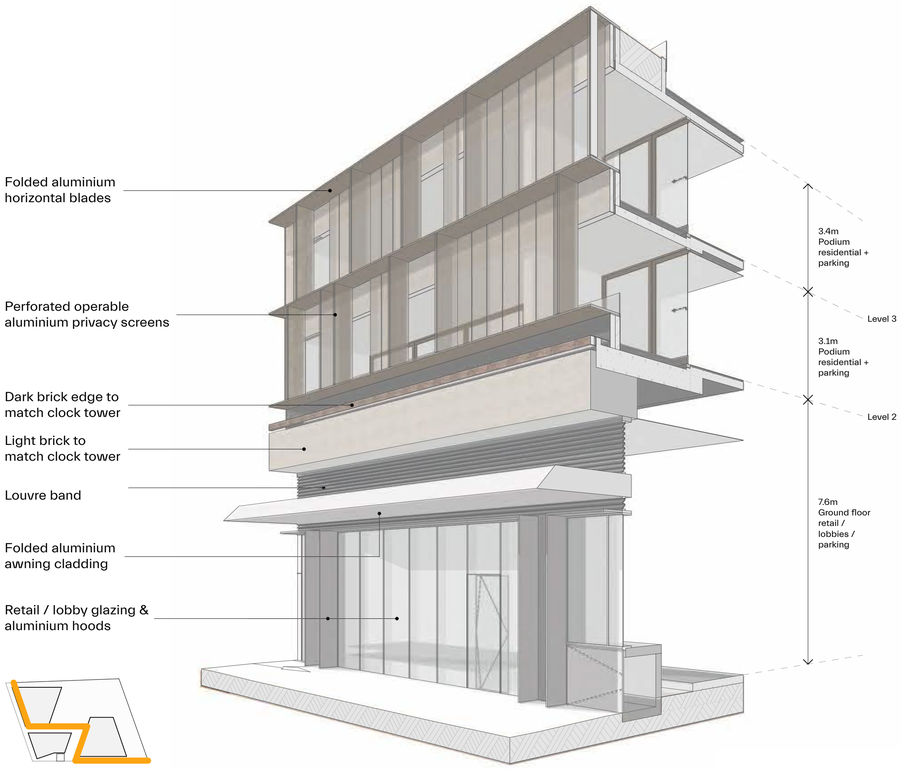

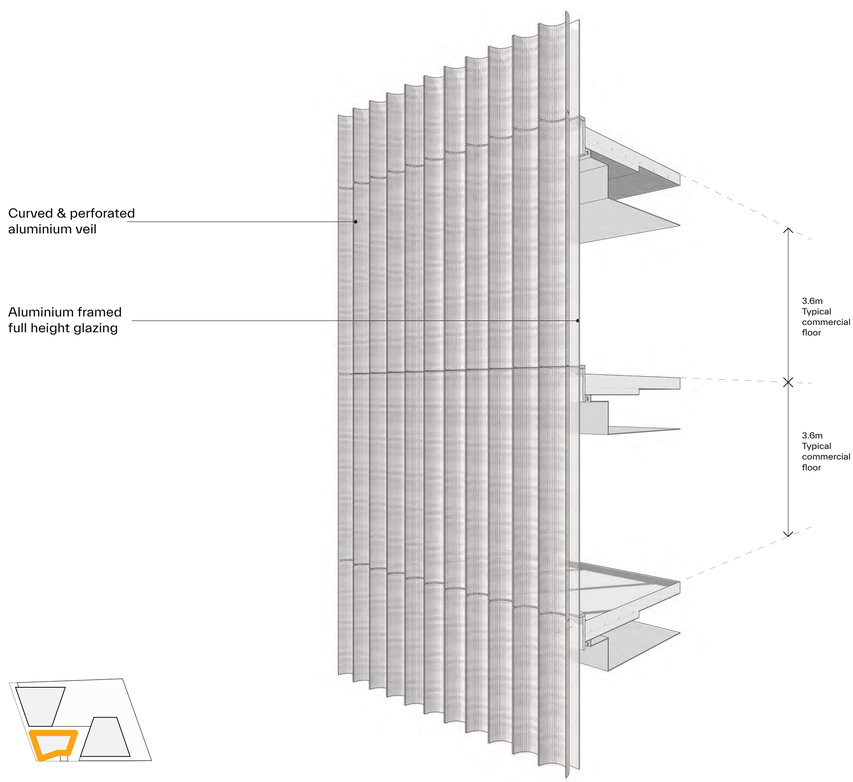

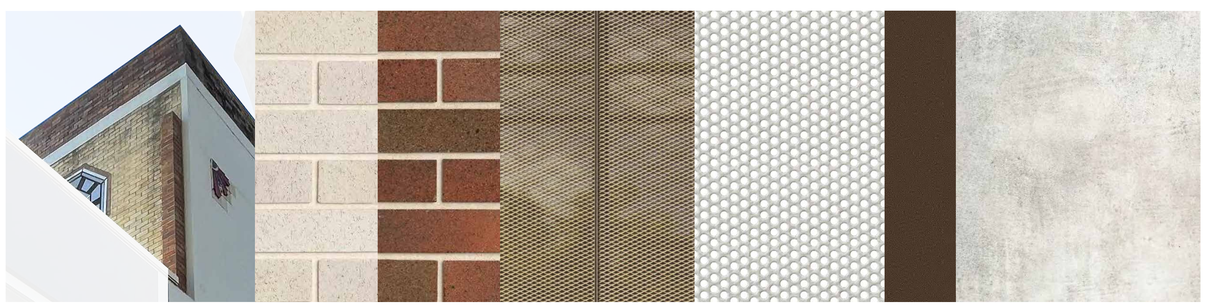

Podium
1. Existing heritage clock tower
2. Light brick to match clock tower
3. Brown brick to match clock tower
4. Dark bronze perforated screen

Commercial
5. Perforated curved screens

Tower
6. Dark bronze frame & details
7. Concrete perimeter columns

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project

Dairy Farmers Corner

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drawing title

Materiality
Podium Materiality

drawing scale	drawn	verified	date
AS SHOWN		SC	20/10/21

project #	drawing #	issue
21014	A-5001	A

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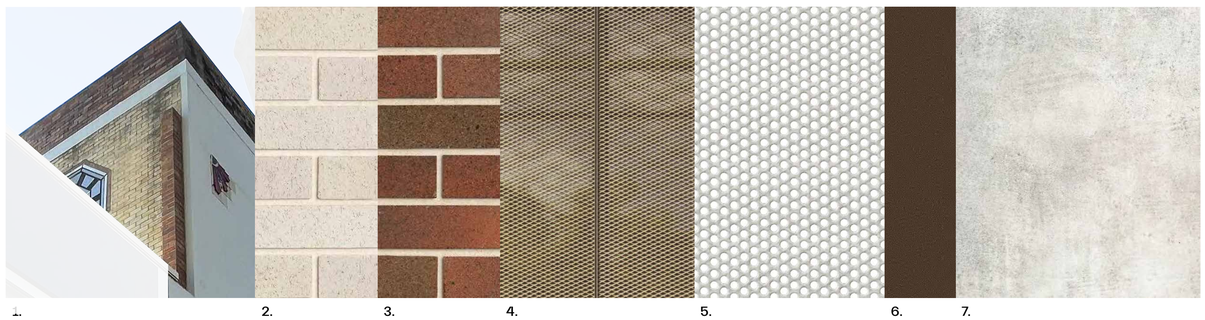

1. 2. 3. 4. 5. 6. 7.

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drawing title

Materiality
Tower Materiality

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21014	A-5002	A

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Summary

	DCP / LEP	Concept Proposal	
FSR	5.5 :1	**5.4 :1**	
GFA	21674.07 m²	**21460 m²**	214
1B		**36 units**	19.7%
2B		**128 units**	69.9%
3B		**19 units**	10.4%
Total Units		**183 units**	

Solar approx 1hr	N/A	85.2%
Solar min 2hr	**70% total**	**73.8%**
'No Sun'	**15% total**	**14.2%**
Cross Vent First 9 floors	**60%**	**79.2%**
Cross Vent Total	N/A	91.3%

Car Parking	232.4 spaces	**237 spaces**
Bike Parking	212.0 spaces	**133 spaces**
Motorbike Parking	9.8 spaces	**18 spaces**

NOTES;
- BASE FSR 5:1 UNDER LEP CLAUSE 7.10
- FSR & HEIGHT ASSUME 10% DESIGN EXCELLENCE BONUS

Area Schedule

		RL (m)	Floor Height	1B	2B	3B	Parking Spaces	Res GFA m² (1)	Comm GFA m² (1)
	Lift Overrun	100.90							
	Roof / Plant	99.90	1						
TOWER	Level 29	96.30	3.6			2		375	
TOWER	Level 28	92.90	3.4			2		375	
TOWER	Level 27	89.50	3.4			2		375	
TOWER	Level 26	86.40	3.1		4			380	
TOWER	Level 25	83.30	3.1		4			380	
TOWER	Level 24	80.20	3.1		4	2		760	
TOWER	Level 23	77.10	3.1		4	2		760	
TOWER	Level 22	74.00	3.1		4	2		760	
TOWER	Level 21	70.90	3.1		6	1		760	
TOWER	Level 20	67.80	3.1		6	1		760	
TOWER	Level 19	64.70	3.1		6	1		760	
TOWER	Level 18	61.60	3.1		6	1		760	
TOWER	Level 17	58.50	3.1		6	1		760	
TOWER	Level 16	55.40	3.1		6	1		760	
TOWER	Level 15	52.30	3.1		6	1		760	
TOWER	Level 14	49.20	3.1	3	6			760	
TOWER	Level 13	46.10	3.1	3	6			760	
TOWER	Level 12	43.00	3.1	3	6			760	
TOWER	Level 11	39.90	3.1	3	6			760	
TOWER	Level 10	36.80	3.1	3	6			760	
TOWER	Level 09	33.70	3.1	3	6			760	
TOWER	Level 08	30.60	3.1	3	6			760	
TOWER	Level 07	27.50	3.1	3	6			760	
TOWER	Level 06	24.40	3.1	3	6			760	
TOWER	Level 05	21.30	3.1	3	6			760	240
PODIUM	Level 04	18.20	3.1	2	1			690	240
PODIUM	Level 03	15.10	3.1	3	3		55	595	240
PODIUM	Level 02	12.00	3.1	1	2		56	575	240
PODIUM	Level 01	8.90	3.1				60	230	240
PODIUM	Ground / Upper Ground	4.6	4.30				66	340	745
	Totals			**36**	**128**	**19**	**237**	**19515**	**1945**

Analysis

'No Sun'	Solar 1hr	Solar 2hr	Cross Vent
0	2	2	2
0	2	2	2
0	2	2	2
1	3	3	4
1	3	3	4
1	5	4	6
1	5	4	6
1	5	4	6
1	6	5	7
1	6	5	7
1	6	5	7
1	6	5	7
1	6	5	7
1	6	5	7
1	8	7	8
1	8	7	8
1	8	7	8
1	8	7	8
1	8	7	8
1	8	7	8
1	8	7	8
1	8	7	8
1	8	7	8
0	3	3	2
2	4	3	3
2			1
14.2%	**85.2%**	**73.8%**	**91.3%**

Parking Calculations

	Car Parking			Bike Parking			Motorbike Parking		
	Rate		Spaces Required	Rate		Spaces Required	Rate		Spaces Required
Residential	Spaces per 1B	0.60	21.6	Residential	1 per unit	183.0	1 space per	20 car spaces	8.2
	Spaces per 2B	0.90	115.2	Visitor	1 per 10 units	18.3			
	Spaces per 3B / 4B	1.40	26.6						
	Visitor	1 per 5	36.6						
Commercial / Retail	1 space per	60 m²	32.4	1 space per	200 m² commercial	9.7	1 space per	20 car spaces	1.6
				1 space per	20 Retail staff				
			232.4			**212.0**			**9.8**

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Electrical Projects Australia
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Mayfield, NSW, 2304

Mechanical Engineer
EVC Consulting Engineers
Suite 101, 470 King St
Newcastle West, NSW, 2302

Hydraulic Engineer
Wallace Design Group
PO Box 850
Warners Bay, NSW, 2282

client

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www.ckds.com.au
CENTRAL COAST
1/39 Adelaide St
(P.O. Box 4400)
East Gosford NSW 2250
P 02 4321 0503
E admin@ckds.com.au

project

Dairy Farmers Corner

924 Hunter Street 2/DP445736
Newcastle West NSW 2302

drawing title

Schedules
Yield Schedule

drawing scale	drawn	verified	date
AS SHOWN		SC	20/10/21

project #	drawing #	issue
21014	A-7001	A

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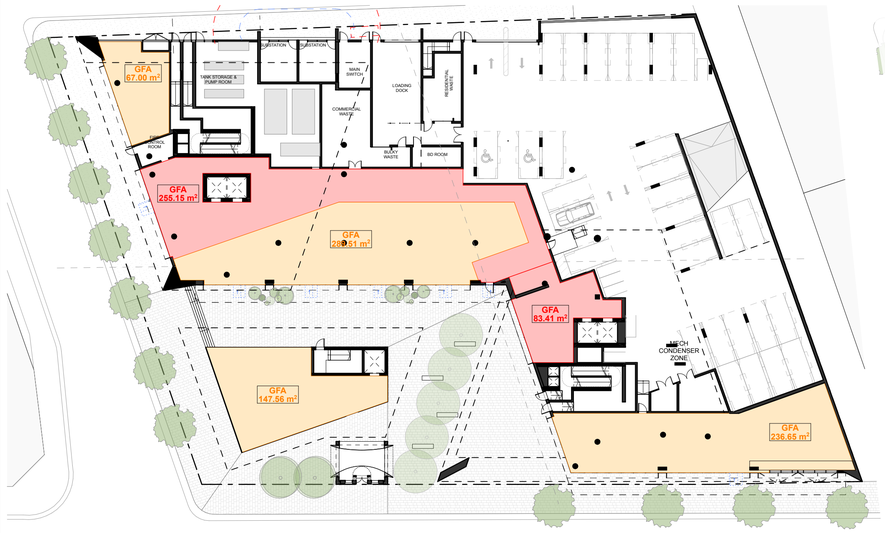
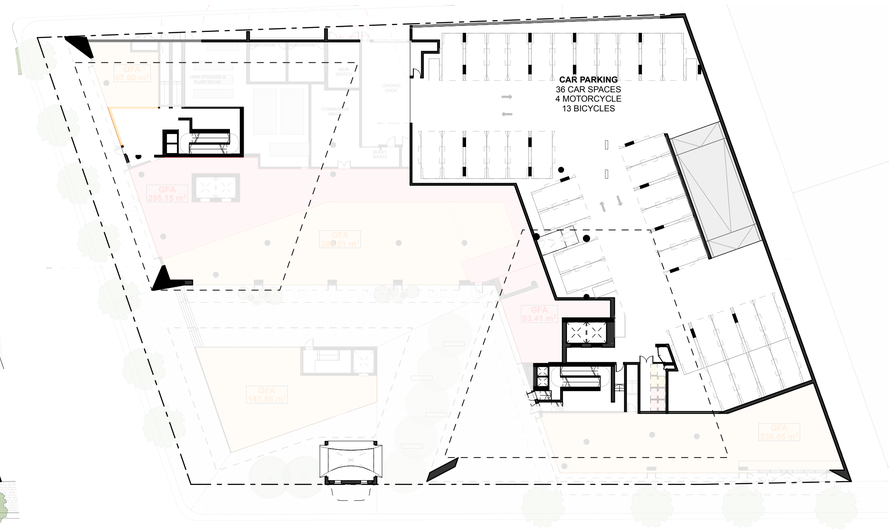
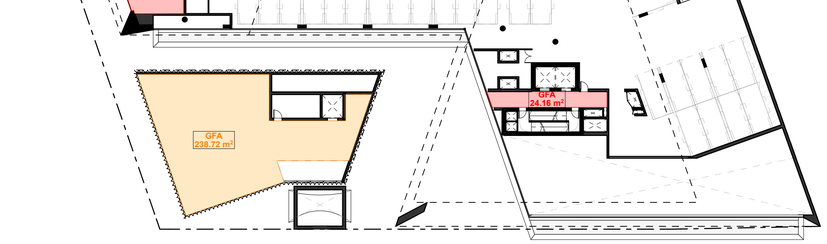
Development Application



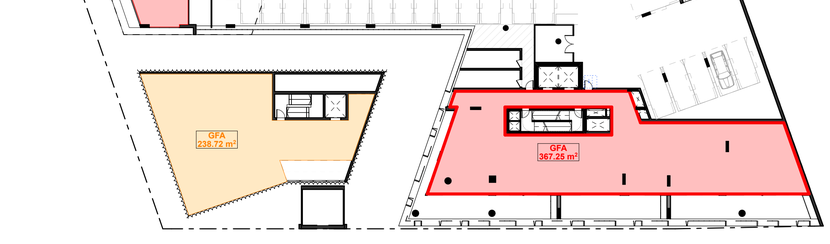
1 Ground
SCALE 1:350 @ A1



2 Upper Ground Car Park
SCALE 1:350 @ A1

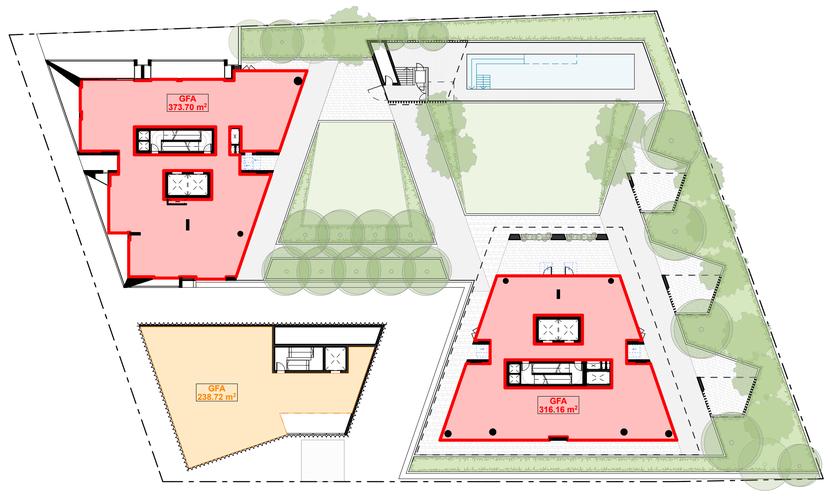


3 Level 1
SCALE 1:350 @ A1



4 Level 2
SCALE 1:350 @ A1

5 Level 3
SCALE 1:350 @ A1



6 Level 4
SCALE 1:350 @ A1

REFER TO A-7001 FOR FSR SUMMARY & AREA SCHEDULE

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issue	description	date	verified
01	Issue for Review	13/8/21	01
02	Issue for Pre-DA	27/9/21	02
03	Issue for DRAFT DA	8/10/21	03
A	Issue for Development Application	20/10/21	A

key plan

North Point

consultants

Civil/Structural Engineers
Northrop Consulting Engineers
Level 1, 215 Pacific Highway
Charlestown, NSW, 2290

Electrical Engineer
Electrical Projects Australia
386 Maitland Rd
Mayfield, NSW, 2304

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client

THIRD GROUP

base Build PTY LTD

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project

Dairy Farmers Corner

924 Hunter Street 2/DP445736
Newcastle West NSW 2302

drawing title

Schedules
GFA Calculations

drawing scale	drawn	verified	date
AS SHOWN		SC	20/10/21

project #	drawing #	issue
21014	A-7002	A

Development Application

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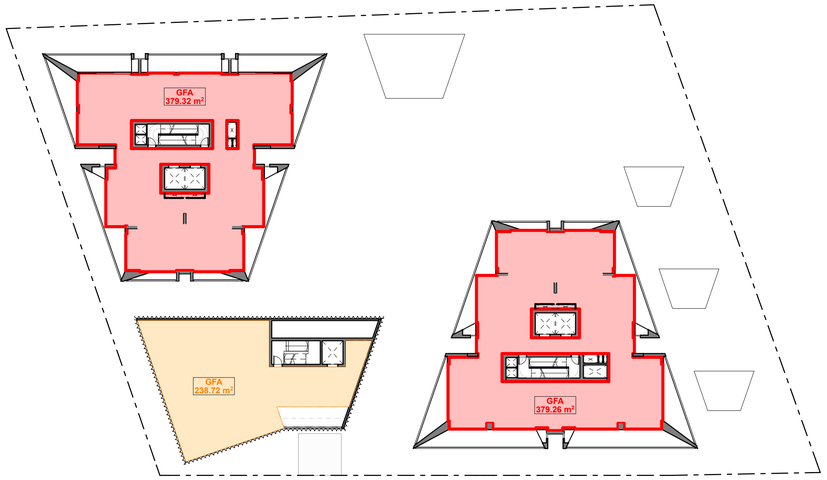
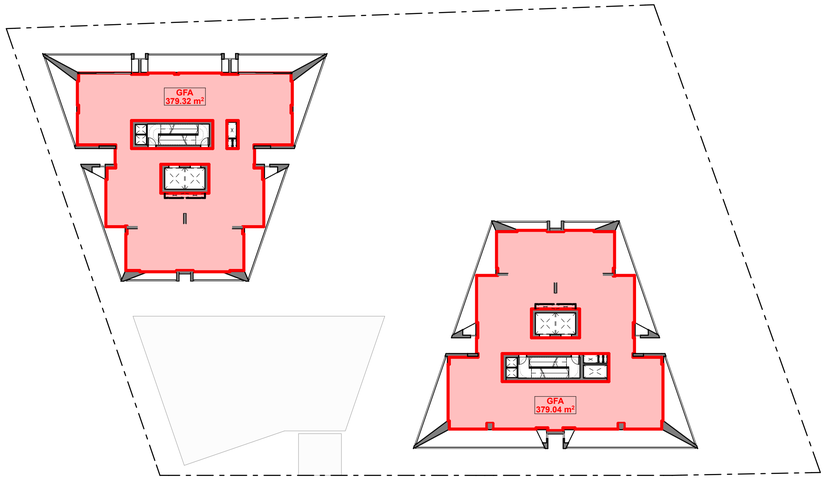
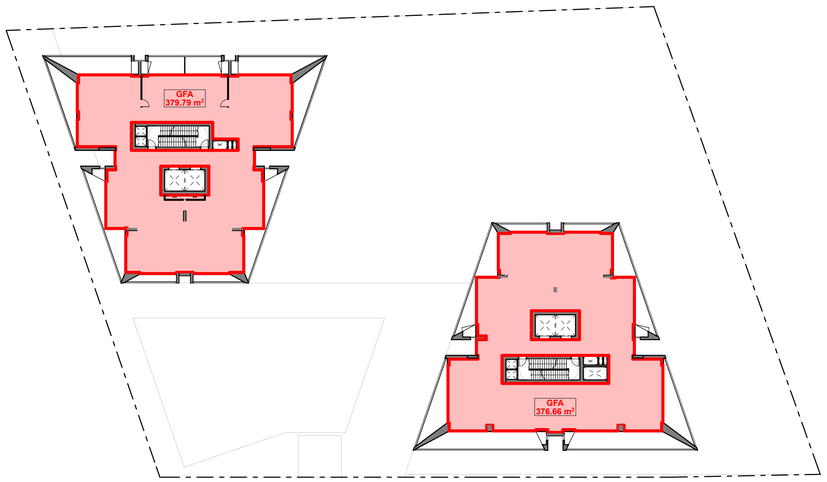


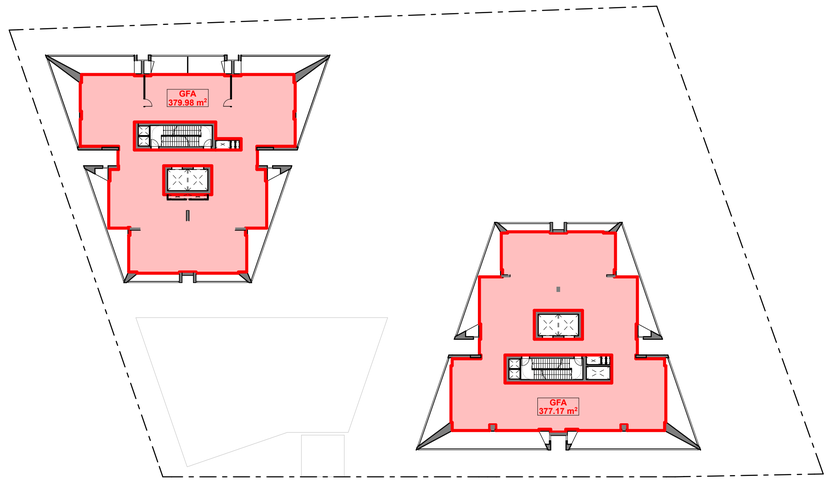
1 Level 5
SCALE 1:350 @ A1



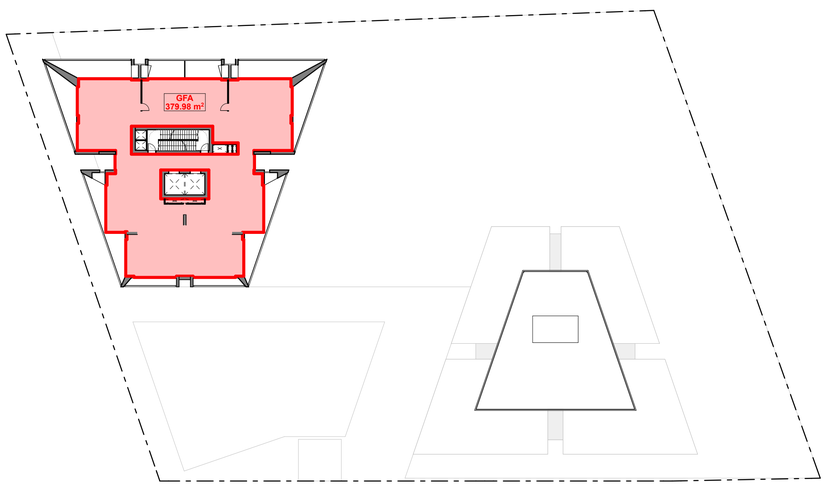
2 Level 6-14
SCALE 1:350 @ A1



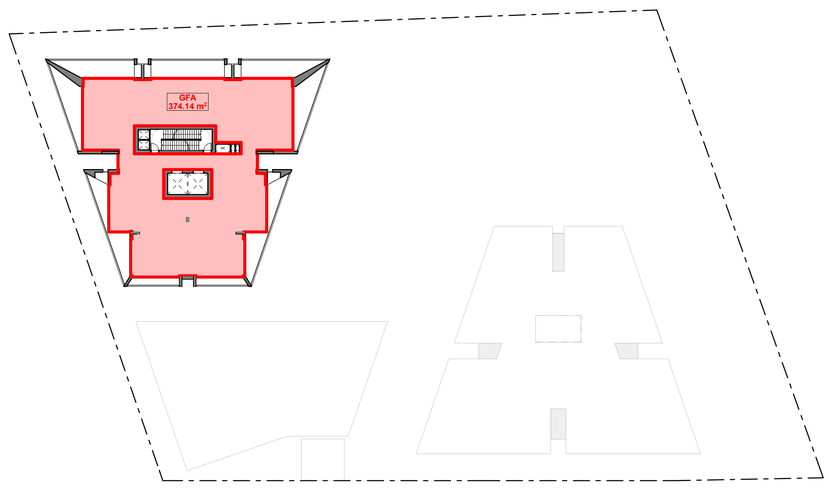
3 Level 15 - 21
SCALE 1:350 @ A1



4 Level 22 - 24
SCALE 1:350 @ A1



5 Level 25 - 26
SCALE 1:350 @ A1



6 Level 27 - 29
SCALE 1:350 @ A1

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A	Issue for Development Application	20/10/21	A

key plan

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project

Dairy Farmers Corner

924 Hunter Street 2/DP445736
Newcastle West NSW 2302

drawing title

Schedules
GFA Calculations

drawing scale	drawn	verified	date
AS SHOWN		SC	20/10/21

project #	drawing #	issue
21014	A-7003	A

Development Application

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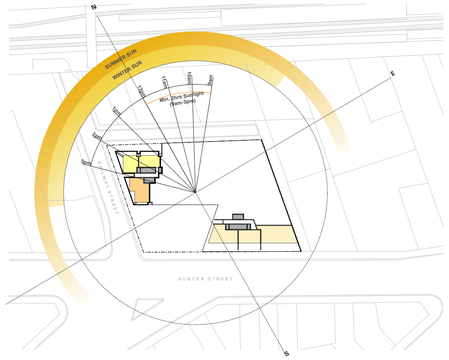
ADG Solar Analysis

Totals

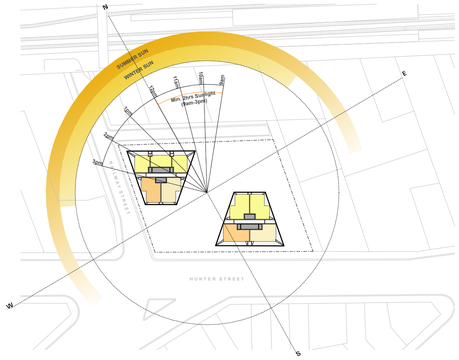
Solar approx 1hr	N/A	85.2%
Solar min 2hr	**70% total**	**73.8%**
'No Sun'	**15% total**	**14.2%**

Typical Floor Analysis



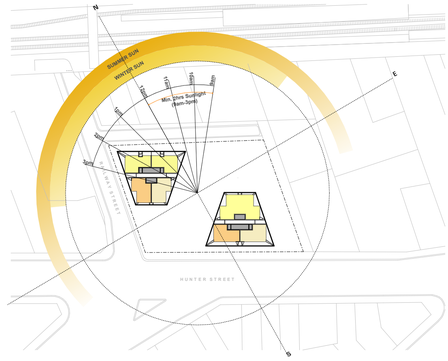
Podium Level Plans

< 2hrs (3 out of 6) 50.00%	min 2hrs (1 out of 6) 33.35%	min 3hrs (2 out of 6) 33.35%



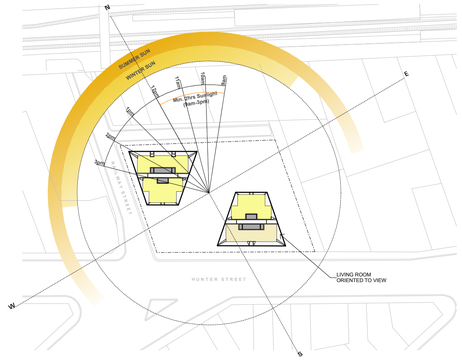
Tower Low Level Plans

< 2hrs (2 out of 9) 22.00%	min 2hrs (2 out of 9) 22.00%	min 3hrs (5 out of 9) 56.00%



Tower Mid Level Plans

< 2hrs (2 out of 7) 28.50%	min 2hrs (2 out of 7) 28.50%	min 3hrs (3 out of 7) 43.00%



Tower High Level Plans

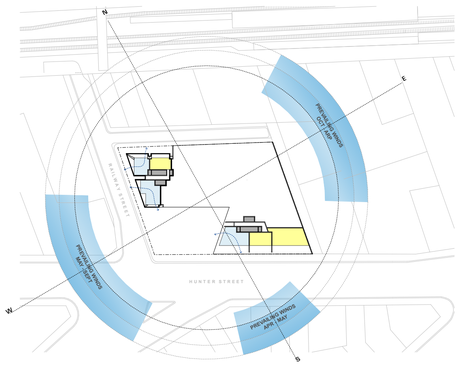
< 2hrs (1 out of 4) 25.00%	min 2hrs (0 out of 4) 0.00%	min 3hrs (3 out of 4) 75.00%

ADG Cross Ventilation Analysis

Totals

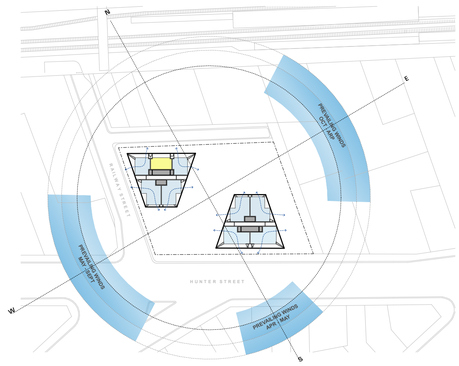
Cross Vent First 9 floors	**60%**	**79.2%**
Cross Vent Total	N/A	91.3%

Typical Floor Analysis



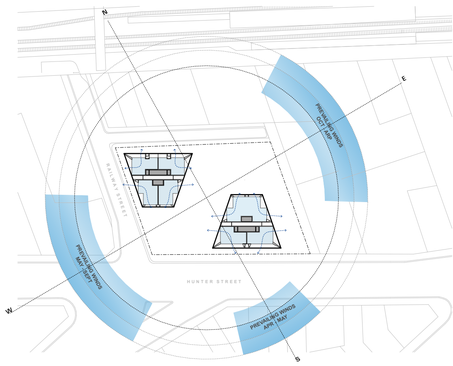
Podium Level Plans

Single Aspect (3 out of 6) 50.00%	Cross Vent (3 out of 6) 50.00%



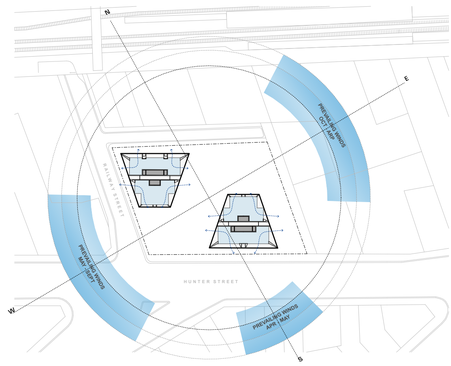
Tower Low Level Plans

Single Aspect (1 out of 9) 11.00%	Cross Vent (8 out of 9) 89.00%



Tower Mid Level Plans

Single Aspect (0 out of 7) 0.00%	Cross Vent (7 out of 7) 100.00%



Tower High Level Plans

Single Aspect (0 out of 4) 0.00%	Cross Vent (4 out of 4) 100.00%

Mix Summary

	DCP / LEP	Concept Proposal	
FSR	5.5 :1	**5.4 :1**	
GFA	21674.07 m²	**21460 m²**	214
1B		**36 units**	19.7%
2B		**128 units**	69.9%
3B		**19 units**	10.4%
Total Units		**183 units**	

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project

Dairy Farmers Corner

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Newcastle West NSW 2302

drawing title

Schedules
ADG Solar & Cross Ventilation

drawing scale	drawn	verified	date
AS SHOWN		SC	20/10/21

project #	drawing #	issue
21014	A-7004	A

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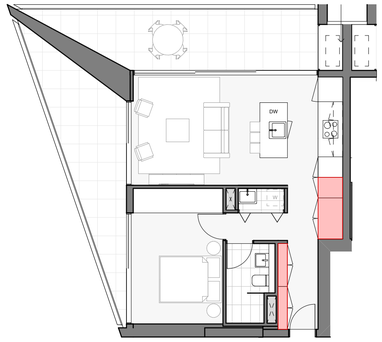
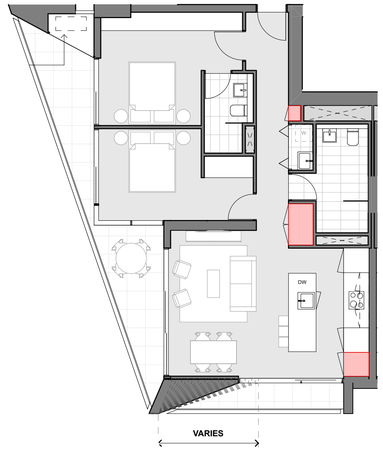


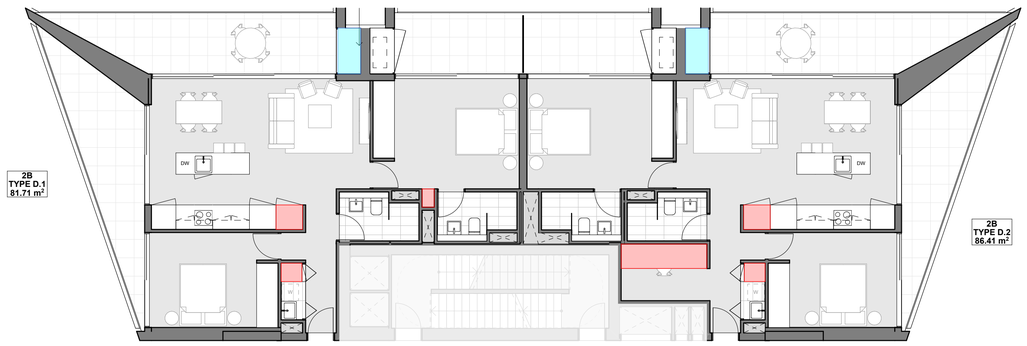
1 UNIT TYPE A - 1B TOWER
SCALE 1:100 @ A1

2 UNIT TYPE B - 1B TOWER
SCALE 1:100 @ A1

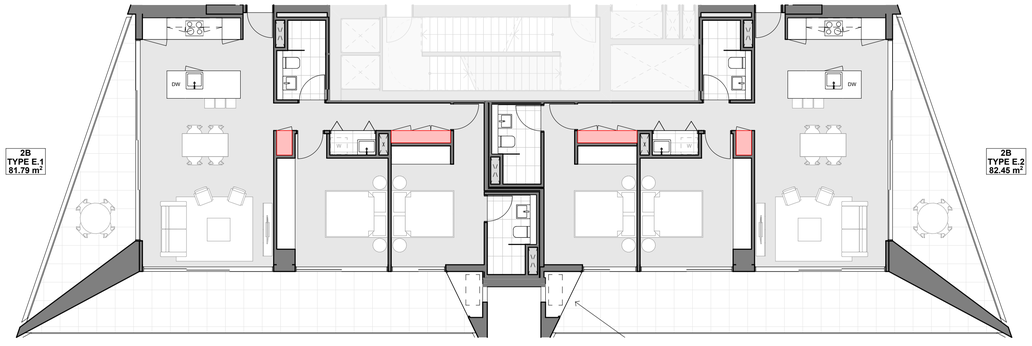


REFER ELEVATIONS

3 UNIT TYPE C - 2B TOWER
SCALE 1:100 @ A1



4 UNIT TYPE D.1 & D.2 - 2B TOWER
SCALE 1:100 @ A1



5 UNIT TYPE E.1 & E.2 - 2B TOWER
SCALE 1:100 @ A1

ADG Storage Review

Unit Type	Unit Number	Total Unit Type	Beds	Internal Storage m³ 1B min 3m³ 2B min 4m³ 3B min 5m³	External Storage m³ Balcony	External Storage m³ Storage Cage Minimum Volume	Total Storage Provided m³
Type A	N.301 / N.401 / N.501 / N.503 N.601 / N.603 / N.701 / N.703 N.801 / N.803 / N.901 / N.903 N.1001 / N.1003 / N.1101 / N.1103 N.1201 / N.1203 / N.1301 / N.1303 N.1401 / N.1403	22	1B	6.17			6.17
Type B	N.302 / N.402 / N.502 / N.602 N.702 / N.802 / N.902 / N.1002 N.1102 / N.1202 / N.1302 / N.1402	12	1B	4.64	3.04		7.68
Type C	N.303 / N.403 / N.504 / N.505 N.604 / N.605 / N.704 / N.705 N.804 / N.805 / N.904 / N.905 N.1004 / N.1005 / N.1104 / N.1105 N.1204 / N.1205 / N.1304 / N.1305 N.1404 / N.1405 / N.1503 / N.1504 N.1603 / N.1604 / N.1703 / N.1704 N.1803 / N.1804 / N.1903 / N.1904 N.2003 / N.2004 / N.2103 / N.2104 N.2203 / N.2204 / N.2303 / N.2304 N.2403 / N.2404 / N.2503 / N.2504 N.2603 / N.2604 S.501 / S.502 / S.601 / S.602 S.701 / S.702 / S.801 / S.802 S.901 / S9.02 / S.1001 / S.1002 S.1101 / S.1102 / S.1201 / S.1202 S.1301 / S.1302 / S.1401 / S.1402	66	2B	5.00		3.00	8.00
Type D.1	N.1501 / N.1601 / N.1701 / N.1801 N.1901 / N.2001 / N.2101 / N.2201 N.2301 / N.2401/ N.2501 / N.2601	12	2B	3.62	2.83	1.55	8.00
Type D.2	N.1502 / N.1602 / N.1702 / N.1802 N.1902 / N.2002 / N.2102 / N.2202 N.2302 / N.2402 / N.2502 / N.2602	12	2B	9.02	2.83		11.85
Type E.1	S.503 / S.603 / S.703 / S.803 S.903 / S.1003 / S.1103 / S.1203 S.1303 / S.1403 / S.1502 / S.1602 S.1702 / S.1802 / S.1902 / S.2002 S.2102	17	2B	3.17		4.83	8.00
Type E.2	S.504 / S.604 / S.704 / S.804 S.904 / S.1004 / S.1104 / S.1204 S.1304 / S.1404 / S.1503 / S.1603 S.1703 / S.1803 / S.1903 / S.2003 S.2103	17	2B	3.17		4.83	8.00
Type F	N.2701 / N.2801 / N.2901	3	3B	6.42	6.08		12.50
Type G	N.2702 / N.2802 / N.2902 S.1501 / S.1601 / S.1701 / S.1801 S.1901 / S.2001 / S.2101 / S.2201 S.2301 / S.2401	13	3B	17.25			17.25
Type H	S.2202 / S.2302 / S.2402	3	3B	10.06			10.06
Type I	S.201 / S.301	2	2B	5.66	2.84		8.50
Type J	S.202 / S.302	2	1B	3.40	2.84		6.24
Type K	S.203 / S.303	2	2B	10.26	2.85		13.11

Development Application

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INTERNAL STORAGE

EXTERNAL STORAGE

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project

Dairy Farmers Corner

924 Hunter Street 2/DP445736
Newcastle West NSW 2302

drawing title

Schedules
ADG Storage

drawing scale	drawn	verified	date
AS SHOWN	CH	SC	20/10/21

project #	drawing #	issue
21014	A-7005	A

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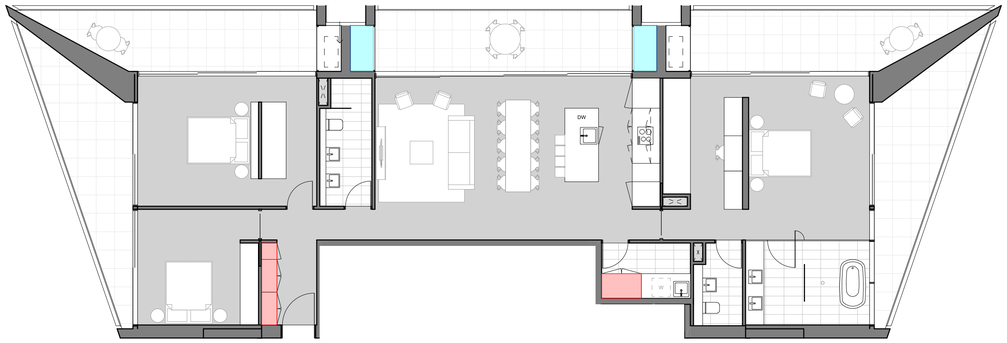
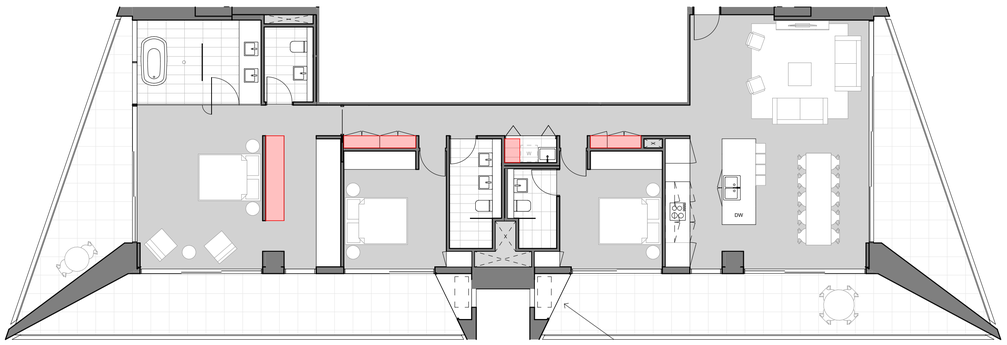
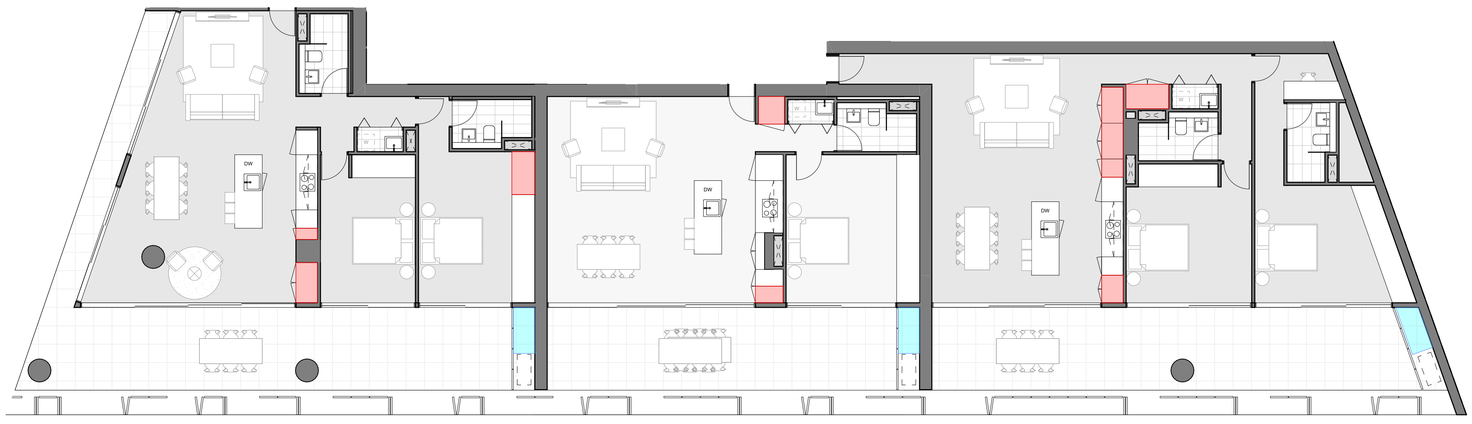


1 UNIT TYPE F - 3B PENTHOUSE
SCALE 1:100 @ A1

2 UNIT TYPE G - 3B PENTHOUSE
SCALE 1:100 @ A1



3 UNIT TYPE H - 3B PENTHOUSE
SCALE 1:100 @ A1



4 UNIT TYPE I - 2B PODIUM
SCALE 1:100 @ A1

5 UNIT TYPE J - 1B PODIUM
SCALE 1:100 @ A1

6 UNIT TYPE K - 2B PODIUM
SCALE 1:100 @ A1

ADG Storage Review

Unit Type	Unit Number	Total Unit Type	Beds	Internal Storage m³ 1B min 3m³ 2B min 4m³ 3B min 5m³	External Storage m³ Balcony	External Storage m³ Storage Cage Minimum Volume	Total Storage Provided m³
Type A	N.301 / N.401 / N.501 / N.503 N.601 / N.603 / N.701 / N.703 N.801 / N.803 / N.901 / N.903 N.1001 / N.1003 / N.1101 / N.1103 N.1201 / N.1203 / N.1301 / N.1303 N.1401 / N.1403	22	1B	6.17			6.17
Type B	N.302 / N.402 / N.502 / N.602 N.702 / N.802 / N.902 / N.1002 N.1102 / N.1202 / N.1302 / N.1402	12	1B	4.64	3.04		7.68
Type C	N.303 / N.403 / N.504 / N.505 N.604 / N.605 / N.704 / N.705 N.804 / N.805 / N.904 / N.905 N.1004 / N.1005 / N.1104 / N.1105 N.1204 / N.1205 / N.1304 / N.1305 N.1404 / N.1405 / N.1503 / N.1504 N.1603 / N.1604 / N.1703 / N.1704 N.1803 / N.1804 / N.1903 / N.1904 N.2003 / N.2004 / N.2103 / N.2104 N.2203 / N.2204 / N.2303 / N.2304 N.2403 / N.2404 / N.2503 / N.2504 N.2603 / N.2604 S.501 / S.502 / S.601 / S.602 S.701 / S.702 / S.801 / S.802 S.901 / S9.02 / S.1001 / S.1002 S.1101 / S.1102 / S.1201 / S.1202 S.1301 / S.1302 / S.1401 / S.1402	66	2B	5.00		3.00	8.00
Type D.1	N.1501 / N.1601 / N.1701 / N.1801 N.1901 / N.2001 / N.2101 / N.2201 N.2301 / N.2401/ N.2501 / N.2601	12	2B	3.62	2.83	1.55	8.00
Type D.2	N.1502 / N.1602 / N.1702 / N.1802 N.1902 / N.2002 / N.2102 / N.2202 N.2302 / N.2402 / N.2502 / N.2602	12	2B	9.02	2.83		11.85
Type E.1	S.503 / S.603 / S.703 / S.803 S.903 / S.1003 / S.1103 / S.1203 S.1303 / S.1403 / S.1502 / S.1602 S.1702 / S.1802 / S.1902 / S.2002 S.2102	17	2B	3.17		4.83	8.00
Type E.2	S.504 / S.604 / S.704 / S.804 S.904 / S.1004 / S.1104 / S.1204 S.1304 / S.1404 / S.1503 / S.1603 S.1703 / S.1803 / S.1903 / S.2003 S.2103	17	2B	3.17		4.83	8.00
Type F	N.2701 / N.2801 / N.2901	3	3B	6.42	6.08		12.50
Type G	N.2702 / N.2802 / N.2902 S.1501 / S.1601 / S.1701 / S.1801 S.1901 / S.2001 / S.2101 / S.2201 S.2301 / S.2401	13	3B	17.25			17.25
Type H	S.2202 / S.2302 / S.2402	3	3B	10.06			10.06
Type I	S.201 / S.301	2	2B	5.66	2.84		8.50
Type J	S.202 / S.302	2	1B	3.40	2.84		6.24
Type K	S.203 / S.303	2	2B	10.26	2.85		13.11

Development Application

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Nominated Architects: Caine King NSW ARB 7674 / Stuart Campbell NSW ARB 7545

INTERNAL STORAGE

EXTERNAL STORAGE

issue	description	date	verified
01	Issue for DRAFT DA	8/10/21	01
A	Issue for Development Application	20/10/21	A

key plan

consultants

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project

Dairy Farmers Corner

924 Hunter Street 2/DP445736
Newcastle West NSW 2302

drawing title

Schedules
ADG Storage

drawing scale	drawn	verified	date
AS SHOWN		SC	20/10/21

project #	drawing #	issue
21014	A-7006	A

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Nominated Architects: Caine King NSW ARB 7974 / Stuart Campbell NSW ARB 7545

issue	description	date	verified
01	Issue for Pre-DA	16/9/21	01
02	Issue for Pre-DA	27/9/21	02
03	Issue for Draft DA	1/10/21	03
04	Issue for DRAFT DA	8/10/21	04
A	Issue for Development Application	21/10/21	A

key plan

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project

Dairy Farmers Corner

924 Hunter Street 2/DP445736
Newcastle West NSW 2302

drawing title

Visualisation
Perspective Views

drawing scale	drawn	verified	date
AS SHOWN		SC	21/10/21

project #	drawing #	issue
21014	A-8001	A

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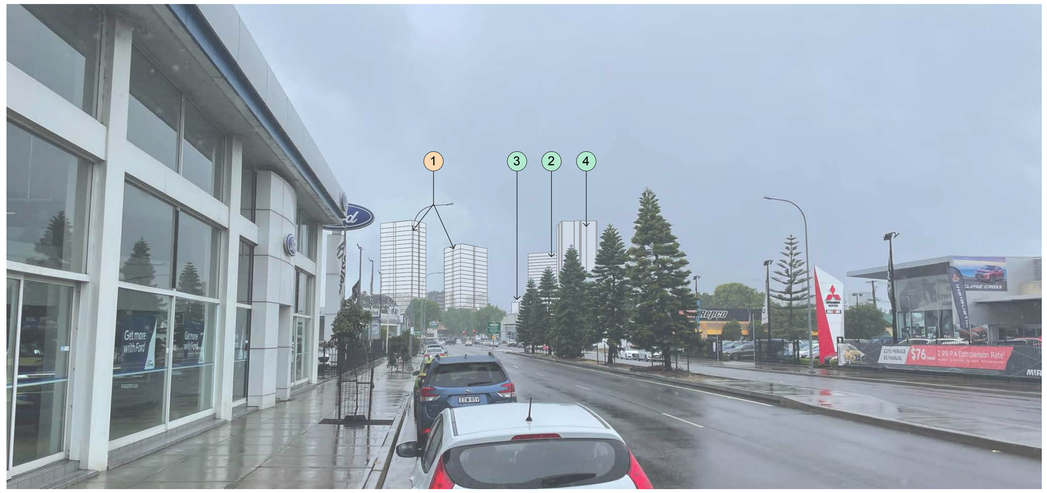
Development Application

VIEW LOCATIONS



VIEW 1 Tudor St Long View

VIEW 2 Hunter Street Bridge

VIEW 3 Hawkins Oval, Wickham Park

VIEW 4 Station St

VIEW 5 Hannell Street Marina

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Nominated Architects: Caine King NSW ARB 7974 / Stuart Campbell NSW ARB 7545

1 PROPOSED DA - *DAIRY FARMERS TOWERS* - 99m
DUAL RESIDENTIAL APARTMENT TOWERS

2 APPROVED DA - *THE STORE* - 90m
DUAL RESIDENTIAL APARTMENT TOWERS

3 APPROVED DA - *815 HUNTER STREET* - 56m
SINGLE RESIDENTIAL APARTMENT TOWER

4 APPROVED DA - *20 DENISON STREET* - 71m
SINGLE RESIDENTIAL APARTMENT TOWER

5 APPROVED DA - *73 - 79 RAILWAY LANE* - 44.9m
DUAL RESIDENTIAL APARTMENT TOWERS

NOTE: APPROXIMATE HEIGHT AND SCALE FOR SKYLINE FORM STUDY ONLY
PHOTOGRAPHS NOT SURVEYED

issue	description	date	verified
01	Issue for DRAFT DA	15/10/21	01
A	Issue for Development Application	20/10/21	A

key plan

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project

Dairy Farmers Corner

924 Hunter Street 2/DP445736
Newcastle West NSW 2302

drawing title

Visualisation
Long View Study

drawing scale	drawn	verified	date
AS SHOWN		SC	20/10/21

project #	drawing #	issue
21014	A-8002	A

Development Application

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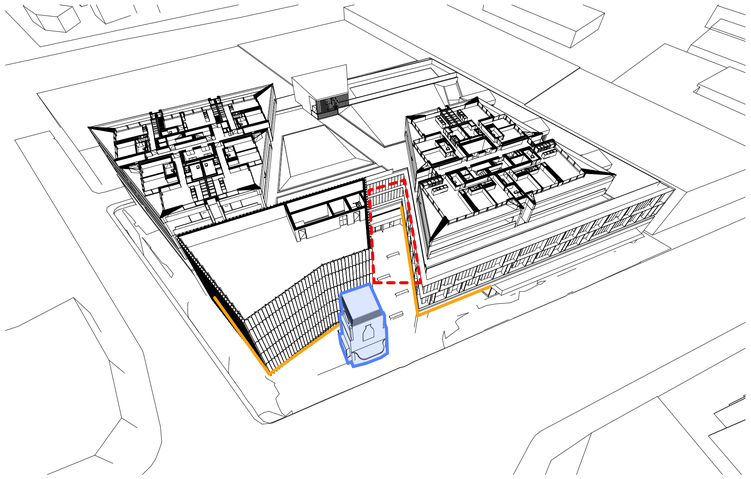
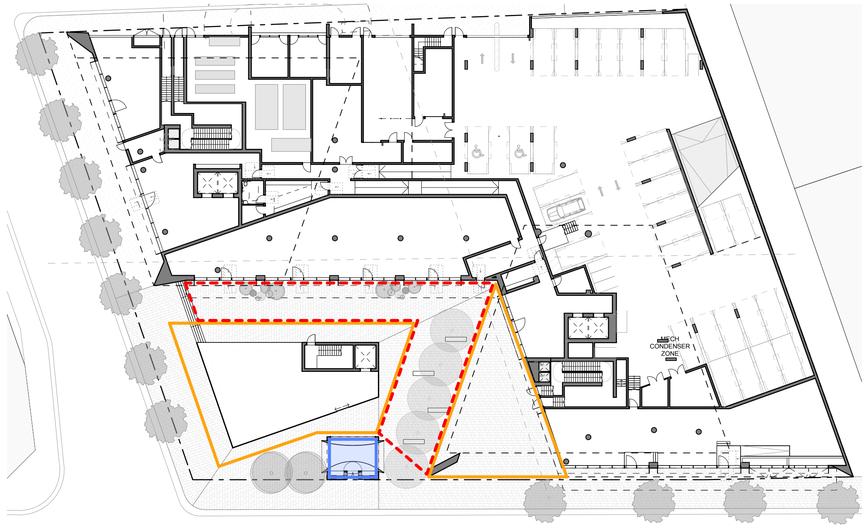
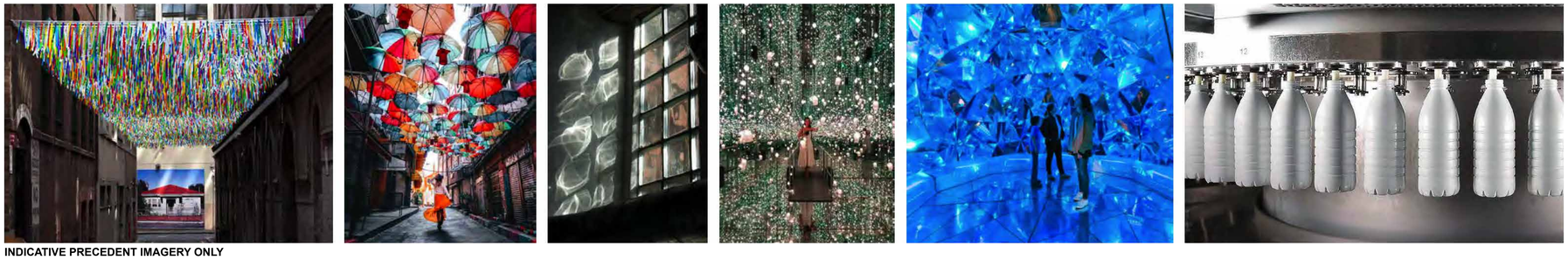




Permanent, publicly accessible art installation within heritage listed clock tower

Soffit artwork opportunity

Suspended laneway art



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Nominated Architects: Caine King NSW ARB 7974 / Stuart Campbell NSW ARB 7545

Note 01 Detailed public art installation to be developed in collaboration with Heritage consultant

issue	description	date	verified
A	Issue for Development Application	21/10/21	A

key plan

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project

Dairy Farmers Corner

924 Hunter Street 2/DP445736
Newcastle West NSW 2302

drawing title

Visualisation
Public Art Opportunities

drawing scale	drawn	verified	date
AS SHOWN		SC	21/10/21

project #	drawing #	issue
21014	A-8003	A

Development Application

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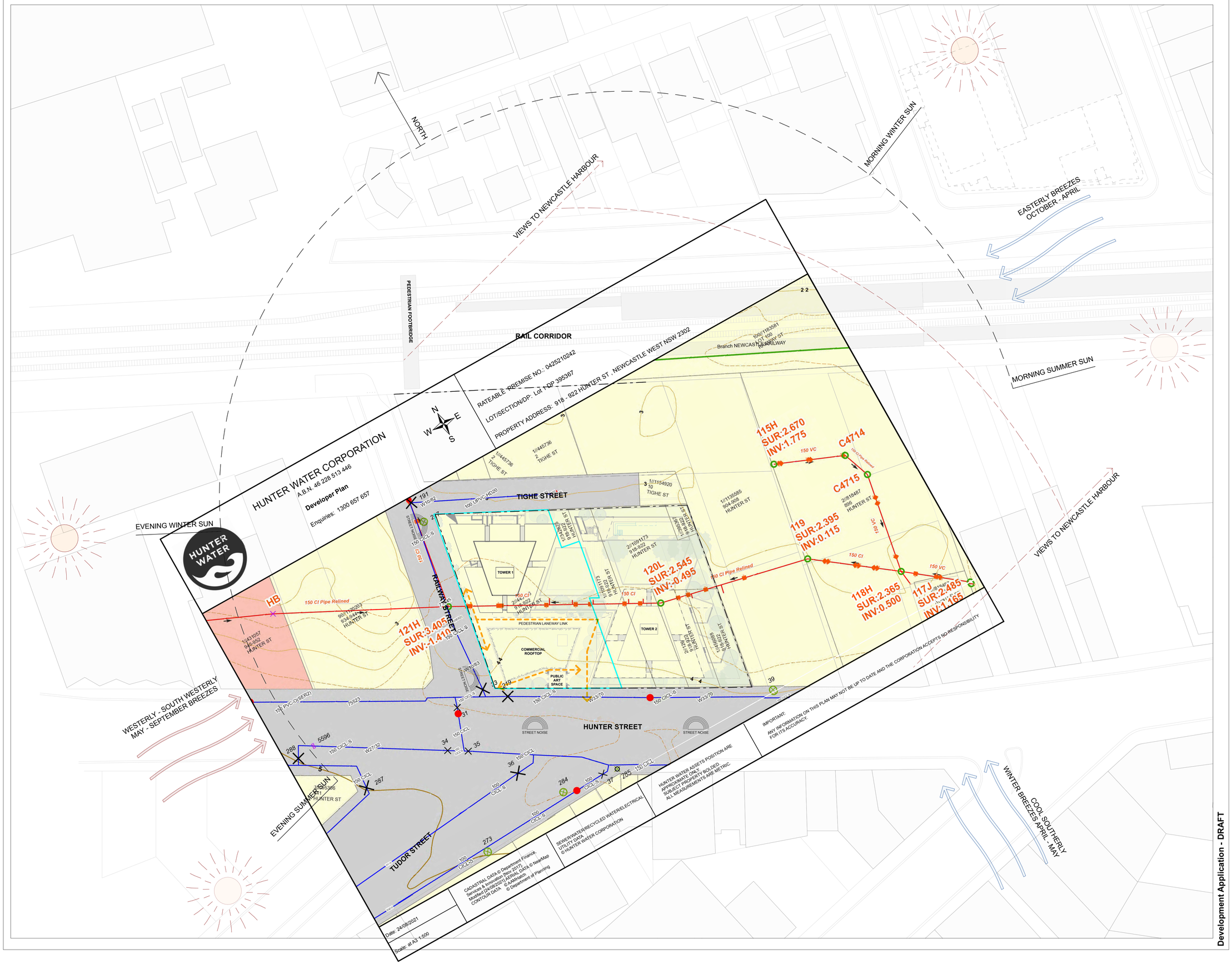

Development Application - DRAFT

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Nominated Architects: Caine King NSW ARB 7924 / Stuart Campbell NSW ARB 7545

issue	description	date	verified
01	Issue for Pre-DA	27/9/21	01
02	Issue for DRAFT DA	8/10/21	02

key plan

North Point

consultants

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project

Dairy Farmers Corner

924 Hunter Street 2/DP445736
Newcastle West NSW 2302

drawing title

Site Plans
Site Plan

drawing scale	drawn	verified	date
AS SHOWN		SC	8/10/21

project #	drawing #	issue
21014	A-1001	02

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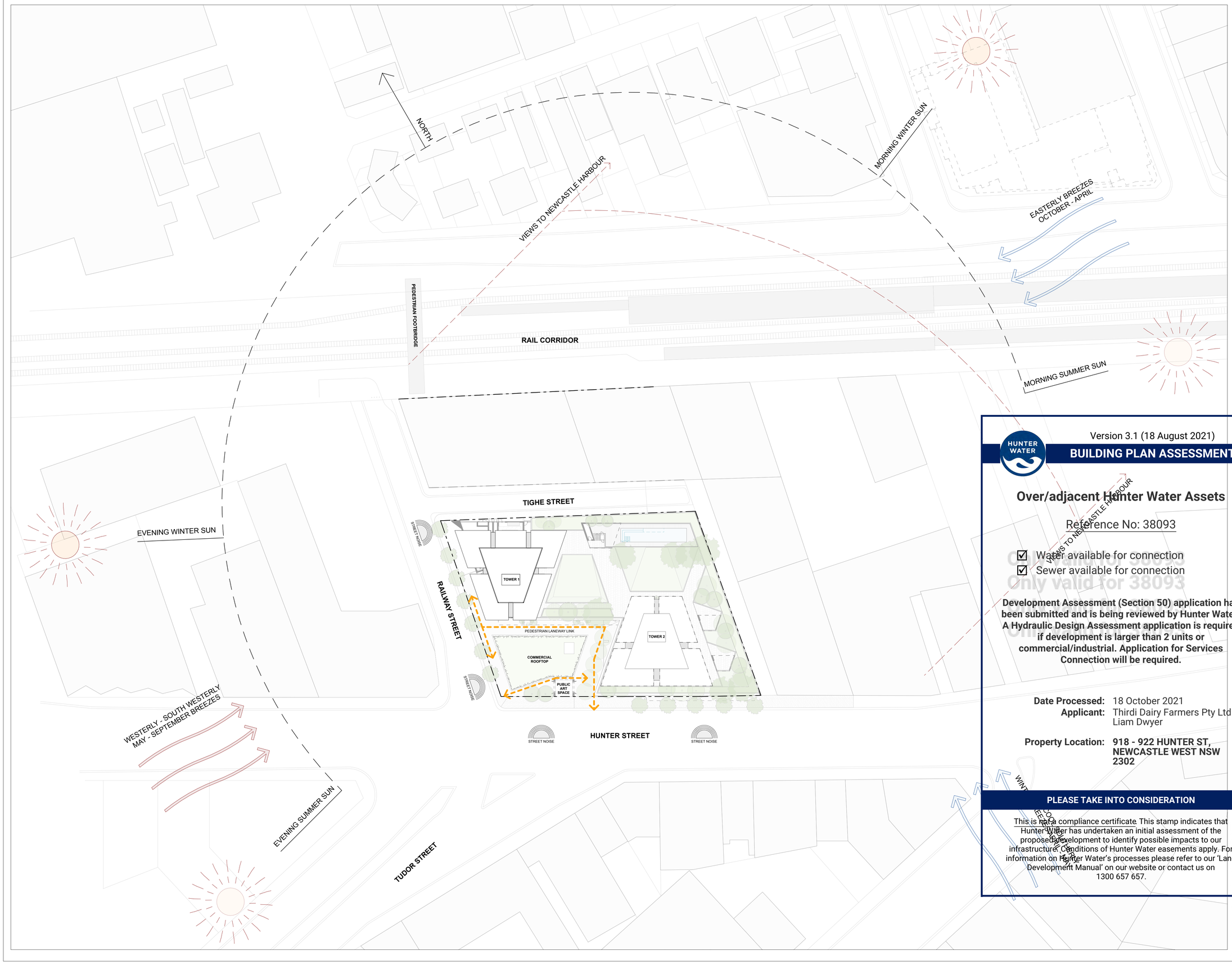

Version 3.1 (18 August 2021)

BUILDING PLAN ASSESSMENT

Over/adjacent Hunter Water Assets

Reference No: 38093

☑ Water available for connection
☑ Sewer available for connection

Development Assessment (Section 50) application has been submitted and is being reviewed by Hunter Water. A Hydraulic Design Assessment application is required if development is larger than 2 units or commercial/industrial. Application for Services Connection will be required.

Date Processed: 18 October 2021
Applicant: Thirdi Dairy Farmers Pty Ltd - Liam Dwyer

Property Location: **918 - 922 HUNTER ST, NEWCASTLE WEST NSW 2302**

PLEASE TAKE INTO CONSIDERATION

This is not a compliance certificate. This stamp indicates that Hunter Water has undertaken an initial assessment of the proposed development to identify possible impacts to our infrastructure. Conditions of Hunter Water easements apply. For information on Hunter Water's processes please refer to our 'Land Development Manual' on our website or contact us on 1300 657 657.

Development Application - DRAFT

issue	description	date	verified
01	Issue for Pre-DA	27/9/21	01
02	Issue for DRAFT DA	8/10/21	02

key plan

North Point

consultants

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project

Dairy Farmers Corner

924 Hunter Street 2/DP445736
Newcastle West NSW 2302

drawing title

Site Plans
Site Plan

drawing scale	drawn	verified	date
AS SHOWN		SC	8/10/21

project #	drawing #	issue
21014	A-1001	02

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Appendix D

LANDSCAPE PLANS (XERISCAPES)

DRAWING SCHEDULE		
Drawing #	***Drawing Name***	***Revision***
L000	Coversheet	A
L101	Ground Level Landscape Plan	A
L102	Level 4 (Podium) Landscape Plan	A
L103	Landscape Sections	A
L104	Precedent Images	A
L105	Indicative Plant Schedule	A

STATUTORY & PLANNING GUIDELINES
The City of Newcastle
- *Newcastle Street Tree Masterplan 2011*
- *Newcastle City Council DCP 2012: Part 7.02; Landscape, Open Space and Visual Amenity*
- *Newcastle City Council Technical Manual Landscape 2015*
- *Newcastle City Council Street Tree Selection Manual 2016*
- *Newcastle Urban Forest Technical Manual Part B Public Trees 2018*
NSW Government Planning & Infrastructure
- *Apartment Design Guide; Part 4O – Landscape Design*
- *Apartment Design Guide; Part 4P – Planting on Structures*

AREA CALCULATIONS		
Total Site Area	**3940m2**	
Total Public Domain Area (Gr. Floor)	**1038m2**	**26%**
Total Soft Landscape Areas	30m2	0.8%
Total Hard Landscape Areas	983m2	25.2%
Total Common Open Space Area (L4)	**1932m2**	**49%**
Total Soft Landscape Areas	919m2	23%
Total Hard Landscape Areas	1013m2	26%

Site Description:

The subject site is located at 924 Hunter Street Newcastle West and is historically known as the Dairy Farmers Corner as it was a former milk bottling facility which produced fresh milk for home delivery to residents of Newcastle and surrounding suburbs. This corner site is bounded by Hunter Street, Railway Street and Tighe Lane and in more recent times was a former commercial car sales premises. The site consists of several lots which are Lot 2 (DP445736), Lot 1 (DP342675), Lots 1 & 2 (DP1091173), Lot 1 (DP395367), Lot 2 (DP126) & Lot 1 (DP395367).

Currently the site is occupied by a two-storey rendered commercial building, a single storey commercial building and the heritage brick clock tower. With the exception of the heritage brick clock tower (to be retained) the commercial buildings will be demolished as part of this development. The site was a former commercial car sales premises so there are large expanses of asphalt paving & concrete paving with very little existing vegetation within the site boundary.

The limited existing vegetation around and within the subject site consists of the following:

Hunter Street:	2 no. existing street trees; *Platanus × acerifolia* (London Plane)
Railway Street:	1 no. *Cupaniopsis anacardioides* (Tuckeroo)
Tighe Lane:	Mass Planted Hedge *Murraya paniculata* (Orange Blossom)

All this existing vegetation will be removed as part of the proposed development.

The site is generally relatively flat with the high point being on the south-east corner (Hunter St) with an existing level of RL 4.11 and the low point of the site being on the north-west corner (corner of Railway St & Tighe Lane) with an existing level of RL 3.20.

Local Context/Character:

The existing street character consists of predominantly commercial buildings of varying heights and scale and would be best described as being highly 'urban' with lots of hard paved surfaces with very little green infrastructure such as open space parks and street tree planting. The site is located within close proximity to the Newcastle Rail Interchange, Newcastle West Market-town Shopping Centre and the Gateway mix-use development (Pacific Hwy) and the recently constructed Honeysuckle foreshore developments. The closest open space recreational spaces include the Honeysuckle foreshore and Hawkins Oval.

Proposed Development:

The proposed development will include a commercial food & beverage (ground level), a small commercial office building (5 levels) and 2 no. residential towers (24 levels & 29 levels). The landscape design will include a public domain area located on the ground floor with access from Hunter & Railways streets. This proposed development will include a large common open space area for residents located on the podium level (Level 4).

Ground Floor Public Domain:

The public domain areas have been designed to provide street activation for the proposed food & beverage, small retail & commercial tenancies located on the ground floor. The design intent is to provide a public lane way (or thru site link) from Railway & Hunter Streets that provide generous forecourt spaces whilst being respectful to the retained heritage brick clock tower. It is intended that a public art installation will be implemented within this clock tower (TBC).

Although this site is located outside the parameters as identified in the City of Newcastle CBD Public Domain Technical Manual some of the principles in this manual have been referred to in the landscape design. These principles include proposed street tree planting, planting in pavements, implementation of feature stone paving, banded unit paving, external lighting and street furniture such as seating, bike racks and bins.

Off-form concrete benches have been strategically placed though the lane way to provide a sculptural seating element and to also act as a 'bollard' against possible ram-raiding or terrorist threats.

The widening of the public footpaths on Hunter & Railway Streets will allow space for new street tree planting which will in accordance with the City of Newcastle '*Urban Forest Technical Manual for Public Trees'* and the *'Street Tree Selection Manual'.* Feature trees within paving using a strata-vault system will define the laneway, provide shade and will assist in softening the extent of hard-paved areas.

Where new tree planting is not practical within pavements, large GRC planters with mass planted shrubs and groundcovers have been proposed within this area to provide visual amenity.

Common Open Space Areas:
The common open space areas of this development will be located on the level 4 podium (above car park areas located on levels 1-3). This north facing, podium level, open space will receive lots of sunlight as well as taking advantage of the views.

The landscape design intent for this level was to create a podium level small 'urban' park that can be used and enjoyed by all the residents.

Extensive tree planting in raised planters that are intended to provide seasonal colour, shade & amenity.

Mown turf areas will be on a slight incline or berm are intended for passive recreation activities such as individual meditation, outdoor Yoga or Tai-chi.

A communal swimming pool with equitable access on an elevated pool deck will take advantage of the uninhibited views.

Paved break-out spaces for near the work-from-home hub, function rooms and the gym can be used for smaller group activities or private functions.

External fixed shade structures with communal table & bench settings & BBQs have been located so as to provide some privacy and separation. Other external fixtures will include

bench seats, external lighting, outdoor fitness equipment and games activities such as outdoor table tennis.

Raised garden beds around the periphery of this podium level will ensure that there are adequate soil depths required for different sizes of planting on structure as well as reducing potential structural load on the building. These raised garden beds will also provide a physical separation between spaces, so a level of privacy, screening and intimacy of these smaller spaces is maintained.

Common open space areas to include raised planters on structure. All raised planters to include minimum suitable soil media in relation to trees, shrubs & groundcovers to promote optimum plant growth and in accordance with NSW Planning & Environment; Apartment Design Guide; Part 4P, Planting on Structures.

Planting Design Strategy:
The planting design strategy for this residential flat building development to include the following:

- Street Tree planting at ground level to assist in reducing within appropriate deep soil zones to reduce bulk & scale of the development
- Evergreen tree planting to provide shade & amenity
- Deciduous tree planting to allow for solar access & seasonal change
- A broad planting palette to include a variety native species & exotic species to provide colour, texture, aroma & form
- Implementation of some indigenous species to encourage canopy corridor links and bio-diversity

With the proposed landscape design for this development we would implement the following safety planting initiatives:

- Avoid planting tree species that are prone to potential limb drop
- Avoid planting species close to paths and hard paved areas that are known for excessive flower, foliage & fruit drop that may cause potential slip hazards
- Avoid planting species that are known for invasive root structure that may cause damage to existing infrastructure and damage paths & hard paved areas and which may cause potential trip hazards
- Avoid planting species that are known to be toxic or may cause respiratory, allergy and/or skin irritations

All proposed plant species selection has been considered in terms of soil types, species hardiness and on-going watering maintenance requirements. Predominantly low water use

species (both native & exotic) have been grouped in regard to watering requirements and to reduce reliance on use of potable water.

All raised planters to include minimum suitable soil media in relation to trees, shrubs & groundcovers to promote optimum plant growth and in accordance with NSW Planning & Environment; Apartment Design Guide; Part 4P, Planting on Structures.

Kind Regards,

Geoff Olson

Director
BLArch - 1st Class Honours (UWA)
AILA Registered Landscape Architect #1288

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DAIRY FARMERS CORNER NEWCASTLE
OCTOBER 2021

LOCATION MAP

Drawing Schedule

Name	Drawing #	Revision
Cover Sheet	L000	A
Ground Level Landscape Plan	L101	A
Level 4 (Podium) Landscape Plan	L102	A
Landscape Sections	L103	A
Precedent Images	L104	A
Indicative Plant Schedule	L105	A

Statutory & Regulatory Guidelines

The City of Newcastle
- Newcastle Street Tree Masterplan 2011
- Newcastle City Council DCP 2012: Part 7.02; Landscape, Open Space and Visual Amenity
- Newcastle City Council Technical Manual Landscape 2015
- Newcastle City Council Street Tree Selection Manual 2016 -
- Newcastle Urban Forest Technical Manual Part B Public Trees 2018

NSW Government Planning & Infrastructure
- Apartment Design Guide; Part 4O – Landscape Design
- Apartment Design Guide; Part 4P – Planting on Structures

Site Calculations

Item	Area	Percentage
Total Site	3940m^2	
Total Public Domain Area (Gr. Floor)	**1038m^2**	**26%**
Total Soft Landscape Areas	30m^2	0.8%
Total Hard Landscape Areas	983m^2	25.2%
Total Common Open Space Area (L4)	**1932m^2**	**49%**
Total Soft Landscape Areas	919m^2	23%
Total Hard Landscape Areas	1013m^2	26%

Site Description:

The subject site is located at 924 Hunter Street Newcastle West and is historically known as the Dairy Farmers Corner as it was a former milk bottling facility which produced fresh milk for home delivery to residents of Newcastle and surrounding suburbs. This corner site is bounded by Hunter Street, Railway Street and Tighe Lane and in more recent times was a former commercial car sales premises. The site consists of several lots which are Lot 2 (DP445736), Lot 1 (DP342675), Lots 1 & 2 (DP1091173), Lot 1 (DP395367), Lot 2 (DP126) & Lot 1 (DP395367).

Currently the site is occupied by a two-storey rendered commercial building, a single storey commercial building and the heritage brick clock tower. With the exception of the heritage brick clock tower (to be retained) the commercial buildings will be demolished as part of this development. The site was a former commercial car sales premises so there are large expanses of asphalt paving & concrete paving with very little existing vegetation within the site boundary.

The limited existing vegetation around and within the subject site consists of the following:

Hunter Street:	2 no. existing street trees; Platanus × acerifolia
(London Plane)Railway Street:	1 no. Cupaniopsis anacardioides (Tuckeroo)
Tighe Lane:	Mass Planted Hedge Murraya paniculata (Orange Blossom)

All this existing vegetation will be removed as part of the proposed development.

The site is generally relatively flat with the high point being on the south-east corner (Hunter St) with an existing level of RL 4.11 and the low point of the site being on the north-west corner (corner of Railway St & Tighe Lane) with an existing level of RL 3.20.

Local Context/Character:

The existing street character consists of predominantly commercial buildings of varying heights and scale and would be best described as being highly 'urban' with lots of hard paved surfaces with very little green infrastructure such as open space parks and street tree planting. The site is located within close proximity to the Newcastle Rail Interchange, Newcastle West Market-town Shopping Centre and the Gateway mix-use development (Pacific Hwy) and the recently constructed Honeysuckle foreshore developments. The closest open space recreational spaces include the Honeysuckle foreshore and Hawkins Oval.

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PROJECT
DAIRY FARMERS CORNER
924 HUNTER STREET NEWCASTLE WEST NSW 2302

DRAWING NAME
COVER SHEET

CLIENT	THIRDI GROUP	**REVISION**	A
PROJECT NO	21097	**DATE**	18.10.2021
DRAWING NO	DA-L000		
SCALE	NA		

TIGHE STREET

RAILWAY STREET

HUNTER STREET

Street Tree in Pavement as per NCC Street Tree Masterplan & PDTM

RETAIL COMMERCIAL TENANCY
FFL 3,400

BOH
FFL 3,400

FFL 5,700

LOADING DOCK
RL 3,300

CARPARK ENTRY/EXIT

RL 3,300

CARPARK

FFL 3,550

LOBBY
FFL 3,550

1:14 RAMP
FFL 3,980
1:14 RAMP
FFL 4,600

RETAIL COMMERCIAL TENANCY
FFL 4,600

COMMERCIAL LOBBY
FFL 4,600

1:21 Walkway

1:21 Walkway

CLOCK TOWER

LOBBY

RETAIL COMMERCIAL TENANCY
FFL 4,600

FFL 4,200

FFL 4,200

Street Tree in Pavement as per NCC Street Tree Masterplan & PDTM

Street Tree in Pavement as per NCC Street Tree Masterplan & PDTM

New Kerb Ramp to AS1428

Feature Unit Banding to BOK as per NCC PDTM

Maintain Visual Connectivity at prominent corner of Hunter & Railways Streets

Small Feature Tree in Feature Paving

1:21 Walkway Access to AS1428

Off-form Plaza Bench Seat

1:21 Walkway Access to AS1428

LEGEND

- Site Boundary Line
- Building Line — *Refer Architects Drawings*
- Basement Line Under — *Refer Architects Drawings*
- Paving Type 1 — *Feature Unit Paving*
- Paving Type 2 — *Feature Unit Paving*
- Paving Type 3 — *Concrete Pedestrian Footpath*
- Feature Unit Banding Type 1 — *Exposed Aggregate Concrete Paving*
- Feature Unit Banding Type 2 — *Pool Decking*
- Street Tree/Shade Amenity Tree — *Refer Plant Schedule*
- Small Feature Tree — *Refer Plant Schedule*
- *Off-form Plaza Bench Seat*
- Shrub/Pot Planting — *Refer Plant Schedule*
- Tree Pit Planting/Low Mass Planting — *Refer Plant Schedule*

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PROJECT
DAIRY FARMERS CORNER
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DRAWING NAME
GROUND LEVEL
LANDSCAPE PLAN

NORTH

CLIENT	THIRDI GROUP	REVISION	A
PROJECT NO	21097	DATE	15.10.2021
DRAWING NO	DA-L101		
SCALE	1:150 @ A1	0 1 2 3 4 5m 10m	

TIGHE STREET

RAILWAY STREET

HUNTER STREET

Common Open Space Activities Area (ie. POPP Tennis Table)

Pool Deck (Nom. 1200 H. above Slab Level).

POOL DECK

POOL

Shade Amenity Tree Planting in Raised Planter (Mounded to obtain min. 1m Soil Depth)

Shade Structure, Table Bench Settings & BBQ Facilities

POS Terrace

POS Terrace

POS Terrace

POS Terrace

FFL 18,700

Entry

Fall

Fall

EXTERNAL FUNCTION SPACE

Entry

FFL 18,700

Entry

Raised Turf Berm in Raised Planter (Mound to obtain min 1.0m Soil Depth for Tree Planting).

GRC Planters with Shrub Planting & Climbers (on S/S Tensile Wires) to External Function Space

FFL 19,400

1100

Palisade Blade Perimeter Fence (on Concrete Hob) within Planter

Shade Structure, Table Bench Settings & BBQ Facilities

Shade Amenity Tree Planting in Raised Planter (Mounded to obtain min. 1m Soil Depth)

LEGEND

- Site Boundary Line
- Building Line — *Refer Architects Drawings*
- Basement Line Under — *Refer Architects Drawings*
- Paving Type 1 — *POS Terrace Paving*
- Paving Type 2 — *Entry Feature Unit Paving*
- Paving Type 3 — *Exposed Aggregate Concrete Paving*
- Paving Type 4 — *Exposed Aggregate Concrete Paving*
- Paving Type 4 — *Pool Decking*
- Fence Type 1 — *Pool Fence*
- Shade Amenity Tree — *Refer Plant Schedule*
- Small Feature Tree — *Refer Plant Schedule*
- Deciduous Tree — *Refer Plant Schedule*
- Tall Screen Shrub Planting — *Refer Plant Schedule*
- Shrub Planting — *Refer Plant Schedule*
- Mass Planted Groundcovers — *Refer Plant Schedule*
- Low Border Plantng — *Refer Plant Schedule*
- Turf Areas

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PROJECT

DAIRY FARMERS CORNER

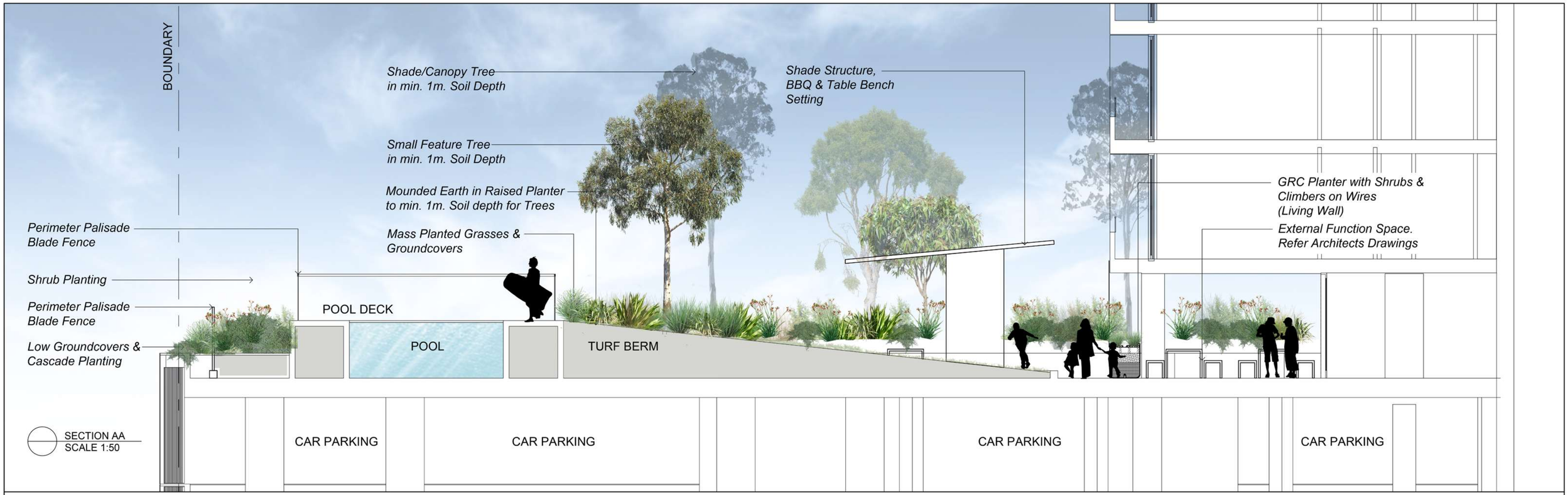
924 HUNTER STREET NEWCASTLE WEST NSW 2302

DRAWING NAME

LEVEL 4 (PODIUM)
LANDSCAPE PLAN

CLIENT	THIRDI GROUP	**REVISION**	A
PROJECT NO	21097	**DATE**	18.10.2021
DRAWING NO	DA-L102		
SCALE	1:150 @ A1		

0 1 2 3 4 5m 10m



SECTION AA
SCALE 1:50

SECTION BB
SCALE 1:50

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PROJECT
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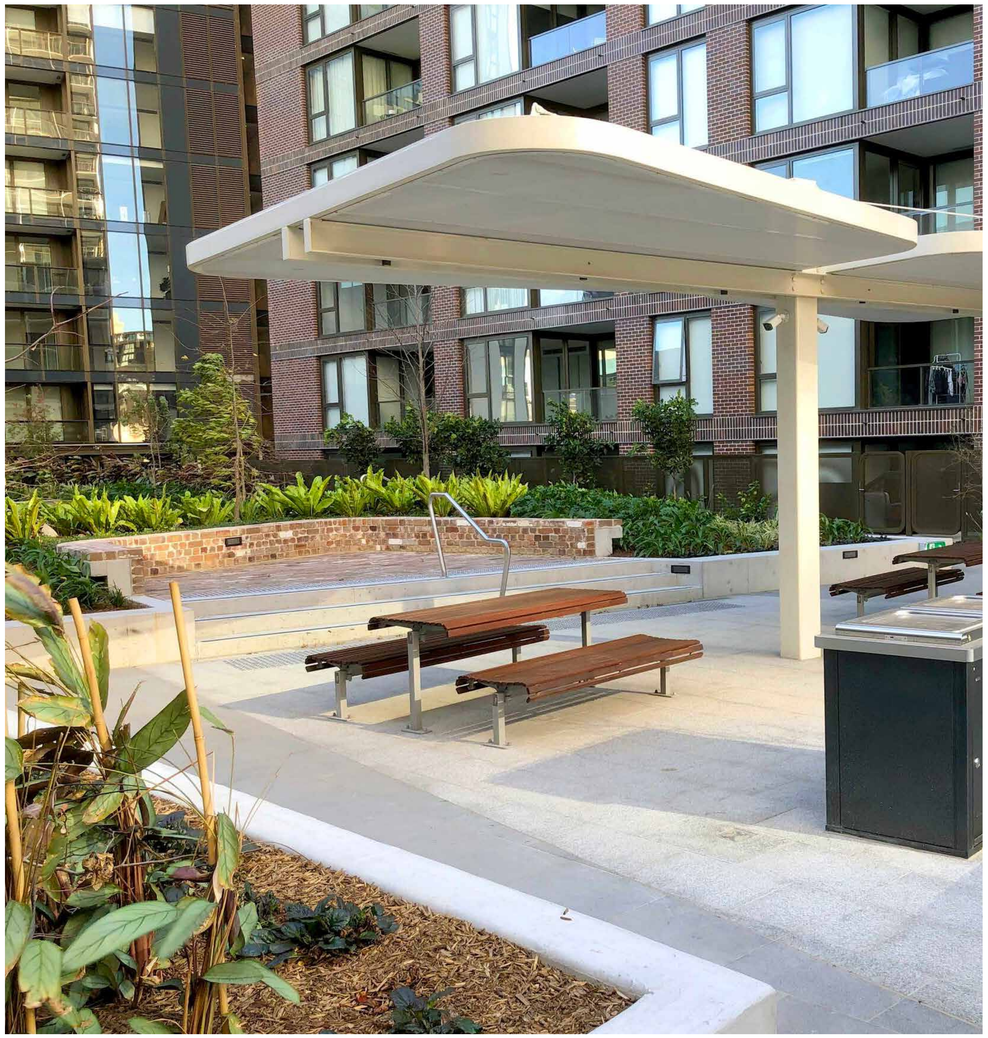
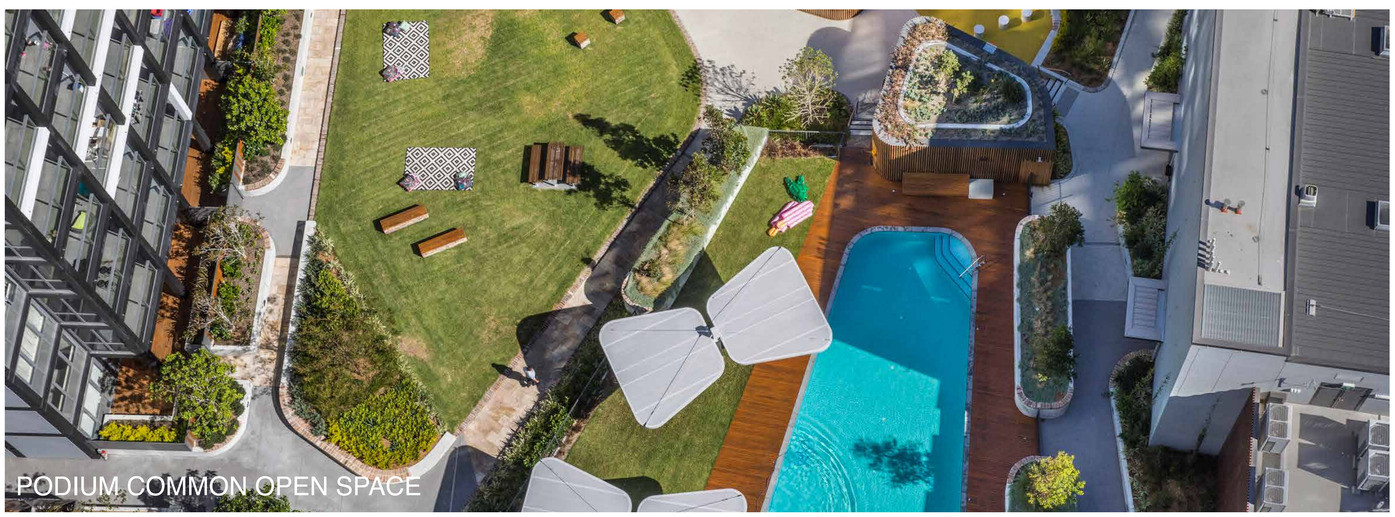
924 HUNTER STREET NEWCASTLE WEST NSW 2302

DRAWING NAME
LANDSCAPE SECTIONS

CLIENT	THIRDI GROUP	REVISION	A
PROJECT NO	21097	DATE	18.10.2021
DRAWING NO	DA-L103		
SCALE	1:150 @ A1	0 1 2 3 4 5m	





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PROJECT
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DRAWING NAME
PRECEDENT IMAGES

CLIENT	THIRDI GROUP	REVISION	A
PROJECT NO	21097	DATE	18.10.2021
DRAWING NO	DA-L104		
SCALE	NA		

Image	Botanical Name	Common Name	Mature Height (m.)	Mature Spread (m.)	Pot Size	Comments
Street Trees/Shade Amenity Tree						
	Alloxylon flammeum	Tree Waratah	15	6-8	75L	Stakes and ties
01	*Backhousia citriodora*	Lemon Myrtle	5-10	2-5	75L	Stakes and ties
	Brachychiton acerifolius	Illawarra Flame Tree	15	5	75L	Stakes and ties
02	*Waterhousia floribunda 'Sweeper'*	Weeping Lilly Pilly	10	7	75L	Stakes and ties
Small Feature Trees						
	Ficus longifolia	Narrow Leaf Fig	6	4	45L	Stakes and ties
	Elaeocarpus reticulatus	Blueberry Ash	10	5-8	45L	Stakes and ties
03	*Cupaniopsis anacardioides*	Tuckeroo	8	7	75L	Stakes and ties
04	*Tristaniopsis 'Luscious'*	Luscious Water Gum	8	5	75L	Stakes and ties
Deciduous Trees						
05	*Ginko biloba*	Maidenhair Tree	6	4	45L	Stakes and ties
06	*Lagerstroemia indica 'Natchez'*	Crepe Myrtle	7	4	45L	Stakes and ties
	Nyssa Sylvatica	Black Tupelo	8	9	45L	Stakes and ties
Feature/Tall Screen Shrubs > 1.5m						
	Alpinia zerumbet	Shell Ginger	2	1	200mm	
07	*Banksia robur*	Swamp Banksia	2	2	300mm	
08	*Cordyline stricta*	Broad-leaved Palm Lily	3	1.5	140mm	
09	*Doryanthes excelsa*	Gymea Lily	2	2	200mm	
	Dracaena marginata	Madagascar Dragon Tree	4	2	200mm	
	Grevillea 'Honey Gem'	Spider Flower Grevillea	4	3	300mm	
	Philodendron 'Rojo Congo'	Rojo Congo	1.5	0.8	300mm	
	Rhapis humilis	Slander Lady Palm	2	2.5	300mm	
	Strelizia nicolai	Giant Bird Paradise	3	2	300mm	
10	*Syzigium australe 'Straight & Narrow'*	Narrow Lilly Pilly	5-8	1-1.5	300mm	
	Viburnum odoratissimum	Dense Fence	2.5	2	300mm	
Shrubs < 1.5m						
	Callistemon 'Better John'	Better John Bottlebrush	1.2	0.9	200mm	
	Canna tropicanna	Cana Lily	0.7	0.7	200mm	
11	*Crassula ovata 'Blue Bird'*	Blue Jade Tree	0.3	0.4	140mm	
	Macrozamia communis	Burrawang	0.8	0.8	200mm	
12	*Raphiolepis 'Snow Maiden'*	Indian Hawthorn	0.75	0.5	200mm	
	Westringia fruiticosa 'Zena'	Coastal Rosemary	1.2	1.2	200mm	
13	*Zamia furfuracea*	Cardboard Palm	1	1.5	200mm	
Mass Planted Groundcovers						
	Dianella caerulea 'Little Jess'	Little Jess Flax Lily	0.4	0.4	140mm	
14	*Dichondra repens*	Kidney Weed	0.1	1.5	140mm	
	Hardenbergia violacea	False Sarsaparilla	1	2.5	140mm	
15	*Kalanchoe bracteata*	Silver Teaspoons	0.5	0.4	140mm	
	Leucophyta brownii 'Moonshine'	Cushion Bush	0.5	0.5	200mm	
	Liriope muscari 'Evergreen Giant'	Evergreen Giant Liriope	0.45	0.45	140mm	
16	*Liriope muscari 'Isabella'*	Isabella Fine Leaf Liriope	0.4	0.5	140mm	
17	*Lomandra 'Tanika'*	Fine Leaf Lomandra	0.5	0.6	140mm	
	Myoporum parvifolum 'Yareena'	Yareena Creeping Boobialla	0.1	1	140mm	
18	*Neomarica gracilis*	Walking Iris	0.5	0.5	140mm	
	Poa labillardieri 'Kingsdale'	Blue Tussock Grass	0.45	0.45	140mm	
	Santolina chamaecyparissus	Lavender Cotton	0.6	0.4	200mm	
	Senecio serpens	Blue Chalksticks	0.7	0.8	140mm	
19	*Westringia 'Mundi'*	Westringia 'Mundi'	0.6	1.5	140mm	
Low Border Planting						
20	*Carex albula 'Frosted Curls'*	New Zealand Hair Sedge	0.6	0.6	140mm	
21	*Chrysocephalum apiculatum 'Desert Flame'*	Yellow Buttons	0.5	0.3	140mm	
22	*Lomandra labill*	Evergreen Baby	0.45	0.45	140mm	
	Stachys byzantina	Lambs Ears	0.5	0.5	140mm	
	Viola hederacea	Native Violet	0.1	0.3	140mm	
Cascading Planting						
23	*Casuarina glauca 'Cousin It'*	Cousin It	0.3	1	140mm	
24	*Dichondra argentea 'Silver Falls'*	Silver Falls	0.2	1	140mm	
	Hardenbergia violacea 'Meema'	Meema Snake Vine	0.5	2	140mm	
	Russelia equisetiformis	Fountainbrush	1	2	140mm	
25	*Rosmarinus officinalis 'Blue Lagoon'*	Blue Lagoon Rosemary	0.3	1	140mm	

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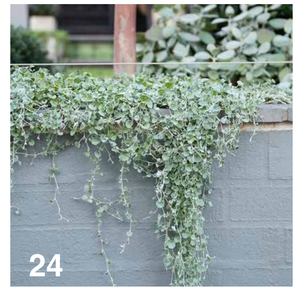
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PROJECT
DAIRY FARMERS CORNER
924 HUNTER STREET NEWCASTLE WEST NSW 2302

DRAWING NAME
INDICATIVE PLANT SCHEDULE

CLIENT	THIRDI GROUP	REVISION	A
PROJECT NO	21097	DATE	15.10.2021
DRAWING NO	DA-L105		
SCALE	NA		

Appendix E

SEPP 65 ARCHITECTURAL DESIGN STATEMENT (CKDS)

Dairy Farmers Corner

924 Hunter St, Newcastle West, 2302

SEPP 65 Compliance Statement

Revision A
14/10/21

Prepared to accompany the Development Application submitted for;

Mixed Use Development at 924 Hunter St, Newcastle West, 2302.
For Thirdi Dairy Farmers Pty Ltd

Verification of Qualifications

Caine King and Stuart Campbell are registered as Architects in New South Wales and are enrolled in the Division of Chartered Architects in the register of Architects pursuant to the Architect Act 1921. Their registration numbers are 7974 and 7574 respectfully.

Statement of Design

CKDS Architecture has been working in conjunction with related professionals and experts in respect of the design. The project has been designed to provide a development that is respectful of local planning and design controls and that responds to the best practice design principles of SEPP No. 65.

CKDS Architecture verify that the design quality principles set out in Part 2 of State Environmental Planning Policy No. 65 – Design Quality of Residential Flat Development are achieved for the proposed residential development as stated below.

SEPP Design Verification Statement

The assessment of the proposal is made in accordance with respect to the Design Quality principles as set out in SEPP 65, part 2. As noted in the introduction:

- Good design is a creative process which, when applied to towns and cities, results in the development of great urban places: buildings, streets, squares and parks.

- Good design is inextricably linked to its site and locality, responding to the landscape, existing built form, culture and attitudes. It provides sustainable living environments, both in private and public areas.

- Good Design serves the public interest and includes appropriate innovation to respond to technical, social, aesthetic, economic and environmental challenges.

  The design quality principles do not generate design solutions, but provide a guide to achieving good design and the means of evaluating the merit of proposed solutions.

CKDS Architecture has prepared and reviewed the architectural drawings and are satisfied that the design meets the intent of the design quality principles as set out in part 2 of State Environmental Planning Policy No.65 Design Quality of Residential Flat Development.

CKDS Architecture has extensive experience in the design of residential housing and developments in various forms ranging from individual residential houses to high-density apartment development.

Reference has also been made to the Apartment Design Guide in preparing this report. These sections are used in order to cite objectives for each of the section headings.

Design Quality Principle 1: Context

Objectives	Proposed Development	Compliance
"Good design responds and contributes to its context. Context is the key natural and natural built features of an area, their relationship and the character they create when combined. It also includes social, economic, health and environmental conditions."	- The site occupies a prominent gateway position and site line from Tudor St, on the western edge of the Newcastle CBD. It forms part of the new, higher density urban district planned at the western end of the Newcastle City Centre, close to the Wickham Interchange. It is well located for transport, shopping, public places and civic open spaces within the Newcastle City Centre, refer to diagrams on A-0003. - The projects total site area is 3,941m,^{2} with the primary street frontage on Hunter St to the south, a secondary street frontage on Railway St to the east, and a minor street frontage to Tighe St on the North. It is currently occupied by a low-scale car dealership showroom, gym, and private hardstand car parking. - The former use of the site as the Dairy Farmer's Co-operative Milk Company has provided an important inspiration in developing the design. The co-operative used the site for the receiving, bottling and distribution of milk which included state of the art equipment for its time. The complex of buildings included the administration offices that featured an enormous milk bottle formed from glass blocks within the facade facing Hunter street. Despite demolition of many of the original late 1930's buildings, this unique feature still stands today. As a way of respecting the former complex of buildings and remaining heritage item, the stepped towers will create a transition in scale and density and embrace the remaining heritage item as an integrated element. - The design has been developed with extensive consultation with Councils Urban Design Review panel, appointed by the Government architects office as the design excellence panel for the scheme, and is considered a response to the scale and character of the site and the areas evolving urbanity.	Yes

Design Quality Principle 2: Built Form and Scale

Objectives	Proposed Development	Compliance
"Good Design achieves a scale, bulk and height appropriate to the existing or desired future character of the street and surrounding buildings." Good Design also achieves an appropriate built form for the site and the building in terms of building alignments, proportions, building type, articulation and the manipulation of building elements. Appropriate built form defines the public domain, contributes to the character of streetscapes and parks, including their views and vistas, and provides internal amenity and outlook.	- A series of rigorous options testing against the key design principles informed the proposed outcome for built form and scale. - The proposed development is conceived as a package of three towers; varying in height and scale. The collection of building forms creates a 'scalable' built form relating to the 'micro' human scale of Hunter St, while transitioning to the taller 'macro' scale of the evolving Newcastle skyline. - The podium form defines the street wall to Hunter & Railway St. The public domain is driven deep into the site, cutting the corner to create an activated pedestrian laneway that incorporates public art and landscape, and provides a welcoming refuge from the busy street intersection. - The corner commercial building responds directly to the retention and celebration of the heritage 'milk bottle' and clock tower building. The impression on the built form to 'cradle' the tower, while allowing it to stand alone, retains key vistas and draws attention to the only original remaining built elements of the iconic 'Dairy Farmers Corner.' - The tower forms sit within the 12m ADG side setback to the east, with 3m tower setbacks proposed to Hunter, Railway & Tighe St, consistent with 'The Store' approved scheme further east along Hunter St. Separation between the two towers complies with ADG 24m separation at this height. - Two, small footprint, opposing wedge tower forms at opposite corners of the rhombus shaped site were the optimal outcome from a rigorous series of options testing of both single and two tower forms on the site. These tower forms respond to the sites geometry, while maximizing opportunities for solar and view access. - A variation in height between the towers ranging from 99m at the north to 84m at the south creates a visual contrast in the skyline, with horizontal roof plates expressing the dynamic forms in a dynamic way when viewed from different vantage points.	Yes

Design Quality Principle 3: Density

Objectives	Proposed Development	Compliance
"Good design achieves a high level of amenity for residents and each apartment, resulting in a density appropriate to the site and its context. Appropriate densities are consistent with the area's existing or projected population. Appropriate densities can be sustained by existing or proposed infrastructure, public transport, access to jobs, community facilities and the environment."	- The proposed development is consistent with LEP height and floor space controls when accounting for a 10% design excellence bonus. - The proposal contains 183 new residential apartments that provide a mix of accommodation which cater for contemporary requirements and comply with current standards. The mix includes no studios, 36 x 1 bed (19.7%), 128 x 2 bed (69.9%), and 19 x 3 bed (10.4%). - In addition to the apartments above, retail and commercial spaces at the lower levels and dedicated corner commercial building diversify the use of the site and offer potential for live / work and shopping opportunities. - The proposed density and mix will be appropriate in such a well-served urban context. The site is ideal for a contemporary mixed-use / residential apartment proposal given the proximity to transport, schools, the harbourfront, parks, and the CBD itself.	Yes

Design Quality Principle 4: Sustainability

Objectives	Proposed Development	Compliance
"Good design combines positive environmental, social and economic outcomes. Good Sustainable design includes use of natural cross ventilation and sunlight for the amenity and liveability of residents and passive thermal design for ventilation, heating and cooling reducing reliance on technology and operation costs. Other elements include recycling and reuse of materials, and deep soil zones for groundwater recharge and vegetation."	- The site is within easy walking distance from the Wickham Interchange, and promotes compact and efficient planning principles consistent with planning policies and best practices. - In addition to the substantial residential accommodation, the proposal has a mix of commercial, retail and communal spaces including a unique dedicated 'work from home' space that will add diversity to the area and promote live / work and recreational opportunities. - Beyond compliance with BASIX's numerical standards, the site planning and building design maximise the benefits of passive solar design to the dwellings,	Yes

	exceeding ADG minimum standards. Generous wrap around balconies provides shade to all residential unit glazing. - Solar analysis indicates 84.7% of units receive at least 1 hour of sun between 9am and 3pm mid winter, with 73.8% receiving minimum 2 hours. - All living rooms open directly to balconies, which offer protection from direct sun to interiors in summer. - 91.3% of units are dual aspect and cross ventilated, with the majority receiving access to harbour views. - All tower common lobbies are day-lit and naturally ventilated from two sides.	
Design Quality Principle 5: Landscape		
Objectives "Good design recognises that together landscape and buildings operate as an integrated and sustainable system, resulting in attractive developments with good amenity. A positive image and contextual fit of well designed developments is achieved by contributing to the landscape character of the streetscape and neighbourhood. Good Landscape design enhances the development's environmental performance by retaining positive natural features which contribute to the local context, co-ordinating water and soil management, solar access, micro-climate, tree canopy, habitat values, and preserving green networks. Good landscape design optimises usability, privacy and opportunities for social interaction, provides for practical establishment and long term management."	Proposed Development - Even on the constrained urban site, the proposals landscape strategy by Xeriscapes provides significant enhancement to the public domain and communal open space areas. - In the public domain, a new pedestrian laneway cuts the corner between Hunter & Railway St, framed by the dynamic shared work space on the street corner and activated at the groundplane by F&B, retail and residential lobbies. The landscape proposal includes considered pavement banding, planting in the pavement, and off-form concrete benches to provide shaded seating areas and define the laneway. Feature street trees are proposed to both Hunter and Railway St, complementing the minimum 3m full height built form setback from the Boundary on Railway St. - A common open space area on the north facing level 4 podium roof, the landscape design intent is to create a generous private 'urban park' for the residents. Extensive tree planting areas in raised planters and turf berms respond to the dynamic built form geometry, and provide colour, shade, and amenity to these outdoor recreation areas.	Compliance Yes

Design Quality Principle 6: Amenity

Objectives	Proposed Development	Compliance
"Good design positively influences internal and external amenity for residents and neighbours. Achieving good amenity contributes to positive living environments and resident well being. Good amenity combines appropriate room dimensions and shapes, access to sunlight, natural ventilation, outlook, visual and acoustic privacy, storage, indoor and outdoor space, efficient layouts and service areas, and ease of access for all age groups and degrees of mobility.."	- All dwellings have well proportioned internal living spaces that open directly to private balconies. Analysis indicates 84.7% of apartments receive 1 hour of sun to living space between 9am and 3pm mid winter, with 73.8% of apartments receiving minimum 2 hours. - All dwellings have generous private outdoor spaces in the form of balconies, which wrap the full perimeter residential units of both towers. - In addition to balconies off living rooms, all bedrooms benefit from direct opening to a private balcony space. The arrangement allows full height sliding glazing offset from the building edge to the full perimeter of both towers, increasing the apartments sense of spaciousness, openness to the outside, and sunlight. - 3.1m floor to floors typically provided to accommodate 2.7m ceilings in accordance with the ADG. - All common lobbies in both towers have natural light and ventilation from two sides. - 35% of apartments incorporate the liveable housing guidelines silver level universal design features, in excess of the minimum stipulated by the ADG. - In addition to storage within the apartment, many have additional external storage cages in secure car parking areas or dedicated resident bike / storage rooms. - Common garbage rooms have been provided in the car park, conveniently located near each core.	Yes

Design Quality Principle 7: Safety

Objectives	Proposed Development	Compliance
"Good design optimises safety and security, within the development and the public domain. It provides for quality public and private spaces that are clearly defined and fit for intended purpose. Opportunities to maximise passive surveillance of public and communal areas promote safety. A positive relationship between public and private spaces is achieved through clearly defines secure access points and well lit and visible areas that are easily maintained and appropriate to the location and purpose"	- The apartments, commercial and retail spaces will provide excellent animation and passive surveillance of the street and extended public domain. - The main entry to the northern tower is clearly identifiable and accessed directly from Railway St. - The southern tower main entry lobby is directly visible from both Hunter and Railway St through the wide, open pedestrian laneways. - Common internal circulation means either tower is securely accessed by either lobby, meaning all residential dwellings can be accessed either directly from the street, or from within the highly visible laneway. - The services and escapes are discreetly handled and largely presented to the minor street frontage of Tighe St to minimize their impact on the primary streetscapes and entry points.	Yes

Design Quality Principle 8: Housing Diversity and Social Interaction

Objectives	Proposed Development	Compliance
"Good Design achieves a mix of apartment sizes, providing housing choice for different demographics, living needs and household budgets. Well designed apartment developments respond to social context by providing housing facilities to suit the existing and future social mix. Good design involves practical and flexible features, including different types of communal spaces for a broad range of people, providing opportunities for social interaction amongst residents.	- The proposed development is extremely well located in relation to major public transport, shopping centres, parks, schools and existing services. The Wickham interchange is located nearby, and there is an existing bus services in the streets. Ample bike parking is provided, and the site is within easy walk of many destinations. This well-serviced location should minimize reliance on the use of private motor vehicles. - The proposal allows for a wide range of apartment types including podium and tower units, in a range of 1B, 2B & 3B options in various configurations and orientations. - The generous communal rooftop garden spaces can become a great asset for future residents and their visitors, and should engender a sense of community, provide recreational opportunities and the chance for easy socialization. - High amenity common lobbies are provided to both towers, expressed as breezeways forming open ended slots with light and air from two sides. - In addition to the apartments above, retail and commercial spaces at the lower levels and dedicated corner building diversify the use of the site, and offer potential for live / work and shopping opportunities.	Yes

- The building is served by generous communal facilities including secure and discreet bike / storage rooms, gym / pilates spaces, multi-function rooms, work from home space, pool, and landscaped rooftop open space.

Design Quality Principle 9: Aesthetics

Objectives	Proposed Development	Compliance
"Good Design achieves a built form that has good proportions and a balanced composition of elements, reflecting the internal layout and structure. Good Design uses a variety of materials colours and textures. The visual appearance of well designed apartment development responds to the existing or future local context, particularly desirable elements and repetitions of the streetscape.	- The architectural design will bring an elegant yet dynamic presence to the Newcastle streetscape and skyline. It has been subject to extensive external design review, and has a considered material palette that considers aesthetics, durability, maintenance, and response to heritage. - The design has been developed in consultation with the Councils Urban Design Review Panel, appointed by the Government Architects office as the projects design excellence review panel. It is a considered response to the scale and character of the sites evolving urbanity. - The proposed development is conceived as a package of three towers; varying in height and scale. The collection of building forms creates a 'scalable' built form relating to the 'micro' human scale of Hunter Street whilst transitioning to the taller 'macro' scale of the evolving Newcastle skyline. - Two opposing wedge tower forms at opposite corners of the rhombus shaped site were the optimal outcome from a rigorous series of options testing on the site that included various one and two tower options. These tower forms respond to the sites geometry, while maximizing opportunities for solar and view access. - A variation in height between the towers ranging from 99m at the north to 84m at the south creates a visual contrast in the skyline, with horizontal roof places expressing the dynamic forms in different ways from vantage points at all angles. - The street wall facades reference the Dairy Farmers heritage through both materiality, and a strong horizontal articulation and spandrel aligned to the top of the lost former administration wings which once extended from the milk bottle clock tower. Screening elements separated by horizontal blades provide privacy to the podium units above this line and pick up on the scale of the clock tower, while glazing framed by hoods provide articulation and activation to the groundplane.	Yes

- The facades to the independent corner commercial building further reference the heritage of the site with a ‘veil’ of curved and perforated screening elements that invoke a sense of the repetitious receiving, bottling, and state of the art equipment at the time of its former use.

Conclusion

- The design achieves a high quality architectural, urban design and landscape resolution, and forms part of the revitalization of the citys west end.
- The design has been developed in consultation with the Councils Urban Design Review Panel, appointed by the Government Architects office as the projects design excellence review panel. It is a considered response to the scale and character of the sites evolving urbanity.
- The site is well located to public transport, services and amenity, ideal for a mixed-use urban consolidation and redevelopment.
- The massing of the proposal responds to the major changes proposed in this inner urban context, opportunities to extend the public domain, and the unique geometry of the site.
- The proposed development is conceived as a package of three towers; varying in height and scale. The collection of building forms creates a ‘scalable’ built form relating to the 'micro' human scale of Hunter Street whilst transitioning to the taller ‘macro' scale of the evolving Newcastle skyline.
- The project has a distinctive architectural character, scale and silhouette that will be an appropriate addition to Newcastle’s urban landscape.
- The proposal aims to reconnect the public with the sites significant ‘Dairy Farmers Corner’ heritage through a highly pedestrianised ground plane, and the incorporation of interpretive public art and landscape. A new pedestrian laneway, framed by an elevated and veiled corner building form housing the dynamic shared work space on the street corner, will provide a welcoming refuge from the busy street corner.
- The design appropriately responds to and integrates with the sites heritage through retention and celebration of the existing milk bottle clock tower, the only remaining original heritage fabric from the sites former use as the Dairy Farmers milk bottling and distribution plant. Built forms maintain and highlight key views towards the clock tower, while articulation and materiality in the building facades complement and respond to the retained and restored heritage item.
- Environmentally sustainable design issues have ben holistically incorporated into the project.
- The landscape design is fully integrated into the site planning of the proposal, enhancing the public domain and providing a unique, North facing private open ‘urban parkland’ for the residents to enjoy.
- The proposed scheme incorporates a diversity of residential accommodation, incorporating principles of adaptability, to increase housing choices available in Newcastle.
- The proposal satisfactorily considers the privacy and amenity of neighboring properties, respecting the redevelopment potential of the bordering site to the east with an ADG compliant 12m setback above streetwall. An ADG compliant 24m separation is provided between the two residential towers.
- The project will create a high quality residential environment for future residents, with very good amenity generally exceeding ADG minimums.
- The resolution of urban, architectural, environmental and social design considerations demonstrates that the proposal is an appropriate fit to its site and context.

Stuart Campbell

Architect; NSW ARB number: #7545

Director, CKDS Architecture

Revision B
21th October, 2021
Job Number 21014

DAIRY FARMERS CORNER
SEPP 65
DA DESIGN QUALITY STATEMENT

1.0 OBJECTIVES

OBJECTIVE	SUMMARY	ACTIONS	Compliance
	SITING		
3A-1	Site Analysis illustrates that design decisions have been based upon the opportunities and constraints of the site.	The site is well located to public transport, services and amenity. The massing of the proposal responds to the major changed proposed in this inner urban context, opportunities to extend the public domain, and the unique geometry of the site.	Yes
3B-1	Building types and layouts respond to the streetscape and site while optimising solar access within the development	The podium form defines the streetwall at all three street frontages, while the corner building form responds to heritage and public domain. The residential towers are located to optimise solar access and views.	Yes
3B-2	Overshadowing of neighbouring properties is minimised during mid winter	The height of the towers complies with the LEP height limit with the 10% design excellence bonus applied. Directly to the east and west of the site are existing commercial buildings, and the four lane width of Hunter St provides a buffer to future residential proposals across the road to the south of the site. Due to the towers relative slenderness, adverse overshadowing of other properties is minimised during mid winter. The UDRP noted the overshadowing impacts as appearing acceptable.	Yes
3C-1	Transition between private and public domain is achieved without compromising safety and security	The scheme proposed generous pedestrian laneway widths to allow a high level of permeability and visibility from the street to all retail and lobby spaces	Yes

		at the groundplane, as well as passive surveillance from the residential towers above. The car park will provide secure vehicular access from Tighe St.	
3C-2	Amenity of the public domain is retained and enhanced	The public domain is driven deep into the site, cutting the corner to create an activated pedestrian laneway between Hunter and Railway St that incorporates interpretive public art and landscape. Framed by an elegant, veiled corner building housing dynamic shared work space, the new pedestrian laneways will provide a welcoming refuge from the busy street corner and invite the public to reconnect with the remaining heritage 'milk bottle' clock tower on Dairy Farmers corner.	Yes
3D-1	An adequate area of communal open space is provided to enhance residential amenity and provide opportunities for landscaping	Substantial landscaped communal open space and outdoor recreational landscaping is provided on the podium roof. Each apartment has private open balcony space.	Yes
3D-2	Communal open space is designed to allow for a range of activities, respond to site conditions and be attractive and inviting	The podium communal roof area incorporates substantial communal amenities including secure bike parking and storage areas, swimming pool, multi-purpose rooms, gym / Pilates rooms, and a work from home space.	Yes
3D-3	Communal open space is designed to maximise safety	Units are positioned to provide passive surveillance to the communal open space on top of the podium.	Yes
3D-4	Public open space, where provided, is responsive to the existing pattern and uses of the neighbourhood	The creation of the pedestrian laneways responds to the fine grain existing and future streetscape patterns along Hunter St. The site book ends the western edge of city block that starts with 'The Store' redevelopment at the Wickham Interchange, and proposes an additional 3m setback from Railway St to improve the pedestrian connection to the Railway St rail overpass to the North of the site.	Yes
3E-1	Deep soil zones allow for and support healthy plant growth. Min. deep soil zones <650sqm No min. dimensions 7% site area 650 – 1500 3m min dimension 7% site area ≥ 1500 6m min dimension 7% site area	The CBD location, density, building typology and non-residential uses at ground floor present limited opportunities for deep soil at ground level. Generous garden and green roof areas have been provided on the communal podium roof. Stormwater management will be provided in accordance with the DCP and civil engineers design.	Yes

3F-1	Adequate building separation distances are shared equitably between neighbouring sites to achieve reasonable levels of external and internal visual privacy Height — Habitable rooms/balconies — Non habitable rooms Up to 12m — 6m — 3m Up to 25m — 9m — 4.5m >25m — 12m — 6m	The site shares only one site with an adjacent property, as the remaining three are street frontage. An ADG compliant 12m side setback to the neighbouring property to the east is proposed to the full height of the towers above street wall.	Yes
3F-2	Site and building design elements increase privacy without compromising access to light and air and balance outlook and views between habitable rooms and private open space.	All units feature generous balconies that wrap the corner, allowing all unit glazing to be set back from the building footprint and provide full height operability and access to outlook and air. Glass balustrades at the higher tower levels provide unobstructed access to sunlight and view, with the introduction of 'diminishing' solid elements to the balustrades at the lower levels for privacy.	Yes
3G-1	Building entries and pedestrian access connects to and addresses the public domain	There are two distinct building entries for each of the towers. The North tower lobby addresses Railway St, and the south tower lobby is accessed through the new public space, while remaining visible from both Hunter & Railway St.	Yes
3G-2	Access, entries and pathways are accessible and easy to identify	The use of framed hoods around groundplane glazing, large ceiling heights, and a dramatic entry under the podium to the south tower lobby have been incorporated into the design of the entries. The generous width of the pedestrian laneways provide easily identifiable and accessible pathways through the site.	Yes
3G-3	Large sites provide pedestrian links for access to streets and connection to destinations	A significant pedestrian link cuts the corner to Railway at the termination of the city block that begins at the Wickham interchange, providing a welcoming refuge from the busy street corner that will incorporate landscape and interpretive public art.	Yes
3H-1	Vehicle access points are designed to achieve safety, minimise conflicts between pedestrians and vehicles and create high quality streetscapes	The car park and loading area vehicular entries are proposed on Tighe St, mitigating potential queuing issues at the busy Hunter & Railway St intersection, and avoid conflict with the more pedestrian trafficked footpaths	Yes

		on Hunter & Railway.	
3J-1	Car parking is provided based on proximity to public transport in metropolitan Sydney and centres in regional areas	Car parking has been designed to the Newcastle DCP.	Yes
3J-2	Parking and facilities are provided for other modes of transport	Motorcycle and bicycle parking is available within the secure podium car park areas.	Yes
3J-3	Car park design and access is safe and secure	The car park will be provided with a security system including roller shutter.	Yes
3J-4	Visual and environmental impacts of underground car parking are minimised	N/A	N/A
3J-5	Visual and environmental impacts of on-grade car parking are minimised	The carparking is sleeved by commercial, retail and residential accommodation to the main Hunter & Railway St street walls. A zero lot line wall is provided to the eastern side boundary podium with the intent that future and existing development will match this alignment.	Yes
3J-6	Visual and environmental impacts of above ground enclosed car parking are minimised	As above	Yes
	DESIGNING THE BUILDING		
4A-1	Optimise the number of apartments receiving min. 2 hours sunlight to habitable rooms, primary windows and private open space between the hours of 9am and 3pm All other areas – a min. of 3 hours A max. of 15% receive no sun in mid winter	The positioning and orientation of the two towers on the site balances and optimises access to solar and key views. Solar analysis indicates between 9am and 3pm mid winter; 84.7% of apartments receive minimum 1hr mid winter 73.8% of apartments receive minimum 2hr mid winter 14.2% of apartments receive 'no sun' – with the exception of 4x units in the podium, these 'no sun' units are all corner units with dual aspect and generous provision of glazing and wrap around balconies.	Yes
	2 hours min sunlight midwinter in Sydney/Newcastle/Wollongong	See above	Yes
	All other areas a min. of 3 hours	See above	Yes
4A-2	Daylight access is maximised where sunlight is limited	In accordance with the guidance contained in the ADG, sun scarce exterior and interior spaces have been given light coloured finishes, and large window bays to provide large amounts of ambient light	Yes
4A-3	Design incorporates shading and glare control, particularly for warmer months	Balconies run the full perimeter of all residential units, allowing all glazing to be recessed from the building footprint and shaded by overhangs.	Yes

4B-1	All habitable rooms are naturally ventilated	All habitable rooms are naturally ventilated, and many have multiple windows in different facades.	Yes
4B-2	The layout and design of single aspect apartments maximises natural ventilation	Majority of the small percentage of single aspect units are north facing, featuring generous glazing and openings.	Yes
4B-3	The number of apartments with cross ventilation is maximised At least 60% of apartments are naturally cross ventilated Over all depth of cross over apartments in 18m max.	The vast majority of units are corner units with dual aspect and cross ventilation. 79.2% of dwellings in the first 9-floors are cross ventilated. 91.3% of total dwellings in the proposal are cross ventilated.	Yes Yes
4C-1	Ceiling height achieves sufficient natural ventilation and daylight access. Min height of – Habitable rooms 2.7m Non habitable rooms 2.4m Two storey apartments 2.7m main living floor 2.4m for second floor (max. 50% area) Attic spaces 1.8m at edge of room 30º ceiling slope	All habitable rooms have ceiling heights of ≥ 2.7m All non habitable rooms have ceiling heights of ≥ 2.4m	Yes Yes
4C-2	Ceiling height increases the sense of space in apartments and provides for well proportioned rooms	Proposal has adequate floor to ceiling heights, see above	Yes
4C-3	Ceiling height contributed to flexibility of building use over the life of the building	Ceiling heights comply	Yes
4D-1	Layout of rooms within an apartment is functional, well organised and provides a high standard of amenity	Layout of rooms is functional and rational, articulated by balconies to make best use of the design's character and provide a high standard of amenity	Yes
	Min. areas Studio 35sqm 1 bed 50sqm 2 bed 70sqm 3 bed 90sqm	 N/A Complies Complies Complies	Yes
	Every habitable room must have a window in an external wall with a total minimum glass area of not less than 10% of the floor area of the room.	All habitable rooms have operable windows in excess of the 10% minimum requirement.	Yes

	Daylight and air may not be borrowed from other rooms.		
4D-2	Environmental performance of the apartment is maximised	See above	Yes
	Habitable room depths are limited to a maximum of 2.5 x the ceiling height	Given the thin cross section design, all habitable room depths easily exceed these requirements.	Yes
	In open plan layouts the maximum habitable room depth is 8m from a window	Complies.	Yes
4D-3	Apartment layouts are designed to accommodate a variety of household activities and needs	Layouts are compact but flexible.	Yes
	Master bedrooms have a minimum area of 10sqm and other bedrooms 9sqm (excluding wardrobes)	Complies.	Yes
	Bedrooms have a minimum dimension of 3m (excluding robes)	Complies.	Yes
	Living rooms or open plan living have min width of 3.6m for studios/1beds 4m for 2/3beds	Complies.	Yes
	Width of cross over apartments are at least 4m internally to avoid narrow layouts	Not applicable	NA
4E-1	Apartments provide appropriately sized private open space and balconies to enhance residential amenity	All dwellings have generous private outdoor spaces in the form of balconies. The vast majority of units are dual aspect, with the balcony wrapping the full perimeter of the apartment.	Yes
	Primary balconies Studio 4sqm 1 bed 8sqm 2m min depth 2 bed 10sqm 2m min depth 3 bed 12sqm 2.4m min depth	Areas comply and typically far exceed ADG minimum total sizes per unit. Depths vary above and below the minimums in some areas of balcony. Multiple balconies per apartment are generally provided, with the relationship of balconies to living room spaces allowing the balconies in most instances to serve as an extension to the living space. Splayed blade walls are provided to the corners to create wind breaks, frame views and provide multiple balcony options for corner apartments.	Yes
	Apartments at ground level or on podium have a private open space instead of a balcony. Minimum area is 15sqm and minimum depth is 3m	N/A	N/A
4E-3	Private open space and balcony design is integrated into and contributes to the overall architectural form and detail of the building	All balconies are designed and detailed as integral components of the façades.	Yes

4E-4	Private open space and balcony design maximises safety	All balconies to be designed and constructed in accordance with the BCA	Yes
4F-1	Common circulation spaces achieve good amenity and properly service the number of apartments	All tower lobbies have access to natural light and ventilation from two sides, with easy access to the generous communal landscaped podium roof.	Yes
	Maximum number of apartments off a circulation core on a single level is 8	Maximum of 5 dwellings off a single core at the lower levels of the northern tower, with the remainder 4 dwellings or less per core at each level.	Yes
	For buildings 10 + storeys, maximum number of apartments sharing a single lift is 40	Complies	Yes
4F-2	Common circulation spaces promote safety and provide for social interaction between residents	Circulation is direct, legible and secure. Communal spaces including multi-purpose rooms, work from home spaces, gym /pilates rooms are easily accessible and co-located with the podium roof communal open space.	Yes
4G-1	Adequate, well designed storage is provided in each apartment	All apartments are provided with storage external to kitchens and bedrooms, and will also have access to storage areas within the podium and car park.	Yes
	Studios 4m3 1 bed 6m3 2 bed 8m3 3 + 10m3	Internal volumes generally achieved. Minor shorfalls on some unit types to be compensated with additional external volume to achieve compliant totals. Refer A-7006 for calculations.	Yes
4G-2	Additional storage is conveniently located, accessible and nominated for individual apartments.	Complies	Yes
4H-1	Noise transfer is minimised through the siting of buildings and building layout	Most apartments on site are located away from the major traffic noise. All wall construction and glazing in accordance with the Acoustic Engineer's recommendations.	Yes
4H-2	Noise impacts are mitigated within apartments through layout and acoustic treatments	All separating construction to be in accordance with the BCA	Yes
4J-1	In noisy or hostile environments the impacts of external noise and pollution are minimised through careful siting and layout of buildings	Street noise has been assessed by an acoustic engineer & the recommendations adopted.	Yes
4J-2	Appropriate noise shielding or attenuation techniques for the building design, construction and choice of materials are used to mitigate noise transmission.	In accordance with recommendations of the acoustic engineer.	Yes
4K-1	A range of apartment types and sizes is provided to cater for different household types now and into the future.	The proposal contains a mix of one, two and three bedroom units of varying configurations and character.	Yes
4K-2	The apartment mix is distributed to suitable locations within the building.	Different apartment types are located to best utilise and accommodate the	Yes

		site's best attributes.	
4L-1	Street frontage activity is maximised where ground floor apartments are located.	N/A – no ground floor apartments proposed.	N/A
4L-2	Design of ground floor apartments delivers amenity and safety for residents	N/A	N/A
4M-1	Building facades provide visual interest along the street while respecting the character of the local area.	The street wall facades reference the Dairy Farmers heritage through both materiality, and a strong horizontal articulation and spandrel aligned to the top of the lost former administration wings which once extended from the milk bottle clock tower. Screening elements separated by horizontal blades provide privacy to the podium units above this line, while glazing framed by hoods provide articulation and activation to the groundplane. The facades to the independent corner commercial building further reference the heritage of the site with a 'veil' of curved and perforated screening elements that invoke a sense of the repetitious receiving, bottling, and state of the art equipment at the time of its former use.	Yes
4M-2	Building functions are expressed by the façade	The horizontal layering of façade treatments and materiality provide a clear expression of active ground floor retail / commercial, lobbies, screened podium residential, and tower residential above.	Yes
4N-1	Roof treatments are integrated into the building design and respond positively to the street.	The development proposes a complex of buildings of varying heights and scales. The deliberate variation in heights between the towers creates a visual contrast using horizontal roof planes. Plant screening is integrated with the wedge geometry of the floor plates with a large and consistent offset from the edges.	Yes
4N-2	Opportunities to use roof space for residential accommodation and open space are maximised.	The entire podium rooftop is utilised as north facing, communal open space.	Yes
4N-3	Roof design incorporates sustainability features	The tower roofs extend to the full footprint of the floors below, providing overhangs to shade the penthouse units.	Yes
4O-1	Landscape design is viable and sustainable	The landscape design and species selection makes intelligent and diverse use of species for all garden spaces.	Yes
4O-2	Landscape design contributes to the streetscape and amenity	Street trees and public landscaping has been selected and designed by the landscape Architect to contribute to the streetscape.	Yes

4P-1	Appropriate soil profiles are provided	Landscape Architect has provided appropriate plant species for proposed soil volumes.	Yes
4P-2	Plant growth is optimised with appropriate selection and maintenance	Plants have been selected by the Landscape Architect to suit the site conditions.	Yes
4P-3	Planting on structures contributes to the quality and amenity of communal and public open spaces	The podium roof communal areas employ generous green roof and planting to provide high quality outdoor open areas. Border planting to the perimeter provides a visual buffer to the adjacent sites.	Yes
4Q-1	Universal design features are included in apartment design to promote flexible housing for all community members	35% of apartments incorporate the liveable housing guidelines silver level universal design features, in excess of the 20% stipulated by the ADG.	Yes
4Q-2	A variety of apartments with adaptable designs are provided	See above.	Yes
4Q-3	Apartment layouts are flexible and accommodate a range of lifestyle needs	A good mix of apartment types are provided, with all units responding to the site's particular opportunities.	Yes
4R-1	New additions to existing buildings are contemporary and complementary and enhance an areas identity and sense of place	Not applicable	N/A
4R-2	Adapted buildings provide residential amenity while not precluding future adaptive reuse	Not applicable	N/A
4S-1	Mixed use developments are provided in appropriate locations and provide active street frontages that encourage pedestrian movement.	Ground floor retail with an independent corner commercial building have been designed to address and activate both Hunter & Railway St, and address the prominent street corner.	Yes
4S-2	Residential levels of the building are integrated within the development, and safety and amenity is maximised for residents	Residential circulation areas are clearly defined, with entry lobbies separate from commercial and retail entries. Residential car parking and communal facilities are separated and secured.	Yes
4T-1	Awnings are well located and complement and integrate with building design	An awning along Hunter St is integrated with the building design, and provides a continuous horizontal wayfinding element that weaves through the pedestrian laneway.	Yes
4T-2	Signage responds to the context and desired streetscape character	Signage is to be integrated into the building frontage, and retail articulation zones.	Yes
4U-1	Development incorporates passive environmental design	Beyond compliance with BASIX's numerical standards, the site planning and building design maximise the benefits of passive solar design to the dwellings.	Yes

4U-2	Development incorporates passive solar design to optimise heat storage in winter and reduce heat transfer in summer	Thermal mass in concrete and use balcony overhangs throughout will provide optimised passive solar design throughout the year	Yes
4U-3	Adequate natural ventilation minimises the need for mechanical ventilation	All apartments are provided with natural ventilation, with the vast majority of units also dual aspect cross ventilated.	Yes
4V-1	Potable water use is minimised	Water efficient appliances and tapware will be installed in compliance with the BASIX assessment.	Yes
4V-2	Urban stormwater is treated on site before being discharged to receiving waters	In accordance with DCP and civil engineers design.	Yes
4V-3	Flood management systems are integrated into site design	Ground floor levels are set at the minimum occupiable floor level in accordance with the City of Newcastle flood certificate. Management systems in accordance with DCP and civil engineers design.	Yes
4W-1	Waste storage facilities are designed to minimise impacts on the streetscape, building entry and amenity of residents	Communal waste storage areas are located within the building for no impact to main entries or streetscapes. Main holding rooms for both residential and commercial waste are located at ground floor near Tighe St for ease of collection.	Yes
4W-2	Domestic waste is minimised by providing safe and convenient source separation and recycling	Separate recycling and waste collection bins are provided at each screened waste room within the car parking areas.	Yes
4X-1	Building design detail provides protection from weathering	Provision of durable building materials ensure longevity of the building.	Yes
4X-2	Systems and access enable ease of maintenance	Long life, low maintenance materials selected.	Yes
4X-3	Material selection reduces ongoing maintenance costs	Robust and durable materials have been specified.	Yes

The project will create a high quality residential environment for future residents, with very good amenity well above ADG requirements.

Stuart Campbell
Architect; NSW ARB number: #7545
Director, CKDS Architecture

Appendix F

BASIX CERTIFICATE

BASIX® Certificate

Building Sustainability Index www.basix.nsw.gov.au

Multi Dwelling

Certificate number: 1241680M

This certificate confirms that the proposed development will meet the NSW government's requirements for sustainability, if it is built in accordance with the commitments set out below. Terms used in this certificate, or in the commitments, have the meaning given by the document entitled "BASIX Definitions" dated 10/09/2020 published by the Department. This document is available at www.basix.nsw.gov.au

Secretary
Date of issue: Thursday, 21 October 2021
To be valid, this certificate must be lodged within 3 months of the date of issue.

NSW GOVERNMENT | Planning, Industry & Environment

Project summary	
Project name	E21134-Dairy Farmers
Street address	924 Hunter Street Newcastle West 2302
Local Government Area	Newcastle City Council
Plan type and plan number	deposited 445736
Lot no.	2
Section no.	-
No. of residential flat buildings	2
No. of units in residential flat buildings	183
No. of multi-dwelling houses	0
No. of single dwelling houses	0

Project score		
Water	✔ 40	Target 40
Thermal Comfort	✔ Pass	Target Pass
Energy	✔ 22	Target 20

Certificate Prepared by
Name / Company Name: Credwell Energy
ABN (if applicable): 625598352

Description of project

Project address	
Project name	E21134-Dairy Farmers
Street address	924 Hunter Street Newcastle West 2302
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Plan type and plan number	deposited 445736
Lot no.	2
Section no.	-

Project type	
No. of residential flat buildings	2
No. of units in residential flat buildings	183
No. of multi-dwelling houses	0
No. of single dwelling houses	0

Site details	
Site area (m²)	3941
Roof area (m²)	1556
Non-residential floor area (m²)	1866.0
Residential car spaces	238
Non-residential car spaces	-

Common area landscape	
Common area lawn (m²)	880.0
Common area garden (m²)	0.0
Area of indigenous or low water use species (m²)	0.0

Assessor details	
Assessor number	101026
Certificate number	0006699340
Climate zone	15
Ceiling fan in at least one bedroom	No
Ceiling fan in at least one living room or other conditioned area	No

Project score		
Water	✔ 40	Target 40
Thermal Comfort	✔ Pass	Target Pass
Energy	✔ 22	Target 20

Description of project

The tables below describe the dwellings and common areas within the project

Residential flat buildings - Building North, 110 dwellings, 30 storeys above ground

Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)
N301	1	54.0	0.0	0.0	-
N403	2	84.2	0.0	0.0	-
N505	2	84.2	0.0	0.0	-
N605	2	84.2	0.0	0.0	-
N705	2	84.2	0.0	0.0	-
N805	2	84.2	0.0	0.0	-
N905	2	84.2	0.0	0.0	-
N10052		84.2	0.0	0.0	-
N11052		84.2	0.0	0.0	-
N12052		84.2	0.0	0.0	-
N13052		84.2	0.0	0.0	-
N14052		84.2	0.0	0.0	-
N16012		81.7	0.0	0.0	-
N17022		86.4	0.0	0.0	-
N18032		84.2	0.0	0.0	-
N19042		84.2	0.0	0.0	-
N21012		81.7	0.0	0.0	-
N22022		86.4	0.0	0.0	-

Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)
N302	1	53.8	0.0	0.0	-
N501	1	54.0	0.0	0.0	-
N601	1	54.0	0.0	0.0	-
N701	1	54.0	0.0	0.0	-
N801	1	54.0	0.0	0.0	-
N901	1	54.0	0.0	0.0	-
N10011		54.0	0.0	0.0	-
N11011		54.0	0.0	0.0	-
N12011		54.0	0.0	0.0	-
N13011		54.0	0.0	0.0	-
N14011		54.0	0.0	0.0	-
N15012		81.7	0.0	0.0	-
N16022		86.4	0.0	0.0	-
N17032		84.2	0.0	0.0	-
N18042		84.2	0.0	0.0	-
N20012		81.7	0.0	0.0	-
N21022		86.4	0.0	0.0	-
N22032		84.2	0.0	0.0	-

Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)
N303	2	84.2	0.0	0.0	-
N502	1	53.8	0.0	0.0	-
N602	1	53.8	0.0	0.0	-
N702	1	53.8	0.0	0.0	-
N802	1	53.8	0.0	0.0	-
N902	1	53.8	0.0	0.0	-
N10021		53.8	0.0	0.0	-
N11021		53.8	0.0	0.0	-
N12021		53.8	0.0	0.0	-
N13021		53.8	0.0	0.0	-
N14021		53.8	0.0	0.0	-
N15022		86.4	0.0	0.0	-
N16032		84.2	0.0	0.0	-
N17042		84.2	0.0	0.0	-
N19012		81.7	0.0	0.0	-
N20022		86.4	0.0	0.0	-
N21032		84.2	0.0	0.0	-
N22042		84.2	0.0	0.0	-

Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)
N401	1	54.0	0.0	0.0	-
N503	1	54.0	0.0	0.0	-
N603	1	54.0	0.0	0.0	-
N703	1	54.0	0.0	0.0	-
N803	1	81.8	0.0	0.0	-
N903	1	54.0	0.0	0.0	-
N10031		54.0	0.0	0.0	-
N11031		54.0	0.0	0.0	-
N12031		54.0	0.0	0.0	-
N13031		54.0	0.0	0.0	-
N14031		54.0	0.0	0.0	-
N15032		84.2	0.0	0.0	-
N16042		84.2	0.0	0.0	-
N18012		81.7	0.0	0.0	-
N19022		86.4	0.0	0.0	-
N20032		84.2	0.0	0.0	-
N21042		84.2	0.0	0.0	-
N23012		81.7	0.0	0.0	-

Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)
N402	1	53.8	0.0	0.0	-
N504	2	84.2	0.0	0.0	-
N604	2	84.2	0.0	0.0	-
N704	2	84.2	0.0	0.0	-
N804	2	84.2	0.0	0.0	-
N904	2	84.2	0.0	0.0	-
N10042		84.2	0.0	0.0	-
N11042		84.2	0.0	0.0	-
N12042		84.2	0.0	0.0	-
N13042		84.2	0.0	0.0	-
N14042		84.2	0.0	0.0	-
N15042		84.2	0.0	0.0	-
N17012		81.7	0.0	0.0	-
N18022		86.4	0.0	0.0	-
N19032		84.2	0.0	0.0	-
N20042		84.2	0.0	0.0	-
N22012		81.7	0.0	0.0	-
N23022		86.4	0.0	0.0	-

Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)
N23032		84.2	0.0	0.0	-
N24042		84.2	0.0	0.0	-
N26012		81.7	0.0	0.0	-
N27023		170.6	0.0	0.0	-

Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)
N23042		84.2	0.0	0.0	-
N25012		81.7	0.0	0.0	-
N26022		86.4	0.0	0.0	-
N28013		165.7	0.0	0.0	-

Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)
N24012		81.7	0.0	0.0	-
N25022		86.4	0.0	0.0	-
N26032		84.2	0.0	0.0	-
N28023		170.6	0.0	0.0	-

Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)
N24022		86.4	0.0	0.0	-
N25032		84.2	0.0	0.0	-
N26042		84.2	0.0	0.0	-
N29013		165.7	0.0	0.0	-

Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)
N24032		84.2	0.0	0.0	-
N25042		84.2	0.0	0.0	-
N27013		165.7	0.0	0.0	-
N29023		170.6	0.0	0.0	-

Residential flat buildings - Building South, 73 dwellings, 30 storeys above ground

Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)
S201	2	109.1	0.0	0.0	-
S303	2	120.0	0.0	0.0	-
S601	2	84.2	0.0	0.0	-
S702	2	84.2	0.0	0.0	-
S803	2	81.8	0.0	0.0	-
S904	2	82.5	0.0	0.0	-
S11012		84.2	0.0	0.0	-
S12022		84.2	0.0	0.0	-
S13032		81.8	0.0	0.0	-
S14042		82.5	0.0	0.0	-
S16022		86.4	0.0	0.0	-

Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)
S202	1	81.9	0.0	0.0	-
S501	2	84.2	0.0	0.0	-
S602	2	84.2	0.0	0.0	-
S703	2	81.8	0.0	0.0	-
S804	2	82.5	0.0	0.0	-
S10012		84.2	0.0	0.0	-
S11022		84.2	0.0	0.0	-
S12032		81.8	0.0	0.0	-
S13042		82.5	0.0	0.0	-
S15012		84.2	0.0	0.0	-
S16032		82.5	0.0	0.0	-

Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)
S203	2	120.0	0.0	0.0	-
S502	2	84.2	0.0	0.0	-
S603	2	81.8	0.0	0.0	-
S704	2	82.5	0.0	0.0	-
S901	2	84.2	0.0	0.0	-
S10022		84.2	0.0	0.0	-
S11032		81.8	0.0	0.0	-
S12042		82.5	0.0	0.0	-
S14012		84.2	0.0	0.0	-
S15022		84.2	0.0	0.0	-
S17012		84.2	0.0	0.0	-

Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)
S301	2	109.1	0.0	0.0	-
S503	2	81.8	0.0	0.0	-
S604	2	82.5	0.0	0.0	-
S801	2	84.2	0.0	0.0	-
S902	2	84.2	0.0	0.0	-
S10032		81.8	0.0	0.0	-
S11042		82.5	0.0	0.0	-
S13012		84.2	0.0	0.0	-
S14022		84.2	0.0	0.0	-
S15032		82.5	0.0	0.0	-
S17022		84.2	0.0	0.0	-

Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)
S302	1	81.9	0.0	0.0	-
S504	2	82.5	0.0	0.0	-
S701	2	84.2	0.0	0.0	-
S802	2	84.2	0.0	0.0	-
S903	2	81.8	0.0	0.0	-
S10042		82.5	0.0	0.0	-
S12012		84.2	0.0	0.0	-
S13022		84.2	0.0	0.0	-
S14032		81.8	0.0	0.0	-
S16012		81.7	0.0	0.0	-
S17032		82.5	0.0	0.0	-

Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)
S18012	2	84.2	0.0	0.0	-
S19032	2	82.5	0.0	0.0	-
S21022	2	84.2	0.0	0.0	-
S23023	3	159.8	0.0	0.0	-

Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)
S18022	2	84.2	0.0	0.0	-
S20012	1	84.2	0.0	0.0	-
S21032	2	82.5	0.0	0.0	-
S24013	1	170.6	0.0	0.0	-

Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)
S18032	2	82.5	0.0	0.0	-
S20022	2	84.2	0.0	0.0	-
S22013	1	170.6	0.0	0.0	-
S24023	3	159.8	0.0	0.0	-

Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)
S19012	1	84.2	0.0	0.0	-
S20032	2	82.5	0.0	0.0	-
S22023	3	159.8	0.0	0.0	-

Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)
S19022	2	84.2	0.0	0.0	-
S21012	1	84.2	0.0	0.0	-
S23013	1	170.6	0.0	0.0	-

Description of project

The tables below describe the dwellings and common areas within the project

Common areas of unit building - Building North

Common area	Floor area (m²)
Lift car (No.1)	-
Gym - L4 -North	72.25
SP Fan - L2	8.94
Pilates Studio - L4	54.86

Common area	Floor area (m²)
Lift car (No.2)	-
Mech Plant - L2	11.29
Garbage Room - L3	23.3
All Hallways - North	735.0

Common area	Floor area (m²)
Garbage room - L2	23.5
SP Fan - L2	8.47
Garbage Room - L1	19.5
All Levels - Fire Stairs (North)	527.0

Common areas of unit building - Building South

Common area	Floor area (m²)
Lift car (No.3)	-
Garbage room - L2	18.4
SP Fan - L2	13.35
Garbage Room - L1	17.2

Common area	Floor area (m²)
Lift car (No.4)	-
Function/Multi-Purpose- L4 - South	101.56
SP Fan - L2	14.96
All Hallways - South	738.0

Common area	Floor area (m²)
Garbage - UGF	25.1
Resi - work from home - L4 - South	174.25
Garbage Room - L3	28.1
All Levels - Fire Stairs (South)	448.0

Common areas of the development (non-building specific)

Common area	Floor area (m²)
Car park area - GF	1105.0
Car park area - L2	1887.0
Resi Garbage room - GF	28.77
MRV Delivery - GF	84.21
Fire control room - GF	12.29
Pool Plant - L4	7.4

Common area	Floor area (m²)
Car park area - UPG	1172.0
Car park area - L3	1868.0
Bike & External Storage - L1	214.7
Substation - GF	19.32
Fire Pump & Tank - GF	122.7
Ground floor lobby	262.0

Common area	Floor area (m²)
Car park area - L1	2003.0
Switch room- GF	20.0
Bike & Lockers - L2	178.6
Substation - GF	19.32
GF - Bulky Mail	19.8
Outdoor Hallway -	265.0

Schedule of BASIX commitments

1. Commitments for Residential flat buildings - Building North
    - (a) Dwellings
        - (i) Water
        - (ii) Energy
        - (iii) Thermal Comfort
    - (b) Common areas and central systems/facilities
        - (i) Water
        - (ii) Energy

2. Commitments for Residential flat buildings - Building South
    - (a) Dwellings
        - (i) Water
        - (ii) Energy
        - (iii) Thermal Comfort
    - (b) Common areas and central systems/facilities
        - (i) Water
        - (ii) Energy

3. Commitments for multi-dwelling houses

4. Commitments for single dwelling houses

5. Commitments for common areas and central systems/facilities for the development (non-building specific)
    - (i) Water
    - (ii) Energy

Schedule of BASIX commitments

The commitments set out below regulate how the proposed development is to be carried out. It is a condition of any development consent granted, or complying development certificate issued, for the proposed development, that BASIX commitments be complied with.

1. Commitments for Residential flat buildings - Building North

(a) Dwellings

(i) Water	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) The applicant must comply with the commitments listed below in carrying out the development of a dwelling listed in a table below.			
(b) The applicant must plant indigenous or low water use species of vegetation throughout the area of land specified for the dwelling in the "Indigenous species" column of the table below, as private landscaping for that dwelling. (This area of indigenous vegetation is to be contained within the "Area of garden and lawn" for the dwelling specified in the "Description of Project" table).	✔	✔	
(c) If a rating is specified in the table below for a fixture or appliance to be installed in the dwelling, the applicant must ensure that each such fixture and appliance meets the rating specified for it.		✔	✔
(d) The applicant must install an on demand hot water recirculation system which regulates all hot water use throughout the dwelling, where indicated for a dwelling in the "HW recirculation or diversion" column of the table below.		✔	✔
(e) The applicant must install: (aa) a hot water diversion system to all showers, kitchen sinks and all basins in the dwelling, where indicated for a dwelling in the "HW recirculation or diversion" column of the table below; and (bb) a separate diversion tank (or tanks) connected to the hot water diversion systems of at least 100 litres. The applicant must connect the hot water diversion tank to all toilets in the dwelling.		✔ ✔	✔ ✔
(e) The applicant must not install a private swimming pool or spa for the dwelling, with a volume exceeding that specified for it in the table below.	✔	✔	
(f) If specified in the table, that pool or spa (or both) must have a pool cover or shading (or both).		✔	
(g) The pool or spa must be located as specified in the table.	✔	✔	
(h) The applicant must install, for the dwelling, each alternative water supply system, with the specified size, listed for that dwelling in the table below. Each system must be configured to collect run-off from the areas specified (excluding any area which supplies any other alternative water supply system), and to divert overflow as specified. Each system must be connected as specified.	✔	✔	✔

	Fixtures					Appliances		Individual pool				Individual spa		
Dwelling no.	All shower-heads	All toilet flushing systems	All kitchen taps	All bathroom taps	HW recirculation or diversion	All clothes washers	All dish-washers	Volume (max volume)	Pool cover	Pool location	Pool shaded	Volume (max volume)	Spa cover	Spa shaded
All dwellings	4 star (> 6 but <= 7.5 L/min)	4 star	5 star	5 star	no	-	3.5 star	-	-	-	-	-	-	-

	Alternative water source							
Dwelling no.	Alternative water supply systems	Size	Configuration	Landscape connection	Toilet connection (s)	Laundry connection	Pool top-up	Spa top-up
None	-	-	-	-	-	-	-	-

(ii) Energy	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) The applicant must comply with the commitments listed below in carrying out the development of a dwelling listed in a table below.			
(b) The applicant must install each hot water system specified for the dwelling in the table below, so that the dwelling's hot water is supplied by that system. If the table specifies a central hot water system for the dwelling, then the applicant must connect that central system to the dwelling, so that the dwelling's hot water is supplied by that central system.	✔	✔	✔
(c) The applicant must install, in each bathroom, kitchen and laundry of the dwelling, the ventilation system specified for that room in the table below. Each such ventilation system must have the operation control specified for it in the table.		✔	✔
(d) The applicant must install the cooling and heating system/s specified for the dwelling under the "Living areas" and "Bedroom areas" headings of the "Cooling" and "Heating" columns in the table below, in/for at least 1 living/bedroom area of the dwelling. If no cooling or heating system is specified in the table for "Living areas" or "Bedroom areas", then no systems may be installed in any such areas. If the term "zoned" is specified beside an air conditioning system, then the system must provide for day/night zoning between living areas and bedrooms.		✔	✔
(e) This commitment applies to each room or area of the dwelling which is referred to in a heading to the "Artificial lighting" column of the table below (but only to the extent specified for that room or area). The applicant must ensure that the "primary type of artificial lighting" for each such room in the dwelling is fluorescent lighting or light emitting diode (LED) lighting. If the term "dedicated" is specified for a particular room or area, then the light fittings in that room or area must only be capable of being used for fluorescent lighting or light emitting diode (LED) lighting.		✔	✔

(ii) Energy	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(f) This commitment applies to each room or area of the dwelling which is referred to in a heading to the "Natural lighting" column of the table below (but only to the extent specified for that room or area). The applicant must ensure that each such room or area is fitted with a window and/or skylight.	✔	✔	✔
(g) This commitment applies if the applicant installs a water heating system for the dwelling's pool or spa. The applicant must:			
(aa) install the system specified for the pool in the "Individual Pool" column of the table below (or alternatively must not install any system for the pool). If specified, the applicant must install a timer, to control the pool's pump; and		✔	
(bb) install the system specified for the spa in the "Individual Spa" column of the table below (or alternatively must not install any system for the spa). If specified, the applicant must install a timer to control the spa's pump.		✔	
(h) The applicant must install in the dwelling:			
(aa) the kitchen cook-top and oven specified for that dwelling in the "Appliances & other efficiency measures" column of the table below;		✔	
(bb) each appliance for which a rating is specified for that dwelling in the "Appliances & other efficiency measures" column of the table, and ensure that the appliance has that minimum rating; and		✔	✔
(cc) any clothes drying line specified for the dwelling in the "Appliances & other efficiency measures" column of the table.		✔	
(i) If specified in the table, the applicant must carry out the development so that each refrigerator space in the dwelling is "well ventilated".		✔	

	Hot water	Bathroom ventilation system		Kitchen ventilation system		Laundry ventilation system	
Dwelling no.	Hot water system	Each bathroom	Operation control	Each kitchen	Operation control	Each laundry	Operation control
All dwellings	central hot water system 1	individual fan, ducted to façade or roof	manual switch on/off	individual fan, ducted to façade or roof	manual switch on/off	individual fan, ducted to façade or roof	interlocked to light

	Cooling		Heating		Artificial lighting						Natural lighting	
Dwelling no.	living areas	bedroom areas	living areas	bedroom areas	No. of bedrooms &/or study	No. of living &/or dining rooms	Each kitchen	All bathrooms/ toilets	Each laundry	All hallways	No. of bathrooms &/or toilets	Main kitchen
N2701, N2702, N2801, N2802, N2901, N2902	1-phase airconditioning 3.5 Star (old label)	1-phase airconditioning 3.5 Star (old label)	1-phase airconditioning 3.5 Star (old label)	1-phase airconditioning 3.5 Star (old label)	3 (dedicated)	1 (dedicated)	yes (dedicated)	yes (dedicated)	yes (dedicated)	yes (dedicated)	0	no

	Cooling		Heating		Artificial lighting						Natural lighting	
Dwelling no.	living areas	bedroom areas	living areas	bedroom areas	No. of bedrooms &/or study	No. of living &/or dining rooms	Each kitchen	All bathrooms/ toilets	Each laundry	All hallways	No. of bathrooms &/or toilets	Main kitchen
N301, N302, N401, N402, N501, N502, N503, N601, N602, N603, N701, N702, N703, N801, N802, N803, N901, N902, N903, N1001, N1002, N1003, N1101, N1102, N1103, N1201, N1202, N1203, N1301, N1302, N1303, N1401, N1402, N1403	1-phase airconditioning 3.5 Star (old label)	1-phase airconditioning 3.5 Star (old label)	1-phase airconditioning 3.5 Star (old label)	1-phase airconditioning 3.5 Star (old label)	1 (dedicated)	1 (dedicated)	yes (dedicated)	yes (dedicated)	yes (dedicated)	yes (dedicated)	0	no
All other dwellings	1-phase airconditioning 3.5 Star (old label)	1-phase airconditioning 3.5 Star (old label)	1-phase airconditioning 3.5 Star (old label)	1-phase airconditioning 3.5 Star (old label)	2 (dedicated)	1 (dedicated)	yes (dedicated)	yes (dedicated)	yes (dedicated)	yes (dedicated)	0	no

	Individual pool		Individual spa		Appliances & other efficiency measures							
Dwelling no.	Pool heating system	Timer	Spa heating system	Timer	Kitchen cooktop/oven	Refrigerator	Well ventilated fridge space	Dishwasher	Clothes washer	Clothes dryer	Indoor or sheltered clothes drying line	Private outdoor or unsheltered clothes drying line
All dwellings	-	-	-	-	electric cooktop & electric oven	-	yes	4 star	-	2.5 star	yes	yes

(iii) Thermal Comfort	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) The applicant must attach the certificate referred to under "Assessor details" on the front page of this BASIX certificate (the "Assessor Certificate") to the development application and construction certificate application for the proposed development (or, if the applicant is applying for a complying development certificate for the proposed development, to that application). The applicant must also attach the Assessor Certificate to the application for a final occupation certificate for the proposed development.			
(b) The Assessor Certificate must have been issued by an Accredited Assessor in accordance with the Thermal Comfort Protocol.			
(c) The details of the proposed development on the Assessor Certificate must be consistent with the details shown in this BASIX Certificate, including the details shown in the "Thermal Loads" table below.			
(d) The applicant must show on the plans accompanying the development application for the proposed development, all matters which the Thermal Comfort Protocol requires to be shown on those plans. Those plans must bear a stamp of endorsement from the Accredited Assessor, to certify that this is the case.	✔		
(e) The applicant must show on the plans accompanying the application for a construction certificate (or complying development certificate, if applicable), all thermal performance specifications set out in the Assessor Certificate, and all aspects of the proposed development which were used to calculate those specifications.		✔	
(f) The applicant must construct the development in accordance with all thermal performance specifications set out in the Assessor Certificate, and in accordance with those aspects of the development application or application for a complying development certificate which were used to calculate those specifications.		✔	✔
(g) Where there is an in-slab heating or cooling system, the applicant must: (aa) Install insulation with an R-value of not less than 1.0 around the vertical edges of the perimeter of the slab; or (bb) On a suspended floor, install insulation with an R-value of not less than 1.0 underneath the slab and around the vertical edges of the perimeter of the slab.	✔	✔	✔
(h) The applicant must construct the floors and walls of the development in accordance with the specifications listed in the table below.	✔	✔	✔

	Thermal loads	
Dwelling no.	**Area adjusted heating load (in mJ/m²/yr)**	**Area adjusted cooling load (in mJ/m²/yr)**
N301	37.8	31.1
N302	35.3	22.9
N303	40.7	29.5
N401	38.6	31.3
N402	33.0	22.8
N403	41.5	29.3
N501	38.9	31.0
N502	33.6	22.7
N503	44.4	33.5
N601	39.6	31.0
N602	34.3	22.5
N603	45.0	33.9
N604	44.4	29.8
N605	55.0	25.3
N701	40.3	31.4
N702	34.8	22.1
N703	45.8	33.4
N704	45.0	29.5
N705	55.7	25.0
N801	40.7	31.7
N802	35.0	22.3
N803	46.2	33.2
N804	45.3	29.4
N805	56.1	25.0
N901	41.5	31.7
N902	35.6	22.4
N903	47.0	33.1

	Thermal loads	
Dwelling no.	**Area adjusted heating load (in mJ/m²/yr)**	**Area adjusted cooling load (in mJ/m²/yr)**
N904	46.0	29.7
N905	56.8	25.0
N1001	44.4	31.1
N1002	38.2	22.5
N1003	50.1	31.9
N1004	49.1	28.3
N1005	59.6	24.3
N1101	44.9	30.5
N1102	38.6	22.8
N1103	50.5	31.8
N1104	49.6	28.3
N1105	60.1	24.1
N1201	45.0	31.0
N1202	38.7	22.8
N1203	50.8	31.9
N1204	49.8	28.0
N1205	60.3	24.1
N1301	45.5	31.2
N1302	39.1	22.8
N1303	51.3	32.4
N1304	50.2	27.9
N1305	60.7	24.0
N1401	45.8	31.3
N1402	39.2	22.8
N1403	51.5	32.0
N1404	50.4	28.1
N1405	60.9	23.9

	Thermal loads	
Dwelling no.	**Area adjusted heating load (in mJ/m²/yr)**	**Area adjusted cooling load (in mJ/m²/yr)**
N1501	40.7	33.1
N1502	42.7	23.8
N1503	54.3	30.0
N1504	58.7	23.7
N1601	40.6	33.2
N1602	42.8	23.8
N1603	54.3	30.1
N1604	58.9	23.6
N1701	40.7	33.4
N1702	42.9	23.7
N1703	54.6	29.5
N1704	59.1	23.9
N1801	40.8	33.6
N1802	43.1	23.6
N1803	54.8	29.8
N1804	59.3	23.8
N1901	40.9	33.2
N1902	43.2	23.6
N1903	55.0	29.8
N1904	59.5	23.8
N2001	41.0	33.4
N2002	43.5	23.8
N2003	55.0	30.2
N2004	59.7	23.6
N2101	41.1	33.5
N2102	43.7	23.9
N2103	55.3	29.8

	Thermal loads	
Dwelling no.	**Area adjusted heating load (in mJ/m²/yr)**	**Area adjusted cooling load (in mJ/m²/yr)**
N2104	59.9	23.4
N2201	41.3	33.4
N2202	43.8	23.8
N2203	58.1	30.9
N2204	61.2	25.9
N2301	41.6	33.1
N2302	44.0	23.7
N2303	58.4	30.7
N2304	61.4	25.7
N2401	41.8	33.0
N2402	44.2	23.9
N2403	58.6	30.5
N2404	61.4	25.4
N2501	41.9	32.9
N2502	44.1	23.9
N2503	58.1	32.3
N2504	61.0	27.6
N2601	46.3	36.3
N2602	48.1	26.2
N2603	58.3	35.6
N2604	61.1	35.4
N2701	37.6	18.6
N2702	58.8	27.7
N2801	39.0	18.3
N2802	59.1	27.4
N2901	51.5	19.6
N2902	60.3	24.3

	Thermal loads	
Dwelling no.	**Area adjusted heating load (in mJ/m²/yr)**	**Area adjusted cooling load (in mJ/m²/yr)**
All other dwellings	52.7	24.4

(b) Common areas and central systems/facilities

(i) Water	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) If, in carrying out the development, the applicant installs a showerhead, toilet, tap or clothes washer into a common area, then that item must meet the specifications listed for it in the table.		✔	✔
(b) The applicant must install (or ensure that the development is serviced by) the alternative water supply system(s) specified in the "Central systems" column of the table below. In each case, the system must be sized, be configured, and be connected, as specified in the table.	✔	✔	✔
(c) A swimming pool or spa listed in the table must not have a volume (in kLs) greater than that specified for the pool or spa in the table.	✔	✔	
(d) A pool or spa listed in the table must have a cover or shading if specified for the pool or spa in the table.		✔	
(e) The applicant must install each fire sprinkler system listed in the table so that the system is configured as specified in the table.		✔	✔
(f) The applicant must ensure that the central cooling system for a cooling tower is configured as specified in the table.		✔	✔

Common area	Showerheads rating	Toilets rating	Taps rating	Clothes washers rating
All common areas	3 star (> 6 but <= 7.5 L/min)	4 star	5 star	no common laundry facility

(ii) Energy	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) If, in carrying out the development, the applicant installs a ventilation system to service a common area specified in the table below, then that ventilation system must be of the type specified for that common area, and must meet the efficiency measure specified.		✔	✔
(b) In carrying out the development, the applicant must install, as the "primary type of artificial lighting" for each common area specified in the table below, the lighting specified for that common area. This lighting must meet the efficiency measure specified. The applicant must also install a centralised lighting control system or Building Management System (BMS) for the common area, where specified.		✔	✔
(c) The applicant must install the systems and fixtures specified in the "Central energy systems" column of the table below. In each case, the system or fixture must be of the type, and meet the specifications, listed for it in the table.	✔	✔	✔

	Common area ventilation system		Common area lighting		
Common area	**Ventilation system type**	**Ventilation efficiency measure**	**Primary type of artificial lighting**	**Lighting efficiency measure**	**Lighting control system/BMS**
Lift car (No.1)	-	-	light-emitting diode	connected to lift call button	Yes
Lift car (No.2)	-	-	light-emitting diode	connected to lift call button	Yes
Garbage room - L2	ventilation exhaust only	-	light-emitting diode	motion sensors	Yes
Gym - L4 -North	no mechanical ventilation	-	light-emitting diode	motion sensors	Yes
Mech Plant - L2	no mechanical ventilation	-	light-emitting diode	motion sensors	Yes
SP Fan - L2	no mechanical ventilation	-	light-emitting diode	manual on / manual off	Yes
SP Fan - L2	no mechanical ventilation	-	light-emitting diode	manual on / manual off	Yes
Garbage Room - L3	ventilation exhaust only	interlocked to light	light-emitting diode	motion sensors	Yes
Garbage Room - L1	ventilation exhaust only	interlocked to light	light-emitting diode	motion sensors	Yes
Pilates Studio - L4	no mechanical ventilation	-	light-emitting diode	motion sensors	Yes
All Hallways - North	no mechanical ventilation	-	light-emitting diode	motion sensors	Yes
All Levels - Fire Stairs (North)	no mechanical ventilation	-	light-emitting diode	motion sensors	Yes

Central energy systems	Type	Specification
Central hot water system (No. 1)	gas instantaneous	Piping insulation (ringmain & supply risers): (a) Piping external to building: R1.0 (~38 mm); (b) Piping internal to building: R1.0 (~38 mm)
Lift (No. 1)	gearless traction with V V V F motor and regenerative drive	Number of levels (including basement): 30
Lift (No. 2)	gearless traction with V V V F motor and regenerative drive	Number of levels (including basement): 30

2. Commitments for Residential flat buildings - Building South

(a) Dwellings

(i) Water	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) The applicant must comply with the commitments listed below in carrying out the development of a dwelling listed in a table below.			
(b) The applicant must plant indigenous or low water use species of vegetation throughout the area of land specified for the dwelling in the "Indigenous species" column of the table below, as private landscaping for that dwelling. (This area of indigenous vegetation is to be contained within the "Area of garden and lawn" for the dwelling specified in the "Description of Project" table).	✔	✔	
(c) If a rating is specified in the table below for a fixture or appliance to be installed in the dwelling, the applicant must ensure that each such fixture and appliance meets the rating specified for it.		✔	✔
(d) The applicant must install an on demand hot water recirculation system which regulates all hot water use throughout the dwelling, where indicated for a dwelling in the "HW recirculation or diversion" column of the table below.		✔	✔
(e) The applicant must install: (aa) a hot water diversion system to all showers, kitchen sinks and all basins in the dwelling, where indicated for a dwelling in the "HW recirculation or diversion" column of the table below; and (bb) a separate diversion tank (or tanks) connected to the hot water diversion systems of at least 100 litres. The applicant must connect the hot water diversion tank to all toilets in the dwelling.		✔ ✔	✔ ✔
(e) The applicant must not install a private swimming pool or spa for the dwelling, with a volume exceeding that specified for it in the table below.	✔	✔	
(f) If specified in the table, that pool or spa (or both) must have a pool cover or shading (or both).		✔	
(g) The pool or spa must be located as specified in the table.	✔	✔	
(h) The applicant must install, for the dwelling, each alternative water supply system, with the specified size, listed for that dwelling in the table below. Each system must be configured to collect run-off from the areas specified (excluding any area which supplies any other alternative water supply system), and to divert overflow as specified. Each system must be connected as specified.	✔	✔	✔

	Fixtures					Appliances		Individual pool				Individual spa		
Dwelling no.	All shower-heads	All toilet flushing systems	All kitchen taps	All bathroom taps	HW recirculation or diversion	All clothes washers	All dish-washers	Volume (max volume)	Pool cover	Pool location	Pool shaded	Volume (max volume)	Spa cover	Spa shaded
All dwellings	4 star (> 6 but <= 7.5 L/min)	4 star	5 star	5 star	no	-	3.5 star	-	-	-	-	-	-	-

	Alternative water source							
Dwelling no.	Alternative water supply systems	Size	Configuration	Landscape connection	Toilet connection (s)	Laundry connection	Pool top-up	Spa top-up
None	-	-	-	-	-	-	-	-

(ii) Energy	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) The applicant must comply with the commitments listed below in carrying out the development of a dwelling listed in a table below.			
(b) The applicant must install each hot water system specified for the dwelling in the table below, so that the dwelling's hot water is supplied by that system. If the table specifies a central hot water system for the dwelling, then the applicant must connect that central system to the dwelling, so that the dwelling's hot water is supplied by that central system.	✔	✔	✔
(c) The applicant must install, in each bathroom, kitchen and laundry of the dwelling, the ventilation system specified for that room in the table below. Each such ventilation system must have the operation control specified for it in the table.		✔	✔
(d) The applicant must install the cooling and heating system/s specified for the dwelling under the "Living areas" and "Bedroom areas" headings of the "Cooling" and "Heating" columns in the table below, in/for at least 1 living/bedroom area of the dwelling. If no cooling or heating system is specified in the table for "Living areas" or "Bedroom areas", then no systems may be installed in any such areas. If the term "zoned" is specified beside an air conditioning system, then the system must provide for day/night zoning between living areas and bedrooms.		✔	✔
(e) This commitment applies to each room or area of the dwelling which is referred to in a heading to the "Artificial lighting" column of the table below (but only to the extent specified for that room or area). The applicant must ensure that the "primary type of artificial lighting" for each such room in the dwelling is fluorescent lighting or light emitting diode (LED) lighting. If the term "dedicated" is specified for a particular room or area, then the light fittings in that room or area must only be capable of being used for fluorescent lighting or light emitting diode (LED) lighting.		✔	✔

(ii) Energy	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(f) This commitment applies to each room or area of the dwelling which is referred to in a heading to the "Natural lighting" column of the table below (but only to the extent specified for that room or area). The applicant must ensure that each such room or area is fitted with a window and/or skylight.	✔	✔	✔
(g) This commitment applies if the applicant installs a water heating system for the dwelling's pool or spa. The applicant must:			
(aa) install the system specified for the pool in the "Individual Pool" column of the table below (or alternatively must not install any system for the pool). If specified, the applicant must install a timer, to control the pool's pump; and		✔	
(bb) install the system specified for the spa in the "Individual Spa" column of the table below (or alternatively must not install any system for the spa). If specified, the applicant must install a timer to control the spa's pump.		✔	
(h) The applicant must install in the dwelling:			
(aa) the kitchen cook-top and oven specified for that dwelling in the "Appliances & other efficiency measures" column of the table below;		✔	
(bb) each appliance for which a rating is specified for that dwelling in the "Appliances & other efficiency measures" column of the table, and ensure that the appliance has that minimum rating; and		✔	✔
(cc) any clothes drying line specified for the dwelling in the "Appliances & other efficiency measures" column of the table.		✔	
(i) If specified in the table, the applicant must carry out the development so that each refrigerator space in the dwelling is "well ventilated".		✔	

	Hot water	Bathroom ventilation system		Kitchen ventilation system		Laundry ventilation system	
Dwelling no.	Hot water system	Each bathroom	Operation control	Each kitchen	Operation control	Each laundry	Operation control
All dwellings	central hot water system 2	individual fan, ducted to façade or roof	manual switch on/off	individual fan, ducted to façade or roof	manual switch on/off	individual fan, ducted to façade or roof	interlocked to light

	Cooling		Heating		Artificial lighting						Natural lighting	
Dwelling no.	living areas	bedroom areas	living areas	bedroom areas	No. of bedrooms &/or study	No. of living &/or dining rooms	Each kitchen	All bathrooms/ toilets	Each laundry	All hallways	No. of bathrooms &/or toilets	Main kitchen
S202, S302	1-phase airconditioning 3.5 Star (old label)	1-phase airconditioning 3.5 Star (old label)	1-phase airconditioning 3.5 Star (old label)	1-phase airconditioning 3.5 Star (old label)	1 (dedicated)	1 (dedicated)	yes (dedicated)	yes (dedicated)	yes (dedicated)	yes (dedicated)	0	no
S2201, S2202, S2301, S2302, S2401, S2402	1-phase airconditioning 3.5 Star (old label)	1-phase airconditioning 3.5 Star (old label)	1-phase airconditioning 3.5 Star (old label)	1-phase airconditioning 3.5 Star (old label)	3 (dedicated)	1 (dedicated)	yes (dedicated)	yes (dedicated)	yes (dedicated)	yes (dedicated)	0	no
All other dwellings	1-phase airconditioning 3.5 Star (old label)	1-phase airconditioning 3.5 Star (old label)	1-phase airconditioning 3.5 Star (old label)	1-phase airconditioning 3.5 Star (old label)	2 (dedicated)	1 (dedicated)	yes (dedicated)	yes (dedicated)	yes (dedicated)	yes (dedicated)	0	no

	Individual pool		Individual spa		Appliances & other efficiency measures							
Dwelling no.	Pool heating system	Timer	Spa heating system	Timer	Kitchen cooktop/oven	Refrigerator	Well ventilated fridge space	Dishwasher	Clothes washer	Clothes dryer	Indoor or sheltered clothes drying line	Private outdoor or unsheltered clothes drying line
All dwellings	-	-	-	-	electric cooktop & electric oven	-	yes	4 star	-	2.5 star	yes	yes

(iii) Thermal Comfort	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) The applicant must attach the certificate referred to under "Assessor details" on the front page of this BASIX certificate (the "Assessor Certificate") to the development application and construction certificate application for the proposed development (or, if the applicant is applying for a complying development certificate for the proposed development, to that application). The applicant must also attach the Assessor Certificate to the application for a final occupation certificate for the proposed development.			

(iii) Thermal Comfort	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(b) The Assessor Certificate must have been issued by an Accredited Assessor in accordance with the Thermal Comfort Protocol.			
(c) The details of the proposed development on the Assessor Certificate must be consistent with the details shown in this BASIX Certificate, including the details shown in the "Thermal Loads" table below.			
(d) The applicant must show on the plans accompanying the development application for the proposed development, all matters which the Thermal Comfort Protocol requires to be shown on those plans. Those plans must bear a stamp of endorsement from the Accredited Assessor, to certify that this is the case.	✔		
(e) The applicant must show on the plans accompanying the application for a construction certificate (or complying development certificate, if applicable), all thermal performance specifications set out in the Assessor Certificate, and all aspects of the proposed development which were used to calculate those specifications.		✔	
(f) The applicant must construct the development in accordance with all thermal performance specifications set out in the Assessor Certificate, and in accordance with those aspects of the development application or application for a complying development certificate which were used to calculate those specifications.		✔	✔
(g) Where there is an in-slab heating or cooling system, the applicant must: (aa) Install insulation with an R-value of not less than 1.0 around the vertical edges of the perimeter of the slab; or (bb) On a suspended floor, install insulation with an R-value of not less than 1.0 underneath the slab and around the vertical edges of the perimeter of the slab.	✔	✔	✔
(h) The applicant must construct the floors and walls of the development in accordance with the specifications listed in the table below.	✔	✔	✔

	Thermal loads	
Dwelling no.	Area adjusted heating load (in mJ/m²/yr)	Area adjusted cooling load (in mJ/m²/yr)
S201	46.7	27.7
S202	43.3	13.5
S203	40.5	18.2
S301	59.3	28.0
S302	48.9	12.4
S303	45.5	17.6
S501	32.4	26.6

	Thermal loads	
Dwelling no.	**Area adjusted heating load (in mJ/m²/yr)**	**Area adjusted cooling load (in mJ/m²/yr)**
S502	32.3	25.2
S503	61.1	31.5
S504	60.3	24.9
S601	34.1	26.6
S602	33.9	25.1
S603	57.3	30.2
S604	57.9	24.7
S701	34.6	26.6
S702	34.5	25.3
S703	57.9	29.6
S704	58.6	24.4
S801	34.8	26.6
S802	34.7	25.1
S803	58.5	29.7
S804	58.8	24.2
S901	35.3	26.6
S902	35.3	25.0
S903	59.2	29.9
S904	59.8	24.5
S1001	37.9	26.2
S1002	37.6	24.5
S1003	59.9	26.8
S1004	58.0	23.6
S1101	38.3	26.0
S1102	37.9	24.6
S1103	60.3	26.9
S1104	58.4	24.0

	Thermal loads	
Dwelling no.	**Area adjusted heating load (in mJ/m²/yr)**	**Area adjusted cooling load (in mJ/m²/yr)**
S1201	38.6	26.4
S1202	38.1	24.5
S1203	58.7	29.5
S1204	58.6	23.7
S1301	38.9	25.9
S1302	38.4	24.3
S1303	59.0	29.8
S1304	59.0	23.8
S1401	39.1	25.9
S1402	38.6	24.4
S1403	59.0	29.6
S1404	59.2	23.7
S1501	41.6	26.7
S1502	59.2	29.6
S1503	59.4	23.5
S1601	38.8	24.8
S1602	59.3	29.4
S1603	59.6	23.4
S1701	38.9	24.9
S1702	59.6	29.4
S1703	59.8	23.4
S1801	39.0	24.8
S1802	59.4	29.5
S1803	60.1	23.3
S1901	39.2	24.8
S1902	59.6	29.6
S1903	60.3	23.5

	Thermal loads	
Dwelling no.	**Area adjusted heating load (in mJ/m²/yr)**	**Area adjusted cooling load (in mJ/m²/yr)**
S2001	39.2	24.7
S2002	59.8	29.6
S2101	39.4	23.8
S2102	59.9	29.5
S2201	42.7	25.8
S2202	59.8	21.8
S2301	42.8	25.7
S2302	60.1	22.1
S2401	57.5	27.5
S2402	57.2	18.7
All other dwellings	60.5	23.5

(b) Common areas and central systems/facilities

(i) Water	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) If, in carrying out the development, the applicant installs a showerhead, toilet, tap or clothes washer into a common area, then that item must meet the specifications listed for it in the table.		✔	✔
(b) The applicant must install (or ensure that the development is serviced by) the alternative water supply system(s) specified in the "Central systems" column of the table below. In each case, the system must be sized, be configured, and be connected, as specified in the table.	✔	✔	✔
(c) A swimming pool or spa listed in the table must not have a volume (in kLs) greater than that specified for the pool or spa in the table.	✔	✔	
(d) A pool or spa listed in the table must have a cover or shading if specified for the pool or spa in the table.		✔	
(e) The applicant must install each fire sprinkler system listed in the table so that the system is configured as specified in the table.		✔	✔
(f) The applicant must ensure that the central cooling system for a cooling tower is configured as specified in the table.		✔	✔

Common area	Showerheads rating	Toilets rating	Taps rating	Clothes washers rating
All common areas	3 star (> 6 but <= 7.5 L/min)	4 star	5 star	no common laundry facility

(ii) Energy	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) If, in carrying out the development, the applicant installs a ventilation system to service a common area specified in the table below, then that ventilation system must be of the type specified for that common area, and must meet the efficiency measure specified.		✔	✔
(b) In carrying out the development, the applicant must install, as the "primary type of artificial lighting" for each common area specified in the table below, the lighting specified for that common area. This lighting must meet the efficiency measure specified. The applicant must also install a centralised lighting control system or Building Management System (BMS) for the common area, where specified.		✔	✔
(c) The applicant must install the systems and fixtures specified in the "Central energy systems" column of the table below. In each case, the system or fixture must be of the type, and meet the specifications, listed for it in the table.	✔	✔	✔

	Common area ventilation system		Common area lighting		
Common area	**Ventilation system type**	**Ventilation efficiency measure**	**Primary type of artificial lighting**	**Lighting efficiency measure**	**Lighting control system/BMS**
Lift car (No.3)	-	-	light-emitting diode	connected to lift call button	Yes
Lift car (No.4)	-	-	light-emitting diode	connected to lift call button	Yes
Garbage - UGF	ventilation exhaust only	-	light-emitting diode	motion sensors	Yes
Garbage room - L2	ventilation exhaust only	-	light-emitting diode	motion sensors	Yes
Function/Multi-Purpose- L4 - South	no mechanical ventilation	-	light-emitting diode	motion sensors	Yes
Resi - work from home - L4 - South	no mechanical ventilation	-	light-emitting diode	motion sensors	Yes
SP Fan - L2	no mechanical ventilation	-	light-emitting diode	manual on / manual off	Yes
SP Fan - L2	no mechanical ventilation	-	light-emitting diode	manual on / manual off	Yes
Garbage Room - L3	ventilation exhaust only	interlocked to light	light-emitting diode	motion sensors	Yes
Garbage Room - L1	ventilation exhaust only	interlocked to light	light-emitting diode	motion sensors	Yes
All Hallways - South	no mechanical ventilation	-	light-emitting diode	motion sensors	Yes
All Levels - Fire Stairs (South)	no mechanical ventilation	-	light-emitting diode	motion sensors	Yes

Central energy systems	Type	Specification
Central hot water system (No. 2)	gas instantaneous	Piping insulation (ringmain & supply risers): (a) Piping external to building: R1.0 (~38 mm); (b) Piping internal to building: R1.0 (~38 mm)
Lift (No. 3)	gearless traction with V V V F motor and regenerative drive	Number of levels (including basement): 25
Lift (No. 4)	gearless traction with V V V F motor and regenerative drive	Number of levels (including basement): 25

5. Commitments for common areas and central systems/facilities for the development (non-building specific)

(b) Common areas and central systems/facilities

(i) Water	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) If, in carrying out the development, the applicant installs a showerhead, toilet, tap or clothes washer into a common area, then that item must meet the specifications listed for it in the table.		✔	✔
(b) The applicant must install (or ensure that the development is serviced by) the alternative water supply system(s) specified in the "Central systems" column of the table below. In each case, the system must be sized, be configured, and be connected, as specified in the table.	✔	✔	✔
(c) A swimming pool or spa listed in the table must not have a volume (in kLs) greater than that specified for the pool or spa in the table.	✔	✔	
(d) A pool or spa listed in the table must have a cover or shading if specified for the pool or spa in the table.		✔	
(e) The applicant must install each fire sprinkler system listed in the table so that the system is configured as specified in the table.		✔	✔
(f) The applicant must ensure that the central cooling system for a cooling tower is configured as specified in the table.		✔	✔

Common area	Showerheads rating	Toilets rating	Taps rating	Clothes washers rating
All common areas	3 star (> 6 but <= 7.5 L/min)	4 star	5 star	no common laundry facility

Central systems	Size	Configuration	Connection (to allow for...)
Central water tank - rainwater or stormwater (No. 1)	5000.0	To collect run-off from at least: - 1100.0 square metres of roof area of buildings in the development - 0.0 square metres of impervious area in the development - 0.0 square metres of garden/lawn area in the development - 0.0 square metres of planter box area in the development (excluding, in each case, any area which drains to, or supplies, any other alternative water supply system).	- irrigation of 880.0 square metres of common landscaped area on the site - car washing in 0 car washing bays on the site

Central systems	Size	Configuration	Connection (to allow for...)
Pool (No. 1)	Volume: 120.0 kLs	Location: Other Pool shaded: yes	-
Fire sprinkler system (No. 1)	-	So that fire sprinkler test water is contained within the fire sprinkler system for re-use, rather than disposed.	-

(ii) Energy	**Show on DA plans**	**Show on CC/CDC plans & specs**	**Certifier check**
(a) If, in carrying out the development, the applicant installs a ventilation system to service a common area specified in the table below, then that ventilation system must be of the type specified for that common area, and must meet the efficiency measure specified.		✔	✔
(b) In carrying out the development, the applicant must install, as the "primary type of artificial lighting" for each common area specified in the table below, the lighting specified for that common area. This lighting must meet the efficiency measure specified. The applicant must also install a centralised lighting control system or Building Management System (BMS) for the common area, where specified.		✔	✔
(c) The applicant must install the systems and fixtures specified in the "Central energy systems" column of the table below. In each case, the system or fixture must be of the type, and meet the specifications, listed for it in the table.	✔	✔	✔

	Common area ventilation system		Common area lighting		
Common area	**Ventilation system type**	**Ventilation efficiency measure**	**Primary type of artificial lighting**	**Lighting efficiency measure**	**Lighting control system/BMS**
Car park area - GF	ventilation (supply + exhaust)	carbon monoxide monitor + VSD fan	light-emitting diode	motion sensors	Yes
Car park area - UPG	ventilation (supply + exhaust)	carbon monoxide monitor + VSD fan	light-emitting diode	motion sensors	Yes
Car park area - L1	ventilation (supply + exhaust)	carbon monoxide monitor + VSD fan	light-emitting diode	motion sensors	Yes
Car park area - L2	ventilation (supply + exhaust)	carbon monoxide monitor + VSD fan	light-emitting diode	motion sensors	Yes
Car park area - L3	ventilation (supply + exhaust)	carbon monoxide monitor + VSD fan	light-emitting diode	motion sensors	Yes
Switch room- GF	ventilation supply only	thermostatically controlled	light-emitting diode	manual on / manual off	Yes
Resi Garbage room - GF	ventilation exhaust only	-	light-emitting diode	motion sensors	Yes

	Common area ventilation system		Common area lighting		
Common area	**Ventilation system type**	**Ventilation efficiency measure**	**Primary type of artificial lighting**	**Lighting efficiency measure**	**Lighting control system/BMS**
Bike & External Storage - L1	ventilation exhaust only	-	light-emitting diode	motion sensors	Yes
Bike & Lockers - L2	ventilation exhaust only	-	light-emitting diode	motion sensors	Yes
MRV Delivery - GF	no mechanical ventilation	-	light-emitting diode	motion sensors	Yes
Substation - GF	no mechanical ventilation	-	light-emitting diode	manual on / manual off	Yes
Substation - GF	no mechanical ventilation	-	light-emitting diode	manual on / manual off	Yes
Fire control room - GF	no mechanical ventilation	-	light-emitting diode	manual on / manual off	Yes
Fire Pump & Tank - GF	no mechanical ventilation	-	light-emitting diode	manual on / manual off	Yes
GF - Bulky Mail	no mechanical ventilation	-	light-emitting diode	motion sensors	Yes
Pool Plant - L4	no mechanical ventilation	-	light-emitting diode	manual on / manual off	Yes
Ground floor lobby	ventilation supply only	time clock or BMS controlled	light-emitting diode	motion sensors	Yes
Outdoor Hallway -	no mechanical ventilation	-	light-emitting diode	motion sensors	Yes

Central energy systems	Type	Specification
Alternative energy supply	Photovoltaic system	Rated electrical output (min): 65.0 peak kW
Pool (No. 1)	Heating source: no heating	Pump controlled by timer: yes
Other	Building management system installed?: yes	-

Notes

1. In these commitments, "applicant" means the person carrying out the development.
2. The applicant must identify each dwelling, building and common area listed in this certificate, on the plans accompanying any development application, and on the plans and specifications accompanying the application for a construction certificate / complying development certificate, for the proposed development, using the same identifying letter or reference as is given to that dwelling, building or common area in this certificate.
3. This note applies if the proposed development involves the erection of a building for both residential and non-residential purposes (or the change of use of a building for both residential and non-residential purposes). Commitments in this certificate which are specified to apply to a "common area" of a building or the development, apply only to that part of the building or development to be used for residential purposes.
4. If this certificate lists a central system as a commitment for a dwelling or building, and that system will also service any other dwelling or building within the development, then that system need only be installed once (even if it is separately listed as a commitment for that other dwelling or building).
5. If a star or other rating is specified in a commitment, this is a minimum rating.
6. All alternative water systems to be installed under these commitments (if any), must be installed in accordance with the requirements of all applicable regulatory authorities. NOTE: NSW Health does not recommend that stormwater, recycled water or private dam water be used to irrigate edible plants which are consumed raw, or that rainwater be used for human consumption in areas with potable water supply.

Legend

1. Commitments identified with a "✔" in the "Show on DA plans" column must be shown on the plans accompanying the development application for the proposed development (if a development application is to be lodged for the proposed development).
2. Commitments identified with a "✔" in the "Show on CC/CDC plans and specs" column must be shown in the plans and specifications accompanying the application for a construction certificate / complying development certificate for the proposed development.
3. Commitments identified with a "✔" in the "Certifier check" column must be certified by a certifying authority as having been fulfilled. (Note: a certifying authority must not issue an occupation certificate (either interim or final) for a building listed in this certificate, or for any part of such a building, unless it is satisfied that each of the commitments whose fulfilment it is required to monitor in relation to the building or part, has been fulfilled).

Nationwide House Energy Rating Scheme — Class 2 summary
NatHERS Certificate No. 0006699340

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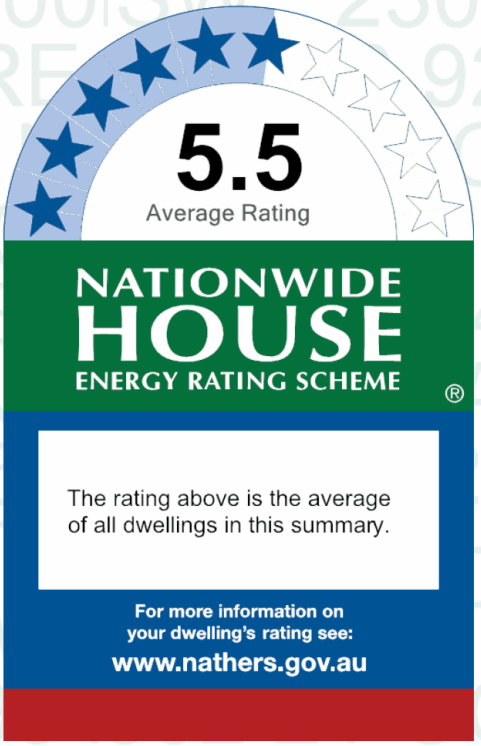

Property

Address 924 Hunter Street , Newcastle West , NSW , 2302

Lot/DP 2/126

NatHERS climate zone 15

Accredited assessor

Padraig Healy

Credwell Energy

phealy@credwell.com.au

0498051209

Accreditation No. 101026

Assessor Accrediting Organisation ABSA

Verification

To verify this certificate, scan the QR code or visit hstar.com.au/QR/Generate?p=cqvtNwXTr . When using either link, ensure you are visiting hstar.com.au

Summary of all dwellings

Certificate number and link	Unit Number	Heating load (MJ/m^2/p.a.)	Cooling load (MJ/m^2/p.a.)	Total load (MJ/m^2/p.a.)	Star rating
0006659379-01	N.301	37.8	31.1	68.9	5.9
0006695993	N.302	35.3	22.9	58.1	6.4
0006697155	N.303	40.7	29.5	70.3	5.8
0006695886	N.401	38.6	31.3	70	5.8
0006696009	N.402	33	22.8	55.8	6.6

Continued Over

National Construction Code (NCC) requirements

The NCC's requirements for NatHERS-rated buildings are detailed in 3.12.0(a)(i) and 3.12.5 of the NCC Volume Two. For apartments the requirements are detailed in J0.2 and J5 to J8 of the NCC Volume One.

In NCC 2019, these requirements include minimum star ratings and separate heating and cooling load limits that need to be met by buildings and apartments through the NatHERS assessment. Requirements additional to the NatHERS assessment that must also be satisfied include, but are not limited to: insulation installation methods, thermal breaks, building sealing, water heating and pumping, and artificial lighting requirements. The NCC and NatHERS Heating and Cooling Load Limits (Australian Building Codes Board Standard) are available at www.abcb.gov.au.

State and territory variations and additions to the NCC may also apply.

Summary of all dwellings (continued)

Certificate number and link	Unit Number	Heating load (MJ/m^2/p.a.)	Cooling load (MJ/m^2/p.a.)	Total load (MJ/m^2/p.a.)	Star rating
0006697163	N.403	41.5	29.3	70.8	5.8
0006695894	N.501	38.9	31	69.9	5.8
0006696017	N.502	33.6	22.7	56.3	6.6
0006695787	N.503	44.4	33.5	77.9	5.4
0006697171	N.504	42.1	28.9	71	5.8
0006697502	N.505	52.7	24.4	77.1	5.4
0006695902	N.601	39.6	31	70.7	5.8
0006696025	N.602	34.3	22.5	56.8	6.6
0006695795	N.603	45	33.9	78.9	5.4
0006697189	N.604	44.4	29.8	74.2	5.6
0006697510	N.605	55	25.3	80.3	5.3
0006695910	N.701	40.3	31.4	71.7	5.7
0006696033	N.702	34.8	22.1	56.9	6.6
0006695803	N.703	45.8	33.4	79.2	5.3
0006697197	N.704	45	29.5	74.5	5.6
0006697569	N.705	55.7	25	80.6	5.3
0006695928	N.801	40.7	31.7	72.4	5.7
0006696041	N.802	35	22.3	57.2	6.5
0006695811	N.803	46.2	33.2	79.4	5.3
0006697205	N.804	45.3	29.4	74.8	5.6
0006697577	N.805	56.1	25	81.1	5.2
0006695936	N.901	41.5	31.7	73.2	5.7
0006696058	N.902	35.6	22.4	58	6.4
0006695829	N.903	47	33.1	80	5.3
0006697312	N.904	46	29.7	75.7	5.5
0006697585	N.905	56.8	25	81.8	5.2
0006695944	N.1001	44.4	31.1	75.5	5.5
0006696066	N.1002	38.2	22.5	60.8	6.3
0006695837	N.1003	50.1	31.9	82	5.2
0006697320	N.1004	49.1	28.3	77.3	5.4
0006697593	N.1005	59.6	24.3	84	5.1
0006695951	N.1101	44.9	30.5	75.4	5.5
0006697114	N.1102	38.6	22.8	61.4	6.3
0006695845	N.1103	50.5	31.8	82.3	5.2
0006697338	N.1104	49.6	28.3	77.9	5.4
0006697601	N.1105	60.1	24.1	84.1	5.1
0006695969	N.1201	45	31	76.1	5.4
0006697122	N.1202	38.7	22.8	61.5	6.3
0006695852	N.1203	50.8	31.9	82.7	5.2
0006697346	N.1204	49.8	28	77.8	5.4

Certificate number and link	Unit Number	Heating load (MJ/m /p.a.)	Cooling load (MJ/m /p.a.)	Total load (MJ/m /p.a.)	Star rating
0006697619	N.1205	60.3	24.1	84.3	5.1
0006695977	N.1301	45.5	31.2	76.7	5.4
0006697130	N.1302	39.1	22.8	61.8	6.3
0006695860	N.1303	51.3	32.4	83.6	5.1
0006697353	N.1304	50.2	27.9	78.1	5.4
0006697627	N.1305	60.7	24	84.7	5.1
0006695985	N.1401	45.8	31.3	77.1	5.4
0006697148	N.1402	39.2	22.8	62	6.3
0006695878	N.1403	51.5	32	83.5	5.1
0006697361	N.1404	50.4	28.1	78.5	5.4
0006697635	N.1405	60.9	23.9	84.8	5.1
0006697775	N.1501	40.7	33.1	73.8	5.6
0006698021	N.1502	42.7	23.8	66.5	6
0006697379	N.1503	54.3	30	84.3	5.1
0006697643	N.1504	58.7	23.7	82.5	5.2
0006697783	N.1601	40.6	33.2	73.8	5.6
0006698039	N.1602	42.8	23.8	66.6	6
0006697387	N.1603	54.3	30.1	84.4	5.1
0006697650	N.1604	58.9	23.6	82.6	5.2
0006697791	N.1701	40.7	33.4	74	5.6
0006698047	N.1702	42.9	23.7	66.6	6
0006697395	N.1703	54.6	29.5	84.1	5.1
0006697676	N.1704	59.1	23.9	83	5.2
0006697809	N.1801	40.8	33.6	74.4	5.6
0006698054	N.1802	43.1	23.6	66.7	6
0006697403	N.1803	54.8	29.8	84.6	5.1
0006697684	N.1804	59.3	23.8	83.2	5.1
0006697817	N.1901	40.9	33.2	74.1	5.6
0006698062	N.1902	43.2	23.6	66.8	6
0006697429	N.1903	55	29.8	84.8	5.1
0006697692	N.1904	59.5	23.8	83.3	5.1
0006697825	N.2001	41	33.4	74.4	5.6
0006698070	N.2002	43.5	23.8	67.3	5.9
0006697437	N.2003	55	30.2	85.3	5
0006697700	N.2004	59.7	23.6	83.4	5.1
0006697833	N.2101	41.1	33.5	74.6	5.6
0006698088	N.2102	43.7	23.9	67.5	5.9
0006697445	N.2103	55.3	29.8	85.1	5
0006697718	N.2104	59.9	23.4	83.4	5.1
0006697841	N.2201	41.3	33.4	74.7	5.6
0006698096	N.2202	43.8	23.8	67.6	5.9
0006697452	N.2203	58.1	30.9	89	4.9

Certificate number and link	Unit Number	Heating load (MJ/m /p.a.)	Cooling load (MJ/m /p.a.)	Total load (MJ/m /p.a.)	Star rating
0006697726	N.2204	61.2	25.9	87.1	4.9
0006697858	N.2301	41.6	33.1	74.7	5.6
0006698104	N.2302	44	23.7	67.7	5.9
0006697460	N.2303	58.4	30.7	89.1	4.9
0006697734	N.2304	61.4	25.7	87.1	4.9
0006697866	N.2401	41.8	33	74.8	5.6
0006698112	N.2402	44.2	23.9	68	5.9
0006697478	N.2403	58.6	30.5	89.1	4.9
0006697742	N.2404	61.4	25.4	86.8	4.9
0006698005	N.2501	41.9	32.9	74.8	5.6
0006698120	N.2502	44.1	23.9	68.1	5.9
0006697486	N.2503	58.1	32.3	90.4	4.8
0006697759	N.2504	61	27.6	88.5	4.9
0006698013	N.2601	46.3	36.3	82.7	5.2
0006698138	N.2602	48.1	26.2	74.3	5.6
0006697494	N.2603	58.3	35.6	94	4.7
0006697767	N.2604	61.1	35.4	96.5	4.6
0006698146	N.2701	37.6	18.6	56.2	6.6
0006698179	N.2702	58.8	27.7	86.6	4.9
0006698153	N.2801	39	18.3	57.3	6.5
0006698187	N.2802	59.1	27.4	86.5	4.9
0006698161	N.2901	51.5	19.6	71.1	5.8
0006698195	N.2902	60.3	24.3	84.6	5.1
0006699144	S.201	46.7	27.7	74.4	5.6
0006699169	S.202	43.3	13.5	56.8	6.6
0006699185	S.203	40.5	18.2	58.7	6.4
0006699151	S.301	59.3	28	87.3	4.9
0006699177	S.302	48.9	12.4	61.3	6.3
0006699193	S.303	45.5	17.6	63.1	6.2
0006698419	S.501	32.4	26.6	59	6.4
0006698518	S.502	32.3	25.2	57.5	6.5
0006698617	S.503	61.1	31.5	92.6	4.7
0006698781	S.504	60.3	24.9	85.2	5
0006698427	S.601	34.1	26.6	60.7	6.4
0006698526	S.602	33.9	25.1	59	6.4
0006698625	S.603	57.3	30.2	87.4	4.9
0006698799	S.604	57.9	24.7	82.6	5.2
0006698435	S.701	34.6	26.6	61.2	6.3
0006698534	S.702	34.5	25.3	59.7	6.4
0006698633	S.703	57.9	29.6	87.5	4.9
0006698807	S.704	58.6	24.4	83	5.2
0006698443	S.801	34.8	26.6	61.4	6.3

Certificate number and link	Unit Number	Heating load (MJ/m /p.a.)	Cooling load (MJ/m /p.a.)	Total load (MJ/m /p.a.)	Star rating
0006698542	S.802	34.7	25.1	59.8	6.4
0006698641	S.803	58.5	29.7	88.2	4.9
0006698831	S.804	58.8	24.2	83.1	5.1
0006698450	S.901	35.3	26.6	61.9	6.3
0006698559	S.902	35.3	25	60.3	6.4
0006698658	S.903	59.2	29.9	89.1	4.9
0006698849	S.904	59.8	24.5	84.3	5.1
0006698468	S.1001	37.9	26.2	64.1	6.2
0006698567	S.1002	37.6	24.5	62	6.3
0006698666	S.1003	59.9	26.8	86.6	4.9
0006698856	S.1004	58	23.6	81.5	5.2
0006698476	S.1101	38.3	26	64.3	6.1
0006698575	S.1102	37.9	24.6	62.6	6.2
0006698674	S.1103	60.3	26.9	87.2	4.9
0006698864	S.1104	58.4	24	82.3	5.2
0006698484	S.1201	38.6	26.4	65	6.1
0006698583	S.1202	38.1	24.5	62.6	6.2
0006698682	S.1203	58.7	29.5	88.2	4.9
0006698872	S.1204	58.6	23.7	82.3	5.2
0006698492	S.1301	38.9	25.9	64.9	6.1
0006698591	S.1302	38.4	24.3	62.7	6.2
0006698690	S.1303	59	29.8	88.7	4.9
0006698880	S.1304	59	23.8	82.7	5.2
0006698500	S.1401	39.1	25.9	65	6.1
0006698609	S.1402	38.6	24.4	62.9	6.2
0006698708	S.1403	59	29.6	88.6	4.9
0006698898	S.1404	59.2	23.7	82.8	5.2
0006698971	S.1501	41.6	26.7	68.3	5.9
0006698716	S.1502	59.2	29.6	88.8	4.9
0006698906	S.1503	59.4	23.5	82.9	5.2
0006698989	S.1601	38.8	24.8	63.6	6.2
0006698724	S.1602	59.3	29.4	88.7	4.9
0006698914	S.1603	59.6	23.4	83	5.2
0006698997	S.1701	38.9	24.9	63.8	6.2
0006698732	S.1702	59.6	29.4	89	4.9
0006698922	S.1703	59.8	23.4	83.3	5.1
0006699003	S.1801	39	24.8	63.9	6.2
0006698740	S.1802	59.4	29.5	88.9	4.9
0006698930	S.1803	60.1	23.3	83.4	5.1
0006699011	S.1901	39.2	24.8	64	6.2
0006698757	S.1902	59.6	29.6	89.2	4.9
0006698948	S.1903	60.3	23.5	83.8	5.1

Certificate number and link	Unit Number	Heating load (MJ/m /p.a.)	Cooling load (MJ/m /p.a.)	Total load (MJ/m /p.a.)	Star rating
0006699029	S.2001	39.2	24.7	63.9	6.2
0006698765	S.2002	59.8	29.6	89.3	4.9
0006698955	S.2003	60.5	23.5	84	5.1
0006699078	S.2101	39.4	24.8	64.2	6.2
0006698773	S.2102	59.9	29.5	89.4	4.9
0006698963	S.2103	60.5	23.5	84	5.1
0006699086	S.2201	42.7	25.8	68.5	5.9
0006699110	S.2202	59.8	21.8	81.6	5.2
0006699094	S.2301	42.8	25.7	68.5	5.9
0006699128	S.2302	60.1	22.1	82.1	5.2
0006699102	S.2401	57.5	27.5	84.9	5.1
0006699136	S.2402	57.2	18.7	76	5.5
Average		48.65	26.87	75.51	5.55

Explanatory Notes

About this report

This summary rating is the average rating of all NCC Class 2 dwellings in a development. The individual dwellings' ratings are a comprehensive, dynamic computer modelling evaluation of a home, using the floorplans, elevations and specifications to estimate the energy load. It addresses the building layout, orientation and fabric (i.e. walls, windows, floors, roofs and ceilings), but does not cover the water or energy use of appliances, or energy production of solar panels. For more details about an individual dwelling's assessment, refer to the individual dwelling's NatHERS Certificate (accessible via link).

Accredited Assessors

To ensure the NatHERS Certificate is of a high quality, always use an accredited or licenced assessor. NatHERS accredited assessors are members of a professional body called an Assessor Accrediting Organisation (AAO). AAOs have specific quality assurance processes in place, and continuing professional development requirements, to maintain a high and consistent standard of assessments across the country.

Any questions or concerns about this report should be directed to the assessor in the first instance. If the assessor is unable to address these questions or concerns, the AAO specified on the front of this certificate should be contacted.

Disclaimer

The format of the NatHERS Certificate was developed by the NatHERS Administrator. However the content, input and creation of the NatHERS Certificate is by the assessor. It is the responsibility of the assessor who prepared this certificate to use NatHERS accredited software correctly and follow the NatHERS Technical Notes to produce a NatHERS Certificate.

Appendix G

CONCEPT CIVIL AND STORMWATER MANAGEMENT PLAN (NORTHROP)

DAIRY FARMERS CORNER

924 HUNTER STREET, NEWCASTLE WEST, NSW, 2302
CIVIL ENGINEERING PACKAGE

LOCALITY PLAN

DRAWING LIST

Sheet Number	Sheet Title
DA-C01.01	COVER SHEET, DRAWING LIST AND LOCALITY PLAN
DA-C02.01	EROSION AND SEDIMENT CONTROL PLAN
DA-C04.01	CIVIL WORKS PLAN
DA-C06.01	VEHICLE SWEPT PATHS
DA-C09.01	CIVIL DETAILS & STORMWATER MANAGEMENT PLAN

DRAWN: R.HUTCHISON DESIGNED: J.CARROL JOB MANAGER: J.CARROL VERIFIER: C. PIPER

NOT FOR CONSTRUCTION

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
1	ISSUED FOR APPROVAL	RH	CP	JC	08.10.21

CLIENT: THIRDI DAIRY FARMERS PTY LTD

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ARCHITECT: CKDS

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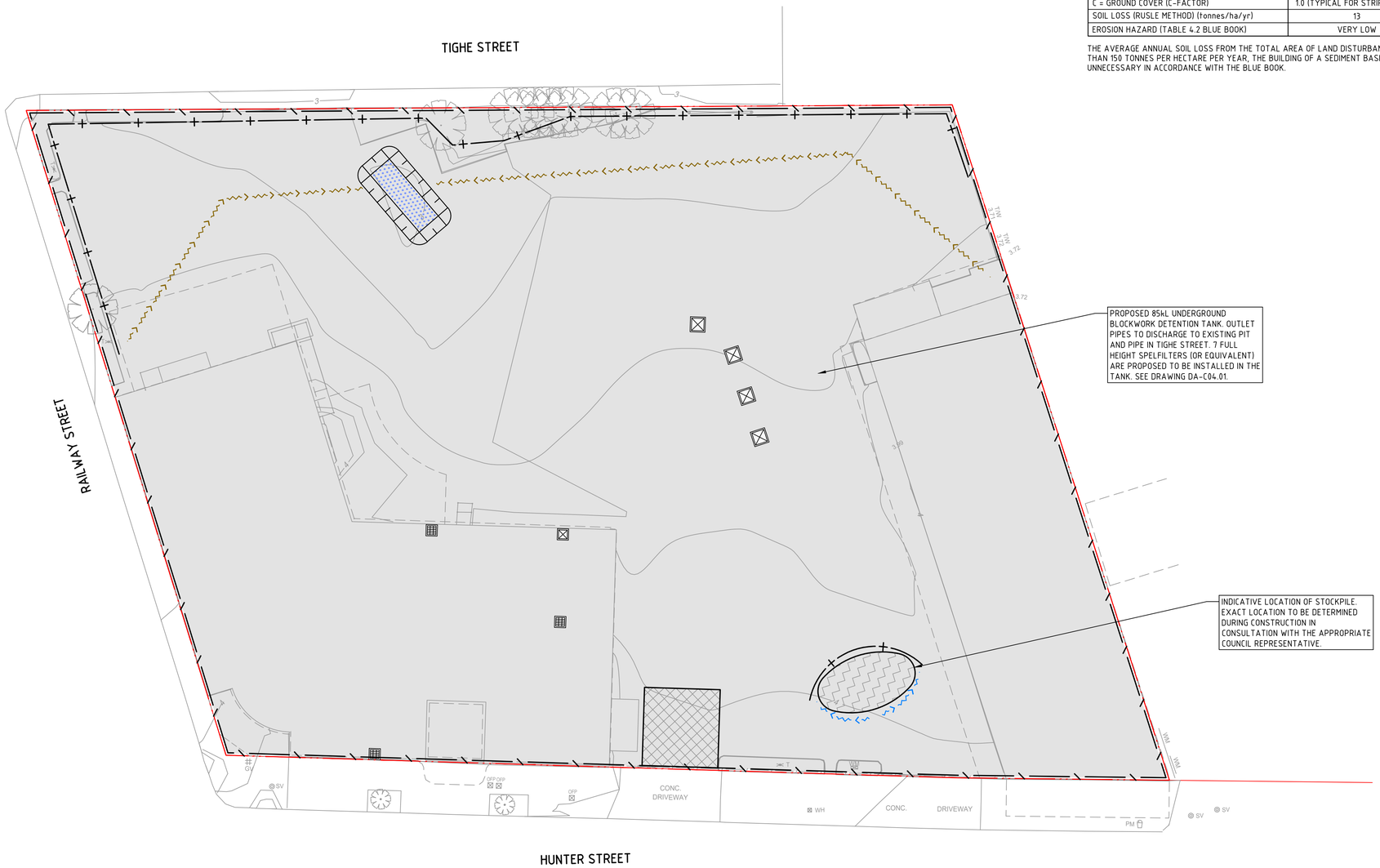
PROJECT: DAIRY FARMERS CORNER
924 HUNTER STREET
NEWCASTLE WEST
NSW, 2302

DRAWING TITLE: CIVIL ENGINEERING PACKAGE
COVER SHEET, DRAWING LIST AND LOCALITY PLAN

JOB NUMBER: NL200577
DRAWING NUMBER: DA-C01.01
REVISION: 1
DRAWING SHEET SIZE = A1



SEDIMENT BASIN SIZING CALCULATION

THE SITE IS LOCATED WITHIN THE HAMILTON SOIL LANDSCAPE AND PRIMARILY CONSISTS OF LOAMY SANDS, WHICH HAS THE FOLLOWING PROPERTIES (IN ACCORDANCE WITH TABLE C13 OF THE "BLUE BOOK"):

SITE PARAMETERS	
CONSTRAINT	VALUE
SEDIMENT TYPE	F
SOIL HYDROLOGY GROUP	A
K = SOIL ERODIBILITY (K-FACTOR)	0.015
R = RAINFALL EROSIVITY (R-FACTOR)	2115
S = 2 YEAR, 6 HOUR STORM INTENSITY	9.75 mm/hr (NEWCASTLE)
LS = SLOPE LENGTH/GRADIENT	0.315 (55m SLOPE @ 1.8% GRADE)
P = EROSION CONTROL PRACTICE (P-FACTOR)	1.3 (TYPICAL)
C = GROUND COVER (C-FACTOR)	1.0 (TYPICAL FOR STRIPPED SITE)
SOIL LOSS (RUSLE METHOD) (tonnes/ha/yr)	13
EROSION HAZARD (TABLE 4.2 BLUE BOOK)	VERY LOW

THE AVERAGE ANNUAL SOIL LOSS FROM THE TOTAL AREA OF LAND DISTURBANCE IS LESS THAN 150 TONNES PER HECTARE PER YEAR, THE BUILDING OF A SEDIMENT BASIN IS UNNECESSARY IN ACCORDANCE WITH THE BLUE BOOK.

LEGEND

- PROPOSED BOUNDARY LINE
- EXISTING BOUNDARY LINE
- EXISTING CONTOURS
- SEDIMENT FENCE
- SECURITY FENCE
- SANDBAG SEDIMENT FILTER
- DIVERSION DRAIN (CLEAN)
- DIVERSION DRAIN (DIRTY)
- STABILISED SITE ACCESS
- STOCKPILE
- SEDIMENT BASIN
- AREA OF DISTURBANCE

EROSION AND SEDIMENTATION CONTROL NOTES:

1. ALL EROSION AND SEDIMENTATION CONTROL MEASURES MUST BE APPROPRIATE FOR THE SEDIMENT TYPE(S) OF THE SOILS ON-SITE, IN ACCORDANCE WITH THE 'BLUE BOOK' (MANAGING URBAN STORMWATER - SOILS AND CONSTRUCTION. LANDCOM, 2004), OR OTHER CURRENT RECOGNISED INDUSTRY STANDARDS FOR EROSION AND SEDIMENT CONTROL FOR AUSTRALIAN CONDITIONS. THIS INCLUDES SEDIMENT TRAPS AND LINING OF CHANNELS.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR KEEPING A DETAILED WRITTEN RECORD OF ALL EROSION AND SEDIMENT CONTROLS ON-SITE DURING THE CONSTRUCTION PERIOD. THIS RECORD SHALL BE UPDATED ON A DAILY BASIS AND SHALL CONTAIN DETAILS ON THE CONDITION OF CONTROLS AND ANY/ALL MAINTENANCE, CLEANING AND BREACHES. THIS RECORD SHALL BE KEPT ON-SITE AT ALL TIMES AND SHALL BE MADE AVAILABLE FOR INSPECTION BY THE PRINCIPAL CERTIFYING AUTHORITY AND THE SUPERINTENDENT DURING NORMAL WORKING HOURS.
3. INSTALL SEDIMENT PROTECTION FILTERS ON ALL NEW AND EXISTING STORMWATER INLET PITS IN ACCORDANCE WITH EITHER THE MESH AND GRAVEL INLET FILTER DETAIL SD6-11 OR THE GEOTEXTILE INLET FILTER DETAIL SD6-12 OF THE 'BLUE BOOK'.
4. ESTABLISH ALL REQUIRED SEDIMENT FENCES IN ACCORDANCE WITH DETAIL SD6-8 OF THE 'BLUE BOOK'.
5. INSTALL SEDIMENT FENCING, OR OTHER SEDIMENT CONTROL DEVICES, AROUND INDIVIDUAL BUILDING ZONES/AREAS AS REQUIRED AND AS DIRECTED BY THE SUPERINTENDENT OR APPROPRIATE COUNCIL OFFICER.
6. ALL TRENCHES INCLUDING ALL SERVICE TRENCHES AND SWALE EXCAVATION SHALL BE SIDE-CAST TO THE HIGH SIDE AND CLOSED AT THE END OF EACH DAYS WORK.
7. THE CONTRACTOR SHALL ENSURE THAT ALL VEGETATION (TREE, SHRUB AND GROUND COVER) WHICH IS TO BE RETAINED SHALL BE PROTECTED DURING THE DURATION OF CONSTRUCTION.
8. ALL VEGETATION TO BE REMOVED SHALL BE MULCHED ON-SITE AND SPREAD/STOCKPILED AS DIRECTED BY THE SUPERINTENDENT.
9. STRIP TOPSOIL IN AREAS DESIGNATED FOR STRIPPING AND STOCKPILE FOR RE-USE AS REQUIRED. ANY SURPLUS MATERIAL SHALL BE SPREAD ON-SITE AS DIRECTED BY THE SUPERINTENDENT OR REMOVED FROM SITE AND DISPOSED OF IN ACCORDANCE WITH EPA GUIDELINES.
10. CONSTRUCT AND MAINTAIN ALL MATERIAL STOCKPILES IN ACCORDANCE WITH DETAIL SD4-1 OF THE 'BLUE BOOK' (INCLUDING CUT-OFF SWALES TO THE HIGH SIDE AND SEDIMENT FENCES TO THE LOW SIDE).
11. ENSURE STOCKPILES DO NOT EXCEED 2.0m HIGH. PROVIDE WIND AND RAIN EROSION PROTECTION AS REQUIRED IN ACCORDANCE WITH THE 'BLUE BOOK'.
12. PROVIDE WATER TRUCKS OR SPRINKLER DEVICES DURING CONSTRUCTION AS REQUIRED TO SUPPRESS DUST.
13. ONCE CUT/FILL OPERATIONS HAVE BEEN FINALIZED ALL DISTURBED AREAS THAT ARE NOT BEING WORKED ON SHALL BE RE-VEGETATED AS SOON AS IS PRACTICAL.

GENERAL NOTES:

1. THE CONTRACTOR SHALL PROVIDE BARRIER/PERSON PROOF FENCE TO THE SITE/THEIR COMPOUND TO ENSURE THE SITE IS MADE SAFE TO THE PUBLIC FOR THE DURATION OF CONSTRUCTION.
2. THE SEDIMENT AND EROSION CONTROL MEASURES SHOWN ON THIS PLAN ARE GENERAL SITE MEASURES. ADDITIONAL MEASURES MAY BE REQUIRED AROUND INDIVIDUAL BUILDING ZONES DEPENDENT ON THE SEQUENCE OF CONSTRUCTION.

NOT FOR CONSTRUCTION

DRAWN: R.HUTCHISON DESIGNED: J.CARROL JOB MANAGER: J.CARROL VERIFIER: C. PIPER

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
1	ISSUED FOR APPROVAL	RH	CP	JC	08.10.21

CLIENT: THIRDI DAIRY FARMERS PTY LTD

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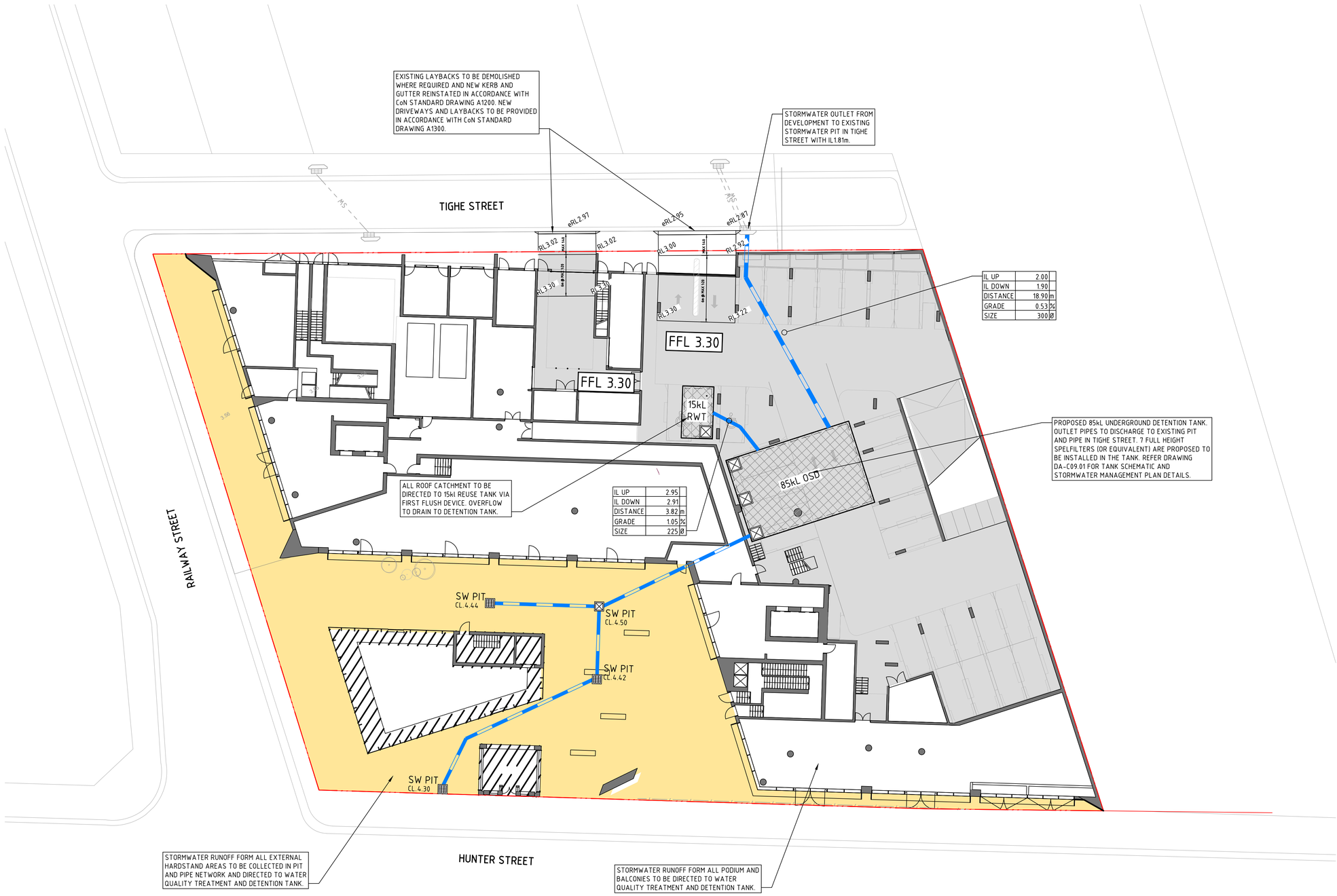
ABN 81 094 433 100

PROJECT: **DAIRY FARMERS CORNER**
924 HUNTER STREET NEWCASTLE WEST NSW, 2302

DRAWING TITLE: **CIVIL ENGINEERING PACKAGE**
EROSION AND SEDIMENT CONTROL PLAN

JOB NUMBER: **NL200577**
DRAWING NUMBER: **DA-C02.01**
REVISION: **1**
DRAWING SHEET SIZE = A1



LEGEND

- PROPOSED BOUNDARY LINE
- EXISTING BOUNDARY LINE
- STORMWATER PIPE
- EXISTING STORMWATER PIPE
- GRATED INLET PIT (NEW / EXTG)
- KERB INLET PIT (NEW / EXTG)
- JUNCTION PIT (NEW / EXTG)
- SW PIT CL.XX.XX IL. XX.XX — STORMWATER PIT TAG COVER LEVEL / INVERT LEVEL
- OSD — ON-SITE DETENTION TANK
- RWT — RAINWATER REUSE TANK
- XX.XX — EXISTING CONTOURS
- FFL 3.30 — FINISHED FLOOR LEVEL

NOTES

1. REFER TO DRAWING C09.01 FOR STORAGE TANK SCHEMATIC AND THE STORMWATER MANAGEMENT PLAN.

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DRAWN: R.HUTCHISON DESIGNED: J.CARROL JOB MANAGER: J.CARROL VERIFIER: C. PIPER

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
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NEWCASTLE WEST
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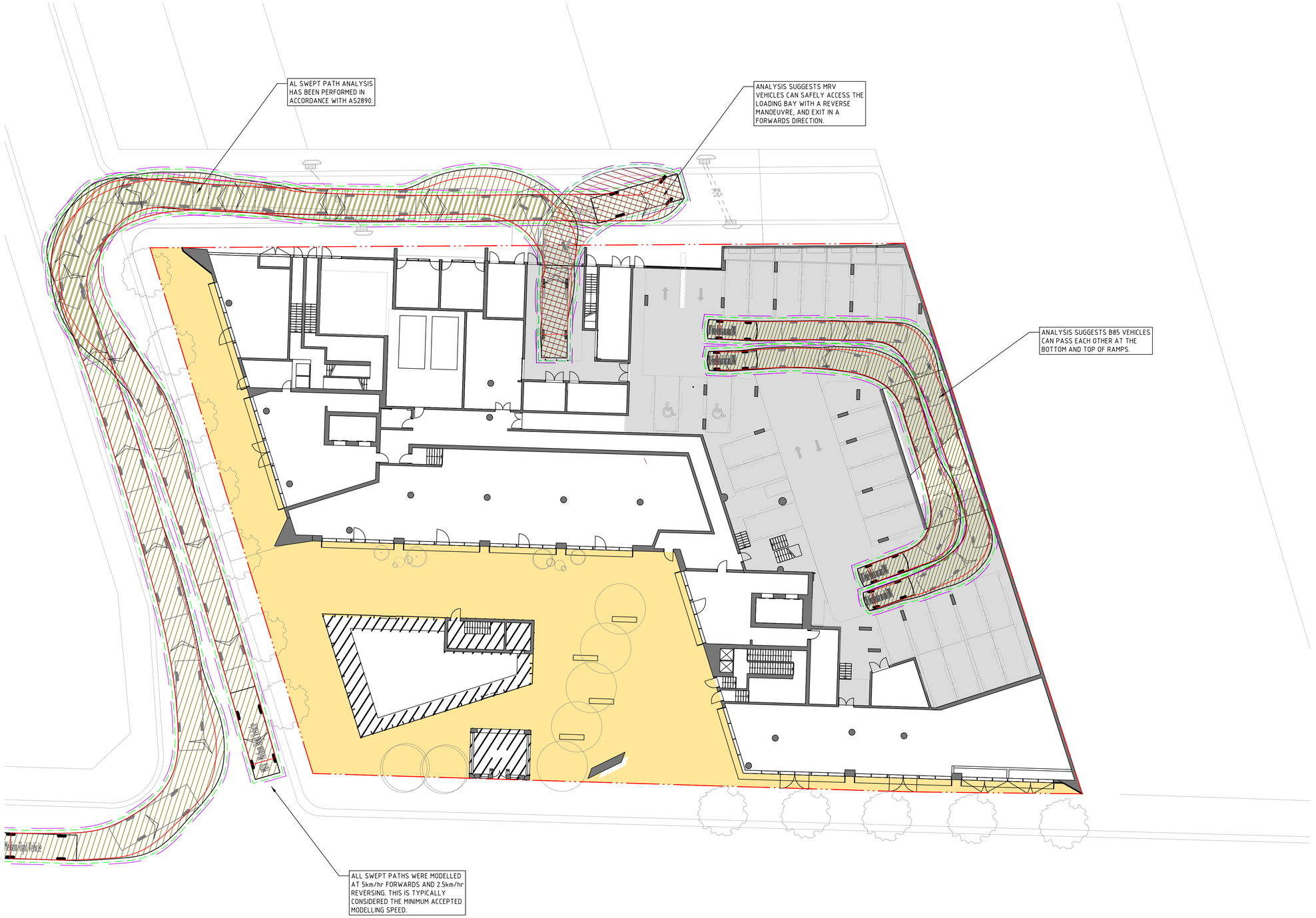
DRAWING TITLE: CIVIL ENGINEERING PACKAGE
CIVIL WORKS PLAN

JOB NUMBER: NL200577
DRAWING NUMBER: DA-C04.01
REVISION: 1
DRAWING SHEET SIZE = A1



LEGEND

- PROPOSED BOUNDARY LINE
- EXISTING BOUNDARY LINE
- B85 VEHICLE WITH CLEARANCE LINES
- MRV VEHICLE WITH CLEARANCE LINES

VEHICLE SIMULATION DISCLAIMER:

THE TURNING PATHS/TEMPLATES PROVIDED HAVE BEEN PRODUCED USING SIMULATION SOFTWARE AND ARE TO BE USED AS A GUIDE ONLY. THESE SIMULATIONS MAY NOT REFLECT ACTUAL DRIVER BEHAVIOUR AND/OR EXPERIENCE UNDER ACTUAL DRIVING CONDITIONS.

IT IS NORTHROP'S INTENTION TO UTILISE STANDARD VEHICLES NOMINATED IN AS2890.1 AND AS2890.2 FOR ALL DESIGN/CHECKING VEHICLE SIMULATIONS AT AN IDEAL MOVEMENT SPEED OF 10KM/H WITH A NOMINAL VEHICLE BODY OFFSET OF 500mm. WHERE MANOEUVRABILITY IS LIMITED AND SITE CONDITIONS ARE FAVOURABLE, AN ABSOLUTE MINIMUM SPEED OF 5KM/H WITH AND ABSOLUTE MINIMUM VEHICLE BODY CLEARANCE OF 300mm MAY BE ADOPTED.

IF THE USE OF SPECIFIC VEHICLES (NOT DETAILED UNDER AS2890) IS REQUESTED, IT IS TO BE NOTED THAT THEIR DIMENSIONS AND MANOEUVRING CHARACTERISTICS HAVE BEEN INTERPRETED INTO THE SIMULATION SOFTWARE FROM INFORMATION PROVIDED BY SERVICE PROVIDERS AND VEHICLE MANUFACTURES. NORTHROP ACCEPTS NO RESPONSIBILITY OF THE ACCURACY THESE VEHICLE MOVEMENTS, AND ANY MANOEUVRES PROVIDED SHOULD ONLY BE USED AS A GUIDE WITH ACTUAL DESIGN BEING BASED AROUND ENGINEERING ADVICE AND AUSTRALIAN STANDARDS.

AT ALL TIMES, STANDARD VEHICLE TURNING PATHS/TEMPLATES ARE TO TAKE DESIGN PRECEDENCE OVER ALL SPECIFIC VEHICLES. UNDER NO CIRCUMSTANCE DOES THE SIMULATION PROVIDED RELIEVE ANY PARTY OF THEIR ROLE AND RESPONSIBILITY FOR PROVIDING DESIGN SOLUTIONS IN ACCORDANCE WITH GOOD DESIGN PRACTICES.

DRAWN: R.HUTCHISON
DESIGNED: J.CARROL
JOB MANAGER: J.CARROL
VERIFIER: C.PIPER

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REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
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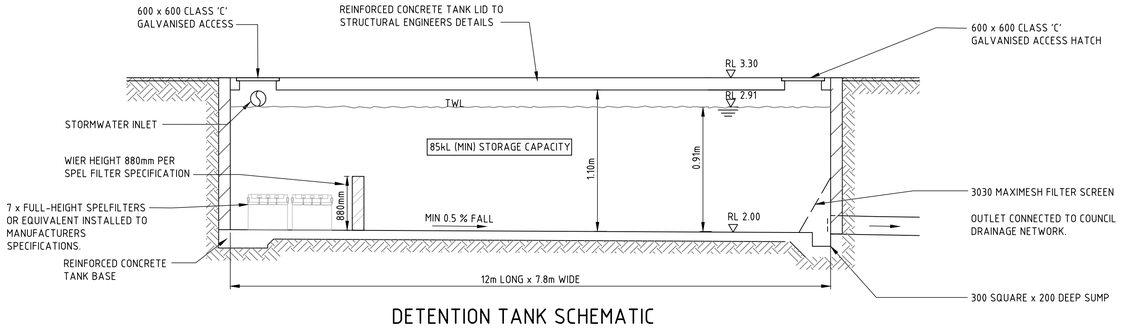
DRAWING TITLE: **CIVIL ENGINEERING PACKAGE**
VEHICLE SWEPT PATHS

JOB NUMBER: **NL200577**
DRAWING NUMBER: **DA-C06.01**
REVISION: **1**
DRAWING SHEET SIZE = A1



DETENTION TANK SCHEMATIC

STORMWATER MANAGEMENT PLAN

STORMWATER SUMMARY

NORTHROP CONSULTING ENGINEERS HAVE PREPARED A CONCEPT STORMWATER MANAGEMENT PLAN FOR THE PROPOSED DEVELOPMENT ON LOT 1 DP1091173, 924 HUNTER STREET, NEWCASTLE. THE PLAN HAS BEEN DEVELOPED IN ACCORDANCE WITH NC'S 2012 DEVELOPMENT CONTROL PLAN SECTION 7.06 AND CN'S STORMWATER AND WATER EFFICIENCY FOR DEVELOPMENT TECHNICAL MANUAL.
THE SITE HAS AN AREA OF APPROXIMATELY 3,941m^2. THE PROPERTY FALLS TO THE NORTH-WEST WITH AN AVERAGE GRADE OF 1.8%. THE SITE CURRENTLY CONSISTS OF COMMERCIAL BUILDINGS AND A CARPARK. THE DEVELOPMENT PROPOSES THE CONSTRUCTION OF TWO RESIDENTIAL TOWERS AND ONE COMMERCIAL TOWER, WITH A COMMUNAL LANDSCAPED PODIUM LEVEL AND GROUND LEVEL RETAIL.

THE PROPOSED STORMWATER MANAGEMENT PHILOSOPHY CAN BE SUMMARISED AS FOLLOWS:

- ALL ROOF WATER IS TO BE CONNECTED TO AN UNDERGROUND RAINWATER HARVESTING SYSTEM. A MINIMUM REUSE VOLUME OF 15kL IS TO BE PROVIDED FOR LANDSCAPE IRRIGATION ON SITE.
- OVERFLOW FROM THE REUSE TANKS AND PODIUM LEVEL RUNOFF IS TO BE DIRECTED TO AN 85kL DETENTION TANK TO MITIGATE STORMWATER FLOWS OFF SITE. CAPTURED WATER FROM THE SOUTH-WESTERN HARDSTAND AREA WILL ALSO BE DIRECTED TO THE DETENTION TANK.
- OVERFLOW FROM THE DETENTION TANK WILL BE CONNECTED TO THE COUNCIL STORMWATER NETWORK VIA AN EXISTING STORMWATER PIT IN TIGHE STREET.
- 7 SPELFILTERS (OR EQUIVILENT) ARE PROPOSED TO BE INSTALLED WITHIN THE DETENTION TANK TO REMOVE SEDIMENT, GROSS POLLUTANTS AND CHEMICALS SUCH AS PHOSPHOROUS AND NITROGEN FROM THE STORMWATER PRIOR TO DISCHARGING FROM SITE.
- APPROXIMATELY 165m^2 (~4%) OF EXTERNAL PATHWAY SURROUNDING THE BUILDING IS PROPOSED TO BYPASS THE TREATMENT NETWORK AND ENTER COUNCILS STORMWATER SYSTEM IN RAILWAY STREET VIA SHEET FLOW.

AREA SUMMARY

- TOTAL AREA = 3,941m^2
- TOTAL IMPERVIOUS AREA = 3,941m^2(100%)
  - TOTAL ROOF AREA = 1,708m^2
  - TOTAL HARDSTAND AREA = 2,233m^2
- TOTAL PERVIOUS AREA = 0m^2 (DOES NOT INCLUDE ABOVE-GROUND LANDSCAPED AREAS)

ONSITE DETENTION

TO MITIGATE THE EFFECTS OF STORMWATER RUNOFF ON DOWNSTREAM AREAS OF THE LOCAL CATCHMENT, ONSITE DETENTION HAS BEEN PROPOSED. THE FOLLOWING CALCULATIONS WERE USED TO DETERMINE TOTAL REQUIRED VOLUME (BASED ON CoN'S DCP 2014):

- TOTAL IMPERVIOUS AREA = 100% OF TOTAL SITE AREA
- TOTAL MITIGATION DEPTH = 25mm
- TOTAL MITIGATION VOLUME = 3941m^2 x 25mm = 98.5m^3

AS SUCH, A MINIMUM OF 98.5kL HAS BEEN PROVIDED. DETENTION VOLUME HAS BEEN DIVIDED BETWEEN THE PROPOSED REUSE TANK AND THE PROPOSED DETENTION TANK.

ON SITE REUSE

A MINIMUM OF 5kL REUSE CAPACITY IS REQUIRED AS PER THE BASIX REPORT PROVIDED FOR THE DEVELOPMENT.
MUSIC MODELLING WAS USED TO ENSURE THE REUSE TANK ACHIEVES A MINIMUM 75% EFFICIENCY. THIS MODELLING SUGGESTED A MINIMUM 15kL OF REUSE VOLUME WAS REQUIRED TO REACH 75% EFFICIENCY.

SITE SPECIFIC FLOOD INFORMATION

THE FLOOD CERTIFICATE (FL2019/00248) OBTAINED FROM NCC INDICATES THAT THE SITE IS LOCATED IN A FLOOD PRONE AREA, AND MAY BE IMPACTED BY LOCAL CATCHMENT FLOODING AND OCEAN FLOODING. THE BELOW SUMMARY SHOULD BE READ IN CONJUNCTION WITH THE FLOOD CERTIFICATE, WHICH IS PROVIDED WITH THESE DRAWINGS. THE FLOOD CERTIFICATE WAS DERIVED AS PART OF A NEWCASTLE CITY WIDE FLOODPLAIN MANAGEMENT PLAN, AND NOTED THE FOLLOWING REGARDING FLOODING AT THE SITE.

FLOOD CERTIFICATE INFORMATION	
IS ANY PART OF THE SITE AFFECTED BY A FLOODWAY?	NO
IS ANY PART OF THE SITE AFFECTED BY A FLOOD STORAGE AREA?	NO
ESTIMATED 1% ANNUAL EXCEEDANCE PROBABILITY EVENT LEVEL:	4.3m AHD (HUNTER STREET FRONTAGE) 3.1m AHD (NORTHERN FRONTAGE)
ESTIMATED MAXIMUM FLOW VELOCITY OF FLOODWATERS	0.7m/s
HIGHEST PROPERTY HAZARD CATEGORY	P2
ESTIMATED PROBABLE MAXIMUM FLOOD LEVEL (LOCAL CATCHMENT FLOODING)	4.4m AHD (HUNTER STREET FRONTAGE) 3.2m AHD (NORTHERN FRONTAGE) (VELOCITY 1.1m/s)
ESTIMATED PROBABLE MAXIMUM FLOOD LEVEL (OCEAN FLOODING)	3.4m AHD
HIGHEST LIFE HAZARD CATEGORY	L2 (H2)
MINIMUM FLOOR LEVEL FOR OCCUPIABLE ROOMS:	4.6m AHD (HUNTER STREET FRONTAGE) 3.4m AHD (NORTHERN FRONTAGE)
IS ONSITE REFUGE REQUIRED?	NO

PLEASE NOTE THAT THE DEVELOPMENT IS NOT AFFECTED BY THE 1% AEP OCEAN FLOODING EVENT.

THE MINIMUM FLOOR LEVELS DEFINED ABOVE PROVIDE A 300mm FREEBOARD ABOVE THE 1% AEP STORM EVENT. DURING MAXIMUM FLOOD EVENTS, THE SITE IS EXPECTED TO REMAIN ABOVE 4.4m AHD AT THE HUNTER STREET FRONTAGE AND 3.2m AHD ALONG THE NORTHERN FRONTAGE, WHICH ARE THE PROBABLE MAXIMUM FLOOD LEVELS DEFINED IN THE FLOOD CERTIFICATE.

PLEASE NOTE THAT THE MINIMUM FLOOR LEVELS SPECIFIED ARE FOR OCCUPIABLE ROOMS. NC'S DCP (CLAUSE 4.01.03) SPECIFIES THAT GARAGE LEVELS CAN BE LOWERED BELOW THE 1% AEP EVENT IF THERE ARE VEHICULAR ACCESS CONSTRAINTS. TO COMPLY WITH THE MAXIMUM DRIVEWAY GRADES SPECIFIED IN THE DCP AND TO ENSURE A MAXIMUM 4% GRADE WITHIN THE LOADING DOCK, THE FINISHED FLOOR LEVEL IN THE LOADING DOCK AND CARPARK HAS BEEN LOWERED TO 3.3m AHD (100mm BELOW THE FLOOD HAZARD LEVEL). AS SUCH, DURING THE 1% AEP EVENT, THE CARPARK AND LOADING DOCK AREAS WOULD HAVE AN EXPECTED FREEBOARD OF 200mm TO THE PEAK FLOOD LEVEL.

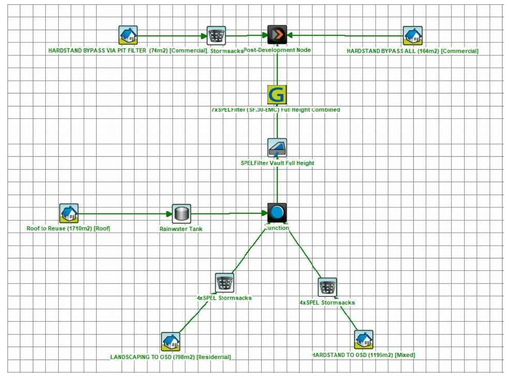
THE PROPERTY HAZARD AND LIFE HAZARD DEFINED IN THE TABLE ABOVE SUGGEST THE LOT IS HYDRAULICALLY SUITABLE FOR PARKED OR MOVING HEAVY VEHICLES AND WADING BY ABLE-BODIED ADULTS DURING FLOOD EVENTS (AS PER THE NC DCP 2012).

BASED ON THE INFORMATION PROVIDED BY THE FLOOD CERTIFICATE AND AS OUTLINED ABOVE, THE LOT MEETS THE "DEVELOPMENT STANDARD FOR FLOOD CONTROL LOTS," TO THE EXTENT SPECIFIED WITHIN THE RELEVANT SUBCLAUSE 3.5(1) OR 3A.38(1) OF THE STATE ENVIRONMENTAL PLANNING POLICY (EXEMPT AND COMPLYING DEVELOPMENT CODES) 2008.

WATER QUALITY

IN ORDER TO MINIMISE ANY ADVERSE IMPACTS UPON THE ECOLOGY OF THE DOWNSTREAM WATERCOURSES; STORMWATER TREATMENT DEVICES HAVE BEEN INCORPORATED INTO THE DESIGN OF THE DEVELOPMENT. THE STORMWATER QUALITY REDUCTION TARGETS FOR CITY OF NEWCASTLE LGA HAVE BEEN SUMMARISED IN TABLE 2.

THE PERFORMANCE OF THE PROPOSED WATER QUALITY CONTROL MEASURES WAS ASSESSED AGAINST THESE TARGETS USING THE CONCEPTUAL SOFTWARE MUSIC V6.3.0. THE MODEL WAS DEVELOPED USING RECOMMENDED PARAMETERS PRESENTED IN THE 2015 NSW MUSIC GUIDELINES AND CoN'S MUSIC LINK. A SCHEMATIC OF THE MUSIC MODEL CAN BE SEEN IN FIGURE 1. NORTHROP ENGINEERS CAN PROVIDE THE MUSIC MODEL IF REQUIRED,



THE FOLLOWING IS A SUMMARY OF THE WATER QUALITY TREATMENT DEVICES THAT HAVE BEEN UTILISED WITHIN THE DESIGN:

- RAINWATER REUSE TANK - RUNOFF FROM THE PROPOSED ROOF AREAS IS TO BE DIRECTED TO A 15kL REUSE TANK WHICH IS TO BE FITTED WITH A PROPRIETARY FIRST FLUSH DEVICE. CAPTURING THE FIRST PORTION OF RUNOFF FROM THE ROOF, THE FIRST FLUSH DEVICE WILL EFFECTIVELY REMOVE SEDIMENT AND ATTACHED POLLUTANTS. RUNOFF COLLECTED IN THE TANKS IS TO BE REUSED EXTERNALLY FOR IRRIGATION. OVERFLOW FROM THE TANKS WILL BE CONNECTED TO THE PROPOSED DETENTION TANK.
- PIT FILTER BASKET - IT IS PROPOSED THAT ONE SPEL STORMSACK PIT FILTER BASKETS (OR APPROVED EQUIVALENT) WILL BE FITTED TO INLET PITS WITHIN HARDSTAND AREAS TO PROVIDE PRIMARY TREATMENT THROUGH THE REMOVAL OF GROSS POLLUTANTS AND ATTACHED NUTRIENTS FROM RUNOFF.
- PROPRIETARY FILTRATION DEVICE - RUNOFF FROM THE PODIUM AND BALCONYS IS TO BE DIRECTED TO THE WATER QUALITY TREATMENT DEVICE. LOW FLOWS WILL BE DIRECTED TO A PRECAST VAULT HOUSING SEVEN SPELFILTER CARTRIDGES (OR APPROVED EQUIVALENT). SEVEN FULL-HEIGHT CARTRIDGES HAVE BEEN DEEMED NECESSARY TO ADEQUATELY REMOVE FINE SEDIMENT AND SUSPENDED NUTRIENTS PRIOR TO DISCHARGE FROM SITE.

TABLE 2 SHOWS THAT THE PROPOSED STORMWATER MANAGEMENT STRATEGY IS PREDICTED TO ACHIEVE THE CN'S LOAD REDUCTION TARGETS, AS ESTIMATED BY MUSIC. A MUSIC-LINK REPORT AND MUSIC MODEL CAN BE PROVIDED ON REQUEST.

POLLUTANT CRITERIA	REDUCTION TARGET (%)	SOURCES (kg/yr)	LOAD (kg/yr)	REDUCTION ACHIEVED (%)
TOTAL SUSPENDED SOLIDS (TSS)	85	356	51.1	85.6
TOTAL PHOSPHOROUS (TP)	65	0.891	0.206	76.8
TOTAL NITROGEN (TN)	45	8.21	3.32	59.5
TOTAL GROSS POLLUTANTS (GP)	90	85.4	4.37	94.9

TABLE 2 - POLLUTANT LOAD REDUCTIONS

NOT FOR CONSTRUCTION

DRAWN: R.HUTCHISON DESIGNED: J.CARROL JOB MANAGER: J.CARROL VERIFIER: C.PIPER

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
1	ISSUED FOR APPROVAL	RH	CP	JC	8.10.21
2	ISSUED FOR APPROVAL	RH	CP	JC	13.10.21

CLIENT: THIRDI DAIRY FARMERS PTY LTD

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ARCHITECT: CKDS

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ABN 81 094 433 100

PROJECT: DAIRY FARMERS CORNER
924 HUNTER STREET
NEWCASTLE WEST
NSW, 2302

DRAWING TITLE: CIVIL ENGINEERING PACKAGE
CIVIL DETAILS & STORMWATER MANAGEMENT PLAN

JOB NUMBER: NL200577
DRAWING NUMBER: DA-C09.01
REVISION: 2
DRAWING SHEET SIZE = A1

THE CITY OF NEWCASTLE

MUSIC-*link* Report

Project Details		Company Details	
Project:	DAIRY FARMERS CORNER	**Company:**	NORTHROP CONSULTING ENGINEERS
Report Export Date:	8/10/2021	**Contact:**	JAMIE CARROLL
Catchment Name:	NL200577_REUSE TANK SIZING_JC	**Address:**	1/215 PACIFIC HIGHWAY, CHARLESTOWN, NSW, 2290
Catchment Area:	0.393ha	**Phone:**	0423399559
Impervious Area*:	79.64%	**Email:**	jcarroll@northrop.com.au
Rainfall Station:	61078 WILLIAMTOWN		
Modelling Time-step:	6 Minutes		
Modelling Period:	1/01/1995 - 31/12/2008 11:54:00 PM		
Mean Annual Rainfall:	1125mm		
Evapotranspiration:	1735mm		
MUSIC Version:	6.3.0		
MUSIC-link data Version:	6.34		
Study Area:	Newcastle		
Scenario:	Newcastle		

* takes into account area from all source nodes that link to the chosen reporting node, excluding Import Data Nodes

Treatment Train Effectiveness

Node: Post-Development Node	Reduction
Flow	8.28%
TSS	85.6%
TP	77%
TN	59.5%
GP	94.9%

Treatment Nodes

Node Type	Number
Rain Water Tank Node	1
Detention Basin Node	1
GPT Node	3
Generic Node	1

Source Nodes

Node Type	Number
Urban Source Node	5

Comments

Passing Parameters

Node Type	Node Name	Parameter	Min	Max	Actual
Detention	SPELFilter Vault Full Height	% Reuse Demand Met	None	None	0
Detention	SPELFilter Vault Full Height	Hi-flow bypass rate (cum/sec)	None	99	99
GPT	2xSPEL Stormsacks	Hi-flow bypass rate (cum/sec)	None	None	0.022
GPT	4xSPEL Stormsacks	Hi-flow bypass rate (cum/sec)	None	None	0.044
GPT	4xSPEL Stormsacks	Hi-flow bypass rate (cum/sec)	None	None	0.044
Post	Post-Development Node	% Load Reduction	None	None	8.28
Post	Post-Development Node	GP % Load Reduction	90	None	94.9
Post	Post-Development Node	TN % Load Reduction	45	None	59.5
Post	Post-Development Node	TP % Load Reduction	65	None	77
Post	Post-Development Node	TSS % Load Reduction	85	None	85.6
Rain	Rainwater Tank	% Reuse Demand Met	70	None	78.31
Urban	HARDSTAND BYPASS ALL (164m2)	Area Impervious (ha)	None	None	0.016
Urban	HARDSTAND BYPASS ALL (164m2)	Area Pervious (ha)	None	None	0
Urban	HARDSTAND BYPASS ALL (164m2)	Total Area (ha)	None	None	0.016
Urban	HARDSTAND BYPASS VIA PIT FILTER (74m2)	Area Impervious (ha)	None	None	0.007
Urban	HARDSTAND BYPASS VIA PIT FILTER (74m2)	Area Pervious (ha)	None	None	0
Urban	HARDSTAND BYPASS VIA PIT FILTER (74m2)	Total Area (ha)	None	None	0.007
Urban	HARDSTAND TO OSD (1196m2)	Area Impervious (ha)	None	None	0.119
Urban	HARDSTAND TO OSD (1196m2)	Area Pervious (ha)	None	None	0
Urban	HARDSTAND TO OSD (1196m2)	Total Area (ha)	None	None	0.119
Urban	LANDSCAPING TO OSD (798m2)	Area Impervious (ha)	None	None	0
Urban	LANDSCAPING TO OSD (798m2)	Area Pervious (ha)	None	None	0.08
Urban	LANDSCAPING TO OSD (798m2)	Total Area (ha)	None	None	0.08
Urban	Roof to Reuse (1710m2)	Area Impervious (ha)	None	None	0.171
Urban	Roof to Reuse (1710m2)	Area Pervious (ha)	None	None	0
Urban	Roof to Reuse (1710m2)	Total Area (ha)	None	None	0.171

Only certain parameters are reported when they pass validation

Appendix H

GEOTECHNICAL ASSESSMENT (DOUGLAS PARTNERS)

Douglas Partners
Geotechnics / Environment / Groundwater

Integrated Practical Solutions

Report on
Preliminary Site Investigation (PSI) and Preliminary Contamination Testing

Proposed Mixed Use Multi-Storey Development
924 Hunter Street, Newcastle West

Prepared for
Thirdi Dairy Farmers Pty Ltd

Project 102077.02
October 2021

Douglas Partners
Geotechnics / Environment / Groundwater

Document History

Document details

Project No.	102077.02	Document No.	R.001.Rev0
Document title	Report on Preliminary Site Investigation (PSI) and Preliminary Contamination Testing Proposed Mixed Use Multi-Storey Development		
Site address	924 Hunter Street, Newcastle West		
Report prepared for	Thirdi Dairy Farmers Pty Ltd		
File name	102077.02.R.001.Rev0.PSI.docx		

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Draft A	Dana Wilson	Matthew Blackert	20 October 2021
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Distribution of copies

Status	Electronic	Paper	Issued to
Draft A	1	0	Luke Griffiths, Catalyst Project Consulting Pty Ltd
Revision 0	1	0	Luke Griffiths, Catalyst Project Consulting Pty Ltd

The undersigned, on behalf of Douglas Partners Pty Ltd, confirm that this document and all attached drawings, logs and test results have been checked and reviewed for errors, omissions and inaccuracies.

	Signature	Date
Author	Dana Wilson	21 October 2021
Reviewer	MBlackert	21 October 2021

bsi. ISO 9001 Quality Management
FS 604853

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Executive Summary

This report presents the results of a preliminary site investigation (PSI) and preliminary contamination testing undertaken for the proposed mixed use multi-storey development at 924 Hunter Street, Newcastle West (the site).

The site comprised existing buildings (Dairy Farmers Corner building and separate commercial building) and a bitumen and concrete sealed carparking area as shown on Drawing 1 in Appendix H.

It is understood that the proposed development comprises two main towers of 80 m and 99 m in height. The lower levels will consist of a mixture of carparking and commercial offices and the upper levels consisting of residential units. No basement is proposed. Conceptual plans of the proposed development are shown in Appendix H. It is understood that construction may require removal of upper fill materials to a depth of 0.5 m to 0.6 m for placement of controlled filling to allow for ground works, however, this is to be confirmed.

The objective of the PSI was to assess the potential for contamination at the site based on past and present land uses and to comment on the need for further investigation and/or management with regard to the proposed development. The PSI included limited intrusive investigation at accessible locations to provide a preliminary assessment of potential areas of environmental concern and contaminant concentrations at the site.

The PSI comprised a review of available published information, previous investigations by DP, brief site history review, site walkover, discussions with site personnel, preparation of a conceptual site model, drilling boreholes, installation of groundwater wells and laboratory analysis of selected soil and groundwater samples for potential contaminants of concern.

The site history information suggested a range of potentially contaminating activities associated with various former and current site uses. This included demolition of former residential / commercial buildings / structures, a possible former blacksmiths, commercial milk processing and distribution by the Dairy Farmers' Co-operative Milk Company Limited (about 50 years), followed by use as a car dealership (30 years to present). One known underground fuel storage tank (UST) remains present at the site (redundant) based on site observations and our current site history findings, however, it is noted at the time of issuing this report searches with SafeWork NSW were still pending. On this basis, and the limited site history information available on the former land uses additional underground fuel storage tanks may be present as well as possible former chemical storage or use.

The preliminary subsurface investigation focused on areas with the highest risk of contamination based on the site history and current site condition and available access. Twelve bores (Bores 201-205; 301-307) were drilled, four groundwater monitoring wells were sampled (two of which were existing wells) and surface sampling was conducted at one location (S1).

The results of the assessment indicated the general absence of gross contamination at the test locations and depths assessed based on field observations and laboratory testing of selected soil and groundwater samples.

Variable fill was identified at the site to depths of 1.0 m to 2.3 m, however, was typically less than 1.5 m and included building materials (potential source of HBM including ACM).

Most soil contaminant concentrations were within the adopted human health and ecological investigation / screening levels and site assessment criteria (SAC). This considered both a generic commercial land use (scenario 'D') and high density residential land use within minimal soil access (scenario 'B') given the possibility for communal areas of open space at ground level. Minor exceedances comprised:

- Slightly elevated benzo(a)pyrene at Bore 203/0.5 m which exceeded health criteria for scenario B;
- Slightly elevated TRH F3 (>C_{16}-C_{34}) at Bore 201/2.0 m exceeding ecological criteria for scenario B
- Asbestos in soil at Bore 305/0.55 m (bonded and friable) and bonded ACM at the surface at S1. Owing to the presence of fill at the site, and widespread presence of building materials in fill, there is a risk of hazardous building materials (HBM) including asbestos in unobserved or untested parts including UST backfill materials.

Preliminary waste classification indicated soils subject to leachability testing were classified as 'General Solid Waste' (GSW), noting that site soils with ACM impact would be classified as 'Special Waste – asbestos'. Leachability testing is pending for a number of bores due to elevated total lead and as such these samples would be classified as Hazardous Waste (HW) or Restricted Solid Waste (RSW) based on total concentrations alone at this point. Additional waste classification would be required to confirm soil classification and any re-use opportunities for natural soils. This could include sampling and analysis of natural soil, which are classified as non-ASS soils, to confirm if they are suitable for classification as virgin excavated natural material (if required).

Exceedances of groundwater assessment criteria were limited to dissolved zinc and copper which is not uncommon for the area regionally. The contaminant concentrations in groundwater were generally low and suggests the absence of significant hydrocarbon impact to groundwater from the known redundant UST.

Preliminary testing for acid sulfate soils (ASS) indicated the presence of potential ASS for natural soils below the groundwater table (i.e. below about 2.6 m).

Based on the PSI findings, remediation / management would be required to render the site suitable for the proposed development from a contamination perspective, due to the bonded and friable ACM impacts in fill materials and potentially as a result of the presence of PAH and TRH impacts in fill or potential residual impacts associated with underground fuel infrastructure. Remediation should be detailed in a site-specific RAP to be integrated with the development, such as any removal of bulk fill for initial ground working. The RAP will require regulatory approval.

Recommendations for additional investigation relating to the assessment of contamination in upper fill, waste classification and ASS, requirements for removal and validation of any USTs and associated infrastructure, as well as preliminary comments on the remediation options for the RAP are discussed in Section 15.

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Report on Preliminary Site Investigation (PSI) and Preliminary Contamination Testing (Contamination)

Proposed Mixed Use Multi-Storey Development

924 Hunter Street, Newcastle West

1. Introduction

Douglas Partners Pty Ltd (DP) has been engaged by Thirdi Dairy Farmers Pty Ltd to complete this preliminary site investigation (PSI) and preliminary contamination testing for the proposed mixed use multi-storey development at 924 Hunter Street, Newcastle West (the site).

The objective of the PSI was to assess the potential for contamination at the site based on past and present land uses and to comment on the need for further investigation and/or management with regard to the proposed development. The PSI included limited intrusive investigation at accessible locations to provide a preliminary assessment of potential areas of environmental concern and contaminant concentrations at the site.

The site comprised existing buildings (Dairy Farmers Corner building and separate commercial building) and a bitumen and concrete sealed carparking area as shown on Drawing 1 in Appendix H.

It is understood that the proposed development of the site includes two towers for residential apartments with ground floor carparking and commercial offices (no basement) and is therefore considered mixed use.

The following key guidelines were consulted in the preparation of this report:

- NEPC *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]* (NEPC, 2013); and
- NSW EPA *Guidelines for Consultants Reporting on Contaminated Land* (NSW EPA, 2020).

This report should be read in with all appendices including the notes provided in Appendix A.

2. Proposed Development

It is understood that the proposed development of the site comprises two main towers of 80 m and 99 m in height. The lower levels will consist of a mixture of carparking and commercial offices and the upper levels consisting of residential units. No basement is proposed. Conceptual plans of the proposed development are shown in Appendix H.

It is understood that construction may require removal of upper fill materials to a depth of 0.5 m to 0.6 m for placement of controlled filling to allow for ground works, however, this is to be confirmed.

3. Scope of Work

The investigation comprised the following:

- Review of available published information on the site including geological, topographical, acid sulfate soil and soil landscape maps and search of registered groundwater bores in the area;
- Review of geotechnical investigations by DP at the site (DP, 1995; 2020);
- Brief site history review to assess the potential for contamination comprising a review of aerial photographs, Safe Work NSW search (result pending), NSW EPA register searches, title deeds search, review of Section 10.7 planning certificate and council record searches;
- Site inspection by a senior environmental engineer to identify areas of potential contamination and assess current site condition;
- Preparation of a conceptual site model (CSM) for the site, which defines the potential contaminant sources, potential receptors and exposure pathways;
- Service locating to clear test locations and assess the location of underground fuel storage tank (UST) and fuel infrastructure in the eastern part of the site;
- Drilling of five boreholes (Bores 201 to 205) to a depth of 5 m below ground level using a track mounted drilling rig with continuous pushtube within the eastern part of the site near underground fuel infrastructure. Groundwater monitoring wells were installed in two of the boreholes (Bores 203 and 204) for groundwater level measurement and to facilitate groundwater sampling and testing;
- Drilling of seven boreholes (Bores 301 to 307) to depths of 0.5 m to 3.0 m below ground level by hand auger (central and western part of the site);
- Collection of soil samples from the bores at regular depth intervals for identification and testing purposes under contamination sampling protocols;
- Collection of one fibro material at the surface (S1/F1) and underlying soil (S1/0-0.05 m) for asbestos identification testing;
- Purging and sampling of groundwater from two new groundwater wells (Bores 203 and 204) and two existing wells (GW1 and GW3), including groundwater level gauging of all site wells;
- Inspection of the fill / dip point for an existing underground fuel storage tank (UST) located on the site;
- Screening of soil samples, groundwater and groundwater well headspace for volatile organic compounds (VOC) using a photoionisation detector (PID);
- Laboratory testing on selected soil samples retrieved from the bores for potential contaminants of concern and ASS conditions;
- Laboratory testing for potential contaminants in groundwater;
- Update of the CSM for the site on the basis of the investigation;
- Preparation of this report presenting the findings of the preliminary site investigation.

4. Site Information

Site Address	924 Hunter Street, Newcastle West	
Legal Description	Lot 1 D.P.342675 Lot 1 D.P.1091173 Lot 2 D.P.126 Lot 2 D.P.1091173	Lot 2 D.P.445736 Lot 1 D.P.395367 Lot 1 D.P.456088
Area	3950 m^2	
Local Council Area	Newcastle City Council	
Zoning	B3 Commercial under NCC Local Environmental Plan 2012	
Current Use	Commercial: Car dealership (central and western portion); Fitness / health centre (eastern portion).	
Surrounding Uses	North – Tighe Street, then commercial developments (vehicle service centre) and railway line; East – Commercial developments (self-storage units and retail); West – Railway Street, then mixed-use developments (car dealerships and possible servicing); South – Hunter Street / Maitland Road / Tudor Street, then mixed-use developments (car dealership, car hire, general business, church and shop top residential).	

Figure 1: Site Location

Figure 2: Lot layout

5. Environmental Setting

5.1 Overview

Site and Regional Topography	Reference to the NSW Contours Hunter and Central Coast LiDAR indicates site levels range from approximately RL 4.5(AHD) (in the south-western corner) to RL 3.0 (in the south-eastern corner). More regionally, the surrounding area slopes from < 10 AHD to 1-2 AHD to the north-east towards coastal areas of the Hunter River and Throsby Creek.
Soil Landscape	Reference to the Newcastle 1:100,000 Soil Landscapes Sheet indicates West the site is located within the Hamilton soil landscape comprising residual soils. This group comprises 'deep' soils (>15cm), well-drained weak Podzols with some 'deep' (>100cm) well-drained Brown Podzolic Soils on fans. Limitations include wind erosion hazard, ground water pollution hazard, strong acidity, non-cohesive soils.
Geology	Reference to the Newcastle Coalfields Surface Geology Sheet, published by BHP, indicates that the site is underlain by the Quaternary aged alluvium. Based on previous investigations by DP, these alluvial soils are underlain by rocks belonging to the lower parts of the Lambton subgroup of the Newcastle Coal Measures. The Newcastle Coal Measures are of Permian age and typically comprises sandstone, conglomerate, siltstone, claystone, coal and tuff. Information suggests that the site and adjacent sites are not undermined.
Acid Sulfate Soils	Reference to NSW ASS mapping indicates that the site is mapped as a low probability occurrence of ASS at depths greater than 3 m below the ground surface. An area of high probability occurrence of ASS within 1 to 3 m of ground surface is located near the northern boundary of the site (approx 10 m to 30 m from lot boundary).
Surface Water	No surface water bodies / courses were identified on site or directly adjacent to the site. The Hunter River is located about 450 m north-east and downgradient of the site. The Hunter River is an estuarine (marine) and tidal environment, and also receives surface water runoff from Throsby Creek about 600 m to the east, fresh water flows from land runoff and freshwater flows from the upgradient Hunter River.
Groundwater	Groundwater is expected at approximately 3 m to 5 m depth based on previous investigations in the area. Groundwater flows are expected to the north-east towards the Hunter River. Refer Section 5.2.

5.2 Groundwater Bores

A search of the publicly available registered groundwater bore database indicated that there are several registered groundwater bores within 500 m of the site as shown in Figure 3. Relevant bores details are summarised in Table 1.

Figure 3: Mapped Groundwater Bores within approx 500 m radius of the site

Table 1: Summary of Available Information from Nearby Registered Groundwater Bores

Bore ID Authorised Purpose	Location Relative to Site	Final Depth (m)	Standing Water Level (m bgl)	Water Quality
GW054766 General use	260 m south west	6.5	-	Salinity 0-500 ppm
GW202915 Domestic	280 m south west	9.0	4.0	-
GW201711 Monitoring bore	290 m east	6.0	1.26	-
GW201710 Monitoring bore	310 m east	3.5	-	-
GW200855 Test bore	300 m south east	6.0	1.5	-
GW201875 Monitoring bore	485 m south-east (possibly upgradient)	6.0	-	-
GW056149 Unknown	300 m south-south-east	7.2	-	-
GW058805 Domestic	350 m south	6.0	-	-
GW200144-GW200150 Test bores	360-400 m- south-west to south-south-west	-	-	

Based on the regional topography, the anticipated flow direction of groundwater beneath the site is to the north east, towards the Hunter River, the likely receiving surface water body for the groundwater flow path.

It is noted that the published records provided limited information only. Based on the shallow depth of installation for the registered bores and regional geology, bores would predominantly be installed in the upper soil (alluvial) profile. Groundwater in the aquifer is expected to be generally fresh to brackish. Although the bores are registered for a variety of purposes, beneficial use of groundwater in the Newcastle area for irrigation and potable uses is expected to be minimal. This is based on the urban setting, availability of potable sources and information published in the Water Sharing Plan for the North Coastal Sands Groundwater Sources 2016. Accordingly, significant potential beneficial uses of the groundwater near the site are unlikely.

5.3 Hazardous Ground Gases – Former Mine Workings

Desktop review in conjunction with on-going geotechnical investigations for the site by DP suggests that the site and adjacent sites are not undermined. Given the absence of coal seams beneath the site and associated underground mining, the risk of potential hazardous ground gases (HGG) from this source at the site is considered to be negligible.

6. Previous Investigations

6.1 Geotechnical Investigation - Douglas Partners (DP, 1995)

DP has previously undertaken a *Geotechnical Investigation* at the site for proposed car showrooms in the south-western and south-eastern corners of the site (i.e. the current site buildings). The investigation also included a proposed workshop to the north on Tighe Street.

The geotechnical investigation was undertaken to provide information on the subsurface conditions and provide recommendations for foundation design and construction practices. One borehole (B2) was drilled near the south-western corner of the site, targeted to the area of the extended building location (i.e. extended upon existing DFC building). Subsurface investigation was therefore limited.

Key information from the 1995 investigation relevant to this assessment is as follows:

- The site had been previously developed and “contains several masonry buildings with the remainder of the area being paved concrete”;
- The existing pavement on the southern portion of the site was to be retained, with the northern pavement to be reconstructed;
- No history was obtained regarding the previous placement of filling;
- Proposed building slabs were to be constructed on 900 mm of controlled filling (material source unknown);
- Subsurface conditions were noted to comprise variable fill materials. Subsurface conditions at Bore 2, comprised:
    - Concrete slab to 0.15 m; underlain by
    - Filling, sand with some medium gravel to 2.0 m; underlain by
    - Sand, slightly clayey from 2.5 to termination at 5.5 m.

- Groundwater was estimated at 2.5 m based on saturated conditions during the investigation. It should be noted that groundwater levels are affected by climatic conditions and soil permeability and will therefore vary with time.

It is noted that the investigation report was limited to geotechnical assessment and details regarding potential contaminants (e.g. staining, odours, slag gravels etc) or anthropogenic inclusions were not recorded or differentiated on the logs at the time of the investigation.

6.2 Geotechnical Investigation - Douglas Partners (DP, 2020)

DP has previously drilled three cone penetration tests (CPTs) at the site in 2020 as part of a geotechnical investigation for proposed development of the site. CPT101 to CPT103 are shown on Drawing 1 in Appendix H. It is noted that field investigations were completed, however, formal assessment and reporting of the results was not completed in 2020. The data will be used in future geotechnical investigation.

Key pertinent information from the CPTs is as follows:

- The profile of the upper 1 m was not recorded as the CPT used a non-instrumented dummy cone to penetrate the upper pavement materials;
- The natural soil profile predominantly comprised sand with interbedded silt / clay lenses to a depth of about 3 m to 4 m overlying a sand unit to a depth of about 9 m to 9.5 m;
- Clay / silty clay with local band of sand underlying sand unit to termination depth of up to 29.9 m where CPT refusal was recorded at one test. The CPT refusal indicates the top of weathered rock although this has not been confirmed by drilling;
- Groundwater was measured at between 2.7 m and 3.0 m following withdrawal of the CPT rod at the completion of the test.

6.3 Geo-environmental investigations – Approx 2020

Based on observations of a number of infilled boreholes observed during the site walkover (refer Section 8), it is understood that additional geotechnical and / or environmental investigations may have been undertaken by others in 2020 following on from DP (2020). Three groundwater monitoring wells, which have been assigned by DP as ‘GW1’ to ‘GW3’, were also located in the eastern part of the site near the location of the underground fuel tank and former bowser. The monitoring well locations are shown on Drawing 1 in Appendix H.

Details regarding the previous subsurface investigation and GW1 to GW3 well construction are unknown. Given the proximity of GW1 to GW3 to the underground fuel storage tank and former bowser location, DP has assumed that the purpose of the wells was to assess groundwater conditions near the tank. The wells may also be related to possible Underground Storage Systems compliance requirements (i.e. three wells near USTs).

Information regarding the observed well condition and depths based on water level gauging and sampling by DP as part of this investigation are included in Section 11.3.

7. Site History

7.1 Overview of 'Dairy Farmers Corner'

The majority of the western lots are known as 'Dairy Farmers Corner' (DFC) based on the former use of the site by the Dairy Farmers' Co-operative Milk Company Limited from 1938, including construction of current building (façade) fronting the south-western corner on Hunter Street. The eastern building may also have been associated with former DFC activities.

A brief review of online information was undertaken to inform general site activities. Information from O'Sullivan (2014) on the history of Dairy Farmers Corner' is summarised as follows:

- The western two-storey DFC building was built in 1938/1939. The building housed administration offices;
- Other site buildings were used for the 'receiving, handling, bottling and distribution of bulk milk'. The facility included a bottling plant for washing and sterilisation of 4000 bottles daily, powered by "two colonial type boilers";
- The facility included a loading dock for constant truck distribution;
- The facility operated at the site for about 50 years (1939 to 1991);
- Redevelopment of the site was undertaken from 1991 becoming Regal Motors car dealership and administration building (vehicle servicing most likely off-site) which involved the demolition of the former milk distribution area in the other parts of the site and lots to the north across Tighe Street (not part of investigation site). The original DFC administration building fronting the south-western corner on Hunter Street remained in place and the building area was extended in 1990s (discussed further in Section 7.3 based on aerial photos).

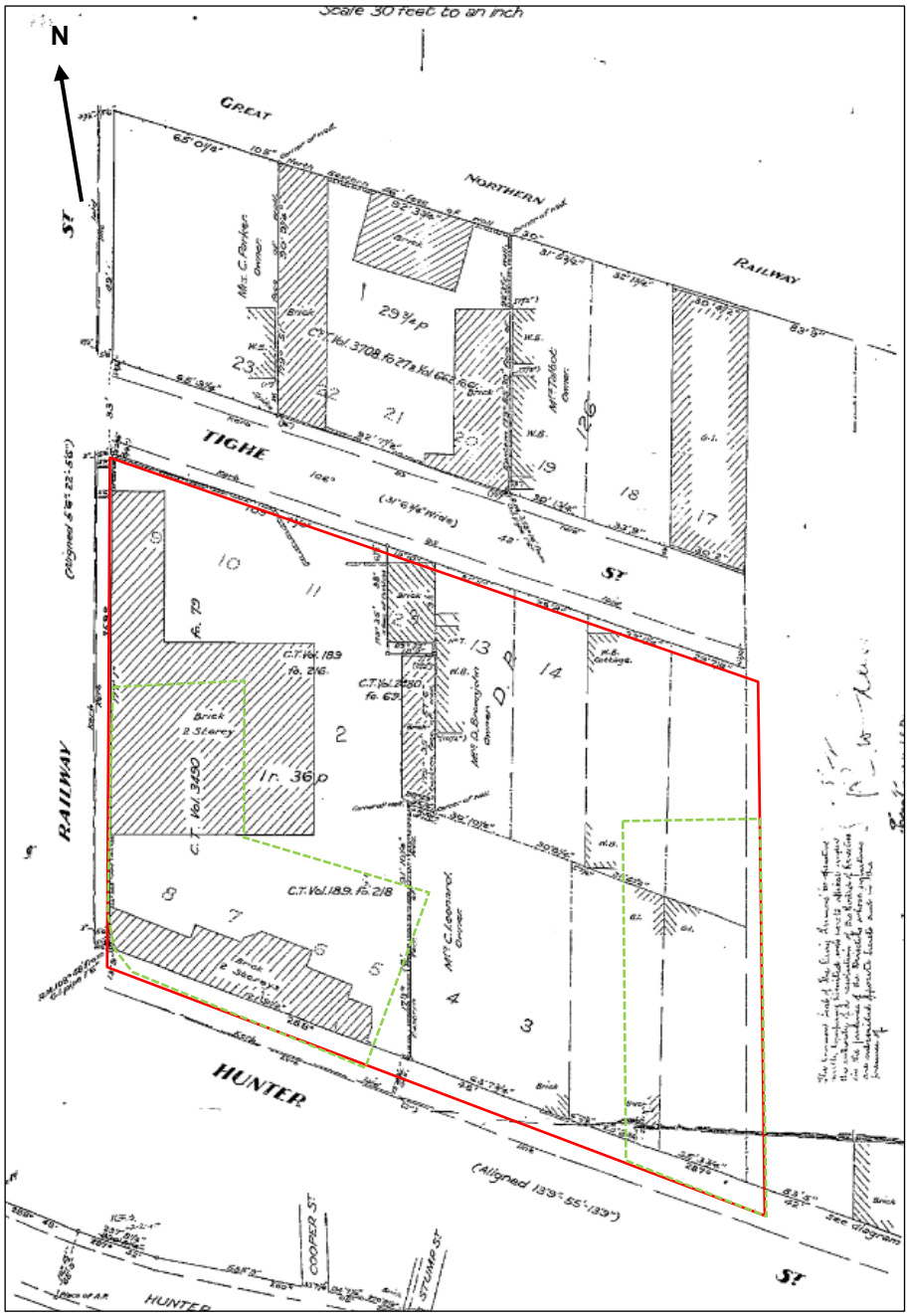

Figure 4: Former layout- site boundary (red), approx location of current building outline (green) - Source: Title Deeds (Appendix C, estimated date about 1940-1950)

7.2 Title Deeds

A historical title deeds search was used to obtain ownership and occupancy information including company names and the occupations of individuals that have historically possessed the title. The title information can assist in the identification of previous land uses by the company names/site owners and can therefore, assist in establishing whether there were potentially contaminating activities occurring at the site.

A historic title deeds search was undertaken for the lots by InfoTrack Pty Ltd which is included in Appendix C. It is noted that the historic lot layout varied from the current layout, comprising a number of smaller areas. Table 2 presents a generalised summary of findings of the titles search related to the current lot layout in Figure 2 in Section 4 and Drawing 1 in Appendix H.

Table 2: Historical Title Deeds

Date	Registered Proprietor(s) & Occupations	Inferred Land Use
Lot 2 D.P. 445736 – Main DFC site (western lot)		
Periods between 1913-1930	Various owners of smaller subsections (builder, railway employee, business manager, commercial traveller, widow)	-
1923/1937 to 1994	The Dairy Farmers' Co-Operative Milk Company Limited Then Dairy Farmers Co-Operative Limited Now Australian Co-Operative Foods Limited	Commercial milk processing and distribution
1994-2019	Zutor Pty. Ltd	Commercial / car dealership
2019-present	# McCloy Newcastle West Pty Limited	Commercial / car dealership
Leases:	Various leases between 2012-2020 (not investigated) Current lease to Manning Valley Motor Holding Pty Ltd	Commercial / car dealership
Lots 1 & 2 D.P. 1091173		
1911/1918-1953/1954	Various owners of smaller subsections (railway guard, miner, labourer), Blacksmith (1914-1952) and pattern maker (1952-1953) in north-east corner of Lot 2 D.P.1091173	Blacksmith
1953/1954 to 1993	The Dairy Farmers' Co-Operative Milk Company Limited Then Dairy Farmers Co-Operative Limited Now Australian Co-Operative Foods Limited	Commercial milk processing and distribution
1994-2019	Zutor Pty. Ltd	Commercial / car dealership
2019-present	# McCloy Newcastle West Pty Limited	Commercial / car dealership
Leases:	Leases between 1918-1954 to The Newcastle Co-Operative Milk Society Limited and The Berrima District Farm and Dairy Company Limited Various leases between 2012-2020 (not investigated) Current lease to Manning Valley Motor Holding Pty Ltd Current leases (2020 to 2024) to Manning Valley Motor Holding Pty Ltd, Lease to Air Locker Training Newcastle Pty Ltd Lease to Barre Effect Pty Ltd	Commercial / car dealership

Date	Registered Proprietor(s) & Occupations	Inferred Land Use
Lot 1 D.P. 395367		
1914-1952	Arthur William Spurr (Blacksmith)	Blacksmith
1952-1953	Edward Spurr (Pattern Maker)	Pattern maker
1953-1956	The Dairy Farmers' Co-Operative Milk Company Limited Then Dairy Farmers Co-Operative Limited Now Australian Co-Operative Foods Limited	Commercial milk processing and distribution
1956-1997	The Council of the City of Newcastle Then Intervening Name Changes Now Energy Australia	Electricity easement
1994-2019	Zutor Pty. Ltd	Commercial / car dealership
2019-present	# McCloy Newcastle West Pty Limited	Commercial / car dealership
Leases:	Various leases between 2012-2020 (not investigated) Current lease to Manning Valley Motor Holding Pty Ltd	Commercial / car dealership
Lot 2 D.P. 126 & Lot 1 D.P. 456088		
1877-1927	Catherine Leonard (married woman)	-
1927-1959	Mary Leonard (Spinster) Elizabeth Minogue (Married woman)	-
1959	Public Trustee	
1959-1993	The Dairy Farmers' Co-Operative Milk Company Limited Then Dairy Farmers Co-Operative Limited Now Australian Co-Operative Foods Limited	Commercial milk processing and distribution
1994-2019	Zutor Pty. Ltd	Commercial / car dealership
2019-present	# McCloy Newcastle West Pty Limited	Commercial / car dealership
Leases:	Various leases between 2012-2020 (not investigated) Current leases (2020 to present) to Lease to Air Locker Training Newcastle Pty Ltd Lease to Barre Effect Pty Ltd	Commercial / car dealership

7.3 Historical Aerial Photography

Several historical aerial photographs were obtained from public databases. Extracts of the aerial photographs are included in Appendix C. A summary of key features observed for the site and surrounding land is presented in Table 3.

Table 3: Summary of Historical Aerial Photographs

Year	Appx C Figure	Site Observations	Surrounding Land Use
1954 (B/W)	C1	• The site developed comprising several structures across all lots, but difficult to ascertain due to the quality of aerial imagery.	• The surrounding area is fully developed at this time. • Hunter Street, Railway and Tighe Street border the site to the north, south and west. • Given the size of structures surrounding the site, the inferred land use is commercial / industrial. • The railway is present to the north at this time.
1966 (B/W)	C2	• Possible new structure(s) present in the south eastern corner of the site area. • The current south-eastern building seems present. • No other significant changes noted during this time.	• There are no obvious changes to surrounding site features since the previous aerial photo. • Surrounding area appears relatively unchanged.
1976 (Colour)	C3	• No obvious changes to the site since the previous aerial photo. • Suggests vehicle parking / storage across the site. Access road west of eastern building.	• Possible demolition of former structure to the west of the site. Former building footprint now used as possible parking / storage area. • The rest of the surrounding area appears to have no significant changes since the previous aerial image.
1984 (B/W)	C4	• The site appears relatively unchanged since the previous aerial photo. • No obvious changes to site structures but difficult to ascertain due to the quality of aerial imagery.	• Demolition / construction work has taken place north of the site on the opposite side of the railway. • Possible new structure present to the west of the site. Previous area for parking / storage at the time of the previous aerial now has a solid structure present. • No other significant changes to immediately adjacent lots.
1986 (orthophoto)	C5	• The site appears relatively unchanged since the previous aerial photo.	• Generally as per 1984.
1990 (Colour)	C6	• There are no obvious changes to the site since the previous aerial image. • No changes to site structures or other features. • Several cars now parked across the site.	• No obvious changes to the immediately surrounding area. • Cleared area now present to the north of the site.
2001 (Colour)	C8	• The site has been redeveloped since the time of the previous aerial image. • Apparent demotion of old buildings in the south western corner and northern areas of the site. Now replaced with visibly newer buildings. • There are an abundance of cars parked at the site during this time. • The aerial photograph suggests that the site is being used as a car dealership during this time. • Building in the south eastern corner of the site has also been either redeveloped or demolition and replaced (possible asbestos roofing removal).	• There are no obvious changes to the immediately adjacent lots to the west and east since the previous aerial image. • The cleared area to the north of the site now appears to have new structures present.
2016	C9	• Generally as per 2011. No obvious site activities (no vehicle parking etc).	• Generally as per 1984.
2021	Refer Drawing 1	• Generally as per 2016.	• Generally as per 2016.

Notes to Table 3: B/W- black and white image

7.4 Recent Photography

A SafeWork NSW Dangerous Goods search for the site has been requested. At the time of reporting, the result had yet to be received. Information relating to the period of underground fuel storage tank operation was not available from the current owner (purchased 2019) or tenant (as of 2020).

It is possible that the known UST located in the north-eastern portion of the site was initially installed around 1994-1995 associated with DA1994/0517 "… Part of Former Factory as a Transport Terminal (Coach Depot - Maintenance and Parking Facility Only)" or BA1996/2014 for a "a Motor Vehicle Sales and Service Centre".

A brief review of Google Streetview images indicates that the bowser remained in place on the north-western corner of the eastern site building in images until about May 2018. The bowser is no longer in place in an image dated August 2019. Site observations (refer section 8) suggest all underground fuel infrastructure remains in place (ie USTs and pipework) and only the bowser was removed. The UST vent pipe remains in place as discussed in Section 8.

Google street view images showing the tank and general site use from 2010 to 2019 and are shown in Figure 5 to Figure 10.

Figure 5: Google Streetview Image from Hunter Street – January 2010

Figure 6: Google Streetview Image from Hunter Street – January 2010

Figure 7: Google Streetview Image from Hunter Street – January 2010

Figure 8: Google Streetview Image from Hunter Street – June 2015

Figure 9: Google Streetview Image from Hunter Street – February 2017

Figure 10: Google Streetview Image from Hunter Street – August 2019

7.5 Public Registers

EPA Notices available under Section 58 of the Contaminated Lands Management Act (CLM Act) (1)	No notices issued under the Protection of the Environment Operations Act 1997 (POEO) on the site or on surrounding sites; accessed 6 August 2021.
Sites notified to EPA under Section 60 of the CLM Act (1)	The site is not listed as a notified contaminated site. There were four listed sites within a 500 m distance of the site as follows: • 113 Parry St, Newcastle West (Former Mobil Service Station), located approximately 200 m south of the site. • 10 Dangar St, Wickham (Former Warehouse), located approximately 300 m east of the site. • 2 Holland St, Wickham (Fuchs Lubricants), located approximately 220 m north of the site. • 50 Railway St, Wickham (Railcorp Wickham), located approximately 280 m north west of the site.
NSW EPA PFAS Investigation Sites (1)	The site and surrounding properties are not listed as per- and polyfluoroalkyl substances (PFAS) investigation sites. The closest listed site was Fuchs site at 2 Holland St, Wickham located about 300 north north-west of the site. This site is not considered to be upgradient.
SafeWork NSW	A SafeWork NSW Dangerous Goods search for the site has been requested. At the time of reporting, the result had yet to be received.

Notes:

(1) Database search dated 6 August 2021

7.6 Council Planning Records

A review of the Council Section 10.7 Planning Certificates for each of the lots, copies of which are included in Appendix C, indicated the following:

- Is not within a proclaimed mine subsidence district;
- The lots have not been listed on the loose-fill asbestos insulation register;
- Regarding land contamination matters under section 59(2) of the *Contaminated Land Management Act 1997*:
  - For Lot 1 D.P. 1091173, Lot 2 D.P. 445736, Lot 2 D.P. 1091173, Lot 1 D.P. 456088 and Lot 2 D.P. 126, Council records indicate that (1) engine works and (2) fuel/oil storage, being potentially contaminating land uses, may have been carried out;
  - For Lot 1 D.P. 456088 and Lot 1 D.P. 342675, there are no prescribed contamination matters to be disclosed.

An online search of Newcastle City Council (NCC) planning records relating to development applications (DA), building applications (BAs) was undertaken on 31 May 2021. The search was undertaken for 924 Hunter Street, Newcastle, the associated address for all lots, with results summarised in Table 4.

Table 4: Records of Approved Development Applications - 924 Hunter Street, Newcastle West

Reference [1]	Description	NCC Record of Lots	Relevance
'BA1989/0999	Cool Room	Lots 23-24 D.P. 126 & Lot 1 D.P. 445736	Off-site (north)
DA1994/0517	The Use of Part of Former Factory Premises as a Transport Terminal (to Uring Coach Depot - Maintenance and Parking Facility Only).	Lots 23-24 D.P. 126 & Lot 1 D.P. 445736	Off-site (north) [3]
BA1996/2014	Establish a Motor Vehicle Sales and Service Centre Incorporating Servicing Workshop & Spare Part Sales and Associated Business Administration NS Functions	Lots 23-24 D.P. 126 & Lot 1 D.P. 445736	Mostly off-site (north), with **exception of sales and administration services assumed on site**
DA1995/0315	Proposed Motor Vehicle Sales & Service Complex	Lots 23-24 D.P. 126 & Lot 1 D.P. 445736	Mostly off-site (north), with **exception of sales and administration services assumed on site**
DA1998/2684	Alterations to building	Lots 23-24 D.P. 126 & Lot 1 D.P. 445736	Off-site (north)
DA2000/0914	Advertising sign	Lots 23-24 D.P. 126 & Lot 1 D.P. 445736	Off-site (north)
DA2004/0644	Alterations & additions to showroom (awning)	Lots 23-24 D.P. 126 & Lot 1 D.P. 445736	**Assumed on-site (incorrect record of lots)**
DA2010/0023	Membrane awnings to rear of existing motor dealership building	Lots 23-24 D.P. 126 & Lot 1 D.P. 445736	**Assumed on-site (incorrect record of lots)**
DA2010/0421	Advertising signs	Lots 23-24 D.P. 126 & Lot 1 D.P. 445736	Off-site (north) or on-site (?)
DA2019/00579	Change of use to recreation facility (indoor)	Assumed eastern lots	**On-site**
DA2020/01160	Signage	Lots 23-24 D.P. 126 & Lot 1 D.P. 445736	Off-site (north) or on-site (?)

Notes to Table 4:

(1) Council development application (DA) reference

(2) "Various Lots & D.P.s No 924 Hunter Street Newcastle West"

(3) Correspondence with Council confirmed DA related to site to the north on Tighe Street

7.7 Site History Integrity Assessment

The information used to establish the history of the site was sourced from reputable and reliable reference documents, many of which were official records held by Government departments/agencies. The databases maintained by various Government agencies potentially can contain high quality information, but some of these do not contain any data at all.

In particular, aerial photographs provide high quality information that is generally independent of memory or documentation. They are only available at intervals of several years, so some gaps exist in the information from this source. The observed site features are open to different interpretations and can be affected by the time of day and/or year at which they were taken, as well as specific events, such as flooding. Care has been taken to consider different possible interpretations of aerial photographs and to consider them in conjunction with other lines of evidence.

7.8 Summary of Site History

It is noted that site personnel or representatives were not available to provide information on current or former site activities, noting that current lease tenants have only been at the site since 2020. The report has also been written prior to receipt of the SafeWork NSW Dangerous Goods search.

The site history information suggests the following:

- Prior to 1930/1940s, site use is unconfirmed. The site comprised a number of smaller lots with various land owners and as such may have been a mix of residential, business or commercial / industrial use. Blacksmith use may have occurred for the central and eastern part of the site (Lot 1-2 D.P. 1091173);
- From 1930s the site included construction of a number of buildings / sheds for commercial milk processing and distribution (i.e. bottling of milk, return of bottles, washing, transport of milk and administration). The facility also extended to the north, outside the current investigation area;
- Details about the use of buildings, furnaces, fuel storage etc during these times are unknown. Aerial photos were often of low resolution to confirm site details;
- Records do not suggest animals were kept on site during dairy production site use;
- Most site buildings were demolished around mid 1990s with the exception of the south-western corner building still in place (DFC administration building – façade area only) and the eastern site building;
- From about 1995, the site included additions to the original DFC building to form the Regal Motors car dealership showroom, with this building current presently. Internal areas of buildings, including the eastern site building were used as showrooms. Records do not suggest that on site vehicle servicing has occurred, rather this was undertaken for the site to the north of Tighe Street in conjunction with the Regal Motors site operations;
- The UST on the eastern side of the site may have been installed around this time for refuelling of vehicles which was common at the time. Records to confirm UST installation and cessation of use have not been located at this time. The bowser was removed between mid-2018 and mid-2019;
- It is also possible that the known UST located in the north-eastern portion of the site was initially installed around 1994-1995 associated with a former Coach Depot (maintenance and parking), however, site history details have not been conclusive;
- Car sales and showroom operations continued to present, noting that images suggest a period in 2019-2020 where the site was unoccupied/untenanted;
- The eastern part of the site has more recently been tenanted for fitness / health clubs;
- The site is surrounded by industrial and commercial premises and include several service stations, factories (including former Steggles factory), car dealerships and servicing centres , some of which may be upgradient of the site.

8. Site Walkover

A site walkover was undertaken by an environmental engineer from DP on 8 October 2021. The general site topography was generally consistent with that described in Section 4. The site layout appears to be consistent with the 6 June 2021 aerial shown on Drawing 1 in Appendix H. Key site photos are included in Appendix C.

The following key site features pertinent to the PSI are as follows:

- The building in the south-western corner of the site (two-storey) comprised a vehicle showroom, administration area, offices and amenities;
- The eastern side building (not accessible) comprised two lease areas:
  - Northern – Barre Effect (Pilates / gym);
  - Southern – Airlocker (gym / fitness club).
- The majority of the site was concrete of asphalt paved;
- A UST was located on the eastern side of the site, with the location of the former bowser near the north-western corner of the eastern building. Fill / dip points were observed and were serviceable (refer Section 11.4). One tank vent pipe was located on the northern side of the building;
- A covered awning on the northern side of the building contained an air conditioner unit and water pump;
- No chemical storage was observed;
- One fibro cement sheet / pipe (confirmed as asbestos-containing material (ACM)) was observed at the surface of the perimeter garden bed on the north-western corner. The material and underlying soil was sampled as S1 as discussed in later sections of this report.

With the exception of S1, there were no observations of potential ACM at the surface, noting that non-sealed areas of the site were limited (i.e. garden beds on the north-eastern, northern and southern perimeters, or part thereof). ACM materials may be present in site buildings which have not been assessed / sampled as part of this assessment.

There were no obvious indications of pesticide spraying or distressed vegetation.

Key site features and observations are annotated on Drawing 1 Appendix H.

9. Preliminary Conceptual Site Model

A conceptual site model (CSM) is a representation of site-related information regarding contamination sources, receptors and exposure pathways between those sources and receptors. The CSM provides the framework for identifying how the site became contaminated and how potential receptors may be exposed to contamination either in the present or the future ie: it enables an assessment of the potential source – pathway – receptor linkages (complete pathways).

Potential Sources

Based on the current investigation, the following potential sources of contamination and associated contaminants of potential concern (COPC) have been identified.

- S1: Fill (source unknown): Associated with site filling / levelling, fill / waste generated on site.
  - COPC include metals, total recoverable hydrocarbons (TRH), benzene, toluene, ethylbenzene, xylene (BTEX), polycyclic aromatic hydrocarbons (PAH), polychlorinated biphenyls (PCB), organochlorine pesticides (OCP), organophosphorus pesticides (OPP) and asbestos, synthetic mineral fibres (SMF), lead (in paint) and PCB.
- S2: Former structures: Associated with site former buildings on the site, demolition, building wastes.
  - COPC include lead in asbestos, synthetic mineral fibres (SMF), lead (in paint) and PCB.
- S3: Possible blacksmiths: Associated with site former buildings on the site, demolition, building wastes.
  - COPC include TRH, PAH, BTEX, metals, VOC, cyanide.
- S4: UST and associated pipework and bowser.
  - COPC include heavy metals (namely lead), TRH, BTEX, PAH and volatile organic compounds (VOC);
- S5: Former commercial / industrial use as DFC (milk processing, bottling), possible furnace, storage of fuels, chemicals, drips/spills, carparking, waste placement;
  - COPC include metals, TRH, BTEX, PAH, PAH, OCP, OPP, ACM, SMF;
- S6: Possible storage of oils / automotive goods if servicing was conducted on site:
  - COPC include TRH, BTEX, PAH, metals, solvents.
- S7: Carparking, drips / spills leaks (possible former unsealed carpark areas?):
  - COPC include TRH, BTEX, PAH, metals, PCB.
- S8: Adjacent/upgradient commercial developments to the west and south (car yards, service stations etc).
  - COPC include TRH, BTEX, PAH, metals and VOC.

Potential Receptors

The following potential human receptors have been identified:

- R1: Current users [commercial users and customers];
- R2: Construction and maintenance workers;
- R3: End users [ground floor commercial users and residential occupants]; and
- R4: Adjacent site users [commercial users].

The following potential environmental receptors have been identified:

- R5: Surface water [The Hunter River; a marine / estuarine environment];
- R6: Groundwater; and
- R7: Terrestrial ecology.

Potential Pathways

The following potential pathways have been identified:

- P1: Ingestion and dermal contact;
- P2: Inhalation of dust and/or vapours;
- P3: Surface water run-off;
- P4: Lateral migration of groundwater providing base flow to water bodies;
- P5: Leaching of contaminants and vertical migration into groundwater; and
- P6: Contact with terrestrial ecology;
- P7: Inhalation, ingestion and absorption.

Summary of Potentially Complete Exposure Pathways

A 'source–pathway–receptor' approach has been used to assess the potential risks of harm being caused to human or environmental receptors from contamination sources on or in the vicinity of the site, via exposure pathways (potential complete pathways). The possible pathways between the above sources (S1 to S6) and receptors (R1 to R7) are provided in below Table 5.

Table 5: Summary of Potentially Complete Exposure Pathways

Source and COPC	Transport Pathway	Receptor	Risk Management Action
S1: Fill : metals, TRH, BTEX, PAH, PCB, OCP, OPP, PCB, asbestos, SMF, lead in paint. S2: Former structures : asbestos, SMF, lead in paint, S3: Blacksmiths: TRH, PAH, BTEX, metals, VOC, cyanide S4: DFC industrial use: metals, TRH, BTEX, PAH, PAH, OCP, OPP, ACM, SMF	P1: Ingestion and dermal contact; P2: Inhalation of dust and/or vapours.	R1: Current users [commercial users and customers] R2: Construction and maintenance workers; R3: End users [ground floor commercial users and residential occupants];	An intrusive investigation is recommended to assess possible contamination including testing of the soils and groundwater.
	P2: Inhalation of dust and/or vapours	R4: Adjacent site users [commercial].	
	P3: Surface water and sediment run-off; P4: Lateral migration of groundwater providing base flow to water bodies	R5: Surface water [Hunter River]	
	P5: Leaching of contaminants and vertical migration into groundwater	R6: Groundwater	
	P6: Contact with terrestrial ecology P7: Inhalation, ingestion and absorption	R7: Terrestrial ecosystems	
S2: UST lead, TRH, BTEX, PAH, VOC S6: Possible storage of oils / automotive goods: TRH, BTEX, PAH, metals, solvents.	P1: Ingestion and dermal contact P2: Inhalation of dust and/or vapours;	R1: Current users [commercial users and customers] R2: Maintenance workers; R3: End users [automotive workers, customers]	
	P2: Inhalation of dust and/or vapours	R4: Adjacent site users [industrial].	
	P3: Surface water and sediment run-off; P4: Lateral migration of groundwater providing base flow to water bodies	R5: Surface water [Hunter River]	
	P5: Leaching of contaminants and vertical migration into groundwater	R6: Groundwater	
	P6: Contact with terrestrial ecology P7: Inhalation, ingestion and absorption	R7: Terrestrial ecosystems	
S7: Carparking: TRH, BTEX, PAH, metals, PCB.	P1: Ingestion and dermal contact P2: Inhalation of dust and/or vapours	R1: Current users [commercial users and customers] R2: Maintenance workers; R3: End users [automotive workers, customers]	
	P3: Surface water and sediment run-off P4: Lateral migration of groundwater providing base flow to water bodies;	R5: Surface water [Hunter River]	
	P5: Leaching of contaminants and vertical migration into groundwater	R6: Groundwater	
	P7: Inhalation, ingestion and absorption.	R7: Terrestrial ecosystems	
S8: Adjacent/upgradient developments: TRH, BTEX, PAH, metals and VOC.	P2: Inhalation of dust and/or vapours.	R1: Current users [commercial users and customers] R3: End users [ground floor commercial users and residential occupants]	
	P1: Ingestion and dermal contact P2: Inhalation of dust and/or vapours	R2: Construction and maintenance workers	
	P7: Inhalation, ingestion and absorption.	R7: Terrestrial ecosystems	

10. Sampling and Analysis Quality Plan

10.1 Data Quality Objectives

The preliminary investigation was devised with reference to the seven-step data quality objective process which is provided in Appendix D Schedule B2, NEPC (2013). The DQO process is outlined in Appendix D.

10.2 Soil Sampling Rationale

Based on the CSM and DQO the following sampling rationale was adopted.

A judgemental sampling strategy to determine borehole locations was adopted for the PSI. Locations were based on site history information, access and the CSM with the rationale provided below. Borehole locations are shown on Drawing 1 in Appendix H.

Bore 202 to 204	Assess soil and fill conditions near and downgradient of UST as well as general soil and fill conditions, including locations of former buildings. Bores 203 and 204 to assess for possible off site hydrocarbon migration (i.e. downgradient of tank and at site boundary).
Bore 201, 301 to 307	Assess general soil and fill conditions, including locations of former buildings.
S1	Surface sampling at observed potential ACM fragment.

Soil samples were collected from each borehole at the surface and approximately 0.5 m thereafter, and changes in lithology or signs of contamination. At this stage a vapour assessment has not been undertaken for the site (i.e. to assess S2 ,S6 or S8), however, the preliminary assessment included PID screening of soil samples from the boreholes and groundwater well and preliminary VOC testing in soil and groundwater.

The general sampling methods are described in the field work methodology, included in Appendix E.

10.3 Groundwater Sampling Rationale

In order to assess the current groundwater contamination status downgradient of the USTs and evaluate whether the previous UST use have impacted on groundwater, sampling from two existing monitoring wells (GW1 and GW3) and two new well installations (Bores 203 to 204) was undertaken.

Well GW1 and Bores 203 and 204 were located north of the fuel tank and bowser, with Bore 202 and GW3 to the west. . The test locations provided data on the concentration of contaminants in groundwater in close proximity to USTs at up and downgradient of UST infrastructure at the site.

The general sampling methods are described in the field work methodology, included in Appendix E.

11. Field Work Results

11.1 Subsurface Conditions

The subsurface conditions encountered in the pits and bores are presented in detail in the borehole logs in Appendix A. The logs should be read in conjunction with the accompanying notes in Appendix A which explain the descriptive terms and classification methods used in the logs.

A generalised geotechnical model of the subsurface profile encountered at the test locations is summarised as follows:

FILL (Unit 1): Asphalt, spray seal or concrete surfacing, overlying predominantly granular fill to a depth ranging from 1.0 m to 2.3 m. Anthropogenic inclusions including ash, brick, ceramic, coal, coal reject, fibro, glass, metal, slag gravel and black slag were observed within fill (refer to potential contamination observations in Section 11.2).

SAND (Unit 2) Sand, generally brown and grey to a depth ranging from 2.0 m (limit of investigation) to 5.0 m (limit of investigation). Silty clay/clayey sand bands were observed within Unit 2 in Bores 201, 203 and 204 between 2.8 m to 3.2 m below ground level (non-continuous layers).

Free groundwater was observed at the following depths during drilling.

Table 6: Groundwater Observations within bores during drilling

Bore	Date	Groundwater level (m below ground level)	Groundwater reduced level (AHD)
201	6/10/2021	3.2	0.7
202		3.2	0.2
203		2.8	0.3
204		2.8	0.5
205		3.0	0.4
301	9/10/2021	2.7	0.3
302		2.9	0.3
303		Not observed within DoI	<2.9
304		Not observed within DoI	<2.5
305		Not observed within DoI	<1.3
306		2.9	0.5
307		Not observed within DoI	<3.4

Notes to Table 6:

DOI – depth of investigation

It should be noted that groundwater levels are variable and can be affected by such factors as soil permeability, recent weather conditions and possible tidal influences.

Results of groundwater purging and sampling are shown in Section 11.3.

11.2 Contaminant Observations in Soil

There were no other visual or olfactory observations (e.g. staining, odours, free phase product) to suggest the presence of gross contamination within the soils or groundwater observed in the investigation.

Observations of potential contamination are shown in Table 7.

Table 7: Summary of Observations of Potential Contamination in Subsurface Investigation

Potential Contamination Observation	Locations and Depths (m)
Fill[1]	All bores. Bore 201/0.11-2.3, 202/0.155-1.0, 203/0.18-1.3, 204/0.12-1.7, 202/0.115-1.4, 301/0.05-1.3), 302/0.03-1.6, 303/0.03-0.7[(2)], 304/0.03-1.0[(2)], 305/0.18-1.3, 306/0.19-1.6, 307/0.16-0.5[(2)]
Fibro Fragments (Potential ACM)	Bore 305 (0.55 m) and surface sample (S1) – refer to logs in Appendix A for details
Hazardous building material (HBM) indicators	Bore 201/0.11-1.6 (brick), 202/0.15-1.0, 203/0.18-1.3 (brick / ceramic), 204/0.12-1.3 (brick), 301/0.3-0.8 (brick), 302/0.4-1.3 (brick), 303/0.3->0.7[(2)] (brick), 306/0.8-1.6 (brick)
Coal / coal reject	Bore 201/0.11-1.6 (trace), 201/0.6-2.3, 202/0.155-1.0, 204/0.12-1.3, 301/0.3-0.8, 302/0.4-1.3, 303/0.3->0.7[(2)] (trace), 304/0.4->1.0[(2)] (trace), 305/0.18-1.1 (trace/some), 306/0.19-0.8 (trace), 306/0.8-1.6
Slag	Bore 201/0.11-1.6, 303/0.3->0.7[(2)] (trace), 304/0.4->1.0[(2)] (trace), 305/0.18-1.1 (trace/some), 306/0.19-0.8 (trace)
Black slag	Bore 202/0.155-1.0 (trace), 305/0.18-1.1 (trace), 306/0.19-0.8 (trace)
Ash	Bore 202/0.155-1.0, 05/0.115-1.4

Notes to Table 7:

1 - Potential presence of a range of contaminants due to unknown source of imported fill

2 – Limit of investigation

The PID screening indicated the absence of significant volatile impacts at the test locations and to the depths investigated, with all recorded values of less than 1 ppm.

11.3 Groundwater Sampling

The results of groundwater level gauging, field parameters and observations during purging and sampling on 7 and 12 October 2021 are shown in Table 8.

Table 8: Results of Groundwater Purging And Sampling – 7 and 12 October 2021

Well ID	Easting	Northing	Ground RL (AHD)	TOC RL (AHD) (3)	Well Depth (m bgl)	Date	Depth to Groundwater Below TOC (m)*	Depth to Groundwater (m bgl)*	RL GW Head (AHD)*	PID Well Headspace (2) (ppm)	PID GW Headspace (2) (ppm)	Thickness of Free Product by Oil-Water Interface Meter (1) (mm)	pH	EC (mS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Temp. (°C)	Volume Purged (L)	Comments
GW1	383738.6	6356497.2	3.28	3.23	5.13	7/10/2021	2.79	2.84	0.44	<1	<1	<1	6.3	0.23	118	0.3	140	20.6	8	Brown, slightly turbid, no obvious odour
						12/10/2021	2.81	2.86	0.42	<1	-	<1	-	-	-	-	-	-	-	Water level gauging only
GW2	383737.1	6356490.7	3.39	3.34	TBC	12/10/2021	2.80	2.85	0.54	<1	-	<1	-	-	-	-	-	-	-	Water level gauging only
GW3	383736.4	6356488.0	3.42	3.37	5.35	7/10/2021	2.69	2.74	0.68	<1	<1	<1	5.7	0.23	130	0.2	160	20.4	14	Brown, slightly turbid, no obvious odour
						12/10/2021	2.71	2.76	0.66	<1	-	<1	-	-	-	-	-	-	-	Water level gauging only
203	383740.4	6356504.8	3.10	3.04	5.00	12/10/2021	2.58	2.64	0.46	7	<1	<1	5.8	0.20	170	4.3	>1000	20.8	8	Brown, highly turbid, no obvious odour
204	383750.2	6356499.3	3.27	3.24	5.00	12/10/2021	2.80	2.83	0.44	<1	<1	<1	6.7	0.60	55	1.7	>1000	20.0	8	Brown, highly turbid, no obvious odour

Notes to Table 8:
DO - Dissolved Oxygen
EC - Electrical Conductivity
GW - Groundwater
m bgl - metres below ground level
NTU - Nephelometric Turbidity Units
PID - Photoionisation Detector
ppm - parts per million
TOC - top of PVC casing
* Prior to Purging
(1) - minimum limit of detection for oil-water interface meter 1 mm
(2) - minimum limit of detection for PID 1 ppm

The results of field testing indicate the following for groundwater for wells in the vicinity of UST infrastructure:

- The pH was slightly acidic;
- The electrical conductivity values are typical of fresh water as would be expected of the quaternary alluvium;
- Redox potential (Eh) indicates oxidising conditions;
- The dissolved oxygen levels indicated generally aerobic conditions.

No staining, odours or light non-aqueous phase liquid (LNAPL) was observed during drilling or groundwater sampling. A PID well headspace of 7 ppm was noted for Well 203 during sampling, however, there was no obvious odour.

The results of groundwater level gauging indicated reduced groundwater levels (piezometric head) varying from 0.4 AHD at GW1 to 0.6 AHD. The results suggest a possible perched groundwater table near GW3 which may be associated with nearby underground stormwater drains. In general a groundwater flow direction to the north-east is expected. Well 204 is therefore considered downgradient of the USTs and associated infrastructure at the northern site boundary.

11.4 UST Inspection / Gauging

Inspection of the underground fuel tank was undertaken on 12 October 2021 in conjunction with groundwater well gauging and sampling. The following was noted:

- The fill / dip point was in good order. There were no observations to suggest surface water runoff may migrate into the tank;
- The base level of the tank was estimated at a depth of 2.75 m below ground level;
- Approximately 0.25 m of fuel, likely petrol, was present in the bottom of the tank based on inspection via a disposable bailer. Observations suggested the absence of water obvious ingress into to the tank (i.e. tank liquid is not suggested to be a mix of water and fuel).

Groundwater level gauging at the time (refer Section 11.3) indicated that groundwater level was at a similar level to the base of the tank (i.e. about 2.8 m below ground level).

12. Laboratory Testing

12.1 Program

12.1.1 Contamination

Laboratory testing was undertaken for selected soil samples for the main potential contaminants of concern outlined in the preliminary CSM in Section 9 and sampling and analysis plan in Section 10. The analytical program for the current assessment is summarised in Table 9.

Table 9: Summary of Analytical Program

Media	Analytes Tested	No. Primary Samples Tested	No. Replicate Samples Tested	No. Trip Spikes / Blanks	No. Equipment Rinsates
Soil	Metals (1), TRH, BTEX, PAH,	17	2	-	-
	OCP, OPP, PCB	15	1		
	VOC	2	1	-	-
	Asbestos ID (500 mL)	6	-	-	-
	TCLP Lead	5	-	-	-
	TCLP PAH	2	-	-	-
	pH (2)	3	-	-	-
	CEC	1	-	-	-
Material (Fibro)	Asbestos ID in material	2	-	-	-
Groundwater	Metals (1), TRH, BTEX, PAH, VOC	1	1	-	-
	Trip spike / blank and rinsate	1	-	1	1

Notes to Table 9:
CEC – cation exchange capacity
Metals:
(1) arsenic (As), cadmium (Cd), chromium (Cr), copper (Cu), mercury (Hg), nickel (Ni), lead (Pb), zinc (Zn),), manganese (Mn), Beryllium (Be), Boron (B), Cobalt (Co), selenium (Se), antimony (Sb), tin (Sn)
(2) Additional pH testing in water was undertaken for natural soils for the ASS assessment (refer Section 12.1.2)
OCP - organochlorine pesticides
OPP - organophosphorus pesticides
PAH - polycyclic aromatic hydrocarbons
PCB - polychlorinated biphenyls
TRH - total recoverable hydrocarbons
TCLP - toxicity characteristic leaching procedure
BTEX – benzene, toluene, ethyl benzene, xylenes

TCLP testing was also undertaken for two soil samples for acid leachable lead and one sample for acid leachable PAH to assist with preliminary waste classification.

The laboratory testing was undertaken by Envirolab Services Pty Ltd, a NATA registered laboratory. Analytical methods used are shown in the laboratory report sheets in Appendix B.

The results of chemical analysis undertaken on soils samples are summarised in Tables B1 to B5 in Appendix B.

12.1.2 Acid Sulfate Soils

Laboratory testing included 20 ASS screening tests for pH in water (pH_F) and pH following oxidation with hydrogen peroxide (pH_{FOX}) using a calibrated pH meter. The ASS screening test results were compared to the adopted acceptance criteria outlined in ASSMAC guidelines (Stone, Ahern, & Blunden, 1998) and QASSIT Manual (Dear, et al., 2014).

Based on the results of the screening tests, two soil samples were selected for detailed laboratory testing, comprising the full chromium suite in accordance with (Dear, et al., 2014), (Stone, Ahern, & Blunden, 1998) and Ahern et al (2014).

The results of the screening tests and detailed chromium testing on selected samples are summarised in Table B5 in Appendix B.

12.2 Results

The results of laboratory analysis and summary tables are included in Appendix B as follows:

- Table B1: Summary of Laboratory Results for Soil (Residential Land Use Comparison – HIL B / HSLB / EIL B/ ESL B);
- Table B2: Summary of Laboratory Results for Soil (Commercial Land Use Comparison – HIL D / HSL D / EIL D/ ESL D);
- Table B3: Summary of Laboratory Results in Soil (Waste Classification Comparison);
- Table B4: Summary of Laboratory Results – Groundwater;
- Table B5: Summary of Laboratory Results – Acid Sulfate Soils.

Chain of custody and sample receipt information are included in Appendix F.

13. Site Assessment Criteria

The site assessment criteria (SAC) applied in the current investigation are informed by the CSM (Section 9) which identified human and environmental receptors to potential contamination on the site. Analytical results are assessed (as a Tier 1 assessment) against the SAC comprising primarily the investigation and screening levels of Schedule B1 of NEPC (2013).

The investigation and screening levels applied in the current investigation comprise levels adopted for a generic residential land use scenario, with consideration of minimal opportunities for soil access (i.e. fully and permanently paved yard space). In addition, a generic commercial land use scenario was also considered due to the likely commercial ground floor use at the site. The derivation of the SAC is included in Appendix G and the adopted SAC are listed on the summary analytical results tables in Appendix B.

14. Discussion

14.1 Soils

14.1.1 Contamination Testing

Nineteen soil samples were analysed to provide a preliminary assessment of contaminant concentrations in soil for the identified potential contaminants of concern in those areas with reference to the CSM. The preliminary soil testing generally confirmed the absence of gross contamination at the test locations and depths investigated.

The results of the laboratory testing indicated the following:

- VOC, BTEX, OCP, OPP and PCB were not detected above the laboratory reporting limits;
- PAH concentrations were identified in nine soil samples. Contaminant concentrations were highest in upper fill materials (i.e. upper 1 m);
- TRH was identified slightly in excess of laboratory reporting limits at two locations (Bore 201/2.0 m and 203/0.5 m), respectively near southern and northern boundaries;
- Asbestos was identified in two fragments; one located in filling at Bore 305/0.55 m and one at the surface of garden bed material (S1/F);
- Of the seven soil samples tested for 500 mL asbestos in soil identification, asbestos fines / friable asbestos were not identified with the exception of asbestos fines in the fill at Bore 305/0.55 m. The result comprised fibre cement material (< 7 mm in size) i.e. friable. The percentage of asbestos fines, being less than 7 mm, exceeded the adopted criterion for residential land use but was within the industrial / commercial land use based on NEPC (2013).

Most soils contaminant concentrations measured were within the adopted site assessment criteria (SAC). A summary of the generally minor exceedances are shown in Table 10. The remainder of analytes not listed in the table were below the SAC.

Table 10: Summary of Soil Analysis Results that Exceeded the Site Assessment Criteria (SAC)

Analyte	SAC	No. Primary Samples	No. Test Locations	No. Exceedances	No. Exceedances >2.5 x SAC	Summary of Bore Locations / Depth (m)
Benzo(a)pyrene TEQ (PAH)	HIL-B	19	1	1	0	203/0.5 m
Asbestos in soil < 7mm	HIL B	7	1	1	N/A	305/0.55 m
Asbestos in soil < 7mm	HIL D	7	0	0	N/A	-
Asbestos in material	All	2	2	2	N/A	305/0.55 m/F; S1
TRH F3 (>C_{16}-C_{34})	ESL B	19	1	1	0	201/2.0 m

Notes to Table 10:
HIL B – health investigation level, residential (high density)
HIL D – health investigation level, commercial / industrial
EIL B – ecological investigation level, residential (high density)
ESL B – ecological screening level, residential (high density)

A brief review of the PAH profile against known PAH sources (www.pahsourceanalyst.com.au), indicates that the contaminant concentrations at Bore 203/0.5 m are indicative of coke materials, which are notably visually similar to coal materials which were observed in fill. Coke and/or coal therefore may be present in trace amounts intermixed in fill.

With the exception of minor perimeter garden beds near the perimeter of the site, the majority of the site is beneath the pavements or buildings. The risk of direct contact with soils based on the current and proposed landuse is considered to be low.

The site is a significantly altered by fill of 1.0 m to 2.3 m depth, is largely covered by pavements and buildings and is surrounded by commercial and industrial landuse. As such the site is not considered to be an ecologically significant site. The ecological exceedances are not considered to be significant for the current or proposed land use which will result in the majority of the site being paved or with limited access to soil.

Based on the results, the tested soils are generally considered to be suitable to remain on site from a contamination perspective.

It is noted that a detailed assessment of asbestos in soil was not conducted for the preliminary investigation. The presence of asbestos materials in fill, together with observed building rubble in fill across the majority of the site and the historical demolition activities at the site indicate a high risk of further asbestos materials to be present within upper fill materials. Detailed asbestos investigation would be required to confirm the extent and concentrations of asbestos across the site.

14.1.2 Waste Classification

The results of preliminary total contaminant testing in soil, together with selected leachability testing, indicated that most of the upper fill materials tested are classified 'General Solid Waste' (GSW) based on total and leachable (SCC1/TCLP1) concentration (EPA, 2014). Leachability testing is pending for a number of bores due to elevated total lead and as such these samples would be classified as Hazardous Waste (HW) or Restricted Solid Waste (RSW) based on total concentrations alone. It is likely that soils would be classified as GSW (SCC1/TCLP1) following confirmation of low leachability results.

The presence of bonded/friable asbestos impacts within fill at Bore 305/0.55 m and surface fill at sample S1 indicated that soil at this location would be classified GSW / RSW / HW (to be confirmed) with trace asbestos 'Special Waste – Asbestos'. Similarly, if ACM is present in other site soils, they would require consideration of both the chemical classification and ACM status.

The classification of underlying natural soils will need to consider ASS conditions as discussed further in Section 14.1.3. Natural soils which are not ASS, could possibly be classified as virgin excavated natural material (VENM). Due to the preliminary nature of the testing conducted, further testing is recommended to confirm waste classification prior to disposal of soils from the site.

14.1.3 Acid Sulfate Soils

Dear, et al (2014) suggest that a soil pH<4 in water (pH_F) is an indicator of actual ASS. The results of screening tests therefore suggest the absence of actual ASS at the locations and depths tested. One sample (Bore 201/3.5 m) returned a soil pH=4 in water.

Dear, et al (2014) also suggest that indicators of potential acid sulfate soils (PASS) include the following:

- Soil pH <3.5 in H_2O_2 (i.e. pH_{FOX});
- Drop of 1 pH unit or more between pH_F and pH_{FOX}.

Of the 20 samples subject to ASS screening tests:

- Sixteen exhibited a drop in pH greater than one;
- Six exhibited a soil pH following oxidation (pH_{FOX}) of less than 3.5.

It is noted that the above test method is a qualitative method only and gives an indication of the intensity of total acidification (pH). Stone, Ahern, & Blunden (1998) indicate that peroxide may also oxidise organic matter (in addition to pyrite) to produce acids which are unlikely to form under natural conditions, thus giving falsely high indication of acid sulfate potential.

It is noted that the above test method is a qualitative method only and gives an indication of the intensity of total acidification (pH). Stone, Ahern, & Blunden (1998) indicate that peroxide may also oxidise organic matter (in addition to pyrite) to produce acids which are unlikely to form under natural conditions, thus giving falsely high indication of acid sulfate potential.

The results of the detailed chromium suite testing indicate that the existing and potential acidity results exceeded the QASSIT action criteria for one of the two samples tested (Bore 204/3.1 m).

On the basis of preliminary ASS testing conducted, the following conditions could be inferred:

- General absence of ASS conditions in natural sands above the water table (i.e. above about 2.6 m depth);
- Presence of potential ASS for natural sand soils below the water table (i.e. below about 2.6 m).

It is noted that only limited detailed ASS testing has been conducted to date and further testing is recommended to confirm the above conditions.

Based on the above results, however, it is recommended that the proposed disturbance of soils below the water table, if any, are undertaken with reference to a site-specific acid sulfate soil management plan (ASSMP). The recommended approach would involve lime application to neutralise the acidity in the soils. Based on the proposed development, disturbance may comprise localised excavations / dewatering for installation of services, or drilling of piles (i.e. pile spoil returned to the surface depending on the pile installation method).

14.2 Groundwater

Four water samples were analysed from the monitoring wells at the site to provide a preliminary assessment of contaminant concentrations in groundwater in the vicinity and downgradient of the known UST in the eastern portion of the site. The results of the laboratory testing indicated the following:

- VOC, PAH, TRH, BTEX were not detected above laboratory reporting limits;
- The tested groundwater was within the following guidelines:
  - ANZG (2018) marine toxicant DGV for slightly to moderately disturbed systems ;
  - NEPC (2013) health screening levels (HSL) for residential land use (HSL A / B) and commercial/industrial land use (i.e. HSL D) for vapour intrusion in sand at depths of 2-4 m;
- Most groundwater results were within ANZG (2018) marine toxicant default guideline values for slightly to moderately disturbed systems except for slightly elevated dissolved copper in all wells (except GW1) and dissolved zinc in all wells.

Groundwater conditions in the north-eastern part of the site suggest generally low contaminant concentrations.

On the basis of the preliminary testing conducted, the results suggest the absence of hydrocarbon impact to groundwater from the known redundant UST and associated infrastructure (i.e. hydrocarbons not detected in groundwater above laboratory reporting limits). The testing also suggests the absence of hydrocarbon migration in groundwater off-site based on the general inferred north-east groundwater flow direction, although groundwater testing to date has been limited to the north eastern corner of the site and possible perched groundwater may be present.

It is noted that copper and zinc are not typical contaminants associated with underground fuel storage, and as such the exceedances may be associated with general site conditions. Elevated metals in groundwater are not uncommon in the Newcastle area, in particular copper and zinc, and may be representative of background / urban environments or associated with prior commercial / industrial use.

We note that the groundwater testing was preliminary and a basement is not part of the proposed development at the site. Further groundwater assessment would be recommended if a basement is proposed to assess the suitability of groundwater conditions for basement construction and for due diligence purposes. Additional groundwater assessment would also be recommended if additional USTs or contaminant sources are identified by the SafeWork NSW Dangerous Goods search or identified in soil during further subsurface investigation.

14.3 Data Quality Assurance and Quality Control

The data quality assurance and quality control (QA/QC) results are included in Appendix F. Based on the results of the field QA and field and laboratory QC, and evaluation against the data quality indicators (DQI) it is concluded that the field and laboratory test data obtained are reliable and useable for this assessment.

15. Conclusions and Recommendations

The PSI and preliminary soil and groundwater testing was undertaken to assess the potential for contamination at the site based on past and present land uses and to comment and the need for further investigation and/or management with regard to the proposed development.

The preliminary subsurface investigation focused on the main identified contamination risk areas within the developed area of the site, most notably the potential for contamination associated with fill materials and a redundant known UST no longer in use. Twelve boreholes (Bores 201 to 205; 301 to 307) were drilled to permit soil sampling for contamination and ASS testing. Two groundwater monitoring wells were installed (Bores 203 and 204) for groundwater sampling. Two existing groundwater monitoring wells were also sampled (GW1 and GW3).

The results of the assessment indicated the following:

Site Conditions

- Presence of fill across the site to depths of 1.0 m to 2.3 m. the average fill depth was less than 1.5 m, with observations suggesting possible deeper fill areas were associated with UST backfill;
- Upper fill materials were variable based on observations during drilling and the results of testing of selected soils and indicated widespread building materials were present within fill across the site (potential source of HBM including ACM);

Soil Contamination

- The general absence of gross contamination at the test locations and depths assessed based on field observations and laboratory testing of selected soil samples. This included areas downgradient of the redundant UST;

- Most soil contamination concentrations were within the adopted human health and ecological investigation / screening levels and site assessment criteria (SAC). This considered both a generic commercial land use (scenario 'D') and high residential land use within minimal soil access (scenario 'B') given the possibility for communal areas of open space at ground level. Minor exceedances were as follows:
  - Elevated Benzo(a)pyrene TEQ (PAH) exceeding HIL B at 203/0.5 m;
  - Elevated TRH F3 (>C_{16}-C_{34}) exceeding ESL B at 201/2.0 m;
  - Asbestos in soil at Bore 305/0.55 m (bonded and friable ACM) and bonded ACM at the surface at S1.
- Given the current and proposed limited access to soils (pavements and buildings), the risk of direct contact with soils is considered to be low;
- The ecological exceedances are not considered to be significant due to the current land use and proposed land use which will result in the majority of the site being paved or with limited access to soil;
- Asbestos was identified in two fragments; one located in filling at Bore 305/0.55 m and one at the surface of garden bed material (S1/F). Friable asbestos as asbestos fines (AF) was identified in the fill at Bore 305/0.55 m comprising fibre cement material (< 7 mm in size). The percentage of asbestos fines, being less than 7 mm, exceeded the adopted criterion for residential land use but was within the industrial / commercial land use based on NEPC (2013). Owing to the presence of fill at the site, and widespread presence of building materials in fill, there is a risk of hazardous building materials (HBM) including asbestos in unobserved or untested parts including UST backfill materials;
- Hydrocarbon impact to soil was not identified within bores near the redundant UST, noting that bores were necessarily limited by the known underground infrastructure and safe set back distances. Residual impacts may be present in the vicinity of underground fuel tank and associated infrastructure (i.e. tank backfill, fuel /service lines). This may include residual impacts to soil and possible impacts to groundwater, if present.

Waste Classification

- Preliminary waste classification testing on upper fill materials indicated a General Solid Waste (GSW) classification with reference to NSW EPA (2014a) based on total and leachable contamination concentrations. A number of samples also returned Hazardous Waste (HW) or Restricted Solid Waste (RSW) classification, with pending confirmation of leach results. Due to the observed presence of bonded ACM in upper fill materials, the preliminary classification of upper fill is GSW containing asbestos waste (Special Waste). The classification of underlying natural soils will need to consider ASS conditions. Due to the preliminary nature of the testing conducted, further testing is recommended to confirm waste classification prior to disposal of soils from the site.

Acid Sulfate Soils

- The preliminary ASS assessment indicated the possible presence of ASS conditions in natural sands below the water table (below about 2.6 m). Proposed disturbance of soils below the water table should be undertaken with reference to a site-specific ASSMP. Further testing however is recommended to confirm the depth and extent of ASS conditions within the site to inform the ASSMP and waste classification of site soils

Groundwater

- The contaminant concentrations in groundwater were generally low and suggests the absence of significant hydrocarbon impact to groundwater from the known redundant UST, including the absence of off-site hydrocarbon migration in the vicinity of this UST. The groundwater conditions encountered at the site, are generally consistent with similar nearby sites within the Newcastle central business district which often have slightly elevated heavy metals, in particular copper and zinc.

Based on the PSI findings, remediation / management would be required to render the site suitable for the proposed development from a contamination perspective, due to the bonded and friable ACM impacts in fill materials and potentially as a result of the presence of PAH and TRH impacts in fill or residual impacts in the vicinity of underground fuel infrastructure. Remediation should be detailed in a site-specific RAP for the development.

It is understood that construction may require removal of upper fill materials to a depth of 0.5 m to 0.6 m, and as such remediation may include removal of impacted soils and/or on-site management.

Management of the ACM impacted fill / soil materials under a suitable capping layer to prevent access/exposure from a contamination perspective could be considered at the site. Given the proposed development is likely to comprise buildings with concrete slabs and concrete pavements across the majority of the site (i.e. minimal landscaping), the proposed development could be considered to manage site soil contamination subject to regulatory approval and the results of additional investigation.

Remediation of ACM, TRH and PAH via excavation, stripping and off-site disposal of impacted materials could also be considered, subject to feasible from both a practical, cost-effective or time-effective perspective based on discussions with the client/developer. The results of the PSI suggest that the bonded and friable ACM impacted soils could be present across the site within filling and as such this option may not be feasible. The feasibility of this options could be assessed via a detailed asbestos assessment which should include sieving of bulk samples and a sampling density commensurate with the risk rating as outlined in WA DoH (2009) and NEPC (2013).

It is noted that at the time of issuing this report searches were still pending from SafeWork NSW. There is a potential for additional underground fuel infrastructure on the site and/or former hazardous chemical storage/use on the site.

The adopted remediation approach should be aligned with the proposed development detailed in a site-specific RAP. It is noted that on-site management of contamination will also attract a notice on the site Section 10.7 planning certificate and would require enforceable controls to ensure the contaminated soils are appropriately managed into the future via a long-term site management plan (SMP). n-site management of site contamination will require regulatory approval.

In summary, the site is considered to be suitable for the proposed mixed use multi-storey development, subject to appropriate remediation / management of contamination and regulatory approvals. The assessment has considered generic residential (minimal access to soils) and commercial / industrial (ground floor) land use scenarios on the basis of the proposed development.

The following comments and recommendations are provided:

- Additional investigation and testing is recommended to further confirm:
  - ASS conditions across the site to inform a site specific ASSMP and confirm waste classification of soils for materials likely to require off-site disposal (extent to be confirmed);
  - The extent and concentration of asbestos impacts across the site to inform the remediation methodology and feasibility;
  - The potential presence of additional USTs and fuel infrastructure across the site. This may also be triggered by the SafeWork NSW Dangerous Goods search results if additional fuel infrastructure or storage of hazardous chemicals are identified. This may include GPR survey of the site and targeted soil and groundwater sampling and testing as required.
- Additional inspection, sampling and testing (where required) is recommended following site demolition activities within building footprints to assess areas that were not readily accessible during the PSI;
- A site specific RAP will be required, which will also require a remediation procedure which sets out the methods and objectives to remove the USTs with reference to NSW EPA (2014c) *Technical Note: Investigation of Service Station Sites*;
- Waste classification testing is recommended to confirm the waste classification of soils prior to disposal of soils from the site, if proposed. This should be conducted prior to RAP preparation to ensure the proposed remediation approach adopted is feasible for the development;
- Further groundwater assessment would be recommended if a basement is proposed to assess the suitability of groundwater conditions for basement construction (not currently proposed).

16. References

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17. Limitations

Douglas Partners (DP) has prepared this report for this project at 924 Hunter Street, Newcastle West in accordance with DP's proposal 102077.01.P.001.Rev0 dated 4 August 2021 and acceptance received from Thirdi Dairy Farmers Pty Ltd. The work was carried out under DP's Conditions of Engagement. This report is provided for the exclusive use of Thirdi Dairy Farmers Pty Ltd for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of DP, does so entirely at its own risk and without recourse to DP for any loss or damage. In preparing this report DP has necessarily relied upon information provided by the client and/or their agents.

The results provided in the report are indicative of the sub-surface conditions on the site only at the specific sampling and/or testing locations, and then only to the depths investigated and at the time the work was carried out. Sub-surface conditions can change abruptly due to variable geological processes and also as a result of human influences. Such changes may occur after DP's field testing has been completed.

DP's advice is based upon the conditions encountered during this investigation. The accuracy of the advice provided by DP in this report may be affected by undetected variations in ground conditions across the site between and beyond the sampling and/or testing locations. The advice may also be limited by budget constraints imposed by others or by site accessibility.

The assessment of atypical safety hazards arising from this advice is restricted to the (geotechnical / environmental / groundwater) components set out in this report and based on known project conditions and stated design advice and assumptions. While some recommendations for safe controls may be provided, detailed 'safety in design' assessment is outside the current scope of this report and requires additional project data and assessment.

This report must be read in conjunction with all of the attached and should be kept in its entirety without separation of individual pages or sections. DP cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion stated in this report.

This report, or sections from this report, should not be used as part of a specification for a project, without review and agreement by DP. This is because this report has been written as advice and opinion rather than instructions for construction.

Asbestos has not been detected by observation or by laboratory analysis, either on the surface of the site, or in filling materials at the test locations sampled and analysed. Building demolition materials, such as concrete, brick, metal, glass, ceramic tile], were, however, located in previous below-ground filling, and these are considered as indicative of the possible presence of hazardous building materials (HBM), including asbestos.

Although the sampling plan adopted for this investigation is considered appropriate to achieve the stated project objectives, there are necessarily parts of the site that have not been sampled and analysed. This is either due to undetected variations in ground conditions or to budget constraints (as discussed above), or to parts of the site being inaccessible and not available for inspection/sampling,. It is therefore considered possible that HBM, including asbestos, may be present in unobserved or untested parts of the site, between and beyond sampling locations, and hence no warranty can be given that asbestos is not present.

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Appendix A

About This Report
Sampling Methods
Soil Descriptions
Symbols and Abbreviations
Borehole Logs (Bores 201 to 205 and 301 to 307)

About this Report

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Introduction

These notes have been provided to amplify DP's report in regard to classification methods, field procedures and the comments section. Not all are necessarily relevant to all reports.

DP's reports are based on information gained from limited subsurface excavations and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

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This report is the property of Douglas Partners Pty Ltd. The report may only be used for the purpose for which it was commissioned and in accordance with the Conditions of Engagement for the commission supplied at the time of proposal. Unauthorised use of this report in any form whatsoever is prohibited.

Borehole and Test Pit Logs

The borehole and test pit logs presented in this report are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will provide the most reliable assessment, but this is not always practicable or possible to justify on economic grounds. In any case the boreholes and test pits represent only a very small sample of the total subsurface profile.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes or pits, the frequency of sampling, and the possibility of other than 'straight line' variations between the test locations.

Groundwater

Where groundwater levels are measured in boreholes there are several potential problems, namely:

- In low permeability soils groundwater may enter the hole very slowly or perhaps not at all during the time the hole is left open;
- A localised, perched water table may lead to an erroneous indication of the true water table;
- Water table levels will vary from time to time with seasons or recent weather changes. They may not be the same at the time of construction as are indicated in the report; and
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water measurements are to be made.

More reliable measurements can be made by installing standpipes which are read at intervals over several days, or perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from a perched water table.

Reports

The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, the information and interpretation may not be relevant if the design proposal is changed. If this happens, DP will be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical and environmental aspects, and recommendations or suggestions for design and construction. However, DP cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions. The potential for this will depend partly on borehole or pit spacing and sampling frequency;
- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

If these occur, DP will be pleased to assist with investigations or advice to resolve the matter.

About this Report

Site Anomalies

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, DP requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.

Information for Contractual Purposes

Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. DP would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

Site Inspection

The company will always be pleased to provide engineering inspection services for geotechnical and environmental aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.

Sampling Methods

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Sampling

Sampling is carried out during drilling or test pitting to allow engineering examination (and laboratory testing where required) of the soil or rock.

Disturbed samples taken during drilling provide information on colour, type, inclusions and, depending upon the degree of disturbance, some information on strength and structure.

Undisturbed samples are taken by pushing a thin-walled sample tube into the soil and withdrawing it to obtain a sample of the soil in a relatively undisturbed state. Such samples yield information on structure and strength, and are necessary for laboratory determination of shear strength and compressibility. Undisturbed sampling is generally effective only in cohesive soils.

Test Pits

Test pits are usually excavated with a backhoe or an excavator, allowing close examination of the in-situ soil if it is safe to enter into the pit. The depth of excavation is limited to about 3 m for a backhoe and up to 6 m for a large excavator. A potential disadvantage of this investigation method is the larger area of disturbance to the site.

Large Diameter Augers

Boreholes can be drilled using a rotating plate or short spiral auger, generally 300 mm or larger in diameter commonly mounted on a standard piling rig. The cuttings are returned to the surface at intervals (generally not more than 0.5 m) and are disturbed but usually unchanged in moisture content. Identification of soil strata is generally much more reliable than with continuous spiral flight augers, and is usually supplemented by occasional undisturbed tube samples.

Continuous Spiral Flight Augers

The borehole is advanced using 90-115 mm diameter continuous spiral flight augers which are withdrawn at intervals to allow sampling or in-situ testing. This is a relatively economical means of drilling in clays and sands above the water table. Samples are returned to the surface, or may be collected after withdrawal of the auger flights, but they are disturbed and may be mixed with soils from the sides of the hole. Information from the drilling (as distinct from specific sampling by SPTs or undisturbed samples) is of relatively low reliability, due to the remoulding, possible mixing or softening of samples by groundwater.

Non-core Rotary Drilling

The borehole is advanced using a rotary bit, with water or drilling mud being pumped down the drill rods and returned up the annulus, carrying the drill cuttings. Only major changes in stratification can be determined from the cuttings, together with some information from the rate of penetration. Where drilling mud is used this can mask the cuttings and reliable identification is only possible from separate sampling such as SPTs.

Continuous Core Drilling

A continuous core sample can be obtained using a diamond tipped core barrel, usually with a 50 mm internal diameter. Provided full core recovery is achieved (which is not always possible in weak rocks and granular soils), this technique provides a very reliable method of investigation.

Standard Penetration Tests

Standard penetration tests (SPT) are used as a means of estimating the density or strength of soils and also of obtaining a relatively undisturbed sample. The test procedure is described in Australian Standard 1289, Methods of Testing Soils for Engineering Purposes - Test 6.3.1.

The test is carried out in a borehole by driving a 50 mm diameter split sample tube under the impact of a 63 kg hammer with a free fall of 760 mm. It is normal for the tube to be driven in three successive 150 mm increments and the 'N' value is taken as the number of blows for the last 300 mm. In dense sands, very hard clays or weak rock, the full 450 mm penetration may not be practicable and the test is discontinued.

The test results are reported in the following form.

- In the case where full penetration is obtained with successive blow counts for each 150 mm of, say, 4, 6 and 7 as:

  4,6,7
  N=13

- In the case where the test is discontinued before the full penetration depth, say after 15 blows for the first 150 mm and 30 blows for the next 40 mm as:

  15, 30/40 mm

The results of the SPT tests can be related empirically to the engineering properties of the soils.

Dynamic Cone Penetrometer Tests / Perth Sand Penetrometer Tests

Dynamic penetrometer tests (DCP or PSP) are carried out by driving a steel rod into the ground using a standard weight of hammer falling a specified distance. As the rod penetrates the soil the number of blows required to penetrate each successive 150 mm depth are recorded. Normally there is a depth limitation of 1.2 m, but this may be extended in certain conditions by the use of extension rods. Two types of penetrometer are commonly used.

- Perth sand penetrometer - a 16 mm diameter flat ended rod is driven using a 9 kg hammer dropping 600 mm (AS 1289, Test 6.3.3). This test was developed for testing the density of sands and is mainly used in granular soils and filling.
- Cone penetrometer - a 16 mm diameter rod with a 20 mm diameter cone end is driven using a 9 kg hammer dropping 510 mm (AS 1289, Test 6.3.2). This test was developed initially for pavement subgrade investigations, and correlations of the test results with California Bearing Ratio have been published by various road authorities.

Description and Classification Methods

The methods of description and classification of soils and rocks used in this report are generally based on Australian Standard AS1726:2017, Geotechnical Site Investigations. In general, the descriptions include strength or density, colour, structure, soil or rock type and inclusions.

Soil Types

Soil types are described according to the predominant particle size, qualified by the grading of other particles present:

Type	Particle size (mm)
Boulder	>200
Cobble	63 - 200
Gravel	2.36 - 63
Sand	0.075 - 2.36
Silt	0.002 - 0.075
Clay	<0.002

The sand and gravel sizes can be further subdivided as follows:

Type	Particle size (mm)
Coarse gravel	19 - 63
Medium gravel	6.7 - 19
Fine gravel	2.36 – 6.7
Coarse sand	0.6 - 2.36
Medium sand	0.21 - 0.6
Fine sand	0.075 - 0.21

Definitions of grading terms used are:

- Well graded - a good representation of all particle sizes
- Poorly graded - an excess or deficiency of particular sizes within the specified range
- Uniformly graded - an excess of a particular particle size
- Gap graded - a deficiency of a particular particle size with the range

The proportions of secondary constituents of soils are described as follows:

In fine grained soils (>35% fines)

Term	Proportion of sand or gravel	Example
And	Specify	Clay (60%) and Sand (40%)
Adjective	>30%	Sandy Clay
With	15 – 30%	Clay with sand
Trace	0 - 15%	Clay with trace sand

In coarse grained soils (>65% coarse)
- with clays or silts

Term	Proportion of fines	Example
And	Specify	Sand (70%) and Clay (30%)
Adjective	>12%	Clayey Sand
With	5 - 12%	Sand with clay
Trace	0 - 5%	Sand with trace clay

In coarse grained soils (>65% coarse)
- with coarser fraction

Term	Proportion of coarser fraction	Example
And	Specify	Sand (60%) and Gravel (40%)
Adjective	>30%	Gravelly Sand
With	15 - 30%	Sand with gravel
Trace	0 - 15%	Sand with trace gravel

The presence of cobbles and boulders shall be specifically noted by beginning the description with 'Mix of Soil and Cobbles/Boulders' with the word order indicating the dominant first and the proportion of cobbles and boulders described together.

Soil Descriptions

Cohesive Soils

Cohesive soils, such as clays, are classified on the basis of undrained shear strength. The strength may be measured by laboratory testing, or estimated by field tests or engineering examination. The strength terms are defined as follows:

Description	Abbreviation	Undrained shear strength (kPa)
Very soft	VS	<12
Soft	S	12 - 25
Firm	F	25 - 50
Stiff	St	50 - 100
Very stiff	VSt	100 - 200
Hard	H	>200
Friable	Fr	-

Cohesionless Soils

Cohesionless soils, such as clean sands, are classified on the basis of relative density, generally from the results of standard penetration tests (SPT), cone penetration tests (CPT) or dynamic penetrometers (PSP). The relative density terms are given below:

Relative Density	Abbreviation	Density Index (%)
Very loose	VL	<15
Loose	L	15-35
Medium dense	MD	35-65
Dense	D	65-85
Very dense	VD	>85

Soil Origin

It is often difficult to accurately determine the origin of a soil. Soils can generally be classified as:

- Residual soil - derived from in-situ weathering of the underlying rock;
- Extremely weathered material – formed from in-situ weathering of geological formations. Has soil strength but retains the structure or fabric of the parent rock;
- Alluvial soil – deposited by streams and rivers;
- Estuarine soil – deposited in coastal estuaries;
- Marine soil – deposited in a marine environment;
- Lacustrine soil – deposited in freshwater lakes;
- Aeolian soil – carried and deposited by wind;
- Colluvial soil – soil and rock debris transported down slopes by gravity;
- Topsoil – mantle of surface soil, often with high levels of organic material.
- Fill – any material which has been moved by man.

Moisture Condition – Coarse Grained Soils

For coarse grained soils the moisture condition should be described by appearance and feel using the following terms:

- Dry (D) Non-cohesive and free-running.
- Moist (M) Soil feels cool, darkened in colour.
  Soil tends to stick together.
  Sand forms weak ball but breaks easily.
- Wet (W) Soil feels cool, darkened in colour.
  Soil tends to stick together, free water forms when handling.

Moisture Condition – Fine Grained Soils

For fine grained soils the assessment of moisture content is relative to their plastic limit or liquid limit, as follows:

- 'Moist, dry of plastic limit' or 'w <PL' (i.e. hard and friable or powdery).
- 'Moist, near plastic limit' or 'w ≈ PL (i.e. soil can be moulded at moisture content approximately equal to the plastic limit).
- 'Moist, wet of plastic limit' or 'w >PL' (i.e. soils usually weakened and free water forms on the hands when handling).
- 'Wet' or 'w ≈LL' (i.e. near the liquid limit).
- 'Wet' or 'w >LL' (i.e. wet of the liquid limit).

Symbols & Abbreviations

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Introduction

These notes summarise abbreviations commonly used on borehole logs and test pit reports.

Drilling or Excavation Methods

C	Core drilling
R	Rotary drilling
SFA	Spiral flight augers
NMLC	Diamond core - 52 mm dia
NQ	Diamond core - 47 mm dia
HQ	Diamond core - 63 mm dia
PQ	Diamond core - 81 mm dia

Water

▷	Water seep
▽	Water level

Sampling and Testing

A	Auger sample
B	Bulk sample
D	Disturbed sample
E	Environmental sample
U_{50}	Undisturbed tube sample (50mm)
W	Water sample
pp	Pocket penetrometer (kPa)
PID	Photo ionisation detector
PL	Point load strength Is(50) MPa
S	Standard Penetration Test
V	Shear vane (kPa)

Description of Defects in Rock

The abbreviated descriptions of the defects should be in the following order: Depth, Type, Orientation, Coating, Shape, Roughness and Other. Drilling and handling breaks are not usually included on the logs.

Defect Type

B	Bedding plane
Cs	Clay seam
Cv	Cleavage
Cz	Crushed zone
Ds	Decomposed seam
F	Fault
J	Joint
Lam	Lamination
Pt	Parting
Sz	Sheared Zone
V	Vein

Orientation

The inclination of defects is always measured from the perpendicular to the core axis.

h	horizontal
v	vertical
sh	sub-horizontal
sv	sub-vertical

Coating or Infilling Term

cln	clean
co	coating
he	healed
inf	infilled
stn	stained
ti	tight
vn	veneer

Coating Descriptor

ca	calcite
cbs	carbonaceous
cly	clay
fe	iron oxide
mn	manganese
slt	silty

Shape

cu	curved
ir	irregular
pl	planar
st	stepped
un	undulating

Roughness

po	polished
ro	rough
sl	slickensided
sm	smooth
vr	very rough

Other

fg	fragmented
bnd	band
qtz	quartz

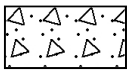
Symbols & Abbreviations

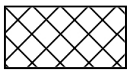
Graphic Symbols for Soil and Rock

General

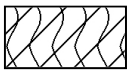
Asphalt

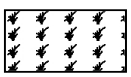
Road base

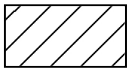

Concrete

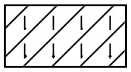

Filling

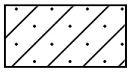
Soils


Topsoil

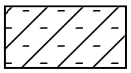

Peat

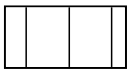

Clay

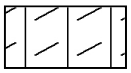

Silty clay

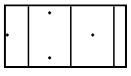

Sandy clay

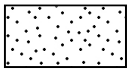
Gravelly clay

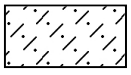

Shaly clay

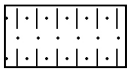

Silt


Clayey silt


Sandy silt

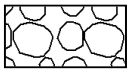

Sand

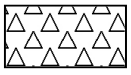

Clayey sand


Silty sand

Gravel

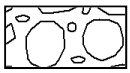
Sandy gravel


Cobbles, boulders

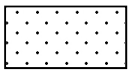

Talus

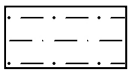
Sedimentary Rocks

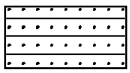
Boulder conglomerate

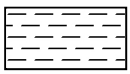

Conglomerate

Conglomeratic sandstone

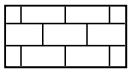

Sandstone


Siltstone

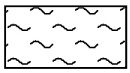

Laminite

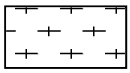

Mudstone, claystone, shale

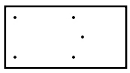
Coal


Limestone

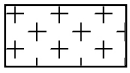
Metamorphic Rocks

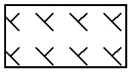

Slate, phyllite, schist

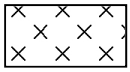

Gneiss

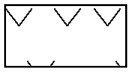

Quartzite

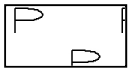
Igneous Rocks


Granite


Dolerite, basalt, andesite


Dacite, epidote


Tuff, breccia


Porphyry

BOREHOLE LOG

CLIENT: Thirdi Dairy Farmers Pty Ltd
PROJECT: Proposed Apartments
LOCATION: 924 Hunter Street, Newcastle

SURFACE LEVEL: 3.89 AHD
EASTING: 383730.5
NORTHING: 6356459.8
DIP/AZIMUTH: 90°/--

BORE No: 201
PROJECT No: 102077.02
DATE: 6/10/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.11	CONCRETE							
		FILL / SILTY GRAVELLY SAND (SP) - Fine to medium grained, grey-brown with fine to medium subangular to subrounded gravel (crushed natural rock), trace brick, coal reject, slag, moist		D	0.2	E	PID <1		
				D	0.5	E	PID <1		
				D	1.0	E	PID <1		
				D	1.5	E	PID <1		
	1.6	FILL / SILTY SAND (SP) - Fine to medium grained, dark grey with coal reject, moist							
				D	2.0	E	PID <1		
	2.3	SAND (SP) - Fine to medium grained, pale brown, trace fine to medium rounded to subrounded gravels, moist		D	2.5	E	PID <1		
	2.8	SILTY CLAY (CL) - Low plasticity, brown-grey, trace fine to medium grained sand, organics, W<PL		D	3.0	E	PID <1		
	3.2	SAND (SP) - Fine to medium grained, brown to pale brown, trace fine rounded gravels, wet						▼	
				D	3.5	E	PID <1		
				D	4.0	E	PID <1		
				D	4.5	E	PID <1		
	5.0			D	5.0	E	PID <1		
		Bore discontinued at 5.0m, limit of investigation							

RIG: Geoprobe 7822DT **DRILLER:** Warren (Terratest) **LOGGED:** Kramer **CASING:** Uncased
TYPE OF BORING: Concrete core to 0.11m, push tube to 5m
WATER OBSERVATIONS: Free groundwater observed at 3.2m
REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Thirdi Dairy Farmers Pty Ltd
PROJECT: Proposed Apartments
LOCATION: 924 Hunter Street, Newcastle

SURFACE LEVEL: 3.37 AHD
EASTING: 383737.1
NORTHING: 6356493.8
DIP/AZIMUTH: 90°/--

BORE No: 202
PROJECT No: 102077.02
DATE: 6/10/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.155	CONCRETE							
		FILL / SILTY SAND (SP) - Fine to medium grained, grey to dark grey, trace fine to medium subangular to subrounded gravels, brick, coal reject, ash and black slag, moist		D	0.2	E	PID <1		
				D	0.5	E	PID <1		
	1.0	SILTY SAND (SP) - Fine to medium grained, grey, moist		D	1.1	E	PID <1		
				D	1.5	E	PID <1		
		From 1.6m, brown							
	1.8	SAND (SP) - Fine to medium grained, pale brown, moist		D	2.0	E	PID <1		
				D	2.5	E	PID <1		
		From approximately 3m to 3.2m, wet		D	3.0	E	PID <1	▼	
		From 3.2m, trace fine rounded to subrounded gravels							
				D	3.5	E	PID <1		
				D	4.0	E	PID <1		
				D	4.5	E	PID <1		
	5.0	Bore discontinued at 5.0m, limit of investigation		D	5.0	E	PID <1		

RIG: Geoprobe 7822DT **DRILLER:** Warren (Terratest) **LOGGED:** Kramer **CASING:** Uncased
TYPE OF BORING: Concrete core to 0.155m, push tube to 5m
WATER OBSERVATIONS: Free groundwater observed at 3.0m to 3.2m
REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Thirdi Dairy Farmers Pty Ltd
PROJECT: Proposed Apartments
LOCATION: 924 Hunter Street, Newcastle

SURFACE LEVEL: 3.10 AHD
EASTING: 383740.4
NORTHING: 6356504.8
DIP/AZIMUTH: 90°/--

BORE No: 203
PROJECT No: 102077.02
DATE: 6/10/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
									Gatic Cover
	0.18	CONCRETE							From 0m to 0.2m, concrete
		FILL / SILTY SAND (SP) - Fine to medium grained, grey to dark grey, trace fine to medium subangular to subrounded gravels (crushed natural rock), ceramic brick, moist		D	0.2	E	PID <1		
				D	0.5	E	PID <1		From 0.2m to 0.7m, backfill
	1	From 1.1m to 1.2m, increased drilling resistance		D	1.0	E	PID <1		From 0m to 2m, blank 50mm diameter Class 18 PVC
	1.3	SAND (SP) - Fine to medium grained, brown, moist		D	1.5	E	PID <1		From 0.7m to 1.5m, bentonite
	2			D	2.0	E	PID <1		
				D	2.5	E	PID <1		
	2.8	CLAYEY SAND (SP) - Fine to medium grained, grey, trace fine crushed rounded gravels, wet		D	3.0	E	PID <1	▼	
	3.2	SAND (SP) - Fine to medium grained, brown, trace fine rounded gravels, wet							From 1.5m to 5m, 5/2mm gravel
		At approximately 3.6m, coal piece		D	3.5	E	PID <1		From 2m to 5m, 50mm diameter Class 18 machine slotted PVC screen
	4			D	4.0	E	PID <1		
				D	4.5	E	PID <1		
	5								End cap
	5.0	Bore discontinued at 5.0m, limit of investigation		D	5.0	E	PID <1		
	6								

RIG: Geoprobe 7822DT **DRILLER:** Warren (Terratest) **LOGGED:** Kramer **CASING:** Uncased

TYPE OF BORING: Concrete core to 0.18m, push tube to 5m

WATER OBSERVATIONS: Free groundwater observed at 2.8m

REMARKS: Top of PVC Casing level 3.04 AHD

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Thirdi Dairy Farmers Pty Ltd
PROJECT: Proposed Apartments
LOCATION: 924 Hunter Street, Newcastle

SURFACE LEVEL: 3.27 AHD
EASTING: 383750.2
NORTHING: 6356499.3
DIP/AZIMUTH: 90°/--

BORE No: 204
PROJECT No: 102077.02
DATE: 6/10/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.12	CONCRETE							Gatic Cover; From 0m to 0.2m, concrete
		FILL / SILTY SAND (SP) - Fine to medium grained, grey-brown, trace fine to medium subangular to subrounded gravels, (crushed natural rock), coal, reject, brick, moist		D	0.2	E	PID <1		
				D	0.5	E	PID<1		From 0.2m to 0.7m, backfill
				D	1.0	E	PID <1		From 0m to 2m, blank 50mm diameter Class 18 PVC; From 0.7m to 1.5m, bentonite
	1.3	SILTY SAND (SP) - Fine to medium grained, dark brown, moist		D	1.5	E	PID <1		
	1.7	From 1.6m, brown							
		SAND (SP) - Fine to medium grained, pale brown, moist		D	2.0	E	PID <1		
				D	2.5	E	PID <1	▼	
	3.0	SANDY CLAY (CL) - Low plasticity, grey with fine to medium grained sand, W>PL		D	3.1	E	PID <1		
	3.2	SAND (SP) - Fine to medium grained, brown, trace rounded gravels, wet							From 1.5m to 5m, 5/2mm gravel
				D	3.5	E	PID <1		From 2m to 5m, 50mm diameter Class 18 machine slotted PVC screen
				D	4.0	E	PID <1		
				D	4.5	E	PID <1		
	5.0	Bore discontinued at 5.0m, limit of investigation		D	5.0	E	PID <1		End cap

RIG: Geoprobe 7822DT **DRILLER:** Warren (Terratest) **LOGGED:** Kramer **CASING:** Uncased

TYPE OF BORING: Concrete core to 0.12m, push tube to 5m

WATER OBSERVATIONS: Free groundwater observed at 2.8m

REMARKS: Top of PVC Casing level 3.24 AHD

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Thirdi Dairy Farmers Pty Ltd
PROJECT: Proposed Apartments
LOCATION: 924 Hunter Street, Newcastle

SURFACE LEVEL: 3.40 AHD
EASTING: 383743.7
NORTHING: 6356490
DIP/AZIMUTH: 90°/--

BORE No: 205
PROJECT No: 102077.02
DATE: 6/10/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.115	CONCRETE							
		FILL / SILTY SAND (SP) - Fine to medium grained, brown-grey, trace fine to medium subangular to subrounded gravels, brick, ash, moist		D	0.2	E	PID <1		
				D	0.5	E	PID <1		
	1			D	1.0	E	PID <1		
		From 1.2m to 1.3m, increased drilling resistance							
	1.4	SAND (SP) - Fine to medium grained, brown to pale brown, moist		D	1.5	E	PID <1		
	2			D	2.0	E	PID <1		
				D	2.5	E	PID <1		
	3	From 3m to 3.1m, wet		D	3.0	E	PID <1	▼	
				D	3.5	E	PID <1		
	4			D	4.0	E	PID <1		
				D	4.5	E	PID <1		
	5	5.0 Bore discontinued at 5.0m, limit of investigation		D	5.0	E	PID <1		
	6								

RIG: Geoprobe 7822DT **DRILLER:** Warren (Terratest) **LOGGED:** Kramer **CASING:** Uncased

TYPE OF BORING: Concrete core to 0.15m, hand auger to 1m, push tube to 5m

WATER OBSERVATIONS: Free groundwater observed at 3.0m

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Thirdi Dairy Farmers Pty Ltd
PROJECT: Proposed Apartments
LOCATION: 924 Hunter Street, Newcastle

SURFACE LEVEL: 2.99 AHD
EASTING: 383715.6
NORTHING: 6356512.9
DIP/AZIMUTH: 90°/--

BORE No: 301
PROJECT No: 102077.02
DATE: 9/10/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.05	ASPHALT		A	0.02	E	PID <1		
				A	0.1	E	PID <1		
	0.3	FILL / SANDY GRAVEL (GP) - Generally comprising brown gravel, subangular to subrounded rock, fine to medium sized, sand is fine to coarse grained, dry			0.2				
				A	0.35	E	PID <1		
					0.45				
		FILL / SILTY SAND (SM) - Generally comprising dark grey, sand is fine to medium grained with coal, occasional brick, (30mm), moist		A	0.5	E	PID <1		
	0.8	From 0.6m, grey			0.6				
2				A	0.9	E	PID <1		
1		FILL / SILTY SAND - Grey and pale grey, fine to medium grained, trace rootlets, moist			1.0				1
	1.3	SAND (SP) - Brown, fine to medium grained with silt, moist							
				A	1.5	E	PID <1		
					1.6				
1	2	From 2.05m, pale brown, fine to coarse grained		A	2.1	E	PID <1		2
					2.2				
		From 2.6m, wet						▼	
				A	2.7	E	PID <1		
	2.9	Bore discontinued at 2.9m, limit of investigation / collapse			2.9				
0	3								3
1	4								4
2	5								5
3	6								6

RIG: Hand Tools **DRILLER:** Lambert **LOGGED:** Wilson **CASING:** Uncased

TYPE OF BORING: 80mm diameter hand auger

WATER OBSERVATIONS: Free groundwater observed at 2.7m during drilling

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Thirdi Dairy Farmers Pty Ltd
PROJECT: Proposed Apartments
LOCATION: 924 Hunter Street, Newcastle

SURFACE LEVEL: 3.24 AHD
EASTING: 383695
NORTHING: 6356527.3
DIP/AZIMUTH: 90°/--

BORE No: 302
PROJECT No: 102077.02
DATE: 9/10/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.03	ASPHALT							
		FILL / SANDY GRAVEL (GP) - Generally comprising brown gravel, subangular to subrounded rock, fine to medium sized, sand is fine to coarse grained, dry		A	0.1 0.3	E	PID <1		
	0.4	FILL / SILTY SAND (SM) - Generally comprising dark grey, sand is fine to medium grained with coal, occasional brick, (30mm), moist		A	0.5 0.6	E	PID <1		
				A	1.0 1.1	E	PID <1		
	1.3	FILL / SILTY SAND - Grey and pale grey, fine to medium grained, trace rootlets, moist		A	1.4 1.5	E	PID <1		
	1.6	SAND (SP) - Brown, fine to medium grained with silt, moist		A	2.0 2.1	E	PID <1		
				A	2.5 2.6	E	PID <1		
		From 2.8m, wet		A	2.9	E	PID <1	▼	
	3.0	Bore discontinued at 3.0m, limit of investigation			3.0				

RIG: Hand Tools **DRILLER:** Lambert **LOGGED:** Wilson **CASING:** Uncased

TYPE OF BORING: 80mm diameter hand auger

WATER OBSERVATIONS: Free groundwater observed at 2.9m during drilling

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Thirdi Dairy Farmers Pty Ltd
PROJECT: Proposed Apartments
LOCATION: 924 Hunter Street, Newcastle

SURFACE LEVEL: 3.57 AHD
EASTING: 383688.7
NORTHING: 6356511.4
DIP/AZIMUTH: 90°/--

BORE No: 303
PROJECT No: 102077.02
DATE: 9/10/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.03	ASPHALT							
		FILL / SANDY GRAVEL (GP) - Generally comprising brown gravel, subangular to subrounded rock, fine to medium sized, sand is fine to coarse grained, dry		A	0.1 0.2	E	PID <1		
	0.3	FILL / SAND - Generally comprising pale brown, fine to medium grained with gravel, fine to medium sized gravel (rock), occasional brick, moist		A	0.5	E	PID <1		
		At 0.6m, with some brick fragments, trace coal and slag gravel		A	0.6	E	PID <1		
	0.7	At 0.65m, ceramic fragment (50mm x 30mm x 15mm)			0.7				
		Bore discontinued at 0.7m, refusal on fill							

RIG: Hand Tools **DRILLER:** Lambert **LOGGED:** Wilson **CASING:** Uncased
TYPE OF BORING: 80mm diameter hand auger
WATER OBSERVATIONS: No free groundwater observed
REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Thirdi Dairy Farmers Pty Ltd
PROJECT: Proposed Apartments
LOCATION: 924 Hunter Street, Newcastle

SURFACE LEVEL: 3.48 AHD
EASTING: 383703.5
NORTHING: 6356502.3
DIP/AZIMUTH: 90°/--

BORE No: 304
PROJECT No: 102077.02
DATE: 9/10/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.03	ASPHALT		D	0.0				
				A	0.02	E	PID <1		
		FILL / SANDY GRAVEL (GP) - Generally comprising brown gravel, subangular to subrounded rock, fine to medium sized, sand is fine to coarse grained, dry			0.1				
	0.4				0.2				
		FILL / SAND - Generally comprising pale brown, fine to medium grained, trace gravel, subrounded to subangular (natural), moist		A	0.5	E	PID <1		
					0.6				
		From 0.65m to 0.7m, intermixed silty clay lense							
				A	0.9	E	PID <1		
	1.0	From 0.75m, with gravel, fine to medium sized, subrounded to subangular, trace slag, gravel and coal			1.0				
		Bore discontinued at 1.0m, refusal							

RIG: Hand Tools **DRILLER:** Lambert **LOGGED:** Wilson **CASING:** Uncased
TYPE OF BORING: 80mm diameter hand auger
WATER OBSERVATIONS: No free groundwater observed
REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Thirdi Dairy Farmers Pty Ltd
PROJECT: Proposed Apartments
LOCATION: 924 Hunter Street, Newcastle

SURFACE LEVEL: 3.25 AHD
EASTING: 383728.5
NORTHING: 6356507.3
DIP/AZIMUTH: 90°/--

BORE No: 305
PROJECT No: 102077.02
DATE: 9/10/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.18	CONCRETE							
		FILL / SAND - Grey, fine to medium grained with gravel, gravel is fine to medium sized, trace slag, gravel and black slag, occasional glass		A	0.2 0.3	E	PID <1		
		At 0.55m, fibro fragment (30mm x 25mm)		A	0.5 0.6	E	PID <1		
		From 0.7m, some slag gravel, occasional glass, metal (bolt)							
	1.1			A	1.0 1.1	E	PID <1		
		FILL / SAND - Possible natural, pale grey, fine to medium grained, trace gravel subrounded, trace roots, moist		A	1.2 1.25	E	PID <1		
	1.3	SAND (SP) - Brown, fine to medium grained with silt, moist		A	1.35 1.4	E	PID <1		
		From 1.5m, pale brown							
	2.0	Bore discontinued at 2.0m, limit of investigation		A	1.9 2.0	E	PID <1		

RIG: Hand Tools **DRILLER:** Lambert **LOGGED:** Wilson **CASING:** Uncased

TYPE OF BORING: 80mm diameter hand auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Thirdi Dairy Farmers Pty Ltd
PROJECT: Proposed Apartments
LOCATION: 924 Hunter Street, Newcastle

SURFACE LEVEL: 3.42 AHD
EASTING: 383717.2
NORTHING: 6356494.2
DIP/AZIMUTH: 90°/--

BORE No: 306
PROJECT No: 102077.02
DATE: 9/10/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.19	CONCRETE							
		FILL / SAND - Grey, fine to medium grained with gravel, gravel is fine to medium sized, trace coal, slag, gravel and black slag, occasional glass		A	0.25 0.35	E	PID <1		
	0.8	From 0.7m, intermixed pale grey							
		FILL / SILTY SAND (SM) - Generally comprising dark grey, sand is fine to medium grained with coal, occasional brick, (30mm), moist		A	0.9 1.0	E	PID <1		
		From 1.2m, pale brown							
				A	1.5	E	PID <1		
	1.6	SAND (SP) - Brown, fine to medium grained with silt, moist			1.6				
				A	2.0 2.1	E	PID <1		
				A	2.5 2.6	E	PID <1		
	2.9				2.9			▼	
	3.0	SAND (SP) - Grey, fine to coarse grained sand with silt, wet		A	3.0	E	PID <1		
		Bore discontinued at 3.0m, limit of investigation							

RIG: Hand Tools **DRILLER:** Lambert **LOGGED:** Wilson **CASING:** Uncased

TYPE OF BORING: 80mm diameter hand auger

WATER OBSERVATIONS: Free groundwater observed at 2.9m during drilling

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Thirdi Dairy Farmers Pty Ltd
PROJECT: Proposed Apartments
LOCATION: 924 Hunter Street, Newcastle

SURFACE LEVEL: 3.93 AHD
EASTING: 383714.1
NORTHING: 6356469.7
DIP/AZIMUTH: 90°/--

BORE No: 307
PROJECT No: 102077.02
DATE: 9/10/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.16	CONCRETE							
		FILL / SANDY GRAVEL - Generally comprising brown, gravel is fine to medium subrounded to subangular (natural), fine to medium grained sand, trace clay, moist		A	0.2 0.3	E	PID <1		
	0.5	Bore discontinued at 0.5m, refusal on fill (possible metal or ceramic pipe)							

RIG: Hand Tools **DRILLER:** Lambert **LOGGED:** Wilson **CASING:** Uncased
TYPE OF BORING: 80mm diameter hand auger
WATER OBSERVATIONS: No free groundwater observed
REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Appendix B

Laboratory Summary Tables B1 to B5

Laboratory Reports (Envirolab Reports 279939, 279939-A, 279939-B, 280242)

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Table B1: Summary of Laboratory Results for Soil (Residential Land Use Comparison – HIL B / HSL / EIL B)

			Metals									TRH						BTEX				PAH			
			Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	Manganese	TRH C6 - C10	TRH >C10-C16	F1 ((C6-C10)-BTEX)	F2 (>C10-C16 less Naphthalene)	F3 (>C16-C34)	F4 (>C34-C40)	Benzene	Toluene	Ethylbenzene	Total Xylenes	Naphthalene [b]	Benzo(a)pyrene (BaP)	Benzo(a)pyrene TEQ	Total PAHs
		PQL	4	0.4	1	1	1	0.1	1	1	1	25	50	25	50	100	100	0.2	0.5	1	1	1	0.05	0.5	0.05
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
201	0.5 m	06/10/2021	**4**	<0.4	**7**	**9**	**10**	<0.1	**4**	**45**	**550**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	**0.72**
			500 100	150 -	500 330	30000 210	1200 1100	120 -	1200 160	60000 510	14000 -	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 33	4 -	400 -
201	2 m	06/10/2021	<4	<0.4	**7**	**58**	**170**	**0.4**	**14**	**130**	**110**	<25	<50	<25	<50	**320**	<100	<0.2	<0.5	<1	<1	<1	**0.3**	<0.5	**4.7**
			500 100	150 -	500 330	30000 65	1200 1100	120 -	1200 160	60000 510	14000 -	- -	- 120	110 180	440 -	- 300	- 2800	0.5 50	310 85	NL 70	95 105	NL 170	- 33	4 -	400 -
202	0.2 m	06/10/2021	<4	<0.4	**6**	**26**	**63**	<0.1	**16**	**57**	**1600**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.4**	<0.5	**3.8**
			500 100	150 -	500 330	30000 210	1200 1100	120 -	1200 160	60000 510	14000 -	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 33	4 -	400 -
D1/JRK	0 m	06/10/2021	<4	<0.4	**6**	**37**	**85**	**0.1**	**21**	**82**	**240**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.5**	**0.7**	**5.8**
			500 100	150 -	500 330	30000 210	1200 1100	120 -	1200 160	60000 510	14000 -	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 33	4 -	400 -
202	3.5 m	06/10/2021	<4	<0.4	**2**	<1	**1**	<0.1	**1**	**2**	**4**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			500 100	150 -	500 330	30000 65	1200 1100	120 -	1200 160	60000 510	14000 -	- -	- 120	110 180	440 -	- 300	- 2800	0.5 50	310 85	NL 70	95 105	NL 170	- 33	4 -	400 -
203	0.5 m	06/10/2021	<4	**0.4**	**14**	**93**	**470**	**0.2**	**15**	**230**	**360**	<25	<50	<25	<50	**220**	<100	<0.2	<0.5	<1	<1	<1	**4.2**	**7.2**	**69**
			500 100	150 -	500 330	30000 210	1200 1100	120 -	1200 160	60000 510	14000 -	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 33	4 -	400 -
204	0.2 m	06/10/2021	**6**	<0.4	**5**	**7**	**9**	<0.1	**4**	**17**	**280**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			500 100	150 -	500 330	30000 210	1200 1100	120 -	1200 160	60000 510	14000 -	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 33	4 -	400 -
204	4 m	06/10/2021	**4**	<0.4	**2**	<1	**1**	<0.1	**2**	**3**	**8**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			500 100	150 -	500 330	30000 65	1200 1100	120 -	1200 160	60000 510	14000 -	- -	- 120	200 180	NL -	- 300	- 2800	0.5 50	540 85	NL 70	170 105	NL 170	- 33	4 -	400 -
205	0.5 m	06/10/2021	<4	<0.4	**2**	**7**	**14**	<0.1	**1**	**18**	**56**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			500 100	150 -	500 330	30000 210	1200 1100	120 -	1200 160	60000 510	14000 -	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 33	4 -	400 -
301	0.1 - 0.2 m	9/10/2021	**5**	<0.4	**5**	**3**	**20**	<0.1	**3**	**27**	**370**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			500 100	150 -	500 330	30000 210	1200 1100	120 -	1200 160	60000 510	14000 -	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 33	4 -	400 -
302	0.5 - 0.6 m	9/10/2021	<4	<0.4	**3**	**44**	**190**	**0.1**	**6**	**160**	**230**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.3**	<0.5	**2.8**
			500 100	150 -	500 330	30000 210	1200 1100	120 -	1200 160	60000 510	14000 -	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 33	4 -	400 -
D1/DEW	-	9/10/2021	<4	<0.4	**6**	**29**	**140**	**0.1**	**4**	**100**	**330**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.2**	<0.5	**2.4**
			500 100	150 -	500 330	30000 210	1200 1100	120 -	1200 160	60000 510	14000 -	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 33	4 -	400 -
302	1.4 - 1.5 m	9/10/2021	<4	<0.4	<1	**10**	**4**	<0.1	<1	**4**	**5**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.1**	<0.5	**0.72**
			500 100	150 -	500 330	30000 210	1200 1100	120 -	1200 160	60000 510	14000 -	- -	- 120	70 180	240 -	- 300	- 2800	0.5 50	220 85	NL 70	60 105	NL 170	- 33	4 -	400 -
303	0.6 - 0.7 m	9/10/2021	<4	<0.4	**5**	**25**	**130**	**0.1**	**3**	**84**	**160**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.2**	<0.5	**1.8**
			500 100	150 -	500 330	30000 210	1200 1100	120 -	1200 160	60000 510	14000 -	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 33	4 -	400 -
304	0.5 - 0.6 m	9/10/2021	<4	<0.4	**1**	<1	**3**	<0.1	<1	**4**	**33**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			500 100	150 -	500 330	30000 210	1200 1100	120 -	1200 160	60000 510	14000 -	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 33	4 -	400 -
305	0.2 - 0.3 m	9/10/2021	**4**	<0.4	**6**	**88**	**1100**	**0.3**	**12**	**260**	**180**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.53**	**0.8**	**5.5**
			500 100	150 -	500 330	30000 210	1200 1100	120 -	1200 160	60000 510	14000 -	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 33	4 -	400 -
305	0.55 m	9/10/2021	<4	<0.4	**4**	**50**	**580**	**0.2**	**7**	**150**	**180**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.4**	**0.7**	**5.4**
			500 100	150 -	500 330	30000 210	1200 1100	120 -	1200 160	60000 510	14000 -	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 33	4 -	400 -
306	0.25 - 0.35 m	9/10/2021	<4	<0.4	**7**	**60**	**310**	**0.3**	**9**	**300**	**410**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.77**	**1.2**	**6.8**
			500 100	150 -	500 330	30000 210	1200 1100	120 -	1200 160	60000 510	14000 -	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 33	4 -	400 -
307	0.2 - 0.3 m	9/10/2021	**5**	<0.4	**6**	**9**	**6**	<0.1	**9**	**29**	**170**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			500 100	150 -	500 330	30000 210	1200 1100	120 -	1200 160	60000 510	14000 -	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 33	4 -	400 -

Lab result

HIL/HSL value EIL/ESL value

HIL/HSL exceedance EIL/ESL exceedance HIL/HSL and EIL/ESL exceedance ML exceedance ML and HIL/HSL or EIL/ESL exceedance

Indicates that asbestos has been detected by the lab, refer to the lab report **Blue** = DC exceedance HSL 0-<1 Exceedance

Bold = Lab detections - = Not tested or No HIL/HSL/EIL/ESL (as applicable) or Not applicable NL = Non limiting AD = Asbestos detected NAD = No Asbestos detected

HIL = Health investigation level HSL = Health screening level (excluding DC) EIL = Ecological investigation level ESL = Ecological screening level ML = Management Limit DC = Direct Contact HSL

Notes:

a QA/QC replicate of sample listed directly below the primary sample

b Reported naphthalene laboratory result obtained from BTEXN suite

c Criteria applies to DDT only

D1/DEW Replicate of 302/0.5 m

D1/JRK Replicate of 202/0.2 m

Site Assessment Criteria (SAC):

Refer to the SAC section of report for information of SAC sources and rationale. Summary information as follows:

SAC based on generic land use thresholds for Residential B with minimal opportunities for soil access

HIL B Residential / Low - High Density (NEPC, 2013)

HSL A/B Residential / Low - High Density (vapour intrusion) (NEPC, 2013)

DC HSL B Direct contact HSL B Residential (High density) (direct contact) (CRC CARE, 2011)

EIL/ESL UR/POS Urban Residential and Public Open Space (NEPC, 2013)

ML R/P/POS Residential, Parkland and Public Open Space (NEPC, 2013)

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Table B1: Summary of Laboratory Results for Soil (Residential Land Use Comparison – HIL B / HSL / EIL B) (Continued)

			OCP											OPP	PCB								Asbestos							
			DDD	DDT+DDE+DDD [c]	DDE	DDT	Aldrin & Dieldrin	Total Chlordane	Endrin	Total Endosulfan	Heptachlor	Hexachlorobenzene	Methoxychlor	Chlorpyriphos	Aroclor 1016	Total PCB	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	Asbestos ID in soil <0.1g/kg	Trace Analysis	Asbestos ID in soil <0.1g/kg	ACM >7mm Estimation	FA and AF Estimation	FA and AF Estimation	Asbestos (500 ml)	Asbestos in Material
		PQL	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1						<0.001	0.001	-
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	-	-	-	g	g	%(w/w)	-	-
201	0.5 m	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-
			- -	600 180	- -	- 180	10 -	90 -	20 -	400 -	10 -	15 -	500 -	340 -	- -	1 -	- -	- -	- -	- -	- -	- -								
201	2 m	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-
			- -	600 180	- -	- 180	10 -	90 -	20 -	400 -	10 -	15 -	500 -	340 -	- -	1 -	- -	- -	- -	- -	- -	- -								
202	0.2 m	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-
			- -	600 180	- -	- 180	10 -	90 -	20 -	400 -	10 -	15 -	500 -	340 -	- -	1 -	- -	- -	- -	- -	- -	- -								
D1/JRK	0 m	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-
			- -	600 180	- -	- 180	10 -	90 -	20 -	400 -	10 -	15 -	500 -	340 -	- -	1 -	- -	- -	- -	- -	- -	- -								
203	0.5 m	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-
			- -	600 180	- -	- 180	10 -	90 -	20 -	400 -	10 -	15 -	500 -	340 -	- -	1 -	- -	- -	- -	- -	- -	- -								
204	0.2 m	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-
			- -	600 180	- -	- 180	10 -	90 -	20 -	400 -	10 -	15 -	500 -	340 -	- -	1 -	- -	- -	- -	- -	- -	- -								
205	0.2 m	06/10/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD	-
			- -	600 180	- -	- 180	10 -	90 -	20 -	400 -	10 -	15 -	500 -	340 -	- -	1 -	- -	- -	- -	- -	- -	- -								
205	0.5 m	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	NT	NT	-	NAD	-
			- -	600 180	- -	- 180	10 -	90 -	20 -	400 -	10 -	15 -	500 -	340 -	- -	1 -	- -	- -	- -	- -	- -	- -								
301	0.1 - 0.2 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-
			- -	600 180	- -	- 180	10 -	90 -	20 -	400 -	10 -	15 -	500 -	340 -	- -	1 -	- -	- -	- -	- -	- -	- -								
302	0.5 - 0.6 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-
			- -	600 180	- -	- 180	10 -	90 -	20 -	400 -	10 -	15 -	500 -	340 -	- -	1 -	- -	- -	- -	- -	- -	- -								
D1/DEW	-	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-
			- -	600 180	- -	- 180	10 -	90 -	20 -	400 -	10 -	15 -	500 -	340 -	- -	1 -	- -	- -	- -	- -	- -	- -								
302	1.4 - 1.5 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-
			- -	600 180	- -	- 180	10 -	90 -	20 -	400 -	10 -	15 -	500 -	340 -	- -	1 -	- -	- -	- -	- -	- -	- -								
303	0.6 - 0.7 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	NT	NT	-	NAD	-
			- -	600 180	- -	- 180	10 -	90 -	20 -	400 -	10 -	15 -	500 -	340 -	- -	1 -	- -	- -	- -	- -	- -	- -								
304	0.5 - 0.6 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	NT	NT	-	NAD	-
			- -	600 180	- -	- 180	10 -	90 -	20 -	400 -	10 -	15 -	500 -	340 -	- -	1 -	- -	- -	- -	- -	- -	- -								
305	0.2 - 0.3 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	NT	NT	-	NAD	-
			- -	600 180	- -	- 180	10 -	90 -	20 -	400 -	10 -	15 -	500 -	340 -	- -	1 -	- -	- -	- -	- -	- -	- -								
305	0.55 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	**AD**	NAD	**AD**	NT	**0.0328**	**0.0049**	**AD**	-
			- -	600 180	- -	- 180	10 -	90 -	20 -	400 -	10 -	15 -	500 -	340 -	- -	1 -	- -	- -	- -	- -	- -	- -								
306	0.25 - 0.35 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	NT	NT	-	NAD	-
			- -	600 180	- -	- 180	10 -	90 -	20 -	400 -	10 -	15 -	500 -	340 -	- -	1 -	- -	- -	- -	- -	- -	- -								
307	0.2 - 0.3 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-
			- -	600 180	- -	- 180	10 -	90 -	20 -	400 -	10 -	15 -	500 -	340 -	- -	1 -	- -	- -	- -	- -	- -	- -								
S1	0 - 0.05 m	9/10/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD	-
			- -	600 180	- -	- 180	10 -	90 -	20 -	400 -	10 -	15 -	500 -	340 -	- -	1 -	- -	- -	- -	- -	- -	- -								
S1/F	0.05 m	9/10/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD	**AD**
			- -	600 180	- -	- 180	10 -	90 -	20 -	400 -	10 -	15 -	500 -	340 -	- -	1 -	- -	- -	- -	- -	- -	- -								
305/F	0.55 m	9/10/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**AD**
			- -	600 180	- -	- 180	10 -	90 -	20 -	400 -	10 -	15 -	500 -	340 -	- -	1 -	- -	- -	- -	- -	- -	- -								

Lab result
HIL/HSL value EIL/ESL value

HIL/HSL exceedance EIL/ESL exceedance HIL/HSL and EIL/ESL exceedance ML exceedance ML and HIL/HSL or EIL/ESL exceedance

Indicates that asbestos has been detected by the lab, refer to the lab report **Blue** = DC exceedance HSL 0-<1 Exceedance

Bold = Lab detections - = Not tested or No HIL/HSL/EIL/ESL (as applicable) or Not applicable NL = Non limiting AD = Asbestos detected NAD = No Asbestos detected

HIL = Health investigation level HSL = Health screening level (excluding DC) EIL = Ecological investigation level ESL = Ecological screening level ML = Management Limit DC = Direct Contact HSL

Notes:

a	QA/QC replicate of sample listed directly below the primary sample
b	Reported naphthalene laboratory result obtained from BTEXN suite
c	Criteria applies to DDT only
D1/DEW	Replicate of 302/0.5 m
D1/JRK	Replicate of 202/0.2 m

Site Assessment Criteria (SAC):

Refer to the SAC section of report for information of SAC sources and rationale. Summary information as follows:

SAC based on generic land use thresholds for Residential B with minimal opportunities for soil access

HIL B	Residential / Low - High Density (NEPC, 2013)
HSL A/B	Residential / Low - High Density (vapour intrusion) (NEPC, 2013)
DC HSL B	Direct contact HSL B Residential (High density) (direct contact) (CRC CARE, 2011)
EIL/ESL UR/POS	Urban Residential and Public Open Space (NEPC, 2013)
ML R/P/POS	Residential, Parkland and Public Open Space (NEPC, 2013)

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Table B2: Summary of Laboratory Results for Soil (Residential Land Use Comparison – HIL D / HSL D / EIL D)

			Metals									TRH						BTEX				PAH			
			Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	Manganese	TRH C6 - C10	TRH >C10-C16	F1 ((C6-C10)-BTEX)	F2 (>C10-C16 less Naphthalene)	F3 (>C16-C34)	F4 (>C34-C40)	Benzene	Toluene	Ethylbenzene	Total Xylenes	Naphthalene [b]	Benzo(a)pyrene (BaP)	Benzo(a)pyrene TEQ	Total PAHs
		PQL	4	0.4	1	1	1	0.1	1	1	1	25	50	25	50	100	100	0.2	0.5	1	1	1	0.05	0.5	0.05
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
201	0.5 m	06/10/2021	**4**	<0.4	**7**	**9**	**10**	<0.1	**4**	**45**	**550**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	**0.72**
			3000 160	900 -	3600 540	240000 300	1500 1800	730 -	6000 260	400000 730	60000 -	- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
201	2 m	06/10/2021	<4	<0.4	**7**	**58**	**170**	**0.4**	**14**	**130**	**110**	<25	<50	<25	<50	**320**	<100	<0.2	<0.5	<1	<1	<1	**0.3**	<0.5	**4.7**
			3000 160	900 -	3600 540	240000 85	1500 1800	730 -	6000 260	400000 250	60000 -	- -	- 170	630 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	NL 180	NL 370	- 33	40 -	4000 -
202	0.2 m	06/10/2021	<4	<0.4	**6**	**26**	**63**	<0.1	**16**	**57**	**1600**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.4**	<0.5	**3.8**
			3000 160	900 -	3600 540	240000 300	1500 1800	730 -	6000 260	400000 730	60000 -	- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
D1/JRK	-	06/10/2021	<4	<0.4	**6**	**37**	**85**	**0.1**	**21**	**82**	**240**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.5**	**0.7**	**5.8**
			3000 160	900 -	3600 540	240000 300	1500 1800	730 -	6000 260	400000 730	60000 -	- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
202	3.5 m	06/10/2021	<4	<0.4	**2**	<1	**1**	<0.1	**1**	**2**	**4**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160	900 -	3600 540	240000 85	1500 1800	730 -	6000 260	400000 250	60000 -	- -	- 170	630 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	NL 180	NL 370	- 33	40 -	4000 -
203	0.5 m	06/10/2021	<4	**0.4**	**14**	**93**	**470**	**0.2**	**15**	**230**	**360**	<25	<50	<25	<50	**220**	<100	<0.2	<0.5	<1	<1	<1	**4.2**	**7.2**	**69**
			3000 160	900 -	3600 540	240000 300	1500 1800	730 -	6000 260	400000 730	60000 -	- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
204	0.2 m	06/10/2021	**6**	<0.4	**5**	**7**	**9**	<0.1	**4**	**17**	**280**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160	900 -	3600 540	240000 300	1500 1800	730 -	6000 260	400000 730	60000 -	- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
204	4 m	06/10/2021	**4**	<0.4	**2**	<1	**1**	<0.1	**2**	**3**	**8**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160	900 -	3600 540	240000 85	1500 1800	730 -	6000 260	400000 250	60000 -	- -	- 170	NL 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	NL 180	NL 370	- 33	40 -	4000 -
205	0.5 m	06/10/2021	<4	<0.4	**2**	**7**	**14**	<0.1	**1**	**18**	**56**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160	900 -	3600 540	240000 300	1500 1800	730 -	6000 260	400000 730	60000 -	- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
301	0.1 - 0.2 m	9/10/2021	**5**	<0.4	**5**	**3**	**20**	<0.1	**3**	**27**	**370**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160	900 -	3600 540	240000 300	1500 1800	730 -	6000 260	400000 730	60000 -	- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
302	0.5 - 0.6 m	9/10/2021	<4	<0.4	**3**	**44**	**190**	**0.1**	**6**	**160**	**230**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.3**	<0.5	**2.8**
			3000 160	900 -	3600 540	240000 300	1500 1800	730 -	6000 260	400000 730	60000 -	- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
D1/DEW	-	9/10/2021	<4	<0.4	**6**	**29**	**140**	**0.1**	**4**	**100**	**330**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.2**	<0.5	**2.4**
			3000 160	900 -	3600 540	240000 300	1500 1800	730 -	6000 260	400000 730	60000 -	- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
302	1.4 - 1.5 m	9/10/2021	<4	<0.4	<1	**10**	**4**	<0.1	<1	**4**	**5**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.1**	<0.5	**0.72**
			3000 160	900 -	3600 540	240000 300	1500 1800	730 -	6000 260	400000 730	60000 -	- -	- 170	370 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	NL 180	NL 370	- 33	40 -	4000 -
303	0.6 - 0.7 m	9/10/2021	<4	<0.4	**5**	**25**	**130**	**0.1**	**3**	**84**	**160**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.2**	<0.5	**1.8**
			3000 160	900 -	3600 540	240000 300	1500 1800	730 -	6000 260	400000 730	60000 -	- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
304	0.5 - 0.6 m	9/10/2021	<4	<0.4	**1**	<1	**3**	<0.1	<1	**4**	**33**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160	900 -	3600 540	240000 300	1500 1800	730 -	6000 260	400000 730	60000 -	- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
305	0.2 - 0.3 m	9/10/2021	**4**	<0.4	**6**	**88**	**1100**	**0.3**	**12**	**260**	**180**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.53**	**0.8**	**5.5**
			3000 160	900 -	3600 540	240000 300	1500 1800	730 -	6000 260	400000 730	60000 -	- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
305	0.55 m	9/10/2021	<4	<0.4	**4**	**50**	**580**	**0.2**	**7**	**150**	**180**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.4**	**0.7**	**5.4**
			3000 160	900 -	3600 540	240000 300	1500 1800	730 -	6000 260	400000 730	60000 -	- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
306	0.25 - 0.35 m	9/10/2021	<4	<0.4	**7**	**60**	**310**	**0.3**	**9**	**300**	**410**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.77**	**1.2**	**6.8**
			3000 160	900 -	3600 540	240000 300	1500 1800	730 -	6000 260	400000 730	60000 -	- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
307	0.2 - 0.3 m	9/10/2021	**5**	<0.4	**6**	**9**	**6**	<0.1	**9**	**29**	**170**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160	900 -	3600 540	240000 300	1500 1800	730 -	6000 260	400000 730	60000 -	- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -

Lab result
HIL/HSL value EIL/ESL value

HIL/HSL exceedance EIL/ESL exceedance HIL/HSL and EIL/ESL exceedance ML exceedance ML and HIL/HSL or EIL/ESL exceedance

Indicates that asbestos has been detected by the lab, refer to the lab report **Blue** = DC exceedance HSL 0-<1 Exceedance

Bold = Lab detections - = Not tested or No HIL/HSL/EIL/ESL (as applicable) or Not applicable NL = Non limiting AD = Asbestos detected NAD = No Asbestos detected

HIL = Health investigation level HSL = Health screening level (excluding DC) EIL = Ecological investigation level ESL = Ecological screening level ML = Management Limit DC = Direct Contact HSL

Notes:

a	QA/QC replicate of sample listed directly below the primary sample
b	Reported naphthalene laboratory result obtained from BTEXN suite
c	Criteria applies to DDT only
D1/DEW	Replicate of 302/0.5 m
D1/JRK	Replicate of 202/0.2 m

Site Assessment Criteria (SAC):

Refer to the SAC section of report for information of SAC sources and rationale. Summary information as follows:

SAC based on generic land use thresholds for Commercial/ industrial D

HIL D	Commercial / Industrial (NEPC, 2013)
HSL D	Commercial / Industrial (vapour intrusion) (NEPC, 2013)
DC HSL D	Direct contact HSL D Commercial/Industrial (direct contact) (CRC CARE, 2011)
EIL/ESL C/Ind	Commercial and Industrial (NEPC, 2013)
ML C/Ind	Commercial and Industrial (NEPC, 2013)

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Table B2: Summary of Laboratory Results for Soil (Residential Land Use Comparison – HIL D / HSL D / EIL D) (Continued)

			OCP											OPP	PCB									Asbestos							
			DDD	DDT+DDE+DDD [c]	DDE	DDT	Aldrin & Dieldrin	Total Chlordane	Endrin	Total Endosulfan	Heptachlor	Hexachlorobenzene	Methoxychlor	Chlorpyriphos	Aroclor 1016	Total PCB	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	Asbestos ID in soil <0.1g/kg	Trace Analysis	Asbestos ID in soil <0.1g/kg	ACM >7mm Estimation	FA and AF Estimation	FA and AF Estimation	Asbestos (500 ml)	Asbestos in Material
		PQL	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1						<0.001	0.001	0.001
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	-	-	-	g	g	%(w/w)	-	-
D1/JRK	0 m	06/10/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -								
201	0.5 m	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -								
201	2 m	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -								
202	0.2 m	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -								
D1/JRK	-	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -								
203	0.5 m	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -								
204	0.2 m	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -								
205	0.2 m	06/10/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	AD	AD	AD	NT	NT	-	AD	AD
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -								
205	0.5 m	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	AD	AD	AD	NT	NT	-	AD	AD
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -								
301	0.1 - 0.2 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -								
302	0.5 - 0.6 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -								
D1/DEW	-	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -								
302	1.4 - 1.5 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -								
303	0.6 - 0.7 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	NT	NT	-	NAD	NAD
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -								
304	0.5 - 0.6 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	NT	NT	-	NAD	NAD
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -								
305	0.2 - 0.3 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	NT	NT	-	NAD	NAD
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -								
305	0.55 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	AD	NAD	AD	NT	**0.0328**	**0.0049**	AD	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -								
306	0.25 - 0.35 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	NT	NT	-	NAD	NAD
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -								
307	0.2 - 0.3 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -								
S1	0 - 0.05 m	9/10/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -								
S1/F	0 m	9/10/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	AD
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -								
305/F	0.55 m	9/10/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	AD
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -								

Lab result
HIL/HSL value EIL/ESL value

HIL/HSL exceedance EIL/ESL exceedance HIL/HSL and EIL/ESL exceedance ML exceedance ML and HIL/HSL or EIL/ESL exceedance

Indicates that asbestos has been detected by the lab, refer to the lab report **Blue** = DC exceedance HSL 0-<1 Exceedance

Bold = Lab detections - = Not tested or No HIL/HSL/EIL/ESL (as applicable) or Not applicable NL = Non limiting AD = Asbestos detected NAD = No Asbestos detected

HIL = Health investigation level HSL = Health screening level (excluding DC) EIL = Ecological investigation level ESL = Ecological screening level ML = Management Limit DC = Direct Contact HSL

Notes:

a QA/QC replicate of sample listed directly below the primary sample
b Reported naphthalene laboratory result obtained from BTEXN suite
c Criteria applies to DDT only
D1/DEW Replicate of 302/0.5 m
D1/JRK Replicate of 202/0.2 m

Site Assessment Criteria (SAC):

Refer to the SAC section of report for information of SAC sources and rationale. Summary information as follows:

SAC based on generic land use thresholds for Commercial/ industrial D
HIL D Commercial / Industrial (NEPC, 2013)
HSL D Commercial / Industrial (vapour intrusion) (NEPC, 2013)
DC HSL D Direct contact HSL D Commercial/Industrial (direct contact) (CRC CARE, 2011)
EIL/ESL C/Ind Commercial and Industrial (NEPC, 2013)
ML C/Ind Commercial and Industrial (NEPC, 2013)

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Table B3: Summary of Laboratory Results in Soil (Waste Classification Comparison)

			Metals																		TRH				
			Arsenic	Cadmium	Total Chromium	Copper	Lead	TCLP in Lead	Mercury (inorganic)	Nickel	Zinc	Manganese	Antimony	Barium	Beryllium	Boron	Cobalt	Molybdenum	Selenium (Total)	Tin (inorganic, Sn4+)	TRH C6 - C9	TRH C10 - C14	TRH C15 - C28	TRH C29 - C36	C10-C36 recoverable hydrocarbons
		PQL	4	0.4	1	1	1	1	0.1	1	1	1	7	1	1	3	1	1	2	1	25	50	100	100	50
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/L	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
201	0.5 m	06/10/2021	**4**	<0.4	**7**	**9**	**10**	-	<0.1	**4**	**45**	**550**	<7	**110**	**1**	<3	**3**	<1	<2	<1	<25	<50	<100	<100	<50
201	2 m	06/10/2021	<4	<0.4	**7**	**58**	**170**	<0.03	**0.4**	**14**	**130**	**110**	<7	**93**	<1	**6**	**9**	<1	<2	**17**	<25	<50	**260**	**100**	**360**
202	0.2 m	06/10/2021	<4	<0.4	**6**	**26**	**63**	-	<0.1	**16**	**57**	**1600**	<7	**130**	<1	**20**	**4**	<1	<4	**2**	<25	<50	<100	<100	<50
D1/JRK	-	06/10/2021	<4	<0.4	**6**	**37**	**85**	-	**0.1**	**21**	**82**	**240**	<7	**130**	<1	**30**	**4**	**1**	<2	**4**	<25	<50	<100	<100	<50
202	3.5 m	06/10/2021	<4	<0.4	**2**	<1	**1**	-	<0.1	**1**	**2**	**4**	<7	**2**	<1	<3	<1	<1	<2	<1	<25	<50	<100	<100	<50
203	0.5 m	06/10/2021	<4	**0.4**	**14**	**93**	**470**	**0.2**	**0.2**	**15**	**230**	**360**	<7	**100**	<1	**5**	**6**	<1	<2	**12**	<25	<50	**130**	**120**	**250**
204	0.2 m	06/10/2021	**6**	<0.4	**5**	**7**	**9**	-	<0.1	**4**	**17**	**280**	<7	**26**	<1	<3	**3**	<1	<2	**1**	<25	<50	<100	<100	<50
204	4 m	06/10/2021	**4**	<0.4	**2**	<1	**1**	-	<0.1	**2**	**3**	**8**	<7	**3**	<1	<3	**2**	<1	<2	<1	<25	<50	<100	<100	<50
205	0.2 m	06/10/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
205	0.5 m	06/10/2021	<4	<0.4	**2**	**7**	**14**	-	<0.1	**1**	**18**	**56**	<7	**12**	<1	<3	**9**	<1	<2	<1	<25	<50	<100	<100	<50
301	0.1 - 0.2 m	9/10/2021	**5**	<0.4	**5**	**3**	**20**	-	<0.1	**3**	**27**	**370**	<7	**34**	<1	<3	**3**	<1	<2	<1	<25	<50	<100	<100	<50
302	0.5 - 0.6 m	9/10/2021	<4	<0.4	**3**	**44**	**190**	pending	**0.1**	**6**	**160**	**230**	<7	**89**	<1	**3**	**2**	<1	<2	**7**	<25	<50	<100	<100	<50
D1/DEW	-	9/10/2021	<4	<0.4	**6**	**29**	**140**	-	**0.1**	**4**	**100**	**330**	<7	**60**	<1	<3	**2**	<1	<2	**5**	<25	<50	<100	<100	<50
302	1.4 - 1.5 m	9/10/2021	<4	<0.4	<1	**10**	**4**	-	<0.1	<1	**4**	**5**	<7	**9**	<1	<3	<1	<1	<2	<1	<25	<50	<100	<100	<50
303	0.6 - 0.7 m	9/10/2021	<4	<0.4	**5**	**25**	**130**	-	**0.1**	**3**	**84**	**160**	<7	**41**	<1	<3	**1**	<1	<2	**2**	<25	<50	<100	<100	<50
304	0.5 - 0.6 m	9/10/2021	<4	<0.4	**1**	<1	**3**	-	<0.1	<1	**4**	**33**	<7	**4**	<1	<3	<1	<1	<2	<1	<25	<50	<100	<100	<50
305	0.2 - 0.3 m	9/10/2021	**4**	<0.4	**6**	**88**	**1100**	pending	**0.3**	**12**	**260**	**180**	<7	**96**	<1	**9**	**13**	<1	<2	**9**	<25	<50	<100	<100	<50
305	0.55 m	9/10/2021	<4	<0.4	**4**	**50**	**580**	-	**0.2**	**7**	**150**	**180**	<7	**130**	<1	**6**	**3**	<1	<2	**7**	<25	<50	<100	<100	<50
306	0.25 - 0.35 m	9/10/2021	<4	<0.4	**7**	**60**	**310**	-	**0.3**	**9**	**300**	**410**	<7	**100**	<1	**5**	**5**	<1	<2	**17**	<25	<50	<100	<100	<50
307	0.2 - 0.3 m	9/10/2021	**5**	<0.4	**6**	**9**	**6**	-	<0.1	**9**	**29**	**170**	<7	**8**	<1	<3	**10**	<1	<2	<1	<25	<50	<100	<100	<50
CT1			100	20	100	NC	100	-	4	40	NC	NC	NC	NC	20	NC	NC	100	20	NC	650	NC	NC	NC	10000
SCC1			500	100	1900	NC	1500	1500	50	1050	NC	NC	NC	NC	100	NC	NC	1000	50	NC	650	NC	NC	NC	10000
TCLP1			N/A	N/A	N/A	NC	N/A	5	N/A	N/A	NC	NC	NC	NC	N/A	NC	NC	N/A	N/A	NC	N/A	NC	NC	NC	N/A
CT2			400	80	400	NC	400	-	16	160	NC	NC	NC	NC	80	NC	NC	400	80	NC	2600	NC	NC	NC	40000
SCC2			2000	400	7600	NC	6000	6000	200	4200	NC	NC	NC	NC	400	NC	NC	4000	200	NC	2600	NC	NC	NC	40000
TCLP2			N/A	N/A	N/A	NC	N/A	20	N/A	N/A	NC	NC	NC	NC	N/A	NC	NC	N/A	N/A	NC	N/A	NC	NC	NC	N/A

CT1 exceedance TCLP1 and/or SCC1 exceedance CT2 exceedance TCLP2 and/or SCC2 exceedance Asbestos detection

NT = Not tested NL = Non limiting NC = No criteria NA = Not applicable

Notes:

a	QA/QC replicate of sample listed directly below the primary sample
b	Total chromium used as initial screen for chromium(VI).
c	Total recoverable hydrocarbons (TRH) used as an initial screen for total petroleum hydrocarbons (TPH)
d	Criteria for scheduled chemicals used as an initial screen
e	Criteria for Chlorpyrifos used as initial screen
f	All criteria are in the same units as the reported results
PQL	Practical quantitation limit
CT1	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values of specific contaminant concentration (SCC) for classification without TCLP: General solid waste
SCC1	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: General solid waste
TCLP1	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: General solid waste
CT2	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values of specific contaminant concentration (SCC) for classification without TCLP: Restricted solid waste
SCC2	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: Restricted solid waste
TCLP2	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: Restricted solid waste
D1/DEW	Replicate of 302/0.5 m
D1/JRK	Replicate of 202/0.2 m

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Table B3: Summary of Laboratory Results in Soil (Waste Classification Comparison) (Continued)

			BTEX						PAH																	OCP		OPP
			Benzene	Toluene	Ethylbenzene	m+p-Xylene	o-Xylene	Xylenes (total)	Benzo(a)pyrene (BaP)	TCLP in Benzo(a)pyrene (BaP)	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(b+j+k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Phenanthrene	Pyrene	Total PAHs	Total Endosulfan	Total Analysed OCP	Total Analysed OPP
		PQL	0.2	0.5	1	2	1	3	0.05	0.05	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	1	0.1	0.1	0.05	0.1	0.1	0.1
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/L	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
201	0.5 m	06/10/2021	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.1	<0.1	<0.1	**0.1**	<0.2	<0.1	<0.1	<0.1	**0.1**	<0.1	<0.1	<1	**0.4**	**0.1**	**0.72**	<0.1	<0.1	<0.1
201	2 m	06/10/2021	<0.2	<0.5	<1	<2	<1	<3	**0.3**	-	<0.1	<0.1	**0.1**	**0.9**	**0.6**	**0.2**	**0.4**	<0.1	**0.5**	<0.1	**0.1**	<1	**0.9**	**0.5**	**4.7**	<0.1	<0.1	<0.1
202	0.2 m	06/10/2021	<0.2	<0.5	<1	<2	<1	<3	**0.4**	-	<0.1	<0.1	<0.1	**0.4**	**0.5**	**0.3**	**0.3**	<0.1	**0.8**	<0.1	**0.2**	<1	**0.2**	**0.8**	**3.8**	<0.1	<0.1	<0.1
D1/JRK	-	06/10/2021	<0.2	<0.5	<1	<2	<1	<3	**0.5**	-	<0.1	<0.1	<0.1	**0.7**	**0.8**	**0.4**	**0.4**	<0.1	**1.2**	<0.1	**0.3**	<1	**0.4**	**1.2**	**5.8**	<0.1	<0.1	<0.1
202	3.5 m	06/10/2021	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.05	-	-	-
203	0.5 m	06/10/2021	<0.2	<0.5	<1	<2	<1	<3	**4.2**	<0.001	<0.1	**0.2**	**1.2**	**6.2**	**15**	**3.8**	**3.8**	**0.6**	**13**	<0.1	**2.5**	<1	**4.2**	**14**	**69**	<0.1	<0.1	<0.1
204	0.2 m	06/10/2021	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1
204	4 m	06/10/2021	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.05	-	-	-
205	0.2 m	06/10/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
205	0.5 m	06/10/2021	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1
301	0.1 - 0.2 m	9/10/2021	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1
302	0.5 - 0.6 m	9/10/2021	<0.2	<0.5	<1	<2	<1	<3	**0.3**	-	<0.1	<0.1	<0.1	**0.3**	**0.7**	**0.2**	**0.2**	<0.1	**0.4**	<0.1	**0.2**	<1	**0.2**	**0.4**	**2.8**	<0.1	<0.1	<0.1
D1/DEW	-	9/10/2021	<0.2	<0.5	<1	<2	<1	<3	**0.2**	-	<0.1	<0.1	<0.1	**0.2**	**0.6**	**0.2**	**0.2**	<0.1	**0.4**	<0.1	**0.1**	<1	<0.1	**0.4**	**2.4**	<0.1	<0.1	<0.1
302	1.4 - 1.5 m	9/10/2021	<0.2	<0.5	<1	<2	<1	<3	**0.1**	-	<0.1	<0.1	<0.1	<0.1	**0.3**	<0.1	<0.1	<0.1	**0.2**	<0.1	<0.1	<1	<0.1	**0.1**	**0.72**	<0.1	<0.1	<0.1
303	0.6 - 0.7 m	9/10/2021	<0.2	<0.5	<1	<2	<1	<3	**0.2**	-	<0.1	<0.1	<0.1	**0.2**	**0.4**	**0.1**	**0.1**	<0.1	**0.3**	<0.1	**0.1**	<1	**0.1**	**0.2**	**1.8**	<0.1	<0.1	<0.1
304	0.5 - 0.6 m	9/10/2021	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1
305	0.2 - 0.3 m	9/10/2021	<0.2	<0.5	<1	<2	<1	<3	**0.53**	-	<0.1	<0.1	<0.1	**0.6**	**1**	**0.4**	**0.4**	<0.1	**0.8**	<0.1	**0.3**	<1	**0.4**	**0.8**	**5.5**	<0.1	<0.1	<0.1
305	0.55 m	9/10/2021	<0.2	<0.5	<1	<2	<1	<3	**0.4**	-	<0.1	<0.1	**0.1**	**0.6**	**1**	**0.3**	**0.4**	<0.1	**0.9**	<0.1	**0.2**	<1	**0.3**	**0.8**	**5.4**	<0.1	<0.1	<0.1
306	0.25 - 0.35 m	9/10/2021	<0.2	<0.5	<1	<2	<1	<3	**0.77**	-	<0.1	<0.1	<0.1	**0.7**	**2**	**0.6**	**0.5**	**0.1**	**0.7**	<0.1	**0.5**	<1	**0.2**	**0.7**	**6.8**	<0.1	<0.1	<0.1
307	0.2 - 0.3 m	9/10/2021	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1
Waste Classification Criteria [f]																												
CT1			10	288	600	NC	NC	1000	0.8	N/A	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	200	60	<50	4
SCC1			18	518	1080	NC	NC	1800	10	N/A	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	200	108	<50	7.5
TCLP1			N/A	N/A	N/A	NC	NC	N/A	N/A	0.04	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	N/A	N/A	N/A	N/A
CT2			40	1152	2400	NC	NC	4000	3.2	N/A	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	800	240	<50	16
SCC2			72	2073	4320	NC	NC	7200	23	N/A	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	800	432	<50	30
TCLP2			N/A	N/A	N/A	NC	NC	N/A	N/A	0.16	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	N/A	N/A	N/A	N/A

CT1 exceedance TCLP1 and/or SCC1 exceedance CT2 exceedance TCLP2 and/or SCC2 exceedance Asbestos detection

NT = Not tested NL = Non limiting NC = No criteria NA = Not applicable

Notes:

a	QA/QC replicate of sample listed directly below the primary sample
b	Total chromium used as initial screen for chromium(VI).
c	Total recoverable hydrocarbons (TRH) used as an initial screen for total petroleum hydrocarbons (TPH)
d	Criteria for scheduled chemicals used as an initial screen
e	Criteria for Chlorpyrifos used as initial screen
f	All criteria are in the same units as the reported results
PQL	Practical quantitation limit
CT1	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values of specific contaminant concentration (SCC) for classification without TCLP: General solid waste
SCC1	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: General solid waste
TCLP1	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: General solid waste
CT2	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values of specific contaminant concentration (SCC) for classification without TCLP: Restricted solid waste
SCC2	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: Restricted solid waste
TCLP2	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: Restricted solid waste
D1/DEW	Replicate of 302/0.5 m
D1/JRK	Replicate of 202/0.2 m

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Table B3: Summary of Laboratory Results in Soil (Waste Classification Comparison) (Continued)

			PCB								VOC															Miscellaneous	
			Aroclhor 1016	Aroclhor 1221	Aroclhor 1232	Aroclhor 1242	Aroclhor 1248	Aroclhor 1254	Aroclor 1260	Total PCB	carbon tetrachloride	Monochlorobenzene	Chloroform	1,2-dichlorobenzene	1,4-dichlorobenzene	1,2-dichloroethane	1,1-Dichloroethene	Styrene (vinylbenzene)	1,1,1,2-tetrachloroethane	1,1,2,2-tetrachloroethane	tetrachloroethene	1,1,1-trichloroethane	1,1,2-trichloroethane	1,1,2-trichloroethylene	Vinyl Chloride	pH	CEC
		PQL	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.1	0.1
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	pH units	meq/100g
201	0.5 m	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8.3	-
201	2 m	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
202	0.2 m	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-
D1/JRK	-	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-
202	3.5 m	06/10/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
203	0.5 m	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8.1	9.6
204	0.2 m	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8.7	-
204	4 m	06/10/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
205	0.2 m	06/10/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
205	0.5 m	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-
301	0.1 - 0.2 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
302	0.5 - 0.6 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D1/DEW	-	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
302	1.4 - 1.5 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
303	0.6 - 0.7 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
304	0.5 - 0.6 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
305	0.2 - 0.3 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
305	0.55 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
306	0.25 - 0.35 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
307	0.2 - 0.3 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CT1			NC	NC	NC	NC	NC	NC	NC	<50	10	2000	120	86	150	10	14	60	200	26	14	600	24	10	4	NC	NC
SCC1			NC	NC	NC	NC	NC	NC	NC	<50	18	3600	126	4.3	7.5	0.5	0.7	108	360	46.8	25.2	1080	43.2	18	7.2	NC	NC
TCLP1			NC	NC	NC	NC	NC	NC	NC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NC	NC
CT2			NC	NC	NC	NC	NC	NC	NC	<50	40	8000	480	344	600	40	56	240	800	104	56	2400	96	40	16	NC	NC
SCC2			NC	NC	NC	NC	NC	NC	NC	<50	72	14400	864	620	1080	72	100	432	1440	187.2	100.8	4320	172.8	72	28.8	NC	NC
TCLP2			NC	NC	NC	NC	NC	NC	NC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NC	NC

CT1 exceedance | TCLP1 and/or SCC1 exceedance | CT2 exceedance | TCLP2 and/or SCC2 exceedance | Asbestos detection

NT = Not tested NL = Non limiting NC = No criteria NA = Not applicable

Notes:

a	QA/QC replicate of sample listed directly below the primary sample
b	Total chromium used as initial screen for chromium(VI).
c	Total recoverable hydrocarbons (TRH) used as an initial screen for total petroleum hydrocarbons (TPH)
d	Criteria for scheduled chemicals used as an initial screen
e	Criteria for Chlorpyrifos used as initial screen
f	All criteria are in the same units as the reported results
PQL	Practical quantitation limit
CT1	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values of specific contaminant concentration (SCC) for classification without TCLP: General solid waste
SCC1	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: General solid waste
TCLP1	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: General solid waste
CT2	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values of specific contaminant concentration (SCC) for classification without TCLP: Restricted solid waste
SCC2	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: Restricted solid waste
TCLP2	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: Restricted solid waste
D1/DEW	Replicate of 302/0.5 m
D1/JRK	Replicate of 202/0.2 m

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Table B3: Summary of Laboratory Results in Soil (Waste Classification Comparison) (Continued)

			Asbestos							
			Asbestos ID in soil >0.1g/kg	Asbestos ID in soil <0.1g/kg	Trace Analysis	ACM >7mm Estimation	FA and AF Estimation	FA and AF Estimation	Total Asbestos#1	Total Asbestos
		PQL						<0.001	<0.1	0.001
Sample ID	Depth	Sample Date	-	-	-	g	g	%(w/w)	g/kg	-
201	0.5 m	06/10/2021	-	-	-	-	-	-	-	-
201	2 m	06/10/2021	-	-	-	-	-	-	-	-
202	0.2 m	06/10/2021	-	-	-	-	-	-	-	-
D1/JRK	0 m	06/10/2021	-	-	-	-	-	-	-	-
202	3.5 m	06/10/2021	-	-	-	-	-	-	-	-
203	0.5 m	06/10/2021	-	-	-	-	-	-	-	-
204	0.2 m	06/10/2021	-	-	-	-	-	-	-	-
204	4 m	06/10/2021	-	-	-	-	-	-	-	-
205	0.2 m	06/10/2021	NAD	NAD	NAD	NT	NT	-	NAD	NAD
205	0.5 m	06/10/2021	NAD	NAD	NAD	NT	NT	-	NAD	NAD
301	0.1 - 0.2 m	9/10/2021	-	-	-	-	-	-	-	-
302	0.5 - 0.6 m	9/10/2021	-	-	-	-	-	-	-	-
D1/DEW	0 m	9/10/2021	-	-	-	-	-	-	-	-
302	1.4 - 1.5 m	9/10/2021	-	-	-	-	-	-	-	-
303	0.6 - 0.7 m	9/10/2021	NAD	NAD	NAD	NT	NT	-	NAD	NAD
304	0.5 - 0.6 m	9/10/2021	NAD	NAD	NAD	NT	NT	-	NAD	NAD
305	0.2 - 0.3 m	9/10/2021	NAD	NAD	NAD	NT	NT	-	NAD	NAD
305	0.55 m	9/10/2021	NAD	**AD**	NAD	NT	**0.0328**	**0.0049**	NAD	NAD
306	0.25 - 0.35 m	9/10/2021	NAD	NAD	NAD	NT	NT	-	NAD	NAD
307	0.2 - 0.3 m	9/10/2021	-	-	-	-	-	-	-	-

CT1	None present	None present	None present	None present	None present	None present	None present	None present
SCC1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TCLP1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
CT2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SCC2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TCLP2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

CT1 exceedance TCLP1 and/or SCC1 exceedance CT2 exceedance TCLP2 and/or SCC2 exceedance Asbestos detection

NT = Not tested NL = Non limiting NC = No criteria NA = Not applicable

Notes:

a	QA/QC replicate of sample listed directly below the primary sample
b	Total chromium used as initial screen for chromium(VI).
c	Total recoverable hydrocarbons (TRH) used as an initial screen for total petroleum hydrocarbons (TPH)
d	Criteria for scheduled chemicals used as an initial screen
e	Criteria for Chlorpyrifos used as initial screen
f	All criteria are in the same units as the reported results
PQL	Practical quantitation limit
CT1	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values of specific contaminant concentration (SCC) for classification without TCLP: General solid waste
SCC1	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: General solid waste
TCLP1	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: General solid waste
CT2	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values of specific contaminant concentration (SCC) for classification without TCLP: Restricted solid waste
SCC2	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: Restricted solid waste
TCLP2	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: Restricted solid waste
D1/DEW	Replicate of 302/0.5 m
D1/JRK	Replicate of 202/0.2 m

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Table B4: Summary of Laboratory Results – Groundwater

						Well ID	GW1	GW3	203	204	Replicate
						Sampled Date	7/10/2021	7/10/2021	12/10/2021	12/10/2021	GWD1 (204) 12/10/2021
Analyte		Units	PQL	ANZG (2018) Marine water 95% toxicant DGVs, slightly to moderately distubed	NEPM 2013 Table 1A(4) Residential HSL A & B GW for Vapour Intrusion, Sand	NEPM 2013 Table 1A(4) Comm/Ind HSL D GW for Vapour Intrusion, Sand					
					2-4m	2-4m					
Metals (filtered)	Antimony	mg/L	0.001				0.001	0.001	0.004	0.004	0.004
	Arsenic	mg/L	0.001				0.004	<0.001	<0.001	0.002	0.002
	Barium	mg/L	0.001				0.005	0.002	0.016	0.029	0.031
	Beryllium	mg/L	0.0005				<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	Boron	mg/L	0.02				0.1	0.1	0.04	0.27	0.28
	Cadmium	mg/L	0.0001	0.0007			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Chromium (III+VI)	mg/L	0.001	0.0044			<0.001	<0.001	<0.001	<0.001	<0.001
	Cobalt	mg/L	0.001	0.001			<0.001	<0.001	<0.001	0.001	0.001
	Copper	mg/L	0.001	0.0013			0.001	0.007	0.003	0.002	0.002
	Lead	mg/L	0.001	0.0044			<0.001	<0.001	<0.001	<0.001	<0.001
	Manganese	mg/L	0.005				<0.005	0.093	0.006	0.036	0.036
	Mercury	mg/L	0.00005	0.0004			<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
	Molybdenum	mg/L	0.001				0.002	0.001	0.002	0.01	0.011
	Nickel	mg/L	0.001	0.07			0.013	0.024	0.008	0.004	0.004
	Selenium	mg/L	0.001				<0.001	<0.001	<0.001	0.003	0.003
	Tin	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
	Zinc	mg/L	0.001	0.008			0.017	0.045	0.32	0.28	0.29
TPH	C6-C10 less BTEX (F1)	mg/L	0.01		1	6	<0.01	<0.01	<0.01	<0.01	<0.01
	C6-C10	mg/L	0.01				<0.01	<0.01	<0.01	<0.01	<0.01
	C10-C16	mg/L	0.05				<0.05	<0.05	<0.05	<0.05	<0.05
	C16-C34	mg/L	0.1				<0.1	<0.1	<0.1	<0.1	<0.1
	C34-C40	mg/L	0.1				<0.1	<0.1	<0.1	<0.1	<0.1
	F2-NAPHTHALENE	mg/L	0.05		1	NL	<0.05	<0.05	<0.05	<0.05	<0.05
	C6 - C9	mg/L	0.01				<0.01	<0.01	<0.01	<0.01	<0.01
	C10 - C14	mg/L	0.05				<0.05	<0.05	<0.05	<0.05	<0.05
	C15 - C28	mg/L	0.1				<0.1	<0.1	<0.1	<0.1	<0.1
	C29-C36	mg/L	0.1				<0.1	<0.1	<0.1	<0.1	<0.1
	+C10 - C36 (Sum of total)	mg/L	0.05				<0.05	<0.05	<0.05	<0.05	<0.05
	C10 - C40 (Sum of total)	mg/L	0.05				<0.05	<0.05	<0.05	<0.05	<0.05
BTEX	Benzene	mg/L	0.001	0.7	0.8	5	<0.001	<0.001	<0.001	<0.001	<0.001
	Ethylbenzene	mg/L	0.001	0.08	NL	NL	<0.001	<0.001	<0.001	<0.001	<0.001
	Toluene	mg/L	0.001	0.18	NL	NL	<0.001	<0.001	<0.001	<0.001	<0.001
	Xylene (m & p)	mg/L	0.002	0.075			<0.002	<0.002	<0.002	<0.002	<0.002
	Xylene (o)	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
MAH	1,2,4-trimethylbenzene	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
	1,3,5-trimethylbenzene	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
	Isopropylbenzene	mg/L	0.001	0.03			<0.001	<0.001	<0.001	<0.001	<0.001
	n-butylbenzene	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
	n-propylbenzene	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
	p-isopropyltoluene	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
	sec-butylbenzene	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
	Styrene	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
	tert-butylbenzene	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
Chlorinated Hydrocarbons	1,1,1,2-tetrachloroethane	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
	1,1,1-trichloroethane	mg/L	0.001	0.27			<0.001	<0.001	<0.001	<0.001	<0.001
	1,1,2,2-tetrachloroethane	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
	1,1,2-trichloroethane	mg/L	0.001	1.9			<0.001	<0.001	<0.001	<0.001	<0.001
	1,1-dichloroethane	mg/L	0.001	19			<0.001	<0.001	<0.001	<0.001	<0.001
	1,1-dichloroethene	mg/L	0.001	0.08			<0.001	<0.001	<0.001	<0.001	<0.001
	1,1-dichloropropene	mg/L	0.001	0.9			<0.001	<0.001	<0.001	<0.001	<0.001
	1,2,3-trichloropropane	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
	1,2-dibromo-3-chloropropane	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
	1,2-dichloroethane	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
	1,2-dichloropropane	mg/L	0.001	0.9			<0.001	<0.001	<0.001	<0.001	<0.001
	1,3-dichloropropane	mg/L	0.001	1.1			<0.001	<0.001	<0.001	<0.001	<0.001
	2,2-dichloropropane	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
	Bromochloromethane	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
	Bromodichloromethane	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
	Bromoform	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
	Carbon tetrachloride	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
	Chlorodibromomethane	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
	Chloroethane	mg/L	0.01				<0.01	<0.01	<0.01	<0.01	<0.01
	Chloroform	mg/L	0.001	0.37			<0.001	<0.001	<0.001	<0.001	<0.001
	Chloromethane	mg/L	0.01				<0.01	<0.01	<0.01	<0.01	<0.01
	cis-1,2-dichloroethene	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
	cis-1,3-dichloropropene	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
	Dibromomethane	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
	Hexachlorobutadiene	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
	Trichloroethene	mg/L	0.001	0.07			<0.001	<0.001	<0.001	<0.001	<0.001
	Tetrachloroethene	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
	trans-1,2-dichloroethene	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
	trans-1,3-dichloropropene	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
	Vinyl chloride	mg/L	0.01	0.1			<0.01	<0.01	<0.01	<0.01	<0.01
Halogenated Hydrocarbons	1,2-dibromoethane	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
	Bromomethane	mg/L	0.01				<0.01	<0.01	<0.01	<0.01	<0.01
	Dichlorodifluoromethane	mg/L	0.01				<0.01	<0.01	<0.01	<0.01	<0.01
	Trichlorofluoromethane	mg/L	0.01				<0.01	<0.01	<0.01	<0.01	<0.01
Halogenated Benzenes	1,2,3-trichlorobenzene	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
	1,2,4-trichlorobenzene	mg/L	0.001	0.08			<0.001	<0.001	<0.001	<0.001	<0.001
	1,2-dichlorobenzene	mg/L	0.001	0.16			<0.001	<0.001	<0.001	<0.001	<0.001
	1,3-dichlorobenzene	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
	1,4-dichlorobenzene	mg/L	0.001	0.06			<0.001	<0.001	<0.001	<0.001	<0.001
	2-chlorotoluene	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
	4-chlorotoluene	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
	Bromobenzene	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
	Chlorobenzene	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
Solvents	Cyclohexane	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
PAH	Total Positive PAHs	mg/L	0.0001				<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Acenaphthene	mg/L	0.0001				<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Acenaphthylene	mg/L	0.0001				<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Anthracene	mg/L	0.0001	0.00001			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Benz(a)anthracene	mg/L	0.0001				<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Benzo(a) pyrene	mg/L	0.0001				<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Benzo(g,h,i)perylene	mg/L	0.0001				<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Chrysene	mg/L	0.0001				<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Dibenz(a,h)anthracene	mg/L	0.0001				<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Fluoranthene	mg/L	0.0001	0.001			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Fluorene	mg/L	0.0001				<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Indeno(1,2,3-c,d)pyrene	mg/L	0.0001				<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Naphthalene	mg/L	0.0002	0.05	NL	NL	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	Phenanthrene	mg/L	0.0001	0.0006			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Pyrene	mg/L	0.0001				<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Benzo(a)pyrene TEQ	mg/L	0.0005				<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	Benzo(b,j+k)fluoranthene	mg/L	0.0002				<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

PQL - Practical Quantitation Limit

GWD1 - field replicate of Bore 204

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Table B5: Summary of Laboratory Results – Acid Sulfate Soils

Bore ID	Ground Surface RL (AHD)	Sample Depth (m)	Sample RL (AHD)	Sample Description	Screening Test Results				pH$_{KCL}$	S$_{KCL}$	Scr %S	s-TAA %S	S$_{NAS}$ %S	s-ANC$_{BT}$ %S	Net Acidity[c] %S	Existing and Potential Acidity %S
					pH											
					pH$_F$	pH$_{FOX}$	pH$_F$ - pH$_{FOX}$	Strength of Reaction								
201	3.89	**3.5**	**0.4**	SAND, brown to pale brown	4.0	**2.7**	**1.3**	Low reaction	-	-	-	-	-	-	-	-
		4.5	**-0.6**	SAND, brown to pale brown	5.8	5.5	0.3	Low reaction	-	-	-	-	-	-	-	-
202	3.37	1.5	1.9	SILTY SAND, grey	5.4	5.0	0.4	Low reaction	-	-	-	-	-	-	-	-
		2.5	0.9	SAND, pale brown	5.8	5.0	0.8	Low reaction	-	-	-	-	-	-	-	-
203	3.10	**4.0**	**-0.9**	SAND, trace gravels, brown	5.8	4.3	**1.5**	Low reaction	-	-	-	-	-	-	-	-
		5.0	**-1.9**	SAND, trace gravels, brown	5.4	5.0	0.4	Low reaction	-	-	-	-	-	-	-	-
204	3.27	2.0	1.3	SAND, pale brown	7.0	5.9	**1.1**	Low reaction	-	-	-	-	-	-	-	-
		3.1	**0.2**	SAND, trace gravels, brown	4.7	**1.9**	**2.8**	Volcanic reaction	4.0	0.091	0.26	0.06	0.010	-	0.32	0.33
205	3.40	1.5	1.9	SAND, pale brown	6.5	5.4	**1.1**	Low reaction	6.7	<0.005	<0.005	<0.01	-	<0.05	<0.005	<0.05
		2.5	0.9	SAND, pale brown	4.5	**1.8**	**2.7**	Volcanic reaction	-	-	-	-	-	-	-	-
301	2.99	1.5-1.6	1.39-1.49	SAND, with silt, brown	7.3	5.7	**1.6**	Low reaction	-	-	-	-	-	-	-	-
		2.1-2.2	0.79-0.89	SAND, with silt, pale brown	7.2	4.7	**2.5**	Low reaction	-	-	-	-	-	-	-	-
		2.7-2.9	**0.09-0.29**	SAND, with silt, pale brown	6.9	**1.9**	**5.0**	Medium reaction	-	-	-	-	-	-	-	-
302	3.24	2.0-2.1	1.14-1.24	SAND, with silt, brown	7.3	5.8	**1.5**	Low reaction	-	-	-	-	-	-	-	-
		2.5-2.6	0.64-0.74	SAND, with silt, brown	7.3	5.6	**1.7**	Low reaction	-	-	-	-	-	-	-	-
		2.9-3.0	**0.24-0.34**	SAND, with silt, brown	6.6	**2.1**	**4.5**	Extreme reaction	-	-	-	-	-	-	-	-
305	3.25	1.35-1.4	1.85-1.9	SAND, with silt, brown	7.3	5.7	**1.6**	Low reaction	-	-	-	-	-	-	-	-
306	3.42	2.0-2.1	1.32-1.42	SAND, with silt, brown	7.3	5.8	**1.5**	Low reaction	-	-	-	-	-	-	-	-
		2.5-2.6	0.82-0.92	SAND, with silt, brown	7.3	5.7	**1.6**	Low reaction	-	-	-	-	-	-	-	-
		2.9-3.0	**0.42-0.52**	SAND, with silt, grey	6.3	**1.8**	**4.5**	Volcanic reaction	-	-	-	-	-	-	-	-
Guideline					**<4[d]**	**<3.5[e]**	**≥1[e]**	-	Coarse sands, poorly buffered							0.01
									Coarse sands to loamy sands and peats							0.03
									Medium sandy loams to light clays							0.06[f]/0.03[g]
									Fine medium to heavy clays & silty clays							0.1[f]/0.03[g]

Notes to Table B5:

a Depth below ground surface

b Strength of Reaction
- 1 denotes no or slight reaction
- 2 denotes moderate reaction
- 3 denotes high reaction
- 4 denotes very vigorous reaction
- F denotes bubbling/frothy reaction indicative of organics
- V denotes vapours generated
- B denotes bubbles generated
- H denotes heat generated

c Calculated by the laboratory based on the ABA equation in ASS Laboratory Methods Guidelines (Ref3)

d For actual acid sulphate soils (ASS)

e Indicative value only for Potential Acid Sulphate Soils (PASS)

f QASSIT Action Criteria for disturbance of 1-1000 tonnes of material

g QASSIT Action Criteria for disturbance of more than 1000 tonnes of material

Bold results indicative of ASS/PASS

Shaded results indicate an exceedence of QASSIT action criteria

Blue results indicate sample collected from below the groundwater table at time of sampling

pH$_F$ - Soil pH Test (1:5 soil:distilled water)

pH$_{FOX}$ - Soil Peroxide pH Test (1:4 soil:distilled water following oxidation of soil with 30% hydrogen peroxide (H_2O_2))

*Laboratory methods used to quantify ANC are likely to overestimate environmental effectiveness

- indicates not tested

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CERTIFICATE OF ANALYSIS 279939

Client Details

Client	Douglas Partners Newcastle
Attention	Joshua Kramer
Address	Box 324 Hunter Region Mail Centre, Newcastle, NSW, 2310

Sample Details

Your Reference	**102077.02, Newcastle**
Number of Samples	20 Soil, 5 Water
Date samples received	08/10/2021
Date completed instructions received	08/10/2021

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	13/10/2021
Date of Issue	13/10/2021

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Asbestos Approved By
Analysed by Asbestos Approved Analyst: Nyovan Moonean
Authorised by Asbestos Approved Signatory: Lucy Zhu

Results Approved By
Diego Bigolin, Inorganics Supervisor
Dragana Tomas, Senior Chemist
Hannah Nguyen, Metals Supervisor
Lucy Zhu, Asbestos Supervisor

Authorised By

Nancy Zhang, Laboratory Manager

VOCs in soil				
Our Reference		279939-3	279939-9	279939-10
Your Reference	UNITS	202	205	D1/JRK
Depth		0.2	0.5	-
Date Sampled		06/10/2021	06/10/2021	06/10/2021
Type of sample		Soil	Soil	Soil
Date extracted	-	11/10/2021	11/10/2021	11/10/2021
Date analysed	-	12/10/2021	12/10/2021	12/10/2021
Dichlorodifluoromethane	mg/kg	<1	<1	<1
Chloromethane	mg/kg	<1	<1	<1
Vinyl Chloride	mg/kg	<1	<1	<1
Bromomethane	mg/kg	<1	<1	<1
Chloroethane	mg/kg	<1	<1	<1
Trichlorofluoromethane	mg/kg	<1	<1	<1
1,1-Dichloroethene	mg/kg	<1	<1	<1
trans-1,2-dichloroethene	mg/kg	<1	<1	<1
1,1-dichloroethane	mg/kg	<1	<1	<1
cis-1,2-dichloroethene	mg/kg	<1	<1	<1
bromochloromethane	mg/kg	<1	<1	<1
chloroform	mg/kg	<1	<1	<1
2,2-dichloropropane	mg/kg	<1	<1	<1
1,2-dichloroethane	mg/kg	<1	<1	<1
1,1,1-trichloroethane	mg/kg	<1	<1	<1
1,1-dichloropropene	mg/kg	<1	<1	<1
Cyclohexane	mg/kg	<1	<1	<1
carbon tetrachloride	mg/kg	<1	<1	<1
Benzene	mg/kg	<0.2	<0.2	<0.2
dibromomethane	mg/kg	<1	<1	<1
1,2-dichloropropane	mg/kg	<1	<1	<1
trichloroethene	mg/kg	<1	<1	<1
bromodichloromethane	mg/kg	<1	<1	<1
trans-1,3-dichloropropene	mg/kg	<1	<1	<1
cis-1,3-dichloropropene	mg/kg	<1	<1	<1
1,1,2-trichloroethane	mg/kg	<1	<1	<1
Toluene	mg/kg	<0.5	<0.5	<0.5
1,3-dichloropropane	mg/kg	<1	<1	<1
dibromochloromethane	mg/kg	<1	<1	<1
1,2-dibromoethane	mg/kg	<1	<1	<1
tetrachloroethene	mg/kg	<1	<1	<1
1,1,1,2-tetrachloroethane	mg/kg	<1	<1	<1
chlorobenzene	mg/kg	<1	<1	<1

VOCs in soil				
Our Reference		279939-3	279939-9	279939-10
Your Reference	UNITS	202	205	D1/JRK
Depth		0.2	0.5	-
Date Sampled		06/10/2021	06/10/2021	06/10/2021
Type of sample		Soil	Soil	Soil
Ethylbenzene	mg/kg	<1	<1	<1
bromoform	mg/kg	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2
styrene	mg/kg	<1	<1	<1
1,1,2,2-tetrachloroethane	mg/kg	<1	<1	<1
o-Xylene	mg/kg	<1	<1	<1
1,2,3-trichloropropane	mg/kg	<1	<1	<1
isopropylbenzene	mg/kg	<1	<1	<1
bromobenzene	mg/kg	<1	<1	<1
n-propyl benzene	mg/kg	<1	<1	<1
2-chlorotoluene	mg/kg	<1	<1	<1
4-chlorotoluene	mg/kg	<1	<1	<1
1,3,5-trimethyl benzene	mg/kg	<1	<1	<1
tert-butyl benzene	mg/kg	<1	<1	<1
1,2,4-trimethyl benzene	mg/kg	<1	<1	<1
1,3-dichlorobenzene	mg/kg	<1	<1	<1
sec-butyl benzene	mg/kg	<1	<1	<1
1,4-dichlorobenzene	mg/kg	<1	<1	<1
4-isopropyl toluene	mg/kg	<1	<1	<1
1,2-dichlorobenzene	mg/kg	<1	<1	<1
n-butyl benzene	mg/kg	<1	<1	<1
1,2-dibromo-3-chloropropane	mg/kg	<1	<1	<1
1,2,4-trichlorobenzene	mg/kg	<1	<1	<1
hexachlorobutadiene	mg/kg	<1	<1	<1
1,2,3-trichlorobenzene	mg/kg	<1	<1	<1
Surrogate Dibromofluorometha	%	99	99	99
Surrogate aaa-Trifluorotoluene	%	85	87	82
Surrogate Toluene-d_8	%	98	99	98
Surrogate 4-Bromofluorobenzene	%	105	105	102

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		279939-1	279939-2	279939-3	279939-4	279939-5
Your Reference	UNITS	201	201	202	202	203
Depth		0.5	2.0	0.2	3.5	0.5
Date Sampled		06/10/2021	06/10/2021	06/10/2021	06/10/2021	06/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	11/10/2021	11/10/2021	11/10/2021	11/10/2021	11/10/2021
Date analysed	-	12/10/2021	12/10/2021	12/10/2021	12/10/2021	12/10/2021
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<3	<3	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	88	81	85	87	85

vTRH(C6-C10)/BTEXN in Soil					
Our Reference		279939-6	279939-7	279939-9	279939-10
Your Reference	UNITS	204	204	205	D1/JRK
Depth		0.2	4.0	0.5	-
Date Sampled		06/10/2021	06/10/2021	06/10/2021	06/10/2021
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	11/10/2021	11/10/2021	11/10/2021	11/10/2021
Date analysed	-	12/10/2021	12/10/2021	12/10/2021	12/10/2021
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<3	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	94	87	87	82

svTRH (C10-C40) in Soil						
Our Reference		279939-1	279939-2	279939-3	279939-4	279939-5
Your Reference	UNITS	201	201	202	202	203
Depth		0.5	2.0	0.2	3.5	0.5
Date Sampled		06/10/2021	06/10/2021	06/10/2021	06/10/2021	06/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	11/10/2021	11/10/2021	11/10/2021	11/10/2021	11/10/2021
Date analysed	-	11/10/2021	11/10/2021	11/10/2021	11/10/2021	11/10/2021
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	260	<100	<100	130
TRH C_{29} - C_{36}	mg/kg	<100	100	<100	<100	120
Total +ve TRH (C10-C36)	mg/kg	<50	360	<50	<50	250
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	320	<100	<100	220
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	320	<50	<50	220
Surrogate o-Terphenyl	%	87	100	93	91	93

svTRH (C10-C40) in Soil					
Our Reference		279939-6	279939-7	279939-9	279939-10
Your Reference	UNITS	204	204	205	D1/JRK
Depth		0.2	4.0	0.5	-
Date Sampled		06/10/2021	06/10/2021	06/10/2021	06/10/2021
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	11/10/2021	11/10/2021	11/10/2021	11/10/2021
Date analysed	-	11/10/2021	11/10/2021	11/10/2021	11/10/2021
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50	<50
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50
Surrogate o-Terphenyl	%	92	92	89	89

PAHs in Soil						
Our Reference		279939-1	279939-2	279939-3	279939-4	279939-5
Your Reference	UNITS	201	201	202	202	203
Depth		0.5	2.0	0.2	3.5	0.5
Date Sampled		06/10/2021	06/10/2021	06/10/2021	06/10/2021	06/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	11/10/2021	11/10/2021	11/10/2021	11/10/2021	11/10/2021
Date analysed	-	12/10/2021	12/10/2021	12/10/2021	12/10/2021	12/10/2021
Naphthalene	mg/kg	<0.1	0.1	<0.1	<0.1	0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.2
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.4	0.9	0.2	<0.1	4.2
Anthracene	mg/kg	<0.1	0.1	<0.1	<0.1	1.2
Fluoranthene	mg/kg	0.1	0.5	0.8	<0.1	13
Pyrene	mg/kg	0.1	0.5	0.8	<0.1	14
Benzo(a)anthracene	mg/kg	0.1	0.9	0.4	<0.1	6.2
Chrysene	mg/kg	<0.1	0.4	0.3	<0.1	3.8
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	0.6	0.5	<0.2	15
Benzo(a)pyrene	mg/kg	<0.05	0.3	0.4	<0.05	4.2
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	0.1	0.2	<0.1	2.5
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.6
Benzo(g,h,i)perylene	mg/kg	<0.1	0.2	0.3	<0.1	3.8
Total +ve PAH's	mg/kg	0.72	4.7	3.8	<0.05	69
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	7.2
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	0.5	0.5	<0.5	7.2
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	0.6	0.6	<0.5	7.2
Surrogate p-Terphenyl-d14	%	109	105	116	124	109

PAHs in Soil					
Our Reference		279939-6	279939-7	279939-9	279939-10
Your Reference	UNITS	204	204	205	D1/JRK
Depth		0.2	4.0	0.5	-
Date Sampled		06/10/2021	06/10/2021	06/10/2021	06/10/2021
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	11/10/2021	11/10/2021	11/10/2021	11/10/2021
Date analysed	-	12/10/2021	12/10/2021	12/10/2021	12/10/2021
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	0.4
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	1.2
Pyrene	mg/kg	<0.1	<0.1	<0.1	1.2
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	0.7
Chrysene	mg/kg	<0.1	<0.1	<0.1	0.4
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	0.8
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	0.5
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	0.3
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	0.4
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	5.8
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	0.7
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	0.7
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	0.8
Surrogate p-Terphenyl-d14	%	130	118	115	109

Organochlorine Pesticides in soil						
Our Reference		279939-1	279939-2	279939-3	279939-5	279939-6
Your Reference	UNITS	201	201	202	203	204
Depth		0.5	2.0	0.2	0.5	0.2
Date Sampled		06/10/2021	06/10/2021	06/10/2021	06/10/2021	06/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	11/10/2021	11/10/2021	11/10/2021	11/10/2021	11/10/2021
Date analysed	-	12/10/2021	12/10/2021	12/10/2021	12/10/2021	12/10/2021
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	103	96	110	103	112

Organochlorine Pesticides in soil			
Our Reference		279939-9	279939-10
Your Reference	UNITS	205	D1/JRK
Depth		0.5	-
Date Sampled		06/10/2021	06/10/2021
Type of sample		Soil	Soil
Date extracted	-	11/10/2021	11/10/2021
Date analysed	-	12/10/2021	12/10/2021
alpha-BHC	mg/kg	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1
Surrogate TCMX	%	105	107

Organophosphorus Pesticides in Soil						
Our Reference		279939-1	279939-2	279939-3	279939-5	279939-6
Your Reference	UNITS	201	201	202	203	204
Depth		0.5	2.0	0.2	0.5	0.2
Date Sampled		06/10/2021	06/10/2021	06/10/2021	06/10/2021	06/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	11/10/2021	11/10/2021	11/10/2021	11/10/2021	11/10/2021
Date analysed	-	12/10/2021	12/10/2021	12/10/2021	12/10/2021	12/10/2021
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	103	96	110	103	112

Organophosphorus Pesticides in Soil			
Our Reference		279939-9	279939-10
Your Reference	UNITS	205	D1/JRK
Depth		0.5	-
Date Sampled		06/10/2021	06/10/2021
Type of sample		Soil	Soil
Date extracted	-	11/10/2021	11/10/2021
Date analysed	-	12/10/2021	12/10/2021
Dichlorvos	mg/kg	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1
Surrogate TCMX	%	105	107

PCBs in Soil						
Our Reference		279939-1	279939-2	279939-3	279939-5	279939-6
Your Reference	UNITS	201	201	202	203	204
Depth		0.5	2.0	0.2	0.5	0.2
Date Sampled		06/10/2021	06/10/2021	06/10/2021	06/10/2021	06/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	11/10/2021	11/10/2021	11/10/2021	11/10/2021	11/10/2021
Date analysed	-	12/10/2021	12/10/2021	12/10/2021	12/10/2021	12/10/2021
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	103	96	110	103	112

PCBs in Soil			
Our Reference		279939-9	279939-10
Your Reference	UNITS	205	D1/JRK
Depth		0.5	-
Date Sampled		06/10/2021	06/10/2021
Type of sample		Soil	Soil
Date extracted	-	11/10/2021	11/10/2021
Date analysed	-	12/10/2021	12/10/2021
Aroclor 1016	mg/kg	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1
Surrogate TCMX	%	105	107

Acid Extractable metals in soil						
Our Reference		279939-1	279939-2	279939-3	279939-4	279939-5
Your Reference	UNITS	201	201	202	202	203
Depth		0.5	2.0	0.2	3.5	0.5
Date Sampled		06/10/2021	06/10/2021	06/10/2021	06/10/2021	06/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	13/10/2021	13/10/2021	13/10/2021	13/10/2021	13/10/2021
Date analysed	-	13/10/2021	13/10/2021	13/10/2021	13/10/2021	13/10/2021
Arsenic	mg/kg	4	<4	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	0.4
Chromium	mg/kg	7	7	6	2	14
Copper	mg/kg	9	58	26	<1	93
Lead	mg/kg	10	170	63	1	470
Mercury	mg/kg	<0.1	0.4	<0.1	<0.1	0.2
Nickel	mg/kg	4	14	16	1	15
Zinc	mg/kg	45	130	57	2	230
Boron	mg/kg	<3	6	20	<3	5
Barium	mg/kg	110	93	130	2	100
Beryllium	mg/kg	1	<1	<1	<1	<1
Cobalt	mg/kg	3	9	4	<1	6
Manganese	mg/kg	550	110	1,600	4	360
Molybdenum	mg/kg	<1	<1	<1	<1	<1
Antimony	mg/kg	<7	<7	<7	<7	<7
Selenium	mg/kg	<2	<2	<4	<2	<2
Tin	mg/kg	<1	17	2	<1	12

Acid Extractable metals in soil						
Our Reference		279939-6	279939-7	279939-9	279939-10	279939-26
Your Reference	UNITS	204	204	205	D1/JRK	202 - [TRIPLICATE]
Depth		0.2	4.0	0.5	-	0.2
Date Sampled		06/10/2021	06/10/2021	06/10/2021	06/10/2021	06/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	13/10/2021	13/10/2021	13/10/2021	13/10/2021	13/10/2021
Date analysed	-	13/10/2021	13/10/2021	13/10/2021	13/10/2021	13/10/2021
Arsenic	mg/kg	6	4	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	5	2	2	6	4
Copper	mg/kg	7	<1	7	37	21
Lead	mg/kg	9	1	14	85	51
Mercury	mg/kg	<0.1	<0.1	<0.1	0.1	<0.1
Nickel	mg/kg	4	2	1	21	15
Zinc	mg/kg	17	3	18	82	46
Boron	mg/kg	<3	<3	<3	30	20
Barium	mg/kg	26	3	12	130	110
Beryllium	mg/kg	<1	<1	<1	<1	<1
Cobalt	mg/kg	3	2	9	4	3
Manganese	mg/kg	280	8	56	240	470
Molybdenum	mg/kg	<1	<1	<1	1	<1
Antimony	mg/kg	<7	<7	<7	<7	<7
Selenium	mg/kg	<2	<2	<2	<2	<2
Tin	mg/kg	1	<1	<1	4	2

Moisture						
Our Reference		279939-1	279939-2	279939-3	279939-4	279939-5
Your Reference	UNITS	201	201	202	202	203
Depth		0.5	2.0	0.2	3.5	0.5
Date Sampled		06/10/2021	06/10/2021	06/10/2021	06/10/2021	06/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	11/10/2021	11/10/2021	11/10/2021	11/10/2021	11/10/2021
Date analysed	-	12/10/2021	12/10/2021	12/10/2021	12/10/2021	12/10/2021
Moisture	%	8.1	18	17	15	13

Moisture					
Our Reference		279939-6	279939-7	279939-9	279939-10
Your Reference	UNITS	204	204	205	D1/JRK
Depth		0.2	4.0	0.5	-
Date Sampled		06/10/2021	06/10/2021	06/10/2021	06/10/2021
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	11/10/2021	11/10/2021	11/10/2021	11/10/2021
Date analysed	-	12/10/2021	12/10/2021	12/10/2021	12/10/2021
Moisture	%	7.5	16	11	19

Asbestos ID - soils NEPM			
Our Reference		279939-8	279939-9
Your Reference	UNITS	205	205
Depth		0.2	0.5
Date Sampled		06/10/2021	06/10/2021
Type of sample		Soil	Soil
Date analysed	-	13/10/2021	13/10/2021
Sample mass tested	g	776.54	720.26
Sample Description	-	Brown coarse-grained soil & rocks	Brown fine-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected
Total Asbestos#1	g/kg	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	–	–
FA and AF Estimation*	g	–	–
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001

sPOCAS field test						
Our Reference		279939-16	279939-17	279939-18	279939-19	279939-20
Your Reference	UNITS	201	201	202	202	203
Depth		3.5	4.5	1.5	2.5	4
Date Sampled		06/10/2021	06/10/2021	06/10/2021	06/10/2021	06/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	11/10/2021	11/10/2021	11/10/2021	11/10/2021	11/10/2021
Date analysed	-	11/10/2021	11/10/2021	11/10/2021	11/10/2021	11/10/2021
pH_F (field pH test)*	pH Units	4.0	5.8	5.4	5.8	5.8
pH_{FOX} (field peroxide test)*	pH Units	2.7	5.5	5.0	5.0	4.3
Reaction Rate*	-	Low reaction	Low reaction	Low reaction	Low reaction	Low reaction

sPOCAS field test						
Our Reference		279939-21	279939-22	279939-23	279939-24	279939-25
Your Reference	UNITS	203	204	204	205	205
Depth		5	2	3.1	1.5	2.5
Date Sampled		06/10/2021	06/10/2021	06/10/2021	06/10/2021	06/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	11/10/2021	11/10/2021	11/10/2021	11/10/2021	11/10/2021
Date analysed	-	11/10/2021	11/10/2021	11/10/2021	11/10/2021	11/10/2021
pH_F (field pH test)*	pH Units	5.4	7.0	4.7	6.5	4.5
pH_{FOX} (field peroxide test)*	pH Units	5.0	5.9	1.9	5.4	1.8
Reaction Rate*	-	Low reaction	Low reaction	Volcanic reaction	Low reaction	Volcanic reaction

VOCs in water				
Our Reference		279939-11	279939-12	279939-13
Your Reference	UNITS	GW1	GW3	R1
Depth		-	-	-
Date Sampled		07/10/2021	07/10/2021	07/10/2021
Type of sample		Water	Water	Water
Date extracted	-	11/10/2021	11/10/2021	11/10/2021
Date analysed	-	12/10/2021	12/10/2021	12/10/2021
Dichlorodifluoromethane	µg/L	<10	<10	<10
Chloromethane	µg/L	<10	<10	<10
Vinyl Chloride	µg/L	<10	<10	<10
Bromomethane	µg/L	<10	<10	<10
Chloroethane	µg/L	<10	<10	<10
Trichlorofluoromethane	µg/L	<10	<10	<10
1,1-Dichloroethene	µg/L	<1	<1	<1
Trans-1,2-dichloroethene	µg/L	<1	<1	<1
1,1-dichloroethane	µg/L	<1	<1	<1
Cis-1,2-dichloroethene	µg/L	<1	<1	<1
Bromochloromethane	µg/L	<1	<1	<1
Chloroform	µg/L	<1	<1	<1
2,2-dichloropropane	µg/L	<1	<1	<1
1,2-dichloroethane	µg/L	<1	<1	<1
1,1,1-trichloroethane	µg/L	<1	<1	<1
1,1-dichloropropene	µg/L	<1	<1	<1
Cyclohexane	µg/L	<1	<1	<1
Carbon tetrachloride	µg/L	<1	<1	<1
Benzene	µg/L	<1	<1	<1
Dibromomethane	µg/L	<1	<1	<1
1,2-dichloropropane	µg/L	<1	<1	<1
Trichloroethene	µg/L	<1	<1	<1
Bromodichloromethane	µg/L	<1	<1	<1
trans-1,3-dichloropropene	µg/L	<1	<1	<1
cis-1,3-dichloropropene	µg/L	<1	<1	<1
1,1,2-trichloroethane	µg/L	<1	<1	<1
Toluene	µg/L	<1	<1	<1
1,3-dichloropropane	µg/L	<1	<1	<1
Dibromochloromethane	µg/L	<1	<1	<1
1,2-dibromoethane	µg/L	<1	<1	<1
Tetrachloroethene	µg/L	<1	<1	<1
1,1,1,2-tetrachloroethane	µg/L	<1	<1	<1
Chlorobenzene	µg/L	<1	<1	<1

VOCs in water				
Our Reference		279939-11	279939-12	279939-13
Your Reference	UNITS	GW1	GW3	R1
Depth		-	-	-
Date Sampled		07/10/2021	07/10/2021	07/10/2021
Type of sample		Water	Water	Water
Ethylbenzene	µg/L	<1	<1	<1
Bromoform	µg/L	<1	<1	<1
m+p-xylene	µg/L	<2	<2	<2
Styrene	µg/L	<1	<1	<1
1,1,2,2-tetrachloroethane	µg/L	<1	<1	<1
o-xylene	µg/L	<1	<1	<1
1,2,3-trichloropropane	µg/L	<1	<1	<1
Isopropylbenzene	µg/L	<1	<1	<1
Bromobenzene	µg/L	<1	<1	<1
n-propyl benzene	µg/L	<1	<1	<1
2-chlorotoluene	µg/L	<1	<1	<1
4-chlorotoluene	µg/L	<1	<1	<1
1,3,5-trimethyl benzene	µg/L	<1	<1	<1
Tert-butyl benzene	µg/L	<1	<1	<1
1,2,4-trimethyl benzene	µg/L	<1	<1	<1
1,3-dichlorobenzene	µg/L	<1	<1	<1
Sec-butyl benzene	µg/L	<1	<1	<1
1,4-dichlorobenzene	µg/L	<1	<1	<1
4-isopropyl toluene	µg/L	<1	<1	<1
1,2-dichlorobenzene	µg/L	<1	<1	<1
n-butyl benzene	µg/L	<1	<1	<1
1,2-dibromo-3-chloropropane	µg/L	<1	<1	<1
1,2,4-trichlorobenzene	µg/L	<1	<1	<1
Hexachlorobutadiene	µg/L	<1	<1	<1
1,2,3-trichlorobenzene	µg/L	<1	<1	<1
Surrogate Dibromofluoromethane	%	108	108	107
Surrogate toluene-d8	%	95	96	95
Surrogate 4-BFB	%	87	87	86

BTEX in Water			
Our Reference		279939-14	279939-15
Your Reference	UNITS	TS	TB
Depth		-	-
Date Sampled		07/10/2021	07/10/2021
Type of sample		Water	Water
Date extracted	-	11/10/2021	11/10/2021
Date analysed	-	12/10/2021	12/10/2021
Benzene	µg/L	96%	<1
Toluene	µg/L	93%	<1
Ethylbenzene	µg/L	102%	<1
m+p-xylene	µg/L	99%	<2
o-xylene	µg/L	105%	<1
Surrogate Dibromofluoromethane	%	108	108
Surrogate toluene-d8	%	97	96
Surrogate 4-BFB	%	97	85

HM in water - dissolved				
Our Reference		279939-11	279939-12	279939-13
Your Reference	UNITS	GW1	GW3	R1
Depth		-	-	-
Date Sampled		07/10/2021	07/10/2021	07/10/2021
Type of sample		Water	Water	Water
Date prepared	-	13/10/2021	13/10/2021	13/10/2021
Date analysed	-	13/10/2021	13/10/2021	13/10/2021
Arsenic-Dissolved	µg/L	4	<1	<1
Cadmium-Dissolved	µg/L	<0.1	<0.1	<0.1
Chromium-Dissolved	µg/L	<1	<1	<1
Copper-Dissolved	µg/L	1	7	<1
Lead-Dissolved	µg/L	<1	<1	<1
Mercury-Dissolved	µg/L	<0.05	<0.05	<0.05
Nickel-Dissolved	µg/L	13	24	<1
Zinc-Dissolved	µg/L	17	45	5
Boron-Dissolved	µg/L	100	100	<20
Barium-Dissolved	µg/L	5	2	<1
Beryllium-Dissolved	µg/L	<0.5	<0.5	<0.5
Cobalt-Dissolved	µg/L	<1	<1	<1
Manganese-Dissolved	µg/L	<5	93	<5
Molybdenum-Dissolved	µg/L	2	1	<1
Antimony-Dissolved	µg/L	1	1	<1
Selenium-Dissolved	µg/L	<1	<1	<1
Tin-Dissolved	µg/L	<1	<1	<1

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
ASB-001	Asbestos ID - Identification of asbestos in soil samples using Polarised Light Microscopy and Dispersion Staining Techniques. Minimum 500mL soil sample was analysed as recommended by "National Environment Protection (Assessment of site contamination) Measure, Schedule B1 and "The Guidelines from the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia - May 2009" with a reporting limit of 0.1g/kg (0.01% w/w) as per Australian Standard AS4964-2004. Results reported denoted with * are outside our scope of NATA accreditation. **NOTE** #1 Total Asbestos g/kg was analysed and reported as per Australian Standard AS4964 (This is the sum of ACM >7mm, <7mm and FA/AF) **NOTE** #2 The screening level of 0.001% w/w asbestos in soil for FA and AF only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres. Estimation = Estimated asbestos weight Results reported with "--" is equivalent to no visible asbestos identified using Polarised Light microscopy and Dispersion Staining Techniques.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Inorg-063	pH- measured using pH meter and electrode. Soil is oxidised with Hydrogen Peroxide or extracted with water. Based on section H, Acid Sulfate Soils Laboratory Methods Guidelines, Version 2.1 - June 2004. To ensure accurate results these tests are recommended to be done in the field as pH may change with time thus these results may not be representative of true field conditions.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Metals-022	Determination of various metals by ICP-MS.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.

Method ID	Methodology Summary
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-022	Determination of VOCs sampled onto coconut shell charcoal sorbent tubes, that can be desorbed using carbon disulphide, and analysed by GC-MS.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.
Org-022/025	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-MS/GC-MSMS. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS and/or GC-MS/MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ PQL'values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero'values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL'values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-023	Water samples are analysed directly by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

QUALITY CONTROL: VOCs in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	279939-9
Date extracted	-			11/10/2021	3	11/10/2021	11/10/2021		11/10/2021	11/10/2021
Date analysed	-			12/10/2021	3	12/10/2021	12/10/2021		12/10/2021	12/10/2021
Dichlorodifluoromethane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Chloromethane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Vinyl Chloride	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Bromomethane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Chloroethane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Trichlorofluoromethane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,1-Dichloroethene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
trans-1,2-dichloroethene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,1-dichloroethane	mg/kg	1	Org-023	<1	3	<1	<1	0	89	80
cis-1,2-dichloroethene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
bromochloromethane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
chloroform	mg/kg	1	Org-023	<1	3	<1	<1	0	91	79
2,2-dichloropropane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,2-dichloroethane	mg/kg	1	Org-023	<1	3	<1	<1	0	84	78
1,1,1-trichloroethane	mg/kg	1	Org-023	<1	3	<1	<1	0	83	75
1,1-dichloropropene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Cyclohexane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
carbon tetrachloride	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-023	<0.2	3	<0.2	<0.2	0	[NT]	[NT]
dibromomethane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,2-dichloropropane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
trichloroethene	mg/kg	1	Org-023	<1	3	<1	<1	0	78	72
bromodichloromethane	mg/kg	1	Org-023	<1	3	<1	<1	0	91	84
trans-1,3-dichloropropene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
cis-1,3-dichloropropene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,1,2-trichloroethane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-023	<0.5	3	<0.5	<0.5	0	[NT]	[NT]
1,3-dichloropropane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
dibromochloromethane	mg/kg	1	Org-023	<1	3	<1	<1	0	88	81
1,2-dibromoethane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
tetrachloroethene	mg/kg	1	Org-023	<1	3	<1	<1	0	87	79
1,1,1,2-tetrachloroethane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
chlorobenzene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
bromoform	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-023	<2	3	<2	<2	0	[NT]	[NT]
styrene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,1,2,2-tetrachloroethane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]

QUALITY CONTROL: VOCs in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	279939-9
o-Xylene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,2,3-trichloropropane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
isopropylbenzene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
bromobenzene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
n-propyl benzene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
2-chlorotoluene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
4-chlorotoluene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,3,5-trimethyl benzene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
tert-butyl benzene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,2,4-trimethyl benzene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,3-dichlorobenzene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
sec-butyl benzene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,4-dichlorobenzene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
4-isopropyl toluene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,2-dichlorobenzene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
n-butyl benzene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,2-dibromo-3-chloropropane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,2,4-trichlorobenzene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
hexachlorobutadiene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,2,3-trichlorobenzene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluorometha	%		Org-023	99	3	99	98	1	100	99
Surrogate aaa-Trifluorotoluene	%		Org-023	102	3	85	79	7	97	87
Surrogate Toluene-d_8	%		Org-023	99	3	98	98	0	99	98
Surrogate 4-Bromofluorobenzene	%		Org-023	105	3	105	103	2	103	107

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	279939-9
Date extracted	-			11/10/2021	3	11/10/2021	11/10/2021		11/10/2021	11/10/2021
Date analysed	-			12/10/2021	3	12/10/2021	12/10/2021		12/10/2021	12/10/2021
TRH C_6 - C_9	mg/kg	25	Org-023	<25	3	<25	<25	0	100	94
TRH C_6 - C_{10}	mg/kg	25	Org-023	<25	3	<25	<25	0	100	94
Benzene	mg/kg	0.2	Org-023	<0.2	3	<0.2	<0.2	0	89	81
Toluene	mg/kg	0.5	Org-023	<0.5	3	<0.5	<0.5	0	90	83
Ethylbenzene	mg/kg	1	Org-023	<1	3	<1	<1	0	108	102
m+p-xylene	mg/kg	2	Org-023	<2	3	<2	<2	0	107	102
o-Xylene	mg/kg	1	Org-023	<1	3	<1	<1	0	105	98
naphthalene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	102	3	85	79	7	97	87

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	279939-9
Date extracted	-			11/10/2021	3	11/10/2021	11/10/2021		11/10/2021	11/10/2021
Date analysed	-			11/10/2021	3	11/10/2021	11/10/2021		11/10/2021	11/10/2021
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	3	<50	<50	0	97	99
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	3	<100	<100	0	86	97
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	3	<100	<100	0	79	88
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	3	<50	<50	0	97	99
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	3	<100	<100	0	86	97
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	3	<100	<100	0	79	88
Surrogate o-Terphenyl	%		Org-020	94	3	93	91	2	113	124

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	279939-9
Date extracted	-			11/10/2021	3	11/10/2021	11/10/2021		11/10/2021	11/10/2021
Date analysed	-			12/10/2021	3	12/10/2021	12/10/2021		12/10/2021	12/10/2021
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	118	113
Acenaphthylene	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	107	97
Fluorene	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	111	93
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	3	0.2	0.2	0	133	124
Anthracene	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	<0.1	3	0.8	0.9	12	112	114
Pyrene	mg/kg	0.1	Org-022/025	<0.1	3	0.8	0.9	12	123	117
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	<0.1	3	0.4	0.5	22	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	<0.1	3	0.3	0.4	29	91	83
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	<0.2	3	0.5	0.6	18	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	<0.05	3	0.4	0.4	0	128	122
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	<0.1	3	0.2	0.2	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	<0.1	3	0.3	0.3	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	130	3	116	109	6	120	91

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	279939-9
Date extracted	-			11/10/2021	3	11/10/2021	11/10/2021		11/10/2021	11/10/2021
Date analysed	-			12/10/2021	3	12/10/2021	12/10/2021		12/10/2021	12/10/2021
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	120	114
HCB	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	117	106
gamma-BHC	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	109	107
delta-BHC	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	124	120
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	122	110
gamma-Chlordane	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	121	115
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	130	118
Endrin	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	74	109
Endosulfan II	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	112	104
Endrin Aldehyde	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	100	70
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	103	3	110	112	2	116	87

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	279939-9
Date extracted	-			11/10/2021	3	11/10/2021	11/10/2021		11/10/2021	11/10/2021
Date analysed	-			12/10/2021	3	12/10/2021	12/10/2021		12/10/2021	12/10/2021
Dichlorvos	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	89	77
Dimethoate	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	124	114
Fenitrothion	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	97	83
Malathion	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	120	114
Chlorpyriphos	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	128	122
Parathion	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	97	87
Bromophos-ethyl	mg/kg	0.1	Org-022	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	92	86
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	103	3	110	112	2	116	87

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	279939-9
Date extracted	-			11/10/2021	3	11/10/2021	11/10/2021		11/10/2021	11/10/2021
Date analysed	-			12/10/2021	3	12/10/2021	12/10/2021		12/10/2021	12/10/2021
Aroclor 1016	mg/kg	0.1	Org-021	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	<0.1	3	<0.1	<0.1	0	120	120
Aroclor 1260	mg/kg	0.1	Org-021	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	103	3	110	112	2	116	87

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	279939-9
Date prepared	-			13/10/2021	3	13/10/2021	13/10/2021		13/10/2021	13/10/2021
Date analysed	-			13/10/2021	3	13/10/2021	13/10/2021		13/10/2021	13/10/2021
Arsenic	mg/kg	4	Metals-020	<4	3	<4	<4	0	100	100
Cadmium	mg/kg	0.4	Metals-020	<0.4	3	<0.4	<0.4	0	96	93
Chromium	mg/kg	1	Metals-020	<1	3	6	10	50	97	98
Copper	mg/kg	1	Metals-020	<1	3	26	22	17	99	118
Lead	mg/kg	1	Metals-020	<1	3	63	52	19	98	81
Mercury	mg/kg	0.1	Metals-021	<0.1	3	<0.1	<0.1	0	94	115
Nickel	mg/kg	1	Metals-020	<1	3	16	15	6	100	100
Zinc	mg/kg	1	Metals-020	<1	3	57	54	5	97	75
Boron	mg/kg	3	Metals-020	<3	3	20	31	43	99	97
Barium	mg/kg	1	Metals-020	<1	3	130	130	0	104	103
Beryllium	mg/kg	1	Metals-020	<1	3	<1	<1	0	101	101
Cobalt	mg/kg	1	Metals-020	<1	3	4	3	29	98	125
Manganese	mg/kg	1	Metals-020	<1	3	1600	1600	0	99	#
Molybdenum	mg/kg	1	Metals-020	<1	3	<1	3	100	95	99
Antimony	mg/kg	7	Metals-020	<7	3	<7	<7	0	91	93
Selenium	mg/kg	2	Metals-020	<2	3	<4	<4	0	96	95
Tin	mg/kg	1	Metals-020	<1	3	2	2	0	93	96

QUALITY CONTROL: sPOCAS field test						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	[NT]
Date prepared	-			11/10/2021	16	11/10/2021	11/10/2021		11/10/2021	[NT]
Date analysed	-			11/10/2021	16	11/10/2021	11/10/2021		11/10/2021	[NT]
pH_F (field pH test)*	pH Units		Inorg-063	[NT]	16	4.0	3.9	3	100	[NT]
pH_{FOX} (field peroxide test)*	pH Units		Inorg-063	[NT]	16	2.7	2.7	0	100	[NT]

QUALITY CONTROL: VOCs in water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
Date extracted	-			11/10/2021	11	11/10/2021	12/10/2021		11/10/2021	[NT]
Date analysed	-			12/10/2021	11	12/10/2021	13/10/2021		12/10/2021	[NT]
Dichlorodifluoromethane	µg/L	10	Org-023	<10	11	<10	<10	0	[NT]	[NT]
Chloromethane	µg/L	10	Org-023	<10	11	<10	<10	0	[NT]	[NT]
Vinyl Chloride	µg/L	10	Org-023	<10	11	<10	<10	0	[NT]	[NT]
Bromomethane	µg/L	10	Org-023	<10	11	<10	<10	0	[NT]	[NT]
Chloroethane	µg/L	10	Org-023	<10	11	<10	<10	0	[NT]	[NT]
Trichlorofluoromethane	µg/L	10	Org-023	<10	11	<10	<10	0	[NT]	[NT]
1,1-Dichloroethene	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
Trans-1,2-dichloroethene	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
1,1-dichloroethane	µg/L	1	Org-023	<1	11	<1	<1	0	109	[NT]
Cis-1,2-dichloroethene	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
Bromochloromethane	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
Chloroform	µg/L	1	Org-023	<1	11	<1	<1	0	113	[NT]
2,2-dichloropropane	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
1,2-dichloroethane	µg/L	1	Org-023	<1	11	<1	<1	0	112	[NT]
1,1,1-trichloroethane	µg/L	1	Org-023	<1	11	<1	<1	0	101	[NT]
1,1-dichloropropene	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
Cyclohexane	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
Carbon tetrachloride	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
Benzene	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
Dibromomethane	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
1,2-dichloropropane	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
Trichloroethene	µg/L	1	Org-023	<1	11	<1	<1	0	125	[NT]
Bromodichloromethane	µg/L	1	Org-023	<1	11	<1	<1	0	106	[NT]
trans-1,3-dichloropropene	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
cis-1,3-dichloropropene	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
1,1,2-trichloroethane	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
Toluene	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
1,3-dichloropropane	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
Dibromochloromethane	µg/L	1	Org-023	<1	11	<1	<1	0	98	[NT]
1,2-dibromoethane	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
Tetrachloroethene	µg/L	1	Org-023	<1	11	<1	<1	0	95	[NT]
1,1,1,2-tetrachloroethane	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
Chlorobenzene	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
Bromoform	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
m+p-xylene	µg/L	2	Org-023	<2	11	<2	<2	0	[NT]	[NT]
Styrene	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
1,1,2,2-tetrachloroethane	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]

QUALITY CONTROL: VOCs in water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
o-xylene	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
1,2,3-trichloropropane	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
Isopropylbenzene	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
Bromobenzene	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
n-propyl benzene	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
2-chlorotoluene	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
4-chlorotoluene	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
1,3,5-trimethyl benzene	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
Tert-butyl benzene	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
1,2,4-trimethyl benzene	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
1,3-dichlorobenzene	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
Sec-butyl benzene	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
1,4-dichlorobenzene	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
4-isopropyl toluene	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
1,2-dichlorobenzene	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
n-butyl benzene	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
1,2-dibromo-3-chloropropane	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
1,2,4-trichlorobenzene	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
Hexachlorobutadiene	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
1,2,3-trichlorobenzene	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	110	11	108	109	1	108	[NT]
Surrogate toluene-d8	%		Org-023	98	11	95	70	30	95	[NT]
Surrogate 4-BFB	%		Org-023	85	11	87	96	10	108	[NT]

QUALITY CONTROL: BTEX in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
Date extracted	-			11/10/2021	[NT]	[NT]	[NT]	[NT]	11/10/2021	[NT]
Date analysed	-			12/10/2021	[NT]	[NT]	[NT]	[NT]	12/10/2021	[NT]
Benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	113	[NT]
Toluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	111	[NT]
m+p-xylene	µg/L	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	120	[NT]
o-xylene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	116	[NT]
Surrogate Dibromofluoromethane	%		Org-023	110	[NT]	[NT]	[NT]	[NT]	108	[NT]
Surrogate toluene-d8	%		Org-023	98	[NT]	[NT]	[NT]	[NT]	95	[NT]
Surrogate 4-BFB	%		Org-023	85	[NT]	[NT]	[NT]	[NT]	108	[NT]

QUALITY CONTROL: HM in water - dissolved					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date prepared	-			13/10/2021	[NT]	[NT]	[NT]	[NT]	13/10/2021	[NT]
Date analysed	-			13/10/2021	[NT]	[NT]	[NT]	[NT]	13/10/2021	[NT]
Arsenic-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Cadmium-Dissolved	µg/L	0.1	Metals-022	<0.1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Chromium-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Copper-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Lead-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Mercury-Dissolved	µg/L	0.05	Metals-021	<0.05	[NT]	[NT]	[NT]	[NT]	105	[NT]
Nickel-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Zinc-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Boron-Dissolved	µg/L	20	Metals-022	<20	[NT]	[NT]	[NT]	[NT]	96	[NT]
Barium-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Beryllium-Dissolved	µg/L	0.5	Metals-022	<0.5	[NT]	[NT]	[NT]	[NT]	97	[NT]
Cobalt-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Manganese-Dissolved	µg/L	5	Metals-022	<5	[NT]	[NT]	[NT]	[NT]	102	[NT]
Molybdenum-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Antimony-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	90	[NT]
Selenium-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	97	[NT]
Tin-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	98	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Report Comments

Asbestos-ID in soil: NEPM
This report is consistent with the reporting recommendations in the National Environment Protection (Assessment of Site Contamination) Measure, Schedule B1, May 2013. This is reported outside our scope of NATA accreditation.

Acid Extractable Metals in Soil:
- The laboratory RPD acceptance criteria has been exceeded for 279939-3 for Cr. Therefore a triplicate result has been issued as laboratory sample number 279939-26.
- The PQL for Se has been raised due to interferences from analytes (other than those being tested) in sample 279939-3.
- # Percent recovery is not possible to report due to the inhomogeneous nature of the element/s in the sample/s. However an acceptable recovery was obtained for the LCS.

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CERTIFICATE OF ANALYSIS 279939-A

Client Details

Client	Douglas Partners Newcastle
Attention	Dana Wilson
Address	Box 324 Hunter Region Mail Centre, Newcastle, NSW, 2310

Sample Details

Your Reference	**102077.02, Newcastle**
Number of Samples	additional analysis
Date samples received	08/10/2021
Date completed instructions received	13/10/2021

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

Date results requested by	15/10/2021
Date of Issue	15/10/2021

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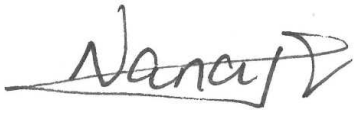
Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

Results Approved By
Dragana Tomas, Senior Chemist

Authorised By



Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Water				
Our Reference	UNITS	279939-A-11	279939-A-12	279939-A-13
Your Reference		GW1	GW3	R1
Depth		-	-	-
Date Sampled		07/10/2021	07/10/2021	07/10/2021
Type of sample		Water	Water	Water
Date extracted	-	11/10/2021	11/10/2021	11/10/2021
Date analysed	-	12/10/2021	12/10/2021	12/10/2021
TRH C_6 - C_9	µg/L	<10	<10	<10
TRH C_6 - C_{10}	µg/L	<10	<10	<10
TRH C_6 - C_{10} less BTEX (F1)	µg/L	<10	<10	<10
Benzene	µg/L	<1	<1	<1
Toluene	µg/L	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	<1
m+p-xylene	µg/L	<2	<2	<2
o-xylene	µg/L	<1	<1	<1
Naphthalene	µg/L	<1	<1	<1
Surrogate Dibromofluoromethane	%	108	108	107
Surrogate toluene-d8	%	95	96	95
Surrogate 4-BFB	%	87	87	86

svTRH (C10-C40) in Water				
Our Reference		279939-A-11	279939-A-12	279939-A-13
Your Reference	UNITS	GW1	GW3	R1
Depth		-	-	-
Date Sampled		07/10/2021	07/10/2021	07/10/2021
Type of sample		Water	Water	Water
Date extracted	-	14/10/2021	14/10/2021	14/10/2021
Date analysed	-	14/10/2021	14/10/2021	14/10/2021
TRH C_{10} - C_{14}	µg/L	<50	<50	<50
TRH C_{15} - C_{28}	µg/L	<100	<100	<100
TRH C_{29} - C_{36}	µg/L	<100	<100	<100
Total +ve TRH (C10-C36)	µg/L	<50	<50	<50
TRH >C_{10} - C_{16}	µg/L	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	µg/L	<50	<50	<50
TRH >C_{16} - C_{34}	µg/L	<100	<100	<100
TRH >C_{34} - C_{40}	µg/L	<100	<100	<100
Total +ve TRH (>C10-C40)	µg/L	<50	<50	<50
Surrogate o-Terphenyl	%	94	80	81

PAHs in Water - Low Level				
Our Reference	UNITS	279939-A-11	279939-A-12	279939-A-13
Your Reference		GW1	GW3	R1
Depth		-	-	-
Date Sampled		07/10/2021	07/10/2021	07/10/2021
Type of sample		Water	Water	Water
Date extracted	-	14/10/2021	14/10/2021	14/10/2021
Date analysed	-	14/10/2021	14/10/2021	14/10/2021
Naphthalene	µg/L	<0.2	<0.2	<0.2
Acenaphthylene	µg/L	<0.1	<0.1	<0.1
Acenaphthene	µg/L	<0.1	<0.1	<0.1
Fluorene	µg/L	<0.1	<0.1	<0.1
Phenanthrene	µg/L	<0.1	<0.1	<0.1
Anthracene	µg/L	<0.1	<0.1	<0.1
Fluoranthene	µg/L	<0.1	<0.1	<0.1
Pyrene	µg/L	<0.1	<0.1	<0.1
Benzo(a)anthracene	µg/L	<0.1	<0.1	<0.1
Chrysene	µg/L	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	µg/L	<0.2	<0.2	<0.2
Benzo(a)pyrene	µg/L	<0.1	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	µg/L	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	µg/L	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ	µg/L	<0.5	<0.5	<0.5
Total +ve PAH's	µg/L	<0.1	<0.1	<0.1
Surrogate p-Terphenyl-d14	%	79	77	79

Method ID	Methodology Summary
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Org-023	Water samples are analysed directly by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			11/10/2021	11	11/10/2021	12/10/2021		11/10/2021	[NT]
Date analysed	-			12/10/2021	11	12/10/2021	13/10/2021		12/10/2021	[NT]
TRH C_6 - C_9	µg/L	10	Org-023	<10	11	<10	<10	0	114	[NT]
TRH C_6 - C_{10}	µg/L	10	Org-023	<10	11	<10	<10	0	114	[NT]
Benzene	µg/L	1	Org-023	<1	11	<1	<1	0	113	[NT]
Toluene	µg/L	1	Org-023	<1	11	<1	<1	0	104	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	11	<1	<1	0	111	[NT]
m+p-xylene	µg/L	2	Org-023	<2	11	<2	<2	0	120	[NT]
o-xylene	µg/L	1	Org-023	<1	11	<1	<1	0	116	[NT]
Naphthalene	µg/L	1	Org-023	<1	11	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	110	11	108	109	1	108	[NT]
Surrogate toluene-d8	%		Org-023	98	11	95	70	30	95	[NT]
Surrogate 4-BFB	%		Org-023	85	11	87	96	10	108	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			14/10/2021	11	14/10/2021	14/10/2021		14/10/2021	[NT]
Date analysed	-			14/10/2021	11	14/10/2021	14/10/2021		14/10/2021	[NT]
TRH C_{10} - C_{14}	µg/L	50	Org-020	<50	11	<50	<50	0	99	[NT]
TRH C_{15} - C_{28}	µg/L	100	Org-020	<100	11	<100	<100	0	93	[NT]
TRH C_{29} - C_{36}	µg/L	100	Org-020	<100	11	<100	<100	0	91	[NT]
TRH >C_{10} - C_{16}	µg/L	50	Org-020	<50	11	<50	<50	0	99	[NT]
TRH >C_{16} - C_{34}	µg/L	100	Org-020	<100	11	<100	<100	0	93	[NT]
TRH >C_{34} - C_{40}	µg/L	100	Org-020	<100	11	<100	<100	0	91	[NT]
Surrogate o-Terphenyl	%		Org-020	81	11	94	80	16	83	[NT]

QUALITY CONTROL: PAHs in Water - Low Level						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			14/10/2021	11	14/10/2021	14/10/2021		14/10/2021	[NT]
Date analysed	-			14/10/2021	11	14/10/2021	14/10/2021		14/10/2021	[NT]
Naphthalene	µg/L	0.2	Org-022/025	<0.2	11	<0.2	<0.2	0	83	[NT]
Acenaphthylene	µg/L	0.1	Org-022/025	<0.1	11	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	µg/L	0.1	Org-022/025	<0.1	11	<0.1	<0.1	0	73	[NT]
Fluorene	µg/L	0.1	Org-022/025	<0.1	11	<0.1	<0.1	0	82	[NT]
Phenanthrene	µg/L	0.1	Org-022/025	<0.1	11	<0.1	<0.1	0	104	[NT]
Anthracene	µg/L	0.1	Org-022/025	<0.1	11	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	µg/L	0.1	Org-022/025	<0.1	11	<0.1	<0.1	0	74	[NT]
Pyrene	µg/L	0.1	Org-022/025	<0.1	11	<0.1	<0.1	0	75	[NT]
Benzo(a)anthracene	µg/L	0.1	Org-022/025	<0.1	11	<0.1	<0.1	0	[NT]	[NT]
Chrysene	µg/L	0.1	Org-022/025	<0.1	11	<0.1	<0.1	0	64	[NT]
Benzo(b,j+k)fluoranthene	µg/L	0.2	Org-022/025	<0.2	11	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	µg/L	0.1	Org-022/025	<0.1	11	<0.1	<0.1	0	96	[NT]
Indeno(1,2,3-c,d)pyrene	µg/L	0.1	Org-022/025	<0.1	11	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	0.1	Org-022/025	<0.1	11	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	0.1	Org-022/025	<0.1	11	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	78	11	79	77	3	80	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Report Comments

pH
Samples were out of the recommended holding time for this analysis.

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CERTIFICATE OF ANALYSIS 279939-B

Client Details

Client	Douglas Partners Newcastle
Attention	Dana Wilson
Address	Box 324 Hunter Region Mail Centre, Newcastle, NSW, 2310

Sample Details

Your Reference	**102077.02, Newcastle**
Number of Samples	additional analysis
Date samples received	08/10/2021
Date completed instructions received	13/10/2021

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	19/10/2021
Date of Issue	19/10/2021
Reissue Details	This report replaces R00 created on 19/10/2021 due to: revised report with Chromium Suite results amended.

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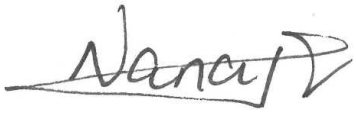
Results Approved By
Dragana Tomas, Senior Chemist
Hannah Nguyen, Metals Supervisor
Priya Samarawickrama, Senior Chemist

Authorised By



Nancy Zhang, Laboratory Manager

Misc Inorg - Soil				
Our Reference		279939-B-1	279939-B-5	279939-B-6
Your Reference	UNITS	201	203	204
Depth		0.5	0.5	0.2
Date Sampled		06/10/2021	06/10/2021	06/10/2021
Type of sample		Soil	Soil	Soil
Date prepared	-	15/10/2021	15/10/2021	15/10/2021
Date analysed	-	15/10/2021	15/10/2021	15/10/2021
pH 1:5 soil:water	pH Units	8.3	8.1	8.7

CEC		
Our Reference		279939-B-5
Your Reference	UNITS	203
Depth		0.5
Date Sampled		06/10/2021
Type of sample		Soil
Date prepared	-	18/10/2021
Date analysed	-	18/10/2021
Exchangeable Ca	meq/100g	8.9
Exchangeable K	meq/100g	0.2
Exchangeable Mg	meq/100g	0.4
Exchangeable Na	meq/100g	<0.1
Cation Exchange Capacity	meq/100g	9.6

TCLP Preparation - Acid			
Our Reference		279939-B-2	279939-B-5
Your Reference	UNITS	201	203
Depth		2.0	0.5
Date Sampled		06/10/2021	06/10/2021
Type of sample		Soil	Soil
pH of soil for fluid# determ.	pH units	8.4	8.3
pH of soil TCLP (after HCl)	pH units	1.9	1.8
Extraction fluid used	-	1	1
pH of final Leachate	pH units	4.9	4.9

PAHs in TCLP (USEPA 1311)		
Our Reference		279939-B-5
Your Reference	UNITS	203
Depth		0.5
Date Sampled		06/10/2021
Type of sample		Soil
Date extracted	-	15/10/2021
Date analysed	-	15/10/2021
Naphthalene in TCLP	mg/L	<0.001
Acenaphthylene in TCLP	mg/L	<0.001
Acenaphthene in TCLP	mg/L	<0.001
Fluorene in TCLP	mg/L	<0.001
Phenanthrene in TCLP	mg/L	<0.001
Anthracene in TCLP	mg/L	<0.001
Fluoranthene in TCLP	mg/L	<0.001
Pyrene in TCLP	mg/L	<0.001
Benzo(a)anthracene in TCLP	mg/L	<0.001
Chrysene in TCLP	mg/L	<0.001
Benzo(bjk)fluoranthene in TCLP	mg/L	<0.002
Benzo(a)pyrene in TCLP	mg/L	<0.001
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	<0.001
Dibenzo(a,h)anthracene in TCLP	mg/L	<0.001
Benzo(g,h,i)perylene in TCLP	mg/L	<0.001
Total +ve PAH's	mg/L	NIL (+)VE
Surrogate p-Terphenyl-d14	%	96

Metals from Leaching Fluid pH 2.9 or 5			
Our Reference		279939-B-2	279939-B-5
Your Reference	UNITS	201	203
Depth		2.0	0.5
Date Sampled		06/10/2021	06/10/2021
Type of sample		Soil	Soil
Date extracted	-	18/10/2021	18/10/2021
Date analysed	-	18/10/2021	18/10/2021
Lead	mg/L	<0.03	0.2

Chromium Suite			
Our Reference		279939-B-23	279939-B-24
Your Reference	UNITS	204	205
Depth		3.1	1.5
Date Sampled		06/10/2021	06/10/2021
Type of sample		Soil	Soil
Date prepared	-	15/10/2021	15/10/2021
Date analysed	-	15/10/2021	15/10/2021
pH $_{kcl}$	pH units	4.0	6.7
s-TAA pH 6.5	%w/w S	0.06	<0.01
TAA pH 6.5	moles H^+ /t	36	<5
Chromium Reducible Sulfur	%w/w	0.26	<0.005
a-Chromium Reducible Sulfur	moles H^+ /t	160	<3
S_{HCl}	%w/w S	0.10	[NT]
S_{KCl}	%w/w S	0.091	[NT]
S_{NAS}	%w/w S	0.010	[NT]
ANC_{BT}	% $CaCO_3$	[NT]	0.15
s-ANC_{BT}	%w/w S	[NT]	<0.05
s-Net Acidity	%w/w S	0.32	<0.005
a-Net Acidity	moles H^+ /t	200	<5
Liming rate	kg $CaCO_3$ /t	15	<0.75
a-Net Acidity without ANCE	moles H^+ /t	200	<5
Liming rate without ANCE	kg $CaCO_3$ /t	15	<0.75
s-Net Acidity without ANCE	%w/w S	0.32	<0.005

Method ID	Methodology Summary
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
INORG-004	Toxicity Characteristic Leaching Procedure (TCLP) using Zero Headspace Extraction (zHE) using AS4439 and USEPA 1311.
Inorg-004	Toxicity Characteristic Leaching Procedure (TCLP) using AS 4439 and USEPA 1311. Please note that the mass used may be scaled down from default based on sample mass available. Samples are stored at 2-6oC before and after leachate preparation.
Inorg-068	Chromium Reducible Sulfur - Hydrogen Sulfide is quantified by iodometric titration after distillation to determine potential acidity.
Metals-020	Determination of various metals by ICP-AES following buffer determination as per USEPA 1311 and hence AS 4439.3. Extraction Fluid 1 refers to the pH 5.0 buffer and Extraction Fluid 2 is the pH 2.9 buffer.
Metals-020	Determination of exchangeable cations and cation exchange capacity in soils using 1M Ammonium Chloride exchange and ICP-AES analytical finish.
Org-022/025	Leachates are extracted with Dichloromethane and analysed by GC-MS/GC-MSMS.

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			15/10/2021	1	15/10/2021	15/10/2021		15/10/2021	[NT]
Date analysed	-			15/10/2021	1	15/10/2021	15/10/2021		15/10/2021	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	1	8.3	8.4	1	101	[NT]

QUALITY CONTROL: CEC						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			18/10/2021	[NT]	[NT]	[NT]	[NT]	18/10/2021	[NT]
Date analysed	-			18/10/2021	[NT]	[NT]	[NT]	[NT]	18/10/2021	[NT]
Exchangeable Ca	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	110	[NT]
Exchangeable K	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Exchangeable Mg	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Exchangeable Na	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	116	[NT]

QUALITY CONTROL: PAHs in TCLP (USEPA 1311)					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
Date extracted	-			15/10/2021	[NT]	[NT]	[NT]	[NT]	15/10/2021	[NT]
Date analysed	-			15/10/2021	[NT]	[NT]	[NT]	[NT]	15/10/2021	[NT]
Naphthalene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	102	[NT]
Acenaphthylene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	88	[NT]
Fluorene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	98	[NT]
Phenanthrene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	122	[NT]
Anthracene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	88	[NT]
Pyrene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	88	[NT]
Benzo(a)anthracene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	78	[NT]
Benzo(bjk)fluoranthene in TCLP	mg/L	0.002	Org-022/025	<0.002	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	88	[NT]
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	109	[NT]	[NT]	[NT]	[NT]	111	[NT]

QUALITY CONTROL: Metals from Leaching Fluid pH 2.9 or 5					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			18/10/2021	[NT]	[NT]	[NT]	[NT]	18/10/2021	[NT]
Date analysed	-			18/10/2021	[NT]	[NT]	[NT]	[NT]	18/10/2021	[NT]
Lead	mg/L	0.03	Metals-020	<0.03	[NT]	[NT]	[NT]	[NT]	97	[NT]

QUALITY CONTROL: Chromium Suite					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			15/10/2021	[NT]	[NT]	[NT]	[NT]	15/10/2021	[NT]
Date analysed	-			15/10/2021	[NT]	[NT]	[NT]	[NT]	15/10/2021	[NT]
pH $_{kcl}$	pH units		Inorg-068	[NT]	[NT]	[NT]	[NT]	[NT]	97	[NT]
s-TAA pH 6.5	%w/w S	0.01	Inorg-068	<0.01	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
TAA pH 6.5	moles H^+ /t	5	Inorg-068	<5	[NT]	[NT]	[NT]	[NT]	97	[NT]
Chromium Reducible Sulfur	%w/w	0.005	Inorg-068	<0.005	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
a-Chromium Reducible Sulfur	moles H^+ /t	3	Inorg-068	<3	[NT]	[NT]	[NT]	[NT]	108	[NT]
S_{HCl}	%w/w S	0.005	Inorg-068	<0.005	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
S_{KCl}	%w/w S	0.005	Inorg-068	<0.005	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
S_{NAS}	%w/w S	0.005	Inorg-068	<0.005	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
ANC_{BT}	% $CaCO_3$	0.05	Inorg-068	<0.05	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
s-ANC_{BT}	%w/w S	0.05	Inorg-068	<0.05	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
s-Net Acidity	%w/w S	0.005	Inorg-068	<0.005	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
a-Net Acidity	moles H^+ /t	5	Inorg-068	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Liming rate	kg $CaCO_3$ /t	0.75	Inorg-068	<0.75	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
a-Net Acidity without ANCE	moles H^+ /t	5	Inorg-068	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Liming rate without ANCE	kg $CaCO_3$ /t	0.75	Inorg-068	<0.75	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
s-Net Acidity without ANCE	%w/w S	0.005	Inorg-068	<0.005	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Report Comments

pH
Samples were out of the recommended holding time for this analysis.

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CERTIFICATE OF ANALYSIS 280242

Client Details

Client	Douglas Partners Newcastle
Attention	Dana Wilson
Address	Box 324 Hunter Region Mail Centre, Newcastle, NSW, 2310

Sample Details

Your Reference	**102077.02, Newcastle**
Number of Samples	3 Water
Date samples received	13/10/2021
Date completed instructions received	13/10/2021

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

Date results requested by	18/10/2021
Date of Issue	18/10/2021

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Results Approved By
Dragana Tomas, Senior Chemist
Giovanni Agosti, Group Technical Manager

Authorised By

Nancy Zhang, Laboratory Manager

VOCs in water				
Our Reference		280242-1	280242-2	280242-3
Your Reference	UNITS	203	204	GWD1
Date Sampled		12/10/2021	12/10/2021	12/10/2021
Type of sample		Water	Water	Water
Date extracted	-	14/10/2021	14/10/2021	14/10/2021
Date analysed	-	15/10/2021	15/10/2021	15/10/2021
Dichlorodifluoromethane	µg/L	<10	<10	<10
Chloromethane	µg/L	<10	<10	<10
Vinyl Chloride	µg/L	<10	<10	<10
Bromomethane	µg/L	<10	<10	<10
Chloroethane	µg/L	<10	<10	<10
Trichlorofluoromethane	µg/L	<10	<10	<10
1,1-Dichloroethene	µg/L	<1	<1	<1
Trans-1,2-dichloroethene	µg/L	<1	<1	<1
1,1-dichloroethane	µg/L	<1	<1	<1
Cis-1,2-dichloroethene	µg/L	<1	<1	<1
Bromochloromethane	µg/L	<1	<1	<1
Chloroform	µg/L	<1	<1	<1
2,2-dichloropropane	µg/L	<1	<1	<1
1,2-dichloroethane	µg/L	<1	<1	<1
1,1,1-trichloroethane	µg/L	<1	<1	<1
1,1-dichloropropene	µg/L	<1	<1	<1
Cyclohexane	µg/L	<1	<1	<1
Carbon tetrachloride	µg/L	<1	<1	<1
Benzene	µg/L	<1	<1	<1
Dibromomethane	µg/L	<1	<1	<1
1,2-dichloropropane	µg/L	<1	<1	<1
Trichloroethene	µg/L	<1	<1	<1
Bromodichloromethane	µg/L	<1	<1	<1
trans-1,3-dichloropropene	µg/L	<1	<1	<1
cis-1,3-dichloropropene	µg/L	<1	<1	<1
1,1,2-trichloroethane	µg/L	<1	<1	<1
Toluene	µg/L	<1	<1	<1
1,3-dichloropropane	µg/L	<1	<1	<1
Dibromochloromethane	µg/L	<1	<1	<1
1,2-dibromoethane	µg/L	<1	<1	<1
Tetrachloroethene	µg/L	<1	<1	<1
1,1,1,2-tetrachloroethane	µg/L	<1	<1	<1
Chlorobenzene	µg/L	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	<1

VOCs in water				
Our Reference	UNITS	280242-1	280242-2	280242-3
Your Reference		203	204	GWD1
Date Sampled		12/10/2021	12/10/2021	12/10/2021
Type of sample		Water	Water	Water
Bromoform	µg/L	<1	<1	<1
m+p-xylene	µg/L	<2	<2	<2
Styrene	µg/L	<1	<1	<1
1,1,2,2-tetrachloroethane	µg/L	<1	<1	<1
o-xylene	µg/L	<1	<1	<1
1,2,3-trichloropropane	µg/L	<1	<1	<1
Isopropylbenzene	µg/L	<1	<1	<1
Bromobenzene	µg/L	<1	<1	<1
n-propyl benzene	µg/L	<1	<1	<1
2-chlorotoluene	µg/L	<1	<1	<1
4-chlorotoluene	µg/L	<1	<1	<1
1,3,5-trimethyl benzene	µg/L	<1	<1	<1
Tert-butyl benzene	µg/L	<1	<1	<1
1,2,4-trimethyl benzene	µg/L	<1	<1	<1
1,3-dichlorobenzene	µg/L	<1	<1	<1
Sec-butyl benzene	µg/L	<1	<1	<1
1,4-dichlorobenzene	µg/L	<1	<1	<1
4-isopropyl toluene	µg/L	<1	<1	<1
1,2-dichlorobenzene	µg/L	<1	<1	<1
n-butyl benzene	µg/L	<1	<1	<1
1,2-dibromo-3-chloropropane	µg/L	<1	<1	<1
1,2,4-trichlorobenzene	µg/L	<1	<1	<1
Hexachlorobutadiene	µg/L	<1	<1	<1
1,2,3-trichlorobenzene	µg/L	<1	<1	<1
Surrogate Dibromofluoromethane	%	98	98	99
Surrogate toluene-d8	%	99	98	99
Surrogate 4-BFB	%	106	108	108

vTRH(C6-C10)/BTEXN in Water				
Our Reference	UNITS	280242-1	280242-2	280242-3
Your Reference		203	204	GWD1
Date Sampled		12/10/2021	12/10/2021	12/10/2021
Type of sample		Water	Water	Water
Date extracted	-	14/10/2021	14/10/2021	14/10/2021
Date analysed	-	15/10/2021	15/10/2021	15/10/2021
TRH C_6 - C_9	µg/L	<10	<10	<10
TRH C_6 - C_{10}	µg/L	<10	<10	<10
TRH C_6 - C_{10} less BTEX (F1)	µg/L	<10	<10	<10
Benzene	µg/L	<1	<1	<1
Toluene	µg/L	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	<1
m+p-xylene	µg/L	<2	<2	<2
o-xylene	µg/L	<1	<1	<1
Naphthalene	µg/L	<1	<1	<1
Surrogate Dibromofluoromethane	%	98	98	99
Surrogate toluene-d8	%	99	98	99
Surrogate 4-BFB	%	106	108	108

svTRH (C10-C40) in Water				
Our Reference		280242-1	280242-2	280242-3
Your Reference	UNITS	203	204	GWD1
Date Sampled		12/10/2021	12/10/2021	12/10/2021
Type of sample		Water	Water	Water
Date extracted	-	14/10/2021	14/10/2021	14/10/2021
Date analysed	-	15/10/2021	15/10/2021	15/10/2021
TRH C_{10} - C_{14}	µg/L	<50	<50	<50
TRH C_{15} - C_{28}	µg/L	<100	<100	<100
TRH C_{29} - C_{36}	µg/L	<100	<100	<100
Total +ve TRH (C10-C36)	µg/L	<50	<50	<50
TRH >C_{10} - C_{16}	µg/L	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	µg/L	<50	<50	<50
TRH >C_{16} - C_{34}	µg/L	<100	<100	<100
TRH >C_{34} - C_{40}	µg/L	<100	<100	<100
Total +ve TRH (>C10-C40)	µg/L	<50	<50	<50
Surrogate o-Terphenyl	%	78	98	97

PAHs in Water - Low Level				
Our Reference	UNITS	280242-1	280242-2	280242-3
Your Reference		203	204	GWD1
Date Sampled		12/10/2021	12/10/2021	12/10/2021
Type of sample		Water	Water	Water
Date extracted	-	14/10/2021	14/10/2021	14/10/2021
Date analysed	-	14/10/2021	14/10/2021	14/10/2021
Naphthalene	µg/L	<0.2	<0.2	<0.2
Acenaphthylene	µg/L	<0.1	<0.1	<0.1
Acenaphthene	µg/L	<0.1	<0.1	<0.1
Fluorene	µg/L	<0.1	<0.1	<0.1
Phenanthrene	µg/L	<0.1	<0.1	<0.1
Anthracene	µg/L	<0.1	<0.1	<0.1
Fluoranthene	µg/L	<0.1	<0.1	<0.1
Pyrene	µg/L	<0.1	<0.1	<0.1
Benzo(a)anthracene	µg/L	<0.1	<0.1	<0.1
Chrysene	µg/L	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	µg/L	<0.2	<0.2	<0.2
Benzo(a)pyrene	µg/L	<0.1	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	µg/L	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	µg/L	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ	µg/L	<0.5	<0.5	<0.5
Total +ve PAH's	µg/L	<0.1	<0.1	<0.1
Surrogate p-Terphenyl-d14	%	75	82	76

All metals in water-dissolved				
Our Reference	UNITS	280242-1	280242-2	280242-3
Your Reference		203	204	GWD1
Date Sampled		12/10/2021	12/10/2021	12/10/2021
Type of sample		Water	Water	Water
Date prepared	-	14/10/2021	14/10/2021	14/10/2021
Date analysed	-	14/10/2021	14/10/2021	14/10/2021
Arsenic-Dissolved	µg/L	<1	2	2
Boron-Dissolved	µg/L	40	270	280
Barium-Dissolved	µg/L	16	29	31
Beryllium-Dissolved	µg/L	<0.5	<0.5	<0.5
Cadmium-Dissolved	µg/L	<0.1	0.1	0.1
Chromium-Dissolved	µg/L	<1	<1	<1
Copper-Dissolved	µg/L	3	2	2
Cobalt-Dissolved	µg/L	<1	1	1
Mercury-Dissolved	µg/L	<0.05	<0.05	<0.05
Manganese-Dissolved	µg/L	6	36	36
Molybdenum-Dissolved	µg/L	2	10	11
Nickel-Dissolved	µg/L	8	4	4
Lead-Dissolved	µg/L	<1	<1	<1
Antimony-Dissolved	µg/L	4	4	4
Selenium-Dissolved	µg/L	<1	3	3
Tin-Dissolved	µg/L	<1	<1	<1
Zinc-Dissolved	µg/L	320	280	290

Method ID	Methodology Summary
Metals-021	Determination of Mercury by Cold Vapour AAS.
Metals-022	Determination of various metals by ICP-MS.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Org-023	Water samples are analysed directly by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.

QUALITY CONTROL: VOCs in water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			14/10/2021	1	14/10/2021	15/10/2021		14/10/2021	[NT]
Date analysed	-			15/10/2021	1	15/10/2021	18/10/2021		15/10/2021	[NT]
Dichlorodifluoromethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Chloromethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Vinyl Chloride	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Bromomethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Chloroethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Trichlorofluoromethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
1,1-Dichloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Trans-1,2-dichloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,1-dichloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	92	[NT]
Cis-1,2-dichloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Bromochloromethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Chloroform	µg/L	1	Org-023	<1	1	<1	<1	0	100	[NT]
2,2-dichloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2-dichloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	93	[NT]
1,1,1-trichloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	91	[NT]
1,1-dichloropropene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Cyclohexane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Carbon tetrachloride	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Dibromomethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2-dichloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Trichloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	97	[NT]
Bromodichloromethane	µg/L	1	Org-023	<1	1	<1	<1	0	92	[NT]
trans-1,3-dichloropropene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
cis-1,3-dichloropropene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,1,2-trichloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Toluene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,3-dichloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Dibromochloromethane	µg/L	1	Org-023	<1	1	<1	<1	0	91	[NT]
1,2-dibromoethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Tetrachloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	101	[NT]
1,1,1,2-tetrachloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Chlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Bromoform	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
m+p-xylene	µg/L	2	Org-023	<2	1	<2	<2	0	[NT]	[NT]
Styrene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,1,2,2-tetrachloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]

QUALITY CONTROL: VOCs in water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
o-xylene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2,3-trichloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Isopropylbenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Bromobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
n-propyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
2-chlorotoluene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
4-chlorotoluene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,3,5-trimethyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Tert-butyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2,4-trimethyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,3-dichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Sec-butyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,4-dichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
4-isopropyl toluene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2-dichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
n-butyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2-dibromo-3-chloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2,4-trichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Hexachlorobutadiene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2,3-trichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	97	1	98	99	1	120	[NT]
Surrogate toluene-d8	%		Org-023	99	1	99	98	1	117	[NT]
Surrogate 4-BFB	%		Org-023	105	1	106	102	4	105	[NT]

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			14/10/2021	1	14/10/2021	15/10/2021		14/10/2021	[NT]
Date analysed	-			15/10/2021	1	15/10/2021	18/10/2021		15/10/2021	[NT]
TRH C_6 - C_9	µg/L	10	Org-023	<10	1	<10	<10	0	97	[NT]
TRH C_6 - C_{10}	µg/L	10	Org-023	<10	1	<10	<10	0	97	[NT]
Benzene	µg/L	1	Org-023	<1	1	<1	<1	0	97	[NT]
Toluene	µg/L	1	Org-023	<1	1	<1	<1	0	99	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	1	<1	<1	0	97	[NT]
m+p-xylene	µg/L	2	Org-023	<2	1	<2	<2	0	97	[NT]
o-xylene	µg/L	1	Org-023	<1	1	<1	<1	0	95	[NT]
Naphthalene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	97	1	98	99	1	120	[NT]
Surrogate toluene-d8	%		Org-023	99	1	99	98	1	117	[NT]
Surrogate 4-BFB	%		Org-023	105	1	106	102	4	105	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			14/10/2021	[NT]	[NT]	[NT]	[NT]	14/10/2021	[NT]
Date analysed	-			14/10/2021	[NT]	[NT]	[NT]	[NT]	14/10/2021	[NT]
TRH C_{10} - C_{14}	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	109	[NT]
TRH C_{15} - C_{28}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	104	[NT]
TRH C_{29} - C_{36}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	94	[NT]
TRH >C_{10} - C_{16}	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	109	[NT]
TRH >C_{16} - C_{34}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	104	[NT]
TRH >C_{34} - C_{40}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	94	[NT]
Surrogate o-Terphenyl	%		Org-020	79	[NT]	[NT]	[NT]	[NT]	87	[NT]

QUALITY CONTROL: PAHs in Water - Low Level						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			14/10/2021	[NT]	[NT]	[NT]	[NT]	14/10/2021	[NT]
Date analysed	-			14/10/2021	[NT]	[NT]	[NT]	[NT]	14/10/2021	[NT]
Naphthalene	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	83	[NT]
Acenaphthylene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	73	[NT]
Fluorene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	82	[NT]
Phenanthrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Anthracene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	74	[NT]
Pyrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	75	[NT]
Benzo(a)anthracene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	64	[NT]
Benzo(b,j+k)fluoranthene	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Indeno(1,2,3-c,d)pyrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	78	[NT]	[NT]	[NT]	[NT]	80	[NT]

QUALITY CONTROL: All metals in water-dissolved					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			14/10/2021	[NT]	[NT]	[NT]	[NT]	14/10/2021	[NT]
Date analysed	-			14/10/2021	[NT]	[NT]	[NT]	[NT]	14/10/2021	[NT]
Arsenic-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Boron-Dissolved	µg/L	20	Metals-022	<20	[NT]	[NT]	[NT]	[NT]	101	[NT]
Barium-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Beryllium-Dissolved	µg/L	0.5	Metals-022	<0.5	[NT]	[NT]	[NT]	[NT]	101	[NT]
Cadmium-Dissolved	µg/L	0.1	Metals-022	<0.1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Chromium-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Copper-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Cobalt-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Mercury-Dissolved	µg/L	0.05	Metals-021	<0.05	[NT]	[NT]	[NT]	[NT]	102	[NT]
Manganese-Dissolved	µg/L	5	Metals-022	<5	[NT]	[NT]	[NT]	[NT]	99	[NT]
Molybdenum-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Nickel-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Lead-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Antimony-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Selenium-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Tin-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	97	[NT]
Zinc-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	99	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Douglas Partners
Geotechnics / Environment / Groundwater

Table B1: Summary of Laboratory Results for Soil (Residential Land Use Comparison – HIL B / HSL / EIL B)

			Metals									TRH						BTEX				PAH			
			Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	Manganese	TRH C6 - C10	TRH >C10-C16	F1 ((C6-C10)-BTEX)	F2 (>C10-C16 less Naphthalene)	F3 (>C16-C34)	F4 (>C34-C40)	Benzene	Toluene	Ethylbenzene	Total Xylenes	Naphthalene [b]	Benzo(a)pyrene (BaP)	Benzo(a)pyrene TEQ	Total PAHs
		PQL	4	0.4	1	1	1	0.1	1	1	1	25	50	25	50	100	100	0.2	0.5	1	1	1	0.05	0.5	0.05
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
201	0.5 m	06/10/2021	**4**	<0.4	**7**	**9**	**10**	<0.1	**4**	**45**	**550**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	**0.72**
			500 100	150 -	500 330	30000 210	1200 1100	120 -	1200 160	60000 510	14000 -	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 33	4 -	400 -
201	2 m	06/10/2021	<4	<0.4	**7**	**58**	**170**	**0.4**	**14**	**130**	**110**	<25	<50	<25	<50	**320**	<100	<0.2	<0.5	<1	<1	<1	**0.3**	<0.5	**4.7**
			500 100	150 -	500 330	30000 65	1200 1100	120 -	1200 160	60000 510	14000 -	- -	- 120	110 180	440 -	- 300	- 2800	0.5 50	310 85	NL 70	95 105	NL 170	- 33	4 -	400 -
202	0.2 m	06/10/2021	<4	<0.4	**6**	**26**	**63**	<0.1	**16**	**57**	**1600**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.4**	<0.5	**3.8**
			500 100	150 -	500 330	30000 210	1200 1100	120 -	1200 160	60000 510	14000 -	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 33	4 -	400 -
D1/JRK	0 m	06/10/2021	<4	<0.4	**6**	**37**	**85**	**0.1**	**21**	**82**	**240**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.5**	**0.7**	**5.8**
			500 100	150 -	500 330	30000 210	1200 1100	120 -	1200 160	60000 510	14000 -	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 33	4 -	400 -
202	3.5 m	06/10/2021	<4	<0.4	**2**	<1	**1**	<0.1	**1**	**2**	**4**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			500 100	150 -	500 330	30000 65	1200 1100	120 -	1200 160	60000 510	14000 -	- -	- 120	110 180	440 -	- 300	- 2800	0.5 50	310 85	NL 70	95 105	NL 170	- 33	4 -	400 -
203	0.5 m	06/10/2021	<4	**0.4**	**14**	**93**	**470**	**0.2**	**15**	**230**	**360**	<25	<50	<25	<50	**220**	<100	<0.2	<0.5	<1	<1	<1	**4.2**	**7.2**	**69**
			500 100	150 -	500 330	30000 210	1200 1100	120 -	1200 160	60000 510	14000 -	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 33	4 -	400 -
204	0.2 m	06/10/2021	**6**	<0.4	**5**	**7**	**9**	<0.1	**4**	**17**	**280**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			500 100	150 -	500 330	30000 210	1200 1100	120 -	1200 160	60000 510	14000 -	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 33	4 -	400 -
204	4 m	06/10/2021	**4**	<0.4	**2**	<1	**1**	<0.1	**2**	**3**	**8**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			500 100	150 -	500 330	30000 65	1200 1100	120 -	1200 160	60000 510	14000 -	- -	- 120	200 180	NL -	- 300	- 2800	0.5 50	540 85	NL 70	170 105	NL 170	- 33	4 -	400 -
205	0.5 m	06/10/2021	<4	<0.4	**2**	**7**	**14**	<0.1	**1**	**18**	**56**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			500 100	150 -	500 330	30000 210	1200 1100	120 -	1200 160	60000 510	14000 -	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 33	4 -	400 -
301	0.1 - 0.2 m	9/10/2021	**5**	<0.4	**5**	**3**	**20**	<0.1	**3**	**27**	**370**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			500 100	150 -	500 330	30000 210	1200 1100	120 -	1200 160	60000 510	14000 -	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 33	4 -	400 -
302	0.5 - 0.6 m	9/10/2021	<4	<0.4	**3**	**44**	**190**	**0.1**	**6**	**160**	**230**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.3**	<0.5	**2.8**
			500 100	150 -	500 330	30000 210	1200 1100	120 -	1200 160	60000 510	14000 -	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 33	4 -	400 -
D1/DEW	-	9/10/2021	<4	<0.4	**6**	**29**	**140**	**0.1**	**4**	**100**	**330**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.2**	<0.5	**2.4**
			500 100	150 -	500 330	30000 210	1200 1100	120 -	1200 160	60000 510	14000 -	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 33	4 -	400 -
302	1.4 - 1.5 m	9/10/2021	<4	<0.4	<1	**10**	**4**	<0.1	<1	**4**	**5**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.1**	<0.5	**0.72**
			500 100	150 -	500 330	30000 210	1200 1100	120 -	1200 160	60000 510	14000 -	- -	- 120	70 180	240 -	- 300	- 2800	0.5 50	220 85	NL 70	60 105	NL 170	- 33	4 -	400 -
303	0.6 - 0.7 m	9/10/2021	<4	<0.4	**5**	**25**	**130**	**0.1**	**3**	**84**	**160**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.2**	<0.5	**1.8**
			500 100	150 -	500 330	30000 210	1200 1100	120 -	1200 160	60000 510	14000 -	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 33	4 -	400 -
304	0.5 - 0.6 m	9/10/2021	<4	<0.4	**1**	<1	**3**	<0.1	<1	**4**	**33**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			500 100	150 -	500 330	30000 210	1200 1100	120 -	1200 160	60000 510	14000 -	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 33	4 -	400 -
305	0.2 - 0.3 m	9/10/2021	**4**	<0.4	**6**	**88**	**1100**	**0.3**	**12**	**260**	**180**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.53**	**0.8**	**5.5**
			500 100	150 -	500 330	30000 210	1200 1100	120 -	1200 160	60000 510	14000 -	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 33	4 -	400 -
305	0.55 m	9/10/2021	<4	<0.4	**4**	**50**	**580**	**0.2**	**7**	**150**	**180**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.4**	**0.7**	**5.4**
			500 100	150 -	500 330	30000 210	1200 1100	120 -	1200 160	60000 510	14000 -	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 33	4 -	400 -
306	0.25 - 0.35 m	9/10/2021	<4	<0.4	**7**	**60**	**310**	**0.3**	**9**	**300**	**410**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.77**	**1.2**	**6.8**
			500 100	150 -	500 330	30000 210	1200 1100	120 -	1200 160	60000 510	14000 -	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 33	4 -	400 -
307	0.2 - 0.3 m	9/10/2021	**5**	<0.4	**6**	**9**	**6**	<0.1	**9**	**29**	**170**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			500 100	150 -	500 330	30000 210	1200 1100	120 -	1200 160	60000 510	14000 -	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 33	4 -	400 -

Lab result

HIL/HSL value EIL/ESL value

HIL/HSL exceedance EIL/ESL exceedance HIL/HSL and EIL/ESL exceedance ML exceedance ML and HIL/HSL or EIL/ESL exceedance

Indicates that asbestos has been detected by the lab, refer to the lab report **Blue** = DC exceedance HSL 0-<1 Exceedance

Bold = Lab detections - = Not tested or No HIL/HSL/EIL/ESL (as applicable) or Not applicable NL = Non limiting AD = Asbestos detected NAD = No Asbestos detected

HIL = Health investigation level HSL = Health screening level (excluding DC) EIL = Ecological investigation level ESL = Ecological screening level ML = Management Limit DC = Direct Contact HSL

Notes:

a QA/QC replicate of sample listed directly below the primary sample

b Reported naphthalene laboratory result obtained from BTEXN suite

c Criteria applies to DDT only

D1/DEW Replicate of 302/0.5 m

D1/JRK Replicate of 202/0.2 m

Site Assessment Criteria (SAC):

Refer to the SAC section of report for information of SAC sources and rationale. Summary information as follows:

SAC based on generic land use thresholds for Residential B with minimal opportunities for soil access

HIL B Residential / Low - High Density (NEPC, 2013)

HSL A/B Residential / Low - High Density (vapour intrusion) (NEPC, 2013)

DC HSL B Direct contact HSL B Residential (High density) (direct contact) (CRC CARE, 2011)

EIL/ESL UR/POS Urban Residential and Public Open Space (NEPC, 2013)

ML R/P/POS Residential, Parkland and Public Open Space (NEPC, 2013)

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Table B1: Summary of Laboratory Results for Soil (Residential Land Use Comparison – HIL B / HSL / EIL B) (Continued)

			OCP											OPP	PCB								Asbestos							
			DDD	DDT+DDE+DDD [c]	DDE	DDT	Aldrin & Dieldrin	Total Chlordane	Endrin	Total Endosulfan	Heptachlor	Hexachlorobenzene	Methoxychlor	Chlorpyriphos	Aroclor 1016	Total PCB	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	Asbestos ID in soil <0.1g/kg	Trace Analysis	Asbestos ID in soil <0.1g/kg	ACM >7mm Estimation	FA and AF Estimation	FA and AF Estimation	Asbestos (500 ml)	Asbestos in Material
		PQL	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1						<0.001	0.001	-
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	-	-	-	g	g	%(w/w)	-	-
201	0.5 m	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-
			- -	600 180	- -	- 180	10 -	90 -	20 -	400 -	10 -	15 -	500 -	340 -	- -	1 -	- -	- -	- -	- -	- -	- -								
201	2 m	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-
			- -	600 180	- -	- 180	10 -	90 -	20 -	400 -	10 -	15 -	500 -	340 -	- -	1 -	- -	- -	- -	- -	- -	- -								
202	0.2 m	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-
			- -	600 180	- -	- 180	10 -	90 -	20 -	400 -	10 -	15 -	500 -	340 -	- -	1 -	- -	- -	- -	- -	- -	- -								
D1/JRK	0 m	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-
			- -	600 180	- -	- 180	10 -	90 -	20 -	400 -	10 -	15 -	500 -	340 -	- -	1 -	- -	- -	- -	- -	- -	- -								
203	0.5 m	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-
			- -	600 180	- -	- 180	10 -	90 -	20 -	400 -	10 -	15 -	500 -	340 -	- -	1 -	- -	- -	- -	- -	- -	- -								
204	0.2 m	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-
			- -	600 180	- -	- 180	10 -	90 -	20 -	400 -	10 -	15 -	500 -	340 -	- -	1 -	- -	- -	- -	- -	- -	- -								
205	0.2 m	06/10/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD	-
			- -	600 180	- -	- 180	10 -	90 -	20 -	400 -	10 -	15 -	500 -	340 -	- -	1 -	- -	- -	- -	- -	- -	- -								
205	0.5 m	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	NT	NT	-	NAD	-
			- -	600 180	- -	- 180	10 -	90 -	20 -	400 -	10 -	15 -	500 -	340 -	- -	1 -	- -	- -	- -	- -	- -	- -								
301	0.1 - 0.2 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-
			- -	600 180	- -	- 180	10 -	90 -	20 -	400 -	10 -	15 -	500 -	340 -	- -	1 -	- -	- -	- -	- -	- -	- -								
302	0.5 - 0.6 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-
			- -	600 180	- -	- 180	10 -	90 -	20 -	400 -	10 -	15 -	500 -	340 -	- -	1 -	- -	- -	- -	- -	- -	- -								
D1/DEW	-	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-
			- -	600 180	- -	- 180	10 -	90 -	20 -	400 -	10 -	15 -	500 -	340 -	- -	1 -	- -	- -	- -	- -	- -	- -								
302	1.4 - 1.5 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-
			- -	600 180	- -	- 180	10 -	90 -	20 -	400 -	10 -	15 -	500 -	340 -	- -	1 -	- -	- -	- -	- -	- -	- -								
303	0.6 - 0.7 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	NT	NT	-	NAD	-
			- -	600 180	- -	- 180	10 -	90 -	20 -	400 -	10 -	15 -	500 -	340 -	- -	1 -	- -	- -	- -	- -	- -	- -								
304	0.5 - 0.6 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	NT	NT	-	NAD	-
			- -	600 180	- -	- 180	10 -	90 -	20 -	400 -	10 -	15 -	500 -	340 -	- -	1 -	- -	- -	- -	- -	- -	- -								
305	0.2 - 0.3 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	NT	NT	-	NAD	-
			- -	600 180	- -	- 180	10 -	90 -	20 -	400 -	10 -	15 -	500 -	340 -	- -	1 -	- -	- -	- -	- -	- -	- -								
305	0.55 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	**AD**	NAD	**AD**	NT	**0.0328**	**0.0049**	**AD**	-
			- -	600 180	- -	- 180	10 -	90 -	20 -	400 -	10 -	15 -	500 -	340 -	- -	1 -	- -	- -	- -	- -	- -	- -								
306	0.25 - 0.35 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	NT	NT	-	NAD	-
			- -	600 180	- -	- 180	10 -	90 -	20 -	400 -	10 -	15 -	500 -	340 -	- -	1 -	- -	- -	- -	- -	- -	- -								
307	0.2 - 0.3 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-
			- -	600 180	- -	- 180	10 -	90 -	20 -	400 -	10 -	15 -	500 -	340 -	- -	1 -	- -	- -	- -	- -	- -	- -								
S1	0 - 0.05 m	9/10/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD	-
			- -	600 180	- -	- 180	10 -	90 -	20 -	400 -	10 -	15 -	500 -	340 -	- -	1 -	- -	- -	- -	- -	- -	- -								
S1/F	0.05 m	9/10/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD	**AD**
			- -	600 180	- -	- 180	10 -	90 -	20 -	400 -	10 -	15 -	500 -	340 -	- -	1 -	- -	- -	- -	- -	- -	- -								
305/F	0.55 m	9/10/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**AD**
			- -	600 180	- -	- 180	10 -	90 -	20 -	400 -	10 -	15 -	500 -	340 -	- -	1 -	- -	- -	- -	- -	- -	- -								

Lab result
HIL/HSL value EIL/ESL value

HIL/HSL exceedance EIL/ESL exceedance HIL/HSL and EIL/ESL exceedance ML exceedance ML and HIL/HSL or EIL/ESL exceedance

Indicates that asbestos has been detected by the lab, refer to the lab report **Blue** = DC exceedance HSL 0-<1 Exceedance

Bold = Lab detections - = Not tested or No HIL/HSL/EIL/ESL (as applicable) or Not applicable NL = Non limiting AD = Asbestos detected NAD = No Asbestos detected

HIL = Health investigation level HSL = Health screening level (excluding DC) EIL = Ecological investigation level ESL = Ecological screening level ML = Management Limit DC = Direct Contact HSL

Notes:

a	QA/QC replicate of sample listed directly below the primary sample
b	Reported naphthalene laboratory result obtained from BTEXN suite
c	Criteria applies to DDT only
D1/DEW	Replicate of 302/0.5 m
D1/JRK	Replicate of 202/0.2 m

Site Assessment Criteria (SAC):

Refer to the SAC section of report for information of SAC sources and rationale. Summary information as follows:

SAC based on generic land use thresholds for Residential B with minimal opportunities for soil access

HIL B	Residential / Low - High Density (NEPC, 2013)
HSL A/B	Residential / Low - High Density (vapour intrusion) (NEPC, 2013)
DC HSL B	Direct contact HSL B Residential (High density) (direct contact) (CRC CARE, 2011)
EIL/ESL UR/POS	Urban Residential and Public Open Space (NEPC, 2013)
ML R/P/POS	Residential, Parkland and Public Open Space (NEPC, 2013)

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Table B2: Summary of Laboratory Results for Soil (Residential Land Use Comparison – HIL D / HSL D / EIL D)

			Metals									TRH						BTEX				PAH			
			Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	Manganese	TRH C6 - C10	TRH >C10-C16	F1 ((C6-C10)-BTEX)	F2 (>C10-C16 less Naphthalene)	F3 (>C16-C34)	F4 (>C34-C40)	Benzene	Toluene	Ethylbenzene	Total Xylenes	Naphthalene [b]	Benzo(a)pyrene (BaP)	Benzo(a)pyrene TEQ	Total PAHs
		PQL	4	0.4	1	1	1	0.1	1	1	1	25	50	25	50	100	100	0.2	0.5	1	1	1	0.05	0.5	0.05
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
201	0.5 m	06/10/2021	**4**	<0.4	**7**	**9**	**10**	<0.1	**4**	**45**	**550**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	**0.72**
			3000 160	900 -	3600 540	240000 300	1500 1800	730 -	6000 260	400000 730	60000 -	- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
201	2 m	06/10/2021	<4	<0.4	**7**	**58**	**170**	**0.4**	**14**	**130**	**110**	<25	<50	<25	<50	**320**	<100	<0.2	<0.5	<1	<1	<1	**0.3**	<0.5	**4.7**
			3000 160	900 -	3600 540	240000 85	1500 1800	730 -	6000 260	400000 250	60000 -	- -	- 170	630 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	NL 180	NL 370	- 33	40 -	4000 -
202	0.2 m	06/10/2021	<4	<0.4	**6**	**26**	**63**	<0.1	**16**	**57**	**1600**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.4**	<0.5	**3.8**
			3000 160	900 -	3600 540	240000 300	1500 1800	730 -	6000 260	400000 730	60000 -	- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
D1/JRK	-	06/10/2021	<4	<0.4	**6**	**37**	**85**	**0.1**	**21**	**82**	**240**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.5**	**0.7**	**5.8**
			3000 160	900 -	3600 540	240000 300	1500 1800	730 -	6000 260	400000 730	60000 -	- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
202	3.5 m	06/10/2021	<4	<0.4	**2**	<1	**1**	<0.1	**1**	**2**	**4**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160	900 -	3600 540	240000 85	1500 1800	730 -	6000 260	400000 250	60000 -	- -	- 170	630 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	NL 180	NL 370	- 33	40 -	4000 -
203	0.5 m	06/10/2021	<4	**0.4**	**14**	**93**	**470**	**0.2**	**15**	**230**	**360**	<25	<50	<25	<50	**220**	<100	<0.2	<0.5	<1	<1	<1	**4.2**	**7.2**	**69**
			3000 160	900 -	3600 540	240000 300	1500 1800	730 -	6000 260	400000 730	60000 -	- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
204	0.2 m	06/10/2021	**6**	<0.4	**5**	**7**	**9**	<0.1	**4**	**17**	**280**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160	900 -	3600 540	240000 300	1500 1800	730 -	6000 260	400000 730	60000 -	- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
204	4 m	06/10/2021	**4**	<0.4	**2**	<1	**1**	<0.1	**2**	**3**	**8**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160	900 -	3600 540	240000 85	1500 1800	730 -	6000 260	400000 250	60000 -	- -	- 170	NL 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	NL 180	NL 370	- 33	40 -	4000 -
205	0.5 m	06/10/2021	<4	<0.4	**2**	**7**	**14**	<0.1	**1**	**18**	**56**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160	900 -	3600 540	240000 300	1500 1800	730 -	6000 260	400000 730	60000 -	- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
301	0.1 - 0.2 m	9/10/2021	**5**	<0.4	**5**	**3**	**20**	<0.1	**3**	**27**	**370**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160	900 -	3600 540	240000 300	1500 1800	730 -	6000 260	400000 730	60000 -	- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
302	0.5 - 0.6 m	9/10/2021	<4	<0.4	**3**	**44**	**190**	**0.1**	**6**	**160**	**230**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.3**	<0.5	**2.8**
			3000 160	900 -	3600 540	240000 300	1500 1800	730 -	6000 260	400000 730	60000 -	- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
D1/DEW	-	9/10/2021	<4	<0.4	**6**	**29**	**140**	**0.1**	**4**	**100**	**330**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.2**	<0.5	**2.4**
			3000 160	900 -	3600 540	240000 300	1500 1800	730 -	6000 260	400000 730	60000 -	- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
302	1.4 - 1.5 m	9/10/2021	<4	<0.4	<1	**10**	**4**	<0.1	<1	**4**	**5**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.1**	<0.5	**0.72**
			3000 160	900 -	3600 540	240000 300	1500 1800	730 -	6000 260	400000 730	60000 -	- -	- 170	370 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	NL 180	NL 370	- 33	40 -	4000 -
303	0.6 - 0.7 m	9/10/2021	<4	<0.4	**5**	**25**	**130**	**0.1**	**3**	**84**	**160**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.2**	<0.5	**1.8**
			3000 160	900 -	3600 540	240000 300	1500 1800	730 -	6000 260	400000 730	60000 -	- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
304	0.5 - 0.6 m	9/10/2021	<4	<0.4	**1**	<1	**3**	<0.1	<1	**4**	**33**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160	900 -	3600 540	240000 300	1500 1800	730 -	6000 260	400000 730	60000 -	- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
305	0.2 - 0.3 m	9/10/2021	**4**	<0.4	**6**	**88**	**1100**	**0.3**	**12**	**260**	**180**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.53**	**0.8**	**5.5**
			3000 160	900 -	3600 540	240000 300	1500 1800	730 -	6000 260	400000 730	60000 -	- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
305	0.55 m	9/10/2021	<4	<0.4	**4**	**50**	**580**	**0.2**	**7**	**150**	**180**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.4**	**0.7**	**5.4**
			3000 160	900 -	3600 540	240000 300	1500 1800	730 -	6000 260	400000 730	60000 -	- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
306	0.25 - 0.35 m	9/10/2021	<4	<0.4	**7**	**60**	**310**	**0.3**	**9**	**300**	**410**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.77**	**1.2**	**6.8**
			3000 160	900 -	3600 540	240000 300	1500 1800	730 -	6000 260	400000 730	60000 -	- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -
307	0.2 - 0.3 m	9/10/2021	**5**	<0.4	**6**	**9**	**6**	<0.1	**9**	**29**	**170**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160	900 -	3600 540	240000 300	1500 1800	730 -	6000 260	400000 730	60000 -	- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 33	40 -	4000 -

Lab result
HIL/HSL value EIL/ESL value

HIL/HSL exceedance EIL/ESL exceedance HIL/HSL and EIL/ESL exceedance ML exceedance ML and HIL/HSL or EIL/ESL exceedance

Indicates that asbestos has been detected by the lab, refer to the lab report **Blue** = DC exceedance HSL 0-<1 Exceedance

Bold = Lab detections - = Not tested or No HIL/HSL/EIL/ESL (as applicable) or Not applicable NL = Non limiting AD = Asbestos detected NAD = No Asbestos detected

HIL = Health investigation level HSL = Health screening level (excluding DC) EIL = Ecological investigation level ESL = Ecological screening level ML = Management Limit DC = Direct Contact HSL

Notes:

a	QA/QC replicate of sample listed directly below the primary sample
b	Reported naphthalene laboratory result obtained from BTEXN suite
c	Criteria applies to DDT only
D1/DEW	Replicate of 302/0.5 m
D1/JRK	Replicate of 202/0.2 m

Site Assessment Criteria (SAC):

Refer to the SAC section of report for information of SAC sources and rationale. Summary information as follows:

SAC based on generic land use thresholds for Commercial/ industrial D

HIL D	Commercial / Industrial (NEPC, 2013)
HSL D	Commercial / Industrial (vapour intrusion) (NEPC, 2013)
DC HSL D	Direct contact HSL D Commercial/Industrial (direct contact) (CRC CARE, 2011)
EIL/ESL C/Ind	Commercial and Industrial (NEPC, 2013)
ML C/Ind	Commercial and Industrial (NEPC, 2013)

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Table B2: Summary of Laboratory Results for Soil (Residential Land Use Comparison – HIL D / HSL D / EIL D) (Continued)

			OCP											OPP	PCB									Asbestos							
			DDD	DDT+DDE+DDD [c]	DDE	DDT	Aldrin & Dieldrin	Total Chlordane	Endrin	Total Endosulfan	Heptachlor	Hexachlorobenzene	Methoxychlor	Chlorpyriphos	Aroclor 1016	Total PCB	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	Asbestos ID in soil <0.1g/kg	Trace Analysis	Asbestos ID in soil <0.1g/kg	ACM >7mm Estimation	FA and AF Estimation	FA and AF Estimation	Asbestos (500 ml)	Asbestos in Material
		PQL	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1						<0.001	0.001	0.001
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	-	-	-	g	g	%(w/w)	-	-
D1/JRK	0 m	06/10/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -								
201	0.5 m	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -								
201	2 m	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -								
202	0.2 m	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -								
D1/JRK	-	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -								
203	0.5 m	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -								
204	0.2 m	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -								
205	0.2 m	06/10/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	AD	AD	AD	NT	NT	-	AD	AD
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -								
205	0.5 m	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	AD	AD	AD	NT	NT	-	AD	AD
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -								
301	0.1 - 0.2 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -								
302	0.5 - 0.6 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -								
D1/DEW	-	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -								
302	1.4 - 1.5 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -								
303	0.6 - 0.7 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	NT	NT	-	NAD	NAD
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -								
304	0.5 - 0.6 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	NT	NT	-	NAD	NAD
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -								
305	0.2 - 0.3 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	NT	NT	-	NAD	NAD
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -								
305	0.55 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	AD	NAD	AD	NT	**0.0328**	**0.0049**	AD	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -								
306	0.25 - 0.35 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	NT	NT	-	NAD	NAD
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -								
307	0.2 - 0.3 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -								
S1	0 - 0.05 m	9/10/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	NT	NT	-	NAD	-
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -								
S1/F	0 m	9/10/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	AD
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -								
305/F	0.55 m	9/10/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	AD
			- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	- -	7 -	- -	- -	- -	- -	- -	- -								

Lab result
HIL/HSL value EIL/ESL value

HIL/HSL exceedance EIL/ESL exceedance HIL/HSL and EIL/ESL exceedance ML exceedance ML and HIL/HSL or EIL/ESL exceedance

Indicates that asbestos has been detected by the lab, refer to the lab report **Blue** = DC exceedance HSL 0-<1 Exceedance

Bold = Lab detections - = Not tested or No HIL/HSL/EIL/ESL (as applicable) or Not applicable NL = Non limiting AD = Asbestos detected NAD = No Asbestos detected

HIL = Health investigation level HSL = Health screening level (excluding DC) EIL = Ecological investigation level ESL = Ecological screening level ML = Management Limit DC = Direct Contact HSL

Notes:

a QA/QC replicate of sample listed directly below the primary sample
b Reported naphthalene laboratory result obtained from BTEXN suite
c Criteria applies to DDT only
D1/DEW Replicate of 302/0.5 m
D1/JRK Replicate of 202/0.2 m

Site Assessment Criteria (SAC):

Refer to the SAC section of report for information of SAC sources and rationale. Summary information as follows:

SAC based on generic land use thresholds for Commercial/ industrial D
HIL D Commercial / Industrial (NEPC, 2013)
HSL D Commercial / Industrial (vapour intrusion) (NEPC, 2013)
DC HSL D Direct contact HSL D Commercial/Industrial (direct contact) (CRC CARE, 2011)
EIL/ESL C/Ind Commercial and Industrial (NEPC, 2013)
ML C/Ind Commercial and Industrial (NEPC, 2013)

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Table B3: Summary of Laboratory Results in Soil (Waste Classification Comparison)

			Metals																		TRH				
			Arsenic	Cadmium	Total Chromium	Copper	Lead	TCLP in Lead	Mercury (inorganic)	Nickel	Zinc	Manganese	Antimony	Barium	Beryllium	Boron	Cobalt	Molybdenum	Selenium (Total)	Tin (inorganic, SnIV)	TRH C6 - C9	TRH C10 - C14	TRH C15 - C28	TRH C29 - C36	C10-C36 recoverable hydrocarbons
		PQL	4	0.4	1	1	1	1	0.1	1	1	1	7	1	1	3	1	1	2	1	25	50	100	100	50
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/L	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
201	0.5 m	06/10/2021	**4**	<0.4	**7**	**9**	**10**	-	<0.1	**4**	**45**	**550**	<7	**110**	**1**	<3	**3**	<1	<2	<1	<25	<50	<100	<100	<50
201	2 m	06/10/2021	<4	<0.4	**7**	**58**	**170**	<0.03	**0.4**	**14**	**130**	**110**	<7	**93**	<1	**6**	**9**	<1	<2	**17**	<25	<50	**260**	**100**	**360**
202	0.2 m	06/10/2021	<4	<0.4	**6**	**26**	**63**	-	<0.1	**16**	**57**	**1600**	<7	**130**	<1	**20**	**4**	<1	<4	**2**	<25	<50	<100	<100	<50
D1/JRK	-	06/10/2021	<4	<0.4	**6**	**37**	**85**	-	**0.1**	**21**	**82**	**240**	<7	**130**	<1	**30**	**4**	**1**	<2	**4**	<25	<50	<100	<100	<50
202	3.5 m	06/10/2021	<4	<0.4	**2**	<1	**1**	-	<0.1	**1**	**2**	**4**	<7	**2**	<1	<3	<1	<1	<2	<1	<25	<50	<100	<100	<50
203	0.5 m	06/10/2021	<4	**0.4**	**14**	**93**	**470**	**0.2**	**0.2**	**15**	**230**	**360**	<7	**100**	<1	**5**	**6**	<1	<2	**12**	<25	<50	**130**	**120**	**250**
204	0.2 m	06/10/2021	**6**	<0.4	**5**	**7**	**9**	-	<0.1	**4**	**17**	**280**	<7	**26**	<1	<3	**3**	<1	<2	**1**	<25	<50	<100	<100	<50
204	4 m	06/10/2021	**4**	<0.4	**2**	<1	**1**	-	<0.1	**2**	**3**	**8**	<7	**3**	<1	<3	**2**	<1	<2	<1	<25	<50	<100	<100	<50
205	0.2 m	06/10/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
205	0.5 m	06/10/2021	<4	<0.4	**2**	**7**	**14**	-	<0.1	**1**	**18**	**56**	<7	**12**	<1	<3	**9**	<1	<2	<1	<25	<50	<100	<100	<50
301	0.1 - 0.2 m	9/10/2021	**5**	<0.4	**5**	**3**	**20**	-	<0.1	**3**	**27**	**370**	<7	**34**	<1	<3	**3**	<1	<2	<1	<25	<50	<100	<100	<50
302	0.5 - 0.6 m	9/10/2021	<4	<0.4	**3**	**44**	**190**	pending	**0.1**	**6**	**160**	**230**	<7	**89**	<1	**3**	**2**	<1	<2	**7**	<25	<50	<100	<100	<50
D1/DEW	-	9/10/2021	<4	<0.4	**6**	**29**	**140**	-	**0.1**	**4**	**100**	**330**	<7	**60**	<1	<3	**2**	<1	<2	**5**	<25	<50	<100	<100	<50
302	1.4 - 1.5 m	9/10/2021	<4	<0.4	<1	**10**	**4**	-	<0.1	<1	**4**	**5**	<7	**9**	<1	<3	<1	<1	<2	<1	<25	<50	<100	<100	<50
303	0.6 - 0.7 m	9/10/2021	<4	<0.4	**5**	**25**	**130**	-	**0.1**	**3**	**84**	**160**	<7	**41**	<1	<3	**1**	<1	<2	**2**	<25	<50	<100	<100	<50
304	0.5 - 0.6 m	9/10/2021	<4	<0.4	**1**	<1	**3**	-	<0.1	<1	**4**	**33**	<7	**4**	<1	<3	<1	<1	<2	<1	<25	<50	<100	<100	<50
305	0.2 - 0.3 m	9/10/2021	**4**	<0.4	**6**	**88**	**1100**	pending	**0.3**	**12**	**260**	**180**	<7	**96**	<1	**9**	**13**	<1	<2	**9**	<25	<50	<100	<100	<50
305	0.55 m	9/10/2021	<4	<0.4	**4**	**50**	**580**	-	**0.2**	**7**	**150**	**180**	<7	**130**	<1	**6**	**3**	<1	<2	**7**	<25	<50	<100	<100	<50
306	0.25 - 0.35 m	9/10/2021	<4	<0.4	**7**	**60**	**310**	-	**0.3**	**9**	**300**	**410**	<7	**100**	<1	**5**	**5**	<1	<2	**17**	<25	<50	<100	<100	<50
307	0.2 - 0.3 m	9/10/2021	**5**	<0.4	**6**	**9**	**6**	-	<0.1	**9**	**29**	**170**	<7	**8**	<1	<3	**10**	<1	<2	<1	<25	<50	<100	<100	<50
CT1			100	20	100	NC	100	-	4	40	NC	NC	NC	NC	20	NC	NC	100	20	NC	650	NC	NC	NC	10000
SCC1			500	100	1900	NC	1500	1500	50	1050	NC	NC	NC	NC	100	NC	NC	1000	50	NC	650	NC	NC	NC	10000
TCLP1			N/A	N/A	N/A	NC	N/A	5	N/A	N/A	NC	NC	NC	NC	N/A	NC	NC	N/A	N/A	NC	N/A	NC	NC	NC	N/A
CT2			400	80	400	NC	400	-	16	160	NC	NC	NC	NC	80	NC	NC	400	80	NC	2600	NC	NC	NC	40000
SCC2			2000	400	7600	NC	6000	6000	200	4200	NC	NC	NC	NC	400	NC	NC	4000	200	NC	2600	NC	NC	NC	40000
TCLP2			N/A	N/A	N/A	NC	N/A	20	N/A	N/A	NC	NC	NC	NC	N/A	NC	NC	N/A	N/A	NC	N/A	NC	NC	NC	N/A

CT1 exceedance TCLP1 and/or SCC1 exceedance CT2 exceedance TCLP2 and/or SCC2 exceedance Asbestos detection

NT = Not tested NL = Non limiting NC = No criteria NA = Not applicable

Notes:

a QA/QC replicate of sample listed directly below the primary sample

b Total chromium used as initial screen for chromium(VI).

c Total recoverable hydrocarbons (TRH) used as an initial screen for total petroleum hydrocarbons (TPH)

d Criteria for scheduled chemicals used as an initial screen

e Criteria for Chlorpyrifos used as initial screen

f All criteria are in the same units as the reported results

PQL Practical quantitation limit

CT1 NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values of specific contaminant concentration (SCC) for classification without TCLP: General solid waste

SCC1 NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: General solid waste

TCLP1 NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: General solid waste

CT2 NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values of specific contaminant concentration (SCC) for classification without TCLP: Restricted solid waste

SCC2 NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: Restricted solid waste

TCLP2 NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: Restricted solid waste

D1/DEW Replicate of 302/0.5 m

D1/JRK Replicate of 202/0.2 m

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Table B3: Summary of Laboratory Results in Soil (Waste Classification Comparison) (Continued)

			BTEX						PAH																	OCP		OPP
			Benzene	Toluene	Ethylbenzene	m+p-Xylene	o-Xylene	Xylenes (total)	Benzo(a)pyrene (BaP)	TCLP in Benzo(a)pyrene (BaP)	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(b,j+k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Phenanthrene	Pyrene	Total PAHs	Total Endosulfan	Total Analysed OCP	Total Analysed OPP
		PQL	0.2	0.5	1	2	1	3	0.05	0.05	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	1	0.1	0.1	0.05	0.1	0.1	0.1
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/L	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
201	0.5 m	06/10/2021	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.1	<0.1	<0.1	0.1	<0.2	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<1	0.4	0.1	0.72	<0.1	<0.1	<0.1
201	2 m	06/10/2021	<0.2	<0.5	<1	<2	<1	<3	0.3	-	<0.1	<0.1	0.1	0.9	0.6	0.2	0.4	<0.1	0.5	<0.1	0.1	<1	0.9	0.5	4.7	<0.1	<0.1	<0.1
202	0.2 m	06/10/2021	<0.2	<0.5	<1	<2	<1	<3	0.4	-	<0.1	<0.1	<0.1	0.4	0.5	0.3	0.3	<0.1	0.8	<0.1	0.2	<1	0.2	0.8	3.8	<0.1	<0.1	<0.1
D1/JRK	-	06/10/2021	<0.2	<0.5	<1	<2	<1	<3	0.5	-	<0.1	<0.1	<0.1	0.7	0.8	0.4	0.4	<0.1	1.2	<0.1	0.3	<1	0.4	1.2	5.8	<0.1	<0.1	<0.1
202	3.5 m	06/10/2021	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.05	-	-	-
203	0.5 m	06/10/2021	<0.2	<0.5	<1	<2	<1	<3	4.2	<0.001	<0.1	0.2	1.2	6.2	15	3.8	3.8	0.6	13	<0.1	2.5	<1	4.2	14	69	<0.1	<0.1	<0.1
204	0.2 m	06/10/2021	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1
204	4 m	06/10/2021	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.05	-	-	-
205	0.2 m	06/10/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
205	0.5 m	06/10/2021	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1
301	0.1 - 0.2 m	9/10/2021	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1
302	0.5 - 0.6 m	9/10/2021	<0.2	<0.5	<1	<2	<1	<3	0.3	-	<0.1	<0.1	<0.1	0.3	0.7	0.2	0.2	<0.1	0.4	<0.1	0.2	<1	0.2	0.4	2.8	<0.1	<0.1	<0.1
D1/DEW	-	9/10/2021	<0.2	<0.5	<1	<2	<1	<3	0.2	-	<0.1	<0.1	<0.1	0.2	0.6	0.2	0.2	<0.1	0.4	<0.1	0.1	<1	<0.1	0.4	2.4	<0.1	<0.1	<0.1
302	1.4 - 1.5 m	9/10/2021	<0.2	<0.5	<1	<2	<1	<3	0.1	-	<0.1	<0.1	<0.1	<0.1	0.3	<0.1	<0.1	<0.1	0.2	<0.1	<0.1	<1	<0.1	0.1	0.72	<0.1	<0.1	<0.1
303	0.6 - 0.7 m	9/10/2021	<0.2	<0.5	<1	<2	<1	<3	0.2	-	<0.1	<0.1	<0.1	0.2	0.4	0.1	0.1	<0.1	0.3	<0.1	0.1	<1	0.1	0.2	1.8	<0.1	<0.1	<0.1
304	0.5 - 0.6 m	9/10/2021	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1
305	0.2 - 0.3 m	9/10/2021	<0.2	<0.5	<1	<2	<1	<3	0.53	-	<0.1	<0.1	<0.1	0.6	1	0.4	0.4	<0.1	0.8	<0.1	0.3	<1	0.4	0.8	5.5	<0.1	<0.1	<0.1
305	0.55 m	9/10/2021	<0.2	<0.5	<1	<2	<1	<3	0.4	-	<0.1	<0.1	0.1	0.6	1	0.3	0.4	<0.1	0.9	<0.1	0.2	<1	0.3	0.8	5.4	<0.1	<0.1	<0.1
306	0.25 - 0.35 m	9/10/2021	<0.2	<0.5	<1	<2	<1	<3	0.77	-	<0.1	<0.1	<0.1	0.7	2	0.6	0.5	0.1	0.7	<0.1	0.5	<1	0.2	0.7	6.8	<0.1	<0.1	<0.1
307	0.2 - 0.3 m	9/10/2021	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1
Waste Classification Criteria [f]																												
CT1			10	288	600	NC	NC	1000	0.8	-	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	200	60	<50	4
SCC1			18	518	1080	NC	NC	1800	10	10	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	200	108	<50	7.5
TCLP1			N/A	N/A	N/A	NC	NC	N/A	N/A	5	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	N/A	N/A	N/A	N/A
CT2			40	1152	2400	NC	NC	4000	3.2	-	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	800	240	<50	16
SCC2			72	2073	4320	NC	NC	7200	23	23	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	800	432	<50	30
TCLP2			N/A	N/A	N/A	NC	NC	N/A	N/A	20	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	N/A	N/A	N/A	N/A

CT1 exceedance TCLP1 and/or SCC1 exceedance CT2 exceedance TCLP2 and/or SCC2 exceedance Asbestos detection

NT = Not tested NL = Non limiting NC = No criteria NA = Not applicable

Notes:

a	QA/QC replicate of sample listed directly below the primary sample
b	Total chromium used as initial screen for chromium(VI).
c	Total recoverable hydrocarbons (TRH) used as an initial screen for total petroleum hydrocarbons (TPH)
d	Criteria for scheduled chemicals used as an initial screen
e	Criteria for Chlorpyrifos used as initial screen
f	All criteria are in the same units as the reported results
PQL	Practical quantitation limit
CT1	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values of specific contaminant concentration (SCC) for classification without TCLP: General solid waste
SCC1	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: General solid waste
TCLP1	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: General solid waste
CT2	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values of specific contaminant concentration (SCC) for classification without TCLP: Restricted solid waste
SCC2	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: Restricted solid waste
TCLP2	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: Restricted solid waste
D1/DEW	Replicate of 302/0.5 m
D1/JRK	Replicate of 202/0.2 m

Table B3: Summary of Laboratory Results in Soil (Waste Classification Comparison) (Continued)

			PCB								VOC															Miscellaneous	
			Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	Total PCB	carbon tetrachloride	Monochlorobenzene	Chloroform	1,2-dichlorobenzene	1,4-dichlorobenzene	1,2-dichloroethane	1,1-Dichloroethene	Styrene (vinylbenzene)	1,1,1,2-tetrachloroethane	1,1,2,2-tetrachloroethane	tetrachloroethene	1,1,1-trichloroethane	1,1,2-trichloroethane	1,1,2-trichloroethylene	Vinyl Chloride	pH	CEC
		PQL	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.1	0.1
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	pH units	meq/100g
201	0.5 m	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8.3	-
201	2 m	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
202	0.2 m	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-
D1/JRK	-	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-
202	3.5 m	06/10/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
203	0.5 m	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8.1	9.6
204	0.2 m	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8.7	-
204	4 m	06/10/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
205	0.2 m	06/10/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
205	0.5 m	06/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-
301	0.1 - 0.2 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
302	0.5 - 0.6 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D1/DEW	-	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
302	1.4 - 1.5 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
303	0.6 - 0.7 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
304	0.5 - 0.6 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
305	0.2 - 0.3 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
305	0.55 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
306	0.25 - 0.35 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
307	0.2 - 0.3 m	9/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CT1			NC	NC	NC	NC	NC	NC	NC	<50	10	2000	120	86	150	10	14	60	200	26	14	600	24	10	4	NC	NC
SCC1			NC	NC	NC	NC	NC	NC	NC	<50	18	3600	126	4.3	7.5	0.5	0.7	108	360	46.8	25.2	1080	43.2	18	7.2	NC	NC
TCLP1			NC	NC	NC	NC	NC	NC	NC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NC	NC
CT2			NC	NC	NC	NC	NC	NC	NC	<50	40	8000	480	344	600	40	56	240	800	104	56	2400	96	40	16	NC	NC
SCC2			NC	NC	NC	NC	NC	NC	NC	<50	72	14400	864	620	1080	72	100	432	1440	187.2	100.8	4320	172.8	72	28.8	NC	NC
TCLP2			NC	NC	NC	NC	NC	NC	NC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NC	NC

CT1 exceedance TCLP1 and/or SCC1 exceedance CT2 exceedance TCLP2 and/or SCC2 exceedance Asbestos detection

NT = Not tested NL = Non limiting NC = No criteria NA = Not applicable

Notes:

a	QA/QC replicate of sample listed directly below the primary sample
b	Total chromium used as initial screen for chromium(VI).
c	Total recoverable hydrocarbons (TRH) used as an initial screen for total petroleum hydrocarbons (TPH)
d	Criteria for scheduled chemicals used as an initial screen
e	Criteria for Chlorpyrifos used as initial screen
f	All criteria are in the same units as the reported results
PQL	Practical quantitation limit
CT1	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values of specific contaminant concentration (SCC) for classification without TCLP: General solid waste
SCC1	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: General solid waste
TCLP1	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: General solid waste
CT2	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values of specific contaminant concentration (SCC) for classification without TCLP: Restricted solid waste
SCC2	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: Restricted solid waste
TCLP2	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: Restricted solid waste
D1/DEW	Replicate of 302/0.5 m
D1/JRK	Replicate of 202/0.2 m

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Table B3: Summary of Laboratory Results in Soil (Waste Classification Comparison) (Continued)

			Asbestos							
			Asbestos ID in soil >0.1g/kg	Asbestos ID in soil <0.1g/kg	Trace Analysis	ACM >7mm Estimation	FA and AF Estimation	FA and AF Estimation	Total Asbestos#1	Total Asbestos
		PQL						<0.001	<0.1	0.001
Sample ID	Depth	Sample Date	-	-	-	g	g	%(w/w)	g/kg	-
201	0.5 m	06/10/2021	-	-	-	-	-	-	-	-
201	2 m	06/10/2021	-	-	-	-	-	-	-	-
202	0.2 m	06/10/2021	-	-	-	-	-	-	-	-
D1/JRK	0 m	06/10/2021	-	-	-	-	-	-	-	-
202	3.5 m	06/10/2021	-	-	-	-	-	-	-	-
203	0.5 m	06/10/2021	-	-	-	-	-	-	-	-
204	0.2 m	06/10/2021	-	-	-	-	-	-	-	-
204	4 m	06/10/2021	-	-	-	-	-	-	-	-
205	0.2 m	06/10/2021	NAD	NAD	NAD	NT	NT	-	NAD	NAD
205	0.5 m	06/10/2021	NAD	NAD	NAD	NT	NT	-	NAD	NAD
301	0.1 - 0.2 m	9/10/2021	-	-	-	-	-	-	-	-
302	0.5 - 0.6 m	9/10/2021	-	-	-	-	-	-	-	-
D1/DEW	0 m	9/10/2021	-	-	-	-	-	-	-	-
302	1.4 - 1.5 m	9/10/2021	-	-	-	-	-	-	-	-
303	0.6 - 0.7 m	9/10/2021	NAD	NAD	NAD	NT	NT	-	NAD	NAD
304	0.5 - 0.6 m	9/10/2021	NAD	NAD	NAD	NT	NT	-	NAD	NAD
305	0.2 - 0.3 m	9/10/2021	NAD	NAD	NAD	NT	NT	-	NAD	NAD
305	0.55 m	9/10/2021	NAD	**AD**	NAD	NT	**0.0328**	**0.0049**	NAD	NAD
306	0.25 - 0.35 m	9/10/2021	NAD	NAD	NAD	NT	NT	-	NAD	NAD
307	0.2 - 0.3 m	9/10/2021	-	-	-	-	-	-	-	-

CT1	None present	None present	None present	None present	None present	None present	None present	None present
SCC1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TCLP1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
CT2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SCC2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TCLP2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

CT1 exceedance TCLP1 and/or SCC1 exceedance CT2 exceedance TCLP2 and/or SCC2 exceedance Asbestos detection

NT = Not tested NL = Non limiting NC = No criteria NA = Not applicable

Notes:

a	QA/QC replicate of sample listed directly below the primary sample
b	Total chromium used as initial screen for chromium(VI).
c	Total recoverable hydrocarbons (TRH) used as an initial screen for total petroleum hydrocarbons (TPH)
d	Criteria for scheduled chemicals used as an initial screen
e	Criteria for Chlorpyrifos used as initial screen
f	All criteria are in the same units as the reported results
PQL	Practical quantitation limit
CT1	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values of specific contaminant concentration (SCC) for classification without TCLP: General solid waste
SCC1	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: General solid waste
TCLP1	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: General solid waste
CT2	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values of specific contaminant concentration (SCC) for classification without TCLP: Restricted solid waste
SCC2	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: Restricted solid waste
TCLP2	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: Restricted solid waste
D1/DEW	Replicate of 302/0.5 m
D1/JRK	Replicate of 202/0.2 m

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Table B4: Summary of Laboratory Results – Groundwater

						Well ID	GW1	GW3	203	204	Replicate
						Sampled Date	7/10/2021	7/10/2021	12/10/2021	12/10/2021	GWD1 (204) 12/10/2021
Analyte		Units	PQL	ANZG (2018) Marine water 95% toxicant DGVs, slightly to moderately distubed	NEPM 2013 Table 1A(4) Residential HSL A & B GW for Vapour Intrusion, Sand	NEPM 2013 Table 1A(4) Comm/Ind HSL D GW for Vapour Intrusion, Sand					
					2-4m	2-4m					
Metals (filtered)	Antimony	mg/L	0.001				0.001	0.001	0.004	0.004	0.004
	Arsenic	mg/L	0.001				0.004	<0.001	<0.001	0.002	0.002
	Barium	mg/L	0.001				0.005	0.002	0.016	0.029	0.031
	Beryllium	mg/L	0.0005				<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	Boron	mg/L	0.02				0.1	0.1	0.04	0.27	0.28
	Cadmium	mg/L	0.0001	0.0007			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Chromium (III+VI)	mg/L	0.001	0.0044			<0.001	<0.001	<0.001	<0.001	<0.001
	Cobalt	mg/L	0.001	0.001			<0.001	<0.001	<0.001	0.001	0.001
	Copper	mg/L	0.001	0.0013			0.001	0.007	0.003	0.002	0.002
	Lead	mg/L	0.001	0.0044			<0.001	<0.001	<0.001	<0.001	<0.001
	Manganese	mg/L	0.005				<0.005	0.093	0.006	0.036	0.036
	Mercury	mg/L	0.00005	0.0004			<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
	Molybdenum	mg/L	0.001				0.002	0.001	0.002	0.01	0.011
	Nickel	mg/L	0.001	0.07			0.013	0.024	0.008	0.004	0.004
	Selenium	mg/L	0.001				<0.001	<0.001	<0.001	0.003	0.003
	Tin	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
	Zinc	mg/L	0.001	0.008			0.017	0.045	0.32	0.28	0.29
TPH	C6-C10 less BTEX (F1)	mg/L	0.01		1	6	<0.01	<0.01	<0.01	<0.01	<0.01
	C6-C10	mg/L	0.01				<0.01	<0.01	<0.01	<0.01	<0.01
	C10-C16	mg/L	0.05				<0.05	<0.05	<0.05	<0.05	<0.05
	C16-C34	mg/L	0.1				<0.1	<0.1	<0.1	<0.1	<0.1
	C34-C40	mg/L	0.1				<0.1	<0.1	<0.1	<0.1	<0.1
	F2-NAPHTHALENE	mg/L	0.05		1	NL	<0.05	<0.05	<0.05	<0.05	<0.05
	C6 - C9	mg/L	0.01				<0.01	<0.01	<0.01	<0.01	<0.01
	C10 - C14	mg/L	0.05				<0.05	<0.05	<0.05	<0.05	<0.05
	C15 - C28	mg/L	0.1				<0.1	<0.1	<0.1	<0.1	<0.1
	C29-C36	mg/L	0.1				<0.1	<0.1	<0.1	<0.1	<0.1
	+C10 - C36 (Sum of total)	mg/L	0.05				<0.05	<0.05	<0.05	<0.05	<0.05
	C10 - C40 (Sum of total)	mg/L	0.05				<0.05	<0.05	<0.05	<0.05	<0.05
BTEX	Benzene	mg/L	0.001	0.7	0.8	5	<0.001	<0.001	<0.001	<0.001	<0.001
	Ethylbenzene	mg/L	0.001	0.08	NL	NL	<0.001	<0.001	<0.001	<0.001	<0.001
	Toluene	mg/L	0.001	0.18	NL	NL	<0.001	<0.001	<0.001	<0.001	<0.001
	Xylene (m & p)	mg/L	0.002	0.075			<0.002	<0.002	<0.002	<0.002	<0.002
	Xylene (o)	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
MAH	1,2,4-trimethylbenzene	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
	1,3,5-trimethylbenzene	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
	Isopropylbenzene	mg/L	0.001	0.03			<0.001	<0.001	<0.001	<0.001	<0.001
	n-butylbenzene	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
	n-propylbenzene	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
	p-isopropyltoluene	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
	sec-butylbenzene	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
	Styrene	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
	tert-butylbenzene	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
Chlorinated Hydrocarbons	1,1,1,2-tetrachloroethane	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
	1,1,1-trichloroethane	mg/L	0.001	0.27			<0.001	<0.001	<0.001	<0.001	<0.001
	1,1,2,2-tetrachloroethane	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
	1,1,2-trichloroethane	mg/L	0.001	1.9			<0.001	<0.001	<0.001	<0.001	<0.001
	1,1-dichloroethane	mg/L	0.001	19			<0.001	<0.001	<0.001	<0.001	<0.001
	1,1-dichloroethene	mg/L	0.001	0.08			<0.001	<0.001	<0.001	<0.001	<0.001
	1,1-dichloropropene	mg/L	0.001	0.9			<0.001	<0.001	<0.001	<0.001	<0.001
	1,2,3-trichloropropane	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
	1,2-dibromo-3-chloropropane	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
	1,2-dichloroethane	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
	1,2-dichloropropane	mg/L	0.001	0.9			<0.001	<0.001	<0.001	<0.001	<0.001
	1,3-dichloropropane	mg/L	0.001	1.1			<0.001	<0.001	<0.001	<0.001	<0.001
	2,2-dichloropropane	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
	Bromochloromethane	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
	Bromodichloromethane	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
	Bromoform	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
	Carbon tetrachloride	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
	Chlorodibromomethane	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
	Chloroethane	mg/L	0.01				<0.01	<0.01	<0.01	<0.01	<0.01
	Chloroform	mg/L	0.001	0.37			<0.001	<0.001	<0.001	<0.001	<0.001
	Chloromethane	mg/L	0.01				<0.01	<0.01	<0.01	<0.01	<0.01
	cis-1,2-dichloroethene	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
	cis-1,3-dichloropropene	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
	Dibromomethane	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
	Hexachlorobutadiene	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
	Trichloroethene	mg/L	0.001	0.07			<0.001	<0.001	<0.001	<0.001	<0.001
	Tetrachloroethene	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
	trans-1,2-dichloroethene	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
	trans-1,3-dichloropropene	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
	Vinyl chloride	mg/L	0.01	0.1			<0.01	<0.01	<0.01	<0.01	<0.01
Halogenated Hydrocarbons	1,2-dibromoethane	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
	Bromomethane	mg/L	0.01				<0.01	<0.01	<0.01	<0.01	<0.01
	Dichlorodifluoromethane	mg/L	0.01				<0.01	<0.01	<0.01	<0.01	<0.01
	Trichlorofluoromethane	mg/L	0.01				<0.01	<0.01	<0.01	<0.01	<0.01
Halogenated Benzenes	1,2,3-trichlorobenzene	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
	1,2,4-trichlorobenzene	mg/L	0.001	0.08			<0.001	<0.001	<0.001	<0.001	<0.001
	1,2-dichlorobenzene	mg/L	0.001	0.16			<0.001	<0.001	<0.001	<0.001	<0.001
	1,3-dichlorobenzene	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
	1,4-dichlorobenzene	mg/L	0.001	0.06			<0.001	<0.001	<0.001	<0.001	<0.001
	2-chlorotoluene	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
	4-chlorotoluene	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
	Bromobenzene	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
	Chlorobenzene	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
Solvents	Cyclohexane	mg/L	0.001				<0.001	<0.001	<0.001	<0.001	<0.001
PAH	Total Positive PAHs	mg/L	0.0001				<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Acenaphthene	mg/L	0.0001				<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Acenaphthylene	mg/L	0.0001				<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Anthracene	mg/L	0.0001	0.00001			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Benz(a)anthracene	mg/L	0.0001				<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Benzo(a) pyrene	mg/L	0.0001				<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Benzo(g,h,i)perylene	mg/L	0.0001				<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Chrysene	mg/L	0.0001				<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Dibenz(a,h)anthracene	mg/L	0.0001				<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Fluoranthene	mg/L	0.0001	0.001			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Fluorene	mg/L	0.0001				<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Indeno(1,2,3-c,d)pyrene	mg/L	0.0001				<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Naphthalene	mg/L	0.0002	0.05	NL	NL	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	Phenanthrene	mg/L	0.0001	0.0006			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Pyrene	mg/L	0.0001				<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Benzo(a)pyrene TEQ	mg/L	0.0005				<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	Benzo(b,j+k)fluoranthene	mg/L	0.0002				<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

PQL - Practical Quantitation Limit

GWD1 - field replicate of Bore 204

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Table B5: Summary of Laboratory Results – Acid Sulfate Soils

Bore ID	Ground Surface RL (AHD)	Sample Depth (m)	Sample RL (AHD)	Sample Description	Screening Test Results				pH$_{KCL}$	S$_{KCL}$	Scr %S	s-TAA %S	S$_{NAS}$ %S	s-ANC$_{BT}$ %S	Net Acidity[c] %S	Existing and Potential Acidity %S
					pH											
					pH$_F$	pH$_{FOX}$	pH$_F$ - pH$_{FOX}$	Strength of Reaction								
201	3.89	**3.5**	**0.4**	SAND, brown to pale brown	4.0	**2.7**	**1.3**	Low reaction	-	-	-	-	-	-	-	-
		4.5	**-0.6**	SAND, brown to pale brown	5.8	5.5	0.3	Low reaction	-	-	-	-	-	-	-	-
202	3.37	1.5	1.9	SILTY SAND, grey	5.4	5.0	0.4	Low reaction	-	-	-	-	-	-	-	-
		2.5	0.9	SAND, pale brown	5.8	5.0	0.8	Low reaction	-	-	-	-	-	-	-	-
203	3.10	**4.0**	**-0.9**	SAND, trace gravels, brown	5.8	4.3	**1.5**	Low reaction	-	-	-	-	-	-	-	-
		5.0	**-1.9**	SAND, trace gravels, brown	5.4	5.0	0.4	Low reaction	-	-	-	-	-	-	-	-
204	3.27	2.0	1.3	SAND, pale brown	7.0	5.9	**1.1**	Low reaction	-	-	-	-	-	-	-	-
		3.1	**0.2**	SAND, trace gravels, brown	4.7	**1.9**	**2.8**	Volcanic reaction	4.0	0.091	0.26	0.06	0.010	-	0.32	0.33
205	3.40	1.5	1.9	SAND, pale brown	6.5	5.4	**1.1**	Low reaction	6.7	<0.005	<0.005	<0.01	-	<0.05	<0.005	<0.05
		2.5	0.9	SAND, pale brown	4.5	**1.8**	**2.7**	Volcanic reaction	-	-	-	-	-	-	-	-
301	2.99	1.5-1.6	1.39-1.49	SAND, with silt, brown	7.3	5.7	**1.6**	Low reaction	-	-	-	-	-	-	-	-
		2.1-2.2	0.79-0.89	SAND, with silt, pale brown	7.2	4.7	**2.5**	Low reaction	-	-	-	-	-	-	-	-
		2.7-2.9	**0.09-0.29**	SAND, with silt, pale brown	6.9	**1.9**	**5.0**	Medium reaction	-	-	-	-	-	-	-	-
302	3.24	2.0-2.1	1.14-1.24	SAND, with silt, brown	7.3	5.8	**1.5**	Low reaction	-	-	-	-	-	-	-	-
		2.5-2.6	0.64-0.74	SAND, with silt, brown	7.3	5.6	**1.7**	Low reaction	-	-	-	-	-	-	-	-
		2.9-3.0	**0.24-0.34**	SAND, with silt, brown	6.6	**2.1**	**4.5**	Extreme reaction	-	-	-	-	-	-	-	-
305	3.25	1.35-1.4	1.85-1.9	SAND, with silt, brown	7.3	5.7	**1.6**	Low reaction	-	-	-	-	-	-	-	-
306	3.42	2.0-2.1	1.32-1.42	SAND, with silt, brown	7.3	5.8	**1.5**	Low reaction	-	-	-	-	-	-	-	-
		2.5-2.6	0.82-0.92	SAND, with silt, brown	7.3	5.7	**1.6**	Low reaction	-	-	-	-	-	-	-	-
		2.9-3.0	**0.42-0.52**	SAND, with silt, grey	6.3	**1.8**	**4.5**	Volcanic reaction	-	-	-	-	-	-	-	-
Guideline					**<4[d]**	**<3.5[e]**	**≥1[e]**	-	Coarse sands, poorly buffered							0.01
									Coarse sands to loamy sands and peats							0.03
									Medium sandy loams to light clays							0.06[f]/0.03[g]
									Fine medium to heavy clays & silty clays							0.1[f]/0.03[g]

Notes to Table B5:

a Depth below ground surface

b Strength of Reaction
- 1 denotes no or slight reaction
- 2 denotes moderate reaction
- 3 denotes high reaction
- 4 denotes very vigorous reaction
- F denotes bubbling/frothy reaction indicative of organics
- V denotes vapours generated
- B denotes bubbles generated
- H denotes heat generated

c Calculated by the laboratory based on the ABA equation in ASS Laboratory Methods Guidelines (Ref3)

d For actual acid sulphate soils (ASS)

e Indicative value only for Potential Acid Sulphate Soils (PASS)

f QASSIT Action Criteria for disturbance of 1-1000 tonnes of material

g QASSIT Action Criteria for disturbance of more than 1000 tonnes of material

Bold results indicative of ASS/PASS

Shaded results indicate an exceedence of QASSIT action criteria

Blue results indicate sample collected from below the groundwater table at time of sampling

pH$_F$ - Soil pH Test (1:5 soil:distilled water)

pH$_{FOX}$ - Soil Peroxide pH Test (1:4 soil:distilled water following oxidation of soil with 30% hydrogen peroxide (H_2O_2))

*Laboratory methods used to quantify ANC are likely to overestimate environmental effectiveness

- indicates not tested

Appendix C

Historical Aerial Photo Summary
Site Photos (Photoplates 1 to 9)
Title Deeds Search (InfoTrack Pty Ltd)
Section 10.7 Planning Certificates
Water NSW Work Summaries

Appendix C
Historical Aerial Photo Summary
924 Hunter Street, Newcastle West

Photo C1: 1954 aerial (Site in red outline)

Photo C2: 1966 aerial (Site in red outline)

Photo C3: 1976 aerial (Site in red outline)

Photo C3A: 1976 aerial (Site in red outline)

Photo C4: 1984 (Site in red outline)

Figure C5: 1986 orthophoto (Site in red outline)

Photo C6: 1990 aerial (Site in red outline)

Photo C7: 1998 aerial (site in red outline)

Photo C8: 2001 aerial (Site in red outline)

Douglas Partners Pty Ltd

Photo 1: Main building (showroom) in the SW corner (looking W)

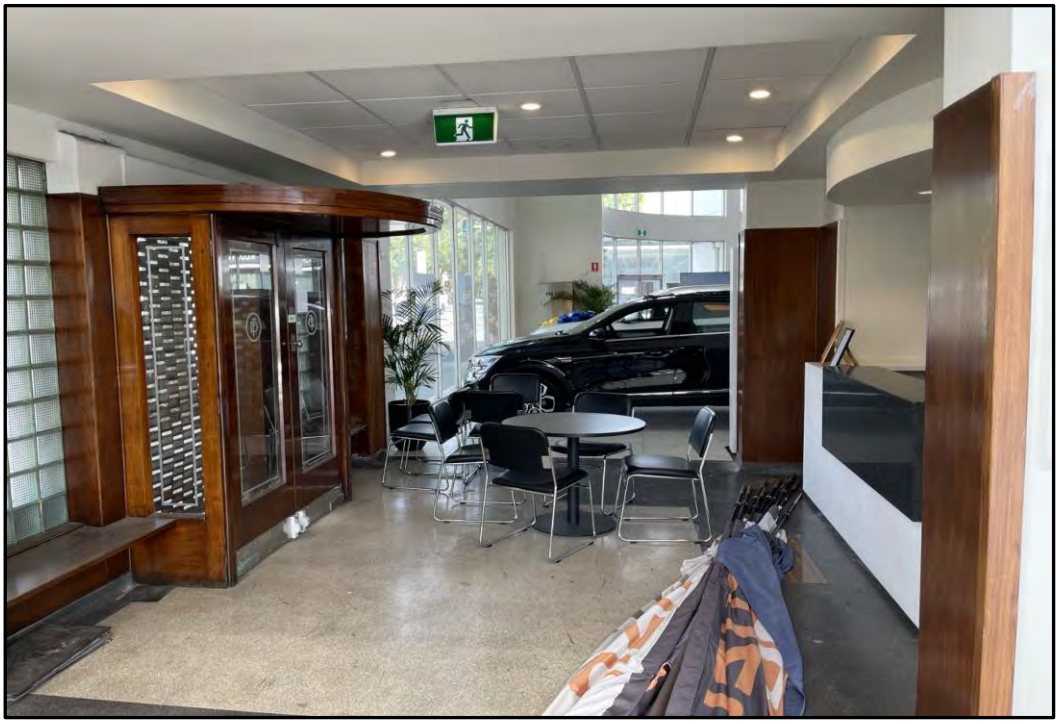


Photo 2: Main building (showroom) (looking W)

Douglas Partners Geotechnics | Environment | Groundwater	**Photoplates**	PROJECT:	102077.02
	924 Hunter Street	Plate	1
	Newcastle West	REV:	A
	Client: Thirdi Dairy Farmers Pty Ltd	DATE:	18-Oct-21

Photo 3: Main building (showroom and offices) (looking NW)

Photo 4: Western part of site for vehicle storage (looking NW)

Douglas Partners Geotechnics | Environment | Groundwater	**Photoplates**	PROJECT:	102077.02
	924 Hunter Street	Plate	2
	Newcastle West	REV:	A
	Client: Thirdi Dairy Farmers Pty Ltd	DATE:	18-Oct-21

Photo 5: Western part of site for vehicle storage (looking N)

Photo 6: Concrete pavements (cracked), tie down rings in pavement

Douglas Partners Geotechnics | Environment | Groundwater	**Photoplates**	PROJECT:	102077.02
	924 Hunter Street	Plate	3
	Newcastle West	REV:	A
	Client: Thirdi Dairy Farmers Pty Ltd	DATE:	18-Oct-21

Photo 7: Power substation in N part of site in garden (looking NE)

Photo 8: Eastern site building and concrete pavements (looking SE)

Douglas Partners Geotechnics / Environment / Groundwater	**Photoplates**	PROJECT:	102077.02
	924 Hunter Street	Plate	4
	Newcastle West	REV:	A
	Client: Thirdi Dairy Farmers Pty Ltd	DATE:	18-Oct-21

Photo 9: Awning N of E site building and former bowser location (looking E)

Photo 10: Eastern building - frontage to Hunter Street (looking E)

Douglas Partners Geotechnics | Environment | Groundwater	**Photoplates**	PROJECT:	102077.02
	924 Hunter Street	Plate	5
	Newcastle West	REV:	A
	Client: Thirdi Dairy Farmers Pty Ltd	DATE:	18-Oct-21

Photo 11: Eastern building from SW on Hunter Street (looking NW)

Photo 12: Eastern building from cnr Railway and Hunter Street (looking NE)

Douglas Partners Geotechnics / Environment / Groundwater	**Photoplates**	PROJECT:	102077.02
	924 Hunter Street	Plate	6
	Newcastle West	REV:	A
	Client: Thirdi Dairy Farmers Pty Ltd	DATE:	18-Oct-21

Photo 13: Eastern building - from cnr Railway and Hunter Street (looking N)

Photo 14: Western part of site from Railway Street (looking NE)

Douglas Partners Geotechnics | Environment | Groundwater	**Photoplates**	PROJECT:	102077.02
	924 Hunter Street	Plate	7
	Newcastle West	REV:	A
	Client: Thirdi Dairy Farmers Pty Ltd	DATE:	18-Oct-21

Photo 15: Western site building (two storey) (looking S)

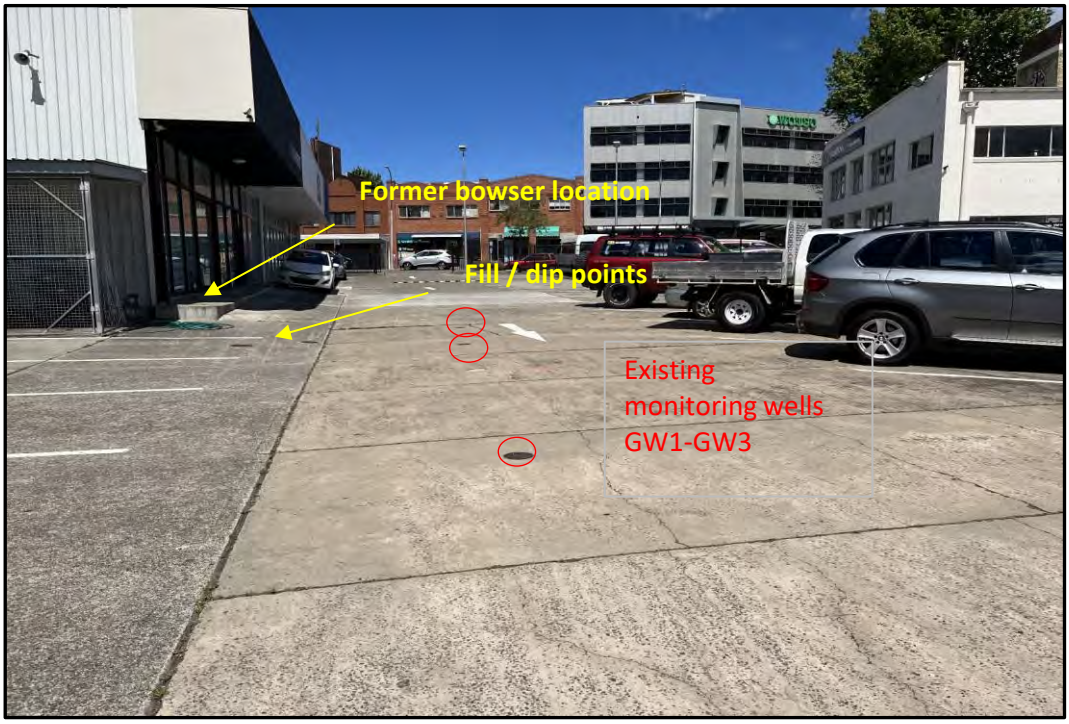


Photo 16: Location of former bowser near redundant UST (looking E)

Douglas Partners Geotechnics | Environment | Groundwater	**Photoplates**	PROJECT:	102077.02
	924 Hunter Street	Plate	8
	Newcastle West	REV:	A
	Client: Thirdi Dairy Farmers Pty Ltd	DATE:	18-Oct-21

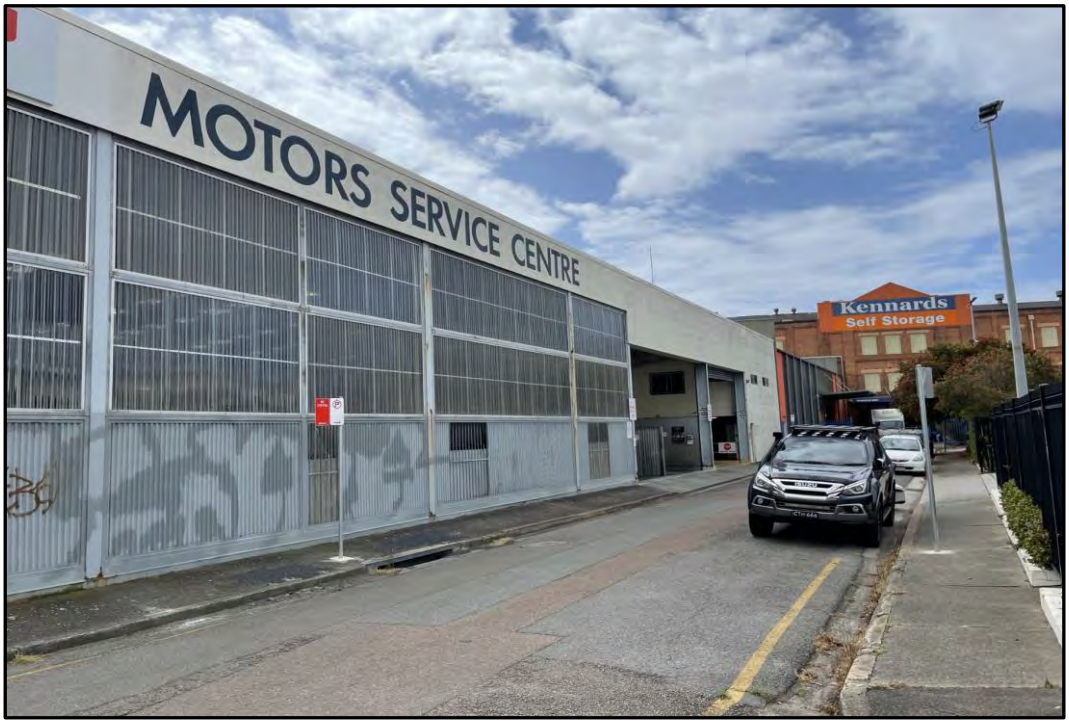


Photo 17: Vehicle service centre to the north (looking E)

Douglas Partners Geotechnics | Environment | Groundwater	**Photoplates**		PROJECT:	102077.02
	924 Hunter Street		Plate	9
	Newcastle West		REV:	A
	Client	Thirdi Dairy Farmers Pty Ltd	DATE:	18-Oct-21

ABN: 36 092 724 251
Ph: 02 9099 7400
(Ph: 0412 199 304)

Level 14, 135 King Street, Sydney
Sydney 2000
GPO Box 4103 Sydney NSW 2001
DX 967 Sydney

Summary of Owners Report

Address: 924 Hunter Street, Newcastle West, NSW 2302

Description: - Lot 2 D.P. 445736, Lot 1 D.P. 342675, Lots 1 & 2 D.P. 1091173, Lot 1 D.P. 456088, Lot 1 D.P. 395367 & Lot 2 D.P. 126

As regards to Lot 2 D.P. 445736: -

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
	As regards to the part numbered 1 on attached Cadastral Records Enquiry: -	
09.02.1912 (1912 to 1923)	Donald McNaughton (Builder)	Volume 2226 Folios 189 to 190
16.07.1923 (1923 to 1994)	The Dairy Farmers' Co-Operative Milk Company Limited Then Dairy Farmers Co-Operative Limited Now Australian Co-Operative Foods Limited	Volume 2226 Folios 189 to 190 Then Volume 3490 Folio 79 Then Volume 5161 Folio 181 Now 2/445736
	As regards to the part numbered 2 on attached Cadastral Records Enquiry: -	
13.03.1914 (1914 to 1918)	The Newcastle Co-Operative Milk Society Limited	Volume 189 Folio 218
26.06.1918 (1918 to 1994)	The Dairy Farmers' Co-Operative Milk Company Limited Then Dairy Farmers Co-Operative Limited Now Australian Co-Operative Foods Limited	Volume 189 Folio 218 Then Volume 5161 Folio 181 Now 2/445736
	As regards to the part numbered 3 on attached Cadastral Records Enquiry: -	
21.01.1899 (1899 to 1926)	Susan Pavey (Married Woman)	Volume 189 Folio 216
14.12.1926 (1926 to 1937)	Sarah Hindmarsh (Married Woman)	Volume 189 Folio 216
20.09.1937 (1937 to 1994)	The Dairy Farmers' Co-Operative Milk Company Limited Then Dairy Farmers Co-Operative Limited Now Australian Co-Operative Foods Limited	Volume 189 Folio 216 Then Volume 5161 Folio 181 Now 2/445736

Continued Over.

ABN: 36 092 724 251
Ph: 02 9099 7400
(Ph: 0412 199 304)

Level 14, 135 King Street, Sydney
Sydney 2000
GPO Box 4103 Sydney NSW 2001
DX 967 Sydney

Date of Acquisition and term held	**Registered Proprietor(s) & Occupations where available**	**Reference to Title at Acquisition and sale**
	As regards to the part numbered 4 on attached Cadastral Records Enquiry: -	
31.03.1913 (1913 to 1925)	Thomas Wrightson (Railway Employee)	Volume 2480 Folio 69
03.06.1925 (1925 to 1927)	Charles Joseph Parker (Business Manager)	Volume 2480 Folio 69
28.06.1927 (1927 to 1930)	Edwin Knight Jacka (Commercial Traveller)	Volume 2480 Folio 69
12.02.1930 (1930 to 1937)	Elizabeth Jacka (Widow) (Transmission Application not investigated)	Volume 2480 Folio 69
20.09.1937 (1937 to 1994)	The Dairy Farmers' Co-Operative Milk Company Limited Then Dairy Farmers Co-Operative Limited Now Australian Co-Operative Foods Limited	Then Volume 5161 Folio 181 Now 2/445736
	Continued as to the whole: -	
06.12.1994 (1994 to 2019)	Zutor Pty. Ltd (Or Zutor Pty Ltd) (Or Zutor Pty. Limited)	2/445736
01.03.2019 (2019 to Date)	# McCloy Newcastle West Pty Limited	2/445736

 # Denotes current registered proprietor

Leases: -

- **Various leases were found between 19.10.2012 to 25.03.2020 that have since been surrendered or expired by effluxion of time. Not investigated.**
- 23.11.2020 (AQ502865): Lease to Manning Valley Motor Holding Pty Ltd of Tenancy 1, 924 Hunter Street and 4 Tighe Street, Newcastle West. Expires 15.05.2024.

Easements: -

- 06.06.1997 (3077496): Easement for underground electricity cables & access affecting the part shown so designated (C) in D.P. 267291.

ABN: 36 092 724 251
Ph: 02 9099 7400
(Ph: 0412 199 304)

Level 14, 135 King Street, Sydney
Sydney 2000
GPO Box 4103 Sydney NSW 2001
DX 967 Sydney

As regards to Lot 1 D.P. 342675, numbered 5 on Cadastral Records Enquiry: -

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
31.03.1913 (1913 to 1925)	Thomas Wrightson (Railway Employee)	Volume 2480 Folio 69
03.06.1925 (1925 to 1927)	Charles Joseph Parker (Business Manager)	Volume 2480 Folio 69
28.06.1927 (1927 to 1930)	Edwin Knight Jacka (Commercial Traveller)	Volume 2480 Folio 69
12.02.1930 (1930 to 1937)	Elizabeth Jacka (Widow) (Transmission Application not investigated)	Volume 2480 Folio 69
20.09.1937 (1937 to 1938)	The Dairy Farmers' Co-Operative Milk Company Limited	Volume 2480 Folio 69
08.08.1938 (1938 to 1956)	The Council of the City of Newcastle (Formerly styled The Council of the City of Greater Newcastle)	Volume 2480 Folio 69 (Part) Now Volume 5161 Folio 225
04.04.1956 (1956 to 1994)	The Dairy Farmers' Co-Operative Milk Company Limited Then Dairy Farmers Co-Operative Limited Now Australian Co-Operative Foods Limited	Volume 5161 Folio 225 Now 1/342675
06.12.1994 (1994 to 2019)	Zutor Pty. Ltd (Or Zutor Pty Ltd) (Or Zutor Pty. Limited)	1/342675
01.03.2019 (2019 to Date)	# McCloy Newcastle West Pty Limited	1/342675

 # Denotes current registered proprietor

Leases: -

- **Various leases were found between 19.10.2012 to 25.03.2020 that have since been surrendered or expired by effluxion of time. Not investigated.**
- 23.11.2020 (AQ502865): Lease to Manning Valley Motor Holding Pty Ltd of Tenancy 1, 924 Hunter Street and 4 Tighe Street, Newcastle West. Expires 15.05.2024.

Easements: -

- 06.06.1997 (3077496): Easement for underground electricity cables & access affecting the part shown so designated (B) in D.P. 267291.

ABN: 36 092 724 251
Ph: 02 9099 7400
(Ph: 0412 199 304)

Level 14, 135 King Street, Sydney
Sydney 2000
GPO Box 4103 Sydney NSW 2001
DX 967 Sydney

As regards to Auto Consol 7174-135 (Lots 1 & 2 D.P. 1091173): -

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
	As regards to the part numbered 6 on attached Cadastral Records Enquiry: -	
12.12.1911 (1911 to 1950)	Mary Leonard (Spinster)	Volume 2208 Folio 225
14.04.1950 (1950 to 1954)	Merle Winifred Gabriel (Married Woman) (Transmission Application not investigated)	Volume 2208 Folio 225
20.04.1954 (1954 to 1993)	The Dairy Farmers' Co-Operative Milk Company Limited Then Dairy Farmers Co-Operative Limited Now Australian Co-Operative Foods Limited	Volume 2208 Folio 225 Then Volume 6909 Folio 186 Now Volume 7174 Folio 135
	As regards to the part numbered 7 on attached Cadastral Records Enquiry: -	
01.05.1918 (1918 to 1922)	John Stevens (Railway Guard)	Volume 758 Folio 200
28.08.1922 (1922 to 1922)	Public Trustee) (Transmission Application not investigated)	Volume 758 Folio 200
03.10.1922 (1922 to 1926)	Sylvia Myra Sadler (Salvation Army Officer, Spinster)	Volume 758 Folio 200
17.06.1926 (1926 to 1927)	John Butler (Miner) Sara Butler (Married Woman)	Volume 758 Folio 200
30.09.1927 (1927 to 1929)	Charles Frederick Davies (Laborer) Emily Davies (Married Woman)	Volume 758 Folio 200 Now Volume 4326 Folio 12
08.08.1929 (1929 to 1954)	Ivy May Brownjohn (Married Woman)	Volume 4326 Folio 12
15.07.1954 (1954 to 1993)	The Dairy Farmers' Co-Operative Milk Company Limited Then Dairy Farmers Co-Operative Limited Now Australian Co-Operative Foods Limited	Volume 4326 Folio 12 Then Volume 6909 Folio 186 Now Volume 7174 Folio 135
	As regards to the part numbered 8 on attached Cadastral Records Enquiry: -	
01.05.1918 (1918 to 1926)	Lizzy Redding (Married Woman)	Volumes 336 Folio 77
01.09.1926 (1926 to 1953)	Elizabeth Duncan Shaw (Married Woman)	Volumes 336 Folio 77
01.07.1953 (1953 to 1993)	The Dairy Farmers' Co-Operative Milk Company Limited Then Dairy Farmers Co-Operative Limited Now Australian Co-Operative Foods Limited (Mortgagee Sale)	Volumes 336 Folio 77 Then Volume 6909 Folio 186 Now Volume 7174 Folio 135

Continued Over.

ABN: 36 092 724 251
Ph: 02 9099 7400
(Ph: 0412 199 304)

Level 14, 135 King Street, Sydney
Sydney 2000
GPO Box 4103 Sydney NSW 2001
DX 967 Sydney

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
	As regards to the part numbered 9 on attached Cadastral Records Enquiry: -	
30.04.1918 (1918 to 1953)	Edward Spurr (Pattern Maker)	Volume 192 Folio 236
06.01.1953 (1953 to 1993)	The Dairy Farmers' Co-Operative Milk Company Limited Then Dairy Farmers Co-Operative Limited Now Australian Co-Operative Foods Limited	Volume 192 Folio 236 Then Volume 6854 Folio 142 Then Volume 6909 Folio 186 Now Volume 7174 Folio 135
	As regards to the part numbered 10 on attached Cadastral Records Enquiry: - Lot 16	
14.07.1914 (1914 to 1952)	Arthur William Spurr (Blacksmith)	Volume 262 Folio 213
27.05.1952 (1952 to 1953)	Edward Spurr (Pattern Maker) (Transmission Application not investigated)	Volume 262 Folio 213
06.01.1953 (1953 to 1994)	The Dairy Farmers' Co-Operative Milk Company Limited Then Dairy Farmers Co-Operative Limited Now Australian Co-Operative Foods Limited	Volume 262 Folio 213 Then Volume 6854 Folio 142 Then Volume 6909 Folio 186 Now Volume 7174 Folio 135
	Continued as to the whole:	
06.12.1994 (1994 to 2019)	Zutor Pty. Ltd (Or Zutor Pty Ltd) (Or Zutor Pty. Limited)	Auto Consol 7174-135
01.03.2019 (2019 to Date)	# McCloy Newcastle West Pty Limited	Auto Consol 7174-135

 # Denotes current registered proprietor

Leases: -

- 16.09.1918 (A392996): Lease to The Newcastle Co-Operative Milk Society Limited of part of Lot 4 D.P. 126 of the land within described. Expired by effluxion of time 23.04.1954.
- 06.10.1921 (A747253): Lease to The Berrima District Farm and Dairy Company Limited of part of the land within described. Expired by effluxion of time 23.04.1954.
- **Various leases were found between 19.10.2012 to 25.03.2020 that have since been surrendered or expired by effluxion of time. Not investigated.**
- 23.11.2020 (AQ502865): Lease to Manning Valley Motor Holding Pty Ltd of Tenancy 1, 924 Hunter Street and 4 Tighe Street, Newcastle West. Expires 15.05.2024.
- 23.11.2020 (AQ502866): Lease to Air Locker Training Newcastle Pty Ltd of Tenancy 2, 924 Hunter Street, Newcastle West. Expires 21.04.2024.
- 23.11.2020 (AQ502867): Lease to Barre Effect Pty Ltd of Tenancy 3, Eastern Showroom, 924 Hunter Street, Newcastle West. Expires 21.05.2024.

Easements: -

- 06.06.1997 (3077496): Easement for underground cables of electricity and access affecting the part shown so designated (A) in D.P. 267291.

ABN: 36 092 724 251
Ph: 02 9099 7400
(Ph: 0412 199 304)

Level 14, 135 King Street, Sydney
Sydney 2000
GPO Box 4103 Sydney NSW 2001
DX 967 Sydney

As regards to Lot 1 D.P. 395367, numbered 11 on attached Cadastral Records Enquiry: -

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
14.07.1914 (1914 to 1952)	Arthur William Spurr (Blacksmith)	Volume 262 Folio 213
27.05.1952 (1952 to 1953)	Edward Spurr (Pattern Maker) (Transmission Application not investigated)	Volume 262 Folio 213
06.01.1953 (1953 to 1956)	The Dairy Farmers' Co-Operative Milk Company Limited Then Dairy Farmers Co-Operative Limited Now Australian Co-Operative Foods Limited	Volume 262 Folio 213 Then Volume 6854 Folio 142 Now Volume 6909 Folio 186
02.02.1956 (1956 to 1997)	The Council of the City of Newcastle Then **Intervening Name Changes** Now Energy Australia	Volume 6909 Folio 186 Now Volume 7174 Folio 134 Now 1/395367
04.09.1997 (1997 to 2019)	Zutor Pty. Ltd (Or Zutor Pty Ltd) (Or Zutor Pty. Limited)	1/395367
01.03.2019 (2019 to Date)	# McCloy Newcastle West Pty Limited	1/395367

 # Denotes current registered proprietor

Leases: -

- **Various leases were found between 19.10.2012 to 25.03.2020 that have since been surrendered or expired by effluxion of time. Not investigated.**
- 23.11.2020 (AQ502865): Lease to Manning Valley Motor Holding Pty Ltd of Tenancy 1, 924 Hunter Street and 4 Tighe Street, Newcastle West. Expires 15.05.2024.

Easements: - NIL

ABN: 36 092 724 251
Ph: 02 9099 7400
(Ph: 0412 199 304)

Level 14, 135 King Street, Sydney
Sydney 2000
GPO Box 4103 Sydney NSW 2001
DX 967 Sydney

As regards to Auto Consol 8377-233 (Lot 2 D.P. 126 & Lot 1 D.P. 456088): -

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
	As regards to the part numbered 12 on attached Cadastral Records Enquiry: -	
05.08.1902 (1902 to 1959)	Elizabeth Leonard (Spinster) Mary Leonard (Spinster) Bridget Leonard (Spinster now Widow)	Volume 710 Folio 91
09.06.1959 (1959 to 1959)	Bridget Harrison (Spinster now Widow) (Formerly Bridget Leonard) (Notice of Death - Surviving Proprietor)	Volume 710 Folio 91
01.08.1959 (1959 to 1993)	The Dairy Farmers' Co-Operative Milk Company Limited Then Dairy Farmers Co-Operative Limited Now Australian Co-Operative Foods Limited	Volume 710 Folio 91 Then Volume 7929 Folio 72 Now Volume 8377 Folio 233
	As regards to the part numbered 13 on attached Cadastral Records Enquiry: -	
27.08.1877 (1877 to 1927)	Catherine Leonard (Married Woman)	Volume 266 Folio 136
20.07.1927 (1927 to 1959)	Mary Leonard (Spinster) Elizabeth Minogue (Married woman) (Transmission Application not investigated)	Volume 266 Folio 136
09.06.1959 (1959 to 1959)	Public Trustee (Section 94 Application not investigated)	Volume 266 Folio 136
21.09.1959 (1959 to 1993)	The Dairy Farmers' Co-Operative Milk Company Limited Then Dairy Farmers Co-Operative Limited Now Australian Co-Operative Foods Limited	Volume 266 Folio 136 Then Volume 7929 Folio 72 Now Volume 8377 Folio 233
	Continued as to the whole: -	
23.09.1993 (1993 to 1994)	Australian Co-Operative Foods Limited	Volume 8377 Folio 233
06.12.1994 (1994 to 2019)	Zutor Pty. Ltd (Or Zutor Pty Ltd) (Or Zutor Pty. Limited)	Volume 8377 Folio 233 Now Auto Consol 8377-233
01.03.2019 (2019 to Date)	# McCloy Newcastle West Pty Limited	Auto Consol 8377-233

 # Denotes current registered proprietor

Leases: -

- **Various leases were found between 19.10.2012 to 25.03.2020 that have since been surrendered or expired by effluxion of time. Not investigated.**
- 23.11.2020 (AQ502866): Lease to Air Locker Training Newcastle Pty Ltd of Tenancy 2, 924 Hunter Street, Newcastle West. Expires 21.04.2024.
- 23.11.2020 (AQ502867): Lease to Barre Effect Pty Ltd of Tenancy 3, Eastern Showroom, 924 Hunter Street, Newcastle West. Expires 21.05.2024.

Easements: - NIL

ABN: 36 092 724 251
Ph: 02 9099 7400
(Ph: 0412 199 304)

Level 14, 135 King Street, Sydney
Sydney 2000
GPO Box 4103 Sydney NSW 2001
DX 967 Sydney

Yours Sincerely
Taylor Wilson
20th August 2021

Cadastral Records Enquiry Report : Lot 2 DP 445736

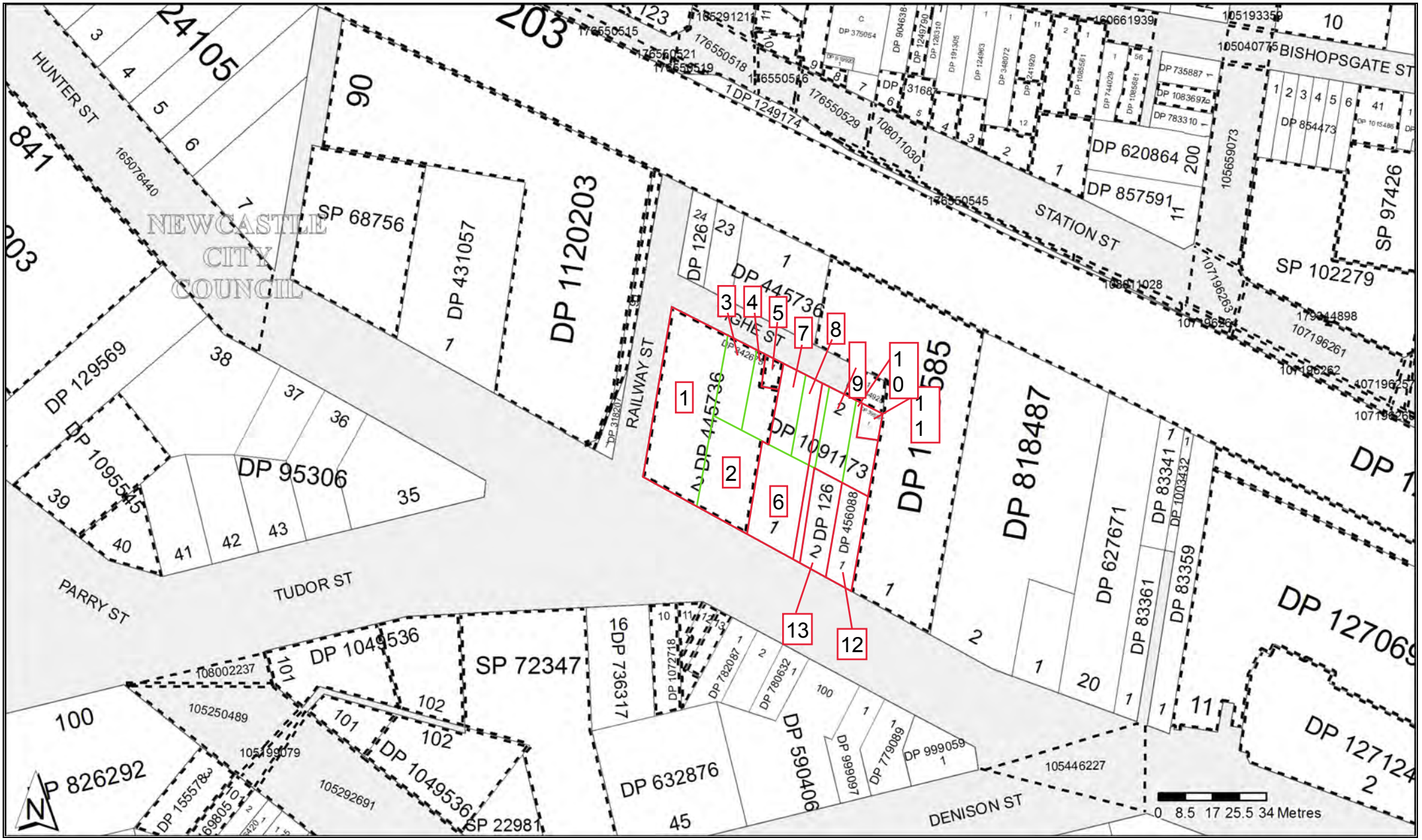
Ref : 924 Hunter Street, Newcastle West

Locality : NEWCASTLE WEST

Parish : NEWCASTLE

LGA : NEWCASTLE

County : NORTHUMBERLAND



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This information is provided as a searching aid only.Whilst every endeavour is made to ensure that current map, plan and titling information is accurately reflected, the Registrar General cannot guarantee the information provided. For ALL ACTIVITY PRIOR TO SEPTEMBER 2002 you must refer to the RGs Charting and Reference Maps

	Status	Surv/Comp	Purpose
DP131687			
Lot(s): 9			
DP962038	HISTORICAL	SURVEY	UNRESEARCHED
Lot(s): 10			
DP961397	HISTORICAL	SURVEY	UNRESEARCHED
Lot(s): 3			
DP906983	HISTORICAL	COMPILATION	UNRESEARCHED
Lot(s): 8			
DP905574	HISTORICAL	COMPILATION	UNRESEARCHED
Lot(s): 5			
DP904793	HISTORICAL	COMPILATION	UNRESEARCHED
Lot(s): 6			
DP904362	HISTORICAL	COMPILATION	UNRESEARCHED
Lot(s): 2			
DP348072	HISTORICAL	SURVEY	UNRESEARCHED
Lot(s): 11			
DP314974	HISTORICAL	SURVEY	UNRESEARCHED
Lot(s): 1			
DP229361	HISTORICAL	SURVEY	SUBDIVISION
Lot(s): 4			
DP191305	HISTORICAL	SURVEY	UNRESEARCHED
DP155578			
Lot(s): 3			
CA91799 - LOT 3 DP155578			
DP342675			
Lot(s): 1			
DP267291	REGISTERED	SURVEY	EASEMENT
DP445736			
Lot(s): 2			
DP267291	REGISTERED	SURVEY	EASEMENT
DP1015486			
Lot(s): 41			
PA81159 - LOT 41 DP1015486			
DP1049536			
Lot(s): 101			
DP996163	HISTORICAL	COMPILATION	DEPARTMENTAL
DP996944	HISTORICAL	COMPILATION	DEPARTMENTAL
Lot(s): 101, 102			
DP782092	HISTORICAL	COMPILATION	DEPARTMENTAL
DP995963	HISTORICAL	COMPILATION	DEPARTMENTAL
DP1072718			
Lot(s): 10			
DP779670	HISTORICAL	COMPILATION	DEPARTMENTAL
Lot(s): 11, 12, 13			
DP217742	HISTORICAL	SURVEY	SUBDIVISION
DP1083697			
Lot(s): 6			
CA94668 - LOT 6 DP1083697			
DP1085561			
Lot(s): 1, 2			
DP229361	HISTORICAL	SURVEY	SUBDIVISION
DP1085681			
Lot(s): 56			
CA94666 - LOT 56 DP1085681			

Caution: This information is provided as a searching aid only. Whilst every endeavour is made the ensure that current map, plan and titling information is accurately reflected, the Registrar General cannot guarantee the information provided. For **ALL ACTIVITY PRIOR TO SEPTEMBER 2002** you must refer to the RGs Charting and Reference Maps.

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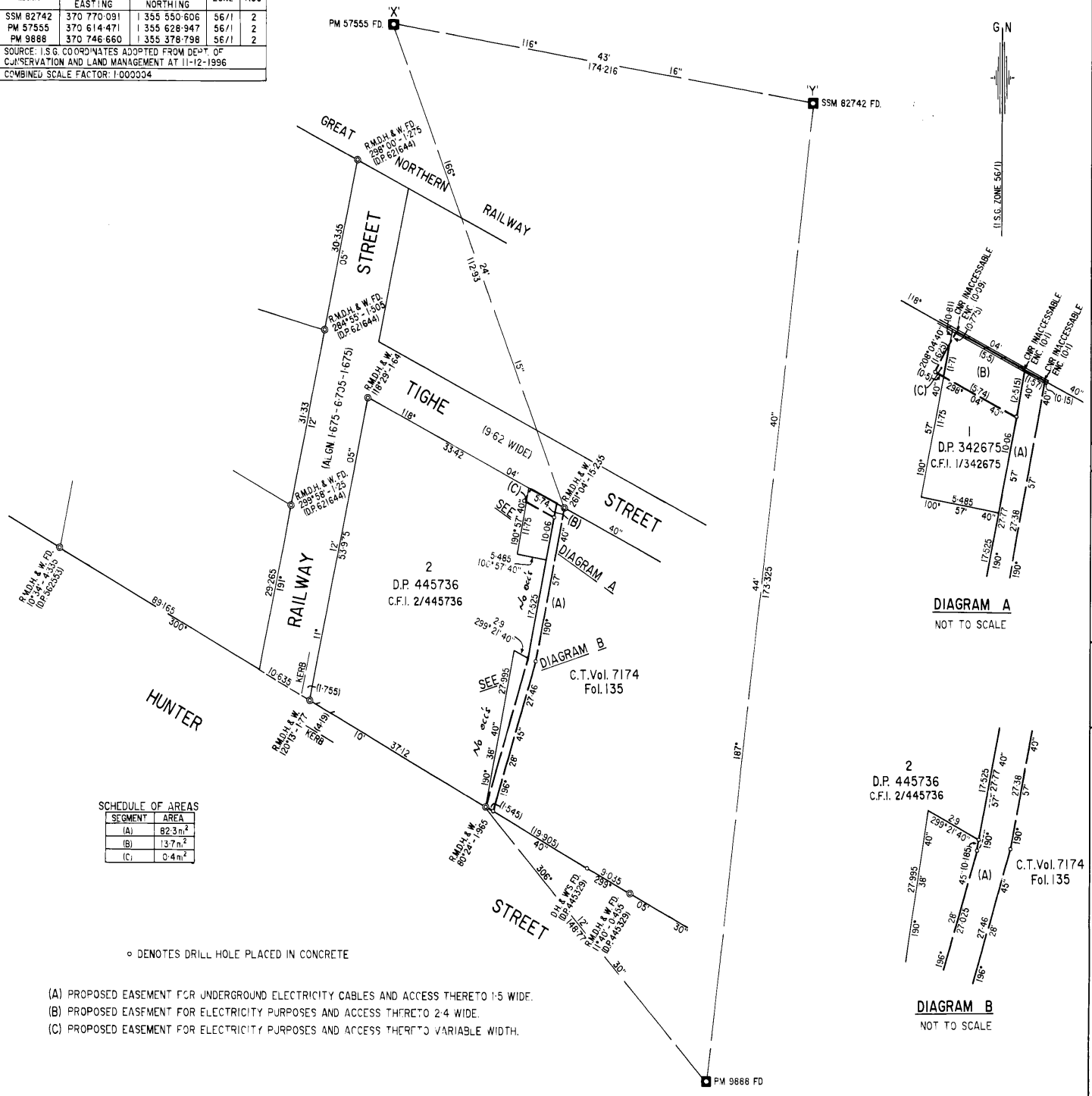
PLAN FORM 2

Plan Drawing only to appear in this space

*OFFICE USE ONLY

SIGNATURE AND SEALS ONLY.

SURVEYORS (PRACTICE) REGULATION 1996: CLAUSE 32(2)				
MARK	I.S.G. COORDINATES		ZONE	ACC
	EASTING	NORTHING		
SSM 82742	370 770·091	1 355 550·606	56/1	2
PM 57555	370 614·471	1 355 628·947	56/1	2
PM 9888	370 746·660	1 355 378·798	56/1	2
SOURCE: I.S.G. COORDINATES ADOPTED FROM DEPT. OF CONSERVATION AND LAND MANAGEMENT AT 11-12-1996				
COMBINED SCALE FACTOR: 1·000004				



SCHEDULE OF AREAS

SEGMENT	AREA
(A)	82·3m²
(B)	13·7m²
(C)	0·4m²

o DENOTES DRILL HOLE PLACED IN CONCRETE

(A) PROPOSED EASEMENT FOR UNDERGROUND ELECTRICITY CABLES AND ACCESS THERETO 1·5 WIDE.
(B) PROPOSED EASEMENT FOR ELECTRICITY PURPOSES AND ACCESS THERETO 2·4 WIDE.
(C) PROPOSED EASEMENT FOR ELECTRICITY PURPOSES AND ACCESS THERETO VARIABLE WIDTH.

Crown Lands Office Approval

PLAN APPROVED .....
Authorised Officer
Land District .....
Paper No. .....
Field Book ..... pages .....

Council's Certificate

I hereby certify that –

(a) the requirements of the Local Government Act, 1919 (other than the requirements for the registration of plans), and

*(b) the requirements of † Part 3 Division 2 of the Water Board Act 1987, or † Part 5 Division 7 of the Hunter Water Board (Corporatisation) Act 1991.

have been complied with by the applicant in relation to the proposed.....
(Insert "new road", "subdivision" or "consolidated lot") set out herein

Subdivision No. .....

Date .....

(Signature) .....
General Manager/Authorised Person

Council File No. .....

*This part of certificate to be deleted where the application is only for a consolidated lot or the opening of a new road or where the land to be subdivided is wholly outside the areas of operations of the Water Board and the Hunter Water Corporation Ltd.

†Delete if inapplicable

SURVEYOR'S REFERENCE: 12315 CHECKLIST

DP 267291

Registered: 28-1-1997

C.A: —

Title System: TORRENS

Purpose: PROPOSED EASEMENT

Ref. Map: U6350-34

Last Plan: DP342675 DP445736

PLAN OF PROPOSED EASEMENT FOR UNDERGROUND ELECTRICITY CABLES AND ACCESS THERETO WITHIN LOT 2 D.P. 445736, LOT 1 D.P. 342675 AND LAND IN C.T. Vol. 7174 Fol. 135.

Lengths are in metres. Reduction Ratio 1:500

LGA NEWCASTLE

Locality: NEWCASTLE WEST

Parish: NEWCASTLE

County: NORTHUMBERLAND

This is sheet 1 of my plan in ~~sheets~~ (Delete if inapplicable)

I, BRUCE PHILLIP GANDER

of C.R. HUTCHISON & CO. P/L - DX 7881 NEWCASTLE A.C.N. 001 747 182

a surveyor registered under the Surveyors Act 1929, hereby certify that the survey represented in this plan is accurate, has been made in accordance with the Survey Practice Regulation 1990 and was completed on 6/1/1997

(Signature) .....
Surveyor registered under the surveyors Act 1929

Datum Line of Azimuth

'X' - 'Y'

Plans used in preparation of survey/compilation
D.P. 445736
D.P. 342675
D.P. 445329
D.P. 562553
D.P. 621644

PANEL FOR USE ONLY for statements of intention to dedicate public roads, to create public reserves, drainage reserves, easements, restrictions on the use of land or positive covenants.

10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 Table of mm 210 220 230 240 250 260 270 280 290 300 310 320 330 340 350 360 370 380 390

WARNING: CREASING OR FOLDING WILL LEAD TO REJECTION

DP 267291

InfoTrack
© Office of the Registrar-General /Src:INFOTRACK /Ref:924 Hunter Street, Newcastle West /Doc:DP 0267291 P /Rev:30-Jan-1997 /NSW LRS /Pgs:ALL /Prt:20-Aug-2021 14:12 /Seq:1 of 1 /Req:R392129

I, Bruce Richard Davies, Registrar General for New South Wales, certify that this negative is a photograph made as a permanent record of a PLAN IN REGISTRAR GENERAL'S OFFICE.

AMENDMENTS AND/OR ADDITIONS NOTED ON

~~364916~~ C922329

City of Greater Newcastle.

PLAN FP445736

~~F.P.445736~~

showing re-survey for amendment of C^s.T.

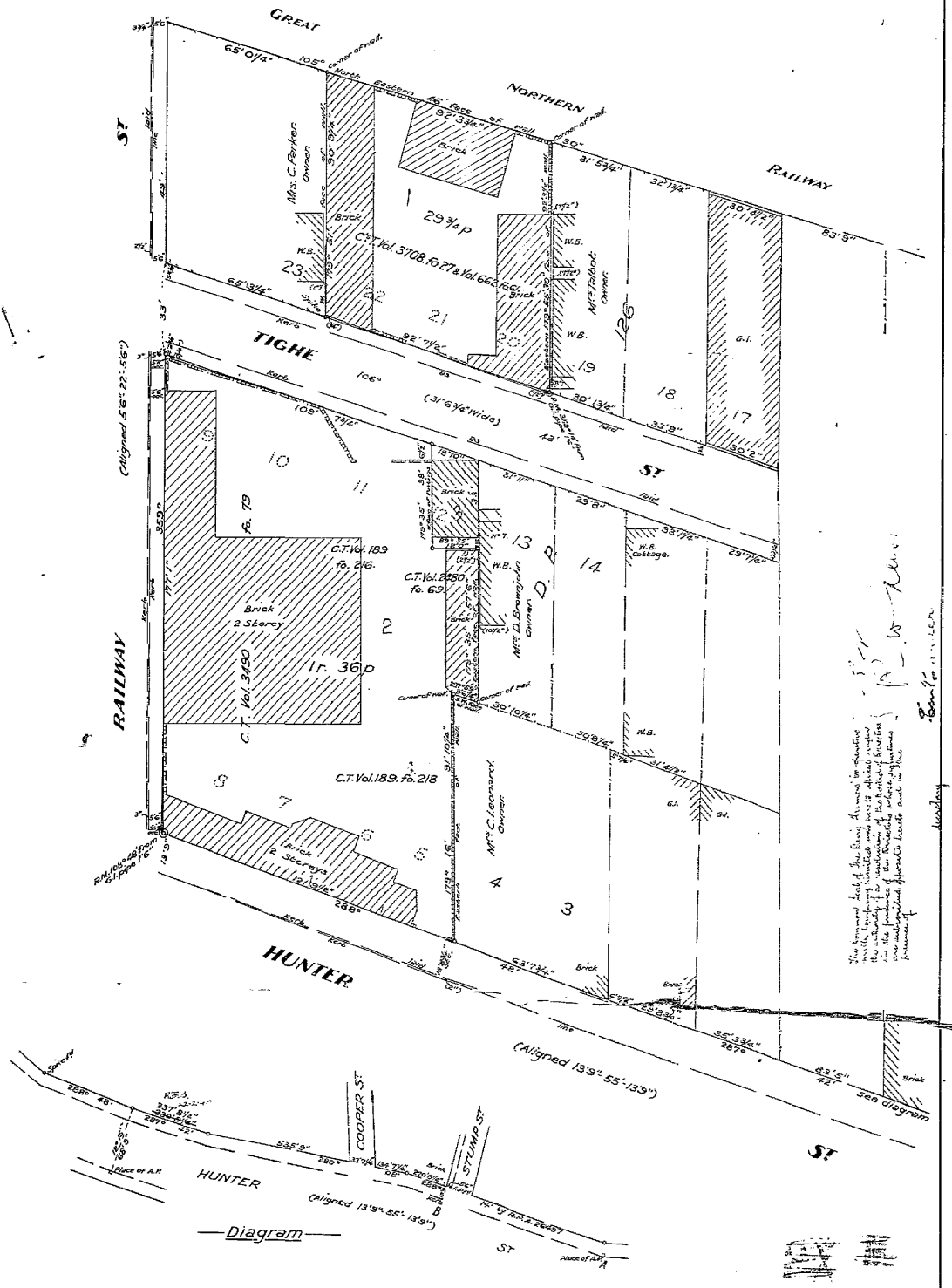
~~C.T.~~

Vol. 189. fol. 218, Vol. 3490. fol. 79, Vol. 189. fol. 216, Vol. 2480. fol. 69, Vol. 662. fol. 61 & Vol. 3708. fol. 27.

at Wickham.

Parish of Newcastle **County of Northumberland**

Scale 30 feet to an inch



CONVERSION TABLE ADDED IN DEPARTMENT OF LANDS

DP 445736

FEET	INCHES	METRES
–	0 1/4	0.006
–	0 1/2	0.013
–	0 3/4	0.019
–	0 7/8	0.022
–	1	0.025
–	2	0.051
–	2 1/2	0.064
–	2 7/8	0.073
–	3	0.076
–	3 3/4	0.095
–	7 1/2	0.191
–	7 3/4	0.197
–	8	0.203
–	10 1/2	0.267
1	6	0.457
4	2 3/4	1.289
5	4 3/4	1.645
5	5 3/4	1.670
5	6	1.676
5	7 1/4	1.708
5	11	1.803
6	–	1.829
6	7 1/2	2.019
6	7 3/4	2.026
9	6 1/8	2.899
9	6 1/4	2.902
10	11 3/8	3.337
13	8 1/4	4.172
13	8 3/4	4.185
13	9	4.191
18	–	5.486
18	10	5.740
22	–	6.706
29	7 1/4	9.023
29	8	9.042
29	8 3/4	9.061
30	1	9.169
30	1 3/4	9.188
30	2	9.195
30	4 1/2	9.258
30	8 1/4	9.354
30	10 1/4	9.404
31	4 1/2	9.563
31	5 3/4	9.595
31	6 3/4	9.620
31	11	9.728
32	1 3/4	9.798
33	–	10.058
33	1 1/4	10.090
33	7 1/4	10.243
33	9	10.287
35	3 3/4	10.763
35	3 7/8	10.766
38	6 1/2	11.748
55	–	16.764
57	6	17.526
60	2	18.339
63	7 3/4	19.399
65	0 1/4	19.818
65	3 1/4	19.895
68	9	20.955
83	5	25.425
83	9	25.527
90	9 1/4	27.667
91	10 1/4	27.997
92	3 1/4	28.124
92	3 1/2	28.131
92	3 3/4	28.137
92	7 1/2	28.232
92	7 3/4	28.238
109	7 3/4	33.420
121	9 1/2	37.122
134	7 1/4	41.027
177	1	53.975
230	8 1/4	70.314
237	8 1/2	72.454
237	8 3/4	72.460

CONVERSION TABLE ADDED IN DEPARTMENT OF LANDS CONTINUED

DP 445736

FEET	INCHES	METRES
270	7 7/8	82.496
270	8 1/4	82.506
330	–	100.584
490	–	149.352
535	9	163.297

AC	RD	P	SQ M
–	–	29 3/4	752.5
–	1	36	1922

Subscribed and declared before me at Newcastle this 28th day of July. 1939.

A. A. Bright J.P.

I, Reginald Frederick Bruyn, of Newcastle, a surveyor registered under the Surveyors Act, 1929, do hereby solemnly and sincerely declare, (a) that all boundaries and measurements shown on this plan are correct, (b) that all survey marks found and relevant physical objects on or adjacent to the boundaries are correctly represented, (c) that all physical objects indicated actually exist in the positions shown, (d) that the whole of the material facts in relation to the land are correctly represented, (e) that the survey represented in this plan has been made in accordance with the Survey Practice Regulations, 1933, by me, was completed on 17th July, 1939, and the reference marks have been placed as shown hereon. And I make this solemn declaration conscientiously believing the same to be true and by virtue of the provisions of the Oaths Act, 1900.

R. F. Bruyn.

Surveyor registered under the Surveyors Act, 1929.

Req:R387058 /Doc:DP 0445736 P /Rev:31-Dec-1992 /NSW LRS /Pgs:ALL /Prt:20-Aug-2021 09:32 /Seq:1 of 1
© Office of the Registrar-General /Src:INFOTRACK /Ref:924 Hunter Street, Newcastle West

C922328 [redacted]
~~C707453~~

F.P. 342675

City of Greater Newcastle

PLAN

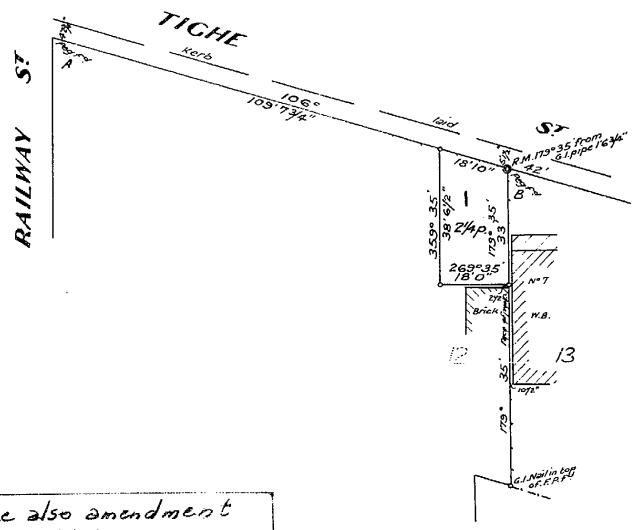
of part of Lot 12. D.P. 126.

Parish of Newcastle County of Northumberland

Scale 30 feet to an inch.

C922328

M P S (R.P.)
42675



See also amendment plan filed as F.P. 440917

THE COUNTY OF NORTHUMBERLAND
GENERAL ... 6 ... 1919
SUBDIVISION OF LAND
This plan was approved on 27 7 38
Certificate No 63 29 7 38

Subscribed and declared before me at Newcastle this 11th day of July, 1938.

I, Reginald Frederick Bruyn, of Newcastle, a surveyor registered under the Surveyors Act, 1929, do hereby solemnly and sincerely declare, (a) that all boundaries and measurements shown on this plan are correct, (b) that all survey marks found and relevant physical objects on or adjacent to the boundaries are correctly represented, (c) that all physical objects indicated actually exist in the positions shown, (d) that the whole of the material facts in relation to the land are correctly represented, (e) that the survey represented in this plan has been made in accordance with the Survey Practice Regulations, 1933, by me, was completed on 11th July, 1938, and the reference mark has been placed as shown hereon. And I make this solemn declaration conscientiously believing the same to be true, and by virtue of the provisions of the Oaths Act, 1900

R. F. Bruyn.

Surveyor registered under the Surveyors Act, 1929.

Datum line of Azimuth. A-B.

LOT No ADDED IN L.T.O. 20.3.1990.
This is the plan marked "A" referred to in ...
Dated 8th August 1938

CONVERSION TABLE ADDED IN DEPARTMENT OF LANDS

DP 342675

FEET	INCHES	METRES
-	2 1/2	0.064
-	10 1/2	0.267
1	6 3/4	0.476
4	2 3/4	1.289
5	1 1/2	1.562
18	-	5.486
18	10	5.740
33	-	10.058
38	6 1/2	11.748
109	7 3/4	33.420

AC	RD	P	SQ M
-	-	2 1/4	56.9

AMENDMENTS AND/OR ADDITIONS MADE ON PLAN IN THE LAND TITLES OFFICE

	10	20	30	40	50	60	70 Table of mm	110	120	130	140

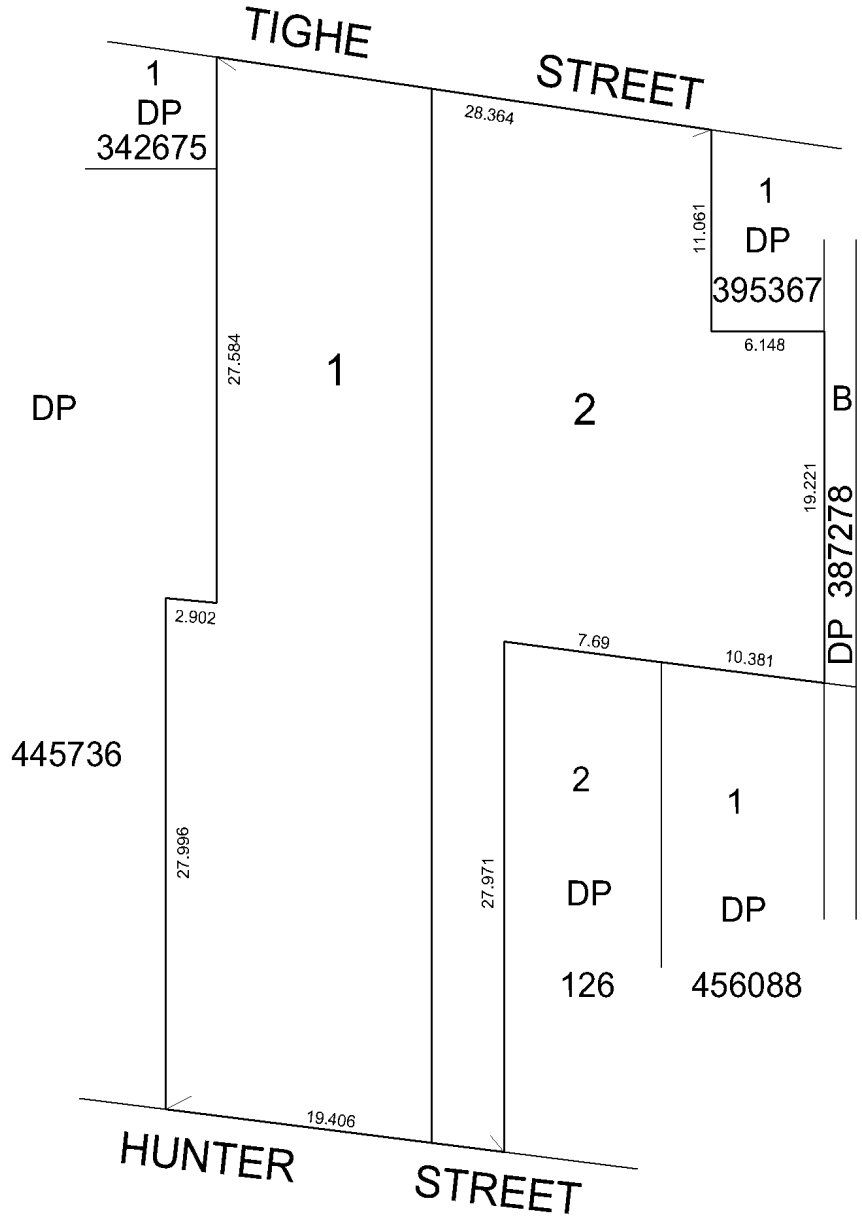
This negative is a photograph made as a permanent record of a document in the custody of the Registrar General this day. 22nd March, 1990

InfoTrack
Reg:R386956 /Doc:DP 0342675 P /Rev:03-Nov-1992 /NSW LRS /Pgs:ALL /Prt:20-Aug-2021 09:27 /Seq:1 of 1
© Office of the Registrar-General /Src:INFOTRACK /Ref:924 Hunter Street, Newcastle West

InfoTrack

e-departmental

Full dimensions and/or area(s) are not available for all lots. Any division of the lands herein may necessitate the lodgement of a plan of survey.



TOTAL AREA FOR LOTS 1 & 2: 1397 m²

DP 1091173

Registered : 22.11.2005

Title System : TORRENS

Purpose : DEPARTMENTAL

Ref. Map : U6350-34

Last Plan : DP126

PLAN OF PART OF PORS 198 & 199

COMPRISED IN VOL. 7174 FOL. 135

Lengths are in metres. Reduction Ratio - NTS

LPI Ref. : TCB 37/38

Sheet 1 of 1 sheet

L.G.A. : NEWCASTLE

LOCALITY : NEWCASTLE WEST

PARISH : NEWCASTLE

COUNTY : CUMBERLAND

LOT	PRIOR IDENTITY
1	PT POR. 198
2	PT POR. 199

THIS PLAN HAS BEEN PREPARED TO PROVIDE AN UNIQUE IDENTITY FOR THE LAND IN THE CERTIFICATE OF TITLE REFERRED TO ABOVE.

IT IS NOT A CURRENT PLAN IN THE TERMS OF 7A OF THE CONVEYANCING ACT, 1919.

Req:R361344 /Doc:DP 1091173 P /Rev:01-Dec-2005 /NSW LRS /Pgs:ALL /Prt:18-Aug-2021 12:17 /Seq:1 of 1
© Office of the Registrar-General /Src:INFOTRACK /Ref:924 Hunter Street, Newcastle West

InfoTrack

Req:R387380 /Doc:DP 0201679 P /Rev:05-Jun-1992 /NSW LRS /Pgs:ALL /Prt:20-Aug-2021 09:55 /Seq:1 of 1
© Office of the Registrar-General /Src:INFOTRACK /Ref:924 Hunter Street, Newcastle West

DP201679s

Plan Form No. 6 (for transfers, leases, etc.)

~~Municipality of~~
~~Shire of~~
City of Newcastle

PLAN

of part lot 1, D.P. 126

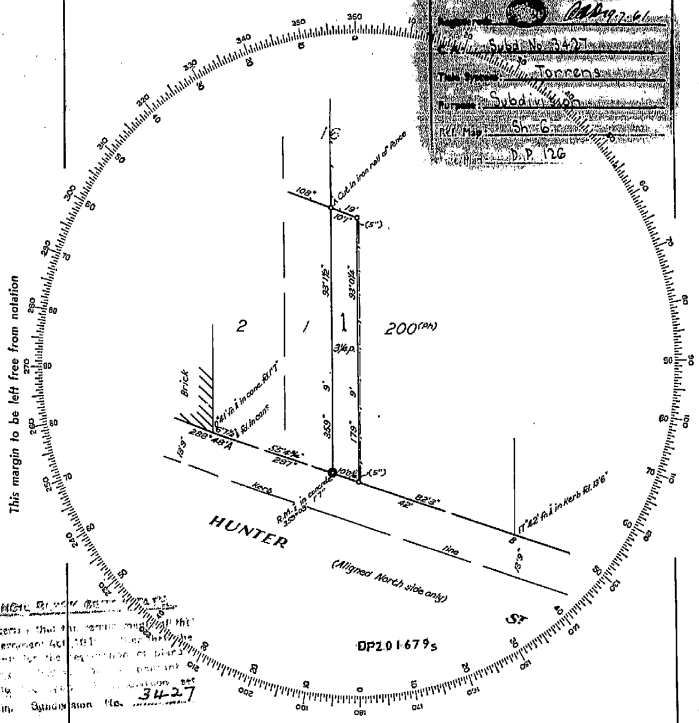
Parish of Newcastle County of Northumberland

Scale 30 feet to an inch.

DP201679 s

Registered: 9.7.61
Subd. No. 3427
Title System: Torrens
Purpose: Subdivision
Ref. Map: Sh. 6
Last Plan: D.P. 126

This margin to be left free from notation



Signatures of parties to be made in this margin.

This is the plan marked " " referred to in.....

Dated.....

COUNCIL RESOLUTION

I hereby certify that this [illegible] Local Government Act, 1919 [illegible] Subdivision No. 3427 approved 8th November 1960.

TOWN CLERK

Approved by the Council and Certified in accordance with the Provisions of Section 327 of the Local Government Act, 1919.

Subdivision No.....

Council Clerk.....

Datum Line of Azimuth A-B. (Ste H322601.)

I, Reginald Frederick Bruyn

of Newcastle

a surveyor registered under the Surveyors Act, 1929-1946, hereby certify that the survey represented in this plan is accurate and has been made * (1) by me ~~(2) under my immediate supervision~~ in accordance with the Survey Practice Regulations, 1933, and was completed on † 16th September 1960.

(Signature) R F Bruyn

Surveyor registered under the Surveyors Act, 1929-46.

* Strike out either (1) or (2). † Insert date of survey.

CONVERSION TABLE ADDED IN REGISTRAR GENERAL'S DEPARTMENT

DP 201679

FEET	INCHES	METRES
-	5	0.127
1	1	0.330
1	7	0.483
3	9	1.143
6	7 1/2	2.019
8	7	2.616
9	3 3/4	2.838
10	0 3/4	3.067
10	1	3.073
13	6	4.115
13	9	4.191
55	4 3/4	16.885
82	3	25.070
93	0 1/4	28.353
93	1 1/2	28.385

AC	RD	P	SQ M
-	-	3 1/4	82.2

I, Bruce Richard Davies, Registrar General for New South Wales, certify that this negative is a photograph made as a permanent record of a document in my custody this 14th day of February, 1977

Table of mm

Req:R359856 /Doc:DP 0000126 P /Rev:17-Feb-2015 /NSW LRS /Prt:18-Aug-2021 10:47 /Seq:1 of 1
© Office of the Registrar-General /Src:INFOTRACK /Ref:924 Hunter Street, Newcastle West

CONVERSION TABLE ADDED IN REGISTRAR GENERAL'S DEPARTMENT

DP 126

FEET	INCHES	METRES
29	6	8.99
29	9	9.07
29	10	9.095
30	-	9.145
30	1	9.17
30	2	9.195
33	-	10.06
80	2	24.435
87	6	26.67
87	9	26.745
87	11	26.795
88	3	26.9
88	4	26.925
88	9	27.05
89	2	27.18
89	3	27.205
89	7	27.305
89	9	27.355
90	1	27.455
90	3	27.51
90	6	27.585
90	9	27.66
91	-	27.735
91	3	27.815
91	9	27.965

AC	RD	P	SQ M
-	-	9 1/4	234
-	-	9 1/2	240.3
-	-	18	455.3
-	-	18 1/2	467.9
-	-	28	708.2
-	-	36 1/2	923.2
-	1	7	1189

DP 126

PLAN OF 24 ALLOTMENTS IN THE CITY OF at Wickham Pt. NEWCASTLE. Co. Northumberland

Scale 1 chain to 2 inches

Being Portions 197 198 & 199 suburban allotments as per Government plans of Newcastle, and now belonging to Clarence H. Hannell.

COPY MADE L. & P. 18.9.94
EXAMINED J. L. M. 16.10.94

GREAT NORTHERN RAILWAY

RESERVED ROAD

TICHE STREET

GREAT NORTHERN ROAD

T. 20048 18 per.
T. 12414 O. 1. 7
T. 17519 9½ per.
T. 12412 9¼ per.
T. 18362 9¼ per.
T. 26325 9¼ per.
T. 12669 9¼ per.
T. 19441 9¼ per.
T. 12609 36½ per.
T. 12609 28 per.
T. 12413 18½ per.
T. 19732 9¼ p.
T. 19733 9¼ p.

House. owner & occupier

Thomas Bryant. owner & occupier

197. 198. 199.

All granted to Clarence Hewson Hannell 3 Grants dated 14th Augst 1868
Portion 197. Vol. 72 fo. 250
do 198 " 73 " 1
do 199 " 73 " 2

No. 126

I certify that the above Diagram and Description are correct for the purposes of the accompanying Application of Clarence Hewson Hannell, under the Land Titles Act — D'Mahaiduane Lic. Surveyor

Sworn before me this 12th day of June 1874.
W. A. Scratton J.P

D'Mahaiduane Lic. Surveyor June 1874

Historical Title

NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE
18/8/2021 9:30AM

FOLIO: 2/445736

First Title(s): VOL 72 FOL 250 VOL 73 FOL 1
Prior Title(s): VOL 5161 FOL 181

Recorded	Number	Type of Instrument	C.T. Issue
18/12/1988		TITLE AUTOMATION PROJECT	LOT RECORDED FOLIO NOT CREATED
19/2/1990	Y746376	APPLICATION FOR REPLACEMENT CERTIFICATE OF TITLE	FOLIO CREATED EDITION 1
20/9/1993	I651038	CHANGE OF NAME	EDITION 2
10/12/1993	I760985	MORTGAGE	EDITION 3
6/12/1994	U840926	DISCHARGE OF MORTGAGE	
6/12/1994	U840927	TRANSFER	EDITION 4
28/1/1997	DP267291	DEPOSITED PLAN	
6/6/1997	3077496	TRANSFER GRANTING EASEMENT	EDITION 5
4/9/1997	3361314	MORTGAGE	EDITION 6
19/7/2000	6946978	VARIATION OF MORTGAGE	EDITION 7
23/10/2002	9045568	DISCHARGE OF MORTGAGE	
23/10/2002	9045569	MORTGAGE	EDITION 8
19/10/2012	AH287400	DISCHARGE OF MORTGAGE	
19/10/2012	AH287401	LEASE	EDITION 9
12/11/2014	AI999577	SURRENDER OF LEASE	
12/11/2014	AI999578	LEASE	EDITION 10
31/8/2016	AK715910	SURRENDER OF LEASE	EDITION 11
28/2/2019	AP90588	DEPARTMENTAL DEALING	
1/3/2019	AP94672	TRANSFER	EDITION 12
23/11/2020	AQ502865	LEASE	EDITION 13
5/2/2021	AQ779633	CAVEAT	

*** END OF SEARCH ***

924 Hunter Street, Newcastle West PRINTED ON 18/8/2021

InfoTrack an approved NSW Information Broker hereby certifies that the information contained in this document has been provided electronically by the Registrar General in accordance with Section 96B(2) of the Real Property Act 1900.

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Received: 18/08/2021 09:30:41

Req:R382727 /Doc:DL I651038 /Rev:19-Apr-2010 /NSW LRS /Pgs:ALL /Prt:19-Aug-2021 16:23 /Seq:1 of 13
© Office of the Registrar-General /Src:INFOTRACK /Ref:924 Hunter Street, Newcastle West

RP33

[redacted]

Application to Record

CHANGE OF N

Real Property Act 1900
Crown Lands Consolidation Act 1900
Western Lands Act 1901

I
651038 N

B4002 16/9
E-RN
V-TZ 16/9

B

See copies A, B, C

(A) [redacted]
Show no more than 20 References to Title.

[redacted]

(B) **REGISTERED DEALING**
If applicable.

(C) **LODGED BY**

L.T.O. Box	Name, Address or DX and Telephone
92Q.	BAKER & McKENZIE DX 218 SYDNEY REFERENCE (max 15 characters):

(D) [redacted]
whose name is to be changed.

[redacted]

(E) [redacted]
In full.

CN	[redacted] (ARBN 010 308 068) S

(F) I, the Registered Proprietor, apply to have my New Name recorded in the Register in respect of the above **Land/~~Registered Dealing~~**.

(G) **STATUTORY DECLARATION BY THE APPLICANT** SEE ANNEXURE 'B'

~~I, *[New Name]* ....., solemnly and sincerely declare that~~

~~1. I am identical with the Registered Proprietor referred to above,~~

~~2. On ..... 199 ..... at .....~~

~~in the State of ..... I married .....;~~

~~3. .....~~

I make this solemn declaration conscientiously believing the same to be true and by virtue of the Oaths Act 1900, and I certify this application correct for the purposes of the Real Property Act 1900.

Made and subscribed at ..... in the State of .....

on ..... 199 ..... in the presence of

.....
Signature of Witness

.....
Name of Witness (BLOCK LETTERS)

.....
~~Address and Qualification of Witness~~

.....
~~Signature of Applicant~~

CHECKED BY (office use only) GLG

Cocco

CT-92Q

Ausdoc Commercial and Law Stationers

Req:R382727 /Doc:DL I651038 /Rev:19-Apr-2010 /NSW LRS /Pgs:ALL /Prt:19-Aug-2021 16:23 /Seq:2 of 13
© Office of the Registrar-General /Src:INFOTRACK /Ref:924 Hunter Street, Newcastle West

THIS IS PAGE ONE OF THE ANNEXURE "A" REFERRED TO
IN THE CHANGE OF NAME (RP33)

Dated 9th July 1993

B

Torrens Title Reference

Folio Identifier 28/2067 878-114
Folio Identifier 1/601958 14100-27
Folio Identifier A/370276 6278-138
Folio Identifier 110/D/1195 4120-154
Auto Consol 6818-134
Folio Identifier 78/736042
Folio Identifier 11/787701
Folio Identifier 1/23241 9811-204
Volume 9501 Folio 192 - now 9/15/2780
Folio Identifier 1/534602 11047-41
Folio Identifier 22/240568
Volume 10943 Folio 151 - now 12/532025
Volume 10943 Folio 152 - now 13/532025
Volume 11106 Folio 213 - now 16/534579
Folio Identifier 18/240568
Volume 11551 Folio 116 - now 19/240568
Volume 11551 Folio 117 - now 20/240568
Volume 11551 Folio 118 - now 21/240568
Folio Identifier 21/738036
Folio Identifier 1/797024

[signature] [signature] (JP)

Req:R382727 /Doc:DL I651038 /Rev:19-Apr-2010 /NSW LRS /Pgs:ALL /Prt:19-Aug-2021 16:23 /Seq:3 of 13
© Office of the Registrar-General /Src:INFOTRACK /Ref:924 Hunter Street, Newcastle West

THIS IS PAGE TWO OF THE ANNEXURE "A" REFERRED TO
IN THE CHANGE OF NAME (RP33)
Dated 9th July 1993

B

Torrens Title Reference

Folio Identifier 2/797024
Folio Identifier 6/261968 14556 - 110
Folio Identifier 1/507180 10019 - 49
Folio Identifier 36/220788 9915 - 186
Folio Identifier 1/431958
Folio Identifier 1/532996
Folio Identifier 2/532996 10985 - 45
Volume 10738 Folio 38
Folio Identifier B/103432 10002 - 39
[redacted]
Folio Identifier 1/445736
[redacted]
Volume 8632 Folio 145 - auto consol.
Folio Identifier 12/569799 12461 - 228
Folio Identifier 21/263269 14874 - 108
Folio Identifier 22/263269 14874 - 109
Volume 13013 Folio 19 NOW BEING 1/582097
Volume 13013 Folio 20 2/582097
Folio Identifier 13/B/9140 9973 - 201
Folio Identifier 14/B/9140 9973 - 202

Req:R382727 /Doc:DL I651038 /Rev:19-Apr-2010 /NSW LRS /Pgs:ALL /Prt:19-Aug-2021 16:23 /Seq:4 of 13
© Office of the Registrar-General /Src:INFOTRACK /Ref:924 Hunter Street, Newcastle West

THIS IS PAGE THREE OF THE ANNEXURE "A" REFERRED TO

IN THE CHANGE OF NAME (RP33)

Dated 9th July 1993

B

Torrens Title Reference

Folio Identifier 15/B/9140 } 9973 - 203/204
Folio Identifier 16/B/9140 }
Folio Identifier 1/76938 - 3851 - 201
Volume 4237 Folio 132 auto consol
Volume 5865 Folio 194 now 12/3459
Volume 5865 Folio 195 NOW BEING 13/3459
Volume 12533 Folio 244 ϕ ϕ NOW BEING 14/571651
Folio Identifier 12/719715
Folio Identifier 38/10704 6393 - 108
Folio Identifier 37/10704 3462 - 240
Folio Identifier A/340379 5065 - 93
Folio Identifier 40/10704 3596 - 138

Req:R382727 /Doc:DL I651038 /Rev:19-Apr-2010 /NSW LRS /Pgs:ALL /Prt:19-Aug-2021 16:23 /Seq:5 of 13
© Office of the Registrar-General /Src:INFOTRACK /Ref:924 Hunter Street, Newcastle West

THIS IS THE ANNEXURE MARKED "B" REFERRED TO IN THE APPLICATION TO RECORD CHANGE OF NAME (RP33)

Dated 9th July 1993

B

STATUTORY DECLARATION

I, GEOFFREY DOUGLAS BOXSELL of 55 Chandos Street, St Leonards in the State of New South Wales, Company Secretary do solemnly and sincerely declare as follows:

1. I am the secretary of Australian Co-operative Foods Limited a co-operative society duly registered under the Co-operatives Act, 1992 (NSW) as amended.

2. I am duly authorised by Australian Co-operative Foods Limited to make this Statutory Declaration.

3. Dairy Farmers Co-operative Limited is recorded as the registered proprietor of the whole of the land contained in the Certificates of Title referred to in Annexure "A" of the Application to Record Change of Name (RP33).

4. On the 8th December 1989, the Registrar of Co-operative Societies recorded that Dairy Farmers Co-operative Limited had changed its name to Australian Co-operative Foods Limited. A copy of the Certificate of Incorporation following change of name is attached and marked "C".

And I make this solemn declaration conscientiously believing the same to be true and by virtue of the provisions of the Oaths Act, 1900 (as amended).

Subscribed and declared at)
Sydney this 9th)
day of July 1993)
Before me:)

GBoxsell
.....

.....

Req:R382727 /Doc:DL I651038 /Rev:19-Apr-2010 /NSW LRS /Pgs:ALL /Prt:19-Aug-2021 16:23 /Seq:6 of 13
© Office of the Registrar-General /Src:INFOTRACK /Ref:924 Hunter Street, Newcastle West

'C'

FORM 18
REGULATION 30

NEW SOUTH WALES

B

CO-OPERATION ACT

Certificate of Incorporation

(FOLLOWING CHANGE OF NAME)

I Certify that DAIRY FARMERS CO-OPERATIVE LIMITED

has registered a change of its name, and is now incorporated as a RURAL society under the name of AUSTRALIAN CO-OPERATIVE FOODS LIMITED

Dated this EIGHTH day of DECEMBER 19 89

Deputy Registrar of Co-operative Societies.

Req:R382727 /Doc:DL I651038 /Rev:19-Apr-2010 /NSW LRS /Pgs:ALL /Prt:19-Aug-2021 16:23 /Seq:7 of 13
© Office of the Registrar-General /Src:INFOTRACK /Ref:924 Hunter Street, Newcastle West

DATED 1993.

B

STATUTORY DECLARATION

of

GEOFFREY DOUGLAS BOXSELL

ADDISONS
Solicitors
7th Floor
Culwulla Chambers
67 Castlereagh Street
SYDNEY NSW 2000
DX 262 SYDNEY
Tel: (02) 233-4622
Ref: DB:AUS005/660:0717B/7

Req:R382727 /Doc:DL I651038 /Rev:19-Apr-2010 /NSW LRS /Pgs:ALL /Prt:19-Aug-2021 16:23 /Seq:8 of 13
© Office of the Registrar-General /Src:INFOTRACK /Ref:924 Hunter Street, Newcastle West

RP33

Application to Record

CHANGE OF N

Real Property Act 1900
Crown Lands Consolidation Act 190[illegible]
Western Lands Act 1901

I
651038 N A

R1/1

B4002 E-BM 16/9 V-KV 16/9

(A) **LAND**
Show no more than 20 References to Title.

SEE ANNEXURE **B**

(B) **REGISTERED DEALING**
If applicable.

(C) **LODGED BY**

L.T.O. Box	Name, Address or DX and Telephone
920	BAKER & McKENZIE DX 218 SYDNEY REFERENCE (max ~~15 characters~~):

(D) **REGISTERED PROPRIETOR**
whose name is to be changed.

DAIRY FARMERS CO-OPERATIVE LIMITED

(E) **NEW NAME**
In full.

CN AUSTRALIAN CO-OPERATIVE FOODS LIMITED
(ARBN 010 308 068)

(F) I, the Registered Proprietor, apply to have my New Name recorded in the Register in respect of the above ~~Land/Registered Dealing~~.

(G) **STATUTORY DECLARATION BY THE APPLICANT** SEE ANNEXURE 'B'

~~*1, [New Name]* ....., solemnly and sincerely declare that~~

~~*1. I am identical with the Registered Proprietor referred to above,*~~

~~*2. On ..... 199..... at .....*~~

~~*in the State of ..... I married .....;*~~

~~*3.* .....~~

.....

I make this solemn declaration conscientiously believing the same to be true and by virtue of the Oaths Act 1900, and I certify this application correct for the purposes of the Real Property Act 1900.

Made and subscribed at ..... in the State of .....

on ..... 199..... in the presence of

.....
Signature of Witness

.....
Name of Witness (BLOCK LETTERS)

.....
~~Address and Qualification of Witness~~

.....
~~Signature of Applicant~~

CHECKED BY (office use only) BLG

CT- 920

Req:R382727 /Doc:DL I651038 /Rev:19-Apr-2010 /NSW LRS /Pgs:ALL /Prt:19-Aug-2021 16:23 /Seq:9 of 13
© Office of the Registrar-General /Src:INFOTRACK /Ref:924 Hunter Street, Newcastle West

THIS IS PAGE ONE OF THE ANNEXURE REFERRED TO
IN THE CHANGE OF NAME (RP33)
Dated 9th July 1993

B

Torrens Title Reference

✓Folio Identifier 28/2067 878-114
✓Folio Identifier 1/601958 14100-27
✓Folio Identifier A/370276 6278-138
✓Folio Identifier 110/D/1195 4120-154
✓Auto Consol 6818-134
✓Folio Identifier 78/736042
✓Folio Identifier 11/787701
✓Folio Identifier 1/23241 9811-204
✓Volume 9501 Folio 192 - now 9/15/2780
✓Folio Identifier 1/534602 11047-41
✓Folio Identifier 22/240568
✓Volume 10943 Folio 151 - now 12/532025
✓Volume 10943 Folio 152 - now 13/532025
✓Volume 11106 Folio 213 - now 16/534579
✓Folio Identifier 18/240568
✓Volume 11551 Folio 116 - now 19/240568
✓Volume 11551 Folio 117 - now 20/240568
✓Volume 11551 Folio 118 - now 21/240568
✓Folio Identifier 21/738036
✓Folio Identifier 1/797024

[signature] [signature] (JP)

Req:R382727 /Doc:DL I651038 /Rev:19-Apr-2010 /NSW LRS /Pgs:ALL /Prt:19-Aug-2021 16:23 /Seq:10 of 13
© Office of the Registrar-General /Src:INFOTRACK /Ref:924 Hunter Street, Newcastle West

RP33

Application to Record

CHANGE OF N

Real Property Act 1900
Crown Lands Consolidation Act 1900
Western Lands Act 1901

I
651038 N B

R1/1

B4002 E-Bn 16/9 V-tz 16/9

(A) **LAND**
Show no more than 20 References to Title.

SEE ANNEXURE **B**

(B) **REGISTERED DEALING**
If applicable.

(C) **LODGED BY**

L.T.O. Box	Name, Address or DX and Telephone
920	BAKER & McKENZIE DX 218 SYDNEY REFERENCE (max ~~15 characters~~):

(D) **REGISTERED PROPRIETOR**
whose name is to be changed.

DAIRY FARMERS CO-OPERATIVE LIMITED

(E) **NEW NAME**
In full.

CN AUSTRALIAN CO-OPERATIVE FOODS LIMITED
(ARBN 010 308 068) S

(F) I, the Registered Proprietor, apply to have my New Name recorded in the Register in respect of the above ~~Land/Registered Dealing~~.

(G) **STATUTORY DECLARATION BY THE APPLICANT** SEE ANNEXURE 'B'

~~I, [New Name] ....., solemnly and sincerely declare that~~

~~1. I am identical with the Registered Proprietor referred to above;~~

~~2. On ..... 199..... at .....~~
~~in the State of ..... I married .....;~~

~~3. .....~~

.....

I make this solemn declaration conscientiously believing the same to be true and by virtue of the Oaths Act 1900, and I certify this application correct for the purposes of the Real Property Act 1900.

Made and subscribed at ..... in the State of .....

on ..... 199..... in the presence of

.....
Signature of Witness

.....
Name of Witness (BLOCK LETTERS)

.....
~~Address and Qualification of Witness~~

.....
~~Signature of Applicant~~

CHECKED BY (office use only) 626

CT-920

Req:R382727 /Doc:DL I651038 /Rev:19-Apr-2010 /NSW LRS /Pgs:ALL /Prt:19-Aug-2021 16:23 /Seq:11 of 13
© Office of the Registrar-General /Src:INFOTRACK /Ref:924 Hunter Street, Newcastle West

THIS IS PAGE TWO OF THE ANNEXURE REFERRED TO
IN THE CHANGE OF NAME (RP33)
Dated 9th July 1993

B

Torrens Title Reference

Folio Identifier 2/797024
Folio Identifier 6/261968 14556 - 110
Folio Identifier 1/507180 10019 - 49
Folio Identifier 36/220788 9915 - 186
Folio Identifier 1/431958
Folio Identifier 1/532996
Folio Identifier 2/532996 10985 - 45
Volume 10738 Folio 38
Folio Identifier B/103432 10002 - 39
Folio Identifier 2/445736
Folio Identifier 1/445736
Folio Identifier 1/342675
Volume 8632 Folio 145 - auto consol.
Folio Identifier 12/569799 12465 - 228
Folio Identifier 21/263269 14874 - 108
Folio Identifier 22/263269 14874 - 109
Volume 13013 Folio 19 NOW BEING 1/582097
Volume 13013 Folio 20 2/582097
Folio Identifier 13/B/9140 9973 - 201
Folio Identifier 14/B/9140 9973 - 202

G Boosell [signature] (JP)

Req:R382727 /Doc:DL I651038 /Rev:19-Apr-2010 /NSW LRS /Pgs:ALL /Prt:19-Aug-2021 16:23 /Seq:12 of 13
© Office of the Registrar-General /Src:INFOTRACK /Ref:924 Hunter Street, Newcastle West

RP33

Application to Recorc

CHANGE OF N

Real Property Act 1900
Crown Lands Consolidation Act 190(
Western Lands Act 1901

I
651038 N C

R1/1

B4002 16/9
E-RN 16/9
V-tz 16/9

(A) **LAND**
Show no more than 20 References to Title.

SEE ANNEXURE **B**

(B) **REGISTERED DEALING**
If applicable.

(C) **LODGED BY**

L.T.O. Box	Name, Address or DX and Telephone
92Q	BAKER & McKENZIE DX 218 SYDNEY REFERENCE (max 15 characters):

(D) **REGISTERED PROPRIETOR**
whose name is to be changed.

DAIRY FARMERS CO-OPERATIVE LIMITED

(E) **NEW NAME**
In full.

CN AUSTRALIAN CO-OPERATIVE FOODS LIMITED
(ARBN 010 308 068) S

(F) I, the Registered Proprietor, apply to have my New Name recorded in the Register in respect of the above **Land/~~Registered Dealing~~**.

(G) **STATUTORY DECLARATION BY THE APPLICANT** SEE ANNEXURE 'B'

~~I, [New Name] ....., solemnly and sincerely declare that~~

~~1. I am identical with the Registered Proprietor referred to above;~~

~~2. On ..... 199 ..... at .....~~

~~in the State of ..... I married .....;~~

~~3. .....~~

I make this solemn declaration conscientiously believing the same to be true and by virtue of the Oaths Act 1900, and I certify this application correct for the purposes of the Real Property Act 1900.

Made and subscribed at ..... in the State of .....

on ..... 199 ..... in the presence of

.....
Signature of Witness

.....
Name of Witness (BLOCK LETTERS)

.....
~~Address and Qualification of Witness~~

.....
~~Signature of Applicant~~

CHECKED BY (office use only) 6/6

CT-92Q

Req:R382727 /Doc:DL I651038 /Rev:19-Apr-2010 /NSW LRS /Pgs:ALL /Prt:19-Aug-2021 16:23 /Seq:13 of 13
© Office of the Registrar-General /Src:INFOTRACK /Ref:924 Hunter Street, Newcastle West

THIS IS PAGE THREE OF THE ANNEXURE REFERRED TO

IN THE CHANGE OF NAME (RP33)

Dated 9th July 1993

B

Torrens Title Reference

Folio Identifier 15/B/9140 } 9973 - 203/204
Folio Identifier 16/B/9140 }
Folio Identifier 1/76938 - 3851 - 201
Volume 4237 Folio 132 auto consol
Volume 5865 Folio 194 now 12/3459
Volume 5865 Folio 195 NOW BEING 13/3459
Volume 12533 Folio 244 ϕ ϕ NOW BEING 14/571651
Folio Identifier 12/719715
Folio Identifier 38/10704 6393 - 108
Folio Identifier 37/10704 3462 - 240
Folio Identifier A/340379 5065 - 93
Folio Identifier 40/10704 3596 - 138

Req:R359245 /Doc:DL U840927 /Rev:16-Mar-2010 /NSW LRS /Pgs:ALL /Prt:18-Aug-2021 09:51 /Seq:1 of 1
© Office of the Registrar-General /Src:INFOTRACK /Ref:924 Hunter Street, Newcastle West

97-01T

TRANSFER

Real Property Act, 1900

Land Titles Office use only

U 840927 B

(6)

Office

101194 2205 04 800438497/02

(A) [redacted]

Show no more than 20 References to Title.
If appropriate, specify the share transferred.

[redacted]

(B) **LODGED BY**

L.T.O. Box	Name, Address or DX and Telephone
35D	MORRIS, HAYES & EDGAR LAW STATIONERS 74 CASTLEREAGH ST., SYDNEY DX 420 232 2411 REFERENCE (max. 15 characters):

6A20694
Cleaves
Mollik
Gibbs

(C) [redacted]

[redacted]

[A.R.B.N. 010 308 068]

(D) acknowledges receipt of the consideration of $1,010,000.00

and as regards the land specified above transfers to the Transferee an estate in fee simple

(E) subject to the following **ENCUMBRANCES** 1. Nil 2. 3.

(F) [redacted]

(G)

T	S [redacted]
	TENANCY:

(H) We certify this dealing correct for the purposes of the Real Property Act, 1900.

Signed in my presence by the Transferor who is personally known to me.

Signature of Witness

L.W. Robinson

Name of Witness (BLOCK LETTERS)

168 Walker Street, North Sydney

Address of Witness

DATED 28 NOV 1994

AUSTRALIAN CO-OPERATIVE FOODS LIMITED by its Attorney ALAN RICHARD TOOTH who states that at the date of his execution hereof he has had no notice of the revocation of the Power of Attorney dated 14 June 1994 registered No. 674 Book 4061 under the authority of which he has executed this Transfer in the presence of:

Signature of Transferor

Signed in my presence by the Transferee who is personally known to

Signature of Witness

Name of Witness (BLOCK LETTERS)

Address of Witness

Solicitor for JOHN McINTOSH CLEAVES

~~Signature of Transferee~~

INSTRUCTIONS FOR FILLING OUT THIS FORM ARE AVAILABLE FROM THE LAND TITLES OFFICE

CHECKED BY (office use only)

GOLD CT 35D

MDE prepared

Notice of Sale 5/12/94

Req:R359108 /Doc:DL AP094672 /Rev:01-Mar-2019 /NSW LRS /Prt:18-Aug-2021 09:38 /Seq:1 of 2
© Office of the Registrar-General /Src:INFOTRACK /Ref:924 Hunter Street, Newcastle West

System Document Identification

Form Number: 01T-e
Template Number: T_nsw16
ELN Document ID: 9773888
ELN NOS ID: 9773889

TRANSFER

New South Wales
Real Property Act 1900

Land Registry Document Identification

AP94672

Stamp Duty: 9543087-001

PRIVACY NOTE: Section 31B of the Real Property Act 1900 (RP Act) authorises the Registrar General to collect the information required by this form for the establishment and maintenance of the Real Property Act Register. Section 96B RP Act requires that the Register is made available to any person for search upon payment of a fee, if any.

LODGED BY:

Responsible Subscriber: HALL & WILCOX ABN 58041376985
Address: Rialto South Tower
L11, 525 Collins ST
Melbourne 3000
Telephone:
PEXA Subscriber Number: 8120
Customer Account Number: 502209W
Document Collection Box: 1W
Client Reference: ACB:SLH:149901

LAND TITLE REFERENCE

8632-145
8377-233
1/342675
1/395367
2/445736
1/445736
7174-135

TRANSFEROR

ZUTOR PTY LTD ACN 001561379
Registered company

TRANSFEREE

MCCLOY NEWCASTLE WEST PTY LIMITED ACN 630410785
Registered company

Tenancy: Sole Proprietor

CONSIDERATION

The transferor acknowledges receipt of the consideration of $10,500,000.00

ESTATE TRANSFERRED

FEE SIMPLE

The Transferor transfers to the Transferee the Estate specified in this Instrument and acknowledges receipt of any Consideration shown.

SIGNING FOR TRANSFEROR

I certify that:

1. The Certifier has taken reasonable steps to ensure that this Registry Instrument or Document is correct and compliant with relevant legislation and any Prescribed Requirement.
2. The Certifier has retained the evidence supporting this Registry Instrument or Document.
3. The Certifier holds a properly completed Client Authorisation for the Conveyancing Transaction including this Registry Instrument or Document.
4. The Certifier has taken reasonable steps to verify the identity of the transferor.

Party Represented by Subscriber:

ZUTOR PTY LTD

Req:R359108 /Doc:DL AP094672 /Rev:01-Mar-2019 /NSW LRS /Prt:18-Aug-2021 09:38 /Seq:2 of 2
© Office of the Registrar-General /Src:INFOTRACK /Ref:924 Hunter Street, Newcastle West

Signed By: Leah Jean Reynolds
Signer Capacity: Practitioner Certifier
PEXA Signer Number: 70866
Digital Signing Certificate Number: 44467

Signed for Subscriber: O'HEARN LAWYERS PTY LIMITED ABN 94630101585

O'HEARN LAWYERS

Subscriber Capacity: Representative Subscriber
PEXA Subscriber Number: 25712
Customer Account Number: 504592
Date: 01/03/2019

SIGNING FOR TRANSFEREE

I certify that:

1. The Certifier has taken reasonable steps to ensure that this Registry Instrument or Document is correct and compliant with relevant legislation and any Prescribed Requirement.
2. The Certifier has retained the evidence supporting this Registry Instrument or Document.
3. The Certifier holds a properly completed Client Authorisation for the Conveyancing Transaction including this Registry Instrument or Document.
4. The Certifier has taken reasonable steps to verify the identity of the transferee.

Party Represented by Subscriber:

MCCLOY NEWCASTLE WEST PTY LIMITED

Signed By: Anna Zafira Bailey
Signer Capacity: Practitioner Certifier
PEXA Signer Number: 44712
Digital Signing Certificate Number: 22489

Signed for Subscriber: PARTNERS OF HALL & WILCOX ABN 58041376985

HALL & WILCOX

Subscriber Capacity: Representative Subscriber
PEXA Subscriber Number: 8120
Customer Account Number: 502209
Date: 01/03/2019

Title Search

NEW SOUTH WALES LAND REGISTRY SERVICES - TITLE SEARCH

FOLIO: 2/445736

SEARCH DATE	TIME	EDITION NO	DATE
18/8/2021	9:29 AM	13	23/11/2020

LAND

LOT 2 IN DEPOSITED PLAN 445736
AT WICKHAM
LOCAL GOVERNMENT AREA NEWCASTLE
PARISH OF NEWCASTLE COUNTY OF NORTHUMBERLAND
TITLE DIAGRAM DP445736

FIRST SCHEDULE

MCCLOY NEWCASTLE WEST PTY LIMITED (T AP94672)

SECOND SCHEDULE (4 NOTIFICATIONS)

1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
2 3077496 EASEMENT FOR UNDERGROUND ELECTRICITY CABLES & ACCESS AFFECTING THE PART SHOWN DESIGNATED (C) IN DP267291
3 AQ502865 LEASE TO MANNING VALLEY MOTOR HOLDING PTY LTD OF TENANCY 1, 924 HUNTER STREET AND 4 TIGHE STREET, NEWCASTLE WEST. EXPIRES: 15/5/2024.
* 4 AQ779633 CAVEAT BY THIRDI DAIRY FARMERS PTY LTD

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

* Any entries preceded by an asterisk do not appear on the current edition of the Certificate of Title. Warning: the information appearing under notations has not been formally recorded in the Register. InfoTrack an approved NSW Information Broker hereby certifies that the information contained in this document has been provided electronically by the Registrar General in accordance with Section 96B(2) of the Real Property Act 1900.

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Received: 18/08/2021 09:29:04

Historical Title

NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE
18/8/2021 9:30AM

FOLIO: 1/342675

First Title(s): VOL 73 FOL 1
Prior Title(s): VOL 5161 FOL 225

Recorded	Number	Type of Instrument	C.T. Issue
19/2/1990	Y746376	APPLICATION FOR REPLACEMENT CERTIFICATE OF TITLE	FOLIO CREATED EDITION 1
20/9/1993	I651038	CHANGE OF NAME	EDITION 2
10/12/1993	I760985	MORTGAGE	EDITION 3
6/12/1994	U840926	DISCHARGE OF MORTGAGE	
6/12/1994	U840927	TRANSFER	EDITION 4
28/1/1997	DP267291	DEPOSITED PLAN	
6/6/1997	3077496	TRANSFER GRANTING EASEMENT	EDITION 5
4/9/1997	3361314	MORTGAGE	EDITION 6
19/7/2000	6946978	VARIATION OF MORTGAGE	EDITION 7
23/10/2002	9045568	DISCHARGE OF MORTGAGE	
23/10/2002	9045569	MORTGAGE	EDITION 8
19/10/2012	AH287400	DISCHARGE OF MORTGAGE	
19/10/2012	AH287401	LEASE	EDITION 9
12/11/2014	AI999577	SURRENDER OF LEASE	
12/11/2014	AI999578	LEASE	EDITION 10
31/8/2016	AK715910	SURRENDER OF LEASE	EDITION 11
28/2/2019	AP90588	DEPARTMENTAL DEALING	
1/3/2019	AP94672	TRANSFER	EDITION 12
23/11/2020	AQ502865	LEASE	EDITION 13
5/2/2021	AQ779633	CAVEAT	

*** END OF SEARCH ***

924 Hunter Street, Newcastle West PRINTED ON 18/8/2021

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Received: 18/08/2021 09:30:40

Title Search

NEW SOUTH WALES LAND REGISTRY SERVICES - TITLE SEARCH

FOLIO: 1/342675

SEARCH DATE	TIME	EDITION NO	DATE
18/8/2021	9:29 AM	13	23/11/2020

LAND

LOT 1 IN DEPOSITED PLAN 342675
AT WICKHAM
LOCAL GOVERNMENT AREA NEWCASTLE
PARISH OF NEWCASTLE COUNTY OF NORTHUMBERLAND
TITLE DIAGRAM DP342675

FIRST SCHEDULE

MCCLOY NEWCASTLE WEST PTY LIMITED (T AP94672)

SECOND SCHEDULE (4 NOTIFICATIONS)

1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
2 3077496 EASEMENT FOR UNDERGROUND ELECTRICITY CABLES & ACCESS AFFECTING THE PART SHOWN DESIGNATED (B) IN DP267291
3 AQ502865 LEASE TO MANNING VALLEY MOTOR HOLDING PTY LTD OF TENANCY 1, 924 HUNTER STREET AND 4 TIGHE STREET, NEWCASTLE WEST. EXPIRES: 15/5/2024.
* 4 AQ779633 CAVEAT BY THIRDI DAIRY FARMERS PTY LTD

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

* Any entries preceded by an asterisk do not appear on the current edition of the Certificate of Title. Warning: the information appearing under notations has not been formally recorded in the Register. InfoTrack an approved NSW Information Broker hereby certifies that the information contained in this document has been provided electronically by the Registrar General in accordance with Section 96B(2) of the Real Property Act 1900.

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Received: 18/08/2021 09:29:06

Historical Title

NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE
18/8/2021 9:30AM

FOLIO: AUTO CONSOL 7174-135

Recorded	Number	Type of Instrument	C.T. Issue
22/11/2005	DP1091173	DEPOSITED PLAN	
22/11/2005	AB928381	CONSOL HISTORY RECORD CREATED FOR AUTO CONSOL 7174-135 PARCELS IN CONSOL ARE: 1-2/1091173.	
19/10/2012	AH287400	DISCHARGE OF MORTGAGE	
19/10/2012	AH287401	LEASE	EDITION 1
12/11/2014	AI999577	SURRENDER OF LEASE	
12/11/2014	AI999578	LEASE	EDITION 2
31/8/2016	AK715910	SURRENDER OF LEASE	EDITION 3
1/3/2019	AP94672	TRANSFER	EDITION 4
25/3/2020	AP976757	LEASE	EDITION 5
23/11/2020	AQ502864	SURRENDER OF LEASE	
23/11/2020	AQ502865	LEASE	
23/11/2020	AQ502866	LEASE	
23/11/2020	AQ502867	LEASE	EDITION 6
5/2/2021	AQ779633	CAVEAT	

*** END OF SEARCH ***

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Received: 18/08/2021 09:30:33

Title Search

NEW SOUTH WALES LAND REGISTRY SERVICES - TITLE SEARCH

FOLIO: AUTO CONSOL 7174-135

SEARCH DATE	TIME	EDITION NO	DATE
18/8/2021	9:29 AM	6	23/11/2020

LAND

LAND DESCRIBED IN SCHEDULE OF PARCELS
AT NEWCASTLEWEST
LOCAL GOVERNMENT AREA NEWCASTLE
PARISH OF NEWCASTLE COUNTY OF NORTHUMBERLAND
TITLE DIAGRAM DP1091173

FIRST SCHEDULE

MCCLOY NEWCASTLE WEST PTY LIMITED (T AP94672)

SECOND SCHEDULE (6 NOTIFICATIONS)

1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
2 3077496 EASEMENT FOR UNDERGROUND CABLES OF ELECTRICITY AND ACCESS AFFECTING THE PART SHOWN DESIGNATED (A) IN DP267291
3 AQ502865 LEASE TO MANNING VALLEY MOTOR HOLDING PTY LTD OF TENANCY 1, 924 HUNTER STREET AND 4 TIGHE STREET, NEWCASTLE WEST. EXPIRES: 15/5/2024.
4 AQ502866 LEASE TO AIR LOCKER TRAINING NEWCASTLE PTY LTD OF TENANCY 2, 924 HUNTER STREET, NEWCASTLE WEST. EXPIRES: 21/5/2024.
5 AQ502867 LEASE TO BARRE EFFECT PTY LTD OF TENANCY 3, EASTERN SHOWROOM, 924 HUNTER STREET NEWCASTLE WEST. EXPIRES: 21/5/2024.
* 6 AQ779633 CAVEAT BY THIRDI DAIRY FARMERS PTY LTD

NOTATIONS

UNREGISTERED DEALINGS: NIL

SCHEDULE OF PARCELS

LOTS 1-2 IN DP1091173.

*** END OF SEARCH ***

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Historical Title

NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE
18/8/2021 9:30AM

FOLIO: 1/395367

First Title(s): VOL 6909 FOL 186
Prior Title(s): VOL 7174 FOL 134

Recorded	Number	Type of Instrument	C.T. Issue
21/4/1989		CONVERTED TO COMPUTER FOLIO	FOLIO CREATED CT NOT ISSUED
4/9/1997	3361313	TRANSFER	
4/9/1997	3361314	MORTGAGE	EDITION 1
19/7/2000	6946978	VARIATION OF MORTGAGE	EDITION 2
23/10/2002	9045568	DISCHARGE OF MORTGAGE	
23/10/2002	9045569	MORTGAGE	EDITION 3
19/10/2012	AH287400	DISCHARGE OF MORTGAGE	
19/10/2012	AH287401	LEASE	EDITION 4
12/11/2014	AI999577	SURRENDER OF LEASE	
12/11/2014	AI999578	LEASE	EDITION 5
31/8/2016	AK715910	SURRENDER OF LEASE	EDITION 6
28/2/2019	AP90588	DEPARTMENTAL DEALING	
1/3/2019	AP94672	TRANSFER	EDITION 7
25/3/2020	AP976757	LEASE	EDITION 8
23/11/2020	AQ502864	SURRENDER OF LEASE	
23/11/2020	AQ502865	LEASE	EDITION 9
5/2/2021	AQ779633	CAVEAT	

*** END OF SEARCH ***

924 Hunter Street, Newcastle West PRINTED ON 18/8/2021

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Received: 18/08/2021 09:30:33

Req:R359125 /Doc:DL 3361313 /Rev:12-Sep-1997 /NSW LRS /Pgs:ALL /Prt:18-Aug-2021 09:40 /Seq:1 of 3
© Office of the Registrar-General /Src:INFOTRACK /Ref:924 Hunter Street, Newcastle West

97-01T
006CN/0307/95

TRANSFER

Real Property Act, 1900

3361313 J

(1)

Office of State Revenue use only

OFFICE OF STATE REVENUE
STAMP DUTY (... TREASURY) N4
1996/97
DUTY $ 2-00 1S FREE No 800 673071

(A) [redacted] D
Show no more than 20 References to Title. If appropriate, specify the share transferred.

[redacted] 7

(B) **LODGED BY**

L.T.O.Box *Name, Address or DX and Telephone*

BURKHART & COMPANY PTY LTD
BOX 155S
TEL: 9231 0122 FAX: 9262 1904

D F M Inchcape.

REFERENCE (max. 15 characters)

(C) [redacted] R [redacted] A

(D) acknowledges receipt of the consideration of $2,000.00

and as regards the land specified above transfers to the Transferee an estate in fee simple

(E) subject to the following **ENCUMBRANCES** 1 Nil 2 3

(F) [redacted] E

T TS (s713LGA) TW (Sheriff)	[redacted]] **TENANCY:**

(G)

(H) We certify this dealing correct for the purposes of the Real Property Act, 1900.

DATED 16. 6. 1997

Signed in my presence by the Transferor who is personally known to me.

Bruce Smith
Signature of Witness

BRUCE SMITH
Name of Witness (BLOCK LETTERS)

4 MONITOR ST, ADAMSTOWN HTS 2289
Address of Witness

SIGNED SEALED AND DELIVERED
For and on behalf of
energyAustralia by
PHIL GUDMUNSON
its duly constituted Attorney
pursuant to Power of Attorney
registered Book 4129 No. 872
who declares that he holds the
position set out beneath his
signature

Signature of Transferor

MANAGER-PROPERTY & INSURANCE

Bruce Smith
Witness

Signed in my presence by the Transferee who is personally known to me.

Signature of Witness

Name of Witness (BLOCK LETTERS)

Address of Witness

J. Cleaves
Signature of Transferee

CHECKED BY (office use only)

8 Reg 80

Req:R359125 /Doc:DL 3361313 /Rev:12-Sep-1997 /NSW LRS /Pgs:ALL /Prt:18-Aug-2021 09:40 /Seq:2 of 3
© Office of the Registrar-General /Src:INFOTRACK /Ref:924 Hunter Street, Newcastle West

PLM
3361313

STATUTORY DECLARATION

I, BRIAN OAKLEY of Administration Centre, 145 Newcastle Road, Wallsend, in the State of New South Wales, Manager do hereby solemnly and sincerely declare as follows:-

1. I am the duly appointed Attorney for ENERGYAUSTRALIA and state that by my own knowledge I know the following facts to be true and correct and that I am authorised and qualified to make this declaration on behalf of ENERGYAUSTRALIA pursuant to Power of Attorney Book 4129 No 872..

2. I refer to Section 564B(1)(a) of the Local Government Act 1919 and I refer to proclamation dated 3rd July, 1957 published in the New South Wales Government Gazette No. 77 of 12th July, 1957. By the said proclamation inter alia the whole of the City of Newcastle was constituted as part of a county district for Local Government purposes under the name of the Shortland County Council District and the Shortland County Council was thereby constituted to exercise or perform for the benefit of the county district inter alia all the powers or duties under Section 382 of the Electricity Development Act, 1945-57 relating to the construction extension, production, maintenance, control and management of works for the supply of electricity and the supply and installation of electrical fittings and appliances.

3. The land in Certificate of Title Volume 7174 Folio 134 (Folio Identifier 1/395367) was acquired to be used for electrical purposes and was used for such purposes. No action apart from the effect of Section 564(1)(a) of the Local Government Act, 1919 and the said proclamation was taken to vest the said lands in the name of the Shortland County Council.

4. By virtue of the provisions of the Electricity (Amendment) Act 1993 the Shortland County Council became known as Shortland Electricity.

5. By proclamation published in Government Gazette No. 118 dated 27th September, 1995 Shortland Electricity was dissolved and MetNorth Energy was created pursuant to Section 6A of the Electricity Act, 1945, effective from 1st October, 1995.

Req:R359125 /Doc:DL 3361313 /Rev:12-Sep-1997 /NSW LRS /Pgs:ALL /Prt:18-Aug-2021 09:40 /Seq:3 of 3
© Office of the Registrar-General /Src:INFOTRACK /Ref:924 Hunter Street, Newcastle West

6. Apart from the vesting by law effected by Section 564(1)(a) of the Local Government Act, 1919 and the said proclamations dated 3rd July, 1957 and 27th September, 1995 there has not since that date been any dealings with any of the said land and there are no leases, tenancies, occupancies or mortgages over the said lands other than the occupancy of MetNorth Energy. There has been no trusts expressed or implied or constructive created in respect of the land and there has been no equitable interest created by contract or otherwise in respect of the land..

7. By virtue of Regulation pursuant to Section 12 of the Energy Services Corporations Act effective from 2 March 1996 Part 2 of Schedule 1 of that Act was amended by omitting the name MetNorth Energy and inserting the name EnergyAustralia.

AND I make this solemn declaration conscientiously believing the same to be true and by virtue of the provisions of the Oaths Act, 1900 (as amended).

SUBSCRIBED AND DECLARED at WALLSEND)
this 11 day of APRIL , 1997)
before me: BRUCE LESLIE SMITH)
4 MONITOR STREET
ADAMSTOWN HTS 2289
Reg N° 9500849

.....
A JUSTICE OF THE PEACE/~~SOLICITOR~~

PH:GLW:37377:003

Title Search

NEW SOUTH WALES LAND REGISTRY SERVICES - TITLE SEARCH

FOLIO: 1/395367

SEARCH DATE	TIME	EDITION NO	DATE
18/8/2021	9:29 AM	9	23/11/2020

LAND

LOT 1 IN DEPOSITED PLAN 395367
AT WICKHAM
LOCAL GOVERNMENT AREA NEWCASTLE
PARISH OF NEWCASTLE COUNTY OF NORTHUMBERLAND
TITLE DIAGRAM DP395367

FIRST SCHEDULE

MCCLOY NEWCASTLE WEST PTY LIMITED (T AP94672)

SECOND SCHEDULE (3 NOTIFICATIONS)

1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
2 AQ502865 LEASE TO MANNING VALLEY MOTOR HOLDING PTY LTD OF TENANCY 1, 924 HUNTER STREET AND 4 TIGHE STREET, NEWCASTLE WEST. EXPIRES: 15/5/2024.
* 3 AQ779633 CAVEAT BY THIRDI DAIRY FARMERS PTY LTD

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

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Historical Title

NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE
18/8/2021 9:33AM

FOLIO: AUTO CONSOL 8377-233

Recorded	Number	Type of Instrument	C.T. Issue
3/9/1997		CONSOL HISTORY RECORD CREATED FOR AUTO CONSOL 8377-233 PARCELS IN CONSOL ARE: 2/126, 1/456088.	
4/9/1997	3361314	MORTGAGE	EDITION 1
19/7/2000	6946978	VARIATION OF MORTGAGE	EDITION 2
23/10/2002	9045568	DISCHARGE OF MORTGAGE	
23/10/2002	9045569	MORTGAGE	EDITION 3
19/10/2012	AH287400	DISCHARGE OF MORTGAGE	
19/10/2012	AH287401	LEASE	EDITION 4
12/11/2014	AI999577	SURRENDER OF LEASE	
12/11/2014	AI999578	LEASE	EDITION 5
31/8/2016	AK715910	SURRENDER OF LEASE	EDITION 6
28/2/2019	AP90588	DEPARTMENTAL DEALING	
1/3/2019	AP94672	TRANSFER	EDITION 7
25/3/2020	AP976757	LEASE	EDITION 8
23/11/2020	AQ502864	SURRENDER OF LEASE	
23/11/2020	AQ502866	LEASE	
23/11/2020	AQ502867	LEASE	EDITION 9
5/2/2021	AQ779633	CAVEAT	

*** END OF SEARCH ***

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Received: 18/08/2021 09:33:02

Title Search

NEW SOUTH WALES LAND REGISTRY SERVICES - TITLE SEARCH

FOLIO: AUTO CONSOL 8377-233

SEARCH DATE	TIME	EDITION NO	DATE
18/8/2021	9:29 AM	9	23/11/2020

LAND

LAND DESCRIBED IN SCHEDULE OF PARCELS
LOCAL GOVERNMENT AREA NEWCASTLE
PARISH OF NEWCASTLE COUNTY OF NORTHUMBERLAND
TITLE DIAGRAM SEE SCHEDULE OF PARCELS

FIRST SCHEDULE

MCCLOY NEWCASTLE WEST PTY LIMITED (T AP94672)

SECOND SCHEDULE (4 NOTIFICATIONS)

1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
2 AQ502866 LEASE TO AIR LOCKER TRAINING NEWCASTLE PTY LTD OF TENANCY 2, 924 HUNTER STREET, NEWCASTLE WEST. EXPIRES: 21/5/2024.
3 AQ502867 LEASE TO BARRE EFFECT PTY LTD OF TENANCY 3, EASTERN SHOWROOM, 924 HUNTER STREET NEWCASTLE WEST. EXPIRES: 21/5/2024.
* 4 AQ779633 CAVEAT BY THIRDI DAIRY FARMERS PTY LTD

NOTATIONS

NOTE: DISPOSAL OF ANY LOTS IN DP456088 MAY REQUIRE REGISTRATION OF A DEPOSITED PLAN OF SURVEY PURSUANT TO SECTION 114 OF THE REAL PROPERTY ACT, 1900

UNREGISTERED DEALINGS: NIL

SCHEDULE OF PARCELS	TITLE DIAGRAM
LOT 2 IN DP126	DP126
LOT 1 IN DP456088	DP456088.

*** END OF SEARCH ***

924 Hunter Street, Newcastle West PRINTED ON 18/8/2021

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Received: 18/08/2021 09:29:08

Planning Certificate

Section 10.7, Environmental Planning and Assessment Act 1979

To: Douglas Partners Pty Ltd
15 Callistemon Close
Warabrook NSW 2304

Certificate No: PL2021/05204
Fees: $133.00
Receipt No(s): D002049823

Your Reference: Project 102077.02

Date of Issue: 17/09/2021

The Land: Lot 1 DP 395367
924 Hunter Street Newcastle West NSW 2302

Advice provided on this Certificate:

Advice under section 10.7(2): see items 1 – 21
Additional advice under section 10.7(5): see Items 22 – 28

IMPORTANT: Please read this certificate carefully

This certificate contains important information about the land.

Please check for any item which could be inconsistent with the proposed use or development of the land. If there is anything you do not understand, phone our **Customer Contact Centre** on (02) 4974 2000, or come in and see us.

The information provided in this certificate relates only to the land described above. If you need information about adjoining or nearby land, or about the City of Newcastle (CN) development policies for the general area, contact our **Customer Contact Centre**.

All information provided is correct as at 17/09/2021. However, it's possible for changes to occur within a short time. We recommend that you only rely upon a very recent certificate.

City of Newcastle

PO Box 489
NEWCASTLE 2300

Phone: (02) 4974 2000
Facsimile: (02) 4974 2222

Customer Contact Centre
Ground floor,
12 Stewart Avenue
Newcastle West NSW 2300

Office hours:
Mondays to Fridays 8.30 am to 5.00 pm

Planning Certificate

Section 10.7, Environmental Planning and Assessment Act 1979

To: Douglas Partners Pty Ltd
15 Callistemon Close
Warabrook NSW 2304

Certificate No: PL2021/05210
Fees: $133.00
Receipt No(s): D002049823

Your Reference: Project 102077.02

Date of Issue: 17/09/2021

The Land: Lot 2 DP 445736
924 Hunter Street Newcastle West NSW 2302

Advice provided on this Certificate:

Advice under section 10.7(2): see items 1 – 21
Additional advice under section 10.7(5): see Items 22 – 28

IMPORTANT: Please read this certificate carefully

This certificate contains important information about the land.

Please check for any item which could be inconsistent with the proposed use or development of the land. If there is anything you do not understand, phone our **Customer Contact Centre** on (02) 4974 2000, or come in and see us.

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All information provided is correct as at 17/09/2021. However, it's possible for changes to occur within a short time. We recommend that you only rely upon a very recent certificate.

City of Newcastle

PO Box 489
NEWCASTLE 2300

Phone: (02) 4974 2000
Facsimile: (02) 4974 2222

Customer Contact Centre
Ground floor,
12 Stewart Avenue
Newcastle West NSW 2300

Office hours:
Mondays to Fridays 8.30 am to 5.00 pm

Part 1:

Advice provided under section 10.7(2)

ATTENTION: The explanatory notes appearing in italic print within Part 1 are provided to assist understanding, but do not form part of the advice provided under section 10.7(2). These notes shall be taken as being advice provided under section 10.7(5).

1. Names of relevant planning instruments and DCPs

The following environmental planning instruments, proposed environmental planning instruments and development control plans apply to the land, either in full or in part.

State Environmental Planning Policy No. 1 - Development Standards

State Environmental Planning Policy No. 21 - Caravan Parks

State Environmental Planning Policy No. 33 - Hazardous and Offensive Development

State Environmental Planning Policy No. 36 - Manufactured Home Estates

State Environmental Planning Policy (Koala Habitat Protection) Amendment (Maps) 2020

State Environmental Planning Policy No. 50 - Canal Estate Development

State Environmental Planning Policy No. 55 - Remediation of Land

State Environmental Planning Policy No. 64 - Advertising and Signage

State Environmental Planning Policy No. 65 - Design Quality of Residential Flat Development

State Environmental Planning Policy No. 70 - Affordable Housing (Revised Schemes)

State Environmental Planning Policy (Housing For Seniors or People with a Disability) 2004

State Environmental Planning Policy (Building Sustainability Index:BASIX) 2004

State Environmental Planning Policy (State Significant Precincts) 2005

State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007

State Environmental Planning Policy (Miscellaneous Consent Provisions) 2007

State Environmental Planning Policy (Infrastructure) 2007

State Environmental Planning Policy (Exempt and Complying Development Codes) 2008

State Environmental Planning Policy (Urban Renewal) 2010

State Environmental Planning Policy (Affordable Rental Housing) 2009

State Environmental Planning Policy (State and Regional Development) 2011

State Environmental Planning Policy (Educational Establishments and Child Care Facilities) 2017

State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017

State Environmental Planning Policy (Concurrences) 2018

State Environmental Planning Policy (Coastal Management) 2018

State Environmental Planning Policy (Primary Production and Rural Development) 2019

Newcastle Local Environmental Plan 2012

Newcastle Development Control Plan 2012

2. Zoning and land use under relevant LEPs

Newcastle Local Environmental Plan 2012

Zoning: The Newcastle Local Environmental Plan 2012 identifies the land as being within the following zone(s):

Zone B3 Commercial Core

Note: Refer to www. newcastle.nsw.gov.au or www. legislation.nsw.gov.au website for LEP instrument and zoning maps.

The following is an extract from the zoning provisions contained in Newcastle Local Environmental Plan 2012:

Zone B3 Commercial Core

- **Objectives of zone**
    - To provide a wide range of retail, business, office, entertainment, community and other suitable land uses that serve the needs of the local and wider community.
    - To encourage appropriate employment opportunities in accessible locations.
    - To maximise public transport patronage and encourage walking and cycling.
    - To provide for commercial floor space within a mixed use development.
    - To strengthen the role of the Newcastle City Centre as the regional business, retail and cultural centre of the Hunter region.
    - To provide for the retention and creation of view corridors.
- **Permitted without consent**

  Environmental protection works; Home occupations
- **Permitted with consent**

  Car parks; Centre-based child care facilities; Commercial premises; Community facilities; Educational establishments; Entertainment facilities; Environmental facilities; Flood mitigation works; Function centres; Hotel or motel accommodation; Information and education facilities; Medical centres; Mortuaries; Oyster aquaculture; Passenger transport facilities; Places of public worship; Recreation areas; Recreation facilities (indoor); Registered clubs; Respite day care centres; Restricted premises; Roads; Sex services premises; Shop top housing; Signage; Tank-based aquaculture; Tourist and visitor accommodation; Transport depots
- **Prohibited**

  Pond-based aquaculture; Any development not specified in, permitted without consent or permitted with consent

Minimum land dimensions for erection of a dwelling-house: There are no minimum land dimensions for the erection of a dwelling-house that apply to this site.

Critical habitat: The land does not identify as including or comprising critical habitat.

Heritage conservation area: The land is situated within the Newcastle City Centre Heritage Conservation Area. Refer to the Newcastle Local Environmental Plan 2012 for provisions relating to development within a heritage conservation area.

Heritage items: A heritage item listed in the Newcastle Local Environmental Plan 2012 is situated on the land. Refer to the LEP for provisions relating to development involving a heritage item.

3. Complying development

Note Other requirements: *The advice below for all Complying Development Codes, is limited to identifying whether or not the* ***land****, the subject of the certificate, is land on which complying development may be carried out because of Clauses 1.17A(1)(c) to (e), (2), (3) & (4), 1.18 (1)(c3) and 1.19 of State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 (the Codes SEPP).*

To ascertain the extent to which the complying development may or may not be carried out on the land, maps are available on City of Newcastle (CN) web pages.

Housing Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by General land exemptions, being land that comprises, or on which there is, a Heritage Item.

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land within a Heritage Conservation Area or a Draft Heritage Conservation Area unless the development is for a detached outbuilding or swimming pool.

Rural Housing Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by General land exemptions, being land that comprises, or on which there is, a Heritage Item.

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land within a Heritage Conservation Area or a Draft Heritage Conservation Area unless the development is for a detached outbuilding or swimming pool.

Low Rise Housing Diversity Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by General land exemptions, being land that comprises, or on which there is, a Heritage Item.

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land within a Heritage Conservation Area or a Draft Heritage Conservation Area unless the development is for a detached outbuilding or swimming pool.

Greenfield Housing Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by General land exemptions, being land that comprises, or on which there is, a Heritage Item.

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land within a Heritage Conservation Area or a Draft Heritage Conservation Area unless the development is for a detached outbuilding or swimming pool.

Inland Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by General land exemptions, being land that comprises, or on which there is, a Heritage Item.

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land within a Heritage Conservation Area or a Draft Heritage Conservation Area unless the development is for a detached outbuilding or swimming pool.

Housing Alterations Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by General land exemptions, being land that comprises, or on which there is, a Heritage Item.

General Development Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by General land exemptions, being land that comprises, or on which there is, a Heritage Item.

Commercial and Industrial Alterations Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by General land exemptions, being land that comprises, or on which there is, a Heritage Item.

Commercial and Industrial (New Buildings and Additions) Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by General land exemptions, being land that comprises, or on which there is, a Heritage Item.

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land within a Heritage Conservation Area or a Draft Heritage Conservation Area.

Container Recycling Facilities Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by General land exemptions, being land that comprises, or on which there is, a Heritage Item.

Subdivision Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by General land exemptions, being land that comprises, or on which there is, a Heritage Item.

Demolition Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by General land exemptions, being land that comprises, or on which there is, a Heritage Item.

Fire Safety Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by General land exemptions, being land that comprises, or on which there is, a Heritage Item.

4B. Annual charges under Local Government Act 1993 for coastal protection services that relate to existing coastal protection works

The land IS NOT subject to an agreement for annual charges under section 496B of the Local Government Act 1993 for coastal protection services (within the meaning of section 553B of that Act).

5. Coal Mine Subsidence Compensation Act 2017

The land IS NOT WITHIN a Mine Subsidence District declared under section 20 of the Coal Mine Subsidence Compensation Act 2017.

NOTE: The above advice is provided to the extent that City of Newcastle (CN) has been notified by Subsidence Advisory NSW.

6. Road widening or realignment

NOTE: The Roads and Maritime Services (RMS) may have proposals that are not referred to in this item. For advice about affectation by RMS proposals, contact the Roads and Maritime Services, Locked Mail Bag 30 Newcastle 2300. Ph: 131 782.

The land IS NOT AFFECTED by any road widening or road realignment under Division 2 of Part 3 of the Roads Act 1993.

The land IS NOT AFFECTED by any road widening or road realignment under an environmental planning instrument.

The land IS NOT AFFECTED by road widening or road realignment under a resolution of the Council.

7. Policies on hazard risk restrictions

Except as stated below, the land is not affected by a policy referred to in Item 7 of Schedule 4 of the Environmental Planning and Assessment Regulation 2000 that restricts the development of the land because of the likelihood of land slip, bushfire, tidal inundation, subsidence, acid sulphate soils or any other risk (other than flooding).

Potential acid sulfate soils: Works carried out on the land must be undertaken in accordance with Clause 6.1 Acid sulfate soils of the Newcastle Local Environmental Plan 2012.

Land Contamination: We have land contamination information/records in relation to this property. Council has adopted a policy of restricting development or imposing conditions on properties affected by land contamination. Refer to Section 5.02 Land Contamination of Newcastle Development Control Plan 2012, which is available to view and download from City of Newcastle's website.

NOTE: The absence of a policy to restrict development of the land because of the likelihood of a particular risk does not imply that the land is free from that risk. City of Newcastle (CN) considers the likelihood of natural and man-made risks when determining development applications under section 4.15 of the Environmental Planning and Assessment Act 1979. Detailed investigation carried out in conjunction with the preparation or assessment of a development application may result in CN either refusing development consent or imposing conditions of consent on the basis of risks that are not identified above.

7A. Flood related development controls information

7A(1) Mapping information is not available and it is unknown if the land or part of the land is within the flood planning area.
7A(2) Mapping information is not available and it is unknown if the land or part of the land is between the flood planning area and the probable maximum flood.

Our information currently indicates that the property is, or contains, flood prone land as defined in the Floodplain Development Manual: the management of flood liable land, April 2005 published by the NSW Government.

Section 4.01 Flood Management of Newcastle Development Control Plan (DCP) 2012 provides guidelines with respect to all development of flood prone land. This includes development for the purpose of dwelling houses, dual occupancies, multi dwelling housing or residential flat buildings. The DCP may be viewed on our website, inspected or purchased at our Customer Contact Centre.

NOTE: More detailed flood information specific to the property is available on separate flooding certificate application through our Customer Contact Centre on (02) 4974 2000

8. Land reserved for acquisition

The land is not identified for acquisition by a public authority (as referred to in section 3.15 of the Act) by any environmental planning instrument or proposed environmental planning instrument applying to the land.

9. Contributions plans

The following contribution plan/s apply to the land.

Section 7.12 Newcastle Local Infrastructure Contributions Plan 2019: Effective 9 September 2019.

The Plan specifies section 7.12 contributions that may be imposed as a condition of development consent.

NOTE: Contributions plans are available on our website or may be inspected or purchased at our Customer Contact Centre.

9A. Biodiversity certified land

The land IS NOT biodiversity certified land under Part 8 of the Biodiversity Conservation Act 2016.

10. Biodiversity stewardship sites

The land IS NOT land (of which CN is aware) under a biodiversity stewardship agreement under Part 5 of the Biodiversity Conservation Act 2016.

10A. Native vegetation clearing set asides

The land IS NOT land (of which CN is aware) that contains a set aside area under section 60ZC of the Local Land Services Act 2013.

11. Bush fire prone land

The land IS NOT bush fire prone land for the purposes of the Environmental Planning and Assessment Act 1979.

12. Property vegetation plans

Not applicable. The Native Vegetation Act 2003 does not apply to the Newcastle local government area.

13. Orders under Trees (Disputes Between Neighbours) Act 2006

CN HAS NOT been notified that an order has been made under the Trees (Disputes between Neighbours) Act 2006 to carry out work in relation to a tree on the land.

14. Directions under Part 3A

The land IS NOT AFFECTED by a direction by the Minister in force under section 75P (2) (c1) of the Act.

15. Site compatibility certificates and conditions for seniors housing

(a) The land IS NOT AFFECTED by a current site compatibility certificate (of which CN is aware) issued under the State Environmental Planning Policy (Housing for Seniors and People with a Disability) 2004.

(b) The land IS NOT AFFECTED by any terms of kind referred to in clause 18(2) of the State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004, that have been imposed as a condition of consent to a development application granted after 11 October, 2007 in respect of the land.

16. Site compatibility certificates for infrastructure, schools or TAFE establishments

The land IS NOT AFFECTED by a valid site compatibility certificate (of which CN is aware) issued under the State Environmental Planning Policy (Infrastructure) 2007.

17. Site compatibility certificates and conditions for affordable rental housing

The land IS NOT AFFECTED by a valid site compatibility certificate (of which CN is aware) issued under the State Environmental Planning Policy (Affordable Rental Housing) 2009.

18. Paper subdivision information

The land IS NOT AFFECTED by any development plan that applies to the land or that is proposed to be subject to a consent ballot.

19. Site verification certificates

The land IS NOT AFFECTED by a current site verification certificate (of which CN is aware) issued under the State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007.

20. Loose-fill asbestos insulation

CN HAS NOT been notified that the land includes any residential premises (within the meaning of Division 1A of Part 8 of the Home Building Act 1989) that are listed on the register of loose-fill asbestos insulation, that is required to be maintained under that Division.

21. Affected building notices and building product rectification orders

The land IS NOT AFFECTED by any affected building notice of which CN is aware that is in force in respect of the land.

The land IS NOT AFFECTED by any building product rectification order that has not been fully complied with, of which CN is aware that is in force in respect of the land.

The land IS NOT AFFECTED by an outstanding notice of intention to make a building product rectification order of which CN is aware.

An affected building notice has the same meaning as in Part 4 of the Building Products (Safety) Act 2017.
Building product rectification order has the same meaning as in the Building Products (Safety) Act 2017.

Note: *There are no matters prescribed by section 59(2) of the Contaminated Land Management Act 1997 to be disclosed, however if other contamination information is held by the Council this may be provided under a section 10.7(5) certificate.*

Part 2:

Advice provided under section 10.7(5)

ATTENTION: Section 10.7(6) of the Act states that a Council shall not incur any liability in respect of advice provided in good faith pursuant to sub-section 10.7(5).

22. Outstanding Notices and Orders issued by City of Newcastle (CN).

This Certificate does not include any advice regarding outstanding notices or orders issued under the Environmental Planning and Assessment Act 1979, the Local Government Act 1993 or any other relevant legislation. To obtain advice regarding these matters, it is recommended you lodge an application for a Certificate as to Outstanding Notices and Orders (accompanied by the appropriate fee). For further information, please contact the Customer Contact Centre on (02) 4974 2000.

23. Draft development control plans.

A draft development control plan DOES NOT APPLY to the land. The draft plans are exhibited pursuant to Part 3 of the Environmental Planning and Assessment Regulation 2000.

24. Heritage Act 1977.

The land IS NOT AFFECTED by a listing on the State Heritage Register or an Interim Heritage Order that is in force under the Heritage Act 1977.

NOTE: The above advice is provided to the extent that CN has been notified by the Heritage Council of NSW. For up-to-date details, contact the Office of Environment and Heritage, PO Box A290, South Sydney NSW 1232 Ph: (02) 9995 5000.

25. Listing by National Trust of Australia.

The land IS AFFECTED by a listing of the National Trust of Australia (NSW).

NOTE: The above advice is provided to the extent that CN has been notified by the National Trust of Australia (NSW). For up-to-date details, contact the National Trust Ph 02 9258 0123.

26. Australian Heritage Database.

The land IS NOT AFFECTED by a listing on the Australian Heritage Database.

NOTE: The above advice is provided to the extent that CN has been notified by the Department of the Environment. For up-to-date details, contact the Department of the Environment, Heritage, King Edward Terrace, Parkes ACT 2600. Ph (02) 6274 1111.

27. Environment Protection & Biodiversity Conservation Act 1999 (Cth)

Under the (Commonwealth) Environment Protection and Biodiversity Conservation Act 1999, actions which have, may have or are likely to have, a significant impact on a matter of national environmental significance may be taken only with the approval of the Commonwealth Minister for the Environment.

Approval is also required for actions that have a significant effect on the environment of Commonwealth land. These actions may be on Commonwealth land or other land.

This approval is in addition to any approvals under the (NSW) Environmental Planning and Assessment Act 1979 or other NSW legislation.

Matters of national environmental significance are:

- declared World Heritage areas
- declared Ramsar wetlands
- listed threatened species and ecological communities
- listed migratory species
- nuclear actions
- the environment of Commonwealth marine areas.

Locations within the City of Newcastle that are a declared Ramsar wetland include Kooragang Nature Reserve and Shortland Wetlands. Listed threatened species and listed migratory species are known to occur within the City of Newcastle.

28. Other matters

The land is affected by the following:

Newcastle earthquake

Earthquakes occurred in the vicinity of Newcastle on 28th December 1989 and 6 August 1994. Buildings on the land may have suffered damage as a consequence of the earthquakes. Prospective purchasers are advised to make their own enquiries as to whether the property is affected by any damage.

Further consent requirements under the Newcastle Local Environmental Plan 2012.

The following provisions of the Newcastle Local Environmental Plan 2012 affect the carrying out of development on the land. These provisions are in addition to those required to be disclosed at Item 2 of this Certificate.

Refer to clause 3.1 Exempt Development of the Newcastle Local Environmental Plan 2012

Refer to clause 3.2 Complying Development of the Newcastle Local Environmental Plan 2012

Local Strategic Planning Statement

The Local Strategic Planning Statement (LSPS) was adopted by council on 26 May 2020 and replaces the Local Planning Strategy. The LSPS is taken into account when CN assesses development applications and amendments to the Newcastle Local Environmental Plan 2012.

Note: Refer to our website to view the document. www.newcastle.nsw.gov.au

Hunter Regional Plan 2036

The Hunter Regional Plan has been prepared by the Department of Planning and Environment. The contents of the strategy will be taken into account when CN assesses development applications and amendments to the Newcastle Local Environmental Plan 2012.

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The Greater Newcastle Metropolitan Plan 2036 has been prepared by the Department of Planning and Environment. The Plan will be taken into account when CN assesses development applications and amendments to the Newcastle Local Environmental Plan 2012.

Parking permit policy

This property is within the Permit Exclusion Area of the City Centre Parking Strategy adopted by Council on 25 June 2002 and updated on 16 May 2005. Residents within the Permit Exclusion Area are not eligible for resident parking permit stickers. For further information please contact Parking Services Coordinator Michael Heather on 4974 5008.

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Council records indicate the following potentially contaminating landuse(s) may have been carried out on the land:

1. engine works
2. fuel/oil storage

Persons relying on the certificate are advised to make their own investigations as to whether the land is affected by elevated concentrations of soil or groundwater contaminants in relation to proposed purchase or use of land.

Issued without alterations or additions, 17/09/21
Authorised by

JEREMY BATH
CHIEF EXECUTIVE OFFICER

Planning Certificate

Section 10.7, Environmental Planning and Assessment Act 1979

To: Douglas Partners Pty Ltd
15 Callistemon Close
Warabrook NSW 2304

Certificate No: PL2021/05215
Fees: $133.00
Receipt No(s): D002049823

Your Reference: Project 102077.02

Date of Issue: 17/09/2021

The Land: Lot 1 DP 1091173
924 Hunter Street Newcastle West NSW 2302

Advice provided on this Certificate:

Advice under section 10.7(2): see items 1 – 21
Additional advice under section 10.7(5): see Items 22 – 28

IMPORTANT: Please read this certificate carefully

This certificate contains important information about the land.

Please check for any item which could be inconsistent with the proposed use or development of the land. If there is anything you do not understand, phone our **Customer Contact Centre** on (02) 4974 2000, or come in and see us.

The information provided in this certificate relates only to the land described above. If you need information about adjoining or nearby land, or about the City of Newcastle (CN) development policies for the general area, contact our **Customer Contact Centre**.

All information provided is correct as at 17/09/2021. However, it's possible for changes to occur within a short time. We recommend that you only rely upon a very recent certificate.

City of Newcastle

PO Box 489
NEWCASTLE 2300

Phone: (02) 4974 2000
Facsimile: (02) 4974 2222

Customer Contact Centre
Ground floor,
12 Stewart Avenue
Newcastle West NSW 2300

Office hours:
Mondays to Fridays 8.30 am to 5.00 pm

Part 1:

Advice provided under section 10.7(2)

ATTENTION: The explanatory notes appearing in italic print within Part 1 are provided to assist understanding, but do not form part of the advice provided under section 10.7(2). These notes shall be taken as being advice provided under section 10.7(5).

1. Names of relevant planning instruments and DCPs

The following environmental planning instruments, proposed environmental planning instruments and development control plans apply to the land, either in full or in part.

State Environmental Planning Policy No. 1 - Development Standards

State Environmental Planning Policy No. 21 - Caravan Parks

State Environmental Planning Policy No. 33 - Hazardous and Offensive Development

State Environmental Planning Policy No. 36 - Manufactured Home Estates

State Environmental Planning Policy (Koala Habitat Protection) Amendment (Maps) 2020

State Environmental Planning Policy No. 50 - Canal Estate Development

State Environmental Planning Policy No. 55 - Remediation of Land

State Environmental Planning Policy No. 64 - Advertising and Signage

State Environmental Planning Policy No. 65 - Design Quality of Residential Flat Development

State Environmental Planning Policy No. 70 - Affordable Housing (Revised Schemes)

State Environmental Planning Policy (Housing For Seniors or People with a Disability) 2004

State Environmental Planning Policy (Building Sustainability Index:BASIX) 2004

State Environmental Planning Policy (State Significant Precincts) 2005

State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007

State Environmental Planning Policy (Miscellaneous Consent Provisions) 2007

State Environmental Planning Policy (Infrastructure) 2007

State Environmental Planning Policy (Exempt and Complying Development Codes) 2008

State Environmental Planning Policy (Urban Renewal) 2010

State Environmental Planning Policy (Affordable Rental Housing) 2009

State Environmental Planning Policy (State and Regional Development) 2011

State Environmental Planning Policy (Educational Establishments and Child Care Facilities) 2017

State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017

State Environmental Planning Policy (Concurrences) 2018

State Environmental Planning Policy (Coastal Management) 2018

State Environmental Planning Policy (Primary Production and Rural Development) 2019

Newcastle Local Environmental Plan 2012

Newcastle Development Control Plan 2012

2. Zoning and land use under relevant LEPs

Newcastle Local Environmental Plan 2012

Zoning: The Newcastle Local Environmental Plan 2012 identifies the land as being within the following zone(s):

Zone B3 Commercial Core

Note: Refer to www. newcastle.nsw.gov.au or www. legislation.nsw.gov.au website for LEP instrument and zoning maps.

The following is an extract from the zoning provisions contained in Newcastle Local Environmental Plan 2012:

Zone B3 Commercial Core

- **Objectives of zone**
  - To provide a wide range of retail, business, office, entertainment, community and other suitable land uses that serve the needs of the local and wider community.
  - To encourage appropriate employment opportunities in accessible locations.
  - To maximise public transport patronage and encourage walking and cycling.
  - To provide for commercial floor space within a mixed use development.
  - To strengthen the role of the Newcastle City Centre as the regional business, retail and cultural centre of the Hunter region.
  - To provide for the retention and creation of view corridors.
- **Permitted without consent**

  Environmental protection works; Home occupations
- **Permitted with consent**

  Car parks; Centre-based child care facilities; Commercial premises; Community facilities; Educational establishments; Entertainment facilities; Environmental facilities; Flood mitigation works; Function centres; Hotel or motel accommodation; Information and education facilities; Medical centres; Mortuaries; Oyster aquaculture; Passenger transport facilities; Places of public worship; Recreation areas; Recreation facilities (indoor); Registered clubs; Respite day care centres; Restricted premises; Roads; Sex services premises; Shop top housing; Signage; Tank-based aquaculture; Tourist and visitor accommodation; Transport depots
- **Prohibited**

  Pond-based aquaculture; Any development not specified in, permitted without consent or permitted with consent

Minimum land dimensions for erection of a dwelling-house: There are no minimum land dimensions for the erection of a dwelling-house that apply to this site.

Critical habitat: The land does not identify as including or comprising critical habitat.

Heritage conservation area: The land is situated within the Newcastle City Centre Heritage Conservation Area. Refer to the Newcastle Local Environmental Plan 2012 for provisions relating to development within a heritage conservation area.

Heritage items: There are no heritage items listed in the Newcastle Local Environmental Plan 2012 situated on the land.

3. Complying development

Note Other requirements: *The advice below for all Complying Development Codes, is limited to identifying whether or not the* ***land****, the subject of the certificate, is land on which complying development may be carried out because of Clauses 1.17A(1)(c) to (e), (2), (3) & (4), 1.18 (1)(c3) and 1.19 of State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 (the Codes SEPP).*

To ascertain the extent to which the complying development may or may not be carried out on the land, maps are available on City of Newcastle (CN) web pages.

Housing Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land within a Heritage Conservation Area or a Draft Heritage Conservation Area unless the development is for a detached outbuilding or swimming pool.

Rural Housing Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land within a Heritage Conservation Area or a Draft Heritage Conservation Area unless the development is for a detached outbuilding or swimming pool.

Low Rise Housing Diversity Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land within a Heritage Conservation Area or a Draft Heritage Conservation Area unless the development is for a detached outbuilding or swimming pool.

Greenfield Housing Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land within a Heritage Conservation Area or a Draft Heritage Conservation Area unless the development is for a detached outbuilding or swimming pool.

Inland Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land within a Heritage Conservation Area or a Draft Heritage Conservation Area unless the development is for a detached outbuilding or swimming pool.

Housing Alterations Code

Complying development under the Housing Alterations Code MAY be carried out on this land.

General Development Code

Complying development under the General Development Code MAY be carried out on this land.

Commercial and Industrial Alterations Code

Complying development under the Commercial and Industrial Code MAY be carried out on this land.

Commercial and Industrial (New Buildings and Additions) Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land within a Heritage Conservation Area or a Draft Heritage Conservation Area.

Container Recycling Facilities Code

Complying development under the Container Recycling Facilities Code MAY be carried out on this land.

Subdivision Code

Complying development under the Subdivision Code MAY be carried out on this land.

Demolition Code

Complying development under the Demolition Code MAY be carried out on this land.

Fire Safety Code

Complying development under the Fire Safety Code MAY be carried out on this land.

4B. Annual charges under Local Government Act 1993 for coastal protection services that relate to existing coastal protection works

The land IS NOT subject to an agreement for annual charges under section 496B of the Local Government Act 1993 for coastal protection services (within the meaning of section 553B of that Act).

5. Coal Mine Subsidence Compensation Act 2017

The land IS NOT WITHIN a Mine Subsidence District declared under section 20 of the Coal Mine Subsidence Compensation Act 2017.

NOTE: The above advice is provided to the extent that City of Newcastle (CN) has been notified by Subsidence Advisory NSW.

6. Road widening or realignment

NOTE: The Roads and Maritime Services (RMS) may have proposals that are not referred to in this item. For advice about affectation by RMS proposals, contact the Roads and Maritime Services, Locked Mail Bag 30 Newcastle 2300. Ph: 131 782.

The land IS NOT AFFECTED by any road widening or road realignment under Division 2 of Part 3 of the Roads Act 1993.

The land IS NOT AFFECTED by any road widening or road realignment under an environmental planning instrument.

The land IS NOT AFFECTED by road widening or road realignment under a resolution of the Council.

7. Policies on hazard risk restrictions

Except as stated below, the land is not affected by a policy referred to in Item 7 of Schedule 4 of the Environmental Planning and Assessment Regulation 2000 that restricts the development of the land because of the likelihood of land slip, bushfire, tidal inundation, subsidence, acid sulphate soils or any other risk (other than flooding).

Potential acid sulfate soils: Works carried out on the land must be undertaken in accordance with Clause 6.1 Acid sulfate soils of the Newcastle Local Environmental Plan 2012.

Land Contamination: We have land contamination information/records in relation to this property. Council has adopted a policy of restricting development or imposing conditions on properties affected by land contamination. Refer to Section 5.02 Land Contamination of Newcastle Development Control Plan 2012, which is available to view and download from City of Newcastle's website.

NOTE: The absence of a policy to restrict development of the land because of the likelihood of a particular risk does not imply that the land is free from that risk. City of Newcastle (CN) considers the likelihood of natural and man-made risks when determining development applications under section 4.15 of the Environmental Planning and Assessment Act 1979. Detailed investigation carried out in conjunction with the preparation or assessment of a development application may result in CN either refusing development consent or imposing conditions of consent on the basis of risks that are not identified above.

7A. Flood related development controls information

7A(1) Mapping information is not available and it is unknown if the land or part of the land is within the flood planning area.
7A(2) Mapping information is not available and it is unknown if the land or part of the land is between the flood planning area and the probable maximum flood.

Our information currently indicates that the property is, or contains, flood prone land as defined in the Floodplain Development Manual: the management of flood liable land, April 2005 published by the NSW Government.

Section 4.01 Flood Management of Newcastle Development Control Plan (DCP) 2012 provides guidelines with respect to all development of flood prone land. This includes development for the purpose of dwelling houses, dual occupancies, multi dwelling housing or residential flat buildings. The DCP may be viewed on our website, inspected or purchased at our Customer Contact Centre.

NOTE: More detailed flood information specific to the property is available on separate flooding certificate application through our Customer Contact Centre on (02) 4974 2000

8. Land reserved for acquisition

The land is not identified for acquisition by a public authority (as referred to in section 3.15 of the Act) by any environmental planning instrument or proposed environmental planning instrument applying to the land.

9. Contributions plans

The following contribution plan/s apply to the land.

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The Plan specifies section 7.12 contributions that may be imposed as a condition of development consent.

NOTE: Contributions plans are available on our website or may be inspected or purchased at our Customer Contact Centre.

9A. Biodiversity certified land

The land IS NOT biodiversity certified land under Part 8 of the Biodiversity Conservation Act 2016.

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The land IS NOT land (of which CN is aware) that contains a set aside area under section 60ZC of the Local Land Services Act 2013.

11. Bush fire prone land

The land IS NOT bush fire prone land for the purposes of the Environmental Planning and Assessment Act 1979.

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Not applicable. The Native Vegetation Act 2003 does not apply to the Newcastle local government area.

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CN HAS NOT been notified that an order has been made under the Trees (Disputes between Neighbours) Act 2006 to carry out work in relation to a tree on the land.

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Authorised by

JEREMY BATH
CHIEF EXECUTIVE OFFICER

Planning Certificate

Section 10.7, Environmental Planning and Assessment Act 1979

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Part 1:

Advice provided under section 10.7(2)

ATTENTION: The explanatory notes appearing in italic print within Part 1 are provided to assist understanding, but do not form part of the advice provided under section 10.7(2). These notes shall be taken as being advice provided under section 10.7(5).

1. Names of relevant planning instruments and DCPs

The following environmental planning instruments, proposed environmental planning instruments and development control plans apply to the land, either in full or in part.

State Environmental Planning Policy No. 1 - Development Standards

State Environmental Planning Policy No. 21 - Caravan Parks

State Environmental Planning Policy No. 33 - Hazardous and Offensive Development

State Environmental Planning Policy No. 36 - Manufactured Home Estates

State Environmental Planning Policy (Koala Habitat Protection) Amendment (Maps) 2020

State Environmental Planning Policy No. 50 - Canal Estate Development

State Environmental Planning Policy No. 55 - Remediation of Land

State Environmental Planning Policy No. 64 - Advertising and Signage

State Environmental Planning Policy No. 65 - Design Quality of Residential Flat Development

State Environmental Planning Policy No. 70 - Affordable Housing (Revised Schemes)

State Environmental Planning Policy (Housing For Seniors or People with a Disability) 2004

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State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007

State Environmental Planning Policy (Miscellaneous Consent Provisions) 2007

State Environmental Planning Policy (Infrastructure) 2007

State Environmental Planning Policy (Exempt and Complying Development Codes) 2008

State Environmental Planning Policy (Urban Renewal) 2010

State Environmental Planning Policy (Affordable Rental Housing) 2009

State Environmental Planning Policy (State and Regional Development) 2011

State Environmental Planning Policy (Educational Establishments and Child Care Facilities) 2017

State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017

State Environmental Planning Policy (Concurrences) 2018

State Environmental Planning Policy (Coastal Management) 2018

State Environmental Planning Policy (Primary Production and Rural Development) 2019

Newcastle Local Environmental Plan 2012

Newcastle Development Control Plan 2012

2. Zoning and land use under relevant LEPs

Newcastle Local Environmental Plan 2012

Zoning: The Newcastle Local Environmental Plan 2012 identifies the land as being within the following zone(s):

Zone B3 Commercial Core

Note: Refer to www. newcastle.nsw.gov.au or www. legislation.nsw.gov.au website for LEP instrument and zoning maps.

The following is an extract from the zoning provisions contained in Newcastle Local Environmental Plan 2012:

Zone B3 Commercial Core

- **Objectives of zone**
  - To provide a wide range of retail, business, office, entertainment, community and other suitable land uses that serve the needs of the local and wider community.
  - To encourage appropriate employment opportunities in accessible locations.
  - To maximise public transport patronage and encourage walking and cycling.
  - To provide for commercial floor space within a mixed use development.
  - To strengthen the role of the Newcastle City Centre as the regional business, retail and cultural centre of the Hunter region.
  - To provide for the retention and creation of view corridors.
- **Permitted without consent**

  Environmental protection works; Home occupations
- **Permitted with consent**

  Car parks; Centre-based child care facilities; Commercial premises; Community facilities; Educational establishments; Entertainment facilities; Environmental facilities; Flood mitigation works; Function centres; Hotel or motel accommodation; Information and education facilities; Medical centres; Mortuaries; Oyster aquaculture; Passenger transport facilities; Places of public worship; Recreation areas; Recreation facilities (indoor); Registered clubs; Respite day care centres; Restricted premises; Roads; Sex services premises; Shop top housing; Signage; Tank-based aquaculture; Tourist and visitor accommodation; Transport depots
- **Prohibited**

  Pond-based aquaculture; Any development not specified in, permitted without consent or permitted with consent

Minimum land dimensions for erection of a dwelling-house: There are no minimum land dimensions for the erection of a dwelling-house that apply to this site.

Critical habitat: The land does not identify as including or comprising critical habitat.

Heritage conservation area: The land is situated within the Newcastle City Centre Heritage Conservation Area. Refer to the Newcastle Local Environmental Plan 2012 for provisions relating to development within a heritage conservation area.

Heritage items: There are no heritage items listed in the Newcastle Local Environmental Plan 2012 situated on the land.

3. Complying development

Note Other requirements: *The advice below for all Complying Development Codes, is limited to identifying whether or not the* ***land****, the subject of the certificate, is land on which complying development may be carried out because of Clauses 1.17A(1)(c) to (e), (2), (3) & (4), 1.18 (1)(c3) and 1.19 of State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 (the Codes SEPP).*

To ascertain the extent to which the complying development may or may not be carried out on the land, maps are available on City of Newcastle (CN) web pages.

Housing Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land within a Heritage Conservation Area or a Draft Heritage Conservation Area unless the development is for a detached outbuilding or swimming pool.

Rural Housing Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land within a Heritage Conservation Area or a Draft Heritage Conservation Area unless the development is for a detached outbuilding or swimming pool.

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Greenfield Housing Code

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General Development Code

Complying development under the General Development Code MAY be carried out on this land.

Commercial and Industrial Alterations Code

Complying development under the Commercial and Industrial Code MAY be carried out on this land.

Commercial and Industrial (New Buildings and Additions) Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land within a Heritage Conservation Area or a Draft Heritage Conservation Area.

Container Recycling Facilities Code

Complying development under the Container Recycling Facilities Code MAY be carried out on this land.

Subdivision Code

Complying development under the Subdivision Code MAY be carried out on this land.

Demolition Code

Complying development under the Demolition Code MAY be carried out on this land.

Fire Safety Code

Complying development under the Fire Safety Code MAY be carried out on this land.

4B. Annual charges under Local Government Act 1993 for coastal protection services that relate to existing coastal protection works

The land IS NOT subject to an agreement for annual charges under section 496B of the Local Government Act 1993 for coastal protection services (within the meaning of section 553B of that Act).

5. Coal Mine Subsidence Compensation Act 2017

The land IS NOT WITHIN a Mine Subsidence District declared under section 20 of the Coal Mine Subsidence Compensation Act 2017.

NOTE: The above advice is provided to the extent that City of Newcastle (CN) has been notified by Subsidence Advisory NSW.

6. Road widening or realignment

NOTE: The Roads and Maritime Services (RMS) may have proposals that are not referred to in this item. For advice about affectation by RMS proposals, contact the Roads and Maritime Services, Locked Mail Bag 30 Newcastle 2300. Ph: 131 782.

The land IS NOT AFFECTED by any road widening or road realignment under Division 2 of Part 3 of the Roads Act 1993.

The land IS NOT AFFECTED by any road widening or road realignment under an environmental planning instrument.

The land IS NOT AFFECTED by road widening or road realignment under a resolution of the Council.

7. Policies on hazard risk restrictions

Except as stated below, the land is not affected by a policy referred to in Item 7 of Schedule 4 of the Environmental Planning and Assessment Regulation 2000 that restricts the development of the land because of the likelihood of land slip, bushfire, tidal inundation, subsidence, acid sulphate soils or any other risk (other than flooding).

Potential acid sulfate soils: Works carried out on the land must be undertaken in accordance with Clause 6.1 Acid sulfate soils of the Newcastle Local Environmental Plan 2012.

Land Contamination: We have land contamination information/records in relation to this property. Council has adopted a policy of restricting development or imposing conditions on properties affected by land contamination. Refer to Section 5.02 Land Contamination of Newcastle Development Control Plan 2012, which is available to view and download from City of Newcastle's website.

NOTE: The absence of a policy to restrict development of the land because of the likelihood of a particular risk does not imply that the land is free from that risk. City of Newcastle (CN) considers the likelihood of natural and man-made risks when determining development applications under section 4.15 of the Environmental Planning and Assessment Act 1979. Detailed investigation carried out in conjunction with the preparation or assessment of a development application may result in CN either refusing development consent or imposing conditions of consent on the basis of risks that are not identified above.

7A. Flood related development controls information

7A(1) Mapping information is not available and it is unknown if the land or part of the land is within the flood planning area.
7A(2) Mapping information is not available and it is unknown if the land or part of the land is between the flood planning area and the probable maximum flood.

Our information currently indicates that the property is, or contains, flood prone land as defined in the Floodplain Development Manual: the management of flood liable land, April 2005 published by the NSW Government.

Section 4.01 Flood Management of Newcastle Development Control Plan (DCP) 2012 provides guidelines with respect to all development of flood prone land. This includes development for the purpose of dwelling houses, dual occupancies, multi dwelling housing or residential flat buildings. The DCP may be viewed on our website, inspected or purchased at our Customer Contact Centre.

NOTE: More detailed flood information specific to the property is available on separate flooding certificate application through our Customer Contact Centre on (02) 4974 2000

8. Land reserved for acquisition

The land is not identified for acquisition by a public authority (as referred to in section 3.15 of the Act) by any environmental planning instrument or proposed environmental planning instrument applying to the land.

9. Contributions plans

The following contribution plan/s apply to the land.

Section 7.12 Newcastle Local Infrastructure Contributions Plan 2019: Effective 9 September 2019.

The Plan specifies section 7.12 contributions that may be imposed as a condition of development consent.

NOTE: Contributions plans are available on our website or may be inspected or purchased at our Customer Contact Centre.

9A. Biodiversity certified land

The land IS NOT biodiversity certified land under Part 8 of the Biodiversity Conservation Act 2016.

10. Biodiversity stewardship sites

The land IS NOT land (of which CN is aware) under a biodiversity stewardship agreement under Part 5 of the Biodiversity Conservation Act 2016.

10A. Native vegetation clearing set asides

The land IS NOT land (of which CN is aware) that contains a set aside area under section 60ZC of the Local Land Services Act 2013.

11. Bush fire prone land

The land IS NOT bush fire prone land for the purposes of the Environmental Planning and Assessment Act 1979.

12. Property vegetation plans

Not applicable. The Native Vegetation Act 2003 does not apply to the Newcastle local government area.

13. Orders under Trees (Disputes Between Neighbours) Act 2006

CN HAS NOT been notified that an order has been made under the Trees (Disputes between Neighbours) Act 2006 to carry out work in relation to a tree on the land.

14. Directions under Part 3A

The land IS NOT AFFECTED by a direction by the Minister in force under section 75P (2) (c1) of the Act.

15. Site compatibility certificates and conditions for seniors housing

(a) The land IS NOT AFFECTED by a current site compatibility certificate (of which CN is aware) issued under the State Environmental Planning Policy (Housing for Seniors and People with a Disability) 2004.

(b) The land IS NOT AFFECTED by any terms of kind referred to in clause 18(2) of the State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004, that have been imposed as a condition of consent to a development application granted after 11 October, 2007 in respect of the land.

16. Site compatibility certificates for infrastructure, schools or TAFE establishments

The land IS NOT AFFECTED by a valid site compatibility certificate (of which CN is aware) issued under the State Environmental Planning Policy (Infrastructure) 2007.

17. Site compatibility certificates and conditions for affordable rental housing

The land IS NOT AFFECTED by a valid site compatibility certificate (of which CN is aware) issued under the State Environmental Planning Policy (Affordable Rental Housing) 2009.

18. Paper subdivision information

The land IS NOT AFFECTED by any development plan that applies to the land or that is proposed to be subject to a consent ballot.

19. Site verification certificates

The land IS NOT AFFECTED by a current site verification certificate (of which CN is aware) issued under the State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007.

20. Loose-fill asbestos insulation

CN HAS NOT been notified that the land includes any residential premises (within the meaning of Division 1A of Part 8 of the Home Building Act 1989) that are listed on the register of loose-fill asbestos insulation, that is required to be maintained under that Division.

21. Affected building notices and building product rectification orders

The land IS NOT AFFECTED by any affected building notice of which CN is aware that is in force in respect of the land.

The land IS NOT AFFECTED by any building product rectification order that has not been fully complied with, of which CN is aware that is in force in respect of the land.

The land IS NOT AFFECTED by an outstanding notice of intention to make a building product rectification order of which CN is aware.

An affected building notice has the same meaning as in Part 4 of the Building Products (Safety) Act 2017. Building product rectification order has the same meaning as in the Building Products (Safety) Act 2017.

Note: *There are no matters prescribed by section 59(2) of the Contaminated Land Management Act 1997 to be disclosed, however if other contamination information is held by the Council this may be provided under a section 10.7(5) certificate.*

Part 2:

Advice provided under section 10.7(5)

ATTENTION: Section 10.7(6) of the Act states that a Council shall not incur any liability in respect of advice provided in good faith pursuant to sub-section 10.7(5).

22. Outstanding Notices and Orders issued by City of Newcastle (CN).

This Certificate does not include any advice regarding outstanding notices or orders issued under the Environmental Planning and Assessment Act 1979, the Local Government Act 1993 or any other relevant legislation. To obtain advice regarding these matters, it is recommended you lodge an application for a Certificate as to Outstanding Notices and Orders (accompanied by the appropriate fee). For further information, please contact the Customer Contact Centre on (02) 4974 2000.

23. Draft development control plans.

A draft development control plan DOES NOT APPLY to the land. The draft plans are exhibited pursuant to Part 3 of the Environmental Planning and Assessment Regulation 2000.

24. Heritage Act 1977.

The land IS NOT AFFECTED by a listing on the State Heritage Register or an Interim Heritage Order that is in force under the Heritage Act 1977.

NOTE: The above advice is provided to the extent that CN has been notified by the Heritage Council of NSW. For up-to-date details, contact the Office of Environment and Heritage, PO Box A290, South Sydney NSW 1232 Ph: (02) 9995 5000.

25. Listing by National Trust of Australia.

The land IS NOT AFFECTED by a listing of the National Trust of Australia (NSW).

NOTE: The above advice is provided to the extent that CN has been notified by the National Trust of Australia (NSW). For up-to-date details, contact the National Trust Ph 02 9258 0123.

26. Australian Heritage Database.

The land IS NOT AFFECTED by a listing on the Australian Heritage Database.

NOTE: The above advice is provided to the extent that CN has been notified by the Department of the Environment. For up-to-date details, contact the Department of the Environment, Heritage, King Edward Terrace, Parkes ACT 2600. Ph (02) 6274 1111.

27. Environment Protection & Biodiversity Conservation Act 1999 (Cth)

Under the (Commonwealth) Environment Protection and Biodiversity Conservation Act 1999, actions which have, may have or are likely to have, a significant impact on a matter of national environmental significance may be taken only with the approval of the Commonwealth Minister for the Environment.

Approval is also required for actions that have a significant effect on the environment of Commonwealth land. These actions may be on Commonwealth land or other land.

This approval is in addition to any approvals under the (NSW) Environmental Planning and Assessment Act 1979 or other NSW legislation.

Matters of national environmental significance are:

- declared World Heritage areas
- declared Ramsar wetlands
- listed threatened species and ecological communities
- listed migratory species
- nuclear actions
- the environment of Commonwealth marine areas.

Locations within the City of Newcastle that are a declared Ramsar wetland include Kooragang Nature Reserve and Shortland Wetlands. Listed threatened species and listed migratory species are known to occur within the City of Newcastle.

28. Other matters

The land is affected by the following:

Newcastle earthquake

Earthquakes occurred in the vicinity of Newcastle on 28th December 1989 and 6 August 1994. Buildings on the land may have suffered damage as a consequence of the earthquakes. Prospective purchasers are advised to make their own enquiries as to whether the property is affected by any damage.

Further consent requirements under the Newcastle Local Environmental Plan 2012.

The following provisions of the Newcastle Local Environmental Plan 2012 affect the carrying out of development on the land. These provisions are in addition to those required to be disclosed at Item 2 of this Certificate.

Refer to clause 3.1 Exempt Development of the Newcastle Local Environmental Plan 2012

Refer to clause 3.2 Complying Development of the Newcastle Local Environmental Plan 2012

Local Strategic Planning Statement

The Local Strategic Planning Statement (LSPS) was adopted by council on 26 May 2020 and replaces the Local Planning Strategy. The LSPS is taken into account when CN assesses development applications and amendments to the Newcastle Local Environmental Plan 2012.

Note: Refer to our website to view the document. www.newcastle.nsw.gov.au

Hunter Regional Plan 2036

The Hunter Regional Plan has been prepared by the Department of Planning and Environment. The contents of the strategy will be taken into account when CN assesses development applications and amendments to the Newcastle Local Environmental Plan 2012.

Note: Refer to the Department of Planning and Environment's website to view the document. www.planning.nsw.gov.au

Newcastle City-Wide Floodplain Risk Management Study and Plan (2012)

The Newcastle City-wide Floodplain Risk Management Study and Plan addresses flood management for the City of Newcastle. The Study and Plan will be taken into account when CN assesses development applications and amendments to the Newcastle Local Environmental Plan 2012.

Note: Refer to our *website to view the document. www.newcastle.nsw.gov.au*

Greater Newcastle Metropolitan Plan 2036

The Greater Newcastle Metropolitan Plan 2036 has been prepared by the Department of Planning and Environment. The Plan will be taken into account when CN assesses development applications and amendments to the Newcastle Local Environmental Plan 2012.

Parking permit policy

This property is within the Permit Exclusion Area of the City Centre Parking Strategy adopted by Council on 25 June 2002 and updated on 16 May 2005. Residents within the Permit Exclusion Area are not eligible for resident parking permit stickers. For further information please contact Parking Services Coordinator Michael Heather on 4974 5008.

Contaminated land information

Council records indicate the following potentially contaminating landuse(s) may have been carried out on the land:

1. engine works
2. fuel/oil storage

Persons relying on the certificate are advised to make their own investigations as to whether the land is affected by elevated concentrations of soil or groundwater contaminants in relation to proposed purchase or use of land.

Issued without alterations or additions, 17/09/21
Authorised by

JEREMY BATH
CHIEF EXECUTIVE OFFICER

Planning Certificate

Section 10.7, Environmental Planning and Assessment Act 1979

To: Douglas Partners Pty Ltd
15 Callistemon Close
Warabrook NSW 2304

Certificate No: PL2021/05217
Fees: $133.00
Receipt No(s): D002049823

Your Reference: Project 102077.02

Date of Issue: 17/09/2021

The Land: Lot 1 DP 456088
924 Hunter Street Newcastle West NSW 2302

Advice provided on this Certificate:

Advice under section 10.7(2): see items 1 – 21
Additional advice under section 10.7(5): see Items 22 – 28

IMPORTANT: Please read this certificate carefully

This certificate contains important information about the land.

Please check for any item which could be inconsistent with the proposed use or development of the land. If there is anything you do not understand, phone our **Customer Contact Centre** on (02) 4974 2000, or come in and see us.

The information provided in this certificate relates only to the land described above. If you need information about adjoining or nearby land, or about the City of Newcastle (CN) development policies for the general area, contact our **Customer Contact Centre**.

All information provided is correct as at 17/09/2021. However, it's possible for changes to occur within a short time. We recommend that you only rely upon a very recent certificate.

City of Newcastle

PO Box 489
NEWCASTLE 2300

Phone: (02) 4974 2000
Facsimile: (02) 4974 2222

Customer Contact Centre
Ground floor,
12 Stewart Avenue
Newcastle West NSW 2300

Office hours:
Mondays to Fridays 8.30 am to 5.00 pm

Part 1:

Advice provided under section 10.7(2)

ATTENTION: The explanatory notes appearing in italic print within Part 1 are provided to assist understanding, but do not form part of the advice provided under section 10.7(2). These notes shall be taken as being advice provided under section 10.7(5).

1. Names of relevant planning instruments and DCPs

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2. Zoning and land use under relevant LEPs

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Zoning: The Newcastle Local Environmental Plan 2012 identifies the land as being within the following zone(s):

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The land IS NOT subject to an agreement for annual charges under section 496B of the Local Government Act 1993 for coastal protection services (within the meaning of section 553B of that Act).

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The land IS NOT WITHIN a Mine Subsidence District declared under section 20 of the Coal Mine Subsidence Compensation Act 2017.

NOTE: The above advice is provided to the extent that City of Newcastle (CN) has been notified by Subsidence Advisory NSW.

6. Road widening or realignment

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10A. Native vegetation clearing set asides

The land IS NOT land (of which CN is aware) that contains a set aside area under section 60ZC of the Local Land Services Act 2013.

11. Bush fire prone land

The land IS NOT bush fire prone land for the purposes of the Environmental Planning and Assessment Act 1979.

12. Property vegetation plans

Not applicable. The Native Vegetation Act 2003 does not apply to the Newcastle local government area.

13. Orders under Trees (Disputes Between Neighbours) Act 2006

CN HAS NOT been notified that an order has been made under the Trees (Disputes between Neighbours) Act 2006 to carry out work in relation to a tree on the land.

14. Directions under Part 3A

The land IS NOT AFFECTED by a direction by the Minister in force under section 75P (2) (c1) of the Act.

15. Site compatibility certificates and conditions for seniors housing

(a) The land IS NOT AFFECTED by a current site compatibility certificate (of which CN is aware) issued under the State Environmental Planning Policy (Housing for Seniors and People with a Disability) 2004.

(b) The land IS NOT AFFECTED by any terms of kind referred to in clause 18(2) of the State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004, that have been imposed as a condition of consent to a development application granted after 11 October, 2007 in respect of the land.

16. Site compatibility certificates for infrastructure, schools or TAFE establishments

The land IS NOT AFFECTED by a valid site compatibility certificate (of which CN is aware) issued under the State Environmental Planning Policy (Infrastructure) 2007.

17. Site compatibility certificates and conditions for affordable rental housing

The land IS NOT AFFECTED by a valid site compatibility certificate (of which CN is aware) issued under the State Environmental Planning Policy (Affordable Rental Housing) 2009.

18. Paper subdivision information

The land IS NOT AFFECTED by any development plan that applies to the land or that is proposed to be subject to a consent ballot.

19. Site verification certificates

The land IS NOT AFFECTED by a current site verification certificate (of which CN is aware) issued under the State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007.

20. Loose-fill asbestos insulation

CN HAS NOT been notified that the land includes any residential premises (within the meaning of Division 1A of Part 8 of the Home Building Act 1989) that are listed on the register of loose-fill asbestos insulation, that is required to be maintained under that Division.

21. Affected building notices and building product rectification orders

The land IS NOT AFFECTED by any affected building notice of which CN is aware that is in force in respect of the land.

The land IS NOT AFFECTED by any building product rectification order that has not been fully complied with, of which CN is aware that is in force in respect of the land.

The land IS NOT AFFECTED by an outstanding notice of intention to make a building product rectification order of which CN is aware.

An affected building notice has the same meaning as in Part 4 of the Building Products (Safety) Act 2017. Building product rectification order has the same meaning as in the Building Products (Safety) Act 2017.

Note: *There are no matters prescribed by section 59(2) of the Contaminated Land Management Act 1997 to be disclosed, however if other contamination information is held by the Council this may be provided under a section 10.7(5) certificate.*

Part 2:

Advice provided under section 10.7(5)

ATTENTION: Section 10.7(6) of the Act states that a Council shall not incur any liability in respect of advice provided in good faith pursuant to sub-section 10.7(5).

22. Outstanding Notices and Orders issued by City of Newcastle (CN).

This Certificate does not include any advice regarding outstanding notices or orders issued under the Environmental Planning and Assessment Act 1979, the Local Government Act 1993 or any other relevant legislation. To obtain advice regarding these matters, it is recommended you lodge an application for a Certificate as to Outstanding Notices and Orders (accompanied by the appropriate fee). For further information, please contact the Customer Contact Centre on (02) 4974 2000.

23. Draft development control plans.

A draft development control plan DOES NOT APPLY to the land. The draft plans are exhibited pursuant to Part 3 of the Environmental Planning and Assessment Regulation 2000.

24. Heritage Act 1977.

The land IS NOT AFFECTED by a listing on the State Heritage Register or an Interim Heritage Order that is in force under the Heritage Act 1977.

NOTE: The above advice is provided to the extent that CN has been notified by the Heritage Council of NSW. For up-to-date details, contact the Office of Environment and Heritage, PO Box A290, South Sydney NSW 1232 Ph: (02) 9995 5000.

25. Listing by National Trust of Australia.

The land IS NOT AFFECTED by a listing of the National Trust of Australia (NSW).

NOTE: The above advice is provided to the extent that CN has been notified by the National Trust of Australia (NSW). For up-to-date details, contact the National Trust Ph 02 9258 0123.

26. Australian Heritage Database.

The land IS NOT AFFECTED by a listing on the Australian Heritage Database.

NOTE: The above advice is provided to the extent that CN has been notified by the Department of the Environment. For up-to-date details, contact the Department of the Environment, Heritage, King Edward Terrace, Parkes ACT 2600. Ph (02) 6274 1111.

27. Environment Protection & Biodiversity Conservation Act 1999 (Cth)

Under the (Commonwealth) Environment Protection and Biodiversity Conservation Act 1999, actions which have, may have or are likely to have, a significant impact on a matter of national environmental significance may be taken only with the approval of the Commonwealth Minister for the Environment.

Approval is also required for actions that have a significant effect on the environment of Commonwealth land. These actions may be on Commonwealth land or other land.

This approval is in addition to any approvals under the (NSW) Environmental Planning and Assessment Act 1979 or other NSW legislation.

Matters of national environmental significance are:

- declared World Heritage areas
- declared Ramsar wetlands
- listed threatened species and ecological communities
- listed migratory species
- nuclear actions
- the environment of Commonwealth marine areas.

Locations within the City of Newcastle that are a declared Ramsar wetland include Kooragang Nature Reserve and Shortland Wetlands. Listed threatened species and listed migratory species are known to occur within the City of Newcastle.

28. Other matters

The land is affected by the following:

Newcastle earthquake

Earthquakes occurred in the vicinity of Newcastle on 28th December 1989 and 6 August 1994. Buildings on the land may have suffered damage as a consequence of the earthquakes. Prospective purchasers are advised to make their own enquiries as to whether the property is affected by any damage.

Further consent requirements under the Newcastle Local Environmental Plan 2012.

The following provisions of the Newcastle Local Environmental Plan 2012 affect the carrying out of development on the land. These provisions are in addition to those required to be disclosed at Item 2 of this Certificate.

Refer to clause 3.1 Exempt Development of the Newcastle Local Environmental Plan 2012

Refer to clause 3.2 Complying Development of the Newcastle Local Environmental Plan 2012

Local Strategic Planning Statement

The Local Strategic Planning Statement (LSPS) was adopted by council on 26 May 2020 and replaces the Local Planning Strategy. The LSPS is taken into account when CN assesses development applications and amendments to the Newcastle Local Environmental Plan 2012.

Note: Refer to our website to view the document. www.newcastle.nsw.gov.au

Hunter Regional Plan 2036

The Hunter Regional Plan has been prepared by the Department of Planning and Environment. The contents of the strategy will be taken into account when CN assesses development applications and amendments to the Newcastle Local Environmental Plan 2012.

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Newcastle City-Wide Floodplain Risk Management Study and Plan (2012)

The Newcastle City-wide Floodplain Risk Management Study and Plan addresses flood management for the City of Newcastle. The Study and Plan will be taken into account when CN assesses development applications and amendments to the Newcastle Local Environmental Plan 2012.

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The Greater Newcastle Metropolitan Plan 2036 has been prepared by the Department of Planning and Environment. The Plan will be taken into account when CN assesses development applications and amendments to the Newcastle Local Environmental Plan 2012.

Parking permit policy

This property is within the Permit Exclusion Area of the City Centre Parking Strategy adopted by Council on 25 June 2002 and updated on 16 May 2005. Residents within the Permit Exclusion Area are not eligible for resident parking permit stickers. For further information please contact Parking Services Coordinator Michael Heather on 4974 5008.

Contaminated land information

Council records indicate the following potentially contaminating landuse(s) may have been carried out on the land:

1. engine works
2. fuel/oil storage

Persons relying on the certificate are advised to make their own investigations as to whether the land is affected by elevated concentrations of soil or groundwater contaminants in relation to proposed purchase or use of land.

Issued without alterations or additions, 17/09/21
Authorised by

JEREMY BATH
CHIEF EXECUTIVE OFFICER

Planning Certificate

Section 10.7, Environmental Planning and Assessment Act 1979

To: Douglas Partners Pty Ltd
15 Callistemon Close
Warabrook NSW 2304

Certificate No: PL2021/05218
Fees: $133.00
Receipt No(s): D002049823

Your Reference: Project 102077.02

Date of Issue: 17/09/2021

The Land: Lot 1 DP 395367
924 Hunter Street Newcastle West NSW 2302

Advice provided on this Certificate:

Advice under section 10.7(2): see items 1 – 21
Additional advice under section 10.7(5): see Items 22 – 28

IMPORTANT: Please read this certificate carefully

This certificate contains important information about the land.

Please check for any item which could be inconsistent with the proposed use or development of the land. If there is anything you do not understand, phone our **Customer Contact Centre** on (02) 4974 2000, or come in and see us.

The information provided in this certificate relates only to the land described above. If you need information about adjoining or nearby land, or about the City of Newcastle (CN) development policies for the general area, contact our **Customer Contact Centre**.

All information provided is correct as at 17/09/2021. However, it's possible for changes to occur within a short time. We recommend that you only rely upon a very recent certificate.

City of Newcastle

PO Box 489
NEWCASTLE 2300

Phone: (02) 4974 2000
Facsimile: (02) 4974 2222

Customer Contact Centre
Ground floor,
12 Stewart Avenue
Newcastle West NSW 2300

Office hours:
Mondays to Fridays 8.30 am to 5.00 pm

Part 1:

Advice provided under section 10.7(2)

ATTENTION: The explanatory notes appearing in italic print within Part 1 are provided to assist understanding, but do not form part of the advice provided under section 10.7(2). These notes shall be taken as being advice provided under section 10.7(5).

1. Names of relevant planning instruments and DCPs

The following environmental planning instruments, proposed environmental planning instruments and development control plans apply to the land, either in full or in part.

State Environmental Planning Policy No. 1 - Development Standards

State Environmental Planning Policy No. 21 - Caravan Parks

State Environmental Planning Policy No. 33 - Hazardous and Offensive Development

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State Environmental Planning Policy (Koala Habitat Protection) Amendment (Maps) 2020

State Environmental Planning Policy No. 50 - Canal Estate Development

State Environmental Planning Policy No. 55 - Remediation of Land

State Environmental Planning Policy No. 64 - Advertising and Signage

State Environmental Planning Policy No. 65 - Design Quality of Residential Flat Development

State Environmental Planning Policy No. 70 - Affordable Housing (Revised Schemes)

State Environmental Planning Policy (Housing For Seniors or People with a Disability) 2004

State Environmental Planning Policy (Building Sustainability Index:BASIX) 2004

State Environmental Planning Policy (State Significant Precincts) 2005

State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007

State Environmental Planning Policy (Miscellaneous Consent Provisions) 2007

State Environmental Planning Policy (Infrastructure) 2007

State Environmental Planning Policy (Exempt and Complying Development Codes) 2008

State Environmental Planning Policy (Urban Renewal) 2010

State Environmental Planning Policy (Affordable Rental Housing) 2009

State Environmental Planning Policy (State and Regional Development) 2011

State Environmental Planning Policy (Educational Establishments and Child Care Facilities) 2017

State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017

State Environmental Planning Policy (Concurrences) 2018

State Environmental Planning Policy (Coastal Management) 2018

State Environmental Planning Policy (Primary Production and Rural Development) 2019

Newcastle Local Environmental Plan 2012

Newcastle Development Control Plan 2012

2. Zoning and land use under relevant LEPs

Newcastle Local Environmental Plan 2012

Zoning: The Newcastle Local Environmental Plan 2012 identifies the land as being within the following zone(s):

Zone B3 Commercial Core

Note: Refer to www. newcastle.nsw.gov.au or www. legislation.nsw.gov.au website for LEP instrument and zoning maps.

The following is an extract from the zoning provisions contained in Newcastle Local Environmental Plan 2012:

Zone B3 Commercial Core

- **Objectives of zone**
    - To provide a wide range of retail, business, office, entertainment, community and other suitable land uses that serve the needs of the local and wider community.
    - To encourage appropriate employment opportunities in accessible locations.
    - To maximise public transport patronage and encourage walking and cycling.
    - To provide for commercial floor space within a mixed use development.
    - To strengthen the role of the Newcastle City Centre as the regional business, retail and cultural centre of the Hunter region.
    - To provide for the retention and creation of view corridors.
- **Permitted without consent**

  Environmental protection works; Home occupations
- **Permitted with consent**

  Car parks; Centre-based child care facilities; Commercial premises; Community facilities; Educational establishments; Entertainment facilities; Environmental facilities; Flood mitigation works; Function centres; Hotel or motel accommodation; Information and education facilities; Medical centres; Mortuaries; Oyster aquaculture; Passenger transport facilities; Places of public worship; Recreation areas; Recreation facilities (indoor); Registered clubs; Respite day care centres; Restricted premises; Roads; Sex services premises; Shop top housing; Signage; Tank-based aquaculture; Tourist and visitor accommodation; Transport depots
- **Prohibited**

  Pond-based aquaculture; Any development not specified in, permitted without consent or permitted with consent

Minimum land dimensions for erection of a dwelling-house: There are no minimum land dimensions for the erection of a dwelling-house that apply to this site.

Critical habitat: The land does not identify as including or comprising critical habitat.

Heritage conservation area: The land is situated within the Newcastle City Centre Heritage Conservation Area. Refer to the Newcastle Local Environmental Plan 2012 for provisions relating to development within a heritage conservation area.

Heritage items: There are no heritage items listed in the Newcastle Local Environmental Plan 2012 situated on the land.

3. Complying development

Note Other requirements: *The advice below for all Complying Development Codes, is limited to identifying whether or not the* ***land****, the subject of the certificate, is land on which complying development may be carried out because of Clauses 1.17A(1)(c) to (e), (2), (3) & (4), 1.18 (1)(c3) and 1.19 of State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 (the Codes SEPP).*

To ascertain the extent to which the complying development may or may not be carried out on the land, maps are available on City of Newcastle (CN) web pages.

Housing Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land within a Heritage Conservation Area or a Draft Heritage Conservation Area unless the development is for a detached outbuilding or swimming pool.

Rural Housing Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land within a Heritage Conservation Area or a Draft Heritage Conservation Area unless the development is for a detached outbuilding or swimming pool.

Low Rise Housing Diversity Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land within a Heritage Conservation Area or a Draft Heritage Conservation Area unless the development is for a detached outbuilding or swimming pool.

Greenfield Housing Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land within a Heritage Conservation Area or a Draft Heritage Conservation Area unless the development is for a detached outbuilding or swimming pool.

Inland Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land within a Heritage Conservation Area or a Draft Heritage Conservation Area unless the development is for a detached outbuilding or swimming pool.

Housing Alterations Code

Complying development under the Housing Alterations Code MAY be carried out on this land.

General Development Code

Complying development under the General Development Code MAY be carried out on this land.

Commercial and Industrial Alterations Code

Complying development under the Commercial and Industrial Code MAY be carried out on this land.

Commercial and Industrial (New Buildings and Additions) Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land within a Heritage Conservation Area or a Draft Heritage Conservation Area.

Container Recycling Facilities Code

Complying development under the Container Recycling Facilities Code MAY be carried out on this land.

Subdivision Code

Complying development under the Subdivision Code MAY be carried out on this land.

Demolition Code

Complying development under the Demolition Code MAY be carried out on this land.

Fire Safety Code

Complying development under the Fire Safety Code MAY be carried out on this land.

4B. Annual charges under Local Government Act 1993 for coastal protection services that relate to existing coastal protection works

The land IS NOT subject to an agreement for annual charges under section 496B of the Local Government Act 1993 for coastal protection services (within the meaning of section 553B of that Act).

5. Coal Mine Subsidence Compensation Act 2017

The land IS NOT WITHIN a Mine Subsidence District declared under section 20 of the Coal Mine Subsidence Compensation Act 2017.

NOTE: The above advice is provided to the extent that City of Newcastle (CN) has been notified by Subsidence Advisory NSW.

6. Road widening or realignment

NOTE: The Roads and Maritime Services (RMS) may have proposals that are not referred to in this item. For advice about affectation by RMS proposals, contact the Roads and Maritime Services, Locked Mail Bag 30 Newcastle 2300. Ph: 131 782.

The land IS NOT AFFECTED by any road widening or road realignment under Division 2 of Part 3 of the Roads Act 1993.

The land IS NOT AFFECTED by any road widening or road realignment under an environmental planning instrument.

The land IS NOT AFFECTED by road widening or road realignment under a resolution of the Council.

7. Policies on hazard risk restrictions

Except as stated below, the land is not affected by a policy referred to in Item 7 of Schedule 4 of the Environmental Planning and Assessment Regulation 2000 that restricts the development of the land because of the likelihood of land slip, bushfire, tidal inundation, subsidence, acid sulphate soils or any other risk (other than flooding).

Potential acid sulfate soils: Works carried out on the land must be undertaken in accordance with Clause 6.1 Acid sulfate soils of the Newcastle Local Environmental Plan 2012.

Land Contamination: Council has adopted a policy of restricting development or imposing conditions on properties affected by Land Contamination. Refer to the Newcastle Development Control Plan 2012, which is available to view and download from City of Newcastle's website.

NOTE: The absence of a policy to restrict development of the land because of the likelihood of a particular risk does not imply that the land is free from that risk. City of Newcastle (CN) considers the likelihood of natural and man-made risks when determining development applications under section 4.15 of the Environmental Planning and Assessment Act 1979. Detailed investigation carried out in conjunction with the preparation or assessment of a development application may result in CN either refusing development consent or imposing conditions of consent on the basis of risks that are not identified above.

7A. Flood related development controls information

7A(1) Mapping information is not available and it is unknown if the land or part of the land is within the flood planning area.
7A(2) Mapping information is not available and it is unknown if the land or part of the land is between the flood planning area and the probable maximum flood.

Our information currently indicates that the property is, or contains, flood prone land as defined in the Floodplain Development Manual: the management of flood liable land, April 2005 published by the NSW Government.

Section 4.01 Flood Management of Newcastle Development Control Plan (DCP) 2012 provides guidelines with respect to all development of flood prone land. This includes development for the purpose of dwelling houses, dual occupancies, multi dwelling housing or residential flat buildings. The DCP may be viewed on our website, inspected or purchased at our Customer Contact Centre.

NOTE: More detailed flood information specific to the property is available on separate flooding certificate application through our Customer Contact Centre on (02) 4974 2000

8. Land reserved for acquisition

The land is not identified for acquisition by a public authority (as referred to in section 3.15 of the Act) by any environmental planning instrument or proposed environmental planning instrument applying to the land.

9. Contributions plans

The following contribution plan/s apply to the land.

Section 7.12 Newcastle Local Infrastructure Contributions Plan 2019: Effective 9 September 2019.

The Plan specifies section 7.12 contributions that may be imposed as a condition of development consent.

NOTE: Contributions plans are available on our website or may be inspected or purchased at our Customer Contact Centre.

9A. Biodiversity certified land

The land IS NOT biodiversity certified land under Part 8 of the Biodiversity Conservation Act 2016.

10. Biodiversity stewardship sites

The land IS NOT land (of which CN is aware) under a biodiversity stewardship agreement under Part 5 of the Biodiversity Conservation Act 2016.

10A. Native vegetation clearing set asides

The land IS NOT land (of which CN is aware) that contains a set aside area under section 60ZC of the Local Land Services Act 2013.

11. Bush fire prone land

The land IS NOT bush fire prone land for the purposes of the Environmental Planning and Assessment Act 1979.

12. Property vegetation plans

Not applicable. The Native Vegetation Act 2003 does not apply to the Newcastle local government area.

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CN HAS NOT been notified that an order has been made under the Trees (Disputes between Neighbours) Act 2006 to carry out work in relation to a tree on the land.

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Authorised by

JEREMY BATH
CHIEF EXECUTIVE OFFICER

Planning Certificate

Section 10.7, Environmental Planning and Assessment Act 1979

To: Douglas Partners Pty Ltd
15 Callistemon Close
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Fees: $133.00
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Your Reference: Project 102077.02

Date of Issue: 17/09/2021

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State Environmental Planning Policy No. 70 - Affordable Housing (Revised Schemes)

State Environmental Planning Policy (Housing For Seniors or People with a Disability) 2004

State Environmental Planning Policy (Building Sustainability Index:BASIX) 2004

State Environmental Planning Policy (State Significant Precincts) 2005

State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007

State Environmental Planning Policy (Miscellaneous Consent Provisions) 2007

State Environmental Planning Policy (Infrastructure) 2007

State Environmental Planning Policy (Exempt and Complying Development Codes) 2008

State Environmental Planning Policy (Urban Renewal) 2010

State Environmental Planning Policy (Affordable Rental Housing) 2009

State Environmental Planning Policy (State and Regional Development) 2011

State Environmental Planning Policy (Educational Establishments and Child Care Facilities) 2017

State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017

State Environmental Planning Policy (Concurrences) 2018

State Environmental Planning Policy (Coastal Management) 2018

State Environmental Planning Policy (Primary Production and Rural Development) 2019

Newcastle Local Environmental Plan 2012

Newcastle Development Control Plan 2012

2. Zoning and land use under relevant LEPs

Newcastle Local Environmental Plan 2012

Zoning: The Newcastle Local Environmental Plan 2012 identifies the land as being within the following zone(s):

Zone B3 Commercial Core

Note: Refer to www. newcastle.nsw.gov.au or www. legislation.nsw.gov.au website for LEP instrument and zoning maps.

The following is an extract from the zoning provisions contained in Newcastle Local Environmental Plan 2012:

Zone B3 Commercial Core

- **Objectives of zone**
  - To provide a wide range of retail, business, office, entertainment, community and other suitable land uses that serve the needs of the local and wider community.
  - To encourage appropriate employment opportunities in accessible locations.
  - To maximise public transport patronage and encourage walking and cycling.
  - To provide for commercial floor space within a mixed use development.
  - To strengthen the role of the Newcastle City Centre as the regional business, retail and cultural centre of the Hunter region.
  - To provide for the retention and creation of view corridors.
- **Permitted without consent**

  Environmental protection works; Home occupations
- **Permitted with consent**

  Car parks; Centre-based child care facilities; Commercial premises; Community facilities; Educational establishments; Entertainment facilities; Environmental facilities; Flood mitigation works; Function centres; Hotel or motel accommodation; Information and education facilities; Medical centres; Mortuaries; Oyster aquaculture; Passenger transport facilities; Places of public worship; Recreation areas; Recreation facilities (indoor); Registered clubs; Respite day care centres; Restricted premises; Roads; Sex services premises; Shop top housing; Signage; Tank-based aquaculture; Tourist and visitor accommodation; Transport depots
- **Prohibited**

  Pond-based aquaculture; Any development not specified in, permitted without consent or permitted with consent

Minimum land dimensions for erection of a dwelling-house: There are no minimum land dimensions for the erection of a dwelling-house that apply to this site.

Critical habitat: The land does not identify as including or comprising critical habitat.

Heritage conservation area: The land is situated within the Newcastle City Centre Heritage Conservation Area. Refer to the Newcastle Local Environmental Plan 2012 for provisions relating to development within a heritage conservation area.

Heritage items: There are no heritage items listed in the Newcastle Local Environmental Plan 2012 situated on the land.

3. Complying development

Note Other requirements: *The advice below for all Complying Development Codes, is limited to identifying whether or not the* ***land****, the subject of the certificate, is land on which complying development may be carried out because of Clauses 1.17A(1)(c) to (e), (2), (3) & (4), 1.18 (1)(c3) and 1.19 of State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 (the Codes SEPP).*

To ascertain the extent to which the complying development may or may not be carried out on the land, maps are available on City of Newcastle (CN) web pages.

Housing Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land within a Heritage Conservation Area or a Draft Heritage Conservation Area unless the development is for a detached outbuilding or swimming pool.

Rural Housing Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land within a Heritage Conservation Area or a Draft Heritage Conservation Area unless the development is for a detached outbuilding or swimming pool.

Low Rise Housing Diversity Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land within a Heritage Conservation Area or a Draft Heritage Conservation Area unless the development is for a detached outbuilding or swimming pool.

Greenfield Housing Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land within a Heritage Conservation Area or a Draft Heritage Conservation Area unless the development is for a detached outbuilding or swimming pool.

Inland Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land within a Heritage Conservation Area or a Draft Heritage Conservation Area unless the development is for a detached outbuilding or swimming pool.

Housing Alterations Code

Complying development under the Housing Alterations Code MAY be carried out on this land.

General Development Code

Complying development under the General Development Code MAY be carried out on this land.

Commercial and Industrial Alterations Code

Complying development under the Commercial and Industrial Code MAY be carried out on this land.

Commercial and Industrial (New Buildings and Additions) Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land within a Heritage Conservation Area or a Draft Heritage Conservation Area.

Container Recycling Facilities Code

Complying development under the Container Recycling Facilities Code MAY be carried out on this land.

Subdivision Code

Complying development under the Subdivision Code MAY be carried out on this land.

Demolition Code

Complying development under the Demolition Code MAY be carried out on this land.

Fire Safety Code

Complying development under the Fire Safety Code MAY be carried out on this land.

4B. Annual charges under Local Government Act 1993 for coastal protection services that relate to existing coastal protection works

The land IS NOT subject to an agreement for annual charges under section 496B of the Local Government Act 1993 for coastal protection services (within the meaning of section 553B of that Act).

5. Coal Mine Subsidence Compensation Act 2017

The land IS NOT WITHIN a Mine Subsidence District declared under section 20 of the Coal Mine Subsidence Compensation Act 2017.

NOTE: The above advice is provided to the extent that City of Newcastle (CN) has been notified by Subsidence Advisory NSW.

6. Road widening or realignment

NOTE: The Roads and Maritime Services (RMS) may have proposals that are not referred to in this item. For advice about affectation by RMS proposals, contact the Roads and Maritime Services, Locked Mail Bag 30 Newcastle 2300. Ph: 131 782.

The land IS NOT AFFECTED by any road widening or road realignment under Division 2 of Part 3 of the Roads Act 1993.

The land IS NOT AFFECTED by any road widening or road realignment under an environmental planning instrument.

The land IS NOT AFFECTED by road widening or road realignment under a resolution of the Council.

7. Policies on hazard risk restrictions

Except as stated below, the land is not affected by a policy referred to in Item 7 of Schedule 4 of the Environmental Planning and Assessment Regulation 2000 that restricts the development of the land because of the likelihood of land slip, bushfire, tidal inundation, subsidence, acid sulphate soils or any other risk (other than flooding).

Potential acid sulfate soils: Works carried out on the land must be undertaken in accordance with Clause 6.1 Acid sulfate soils of the Newcastle Local Environmental Plan 2012.

Land Contamination: We have land contamination information/records in relation to this property. Council has adopted a policy of restricting development or imposing conditions on properties affected by land contamination. Refer to Section 5.02 Land Contamination of Newcastle Development Control Plan 2012, which is available to view and download from City of Newcastle's website.

NOTE: The absence of a policy to restrict development of the land because of the likelihood of a particular risk does not imply that the land is free from that risk. City of Newcastle (CN) considers the likelihood of natural and man-made risks when determining development applications under section 4.15 of the Environmental Planning and Assessment Act 1979. Detailed investigation carried out in conjunction with the preparation or assessment of a development application may result in CN either refusing development consent or imposing conditions of consent on the basis of risks that are not identified above.

7A. Flood related development controls information

7A(1) Mapping information is not available and it is unknown if the land or part of the land is within the flood planning area.
7A(2) Mapping information is not available and it is unknown if the land or part of the land is between the flood planning area and the probable maximum flood.

Our information currently indicates that the property is, or contains, flood prone land as defined in the Floodplain Development Manual: the management of flood liable land, April 2005 published by the NSW Government.

Section 4.01 Flood Management of Newcastle Development Control Plan (DCP) 2012 provides guidelines with respect to all development of flood prone land. This includes development for the purpose of dwelling houses, dual occupancies, multi dwelling housing or residential flat buildings. The DCP may be viewed on our website, inspected or purchased at our Customer Contact Centre.

NOTE: More detailed flood information specific to the property is available on separate flooding certificate application through our Customer Contact Centre on (02) 4974 2000

8. Land reserved for acquisition

The land is not identified for acquisition by a public authority (as referred to in section 3.15 of the Act) by any environmental planning instrument or proposed environmental planning instrument applying to the land.

9. Contributions plans

The following contribution plan/s apply to the land.

Section 7.12 Newcastle Local Infrastructure Contributions Plan 2019: Effective 9 September 2019.

The Plan specifies section 7.12 contributions that may be imposed as a condition of development consent.

NOTE: Contributions plans are available on our website or may be inspected or purchased at our Customer Contact Centre.

9A. Biodiversity certified land

The land IS NOT biodiversity certified land under Part 8 of the Biodiversity Conservation Act 2016.

10. Biodiversity stewardship sites

The land IS NOT land (of which CN is aware) under a biodiversity stewardship agreement under Part 5 of the Biodiversity Conservation Act 2016.

10A. Native vegetation clearing set asides

The land IS NOT land (of which CN is aware) that contains a set aside area under section 60ZC of the Local Land Services Act 2013.

11. Bush fire prone land

The land IS NOT bush fire prone land for the purposes of the Environmental Planning and Assessment Act 1979.

12. Property vegetation plans

Not applicable. The Native Vegetation Act 2003 does not apply to the Newcastle local government area.

13. Orders under Trees (Disputes Between Neighbours) Act 2006

CN HAS NOT been notified that an order has been made under the Trees (Disputes between Neighbours) Act 2006 to carry out work in relation to a tree on the land.

14. Directions under Part 3A

The land IS NOT AFFECTED by a direction by the Minister in force under section 75P (2) (c1) of the Act.

15. Site compatibility certificates and conditions for seniors housing

(a) The land IS NOT AFFECTED by a current site compatibility certificate (of which CN is aware) issued under the State Environmental Planning Policy (Housing for Seniors and People with a Disability) 2004.

(b) The land IS NOT AFFECTED by any terms of kind referred to in clause 18(2) of the State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004, that have been imposed as a condition of consent to a development application granted after 11 October, 2007 in respect of the land.

16. Site compatibility certificates for infrastructure, schools or TAFE establishments

The land IS NOT AFFECTED by a valid site compatibility certificate (of which CN is aware) issued under the State Environmental Planning Policy (Infrastructure) 2007.

17. Site compatibility certificates and conditions for affordable rental housing

The land IS NOT AFFECTED by a valid site compatibility certificate (of which CN is aware) issued under the State Environmental Planning Policy (Affordable Rental Housing) 2009.

18. Paper subdivision information

The land IS NOT AFFECTED by any development plan that applies to the land or that is proposed to be subject to a consent ballot.

19. Site verification certificates

The land IS NOT AFFECTED by a current site verification certificate (of which CN is aware) issued under the State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007.

20. Loose-fill asbestos insulation

CN HAS NOT been notified that the land includes any residential premises (within the meaning of Division 1A of Part 8 of the Home Building Act 1989) that are listed on the register of loose-fill asbestos insulation, that is required to be maintained under that Division.

21. Affected building notices and building product rectification orders

The land IS NOT AFFECTED by any affected building notice of which CN is aware that is in force in respect of the land.

The land IS NOT AFFECTED by any building product rectification order that has not been fully complied with, of which CN is aware that is in force in respect of the land.

The land IS NOT AFFECTED by an outstanding notice of intention to make a building product rectification order of which CN is aware.

An affected building notice has the same meaning as in Part 4 of the Building Products (Safety) Act 2017. Building product rectification order has the same meaning as in the Building Products (Safety) Act 2017.

Note: *There are no matters prescribed by section 59(2) of the Contaminated Land Management Act 1997 to be disclosed, however if other contamination information is held by the Council this may be provided under a section 10.7(5) certificate.*

Part 2:

Advice provided under section 10.7(5)

ATTENTION: Section 10.7(6) of the Act states that a Council shall not incur any liability in respect of advice provided in good faith pursuant to sub-section 10.7(5).

22. Outstanding Notices and Orders issued by City of Newcastle (CN).

This Certificate does not include any advice regarding outstanding notices or orders issued under the Environmental Planning and Assessment Act 1979, the Local Government Act 1993 or any other relevant legislation. To obtain advice regarding these matters, it is recommended you lodge an application for a Certificate as to Outstanding Notices and Orders (accompanied by the appropriate fee). For further information, please contact the Customer Contact Centre on (02) 4974 2000.

23. Draft development control plans.

A draft development control plan DOES NOT APPLY to the land. The draft plans are exhibited pursuant to Part 3 of the Environmental Planning and Assessment Regulation 2000.

24. Heritage Act 1977.

The land IS NOT AFFECTED by a listing on the State Heritage Register or an Interim Heritage Order that is in force under the Heritage Act 1977.

NOTE: The above advice is provided to the extent that CN has been notified by the Heritage Council of NSW. For up-to-date details, contact the Office of Environment and Heritage, PO Box A290, South Sydney NSW 1232 Ph: (02) 9995 5000.

25. Listing by National Trust of Australia.

The land IS NOT AFFECTED by a listing of the National Trust of Australia (NSW).

NOTE: The above advice is provided to the extent that CN has been notified by the National Trust of Australia (NSW). For up-to-date details, contact the National Trust Ph 02 9258 0123.

26. Australian Heritage Database.

The land IS NOT AFFECTED by a listing on the Australian Heritage Database.

NOTE: The above advice is provided to the extent that CN has been notified by the Department of the Environment. For up-to-date details, contact the Department of the Environment, Heritage, King Edward Terrace, Parkes ACT 2600. Ph (02) 6274 1111.

27. Environment Protection & Biodiversity Conservation Act 1999 (Cth)

Under the (Commonwealth) Environment Protection and Biodiversity Conservation Act 1999, actions which have, may have or are likely to have, a significant impact on a matter of national environmental significance may be taken only with the approval of the Commonwealth Minister for the Environment.

Approval is also required for actions that have a significant effect on the environment of Commonwealth land. These actions may be on Commonwealth land or other land.

This approval is in addition to any approvals under the (NSW) Environmental Planning and Assessment Act 1979 or other NSW legislation.

Matters of national environmental significance are:

- declared World Heritage areas
- declared Ramsar wetlands
- listed threatened species and ecological communities
- listed migratory species
- nuclear actions
- the environment of Commonwealth marine areas.

Locations within the City of Newcastle that are a declared Ramsar wetland include Kooragang Nature Reserve and Shortland Wetlands. Listed threatened species and listed migratory species are known to occur within the City of Newcastle.

28. Other matters

The land is affected by the following:

Newcastle earthquake

Earthquakes occurred in the vicinity of Newcastle on 28th December 1989 and 6 August 1994. Buildings on the land may have suffered damage as a consequence of the earthquakes. Prospective purchasers are advised to make their own enquiries as to whether the property is affected by any damage.

Further consent requirements under the Newcastle Local Environmental Plan 2012.

The following provisions of the Newcastle Local Environmental Plan 2012 affect the carrying out of development on the land. These provisions are in addition to those required to be disclosed at Item 2 of this Certificate.

Refer to clause 3.1 Exempt Development of the Newcastle Local Environmental Plan 2012

Refer to clause 3.2 Complying Development of the Newcastle Local Environmental Plan 2012

Local Strategic Planning Statement

The Local Strategic Planning Statement (LSPS) was adopted by council on 26 May 2020 and replaces the Local Planning Strategy. The LSPS is taken into account when CN assesses development applications and amendments to the Newcastle Local Environmental Plan 2012.

Note: Refer to our website to view the document. www.newcastle.nsw.gov.au

Hunter Regional Plan 2036

The Hunter Regional Plan has been prepared by the Department of Planning and Environment. The contents of the strategy will be taken into account when CN assesses development applications and amendments to the Newcastle Local Environmental Plan 2012.

Note: Refer to the Department of Planning and Environment's website to view the document. www.planning.nsw.gov.au

Newcastle City-Wide Floodplain Risk Management Study and Plan (2012)

The Newcastle City-wide Floodplain Risk Management Study and Plan addresses flood management for the City of Newcastle. The Study and Plan will be taken into account when CN assesses development applications and amendments to the Newcastle Local Environmental Plan 2012.

Note: Refer to our *website to view the document. www.newcastle.nsw.gov.au*

Greater Newcastle Metropolitan Plan 2036

The Greater Newcastle Metropolitan Plan 2036 has been prepared by the Department of Planning and Environment. The Plan will be taken into account when CN assesses development applications and amendments to the Newcastle Local Environmental Plan 2012.

Parking permit policy

This property is within the Permit Exclusion Area of the City Centre Parking Strategy adopted by Council on 25 June 2002 and updated on 16 May 2005. Residents within the Permit Exclusion Area are not eligible for resident parking permit stickers. For further information please contact Parking Services Coordinator Michael Heather on 4974 5008.

Contaminated land information

Council records indicate the following potentially contaminating landuse(s) may have been carried out on the land:

1. engine works
2. fuel/oil storage

Persons relying on the certificate are advised to make their own investigations as to whether the land is affected by elevated concentrations of soil or groundwater contaminants in relation to proposed purchase or use of land.

Issued without alterations or additions, 17/09/21
Authorised by

JEREMY BATH
CHIEF EXECUTIVE OFFICER

Part 1:

Advice provided under section 10.7(2)

ATTENTION: The explanatory notes appearing in italic print within Part 1 are provided to assist understanding, but do not form part of the advice provided under section 10.7(2). These notes shall be taken as being advice provided under section 10.7(5).

1. Names of relevant planning instruments and DCPs

The following environmental planning instruments, proposed environmental planning instruments and development control plans apply to the land, either in full or in part.

State Environmental Planning Policy No. 1 - Development Standards

State Environmental Planning Policy No. 21 - Caravan Parks

State Environmental Planning Policy No. 33 - Hazardous and Offensive Development

State Environmental Planning Policy No. 36 - Manufactured Home Estates

State Environmental Planning Policy (Koala Habitat Protection) Amendment (Maps) 2020

State Environmental Planning Policy No. 50 - Canal Estate Development

State Environmental Planning Policy No. 55 - Remediation of Land

State Environmental Planning Policy No. 64 - Advertising and Signage

State Environmental Planning Policy No. 65 - Design Quality of Residential Flat Development

State Environmental Planning Policy No. 70 - Affordable Housing (Revised Schemes)

State Environmental Planning Policy (Housing For Seniors or People with a Disability) 2004

State Environmental Planning Policy (Building Sustainability Index:BASIX) 2004

State Environmental Planning Policy (State Significant Precincts) 2005

State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007

State Environmental Planning Policy (Miscellaneous Consent Provisions) 2007

State Environmental Planning Policy (Infrastructure) 2007

State Environmental Planning Policy (Exempt and Complying Development Codes) 2008

State Environmental Planning Policy (Urban Renewal) 2010

State Environmental Planning Policy (Affordable Rental Housing) 2009

State Environmental Planning Policy (State and Regional Development) 2011

State Environmental Planning Policy (Educational Establishments and Child Care Facilities) 2017

State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017

State Environmental Planning Policy (Concurrences) 2018

State Environmental Planning Policy (Coastal Management) 2018

State Environmental Planning Policy (Primary Production and Rural Development) 2019

Newcastle Local Environmental Plan 2012

Newcastle Development Control Plan 2012

2. Zoning and land use under relevant LEPs

Newcastle Local Environmental Plan 2012

Zoning: The Newcastle Local Environmental Plan 2012 identifies the land as being within the following zone(s):

Zone B3 Commercial Core

Note: Refer to www. newcastle.nsw.gov.au or www. legislation.nsw.gov.au website for LEP instrument and zoning maps.

The following is an extract from the zoning provisions contained in Newcastle Local Environmental Plan 2012:

Zone B3 Commercial Core

- **Objectives of zone**
    - To provide a wide range of retail, business, office, entertainment, community and other suitable land uses that serve the needs of the local and wider community.
    - To encourage appropriate employment opportunities in accessible locations.
    - To maximise public transport patronage and encourage walking and cycling.
    - To provide for commercial floor space within a mixed use development.
    - To strengthen the role of the Newcastle City Centre as the regional business, retail and cultural centre of the Hunter region.
    - To provide for the retention and creation of view corridors.
- **Permitted without consent**

  Environmental protection works; Home occupations
- **Permitted with consent**

  Car parks; Centre-based child care facilities; Commercial premises; Community facilities; Educational establishments; Entertainment facilities; Environmental facilities; Flood mitigation works; Function centres; Hotel or motel accommodation; Information and education facilities; Medical centres; Mortuaries; Oyster aquaculture; Passenger transport facilities; Places of public worship; Recreation areas; Recreation facilities (indoor); Registered clubs; Respite day care centres; Restricted premises; Roads; Sex services premises; Shop top housing; Signage; Tank-based aquaculture; Tourist and visitor accommodation; Transport depots
- **Prohibited**

  Pond-based aquaculture; Any development not specified in, permitted without consent or permitted with consent

Minimum land dimensions for erection of a dwelling-house: There are no minimum land dimensions for the erection of a dwelling-house that apply to this site.

Critical habitat: The land does not identify as including or comprising critical habitat.

Heritage conservation area: The land is situated within the Newcastle City Centre Heritage Conservation Area. Refer to the Newcastle Local Environmental Plan 2012 for provisions relating to development within a heritage conservation area.

Heritage items: There are no heritage items listed in the Newcastle Local Environmental Plan 2012 situated on the land.

3. Complying development

Note Other requirements: *The advice below for all Complying Development Codes, is limited to identifying whether or not the* ***land****, the subject of the certificate, is land on which complying development may be carried out because of Clauses 1.17A(1)(c) to (e), (2), (3) & (4), 1.18 (1)(c3) and 1.19 of State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 (the Codes SEPP).*

To ascertain the extent to which the complying development may or may not be carried out on the land, maps are available on City of Newcastle (CN) web pages.

Housing Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land within a Heritage Conservation Area or a Draft Heritage Conservation Area unless the development is for a detached outbuilding or swimming pool.

Rural Housing Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land within a Heritage Conservation Area or a Draft Heritage Conservation Area unless the development is for a detached outbuilding or swimming pool.

Low Rise Housing Diversity Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land within a Heritage Conservation Area or a Draft Heritage Conservation Area unless the development is for a detached outbuilding or swimming pool.

Greenfield Housing Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land within a Heritage Conservation Area or a Draft Heritage Conservation Area unless the development is for a detached outbuilding or swimming pool.

Inland Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land within a Heritage Conservation Area or a Draft Heritage Conservation Area unless the development is for a detached outbuilding or swimming pool.

Housing Alterations Code

Complying development under the Housing Alterations Code MAY be carried out on this land.

General Development Code

Complying development under the General Development Code MAY be carried out on this land.

Commercial and Industrial Alterations Code

Complying development under the Commercial and Industrial Code MAY be carried out on this land.

Commercial and Industrial (New Buildings and Additions) Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land within a Heritage Conservation Area or a Draft Heritage Conservation Area.

Container Recycling Facilities Code

Complying development under the Container Recycling Facilities Code MAY be carried out on this land.

Subdivision Code

Complying development under the Subdivision Code MAY be carried out on this land.

Demolition Code

Complying development under the Demolition Code MAY be carried out on this land.

Fire Safety Code

Complying development under the Fire Safety Code MAY be carried out on this land.

4B. Annual charges under Local Government Act 1993 for coastal protection services that relate to existing coastal protection works

The land IS NOT subject to an agreement for annual charges under section 496B of the Local Government Act 1993 for coastal protection services (within the meaning of section 553B of that Act).

5. Coal Mine Subsidence Compensation Act 2017

The land IS NOT WITHIN a Mine Subsidence District declared under section 20 of the Coal Mine Subsidence Compensation Act 2017.

NOTE: The above advice is provided to the extent that City of Newcastle (CN) has been notified by Subsidence Advisory NSW.

6. Road widening or realignment

NOTE: The Roads and Maritime Services (RMS) may have proposals that are not referred to in this item. For advice about affectation by RMS proposals, contact the Roads and Maritime Services, Locked Mail Bag 30 Newcastle 2300. Ph: 131 782.

The land IS NOT AFFECTED by any road widening or road realignment under Division 2 of Part 3 of the Roads Act 1993.

The land IS NOT AFFECTED by any road widening or road realignment under an environmental planning instrument.

The land IS NOT AFFECTED by road widening or road realignment under a resolution of the Council.

7. Policies on hazard risk restrictions

Except as stated below, the land is not affected by a policy referred to in Item 7 of Schedule 4 of the Environmental Planning and Assessment Regulation 2000 that restricts the development of the land because of the likelihood of land slip, bushfire, tidal inundation, subsidence, acid sulphate soils or any other risk (other than flooding).

Potential acid sulfate soils: Works carried out on the land must be undertaken in accordance with Clause 6.1 Acid sulfate soils of the Newcastle Local Environmental Plan 2012.

Land Contamination: Council has adopted a policy of restricting development or imposing conditions on properties affected by Land Contamination. Refer to the Newcastle Development Control Plan 2012, which is available to view and download from City of Newcastle's website.

NOTE: The absence of a policy to restrict development of the land because of the likelihood of a particular risk does not imply that the land is free from that risk. City of Newcastle (CN) considers the likelihood of natural and man-made risks when determining development applications under section 4.15 of the Environmental Planning and Assessment Act 1979. Detailed investigation carried out in conjunction with the preparation or assessment of a development application may result in CN either refusing development consent or imposing conditions of consent on the basis of risks that are not identified above.

7A. Flood related development controls information

7A(1) Mapping information is not available and it is unknown if the land or part of the land is within the flood planning area.
7A(2) Mapping information is not available and it is unknown if the land or part of the land is between the flood planning area and the probable maximum flood.

Our information currently indicates that the property is, or contains, flood prone land as defined in the Floodplain Development Manual: the management of flood liable land, April 2005 published by the NSW Government.

Section 4.01 Flood Management of Newcastle Development Control Plan (DCP) 2012 provides guidelines with respect to all development of flood prone land. This includes development for the purpose of dwelling houses, dual occupancies, multi dwelling housing or residential flat buildings. The DCP may be viewed on our website, inspected or purchased at our Customer Contact Centre.

NOTE: More detailed flood information specific to the property is available on separate flooding certificate application through our Customer Contact Centre on (02) 4974 2000

8. Land reserved for acquisition

The land is not identified for acquisition by a public authority (as referred to in section 3.15 of the Act) by any environmental planning instrument or proposed environmental planning instrument applying to the land.

9. Contributions plans

The following contribution plan/s apply to the land.

Section 7.12 Newcastle Local Infrastructure Contributions Plan 2019: Effective 9 September 2019.

The Plan specifies section 7.12 contributions that may be imposed as a condition of development consent.

NOTE: Contributions plans are available on our website or may be inspected or purchased at our Customer Contact Centre.

9A. Biodiversity certified land

The land IS NOT biodiversity certified land under Part 8 of the Biodiversity Conservation Act 2016.

10. Biodiversity stewardship sites

The land IS NOT land (of which CN is aware) under a biodiversity stewardship agreement under Part 5 of the Biodiversity Conservation Act 2016.

10A. Native vegetation clearing set asides

The land IS NOT land (of which CN is aware) that contains a set aside area under section 60ZC of the Local Land Services Act 2013.

11. Bush fire prone land

The land IS NOT bush fire prone land for the purposes of the Environmental Planning and Assessment Act 1979.

12. Property vegetation plans

Not applicable. The Native Vegetation Act 2003 does not apply to the Newcastle local government area.

13. Orders under Trees (Disputes Between Neighbours) Act 2006

CN HAS NOT been notified that an order has been made under the Trees (Disputes between Neighbours) Act 2006 to carry out work in relation to a tree on the land.

14. Directions under Part 3A

The land IS NOT AFFECTED by a direction by the Minister in force under section 75P (2) (c1) of the Act.

15. Site compatibility certificates and conditions for seniors housing

(a) The land IS NOT AFFECTED by a current site compatibility certificate (of which CN is aware) issued under the State Environmental Planning Policy (Housing for Seniors and People with a Disability) 2004.

(b) The land IS NOT AFFECTED by any terms of kind referred to in clause 18(2) of the State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004, that have been imposed as a condition of consent to a development application granted after 11 October, 2007 in respect of the land.

16. Site compatibility certificates for infrastructure, schools or TAFE establishments

The land IS NOT AFFECTED by a valid site compatibility certificate (of which CN is aware) issued under the State Environmental Planning Policy (Infrastructure) 2007.

17. Site compatibility certificates and conditions for affordable rental housing

The land IS NOT AFFECTED by a valid site compatibility certificate (of which CN is aware) issued under the State Environmental Planning Policy (Affordable Rental Housing) 2009.

18. Paper subdivision information

The land IS NOT AFFECTED by any development plan that applies to the land or that is proposed to be subject to a consent ballot.

19. Site verification certificates

The land IS NOT AFFECTED by a current site verification certificate (of which CN is aware) issued under the State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007.

20. Loose-fill asbestos insulation

CN HAS NOT been notified that the land includes any residential premises (within the meaning of Division 1A of Part 8 of the Home Building Act 1989) that are listed on the register of loose-fill asbestos insulation, that is required to be maintained under that Division.

21. Affected building notices and building product rectification orders

The land IS NOT AFFECTED by any affected building notice of which CN is aware that is in force in respect of the land.

The land IS NOT AFFECTED by any building product rectification order that has not been fully complied with, of which CN is aware that is in force in respect of the land.

The land IS NOT AFFECTED by an outstanding notice of intention to make a building product rectification order of which CN is aware.

An affected building notice has the same meaning as in Part 4 of the Building Products (Safety) Act 2017. Building product rectification order has the same meaning as in the Building Products (Safety) Act 2017.

Note: *There are no matters prescribed by section 59(2) of the Contaminated Land Management Act 1997 to be disclosed, however if other contamination information is held by the Council this may be provided under a section 10.7(5) certificate.*

Part 2:

Advice provided under section 10.7(5)

ATTENTION: Section 10.7(6) of the Act states that a Council shall not incur any liability in respect of advice provided in good faith pursuant to sub-section 10.7(5).

22. Outstanding Notices and Orders issued by City of Newcastle (CN).

This Certificate does not include any advice regarding outstanding notices or orders issued under the Environmental Planning and Assessment Act 1979, the Local Government Act 1993 or any other relevant legislation. To obtain advice regarding these matters, it is recommended you lodge an application for a Certificate as to Outstanding Notices and Orders (accompanied by the appropriate fee). For further information, please contact the Customer Contact Centre on (02) 4974 2000.

23. Draft development control plans.

A draft development control plan DOES NOT APPLY to the land. The draft plans are exhibited pursuant to Part 3 of the Environmental Planning and Assessment Regulation 2000.

24. Heritage Act 1977.

The land IS NOT AFFECTED by a listing on the State Heritage Register or an Interim Heritage Order that is in force under the Heritage Act 1977.

NOTE: The above advice is provided to the extent that CN has been notified by the Heritage Council of NSW. For up-to-date details, contact the Office of Environment and Heritage, PO Box A290, South Sydney NSW 1232 Ph: (02) 9995 5000.

25. Listing by National Trust of Australia.

The land IS NOT AFFECTED by a listing of the National Trust of Australia (NSW).

NOTE: The above advice is provided to the extent that CN has been notified by the National Trust of Australia (NSW). For up-to-date details, contact the National Trust Ph 02 9258 0123.

26. Australian Heritage Database.

The land IS NOT AFFECTED by a listing on the Australian Heritage Database.

NOTE: The above advice is provided to the extent that CN has been notified by the Department of the Environment. For up-to-date details, contact the Department of the Environment, Heritage, King Edward Terrace, Parkes ACT 2600. Ph (02) 6274 1111.

27. Environment Protection & Biodiversity Conservation Act 1999 (Cth)

Under the (Commonwealth) Environment Protection and Biodiversity Conservation Act 1999, actions which have, may have or are likely to have, a significant impact on a matter of national environmental significance may be taken only with the approval of the Commonwealth Minister for the Environment.

Approval is also required for actions that have a significant effect on the environment of Commonwealth land. These actions may be on Commonwealth land or other land.

This approval is in addition to any approvals under the (NSW) Environmental Planning and Assessment Act 1979 or other NSW legislation.

Matters of national environmental significance are:

- declared World Heritage areas
- declared Ramsar wetlands
- listed threatened species and ecological communities
- listed migratory species
- nuclear actions
- the environment of Commonwealth marine areas.

Locations within the City of Newcastle that are a declared Ramsar wetland include Kooragang Nature Reserve and Shortland Wetlands. Listed threatened species and listed migratory species are known to occur within the City of Newcastle.

28. Other matters

The land is affected by the following:

Newcastle earthquake

Earthquakes occurred in the vicinity of Newcastle on 28th December 1989 and 6 August 1994. Buildings on the land may have suffered damage as a consequence of the earthquakes. Prospective purchasers are advised to make their own enquiries as to whether the property is affected by any damage.

Further consent requirements under the Newcastle Local Environmental Plan 2012.

The following provisions of the Newcastle Local Environmental Plan 2012 affect the carrying out of development on the land. These provisions are in addition to those required to be disclosed at Item 2 of this Certificate.

Refer to clause 3.1 Exempt Development of the Newcastle Local Environmental Plan 2012

Refer to clause 3.2 Complying Development of the Newcastle Local Environmental Plan 2012

Local Strategic Planning Statement

The Local Strategic Planning Statement (LSPS) was adopted by council on 26 May 2020 and replaces the Local Planning Strategy. The LSPS is taken into account when CN assesses development applications and amendments to the Newcastle Local Environmental Plan 2012.

Note: Refer to our website to view the document. www.newcastle.nsw.gov.au

Hunter Regional Plan 2036

The Hunter Regional Plan has been prepared by the Department of Planning and Environment. The contents of the strategy will be taken into account when CN assesses development applications and amendments to the Newcastle Local Environmental Plan 2012.

Note: Refer to the Department of Planning and Environment's website to view the document. www.planning.nsw.gov.au

Newcastle City-Wide Floodplain Risk Management Study and Plan (2012)

The Newcastle City-wide Floodplain Risk Management Study and Plan addresses flood management for the City of Newcastle. The Study and Plan will be taken into account when CN assesses development applications and amendments to the Newcastle Local Environmental Plan 2012.

Note: Refer to our *website to view the document. www.newcastle.nsw.gov.au*

Greater Newcastle Metropolitan Plan 2036

The Greater Newcastle Metropolitan Plan 2036 has been prepared by the Department of Planning and Environment. The Plan will be taken into account when CN assesses development applications and amendments to the Newcastle Local Environmental Plan 2012.

Parking permit policy

This property is within the Permit Exclusion Area of the City Centre Parking Strategy adopted by Council on 25 June 2002 and updated on 16 May 2005. Residents within the Permit Exclusion Area are not eligible for resident parking permit stickers. For further information please contact Parking Services Coordinator Michael Heather on 4974 5008.

Issued without alterations or additions, 17/09/21
Authorised by

JEREMY BATH
CHIEF EXECUTIVE OFFICER

WaterNSW
Work Summary

GW054766

Licence:
Licence Status:
Authorised Purpose(s):
Intended Purpose(s): GENERAL USE

Work Type: Spear
Work Status:
Construct.Method: Jetted
Owner Type: Private

Commenced Date:
Completion Date: 01/11/1980
Final Depth: 6.50 m
Drilled Depth:

Contractor Name: (None)
Driller:
Assistant Driller:

Property:
GWMA:
GW Zone:
Standing Water Level (m):
Salinity Description: 0-500 ppm
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	NORTHUMBERLAND	NEWCA	L12 (268)
Licensed:			

Region: 20 - Hunter
River Basin: 210 - HUNTER RIVER
Area/District:
CMA Map: 9232-2S
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: (Unknown)
Northing: 6356268.000
Easting: 383520.000
Latitude: 32°55'32.3"S
Longitude: 151°45'15.1"E

GS Map: -
MGA Zone: 56
Coordinate Source: GD.,ACC.MAP

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1	1	Casing	P.V.C.	0.00	0.00	30			
1	1	Opening	Screen	6.00	6.50			1	

Remarks

01/11/1983: LOT 12 SECTION B HAMILTON

***** End of GW054766 *****

Warning To Clients: This raw data has been supplied to the NSW Office of Water by drillers, licensees and other sources. The NOW does not verify the accuracy of this data. The data

is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

WaterNSW
Work Summary

GW202915

Licence: **Licence Status:**

Authorised Purpose(s):
Intended Purpose(s): DOMESTIC

Work Type: Spear
Work Status: Supply Obtained
Construct.Method: Auger - Hollow
Owner Type: Private

Commenced Date: **Final Depth:** 9.00 m
Completion Date: 16/12/2012 **Drilled Depth:** 9.00 m

Contractor Name: (None)
Driller: Michael James Lindsay
Assistant Driller:

Property: **Standing Water Level (m):** 4.000
GWMA: **Salinity Description:**
GW Zone: **Yield (L/s):**

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	NORTHUMBERLAND	NEWCA	200//834090
Licensed:			

Region: 20 - Hunter **CMA Map:** 9232-2S
River Basin: 210 - HUNTER RIVER **Grid Zone:** **Scale:**
Area/District:

Elevation: 0.00 m (A.H.D.) **Northing:** 6356231.000 **Latitude:** 32°55'33.5"S
Elevation Source: Unknown **Easting:** 383545.000 **Longitude:** 151°45'16.0"E

GS Map: - **MGA Zone:** 56 **Coordinate Source:** GIS - Geogra

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	9.00	50			Auger - Hollow Flight
1		Annulus	Bentonite	0.00	1.00	50	50		
1		Annulus	Drill Cuttings	1.00	7.50	50	50		
1		Annulus	Crushed Aggregate	7.50	9.00	50	50		Ungraded, PL:Poured/Shovelled
1	1	Casing	Pvc Class 12	0.00	9.00	50	42		Seated, Glued, S: 8.90-9.00m
1	1	Opening	Screen - Round Wire	7.90	8.90	50		0	Aluminium, Glued, A: 74.00mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
4.00	9.00	5.00	Unknown	4.00	1.00			03:00:00	

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments

0.00	0.50	0.50	Gravel	Gravel	
0.50	2.00	1.50	Sand; black	Sand	
2.00	4.00	2.00	Sand; yellow	Sand	
4.00	9.00	5.00	Sand; brown, coarse	Sand	

Remarks

16/12/2012: Form A Remarks:
Nat Carling, 24-Mar-2014; Coordinates based on location map provided with the Form-A.

***** End of GW202915 *****

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WaterNSW
Work Summary

GW201711

Licence: | **Licence Status:**

Authorised Purpose(s):
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status: Equipped
Construct.Method: Auger - Solid
Owner Type: Private

Commenced Date:
Completion Date: 15/06/2011
Final Depth: 6.00 m
Drilled Depth: 6.00 m

Contractor Name: SGA Environmental
Driller: Dahmon Sorongan
Assistant Driller: David Gouge

Property:
GWMA:
GW Zone:
Standing Water Level (m): 1.260
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	NORTHUMBERLAND	NEWCA	30//635397
Licensed:			

Region: 20 - Hunter
River Basin: 210 - HUNTER RIVER
Area/District:
CMA Map: 9232-2S
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6356503.000
Easting: 384023.000
Latitude: 32°55'24.9"S
Longitude: 151°45'34.5"E

GS Map: -
MGA Zone: 56
Coordinate Source: GPS - Global

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	6.00	90			Auger - Solid Flight
1		Annulus	Cement Grout	0.00	0.40	90	50		PL:Poured/Shovelled
1		Annulus	Bentonite	0.40	1.50	90	50		PL:Poured/Shovelled
1		Annulus	Waterworn/Rounded	1.50	6.00	90	50		Graded, PL:Poured/Shovelled
1	1	Casing	Pvc Class 12	0.00	2.00	50	44		Seated on Bottom, Other
1	1	Opening	Slots - Diagonal	2.00	4.00	50		0	Casing - Hand Sawn Slot, PVC Class 12, Other, SL: 40.0mm, A: 5.00mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
1.30	6.00	4.70	Unknown	1.26					5337.00

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.20	0.20	Fill; loose, black/dark grey silty sand,	Fill	

			building rubble fragments		
0.20	0.70	0.50	Sand, silty; loose, light grey	Sand	
0.70	1.10	0.40	Sand, silty; grading to mdoerately dense, brown	Sand	
1.10	1.25	0.15	Sand, silty; as above, grading to dark brown	Sand	
1.25	1.70	0.45	Sand; dense, light brown, marine deposits	Sand	
1.70	2.50	0.80	Sand, silty; dense, grey	Sand	
2.50	2.60	0.10	Sand, silty; dense, grey, with gravel	Sand	
2.60	3.50	0.90	Sand, silty; dense, brown	Sand	
3.50	6.00	2.50	Sand; moderately dense, grey	Sand	

Remarks

15/06/2011: Form A Remarks:
Nat Carling, 3-May-2012; GPS provided by driller/consultant.

***** End of GW201711 *****

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WaterNSW
Work Summary

GW201710

Licence: | **Licence Status:**

Authorised Purpose(s):
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status: Equipped
Construct.Method: Auger - Solid
Owner Type: Private

Commenced Date:
Completion Date: 15/06/2011
Final Depth: 3.50 m
Drilled Depth: 3.50 m

Contractor Name: SGA Environmental
Driller: Dahmon Sorongan
Assistant Driller: David Gouge

Property:
GWMA:
GW Zone:
Standing Water Level (m):
Salinity Description:
Yield (L/s): 1.190

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	NORTHUMBERLAND	NEWCA	30//635397
Licensed:			

Region: 20 - Hunter
River Basin: 210 - HUNTER RIVER
Area/District:
CMA Map: 9232-2S
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6356447.000
Easting: 384044.000
Latitude: 32°55'26.7"S
Longitude: 151°45'35.3"E

GS Map: -
MGA Zone: 56
Coordinate Source: GPS - Global

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	3.50	90			Auger - Solid Flight
1		Annulus	Cement Grout	0.00	0.40	90	50		PL:Poured/Shovelled
1		Annulus	Bentonite	0.40	1.00	90	50		PL:Poured/Shovelled
1		Annulus	Waterworn/Rounded	1.00	3.00	90	50		Graded, PL:Poured/Shovelled
1	1	Casing	Pvc Class 12	0.00	1.40	50	44		Seated on Bottom, Other
1	1	Opening	Slots - Diagonal	1.40	3.00	50		0	Casing - Hand Sawn Slot, PVC Class 12, Other, SL: 40.0mm, A: 5.00mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
1.40	3.50	2.10	Unknown	1.19					941.00

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.20	0.20	Fill; loose yellow, fine sand, some brown	Fill	

			sandy clay		
0.20	0.50	0.30	Fill; soft dark brown/black silty sand, some gravel & ceramic fragments, possible charcoal	Fill	
0.50	0.80	0.30	Sand, loose, brown, minor silt	Sand	
0.80	3.50	2.70	Sand, silty, loose, soft, grey	Sand	

Remarks

15/06/2011: Form A Remarks:
Nat Carling, 3-May-2012; GPS provided by driller/consultant.

***** End of GW201710 *****

Warning To Clients: This raw data has been supplied to the NSW Office of Water by drillers, licensees and other sources. The NOW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

WaterNSW
Work Summary

GW200855

Licence: | **Licence Status:**

Authorised Purpose(s):
Intended Purpose(s): TEST BORE

Work Type: Spear
Work Status: Supply Obtained
Construct.Method: Auger - Hollow
Owner Type: Private

Commenced Date:
Completion Date: 01/06/2010
Final Depth: 6.00 m
Drilled Depth: 6.00 m

Contractor Name: (None)
Driller: Michael James Lindsay
Assistant Driller:

Property:
GWMA:
GW Zone:
Standing Water Level (m): 1.500
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	NORTHUMBERLAND	NEWCA	1//861729
Licensed:			

Region: 20 - Hunter
River Basin: 210 - HUNTER RIVER
Area/District:
CMA Map: 9232-2S
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6356222.000
Easting: 383920.000
Latitude: 32°55'34.0"S
Longitude: 151°45'30.4"E

GS Map: -
MGA Zone: 56
Coordinate Source: GIS - Geogra

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	6.00	50			Auger - Hollow Flight
1		Annulus	Waterworn/Rounded	4.00	6.00	50	50		Graded, PL:Poured/Shovelled
1		Backfill	Sand	5.90	6.00	50			
1	1	Casing	Pvc Class 9	0.00	6.00	50			Seated, Glued, S: 5.90-6.00m
1	1	Opening	Slots - Diagonal	4.90	5.90	50		0	Casing - Drilled Holes, PVC Class 9, Other, SL: 25.0mm, A: 25.00mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
1.50	6.00	4.50	Unknown	1.50	2.00			01:00:00	

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.50	0.50	Sand, brown	Sand	
0.50	2.00	1.50	Sand, grey	Sand	

2.00	2.50	0.50	Mud, black	Mud	
2.50	2.80	0.30	Mud, grey	Mud	
2.80	3.20	0.40	Sand, grey	Sand	
3.20	3.50	0.30	Mud, grey	Mud	
3.50	4.50	1.00	Sand, grey	Sand	
4.50	4.80	0.30	Mud, grey	Mud	
4.80	6.00	1.20	Sand, grey	Sand	

Remarks

01/06/2010: Form A Remarks:
Nat Carling, 29-Oct-2010: Coordinates based on location map provided with the Form-A.

***** End of GW200855 *****

Warning To Clients: This raw data has been supplied to the NSW Office of Water by drillers, licensees and other sources. The NOW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

WaterNSW
Work Summary

GW201875

Licence:
Licence Status:

Authorised Purpose(s):
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status: Equipped
Construct.Method: Auger - Hollow
Owner Type: Local Govt

Commenced Date:
Completion Date: 05/08/2011
Final Depth: 6.00 m
Drilled Depth: 6.00 m

Contractor Name: Total Drilling
Driller: Ben Kiernan
Assistant Driller: Geoff Curry

Property:
GWMA:
GW Zone:
Standing Water Level (m):
Salinity Description:
Yield (L/s): 3.500

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	NORTHUMBERLAND	NEWCA	RD ADJ 1//744738
Licensed:			

Region: 20 - Hunter
River Basin: 210 - HUNTER RIVER
Area/District:
CMA Map: 9232-2S
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6356310.000
Easting: 383235.000
Latitude: 32°55'30.8"S
Longitude: 151°45'04.1"E

GS Map: -
MGA Zone: 56
Coordinate Source: GIS - Geogra

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	6.00	110			Auger - Hollow Flight
1		Annulus	Cement	0.00	1.00	110	60		PL:Poured/Shovelled
1		Annulus	Bentonite	1.00	2.00	110	60		PL:Poured/Shovelled
1		Annulus	Waterworn/Rounded	2.00	6.00	110	60		Graded, PL:Poured/Shovelled
1	1	Casing	Pvc Class 18	0.00	3.00	60	50		Seated on Bottom, Screwed
1	1	Opening	Slots - Horizontal	3.00	6.00	60		0	Mechanically Slotted, PVC Class 18, Screwed, SL: 50.0mm, A: 1.00mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
3.50	6.00	2.50	Unknown	3.50					

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.30	0.30	Topsoil; silty sand, fine-medium, dark	Topsoil	

			brown		
0.30	2.50	2.20	Silty Sand; fine-medium, dark grey	Silty Sand	
2.50	3.50	1.00	Silty Sand; as above, becoming yellow	Silty Sand	
3.50	6.00	2.50	Silty Sand; as above, becoming light brown, wet	Silty Sand	

Remarks

05/08/2011: Form A Remarks:
Nat Carling, 10-May-2012; Coordinates based on location map provided with the Form-A. Lithology taken from consultants log.

***** End of GW201875 *****

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WaterNSW
Work Summary

GW056149

Licence:
Licence Status:

Authorised Purpose(s):
Intended Purpose(s): NOT KNOWN

Work Type: Spear
Work Status:
Construct.Method:
Owner Type: Other Govt

Commenced Date:
Completion Date: 01/11/1981
Final Depth: 7.20 m
Drilled Depth: 7.20 m

Contractor Name: (None)
Driller:
Assistant Driller:

Property:
GWMA:
GW Zone:
Standing Water Level (m):
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	NORTHUMBERLAND	NEWCA	L1 DP584429 (268)
Licensed:			

Region: 20 - Hunter
River Basin: 210 - HUNTER RIVER
Area/District:
CMA Map: 9232-2S
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: (Unknown)
Northing: 6356148.000
Easting: 383756.000
Latitude: 32°55'36.3"S
Longitude: 151°45'24.1"E

GS Map: -
MGA Zone: 56
Coordinate Source: GD.,ACC.MAP

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1	1	Casing	P.V.C.	0.00	7.20	40			Seated on Bottom

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	7.20	7.20	Sand Water Supply	Sand	

***** End of GW056149 *****

Warning To Clients: This raw data has been supplied to the NSW Office of Water by drillers, licensees and other sources. The NOW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

WaterNSW
Work Summary

GW058805

Licence:
Licence Status:

Authorised Purpose(s):
Intended Purpose(s): DOMESTIC

Work Type: Spear
Work Status:
Construct.Method: Hand Dug
Owner Type: Private

Commenced Date:
Completion Date: 01/12/1982
Final Depth: 6.00 m
Drilled Depth: 6.00 m

Contractor Name: (None)
Driller:
Assistant Driller:

Property:
GWMA:
GW Zone:
Standing Water Level (m):
Salinity Description: 0-500 ppm
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	NORTHUMBERLAND	NEWCA	L25 (268)
Licensed:			

Region: 20 - Hunter
River Basin: 210 - HUNTER RIVER
Area/District:
CMA Map: 9232-2S
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: (Unknown)
Northing: 6356116.000
Easting: 383704.000
Latitude: 32°55'37.3"S
Longitude: 151°45'22.1"E

GS Map: -
MGA Zone: 56
Coordinate Source: GD.,ACC.MAP

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1	1	Opening	Screen	-100.00	0.00			1	
1	1	Casing	P.V.C.	0.00	5.00	100			Driven into Hole

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
0.30	5.00	4.70	Unconsolidated			0.50			

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.30	0.30	Topsoil	Topsoil	
0.30	5.00	4.70	Sand Water Supply	Sand	
5.00	6.00	1.00		(Unknown)	

Remarks

01/11/1985: TDS = 50 MG/L

***** End of GW058805 *****

Warning To Clients: This raw data has been supplied to the NSW Office of Water by drillers, licensees and other sources. The NOW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

WaterNSW
Work Summary

GW200144

Licence: 20BL169531 **Licence Status:** ACTIVE

Authorised Purpose(s): TEST BORE
Intended Purpose(s):

Work Type: Bore
Work Status:
Construct.Method:
Owner Type:

Commenced Date: **Final Depth:**
Completion Date: 15/12/2004 **Drilled Depth:**

Contractor Name: (None)
Driller:
Assistant Driller:

Property: N/A 113-125 Parry St And 41 Denison St NEWCASTLE WEST 2302 NSW
GWMA: -
GW Zone: -
Standing Water Level (m):
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	NORTHUMBERLAND	NEWCA	13//456092
Licensed:	NORTHUMBERLAND	NEWCASTLE	Whole Lot 2//1203405

Region: 20 - Hunter
River Basin: - Unknown
Area/District:
CMA Map:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6356080.000
Easting: 383591.000
Latitude: 32°55'38.4"S
Longitude: 151°45'17.7"E

GS Map: -
MGA Zone: 56
Coordinate Source: Map Interpre

Remarks

15/12/2004: Form A Remarks:
Bore location map received
No. Form A received
05/11/2009: Updated coordinates as per existing Eastings and Northings.

***** End of GW200144 *****

Warning To Clients: This raw data has been supplied to the NSW Office of Water by drillers, licensees and other sources. The NOW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

WaterNSW
Work Summary

GW200145

Licence: 20BL169530 **Licence Status:** ACTIVE

Authorised Purpose(s): TEST BORE
Intended Purpose(s):

Work Type: Bore
Work Status:
Construct.Method:
Owner Type:

Commenced Date: **Final Depth:**
Completion Date: 15/12/2004 **Drilled Depth:**

Contractor Name: (None)
Driller:
Assistant Driller:

Property: N/A 113-125 Parry St And 41 Denison St NEWCASTLE WEST 2302 NSW
Standing Water Level (m):
GWMA: -
Salinity Description:
GW Zone: -
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	NORTHUMBERLAND	NEWCA	1//551981
Licensed:	NORTHUMBERLAND	NEWCASTLE	Whole Lot 2//1203405

Region: 20 - Hunter **CMA Map:**
River Basin: - Unknown **Grid Zone:** **Scale:**
Area/District:

Elevation: 0.00 m (A.H.D.) **Northing:** 6356095.000 **Latitude:** 32°55'37.9"S
Elevation Source: Unknown **Easting:** 383540.000 **Longitude:** 151°45'15.8"E

GS Map: - **MGA Zone:** 56 **Coordinate Source:** Map Interpre

Remarks

15/12/2004: Form A Remarks:
Bore Location map received
No Form A received
Licence Holder Bore Number MW01
05/11/2009: Updated coordinates as per existing Eastings and Northings.

***** End of GW200145 *****

Warning To Clients: This raw data has been supplied to the NSW Office of Water by drillers, licensees and other sources. The NOW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

WaterNSW
Work Summary

GW200146

Licence: | **Licence Status:**

Authorised Purpose(s):
Intended Purpose(s):

Work Type: Bore
Work Status:
Construct.Method:
Owner Type:

Commenced Date: | **Final Depth:**
Completion Date: 15/12/2004 | **Drilled Depth:**

Contractor Name: (None)
Driller:
Assistant Driller:

Property: | **Standing Water Level (m):**
GWMA: | **Salinity Description:**
GW Zone: | **Yield (L/s):**

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	NORTHUMBERLAND	NEWCA	10//456092
Licensed:			

Region: 20 - Hunter | **CMA Map:**
River Basin: - Unknown | **Grid Zone:** | **Scale:**
Area/District:

Elevation: 0.00 m (A.H.D.) | **Northing:** 6356093.000 | **Latitude:** 32°55'38.0"S
Elevation Source: Unknown | **Easting:** 383575.000 | **Longitude:** 151°45'17.1"E

GS Map: - | **MGA Zone:** 56 | **Coordinate Source:** Map Interpre

Remarks

15/12/2004: Form A Remarks:
Bore Location map received
No Form A received
Licence holder bore number MW07
05/11/2009: Updated coordinates as per existing Eastings and Northings.

***** End of GW200146 *****

Warning To Clients: This raw data has been supplied to the NSW Office of Water by drillers, licensees and other sources. The NOW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

WaterNSW
Work Summary

GW200147

Licence: 20BL169529 **Licence Status:** ACTIVE

Authorised Purpose(s): TEST BORE
Intended Purpose(s):

Work Type: Bore
Work Status:
Construct.Method:
Owner Type:

Commenced Date: **Final Depth:**
Completion Date: 15/12/2004 **Drilled Depth:**

Contractor Name: (None)
Driller:
Assistant Driller:

Property: N/A 113-125 Parry St And 41 Denison St NEWCASTLE WEST 2302 NSW
Standing Water Level (m):
GWMA: -
Salinity Description:
GW Zone: -
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	NORTHUMBERLAND	NEWCA	10/456092
Licensed:	NORTHUMBERLAND	NEWCASTLE	Whole Lot 2//1203405

Region: 20 - Hunter **CMA Map:**
River Basin: - Unknown **Grid Zone:** **Scale:**
Area/District:

Elevation: 0.00 m (A.H.D.) **Northing:** 6356076.000 **Latitude:** 32°55'38.6"S
Elevation Source: Unknown **Easting:** 383566.000 **Longitude:** 151°45'16.8"E

GS Map: - **MGA Zone:** 56 **Coordinate Source:** Map Interpre

Remarks

15/12/2004: Form A Remarks:
Bore location map received
No Form A received
Licence holder Bore No. MW12
05/11/2009: Updated coordinates as per existing Eastings and Northings.

***** End of GW200147 *****

Warning To Clients: This raw data has been supplied to the NSW Office of Water by drillers, licensees and other sources. The NOW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

WaterNSW
Work Summary

GW200148

Licence:
Licence Status:
Authorised Purpose(s):
Intended Purpose(s):

Work Type: Bore
Work Status:
Construct.Method:
Owner Type:

Commenced Date:
Completion Date: 15/12/2004
Final Depth:
Drilled Depth:

Contractor Name: (None)
Driller:
Assistant Driller:

Property:
GWMA:
GW Zone:
Standing Water Level (m):
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	NORTHUMBERLAND	NEWCA	11//456092
Licensed:			

Region: 20 - Hunter
River Basin: - Unknown
Area/District:
CMA Map:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6356097.000
Easting: 383579.000
Latitude: 32°55'37.9"S
Longitude: 151°45'17.3"E

GS Map: -
MGA Zone: 56
Coordinate Source: Map Interpre

Remarks

15/12/2004: Form A Remarks:
Bore Location map received - bore actually located in Parry Street opposite Lot 10 DP 456092
No Form A received
Licence Holder Bore No. MW20 - Test Bore
05/11/2009: Updated coordinates as per existing Eastings and Northings.

***** End of GW200148 *****

Warning To Clients: This raw data has been supplied to the NSW Office of Water by drillers, licensees and other sources. The NOW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

WaterNSW
Work Summary

GW200150

Licence: 20BL169528 **Licence Status:** ACTIVE

Authorised Purpose(s): TEST BORE
Intended Purpose(s):

Work Type: Bore
Work Status:
Construct.Method:
Owner Type:

Commenced Date: **Final Depth:**
Completion Date: 15/12/2004 **Drilled Depth:**

Contractor Name: (None)
Driller:
Assistant Driller:

Property: N/A 113-125 Parry St And 41 Denison St NEWCASTLE WEST 2302 NSW
GWMA: -
GW Zone: -
Standing Water Level (m):
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	NORTHUMBERLAND	NEWCA	11//456092
Licensed:	NORTHUMBERLAND	NEWCASTLE	LAND ADJACENT TO 2//1203405

Region: 20 - Hunter
River Basin: - Unknown
Area/District:
CMA Map:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6356105.000
Easting: 383606.000
Latitude: 32°55'37.6"S
Longitude: 151°45'18.3"E

GS Map: -
MGA Zone: 56
Coordinate Source: Map Interpre

Remarks

15/12/2004: Form A Remarks:
Bore location map received
No. Form A received
Licence Holder Bore Number MW22
Bore actually located in Parry Street, opposite Lot 1 1035070
05/11/2009: Updated coordinates as per existing Eastings and Northings.

***** End of GW200150 *****

Warning To Clients: This raw data has been supplied to the NSW Office of Water by drillers, licensees and other sources. The NOW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

Appendix D

Data Quality Objectives

Appendix D
Data Quality Objectives
924 Hunter Street, Newcastle

D1.0 Data Quality Objectives

The DSI has been devised broadly in accordance with the seven-step data quality objective (DQO) process which is provided in Appendix B, Schedule B2 of NEPC *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]* (NEPC, 2013).

Step	Summary
1: State the problem	The objective of the investigation was to assess the contamination status of the site with respect to the proposed land use. The report is being undertaken as the land is to be developed The requirements of the regulator, Newcastle City Council, will also be considered by consulting their Development Control Plan (DCP), Local Environment Plan (LEP) and any other requirements based on our recent experience with Council on similar sites. A preliminary conceptual site model (CSM) has been prepared (Section 9) for the proposed development. The project team consisted of experienced environmental engineers and scientists working in the roles of Project Principal, Project Reviewer, Project Manager, field staff. It is noted that access and ability for subsurface drilling using mechanical means was limited on the western part of the site due to current tenancy. Investigation was restricted to hand tools only.
2: Identify the decisions / goal of the study	The site history has identified possible contaminating current and previous land uses which are identified in the CSM (Section 9). The CSM identifies the associated contaminants of potential concern (COPC) and the likely impacted media. The site assessment criteria (SAC) for each of the COPC are detailed in Appendix G. The decision is to establish whether or not the results fall below the SAC or whether or not the 95% upper confidence limit of the sample population falls below the SAC. On this basis, an assessment of the site's suitability from a contamination perspective and whether (or not) further assessment and / or remediation will be derived.
3: Identify the information inputs	Inputs to the investigation will be the results of analysis of samples to measure the concentrations of COPC identified in the CSM (Section 9) at the site using NATA accredited laboratories and methods, where possible. The SAC for each of the COPC are detailed in Appendix G. A photoionization detector (PID) will be used on-site to screen soils for VOC. PID readings will be used to inform sample selection for laboratory analysis. An oil water interface meter will be used to assess for the presence of possible floating / free phase product. A multi parameter meter will be used to measure groundwater quality parameters during sampling.

Step	Summary
4: Define the study boundaries	The lateral boundaries of the investigation area are shown on Drawing 1, Appendix H. The vertical boundaries are to the extent of contamination impact as determined from the site history assessment and site observations. The assessment is limited to the timeframe over which the field investigation was undertaken. Constraints to the assessment are identified and discussed in the conclusions of the report, Section 16.
5: Develop the analytical approach (or decision rule)	The decision rule is to compare all analytical results with SAC (Appendix G, based on NEPC (2013)). Where guideline values are absent, other sources of guideline values accepted by NEPC (2013) shall be adopted where possible. Where a sample result exceeds the adopted criterion, a further site-specific assessment will be made as to the risk posed by the presence of that contaminant(s). Initial comparisons will be with individual results then, where required, summary statistics (including mean, standard deviation and 95% upper confidence limit (UCL) of the arithmetic mean (95% UCL)) to assess potential risks posed by the site contamination. Quality control results are to be assessed according to their relative percent difference (RPD) values. For field duplicates, triplicates and laboratory results, RPDs should generally be below 30%; for field blanks and rinsates, results should be at or less than the limits of reporting (NEPC, 2013). The field and laboratory quality assurance assessment is included in Appendix F.
6: Specify the performance or acceptance criteria	Baseline condition: Contaminants at the site and/or statistical analysis of data (in line with NEPC (2013)) exceed human health and environmental SAC and pose a potentially unacceptable risk to receptors (null hypothesis). Alternative condition: Contaminants at the site and statistical analysis of data (in line with NEPC (2013)) comply with human health and environmental SAC and as such, do not pose a potentially unacceptable risk to receptors (alternative hypothesis). Unless conclusive information from the collected data is sufficient to reject the null hypothesis, it is assumed that the baseline condition is true. Uncertainty that may exist due to the above potential decision errors shall be mitigated as follows: • As well as a primary screening exercise, the use of the 95% UCL as per NEPC (2013) may be applied, i.e.: 95% is the defined confidence level associated with the UCL on the geometric mean for contaminant data. The resultant 95%UCL shall subsequently be screened against the corresponding SAC. • The statistical assessment will only be able to be applied to certain data-sets, such as those obtained via systematic sampling. Identification of areas for targeted sampling will be via professional judgement and errors will not be able to have a probability assigned to them.
7: Optimise the design for obtaining data	As the purpose of the sampling program is to assess for potential contamination across the site, the sampling program is reliant on professional judgement to identify and sample the potentially affected areas. Further details regarding the proposed sampling plan and limitations associated with site access are presented in Section 10.

Reference

NEPC. (2013). *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM].* Australian Government Publishing Services Canberra: National Environment Protection Council.

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Appendix E

Field Work Methodology

Appendix E
Field Work Methodology
924 Hunter Street, Newcastle West

E1.0 Guidelines

The following key guidelines were consulted for the field work methodology:

- NEPC *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]* (NEPC, 2013).

E2.0 Soil Sampling

Soil sampling is carried out in accordance with DP standard operating procedures. The general sampling and sample management procedures comprise:

- Collect soil samples directly from each 1 m length of push tube sleeve at the nominated sample depth or from the hand auger flights. Care was taken to remove any extraneous material prior to sampling;
- Collect near surface samples using stainless hand tools;
- Transfer samples in laboratory-prepared glass jars with Teflon lined lids by hand, capping immediately and minimising headspace within the sample jar;
- Collect replicate samples in zip-lock bags for PID screening;
- Collect ~500 ml samples for FA and AF analysis;
- Wear a new disposable nitrile glove for each sample point thereby minimising potential for cross-contamination;
- Collect 10% replicate samples for QC purposes;
- Label sample containers with individual and unique identification details, including project number, sample location and sample depth (where applicable);
- Place samples into a cooled, insulated and sealed container for transport to the laboratory; and
- Use chain of custody documentation.

E2.1 Field Testing

Field testing is carried out in accordance with DP standard operating procedures. The general sampling and sample management procedures comprise:

PID Field Test

- Calibrate the PID with isobutylene gas at 100 ppm and with fresh air prior to commencement of each successive day's field work;
- Allow the headspace in the PID zip-lock bag samples to equilibrate; and
- Screen using the PID.

E3.0 Groundwater Sampling

E3.1 Monitoring Well Installation

Monitoring wells are constructed using class 18 uPVC machine slotted screen and blank sections with screw threaded joints. The screened section of each well is backfilled with a washed sand filter pack to approximately 0.5 m above the screened interval. Each well is completed with a hydrated bentonite plug of at least 0.5 m thick, finished with cast iron road-box set in a concrete plinth.

E3.2 Monitoring Well Development

Groundwater monitoring wells are developed as soon as practicable following well installation. The purpose of well development is to remove sediments and/or drilling fluid introduced to the well during drilling and to facilitate connection of the monitoring well to the aquifer. The wells are developed by pumping / bailing to remove a minimum of five well volumes, or until dry.

E3.3 Groundwater Sampling

Bladder pump

Groundwater sampling is carried out in accordance with DP standard operating procedures. Groundwater samples are collected using a positive displacement low flow bladder pump via the micro-purge (minimal drawdown) method. The method minimises aeration of the sample and disturbance to the water column thereby enhancing the quality of results for oxygen sensitive analytes.

The sampling method is described as follows:

- Measure the static water level using an electronic interface probe and record the thickness of any LNAPL (if encountered);
- Decontaminate the interface probe and cable between monitoring wells by rinsing in a diluted Liquinox solution and then rinsing in demineralised water;
- Fit the pump with a well-dedicated bladder and tubing. Lower the pump into the well then clamp at a level estimated to be 1 m below the top of the water column (provided the depth of the pump is within the screened section) or to the approximate mid-point of the well screen;
- Set the pump at the lowest rate possible that could produce laminar flow to minimise drawdown of the water column;
- Measure physical parameters by continuously passing the purged water through a flow cell; and

- Following stabilisation of the field parameters, collect samples in laboratory-prepared bottles minimising headspace within the sample bottle and cap immediately.

Decontaminate the interface probe, pump and cable between monitoring wells by rinsing in a diluted Liquinox solution and then rinsing in demineralised water.

Sample Handling

The general groundwater sample handling and management procedures comprise:

- Collect 10% replicate samples for QC purposes;
- Collect equipment rinsate for QC purposes;
- Label sample containers with individual and unique identification details, including project number and sample location;
- Place the sample bottles into a cooled, insulated and sealed container for transport to the laboratory; and
- Use chain of custody documentation.

E4.0 Reference

NEPC. (2013). *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM].* Australian Government Publishing Services Canberra: National Environment Protection Council.

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Appendix F

Quality Assurance and Quality Control Report
Chain of Custody (Field and Despatch)
Laboratory Sample Receipts

Appendix F
Quality Assurance / Quality Control Report
924 Hunter Street, Newcastle

F1.0 Field and Laboratory Data Quality Assurance and Quality Control

The field and laboratory data quality assurance and quality control (QA/QC) procedures and results are summarised in the following Table 1. Reference should be made to the field work methodology and the laboratory results / certificates of analysis for further details. The relative percentage difference (RPD) results, along with the other filed QC samples are included in Table QA1 and QA2 end of this appendix.

Table 1: Field and Laboratory Quality Control

Item	Evaluation / Acceptance Criteria	Compliance
Analytical laboratories used	NATA accreditation	C
Holding times	Various based on type of analysis	C
Intra-laboratory replicates	10% of primary samples; <30% RPD	PC
Trip Spikes	1 per field work program; 60-140% recovery	C
Trip Blanks	1 per field work program event; <PQL	C
Rinsates	1 per sampling round; <PQL	PC
Laboratory Duplicates	1 per batch; Duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.	C
Laboratory / Reagent Blanks	1 per batch; <PQL	C
Matrix Spikes	1 per lab batch; 70-130% recovery (inorganics); 60-140% recovery (organics)	C
Surrogate Spikes	All organics analysis; 70-130% recovery (inorganics); 60-140% recovery (organics)	C
Control Samples	1 per lab batch; 70-130% recovery (inorganics); 60-140% recovery (organics)	C
Standard Operating Procedures (SOP)	Adopting SOP for all aspects of the sampling field work	C

Notes to Table 1:
C = compliance; PC = partial compliance; NC = non-compliance

The RPD results were all within the acceptable range, with the exception of those indicated in Table QA1 (Soil Samples). The exceedances are not, however, considered to be of concern given that:

- The typically low actual differences in the concentrations of the replicate pairs where some RPD exceedances occurred, particularly for groundwater;
- The number of replicate pairs being collected from fill soils which by its nature is heterogeneous;
- Replicates, rather than homogenised duplicates, were used to minimise risk of volatile loss, hence greater variability can be expected;
- Most of the recorded concentrations being relatively close to the PQL;
- The majority of RPDs within a replicate pair being within the acceptable limits;
- All other QA/QC parameters met the DQIs.

Rinsate testing below laboratory PQLs, with the exception of trace dissolved zinc. Concentrations were an order of magnitude less than those detected in the groundwater samples and are therefore considered acceptable;

In summary, the QC data is determined to be of sufficient quality to be considered acceptable for the assessment.

F2.0 Data Quality Indicators

The reliability of field procedures and analytical results was assessed against the following data quality indicators (DQIs) as outlined in NEPC *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]* (NEPC, 2013):

- Completeness: a measure of the amount of usable data from a data collection activity;
- Comparability: the confidence (qualitative) that data may be considered to be equivalent for each sampling and analytical event;
- Representativeness: the confidence (qualitative) of data representativeness of media present on-site;
- Precision: a measure of variability or reproducibility of data; and
- Accuracy: a measure of closeness of the data to the 'true' value.

Table 2: Data Quality Indicators

Data Quality Indicator	Method(s) of Achievement
Completeness	Systematic and selected target locations sampled.
	Preparation of borehole logs, sample location plan and chain of custody records.
	Preparation of field groundwater sampling sheets.
	Laboratory sample receipt information received confirming receipt of samples intact and appropriateness of the chain of custody.
	Samples analysed for contaminants of potential concern (COPC) identified in the Conceptual Site Model (CSM).
	Completion of chain of custody (COC) documentation.
	NATA accredited laboratory results certificates provided by the laboratory.
	Satisfactory frequency and results for field and laboratory quality control (QC) samples as discussed in Section 1.
Comparability	Using appropriate techniques for sample recovery, storage and transportation, which were the same for the duration of the project.
	Experienced samplers used.
	Use of NATA registered laboratories, with test methods the same or similar between laboratories.
	Satisfactory results for field and laboratory QC samples.
Representativeness	Target media sampled.
	Sample numbers recovered and analysed are considered to be representative of the target media and complying with DQOs.
	Samples were extracted and analysed within holding times.
	Samples were analysed in accordance with the COC.
Precision	Field staff followed standard operating procedures.
	Acceptable RPD between original samples and replicates.
	Satisfactory results for all other field and laboratory QC samples.
Accuracy	Field staff followed standard operating procedures.
	Satisfactory results for all field and laboratory QC samples.

Based on the above, it is considered that the DQIs have been complied with.

F3.0 Conclusion

Based on the results of the field QA and field and laboratory QC, and evaluation against the DQIs it is concluded that the field and laboratory test data obtained are reliable and useable for this assessment.

F4.0 Reference

NEPC. (2013). *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM].* Australian Government Publishing Services Canberra: National Environment Protection Council.

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Geotechnics | Environment | Groundwater

CHAIN OF CUSTODY FIELD SHEET

Project No:	102077.02	**Client Project Name:**	Newcastle West, 924 Hunter Street, PSI
Client:	Thirdi Dairy Farmers Pty Ltd	**Location:**	924 Hunter Street, Newcastle
Project Manager:	Dana Wilson	**DP Lab Received**	By: Date:

Do samples contain 'potential' HBM? Yes ☑ No ☐ (If YES, then handle, transport and store in accordance with FPM HAZID)

Field									DP Lab	For Despatch to			Notes
Sample ID	Depth (m)	Duplicate Sample	Sample Type S - soil W - water	Container Type G - glass P - plastic	ASS Samples	Sampling By	Sampling Date	Sampling Time	Storage Locn *	Envirolab Services 7/10/21	Lab 2 [B] Date	Lab 3 [C] Date	
201/0.2	0.2		S	G,P	✓	JRK	6/10/21	8:45	Fridge/				
201/0.5	0.5				✓				freezer 5	✓			
201/1.0	1.0				✓								
201/1.5	1.5				✓								
201/2.0	2.0	D3/JRK			✓					✓			
201/2.5	2.5				✓								
201/3.0	3.0				✓								
201/3.5	3.5				✓					✓			
201/4.0	4.0				✓								
201/4.5	4.5				✓					✓			
201/5.0	5.0				✓								
202/0.2	0.2	D1/JRK			✓					✓			
202/0.5	0.5				✓								
202/1.1	1.1				✓								
202/1.5	1.5				✓					✓			
202/2.0	2.0				✓								
202/2.5	2.5		↓	↓	✓	↓	↓	13:30		✓			

* **Default storage: glass containers in fridge, plastic containers shelved, ASS in freezer, water samples in fridge**

A Envirolab Services

B Provide name of Lab 2

C Provide name of Lab 3

Douglas Partners
Geotechnics | Environment | Groundwater

CHAIN OF CUSTODY FIELD SHEET

Project No:	102077.02	**Client Project Name:**	Newcastle West, 924 Hunter Street, PSI
Client:	Thirdi Dairy Farmers Pty Ltd	**Location:**	924 Hunter Street, Newcastle
Project Manager:	Dana Wilson	**DP Lab Received**	By: Date:

Do samples contain 'potential' HBM? Yes ☑ No ☐ (If YES, then handle, transport and store in accordance with FPM HAZID)

Field									DP Lab	For Despatch to			Notes
Sample ID	Depth (m)	Duplicate Sample	Sample Type S - soil W - water	Container Type G - glass P - plastic	ASS Samples	Sampling By	Sampling Date	Sampling Time	Storage Locn *	Envirolab Services 7/10/21	Lab 2 [B] Date	Lab 3 [C] Date	
202/3.0	3.0		S	G,P	✓	JRK	6/10/21	8:45	Fridge/				
202/3.5	3.5		↓	↓	✓	↓	↓	↓	Freezer S	✓			
202/4.0	4.0				✓								
202/4.5	4.5				✓								
202/5.0	5.0				✓								
203/0.2	0.2				✓								
203/0.5	0.5				✓					✓			
203/1.0	1.0				✓								
203/1.5	1.5	D4/JRK			✓								
203/2.0	2.0				✓								
203/2.5	2.5				✓								
203/3.0	3.0				✓					✓			
203/3.5	3.5				✓								
203/4.0	4.0				✓					✓			
203/4.5	4.5				✓								
203/5.0	5.0				✓					✓			
204/0.2	0.2		↓	↓	✓	↓	↓	13:30		✓			

* **Default storage:** glass containers in fridge, plastic containers shelved, ASS in freezer, water samples in fridge

A Envirolab Services

B Provide name of Lab 2

C Provide name of Lab 3

Douglas Partners
Geotechnics / Environment / Groundwater

CHAIN OF CUSTODY FIELD SHEET

Project No:	102077.02	**Client Project Name:**	Newcastle West, 924 Hunter Street, PSI
Client:	Thirdi Dairy Farmers Pty Ltd	**Location:**	924 Hunter Street, Newcastle
Project Manager:	Dana Wilson	**DP Lab Received**	By: Date:

Do samples contain 'potential' HBM? Yes ☑ No ☐ (If YES, then handle, transport and store in accordance with FPM HAZID)

Field									DP Lab	For Despatch to			Notes
Sample ID	Depth (m)	Duplicate Sample	Sample Type S - soil W - water	Container Type G - glass P - plastic	ASS Samples	Sampling By	Sampling Date	Sampling Time	Storage Locn *	Envirolab Services 7/10/21	Lab 2 [B] Date	Lab 3 [C] Date	
204/0.5	0.5		S	G, P	✓	JRK	6/10/21	8:45	Fridge/				
204/1.0	1.0				✓				freezer S				
204/1.5	1.5				✓								
204/2.0	2.0				✓					✓			
204/2.5	2.5				✓								
204/3.1	3.1				✓					✓			
204/3.5	3.5				✓								
204/4.0	4.0				✓					✓			
204/4.5	4.5				✓								
204/5.0	5.0				✓								
205/0.2	0.2				✓					✓			
205/0.5	0.5	D2/JRK			✓					✓			
205/1.0	1.0				✓								
205/1.5	1.5				✓					✓			
205/2.0	2.0				✓								
205/2.5	2.5				✓					✓			
205/3.0	3.0				✓			13:30					

* **Default storage:** glass containers in fridge, plastic containers shelved, ASS in freezer, water samples in fridge

A Envirolab Services B Provide name of Lab 2 C Provide name of Lab 3

Douglas Partners
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CHAIN OF CUSTODY FIELD SHEET

Project No:	**102077.02**	**Client Project Name:**	**Newcastle West, 924 Hunter Street, PSI**
Client:	**Thirdi Dairy Farmers Pty Ltd**	**Location:**	**924 Hunter Street, Newcastle**
Project Manager:	**Dana Wilson**	**DP Lab Received**	By: Date:

Do samples contain 'potential' HBM? Yes ☑ No ☐ (If YES, then handle, transport and store in accordance with FPM HAZID)

Field									DP Lab	For Despatch to			Notes
Sample ID	Depth (m)	Duplicate Sample	Sample Type S - soil W - water	Container Type G - glass P - plastic	ASS Samples	Sampling By	Sampling Date	Sampling Time	Storage Locn *	Envirolab Services	Lab 2 [B] Date	Lab 3 [C] Date	
205/3.5	3.5		S	G.P	✓	JRK	6/10/21	8:45	Fridge/				
205/4.0	4.0		↓	↓	✓	↓	↓	↓	Freezer 5				
205/4.5	4.5		↓	↓	✓	↓	↓	↓					
205/5.0	5.0		↓	↓	✓	↓	↓	13:30					

* **Default storage: glass containers in fridge, plastic containers shelved, ASS in freezer, water samples in fridge**

A Envirolab Services

B Provide name of Lab 2

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CHAIN OF CUSTODY FIELD SHEET

Project No:	102077.02	**Client Project Name:**	Newcastle West, 924 Hunter Street, PSI
Client:	Thirdi Dairy Farmers Pty Ltd	**Location:**	924 Hunter Street, Newcastle
Project Manager:	Dana Wilson	**DP Lab Received**	By: Date:

Do samples contain 'potential' HBM? Yes ☐ No ☐ (If YES, then handle, transport and store in accordance with FPM HAZID)

Field									DP Lab	For Despatch to			Notes
Sample ID	Depth (m)	Duplicate Sample	Sample Type S - soil W - water	Container Type G - glass P - plastic	ASS Samples	Sampling By	Sampling Date	Sampling Time	Storage Locn *	Envirolab Services 7/10/21	Lab 2 [B] Date	Lab 3 [C] Date	
GW1			W	G,P		JL	7.10.21	0830		✓			
GW3			↓	↓		↓	↓	↓		✓			
R1			↓	↓		↓	↓	1000		✓			
TS | TB			W	G,P		JL	7.10.21	1000		✓			

* **Default storage: glass containers in fridge, plastic containers shelved, ASS in freezer, water samples in fridge**

A Envirolab Services

B Provide name of Lab 2

C Provide name of Lab 3

Douglas Partners
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CHAIN OF CUSTODY FIELD SHEET

Project No:	102077.02	**Client Project Name:**	Newcastle West, 924 Hunter Street, PSI
Client:	Thirdi Dairy Farmers Pty Ltd	**Location:**	924 Hunter Street, Newcastle
Project Manager:	Dana Wilson	**DP Lab Received**	By: Date:

Do samples contain 'potential' HBM? Yes ☐ No ☐ (If YES, then handle, transport and store in accordance with FPM HAZID)

Field									DP Lab	For Despatch to			Notes
Sample ID	Depth (m)	Duplicate Sample	Sample Type S - soil W - water	Container Type G - glass P - plastic	ASS Samples	Sampling By	Sampling Date	Sampling Time	Storage Locn *	Envirolab Services 11/10/21	Lab 2 [B] Date	Lab 3 [C] Date	
303	0.6-0.7	-	S	G,P	✓	DEW	9.10.21			✓			
304	0.0-0.02				✓								
	0.1-0.2				✓					✓			
	0.5-0.6	D2(DEW			✓								
	0.9-1.0	-			✓					✓			
305	0.2-0.3	-			✓								
	0.5-0.6	-		G,P	✓								
	1.0-1.1	-			✓								
	1.2-1.25	-			✓								
	1.35-1.4	-			✓								
	1.9-2.0	-			✓					//			
	0.55/F	-	filter	P	✓					✓			
306	0.25-0.35		S	G,P	✓								
	0.9-1.0				✓								
	1.5-1.6				✓								
	2.0-2.1				✓								
	2.5-2.6				✓								

* **Default storage:** **glass containers in fridge, plastic containers shelved, ASS in freezer, water samples in fridge**

A Envirolab Services

B Provide name of Lab 2

C Provide name of Lab 3

Douglas Partners
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CHAIN OF CUSTODY FIELD SHEET

Project No:	102077.02	**Client Project Name:**	Newcastle West, 924 Hunter Street, PSI
Client:	Thirdi Dairy Farmers Pty Ltd	**Location:**	924 Hunter Street, Newcastle
Project Manager:	Dana Wilson	**DP Lab Received**	By: Date:

Do samples contain 'potential' HBM? Yes ☐ No ☐ (If YES, then handle, transport and store in accordance with FPM HAZID)

Field									DP Lab	For Despatch to			Notes
Sample ID	Depth (m)	Duplicate Sample	Sample Type S - soil W - water	Container Type G - glass P - plastic	ASS Samples	Sampling By	Sampling Date	Sampling Time	Storage Locn *	Envirolab Services 11/10/21	Lab 2 [B] Date	Lab 3 [C] Date	
301	0-0.2	–	ASB sheet	P		DEW/JCL	9.10.21						
	0.1-0.2	–	S	G,P	✓					11/10/21			
	0.35-0.45	–			✓								
	0.5-0.6	–			✓								
	0.9-1.0	–			✓								
	1.5-1.6	–			✓								
	2.1-2.2	–			✓								
↓	2.7-2.9	–	↓		✓								
302	0.1-0.3	–	S	G,P	✓					//			
	0.5-0.6	DI DEW			✓								
	1.0-1.1	–			✓					/			
	1.4-1.5	–			✓								
	2.0-2.1	–			✓								
	2.5-2.6	–			✓								
↓	2.9-3.0	–	↓	↓	✓								
303	0.1-0.2	–	S	G,P	✓								
	0.5-0.6	–	↓		✓								

* **Default storage:** **glass containers in fridge, plastic containers shelved, ASS in freezer, water samples in fridge**

A Envirolab Services

B Provide name of Lab 2

C Provide name of Lab 3

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CHAIN OF CUSTODY FIELD SHEET

Project No:	**102077.02**	**Client Project Name:**	**Newcastle West, 924 Hunter Street, PSI**
Client:	**Thirdi Dairy Farmers Pty Ltd**	**Location:**	**924 Hunter Street, Newcastle**
Project Manager:	**Dana Wilson**	**DP Lab Received**	By: Date:

Do samples contain 'potential' HBM? Yes ☐ No ☐ (If YES, then handle, transport and store in accordance with FPM HAZID)

Field									DP Lab	For Despatch to			Notes
Sample ID	Depth (m)	Duplicate Sample	Sample Type S - soil W - water	Container Type G - glass P - plastic	ASS Samples	Sampling By	Sampling Date	Sampling Time	Storage Locn *	Envirolab Services	Lab 2 B	Lab 3 C	
										Initials	Date	Date	
306	2.9-3.0	-	S	G,P	✓	DEW	9.10.21						
307	0.2-0.3	-	S	G,P	-	↓	↓			✓			
S1	-		FIBRO	P		DEW	9.10.21			✓			
S1	0-0.05		S	G,P		↓	↓			✓			

* **Default storage: glass containers in fridge, plastic containers shelved, ASS in freezer, water samples in fridge**

A Envirolab Services B Provide name of Lab 2 C Provide name of Lab 3

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CHAIN OF CUSTODY DESPATCH SHEET

Project No: 102077.02	**Suburb:** Newcastle		**To:** *Envirolab Services*
Project Manager: Dana Wilson	**Order Number:** 159090	**Sampler:** JRK/JCL	*12 Ashley St, Chatswood NSW 2067*
Email: Dana.Wilson@douglaspartners.com.au, Joshua.Kramer@douglaspartners.com.au			**Attn:** *Sample Receipt*
Turnaround time: ☐ Standard ☑ 72 hour ☐ 48 hour ☐ 24 hour ☐ Same day			**Contact:** *(02) 9910 6200 samplereceipt@envirolab.com.au*
Prior Storage: ☑ Fridge ☑ Freezer ☐ Shelf	**Do samples contain 'potential' HBM?** ☐ No ☑ Yes (If YES, then handle, transport and store in accordance with FPM HAZID)		

Lab ID	Sample ID: Location / Other ID	Sample ID: Depth From	Sample ID: Depth To	Date Sampled	Sample Type: S - soil W - water	Container Type: G - glass P - plastic	Analytes: Metals (17)	TRH, BTEX	PAH	OCP, OPP, PCB	VOC	Asbestos 500mL	Acid Sulfate Soil Screening	Detailed Chromium Suite	TCLP	Trip Spike	Trip Blank	Notes/ Preservation/ Additional Requirements
1	201	0.5	0.5	6/10/21	S	G	✓	✓	✓	✓								Combo 6
2	201	2.0	2.0	6/10/21	S	G	✓	✓	✓	✓								Combo 6
3	202	0.2	0.2	6/10/21	S	G	✓	✓	✓	✓	✓							Combo 6 + VOC
4	202	3.5	3.5	6/10/21	S	G	✓	✓	✓									Combo 3
5	203	0.5	0.5	6/10/21	S	G	✓	✓	✓	✓								Combo 6
6	204	0.2	0.2	6/10/21	S	G	✓	✓	✓	✓								Combo 6
7	204	4.0	4.0	6/10/21	S	G	✓	✓	✓									Combo 3
8	205	0.2	0.2	6/10/21	S	P						✓						Asbestos 500 mL
9	205	0.5	0.5	6/10/21	S	G,P	✓	✓	✓	✓	✓	✓						Combo 6 + VOC + 500mL
10	D1/JRK	-	-	6/10/21	S	G	✓	✓	✓	✓	✓							Combo 6 + VOC
11	GW1	-	-	7/10/21	W	G,P	✓				✓							Metals + VOC
12	GW3	-	-	7/10/21	W	G,P	✓				✓							Metals + VOC
13	R1	-	-	7/10/21	W	G,P	✓				✓							Metals + VOC
14	TS	-	-	7/10/21	W	G										✓		Trip Spike

Metals to analyse: 17- As, B, Ba, Be, Cd, Cr, Cu, Co, Hg, Mn, Mo, Ni, Pb, Sb, Se, Sn, Zn			**LAB RECEIPT**
Number of samples in container: 23	**Transported to laboratory by:** TOLL Courier		**Lab Ref. No:** 279939
Send results to: Douglas Partners Pty Ltd			**Received by:** NS MCK SARLAMI
Address: 15 Callistemon Close, Warabrook NSW 2304	**Phone:** (02) 4960 9600		**Date & Time:**
Relinquished by: JRK	**Date:** 7/10/2021	**Signed:**	**Signed:**

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CHAIN OF CUSTODY DESPATCH SHEET

Project No:	102077.02	**Suburb:**	Newcastle	**To:**	*Envirolab Services*
Project Manager:	Dana Wilson	**Order Number:**		**Dispatch date:**	07/10/2021
					12 Ashley St, Chatswood NSW 2067

Lab ID	Sample ID			Date Sampled	Sample Type	Container Type	Analytes											Notes/ Preservation/ Additional Requirements
	Location / Other ID	Depth From	Depth To		S - soil W - water	G - glass P - plastic	Metals (17)	TRH, BTEX	PAH	OCP, OPP, PCB	VOC	Asbestos 500mL	Acid Sulfate Soil Screening	Detailed Chromium Suite	TCLP	Trip Spike	Trip Blank	
15	TB	-	-	7/10/21	W	G											✓	Trip Blank
16	201	3.5	3.5	6/10/21	S	P							✓					Acid Sulfate Soil Screening
17	201	4.5	4.5	6/10/21	S	P							✓					Acid Sulfate Soil Screening
18	202	1.5	1.5	6/10/21	S	P							✓					Acid Sulfate Soil Screening
19	202	2.5	2.5	6/10/21	S	P							✓					Acid Sulfate Soil Screening
20	203	4	4	6/10/21	S	P							✓					Acid Sulfate Soil Screening
21	203	5	5	6/10/21	S	P							✓					Acid Sulfate Soil Screening
22	204	2	2	6/10/21	S	P							✓					Acid Sulfate Soil Screening
23	204	3.1	3.1	6/10/21	S	P							✓					Acid Sulfate Soil Screening
24	205	1.5	1.5	6/10/21	S	P							✓					Acid Sulfate Soil Screening
25	205	2.5	2.5	6/10/21	S	P							✓					Acid Sulfate Soil Screening

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102077.02 - A request

CHAIN OF CUSTODY DESPATCH SHEET

Project No: 102077.02	**Suburb:** Newcastle		**To:** Envirolab Services
Project Manager: Dana Wilson	**Order Number:** 159090	**Sampler:** JRK/JCL	12 Ashley St, Chatswood NSW 2067
Email: Dana.Wilson@douglaspartners.com.au, Joshua.Kramer@douglaspartners.com.au			**Attn:** Sample Receipt
Turnaround time: ☐ Standard ☑ 72 hour ☐ 48 hour ☐ 24 hour ☐ Same day			**Contact:** (02) 9910 6200 samplereceipt@envirolab.com.au
Prior Storage: ☑ Fridge ☑ Freezer ☐ Shelf	**Do samples contain 'potential' HBM?** ☐ No ☑ Yes (If YES, then handle, transport and store in accordance with FPM HAZID)		

Lab ID	Sample ID: Location / Other ID	Sample ID: Depth From	Sample ID: Depth To	Date Sampled	Sample Type: S - soil W - water	Container Type: G - glass P - plastic	Analytes: Metals (17)	TRH, BTEX	PAH	OCP, OPP, PCB	VOC	Asbestos 500mL	Acid Sulfate Soil Screening	Detailed Chromium Suite	TCLP	Trip Spike	Trip Blank	Notes/ Preservation/ Additional Requirements
1	201	0.5	0.5	6/10/21	S	G	✓	✓	✓	✓								Combo 6
2	201	2.0	2.0	6/10/21	S	G	✓	✓	✓	✓								Combo 6
3	202	0.2	0.2	6/10/21	S	G	✓	✓	✓	✓	✓							Combo 6 + VOC
4	202	3.5	3.5	6/10/21	S	G	✓	✓	✓									Combo 3
5	203	0.5	0.5	6/10/21	S	G	✓	✓	✓	✓								Combo 6
6	204	0.2	0.2	6/10/21	S	G	✓	✓	✓	✓								Combo 6
7	204	4.0	4.0	6/10/21	S	G	✓	✓	✓									Combo 3
8	205	0.2	0.2	6/10/21	S	P						✓						Asbestos 500 mL
9	205	0.5	0.5	6/10/21	S	G,P	✓	✓	✓	✓	✓	✓						Combo 6 + VOC + 500mL
10	D1/JRK	-	-	6/10/21	S	G	✓	✓	✓	✓	✓							Combo 6 + VOC
11	GW1	-	-	7/10/21	W	G,P	✓	X	X	low level PAH								Metals + VOC
12	GW3	-	-	7/10/21	W	G,P	✓	X	X	low level PAH								Metals + VOC
13	R1	-	-	7/10/21	W	G,P	✓	X	X	low level PAH								Metals + VOC
14	TS	-	-	7/10/21	W	G										✓		Trip Spike

Metals to analyse: 17- As, B, Ba, Be, Cd, Cr, Cu, Co, Hg, Mn, Mo, Ni, Pb, Sb, Se, Sn, Zn			**LAB RECEIPT** 279939-A.
Number of samples in container: 23	**Transported to laboratory by:** TOLL Courier		**Lab Ref. No:** 279939
Send results to: Douglas Partners Pty Ltd			**Received by:** NS Nick SARLAMIS
Address: 15 Callistemon Close, Warabrook NSW 2304	**Phone:** (02) 4960 9600		**Date & Time:**
Relinquished by: JRK	**Date:** 7/10/2021	**Signed:**	**Signed:**

TAT: 2 days.
Due: 15/10/2021 MT.

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CHAIN OF CUSTODY DESPATCH SHEET

Project No:	102077.02	**Suburb:**	Newcastle	**To:**	*Envirolab Services*
Project Manager:	Dana Wilson	**Order Number:**		**Dispatch date:**	07/10/2021
					12 Ashley St, Chatswood NSW 2067

Lab ID	Sample ID			Date Sampled	Sample Type	Container Type	Analytes											Notes/ Preservation/ Additional Requirements
	Location / Other ID	Depth From	Depth To		S - soil W - water	G - glass P - plastic	Metals (17)	TRH, BTEX	PAH	OCP, OPP, PCB	VOC	Asbestos 500mL	Acid Sulfate Soil Screening	Detailed Chromium Suite	TCLP	Trip Spike	Trip Blank	
15	TB	-	-	7/10/21	W	G											✓	Trip Blank
16	201	3.5	3.5	6/10/21	S	P							✓					Acid Sulfate Soil Screening
17	201	4.5	4.5	6/10/21	S	P							✓					Acid Sulfate Soil Screening
18	202	1.5	1.5	6/10/21	S	P							✓					Acid Sulfate Soil Screening
19	202	2.5	2.5	6/10/21	S	P							✓					Acid Sulfate Soil Screening
20	203	4	4	6/10/21	S	P							✓					Acid Sulfate Soil Screening
21	203	5	5	6/10/21	S	P							✓					Acid Sulfate Soil Screening
22	204	2	2	6/10/21	S	P							✓					Acid Sulfate Soil Screening
23	204	3.1	3.1	6/10/21	S	P							✓					Acid Sulfate Soil Screening
24	205	1.5	1.5	6/10/21	S	P							✓					Acid Sulfate Soil Screening
25	205	2.5	2.5	6/10/21	S	P							✓					Acid Sulfate Soil Screening

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CHAIN OF CUSTODY DESPATCH SHEET

Project No:	102077.02	**Suburb:**	Newcastle	**To:**	*Envirolab Services*
Project Manager:	Dana Wilson	**Order Number:**	159101	**Sampler:**	JRK
					12 Ashley St, Chatswood NSW 2067
Email:	Dana.Wilson@douglaspartners.com.au, Joshua.Kramer@douglaspartners.com.au			**Attn:**	*Sample Receipt*
Turnaround time:	☐ Standard ☑ 72 hour ☐ 48 hour ☐ 24 hour ☐ Same day			**Contact:**	*(02) 9910 6200 samplereceipt@envirolab.com.au*
Prior Storage:	☑ Fridge ☐ Freezer ☐ Shelf	**Do samples contain 'potential' HBM?**	☑ No ☐ Yes (If YES, then handle, transport and store in accordance with FPM HAZID)		

Lab ID	Sample ID: Location / Other ID	Sample ID: Depth From	Sample ID: Depth To	Date Sampled	Sample Type: S - soil W - water	Container Type: G - glass P - plastic	Analytes: Metals (17)	Analytes: VOC										Notes/ Preservation/ Additional Requirements
1	203	-	-	12/10/21	W	G,P	✓	✓										Metals + VOC
2	204	-	-	12/10/21	W	G,P	✓	✓										Metals + VOC
3	GWD1	-	-	12/10/21	W	G,P	✓	✓										Metals + VOC
																		72 hour turnaround on laboratory results

Metals to analyse:	17- As, B, Ba, Be, Cd, Cr, Cu, Co, Hg, Mn, Mo, Ni, Pb, Sb, Se, Sn, Zn			**LAB RECEIPT**	180242
Number of samples in container:	3	**Transported to laboratory by:**	TOLL Courier	**Lab Ref. No:**	
Send results to:	Douglas Partners Pty Ltd			**Received by:**	CMcLenna
Address:	15 Callistemon Close, Warabrook NSW 2304	**Phone:**	(02) 4960 9600	**Date & Time:**	12/10/21 900
Relinquished by:	JRK	**Date:**	12/10/2021	**Signed:**	
				Signed:	CM

Douglas Partners
Geotechnics / Environment / Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No: 102077.02	**Suburb:** Newcastle		**To:** Envirolab Services
Project Manager: Dana Wilson	**Order Number:** 159090	**Sampler:** JRK/JCL	12 Ashley St, Chatswood NSW 2067
Email: Dana.Wilson@douglaspartners.com.au, Joshua.Kramer@douglaspartners.com.au			**Attn:** Sample Receipt
Turnaround time: ☐ Standard ☑ 72 hour ☐ 48 hour ☐ 24 hour ☐ Same day			**Contact:** (02) 9910 6200 samplereceipt@envirolab.com.au
Prior Storage: ☑ Fridge ☑ Freezer ☐ Shelf	**Do samples contain 'potential' HBM?** ☐ No ☑ Yes (If YES, then handle, transport and store in accordance with FPM HAZID)		

Lab ID	Sample ID: Location / Other ID	Sample ID: Depth From	Sample ID: Depth To	Date Sampled	Sample Type: S - soil W - water	Container Type: G - glass P - plastic	Analytes: Metals (17)	TRH, BTEX	PAH	OCP, OPP, PCB	VOC	Asbestos 500mL	Acid Sulfate Soil Screening	Detailed Chromium Suite	TCLP	pH	CEC	Notes/ Preservation/ Additional Requirements
1	201	0.5	0.5	6/10/21	S	G	✓	✓	✓	✓						pH		Combo 6
2	201	2.0	2.0	6/10/21	S	G	✓	✓	✓	✓					Pb			Combo 6
3	202	0.2	0.2	6/10/21	S	G	✓	✓	✓	✓	✓							Combo 6 + VOC
4	202	3.5	3.5	6/10/21	S	G	✓	✓	✓									Combo 3
5	203	0.5	0.5	6/10/21	S	G	✓	✓	✓	✓					Pb/PAH	pH	CEC	Combo 6
6	204	0.2	0.2	6/10/21	S	G	✓	✓	✓	✓						pH		Combo 6
7	204	4.0	4.0	6/10/21	S	G	✓	✓	✓									Combo 3
8	205	0.2	0.2	6/10/21	S	P						✓						Asbestos 500 mL
9	205	0.5	0.5	6/10/21	S	G,P	✓	✓	✓	✓	✓	✓						Combo 6 + VOC + 500mL
10	D1/JRK	-	-	6/10/21	S	G	✓	✓	✓	✓	✓							Combo 6 + VOC
11	GW1	-	-	7/10/21	W	G,P	✓				✓							Metals + VOC
12	GW3	-	-	7/10/21	W	G,P	✓				✓							Metals + VOC
13	R1	-	-	7/10/21	W	G,P	✓				✓							Metals + VOC
14	TS	-	-	7/10/21	W	G										✓		Trip Spike

Metals to analyse: 17- As, B, Ba, Be, Cd, Cr, Cu, Co, Hg, Mn, Mo, Ni, Pb, Sb, Se, Sn, Zn			**LAB RECEIPT** 279939-B
Number of samples in container: 23	**Transported to laboratory by:** TOLL Courier		**Lab Ref. No:** 279939
Send results to: Douglas Partners Pty Ltd			**Received by:** NS MCK SARLAMI
Address: 15 Callistemon Close, Warabrook NSW 2304	**Phone:** (02) 4960 9600		**Date & Time:**
Relinquished by: JRK	**Date:** 7/10/2021	**Signed:**	**Signed:**

Due: 18-19/10/2021.

Douglas Partners
Geotechnics | Environment | Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	102077.02	**Suburb:**	Newcastle	**To:**	*Envirolab Services*
Project Manager:	Dana Wilson	**Order Number:**		**Dispatch date:**	07/10/2021
					12 Ashley St, Chatswood NSW 2067

Lab ID	Sample ID: Location / Other ID	Depth From	Depth To	Date Sampled	Sample Type: S - soil W - water	Container Type: G - glass P - plastic	Analytes: Metals (17)	TRH, BTEX	PAH	OCP, OPP, PCB	VOC	Asbestos 500mL	Acid Sulfate Soil Screening	Detailed Chromium Suite	TCLP	Trip Spike	Trip Blank	Notes/ Preservation/ Additional Requirements
15	TB	-	-	7/10/21	W	G											✓	Trip Blank
16	201	3.5	3.5	6/10/21	S	P							✓					Acid Sulfate Soil Screening
17	201	4.5	4.5	6/10/21	S	P							✓					Acid Sulfate Soil Screening
18	202	1.5	1.5	6/10/21	S	P							✓					Acid Sulfate Soil Screening
19	202	2.5	2.5	6/10/21	S	P							✓					Acid Sulfate Soil Screening
20	203	4	4	6/10/21	S	P							✓					Acid Sulfate Soil Screening
21	203	5	5	6/10/21	S	P							✓					Acid Sulfate Soil Screening
22	204	2	2	6/10/21	S	P							✓					Acid Sulfate Soil Screening
23	204	3.1	3.1	6/10/21	S	P							✓	⊗				Acid Sulfate Soil Screening
24	205	1.5	1.5	6/10/21	S	P							✓	⊗				Acid Sulfate Soil Screening
25	205	2.5	2.5	6/10/21	S	P							✓					Acid Sulfate Soil Screening
																		279939-B.

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ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

SAMPLE RECEIPT ADVICE

Client Details

Client	Douglas Partners Newcastle
Attention	Joshua Kramer

Sample Login Details

Your reference	102077.02, Newcastle
Envirolab Reference	279939
Date Sample Received	08/10/2021
Date Instructions Received	08/10/2021
Date Results Expected to be Reported	15/10/2021

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	20 Soil, 5 Water
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	8
Cooling Method	Ice
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	**Phone: 02 9910 6200**
Fax: 02 9910 6201	**Fax: 02 9910 6201**
Email: ahie@envirolab.com.au	**Email: jhurst@envirolab.com.au**

Analysis Underway, details on the following page:

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Sample ID	VOCs in soil	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides in Soil	PCBsin Soil	Acid Extractable metalsin soil	Asbestos ID - soils NEPM	sPOCAS field test	VOCs in water	BTEX in Water	HM in water - dissolved
201-0.5		✓	✓	✓	✓	✓	✓	✓					
201-2.0		✓	✓	✓	✓	✓	✓	✓					
202-0.2	✓	✓	✓	✓	✓	✓	✓	✓					
202-3.5		✓	✓	✓				✓					
203-0.5		✓	✓	✓	✓	✓	✓	✓					
204-0.2		✓	✓	✓	✓	✓	✓	✓					
204-4.0		✓	✓	✓				✓					
205-0.2									✓				
205-0.5	✓	✓	✓	✓	✓	✓	✓	✓	✓				
D1/JRK	✓	✓	✓	✓	✓	✓	✓	✓					
GW1											✓		✓
GW3											✓		✓
R1											✓		✓
TS												✓	
TB												✓	
201-3.5										✓			
201-4.5										✓			
202-1.5										✓			
202-2.5										✓			
203-4										✓			
203-5										✓			
204-2										✓			
204-3.1										✓			
205-1.5										✓			
205-2.5										✓			

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.
Requests for longer term sample storage must be received in writing.
Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.
TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

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customerservice@envirolab.com.au
www.envirolab.com.au

SAMPLE RECEIPT ADVICE

Client Details

Client	Douglas Partners Newcastle
Attention	Dana Wilson

Sample Login Details

Your reference	102077.02, Newcastle
Envirolab Reference	279939-A
Date Sample Received	08/10/2021
Date Instructions Received	13/10/2021
Date Results Expected to be Reported	15/10/2021

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	additional analysis
Turnaround Time Requested	2 days
Temperature on Receipt (°C)	8
Cooling Method	Ice
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	**Phone: 02 9910 6200**
Fax: 02 9910 6201	**Fax: 02 9910 6201**
Email: ahie@envirolab.com.au	**Email: jhurst@envirolab.com.au**

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Sample ID	vTRH(C6-C10)/BTEXN in Water	svTRH (C10-C40) in Water	PAHs in Water - Low Level	On Hold
201-0.5				✓
201-2.0				✓
202-0.2				✓
202-3.5				✓
203-0.5				✓
204-0.2				✓
204-4.0				✓
205-0.2				✓
205-0.5				✓
D1/JRK				✓
GW1	✓	✓	✓	
GW3	✓	✓	✓	
R1	✓	✓	✓	
TS				✓
TB				✓
201-3.5				✓
201-4.5				✓
202-1.5				✓
202-2.5				✓
203-4				✓
203-5				✓
204-2				✓
204-3.1				✓
205-1.5				✓
205-2.5				✓
202 - [TRIPLICATE]-0.2				✓

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

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TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

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SAMPLE RECEIPT ADVICE

Client Details

Client	Douglas Partners Newcastle
Attention	Dana Wilson

Sample Login Details

Your reference	102077.02, Newcastle
Envirolab Reference	279939-B
Date Sample Received	08/10/2021
Date Instructions Received	13/10/2021
Date Results Expected to be Reported	18/10/2021

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	additional analysis
Turnaround Time Requested	2 days
Temperature on Receipt (°C)	8
Cooling Method	Ice
Sampling Date Provided	YES

Comments

Chromium suite ready 19/10/21

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	**Phone: 02 9910 6200**
Fax: 02 9910 6201	**Fax: 02 9910 6201**
Email: ahie@envirolab.com.au	**Email: jhurst@envirolab.com.au**

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Sample ID	Misc Inorg - Soil	CEC	TCLP Preparation - Acid	Naphthalene in TCLP	Acenaphthylene in TCLP	Acenaphthene in TCLP	Fluorene in TCLP	Phenanthrene in TCLP	Anthracene in TCLP	Fluoranthene in TCLP	Pyrene in TCLP	Benzo(a)anthracene in TCLP	Chrysene in TCLP	Benzo(bjk)fluoranthene in TCLP	Benzo(a)pyrene in TCLP	Indeno(1,2,3-c,d)pyrene - TCLP	Dibenzo(a,h)anthracene in TCLP	Benzo(g,h,i)perylene in TCLP	Total +vePAH's	Surrogate p-Terphenyl-d14	Lead	Chromium Suite	On Hold
201-0.5	✓																						
201-2.0			✓																		✓		
202-0.2																							✓
202-3.5																							✓
203-0.5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
204-0.2	✓																						
204-4.0																							✓
205-0.2																							✓
205-0.5																							✓
D1/JRK																							✓
GW1																							✓
GW3																							✓
R1																							✓
TS																							✓
TB																							✓
201-3.5																							✓
201-4.5																							✓
202-1.5																							✓
202-2.5																							✓
203-4																							✓

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Sample ID	Misc Inorg - Soil	CEC	TCLP Preparation - Acid	Naphthalene in TCLP	Acenaphthylene in TCLP	Acenaphthene in TCLP	Fluorene in TCLP	Phenanthrene in TCLP	Anthracene in TCLP	Fluoranthene in TCLP	Pyrene in TCLP	Benzo(a)anthracene in TCLP	Chrysene in TCLP	Benzo(bjk)fluoranthene in TCLP	Benzo(a)pyrene in TCLP	Indeno(1,2,3-c,d)pyrene - TCLP	Dibenzo(a,h)anthracene in TCLP	Benzo(g,h,i)perylene in TCLP	Total +vePAH's	Surrogate p-Terphenyl-d14	Lead	Chromium Suite	On Hold
203-5																							✓
204-2																							✓
204-3.1																						✓	
205-1.5																						✓	
205-2.5																							✓
202 - [TRIPLICATE]-0.2																							✓

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.

Requests for longer term sample storage must be received in writing.

Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.

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SAMPLE RECEIPT ADVICE

Client Details

Client	Douglas Partners Newcastle
Attention	Dana Wilson

Sample Login Details

Your reference	102077.02, Newcastle
Envirolab Reference	280242
Date Sample Received	13/10/2021
Date Instructions Received	13/10/2021
Date Results Expected to be Reported	18/10/2021

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	3 Water
Turnaround Time Requested	3 days
Temperature on Receipt (°C)	10
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	**Phone: 02 9910 6200**
Fax: 02 9910 6201	**Fax: 02 9910 6201**
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Sample ID	VOCs in water	All metals in water-dissolved
203	✓	✓
204	✓	✓
GWD1	✓	✓

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.
Requests for longer term sample storage must be received in writing.
Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.
TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

Appendix G

Site Assessment Criteria

Appendix G
Site Assessment Criteria
924 Hunter Street, Newcastle West

G1.0 Introduction

G1.1 Guidelines

The following key guidelines were consulted for deriving the site assessment criteria (SAC):

- NEPC *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]* (NEPC, 2013).
- CRC CARE *Health screening levels for petroleum hydrocarbons in soil and groundwater* (CRC CARE, 2011).
- ANZG *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZG, 2018).
- NHMRC, NRMMC *Australian Drinking Water Guidelines 6 2011, Version 3.2* (NHMRC, NRMMC, 2016).
- ANZECC *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZECC, 2000).

G1.2 General

The SAC applied in the current investigation are informed by the CSM which identified human and environmental receptors to potential contamination at the site. Analytical results are assessed (as a Tier 1 assessment) against the SAC comprising primarily the investigation and screening levels of Schedule B1 of NEPC (2013).

The following inputs are relevant to the selection and/or derivation of the SAC:

- Land use: commercial / industrial based on proposed ground floor land use with reference to NEPC (2013).
    - Corresponding to land use category 'D', commercial / industrial such as shops, offices, factories and industrial sites.
- Soil type: sand being the predominant soil type.

G2.0 Soils

G2.1 Health Investigation and Screening Levels

The generic health investigation levels (HIL) and health screening levels (HSL) are considered to be appropriate for the assessment of human health risk via all relevant pathways of exposure associated with contamination at the site. The adopted soil HIL and HSL for the contaminants of concern are in Table 1 and Table 2.

Table 1: Health Investigation Levels (mg/kg)

Contaminant	HIL-B	HIL-D
Metals		
Arsenic	500	3000
Beryllium	90	500
Boron	40 000	300 000
Cadmium	150	900
Chromium (VI)	500	3600
Cobalt	600	4000
Copper	30 000	240 000
Lead	1200	1500
Manganese	14 000	60 000
Mercury (inorganic)	120	730
Methyl mercury	30	180
Nickel	1200	6000
Selenium	1400	10 000
Zinc	60 000	400 000
Barium	NC	NC
Molybdenum	NC	NC
Antimony	NC	NC
Selenium	NC	NC
Tin	NC	NC
PAH		
B(a)P TEQ	4	40
Total PAH	400	4000
OCP		
DDT+DDE+DDD	600	3600
Aldrin and dieldrin	10	45
Chlordane	90	530
Endosulfan	400	2000
Endrin	20	100
Heptachlor	10	50
HCB	15	80
Methoxychlor	500	2500
OPP		
Chlorpyrifos	340	2000
PCB		
PCB	1	7
VOC (various analytes)	-	-

Table 2: Health Screening Levels (mg/kg)

Contaminant	HSL-A&B	HSL-A&B	HSL-A&B
SAND	**0 m to <1 m**	**1 m to <2 m**	**2 m to <4 m**
Benzene	0.5	0.5	0.5
Toluene	160	220	310
Ethylbenzene	55	NL	NL
Xylenes	40	60	95
Naphthalene	3	NL	NL
TRH F1	45	70	110
TRH F2	110	240	440

Notes to Table 2

TRH F1 is TRH C_6-C_{10} minus BTEX

TRH F2 is TRH >C_{10}-C_{16} minus naphthalene

The soil saturation concentration (Csat) is defined as the soil concentration at which the porewater phase cannot dissolve any more of an individual chemical. The soil vapour that is in equilibrium with the porewater will be at its maximum. If the derived soil HSL exceeds Csat, a soil vapour source concentration for a petroleum mixture could not exceed a level that would results in the maximum allowable vapour risk for the given scenario. For these scenarios, no HSL is presented for these chemicals and the HSL is shown as 'not limiting' or 'NL'

Table 3: Health Screening Levels (mg/kg)

Contaminant	HSL-D	HSL-D	HSL-D
SAND	**0 m to <1 m**	**1 m to <2 m**	**2 m to <4 m**
Benzene	3	3	3
Toluene	NL	NL	NL
Ethylbenzene	NL	NL	NL
Xylenes	230	NL	NL
Naphthalene	NL	NL	NL
TRH F1	260	370	630
TRH F2	NL	NL	NL

Notes to Table 3:

TRH F1 is TRH C_6-C_{10} minus BTEX

TRH F2 is TRH >C_{10}-C_{16} minus naphthalene

The soil saturation concentration (Csat) is defined as the soil concentration at which the porewater phase cannot dissolve any more of an individual chemical. The soil vapour that is in equilibrium with the porewater will be at its maximum. If the derived soil HSL exceeds Csat, a soil vapour source concentration for a petroleum mixture could not exceed a level that would results in the maximum allowable vapour risk for the given scenario. For these scenarios, no HSL is presented for these chemicals and the HSL is shown as 'not limiting' or 'NL'

The HSL for direct contact derived from CRC CARE (2011) are in Table 4.

Table 4: Health Screening Levels for Direct Contact (mg/kg)

Contaminant	DC HSL-B	DC HSL-D	DC HSL-IMW
Benzene	140	430	1100
Toluene	21 000	99 000	120 000
Ethylbenzene	5900	27 000	85 000
Xylenes	17 000	81 000	130 000
Naphthalene	2200	11 000	29 000
TRH F1	5600	26 000	82 000
TRH F2	4200	20 000	62 000
TRH F3	5800	27 000	85 000
TRH F4	8100	38 000	120 000

Notes to Table 4:
TRH F1 is TRH C_6-C_{10} minus BTEX
TRH F2 is TRH >C_{10}-C_{16} minus naphthalene
IMW intrusive maintenance worker

G2.2 Asbestos in Soil

Based on the CSM and/or current site access limitations, a detailed asbestos assessment was not considered to be warranted/feasible at this stage.

The HSL for asbestos in soil are based on likely exposure levels for different scenarios published in NEPC (2013) for the following forms of asbestos:

- Bonded asbestos containing material (ACM); and
- Fibrous asbestos and asbestos fines (FA and AF).

The HSL are in Table 5.

Table 5: Health Screening Levels for Asbestos

Form of Asbestos	HSL-B	HSL-D
ACM	0.04%	0.05%
FA and AF	0.001%	0.001%
FA and AF and ACM	No visible asbestos for surface soil *	No visible asbestos for surface soil *

Notes to Table 5:
Surface soils defined as top 10 cm.
* Based on site observations during the site walkover and at the sampling points and the analytical results of surface samples.

G2.3 Ecological Investigation Levels

Ecological investigation levels (EIL) and added contaminant limits (ACL), where appropriate, have been derived in NEPC (2013) for arsenic, copper, chromium (III), nickel, lead, zinc, DDT and naphthalene. The adopted EIL, derived using the interactive (excel) calculation spreadsheet on the NEPM toolbox website are shown in Table 7, with inputs into their derivation shown in Table 6.

Table 6: Inputs to the Derivation of the Ecological Investigation Levels

Variable	Input	Rationale
Age of contaminants	"Aged" (>2 years)	Potentially contaminating activities > 2 years
pH	pH 8.0 for coarse / fill material	Testing of selected upper fill samples pH 8.1-8.7
	pH 4.0 for sand / natural soils	Testing of selected natural soil samples pH 4.0-7.3 based on ASS screening tests
CEC	9.6 $cmol_c/kg$	Limited testing of CEC indicated 9.6 $cmol_c/kg$
Clay content	5%	Assumed (conservative)
Traffic volumes	High	High traffic locality
State / Territory	NSW	Locality

Table 7: Ecological Investigation Levels (mg/kg)

Contaminant	Soil type	EIL-A-B-C	EIL-D
Metals	Coarse / fill		
Arsenic	Coarse / fill	100	160
Copper	Coarse / fill	210	300
Nickel	Coarse / fill	160	260
Chromium III	Coarse / fill	330	540
Lead	Coarse / fill	1100	1800
Zinc	Coarse / fill	510	730
PAH	Coarse / fill		
Naphthalene	Coarse / fill	170	370
OCP	Coarse / fill		
DDT	Coarse / fill	180	640
Metals	Sand / natural		
Arsenic	Sand / natural	100	160
Copper	Sand / natural	65	85
Nickel	Sand / natural	160	260
Chromium III	Sand / natural	330	540
Lead	Sand / natural	1100	1800
Zinc	Sand / natural	210	250
PAH	Sand / natural		
Naphthalene	Sand / natural	170	370
OCP	Sand / natural		
DDT	Sand / natural	180	640

Notes to Table 7:

EIL-AES area of ecological significance

EIL-A-B-C urban residential and public open space

G2.4 Ecological Screening Levels

Ecological screening levels (ESL) are used to assess the risk of selected petroleum hydrocarbon compounds, BTEX and benzo(a)pyrene to terrestrial ecosystems. The adopted ESL are shown in Table 8.

Table 8: Ecological Screening Levels (mg/kg)

Contaminant	Soil Type	EIL-A-B-C	EIL-D
Benzene	Coarse	50	75
Toluene	Coarse	85	135
Ethylbenzene	Coarse	70	165
Xylenes	Coarse	105	180
TRH F1	Coarse/ Fine	180*	215*
TRH F2	Coarse/ Fine	120*	170*
TRH F3	Coarse	300	1700
TRH F4	Coarse	2800	3300
B(a)P	Coarse	(0.7) 33 (refer below)	(1.4) 33 (refer below)

Notes to Table 8:
ESL are of low reliability except where indicated by * which indicates that the ESL is of moderate reliability
TRH F1 is TRH C_6-C_{10} minus BTEX
TRH F2 is TRH >C_{10}-C_{16} including naphthalene
EIL-A-B-C urban residential and public open space

The NEPM (2013) ESL of 0.7 mg/kg for benzo(a)pyrene (B(a)P) is understood to be based on a single invertebrate species referenced in the Canadian Soil Quality Guidelines (1999, since updated) and is considered conservative in the Australian context. These guidelines were updated in 2010 and now suggest a B(a)P concentration of 20 mg/kg for the protection of environmental health based on the soil contact exposure pathway.

It is also noted that the B(a)P ESL is a low reliability value. Higher reliability screening levels have been published in CRC CARE (2017), Risk-based Management and Remediation Guidance for Benzo(a)pyrene, CRC CARE Technical Report No. 39. The high reliability value of 33 mg/kg for fresh contamination recommended in CRC CARE (2017) has therefore been adopted.

G2.5 Management Limits

In addition to appropriate consideration and application of the HSL and ESL, there are additional considerations which reflect the nature and properties of petroleum hydrocarbons, including:

- Formation of observable light non-aqueous phase liquids (LNAPL);
- Fire and explosion hazards;
- Effects on buried infrastructure eg: penetration of, or damage to, in-ground services.

The adopted management limits are in Table 9.

Table 9: Management Limits (mg/kg)

Contaminant	Soil Type	ML-A-B-C	ML-D
TRH F1	Coarse	700	700
TRH F2	Coarse	1000	1000
TRH F3	Coarse	2500	3500
TRH F4	Coarse	10 000	10 000

Notes to Table 9:
TRH F1 is TRH C_6-C_{10} including BTEX
TRH F2 is TRH >C_{10}-C_{16} including naphthalene
ML-A-B-C residential, parkland and public open space

G3.0 Groundwater

G3.1 Introduction

The groundwater investigation levels (GIL) used for interpretation of the groundwater data (as a Tier 1 assessment) have been selected based on the potential risks posed from contamination sourced from the site to receptors at or down-gradient of the site, as identified by the conceptual site model (CSM). The receptors, exposure points and pathways are summarised in Table 10.

Table 10: Summary of Potential Receptors and Potential Risks

Receptor	Location	Exposure Point	Exposure Pathway
Surface water aquatic ecosystem	Down-gradient from site.	Receiving surface water body at the groundwater discharge point.	Exposure to contaminants.
Occupants of buildings	On site and down-gradient from site.	Enclosed buildings (existing and proposed).	Inhalation of VOC (including TRH and BTEX) overlying VOC impacted groundwater via the vapour intrusion pathway.

The rationale for the selection of GIL is in Table 11.

Table 11: Groundwater Investigation Level Rationale

Receptor / Beneficial Use	GIL	Source	Comments / Rationale
Aquatic ecosystem	DGV	ANZG (2018)	Marine water 99% LOP for bioaccumulative contaminants 95% LOP for non-bioaccumulative contaminants
Building occupants (vapour intrusion)	HSL	NEPC (2013)	2 m to <4 m

Notes to Table 11:
DGV default guideline value
% LOP percentage level of protection of species
HSL health screening level
GV guideline value
LTV long term value (up to 100 years)
STV short term value (up to 20 years)

G3.2 Groundwater Investigation Levels for Aquatic Ecosystems

The DGV for the protection of aquatic ecosystems derived from ANZG (2018) are in Table 12.

Table 12: Groundwater Investigation Levels for Protection of Aquatic Ecosystems (mg/L)

Contaminant	Marine Water 95% protection DGV
Metals	**-**
Arsenic	-
Beryllium	-
Boron	-
Cadmium	0.0007
Chromium (VI)	0.0044
Cobalt	0.001
Copper	0.0013
Lead	0.0044
Manganese	0.08 (LOSP unknown)
Mercury (inorganic)	0.0004
Methyl mercury	-
Nickel	0.07
Selenium	-
Zinc	0.008
PAH	
B(a)P	0.0001
Anthracene	0.00001
Fluoranthene	0.001
Naphthalene	0.05
Phenanthrene	0.0006
Total PAH	-
BTEX	
Benzene	0.7
Ethylbenzene	0.08
m-Xylene	0.075
Toluene	0.18
VOCs	
1,1,2-trichloroethane	1.9
Isopropylbenzene	0.03
1,1,1-trichloroethane	0.27
1,1-dichloroethane	19
1,2,4-trichlorobenzene	0.08
TRH	NC

Notes to Table 12:

Where the contaminant does not have a % LOP, the 'unknown' LOP has been adopted

LOSP – level of species protection

G3.3 Health Screening Levels for Vapour Intrusion

The HSL to evaluate potential vapour intrusion risks derived from NEPC (2013) are in Table 13.

Table 13: Groundwater Health Screening Levels for Vapour Intrusion (µg/L)

Contaminant	HSL-A&B	HSL-D	Solubility Limit
SAND	**2 m to <4 m**	**2 m to <4 m**	**-**
Benzene	800	5000	59 000
Toluene	NL	NL	61 000
Ethylbenzene	NL	NL	3900
Xylenes	NL	NL	21 000
Naphthalene	NL	NL	170
TRH F1	1000	6000	9000
TRH F2	1000	NL	3000

Notes to Table 13:

TRH F1 is TRH C_6-C_{10} minus BTEX

TRH F2 is TRH >C_{10}-C_{16} minus naphthalene

The solubility limit is defined as the groundwater concentration at which the water cannot dissolve any more of an individual chemical based on a petroleum mixture. The soil vapour that is in equilibrium with the groundwater will be at its maximum. If the derived groundwater HSL exceeds the water solubility limit, a soil vapour source concentration for a petroleum mixture could not exceed a level that would result in the maximum allowable vapour risk for the given scenario. For these scenarios, no HSL is presented for these chemicals and the HSL is shown as 'not limiting' or 'NL'.

G4.0 References

ANZECC. (2000). *Australian and New Zealand Guidelines for Fresh and Marine Water Quality.* Australia and New Zealand Environment and Conservation Council.

ANZG. (2018). *Australian and New Zealand Guidelines for Fresh and Marine Water Quality.* Canberra, ACT: Australian and New Zealand Governments and Australian state and territory governments.

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NEPC. (2013). *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM].* Australian Government Publishing Services Canberra: National Environment Protection Council.

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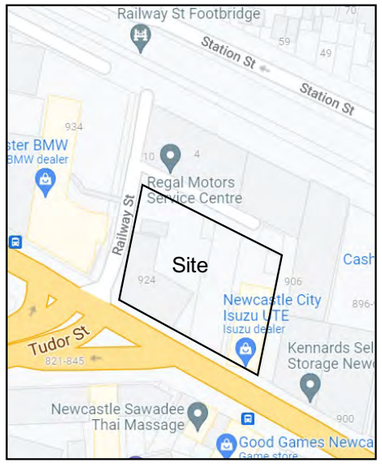
Douglas Partners Pty Ltd

Appendix H

Drawing 1 – Test Location Plan and Site Features
Douglas Partners (1995) – Test Location Plan
CKDS – Proposed Development Plans



Site Location

Drawing adapted from MetroMap Image dated 06.06.2021.

Legend

- (W) Groundwater Monitoring Well (current investigation)
- Borehole Location (Drilling Rig) (current investigation)
- Borehole Location (Hand Auger) (current investigation)
- Surface Sampling Location (current investigation)
- Geotechnical Borehole Location (Drilling Rig) (DP, 1995)
- Previous CPT Location (DP, 2020)
- Site Boundary
- Approx Location of Underground Fuel Storage Tanks
- Approx Location of Former DFC Buildings / Structures based on Title Plans
- Existing Groundwater Monitoring Well (by others, date unknown)
- Lot Boundaries

Douglas Partners
Geotechnics | Environment | Groundwater

CLIENT:	Thirdi Dairy Farmers Pty Ltd	
OFFICE:	Newcastle	DRAWN BY: PLH
SCALE:	1:500 @ A3	DATE: 20.October.2021

TITLE: **Test Location Plan and Site Features**
Proposed Apartments
924 Hunter Street, Newcastle

PROJECT No:	102077.02
DRAWING No:	1
REVISION:	0

PROPOSED
WORKSHOP

B1

PROPOSED
SPARE PARTS

TIGHE STREET

RAILWAY STREET

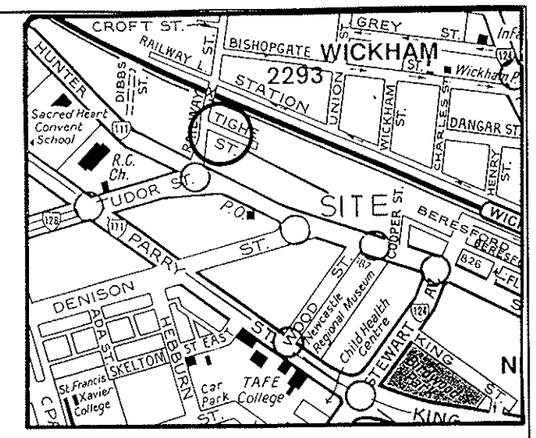
PROPOSED
SHOWROOM

B2

PROPOSED
SHOWROOM

HUNTER STREET

N



LOCALITY PLAN

DRAWING ADAPTED FROM DRAWING NO 7497/01 SUPPLIED BY RODD HAY & CRAIG ASSOCIATES PTY LTD

LEGEND

TEST BORE LOCATION

Douglas Partners
Geotechnics • Environment • Groundwater

Sydney, Newcastle, Brisbane, Melbourne, Perth, Wyong, Singleton, Campbelltown, Townsville, Cairns, Darwin.

TITLE: TEST LOCATION PLAN
PROPOSED SHOWROOM & WORKSHOPS
HUNTER STREET
NEWCASTLE WEST

CLIENT: HTL REINHOLD PTY LTD			
DRAWN BY: PA	SCALE: 1:400	PROJECT No.: 18402	OFFICE: NEWCASTLE
APPROVED BY:		DATE: 19.10.95	DRAWING No.: 1

1 Ground
SCALE 1:200 @ A1

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issue	description	date	verified
01	Issue for Review	20/7/21	01
02	Issue for Review	10/8/21	02
03	Issue for Coordination	7/9/21	03
04	Issue for Pre-DA	16/9/21	04
05	Issue for Pre-DA	27/9/21	05
06	Issue for Draft DA	1/10/21	06
07	Issue for DRAFT DA	8/10/21	07
A	Issue for Development Application	20/10/21	A

key plan

North Point

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project

Dairy Farmers Corner

924 Hunter Street 2/DP445736
Newcastle West NSW 2302

drawing title

General Arrangement Plans
Ground Floor Plan

drawing scale	drawn	verified	date
AS SHOWN		SC	20/10/21

project #	drawing #	issue
21014	A-1101	A

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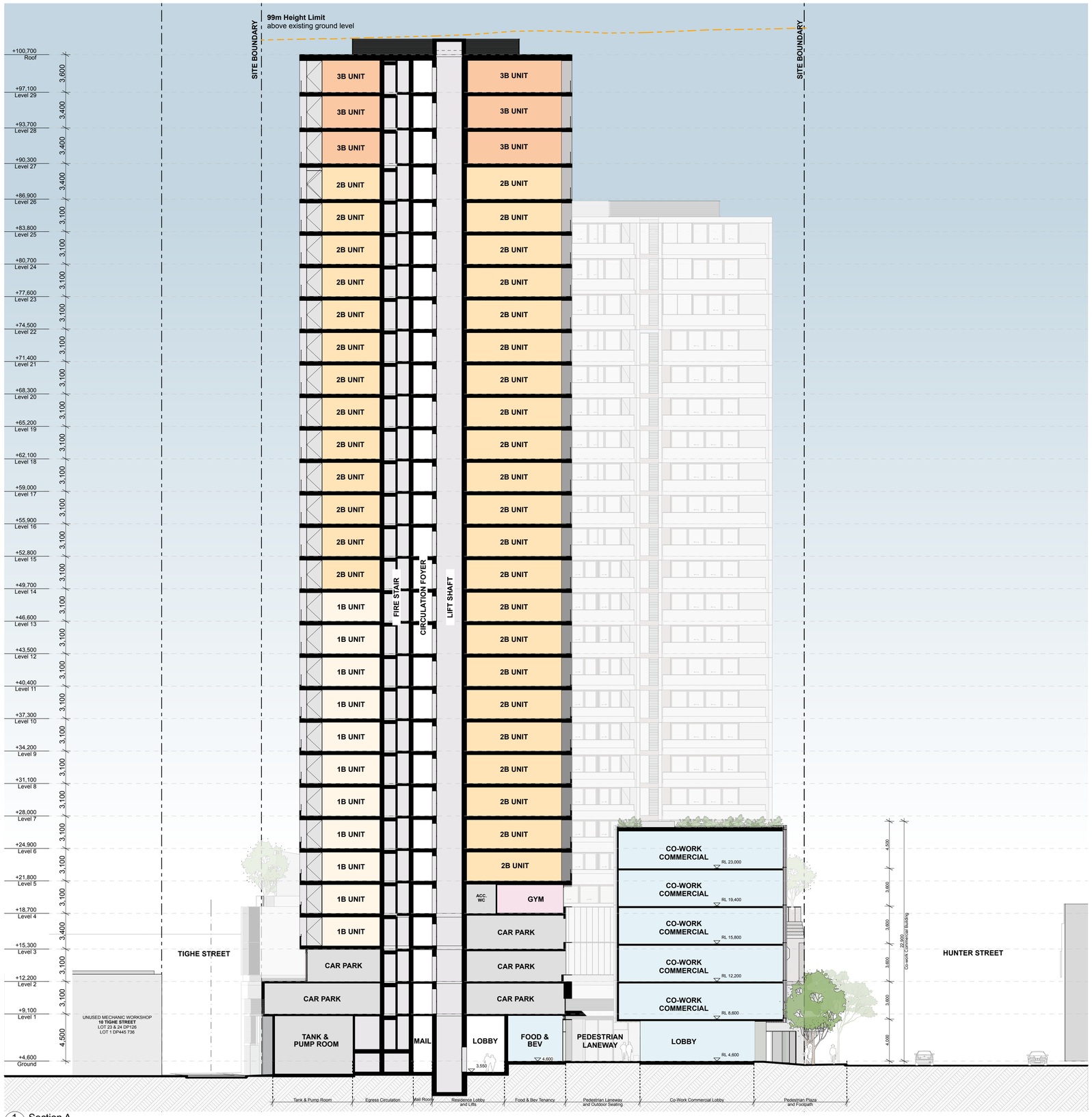

1 Section A
SCALE 1:200 @ A1

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03	Issue for Pre-DA	27/9/21	03
04	Issue for Draft DA	1/10/21	04
05	Issue for DRAFT DA	8/10/21	05
A	Issue for Development Application	20/10/21	A

key plan

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project

Dairy Farmers Corner

924 Hunter Street 2/DP445736
Newcastle West NSW 2302

drawing title

Sections
Section A

drawing scale	drawn	verified	date
AS SHOWN		SC	20/10/21

project #	drawing #	issue
21014	A-3001	A

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Appendix I

HERITAGE IMPACT ASSESSMENT (HERITAS ARCHITECTURE)

Dairy Farmers
Corner

924 Hunter Street
Newcastle West NSW 2302

Statement of Heritage Impact

Issue B | 19 October 2021 ©

HERITAS
HERITAGE & CONSERVATION

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DOCUMENT TRACKING

Issue	A	**B**
Date	15 October 2021	**19 October 2021**
Status	for comment	**for DA**

Cover Image

Illuminated front facade of the new Dairy Farmers' Co-operative Milk Co. Ltd. building, c1939.
source: Decoration and Glass, Vol. 5 No. 8 (01 January 1940)

Nominated Architect: Linda Babic, NSW ARB 6869, AIA
119a Elder Street, Lambton NSW 2299 ABN: 13 969 355 650
T | 0412 993 813 E | mail@heritas.com.au W | heritas.com.au

1 INTRODUCTION

1.1 Background

This report represents an assessment of heritage impact for the proposed partial demolition of the existing Regal Motors building, part of the former Dairy Farmers site at 924 Hunter Street, Newcastle West NSW, and the construction of a new mixed use development. It was prepared by Linda Babic, B.A., B.Arch., M.Herit.Cons. for Thirdi Group.

The subject property is identified as a heritage item of local significance within the Newcastle City Centre Heritage Conservation Area (HCA) under Schedule 5 of the Newcastle Local Environmental Plan (2012) (NLEP).

1.2 Methodology

This report has been undertaken in accordance with the requirements of the Australia ICOMOS Burra Charter (2000), and more specifically the guidelines for Statements of Heritage Impact as issued by the NSW Heritage Office (1996 & 2001). These guidelines note that a Statement of Heritage Impact should address the following issues:

- Why the item is of heritage significance.
- What impact the proposed work will have on that significance.
- What measures are proposed to mitigate negative impacts.

1.3 Limitations, Constraints, Clarifications

The assessment of impact is limited to locally available historical material and DA documentation.

The background history has been prepared without the benefit of a historical Land Titles search, and is therefore limited to the use of locally available sources.

The assessment reviews European cultural heritage significance only.

The DA documentation presented for review is to a development application level only; specific detailing has not been reviewed.

The correct name of the dairy co-operative is *The Dairy Farmers' Co-operative Milk Co. Ltd*. Over the years the naming has been variably noted as simply *Dairy Farmers*, to refer to the co-operative itself but also the site at Newcastle West. Both are used interchangeably through this report.

1.4 Development Proposal

The proposal is for partial demolition of the existing building on a number of conglomerate sites making up the land know as Dairy Farmers Corner, bounded by Hunter, Railway and Tighe streets, Newcastle West. The complex of buildings, including the workshop building on the north side of Tighe Street, was constructed in the 1990s around a remnant masonry clock tower dating to the Dairy Farmers period and built in 1938.

The proposed new construction is for a mixed use of commercial, retail and residential, with a mid-rise commercial building and two high-rise residential towers. The 1938 clock tower will be retained and will form part of the new development.

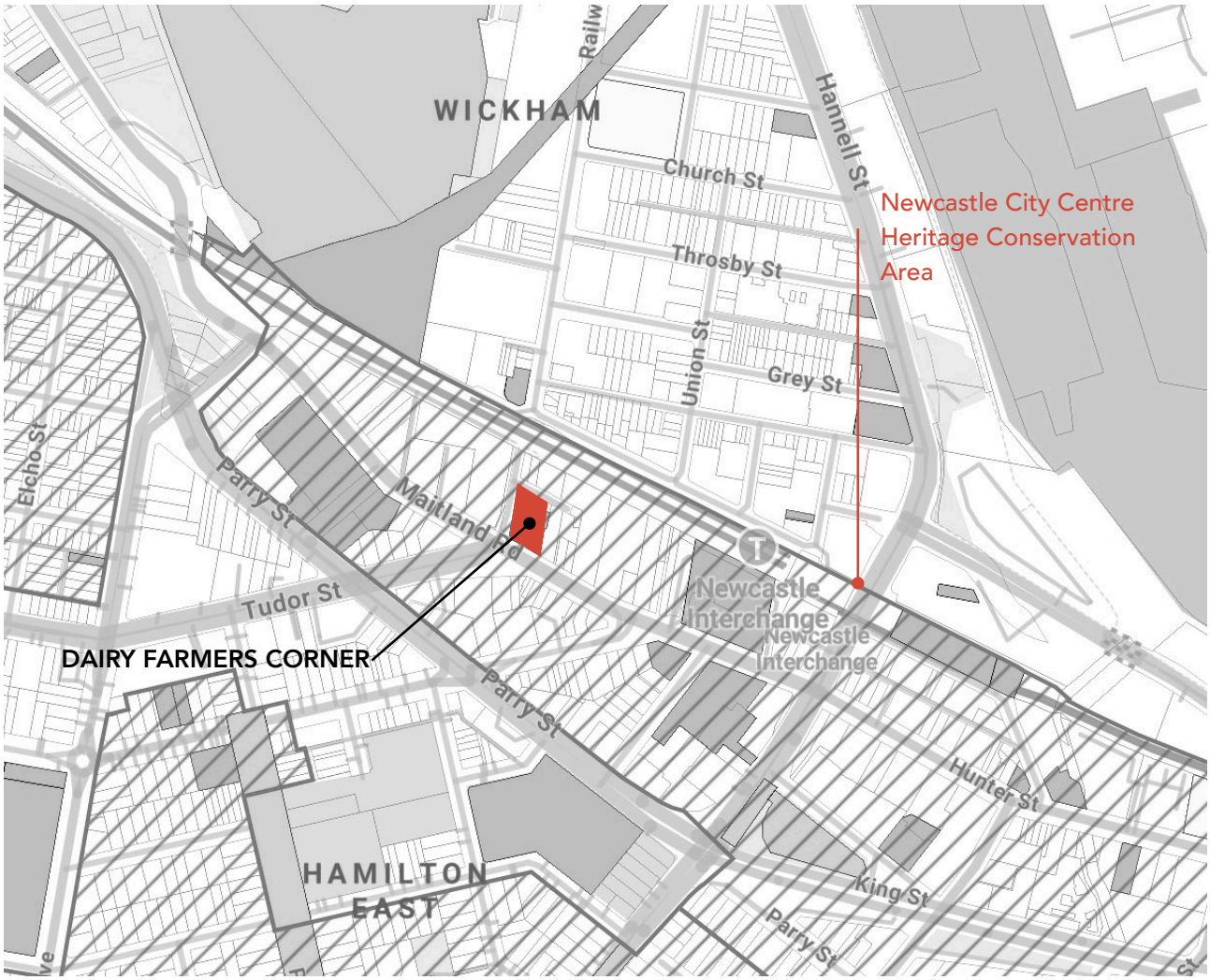

Figure 1
The subject site in context.
source: Mecone Mosaic, Heritas overlay

2 HISTORICAL BACKGROUND[1]

2.1 Historical Context - early development of the area

During the period between 1804 and 1822 when Newcastle operated as a penal settlement, most of the buildings were erected east of present day Watt Street. Although the eastern end of Newcastle is one of Australia's most historic areas, only foundations remain of some of the buildings constructed during the penal settlement era.

In 1823 Henry Dangar was given the job of laying out the township of Newcastle. As the town was opened up to free settlement, access to deep water loading for shipping dictated the pattern of settlement with commercial building development centred around Watt and Hunter streets. Part of the land originally earmarked for the town's expansion was, in fact, given to the Australian Agricultural Company (A.A. Co) in the late 1820s as part of their 2,000 acres of land granted for the purpose of coal mining. The grant initially formed a barrier to westward expansion of the town.[2]

For two decades the A.A. Co declined to subdivide any of its Newcastle grant but in 1853 the company held its first land sales opening up western development of the town along Blane Street (later Hunter Street West) and into Cook's Hill along Darby Street. The company's ongoing land sales continued to shape the city well into the twentieth century. The linear form of Newcastle's CBD evolved in part as a response to port activities along the river's edge and transport routes including the construction of the Great Northern Railway line in the 1850s. Dominating economic progress in the 1850s to 1860s was the expansion of coal mining in the outlying villages combined with the growth of related industries and shipping which all contributed to the development of commerce in Newcastle itself.[3]

By the second half of the nineteenth century the CBD was a mixture of industrial, business, services and residential development. The eastern end of the town was home to government administrative centres, the principal professional firms and the largest retail stores. However by the turn of the twentieth century the western end of town had also attracted large scale retail development which in turn attracted commercial activities. Despite the mix of activities in the CBD, commercial interests dominated with Hunter and King streets forming the main retail centre for the region. The Hunter and King streets axis continued to develop in the Inter-War period.[4]

The arrival of the Broken Hill Proprietary Company at Port Waratah in 1913 transformed Newcastle "into a vibrant industrial centre within a decade."[5] As well as BHP's steel making plant, the establishment of the Newcastle State Dockyard in 1913 also contributed to the growth of Newcastle's CBD. Heavy industry and the large workforce it employed gave business backers confidence in investing in redevelopments in Newcastle's CBD in the wake of the Great Depression.[6]

While the eastern end of the Newcastle City Centre Heritage Conservation Area has retained a high percentage of its nineteenth and early twentieth century heritage items, the western end has undergone significant change. This was recognised in 2003 in a review of Newcastle City Council's Development Control

---

[1] History prepared by hunter History Consultants for Heritas Architecture.

[2] Raymond Evans, 100 Years of Commercial Building in Newcastle, Architectural Diploma Stage VI Thesis, NSW University of Technology – Newcastle College, n.d., p. 2; John Windross and J.P. Ralston, Historical Records of Newcastle 1797-1897, Newcastle, facsimile edition, 1978, p. 22; P.A. Pemberton, Pure Merinos and Others: The Shipping Lists of the Australian Agricultural Company, ANU Archives of Business and Labour, Canberra, 1986, p.8

[3] John Turner, Newcastle Central Business District Heritage Study Draft Statement of Historical Themes, in Suters Busteed Corner Clode Pty Ltd., Newcastle Central Business District Heritage Study: Interim Report, March, 1988; John Turner, Historic Overview and Heritage Assessment, n.d., John Turner Papers, University of Newcastle Archives.

[4] *ibid.*

[5] *ibid.*

[6] *ibid.*

Plan 40: City West, which notes "the higher heritage content, topographic constraints and existing streetscape integrity of City East relative to City West that has a less intensive heritage nature and significant redevelopment opportunities…".[7]

2.2 Early Development of City West

While the fledgling settlement of Newcastle operated as a penal outpost development was limited to land east of Church Hill, with one exception. By 1812 a government farm worked by convict labour, and a cottage most likely used as a guard house, had been established about a mile west of the settlement around Cottage Creek. It is believed that the cottage was on land where the Palais one stood, now replaced by a fast food outlet (KFC).[8]

By the 1840s the A.A. Co. had several mines operating and imported British miners to supplement their workforce that was largely made up of assigned convicts. During the 1830s and 1840s people including Richard Furlong, Alexander Walker Scott, and Dr James Mitchell established farms and small industries on grants to the south east of the town and to the west of Throsby Creek as well as the north side of the harbour. The immigration into the town increased the demand for housing and associated facilities.[9]

Between 1841 and 1846, three burial grounds (Roman Catholic, Presbyterian, and Wesleyan Methodist) were established in the vicinity of the former convict farm at Cottage Creek.[10] Cottage Creek was also the site of one of Australia's first meat canning factories founded by the Dangar family in 1848.[11]

Development of the western end of Newcastle hastened after 1853 when the A.A. Co., which held much of the land west of Brown Street, started to sell its land on the south side of Blane Street (as the western end of Hunter Street was then known).[12] The decision made in 1853 to construct a railway between Newcastle and Maitland with Honeysuckle Point (first located on the site of the former Civic Station) as the line's terminus also provided an impetus for the development of Blane Street.[13] Yet by the late 1850s, the Railway Hotel (later known as the Empire) near the corner of Blane and Steel streets was still considered to be on the western outskirts of the township.[14]

Commercial development of the Railways Department land to the west of the Honeysuckle Railway Workshops began after the opening of the second Honeysuckle Point Station in 1872, 35 chains (700m) west of the original. Although the Railways Department kept a tight hold on its land, leases were issued to private enterprises keen to be located close to the railway line and station. Some of those businesses that were established on the north side of Hunter Street included the Bellevue Hotel, a bank and the Elite Skating Rink.[15] The latter was opened in 1888 opposite the Railway Hotel in premises that would later house the City

---

[7] Review of Development Control Plan 40 – City West, prepared by City Strategy Group, Newcastle City Council, 11 March, 2003.

[8] J.W. Turner, 'Honeysuckle Historical Study', January, 1994, pp. 48, 63.

[9] C. and M.J. Doring Pty. Ltd., Consulting Engineers, 'Honeysuckle Project Historical and Industrial Archaeological Survey', October, 1991, p. 2; Turner, 'Honeysuckle…', p.2.

[10] Peter Douglas and Graham Wilson, '700 Hunter Street Newcastle, NSW: Historical Archaeological & Impact Assessment of the West Newcastle Presbyterian & Roman Catholic Cemetery Site (c1844-1881)', prepared for ACCOR Asia Pacific to comply with the NSW Heritage Council & Newcastle City Council's request to archaeologically assess the site before redevelopment for the proposed ACCOR Ibis Hotel', Archaeological & Heritage Management Solutions Pty. Ltd., Sydney, March, 2001, p.58.; Elaine Sheehan, (ed.), *Newcastle West New South Wales: Presbyterian Burial Ground 1844-1881*, Family History Society Inc., Lambton, 1999, p.2; Elaine Sheehan, (ed.), *Newcastle West New South Wales: Wesleyan Methodist Burial Ground 1858-1881*, Family History Society Inc., Lambton, 1999, p.3. All three Newcastle West cemeteries were closed in 1881 after the opening of Sandgate Cemetery.

[11] Turner, 'Honeysuckle…', p. 56.

[12] *ibid.*, p.47.

[13] *ibid.*, pp.45-46; Doring, 'Honeysuckle project…', p.11.

[14] Newcastle Morning Herald, 7 June, 1909.

[15] Turner, 'Honeysuckle…', pp.63-64; Suters Architects Snell, 'Honeysuckle Goodsyard Civic Workshops and Lee Wharf Area, Heritage & Conservation Study', Draft Final Report, March, 1990, p.7.

Arcade and Western Markets. In 1894 the Empire Music Hall was opened in the same building, subsequently known as the Palais (demolished).[16]

In response to calls for land for public use, the Railways Department yielded some of its land for the erection of a technical college, a trades hall, a post office and a police station on the northern side of Hunter Street near the Union Street intersection in the late nineteenth to early twentieth centuries.[17]

Figure 2
Hunter Street West, 1890, photographed by Ralph Snowball, showing the Elite Skating Rink, McLellan Hellyer & Co. Ironmongers, the Stationmaster's Cottage, and Honeysuckle Point Railway Station, with the harbour beyond.
source: image created by Ralph Snowball, held by University of Newcastle Library's Special Collections

In 1876 a brewery was established towards the end of Charlton Street by brothers John and Joseph Wood, agents for the Castlemaine Brewery Company.[18] Charlton Street was the name given to the extension of Blane Street from Cottage Creek to the western boundary of what we now know as Hunter Street. The Castlemaine Hotel was established nearby, on the corner of Stewart and Charlton streets. By 1886 much of the former A.A. Co's land fronting Charlton Street had been subdivided and developed. In 1887 the land between Stewart Street (Stewart Avenue) and Porcher Street (National Park Street) was developed into eleven separate allotments.[19]

During the early twentieth century the unique retail organisation, the Newcastle and Suburban Co-operative Store, founded in 1898, provided an impetus for retail expansion in Newcastle's West End. The 'Store's' premises were established on the northern side of Hunter Street West, formerly known as Charlton Street, opposite the brewery, and its operations grew so steadily that other retail businesses were attracted to its location.[20]

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[16] Newcastle Herald, 20 April, 1996.

[17] Turner, 'Honeysuckle…', pp. 63-64.

[18] Newcastle Regional Museum Website, http://www.nrmuseum.com.au/homecmb.htm.

[19] EJE Group, Heritage Assessment of Building – 735-739 Hunter Street, Newcastle West, prepared for Newcastle City Council Heritage Assessment 1996; *Gray and Milton's Business Directory Almanac, Diary & Year Book For 1885*, Newcastle, 1885, p. 54.

[20] Turner, 'Honeysuckle…', p. 73.

Development within the vicinity of the Empire Hotel in the 1920s reflected an entertainment focus in the West End. In 1924 the Theatre Royal described as "one of the most comprehensive and elaborately appointed picture houses in Australia"[21] was opened on the south side of Hunter Street a few doors to the west of the Empire Hotel.[22]

2.3 The Changing Nature of City West

From the early 1980s there was a noticeable change in the nature of City West. As noted by Clouston in the West End Strategic Development Plan (1996):

> As the economic climate changed and the focus of Newcastle shifted away from the port and its associated industrial activities, the linear nature of Hunter Street became a problem, with activity fading away from the City Centre. The West End, lacking any main focus, suffered widespread retail decline, business closures and a consequent deterioration of building fabric and the street environment.[23]

Contributing to this decline was the closure of the Newcastle and Suburban Co-operative Store (1981), S & W Miller Store (post-1989 Newcastle earthquake), the Palais, the Theatre Royal and the Bellevue Hotel.

Contributing to a change after several decades of downturn was the Honeysuckle Development Programme, with the construction of a number of significant residential/commercial buildings and the expansion of the Marketown shopping complex. Further development was encouraged by the termination of the heavy rail line at Wickham and the construction of the transport interchange at Wickham Station.

Although not as heritage rich as City East, City West contains some landmark structures and heritage buildings identified in the Newcastle Local Environmental Plan (LEP), including the Sacred Heart Church (841 Hunter Street), the Bank Corner (former Bank of NSW, 744 Hunter Street), the Theatre Royal (669 Hunter Street), the Hunter Water Board Building (599 Hunter Street) and the Newcastle Technical College (590-608 Hunter Street).

2.4 The Dairy Industry in Newcastle

In his 2020 article on the dairy industry, Phillip O'Neill, professor of economic geography, Western Sydney University, noted that in the 1950s more than 1000 Hunter Valley dairy farms supplied milk to local processing plants. This grew from the late 19th century use of timber-cleared land for farming, and dairy farming was suitable for the wet, humid conditions of coastal areas. By the mid-20th century milk had become Australia's favourite farm commodity.[24]

Figure 3
Typical small single-family dairy farm, here in Birdwood Street, New Lambton, mid-20th century.
source: L Babic personal collection

[21] Newcastle Morning Herald, 6 February, 1923.

[22] Newcastle Herald, 20 April, 1996.

[23] Clouston, Newcastle West End Strategic Development Plan, prepared for Newcastle City Council, March 1996.

[24] Newcastle Morning Herald, 20 July 2020,, newcastleherald.com.au

Local dairy farmers were eventually focused around the co-operative model, independent of their farm size, and suburban farms were not unusual in the early part of the 20th century.

Mrs Annie Gamble was a registered milk vendor who started her milk run after moving to Carrington in the 1910s. She kept 40 cows on a reserve at the end of her street, milked them every night starting at midnight, then made two deliveries a day - one before dawn, and another in the early afternoon - seven days a week, via horse and cart. In later years and before her retirement in 1955, she used a utility truck for deliveries.[25]

Small dairy farmers like Annie Gamble were the instigators of the co-operative model that grew into Dairy Farmers' Co-operative Milk Co. and others such as the Hunter Valley Dairy Co-operative.

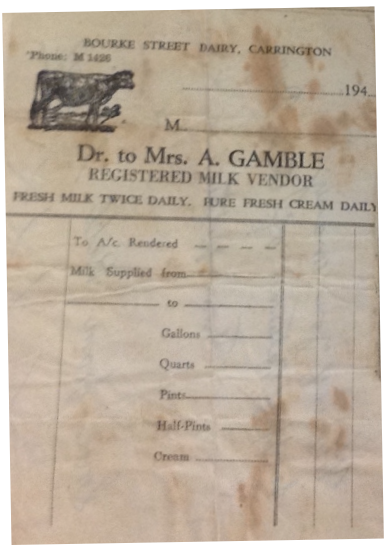
BOURKE STREET DAIRY, CARRINGTON
'Phone: M 1426
194
M
Dr. to Mrs. A. GAMBLE
REGISTERED MILK VENDOR
FRESH MILK TWICE DAILY. PURE FRESH CREAM DAILY
To A/c. Rendered
Milk Supplied from
to
Gallons
Quarts
Pints
Half-Pints
Cream

Figure 4
Customer milk order sheet, early 20th century.
source: courtesy Sue Harper

Figure 5
Milk delivery by horse + cart, early 20th century.
source: courtesy Sue Harper

2.5 Dairy Farmers Co-operative Milk Co.[26]

The Dairy Farmers Co-operative Milk Co. Ltd. was formed on January 15, 1900. Sixty five stakeholders, many of them dairy farmers from the Illawarra region of New South Wales, came together and agreed to run the new organisation on 'true co-operative lines'. The Co-operative was formed with the purpose to help dairy farmers market their milk and butter directly to consumers in the city.

In the 1920s, Dairy Farmers were among the first to introduce milk in bottles,[27] replacing the doorstep milk jug, and by 1931, the public's desire for bulk milk delivery to be replaced by milk delivered in sealed hygienic containers was well recognised. 'This would serve two purposes: guarantee quality, and permit the more economic system of once-a-day delivery. The implications were great. Not only did it mean new bottling plants and new buildings to house them: it also meant reorganisation of processing and delivery. Out would go the 200 or more horse-drawn carts, and in would come a new style of vehicle, equipped for a new delivery technology. Down would come the old depots, up would go new up-to-date facilities designed to meet the changes in city and suburbs.'[28]

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[25] Personal correspondence, Sue Harper, descendant of Annie Gamble, October 2021.

[26] dairyfarmers.com.au

[27] dairyfarmers.com.au

[28] Todd, Jan. *Milk for the Metropolis*, Hale & Iremonger, Sydney: 1994, p135.

Figure 6
Images promoting the enjoyment of milk in the 1920s.
source: dairyfarmers.com.au

In October 1933 the industry was moving toward the universal introduction of the bottled system of distribution, and 'two years later the company opened … a whole new plant equipped with the latest bottling machinery from London.'[29] By 1935 a new bottling building was being constructed and by 1938 'preparations were made for the inclusion of bottling in the redevelopment of the Newcastle branch and the new branch being established at Wollongong.'[30]

In 1941, free milk in schools was launched and ten years later, over 500 metropolitan schools were being served by Dairy Farmers. The co-operative also supplied milk to war soldiers, and in 1942, the government declared Dairy Farmers a 'protected undertaking' to ensure continued supply of fresh dairy produce to soldiers and civilians alike.

During the 1960s, the milk carton was introduced to help prolong the life of the milk, and milk vending machines helped made Dairy Farmers milk accessible as a refreshment on the go.

Figure 7
Cartons of flavoured milk, and milk vending machine, 1960s.
source: dairyfarmers.com.au

During the 1970s, Australia's first modified milk (low fat) was launched with the introduction of the Dairy Farmers 'Hi-lo' brand. An 'instant meal' product called "Dairy Flip" (similar to Liquid Breakfast drinks) made with milk, eggs, sugar and spices was launched in Sydney and proved to be a huge success.

[29] Todd, Jan. *Milk for the Metropolis*, Hale & Iremonger, Sydney: 1994, p135.

[30] Todd, Jan. *Milk for the Metropolis*, Hale & Iremonger, Sydney: 1994, p135.

The success of Dairy Farmers was confirmed in 1993 with its acquisition of Victoria's Midland Milk, Malanda Co-operative (FNQ), Queensco-Unity Dairyfoods Co-operative (SEQ), and Dairy Vale (SA). A little over ten years later, Dairy Farmers members overwhelmingly supported the National Foods offer to acquire the Co-operative, from November 2008.

The co-operative model was a popular one, within other industries but also in other dairy farming areas, such as the Hunter Valley Co-operative Dairy Co. Ltd, who had factories at Hexham and Muswellbrook.

2.6 Dairy Farmers Corner

The site is shown as vacant in 1897, with individual houses fronting onto Tighe Street.

Figure 8
Late 19th century mapping with the subject site indicated.
source: Hunter District Water + Sewerage Board Cadastral maps, AMC55/80 and ACM55/81, c1897.

Dairy Farmers' Newcastle branch commenced operations in May 1917 and by 1918 'the company had acquired its own property, machinery and plant, along with the business of the Newcastle Co-operative Milk Co., a small but ready-made wholesale distributing business run by vendors. There was nothing grand about this acquisition of timber and corrugated iron (Figure 9). But its location on the corner of Hunter Street West and Railway Street gave ready road and rail access, as well as centrality. The Newcastle market soon provided a regular outlet of 1400 gallons per day, seven days per week, with little variation.'[31]

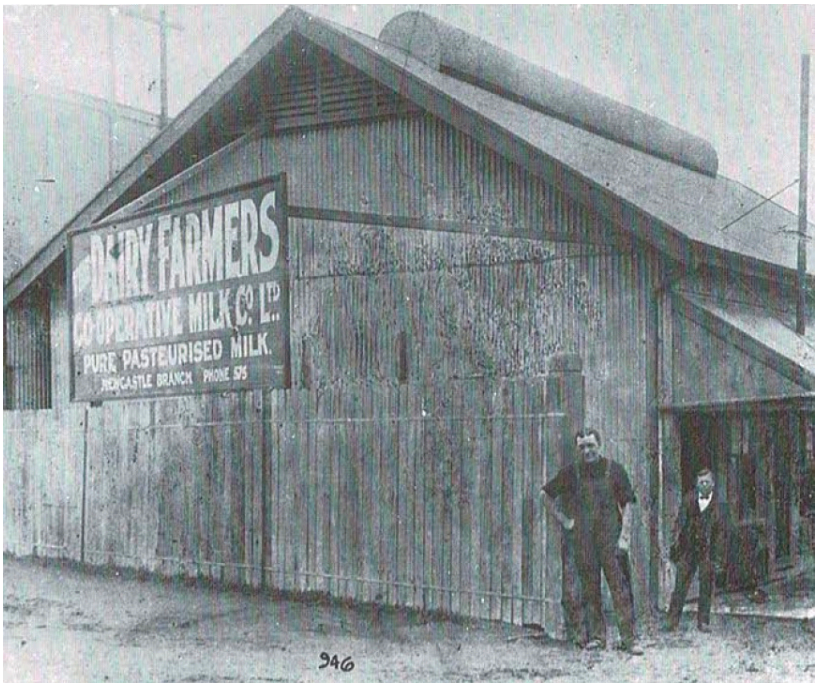

Figure 9
The first Dairy Farmers Co-operative Milk Co. Ltd. building, in Railway Street, Newcastle West, on the current site, c1920.
source: Jan Todd, Milk for the Metropolis, p77

The Newcastle Morning Herald & Miners' Advocate reported in 1937 that plans for a new milk depot in Hunter Street, Wickham had been approved by the local council and that 'expenditure involved will exceed £30,000, and will provide the Newcastle district with one of the most up-to-date establishments of the kind in New South Wales.'[32] The article described the design - by Sydney architect A C Likely - would 'comprise an office block of two stories, with an ornamental clock tower. The building would feature modern machinery and plant, with the whole of the milk treatment floor sealed from the outside. Air would be drawn through special filters and exhausted by means of a fan system. The whole of the construction is to be in brick and reinforced concrete, with curved fibre cement roof. The power plant and refrigerating plant will be housed in a separate wing facing Railway Street. Across the lane at the rear will be the garages and stables. The layout is regarded by the architect and manager as ideal, since the scheme, while separating these from the main depot, has made provision for them in a handy, adjacent part of the area.'[33] Building work was to begin in January 1938 under the supervision of the architect, who was said to have a wide experience in this type of construction. All materials, wherever possible, would be of Australian manufacture and all labour would be employed locally. 'The plant to be installed will allow for the introduction for the first time in Australia in a

[31] Todd, Jan. *Milk for the Metropolis*, Hale & Iremonger, Sydney: 1994, p77.

[32] Newcastle Morning Herald & Miners' Advocate, 4 December 1937, p7.

[33] Newcastle Morning Herald & Miners' Advocate, 4 December 1937, p7.

large way of "container" milk. Bulk and bottled milk will be available, while under the new machinery to be installed wax containers will be something in the nature of an innovation.'[34]

Figure 10
The proposed Dairy Farmers Co-operative Milk Co. Ltd. building, as shown in 1937.
source: Newcastle Morning Herald & Miners' Advocate, 04 December 1937, p7

In April 1938, a call for tenders for the demolition of the remaining buildings on the site front Tighe Street was posted in the Newcastle Sun. It was noted the buildings would be the last to be removed 'preparatory to beginning the new buildings of the company, which will be modern in every way. The new plant is on its way from England, and will be brought direct to Newcastle. The garage block and stables have been completed on portion of the land at the rear. The expenditure will exceed £50,000 on buildings and plant. The work will be carried out by the company as its own contractor, in conformity with plans, etc., prepared by Mr. A. C. Likely, architect, in association with the Manager of the company, Mr J. M. Martin.'[35]

The following month, on 25 May 1938, a ceremony was held marking the laying of the foundation stone by the Premier of NSW, Bertram Sydney Barnsdale Stevens.

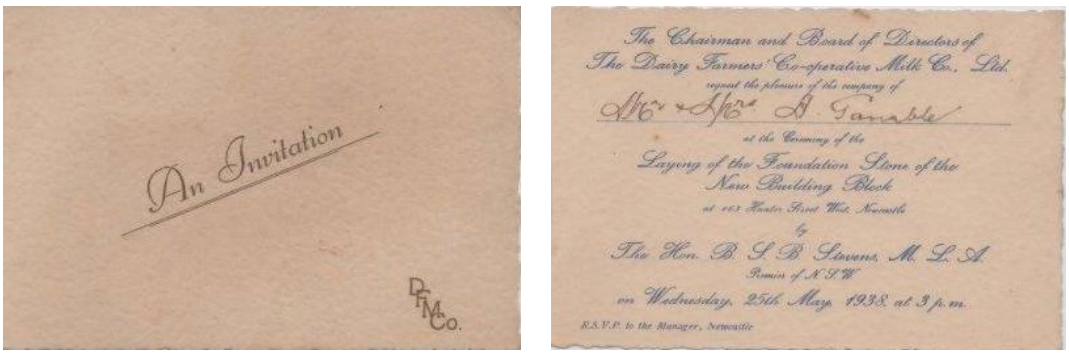

Figure 11
Invitation to the laying of the foundation stone at the new Dairy Farmers Building, Hunter Street West, extended to Mr & Mrs H Gamble, 1938.
source: courtesy Sue Harper

[34] Newcastle Morning Herald & Miners' Advocate, 4 December 1937, p7.

[35] Newcastle Sun, 11 April 1938, p2.

The Newcastle Herald reported again in December 1939, the details of the complex completed, amongst the greater, notable expansion of Hunter Street West, and it provides a detailed description of the new building.

'Construction is carried out in cream brick, with plinth and bands of chocolate brick, the façade being sheathed in synthetic granite blocks relieved with bands of green and brown. A wall treatment in black glass tile enriches the entrance to the administrative block. The tower above features a large milk bottle formed in glass bricks, relieved with coloured terracotta panels. The eastern and western faces of the tower feature several neon clocks, with appropriate trade slogan.

'The use of panels of glass bricks heightens the natural lighting of the staff rooms. Bricks of similar material have been used as margin lights to the plate-glass revolving door opening from Hunter-street to the main offices.

Figure 12
The completed building, Hunter Street, 1938.
source: Jan Todd, Milk for the Metropolis, p258

'The interior treatment of the premises has been carried out by the use of flat dulux dado and a glossy dulux finish to woodwork. Flush panelling, with doors to match, is effectively used in the vestibule and stairway. This treatment has been carried to the landing on the first floor, giving access to the private office of the manager on one side, and is divided by the clock tower stairway from a large reception room on the other side.

'It is the intention of management to use this room for the entertainment of visitors and the display of educational films. It will be the starting point for tours of inspection of a plant, which is entirely new, and incorporating units imported by the company from England.

'An attractively decorated kitchen is an adjunct to this floor. There demonstrations, showing the value of milk in modern cookery, are to be given.

'The ground floor is taken up with general office, ledger office, accountant's office and rest and lunch-rooms for employees. The main milk block occupies a position in the centre between Hunter-street and Tighe-street. It is built along the entire frontage of Railway-street. In cream brick, it matches the office

block and is of two storeys. The ground floor consists mainly of the receiving and delivery platforms. These are separated by the bottled milk cold storage room, tanks and can rooms, the arrangement lending itself to the hygienic and economic handling of the product and utensils. On this floor there are also the bottle-washing and filling equipment.

'A new, hygienic bottle-washer - a complicated device, electrically driven - has a capacity for washing and sterilising 4000 bottles an hour, and in an emergency can increase the number to 6000 an hour. The bottle filler and capper have a similar capacity. In addition to filling the bottles this machine stamps out, prints and caps each bottle with an aluminium cap.

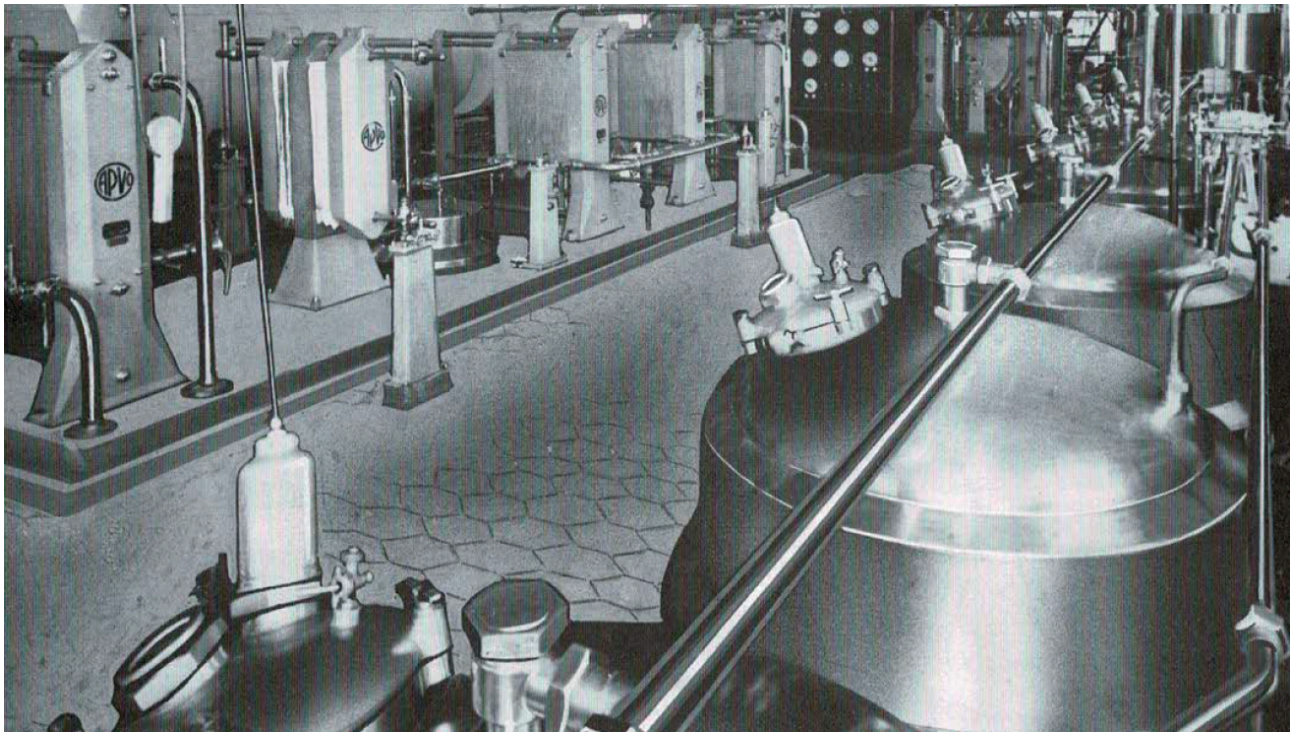

Figure 13
The interior of the new building, Hunter Street, showing APV low-temperature-holding pasteurisers, which. Heated milk to 145-150°F and held it there for at least 30minutes.
source: Jan Todd, Milk for the Metropolis, p135

'The upper floor contains an array of hygienic milk handling equipment, housed in a spacious and well-lighted room. The white, hard plaster walls and domed ceiling are set off at dado height by bands of blue tiles and stainless steel. The intersection of walls and ceilings are carried out in large coves. There are no corners anywhere in the room. The floors are covered with red octagon tiles.

'Equipment in this room consists of a number of 2000-gallon stainless steel storage milk tanks, 1000-gallon glass-lined tank, and low temperature pasteurising plant. Separators, milk pumps, brine and hot water pumps, etc. complete the plant. On the same floor are housed the brine tanks, coolers, and laboratory, equipped for scientific testing in all stages.

'In the wing running off the milk block is the refrigerating plant. The engine room houses a compressor, motors, pumps, etc. Steam is generated from two colonial type boilers - one on automatic control and the other hand fired - and above the boilers is the hot-water storage tank, connected to the system which supplies all points of the plant.

'With the exception of several plant units which it was necessary to import, the new premises are entirely of local construction.'[36]

From its opening, the branding of the original development was unmistakable with its illuminated milk bottle window, but also for its use of neon on the front tower facade proclaiming "Dairy Farmers" and on the east and west tower façades above and below the clock faces, proclaiming "Precious As Time - Dairy Farmers Milk".

Figure 14
Maintenance to one of the clock faces, c1950s.
source: courtesy S Hector Mills

The completed building was also highlighted in the journal *Decoration and Glass*, in their January 1940 edition. The article focused on the decorative features of the design, noting the Hunter Street façade was finished in buff terracotta, with an entrance canopy faced in green terracotta. A cream roller shutter provided security to the revolving glass door entrance at night, which was noted as having a Monel surround and featured black structural glass. The magazine article highlighted that the building was located at the junction of the Sydney and Maitland roads, and that the feature of illuminated clock faces on each side of the tower was a 'very useful feature.'[37]

The Newcastle Sun also reported on the tower, noting the 'illuminated advertising slogan, clear faced clocks, and glass brickwork designed in harmony with the products of the company form a complete whole of distinctive appearance.'[38]

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[36] Newcastle Morning Herald & Miners' Advocate, 09 December 1939, p20.

[37] Decoration and glass, Vol. 5 No. 8 (1 January 1940), p24.

[38] Newcastle Sun, 11 December 1939, p3.

The 'combined efforts of Newcastle's leading constructional firms have resulted in the fine building in Hunter-street West,' according to the Newcastle Sun newspaper.[39] Contractors included:

- United Brick Co. Pty. Ltd., Thornton - brick supply
- C. H.Waite, Waratah - bricklaying
- John C. W. Bridge & Co. (N'cle) Pty. Ltd., Mayfield - sanitary plumbing and draining, hot and cold water services, exhaust ventilation, radiation
- Northern Chromium and Electroplating Co., Newcastle - chrome plating
- James Hardie & Coy Pty. Ltd., Newcastle West - Fibrolite asbestos sheeting
- James Mullen & Co. Pty. Ltd., Hamilton North - structural steel
- Newcastle Lime and Cement Co. Pty. Ltd., Newcastle West - terrazzo flooring and slabs
- Australian Window Glass Pty. Ltd., Alexandria - glass bricks
- Wright & Co., Sydney - Monel nickel alloy

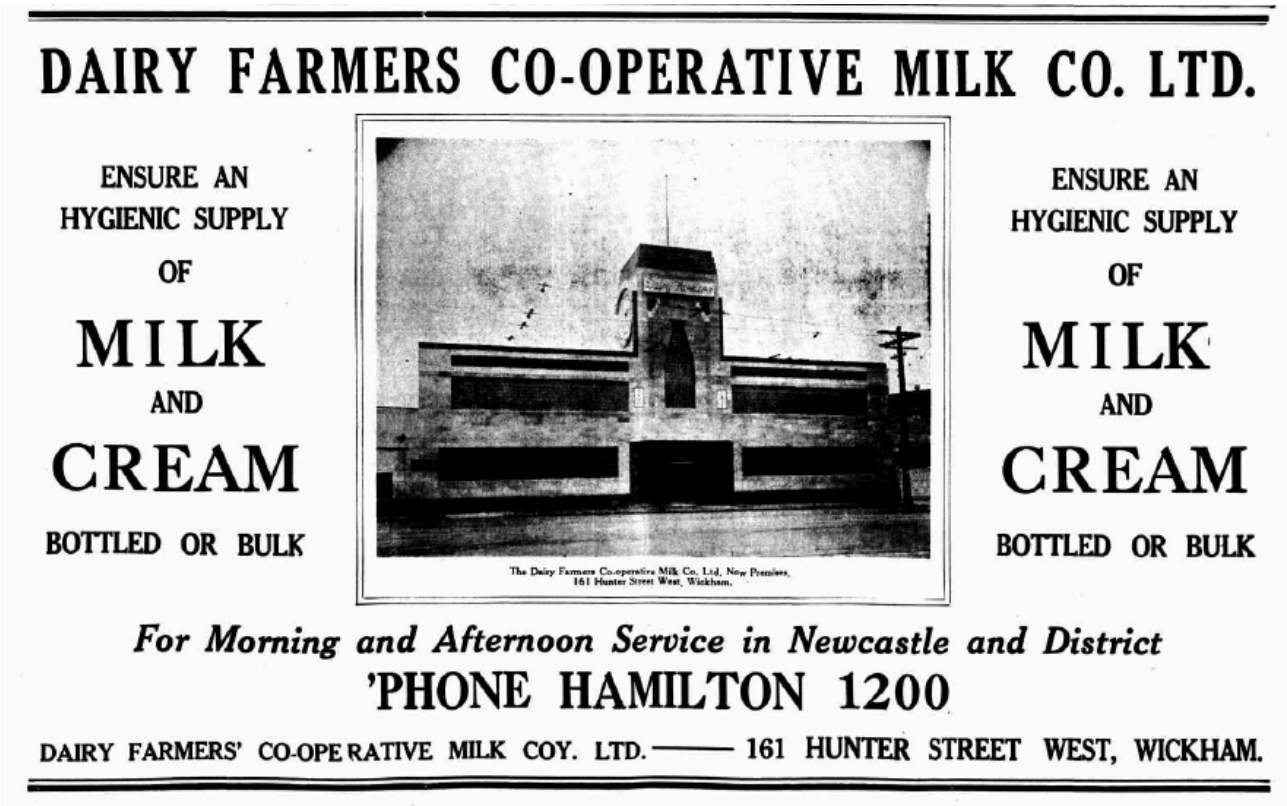


Figure 15
Newspaper advertisement for Dairy Farmers Co-op services, soon after completion of their new premises.
source: Newcastle Sun 11 December 1939, p3

[39] Newcastle Sun, 11 December 1939, p3.

Alva Charles Likely, Architect

Little is known of the architect, Alva Charles Likely, however he is known to have also designed the Dairy Farmers building at Wollongong, at the same time as the Newcastle branch building was constructed. The Wollongong building (demolished) was a smaller, restrained design, using similar materials of cream and red clay brick highlighted with areas of glass block. The building was also located on a corner site and the design highlighted this with the entrance and a small tower above. This further confirms the design for the Newcastle West building was directly related to the view corridor from Tudor Street. Railway Street was a narrow width and likely didn't provide the presentation fitting the new corporate branch addressing that street corner. Railway Street was approved for widening in November 1938 following the advice of the City Engineer.[40]

Likely registered as an architect in NSW in June 1923 - the first year that professional registration was required. He listed himself as based in Greenwich, with a professional experience history with the NSW Fresh Food & Ice Co. Ltd.,[41] a milk distributor in competition with Dairy Farmers, with the latter ultimately winning distribution rights for the Milk Board.

A Joseph Likely was an employee at the Newcastle branch of Dairy Farmers, and is possibly a familial connection linking the architect to his client.[42]

In 1940 the Royal Australian Institute of Architects Membership Roll recorded Alva Likely's place of employment as Dairy Farmers' Co-op. Milk Co. Ltd., 700 Harris Street, Ultimo.[43] It is from this we can assume, at least by this stage, that Likely was the in-house architect for Dairy Farmers.

Figure 16
The Wollongong Dairy Farmers building, completed 1938, also to a design by architect Alva Likely and using similar materials of cream and brown brick, and glass block.
source: Decoration & Glass, 01 January 1940, p36

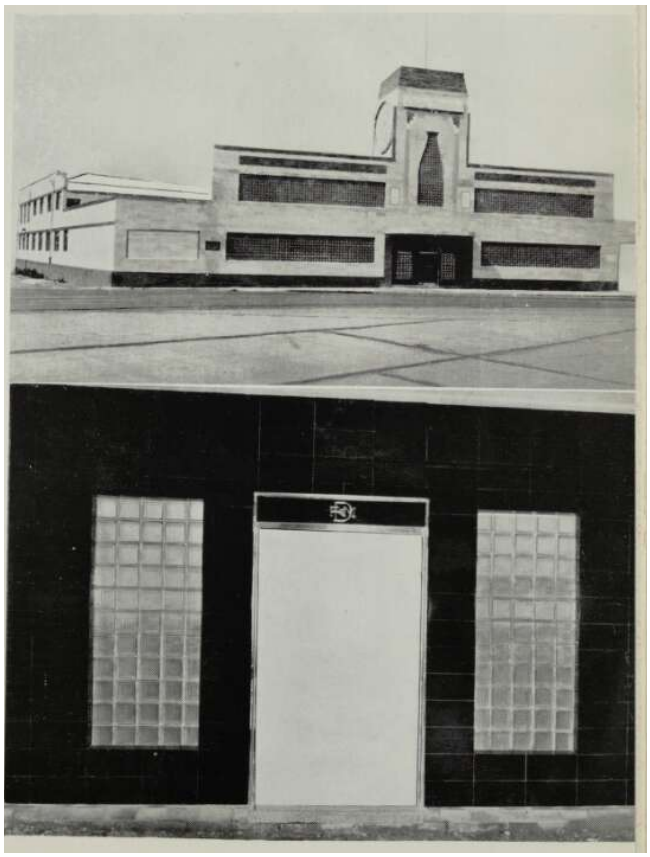


Figure 17
The new Dairy Farmers building, Newcastle West, and detail of the front entry door..
source: Decoration & Glass, 01 January 1940, p25

[40] Newcastle Morning Herald & Miners' Advocate, 10 November 1938, p11.

[41] NSW Architects Registration Board, personal communication, Dr Kirsten Orr, 12 October 2021.

[42] https://westendadventures.wordpress.com/2016/01/06/marvellous-milk-2/

[43] The Royal Australian Institute of Architects Membership Roll, January 1st, 1940.

2.7 The Art Deco Style

'Originating in Europe, the modern movement was the most potent architectural development during the inter-war decades … but the works of main stream modernist architects were too severe and radical to win widespread popular acceptance. Ordinary people who liked cocktails, the Charlston, streamlined cars and chromium-plated electric toasters responded much more easily and happily to Art Deco. This visually stimulating and intellectually undemanding style first came into prominence at the Exposition des Arts Décoratifs et Industriels Modernes held in Paris in 1925.

'The style celebrated the exciting, dynamic aspects of the machine age and … unashamedly made a direct assault on the emotions by the use of vivid decorative elements which served no particular function. Straight lines - often three in parallel - were used horizontally, vertically, and diagonally in conjunction with geometric curves. Low-relief sculpture was popular: it was heavily stylised and tended to be rather naively symbolic of speed, power, industry or progress.

'In the 1930s the cinema and the milk bar each drew heavily on the style and did much to make it popular.'[44]

The style was also used extensively in the design of commercial and residential towers, and further, gained recognition as an appropriate style for industrial architecture, giving 'meaningful expression in an industry that normally enjoyed little esteem.'[45]

In addition to the prolific use of chromium detailing, glazed architectural terracotta (faïence) and polished granite facades, the relatively new material of glass block was surging in popularity during this period. The Owens-Illinois Glass Company released their Insulux glass block product in 1935 and marketed it as 'translucent masonry' and a product 'demanded by the functional and aesthetic requirements of present day buildings.'[46] The company's own research lab in Toledo, Ohio (1936, Figure 18) was built entirely of their glass blocks and would have been an effective advertisement for their product.

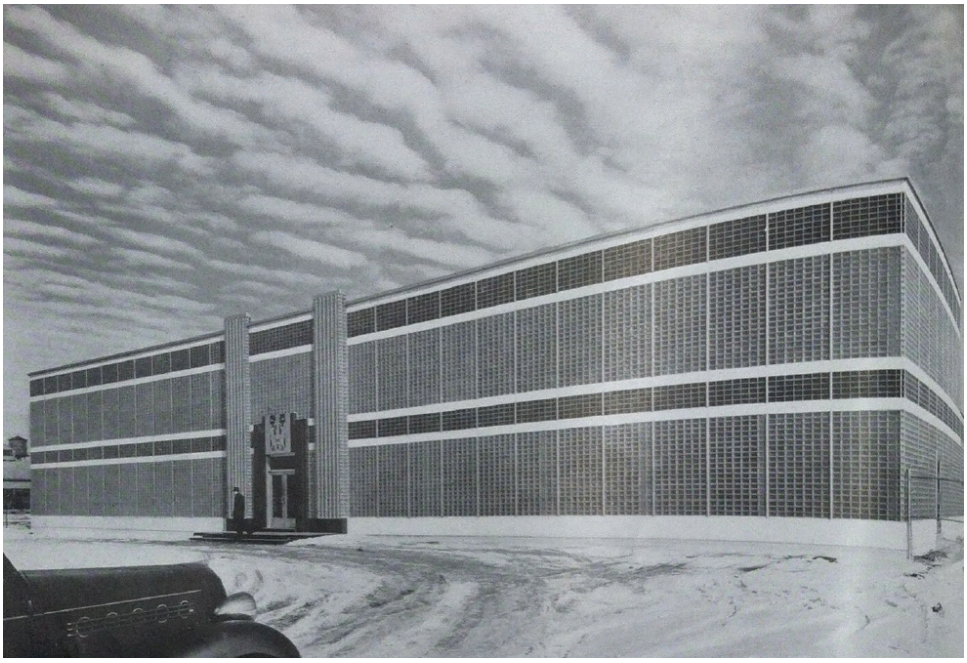


Figure 18
The Owen-Illinois Research Laboratory, 1936..
source: Elizabeth Fagan, Building Walls of Light… p61

[44] Apperly, Irving and Reynolds. *A Pictorial Guide to Identifying Australian Architecture: Styles and Terms from 1788 to the Present*, Angus & Robertson, 1989, p188.

[45] van Daele and Lumby. *A Spirit of Progress: Art Deco architecture in Australia*, Craftsman House, Sydney: 1997, p148.

[46] Fagan, Elizabeth. *Building Walls of Light: The development of glass block and its influence on American architecture in the 1930s*, Columbia University: 2015, p54.

Figure 19
The Campana Factory, Batavia, Illinois, 1936.
source: chicagobusiness.com, Dennis Rodkin photographer

The Campana company were makers of, among other products, the popular 'Italian Balm' hand lotion. Their factory outside Chicago, Illinois was designed using the Bauhaus principles of the 1920s and 30s, with no mullions in the large expanses of glass block and no columns on the exterior. The finish in buff and green faïence tile, black glass to the entry portal and red neon to the corporate signage makes it a very similar, though larger example to Likely's Dairy Farmers design. The Campana Factory is on the US national Register of Historic Places.[47]

Elmslea Chambers, Goulburn (1933) was one of the first buildings in Australia to use coloured polychrome terracotta in its façade. To a design by architect L. P. Burns, the two storey building has a glazed pale pink terracotta façade, featuring four fluted pillars and five coloured terracotta panels.[48]

The 1938 Dairy Farmers building at Newcastle West can be recognised as an early example of the Art Deco style in a regional Australian city, incorporating contemporary international architectural and style trends of faïence tiles, glass blocks and neon signage.

Figure 20
Elmslea Chambers, Goulburn NSW (1933), photo by Jack Miller, 2003.
source: heritage.nsw.gov.au

[47] United States Department of the Interior, National Park Service, National Register of Historic Places - Nomination Form, 1979. https://catalog.archives.gov/id/28893172

[48] heritage.nsw.gov.au

2.8 Dairy Farmers Corner - redevelopment

The Dairy Farmers Co-operative Milk Co. prospered at the Newcastle West site, becoming a local landmark for many Novocastrians. Its location at a busy road intersection, nearby to another co-operative - The Store - meant the milk bottle was always on show.

Details leading up to the redevelopment of the Dairy Farmers Corner site in the mid-1990s have not been uncovered however, it may have related to both the 1989 Newcastle earthquake and to the company expansion in 1993. Distribution of milk by Dairy Farmers was relocated from Newcastle West in the early 1990s to Cardiff, and then to Hexham in the 2000s.

Figure 20
An image capturing a car crash inadvertently also captures the Dairy Farmers building on 29 September 1970. This shows the glass block to office windows has been replaced, the Dairy Farmers signage over the milk bottle has been changed, and the 'Precious as Time Dairy Famers Milk' signage has been removed. The image also shows the different colour and texture to the front of the building (the faïence tile), and the cream and chocolate brick detailing along Railway Street.
source: Ken Magor Collection, Greg and Sylvia Ray

Drawings by Rodd & Hay Associates, Architects, show the documentation for partial demolition and re-use of the site for car dealership Regal Motors was completed in December 1995. Construction work would have commenced soon afterward. Demolition of all building fabric - excepting the milk bottle tower - was part of the works, with a new main showroom built around the original 1938 tower and a vehicle servicing building constructed on the north side of Tighe Street, in the location of the former stable.

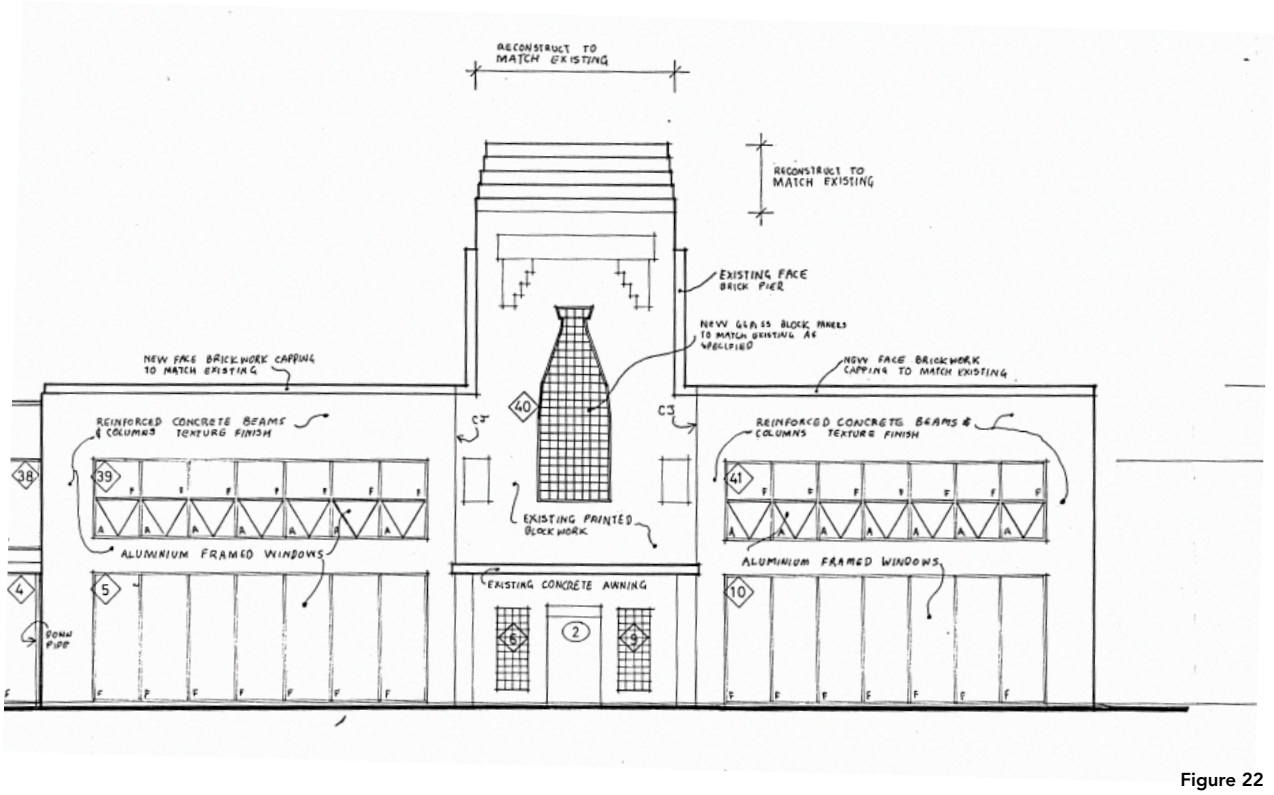


Figure 22
Hunter Street elevation, proposed works by Rodd & Hay Associates, December 1995.
source: CKDS

The retention of the milk bottle tower also retained some interior detail including internal timber bench seating and terrazzo flooring. It is unclear when the glass bricks of the milk bottle motif were removed and larger glazing panels installed, shown in Figure 23. This glazing was subsequently removed and glass bricks re-installed - likely in conjunction with the 1990s redevelopment. The glass brick in the Hunter Street entry also appears to be part of the 1990s work.

The site has operated continuously as Regal Motors since. In recent years, street trees have grown to cover the tower, obscuring the view of the iconic Art Deco landmark.

3 EXISTING FABRIC

3.1 Context

The site is located on the north side of Hunter Street, with secondary frontages to Railway Street and Tighe Street, and at the intersection of Tudor Street. To the immediate north of Tighe Street is the Great Northern Railway, which terminates slightly east at the recently constructed Newcastle Interchange.

Nearby buildings are a mixture of low and medium-rise structures, with recent commercial construction at the former Store site and nearby residential sites opposite the rail line in Wickham currently setting new heights in Newcastle West. In addition, a number of approved developments in the immediate vicinity will see a dramatic to change the character of the context.

3.2 Landscape

The site is essentially devoid of landscape, excepting the street trees within the public domain along Hunter Street. The growth of these trees in recent years has blocked the view corridor of the from the Tudor Street approach and therefore impact negatively on the interpretation of the Dairy Farmers clock tower.

3.3 Built Fabric

The built fabric currently consists of the 1990s concrete construction, and the 1938 tower.

The late 20th century showroom building is precast concrete panel construction, paint finished, and with metal roof sheeting, surrounding the older clock tower. The remainder of the site behind the Hunter Street façade is hardstand parking area.

Figure 23
Northern side of existing building, showing carpark.
source: Heritas, July 2021

The Art Deco-style tower has been altered slightly since its original construction in 1938 however the original fabric of cream and chocolate brick is still evident as part of the greater 1990s redevelopment. The three-storey tower still displays a large milk bottle-shaped opening infilled with glass blocks, capped with corbelled detail in the accented darker brick. The current glass blocks date to the 1990s redevelopment and the corbelled brick of the tower surmount is noted in the 1995 document as to be reconstructed to match original detail.

The Hunter Street façade of the tower, above the awning, appears to have a coated finish over what is likely to be revealed as the original faïence terracotta buff-coloured tiles. This coated finish was noted on the 1995 architectural documents as 'existing painted blockwork.' It is unclear when the façade was painted but it may have been coincidental with the replacement of the bottle window glass.

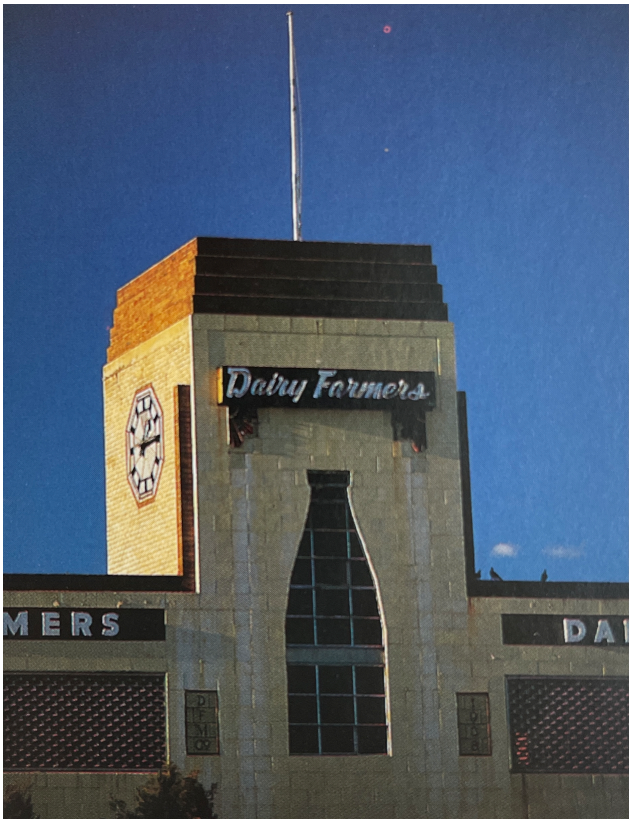


Figure 24
The Dairy Farmers tower, c1995. Note the changed glass to the milk bottle, the changed location of the tower signage, the façade tiles, and the screens over the office windows.
source: Patrick van Daele, in A Spirit of Progress: Art Deco Architecture in Australia, p149

The east and west façades of the tower each incorporate a large milky-coloured glass clock face, also in Art Deco style, which were originally illuminated at night. The front facade neon signage had been replaced at some point during its history, as evidenced by the photographic record of the building, perhaps coincidental with other façade changes.

At ground level, the original main entry point presents as similar to the original design but with some material dating to the 1990s redevelopment. A central, recessed entry doorset is flanked by two vertical glass block windows, and is protected by a cantilevered masonry awning. The entry is protected by a roller shutter, c1990s but in the style of the original shutter noted in descriptions of the building opening in 1938.

There is some vertical detailing on either side of the milk bottle that is unclear in the existing façade, but appears in early images of the building. The milk bottle "cap" also appears to have been amended in shape from the regional construction.

Figure 25
The Dairy Farmers tower in 2021. On the left, the junction between the 1938 tower and the 1990s work is clear. The right shows ground level, with original face brick and 1990s black tile and glass block.
source: Heritas, July 2021

Figure 26
The interior, ground floor, Dairy Farmers tower. Terrazzo floors, timber detailing. And glass block windows. A roller shutter secures the entrance. Leaf doorset is not original. The semi-circular awning is a reminder of the original revolving door in this location.
source: Heritas, July 2021

The interior of the clock tower at ground level is evocative of the original 1930s character, with a mix of original and later materials. The 1995 architectural documentation confirms the large openings to the east, west and south were made at this time. The floor is original terrazzo in cream and black and incorporates a granite foundation stone dating its installation to 25 May 1938. The original location in unclear but it may have been to the west of the entry door on Hunter Street, shown in Figure 12. The entry doorset and adjacent panelling is clear coated timber in an inter-war style. The original entry door is reported as a revolving style however, the existing entry is a double leaf hung doorset in timber framed glazed panels. The glazing incorporates a 'DF' logo and margin striping, as well as chromium handles and kickplates. The origin of these doors is unknown, however the semi-circular timber hood over the doors appears to be a remnant of the original revolving doorset. The two margin window panels in glass block (replaced c1996) have a timber seat at sill level.

The interior of the clock tower at first floor level currently incorporates an office space, and above first floor level is a service space allowing access to the clock mechanisms and rooftop. Structural work dating to the 1990s redevelopment is evident.

Figure 27
The Dairy Farmers tower in 2021. On the left, beyond the glass, the first floor office space showing partial milk bottle window. The right shows the interior at the clock face level, with remedial structural supports to masonry.
source: Heritas, July 2021

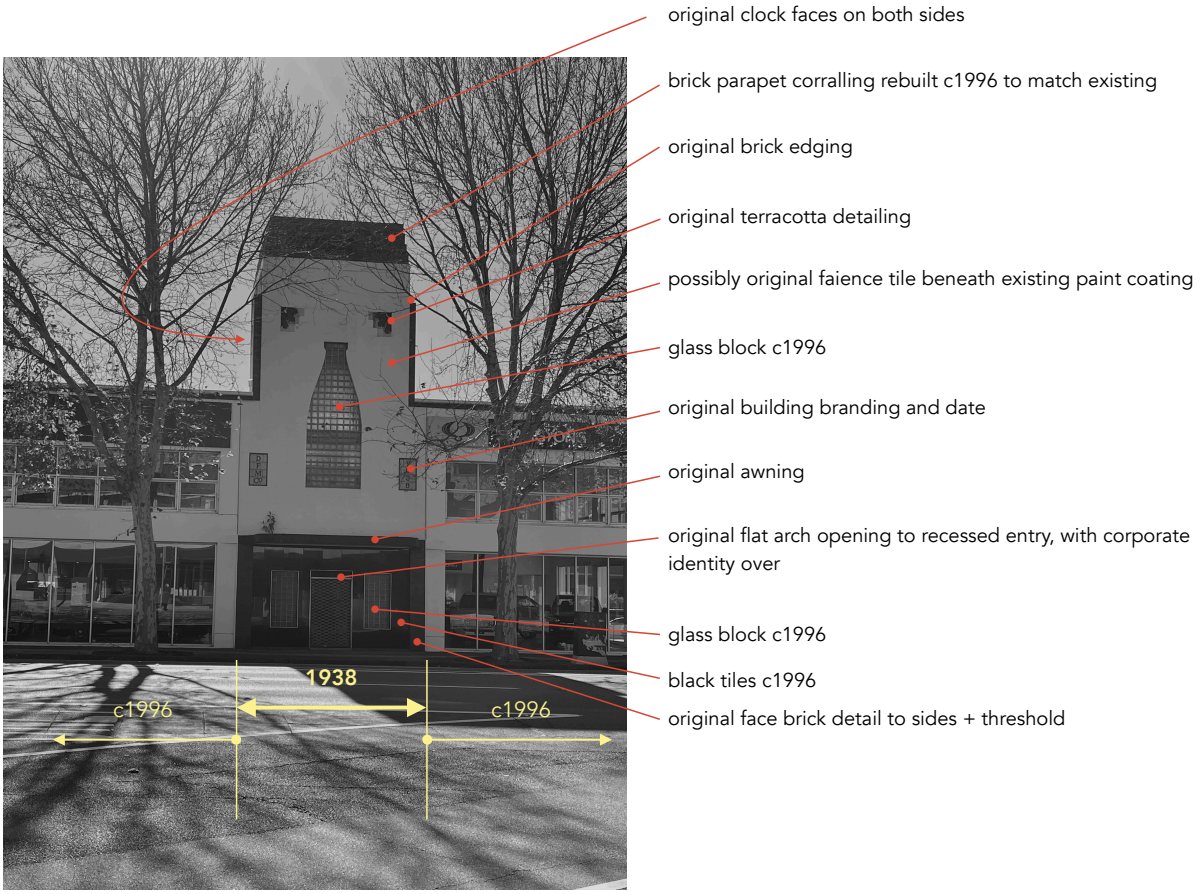


Figure 28
The Dairy Farmers façade showing dates of sections and indicating age of materials.
source: Heritas, October 2021

4 HERITAGE CONTEXT

4.1 Existing Listings

The site known as Dairy Farmers Corner is located within the boundary of the Newcastle City Centre Heritage Conservation Area (HCA) and is an individual heritage item of local significance under the Newcastle Local Environmental Plan 2012.

The HCA boundary is long and narrow, paralleling the harbour foreshore and therefore takes in numerous pockets of historical city development. The 1938 Dairy Farmers building dates to the very end of the Key Period of Significance, noted in the HCA Statement of Significance as 1801-1940. The building (the clock tower) contributes to the Inter-War character of the city's west end and is a social and physical landmark for Novocastrians.

The site also falls within the West End Precinct, development within which encourages the retention of early fabric that contributes to the character of the area.

4.2 Existing Listings in the Vicinity

The subject site is nearby to several other heritage sites including Sacred Heart Cathedral, the Cambridge Hotel, the Lass O'Gowrie Hotel, and the former Castlemaine Brewery, and noted below in Table 3 and Figure 29.

Item	Significance (published)
St Joseph's Convent & Sacred Heart Church & School (local significance)	Church spire is a significant landmark at this end of the CBD. AA Co. sold the land to the Catholic Church in 1889 & 1899 and a school was developed from 1916. Menkens designed much of the work for the Catholic Church in the late 19th Century. The interiors are of significance.
Cambridge Hotel (local significance)	Locally representative of the hotels built in the west end in the 1930s. Also associated with Tooth and Co.
Lass O'Gowrie Hotel (local significance)	Reflects social life of local community. Illustrates form and style of hotel development in the late 19th century and early 20th century.
Former Castlemaine Brewery (State significance)	Significant example of late nineteenth century industrial building of simple design. Progressively modified. Originally built for Fitzgerald - a Melbourne brewer, purchased by Wood and Prendergast (1878) and later Tooth & Co. (1981). Brewing ceased in 1939 and the building was used in 1974 as a distribution centre.The interiors are of significance.
Newcastle City Centre HCA	Refer Section 5.1, following.

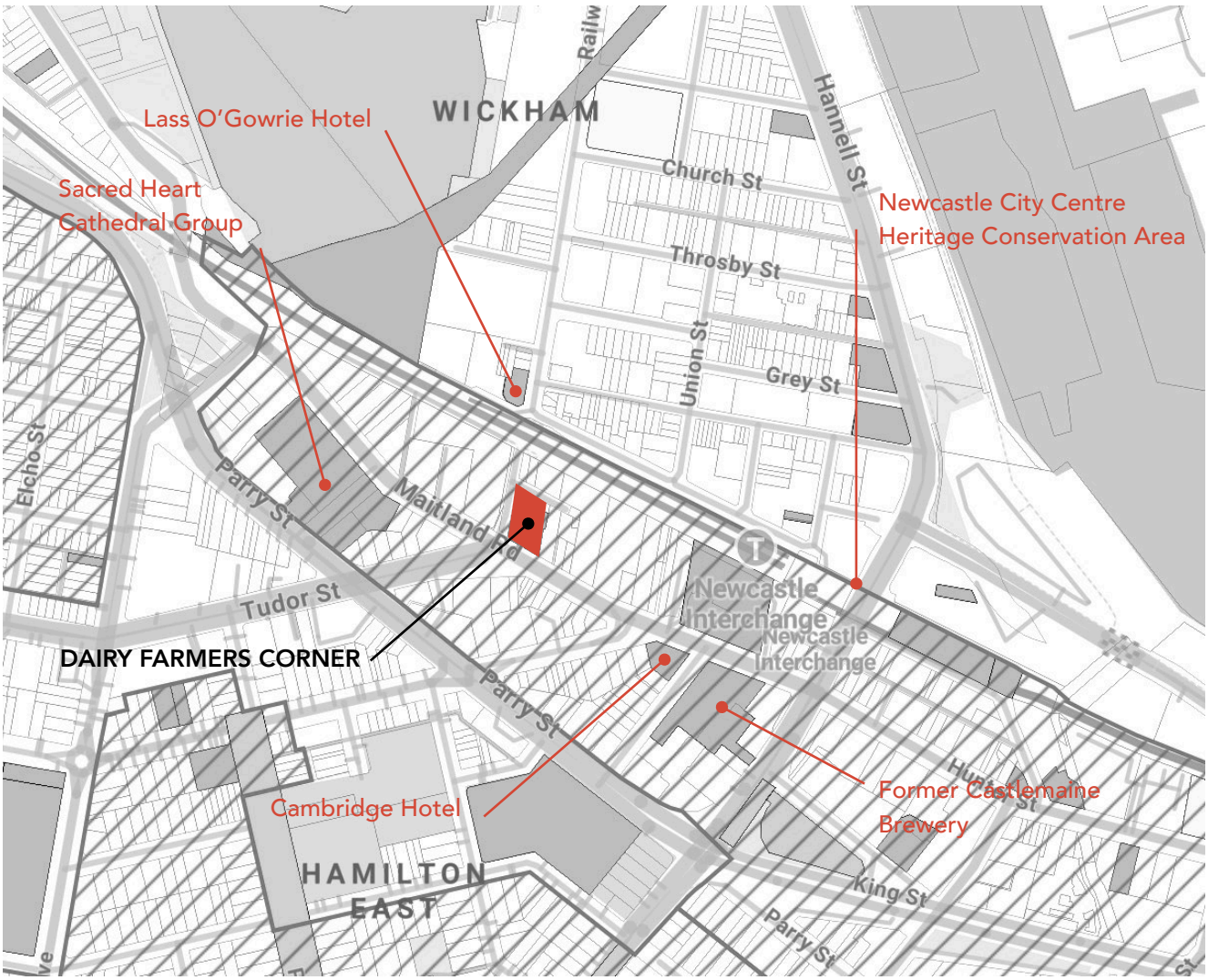


Figure 29
The heritage context of the subject site.
source: Mecone Mosaic, Heritas overlay

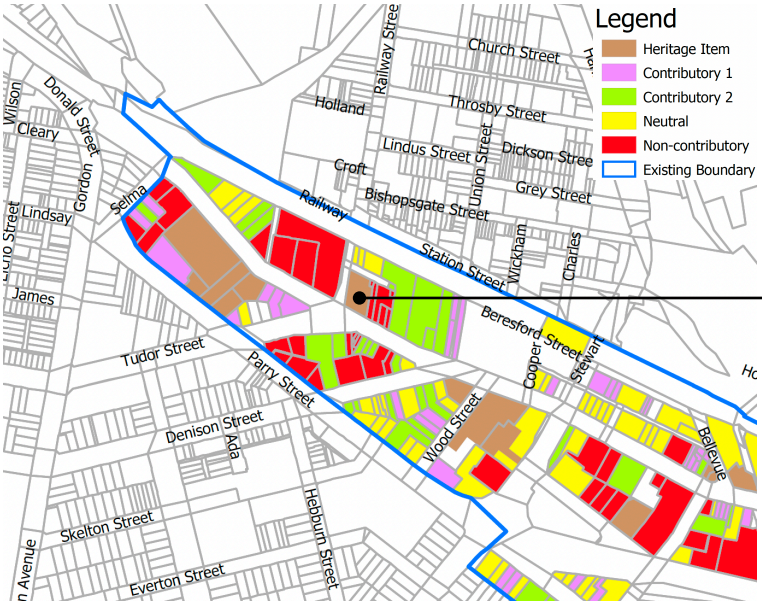


Figure 30
NDCP mapping of contributory buildings. Dairy Farmers Corner indicated.
source: City of Newcastle

5 SIGNIFICANCE

5.1 Significance of the Area

The site falls within the boundary of the Newcastle City Centre Heritage Conservation Area (HCA). The heritage values of the HCA are given in the statement of significance, published by City of Newcastle as reproduced below:

> The Newcastle City Centre Heritage Conservation Area is significant on many levels. The mix of commercial, retail and civic buildings is a powerful reminder of the city's past, its economic and social history. Historic buildings provide the backdrop to a city of dramatic topography on the edge of the sea and the mouth of a harbour.
>
> The pre-1840s buildings in the city are of state significance (Rose Cottage, c1830, Newcomen Club, 1830, parts of James Fletcher Hospital) and share associations with the city's convict origins. Newcastle has a rich archaeological record of national significance, with the potential to yield information about the early convict settlement and early industrial activities. The city area is known to have been a place of contact between colonists and the indigenous population. This evidence is available in historical accounts and in the archaeological record surviving beneath the modern city.
>
> The high numbers of commercial and civic buildings of the 19th and 20th centuries gives the city a rich historic character which is notable and allows an understanding of the importance of the city as a place of commerce, governance and city building. The historical foundation of the city was the discovery and exploitation of coal with good shipping access via a safe and navigable harbour. The town's layout by Surveyor General Henry Dangar in 1828 is still visible in the city's streets, and is an element of historical value, particularly in the vicinity of Thorn, Keightley, Hunter and Market streets.

The above description is focused on the Newcastle City Centre, despite the HCA boundary encompassing the very different character of the western end of the CBD and therefore has little relevance for assessing the subject site.

In 2000, City of Newcastle confirmed the West End context, stating that the 'conservation area at this end of town has no definable or consistent heritage character and the streetscapes are characterised by a mix of uses, building forms and scale.'[49]

The Newastle Development Control Plan (2012) 6.02 Heritage Conservation Areas gives no Desired Future Character Statement for the Newcastle City Centre HCA.

5.2 Significance of the Item

A place considered to be of potential heritage significance is assessed using guidelines established by Federal and State government heritage authorities, namely the Australian Heritage Commission and the NSW Heritage Council. These guidelines set out assessment criteria that broadly encompass possible values of cultural heritage significance:

1. historical significance;
2. aesthetic significance;

[49] Development and Environment Group, DA No. 00/1656 – demolition of existing car park building … Newcastle Workers Club, November 2000, p. 10.

3. social significance;
4. research/technical significance;
5. rarity; and
6. representativeness.

Once the values of heritage significance have been determined, they are then graded to assess their relative contribution to the heritage value of the place. Gradings are:

1. Exceptional (rare or outstanding element directly contributing to an item's significance);
2. High (high degree of original fabric; demonstrates a key element of the item's significance);
3. Moderate (elements with little heritage value, but which contribute to the overall significance of the item);
4. Little (alterations detract from significance; difficult to interpret); and
5. Intrusive (damaging to the item's heritage significance).

The assessment of significance also requires that the level of significance be determined.

1. National significance (significant to the people of Australia);
2. State significance (significant to the people of NSW); and
3. Local significance (significant within the local government area).

Some items of local significance may have values that extend beyond the local government area, or need a wider contextual consideration. Where this is the case these values are included in the statement of significance.

The chart shown in Figure 31 graphically describes the assessment process.

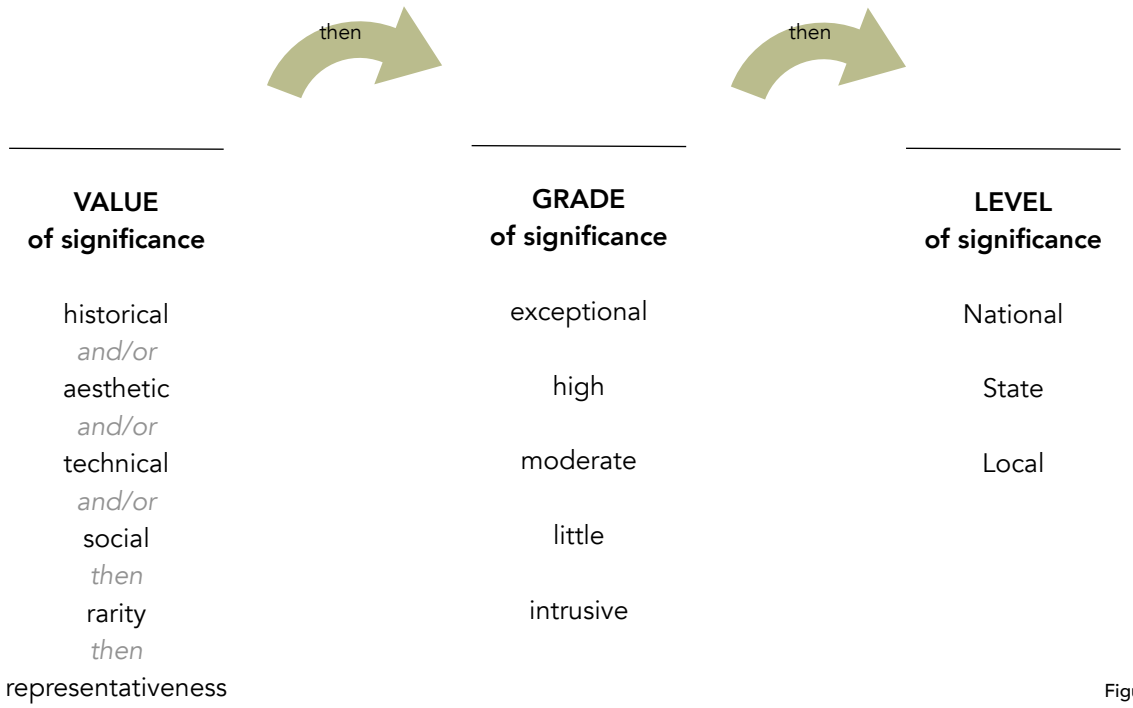


Figure 31
Graphical representation of the assessment of heritage significance.

5.2.1 National Heritage Assessment

In order to assess places for heritage value in a national context, the Australian Heritage Council sets out criteria for their heritage lists, namely the Commonwealth Heritage List, and the National Heritage List. Assessment under these guidelines is carried out using criteria dealing with Australia's natural and cultural history.

To meet the criteria set out by the National Heritage List, a place must have 'outstanding heritage value to the nation.' The former Dairy Farmers site does not meet this criterion.

To meet the criteria set out by the Commonwealth Heritage List, a place must have 'significant heritage value' and be owned or managed by the Commonwealth Government. The former Dairy Farmers site does not meet this criteria.

5.2.2 NSW Heritage Assessment

The Heritage NSW sets out criteria and guidelines in their Assessing Heritage Significance document to assist the assessment of an item's significance.

An item will be considered to be of significance if it meets one or more of the following criteria: historical, aesthetic, technical/research, or social. The integrity of the fabric and the documentary evidence must allow for a sound analysis of heritage significance and in the case of Dairy Farmers Corner, this is considered achieved.

Accordingly, the former Dairy Farmers site is assessed as follows.

HISTORICAL	**Criterion (a)** **The former Dairy Farmers site is important in the course, or pattern, of NSW's (or the local area's) cultural or natural history for the following reasons.**
1	The former Dairy Farmers site is able to demonstrate the formation of co-operatives in the dairy industry, locally, and additionally at a time when Newcastle West was an appropriate location for industry of this type. The site housed offices, milk receiving and milk processing facilities and would have been a focal point for the dairy industry in Newcastle from 1917 - early 1990s.
	Criterion (b) **The former Dairy Farmers site has a strong association with the life or works of a person, or a group of persons, of importance in the local area's cultural or natural history for the following reasons.**
1	The site has a strong association with the dairy farmers of the Newcastle area.
AESTHETIC	**Criterion (c)** **The former Dairy Farmers site is important in demonstrating aesthetic characteristics and/or a high degree of the creative or technical achievement in the local area for the following reasons.**
1	The remnant milk bottle tower, including clock faces, is a local landmark.

2	The original, remnant form and fabric of the tower is of note including the (likely) faïence tile, the clock faces, the milk bottle-shaped window, the terrazzo floor and parts of the timber entrance detailing. The tower inits original form and fabric can be said to be unique in Newcastle. There are a number of commercial buildings dating to the same period which also used faïence tile in their façades however none of note that also used neon as part of their corporate identity.
SOCIAL	**Criterion (d)** **The former Dairy Farmers site has strong or special association with a particular community or cultural group in NSW (or the local area) for the following social, cultural or spiritual reasons.**
1	The former Dairy Farmers site has a special association for the remaining local community of current and former milk producers.
2	The remnant milk bottle tower, including clock faces, is a local landmark for Novocastrians, evidenced not only by its retention in the 1990s redevelopment work but ongoing reminiscences on social media.
RESEARCH	**Criterion (e)** **The former Dairy Farmers site has the potential to yield information that will contribute to an understanding of NSW's (or the local area's) cultural or natural history for the following reasons.**
1	The building (tower) has the ability to reveal details of materials and construction of the Art Deco period in Newcastle, which should be considered uncommon.
RARITY	**Criterion (f)** **The former Dairy Farmers site possesses uncommon, rare or endangered aspects of NSW's (or the local area's) cultural or natural history for the following reasons.**
1	The remnant clock tower relating to the original 1938 Dairy Farmers complex on the site is a unique and iconic structure in Newcastle. Following vacation of the site by Dairy Farmers in the 1990s, the distribution centre relocated to Cardiff and into a building of nondescript architectural style, out of common public view. The remaining masonry tower with its clock faces and its milk bottle window is a rare remnant of a time when corporate entities advertised not only through signage but through their architecture.
REPRESENTATIVENESS	**Criterion (g)** **The former Dairy Farmers site is important in demonstrating the principal characteristics of a class of NSW's (or the local area's):** **- cultural or natural places; or** **- cultural or natural environments.**
1	The place does not meet the criteria for inclusion under this category.

5.3 Statement of Significance

The existing heritage listing for the site, given in the NSW State Heritage Inventory, inadequately states the significance of Dairy Farmers Corner as:

> Forms a visual termination of Tudor Street and is a landmark. The interiors are of significance.

Based on the research undertaken as part of this report, an updated Statement of Significance is given, as follows.

> The site at 924 Hunter Street, Newcastle West - better known as Dairy Farmers Corner - was purchased in 1917 by the the Dairy Farmers' Co-operative Milk Co. Ltd. and later redeveloped by them in the late 1930s to serve as a new receiving, processing, distribution and office complex.
>
> Designed by Dairy Farmers' in-house architect, Alva Charles Likely, the 1938 development incorporated several structures across the greater site, bounded by Hunter Street, Railway Street, and the railway line and bisected by Tighe Street, the administration building fronting Hunter Street was the showpiece of the complex. Drawing strongly on European and American trends of the Art Deco and Bauhaus styles with its central clock tower, large milk bottle-shaped window to the street, use of glass blocks , faïence tile, and neon signage, the building provided offices, lunch and rest rooms for employees, and a kitchen for demonstrations showcasing milk in modern cookery.
>
> The relocation of the Dairy Farmers' enterprise in the 1990s led to a redevelopment of the site later that decade, with the only original fabric retained being the clock tower.
>
> For many decades the site of the Dairy Farmers clock tower at the end of Tudor Street, Hamilton has been a Newcastle icon, despite the redevelopment and reuse of the site as a car sales yard. It retains the ability to demonstrate the importance of corporate architecture of the period and a history of the formation of business co-operatives. The site and its iconic tower has social significance to past dairy industry workers in the greater Newcastle area.
>
> It is a rare remnant of industrial Art Deco style remaining in the Newcastle CBD and of a time when corporate entities advertised not only through signage but through their architecture.
>
> Although the overall site has been largely altered, the remaining clock tower has exceptional historical significance and high aesthetic, social and technical significance, at a local level.

6 STATEMENT of HERITAGE IMPACT

This is a statement of heritage impact for:

Partial demolition of the existing commercial building and construction of a new mixed-use development at 924 Hunter Street, Newcastle West NSW. The subject site extends across several parcels, however the heritage-listed component is within Lot 2 DP445736.

Date:

October 2021

Reference:

The material upon which this assessment has been based is the following documentation prepared by CKDS Architecture.

CKDS 21014

Drawing	A-1101	Issue 06	Ground Floor Plan
	A-1102	Issue 06	Upper Ground Floor Plan
	A-1103	Issue 06	Level 1
	A-1104	Issue 06	Level 2
	A-1105	Issue 06	Level 3
	A-1106	Issue 06	Level 4
	A-1107	Issue 10	Tower Level 5
	A-1108	Issue 10	Tower levels 6-14
	A-1109	Issue 10	Tower levels 15-21
	A-1110	Issue 11	Tower Levels 22-24
	A-1111	Issue 10	Tower Levels 25-26
	A-1112	Issue 10	Tower Levels 27-29
	A-2001	Issue 04	North Elevation
	A-2002	Issue 04	South Elevation
	A-2003	Issue 04	East Elevation
	A-2004	Issue 04	West Elevation
	A-5001	Issue 02	Podium Materiality
	A-5002	Issue 02	Tower Materiality
	A-8001	Issue 03	Perspective Views
	A-8002	Issue 01	Visualisation - Long View Study
	SK-231	Issue 01	Public Art - Concept Plans
	SK-232	-	Public Art - Concept Images
	SK-233	-	Public Art - Concept Images
Other	Email advice from CKDS		

Prepared by:

Heritas Architecture (Linda Babic, B.A., B.Arch., M.Herit.Cons.)
119a Elder Street, Lambton NSW 2299

Prepared for:

Thirdi Dairy Farmers Pty Ltd
3 Harold Street, Floraville NSW 2282

6.1	The following aspects of the proposal respect or enhance the heritage significance of the item/ area for the following reasons.
1	The proposal has no impact on the stated heritage values or significance of the Newcastle City Centre Heritage Conservation Area.
2	The existing fabric (excluding the clock tower) is not considered to be significant in its own right or as a streetscape element. The demolition of the 1990s fabric is not considered to have a detrimental impact on the existing heritage significance of the clock tower, or the stated values of the Newcastle City Centre Heritage Conservation Area.
3	The reduction in bulk achieved by breaking down the residential floor plate into two towers is sympathetic to the context.
4	The respect of the streetscape achieved by the tower setbacks is sympathetic to the area. The built form of the West End is changing to reflect up to 90m height limits and existing and approved towers flank the subject site in Newcastle West as well as in Wickham.
5	The enhancement of the streetscape is achieved by provision of retail space, public art, and courtyard space at ground level - a sympathetic reuse of the Dairy Farmers use of the site as industrial with private commercial use abutting the Hunter Street boundary. Public engagement with the Dairy Farmers clock tower will be greatly enhanced.
6	Despite the proposed development being visible from many locations in the West End, any impact on nearby heritage items is not considered to be detrimental. The setting of heritage items is maintained. While the view of heritage items will be changed in some circumstances, depending on viewpoint, the distance between the proposed towers and nearby heritage items is sufficient to maintain the independence of the heritage items. Streetscape views to heritage items are mitigated by the tower setback.
7	The material palette responds to the large grained built form of the context with precast concrete louvre panels and glazing, while also introducing a finer grain through the use of face brickwork. As brickwork is a predominantly domestic building material, its use here invokes a gentler interface. The material choices complement the character of the western end of the conservation area. Materiality respects the existing clock tower by not replicating any of the existing original fabric.
8	The architectural style of the proposed development is complimentary to the existing and developing character of the West End, and will contribute positively to the existing diversity of built fabric in the conservation area. The modern fabric highlights the heritage fabric more effectively than mimicking a heritage style and therefore considered to be an appropriate response.

9	The proposal is consistent with the planning intent for a new high density centre at the western end of the city, in conjunction with the Newcastle Interchange, and achieves this with sensitivity to nearby heritage items. By confirmation of the allowable height limits in the area under DCP 2012, it must be interpreted that Council has already conceded altered skyline views in Newcastle West.
10	Although the entire site is heritage-listed, the clock tower is deemed to be the significant fabric. The redevelopment of the site in the 1990s effectively removed all other fabric related to the Dairy Farmers occupation.
11	Two periods of major site disturbance - in the 1930s and 1990s - would have removed the probability of pre-1930s archaeological relics on the site.
12	The view of the clock tower on approach from Tudor Street is maintained.
13	The forms across the site are respectful to the clock tower, by reducing from the high point of the setback residential towers, to the mid-height commercial office, to the low-rise podium, to the existing clock tower. The graduation is reinforced by the materiality of the buildings, with the clock tower retaining its heritage detail, the commercial building providing a perforated, consistently simple curtain backdrop to the tower, and the repetitive simplicity of the residential towers beyond.
14	The form of the eastern tower podium is reflective of the former eastern wing of the Dairy Farmers building.
15	The clock tower is successfully embraced into the development without appearing disjointed yet without being subsumed by it. Allowing a minimum curtilage is respectful to the fabric, and allows for the heritage item to be better interpreted "in the round".
16	The intention to retain the original fabric of the clock tower is sympathetic to the structure and also to the heritage conservation area.
17	The adaptation of the ground level uses existing openings. The original floor plan for the building has not been found and therefore it is unclear what the original openings were. Adaptation of the existing openings with new reveals, using new materials, is a sympathetic response.
18	The indicative material and colour palette is sympathetic to the heritage item.
19	Established view corridors to nearby heritage items are not compromised.
20	The proposal is sympathetic to the principle of protecting heritage items and their setting, stated in NDCP 6.01.02 B(7).
21	The proposed lighting of the interior of the tower is consistent with its original intention.

	Assessment Against Newcastle Development Control Plan Section 5.05: Heritage Items
22	5.05.01 General principles The proposal meets the objectives of this section by: retaining the heritage item; by further understanding the heritage significance of the item and adjusting the proposal in sympathy (retaining the tower and fabric); by conserving and reusing the item in a way that highlights the significance to the public; by improving the setting in removal of street trees and providing relief from immediate surrounding modern structure; by removing unsympathetic additions; and, through the greater development, ensuring its ongoing maintenance and care. The proposal meets the controls of this section by: providing this Statement of Heritage Impact and adjusting the proposed scope in sympathy; protecting the setting of the tower, namely the approach from Tudor Street; by retaining significant space that defines the tower; by retaining significant fabric and being open to reconstructing lost original fabric; by removing unsympathetic additions; and, by being open to reinstating missing original elements, such as identity signage.
23	5.05.02 Integrating heritage items into new developments The proposal meets the objectives of this section by: ensuring the heritage research and subsequent confirmation of significance is guiding the design development; by providing a modern, refined and simple material palette for new adjacent works; and, by providing for the long term conservation of the Dairy Farmers tower through its incorporation into the development. The proposal meets the controls of this section by: ensuring the tower is conserved; and, retaining a suitable setting for the tower.
	Assessment Against Newcastle Development Control Plan Section 6.02: Heritage Conservation Areas
24	6.02.01 Alterations and additions in heritage conservation areas The proposal meets the objectives of this section by: retaining the heritage item and relieving it of unsympathetic earlier additions. The objectives of this section of the DCP are not aligned with the Council's West End development strategy, and are more aligned with general residential development. For instance, the architectural style of the host building (1938 tower) is deliberately not reflected in the design of the additions (commercial and residential towers) and is considered an inappropriate design approach.
25	6.02.02 Materials and details in heritage conservation areas The proposal meets the objectives and controls of this section by: recognising the significance of the tower and its original materials and further reflecting this in the material choices for the new construction, proving a materiality and colour palette that is sympathetic to the heritage item and to the context of the heritage conservation area; and, by not painting original face brickwork.
26	6.02.03 Accommodating vehicles in heritage conservation areas The proposal meets the objectives and controls of this section by: providing vehicle accommodation away from public view and that doesn't interfere with the street presentation or interpretation of the 1938 tower.
27	6.02.04 Fences in heritage conservation areas Not applicable.
28	6.02.05 Gardens in heritage conservation areas Not applicable.

29	6.02.06 Subdividing or amalgamating land in heritage conservation areas The proposal meets the objectives and controls of this section by: respecting the historical use of the greater site by Dairy Farmers, as one use, despite a number of individual land parcels.
30	6.02.07 Infill development in heritage conservation areas The objectives of this section are difficult to assess against the variable significance of the west end of the heritage conservation area. Respecting the design of neighbouring properties has a different meaning here than it does in Hamilton South, for example. However the objectives of not replicating or mimicking heritage detail, and respecting character, scale and setback, still apply. In this respect, the proposed development is based on a rigorous assessment of the immediate context - both existing and approved - which has informed the scale, setback and form. The proposal is respectful of the existing and approved character of the west end, and will set a suitable precedent for future character in conjunction with a heritage item. This is essentially the existing character of the west end - larger lots, commercial uses, with small pockets containing heritage items. Although the height of the proposal is greater than any currently existing, it is within Council's planning control and comparable to recently approved developments, which will result in a scale that is comfortable for the future west end form. The immediate context of the site is a mix of non-contributory, neutral and contributory 2 items, with the western junction of Tudor Street and Maitland Road being noted as a contributory 1 landscape item. Heritage items exist as shown in Figure 27. The materials and details of the new work are sympathetic through their rawness and simplicity, reflecting the history, use a materiality of the site, and by not attempting to replicate the Art Deco detailing of the clock tower.
	Assessment Against Newcastle Development Control Plan Section 6.01: Newcastle City Centre
31	6.01.02 Character Areas: overall principles The proposal respects overall Principle 3 by retaining and protecting the heritage item on the site and enhancing its setting. The settings of nearby heritage items are protected.
32	6.01.02 B:West End The principles for the West End Character Area are met in the proposed design through: the creation of new ground level public space in conjunction with increasing the interpretive value of the heritage item on the site; and, the retention of the heritage item and re-purposing of the site, reinvigorating the character of the West End.
6.2	**The following aspects of the proposal could detrimentally impact on the heritage significance of the item/area.**
1	The proposed height of the towers is slightly greater than any currently existing in the area. However, the height in consistent with the future character of the new CBD of Newcastle (DCP 6.01.02 B. West End), the site is in a location within the heritage conservation area that is disjointed from the Newcastle City Centre (as described earlier) and is sufficiently distant from individual heritage items so as not to have a detrimental effect on view corridors to those items or on public engagement with those items.

2	The scale of the new development is much greater than the scale of the remnant clock tower. This has been mitigated by the reduction in scale across the site from residential towers to the commercial tower. The detail of the clock tower and the reconstruction of additional detail to the clock tower will effectively make this element the feature of views to the site on approach from Tudor Street. It is noted that the heritage item is not largely visible on approach from the east or the west until immediately upon it.
3	The proposal for additional detailing to the tower is not included in the reviewed documents, but should be further developed in conjunction with a heritage architect. Specifically, conservation of the clock faces, addition of new or reconstructed signage, addition of new or reconstructed materials, restoration of existing fabric (faïence). It is noted that the original signage to the front and sides of the tower was in neon - it is considered appropriate to reconstruct this.
	Assessment Against Newcastle Development Control Plan Section 6.02: Heritage Conservation Areas
4	6.02.06 Subdividing or amalgamating land in heritage conservation areas The existing lot arrangement over the greater site is of a group of seven allotments. Although the proposal will amalgamate these, it is not considered to have a detrimental impact on the extant heritage fabric of the tower or on the heritage conservation area, as from its original development in the early 20th century the entire greater site has been used by Dairy Farmers. The public interpretation would not have been of several different sites. The proposal respects the historical development of the site related to its significance as the Newcastle branch of Dairy Farmers.
6.3	The following sympathetic solutions were considered and discounted for the following reasons.
1	A concept of pulling the development back further away from the clock tower was considered, initially as being more respectful to the heritage item. However, with further development of the design approach and consideration of integrating the tower into the development, a close yet offset approach to integration was considered to be the most sympathetic to the clock tower, the interpretation of the item, and the streetscape.
2	The design process explored using the clock tower as the entry to the development, and thereby continuing its original use. Following consideration, this option was discounted as it required new building form to connect directly to the tower, which was subsequently considered to stifle the expression of the original tower (much as it does now). Unless the original 1938 design was reconstructed to Hunter Street it is considered appropriate to have the tower independent.

6.4	The following elements should be further explored for inclusion within the development.
1	Reconstruction of clock tower signage should be explored. Neon lighting was first demonstrated by Georges Claude at the 1910 Paris Motor Show, and Claude went on to further develop and patent this type of lighting in conjunction with his company Claude Neon. The entrance to the Paris Opera was lit with neon by 1919, and the style was readily taken up around the world. The Claude Neon company is still operating internationally, headquartered in France and with several locations in Australia. Claude Neon installed and still maintains the iconic Coca-Cola sign in Kings Cross, Sydney. Neon lighting has a strong historical connection with the Art Deco period, and its reconstruction at Dairy Farmers Corner should not be discounted. Modern neon flex material could be considered appropriate due to its sustainable properties and its distance from ground level making it essentially indistinguishable. This has been approved for use at numerous other heritage buildings in NSW.
2	Internal lighting of the tower should be developed alongside further research. Oral history references the interior lighting within the tower, visible to the public, changed colour from time to time. This should be more fully researched prior to detailing a solution for internal lighting.
3	Detailing of finishes to the clock tower, both internal and external, should be resolved in conjunction with a heritage architect with the goal to return the tower to its Art Deco glory. This could include confirming whether a paint layer covers the original faïence tiles on the south face (and subsequent removal of the paint layer), investigating the tower façade vertical detailing either side of the milk bottle (with the view to uncovering/reinstating this), reconstructing some terracotta detailing to the entrance canopy, reconstructing the glass brick infill to the milk bottle and entrance margin glazing, reconstructing the black entrance wall tiles, and exploring options for the reconstruction of neon signage.

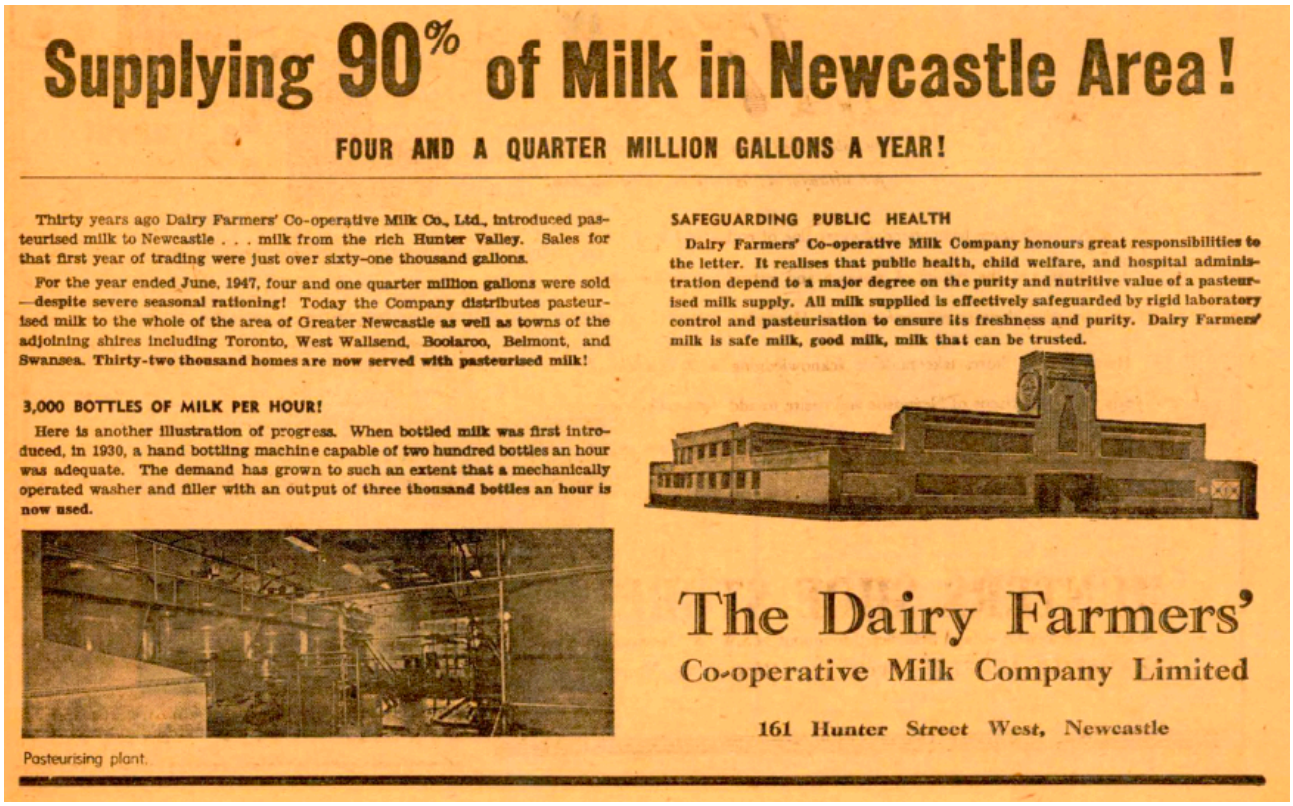
7 CONCLUSION

The current character statement for the Newcastle City Centre Heritage Conservation Area is largely irrelevant when considering the West End. Newcastle DCP 6.01.02 acknowledges this by recognising 'the predominance of larger consolidated land holdings and fewer environmental and heritage constraints' making the area 'ideally suited to become the future CBD of Newcastle.' The City of Newcastle has also referred to the West End as having no definable or consistent heritage character. To maintain significance in the area, the DCP principles for development in this area include simply for heritage items and their settings to be protected.

New development in historical areas must be a reflection of our current culture. Development must endeavour to create a city that reflects the modern complexity of our culture, and represents the spirit of the city at the time. It should be unapologetically modern, while respectfully sympathetic. New architecture should continue the story of Newcastle alongside its history, not simply recount it.

The influx of additional new retail, commercial and residential spaces in the West End will bring increased population, which in turn will have a positive flow-on effect in retaining uses for heritage buildings, and consequently engaging the public in heritage places.

The proposal for Dairy Farmers Corner retains and conserves, and will further unveil, an iconic piece of Newcastle's history and should be fully supported on heritage grounds.



Supplying 90% of Milk in Newcastle Area!

FOUR AND A QUARTER MILLION GALLONS A YEAR!

Thirty years ago Dairy Farmers' Co-operative Milk Co., Ltd., introduced pasteurised milk to Newcastle . . . milk from the rich Hunter Valley. Sales for that first year of trading were just over sixty-one thousand gallons.

For the year ended June, 1947, four and one quarter million gallons were sold —despite severe seasonal rationing! Today the Company distributes pasteurised milk to the whole of the area of Greater Newcastle as well as towns of the adjoining shires including Toronto, West Wallsend, Boolaroo, Belmont, and Swansea. Thirty-two thousand homes are now served with pasteurised milk!

3,000 BOTTLES OF MILK PER HOUR!

Here is another illustration of progress. When bottled milk was first introduced, in 1930, a hand bottling machine capable of two hundred bottles an hour was adequate. The demand has grown to such an extent that a mechanically operated washer and filler with an output of three thousand bottles an hour is now used.

Pasteurising plant.

SAFEGUARDING PUBLIC HEALTH

Dairy Farmers' Co-operative Milk Company honours great responsibilities to the letter. It realises that public health, child welfare, and hospital administration depend to a major degree on the purity and nutritive value of a pasteurised milk supply. All milk supplied is effectively safeguarded by rigid laboratory control and pasteurisation to ensure its freshness and purity. Dairy Farmers' milk is safe milk, good milk, milk that can be trusted.

The Dairy Farmers'
Co-operative Milk Company Limited
161 Hunter Street West, Newcastle

Figure 32
Advertising the success of Dairy Farmers' Co-operative Milk Co. Ltd., 1947.
source: Daily Telegraph, Newcastle 150th Anniversary Souvenir Supplement, 01 September 1947

Appendix J

NOISE ASSESSMENT (MULLER ACOUSTIC CONSULTING)

Noise Assessment

Dairy Farmers Corner
924 Hunter Street
Newcastle West, NSW

Prepared for: Catalyst Project Consulting Pty Ltd
October 2021
MAC211442-01RP1D1

Muller Acoustic Consulting

Document Information

Noise Assessment

Dairy Farmers Corner

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1 Introduction

Muller Acoustic Consulting Pty Ltd (MAC) has been commissioned by Catalyst Project Consulting Pty Ltd (Catalyst) to conduct a Noise Assessment (NA) for the proposed Residential Towers development at 924 Hunter Street, Newcastle, NSW (the 'project').

This report presents the results, findings and recommendations of the NA and has been prepared to accompany the project's Development Application (DA) being prepared for submission to The City of Newcastle Council (TCON).

Key acoustic elements addressed as part of this assessment include:

- road/transportation noise intrusion (impacts to internal spaces within apartments);
- rooftop emissions, including mechanical plant from the project to neighbouring receivers; and
- emissions from ground floor food and beverage tenancies.

Given the acoustic aspects considered in this assessment, the following policies and guidelines have been adopted:

- NSW Environment Protection Authority (EPA), Noise Policy for Industry (NPI), 2017;
- Department of Planning (DPI), Development Near Rail Corridors and Busy Roads - Interim Guideline, 2008;
- NSW Environment Protection Authority (EPA), Road Noise Policy (RNP), 2011;
- NSW EPA's Noise Guide for Local Government (NGFLG), (2013);
- The Independent Liquor and Gaming Authority (ILGA) criteria related to licensed premises;
- Australian Standard AS 1055:2018 Acoustics - Description and measurement of environmental noise - General Procedures;
- Australian Standard AS 3671-1989, Acoustics - road traffic noise intrusion - building site and construction; and
- Australian Standard AS 2107:2016 Acoustics - Recommended design sound levels and reverberation times for building interiors.

A glossary of terms, definitions and abbreviations used in this report is provided in Appendix A. Figure 1 presents the project site and nearest surrounding receivers that have been considered in this assessment.

1.1 Project Summary

The project primarily will consist of two residential towers (North Tower located north west of the site and South Tower located south east of the site). The towers are above car parking, storage and services on the lower floors, with three commercial/retail tenancies located at the ground floor level. There is also a standalone commercial/office building situated on the southern western corner of the site. The project plans are reproduced in **Appendix B**.

FIGURE 1

MAC211442

924 Hunter Street

Newcastle West

KEY

Site Boundary

Receivers

Logger Location

0 5 10 15 20 25 m

N

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2 Noise Policy and Guidelines

2.1 Development Near Rail Corridors and Busy Roads – Interim Guidelines

Guidance for the specification of internal noise levels of habitable rooms is prescribed in Department of Planning's (DoP) Development near Rail Corridors and Busy Roads – Interim Guidelines (2008) ('the guideline').

The guideline outlines internal noise criteria for Clause 102 (Road) of the State Environmental Planning Policy (SEPP) for Infrastructure (Infrastructure SEPP):

> *"If the development is for the purpose of a building for residential use, the consent authority must be satisfied that appropriate measures will be taken to ensure that the following LAeq levels are not exceeded:*
>
> - *in any bedroom in the building: 35dBA at any time 10pm–7am; and*
> - *anywhere else in the building (other than a garage, kitchen, bathroom or hallway): 40dBA at any time."*

Table 3.1 of the guideline clarifies that the above noise criteria are to be determined as an $LA_{eq(15hr)}$ for the daytime and $LA_{eq(9hr)}$ for the night time period.

The guideline assists in the planning, design and assessment of developments in, or adjacent to, rail corridors and busy roads and supports the Infrastructure SEPP. The guidelines are mandatory for residential developments proposed adjacent to busy roads with an Annual Average Daily Traffic (AADT) of greater than 40,000 vehicles or for projects where traffic noise impacts are anticipated.

Traffic flows for Hunter Street were referenced from Table 2-2 of the Newcastle Light Rail, Technical Paper 1- Traffic, Transport and Access Assessment (GHD, 2016). The estimated AADT flow for this section of Hunter Street were 18,300 vehicles for 2015 and were projected to 2021 assuming 2% traffic growth per annum. The traffic volumes were adopted to calibrate the predictive road traffic noise model.

2.1.1 Road Noise Screening Test

Section 5.3.2 of the guideline provides screening tests for single and dual occupancy dwellings. The screening tests provide various categories of noise control treatments for dwellings taking into consideration distance to the road and amount of traffic. The guideline presents two screen tests for a 60/70 km/hr zone and 100/110 km/hr zone that are reproduced in Figure 2 and Figure 3 respectively. The screening tests have been adopted in this assessment to provide guidance on building categories for the project.

Figure 2 Screen test for habitable areas of single/dual occupancy dwellings adjacent to 60/70 km/hr zones.

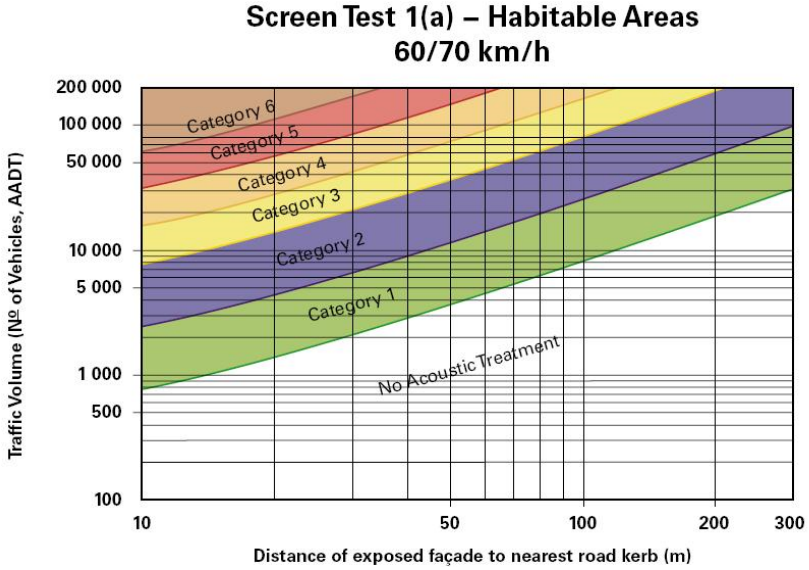
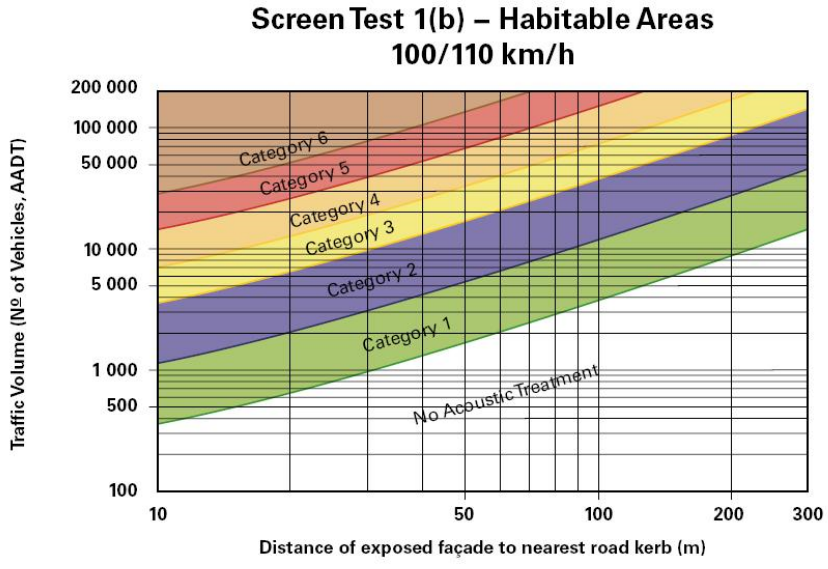


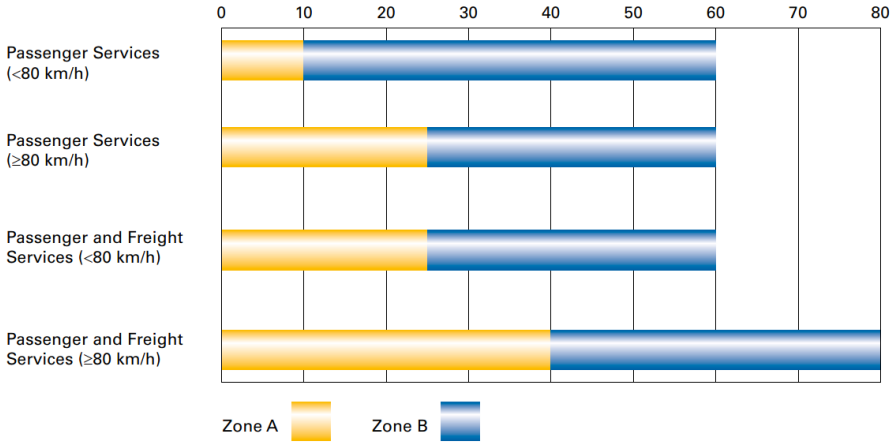
Figure 3 Screen test for habitable areas of single/dual occupancy dwellings adjacent to 100/110 km/hr zones.



2.1.1 Rail Noise Screening Test

Section 5.3.1 of the guideline provides Acoustic Assessment Zones for rail corridors. The Assessment Zones provide offset distances for developments from an operational rail track where a detailed noise impact assessment is required. **Figure 4** reproduces the Acoustic Assessment Zones as presented in the guideline.

Figure 4 Acoustic Assessment Zones.



The section of rail adjacent to the project accommodates passenger trains from Hamilton Station to the Newcastle Interchange. The distance to the nearest rail track to the project site is approximately 50m, and rail traffic would be slowing and be at speeds of less than 80km/hr. It is noted that the project is outside the buffer zone required for a detailed acoustic assessment, hence, rail noise has not been considered further in this assessment.

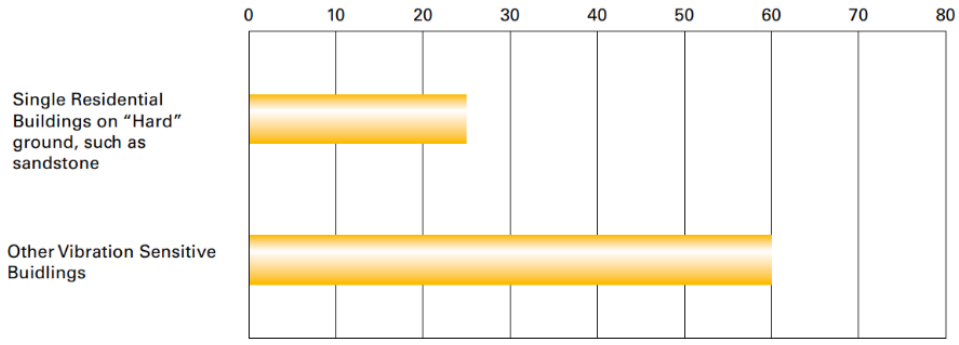
2.1.2 Light Rail Noise

Attended measurements of light rail passbys at Bolton Street Station, identified a L_{Amax} sound power level (Lw) of 99dBA for the light rail vehicle. The setback distance of the project to the nearest Light Rail line of the Newcastle Interchange to the project is 200m, emissions from the light rail movements are expected to be <45dBA at the project façade (excluding intervening buildings that are proposed to be constructed). These levels are negligible compared to ambient noise sources.

2.1.3 Rail Vibration Screening Test

Section 5.3.1 of the guideline provides guidance on the Vibration Assessment Zone for development sites adjacent to rail corridors. As per **Figure 5** reproduced below (from the guideline), the project site is outside the 25m from the existing rail track, hence an assessment of light and heavy rail vibration is not required.

Figure 5 Rail Vibration Assessment Zone (distance (m) to operational track)



2.2 Noise Policy for Industry

The EPA released the Noise Policy for Industry (NPI) in October 2017 which provides a process for establishing noise criteria for consents and licenses enabling the EPA to regulate noise emissions from scheduled premises under the Protection of the Environment Operations Act 1997.

The objectives of the NPI are to:

- provide noise criteria that is used to assess the change in both short term and long-term noise levels;
- provide a clear and consistent framework for assessing environmental noise impacts from industrial premises and industrial development proposals;
- promote the use of best-practice noise mitigation measures that are feasible and reasonable where potential impacts have been identified; and
- support a process to guide the determination of achievable noise limits for planning approvals and/or licences, considering the matters that must be considered under the relevant legislation (such as the economic and social benefits and impacts of industrial development).

The policy sets out a process for industrial noise management involving the following key steps:

1. Determine the Project Noise Trigger Levels (PNTLs) (ie criteria) for a development. These are the levels (criteria), above which noise management measures are required to be considered. They are derived by considering two factors: shorter-term intrusiveness due to changes in the noise environment; and maintaining the noise amenity of an area.

2. Predict or measure the noise levels produced by the development with regard to the presence of annoying noise characteristics and meteorological effects such as temperature inversions and wind.

3. Compare the predicted or measured noise level with the PNTL, assessing impacts and the need for noise mitigation and management measures.

4. Consider residual noise impacts - that is, where noise levels exceed the PNTLs after the application of feasible and reasonable noise mitigation measures. This may involve balancing economic, social and environmental costs and benefits from the proposed development against the noise impacts, including consultation with the affected community where impacts are expected to be significant.

5. Set statutory compliance levels that reflect the best achievable and agreed noise limits for the development.

6. Monitor and report environmental noise levels from the development.

2.2.1 Project Noise Trigger Levels (PNTL)

The policy sets out the procedure to determine the PNTLs relevant to an industrial development. The PNTL is the lower (ie, the more stringent) of the **Project Intrusiveness Noise Level** (PINL) and **Project Amenity Noise Level** (PANL) determined in accordance with Section 2.3 and Section 2.4 of the NPI.

2.2.2 Rating Background Level (RBL)

The Rating Background Level (RBL) is a determined parameter from noise monitoring and is used for assessment purposes. As per the NPI, the RBL is an overall single figure background level representing each assessment period (day, evening and night) over the noise monitoring period. The measured RBLs relevant to the project are contained in **Section 3**.

2.2.3 Project Intrusiveness Noise Level (PINL)

The PINL ($LA_{eq(15min)}$) is the RBL + 5dB and seeks to limit the degree of change a new noise source introduces to an existing environment. Hence, when assessing intrusiveness, background noise levels need to be measured.

Background noise levels need to be determined before intrusive noise can be assessed. The NPI states that background noise levels to be measured are those that are present at the time of the noise assessment and without the subject development operating. For the assessment of modifications to existing premises, the noise from the existing premises should be excluded from background noise measurements. It is note that the exception is where the premises has been operating for a significant period of time and is considered a normal part of the acoustic environment; it may be included in the background noise assessment under the following circumstances:

- the development must have been operating for a period in excess of 10 years in the assessment period/s being considered and is considered a normal part of the acoustic environment; and,
- the development must be operating in accordance with noise limits and requirements imposed in a consent or licence and/or be applying best practice.

Where a project intrusiveness noise level has been derived in this way, the derived level applies for a period of 10 years to avoid continuous incremental increases in intrusiveness noise levels. This approach is consistent with the purpose of the intrusiveness noise level to limit significant change in the acoustic environment. The purpose of the project amenity noise level is to moderate against background noise creep.

2.2.4 Project Amenity Noise Level (PANL)

The PANL is relevant to a specific land use or locality. To limit continuing increases in intrusiveness levels, the ambient noise level within an area from all combined industrial sources should remain below the recommended amenity noise levels specified in Table 2.2 (of the NPI). The NPI defines two categories of amenity noise levels:

- **Amenity Noise Levels (ANL)** – are determined considering all current and future industrial noise within a receiver area; and
- **Project Amenity Noise Level (PANL)** – is the recommended level for a receiver area, specifically focusing the project being assessed.

Additionally, Section 2.4 of the NPI states: “to ensure that industrial noise levels (existing plus new) remain within the recommended amenity noise levels for an area, a project amenity noise level applies for each new source of industrial noise as follows”:

PANL for new industrial developments = recommended **ANL** minus 5dBA.

The following exceptions apply when deriving the PANL:

- areas with high traffic noise levels;
- proposed developments in major industrial clusters;
- existing industrial noise and cumulative industrial noise effects; and
- greenfield sites.

The NPI states with respect to high traffic noise areas:

The level of transport noise, road traffic noise in particular, may be high enough to make noise from an industrial source effectively inaudible, even though the LAeq noise level from that industrial noise source may exceed the project amenity noise level. In such cases the project amenity noise level may be derived from the LAeq, period(traffic) minus 15 dB(A).

Where relevant this assessment has considered influences of traffic with respect to amenity noise levels (ie areas where existing traffic noise levels are 10dB greater than the recommended amenity noise level).

The recommended amenity noise levels as per Table 2.2 of the NPI are reproduced in **Table 1**.

Table 1 Amenity Noise Levels			
Receiver Type	Noise Amenity Area	Time of day	Recommended amenity noise level dB LAeq(period)
Residential	Rural	Day	50
		Evening	45
		Night	40
	Suburban	Day	55
		Evening	45
		Night	40
	Urban	Day	60
		Evening	50
		Night	45
Hotels, motels, caretakers' quarters, holiday accommodation, permanent resident caravan parks.	See column 4	See column 4	5dB above the recommended amenity noise level for a residence for the relevant noise amenity area and time of day
School Classroom	All	Noisiest 1-hour period when in use	35 (internal) 45 (external)
Hospital ward			
- internal	All	Noisiest 1-hour	35
- external	All	Noisiest 1-hour	50
Place of worship - internal	All	When in use	40
Passive Recreation	All	When in use	50
Active Recreation	All	When in use	55
Commercial premises	All	When in use	65
Industrial	All	When in use	70

Notes: The recommended amenity noise levels refer only to noise from industrial noise sources. However, they refer to noise from all such sources at the receiver location, and not only noise due to a specific project under consideration. The levels represent outdoor levels except where otherwise stated.

Types of receivers are defined as rural residential; suburban residential; urban residential; industrial interface; commercial; industrial – see Table 2.3 and Section 2.7 of the NPI.

Note: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

2.2.5 Maximum Noise Assessment Trigger Levels

The potential for sleep disturbance from maximum noise level events from a project during the night-time period needs to be considered. The NPI considers sleep disturbance to be both awakenings and disturbance to sleep stages.

Where night-time noise levels from a development/premises at a residential location exceed the following criteria, a detailed maximum noise level event assessment should be undertaken:

- $L_{Aeq(15min)}$ 40dB or the prevailing RBL plus 5dBA, whichever is the greater, and/or
- L_{Amax} 52dB or the prevailing RBL plus 15dBA, whichever is the greater.

A detailed assessment should cover the maximum noise level, the extent to which the maximum noise level exceeds the rating background noise level, and the number of times this happens during the night-time period.

Other factors that may be important in assessing the impacts on sleep disturbance include:

- how often the events would occur;
- the distribution of likely events across the night-time period and the existing ambient maximum events in the absence of the development;
- whether there are times of day when there is a clear change in the noise environment (such as during early morning shoulder periods); and
- current understanding of effects of maximum noise level events at night.

2.3 Independent Liquor and Gaming Authority (ILGA)

2.3.1 ILGA from the project

There is the potential for the ground floor tenancies of the project to consist of licenced premises (ie restaurants or cafes). Therefore, the NSW EPA's Noise Guide for Local Government (NGFLG) (2013) has been adopted to quantify potential noise emissions from the ground floor tenancies. The ILGA criteria are reproduced from NGFLG below and have been adopted for this assessment:

'The LA10 noise level emitted from the licensed premises shall not exceed the background noise level in an Octave Band Centre Frequency (31.5Hz – 8kHz inclusive) by more than 5dB between 7:00am and 12:00midnight at the boundary of any affected residence.

The LA10 noise level emitted from the licensed premises shall not exceed the background noise level in an Octave Band Centre Frequency (31.5Hz – 8kHz inclusive) between 12:00midnight and 7:00am at the boundary of any affected residence. Notwithstanding compliance with the above, the noise from the licensed premises shall not be audible within any habitable room in any residential premises between the hours of 12:00midnight and 7:00am.'

2.3.2 ILGA to the project

A review of licenced premises in the vicinity of the project has been completed. The closest licenced premises are the Cambridge Hotel 180m, and The Lass O'Gowrie 170m from the project site. Attended measurements of these premises identifies that the noise contribution from the premises are similar to evening/night road noise levels for the area. Notwithstanding, recommendations in this report are anticipated to adequately attenuate residual noise from surrounding licenced premises. Hence, noise emissions from licenced premises have not been considered further in this assessment.

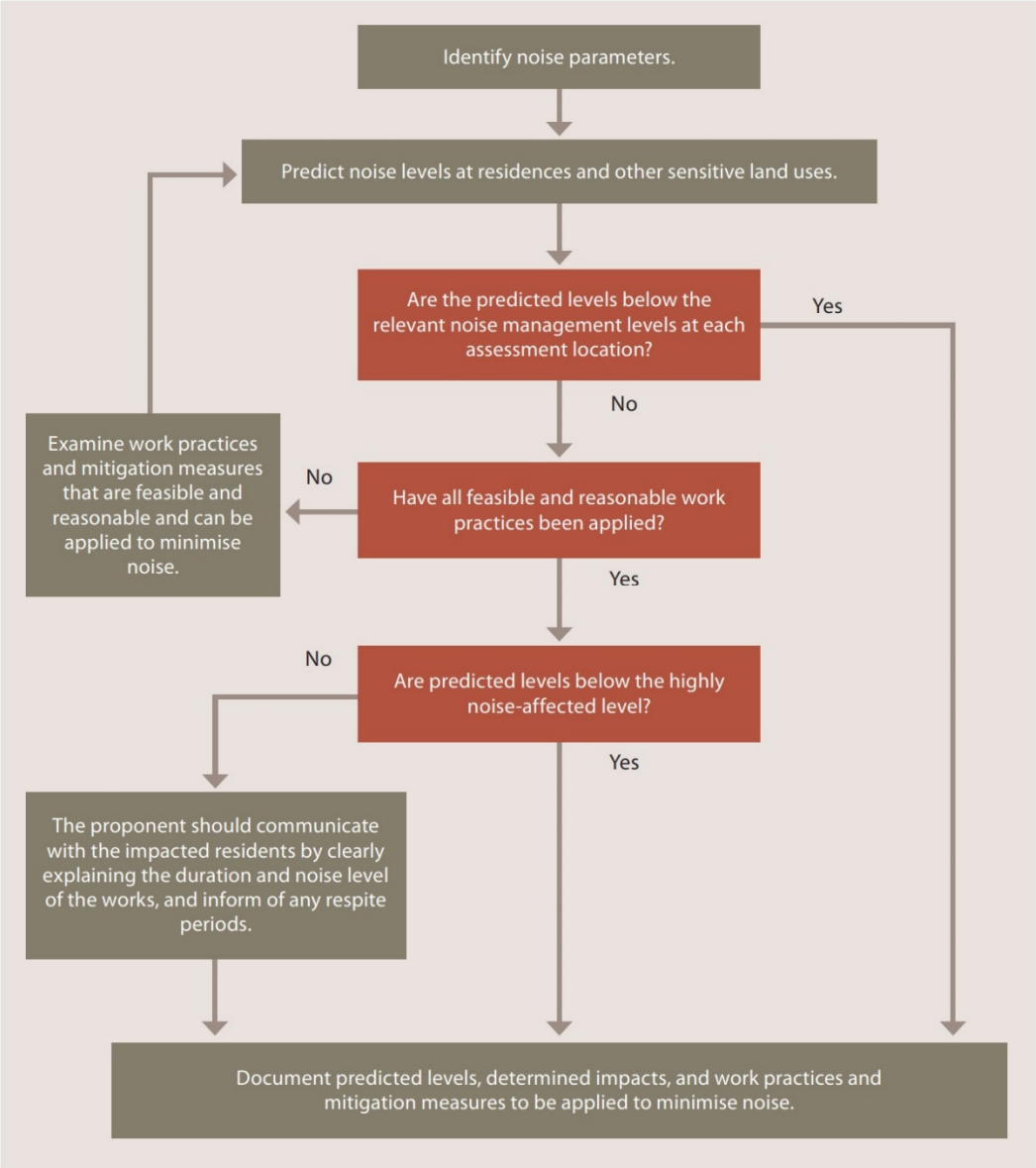
2.4 Interim Construction Noise Guideline

The ICNG sets out procedures to identify and address the impacts of construction noise on residences and other sensitive land uses. This section provides a summary of noise objectives that are applicable to the assessment. The ICNG provides two methodologies for the assessment of construction noise emissions:

- Quantitative, which is suited to major construction projects with typical durations of more than three weeks; and
- Qualitative, which is suited to short term infrastructure maintenance (< three weeks).

The qualitative assessment methodology is a more simplified approach that relies on noise management strategies. This study has adopted a quantitative assessment approach which is summarised in Figure 6. The quantitative approach includes identification of potentially affected receivers, derivation of the construction noise management levels, quantification of potential noise impact at receivers via predictive modelling and, provides management and mitigation recommendations.

Figure 6 Quantitative Assessment Processes for Assessing and Managing Construction Noise



Source: Department of Environment and Climate Change, 2009.

2.4.1 Standard Hours for Construction

Table 2 summaries the ICNG recommended standard hours for construction works.

Table 2 Recommended Standard Hours for Construction

Daytime	Construction Hours
Monday to Friday	7am to 6pm
Saturdays	8am to 1pm
Sundays or Public Holidays	No construction

These recommended hours do not apply in the event of direction from police, or other relevant authorities, for safety reasons or where required in an emergency to avoid the loss of lives, property and/or to prevent environmental harm.

Construction activities are anticipated to be undertaken during standard construction hours.

2.4.2 Construction Noise Management Levels

Section 4 of the ICNG (DECC, 2009) details the quantitative assessment method involving predicting noise levels and comparing them with the Noise Management Level (NML) and are important indicators of the potential level of construction noise impact. **Table 3** reproduces the ICNG Noise Management Level (NML) for residential receivers. The NML is determined by adding 10dB (standard hours) or 5dB (OOH) to the Rating Background Level (RBL) for each specific assessment period.

Table 3 Noise Management Levels		
Time of Day	Management Level LAeq(15min)[1]	How to Apply
Recommended standard hours: Monday to Friday 7am to 6pm Saturday 8am to 1pm No work on Sundays or public holidays.	Noise affected RBL + 10dB	The noise affected level represents the point above which there may be some community reaction to noise. Where the predicted or measured LAeq(15min) is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to meet the noise affected level. The proponent should also inform all potentially impacted residents of the nature of work to be carried out, the expected noise levels and duration, as well as contact details.
	Highly noise affected 75dBA	The highly noise affected level represents the point above which there may be strong community reaction to noise. Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur, taking into account times identified by the community when they are less sensitive to noise such as before and after school for work near schools, or mid-morning or mid-afternoon for work near residences; and if the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.
Outside recommended standard hours.	Noise affected RBL + 5dB	A strong justification would typically be required for work outside the recommended standard hours. The proponent should apply all feasible and reasonable work practices to meet the noise affected level. Where all feasible and reasonable practices have been applied and noise is more than 5dBA above the noise affected level, the proponent should negotiate with the community. For guidance on negotiating agreements see section 7.2.2.

Note 1: The Rating Background Level (RBL) is an overall single figure background level representing each assessment period over the whole monitoring period. The RBL is used to determine the construction noise management levels for noise assessment purposes and is the median of the ABL's.

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3 Existing Environment

3.1 Unattended Noise Monitoring

To quantify the existing background noise environment of the area, unattended noise monitoring was conducted at one location representative of the ambient environment surrounding the project site. The selected monitoring location is shown in **Figure 1** and is considered representative of surrounding residential receivers as per Fact Sheet B1.1 of the NPI.

Attended and unattended noise surveys were conducted in general accordance with the procedures described in Australian Standard AS 1055:2018, "Acoustics – Description and Measurement of Environmental Noise".

The measurements were carried out using one Svantek 977 noise analyser from Friday 10 September 2021 to Monday 20 September 2021. The acoustic instrumentation used carries current NATA calibration and complies with AS/NZS IEC 61672.1-2019-Electroacoustics - Sound level meters - Specifications. Calibration of all instrumentation was checked prior to and following measurements. Drift in calibration did not exceed ±0.5dBA. All equipment carried appropriate and current NATA (or manufacturer) calibration certificates.

Observations on-site identified the surrounding locality was typical of an urban environment, with traffic noise from Hunter Street and urban hum from the surrounding commercial and residential buildings audible.

Data affected by adverse meteorological conditions have been excluded from the results in accordance with methodologies provided in Fact Sheet A4 of the NPI. Residential receivers situated in the surrounding area have been classified under the EPA's urban amenity category. This criteria is used in conjunction with the intrusiveness criteria to determine the limiting criteria. The results of long-term unattended noise monitoring are provided in **Table 4**. The noise monitoring charts for the background monitoring assessment are provided in **Appendix C** of this report.

Table 4 Background Noise Monitoring Summary

Location	Measured Background Noise Level (L_{A90}) dB ABL[1]			Measured dB $L_{Aeq(period)}$		
	Day	Evening	Night	Day	Evening	Night
L1	53	42	38	68	63	61

Note: Excludes periods of wind or rain affected data. Meteorological data obtained from the Bureau of Meteorology weather station Newcastle Nobbys Signal Station AWS 32.9S 151.8°E 33m AMSL.

Note: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

Note 1: Assessment background level (ABL) – the single-figure background level representing each assessment period day, evening and night as per NPI Fact Sheet A.

3.2 Attended Noise Monitoring

To validate background noise levels, an attended noise monitoring measurement was completed at the development site (adjacent to L1) on 10 September 2021.

Observations during the survey noted that road traffic from Hunter Street was the dominant contributor to background noise levels. The monitored noise level contributions and observed meteorological conditions for each measurement are presented in **Table 5**.

Table 5 Operator-Attended Noise Survey Results

Location	Date & Time (hrs)	Descriptor (dBA re 20 µPa)			Meteorology	Description and SPL, dBA
		L_{Amax}	L_{Aeq}	L_{A90}		
A1	10/09/2021 11:06	92	69	60	WD: NW WS: <0.5m/s Rain: Nil	Passing Traffic 50-92 Urban Hum 52-60

Note: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

4 Assessment Criteria

4.1 Operational Noise Criteria

4.1.1 Intrusiveness Noise Levels

The PINL for the project are presented in **Table 6** and have been determined based on the RBL +5dBA and only apply to residential receivers.

Table 6 Project Intrusiveness Noise Levels

Location	Receiver Type	Period[1]	Measured RBL dB LA_{90}	PINL dB $LA_{eq(15min)}$
L1	Residential	Day	53	58
		Evening	42	47
		Night	38	43

Note 1: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

4.1.2 Amenity Noise Levels and Project Amenity Noise Levels

The PANL for residential receivers and other receiver types (ie non-residential) potentially affected by the project are presented in **Table 7.**

Table 7 Amenity Noise Levels and Project Amenity Noise Levels

Receiver Type	Noise Amenity Area	Assessment Period[1]	NPI Recommended ANL dB $LA_{eq(period)}$	ANL dB $LA_{eq(period)}$	PANL dB $LA_{eq(15min)}$[4]
Residential	Urban	Day	60	55[2]	58
		Evening	50	48[3]	51
		Night	45	46[3]	49
Commercial	All	When in use	65	60[2]	63

Note 1: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

Note 2: Project Amenity Noise Level equals the Amenity Noise Level -5dB as there is other industry in the area.

Note 3: $LA_{eq,period}$ (traffic) as per section 2.4.1 of the NPI (i.e. existing $LA_{eq\ Traffic}$ -15dB).

Note 4: Includes a +3dB adjustment to the amenity period level to convert to a 15-minute assessment period as per Section 2.2 of the NPI.

4.1.3 Project Noise Trigger Levels

The PNTL are the lower of either the PINL or the PANL. **Table 8** presents the derivation of the PNTLs in accordance with the methodologies outlined in the NPI.

Table 8 Project Noise Trigger Levels

Receiver Type	Noise Amenity Area	Assessment Period[1]	PINL dB $L_{Aeq(15min)}$	PANL dB $L_{Aeq(15min)}$	PNTL dB $L_{Aeq(15min)}$
Residential	Urban	Day	58	58	58
		Evening	47	51	47
		Night	43	49	43
Commercial	All	When in Use	N/A	63	63

Note 1: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

4.1.4 Maximum Noise Assessment Trigger Levels

The maximum noise trigger levels shown in **Table 9** are based on night time RBLs and trigger levels as per Section 2.5 of the NPI. The trigger levels will be applied to transient noise events that have the potential to cause sleep disturbance.

Table 9 Maximum Noise Trigger Level

Residential Receivers			
$L_{Aeq(15min)}$		L_{Amax}	
40dB $L_{Aeq(15min)}$ or RBL + 5dB		52dB L_{Amax} or RBL + 15dB	
Trigger	40	Trigger	52
RBL 38+5dB	43	RBL 38+15dB	53
Highest	**43**	**Highest**	**53**

Note: Monday to Saturday; Night 10pm to 7am. On Sundays and Public Holidays Night 10pm to 8am.

Note: NPI identifies that maximum of the two values is to be adopted which is shown in bold font.

4.1.5 ILGA Criteria

The relevant ILGA criteria for the period up to midnight has been derived by analysing seven days of single octave LA90 statistical levels from the historic noise monitoring data for the period between 6pm and midnight. This period is representative of peak operating hours for (potential licensed) ground floor tenancies proposed for the project. **Table 10** reproduces the adopted ILGA noise criteria.

Table 10 ILGA Criteria

	L_{A10} Noise Criteria, Octave Band Centre Frequency (Hz), dBA								
	31.5	63	125	250	500	1 k	2 k	4 k	8 k
Octave Background (L_{A90})	5	19	27	31	33	32	26	17	11
L_{A10} criteria (background +5dB)	10	24	32	36	38	37	31	22	16

4.2 Construction Noise Criteria

The relevant Noise Management Levels (NMLs) for standard construction hours are presented in **Table 11**.

Table 11 Construction Noise Management Levels

Receivers	Assessment Period[1]	Daytime RBL dB L_{A90}	NML dB $L_{Aeq(15min)}$
Residential	Standard Hours	53	63 (RBL+10dBA)
Commercial Premises	When in use	N/A	70 (external)

Note 1: See Table 2 for Standard Recommended Hours for Construction.

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5 Modelling Methodology

5.1 Calculation of Road Traffic Noise

A theoretical assessment of road traffic noise was carried out to predict levels at the proposed façades of the project using the Calculation of Road Traffic Noise (CORTN) algorithm, as developed by the UK Department of Transport. This method incorporates flow volumes, average speed, percentage of heavy vehicles, and road gradient and includes attenuation via spherical spreading (or cylindrical in the case of a line source such as a road), soft ground, atmospheric absorption and screening from buildings or barriers. AADT distributions for Hunter Street have been included in the noise model. Hunter Street traffic volumes were referenced from Report for Transport for NSW- Newcastle Light Rail, (GHD, 2016).

The calculation parameters, assumptions and traffic flows used for the modelling assessment are summarised in **Table 12**.

Table 12 Calculation Parameters

Assessment Period	Traffic Volume[1]	% Heavy Vehicles	Speed Limit (km/hr)
Modelled Traffic Flows – Hunter Street, 2021			
Day	16487	2	50
Night	4122	5	50

Note 1: Report for Transport for NSW- Newcastle Light Rail, 22/17478 (GHD).

5.2 Indicative Attenuation Levels

The Environmental Noise Management Manual (ENMM) (2001) provides a summary of indicative attenuation from standard building types. The indicative attenuation levels are summarised in **Table 13**, which provides typical performance of buildings with respect to noise reduction. A masonry residence with single 3mm glazing would be expected to provide a reduction of approximately 25dB from external to internal with windows closed. Where windows are closed, the fresh air requirements outlined in the Building Code of Australia should be taken into consideration.

Table 13 Indicative Building Noise Attenuation

Building Type	Windows	Internal noise reduction, dBA
All	Open	10
Light frame	Single glazed (closed)	20
Masonry	Single glazed (closed)	25
	Double glazed (closed)	30

5.3 Operational and Construction Noise Modelling Methodology

An assessment of potential operational noise emissions from the project has been completed. It is noted that the NPI does not include provision for an assessment of music and patron noise, as this is assessed against relevant ILGA criteria. The assessment has identified several noise sources that may generate acoustic impacts at surrounding residences, such as amplified music and speech/conversation from patrons (ILGA). Additionally, operational noise from the rooftop mechanical plant (the model excluded any louvres or screens around the plant) and communal noise, has been assessed against relevant NPI criteria. Furthermore, this assessment has included gym noise such as music from the proposed gym/Pilates facilities, hence should be considered as a worst case. **Table 14** presents the sound power levels for each source assessed in this report.

Table 14 Sound Power Levels[1]

Item	Octave Band Sound Power Level									Total dBA[3]
	31.5	63	125	250	500	1000	2000	4000	8000	
Operational Assessment (dB $LA_{eq(15min)}$)										
Communal noise (x24) (speech etc external, pool area and podium)	36	48	53	59	64	64	63	58	51	70
Air Conditioning Condensers (x260)	40	48	51	57	66	62	64	64	49	71
Kitchen Exhaust/Commercial Plant (x10)	35	42	44	70	73	68	61	51	31	76
Gym and Pilates music emission Plant (x2) (internal non-licenced premises)	41	65	76	75	78	82	82	78	77	87
ILGA Assessment (dB LA_{10})[2]										
Talking/Conversations and amplified music[4] (x108)	47	59	64	72	76	75	73	66	69	81
Sleep Disturbance Assessment (dB LA_{max})										
Conversation noise (yelling)	45	62	73	80	85	87	84	78	87	92

Note 1: Source - MAC database.

Note 2: As per the ILGA policy, the LA_{10} sound power is required rather than the LA_{eq}.

Note 3: Total dBA is sound power level per item.

Note 4: For all three ground floor food and beverage tenancies.

Brüel and Kjær Predictor Type 7810 (Version 11.10) and DGMR iNoise modelling software was used to assess potential noise impacts associated with the project. A three-dimensional digital terrain map providing all relevant topographic information was used in the modelling process.

Additionally, the model uses relevant noise source data, ground type, attenuation from barrier or buildings and atmospheric information to predict noise levels at the nearest potentially affected receivers.

The sound power levels have been adjusted to account for duration over a fifteen-minute period. It is noted that the potential for maximum noise level events to occur simultaneously is unlikely for this project.

The model calculation method used to predict noise levels was in accordance with ISO 9613:1 and ISO 9613:2 including corrections for meteorological conditions using CONCAWE[1]. The ISO 9613 standards are the most used noise prediction method worldwide. Many countries refer to ISO 9613 in their noise legislation. However, the ISO 9613 standard does not contain guidelines for quality assured software implementation, which leads to differences between applications in calculated results. In 2015 this changed with the release of ISO/TR 17534-3. This quality standard gives clear recommendations for interpreting the ISO 9613 method. iNoise fully supports these recommendations. The models and results for the 19 test cases are included in the software.

For construction, a fleet sound power level of 108dB $LA_{eq(15min)}$ was adopted to quantify construction emissions to surrounding receivers. This sound power level is considered generally representative of average emissions from a variety of construction tasks for residential developments.

5.4 Noise Modelling Assumptions

The noise model incorporated the following recommendations and noise controls:

- glazing in the gym area is a minimum 6mm in thickness; and
- the mechanical plant is located on the rooftop of the development

[1] Report no. 4/18, "the propagation of noise from petroleum and petrochemical complexes to neighbouring communities", Prepared by C.J. Manning, M.Sc., M.I.O.A. Acoustic Technology Limited (Ref.AT 931), CONCAWE, Den Haag May 1981

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6 Noise Assessment Results

6.1 Road Noise Prediction Results

Road noise predictions for the project based on estimated 2021 traffic flows were compared to measured levels at an unattended noise monitoring location at 924 Hunter Street, Newcastle, NSW. This is considered a good practice technique to validate the assumptions made in the assessment. Results of the validation demonstrate a consistent correlation (±<2dB tolerance) when compared against measured levels.

A review of floor plans (CKDS, 2021) (**Appendix B**) for the project have been completed as part of the assessment. The assessment includes potential road noise emissions for both towers (North Tower and South Tower) with results presented in separate tables for each.

Floors of the Towers that contain no residential receivers, have not been included in this assessment.

Table 15 presents a comparison of predicted road traffic noise for units exposed to Hunter Street against the respective day and night internal criteria for the North Tower (North West).

Table 15 Noise Prediction Results – 924 Hunter Street, North Tower					
Level	Receptor Room Category[1]	Predicted level, dB LA_{eq}[2] (internal)		Internal Criteria, dB LA_{eq}	
		Day	Night	Day	Night
West Facade					
3	Bedrooms	<35	<35	40	35
	Living Room	<35	<35	40	40
4-5	Bedrooms	<35	<35	40	35
	Living Room	<35	<35	40	40
6-18	Bedrooms	<35	<35	40	35
	Living Room	<35	<35	40	40
19+	Bedrooms	<35	<35	40	35
	Living Room	<35	<35	40	40
South Facade					
3-5	Bedrooms	<35	<35	40	35
	Living Room	<35	<35	40	40
6-18	Bedrooms	<35	<35	40	35
	Living Room	<35	<35	40	40
19+	Bedrooms	<35	<35	40	35
	Living Room	<35	<35	40	40
East Facade					
3-5	Bedrooms	<35	<35	40	35
	Living Room	<35	<35	40	40
6-18	Bedrooms	<35	<35	40	35
	Living Room	<35	<35	40	40
19+	Bedrooms	<35	<35	40	35
	Living Room	<35	<35	40	40
	Living Room	<35	<35	40	40

Note 1: Determined from proposed site drawing plans (CKDS, 2021).

Note 2: Internally predicted to habitable rooms. Adjustments made assuming attenuation (25dB) for a masonry structure with windows closed and includes +2.5dB façade correction.

Table 16 presents a comparison of predicted road traffic noise for units exposed to Hunter Street against the respective day and night internal criteria for South Tower.

Table 16 Noise Prediction Results – 924 Hunter Street, South Tower

Level	Receptor Room Category[1]	Predicted level, dB LA_{eq}[2] (internal)		Internal Criteria, dB LA_{eq}	
		Day	Night	Day	Night
West Facade					
3-5	Bedrooms	<35	<35	40	35
	Living Room	<35	<35	40	40
6-18	Bedrooms	<35	<35	40	35
	Living Room	<35	<35	40	40
19+	Bedrooms	<35	<35	40	35
	Living Room	<35	<35	40	40
South Facade					
2-3	Bedrooms	44	41	40	35
	Living Room	43	41	40	40
4-5	Bedrooms	37	<35	40	35
	Living Room	37	<35	40	40
6-18	Bedrooms	36	<35	40	35
	Living Room	36	<35	40	40
19+	Bedrooms	<35	<35	40	35
	Living Room	<35	<35	40	40
East Facade					
3-5	Bedrooms	<35	<35	40	35
	Living Room	<35	<35	40	40
6-18	Bedrooms	<35	<35	40	35
	Living Room	<35	<35	40	40
19+	Bedrooms	<35	<35	40	35
	Living Room	<35	<35	40	40
	Living Room	<35	<35	40	40

Note 1: Determined from proposed site drawing plans (CKDS, 2021).

Note 2: Internally predicted to habitable rooms. Adjustments made assuming attenuation (25dB) for a masonry structure with windows closed and includes +2.5dB façade correction.

Results of the noise assessment demonstrate that internal noise criteria for the project for the south façade of the South Tower (ie units fronting Hunter Street) would require additional glazing upgrades to some elements of the building facades.

6.2 Operational Noise Prediction Results (NPI Assessment)

Operational noise levels from the project (mechanical plant, and communal noise), have been predicted to the nearest residential receivers adjacent to the project and other surrounding receivers.

Table 17 presents the single point calculation results and demonstrate that operational noise emissions from the project remain below the relevant PNTL for all assessed receivers.

Table 17 Predicted Operational Noise Levels

Location[1]	Period	Predicted Noise Level dB $L_{Aeq(15min)}$	PNTL dB $L_{Aeq(15min)}$
R1	Day	<35	58
	Evening	<35	47
	Night	<35	43
R2	Day	<35	58
	Evening	<35	47
	Night	<35	43
North Tower[2] (maximum level for most exposed façade)	Day	45	58
	Evening	45	47
	Night	39[3]	43
South Tower[2] (maximum level for most exposed façade)	Day	42	58
	Evening	42	47
	Night	41[3]	43
C1	When in use	<35	63
C2	When in use	<35	63
C3	When in use	<35	63
C4	When in use	<35	63
C5	When in use	<35	63
C6	When in use	<35	63

Note 1: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

Note 2: Assessed to the most exposed tenancy/unit.

Note 3: Assumes pool and gym/pilates will not be operating at night.

6.3 ILGA Noise Assessment

Noise calculations have been completed and compared with the ILGA requirements for ground floor café/bars to nearest surrounding residential receivers and above residential tenancies for the nearest units in North and South Towers. Results of the calculations are presented in **Table 18**, **Table 19** and **Table 20** for the nearest potentially most affected residential receivers.

Table 18 ILGA Noise Assessment Results – Residential Receiver 1

	L_{A10} Noise Criteria, Octave Band Centre Frequency (Hz), dBA								
	31.5	63	125	250	500	1 k	2 k	4 k	8 k
Received level, R1	<1	14	16	21	27	27	25	18	19
Criteria	10	24	32	36	38	37	31	22	16
Exceedance	**Nil**	**Nil**	**Nil**	**Nil**	**Nil**	**Nil**	**Nil**	**Nil**	**Nil**

Table 19 ILGA Noise Assessment Results – North Tower (Level 3 East Façade)

	L_{A10} Noise Criteria, Octave Band Centre Frequency (Hz), dBA								
	31.5	63	125	250	500	1 k	2 k	4 k	8 k
Received level North Tower, Level 5	<1	7	6	16	19	15	14	12	<1
Criteria	10	24	32	36	38	37	31	22	16
Exceedance	**Nil**	**Nil**	**Nil**	**Nil**	**Nil**	**Nil**	**Nil**	**Nil**	**Nil**

Table 20 ILGA Noise Assessment Results – South Tower (Level 3 West Façade)

	L_{A10} Noise Criteria, Octave Band Centre Frequency (Hz), dBA								
	31.5	63	125	250	500	1 k	2 k	4 k	8 k
Received level South Tower, Level 5	2	15	18	24	30	30	27	20	22
Criteria	10	24	32	36	38	37	31	22	16
Exceedance	**Nil**	**Nil**	**Nil**	**Nil**	**Nil**	**Nil**	**Nil**	**Nil**	**Nil**

Calculations of noise emissions from the project to the nearest residential receiver for the project are expected to satisfy the ILGA noise criteria. It is noted that receivers external to the project are also anticipated to satisfy the ILGA noise criteria due to their greater distance to the project.

6.4 Maximum Assessment

A comparison of L_{Amax} noise emissions associated with the project have been assessed against the EPA maximum noise trigger level to the nearest residential tenancies for North and South Towers. Table 21 presents the results of the maximum noise level assessment for each Tower, along with receiver location and key maximum noise source for that receiver. Results identify that the maximum noise events trigger level will be satisfied for all assessed receivers.

Table 21 Maximum Noise Levels Assessment (Night)[1]

Receiver	Maximum source	Predicted Noise Level	Trigger Level
		dB L_{Amax}	dB L_{Amax}
Level 3 North Tower	Yelling (Ground level food and beverage)	50	53
Level 3 South Tower	Yelling (Ground level food and beverage)	48	53
R1	Yelling (Ground level food and beverage)	53	53
R2	Yelling (Ground level food and beverage)	35	53

Note 1: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

Results of the sleep disturbance calculations are identified to remain below maximum noise trigger levels for all receivers notwithstanding, noise controls and management measures are recommended for the project and provided in Section 7.2.

6.5 Construction Noise Results

Predicted $LA_{eq(15min)}$ noise emissions for modelled construction are presented in **Table 22**. Noise modelling identifies that construction activities will be below relevant NMLs at assessed receivers. Notwithstanding, management measures should be considered during the construction phase of the project to minimise impact to the surrounding community.

Table 22 Construction Noise Emissions

Location	Period[1]	Predicted Noise Level dB $LA_{eq(15min)}$	NML dB $LA_{eq(15min)}$
R1	Day	61	63
R2	Day	59	63
C1	When in use	59	70
C2	When in use	60	70
C3	When in use	62	70
C4	When in use	62	70
C5	When in use	66	70
C6	When in use	65	70

Note 1: Standard Hours for Construction for Day are Monday to Friday 7am to 6pm, Saturday 8am to 1pm.

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7 Discussion and Summary of Recommendations

7.1 Road Noise Recommendations

Standard domestic glass is usually acoustically inadequate and can reduce the attenuation performance of the overall building facade. Glazing improvement options include thicker laminated glass or double-glazed laminated windows with an air gap between panels. The frames and air gaps should be adequately sealed to optimise noise reduction.

As windows must remain closed for effective noise reduction, as such relevant BCA requirements regarding ventilation should be noted.

Table 23 provides the recommended minimal building categories as per the guideline (see **Appendix D**) for the unit dwellings.

Table 23 Noise Attenuation Recommendations – South Façade South Tower

Tower / Facade	Levels	Minimum Guideline Category for Glazing Treatments[1]
South Tower – Southern Facade		
South / South	Level 2 to Level 18	Category 3

Note 1: Category 3 glazing requirements include – Windows/Sliding Doors: Openable with minimum 6.38mm laminated glass and full perimeter acoustic seals.

7.2 Operational Noise Recommendations

Recommendations to reduce operational emissions to the surrounding community for this project may include:

- limiting use of the recreational podium to day and evening hours (ie 7am to 10pm) to minimise the potential impacts of maximum noise emissions to receivers; and
- modelling did not include acoustic louvres/screens although this could be considered as an option to provide additional noise attenuation.

7.3 Construction Noise Recommendations

Recommendations for consideration during construction and demolition activities to reduce emissions to the surrounding community for this project may include:

- implement any boundary fencing/hoarding as early as possible to maximise their attenuation benefits;
- toolbox and induction of personnel prior to shift to discuss noise control measures that may be implemented to reduce noise emissions to the community;
- all plant should be shutdown when not in use. Plant to be parked/started at farthest point from relevant assessment locations (ie northern boundary);
- operating plant in a conservative manner (no over-revving);
- selection of the quietest suitable machinery available for each activity;
- avoidance of noisy plant/machinery working simultaneously where practicable;
- minimisation of metallic impact noise;
- all plant are to utilise a broadband reverse alarm in lieu of the traditional hi frequency type reverse alarm; and
- undertake letter box drops to notify receivers of potential works.

7.3.1 Complaints Handling

- Provide a readily accessible contact point, for example, through a 24-hour toll-free information and complaints line and give complaints a fair hearing.
- Have a documented complaints process, including an escalation procedure so that if a complainant is not satisfied there is a clear path to follow.
- Records of all community complaints will be maintained on an up-to-date complaints register. The records will include:
    - date and time of the complaint;
    - the means by which the complaint was made (telephone, mail or email);
    - any personal details of the complainant that were provided, or if no details are provided, a note to that effect;
    - the nature of the complaint;
    - any actions taken by the site supervisor/construction contractor in relation to the complaint, including any follow up contact with the complainant and the timing for implementing action; and
    - if no action was taken by site supervisor/construction contractor in relation to the complaint, the reason why no action was taken.

- Community complaints will be allocated to a responsible contractors representative immediately to facilitate the implementation of corrective actions. The details of the complaint will also be circulated to the applicable construction personnel for action, where required.

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8 Conclusion

Muller Acoustic Consulting Pty Ltd (MAC) has completed an assessment of potential noise impacts associated with the proposed Residential Towers development at 924 Hunter Street, Newcastle, NSW.

The assessment has quantified noise intrusion to the proposed development from transportation noise, and emissions from the development to surrounding receivers.

With respect to road noise attenuation and to protect the internal acoustic amenity of the development it is recommended that the glazing component for the project be reviewed to contain minimum specifications outlined in Section 7.1.

Noise emission from the project including patrons from the ground floor tenancies, rooftop mechanical plant are demonstrated to remain below relevant criteria for all assessed receivers. Notwithstanding, it is recommended that consideration be given to provide screens/louvres to the rooftop mechanic plant to reduce residual noise emissions to residential tenancies below.

Maximum noise emissions satisfy relevant criteria. Tenant noise from this area (in particular yelling) are close to trigger levels. Hence, management of tenants using this space, particularly during the night-time is recommended.

Construction noise emissions are identified to satisfy noise management levels, although, to minimise impacts recommendations have been provided in Section 7.3 for consideration.

Following the findings of the Noise Assessment, it is recommended Council approve the development based on noise control assumptions/recommendations and referenced architectural plans provided in this report.

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Appendix A– Glossary of Terms

A number of technical terms have been used in this report and are explained in **Table A1**.

Table A1 Glossary of Acoustical Terms

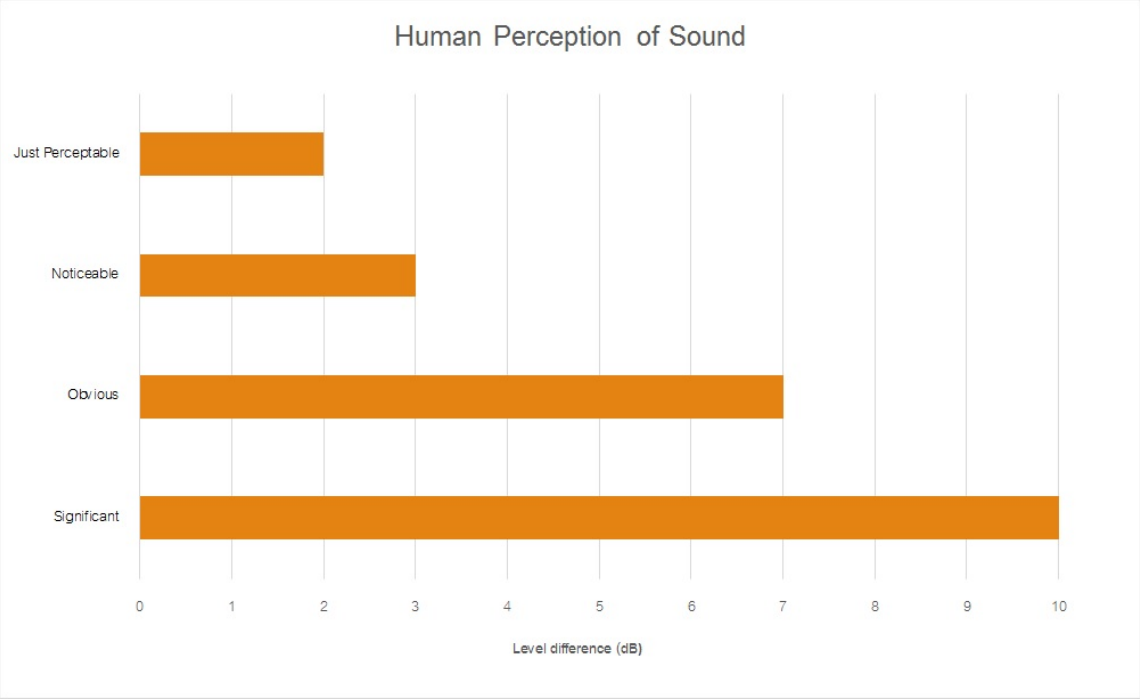
Term	Description
1/3 Octave	Single octave bands divided into three parts
Octave	A division of the frequency range into bands, the upper frequency limit of each band being twice the lower frequency limit.
ABL	Assessment Background Level (ABL) is defined in the NPI as a single figure background level for each assessment period (day, evening and night). It is the tenth percentile of the measured L90 statistical noise levels.
Ambient Noise	The total noise associated with a given environment. Typically, a composite of sounds from all sources located both near and far where no particular sound is dominant.
A Weighting	A standard weighting of the audible frequencies designed to reflect the response of the human ear to sound.
Background Noise	The underlying level of noise present in the ambient noise, excluding the noise source under investigation, when extraneous noise is removed. This is usually represented by the LA90 descriptor
dBA	Noise is measured in units called decibels (dB). There are several scales for describing noise, the most common being the 'A-weighted' scale. This attempts to closely approximate the frequency response of the human ear.
dB(Z), dB(L)	Decibels Z-weighted or decibels Linear (unweighted).
Extraneous Noise	Sound resulting from activities that are not typical of the area.
Hertz (Hz)	The measure of frequency of sound wave oscillations per second - 1 oscillation per second equals 1 hertz.
LA10	A sound level which is exceeded 10% of the time.
LA90	Commonly referred to as the background noise, this is the level exceeded 90% of the time.
LAeq	Represents the average noise energy or equivalent sound pressure level over a given period.
LAmax	The maximum sound pressure level received at the microphone during a measuring interval.
Masking	The phenomenon of one sound interfering with the perception of another sound. For example, the interference of traffic noise with use of a public telephone on a busy street.
RBL	The Rating Background Level (RBL) as defined in the NPI, is an overall single figure representing the background level for each assessment period over the whole monitoring period. The RBL, as defined is the median of ABL values over the whole monitoring period.
Sound power level (Lw or SWL)	This is a measure of the total power radiated by a source in the form of sound and is given by 10.log10 (W/Wo). Where W is the sound power in watts to the reference level of 10^{-12} watts.
Sound pressure level (Lp or SPL)	the level of sound pressure; as measured at a distance by a standard sound level meter. This differs from Lw in that it is the sound level at a receiver position as opposed to the sound 'intensity' of the source.

Table A2 provides a list of common noise sources and their typical sound level.

Table A2 Common Noise Sources and Their Typical Sound Pressure Levels (SPL), dBA

Source	Typical Sound Pressure Level
Threshold of pain	140
Jet engine	130
Hydraulic hammer	120
Chainsaw	110
Industrial workshop	100
Lawn-mower (operator position)	90
Heavy traffic (footpath)	80
Elevated speech	70
Typical conversation	60
Ambient suburban environment	40
Ambient rural environment	30
Bedroom (night with windows closed)	20
Threshold of hearing	0

Figure A1 – Human Perception of Sound



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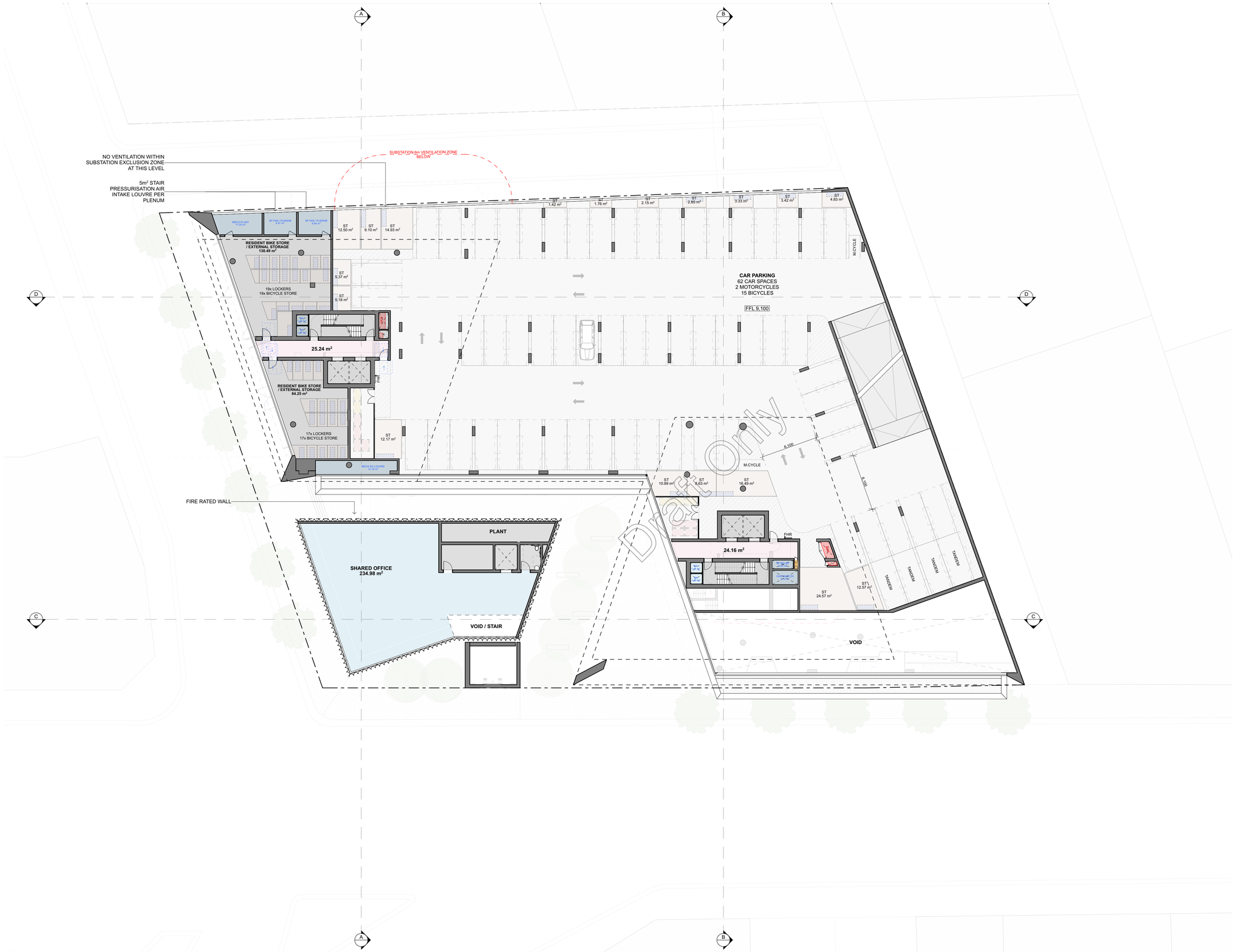
Appendix B – Site Plans



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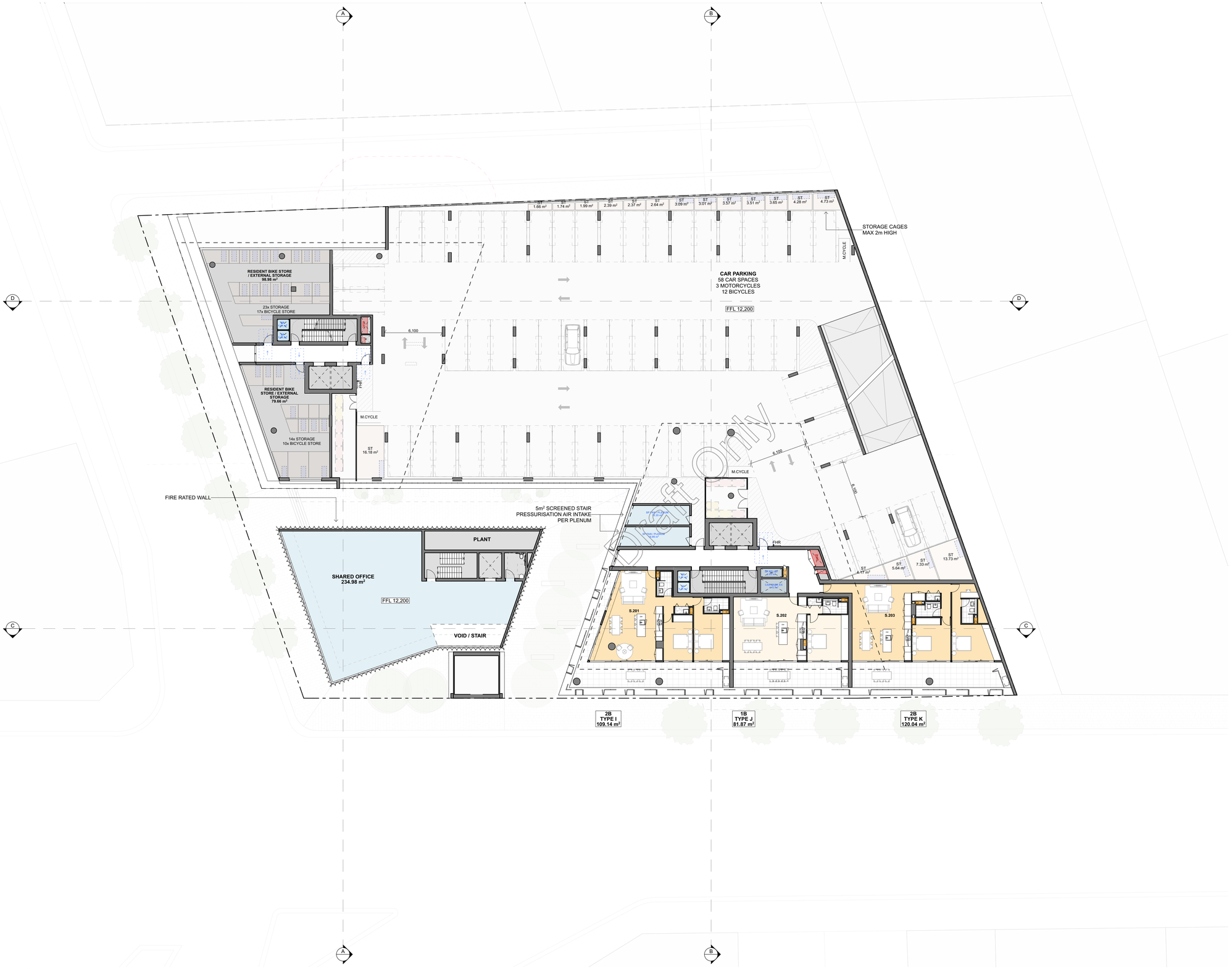

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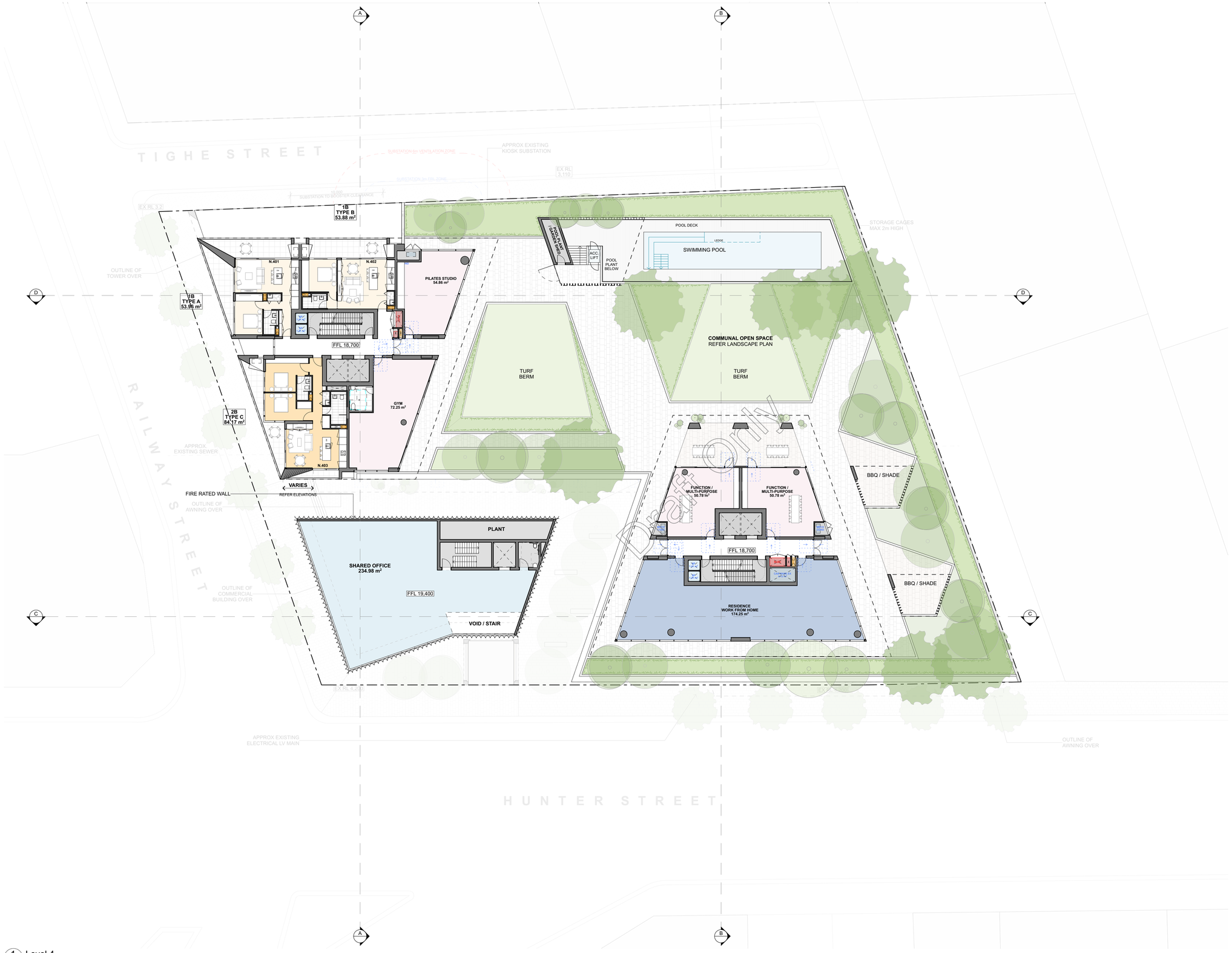

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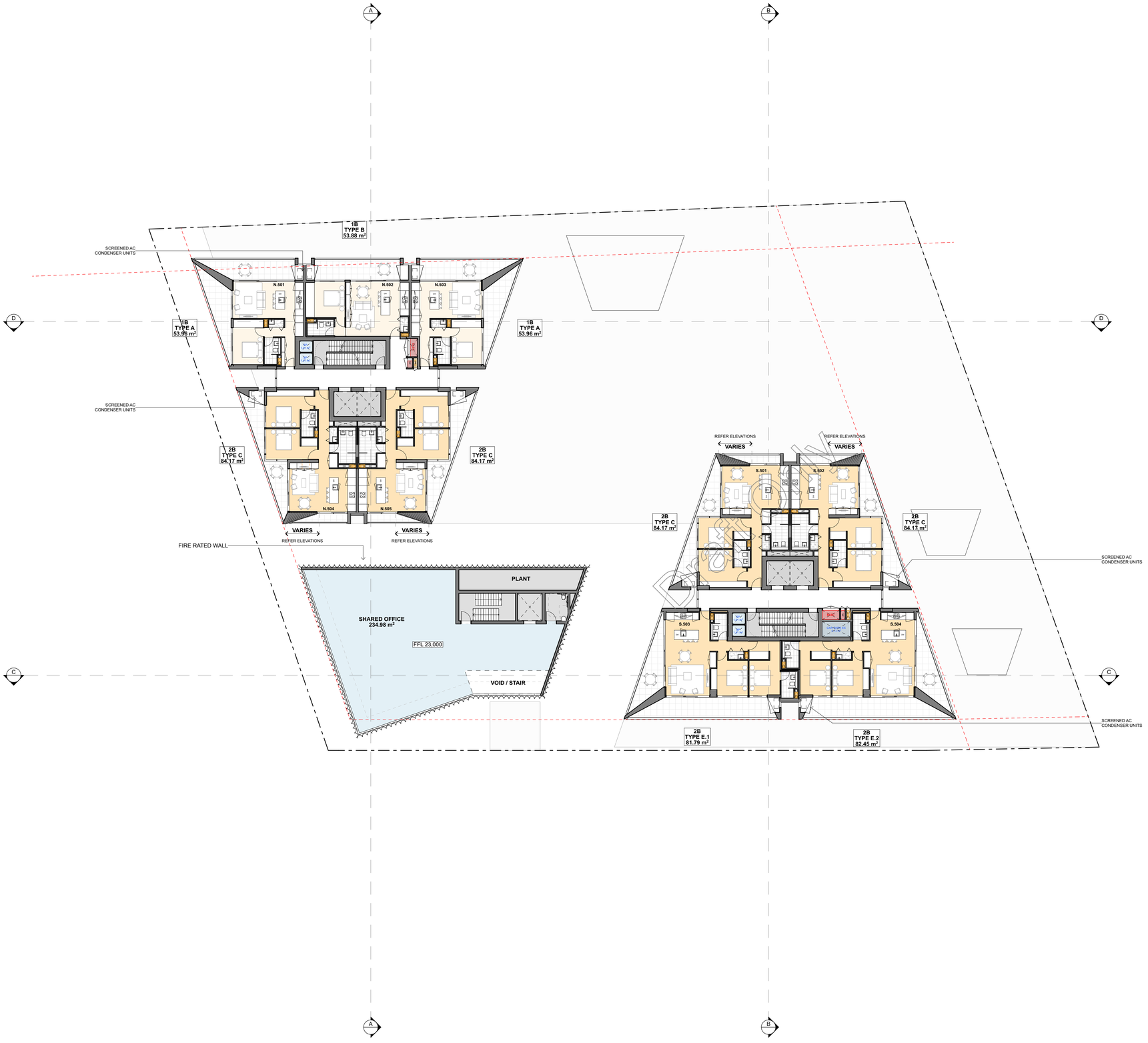

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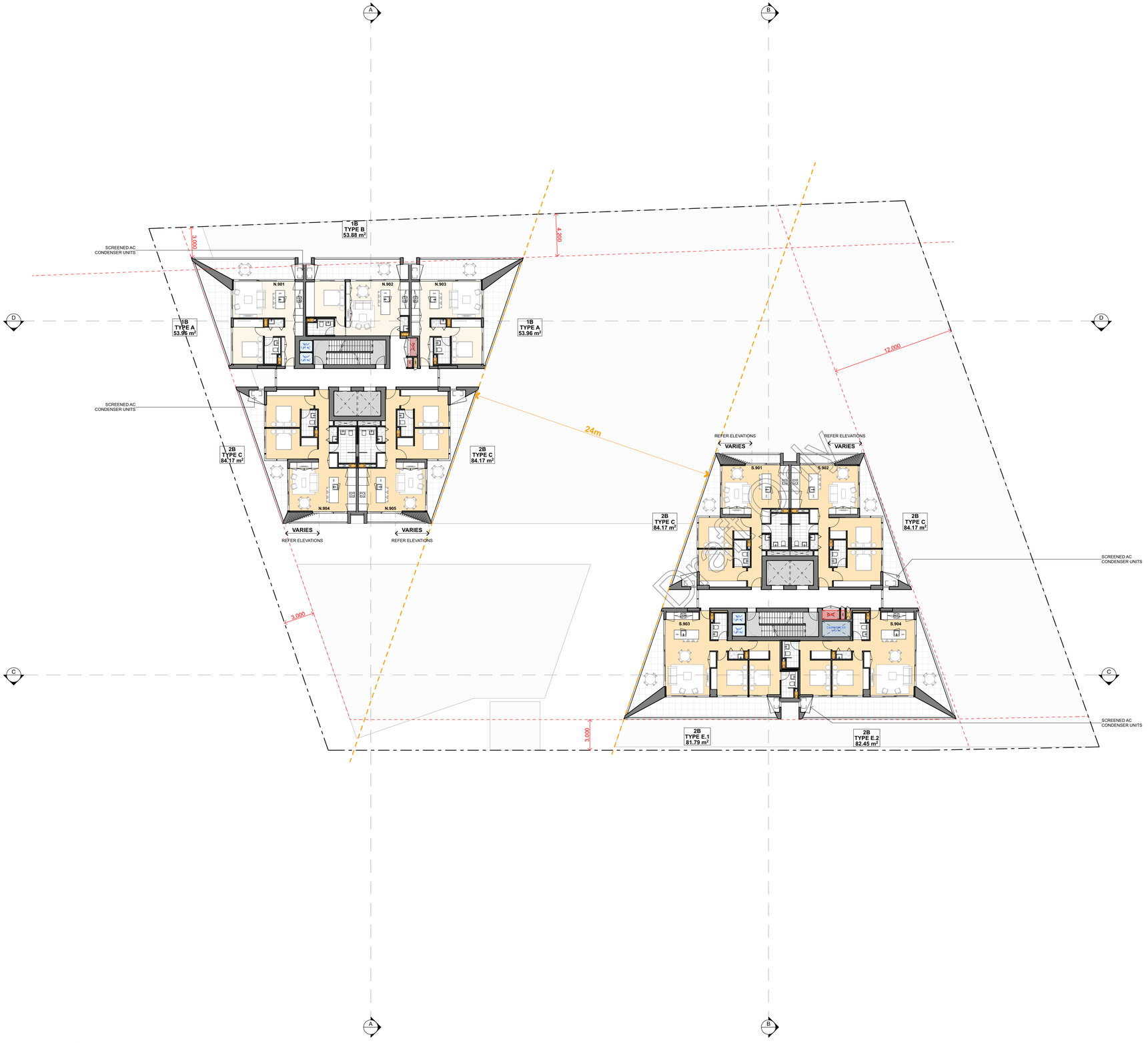

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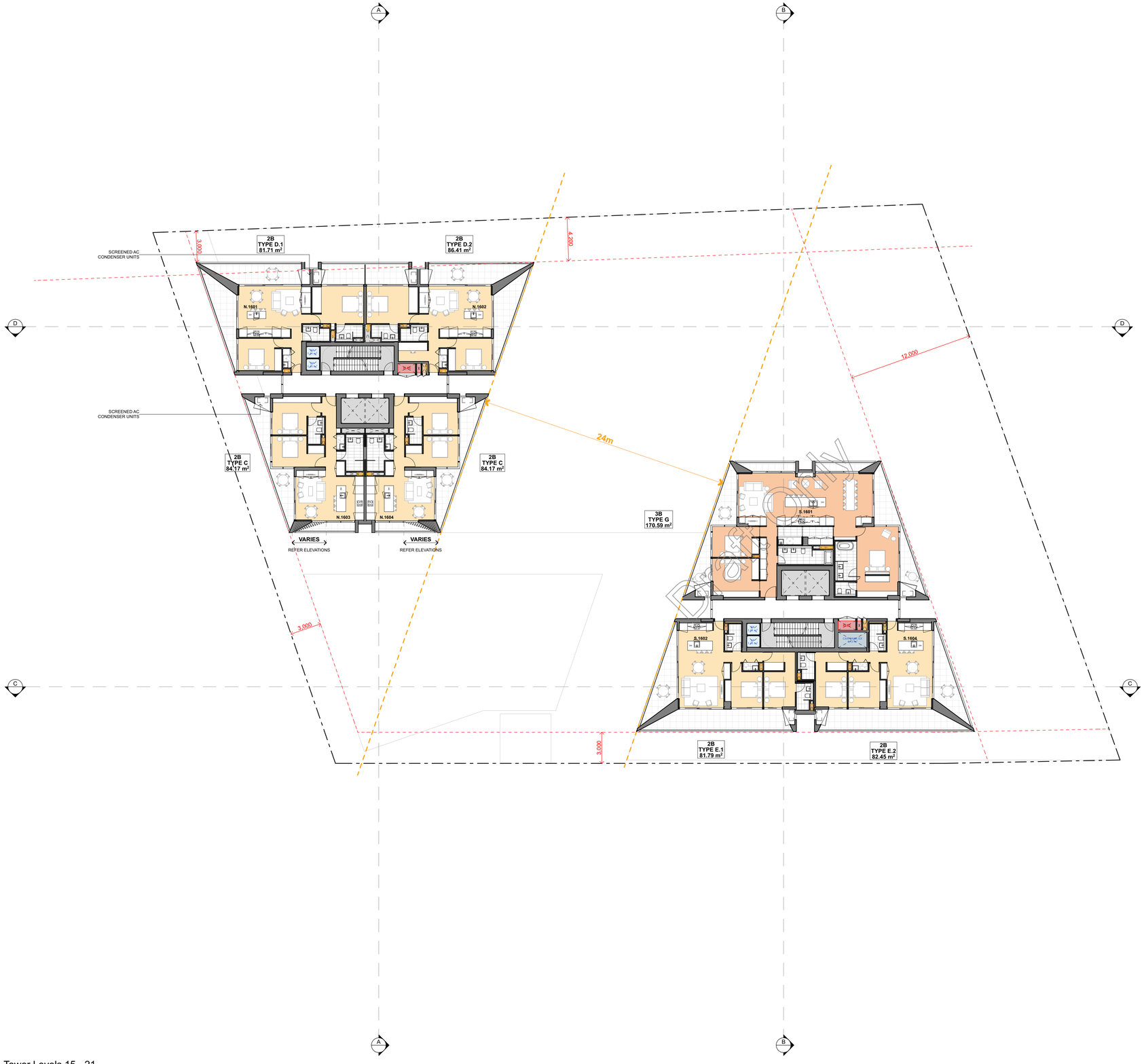

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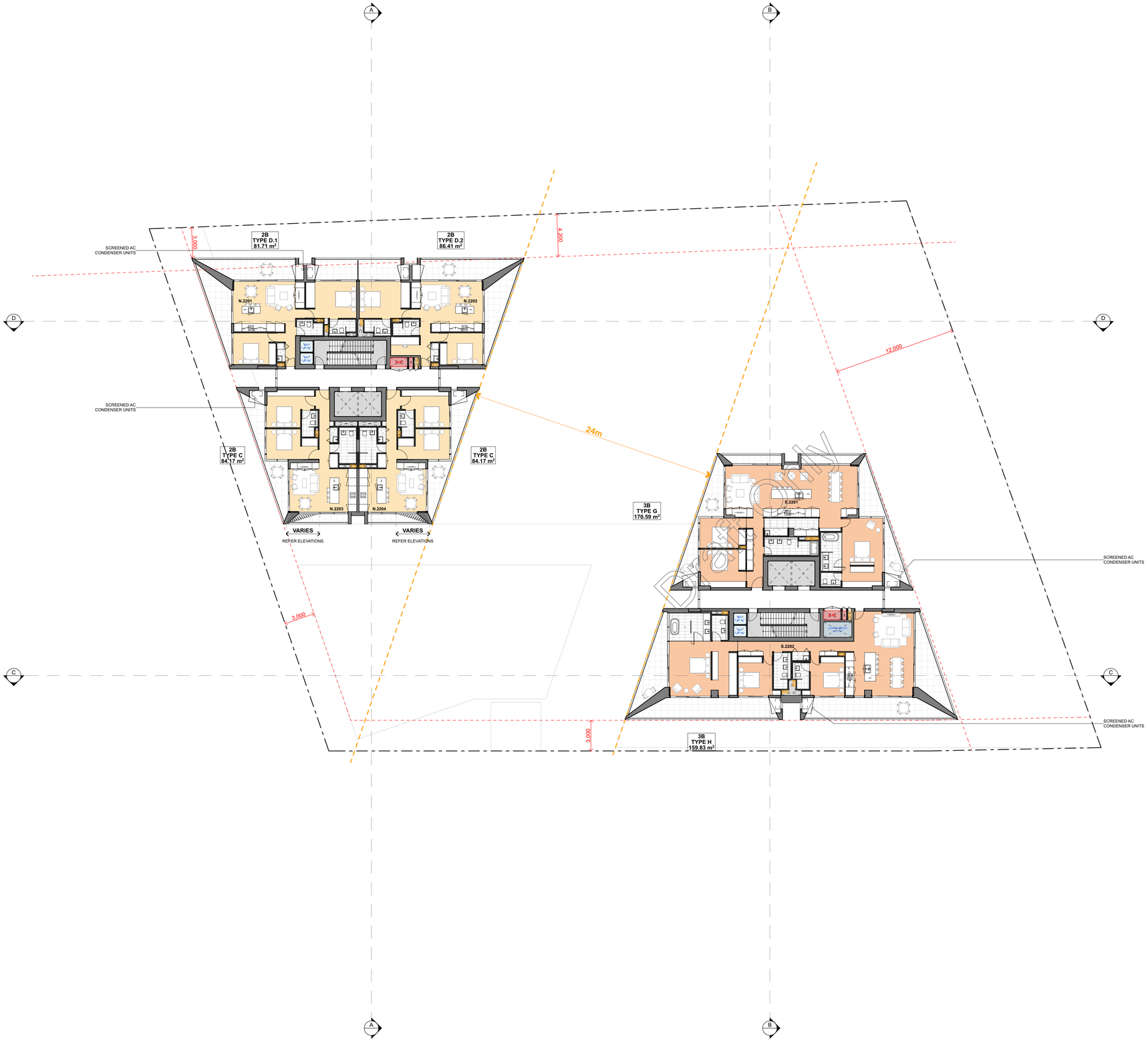

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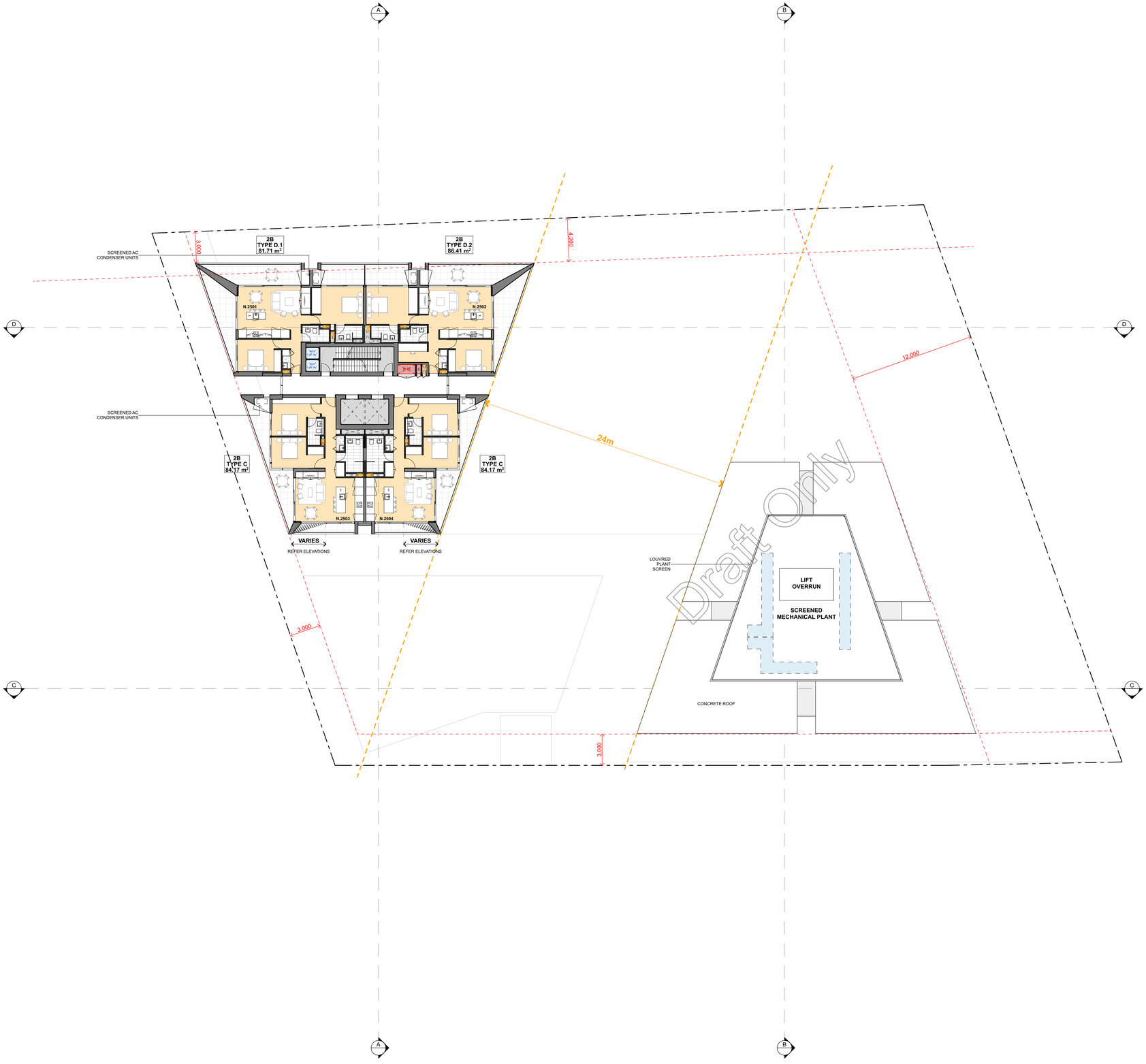

1 Tower Levels 25 - 26
SCALE 1:200 @ A1

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05	Issue for Review	19/8/21	05
06	Issue for Comment	2/9/21	06
07	Issue for Coordination	10/9/21	07
08	Issue for Pre-DA	16/9/21	08
09	Issue for Pre-DA	27/9/21	09
10	Issue for Draft DA	1/10/21	10

key plan

North Point

consultants

Civil/Structural Engineers

Electrical Engineer

Mechanical Engineer

Hydraulic Engineer

client

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project

Dairy Farmers Corner

924 Hunter Street 2/DP445736
Newcastle West NSW 2302

drawing title

General Arrangement Plans
Tower Levels 25 - 26

drawing scale	drawn	verified	date
AS SHOWN		SC	1/10/21

project #	drawing #	issue
21014	A-1111	10

Development Application - PRELIMINARY

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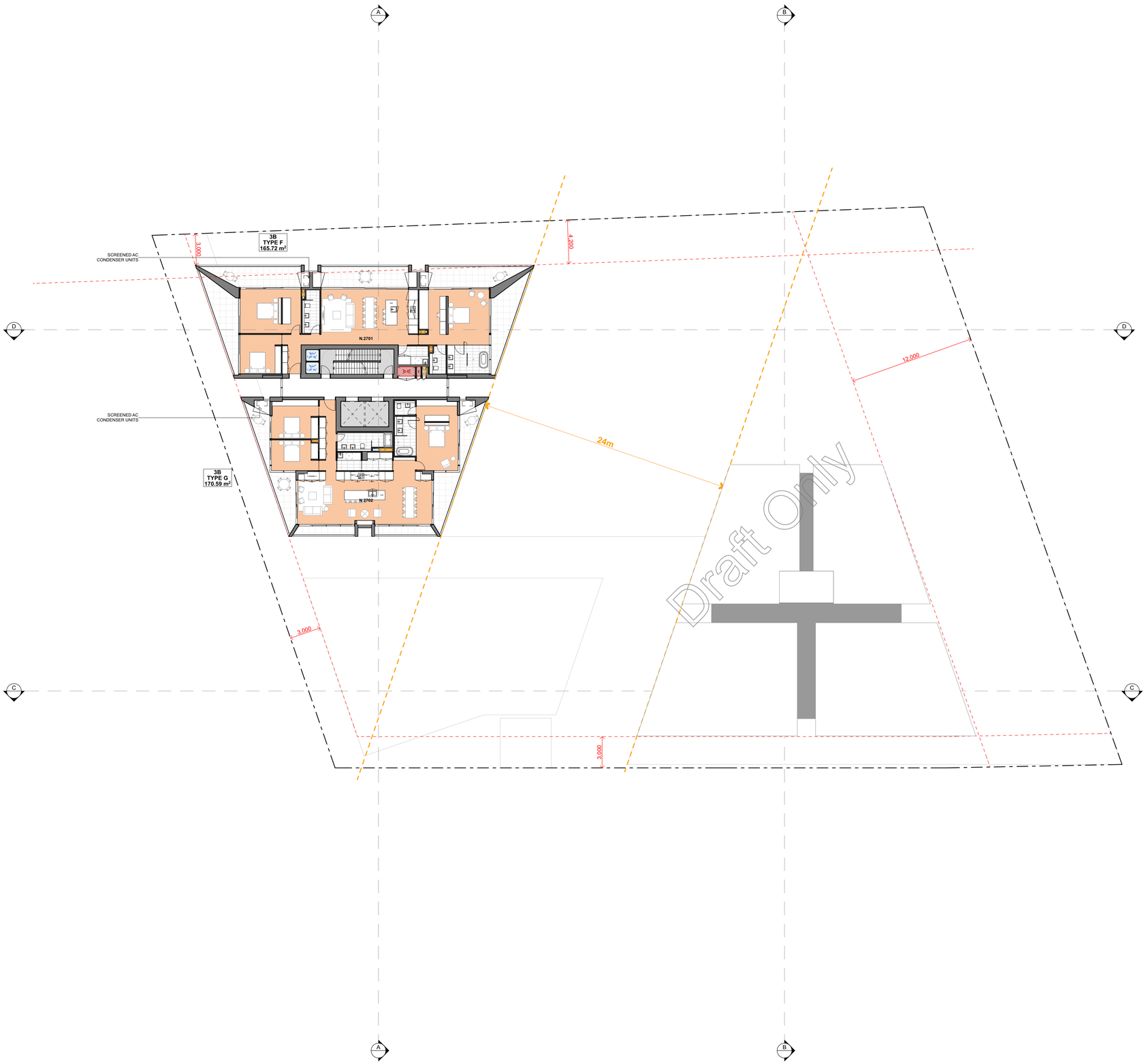

1 Tower Levels 27 - 29
SCALE 1:200 @ A1

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09	Issue for Pre-DA	27/9/21	09
10	Issue for Draft DA	1/10/21	10

key plan

North Point

consultants

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Mechanical Engineer

Hydraulic Engineer

client

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project

Dairy Farmers Corner

924 Hunter Street 2/DP445736
Newcastle West NSW 2302

drawing title

General Arrangement Plans
Tower Levels 27 - 29

drawing scale	drawn	verified	date
AS SHOWN	CH	SC	1/10/21

project #	drawing #	issue
21014	A-1112	10

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TIGHE STREET

RAILWAY STREET

HUNTER STREET

SUBSTATION 6m VENTILATION ZONE

SUBSTATION 3m FFL ZONE

APPROX EXISTING KIOSK SUBSTATION

EX RL 3,110

10,000
SUBSTATION TO BOOSTER CLEARANCE

EX RL 3.2

BOOSTER

PUMP

RETAIL
61.76 m²
FFL 3,400

FIRE PUMP & TANK STORAGE
122.70 m²
FFL 3,400

SUBSTATION
19.32 m²

SUBSTATION
19.32 m²

MAIN SWITCH
20.07 m²

MRV DELIVERY
84.21 m²

5,500

RESIDENTIAL WASTE
28.77 m²
5x GENERAL WASTE
5x RECYCLING

BIN WASH

COMMERCIAL WASTE
50.45 m²
5x GENERAL WASTE
10x RECYCLING

TANK
RL 4,140 min
RL 6,300 SP

TANK
RL 4,140 min
RL 6,300 SP

FFL 5,700

SPRINKLER VALVE

FIRE CONTROL ROOM
12.29 m²

RL 3,300

BULKY WASTE STORE
11.65 m²

BD ROOM
16.59 m²

OUTLINE OF TOWER OVER

MAIL

FFL 3,550

SHARED BOH

GRADED PATH

1:14 RAMP

FFL 3,950

1:14 RAMP

FFL 4,600

NORTH LOBBY
92.36 m²
FFL 3,550

FOOD & BEV / RETAIL
315.12 m²
FFL 4,600

APPROX. EXISTING SEWER

OUTLINE OF AWNING OVER

SHARED CAR PARK / BOH LOBBY

FFL 4,600

SOUTH LOBBY
59.64 m²

ACCESS TO LIFT AT UPPER GROUND UNDER REVIEW

MAIL

BULKY MAIL

COMMERCIAL WASTE
19.74 m²

SHARED OFFICE LOBBY
147.55 m²

FFL 4,600

OUTLINE OF COMMERCIAL BUILDING OVER

PUBLIC ART
21.06 m²

EX RL 4,200

FFL 4,200

FOOD & BEV / RETAIL
235.04 m²

FFL 4,600

FFL 4,200

GAS REG

WATER METER

EX RL 4,200

APPROX EXISTING ELECTRICAL LV MAIN

OUTLINE OF AWNING OVER

CAR PARKING
26 CAR SPACES
7 MOTORCYCLES
7 BICYCLES

RL 3,300

5,600

M/CYCLE

TANDEM

ST
2.85 m²

ST
2.79 m²

ST
3.33 m²

ST
3.29 m²

ST
3.42 m²

ST
3.71 m²

ST
4.83 m²

STORAGE CAGES
MAX 2m HIGH

1 Ground
SCALE 1:200 @ A1

Development Application - PRELIMINARY

issue	description	date	verified
01	Issue for Review	20/7/21	01
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03	Issue for Coordination	7/9/21	03
04	Issue for Pre-DA	16/9/21	04
05	Issue for Pre-DA	27/9/21	05
06	Issue for Draft DA	1/10/21	06

key plan

North Point

consultants

Civil/Structural Engineers

Electrical Engineer

Mechanical Engineer

Hydraulic Engineer

client

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project

Dairy Farmers Corner

924 Hunter Street 2/DP445736
Newcastle West NSW 2302

drawing title

General Arrangement Plans
Ground Floor Plan

drawing scale	drawn	verified	date
AS SHOWN		SC	1/10/21

project #	drawing #	issue
21014	A-1101	06

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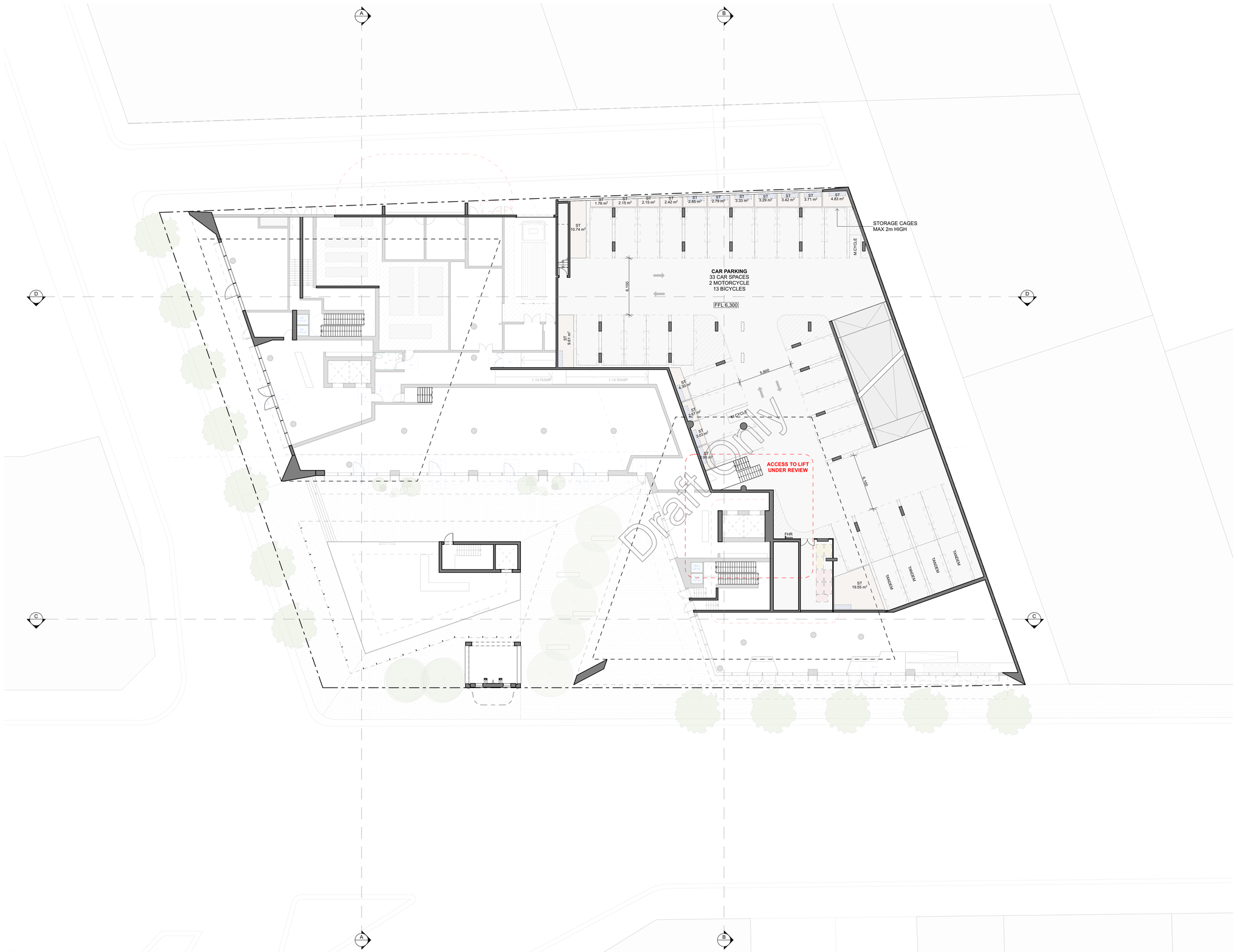

1 Upper Ground
SCALE 1:200 @ A1

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key plan

North Point

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Electrical Engineer

Mechanical Engineer

Hydraulic Engineer

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project

Dairy Farmers Corner

924 Hunter Street 2/DP445736
Newcastle West NSW 2302

drawing title

General Arrangement Plans
Upper Ground Floor Plan

drawing scale	drawn	verified	date
AS SHOWN		SC	1/10/21

project #	drawing #	issue
21014	A-1102	06

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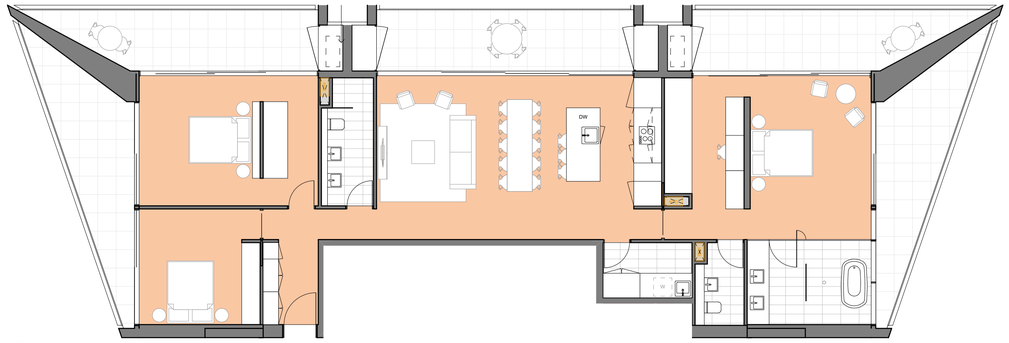
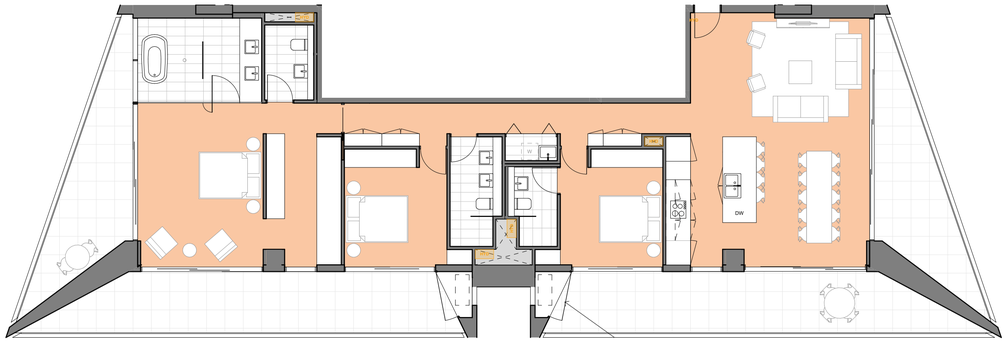
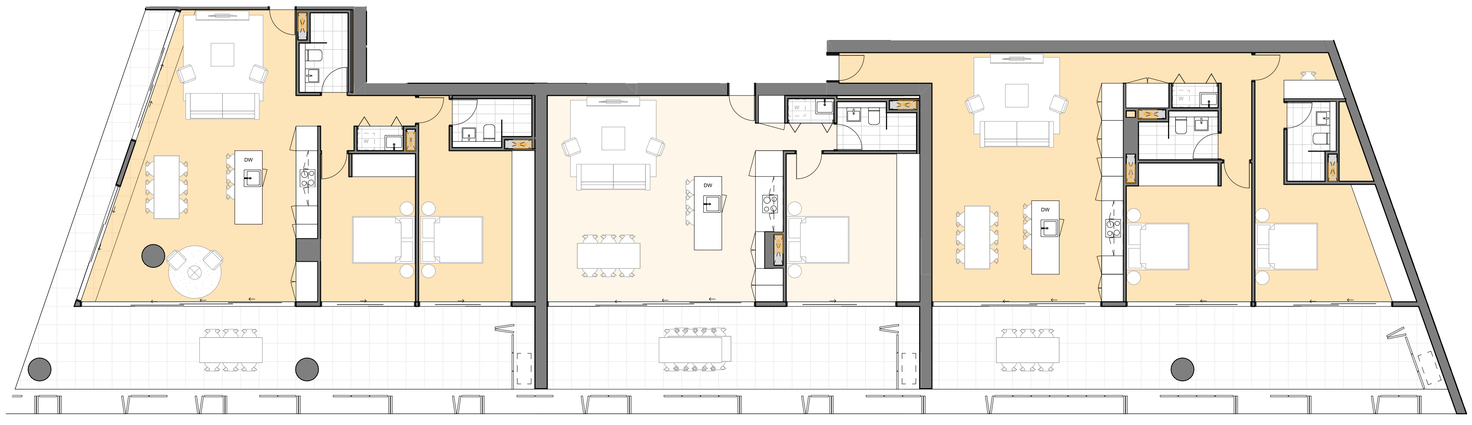


1 UNIT TYPE F - 3B PENTHOUSE
SCALE 1:100 @ A1

2 UNIT TYPE G - 3B PENTHOUSE
SCALE 1:100 @ A1



3 UNIT TYPE H - 3B PENTHOUSE
SCALE 1:100 @ A1



4 UNIT TYPE I - 2B PODIUM
SCALE 1:100 @ A1

5 UNIT TYPE J - 1B PODIUM
SCALE 1:100 @ A1

6 UNIT TYPE K - 2B PODIUM
SCALE 1:100 @ A1

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05	Issue for Draft DA	1/10/21	05

key plan

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Hydraulic Engineer

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project

Dairy Farmers Corner

924 Hunter Street 2/DP445736
Newcastle West NSW 2302

drawing title

Unit Plans
Unit Type F - K

drawing scale	drawn	verified	date
AS SHOWN		SC	1/10/21

project #	drawing #	issue
21014	A-1202	05

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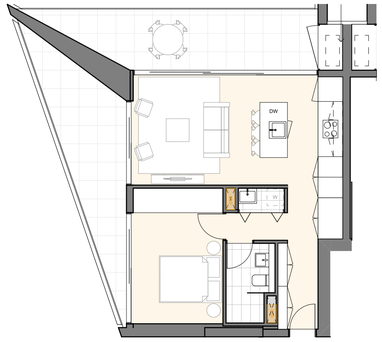
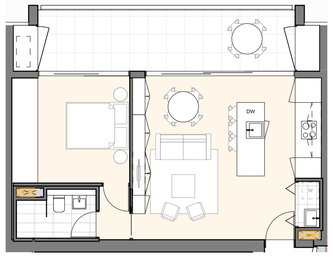
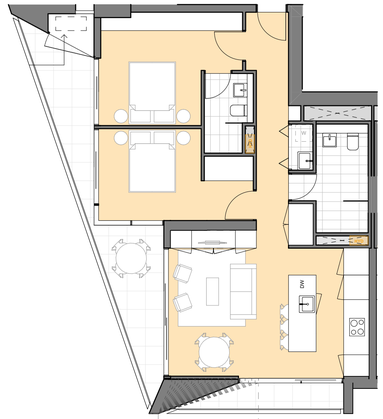


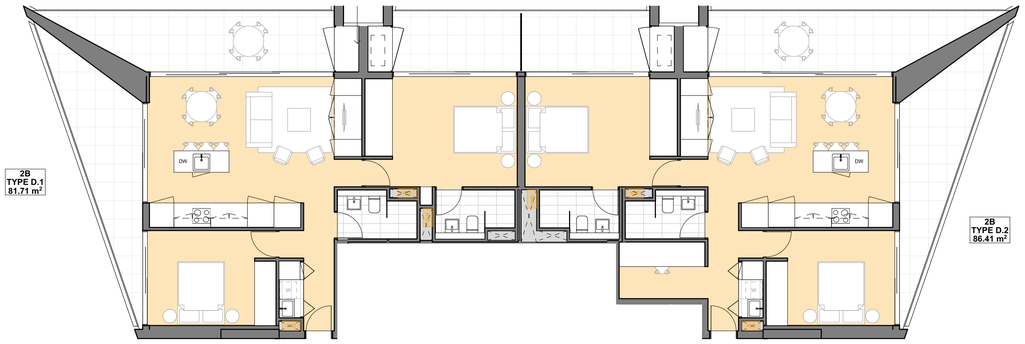
1 UNIT TYPE A - 1B TOWER
SCALE 1:100 @ A1



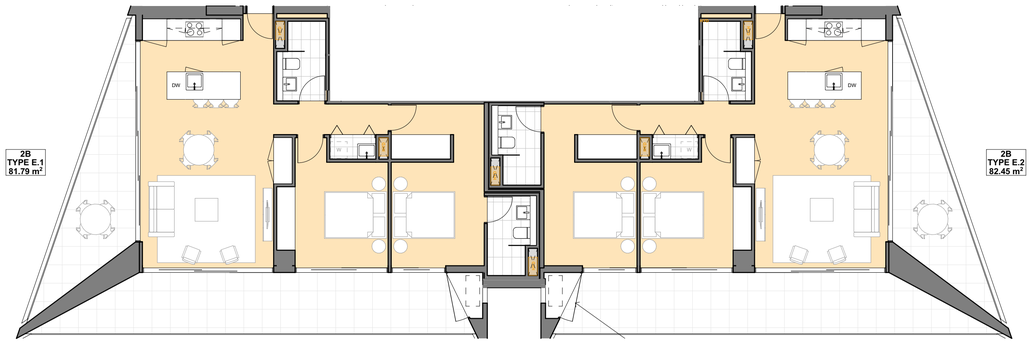
2 UNIT TYPE B - 1B TOWER
SCALE 1:100 @ A1



3 UNIT TYPE C - 2B TOWER
SCALE 1:100 @ A1



4 UNIT TYPE D.1 & D.2 - 2B TOWER
SCALE 1:100 @ A1



5 UNIT TYPE E.1 & E.2 - 2B TOWER
SCALE 1:100 @ A1

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key plan

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project
Dairy Farmers Corner
924 Hunter Street 2/DP445736
Newcastle West NSW 2302

drawing title
Unit Plans
Unit Type A - E

drawing scale	drawn	verified	date
AS SHOWN	CH	SC	1/10/21

project #	drawing #	issue
21014	A-1201	10

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Development Application - PRELIMINARY

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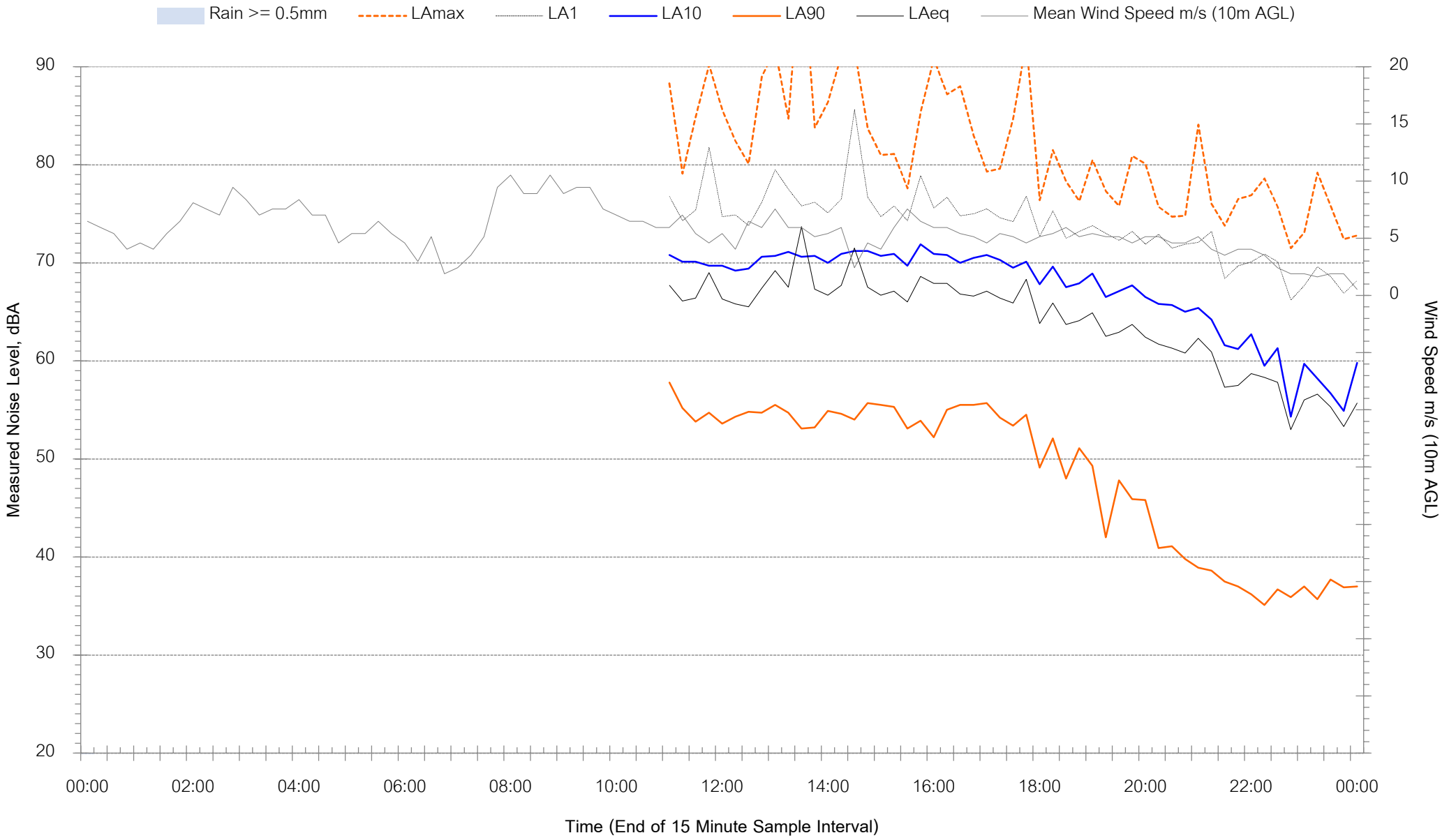
Appendix C – Noise Monitoring Charts

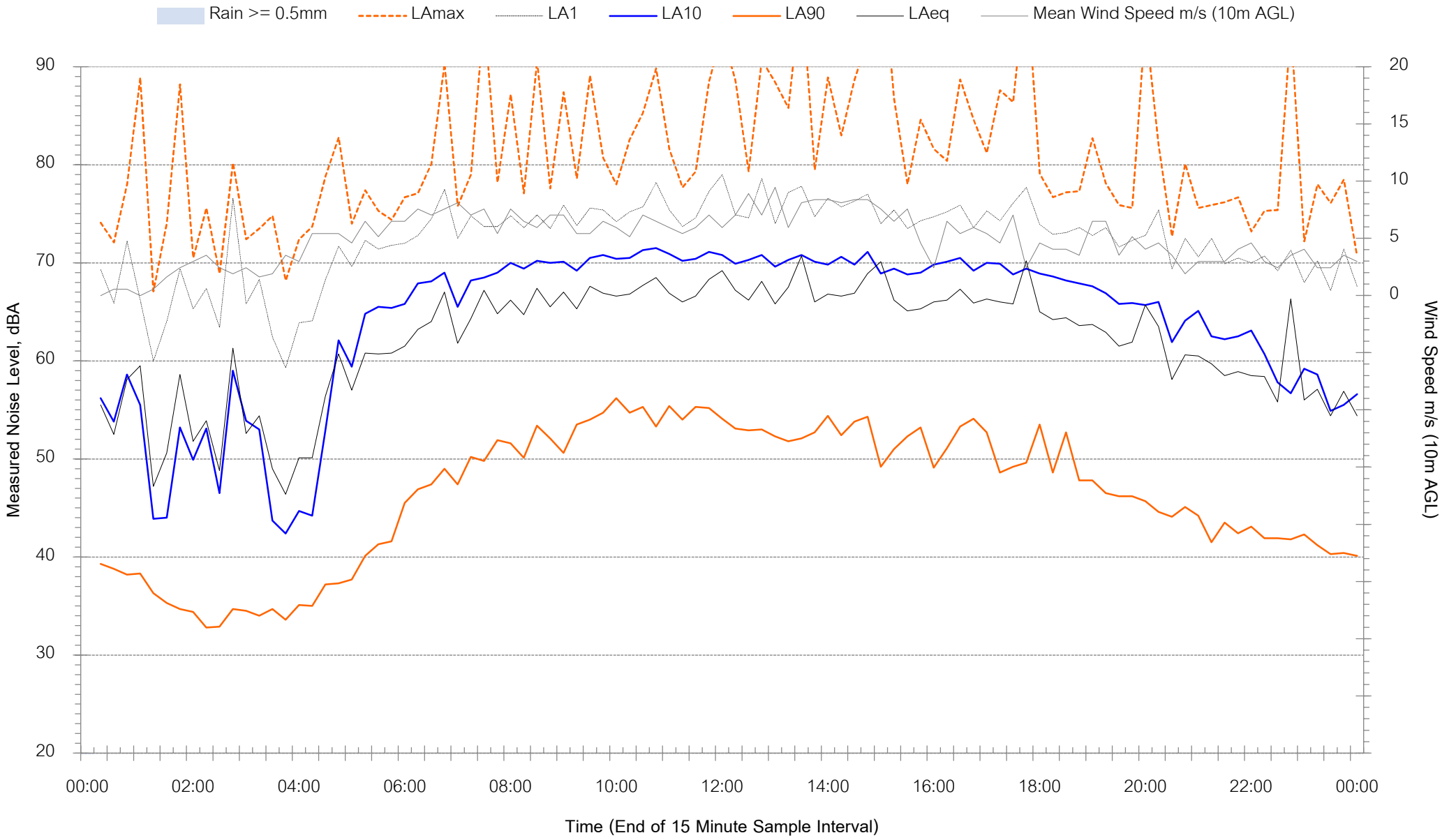
Background Noise Levels

924 Hunter Street, Hamilton - Friday 10 September 2021



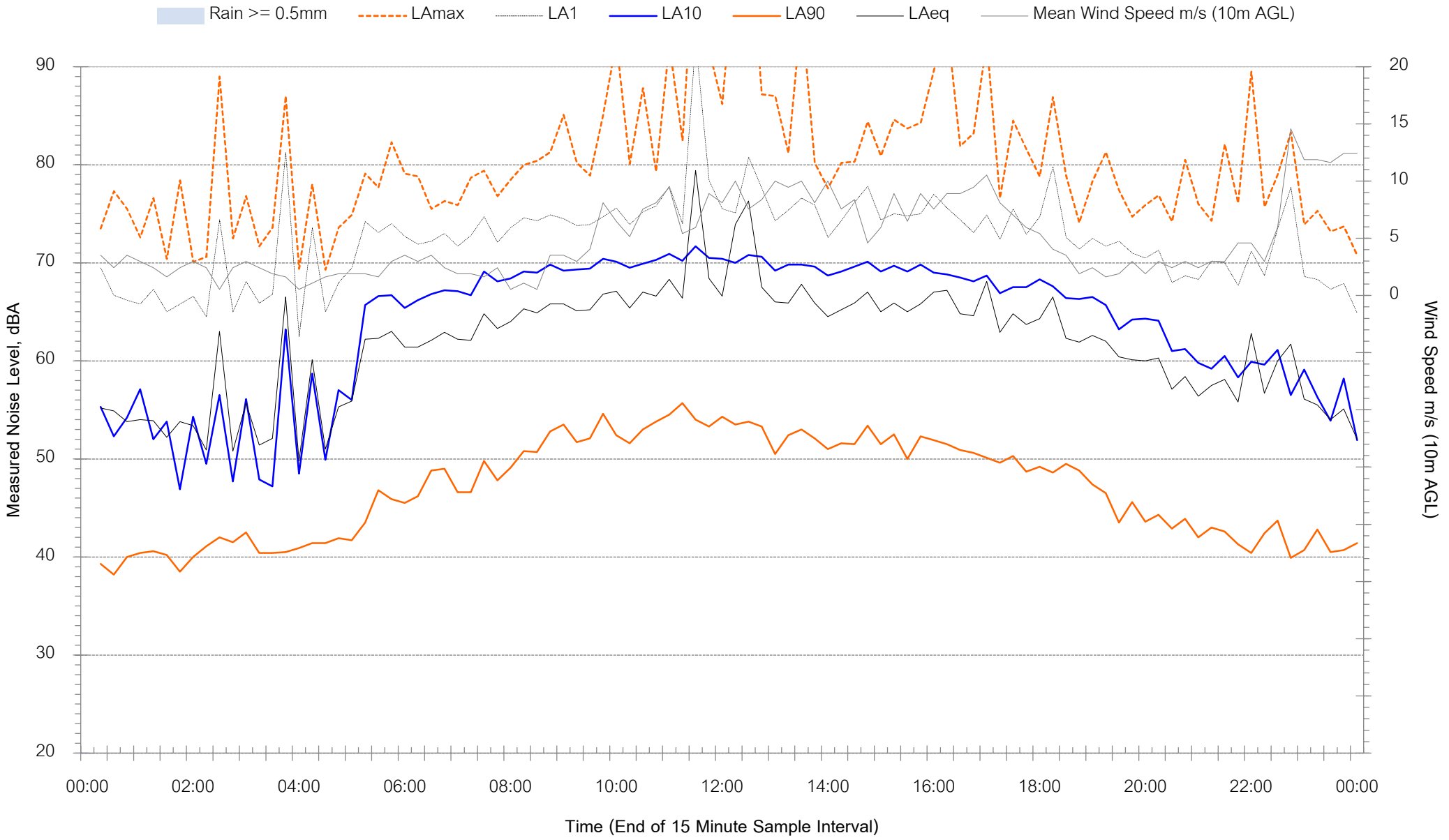
Background Noise Levels

924 Hunter Street, Hamilton - Saturday 11 September 2021



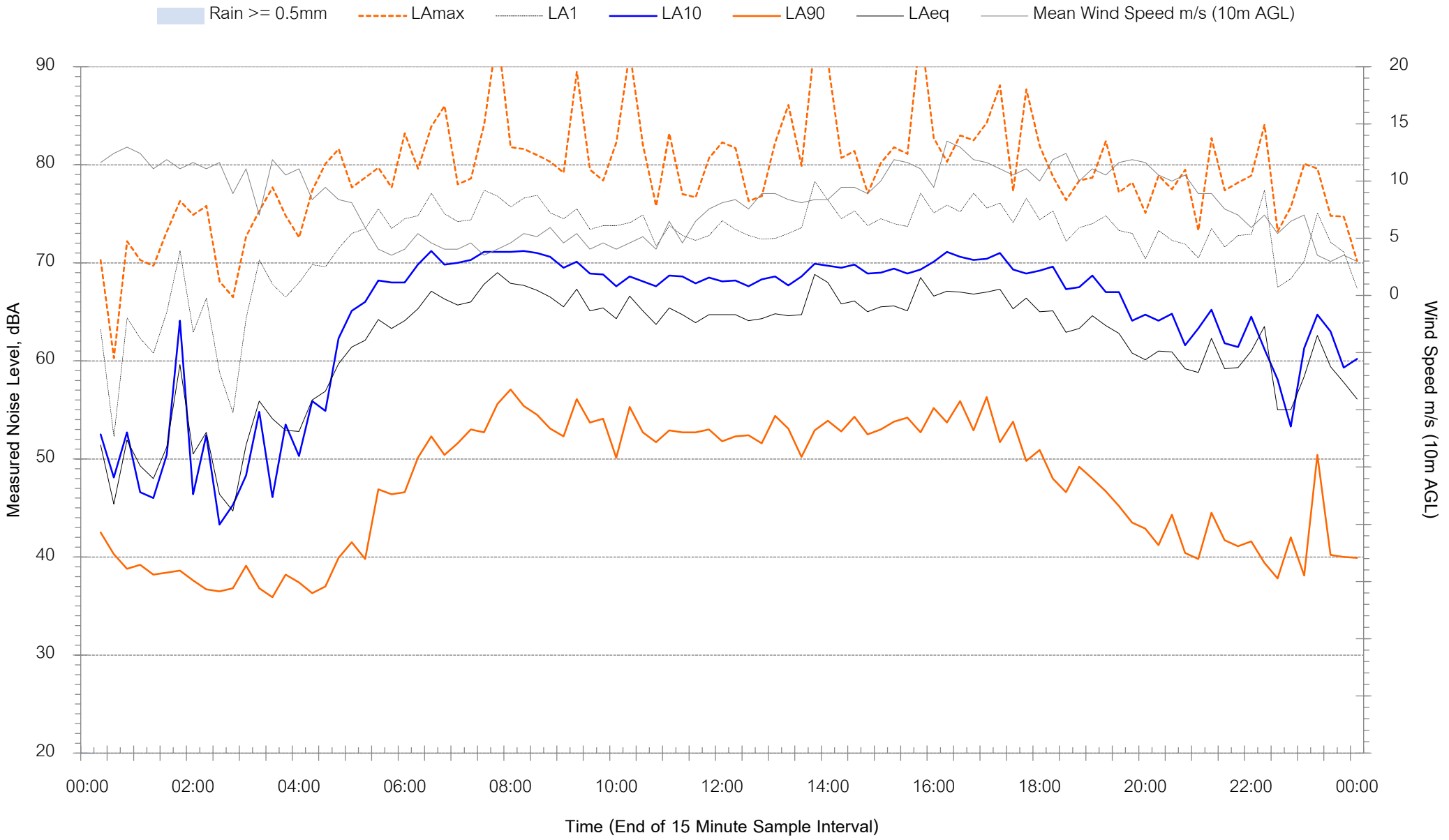
Background Noise Levels

924 Hunter Street, Hamilton - Sunday 12 September 2021



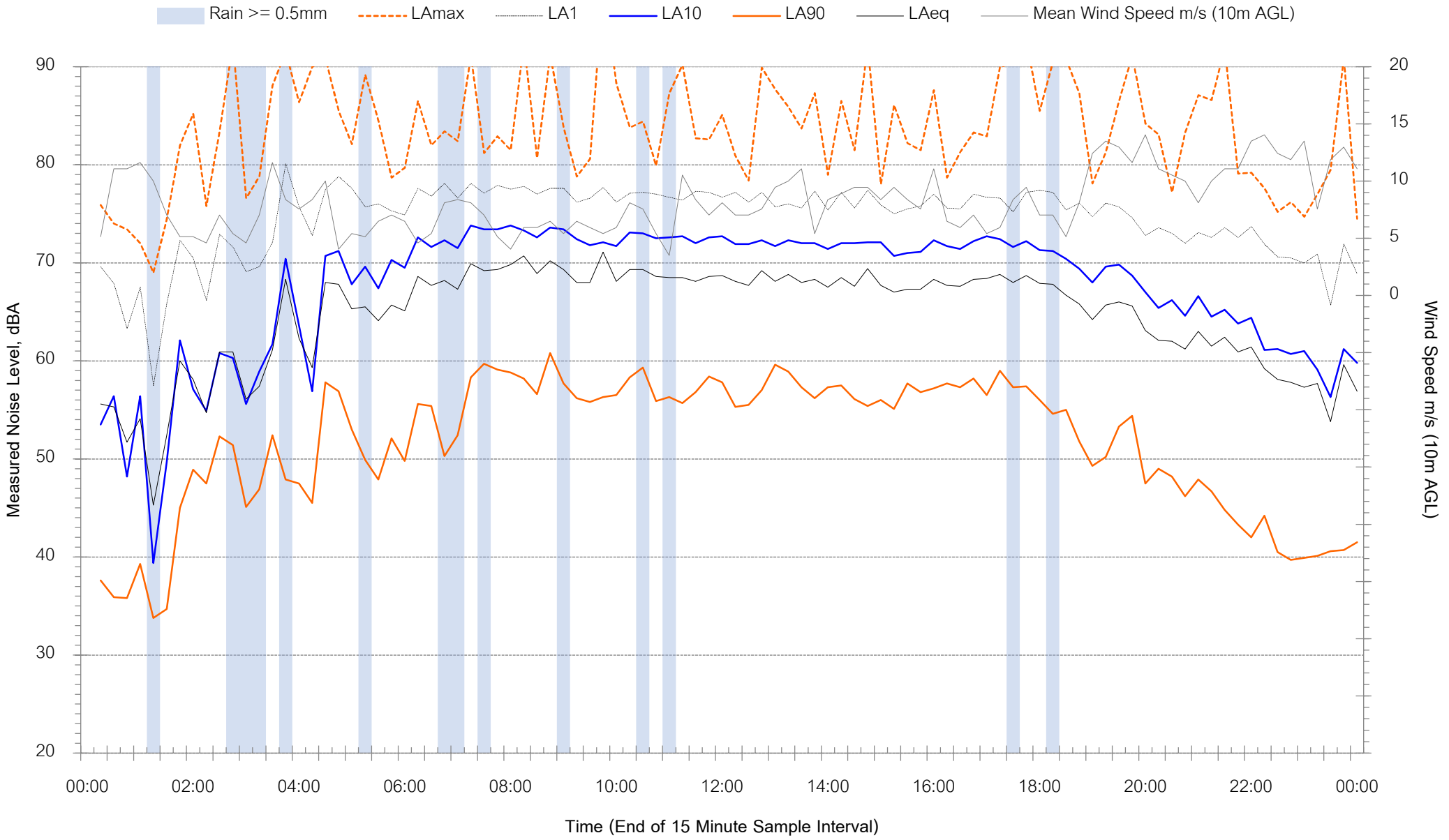
Background Noise Levels

924 Hunter Street, Hamilton - Monday 13 September 2021



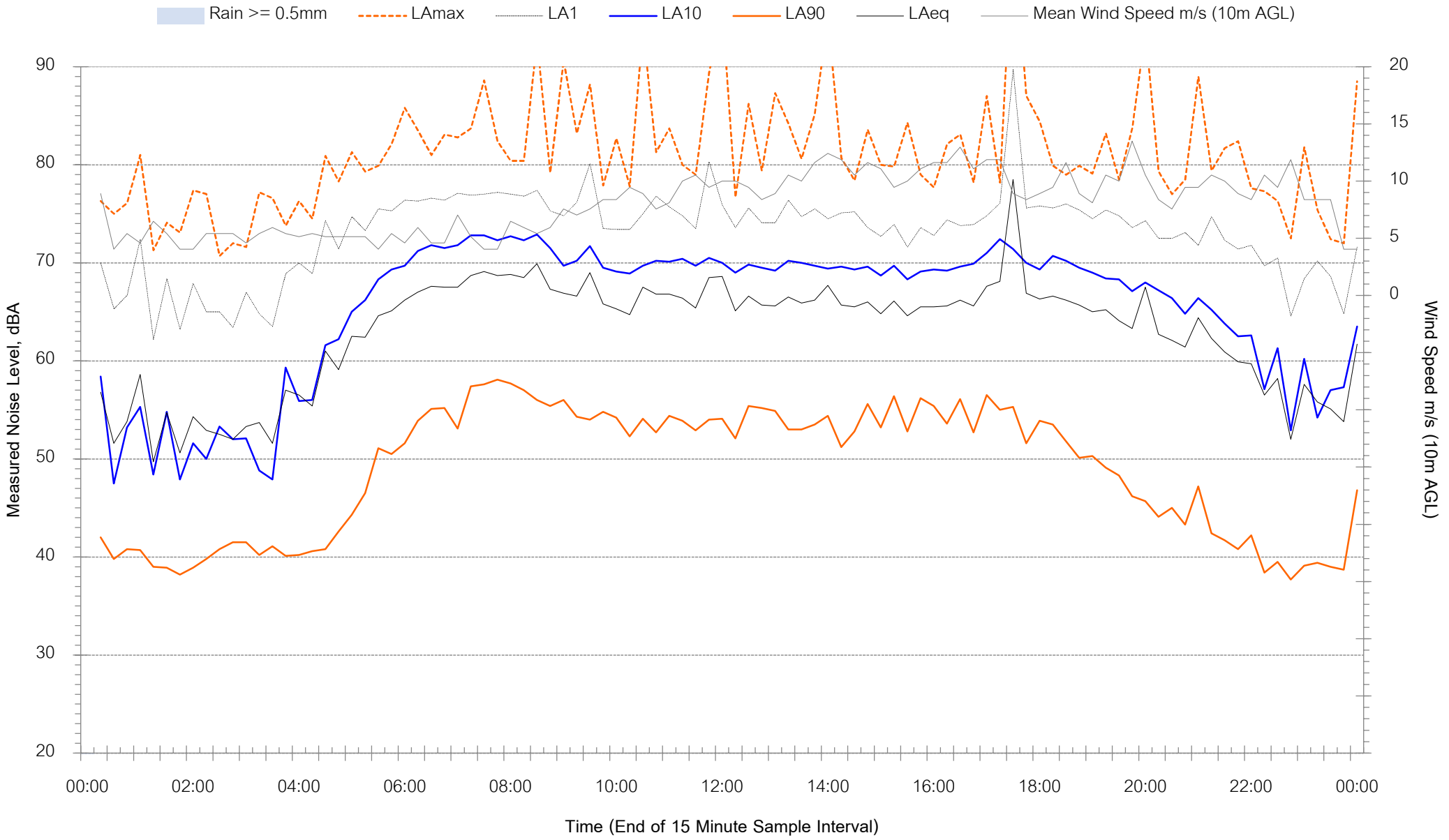
Background Noise Levels

924 Hunter Street, Hamilton - Tuesday 14 September 2021



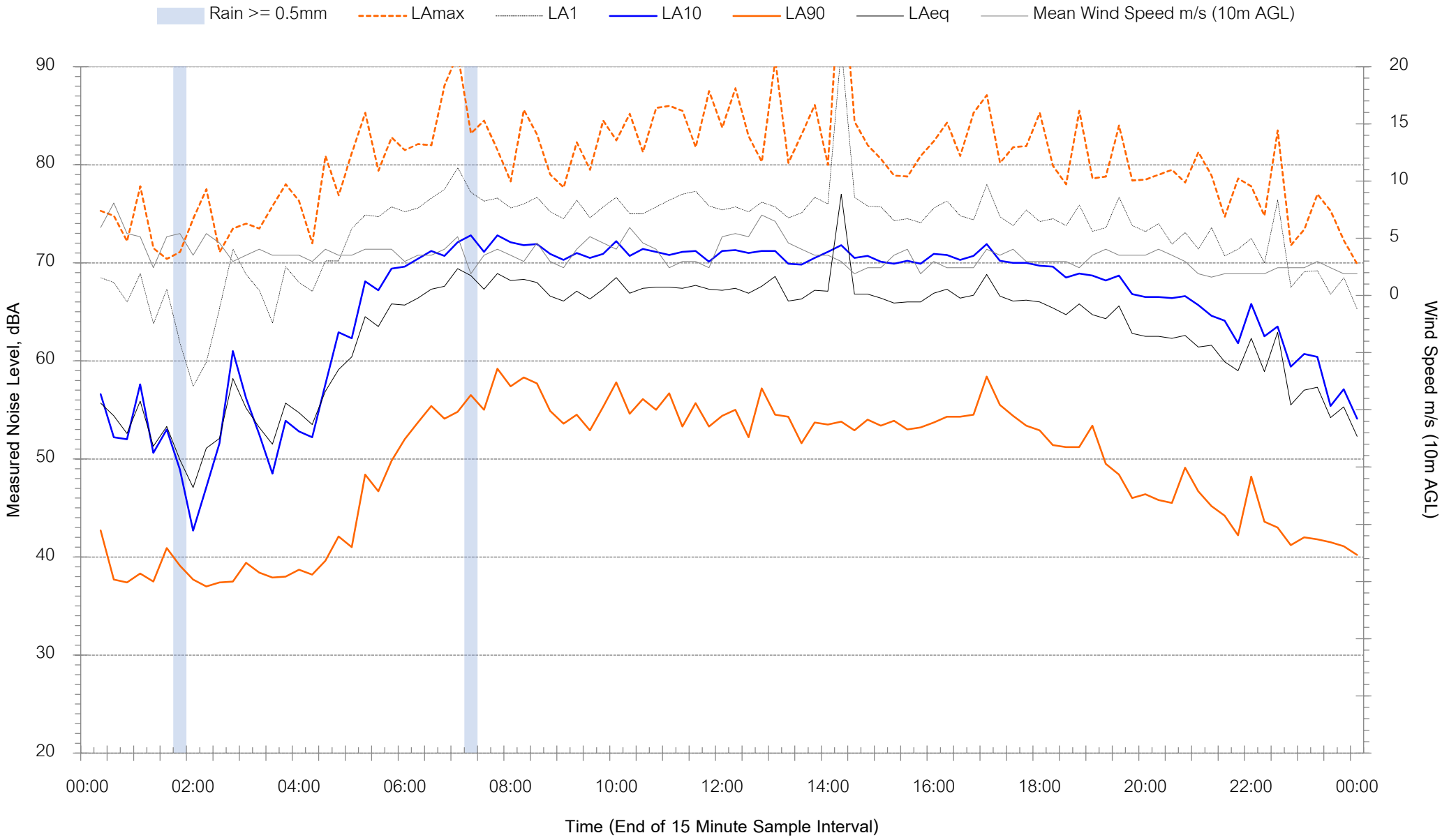
Background Noise Levels

924 Hunter Street, Hamilton - Wednesday 15 September 2021



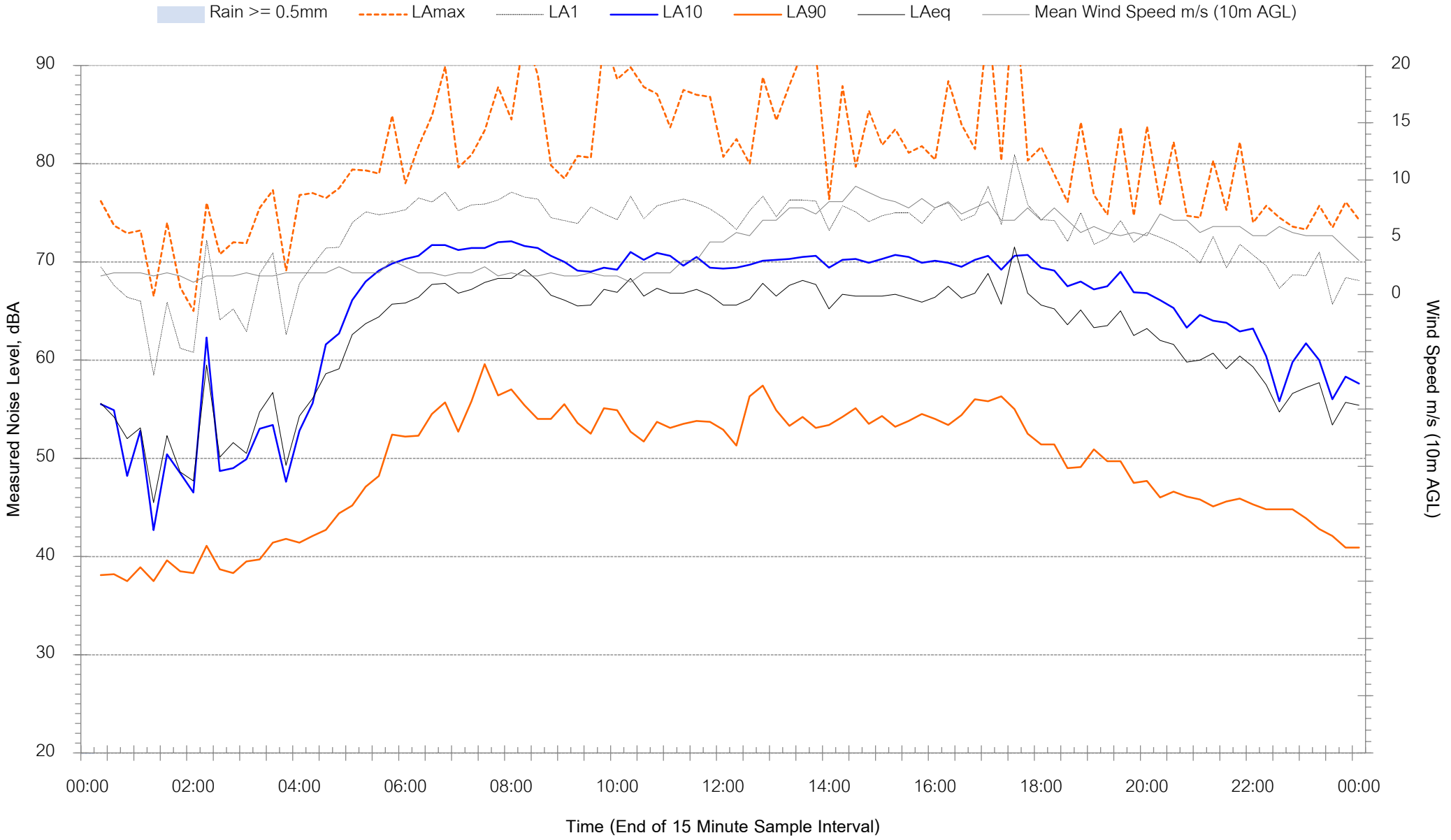
Background Noise Levels

924 Hunter Street, Hamilton - Thursday 16 September 2021



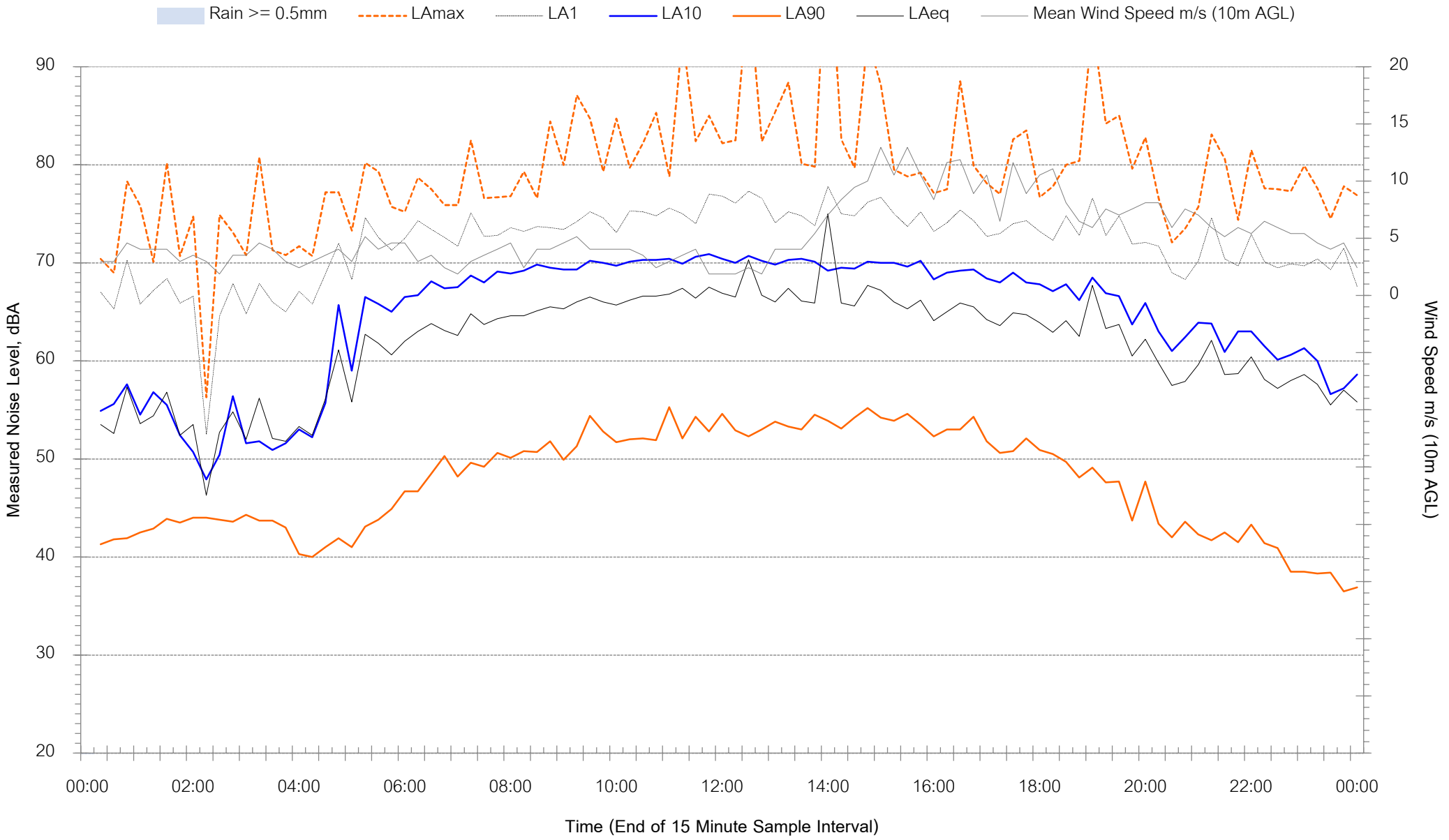
Background Noise Levels

924 Hunter Street, Hamilton - Friday 17 September 2021



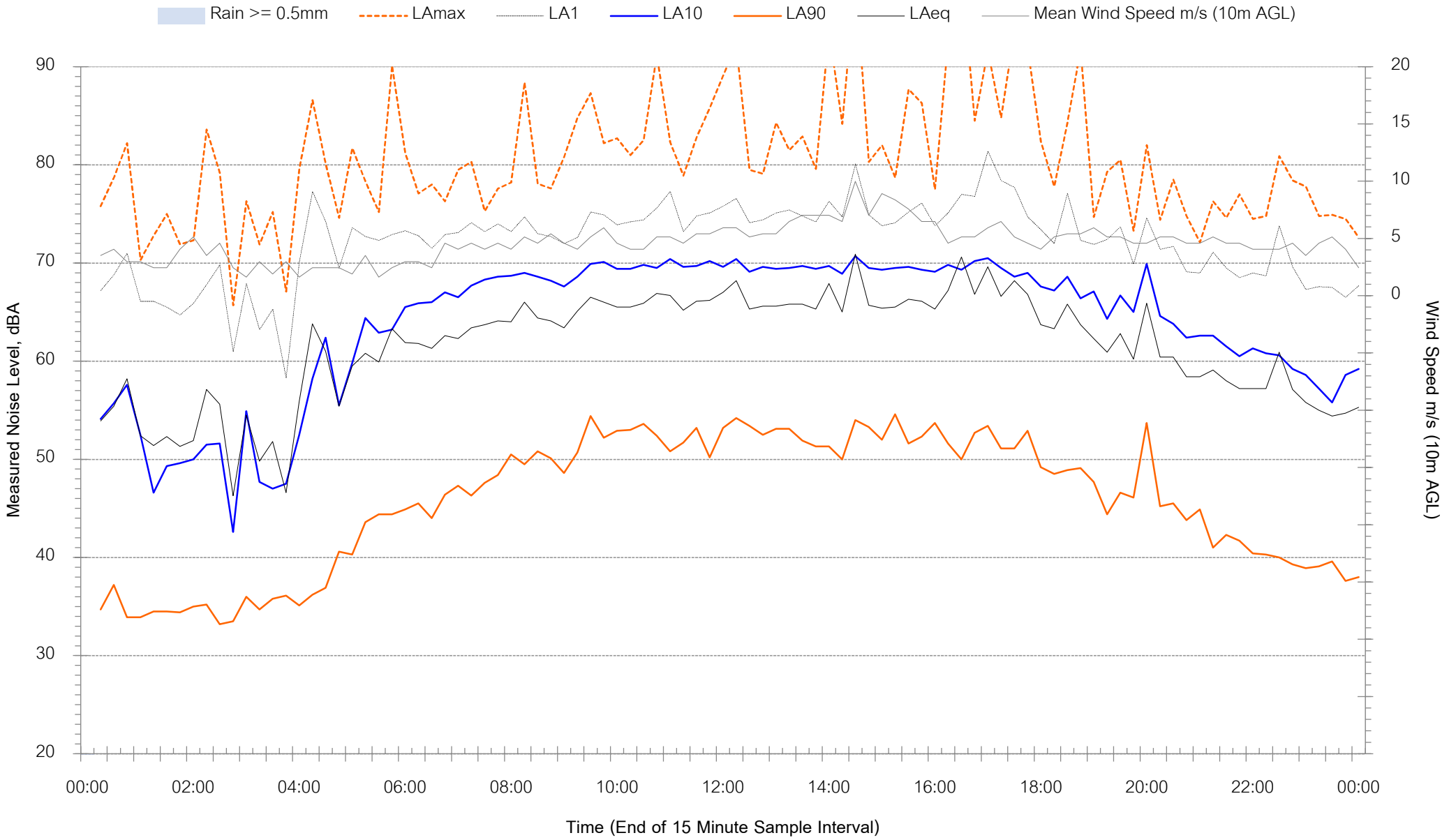
Background Noise Levels

924 Hunter Street, Hamilton - Saturday 18 September 2021



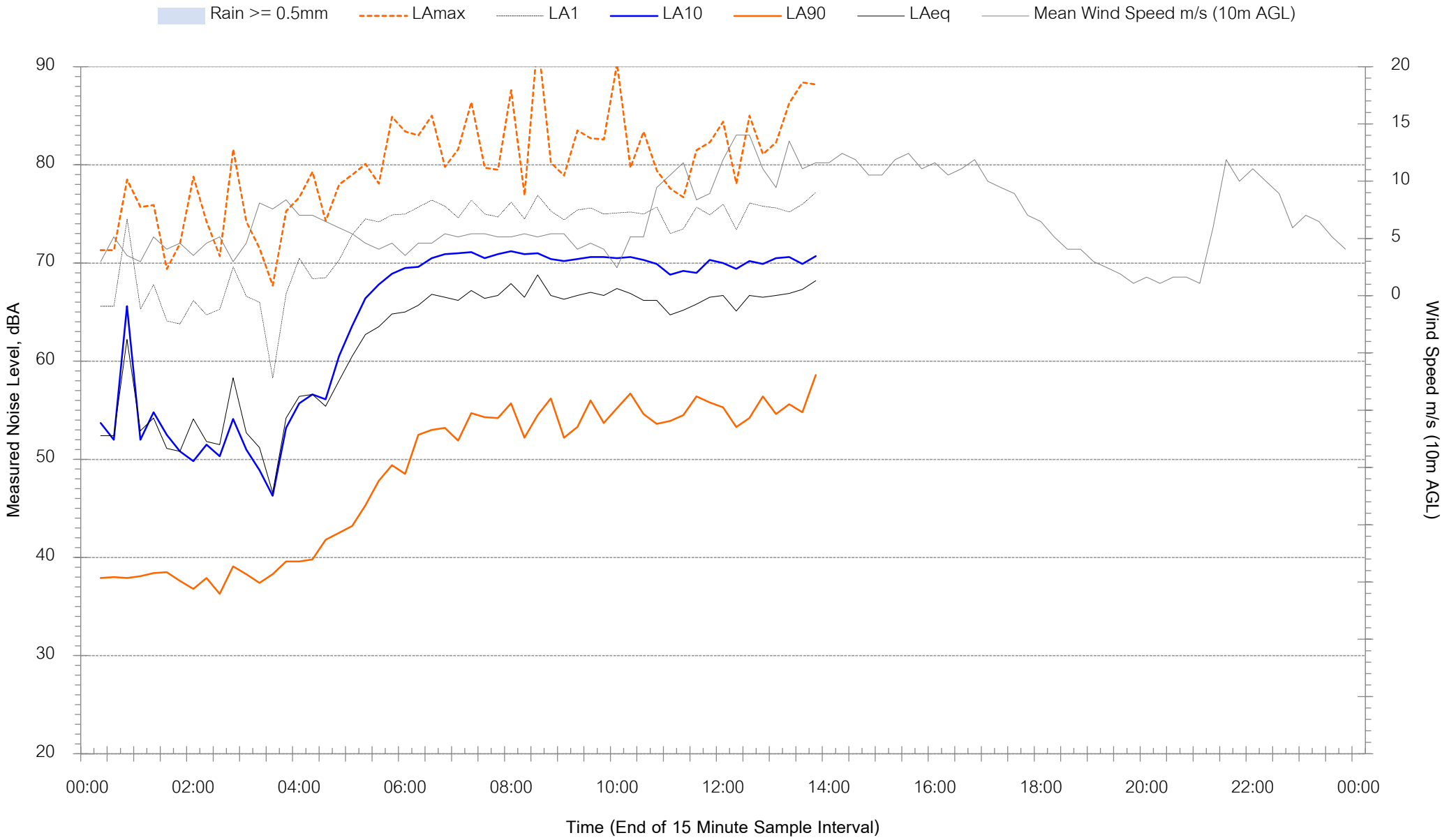
Background Noise Levels

924 Hunter Street, Hamilton - Sunday 19 September 2021



Background Noise Levels

924 Hunter Street, Hamilton - Monday 20 September 2021



Appendix D – Construction Material Categories

Appendix C – Acoustic Treatment of Residences

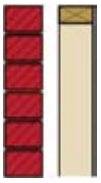
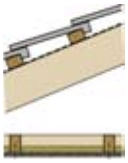
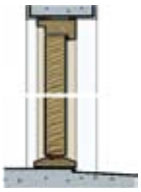
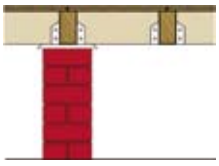
The following table sets out standard (or deemed-to-satisfy) constructions for each category of noise control treatment for the sleeping areas and other habitable areas of single / dual occupancy residential developments only. The assumptions made in the noise modelling are as follows:

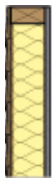
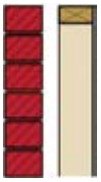
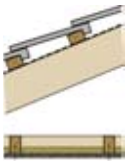
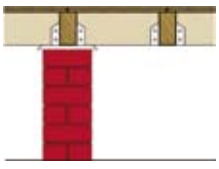
- Typical layout of a modern dwelling taken from a recent large residential development in an outer Sydney suburb
- Bedrooms and other habitable rooms are exposed to road noise

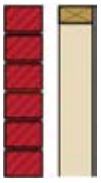
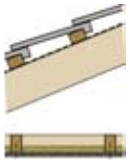
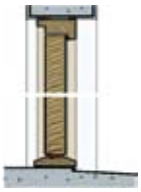
ACOUSTIC PERFORMANCE OF BUILDING ELEMENTS

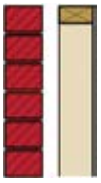
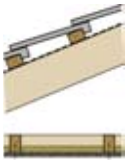
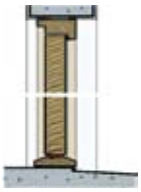
The acoustic performances assumed of each building element in deriving the Standard Constructions for each category of noise control treatment presented in the preceding Table, are presented below in terms of Weighted Sound Reduction Index (Rw) values, which can be used to find alternatives to the standard constructions presented in this Appendix:

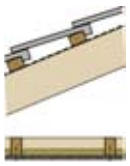
Category of Noise Control Treatment	R_w of Building Elements (minimum assumed)				
	Windows/Sliding Doors	Frontage Facade	Roof	Entry Door	Floor
Category 1	24	38	40	28	29
Category 2	27	45	43	30	29
Category 3	32	52	48	33	50
Category 4	35	55	52	33	50
Category 5	43	55	55	40	50

Category No.	Building Element	Standard Constructions	sample
1	**Windows/Sliding Doors**	Openable with minimum 4mm monolithic glass and standard weather seals	
	Frontage Facade	**Timber Frame or Cladding:** 6mm fibre cement sheeting or weatherboards or plank cladding externally, 90mm deep timber stud or 92mm metal stud, 13mm standard plasterboard internally	
		Brick Veneer: 110mm brick, 90mm timber stud or 92mm metal stud, minimum 50mm clearance between masonry and stud frame, 10mm standard plasterboard internally	
		Double Brick Cavity: 2 leaves of 110mm brickwork separated by 50mm gap	
	Roof	Pitched concrete or terracotta tile or metal sheet roof with sarking, 10mm plasterboard ceiling fixed to ceiling joists, R1.5 insulation batts in roof cavity.	
	Entry Door	35mm solid core timber door fitted with full perimeter acoustic seals	
	Floor	1 layer of 19mm structural floor boards, timber joist on piers	
		Concrete slab floor on ground	

Category No.	Building Element	Standard Constructions	sample
2	**Windows/Sliding Doors**	Openable with minimum 6mm monolithic glass and full perimeter acoustic seals	
	Frontage Facade	**Timber Frame or Cladding Construction:** 6mm fibre cement sheeting or weatherboards or plank cladding externally, 90mm deep timber stud or 92mm metal stud, 13mm standard plasterboard internally with R2 insulation in wall cavity.	
		Brick Veneer Construction: 110mm brick, 90mm timber stud frame or 92mm metal stud, minimum 50mm clearance between masonry and stud frame, 10mm standard plasterboard internally.	
		Double Brick Cavity Construction: 2 leaves of 110mm brickwork separated by 50mm gap	
	Roof	Pitched concrete or terracotta tile or metal sheet roof with sarking, 10mm plasterboard ceiling fixed to ceiling joists, R2 insulation batts in roof cavity.	
	Entry Door	40mm solid core timber door fitted with full perimeter acoustic seals	
	Floor	1 layer of 19mm structural floor boards, timber joist on piers	
		Concrete slab floor on ground	

Category No.	Building Element	Standard Constructions	sample
3	**Windows/Sliding Doors**	Openable with minimum 6.38mm laminated glass and full perimeter acoustic seals	
	Frontage Facade	**Brick Veneer Construction:** 110mm brick, 90mm timber stud or 92mm metal stud, minimum 50mm clearance between masonry and stud frame, 10mm standard plasterboard internally.	
		Double Brick Cavity Construction: 2 leaves of 110mm brickwork separated by 50mm gap	
	Roof	Pitched concrete or terracotta tile or sheet metal roof with sarking, 1 layer of 13mm sound-rated plasterboard fixed to ceiling joists, R2 insulation batts in roof cavity.	
	Entry Door	45mm solid core timber door fitted with full perimeter acoustic seals	
	Floor	Concrete slab floor on ground	

Category No.	Building Element	Standard Constructions	sample
4	**Windows/Sliding Doors**	Openable with minimum 10.38mm laminated glass and full perimeter acoustic seals	
	Frontage Facade	**Brick Veneer Construction:** 110mm brick, 90mm timber stud or 92mm metal stud, minimum 50mm clearance between masonry and stud frame, R2 insulation batts in wall cavity, 10mm standard plasterboard internally.	
		Double Brick Cavity Construction: 2 leaves of 110mm brickwork separated by 50mm gap	
	Roof	Pitched concrete or terracotta tile or sheet metal roof with sarking, 2 layers of 10mm sound-rated plasterboard fixed to ceiling joists, R2 insulation batts in roof cavity.	
	Entry Door	45mm solid core timber door fitted with full perimeter acoustic seals	
	Floor	Concrete slab floor on ground	

Category No.	Building Element	Standard Constructions	sample
5	**Windows/Sliding Doors**	Openable Double Glazing with separate panes: 5mm monolithic glass, 100mm air gap, 5mm monolithic glass with full perimeter acoustic seals.	
	Frontage Facade	**Double Brick Cavity Construction:** 2 leaves of 110mm brickwork separated by 50mm gap with cement render to the external face of the wall and cement render or 13mm plasterboard direct fixed to internal faces of the wall.	
	Roof	Pitched concrete or terracotta tile or sheet metal roof with sarking, 2 layers of 10mm sound-rated plasterboard fixed to ceiling joist using resilient mounts, R2 insulation batts in roof cavity	
	Entry Door	Special high performance acoustic door required - Consult an Acoustic Engineer	*Door to acoustic consultant's specifications*
	Floor	Concrete slab floor on ground	
6	**All**	Consult an Acoustic Engineer	

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MAC
Muller Acoustic Consulting

Appendix K

TRAFFIC AND PARKING ASSESSMENT (INTERSECT TRAFFIC)

TRAFFIC & PARKING ASSESSMENT

MIXED USE DEVELOPMENT

LOT 2 IN DP 445736, LOT 1 IN DP 342675, LOTS 1 & 2 IN DP 1091173, LOT 2 IN DP 126, LOT 1 IN DP 456088 AND LOT 1 IN DP 395367

924 HUNTER STREET, NEWCASTLE WEST

PREPARED FOR: THIRDI DAIRY FARMERS PTY LTD

OCTOBER 2021

21/163

TRAFFIC & PARKING ASSESSMENT
THIRDI DAIRY FARMERS PTY LTD

MIXED USE DEVELOPMENT
LOT 2 IN DP 445736, LOT 1 IN DP 342675, LOTS 1 & 2 IN DP 1091173, LOT 2 IN DP 126, LOT 1 IN DP 456088 AND LOT 1 IN DP 395367
924 HUNTER STREET, NEWCASTLE WEST

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QUALITY ASSURANCE

This document has been prepared, checked and released in accordance with the Quality Control Standards established by Intersect Traffic Pty Ltd.

Issue	Date	Description	By
A	24/09/21	Draft	PA
B	06/10/21	Edit	JG
C	14/10/21	Final Proof/Client Amendments	JG
D	14/10/21	Approved	JG

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This document has been authorised by

Date 14th October 2021

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1.0 INTRODUCTION

Intersect Traffic Pty Ltd has been engaged by Thirdi Dairy Farmers Pty Ltd to prepare a traffic and parking assessment report for a Mixed Use Development on Lot 2 in DP 445736, Lot 1 in DP 342675, Lots 1 & 2 in DP 1091173, Lot 2 in DP 126, Lot 1 in DP 456088 and Lot 1 in DP 395367, 924 Hunter Street, Newcastle West. The proposed development requires the demolition of the two commercial buildings on the site and the construction of a commercial and residential complex containing a 30 level retail / residential tower, a 25 storey retail commercial / residential tower, and a 6 level commercial tower with 4 levels of associated car parking. The development concept plans are shown in ***Attachment A***.

The site has frontage to Hunter Street, Railway Street and Tighe Street with vehicular access proposed from Tighe Street via a new combined entry / exit driveway west of the eastern boundary of the development. This report is required to support a development application to Newcastle City Council and allow the Council to assess the proposal in respect of its impact on the local road network.

This report presents the findings of the traffic assessment and includes the following:

1. An outline of the existing situation in the vicinity of the site.
2. An assessment of the traffic impacts of the proposed development including the predicted traffic generation and its impact on existing road and intersection capacities.
3. A review of parking, public transport, pedestrian, and cycle way requirements for the proposed development, including assessment against Council, Transport for NSW (TfNSW) and Australian Standards requirements.
4. A presentation of conclusions and recommendations.

2.0 SITE DESCRIPTION

The subject site currently contains a 2 storey commercial building located on the corner of Hunter Street and Railway Street and a single storey commercial building at its south eastern corner. The site is located within the western end of the 'Newcastle City Centre' area, in Newcastle West, adjacent to the suburbs of Newcastle and Hamilton. The property adjoins Hunter Street, Railway Street and Tighe Street at its southern, western and northern boundaries, respectively and adjoins a commercial development at its eastern boundary. The NSW's TrainLink Newcastle & Central Coast Hunter Line train services rail corridor is located approximately 40 metres north of the site at the end of Railway Street with the Newcastle Transport Interchange Wickham being approximately 300 metres east of the site. The site, within the context of surrounding buildings, land and transport corridors is shown in the location plan provided as ***Figure 1***, below.

Figure 1 – Site Location

The site contains the following property descriptors:

- Formal land titles:
  - Lot 2 in DP 445736,
  - Lot 1 in DP 342675,
  - Lots 1 & 2 in DP 1091173,
  - Lot 2 in DP 126,
  - Lot 1 in DP 456088, and
  - Lot 1 in DP 395367;
- Street address of 924 Hunter Street, Newcastle West;
- Site area of approximately 4,000 m^2; and
- Land zoning of B3 – Commercial Core in accordance with Newcastle LEP (2012).

The site currently has two vehicular accesses via Hunter Street (13 metres wide in total) and two via Tighe Street (18 metres wide in total). ***Photographs 1 & 2*** show some of the site's existing development and existing vehicular accesses.

Photograph 1 – Development site corner Hunter Street and Railway Street

Photograph 2 – An existing driveway in Hunter Street

3.0 EXISTING ROAD NETWORK

3.1 Hunter Street

Hunter Street fronting the development site is a regional road (RR 464) and under a functional road hierarchy classification it is a sub-arterial road. It is under the care and control of Newcastle City Council with partial funding for its maintenance provided by TfNSW. It is a major transport route and runs northwest – southeast connecting the Newcastle East CBD area to the sub-arterial road network (SH 10) Hannell Street / (SH 10) Stewart Avenue and via Maitland Road (RR 464) providing connection to the suburbs of Wickham, Hamilton, Islington, Tighes Hill, Mayfield and Warabrook to the west where it again connects to the sub-arterial road network (MR 316) Industrial Drive / Maitland Road (SH 10). It also provides connections to the Newcastle beaches and foreshore areas of the Hunter River along the northern side of the Newcastle CBD.

In the vicinity of the site, Hunter Street is a four lane two-way sealed urban road with parking lanes on both sides of the road. The carriageway is 17 metres wide (approx.) with concrete kerb and gutter and longitudinal drainage along its outer edges and centre, lane and edge line markings. A 60 km/h speed limit applies to this section of road. The on-street parking along Hunter Street is 'pay for parking' time restricted 2 hour periods between 9am – 5pm Monday to Friday and 9am – 1pm Saturday.

At the time of inspection Hunter Street was observed to be in good condition. ***Photograph 3*** below shows Hunter Street adjoining the site.

Photograph 3 – Hunter Street adjoining the site

3.2 Tudor Street

Tudor Street is an urban Regional Road (RR 604) and is under the care and control of the Newcastle City Council who receives some funding from TfNSW for maintenance works. Under a functional road hierarchy, it would be considered a sub-arterial road. It connects a series of streets to the west and to the east to the arterial and sub-arterial road network at Lambton Road, Parry Street and Hunter Street. Near the site Tudor Street is a two way four lane sealed road, except where additional turning lanes are provided at intersections, with kerb and gutter, drainage and parking on both sides of the road and a central median island separating the traffic travel directions.

With a carriageway of approximately 23 metres in width it has travel lanes approximately 3.4 metres wide and parking lanes approximately 3.0 metres wide. Where permitted, parking on Tudor Street near the site is 'pay for parking' 2 hour time restricted between 9am – 5pm Monday to Friday and 9am – 1pm Saturday. A 60 km/h speed limit applies to this section of road and at the time of inspection Tudor Street was observed to be in good condition. ***Photograph 4*** shows Tudor Street, Newcastle West near the site.

Photograph 4 – Tudor Street near the site

3.2 Railway Street

Railway Street is a local urban road and is under the care and control of the City of Newcastle. It is approximately 90 metres long between Hunter Street and a dead-end at the rail corridor and connects to Tighe Street. Near the site Railway Street is a two way two lane sealed road with kerb and gutter and parking on alternate sides of the road. With a carriageway of generally 8.5 metres in width it has travel lanes approximately 3.2 metres wide and a parking lane approximately 2.0 metres wide. A 50 km/h speed limit applies to this section of road and at the time of inspection Tudor Street was observed to be in good condition. ***Photograph 5*** shows Railway Street near the site southwest of Hunter Street.

Photograph 5 – Railway Street adjoining the site

3.4 Tighe Street

Tighe Street is a local urban road under the care and control of the City of Newcastle. It is approximately 60 metres long between Railway Street and a dead-end at its eastern end. Near the site Railway Street is a two way two lane sealed road with kerb and gutter and parking on alternate sides of the road. With a carriageway of 7.5 metres wide it has travel lanes approximately 2.4 metres wide and a parking lane approximately 1.8 metres wide. A 50 km/h speed limit applies to this section of road and at the time of inspection Tighe Street was observed to be in good condition as seen in ***Photograph 6*** below.

Photograph 6 – Tighe Street adjoining the site

4.0 ROAD NETWORK IMPROVEMENTS

The proposed and constructed road works for the Newcastle Light Rail and the proposed and implemented public bus and train Newcastle Interchange are operating well at present. Since their implementation there have been no further road network changes proposed that will improve the traffic flow conditions near the site.

5.0 TRAFFIC VOLUMES

For this assessment previous 2019 and 2029 peak hour traffic volumes determined for the Hunter Street / Tudor Street / Railway Street intersection have been utilised. GHD have provided the data sourced from their Paramics model for the road network in this location, which was utilised for the recent assessment of the Newcastle Transport Interchange at Wickham and includes a simulated prediction of traffic at the intersection. It has been accepted by Newcastle City Council and TfNSW and is considered relevant for use for analysis of the traffic impacts of the proposed development.

The GHD traffic data provided is presented in ***Attachment B***.

The 2019 two-way mid-block peak hour traffic volumes determined from the traffic data were:

- Hunter Street – west of Railway Street - 962 vtph AM and 993 PM,
- Hunter Street – east of Railway Street – 1,262 vtph AM and 1,251 PM,
- Tudor Street – southwest of Railway Street - 701 vtph AM and 625 PM, and
- Railway Street – north of Hunter Street - 79 vtph AM and 39 PM

The 2029 two-way mid-block peak hour traffic volumes determined from the traffic data were:

- Hunter Street – west of Railway Street – 1,143 vtph AM and 1,127 PM,
- Hunter Street – east of Railway Street – 1,409 vtph AM and 1,286 PM,
- Tudor Street – southwest of Railway Street - 796 vtph AM and 728 PM, and
- Railway Street – north of Hunter Street - 95 vtph AM and 49 PM

The 2019 and 2029 volumes have each been increased by a 2.0% per annum background traffic growth rate for a further 2 years to determine the 2021 and 2031 AM and PM peak traffic volumes and have been presented in ***Table 1*** below. It is noted this is 0.5 % per annum higher than the background traffic growth used by TfNSW in their lower Hunter traffic modelling therefore is considered a conservative assumption for traffic impact analysis.

Table 1 – Predicted 2021 and 2031 mid-block peak hour traffic volumes

Road	Section	2021 AM peak vtph	2021 PM peak vtph	2031 AM peak vtph	2031 PM peak vtph
Hunter Street west	west of Railway Street	1001	1033	1189	1173
Hunter Street east	east of Railway Street	1313	1302	1466	1338
Tudor Street	southwest of Railway Street	729	650	828	757
Railway Street	north of Hunter Street	82	41	95	51

For the purposes of the assessment the 2021 and 2031 peak hour traffic volumes in Tighe Street are assumed to be the 30 vehicles less than Railway Street volumes which again is considered a conservative estimate.

The volumes as presented above in ***Table 1*** are considered relevant for the report and are utilised for the assessment.

6.0 ROAD CAPACITY

The capacity of the road network is generally determined by the capacity of intersections. However, the *RTA's Guide to Traffic Generating Developments* provides some guidance on mid-block capacities and likely levels of service. For urban roads *Table 4.3* of the *RTA's Guide to Traffic Generating Developments*, reproduced below, provides guidance on mid-block capacities for a LoS C.

Table 4.3
Typical mid-block capacities for urban roads with interrupted flow

Type of Road	One-Way Mid-block Lane Capacity (pcu/hr)	
Median or inner lane:	Divided Road	1,000
	Undivided Road	900
Outer or kerb lane:	With Adjacent Parking Lane	900
	Clearway Conditions	900
	Occasional Parked Cars	600
4 lane undivided:	Occasional Parked Cars	1,500
	Clearway Conditions	1,800
4 lane divided:	Clearway Conditions	1,900

Source: - RTA's Guide to Traffic Generating Developments (2002).

Noting that Hunter Street and Tudor Street in this location are four-lane two-way roads with parking lanes therefore would have a one-way mid-block capacity of at least 1,800 vtph and a two-way mid-block capacity of 3,600 vtph for a LoS C from the above table. Similarly, Railway Street and Tighe Street as two-lane two way roads with limited on-street car parking would have a one-way mid-block capacity of at least 600 vtph and a two-way mid-block capacity of 1,200 vtph for a LoS C from the above table.

From the traffic data sourced and calculated in ***Section 5*** and noting the likely technical two-way mid-block road capacity of Hunter Street, Tudor Street, Railway Street and Tighe Street are well in excess of the 2021 peak hour traffic volumes and predicted 2031 peak hour traffic volumes on the road network, it is considered that the adjacent road network is operating within its technical capacity and has scope to cater for additional traffic generated by some new development.

Therefore, the mid-block road capacity of 3,600 vtph for Hunter Street and Tudor Street, as two-way four-lane urban roads and 1,200 vtph for Railway Street and Tighe Street, as two-way two-lane urban roads with on-street car parking constraints, have been adopted for this assessment.

7.0 ALTERNATE TRANSPORT MODES

Newcastle Transport (Keolis Downer) operates bus, rail, light rail and ferry public transport, for Newcastle Transport, in the Hunter and Lake Macquarie. The Newcastle Transport Interchange, utilised for rail, light rail and bus services is located within convenient walking distance from the development site, approximately 300 metres east of the site. In addition, bus stops, one for westbound services is located 20 metres opposite the site on the southern side of Hunter Street and another for eastbound services is located 60 metres west of the site on the northern side of Hunter Street, respectively. These services provide access to many commercial areas, educational and medical centres and residential areas within the Newcastle and regional areas.

An extract of the public transport services routes map is shown in ***Figure 2*** below, and the bus stop opposite the site frontage on the southern side of Hunter Street is also shown below in ***Photograph 7***.

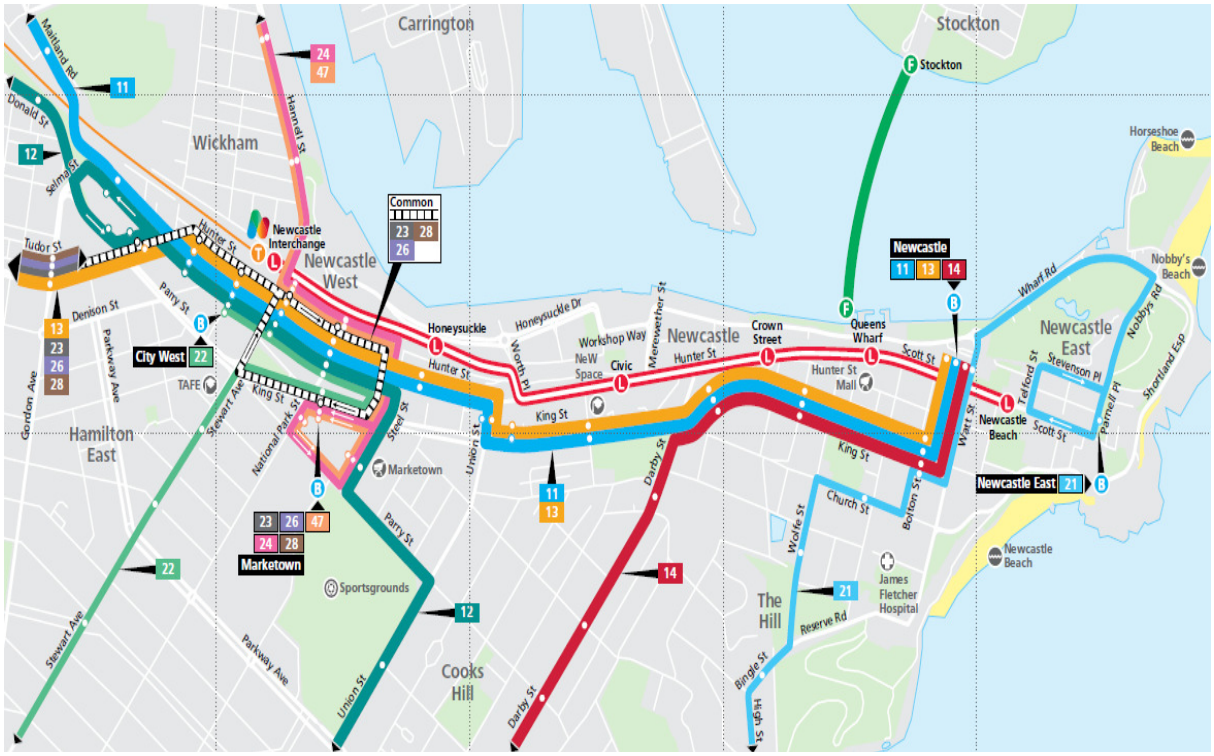


Figure 2 – Keolis Downer bus routes

Photograph 7 – Bus Stop(and footpath) south side of Hunter Street opposite to the site

A review of the route maps and timetables for the bus services indicates that the site is provided with excellent access to public transport. Bus Routes 11 (Newcastle East – Newcastle – Newcastle West – Wickham – Islington – Mayfield – Callaghan – Jesmond – Lambton – New Lambton Heights – Charlestown), 12 (Newcastle East – Newcastle – Newcastle West – Wickham – Hamilton – Georgetown – Waratah – North Lambton – Wallsend) and 13 (Newcastle East – Newcastle – Newcastle West –– Hamilton – Broadmeadow New Lambton – New Lambton Heights – Cardiff Heights – Cardiff – Glendale) travel past the site along Hunter Street. The services also provide access to other bus services, which connect to various suburbs throughout Newcastle, the Newcastle Airport, and the Stockton ferry service at Queens Wharf.

As shown in the above ***Photograph 7***, a full width concrete / brick paver surface footpath approximately 3.7 metres exists opposite the development site on Hunter Street whilst ***Photograph 8*** shows the full width concrete footpath on the north side of Hunter Street fronting the development. The Hunter Street footpaths connect to a network of pedestrian footpaths further east and west along Hunter Street and to a number of cross streets including Tudor Street, Railway Street via kerb ramps, signalised and / or marked road crossings near and adjacent to the site. These pedestrian footways and crossings facilitate safe crossing of Hunter Street, Tudor Street and Railway Street providing pedestrian access to the bus stops and other local retail and commercial areas. A number of these are shown in ***Photographs 9 and 10*** below.

The nearest on-road cycleways are 280 metres southeast of the site on both sides of Stewart Avenue at its intersection with Hunter Street connecting north and south of the intersection to on-road cycleways at the Stewart Avenue signalised intersection with Honeysuckle Drive and King Street, respectively. The cycleways connect to the Newcastle Harbour Foreshore off-road cycleways at Honeysuckle Drive, which connect north running parallel to Hannell Street and east running parallel to Honeysuckle Drive. The off-road cycleway provides connection to the Newcastle foreshore and beaches and other western suburbs of Newcastle through the Newcastle cycle path network. The cycleways together with the footpaths, road crossing facilities, bus, and train transport services provide the site with excellent alternate transport modes of travel infrastructure and services.

Photograph 8 – Pedestrian footpath- Hunter Street - fronting the site

Photograph 9 – Marked and signalised crossings – Hunter Street and Tudor Street

Photograph 10 – Signalised crossing – Railway Street at Hunter Street

8.0 DEVELOPMENT PROPOSAL

The proposal involves the demolition of the existing site buildings and the construction of a multi-level commercial / residential complex comprising a 30 storey retail commercial / residential tower, a 25 storey retail commercial / residential tower, and a 6 storey office commercial tower with associated parking.

The development concept plans are shown in ***Attachment A***.

Specifically, the development involves:

- The demolition of the two existing commercial buildings and associated earthworks,
- A 349 bedroom residential development comprising:
  - 36 – 1 bedroom apartments,
  - 128 – 2 bedroom apartments,
  - 19 – 3 bedroom apartments, and
- A total commercial development comprising:
  - 1,944 m^2 of retail and office commercial area.
- Car parking of 237 car spaces over five levels (Ground to Level 4),
- Resident bike and storage areas of 350 m^2 on Levels 1 and 2,
- The construction of a single combined entry / exit vehicular access 6 metres wide via Tighe Street at the northern side of the site; and
- The construction of drainage and landscaping.

9.0 TRAFFIC GENERATION

The *RTA's Guide to Traffic Generating Development's* provides specific advice on the traffic generation potential of various land uses. However, regarding high density residential flat buildings, the then RMS issued a Technical Direction TDT 2013/04 in May 2013 that provided updated traffic generation rates for certain development types including residential flat buildings.

Therefore, the relevant land use traffic generation rates applied in this assessment are:

Residential Flat Buildings

Weekday Rates	Sydney Average	Sydney Range	Regional Average	Regional Range
AM peak (1 hour) vehicle trips per unit	0.19	0.07-0.32	0.53	0.39-0.67
AM peak (1 hour) vehicle trips per car space	0.15	0.09-0.29	0.35	0.32-0.37
AM peak (1 hour) vehicle trips per bedroom	0.09	0.03-0.13	0.21	0.20-0.22
PM peak (1 hour) vehicle trips per unit	0.15	0.06-0.41	0.32	0.22-0.42
PM peak (1hour) vehicle trips per car space	0.12	0.05-0.28	0.26	0.11-0.40
PM peak (1 hour) vehicle trips per bedroom	0.07	0.03-0.17	0.15	0.07-0.22
Daily vehicle trips per unit	1.52	0.77-3.14	4.58	4.37-4.78
Daily vehicle trips per car space	1.34	0.56-2.16	3.22	2.26-4.18
Daily vehicle trips per bedroom	0.72	0.35-1.29	1.93	1.59-2.26

Café / Restaurants

- *Daily vehicle trips – 60 per 100 m^2 GFA and evening peak hour – 5 per 100 m^2 GFA.*

Commercial Developments

- *Daily vehicle trips – 10 per 100 m^2 GFA and evening peak hour – 2 per 100 m^2 GFA.*

Therefore, the following peak hour traffic generation calculations can be undertaken for the proposed development noting traffic impact assessment is based on peak hour traffic volumes and average regional rates are used due to the site being within the Newcastle City Centre area with excellent access to existing and future public transport.

Commercial & Café / Restaurant space (AM & PM) = 580 m^2 / 100 m^2 x 5 vtph + 1364 m^2 / 100 m^2 x 2 vtph = 57 vtph;

Residential apartments (AM) = 349 x 0.21 = 74 vtph; and

Residential apartments (PM) = 349 x 0.15 = 53 vtph.

Therefore, the total peak hour traffic volumes generated by the proposed development are;

Peak hour traffic generation (AM) = 74 + 57 = **131 vtph** (rounded up)

Peak hour traffic generation (PM) = 57 + 53 = **110 vtph** (rounded up).

10.0 TRIP DISTRIBUTION

Before carrying out any traffic assessment the additional peak hour traffic generated by the development needs to be distributed through the adjoining road network. This involves making assumptions as to distribution patterns to and from the development based on likely origin / destinations and trip making decision making. In this case the traffic distribution from the development has been determined as follows:

- In the AM peak 80% outbound and 20% inbound trips will occur for the residential component, which is mirrored for the commercial component.
- In the PM peak 30% outbound and 70% inbound trips will occur for the residential component, which is also mirrored for the commercial component.
- This equates to 50% inbound and 50% outbound trips for both the AM and PM peak hour period.
- Inbound AM traffic will have origins 45% Hunter Street west, 25% Hunter Street east and 30% southwest of Railway Street, which will be mirrored for the outbound PM traffic,
- Inbound PM traffic will have destinations 35% Hunter Street west, 50% Hunter Street east and 15% southwest of Railway Street, which will be mirrored for the outbound AM peak.

Some variations to the traffic movement assumptions may occur however their impact on the analysis is considered insignificant. Based on the assumptions listed above the resulting predicted peak hour trip distributions for traffic generated by the development is as shown below in ***Figure 3***.

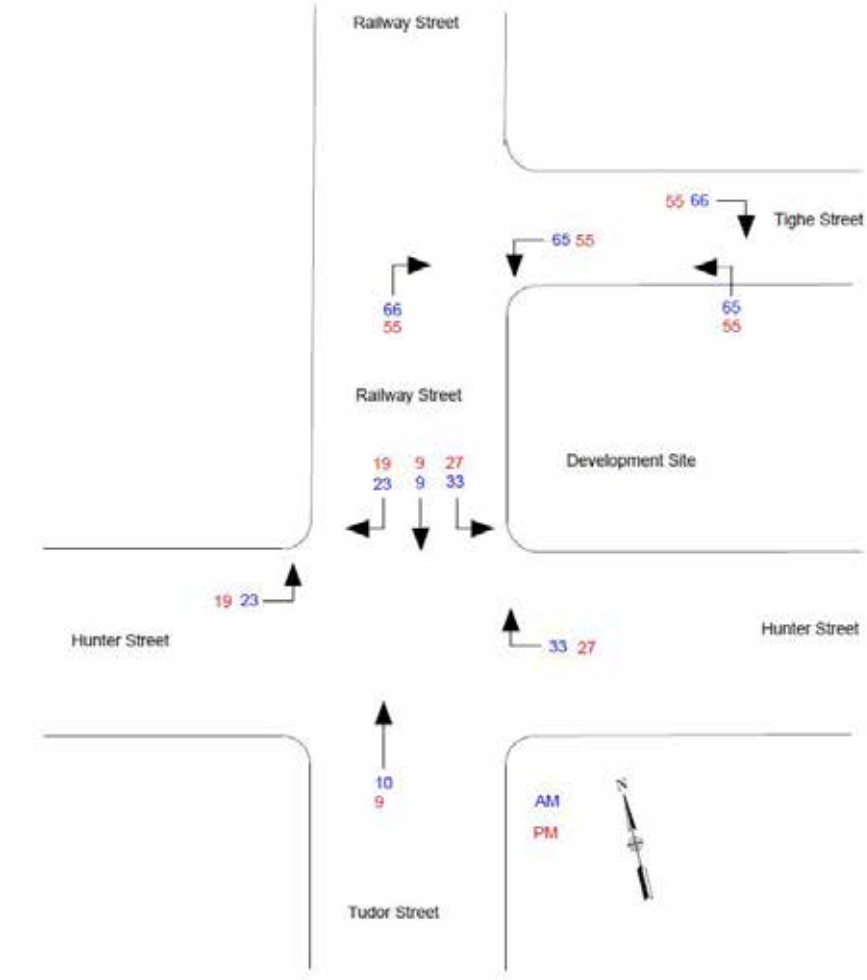


Figure 3 – Development Traffic Trip Distribution

11.0 TRAFFIC IMPACTS OF DEVELOPMENT

The traffic impacts that the development will have on the local road network will include:

- The impact of the additional traffic generated by the development on the capacity of the road network;
- The road safety issues associated with the proposed access to the development; and
- The parking demand generated by the development.

11.1 Road Network Mid-Block Capacity

It has previously been shown in ***Section 6*** of this report that the local and state road network is currently operating within its technical road capacities. The development is likely to generate the addition of up to 154 AM peak hour vehicle trips and 132 PM peak hour vehicle trips. Based on the trip distributions shown in ***Figure 3*** the proposed development is likely to generate the following maximum additional traffic on the local road network.

- Hunter Street west – 46 vtph in the AM and 38 vtph in the PM peak,
- Hunter Street east – 66 vtph in the AM and 54 vtph in the PM peak,
- Tudor Street southwest – 19 vtph in the AM and 18 vtph in the PM peak, and
- Railway Street and Tighe Street – 131 vtph in the AM peak and 110 in the PM peak.

With the addition of this development traffic to the 2021 and 2031 network volumes these road capacity thresholds are not reached. This is demonstrated in ***Table 2*** below.

Table 2 - Road Capacity Assessment

Road	Section	Capacity vtph	2021 AM peak vtph	2021 PM peak vtph	2031 AM peak vtph	2031 PM peak vtph	Development	
							AM	PM
Hunter Street west	west of Railway Street	3600	1047	1071	1235	1211	46	38
Hunter Street east	east of Railway Street	3600	1379	1356	1532	1392	66	54
Tudor Street	southwest of Railway Street	3600	748	668	847	775	19	18
Railway Street	north of Hunter Street	1200	213	151	226	161	131	110

Therefore, subject to satisfactory intersection performance this additional traffic will not increase mid-block traffic congestion on the surrounding road network. As such the development will not adversely impact on the mid-block road capacity of Hunter Street, Tudor Street, Railway Street and Tighe Street.

11.2 Intersection Capacity

In assessing intersection performance, the impacts of the development are best assessed using the SIDRA intersection modelling software. This software package predicts likely delays, queue lengths and thus levels of service that will occur at intersections.

For the Hunter Street / Tudor Street / Railway Street Signalised intersection the following assumptions are made in the modelling:

- The intersection layout will remain as per current conditions.
- 2019 and 2029 traffic volumes used in the modelling were as provided by GHD for the Newcastle Transport Interchange development.
- 2021 & 2031 traffic volumes have been predicted from the GHD data using a 2% per annum background traffic growth rate on all roads.
- Traffic generated by the development is distributed as per ***Figure 3.***

Assessment is then based on the level of service requirements of TfNSW as shown below:

Table 4.2
Level of service criteria for intersections

Level of Service	Average Delay per Vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way & Stop Signs
A	< 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays & spare capacity	Acceptable delays & spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity & accident study required
E	57 to 70	At capacity; at signals, incidents will cause excessive delays Roundabouts require other control mode	At capacity, requires other control mode

Source RTA's Guide to Traffic Generating Developments (2002)

The results of the modelling for the intersection are summarised in ***Tables 3 & 4*** below. For signalised intersection models, the Sidra results summary table shows the intersection average delay and level of service and the worst movement degree of saturation and back of queue lengths. The Sidra Movement Summary Tables, showing the parameters for all movements for the models, are provided in ***Attachment C***.

Table 3 – Hunter St / Tudor St / Railway St Intersection AM Sidra Modelling – Results Summary

Model Scenario	Degree of Saturation (v/c)	Average Delay (s)	Average LoS	95% Back of Queue Length (cars)
2021 AM + 60 sec prac. time	0.710	26.0	B	8.7
2021 AM + 80 sec cycle time	0.510	27.7	B	9.9
2021 AM +DEV 60 sec prac. time	0.782	27.9	B	10.3
2021 AM + DEV 80 sec cycle time	0.568	29.2	C	11.2
2031 AM + DEV 60 sec prac. time	0.870	30.6	C	13.6
2031 AM + DEV 80 sec cycle time	0.625	29.4	C	13.1

Table 4 – Hunter St / Tudor St / Railway St Intersection – PM Sidra Modelling – Results Summary

Model Scenario	Degree of Saturation (v/c)	Average Delay (s)	Average LoS	95% Back of Queue Length (cars)
2021 PM + 60 sec prac. time	0.591	22.4	B	7.3
2021 PM + 80 sec cycle time	0.462	25.0	B	9.0
2021 PM +DEV 60 sec prac. time	0.658	23.7	B	8.9
2021 PM + DEV 80 sec cycle time	0.514	26.2	B	10.4
2031 PM + DEV 60 sec prac. time	0.709	23.6	B	9.5
2031 PM + DEV 80 sec cycle time	0.552	26.3	B	11.1

The modelling shows that the Hunter Street / Tudor Street / Railway Street signalised intersection would continue to operate satisfactorily with the development traffic in 2021 and through to 2031 in both the AM and PM peak periods. The intersection operates at a LoS B or LoS C, with approximately a 4 second increase in intersection average delay and up to 4 vehicles increase in queue lengths for any movements, for all modelling cases.

It is concluded that the modelling demonstrates, that with the additional development traffic of the proposal there is a small increase in the key parameters analysed in the Sidra modelling. Therefore, as the development causes minor impacts at the Hunter Street / Tudor Street / Railway Street Signalised T-intersection no upgrade works are warranted and it is reasonable to conclude the development does not adversely impact on the operation of the intersection.

To assess the performance of the Railway Street / Tighe Street T-intersection and the Tighe Street car park access the below table taken from Austroads *Guide to Traffic Management – Part 6 – Intersections, Interchanges & Crossings (2009)* for which the guide states a detailed analysis to demonstrate adequate capacity is available is unlikely to be necessary as uninterrupted flow conditions would prevail, is utilised.

Major road type[1]	Major road flow (vph)[2]	Minor road flow (vph)[3]
Two-lane	400	250
	500	200
	650	100
Four-lane	1000	100
	1500	50
	2000	25

Notes:

1. Major road is through road (i.e. has priority).
2. Major road flow includes all major road traffic with priority over minor road traffic.
3. Minor road design volumes include through and turning volumes.

Source: - Austroads Guide to Traffic Management – Part 6 – Intersections, Interchanges & Crossings (2009)

The maximum 2031 post development two-way traffic on each of the streets at the two intersections are as follows:

- Railway Street / Tighe Street – 226 vtph / 161 vtph, and
- Tighe Street car park access – 226 vtph / 131 vtph.

The volumes for each of the intersections are all within the thresholds in the table and therefore both intersections will operate with uninterrupted flow conditions. Therefore, the constructed standard BAR / BAL road T-intersections will be satisfactory, and the proposed property access can be constructed as a normal private property urban access, subject to Australian Standards *AS2890.1-2004 Parking facilities – Part 1 - Off-street car parking* requirements described below.

Overall, it can be concluded that the proposed development will not adversely impact on the operation of intersections on the adjoining local and state road network and no upgrades to any other intersections which are all constructed with a high level of intersection control in place will be required due to the development.

Therefore, the proposed development will not adversely impact on the efficiency or effectiveness of the local / state road network.

11.3 Access

The on-site car parks for this development will be accessed via a new combined entry and exit access crossing 6.0 metres wide at Tighe Street to be located approximately 20 metres west of the eastern boundary of the site. Car parking is to be provided on five levels. It is noted a security gate for the car park is proposed at the boundary line in Tighe Street. While not strictly compliant with Australian Standards which require control points at car park entrances to be located 6 metres within the site the local conditions are such that this proposal can be supported on merit. In this

regard it is argued that whilst Tighe Street is a public road it has a low traffic volume and basically only services 2 to 3 properties including the subject property. It is a dead end road therefore traffic speeds are also low and pedestrian traffic in the area is light if not non-existent. Therefore any short 1 minute delay for cars queued in Tighe Street awaiting the gate to open will have little impact on traffic flows or the road safety environment in Tighe Street. This location is similar to Beresford Lane where Council has previously approved residential developments with car park accesses off Beresford Lane and security gates located on the boundary line therefore a precedent exists for Council to support the proposed access to this development off Tighe Street. Further as the ground and first level of the proposed car park will provide car parking including customer car parking for the commercial and retail components of the development this security gate will be fully open during business hours 8 am – 6 pm during which time no delays will be experienced in entering and exiting the site. Additional security for residents will be provided at the bottom of the ramp from level 1 to level 2. Again Council has previously approved a similar situation for a child care centre in Hunter Street therefore precedence exists for Council to support these operating procedures for the entry security gate.

The car park will provide a total of 233 car spaces. Under Table 3.1 of Australian Standard *AS2890.1-2004 Parking facilities – Part 1 - Off-street car parking* a car park between 101 and 300 parking spaces accessed via a local road providing residential, domestic and employee parking (Class 1A) is required to have a Category 2 access facility. A Category 2 access facility requires a combined entry / exit driveway between 6m and 9 m wide. Currently the access is proposed as a combined entry / exit driveway 6 metres wide therefore complies with the minimum requirements of the Australian Standard (AS2890.1-2004).

The provision of a category 2 access as described above will also ensure suitable pedestrian and vehicular sight lines in accordance with the Australian Standard (AS2890.1-2004) exists for exiting vehicles. Vehicular sight lines from the proposed access have been observed to be in excess of the AS2890.1-2004 requirement of a minimum of 45 metres within a 50 km/h speed zone (*Figure 3.2 of AS2890.1-2004*).

It is therefore concluded the proposed car park access arrangements are suitable to service the development and complies with Newcastle City Council and Australian Standard requirements.

11.4 On-site Parking

With regard to on-site parking the proposal is generally required to comply with *Chapter 7.03 Traffic Parking and Access* of Newcastle City Council's DCP (2012). The assessment is to be undertaken on the Newcastle City Centre as the site is within the Newcastle City Centre area identified within the Newcastle LEP (2012). The peak parking demand rates applicable to this development as residential, retail and commercial premises specified within Council's DCP are as follows:

<u>Residential Flats</u>

Car parking	*0.6 spaces per dwelling – small (<75 m^2 or 1 bedroom);*
	0.9 spaces per dwelling – medium (75 m^2 – 100 m2 or 2 bedrooms);
	1.4 spaces per dwelling – large (>100 m^2 or 3 bedrooms);
	1 space for the first 3 dwellings plus 1 for every 5 thereof for visitors.
Bike parking	*1 space per dwelling + 1 space per 10 dwellings (Class 3) for visitors.*
Motorbike parking	*1 space per 20 car spaces.*

<u>Except for residential development</u>

Car parking for development in the Newcastle City Centre is provided at the rate of:

	1 spaces per 60 m^2 gross floor area.
Bike parking	*1 space per 20 staff (Class 2).*
Motorbike parking	*1 space per 20 car spaces.*

Using the above rates, the following car parking requirement for the proposed development can be calculated as shown below:

Residential car parking spaces	*36 x 0.6 +128 x 0.9 +19 x1.4*		*= 163.4*
Visitor parking spaces	*1 (first 3 units) + 36 (180 units / 5)*		*= 37*
Commercial parking spaces	*1944 m^2 / 60*		*= 32.4*
		Total	*= 232.8 (say 233)*
Residents bike parking spaces	*183 dwellings / 1*		*= 183*
Visitor bike parking spaces	*183 dwellings / 10*		*= 18.3*
Commercial bike parking spaces	*40 staff / 20*		*= 2*
Motorbike parking spaces	*233 / 20*		*= 11.65*

The proposed development provides 237 on-site car parking spaces as below:

- Ground floor level - 30 car parking spaces including 2 access spaces plus 5 motorcycle spaces and 7 bike capacity bicycle racks;
- 1st floor level - 36 car parking spaces, 3 motorcycle spaces and 12 bike capacity bike racks;
- Second floor level – 60 car parking spaces, 2 motorcycle spaces and 15 bike capacity bike racks;
- Third floor level – 56 car parking spaces, 3 motorcycle spaces and 14 bike capacity bike racks; and
- Fourth floor level - 55 car parking spaces, 3 motorcycle spaces and 15 bike capacity bike racks

The total off-street parking spaces provided in the development therefore is compliant with the DCP representing a small 4 space excess on DCP requirements. The proposal also provides 16 motorcycle spaces which is 4 spaces in excess of the DCP requirement while the development is also considered to provide sufficient bicycle parking with storage areas provided for residents to store bicycles and up to 63 secure bike racks for use by visitors, commercial tenancies and some residents.

It is noted that the number of residential visitor spaces and the commercial spaces required are 37 and 33 respectively. Given the majority of residential visitor parking would occur in the evenings, when not all the commercial and retail tenancies of the development are operating there will be opportunity to share some of the commercial parking and visitor car parking (residential visitor parking between 6 pm and 8 am) as has been approved by Council previously in a number of similar developments in the City Centre area. The visitor car parking and commercial / retail parking is to be provided on the ground level and the 8 stacked spaces on level 1, with the stacked spacing being assigned to a single tenancy for staff parking. This means a total of 16 spaces will be full-time commercial parking. The remaining 22 spaces on ground level will be assigned as follows;

- 2 accessible spaces – commercial visitor car parking
- 10 spaces – full-time residential visitor car parking; and
- 10 spaces – shared commercial and residential visitor car parking.

This allows a total of 28 commercial parking spaces (staff and visitor) and 10 residential visitor car parking to be available between 8 am and 6 pm and 18 commercial parking spaces (staff and visitors) and 20 residential visitor car parking spaces to be available between 6pm and 8am. Therefore at peak parking demand times this represents a small deficiency on commercial parking (15%) as well as a residential visitor car parking deficiency of 46%. Council has previously set precedent in the Newcastle City Centre area by allowing a number of residential developments with large residential visitor car parking requirements to reduce their visitor car parking requirements by up to 50 % as a way of encouraging public transport use by residential visitors. The residential visitor car parking deficiency in this development is less than 50 % with the car park sharing arrangement therefore is consistent with previous development approvals by Council for similar developments in the area.

It is also important in considering the merits of the proposed car parking allocation to consider the development will also result in the removal of a number of existing redundant kerb cross-overs in both Hunter Street and Railway Street which would be expected to increase on-street car parking availability by up to 4 car spaces likely to benefit commercial and residential visitors of the

development. This reduces the deficiencies within the development by assigning 2 each of these parks to commercial and residential visitors to 9 % and 40 %. Overall it is concluded that sufficient on-site car parking is provided within the development. The applicant for this development is also proposing to construct a multi-storey public car park on the property between Tighe Street and the railway line (4 Tighe Street) with work on the design and DA documentation currently underway. Should Council require additional commercial staff or residential visitor car parking for this mixed use development it can be provided on the ground floor of the future public car park on 4 Tighe Street.

Physical on-site construction / layout parking and manoeuvrability should comply with Australian Standard *AS2890.1-2004 Parking facilities – Part 1 - Off-street car parking* and Newcastle City Council's DCP (2012). In regard to the Newcastle DCP this document requires the following;
*Residential Parking area dimensions and parking layout shall comply with Australian Standard 2890.1-2004 User Class 1A - **Bays at 90 degrees** - being 2.4 metres wide (plus 0.3 metres for each side obstructed) and 5.4 metres long, a minimum aisle width of 5.8 metres and a blind aisle 1.0 metres wide shall be provided. Commercial parking requirements would require a minimum car park width of 2.5 metres.* It is noted from the development plans that parking spaces appear to comply with these requirements.

Therefore, a review of the plans indicates the proposed on-site car parking areas can comply with the requirements of *Australian Standard AS2890.1-2004 Parking facilities – Part 1 - Off-street car parking* and therefore the *Newcastle DCP (2012).*

11.5 Servicing

The development has been designed for collection of waste by private contractor. The collection driver will wheel the waste bin(s) from the waste storage area to the separate MRV on-site loading bay accessed via Tighe Street. Emptying will be completed within 10 minutes. Waste collection will be programmed to ensure it is carried out during non-peak traffic generating periods for the development so as not to coincide with large vehicle commercial or retail deliveries. Servicing of the commercial / retail premises is only likely to be infrequent and undertaken by up to small rigid vehicles typically courier vans or medium rigid vehicles with short turnover periods. It is expected they would be able to use the available on-site loading bay or off-street parking supply for deliveries.

It is considered that the waste collection and commercial / retail servicing arrangements proposed for the development are satisfactory and suitable for the development.

11.6 Pedestrian Facilities

The proposed development will generate additional pedestrian traffic as residents and visitors access the site from nearby on-street car parking, bus stops, and shopping areas. A substantial and suitable concrete footpath network, with crossing facilities, already exist within this area therefore it is concluded that no nexus exists for additional pedestrian facilities as a result of this development though Council may require reinstatement of vehicular driveway crossings and upgrading of the footpaths along parts of the frontage of the site.

11.7 Alternative Transport Mode Facilities

The proposed development is likely to generate an increase in patronage of the existing public transport system (buses and rail). It is noted however that the site already has excellent access to public transport with suitably frequent bus routes passing the site with connection to other bus routes and the Newcastle and Hunter rail transport system. Existing bus stops are already located close to the development therefore it is concluded that the existing public transport services and infrastructure near the site is suitable for the development.

The development may generate some increase in bicycle traffic however the small increase in demand generated by this development would not be sufficient for a nexus to exist for the provision of additional external bicycle infrastructure.

12.0 CONCLUSIONS

This traffic and parking assessment for the proposed mixed use development on Lot 2 in DP 445736, Lot 1 in DP 342675, Lots 1 & 2 in DP 1091173, Lot 2 in DP 126, Lot 1 in DP 456088 and Lot 1 in DP 395367, 924 Hunter Street, Newcastle West, has determined the following;

- The proposed development is likely to generate an additional 131 vtph in the AM peak period and 110 vtph in the PM peak period during normal weekdays.
- The local road network around the site has sufficient spare capacity to cater for the development without the need for any upgrading of the road network.
- The increase in traffic generated by the development will not adversely impact on the operation of Hunter Street / Tudor Street / Railway Street intersection and other major intersections near the site.
- The Railway Street / Tighe Street intersection and the Tighe Street development access T will operate with uninterrupted flow conditions.
- The proposed development does not adversely impact on the local or state road network.
- The proposed vehicular access to the site is suitable and complies with *AS2890.1 – 2004 Parking facilities – Part 1 Off street car parking.*
- The proposed development is considered to comply with the requirements of Section 7.03 of Newcastle Council's DCP (2012) in regard to the supply of on-site car parking subject to Council supporting a small deficiency in commercial parking (9%) and a deficiency of 40 % on the provision of residential visitor car parking as a variation to its DCP requirements which is consistent with previous approvals by Council for similar developments in the area. This is considered a valid strategy to encourage the use of public transport travel for staff and customers of the commercial tenancies and visitors to the residential development.
- Suitable bicycle and motorcycle parking areas are provided within the development to meet the requirements of the Newcastle DCP (2012).
- The proposed on-site car parking layout complies with both Australian Standard *AS2890.1 – 2004 Parking facilities – Part 1 Off street car parking* and *Newcastle City Council's Development Control Plan (DCP) No. 12.*
- Garbage collection servicing and commercial servicing arrangements proposed for the development are satisfactory and suitable for use with the development.
- Excellent public transport services already exist to the site and no additional services or infrastructure are required.
- A suitable concrete footpath network with crossing facilities already exists within the vicinity of the development. It is not considered that the external pedestrian traffic generated by the development would be significant enough as to provide a nexus for the provision of additional external pedestrian facilities to the site as the existing infrastructure in the vicinity of the site is considered satisfactory for the scale of development proposed.
- The development may generate some increase in bicycle traffic however the small increase in demand generated by this development would not be sufficient for a nexus to exist for the provision of additional external bicycle infrastructure.

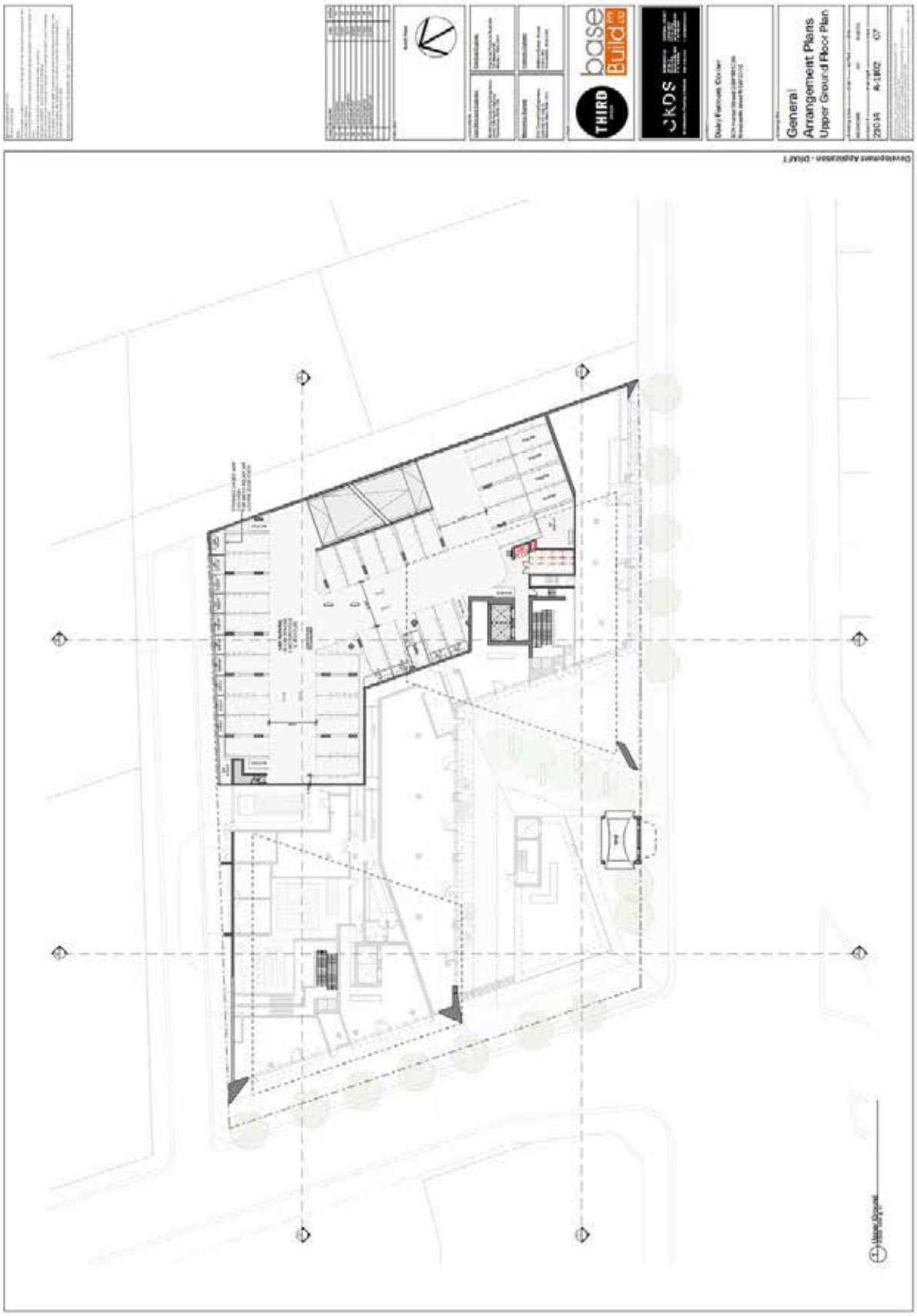
13.0 RECOMMENDATION

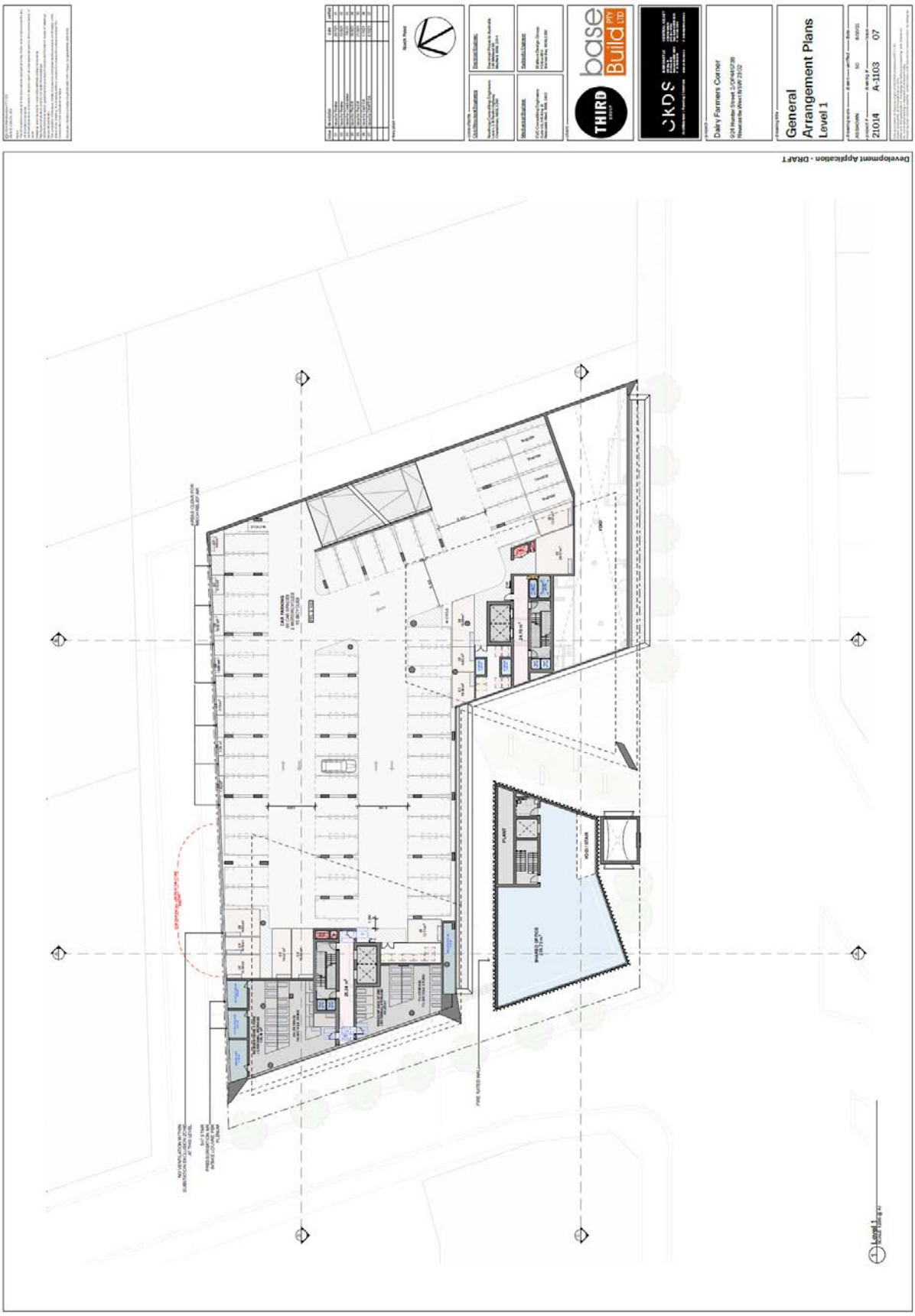
Having carried out this parking assessment for the proposed mixed use development on Lot 2 in DP 445736, Lot 1 in DP 342675, Lots 1 & 2 in DP 1091173, Lot 2 in DP 126, Lot 1 in DP 456088 and Lot 1 in DP 395367, 924 Hunter Street, Newcastle West, it is recommended that the proposal can be supported from a traffic perspective as it will not adversely impact on the local and state road network and complies with the relevant requirements of Newcastle City Council, TfNSW and Australian Standards.

JR Garry BE (Civil), Masters of Traffic
Director
Intersect Traffic Pty Ltd

ATTACHMENT A
DEVELOPMENT PLANS

General
Arrangement Plans
Ground Floor Plan
HUNTER STREET
TIGHE STREET
RAILWAY STREET


base Build
THIRD
SKDS
General Arrangement Plans
Upper Ground Floor Plan

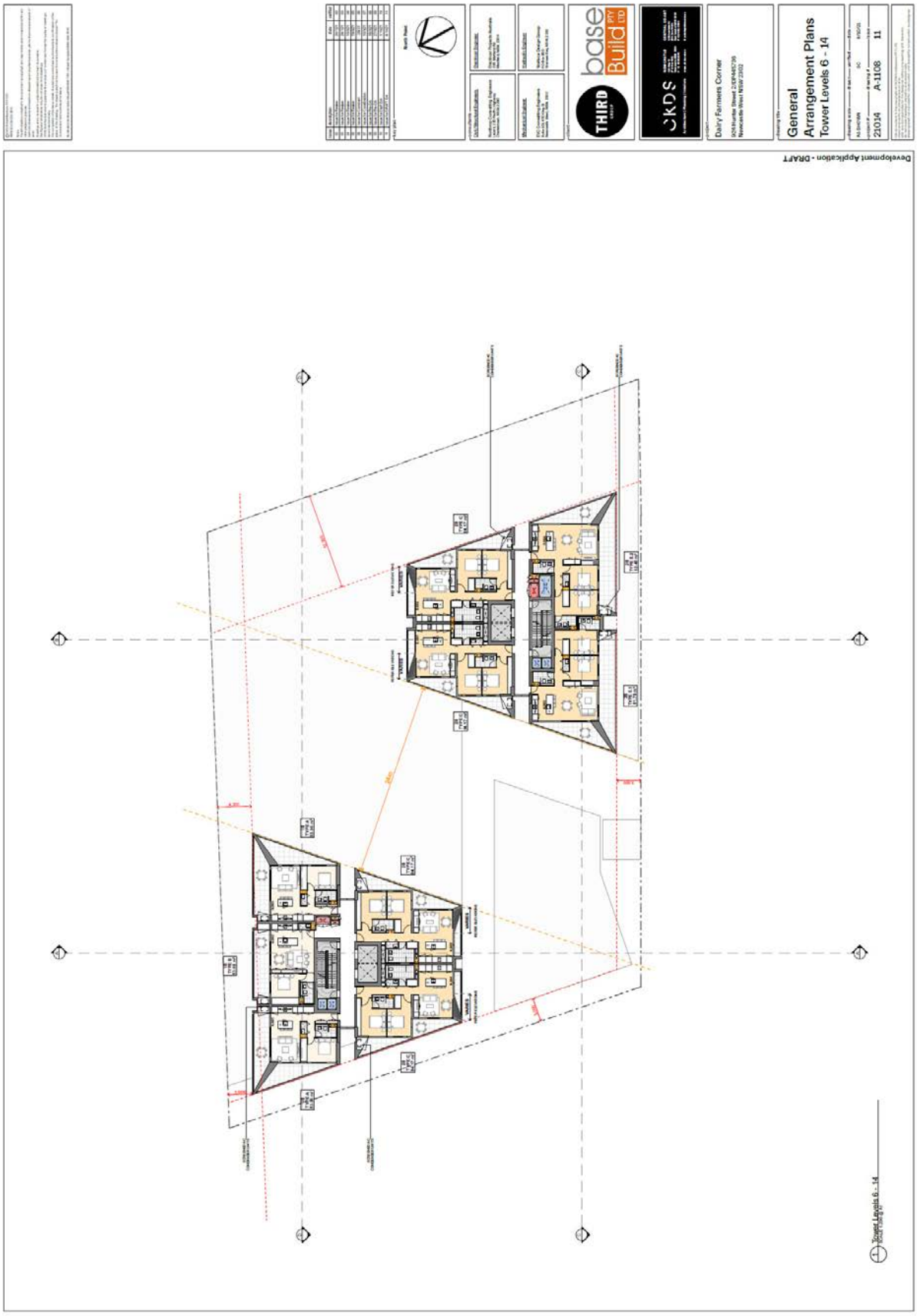

Development Application - DRAFT
THIRD
base Build PTY LTD
CKDS
Dairy Farmers Corner
General
Arrangement Plans
Level 1
21014
A-1103
07

Development Application - DRAFT
General Arrangement Plans
Level 2
Dairy Farmers Corner
2104
A-1104
07

Development Application - DRAFT
THIRD
base Build PTY LTD
CKDS
Dairy Farmers Corner
General
Arrangement Plans
Level 3
21014
A-1105
07

THIRD
base Build
CKDS
Dairy Farmers Corner
General Arrangement Plans Level 4
Development Application - DRAFT

Development Application - DRAFT
Dairy Farmers Corner
General
Arrangement Plans
Tower Level 5
21014
A-1107
11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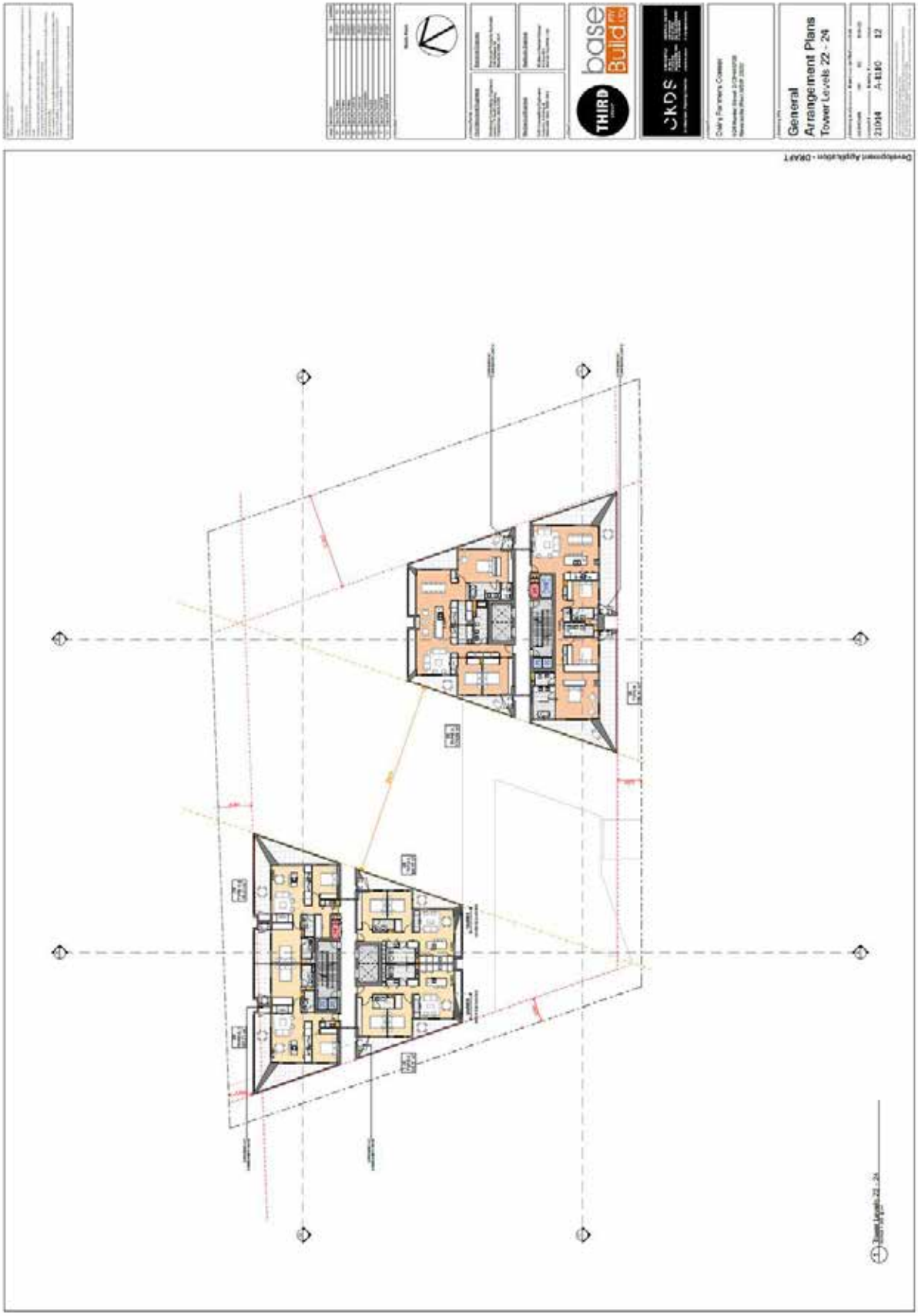
Dairy Farmers Corner
924 Hunter Street 2298485799
Newcastle West NSW 2302
General
Arrangement Plans
Tower Levels 6 - 14
21014
A-1106
11
THIRD
base
Build PTY LTD
CKDS

base Build
THIRD
SKDS
General Arrangement Plans
Tower Levels 15 - 21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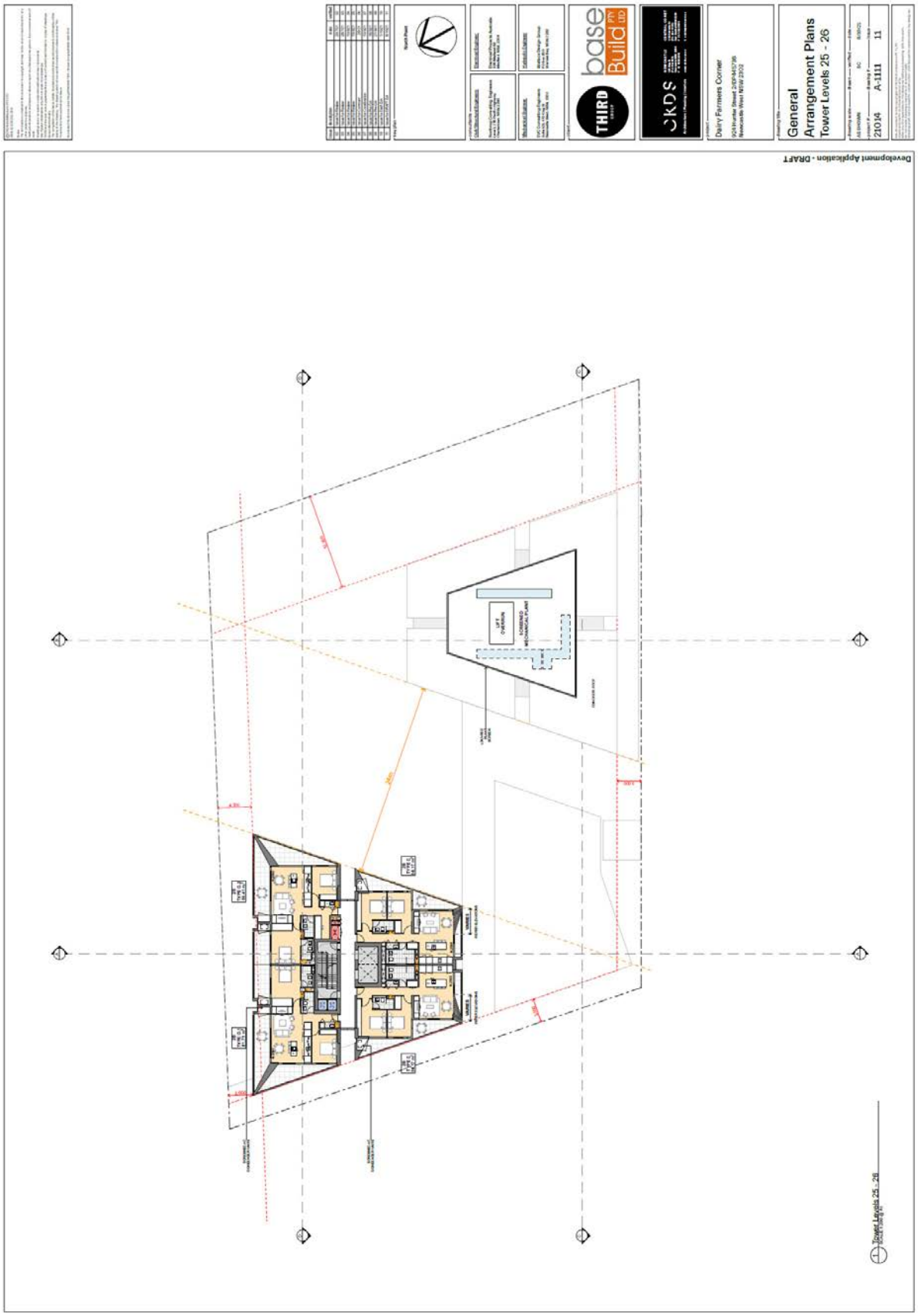
CKDS
General
Arrangement Plans
Tower Levels 22 - 24
21014
A-8180
12
Development Application - DRAFT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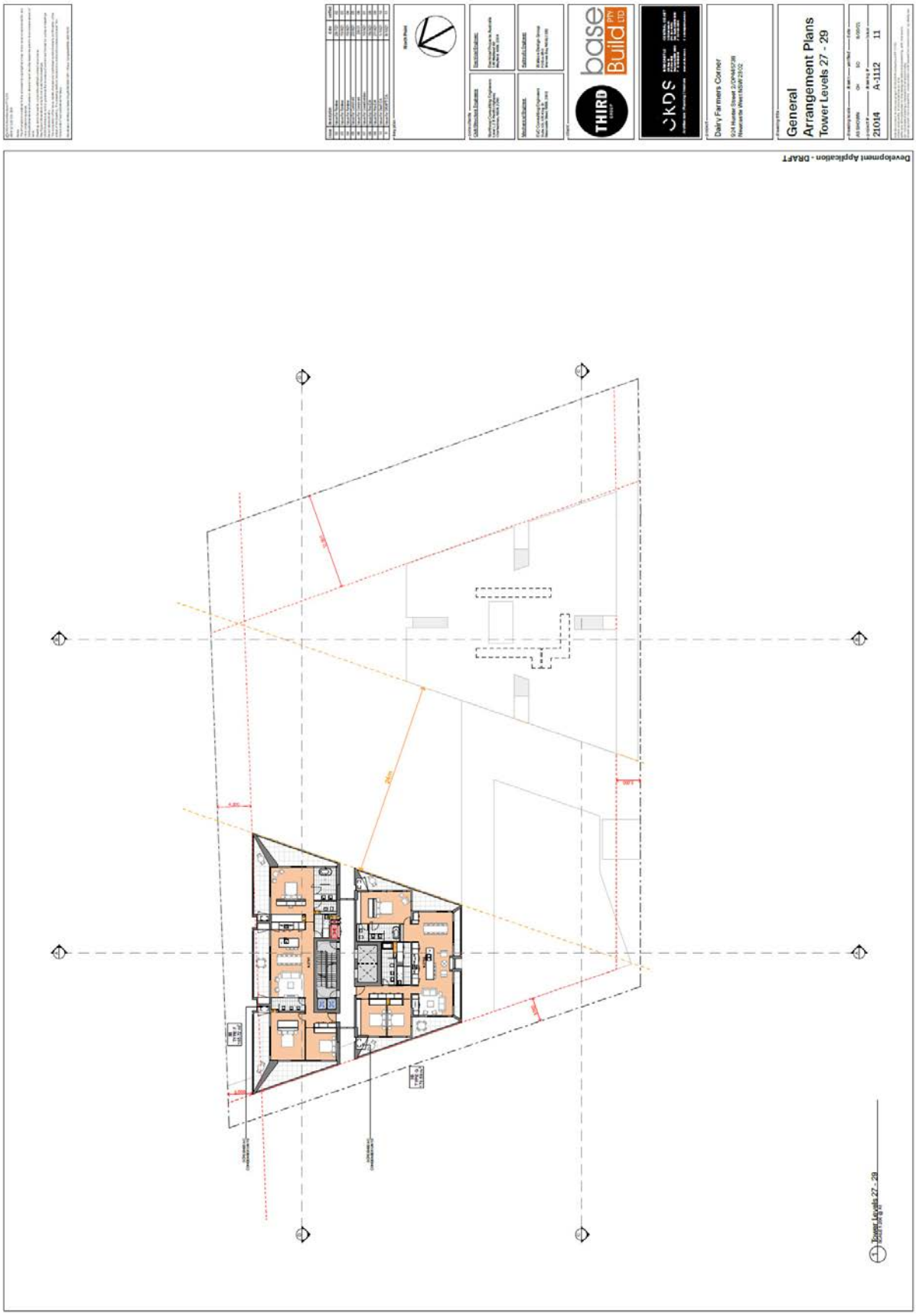
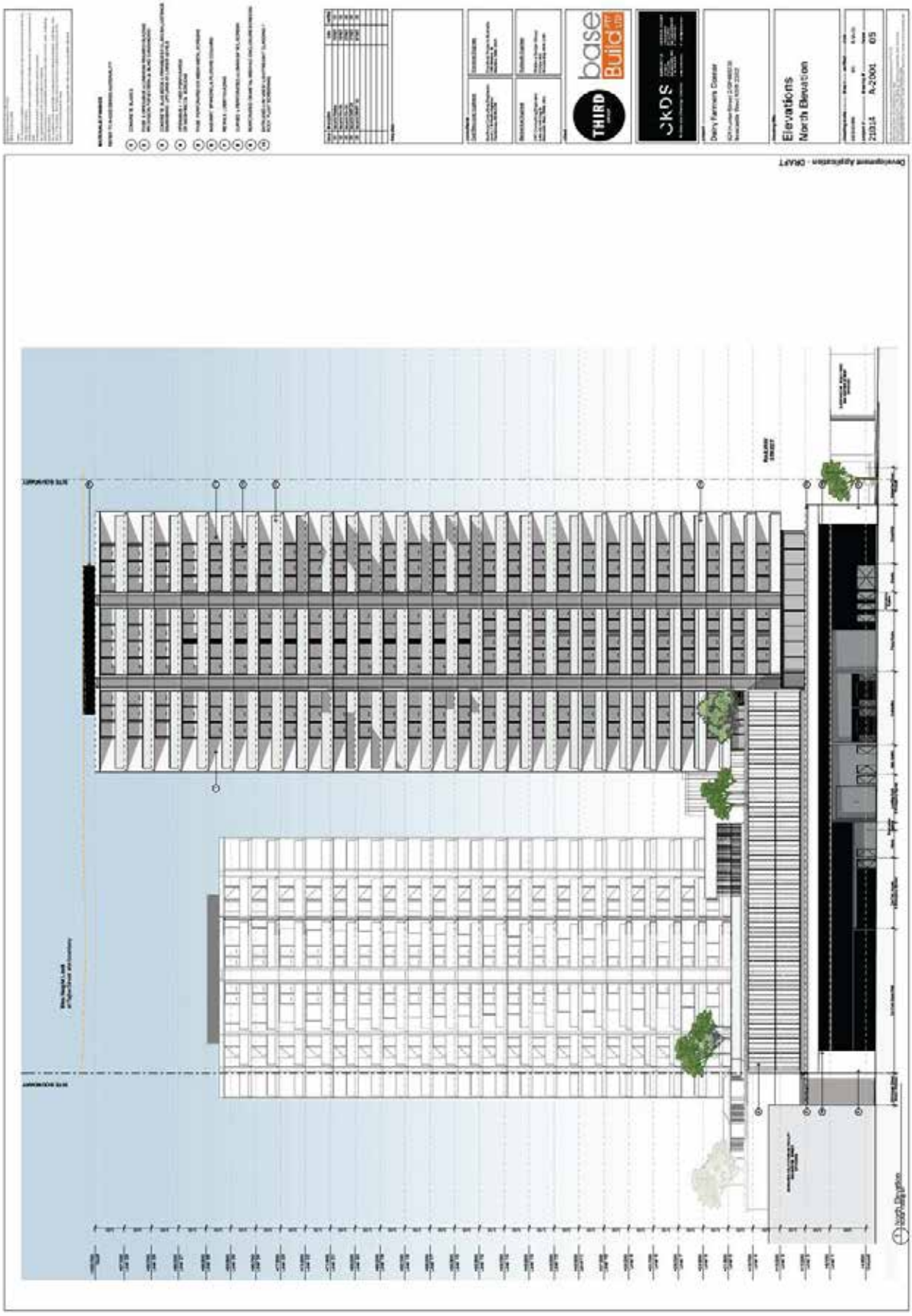
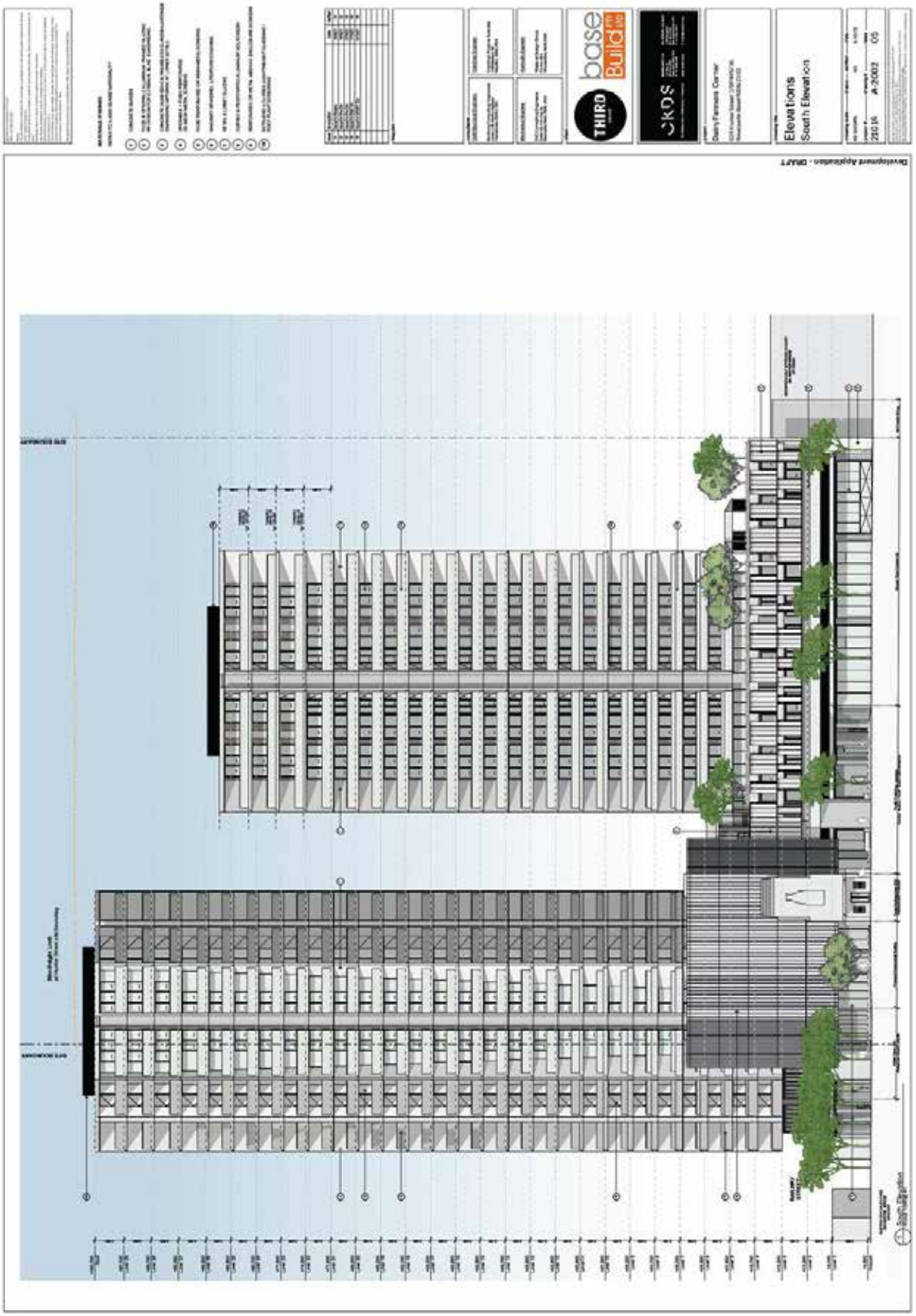
THIRD
base Build PTY LTD
CKDS
Dairy Farmers Corner
General
Arrangement Plans
Tower Levels 25 - 26
21014
A-1111
11
Tower Levels 25 - 26

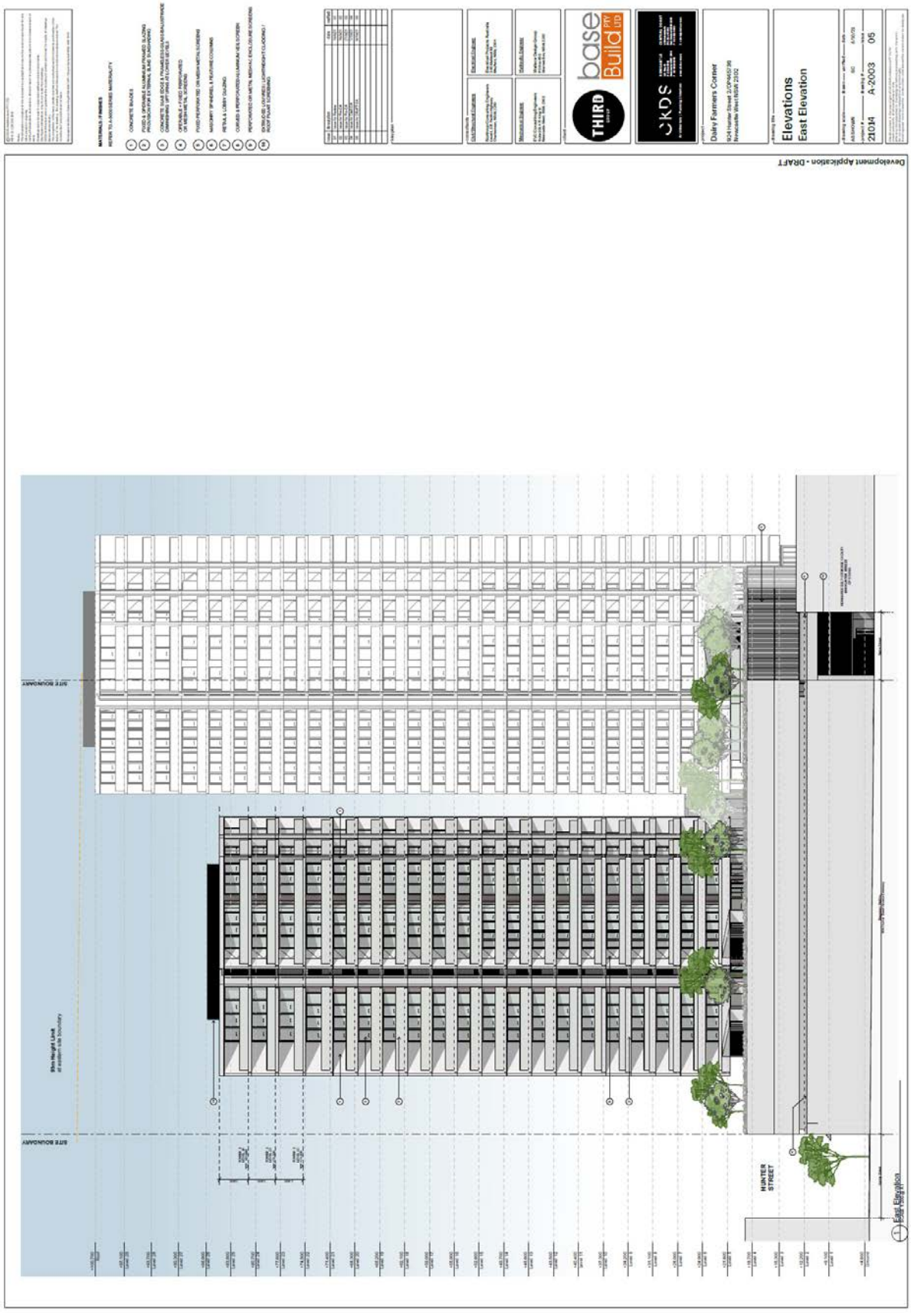

Development Application - DRAFT
General
Arrangement Plans
Tower Levels 27 - 29
Dairy Farmers Corner
base Build PTY LTD
THIRD
SKDS
21014
A-1112
11

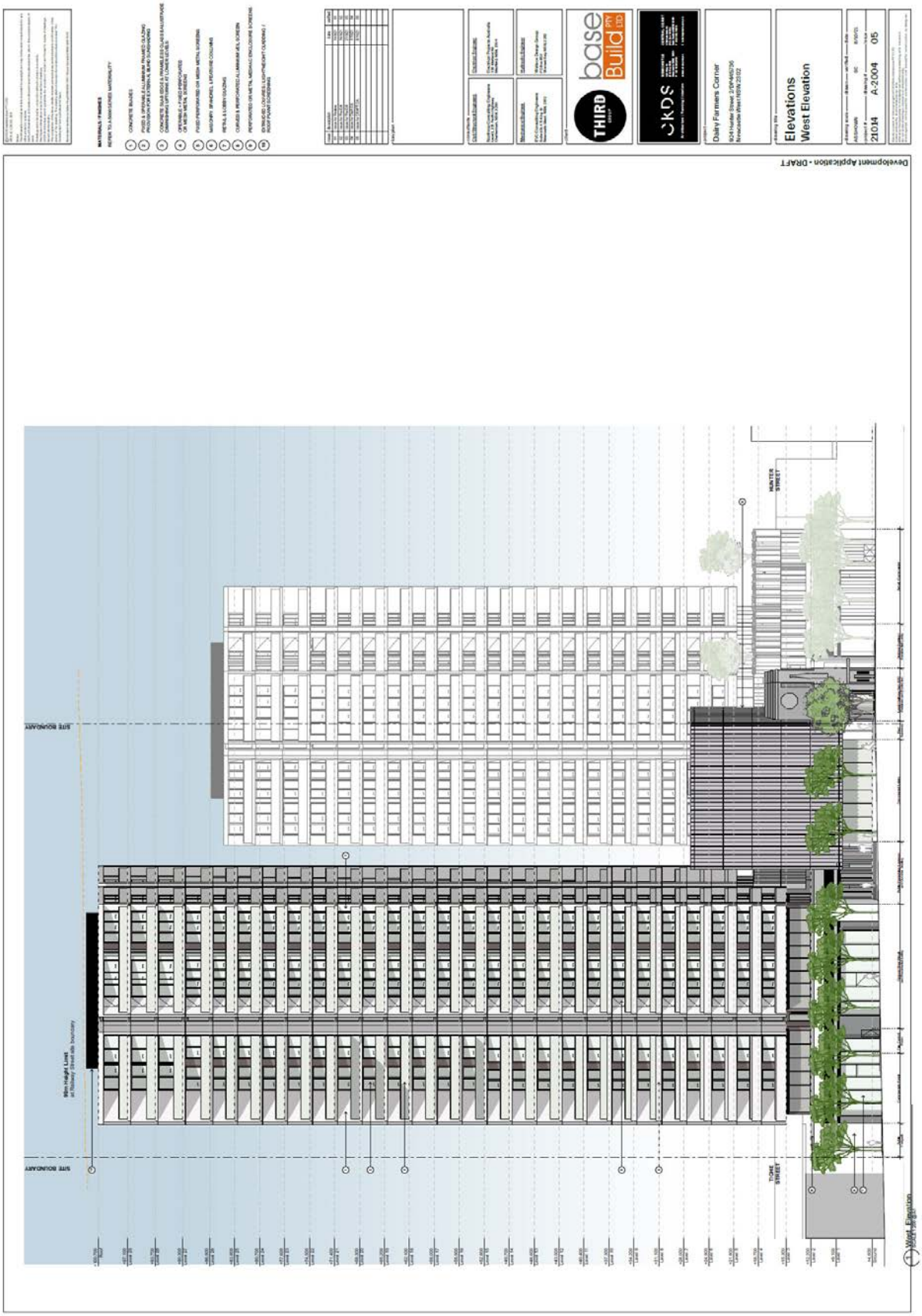
Development Application - DRAFT
UNIT TYPE A - 1B TOWER
UNIT TYPE B - 1B TOWER
UNIT TYPE C - 2B TOWER
UNIT TYPE D.1 & D.2 - 2B TOWER
UNIT TYPE E.1 & E.2 - 2B TOWER
THIRD
base Build PTY LTD
CKDS
Dairy Farmers Corner
Unit Plans
Unit Type A - E
21014
A-1201
11

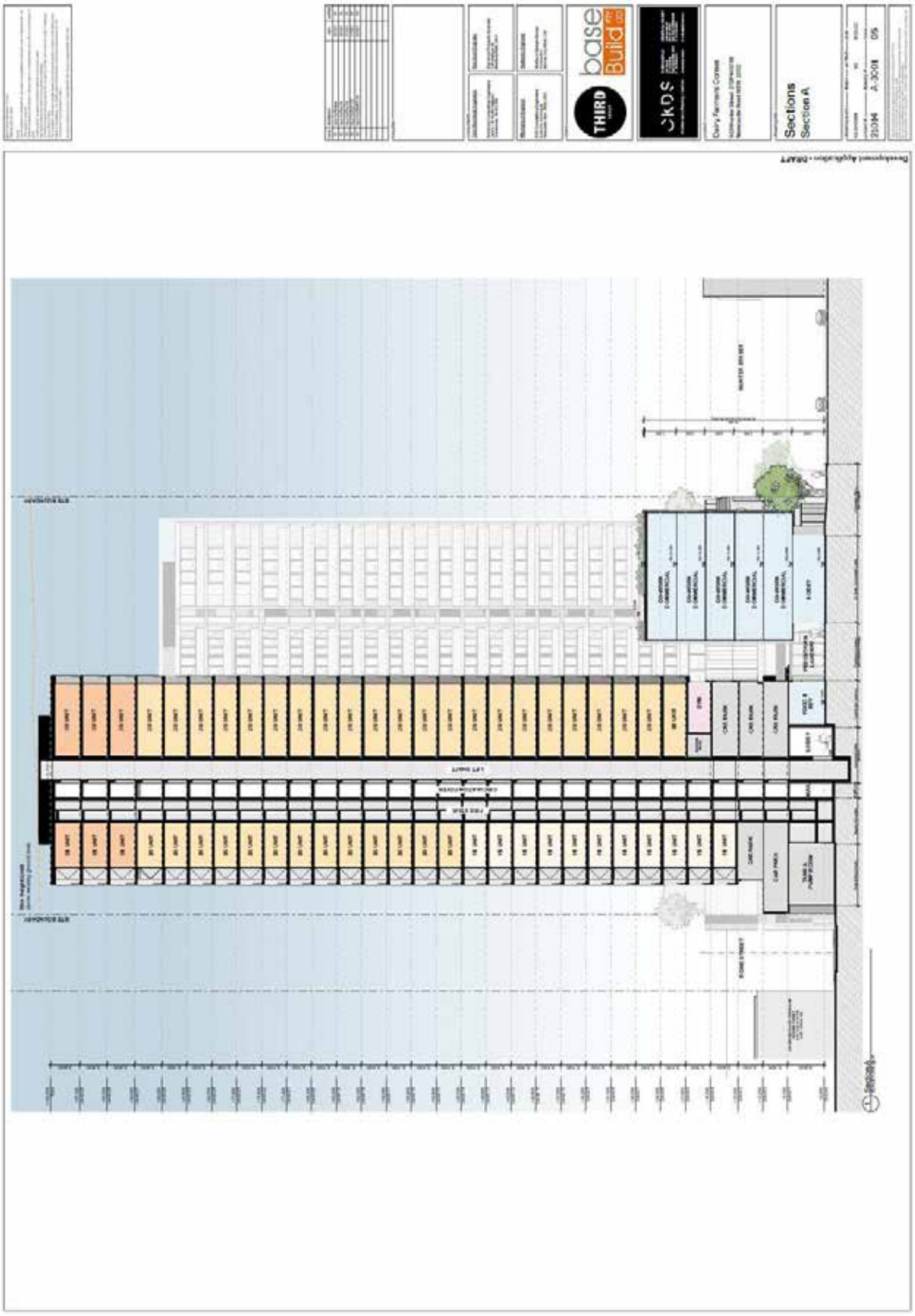
Development Application - DRAFT
Dairy Farmers Corner
Unit Plans
Unit Type F - K
21014
A-1202
06
UNIT TYPE G - 3B PENTHOUSE
UNIT TYPE F - 3B PENTHOUSE
UNIT TYPE H - 3B PENTHOUSE
UNIT TYPE I - 2B PODIUM
UNIT TYPE J - 1B PODIUM
UNIT TYPE K - 2B PODIUM

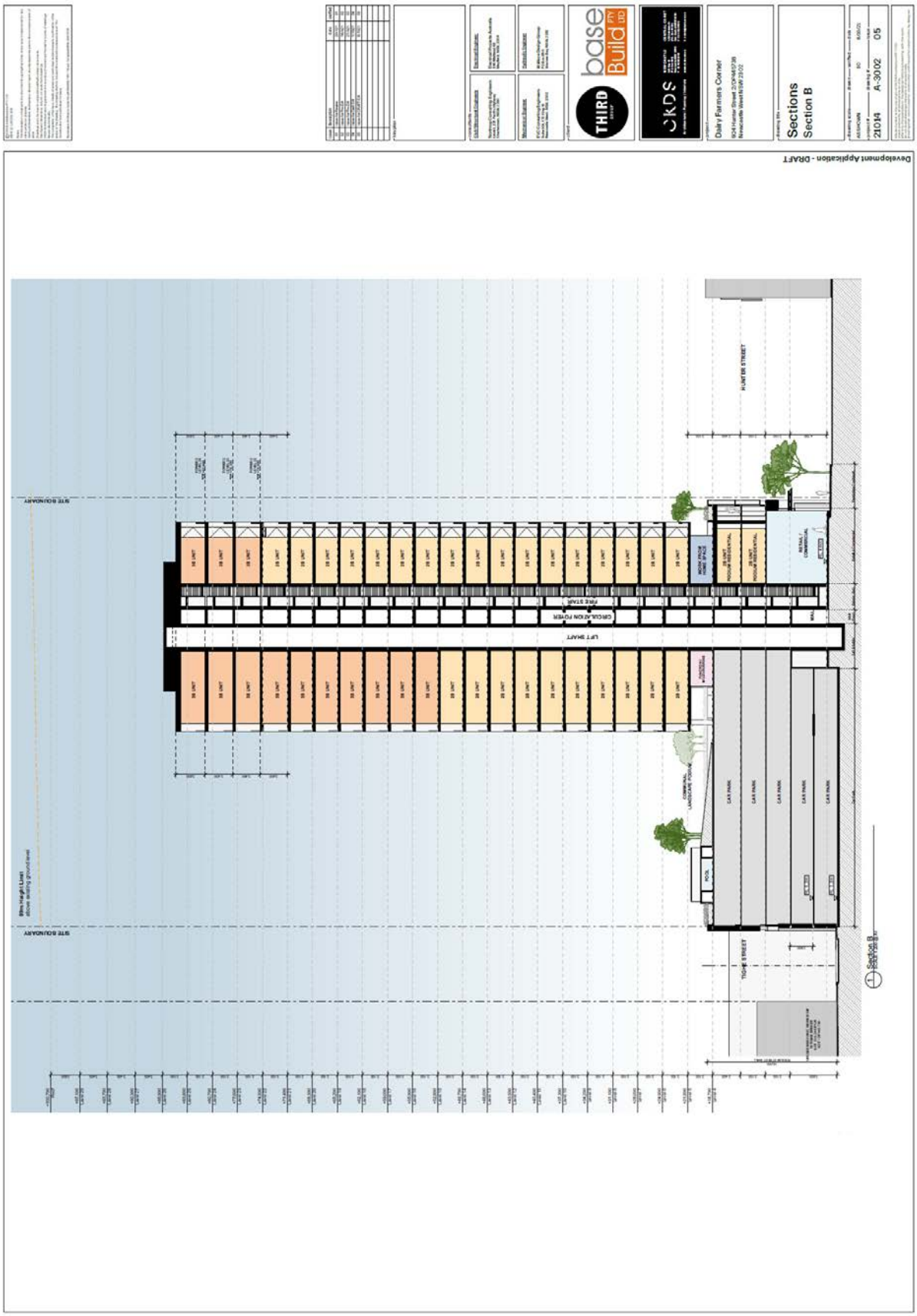

Elevations
North Elevation
Development Application - DRAFT

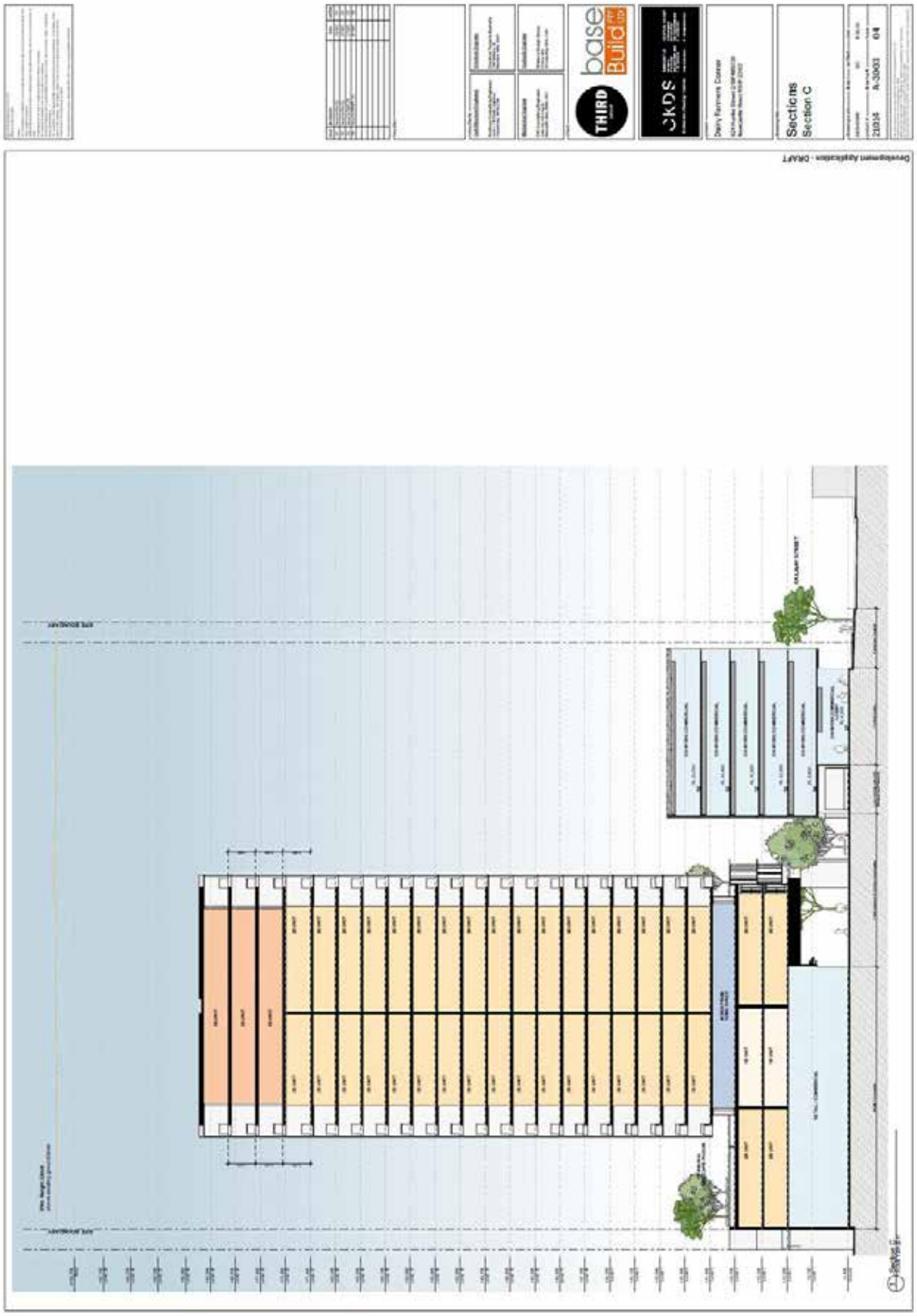

Elevations
South Elevation

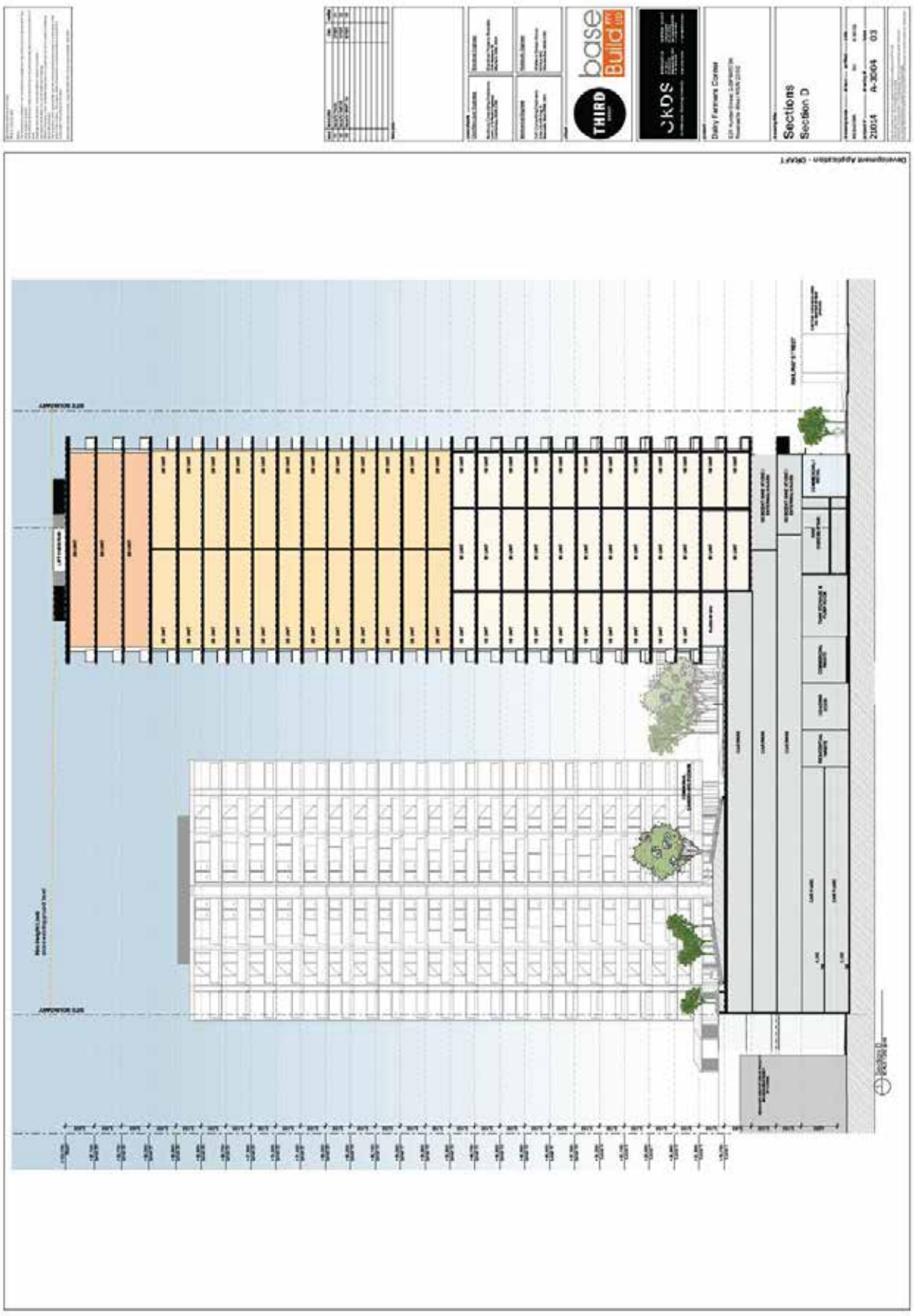

Development Application - DRAFT
Elevations
East Elevation
Dairy Farmers Corner
21014
A-2003
05
HUNTER STREET
SITE BOUNDARY
East Elevation


Dairy Farmers Corner
Elevations
West Elevation
21014
A-2004
05
Development Application - DRAFT
SITE BOUNDARY
HUNTER STREET
TIGHE STREET
West Elevation

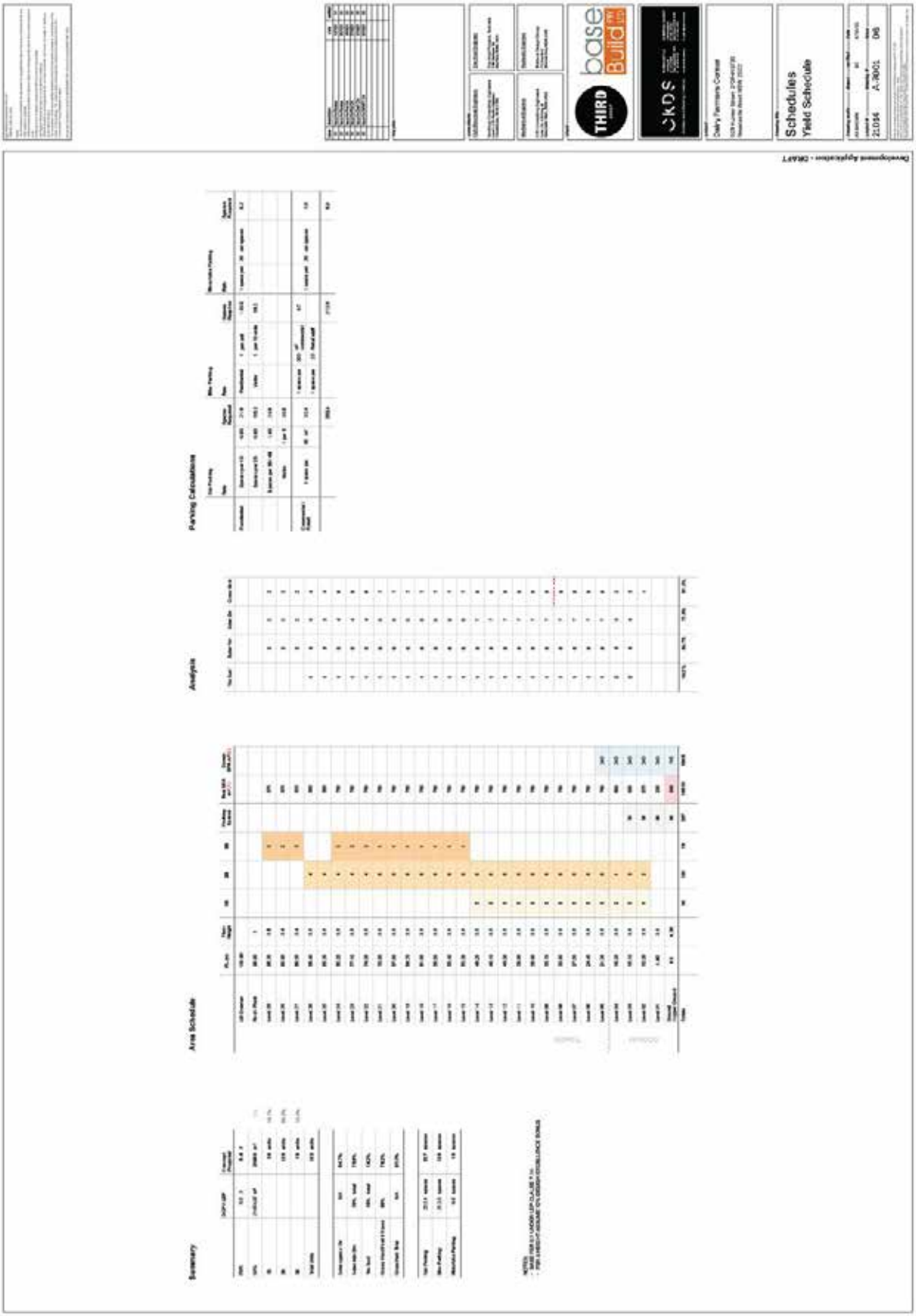

Sections
Section A


Dairy Farmers Corner
Sections
Section B
21014
A-3002
05
Development Application - DRAFT
HUNTER STREET
TIGHE STREET
SITE BOUNDARY
LIFT SHAFT
CIRCULATION FOYER
FIRE STAIR
CAR PARK
POOL
Section B


Sections
Section C
Development Application - DRAFT


base
Build
THIRD
CKDS
Sections
Section D
2004
A-3004
03

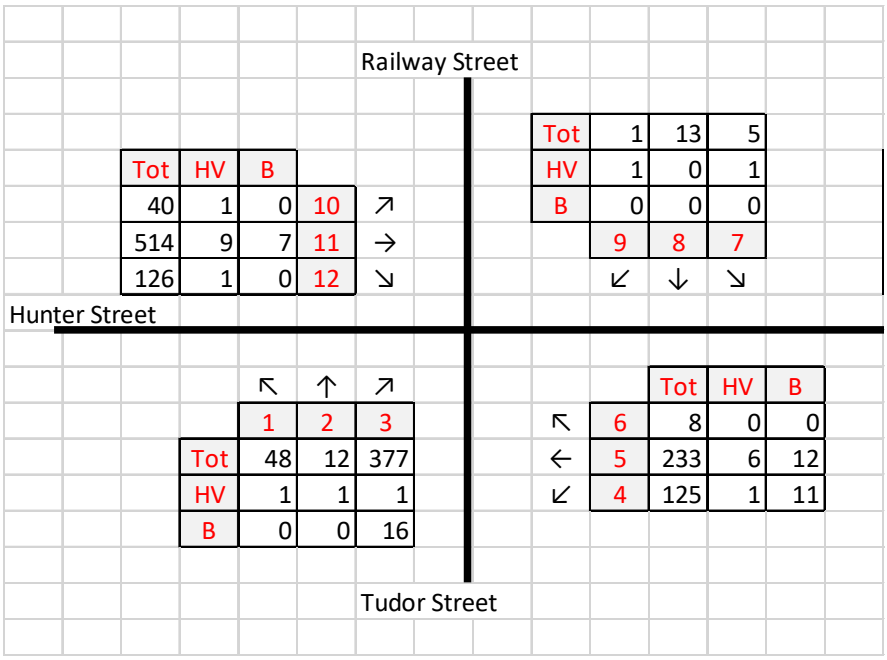
Sections
Laneway Sections
21014
A-3005
04
Development Application - DRAFT


Schedules
Yield Schedule
21014
A-3001
06
Parking Calculations
Analysis
Area Schedule
Summary

ATTACHMENT B
TRAFFIC DATA

GHD TRAFFIC DATA

2019 AM with Interchange



Tot	HV	B		
40	1	0	10	↗
514	9	7	11	→
126	1	0	12	↘

Tot	1	13	5
HV	1	0	1
B	0	0	0
	9	8	7
	↙	↓	↘

	↖	↑	↗
	1	2	3
Tot	48	12	377
HV	1	1	1
B	0	0	16

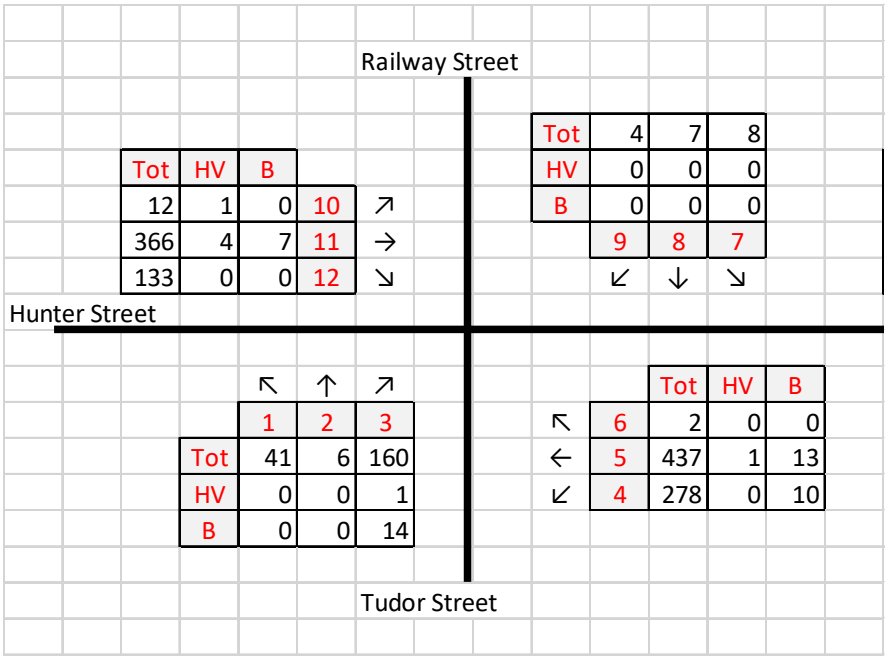
		Tot	HV	B
↖	6	8	0	0
←	5	233	6	12
↙	4	125	1	11

Total = Light vehicles + Heavy vehicles + buses

HV – Heavy Vehicles

B – Buses

2019 PM with interchange



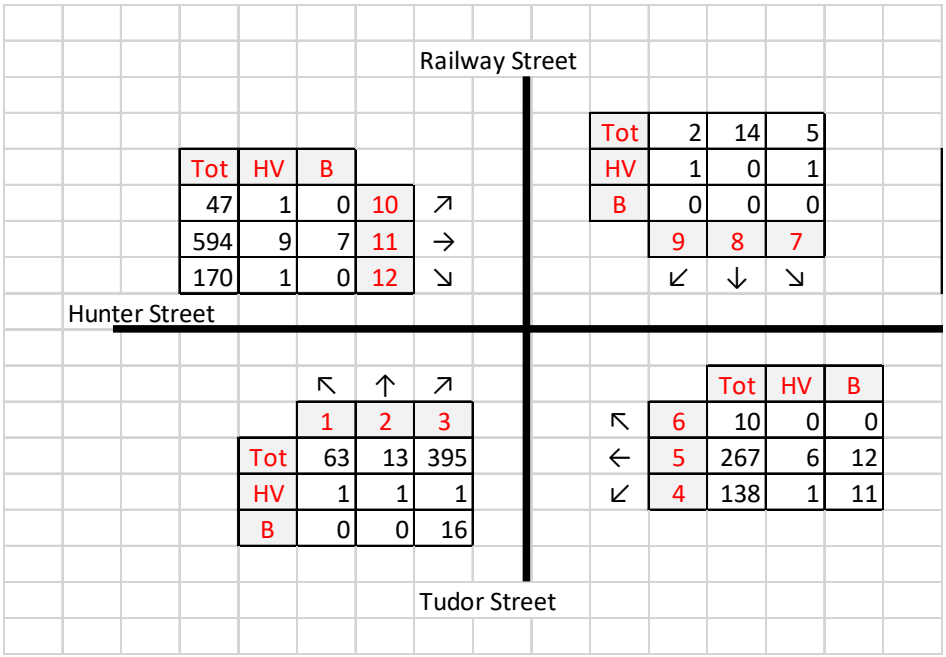
Tot	HV	B		
12	1	0	10	↗
366	4	7	11	→
133	0	0	12	↘

Tot	4	7	8
HV	0	0	0
B	0	0	0
	9	8	7
	↙	↓	↘

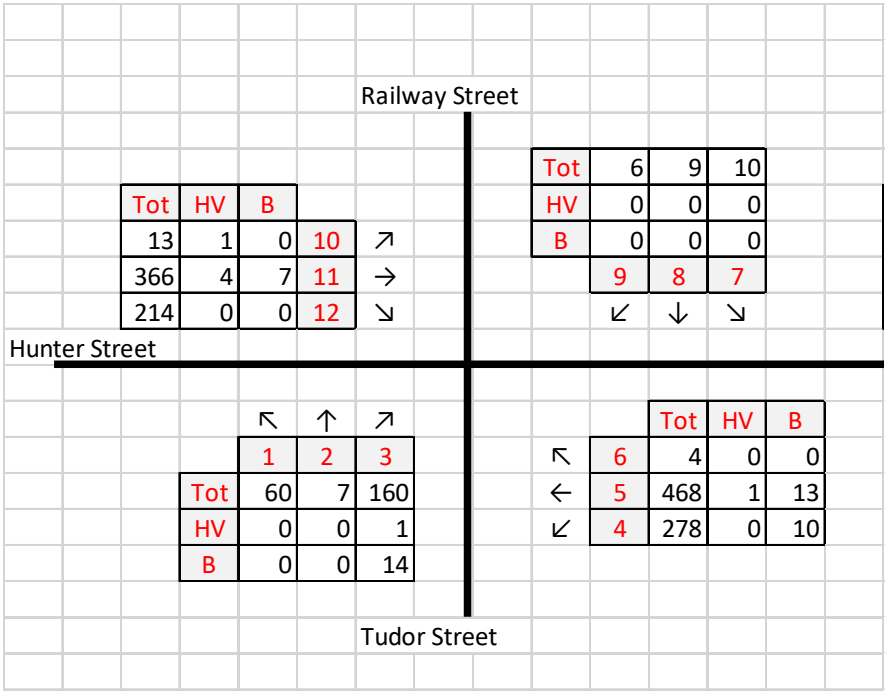
	↖	↑	↗
	1	2	3
Tot	41	6	160
HV	0	0	1
B	0	0	14

		Tot	HV	B
↖	6	2	0	0
←	5	437	1	13
↙	4	278	0	10

2029AM with Interchange



2029 PM with Interchange



ATTACHMENT C
SIDRA MOVEMENT SUMMARY TABLES

AM MOVEMENT TABLES

MOVEMENT SUMMARY

Site: 101 [2021AM (Site Folder: General)]

Mixed Use Development
Hunter Street/Tudor Street/Railway Street Signalised Intersection
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 60 seconds (Site Practical Cycle Time)
Design Life Analysis (Final Year): Results for 2 years

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Tudor Street														
1	L2	48	1	53	2.1	0.041	6.7	LOS A	0.2	1.7	0.27	0.61	0.27	50.1
2	T1	12	1	13	8.3	*0.710	29.7	LOS C	6.5	47.5	1.00	0.89	1.15	17.1
3	R2	377	17	413	4.5	0.710	34.1	LOS C	6.5	47.5	1.00	0.88	1.15	21.4
Approach		437	19	479	4.3	0.710	31.0	LOS C	6.5	47.5	0.92	0.85	1.05	24.0
East: Hunter Street														
4	L2	125	12	137	9.6	0.113	8.8	LOS A	1.3	9.8	0.34	0.63	0.34	41.2
5	T1	233	18	255	7.7	0.435	25.5	LOS B	3.7	27.9	0.94	0.75	0.94	37.2
6	R2	8	0	9	0.0	*0.435	31.1	LOS C	3.6	26.7	0.94	0.75	0.94	22.6
Approach		366	30	401	8.2	0.435	20.0	LOS B	3.7	27.9	0.74	0.71	0.74	37.7
North: Railway Street														
7	L2	5	1	5	20.0	0.058	32.5	LOS C	0.3	2.2	0.93	0.65	0.93	19.4
8	T1	13	0	14	0.0	*0.058	27.8	LOS B	0.3	2.2	0.93	0.64	0.93	19.3
9	R2	1	1	1	100.0	0.058	32.9	LOS C	0.3	2.2	0.93	0.63	0.93	29.7
Approach		19	2	21	10.5	0.058	29.3	LOS C	0.3	2.2	0.93	0.64	0.93	20.2
West: Hunter Street														
10	L2	40	1	44	2.5	0.683	30.0	LOS C	8.6	62.1	0.97	0.85	1.04	34.3
11	T1	514	16	563	3.1	*0.683	24.4	LOS B	8.7	62.6	0.97	0.85	1.04	37.7
12	R2	126	1	138	0.8	0.448	31.2	LOS C	3.8	27.1	0.94	0.78	0.94	32.7
Approach		680	18	745	2.6	0.683	26.0	LOS B	8.7	62.6	0.96	0.84	1.02	36.6
All Vehicles		1502	69	1645	4.6	0.710	26.0	LOS B	8.7	62.6	0.89	0.81	0.96	33.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [2021AM 80 sec cycle time (Site Folder: General)]

Mixed Use Development
Hunter Street/Tudor Street/Railway Street Signalised Intersection
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site User-Given Cycle Time)
Design Life Analysis (Final Year): Results for 2 years

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Tudor Street														
1	L2	48	1	53	2.1	0.040	6.6	LOS A	0.3	1.9	0.22	0.60	0.22	50.3
2	T1	12	1	13	8.3	*0.498	30.4	LOS C	7.4	53.8	0.91	0.80	0.91	16.8
3	R2	377	17	413	4.5	0.498	34.8	LOS C	7.4	53.8	0.91	0.80	0.91	21.1
Approach		437	19	479	4.3	0.498	31.5	LOS C	7.4	53.8	0.84	0.78	0.84	23.8
East: Hunter Street														
4	L2	125	12	137	9.6	0.102	8.0	LOS A	1.3	9.7	0.26	0.60	0.26	42.3
5	T1	233	18	255	7.7	0.405	31.1	LOS C	4.7	35.1	0.91	0.73	0.91	34.4
6	R2	8	0	9	0.0	*0.405	37.4	LOS C	4.7	35.1	0.92	0.74	0.92	19.8
Approach		366	30	401	8.2	0.405	23.4	LOS B	4.7	35.1	0.69	0.69	0.69	35.5
North: Railway Street														
7	L2	5	1	5	20.0	0.078	43.9	LOS D[11]	0.4	3.0	0.96	0.66	0.96	15.9
8	T1	13	0	14	0.0	*0.078	39.2	LOS C	0.4	3.1	0.96	0.65	0.96	15.3
9	R2	1	1	1	100.0	0.078	44.3	LOS D[11]	0.4	3.1	0.96	0.65	0.96	25.7
Approach		19	2	21	10.5	0.078	40.7	LOS C	0.4	3.1	0.96	0.65	0.96	16.2
West: Hunter Street														
10	L2	40	1	44	2.5	0.510	30.1	LOS C	9.8	70.3	0.87	0.75	0.87	34.2
11	T1	514	16	563	3.1	*0.510	24.5	LOS B	9.9	70.8	0.87	0.74	0.87	37.6
12	R2	126	1	138	0.8	0.399	37.3	LOS C	4.9	34.4	0.92	0.78	0.92	30.1
Approach		680	18	745	2.6	0.510	27.2	LOS B	9.9	70.8	0.88	0.75	0.88	35.9
All Vehicles		1502	69	1645	4.6	0.510	27.7	LOS B	9.9	70.8	0.82	0.74	0.82	32.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [2021AM+DEV 80 sec cycle time (Site Folder: General)]

Mixed Use Development
Hunter Street/Tudor Street/Railway Street Signalised Intersection
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Tudor Street														
1	L2	53	1	56	1.9	0.043	7.1	LOS A	0.4	2.6	0.26	0.61	0.26	49.8
2	T1	36	1	38	2.8	*0.549	30.8	LOS C	8.3	60.4	0.93	0.81	0.93	16.9
3	R2	413	17	435	4.1	0.549	35.2	LOS C	8.3	60.4	0.93	0.81	0.93	21.1
Approach		502	19	528	3.8	0.549	31.9	LOS C	8.3	60.4	0.86	0.79	0.86	23.4
East: Hunter Street														
4	L2	137	12	144	8.8	0.106	8.0	LOS A	1.4	10.2	0.26	0.60	0.26	42.4
5	T1	255	18	268	7.1	0.506	31.5	LOS C	5.6	41.2	0.92	0.74	0.92	34.1
6	R2	28	0	29	0.0	*0.506	40.8	LOS C	5.1	37.1	0.97	0.78	0.97	18.3
Approach		420	30	442	7.1	0.506	24.4	LOS B	5.6	41.2	0.71	0.70	0.71	34.4
North: Railway Street														
7	L2	44	1	46	2.3	0.450	45.4	LOS D	2.0	14.5	0.99	0.74	0.99	15.4
8	T1	25	0	26	0.0	*0.450	40.8	LOS C	2.0	14.6	0.99	0.73	0.99	14.4
9	R2	28	1	29	3.6	0.450	45.3	LOS D	2.0	14.6	0.99	0.73	0.99	26.2
Approach		97	2	102	2.1	0.450	44.2	LOS D	2.0	14.6	0.99	0.73	0.99	18.9
West: Hunter Street														
10	L2	79	1	83	1.3	0.568	30.7	LOS C	11.1	79.6	0.89	0.78	0.89	33.6
11	T1	563	16	593	2.8	*0.568	25.1	LOS B	11.2	80.6	0.89	0.77	0.89	37.2
12	R2	138	1	145	0.7	0.484	39.7	LOS C	5.4	37.8	0.96	0.79	0.96	29.2
Approach		780	18	821	2.3	0.568	28.3	LOS B	11.2	80.6	0.90	0.77	0.90	35.2
All Vehicles		1799	69	1894	3.8	0.568	29.2	LOS C	11.2	80.6	0.85	0.76	0.85	31.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [2021AM+DEV 80 sec cycle time (Site Folder: General)]

Mixed Use Development
Hunter Street/Tudor Street/Railway Street Signalised Intersection
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Tudor Street														
1	L2	53	1	56	1.9	0.043	7.1	LOS A	0.4	2.6	0.26	0.61	0.26	49.8
2	T1	36	1	38	2.8	*0.549	30.8	LOS C	8.3	60.4	0.93	0.81	0.93	16.9
3	R2	413	17	435	4.1	0.549	35.2	LOS C	8.3	60.4	0.93	0.81	0.93	21.1
Approach		502	19	528	3.8	0.549	31.9	LOS C	8.3	60.4	0.86	0.79	0.86	23.4
East: Hunter Street														
4	L2	137	12	144	8.8	0.106	8.0	LOS A	1.4	10.2	0.26	0.60	0.26	42.4
5	T1	255	18	268	7.1	0.506	31.5	LOS C	5.6	41.2	0.92	0.74	0.92	34.1
6	R2	28	0	29	0.0	*0.506	40.8	LOS C	5.1	37.1	0.97	0.78	0.97	18.3
Approach		420	30	442	7.1	0.506	24.4	LOS B	5.6	41.2	0.71	0.70	0.71	34.4
North: Railway Street														
7	L2	44	1	46	2.3	0.450	45.4	LOS D	2.0	14.5	0.99	0.74	0.99	15.4
8	T1	25	0	26	0.0	*0.450	40.8	LOS C	2.0	14.6	0.99	0.73	0.99	14.4
9	R2	28	1	29	3.6	0.450	45.3	LOS D	2.0	14.6	0.99	0.73	0.99	26.2
Approach		97	2	102	2.1	0.450	44.2	LOS D	2.0	14.6	0.99	0.73	0.99	18.9
West: Hunter Street														
10	L2	79	1	83	1.3	0.568	30.7	LOS C	11.1	79.6	0.89	0.78	0.89	33.6
11	T1	563	16	593	2.8	*0.568	25.1	LOS B	11.2	80.6	0.89	0.77	0.89	37.2
12	R2	138	1	145	0.7	0.484	39.7	LOS C	5.4	37.8	0.96	0.79	0.96	29.2
Approach		780	18	821	2.3	0.568	28.3	LOS B	11.2	80.6	0.90	0.77	0.90	35.2
All Vehicles		1799	69	1894	3.8	0.568	29.2	LOS C	11.2	80.6	0.85	0.76	0.85	31.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [2031AM+DEV (Site Folder: General)]

Mixed Use Development
Hunter Street/Tudor Street/Railway Street Signalised Intersection
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 60 seconds (Site Practical Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Tudor Street														
1	L2	69	1	73	1.4	0.059	7.1	LOS A	0.4	2.9	0.31	0.62	0.31	49.7
2	T1	37	1	39	2.7	*0.818	33.1	LOS C	8.2	59.3	1.00	0.98	1.34	16.1
3	R2	433	17	456	3.9	0.818	37.5	LOS C	8.2	59.3	1.00	0.98	1.34	20.2
Approach		539	19	567	3.5	0.818	33.3	LOS C	8.2	59.3	0.91	0.93	1.21	23.1
East: Hunter Street														
4	L2	151	12	159	7.9	0.129	8.9	LOS A	1.5	11.4	0.35	0.63	0.35	41.3
5	T1	292	18	307	6.2	0.617	27.1	LOS B	5.1	37.2	0.97	0.81	1.04	36.2
6	R2	30	0	32	0.0	*0.617	33.3	LOS C	5.1	37.2	0.98	0.82	1.05	21.2
Approach		473	30	498	6.3	0.617	21.7	LOS B	5.1	37.2	0.77	0.75	0.82	36.3
North: Railway Street														
7	L2	44	1	46	2.3	0.281	33.6	LOS C	1.5	10.8	0.96	0.73	0.96	18.9
8	T1	26	0	27	0.0	*0.281	29.0	LOS C	1.5	10.9	0.96	0.73	0.96	18.0
9	R2	29	1	31	3.4	0.281	33.5	LOS C	1.5	10.9	0.96	0.73	0.96	30.6
Approach		99	2	104	2.0	0.281	32.4	LOS C	1.5	10.9	0.96	0.73	0.96	23.0
West: Hunter Street														
10	L2	86	1	91	1.2	0.870	38.5	LOS C	13.5	96.3	1.00	1.07	1.40	30.0
11	T1	651	16	685	2.5	*0.870	32.9	LOS C	13.6	97.3	1.00	1.07	1.40	33.4
12	R2	186	1	196	0.5	0.635	32.7	LOS C	5.8	40.5	0.98	0.84	1.05	32.0
Approach		923	18	972	2.0	0.870	33.4	LOS C	13.6	97.3	1.00	1.02	1.33	32.8
All Vehicles		2034	69	2141	3.4	0.870	30.6	LOS C	13.6	97.3	0.92	0.92	1.16	30.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [2031AM+DEV 80 sec cycle time (Site Folder: General)]

Mixed Use Development
Hunter Street/Tudor Street/Railway Street Signalised Intersection
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Tudor Street														
1	L2	69	1	73	1.4	0.057	7.1	LOS A	0.5	3.4	0.26	0.61	0.26	49.8
2	T1	37	1	39	2.7	*0.606	32.0	LOS C	9.0	64.8	0.95	0.82	0.95	16.4
3	R2	433	17	456	3.9	0.606	36.5	LOS C	9.0	64.8	0.95	0.82	0.95	20.6
Approach		539	19	567	3.5	0.606	32.4	LOS C	9.0	64.8	0.86	0.79	0.86	23.5
East: Hunter Street														
4	L2	151	12	159	7.9	0.117	8.0	LOS A	1.5	11.3	0.26	0.61	0.26	42.4
5	T1	292	18	307	6.2	0.577	32.0	LOS C	6.1	45.1	0.93	0.76	0.94	33.8
6	R2	30	0	32	0.0	*0.577	41.2	LOS C	6.1	44.5	0.98	0.79	0.98	18.2
Approach		473	30	498	6.3	0.577	24.9	LOS B	6.1	45.1	0.72	0.71	0.72	34.3
North: Railway Street														
7	L2	44	1	46	2.3	0.465	45.4	LOS D	2.1	14.8	0.99	0.74	0.99	15.4
8	T1	26	0	27	0.0	*0.465	40.8	LOS C	2.1	14.9	0.99	0.74	0.99	14.3
9	R2	29	1	31	3.4	0.465	45.4	LOS D	2.1	14.9	0.99	0.73	0.99	26.2
Approach		99	2	104	2.0	0.465	44.2	LOS D	2.1	14.9	0.99	0.74	0.99	19.0
West: Hunter Street														
10	L2	86	1	91	1.2	0.625	30.5	LOS C	12.9	92.3	0.90	0.79	0.90	33.7
11	T1	651	16	685	2.5	*0.625	25.0	LOS B	13.1	93.4	0.90	0.78	0.90	37.3
12	R2	186	1	196	0.5	0.605	39.7	LOS C	7.3	51.7	0.97	0.81	0.98	29.2
Approach		923	18	972	2.0	0.625	28.5	LOS B	13.1	93.4	0.92	0.79	0.92	35.1
All Vehicles		2034	69	2141	3.4	0.625	29.4	LOS C	13.1	93.4	0.86	0.77	0.86	31.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

PM MOVEMENT TABLES

MOVEMENT SUMMARY

Site: 101 [2021PM (Site Folder: General)]

Mixed Use Development
Hunter Street/Tudor Street/Railway Street Signalised Intersection
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 60 seconds (Site Practical Cycle Time)
Design Life Analysis (Final Year): Results for 2 years

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Tudor Street														
1	L2	41	0	45	0.0	0.040	7.5	LOS A	0.3	2.1	0.34	0.62	0.34	49.3
2	T1	6	0	7	0.0	*0.520	31.4	LOS C	2.8	20.9	0.99	0.78	1.01	16.5
3	R2	160	15	175	9.4	0.520	35.8	LOS C	2.8	20.9	0.99	0.78	1.01	20.6
Approach		207	15	227	7.2	0.520	30.1	LOS C	2.8	20.9	0.86	0.74	0.88	25.4
East: Hunter Street														
4	L2	278	0	304	0.0	0.234	9.1	LOS A	3.2	22.3	0.38	0.66	0.38	41.5
5	T1	437	14	479	3.2	*0.553	20.6	LOS B	7.3	52.6	0.89	0.74	0.89	40.2
6	R2	2	0	2	0.0	0.553	26.6	LOS B	7.3	52.6	0.91	0.76	0.91	25.4
Approach		717	14	785	2.0	0.553	16.2	LOS B	7.3	52.6	0.69	0.71	0.69	40.5
North: Railway Street														
7	L2	8	0	9	0.0	0.055	32.3	LOS C	0.3	2.0	0.93	0.66	0.93	19.5
8	T1	7	0	8	0.0	*0.055	27.7	LOS B	0.3	2.1	0.93	0.65	0.93	18.8
9	R2	4	0	4	0.0	0.055	32.3	LOS C	0.3	2.1	0.93	0.64	0.93	31.5
Approach		19	0	21	0.0	0.055	30.6	LOS C	0.3	2.1	0.93	0.65	0.93	22.6
West: Hunter Street														
10	L2	12	0	13	0.0	0.591	31.1	LOS C	5.9	42.0	0.96	0.80	0.98	34.0
11	T1	366	11	401	3.0	0.591	25.5	LOS B	5.9	42.1	0.96	0.80	0.98	37.2
12	R2	133	0	146	0.0	*0.588	34.0	LOS C	4.3	30.3	0.99	0.81	1.03	31.5
Approach		511	11	560	2.2	0.591	27.9	LOS B	5.9	42.1	0.97	0.80	1.00	35.5
All Vehicles		1454	40	1592	2.8	0.591	22.4	LOS B	7.3	52.6	0.82	0.74	0.83	36.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [2021PM 80 sec cycle time (Site Folder: General)]

Mixed Use Development
Hunter Street/Tudor Street/Railway Street Signalised Intersection
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site User-Given Cycle Time)
Design Life Analysis (Final Year): Results for 2 years

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Tudor Street														
1	L2	41	0	45	0.0	0.040	7.4	LOS A	0.3	2.4	0.28	0.61	0.28	49.5
2	T1	6	0	7	0.0	*0.462	39.1	LOS C	3.5	26.6	0.98	0.77	0.98	14.3
3	R2	160	15	175	9.4	0.462	43.6	LOS D[11]	3.5	26.6	0.98	0.77	0.98	18.1
Approach		207	15	227	7.2	0.462	36.3	LOS C	3.5	26.6	0.84	0.74	0.84	22.8
East: Hunter Street														
4	L2	278	0	304	0.0	0.212	8.2	LOS A	3.1	22.0	0.29	0.63	0.29	42.8
5	T1	437	14	479	3.2	0.452	22.0	LOS B	9.0	64.4	0.81	0.68	0.81	39.4
6	R2	2	0	2	0.0	*0.452	28.1	LOS B	9.0	64.4	0.83	0.71	0.83	24.5
Approach		717	14	785	2.0	0.452	16.6	LOS B	9.0	64.4	0.61	0.66	0.61	40.1
North: Railway Street														
7	L2	8	0	9	0.0	0.073	43.6	LOS D[11]	0.4	2.8	0.96	0.66	0.96	16.0
8	T1	7	0	8	0.0	*0.073	39.0	LOS C	0.4	2.8	0.96	0.66	0.96	15.0
9	R2	4	0	4	0.0	0.073	43.6	LOS D[11]	0.4	2.8	0.96	0.65	0.96	27.1
Approach		19	0	21	0.0	0.073	41.9	LOS C	0.4	2.8	0.96	0.66	0.96	18.6
West: Hunter Street														
10	L2	12	0	13	0.0	0.456	34.3	LOS C	7.1	50.6	0.90	0.75	0.90	32.3
11	T1	366	11	401	3.0	*0.456	28.7	LOS C	7.1	50.8	0.90	0.75	0.90	35.5
12	R2	133	0	146	0.0	0.448	38.5	LOS C	5.3	36.9	0.94	0.79	0.94	29.7
Approach		511	11	560	2.2	0.456	31.4	LOS C	7.1	50.8	0.91	0.76	0.91	33.8
All Vehicles		1454	40	1592	2.8	0.462	25.0	LOS B	9.0	64.4	0.75	0.70	0.75	34.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [2021PM+DEV (Site Folder: General)]

Mixed Use Development
Hunter Street/Tudor Street/Railway Street Signalised Intersection
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 60 seconds (Site Practical Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Tudor Street														
1	L2	45	0	47	0.0	0.044	8.0	LOS A	0.4	2.5	0.38	0.63	0.38	48.8
2	T1	17	0	18	0.0	*0.572	31.7	LOS C	3.1	23.3	1.00	0.80	1.06	16.6
3	R2	175	15	184	8.6	0.572	36.2	LOS C	3.1	23.3	1.00	0.80	1.06	20.6
Approach		237	15	249	6.3	0.572	30.5	LOS C	3.1	23.3	0.88	0.77	0.93	25.0
East: Hunter Street														
4	L2	304	0	320	0.0	0.246	9.1	LOS A	3.4	23.7	0.39	0.66	0.39	41.5
5	T1	479	14	504	2.9	*0.658	21.9	LOS B	8.9	64.0	0.91	0.79	0.97	39.2
6	R2	35	0	37	0.0	0.658	27.9	LOS B	8.9	64.0	0.94	0.82	0.98	24.3
Approach		818	14	861	1.7	0.658	17.4	LOS B	8.9	64.0	0.72	0.75	0.76	39.2
North: Railway Street														
7	L2	25	0	26	0.0	0.231	33.3	LOS C	1.3	8.9	0.96	0.72	0.96	19.6
8	T1	28	0	29	0.0	*0.231	28.7	LOS C	1.3	8.9	0.96	0.72	0.96	18.1
9	R2	30	0	32	0.0	0.231	33.3	LOS C	1.3	8.8	0.96	0.72	0.96	30.4
Approach		83	0	87	0.0	0.231	31.7	LOS C	1.3	8.9	0.96	0.72	0.96	24.1
West: Hunter Street														
10	L2	36	0	38	0.0	0.657	32.0	LOS C	6.7	47.8	0.98	0.84	1.05	33.2
11	T1	401	11	422	2.7	0.657	26.4	LOS B	6.7	48.3	0.98	0.84	1.05	36.6
12	R2	146	0	154	0.0	*0.621	34.4	LOS C	4.6	32.3	0.99	0.83	1.07	31.3
Approach		583	11	614	1.9	0.657	28.8	LOS C	6.7	48.3	0.98	0.84	1.06	35.0
All Vehicles		1721	40	1812	2.3	0.658	23.7	LOS B	8.9	64.0	0.84	0.78	0.89	34.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [2021PM+DEV 80 sec cycle time (Site Folder: General)]

Mixed Use Development
Hunter Street/Tudor Street/Railway Street Signalised Intersection
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Tudor Street														
1	L2	45	0	47	0.0	0.043	7.9	LOS A	0.4	2.8	0.31	0.62	0.31	49.0
2	T1	17	0	18	0.0	*0.509	39.4	LOS C	4.0	29.5	0.98	0.78	0.98	14.4
3	R2	175	15	184	8.6	0.509	43.9	LOS D	4.0	29.5	0.98	0.78	0.98	18.2
Approach		237	15	249	6.3	0.509	36.7	LOS C	4.0	29.5	0.86	0.75	0.86	22.5
East: Hunter Street														
4	L2	304	0	320	0.0	0.222	8.2	LOS A	3.3	23.4	0.29	0.63	0.29	42.8
5	T1	479	14	504	2.9	*0.514	22.1	LOS B	10.4	74.1	0.82	0.70	0.82	39.1
6	R2	35	0	37	0.0	0.514	28.7	LOS C	10.4	74.1	0.85	0.74	0.85	23.8
Approach		818	14	861	1.7	0.514	17.2	LOS B	10.4	74.1	0.62	0.67	0.62	39.3
North: Railway Street														
7	L2	25	0	26	0.0	0.330	45.0	LOS D	1.7	12.1	0.98	0.73	0.98	15.9
8	T1	28	0	29	0.0	*0.330	40.5	LOS C	1.7	12.1	0.98	0.73	0.98	14.4
9	R2	30	0	32	0.0	0.330	45.0	LOS D	1.7	12.1	0.98	0.73	0.98	26.1
Approach		83	0	87	0.0	0.330	43.5	LOS D	1.7	12.1	0.98	0.73	0.98	19.9
West: Hunter Street														
10	L2	36	0	38	0.0	0.507	34.7	LOS C	7.9	56.7	0.92	0.77	0.92	31.9
11	T1	401	11	422	2.7	0.507	29.1	LOS C	8.0	57.2	0.92	0.76	0.92	35.2
12	R2	146	0	154	0.0	*0.509	39.8	LOS C	5.7	39.9	0.96	0.80	0.96	29.2
Approach		583	11	614	1.9	0.509	32.2	LOS C	8.0	57.2	0.93	0.77	0.93	33.4
All Vehicles		1721	40	1812	2.3	0.514	26.2	LOS B	10.4	74.1	0.78	0.72	0.78	33.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [2031PM+DEV (Site Folder: General)]

Mixed Use Development
Hunter Street/Tudor Street/Railway Street Signalised Intersection
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 60 seconds (Site Practical Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Tudor Street														
1	L2	66	0	69	0.0	0.066	8.4	LOS A	0.6	4.0	0.40	0.64	0.40	48.5
2	T1	18	0	19	0.0	*0.575	31.7	LOS C	3.2	23.4	1.00	0.80	1.07	16.6
3	R2	175	15	184	8.6	0.575	36.2	LOS C	3.2	23.4	1.00	0.80	1.07	20.6
Approach		259	15	273	5.8	0.575	28.8	LOS C	3.2	23.4	0.84	0.76	0.90	26.6
East: Hunter Street														
4	L2	304	10	320	3.3	0.252	9.2	LOS A	3.4	24.5	0.39	0.66	0.39	41.2
5	T1	513	14	540	2.7	*0.669	21.3	LOS B	9.5	68.0	0.91	0.80	0.97	39.6
6	R2	37	0	39	0.0	0.669	27.3	LOS B	9.5	68.0	0.94	0.83	0.98	24.6
Approach		854	24	899	2.8	0.669	17.2	LOS B	9.5	68.0	0.72	0.75	0.76	39.4
North: Railway Street														
7	L2	27	0	28	0.0	0.262	33.4	LOS C	1.4	10.1	0.96	0.72	0.96	19.6
8	T1	30	0	32	0.0	*0.262	28.9	LOS C	1.4	10.1	0.96	0.72	0.96	18.0
9	R2	37	0	39	0.0	0.262	33.4	LOS C	1.4	10.0	0.96	0.73	0.96	30.2
Approach		94	0	99	0.0	0.262	32.0	LOS C	1.4	10.1	0.96	0.72	0.96	24.4
West: Hunter Street														
10	L2	37	1	39	2.7	0.659	32.1	LOS C	6.7	48.1	0.98	0.84	1.06	33.1
11	T1	401	11	422	2.7	0.659	26.5	LOS B	6.8	48.5	0.98	0.84	1.06	36.6
12	R2	146	0	154	0.0	*0.709	36.6	LOS C	4.8	33.9	1.00	0.87	1.20	30.4
Approach		584	12	615	2.1	0.709	29.4	LOS C	6.8	48.5	0.98	0.85	1.09	34.7
All Vehicles		1791	51	1885	2.8	0.709	23.6	LOS B	9.5	68.0	0.84	0.78	0.90	35.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [2031PM+DEV 80 sec cycle (Site Folder: General)]

Mixed Use Development
Hunter Street/Tudor Street/Railway Street Signalised Intersection
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Tudor Street														
1	L2	66	0	69	0.0	0.065	8.2	LOS A	0.6	4.5	0.33	0.63	0.33	48.7
2	T1	18	0	19	0.0	*0.511	39.4	LOS C	4.0	29.7	0.98	0.78	0.98	14.4
3	R2	175	15	184	8.6	0.511	43.9	LOS D	4.0	29.7	0.98	0.78	0.98	18.2
Approach		259	15	273	5.8	0.511	34.5	LOS C	4.0	29.7	0.82	0.74	0.82	24.1
East: Hunter Street														
4	L2	304	10	320	3.3	0.228	8.3	LOS A	3.4	24.2	0.29	0.63	0.29	42.5
5	T1	513	14	540	2.7	*0.532	21.5	LOS B	11.1	79.3	0.82	0.70	0.82	39.5
6	R2	37	0	39	0.0	0.532	28.1	LOS B	11.1	79.3	0.85	0.74	0.85	24.1
Approach		854	24	899	2.8	0.532	17.1	LOS B	11.1	79.3	0.63	0.67	0.63	39.5
North: Railway Street														
7	L2	27	0	28	0.0	0.414	45.2	LOS D	2.0	13.8	0.99	0.73	0.99	15.9
8	T1	30	0	32	0.0	*0.414	40.7	LOS C	2.0	13.8	0.99	0.73	0.99	14.3
9	R2	37	0	39	0.0	0.414	45.2	LOS D	2.0	13.8	0.99	0.73	0.99	25.9
Approach		94	0	99	0.0	0.414	43.8	LOS D	2.0	13.8	0.99	0.73	0.99	20.2
West: Hunter Street														
10	L2	37	1	39	2.7	0.537	35.8	LOS C	8.1	58.1	0.93	0.78	0.93	31.3
11	T1	401	11	422	2.7	0.537	30.2	LOS C	8.2	58.6	0.93	0.78	0.93	34.7
12	R2	146	0	154	0.0	*0.552	41.0	LOS C	5.8	40.7	0.97	0.80	0.97	28.7
Approach		584	12	615	2.1	0.552	33.3	LOS C	8.2	58.6	0.94	0.78	0.94	32.9
All Vehicles		1791	51	1885	2.8	0.552	26.3	LOS B	11.1	79.3	0.78	0.72	0.78	33.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Appendix L

ACCESS REPORT (LINDSAY PERRY ACCESS)

lindsay perry access

Access Report

Dairy Farmers Corner Development

924 Hunter Street
NEWCASTLE WEST NSW 2302

For: Thirdi Dairy Farmers
Ref: LP_21371

Executive Summary

Development application documentation for the proposed Dairy Farmers Corner development located at 924 Hunter Street Newcastle West NSW, has been reviewed against current accessibility legislation.

The following table summarises our findings.

Item No.	Description	Compliance Status
Access and Approach		
4.1	Allotment Boundary to Entrance	Compliant Configuration
4.2	Accessible Carparking to Entrance	Compliant Configuration
4.3	Link between Associated Buildings	Compliant Configuration
4.4	Accessways (Pathways Generally)	Compliant Configuration
4.5	Accessible Carparking	Compliant Configuration
4.6	Accessible Ramps	Compliant Configuration
4.7	Stairs	Capable of compliance
4.8	Entrance	Compliant Configuration
4.9	Non-accessible Entrances	Compliant Configuration
Interior		
5.1	Extent of Access Generally	Complaint
5.2	Circulation Areas	Compliant Configuration
5.3	Doorways	Compliant Configuration
5.4	Exempt Areas	Compliant
5.5	Floor Finishes	To be addressed during detailed design
5.6	Carpet	To be addressed during detailed design
5.7	Controls	To be addressed during detailed design
5.8	Visual Indication to Glazing	To be addressed during detailed design
5.9	Tactile Indicators	To be addressed during detailed design
5.10	Signage	To be addressed during detailed design
5.11	Access to Swimming Pool	To be addressed during detailed design
5.12	Slip Resistance (Ramps & Stairs)	To be addressed during detailed design
5.13	Thresholds	To be addressed during detailed design
Sanitary Facilities		
6.1	Distribution	Compliant
6.2	Accessible Toilets	Compliant Configuration
6.3	Ambulant Toilet Cubicles	Compliant Configuration
Vertical Circulation		
7.1	Lifts	Capable of compliance
7.2	Platform Lifts	Capable of compliance
7.3	Stairs	Compliant Configuration
7.4	Fire Isolated Egress Stairs	Capable of compliance

Item No.	Description	Compliance Status
SEPP 65 Universal Housing Requirements | Livable Housing Silver Level		
8.1	Dwelling Access	Compliant
8.2	Dwelling Entrance	Compliant Configuration
8.3	Internal Corridors and Doors	Compliant Configuration
8.4	Toilet	Compliant
8.5	Shower	Compliant
8.6	Reinforcement of Bathroom Walls	To be addressed during detailed design
8.7	Internal Stairways	Not applicable

We consider that the drawings presented for assessment, for the purposes of a development application, generally comply with current statutory requirements.

JILLIAN CORAM-PARKER
Access Consultant (ACAA Affiliate No. 712)
Certificate IV in Access Consulting

LINDSAY PERRY
Access Consultant (ACAA Accreditation No. 136)
Certificate IV in Access Consulting
Internationally Certified Access Consultant ICAC BE-02-106-18
Registered Architect NSW 7021
Livable Housing Assessor 20047 | NDIS SDA Assessor SDA00049

Document Control

This report has been prepared based on the documentation available and time allocated to conduct the review. All reasonable attempts have been made to identify key compliance matters. Best practice options, as noted in the report, are not mandatory but will minimise the risk of a complaint made under the DDA.

Revision Summary:

prepared by:		
Jillian Coram-Parker	Draft Revision 1	30 September 2021 14 October 2021

approved by:		
Lindsay Perry	Draft Revision 1	1 October 2021 19 October 2021

Contact Details:

Lindsay Perry Access Pty Ltd
Suite 8, 15 Alma Road (PO Box 453)
NEW LAMBTON NSW 2305

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0418 909 180

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Clarifications:

This report is limited to items within drawings listed in this report only.

Construction is to be in accordance with the recommendations made in this access report to ensure compliance.

Any dimensions quoted throughout this report and within Australian Standards are CLEAR dimensions, not structural. This needs to be considered during construction to account for wall linings and the like.

The recommendations throughout this report reflect the professional opinion and interpretation of Lindsay Perry Access Pty Ltd. This may differ from that of other consultants.

1 Project Background

The proposed development is a mix of residential, retail, food/beverage and office spaces. The development comprises of three (3) towers with the north and south towers joined by four (4) levels of carparking and an outdoor Podium space at Level 4. The North Tower is over twenty-nine (29) levels, the South tower over twenty-four (24) levels and the Shared Office Tower over six (6) levels.

The ground floor level provides Food & Bev/Retail tenancies, lobbies for all 3 towers, pedestrian laneways, waste rooms and sanitary facilities. Podium Level 4 provides a swimming pool, communal open space, two (2) function/multi-purpose rooms, residence work from home space, gymnasium, pilates studio, and sanitary facilities. Residential units are provided from Level 2 through to Level 29. Sanitary facilities are provided at each level of the Shared Office Tower. The original Milk Bottle is being retained as Public Art adjacent to the Shared Office Tower.

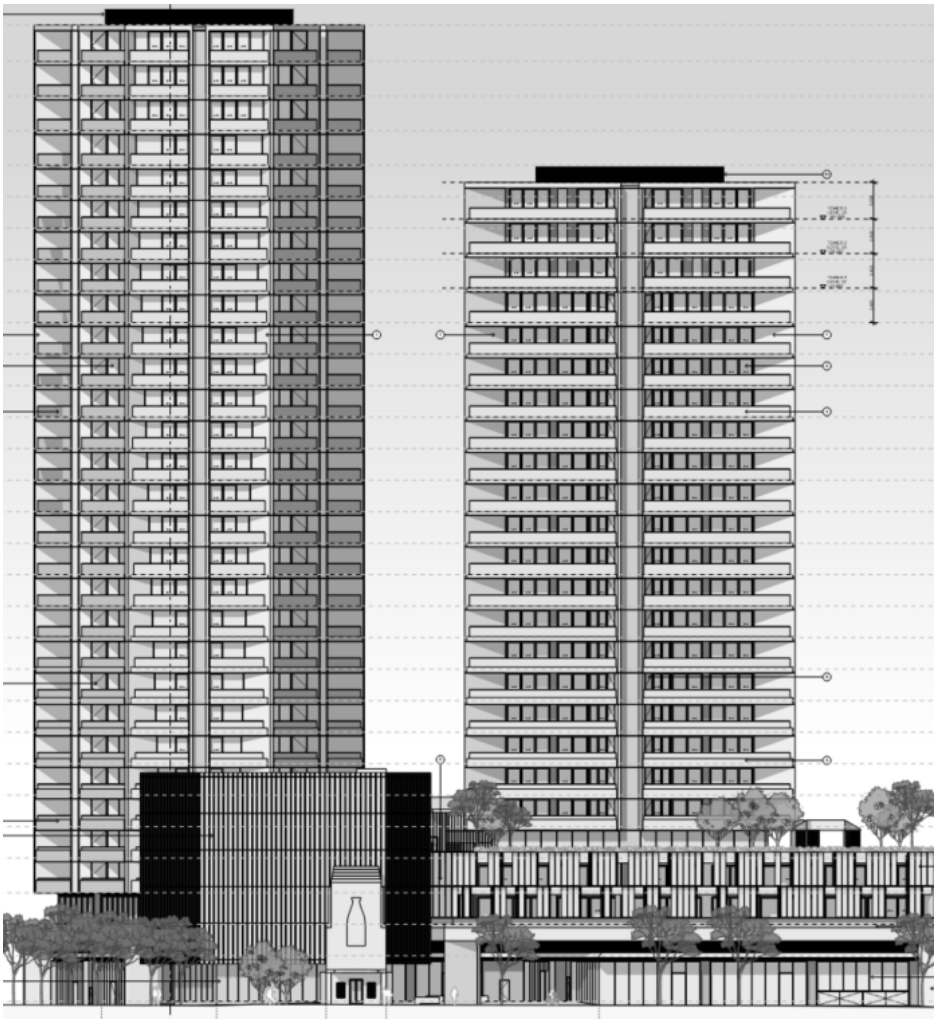

Figure 1 | Proposed Development

2 Reviewed Documentation

Documentation prepared by CKDS has been reviewed as follows:

dwg no.	drawing name	revision
A-0001	Cover Sheet	04
A-0002	Site History	02
A-0003	Site Context	02
A-0004	Street Character & Key Planning Controls	02
A-0005	Existing Site Conditions	02
A-0006	Residential Amenity Analysis	01
A-0007	Concept Development	02
A-0008	Concept Development	02
A-1001	Site Plan	02
A-1101	Ground Floor Plan	07
A-1102	Upper Ground Floor Plan	07
A-1103	Level 1	07
A-1104	Level 2	07
A-1105	Level 3	07
A-1106	Level 4	07
A-1107	Tower Level 5	11
A-1108	Tower Levels 6 - 14	11
A-1109	Tower Levels 15 - 21	11
A-1110	Tower Levels 22 - 24	12
A-1111	Tower Levels 25 - 26	11
A-1112	Tower Levels 27 - 29	11
A-1201	Unit Type A - E	11
A-1202	Unit Type F - K	06
A-2001	North Elevation	05
A-2002	South Elevation	05
A-2003	East Elevation	05
A-2004	West Elevation	05
A-3001	Section A	05
A-3002	Section B	05
A-3003	Section C	04
A-3004	Section D	03
A-3005	Laneway Sections	04
A-4001	Shadow Diagrams	04
A-5001	Podium Materiality	02
A-5002	Tower Materiality	02
A-7001	Yield Schedule	06
A-7002	GFA Calculations	03
A-7003	GFA Calculations	02
A-7004	ADG Solar & Cross Ventilation	02
A-7005	ADG Storage	01
A-7006	ADG Storage	01
A-8001	Perspective Views	04

3 Legislation

Access assessment has been made against Access Legislation including:

- The Commonwealth Disability Discrimination Act 1992 (DDA)
- Disability (Access to Premises (Buildings)) Standards 2010
- Access Code for Buildings 2010
- The National Construction Code Building Code of Australia Volume 1, Amendment 1 2019 (BCA)
  - Section D2.14 / D2.15 / D2.17 – landings, thresholds and slip resistance
  - Section D3 – Access for People with Disabilities
  - Section E3.6 – Passenger Lifts
  - Section F2.4 – Accessible Sanitary Facilities
- Australian Standard AS1428.1 (2009) Amendment 1 & 2, – Design for Access and Mobility
- Australian Standard AS1428.2(1992) – Design for Access and Mobility: Enhanced and additional requirements – Buildings and facilities
- Australian Standard AS1428.4.1 (2009) Amendment 1 – Design for Access and Mobility: Means to assist the orientation of people with vision impairment – Tactile ground surface indicators
- Australian Standard AS2890.6 (2009) – Parking Facilities – Off street carparking For People with Disabilities.
- Australian Standard AS1735.12 – Lifts, escalators and moving walks: Lifts for persons with a disability
- State Environmental Planning Policy 65 – Residential Design Quality of Residential Apartment Development (SEPP65) – Apartment Design Guide – July 2015
- The Livable Housing Design Guidelines – Edition 4

A summary of the requirements of relevant legislation follows.

The Disability Discrimination Act 1992

The DDA requires independent, equitable, dignified access to all parts of the building for all building users regardless of disability. The DDA makes it unlawful to discriminate against a person on the grounds of disability.

The Disability (Access to Premises) Standards

The Disability (Access to Premises - buildings) Standards 2010 (the Premises Standards) commenced on 1 May 2011. Any application for a building approval for a new building or upgrade of an existing building on or after that date triggers the application of the Premises Standards.

The Premises Standards include an **Access Code** written in the same style as the Building Code of Australia. It has a number of Performance Requirements that are expressed in broad terms and references a number of technical Deemed-to-Satisfy Provisions.

The National Construction Code / Building Code of Australia (Volume 1)

The Building Code of Australia (BCA) is contained within the National Construction Code (NCC) and provides the minimum necessary requirements for safety, health, amenity and sustainability in the design and construction of new buildings (and new building work in existing buildings) throughout Australia.

The BCA for Class 2 buildings (residential), access for people with disabilities is required:

- From a pedestrian entrance required to be accessible to at least 1 floor containing sole-occupancy units and to the entrance doorway of each sole-occupancy unit located on that level.
- To and within not less than 1 of each type of room or space for use in common by the residents, including a cooking facility, sauna, gymnasium, swimming pool, common laundry, games room, TV room, individual shop, dining room, public viewing area, ticket purchasing service, lunch room, lounge room, or the like.

Where a ramp complying with AS 1428.1 or a passenger lift is installed—

a) to the entrance doorway of each sole-occupancy unit; and
b) to and within rooms or spaces for use in common by the residents, located on the levels served by the lift or ramp.

The BCA for Class 5 & 6 buildings (commercial/offices & retail) requires access for people with disabilities to and within all areas normally used by the occupants.

AS1428 – Design for Access and Mobility

- Australian Standard AS1428.1 (2009) Amendment 1 & 2, – Design for Access and Mobility contains access requirements that are mandatory for the provision of access for persons with a disability and is referred by BCA
- Australian Standard AS1428.4.1 (2009) Amendment 1 – Design for Access and Mobility: Means to assist the orientation of people with vision impairment – Tactile ground surface indicators

AS2890.6 – Off-street Carparking for People with Disabilities

AS2890.6 (2009) applies to the carparking areas generally.

AS1735– Lifts, escalators and moving walks

AS1735.12 (1992) contains accessibility requirements for passenger lifts.

SEPP 65 Residential Design Quality of Residential Apartment Development.

The Apartment Design Guide includes a requirement for livable housing. Developments are to provide a minimum 20% of apartments that achieve silver level for livable housing.

Livable Housing Australia Design Guidelines

The Livable Housing Design Guidelines, 2017 include Silver, Gold and Platinum Level which cater to differing levels of accessibility.

4 Access and Approach

The approach to the building needs to be considered when considering access for persons with a disability. The BCA has three requirements for the approach to the building for persons with a disability.

An accessible path of travel is required to the building entrance from the allotment boundary at the main points of pedestrian entry, from accessible carparking areas and from any adjacent and associated accessible building.

In this instance, the approach to the building has been considered as follows:

- from the allotment boundary at the pedestrian entrances along Hunter Street and Railway Street to the building entrances;
- from the accessible carparking area to the building entrances.
- between associated accessible buildings within the site

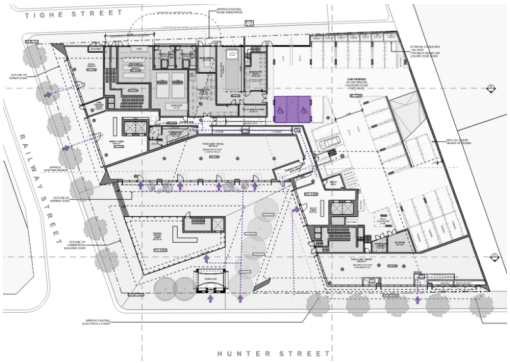

Figure 2 | Overall Site Plan

4.1 Approach from Allotment Boundary

The BCA requires that a continuous accessible path of travel be provided from the allotment boundary at the main points of pedestrian entry to the main entrance.

Compliance Summary:

Compliant Configuration

Commentary:

An accessible path of travel is provided to all building entrances from the allotment boundaries along Hunter Street and Railway Street

4.2 Approach from Accessible Carparking

The BCA requires that a continuous accessible path of travel be provided from the accessible carparking areas to the main entrance.

Compliance Summary:

Compliant Configuration

Commentary:

An accessible path of travel is provided from accessible carparking spaces to all lift Lobbies.

4.3 Approach between Associated Buildings

The BCA requires that a continuous accessible path of travel be provided between associated accessible buildings.

Compliance Summary:

Complaint Configuration

Commentary:

An accessible path of travel is provided between the three (3) towers via pedestrian laneways and accessible ramps.

4.4 Accessways (Pedestrian Areas Generally)

The accessible path of travel refers to a pathway which is grade restricted and provides wheelchair access as per the requirements of AS1428.

Compliance Summary:

Compliant Configuration

Commentary:

All pedestrian laneways and pathways appear to be level offering compliance with current legislation.

Accessibility Requirements:

For compliance with AS1428.1, the following access requirements apply.

a. The minimum unobstructed width of all pathways is to be 1000mm (AS1428.1, Clause 6.3). A width of 1200mm is preferred for compliance with AS1428.2.

b. All pathways are to be constructed with no lip or step at joints between abutting surfaces (a construction tolerance of 3mm is allowable, or 5mm for bevelling edges).

c. The maximum allowable crossfall of pathways is to be 1:40.

d. The ground abutting the sides of the pathways should follow the grade of the pathway and extend horizontally for 600mm. We note that this is not required where there is a kerb or handrail provided to the side of the pathway.

e. Pathways to have passing bays complying with AS1428.1 at maximum 20m intervals where a direct line of site is not available. They are required within 2m of the end of the pathway where it is not possible to continue travelling along the pathway. A passing space shall have a minimum width of 1800 for a minimum length of 2000mm. Refer to AS1428.1, Clause 6.4.

4.5 Accessible Carparking

There is a requirement for the provision of accessible carparking within this development. There are no BCA requirements for the provision of accessible carparking associated with the residential component of the development.

The number of accessible spaces within a Class 5 building requires 1 (one) space for every 100 (one hundred) carparking spaces or part thereof.

The number of accessible spaces within a Class 6 building requires one (1) space for every fifty (50) carparking spaces or part thereof. One (1) additional space is required for every 100 (one hundred) or part thereof in excess of one thousand (1000) carparking spaces.

Compliance Summary:

Compliant Configuration

Commentary:

Accessible carparking is provided at ground floor level.
Two (2) accessible carparking spaces are provided within close proximity to the main entrances. Plans note a total of thirty-three (33) carparking spaces for Commercial/Retail use. Therefore, the number of accessible spaces provides BCA compliance.

Accessibility Requirements:

Access requirements for the accessible carparking are as follows.

a. Accessible carparking to be a minimum of 2400mm wide with a shared area to one side of the space 2400mm wide. Circulation space can be shared between adjacent accessible carparks.

b. Provide a bollard to the shared circulation space as illustrated in AS2890.6, Figure 2.2.

c. The maximum allowable crossfall of accessible carparking area to be, 1:40 (1:33 for bituminous surfaces). This crossfall applies both parallel and perpendicular to the angle of parking.

d. For covered carparking, the clear height of the accessible carparking space to be 2500mm as illustrated in AS2890.6, Figure 2.7.

e. Designated accessible carparking is to be identified using the International Symbol for Access (ISA) between 800 and 1000mm high placed as a pavement marking in the centre of the space between 500-600mm from its entry point. The perimeter of the space is to be identified by an unbroken yellow & slip resistant line 80-100mm wide (except where there is a kerb or wall)

f. Shared space to be identified using yellow slip-resistant & unbroken stipes 150 to 200mm wide with spaces 200 to 300mm between stripes. Stipes to be at an angle of 45° to the side of the space.

4.6 Accessible Ramps

North Tower: An accessible ramp forms a part of the accessible path of travel to the building from accessible carparking spaces.

Food & Beverage/Retail: An accessible ramp forms a part of the accessible path of travel for entry to Food & Beverage /Retail from Hunter Street.

Compliance Summary:

Compliant Configuration

Commentary:

North Tower: The ramp is in two sections with a mid-landing, nominated gradient 1:14. Ensure handrails with extensions to both sides and tactile indicators top and bottom are provided. We note setback from internal corridor to allow for handrail extensions and tactile indicators to not protrude in the transverse path of travel.

Food & Bev/Retail: The ramp (assumed gradient of 1:14) is provided as a single section with adequate landing space top and bottom. Ensure handrails with extensions to both sides and tactile indicators top and bottom are provided.

Accessibility Requirements:

Access requirements for the accessible ramp are as follows.

a. Ramp to comply with AS1428.1, Clause 10.3. Maximum allowable gradient of the ramp is 1:14, minimum clear width to be 1000mm and maximum length between landings to be 9m (for 1:14 gradient).

b. Accessible ramp is to have a maximum rise of 3.6m (BCA Clause 3.11).

c. The ramp is required to be set back a minimum 900mm from the property boundary (AS1428.1, Clause 10.3 (f)). This allows tactile indicators and handrail extensions to occur within the boundary and not protrude into the footpath area.

d. Provide handrails, with extensions, to both sides of the ramp to comply with AS1428.1, Clause 12. Handrails to have an external diameter between 30-50mm to assist persons with a manual disability such as arthritis. Handrails are required on both sides of the ramp to cater for left and right-handed disabilities.

e. Where ramp is not enclosed, provide kerb rails in accordance with AS1428.1. The height of kerb rails is to be less than 65mm or greater than 150mm above the finished surface level. This is to ensure that the foot plate of a wheelchair cannot become lodged on the kerb rail.

f. Provide tactile indicators at the top and bottom of the ramps to comply with BCA Clause D3.8 and AS1428.4. Tactile indicators to be detectable, durable, non-slip and have a minimum 30% luminance contrast to the background colour. For discrete tactile indicators, 45% luminance contrast is required (60% where two-tone indicators are used).

g. Tactile indicators at the top and bottom of the ramps are usually required to be 600-800mm deep across the width of the ramp and set back 300mm from the edge of the ramp (refer AS1428.4.1, Figure A1).

4.7 Stairs

AS1428.1 has access requirements for all public access stairs and is applicable in this instance.

Compliance Summary:

Compliant Configuration
Configuration of stairs will generally facilitate the required accessibility features.

Commentary:
Stairs are provided in various locations within the development to facilitate access between levels within the approach to the buildings.

- Stairs from Railway Street
  Stairs are provided as a part of the pedestrian access from Railway Street to pedestrian laneway between Shared Office Tower and North Tower. Ensure handrails with extensions both sides, tactile indicators top and bottom and contrasting non-slip nosings to treads are provided.

- Ground Floor Carpark to Shared Carpark/BOH Lobby
  A set of stairs from is provided from the Ground Floor Carpark to Shared Carpark/BOH Lobby. Ensure handrails with extensions both sides, tactile indicators top and bottom and contrasting non-slip nosings to treads are provided.

- Ground Floor to back door Food & Bev/Retail (South Tower)
  Stairs are provided from carparking on Ground Floor to back doors of Food & Bev/Retail space along Hunter Street. Ensure handrails with extensions both sides, tactile indicators top and bottom and contrasting non-slip nosings to treads are provided.

Accessibility Requirements:
Access requirements for stairs are as follows.

a. Stairs to comply with AS1428.1(2009), Clause 11.2.

b. Where the stair intersects the property boundary, the stair shall be set back a minimum of 900mm so that handrail extensions and tactile indicators do not protrude into the traverse path of travel.

c. Stairs to have closed or opaque risers. Open risers cause confusion for persons with a vision impairment and may trigger conditions such as epilepsy due to light penetrating through the open riser.

d. Provide handrails, with extensions, to both sides of the stair (AS1428.1 (2009), Clause 11.2 & 12). Handrails to have an external diameter between 30-50mm to assist persons with a manual disability such as arthritis.

e. Handrails are required on both sides of the stair to cater for left and right-handed disabilities. A central handrail is also an acceptable solution where adequate width is available. In this instance, the use of a double handrail is encouraged so that two users can travel in opposite directions and maintain their grip on the handrail.

f. Stair nosings to have minimum 30% luminance contrast strip 50-75mm wide to the top of the stair tread to assist persons with a vision impairment. The strip can be set back 15mm from the edge of the riser.

g. Stair nosings shall not project beyond the face of the riser.

h. Provide tactile indicators at the top and bottom of the stair to comply with BCA Clause D3.8 and AS1428.4.

i. Tactile indicators to be detectable, durable, non-slip and have a minimum 30% luminance contrast to the background colour. For discrete tactile indicators, 45% luminance contrast is required (60% where two-tone indicators are used).

4.8 Accessible Entrances

In a building required to be accessible, an accessway must be provided through the principal pedestrian entrance, and not less than 50% of all pedestrian entrances including the principal pedestrian entrance.

In a building with a total floor area more than 500 sqm a pedestrian entrance which is not accessible must not be located more than 50m from an accessible pedestrian entrance.

Compliance Summary:

Compliant Configuration

Commentary:

Multiple accessible entrances are provided throughout the development. They are provided as single hinged doors, double hinged doors, double automatic doors and unequal double hinged doors. All offering adequate circulation space shown as dashed lines on drawings.

Accessibility Requirements:
The following access requirements apply to the accessible entrances.

a. Entrances to comply with AS1428.1(2009), Clause 13 as part of the accessible path of travel.

b. Doors are to have a minimum clear opening width of 850mm to comply AS1428.1(2009), Clause 13.2 as part of the accessible path of travel. Where double door sets are provided, one door leaf is to be capable of being held in the closed position to provide door opening widths and circulation to comply with AS 1428.1.

c. Entrance doorways to have complying circulation areas as illustrated in AS1428.1(2009), Figure 31. Circulation areas to have a maximum crossfall of 1:40.

d. Doorways to have minimum 30% luminance contrast as described in AS1428.1(2009), Clause 13.1.

e. Door thresholds to be level to provide seamless entry as part of the accessible path of travel. Maximum allowable construction tolerance is 3mm for compliance with AS1428.1(2009), 5mm where beveled edges are provided between surfaces.

f. Doors to have hardware within the accessible height range of 900-1100mm above the finished floor level (AS1428.1(2009), Clause 13.5)

g. Door handles and related hardware shall be able to be unlocked and opened with one hand per AS1428.1 (2009), Clause 13.5.1. The handles shall enable a person who cannot grip to operate the door without their hand slipping from the handle. We recommend the use of lever handles.

4.9 Non-accessible Entrances

There are non-accessible entrances to the Food & Bev/Retail from Hunter Street. As they are located within 50m of an accessible entrance this is compliant with BCA requirements.

Compliance Summary:
Compliant Configuration

Commentary:
One (1) entrance to the Food & Bev/Retail from Hunter Street are not accessible entrances having stairs. An accessible entrance is provided within 50m of this entrance.

Accessibility Requirements:
The following access requirements apply to the non-accessible entrance.

a. Provide direction signage displaying the location of the accessible entrance that displays the International Symbol for Access per BCA Specification D3.6.

5 Interior

The interior areas of the development provide a variety of uses being residential, commercial and retail. The interior areas subject to accessibility requirements include the residential common areas being the entry lobbies, corridors, residential waste room, residential bike store/ external storage, swimming pool, pool deck, communal open space, pilates studio, gymnasium, function/multipurpose rooms, residence work from home space and sanitary facilities. The following do not apply to individual residential units.

5.1 Extent of Access Generally – BCA

Residential Use (Class 2):
Access for people with disabilities is required from a pedestrian entrance required to be accessible to at least 1 floor containing sole-occupancy units and to the entrance doorway of each sole-occupancy unit located on that level.

Where a ramp or a passenger lift is installed, access is required to the entrance doorway of each sole-occupancy unit within the building.

Access is also required to and within not less than 1 of each type of room or space for use in common by the residents.

Commercial and Retail Use (Class 5 & 6):
Access for people with disabilities is required to and within all areas normally used by the occupants.

Compliance Summary:
Compliant

5.2 Circulation Areas

BCA (Clause D3.3) requires the provision of turning spaces and passing areas to corridors to enable wheelchair circulation throughout a building.

Turning spaces 1540mm wide by 2070mm long are required within 2m of the end of corridors to enable a wheelchair to turn through 90° and passing areas 1800mm wide by 2000mm long are required every 20m along a corridor unless there is a clear line of sight.

Within corridor areas, 1500x1500mm is required to facilitate a 90° turn by a wheelchair. This must be accommodated within accessible areas.

Compliance Summary:
Compliant Configuration

Commentary:
All corridors offer the required circulation spaces.

5.3 Doorways Generally

AS1428.1 has requirements for doorways within the accessible path of travel to enable independent access for people using a wheelchair.

Compliance Summary:

Capable of compliance

Commentary:

Doorways within the accessible path of travel are provided with adequate circulation areas for compliance.

Accessibility Requirements:

Access requirements for doorways within the accessible path of travel are as follows.

a. Doorways within the accessible path of travel to have a minimum clear opening width of 850mm (AS1428.1(2009), Clause 13.2). We recommend the use of a 920 leaf door as a minimum to achieve adequate clear width. For double doors, the operable leaf must achieve this clear opening width.

b. All doorways within the accessible path of travel to have complying circulation areas as illustrated in AS1428.1(2009), Figure 31. Circulation areas to have a maximum crossfall of 1:40.

c. Doorways to have minimum 30% luminance contrast as described in AS1428.1(2009), Clause 13.1.

d. Door to have hardware within the accessible height range of 900-1100mm above the finished floor level (AS1428.1(2009), Clause 13.5)

e. Door handles and related hardware shall be able to be unlocked and opened with one hand per AS1428.1 (2009), Clause 13.5.1. The handles shall enable a person who cannot grip to operate the door without their hand slipping from the handle. We recommend the use of lever handles.

f. Doorways to external areas to achieve a level threshold as part of the accessible path of travel. Maximum allowable construction tolerance is 3mm for compliance with AS1428.1(2009), 5mm where beveled edges are provided between surfaces.

g. Doorways to have operational forces per AS1428.1 (2009), Clause 13.5.2. A maximum allowable force of 20N is required to operate the door.

5.4 Exempt Areas

BCA Clause D3.4 does not require access for people with disabilities to areas that would be inappropriate due to the particular use of the area or would pose a health and safety risk. This includes the path of travel to these areas.

5.5 Floor Finishes

All floor finishes are to be flush to provide an accessible path of travel throughout the different areas of the building. Maximum allowable construction tolerance is 3mm (5mm for bevelled edges) as part of the accessible path of travel. Refer to AS1428.1(2009), Clause 7.2 for further details. This should be implemented during construction to ensure compliance.

Compliance Summary:

To be addressed during detailed design stages

5.6 Carpet

AS1428.1 has access requirements for carpet. Where carpet is used as the floor surface, pile height should not exceed 4mm. Exposed edges will be fastened to the floor surface. Carpet trims shall have a vertical face not more than 3mm high.

BCA states that clause 7.4.1(a) of AS 1428.1 does not apply and is replaced with 'the pile height or pile thickness shall not exceed 11 mm and the carpet backing thickness shall not exceed 4 mm.

Compliance Summary:

To be addressed during detailed design stage.

5.7 Controls

Controls such as light switches, GPOs, alarm keypads, card swipes, etc are to be located within the accessible height range of 900-1100mm above the floor level and not within 500mm of an internal corner to comply with AS1428.1(2009), Clause 14. This should be implemented during construction to ensure compliance.

Compliance Summary:

To be addressed during detailed design stage.

5.8 Visual Indication to Glazing

Provide decals to all full height glazing that can be mistaken for a doorway to assist persons with a vision impairment. Decals to be solid and have a minimum 30% luminance contrast to the background colour and be not less than 75mm high located within the height range of 900-1100mm above the finished floor level per AS1428.1, Clause 6.6.

Compliance Summary:

To be addressed during detailed design stage.

5.9 Tactile Indicators

For a building that is required to be accessible, tactile ground surface indicators must be provided to warn people who are blind or have a vision impairment that they are approaching a stairway (other than a fire isolated stair); an escalator; a moving walkway; a ramp (other than a fire isolated ramp, step ramp, kerb ramp or swimming pool ramp); and in the absence of a suitable barrier, an overhead obstruction less than

2m above the floor level or an accessway ,meeting a vehicular way if there is no kerb or kerb ramp (BCA D3.8).

Tactile indicators are generally required to be 600-800mm deep across the width of the hazard and set back 300mm from the edge of the hazard (refer AS1428.4.1, Figure A1). Tactile indicators to be detectable, durable, non-slip and have a minimum 30% luminance contrast to the background color (45% for discrete tactile indicators and 60% for discrete two-tone tactile indicators).

Compliance Summary:
To be addressed during detailed design stage.

5.10 Signage

Signage to identify sanitary facilities, hearing augmentation and required exits are to be provided in accordance with BCA Clause D3.6. This includes provision of the International Symbol for Access or International Symbol for Deafness as appropriate. Signage to comply with AS1428.1 (2009), Clause 8.

Compliance Summary:
To be addressed during detailed design stage.

Accessibility Requirements:

Access requirements for signage are as follows. Note that this does not include general wayfinding signage.

a. Braille and tactile signage formats as outlined within BCA Specification D3.6 that incorporate the international symbol of access or deafness, as appropriate, in accordance with AS 1428.1 must be provided to identify the following:
   - a sanitary facility, except a sanitary facility associated with a bedroom in a Class 1b building or a sole-occupancy unit in a Class 3 or Class 9c building
   - a space with a hearing augmentation system
   - each door required by E4.5 to be provided with an exit sign and state level
   - an accessible unisex sanitary facility and identify if the facility is suitable for left or right handed use
   - an ambulant accessible sanitary facility 1 and be located on the door of the facility
   - where a pedestrian entrance is not accessible, directional signage incorporating the international symbol of access to direct a person to the location of the nearest accessible pedestrian entrance
   - where a bank of sanitary facilities is not provided with an accessible unisex sanitary facility, directional signage incorporating the international symbol of access must be placed at the location of the sanitary facilities that are not accessible, to direct a person to the location of the nearest accessible unisex sanitary

b. Braille and tactile components of the sign to be located not less than 1200mm and not higher than 1600mm affl.

c. Signage to be located at the latch side of the doorway with the leading edge of the sign 50-300mm from the architrave. Where this is not possible, the sign can be located on the door.

Sample signs are as follows. These are examples only – ensure selected signage complies with BCA Specification D3.6 including provision of Braille locator for multiple lines of text and characters.

5.11 Access to Swimming Pool

The BCA requires access for persons with a disability to swimming pools with a total perimeter greater than 40m that are associated with as Class 1b, 2, 3, 5, 6, 7, 8, or 9 building that this required to be accessible (Table D3.1).

For pools required to be accessible by this clause, not less than one accessible entry / exit must be provided by means of a fixed or moveable ramp and an aquatic wheelchair; or a zero-depth entry at a maximum gradient of 1:14; or a platform swimming pool lift; or a swing style swimming pool lift.

For pools with a perimeter greater than 70m, the use of a swing stile swimming pool lift is not permitted.

Compliance Summary:

Capable of compliance

Commentary:

The pool within the development has a perimeter of 46.5 m. Therefore, by definition, an accessible entrance to the pool is required.
A fixed ramp and stairs are provided for access into the swimming pool.

5.12 Slip Resistance (Stairs and Ramps)

The BCA defines the following slip resistance requirements for stairs and ramps:

Application	Surface Conditions	
	Dry	Wet
Ramp steeper than 1:14	P4 or R11	P5 or R12
Ramp steeper than 1:20 but not steeper than 1:14	P3 or R10	P4 or R11
Tread or Landing surface	P3 or R10	P4 or R11
Nosing or landing edge strip	P3	P4

Compliance Summary:

To be addressed during detailed design stage.

5.13 Thresholds

The threshold of a doorway must not incorporate a step or ramp at any point closer to the doorway than the width of the door leaf unless in a building required to be accessible by Part D3, the doorway opens to a road or open space; and is provided with a threshold ramp or step ramp in accordance with AS 1428.1.

Compliance Summary:

To be addressed during detailed design stages.

6 Sanitary Facilities

The BCA / Access Code for Buildings (Clause F2.4) require the provision of sanitary facilities catering for persons with a disability.

6.1 Distribution of Accessible Sanitary Facilities

Accessible sanitary facilities are required as follows.

- A unisex accessible toilet at each level that provides sanitary facilities. Where more than one bank of toilets is provided at any level, at least 50% of those banks will have an accessible toilet facility.

- At each bank of toilets where there is one or more toilets in additional to an unisex accessible sanitary compartment at the bank of toilets, a sanitary compartment suitable for a person with an ambulant disability in accordance with AS1428.1 must be provided for use by males and females

- A unisex accessible shower is required where showers are required by F2.3.

- A unisex accessible adult change facility must be provided in some public buildings.

Compliance Summary:

Compliant

Commentary:

A total of seven (7) unisex accessible sanitary compartments provided within the development.

There is no requirement for ambulant toilets, an accessible shower or accessibility adult change facility within this development.

6.2 Unisex Accessible Sanitary Compartment

Unisex accessible sanitary compartments are required within this development.

Compliance Summary:

Compliant Configuration

Commentary:

- A unisex accessible sanitary compartment is provided at North Tower Ground Floor Level adjacent to North Lobby.
- A unisex accessible sanitary compartment is provided North Tower Level 4 Podium.
- A unisex sanitary compartment (5 off) is provided at Level 1-5 at Shared Office Tower

Overall room dimensions and the set-out of fixtures of the unisex accessible sanitary compartments is conducive to compliance with current accessibility legislation.

Accessibility Requirements:

Access requirements for the accessible toilet facilities are as follows. For compliance with AS1428.1(2009), the minimum room dimensions of the accessible toilet are to be 1900x2300mm plus additional area for the handbasin. These are CLEAR dimensions. Provision for wall linings needs to be considered.

a. Accessible toilet facilities to be unisex facilities for compliance with the BCA.

b. Unisex accessible facilities to comply with AS1428.1(2009), Clause 15 including set-out of fittings and fixtures, circulation areas and doorways.

c. Where more than one unisex accessible toilet is provided within the building, they should be in a mirrored configuration to allow for both left and right-handed use.

WC Pan:

d. Crucial dimensions for the toilet are 450mm from centreline of pan to side wall, 800mm from front of pan to rear wall and a seat height of 470mm.

e. A minimum clear dimension of 1400mm is required from the toilet pan to any other fixture (see figure 43).

f. Grabrails to be provided at the side and rear of the toilet in compliance with AS1428.1 at a height of 800mm.

g. Toilet seat shall be of the full round type, be securely fixed in position when in use and have fixings that create lateral stability. They should be load rated to 150kg, have a minimum 30% luminance contrast to the background colour (eg pan, wall or floor) and remain in the upright position when fully raised.

h. Provide a backrest to accessible toilets to comply with AS1428.1, Clause 15.2.4.

Basin:

i. For the basin, a minimum dimension of 425mm is required from the centreline of the basin to the side wall and height of basin to be between 800 and 830mm.

j. Taps to have lever handles, sensor plates or similar controls. For lever taps, a minimum 50mm clearance to be provided to adjacent surfaces.

Door:

k. Doorways to have a minimum clear opening width of 850mm to comply AS1428.1(2009), Clause 13.2 as part of the accessible path of travel. Adequate circulation area at the latch side of the doorway is required to allow independent access to the facility – for details refer to AS1428.1, Figure 31.

l. Door hardware to be located within the accessible height range of 900-1100mm above the finished floor level. The use of lever handles is encouraged to assist persons with a manual disability such as arthritis.

Controls:

m. Controls such as light switches within the accessible toilet facilities to be in the accessible height range of 900-1100mm above the finished floor level to comply with AS1428.1(2009), Clause 14. Controls should be located not less than 500mm to a corner.

7 Vertical Circulation

The means of vertical circulation throughout the development is as follows:

- Lifts provide the main means of access between levels of the buildings. Five (5) lifts are provided within the development.
- A platform lift is provided for access to the swimming pool Level 4 Podium.
- Stairs are provided at Communal Open Space Level 4 Podium
- All other stairs within the building are fire isolated egress stairs.

7.1 Lifts

Where lifts are provided within a building to facilitate access between levels, they must meet the minimum requirements of the NCC / BCA with regard to the internal lift car size, which is dependent upon the total vertical distance that the lift travels.

Compliance Summary:

Capable of Compliance

Commentary:

Five (5) lifts are provided for access between levels.
The overall size of the lift shaft is capable of accommodating a lift car of adequate dimensions for compliance with BCA.

Accessibility Requirements:

The following access requirements apply to the lifts. These requirements are for disabled access only and do not include requirements for stretchers.

a. Lift is to comply with AS1735.12 and be fully automatic as required by the BCA, Clause E3.6.

b. Minimum internal dimensions of the lift car to be 1400mm wide x 1600mm deep BCA, Clause E3.6 – for a lift that travels over 12m.

c. Clear opening of the lift door to be minimum 900mm.

d. Provide a handrail complying with the provisions for a mandatory handrail in AS1735.12.

e. All lift control buttons are to be in the accessible height range of 900-1100mm affl and have a minimum 30% luminance contrast to the background colour. This includes buttons within the lift car and at each public lift lobby. All buttons are to be provided with information in Braille and tactile formats.

f. Auditory / voice cues are to be provided within the lift car to assist persons with a vision impairment.

g. Series of door opening devices that will detect a 75mm diameter rod across the door opening between 50 mm and 1550mm above the floor level.

h. Emergency hands-free communication, including a button that alerts a call centre of a problem, a light to signal that the call has been received by the call centre and a light indicating assistance is being dispatched.

7.2 Platform Lift

The BCA has limitations for the use of this type of lift as follows. It must not travel more than 12m.

Compliance Summary:

Capable of compliance

Commentary:

A platform lift is provided at Level 4 Podium for access to swimming pool and pool deck.

Accessibility Requirements:

Basic access requirements for Part 16 lifts are as follows (BCA Table E3.6a). Confirmation should be sought from the manufacturers to confirm compliance with AS1735.16 prior to installation.

a. Car size should be a minimum of 1100x1400mm to accommodate a wheelchair.

b. Clear opening of the lift door to be minimum 900mm.

c. Provide a handrail complying with the provisions for a mandatory handrail in AS1735.12.

d. All lift control buttons are to be in the accessible height range of 900-1100mm affl and have a minimum 30% luminance contrast to the background colour. This includes buttons within the lift car and at each public lift lobby. All buttons are to be provided with information in Braille and tactile formats.

7.3 Stairs

AS1428.1 has access requirements for all stairs other than fire isolated egress stairs and is applicable in this instance.

Compliance Summary:

Compliant configuration

Commentary:

Stairs are provided in one location:

- Communal Open Space Level 4 Podium.

Overall configuration offers compliance with current legislation. Ensure handrails with extensions both sides, tactile indicators top and bottom and contrasting non-slip nosings to treads are provided.

Accessibility Requirements:

Access requirements for public access stairs are as follows.

a. Stair construction to comply with AS1428.1, Clause 11.1.

b. Stairs to have closed or opaque risers. Open risers cause confusion for persons with a vision impairment and may trigger conditions such as epilepsy due to light penetrating through the open risers.

c. Where the stair intersects with an internal corridor, the stair shall be set back in accordance with AS1428.1 Figure 26C/D to allow adequate space for handrail extensions and tactile indicators.

d. Provide handrails, with extensions, to both sides of the stair (AS1428.1, Clause 11.2). Handrails to have an external diameter between 30-50mm to assist persons with a manual disability such as arthritis. Handrails should be continuous around the landings where possible.

   Handrails are required on both sides of the stair to cater for left and right-handed disabilities. A central handrail is also an acceptable solution where adequate width is available.

e. Stair nosings to have minimum 30% luminance contrast strip 50-75mm wide to the top of the stair tread to assist persons with a vision impairment. The strip can be set back 15mm from the edge of the riser.

f. Stair nosings shall not project beyond the face of the riser.

g. Provide tactile indicators at the top and bottom of the stair to comply with BCA Clause D3.8 and AS1428.4.1.

   Tactile indicators to be detectable, durable, non-slip and have a minimum 30% luminance contrast to the background colour. For discrete tactile indicators, 45% luminance contrast is required (60% where two-tone indicators are used).

7.4 Fire Isolated Egress Stairs

Designated fire egress stairs are not considered public access stairs and therefore are not subject to the requirements of AS1428.1 with the exception of contrasting nosing strips and handrail requirements. These are required per AS1428.1.

Compliance Summary:

Capable of compliance

Commentary:

Stairs are provided throughout the development to enable egress in the event of a fire.

Accessibility Requirements:

The following access requirements apply to fire isolated egress stairs.

a. Stair nosings to have minimum 30% luminance contrast strip 50-75mm wide to the top of the stair tread to assist persons with a vision impairment. The strip can be set back 15mm from the edge of the riser.

b. Stair nosings shall not project beyond the face of the riser.

c. Handrails in a required exit serving an area required to be accessible, are to be designed and constructed to comply with AS 1428.1, Clause 12 (BCA D2.17).

   Note: handrails within fire-isolated stars are required to one side only and do not require the provision of handrail extensions. They must have a diameter between 30-50mm; be between 865-1000mm high above the noising; be a consistent height along the length of the stair – no vertical sections; have a clearance to the wall not less than 50mm; have no obstruction along the length of its passage; and have an end that turns through 180, turns to the ground, or returns fully to an end post.

   We recommend the use of the staggered stair to maintain a constant height along the length of the handrail per AS1428.,1 (2009), Clause 12.

8 SEPP 65 Universal Housing Requirements Livable Housing

The NSW Government promotes better apartment design across NSW through the State Environmental Planning Policy No. 65 – Design Quality of Residential Apartments Development. Developments are to provide a minimum 20% of apartments that achieve silver level for livable housing.

Within this development, a total of eighty (80) apartments are provided that are capable of achieving silver level livable housing requirements per the Livable Housing Design Guidelines – Fourth Edition. Unit Type C-2B, a two-bedroom Unit, is nominated as Silver Level.

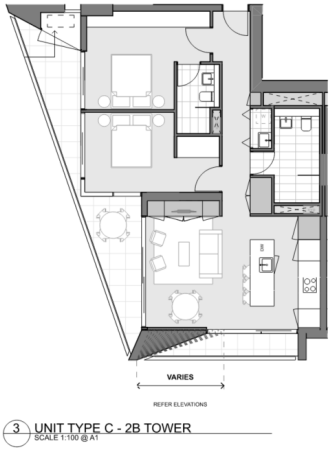

Figure 3 | Unit Type C-2B Floor Plan Arrangement

Livable housing requirements are summarised below:

8.1 Dwelling Access

There is a safe, continuous, step-free pathway from the street entrance and/or parking area to a dwelling entrance that is level.

- Path of travel should be minimum 1000mm wide with no steps; an even, slip resistant surface; crossfall not more than 1:40; and maximum slope of 1:14.
- Where ramps are required, landings at 9m intervals are to be provided and are to be not less than 1200mm in length.
- Where a carparking space is relied upon as the safe and continuous pathway to the dwelling, it should be at least 3200mm wide….
- Step ramps where provided to have a maximum gradient of 1:10, clear width of 1000mm and maximum length of 1900mm.
- Where ramps adjoin gates or doorways, landings no less than 1200mm in length, exclusive of the door swing, are required.

Compliance Summary:

Compliant

Commentary:

An accessible path of travel is provided to all Unit Type C-2B Units.

8.2 Dwelling Entrance

There is at least one level (step-free) entrance into the dwelling to enable home occupants to easily enter and exit the dwelling.

- Entrance doors to have a clear opening with of 820mm and have a level transition (5mm allowable tolerance – where in excess of 5mm, threshold ramp up to 56mm high is allowable)).
- Reasonable shelter from the weather is required.
- 1200x1200mm level landing area required on the arrival side of the door.

Compliance Summary:

Compliant Configuration

Commentary:

Entrances offer shelter and the required landing area.

Accessibility Requirements:

Door sizes and threshold details to be addressed during detailed design.
We recommend the use of an 870mm door leaf to achieve a clear opening of 820mm.

8.3 Internal Corridors and Doors

Internal doors and corridors facilitate comfortable and unimpeded movement between spaces.

- Doorways on the entry level used for living, dining, bedroom, bathroom, kitchen, laundry and sanitary compartment purposes to have a clear opening with of 820mm and level transition between surfaces (5mm allowable tolerance).
- Corridors to be 1000mm wide.

Compliance Summary:

Compliant Configuration

Commentary:

Corridors offer adequate clear width.

Accessibility Requirements:

Door sizes and threshold details to be addressed during detailed design. We recommend the use of an 870mm door leaf to achieve a clear opening of 820mm.

8.4 Toilet

The ground (or entry) level has a toilet to support easy access for home occupants and visitors.

- A toilet on the ground / entry floor is required to have a circulation area in front of the toilet pan 900x1200mm.
- Toilet pan is to be provided in a corner of a room.

Compliance Summary:

Compliant

Commentary:

Bathroom toilet offers compliant circulation areas and is provided in the corner of the room.

8.5 Shower

The bathroom and shower are designed for easy and independent access for all home occupants.

- A bathroom is required to have a non-slip hobless shower, located on the corner of the room.

Compliance Summary:

Compliant

Commentary:

Bathroom shower offers a hob less shower and is provided in the corner of the room.

Accessibility Requirements:

Other items mentioned above are to be addressed during detailed design stages.

8.6 Reinforcement of Bathroom & Toilet Walls

The bathroom and toilet walls are built to enable grabrails to be safely and economically installed.

- Walls to enable safe installation of grabrails to toilet, bath and shower.
- Reinforcement to be in the form of 25mm noggins or plywood sheeting with 12mm thickness.

Compliance Summary:

To be addressed during detailed design stages.

8.7 Internal Stairways

Where installed, stairways are designed to reduce the likelihood of injury and also enable future adaptation.

- Stairs to have a continuous handrail to one side of the stair where the rise is greater than 1m.

Compliance Summary:

Not applicable

9 Best Practice Measures for Consideration

We recommend a best practice approach to accessibility that goes beyond minimum standards and embraces the intent of the DDA. The following measures will promote inclusion and participation for all users.

9.1 Accessways

We recommend that the accessible path of travel be a minimum 1200mm wide to comply with AS1428.2. Wider pathways will allow easy access for more people who have a permanent disability, people with a temporary disability, people pushing prams and elderly people using walking frames and the like. This is in keeping with the principles of Universal Design.

For or a wheelchair and a pram to pass 1500mm is required and for two wheelchairs to pass requires 1800mm.

9.2 Automatic Entrance Doors

The provision of automatic sliding doorways maximizes access for people with a disability. Further, delivery drivers, people carrying parcels and the elderly also benefit from the provision of automatic doors.

Automatic doors provide safe, convenient access for everyone, regardless of age or ability in keeping with universal design principles. They also offer COVID-19 mitigation measures, reducing the transfer of germs and bacteria.

9.3 Accessible Service Counters

The provision of an accessible section of counter will benefit people using wheelchairs and people of short stature.

AS1428.2 contains access requirements for service counters and recommends the height of the counter be between 750mm(±20) and 850mm (±20) above the finished floor level and have foot and knee clearance under the counter. The minimum width of an accessible counter and clearance below is recommended as 900mm.

9.4 Hearing Augmentation at Service Counters

For buildings that are required to be accessible, the BCA (Clause D3.7) requires hearing augmentation systems at service counters **where the user is screened from the service provider**.

With the introduction of sneeze-screens as part of COVID-19 mitigation measures, the provision of hearing augmentation at service counters has become a critical accessibility issue for people with hearing impairment.

9.5 Luminance Contrast

Luminance contrast assists people with a vision impairment to navigate the built environment. Mandatory items that require luminance contrast are tactile indicators, accessible toilet seats and doorways as outlined in other sections of this report. The following can also be provided as a best practice measure to ensure ease of use:

- Minimum 30% luminance contrast between floors and walls or between walls and skirting boards;
- Minimum 30% luminance contrast between the ground surface and obstructions such as columns, bollards and street furniture;
- To assist people with vision impairment locate the building entrance, consider providing features with a minimum 30% luminance contrast to the background surface such as an entry mat or awning.
- Minimum 30% luminance contrast between the floor and the entrance mat (this allows people with vision impairment to locate the entrance;
- Minimum 30% luminance contrast between walls and handrails.

9.6 Visual Indication to Glazing (additional measures)

To ensure full height glazing that can be mistaken for a doorway is highlighted, we recommend the provision of a "double decal" as per international precedent. This involves the provision of two (2) decal strips that have a minimum 30% luminance contrast to each other. As such, the background colour does not need to be relied upon.

9.7 Furniture and Joinery Hardware

The use of D-type pull handles to furniture and joinery that provide a minimum 35mm clearance between the rear face of the handle and the face of the drawer is generally recommended to promote accessibility and inclusion.

9.8 Wayfinding – Signage

Signs and symbols should be provided to inform all users. A signage system which informs all users is encouraged. The use of pictograms and directional cues is recommended as is the use of luminance contrast to ensure the message is clear and legible.

9.9 Terminology (Best-practice recommendation)

The use of positive terminology such as "accessible" should be used when referring to accessible facilities such as toilets and carparking. This term is preferable to "disabled" which is commonly used. This principle is to be adopted through the design and documentation of a project and on signage throughout the completed building.

9.10 Emergency Call Button in Sanitary Compartments

If provided, emergency call button should be located at 600+/- 20mm above the finished floor level in front of the toilet roll holder to enable ease of access for someone who has fallen off the pan. People do fall off the pan, in particular those with no or limited upper trunk control.

10 Conclusion

This report demonstrates that the fundamental aims of accessibility legislation are achievable within the Dairy Farmers Corner Development 924 Hunter Street Newcastle West. Spatial planning and general arrangements of facilities will offer inclusion for all building users.

Disability is often defined as any limitation, restriction or impairment which restricts everyday activities and has lasted or is likely to last for at least 6 months. Disabilities can be very varied. They can be physical, cognitive, intellectual, mental, sensory, or developmental. They can be present at birth or can occur during a person's lifetime. They can also be permanent or temporary. In Australia, almost one in five people – 4.3 million – have a disability with one in three having severe or profound core activity limitation.

Equity and dignity are important aspects in the provision of access to buildings for all users. With respect to people with a disability, equity and dignity are sometimes overlooked in the construction of new buildings or refurbishment works. The design approach needs to maintain a high level of equity for people with disabilities and meet the performance requirements of the BCA. The performance requirements adopt two main concepts in the provision of access for people with a disability being **to the degree necessary** and **safe movement**. Both of these concepts need to be achieved within the context of equitable and dignified access.

In this respect, a wide range of disabilities needs consideration and a compromise reached between requirements of different disability groups. Measures need to be implemented to ensure inclusion of all users, not a particular disability group in isolation.

Appendix M

WIND ASSESSMENT (ARUP GROUP)

Thirdi Dairy Farmers Pty. Ltd.

Dairy Farmers Corner, 924 Hunter St, Newcastle

Wind Assessment

Wind

Rel. 2 | 13 October 2021

This report takes into account the particular instructions and requirements of our client.

It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

Job number 283778

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Document Verification

ARUP

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Document title		Wind Assessment			**File reference**
Document ref		Wind			
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			Prepared by	Checked by	Approved by
		Name	Graeme Wood	Amir Jafari	Graeme Wood
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		Description	Final drawings		
			Prepared by	Checked by	Approved by
		Name	Graeme Wood		Graeme Wood
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		Name			
				Issue Document Verification with Document	✓

Executive summary

Arup have been commissioned by Thirdi Dairy Farmers to provide an experienced-based wind assessment report on the impact of the proposed development at 924 Hunter Street, Newcastle, on the pedestrian level wind conditions for comfort and safety in and around the site.

Integrating the expected wind conditions with the wind climate for all wind directions, the wind conditions along Railway and Hunter Streets would be expected to be classified as suitable for pedestrian walking type activities hence meeting the intended use of the space. Wind conditions along the laneway around the small commercial building in the south-west corner of the site are expected to be classified as suitable for pedestrian standing type activities such as window shopping requiring additional amelioration such as permanent or temporary barriers to improve the local wind conditions when necessary.

It is Arup's opinion that all locations within the proposed development would meet the safety criterion, but would be approaching the criterion along Railway Street caused by winds from all directions.

To quantify the qualitative advice provided in this report, numerical or physical modelling of the development would be required.

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Disclaimer

This assessment of the site environmental wind conditions is presented based on engineering judgement. In addition, experience from more detailed simulations has been used to refine recommendations. No detailed simulation, physical or computational study has been made to develop the recommendations presented in this report.

1 Introduction

Thirdi Dairy Farmers have engaged Arup to provide a qualitative environmental wind assessment for the proposed 924 Hunter St development. This report outlines the assessment and subsequent recommendations for wind engineering services related to pedestrian wind comfort and safety on the ground level.

To quantify the qualitative advice provided in this report, numerical or physical modelling would be required.

2 Site description

The proposed 924 Hunter St site is located in Newcastle West on the south-west corner of the block bounded by Cooper, Hunter, and Railway Streets, and the Railway line, Figure 1.

Figure 1: Site location (source: Google Maps, 2019)

The site is predominantly surrounded by low- to medium-rise buildings. Local wind conditions are generally dictated by the larger exposed buildings, such as the subject site. Topography surrounding the site is essentially flat from a wind perspective.

The proposed development consists of two prismatic towers of irregular floor plan rising above a common podium, with a smaller satellite commercial building to the south-west, Figure 2 to Figure 5. The west and east towers rise to a maximum height of about 95 and 80 m above ground level respectively, Figure 2. The ground floor includes an access laneway around the commercial building with food and beverage outlets to the north, Figure 3.

The top of the podium (Level 4, Figure 4) has a large outdoor terrace wrapping around the towers with an outdoor pool in the north-east corner. As the accessible space wraps around the towers, there will generally always have an area that is protected from the wind conditions with any landscaping offering additional local protection. The towers are generally setback from the podium with the exception of the west façade to the west tower where the tower overhangs to podium towards Railway Street, and to the south of both towers with minimal setback, Figure 3.

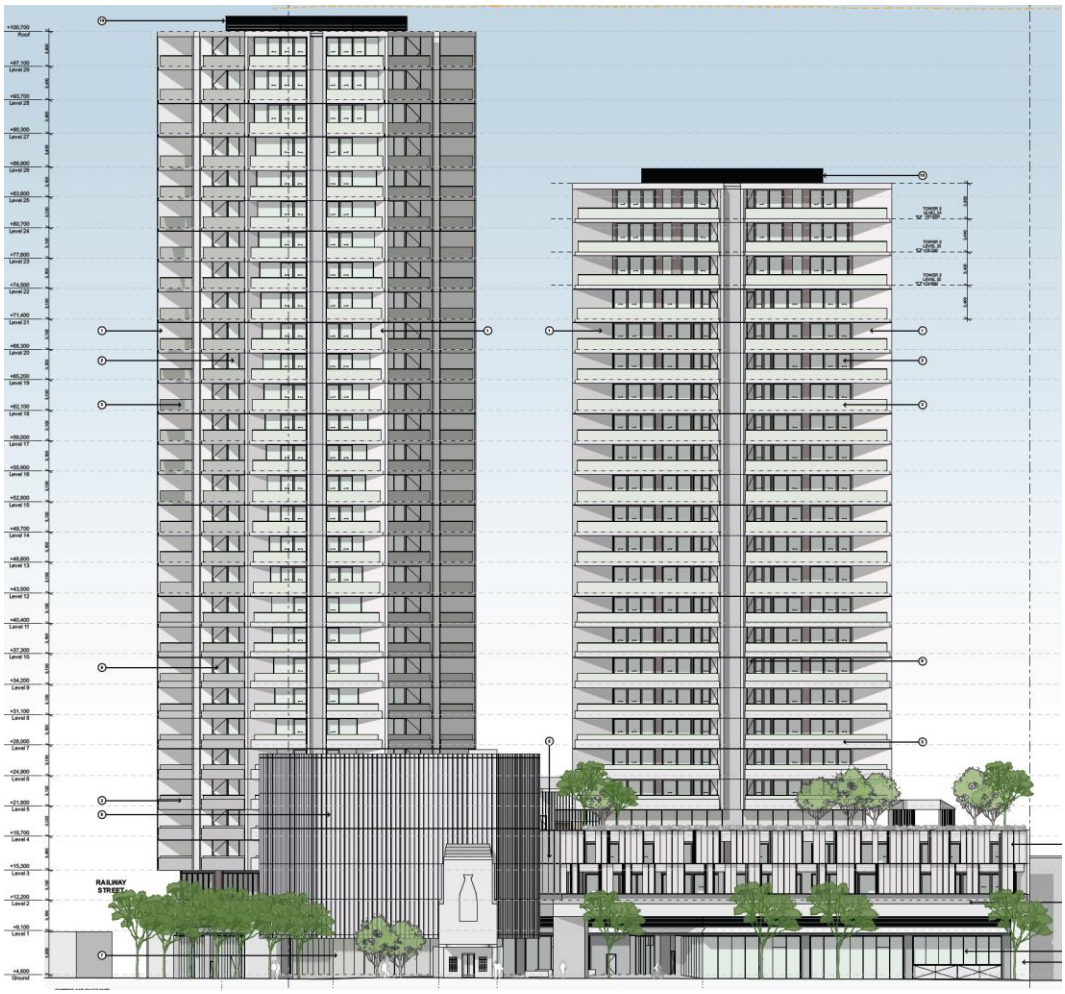

Figure 2: South elevation

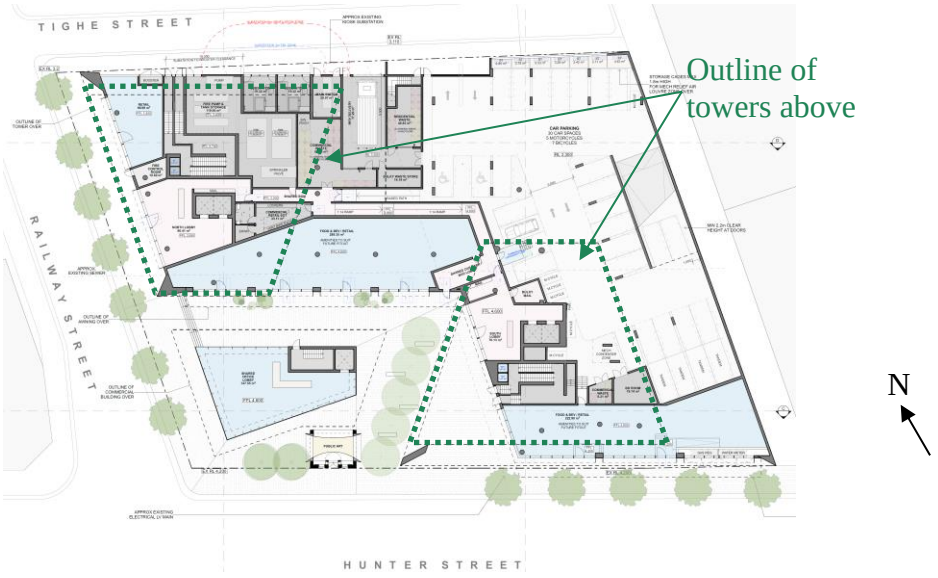

Figure 3: Ground floor plan

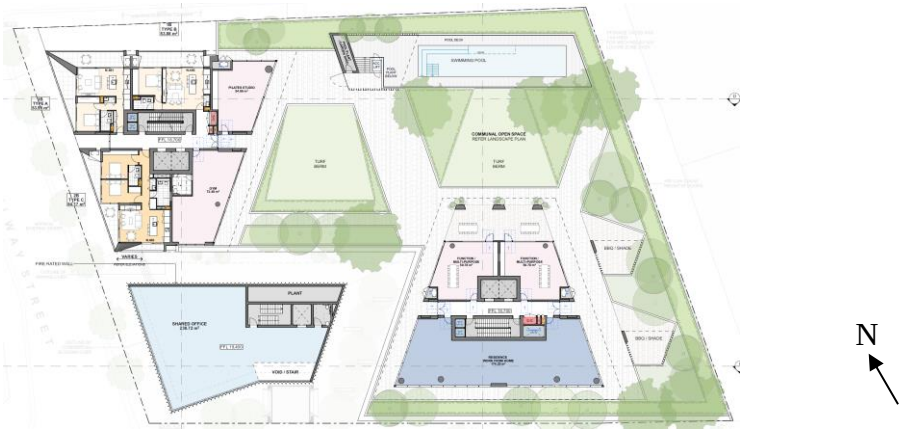

Figure 4: Top of podium (Level 4) with outdoor terrace

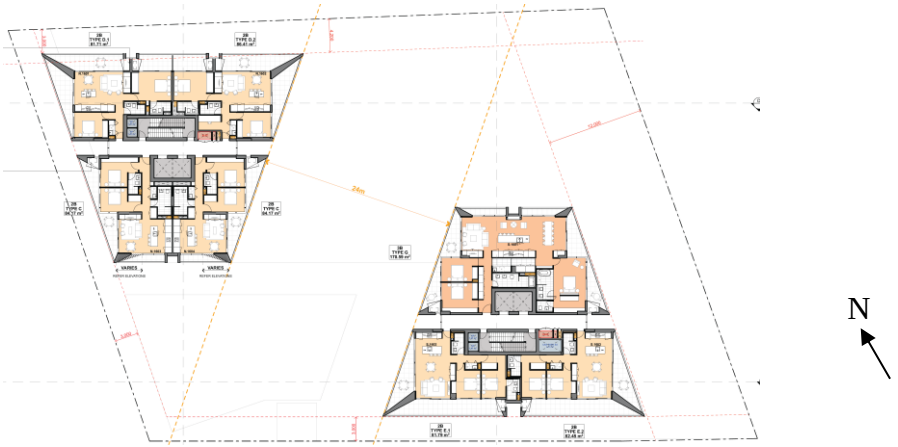

Figure 5: Typical tower floor

3 Wind assessment

3.1 Local wind climate

Weather data recorded at Nobby's Head by the Bureau of Meteorology has been analysed for this project, Figure 6 and Figure 7. The anemometer is located 10 m above the ground, about 3.5 km to the east of the site, Figure 1. The arms of the wind rose point in the direction from where the wind is coming from. The directional wind speeds measured here are considered representative of the incident wind conditions at the site, due to close proximity to the site.

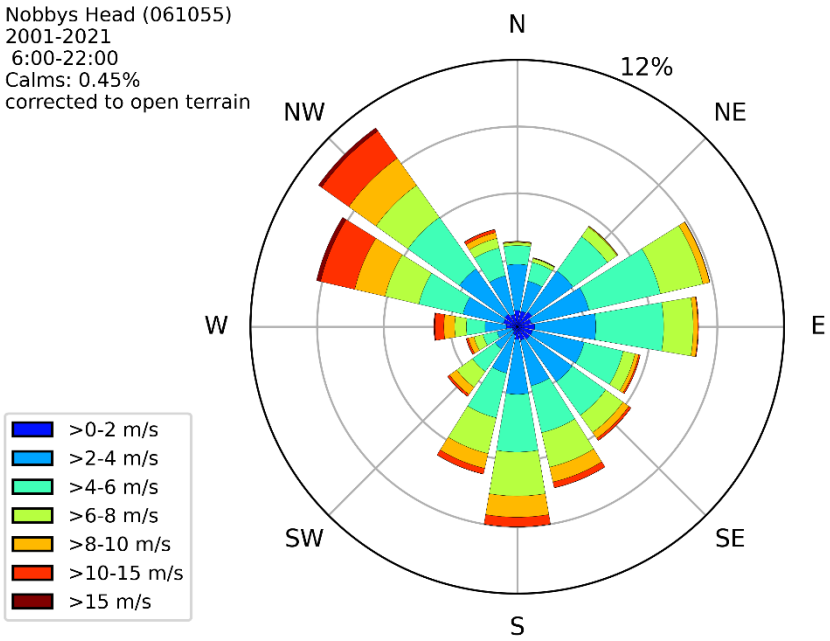

Figure 6: Wind rose showing probability of time of wind direction and speed

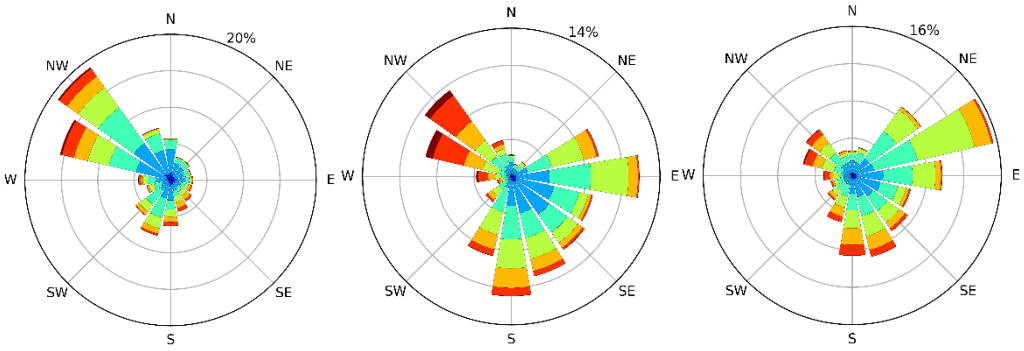

Figure 7: Wind roses for morning 6-11 am (L), afternoon 12-4 pm (C), and evening 5-8 pm (R)

It is evident from Figure 6 that the prevailing wind directions are from the north-west and south quadrants with stronger winds from the north-west, and from Figure 7 that the general wind speed and direction change throughout the day. The

measured mean (50 percentile) wind speed, and the 5% exceedance mean wind speed associated with the Lawson comfort criterion for the various times are presented in Table 1.

Table 1: Probabilistic wind speed for different time of day

Probability	All time	6-11 am	12-4 pm	5-8 pm
50%^{ile} at anemometer	4.8	4.5	5.8	5.5
5%^{ile} exceedance at anemometer	10.5	10.4	11.3	10.5
5%^{ile} exceedance at ground level in Newcastle	6.7	6.6	7.2	6.6

A general description on flow patterns around buildings is given in Appendix 1.

3.2 Specific wind controls

Wind comfort is generally measured in terms of wind speed and rate of change of wind speed, where higher wind speeds and gradients are considered less comfortable. Air speed has a large impact on thermal comfort and is generally welcome during hot summer conditions. There have been many wind comfort criteria proposed, and a general discussion including the effect of wind on people is presented in Appendix 2.

There are no specific wind controls for the site. The wind controls used in this wind assessment are based on the work of Lawson (1990), which are described in Figure 20 and Table 2 for both pedestrian comfort and safety.

Table 2: Pedestrian comfort criteria for various activities

Comfort (max. of mean or GEM wind speed exceeded 5% of the time)	
<2 m/s	Dining
2-4 m/s	Sitting
4-6 m/s	Standing
6-8 m/s	Walking
8-10 m/s	Objective walking or cycling
>10 m/s	Uncomfortable
Safety (max. of mean or GEM wind speed exceeded 0.022% of the time)	
<15 m/s	General access
15-20 m/s	Able-bodied people (less mobile or cyclists not expected)
>20 m/s	Unacceptable

3.3 Predicted wind conditions on ground plane

This section of the report outlines the predicted wind flow patterns and conditions on the ground plane based on the local climate, topography, and building form.

With reference to the wind climate, converting the 5% of the time mean wind speed from the anemometer location at 10 m height to near ground level in similar surrounds to the site would result in a wind speed of about 7 m/s for all hours and times of day, Table 1. According to the Lawson comfort criterion, wind speeds of this magnitude would be classified as suitable for pedestrian walking type activities.

Winds from the north-west

The proposed towers are exposed to winds from the north-west, Figure 8. These winds would impinge on the sharp north corner of the west tower, which would encourage horizontal flow reducing the amount of downwash. The overhang of the west (yellow) tower would increase the wind speed around the corner of Railway and Hunter Streets. Downwash from the tower would be expected to be disrupted by the roof of the small commercial building on the south-west corner, which would act as a podium, reducing the strength of downwash reaching ground level, Figure 8. The skewed orientation of the laneway would limit the amount of downwash flow directed into the laneway, wind conditions in the laneway are expected to be relatively breezy with pressure-driven flow making long-term stationary outdoor activities uncomfortable without additional local amelioration, particularly during the morning and afternoon.

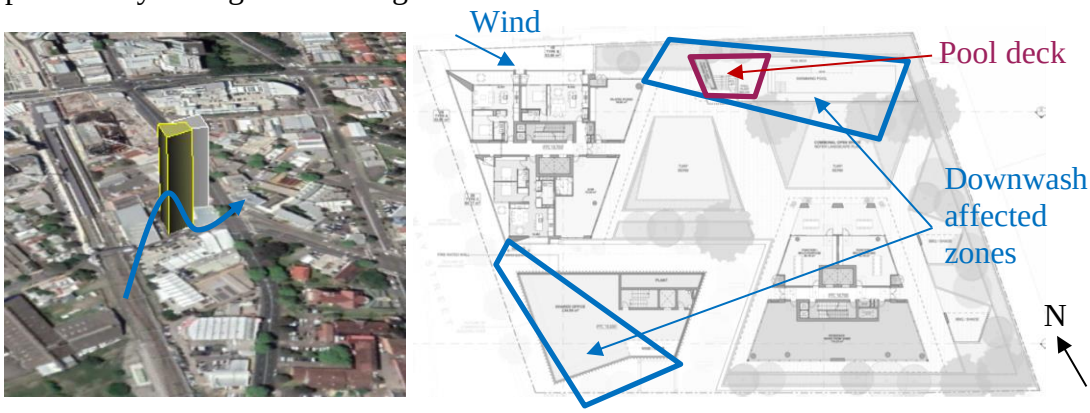

Figure 8: View of site from the north-west (L) (Google Earth 2019) and Level 4 affected areas (R)

Downwash would more affect the wind conditions across the north section of the Level 4 podium, and along Tighe Street, Figure 8, due to the minor tower setback from the podium edge. Tighe Street is not a major pedestrian thoroughfare. The roof and vertical walls around the pool deck, Figure 9, will offer local protection to this area.

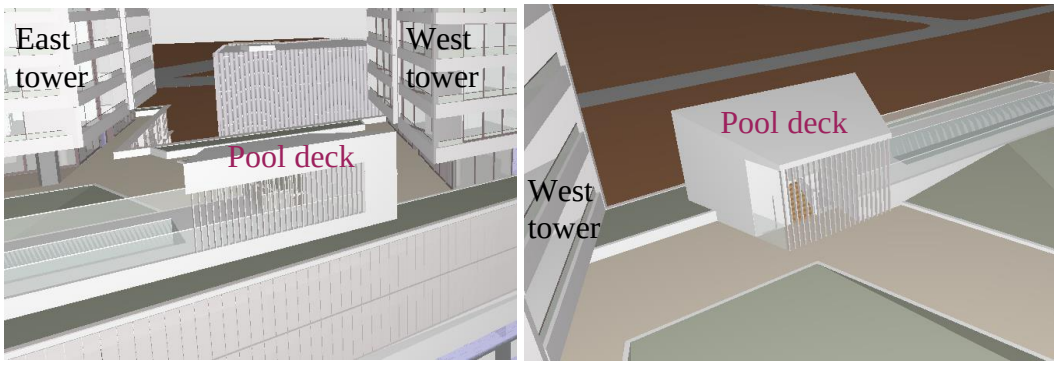

Figure 9: View of the pool deck from north-east (L) and south-west (R)

Winds from the south and south-east quadrants

Winds from the south and south-east quadrants would be relatively undisturbed on reaching the site impinging on the southern corner of the east (white) tower, Figure 10. This would encourage horizontal flow around the tower reducing the

amount of downwash. The east tower orientation would direct a greater portion of the flow to the west rather than the east, over the roof of the commercial building before discharging across Railway Street. The lack of west tower setback from the podium edge would direct more flow to ground level. The wind condition at the intersection of the laneway and Railway Street are expected to be windy. Mitigation would be achieved with the inclusion of a horizontal element over the laneway.

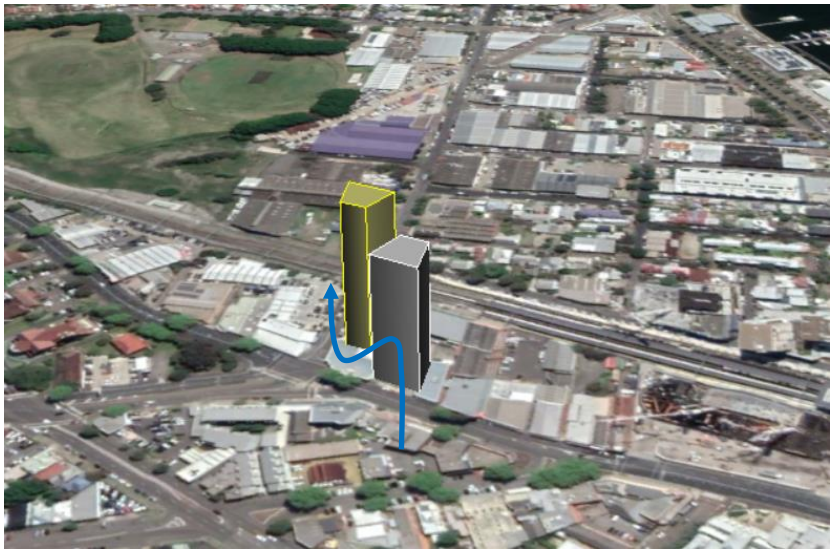

Figure 10: View of site from the south (Google Earth 2019)

Winds from the north-east

Prevailing evening winds from the north-east are generally light. These winds are a sea breeze generated with hot conditions and occur later in the day; the warmer the temperature, the stronger the flow.

The high-rise development is exposed to winds from the north-east due to the open nature of the foreshore area and low- to medium-rise structures upwind of the site, Figure 11. The flow from this direction would impinge on the north-east corner of the towers. The tower orientations would direct more flow to the west across the podium from the east (white) tower and along Tighe Street from the west (yellow) tower. The wide tower setback from the podium edge to the east and the south-west commercial building would redirect a portion of the downwash, but would be expected to cause stronger winds along Hunter Street to the west. The downwash component from the broad face of the west tower would be directed along Tighe Street and across Railway Street. Stronger winds will be felt at the junction and across Railway Street.

The ground level laneway would be relatively well protected by the surrounding buildings for winds from this direction.

The Level 4 terrace between the tower would be expected to be relatively windy, with the conditions improving in the outdoor pool deck area in the north-west corner.

Figure 11: View of site from the north-east (Google Earth 2019)

Summary

Arup have provided qualitative advice on the impact of the proposed development on pedestrian wind comfort.

Integrating the expected wind conditions with the wind climate for all wind directions, the wind conditions along Railway and Hunter Streets would be expected to be classified as suitable for pedestrian walking type activities hence meeting the intended use of the space. Wind conditions along the laneway around the small commercial building in the south-west corner of the site are expected to be classified as suitable for pedestrian standing type activities such as window shopping requiring additional amelioration such as permanent or temporary barriers to improve the local wind conditions when necessary.

As one of the uses of the podium roof is to redirect downwash before reaching ground level, it is considered that wind conditions at the majority of locations on the Level 4 rooftop terrace would be classified as suitable for pedestrian walking type activities, meeting the wind speed associated with the outdoor sitting classification for about 75% of the time. With the range of prevailing incident wind directions, the size of the terrace with localised sheltered areas with the pool deck and barbeque areas, there is likely a location with calmer conditions.

It is Arup's opinion that all locations within the proposed development would meet the safety criterion but would be approaching the criterion along Railway Street caused by winds from all directions.

To quantify the qualitative advice provided in this report, numerical or physical modelling of the development would be required.

4 References

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Appendix 1: Wind flow mechanisms

An urban environment generates a complex wind flow pattern around closely spaced structures, hence it is exceptionally difficult to generalise the flow mechanisms and impact of specific buildings as the flow is generated by the entire surrounds. However, it is best to start with an understanding of the basic flow mechanisms around an isolated structure.

Isolated building

When the wind hits an isolated building, the wind is decelerated on the windward face generating an area of high pressure, Figure 12, with the highest pressure at the stagnation point at about two thirds of the height of the building. The higher pressure bubble extends a distance from the building face of about half the building height or width, whichever is lower. The flow is then accelerated down and around the windward corners to areas of lower pressure, Figure 12. This flow mechanism is called **downwash** and causes the windiest conditions at ground level on the windward corners and along the sides of the building.

Rounding the building corners or chamfering the edges reduces downwash by encouraging the flow to go around the building at higher levels. However, concave curving of the windward face can increase the amount of downwash. Depending on the orientation and isolation of the building, uncomfortable downwash can be experienced on buildings of greater than about 6 storeys.

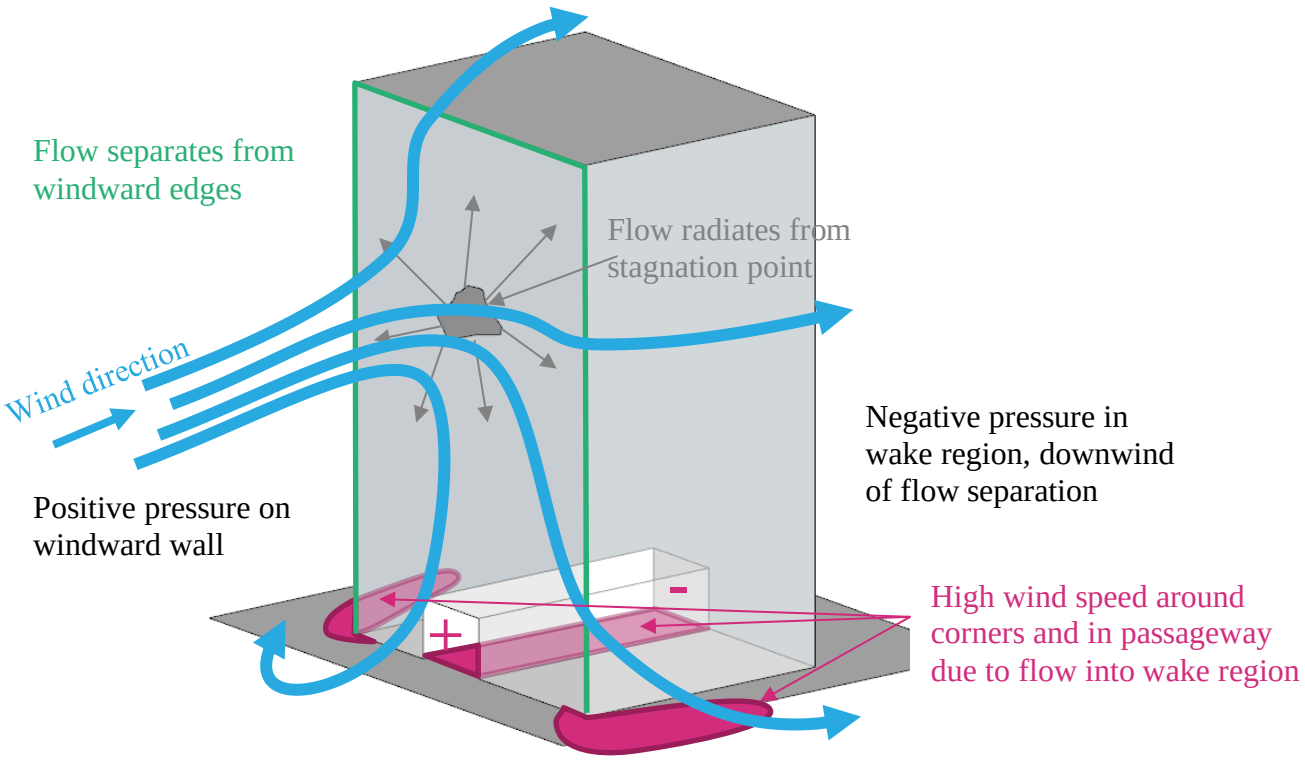

Figure 12 Schematic wind flow around tall isolated building

Techniques to mitigate the effects of downwash winds at ground level include the provision of horizontal elements, the most effective being a podium to divert the downward flow away from pavements and building entrances, but this will generate windy conditions on the podium roof, Figure 11. Generally, the lower the podium roof and deeper the setback from the podium edge to the tower improves the ground level wind conditions. The provision of an 8 m setback on an isolated building is generally sufficient to improve ground level conditions, but is highly dependent on the building isolation, orientation to prevailing wind directions, shape and width of the building, and any plan form changes at higher level.

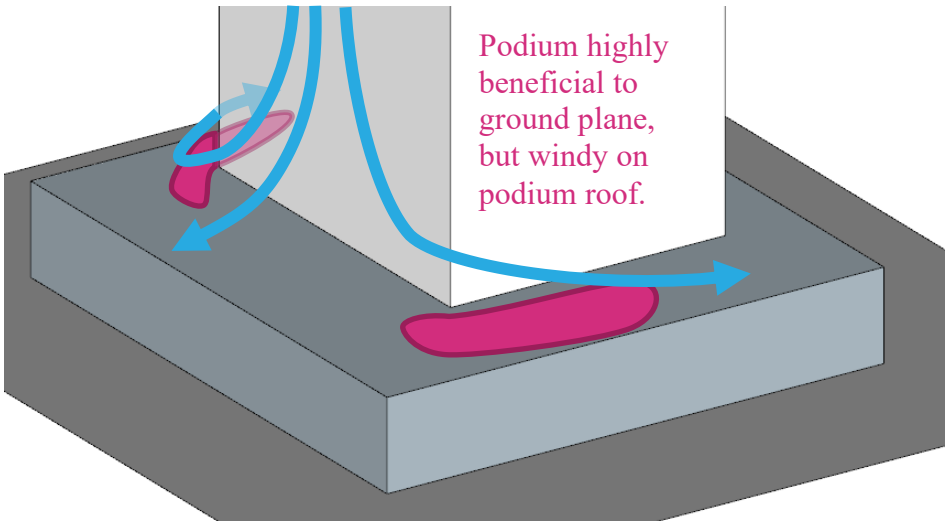

Figure 13 Schematic flow pattern around building with podium

Awnings along street frontages perform a similar function as a podium, and generally the larger the horizontal projection from the façade, the more effective it will be in diverting downwash flow, Figure 14. Awnings become less effective if they are not continuous along the entire façade, or on wide buildings as the positive pressure bubble extends beyond the awning resulting in horizontal flow under the awning.

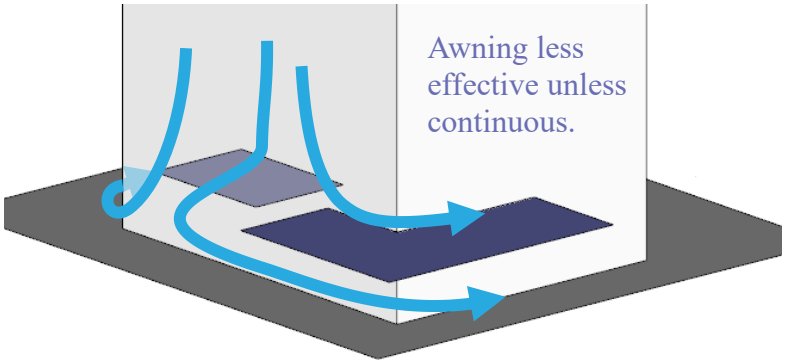

Figure 14 Schematic flow pattern around building with awning

It should be noted that colonnades at the base of a building with no podium generally create augmented windy conditions at the corners due to an increase in the pressure differential, Figure 15. Similarly, open through-site links through a building cause wind issues as the environment tries to equilibrate the pressure generated at the entrances to the link, Figure 12. If the link is blocked, wind

conditions will be calm unless there is a flow path through the building, Figure 16. This area is in a region of high pressure and therefore the is the potential for internal flow issues. A ground level recessed corner has a similar effect as an undercroft, resulting in windier conditions, Figure 16.

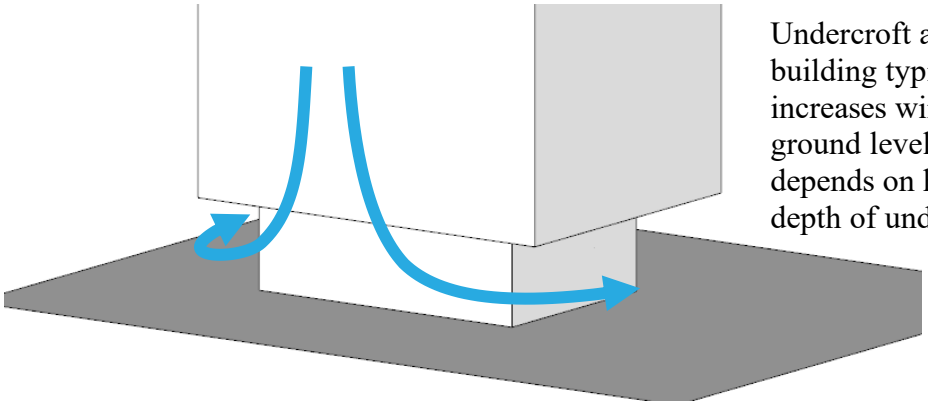

Figure 15 Schematic of flow patterns around isolated building with undercroft

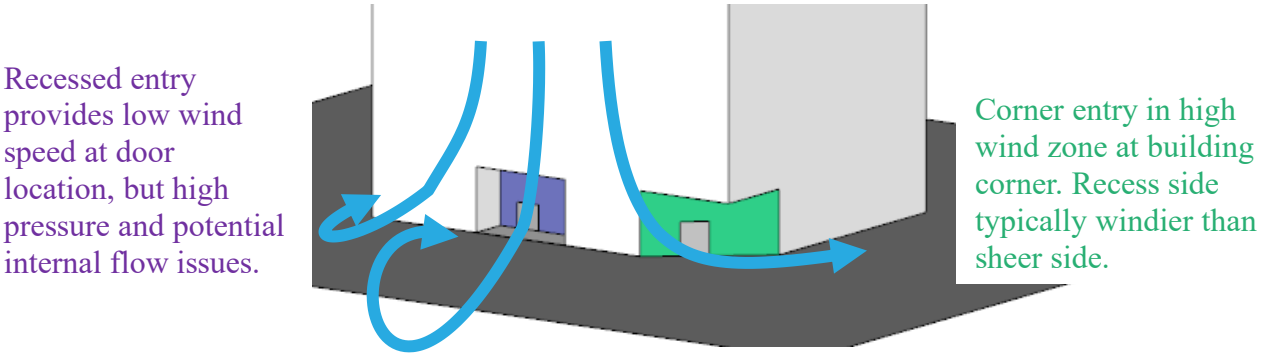

Figure 16 Schematic of flow patterns around isolated building with ground articulation

Multiple buildings

When a building is located in a city environment, depending on upwind buildings, the interference effects may be positive or negative, Figure 17. If the building is taller, more of the wind impacting on the exposed section of the building is likely to be drawn to ground level by the increase in height of the stagnation point, and the additional negative pressure induced at the base. If the upwind buildings are of similar height then the pressure around the building will be more uniform hence downwash is typically reduced with the flow passing over the buildings.

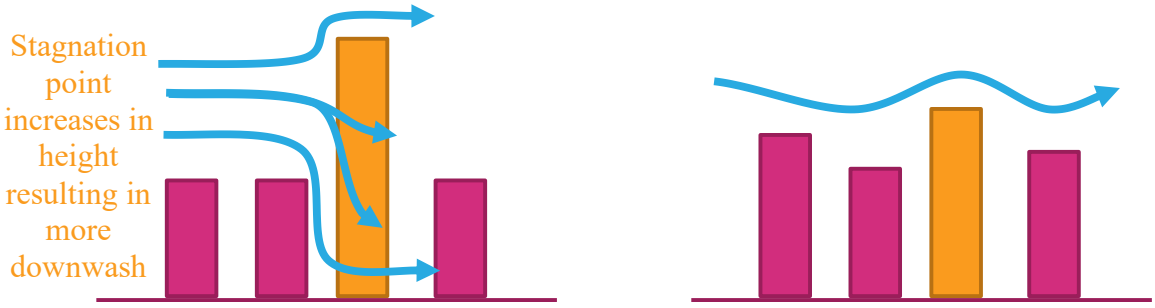

Figure 17 Schematic of flow pattern interference from surrounding buildings

The above discussion becomes more complex when three-dimensional effects are considered, both with orientation and staggering of buildings, and incident wind direction, Figure 18.

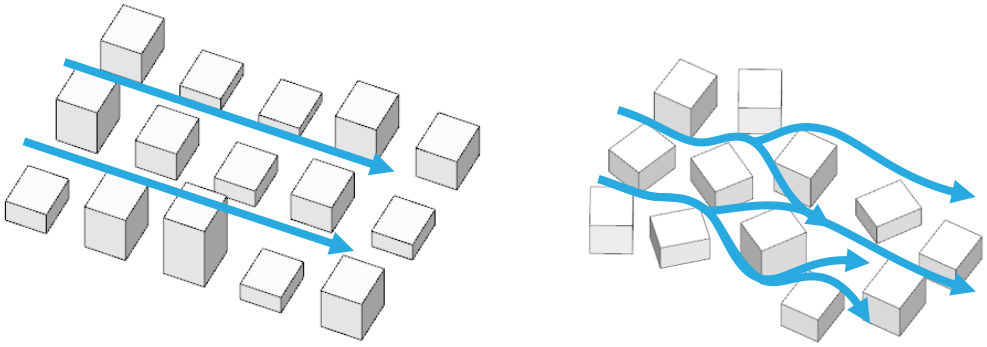

Figure 18 Schematic of flow patterns through a grid and random street layout

Channelling occurs when the wind is accelerated between two buildings, or along straight streets with buildings on either side, Figure 18(L), particularly on the edge of built-up areas where the approaching flow is diverted around the city massing and channelled along the fringe by a relatively continuous wall of building facades. This is generally the primary mechanism driving the wind conditions for this perimeter of a built-up area, particularly on corners, which are exposed to multiple wind directions. The perimeter edge zone in a built-up area is typically about two blocks deep. Downwash is more important flow mechanism for the edge zone of a built-up area with buildings of similar height.

As the city expands, the central section of the city typically becomes calmer, particularly if the grid pattern of the streets is discontinued, Figure 18(R). When buildings are located on the corner of a central city block, the geometry becomes slightly more important with respect to the local wind environment.

Single barriers and screens

The wind flow pattern over a vertical barrier is illustrated in Figure 19, showing there will be recirculation zones near the windward wall and in the immediate lee of the barrier. The typical extent of these recirculation zones relative to the height of the barrier, h, is illustrated in Figure 19. These regions are not fixed but fluctuate in time. The mean wind speed in the wake areas drops significantly compared with the incident flow. With increasing distance from the barrier the flow pattern will resort to the undisturbed state. Typically the mean velocity and turbulence intensity at barrier height would be expected to be within 10% of the free stream conditions at 10 times the height of the structure downwind from the barrier.

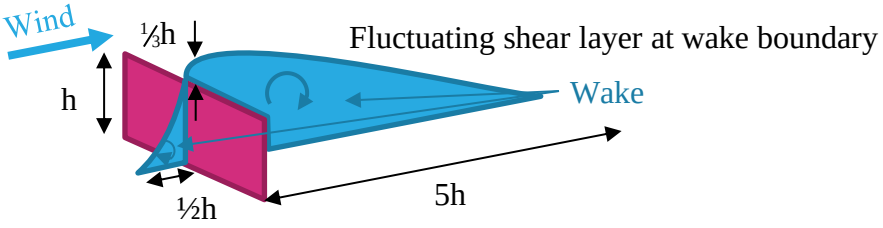

Figure 19: Sketch of the flow pattern over an isolated vertical element

Appendix 2: Wind speed criteria

General discussion

Primary controls that are used in the assessment of how wind affects pedestrians are the wind speed, and rate of change of wind speed. A description of the effect of a specific wind speed on pedestrians is provided in Table 3. It should be noted that the turbulence, or rate of change of wind speed, will affect human response to wind and the descriptions are more associated with response to mean wind speed.

Table 3 Summary of wind effects on pedestrians

Description	Speed (m/s)	Effects
Calm, light air	0–2	Human perception to wind speed at about 0.2 m/s. Napkins blown away and newspapers flutter at about 1 m/s.
Light breeze	2–3	Wind felt on face. Light clothing disturbed. Cappuccino froth blown off at about 2.5 m/s.
Gentle breeze	3–5	Wind extends light flag. Hair is disturbed. Clothing flaps.
Moderate breeze	5–8	Raises dust, dry soil. Hair disarranged. Sand on beach saltates at about 5 m/s. Full paper coffee cup blown over at about 5.5 m/s.
Fresh breeze	8–11	Force felt on body. Limit of agreeable wind on land. Umbrellas used with difficulty. Wind sock fully extended at about 8 m/s.
Strong breeze	11–14	Hair blown straight. Difficult to walk steadily. Wind noise on ears unpleasant. Windborne snow above head height (blizzard).
Near gale	14–17	Inconvenience felt when walking.
Gale	17–21	Generally impedes progress. Difficulty with balance in gusts.
Strong gale	21–24	People blown over by gusts.

Local wind effects can be assessed with respect to a number of environmental wind speed criteria established by various researchers. These have all generally been developed around a 3 s gust, or 1 hour mean wind speed. During strong events, a pedestrian would react to a significantly shorter duration gust than a 3 s, and historic weather data is normally presented as a 10 minute mean.

Despite the apparent differences in numerical values and assumptions made in their development, it has been found that when these are compared on a probabilistic basis, there is some agreement between the various criteria. However, a number of studies have shown that over a wider range of flow conditions, such as smooth flow across water bodies, to turbulent flow in city centres, there is less general agreement among. The downside of these criteria is that they have seldom been benchmarked, or confirmed through long-term

measurements in the field, particularly for comfort conditions. The wind criteria were all developed in temperate climates and are unfortunately not the only environmental factor that affects pedestrian comfort.

For assessing the effects of wind on pedestrians, neither the random peak gust wind speed (3 s or otherwise), nor the mean wind speed in isolation are adequate. The gust wind speed gives a measure of the extreme nature of the wind, but the mean wind speed indicates the longer duration impact on pedestrians. The extreme gust wind speed is considered to be suitable for safety considerations, but not necessarily for serviceability comfort issues such as outdoor dining. This is because the instantaneous gust velocity does not always correlate well with mean wind speed, and is not necessarily representative of the parent distribution. Hence, the perceived 'windiness' of a location can either be dictated by strong steady flows, or gusty turbulent flow with a smaller mean wind speed.

To measure the effect of turbulent wind conditions on pedestrians, a statistical procedure is required to combine the effects of both mean and gust. This has been conducted by various researchers to develop an equivalent mean wind speed to represent the perceived effect of a gust event. This is called the 'gust equivalent mean' or 'effective wind speed' and the relationship between the mean and 3 s gust wind speed is defined within the criteria, but two typical conversions are:

$$U_{GEM} = \frac{(U_{1\ hour\ mean} + 3 \cdot \sigma_u)}{1.85} \text{ and } U_{GEM} = \frac{1.3 \cdot (U_{1\ hour\ mean} + 2 \cdot \sigma_u)}{1.85}$$

It is evident that a standard description of the relationship between the mean and impact of the gust would vary considerably depending on the approach turbulence, and use of the space.

A comparison between the mean and 3 s gust wind speed criteria from a probabilistic basis are presented in Figure 20 and Figure 22. The grey lines are typical results from modelling and show how the various criteria would classify a single location. City of Auckland has control mechanisms for accessing usability of spaces from a wind perspective as illustrated in Figure 20 with definitions of the intended use of the space categories defined in Figure 21.

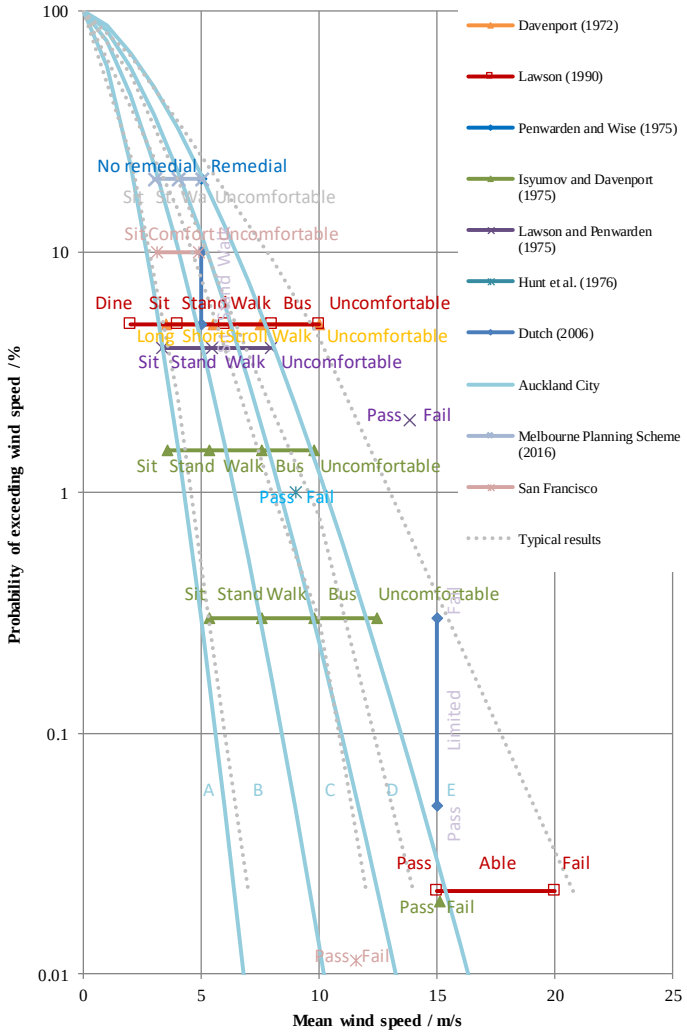

Figure 20 Probabilistic comparison between wind criteria based on mean wind speed

Category A	Areas of pedestrian use or adjacent dwellings containing significant formal elements and features intended to encourage longer term recreational or relaxation use i.e. public open space and adjacent outdoor living space
Category B	Areas of pedestrian use or adjacent dwellings containing minor elements and features intended to encourage short term recreation or relaxation, including adjacent private residential properties
Category C	Areas of formed footpath or open space pedestrian linkages, used primarily for pedestrian transit and devoid of significant or repeated recreational or relaxational features, such as footpaths not covered in categories A or B above
Category D	Areas of road, carriage way, or vehicular routes, used primarily for vehicular transit and open storage, such as roads generally where devoid of any features or form which would include the spaces in categories A - C above.
Category E	Category E represents conditions which are dangerous to the elderly and infants and of considerable cumulative discomfort to others, including residents in adjacent sites. Category E

Figure 21: Auckland Utility Plan (2016) wind categories

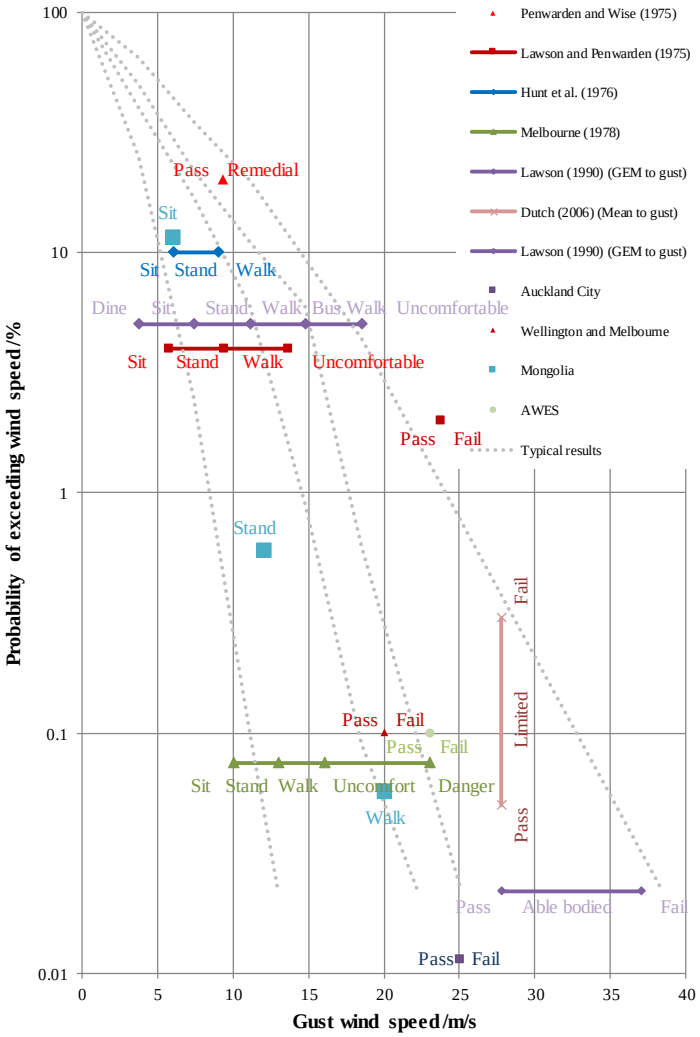

Figure 22 Probabilistic comparison between wind criteria based on 3 s gust wind speed

Appendix 3: Referenced Documents

21014_A-0001_04.pdf
21014_A-0002_02.pdf
21014_A-0003_02.pdf
21014_A-0004_02.pdf
21014_A-0005_02.pdf
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21014_A-1111_11.pdf
21014_A-1112_11.pdf
21014_A-1201_11.pdf
21014_A-1202_06.pdf
21014_A-2001_05.pdf
21014_A-2002_05.pdf
21014_A-2003_05.pdf
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21014_A-3001_05.pdf
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21014_A-7006_01.pdf
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Appendix N

NCC ASSESSMENT REPORT (CREDWELL CONSULTING)

Project	Dairy Farmers Corner 924 Hunter Street, Newcastle West
Report	NCC Assessment Report (DA Stage)
Reference	C21313-NCC-r1
Date	8 October 2021
Client	Catalyst Project Consulting
Contact	Anthony D'Arcy anthony.darcy@catalystpc.com.au

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Document Control

Reference/Revision	Date	Description	NCC Assessment Report
C21313-NCC-r1	8 October 2021	**Prepared by**	**Beau Zaia** Senior Building Surveyor Development Consultant
		Reviewed by	**James Deters** Building Surveyor – Unrestricted BDC0089 Director

1 Introduction

1.1 Building Location

The proposed development the subject of this report, will be located at 924 Hunter Street, Newcastle West and will be known as the "Dairy Farmers Corner".

The proposal is a large mixed-use development comprising of three (3) standalone buildings that are bound by Hunter, Railway and Tighe Street.

The three (3) buildings (known as A, B and C) are summarised as follows:

Building A

Is a large mixed used building, containing a total of thirty (30) storeys.

The ground floor will comprise of retail tenancies, residential lobbies, car parking, loading dock and associated service and plant rooms. The upper ground floor will provide a level of carparking with two (2) open stairs that will connect directly to the ground floor.

Level 1 will comprise of car parking and residential storage.

Levels 2 and 3 will comprise of residential units, carparking and associated storage.

Level 4 will comprise of residential units, communal open space and multipurpose rooms.

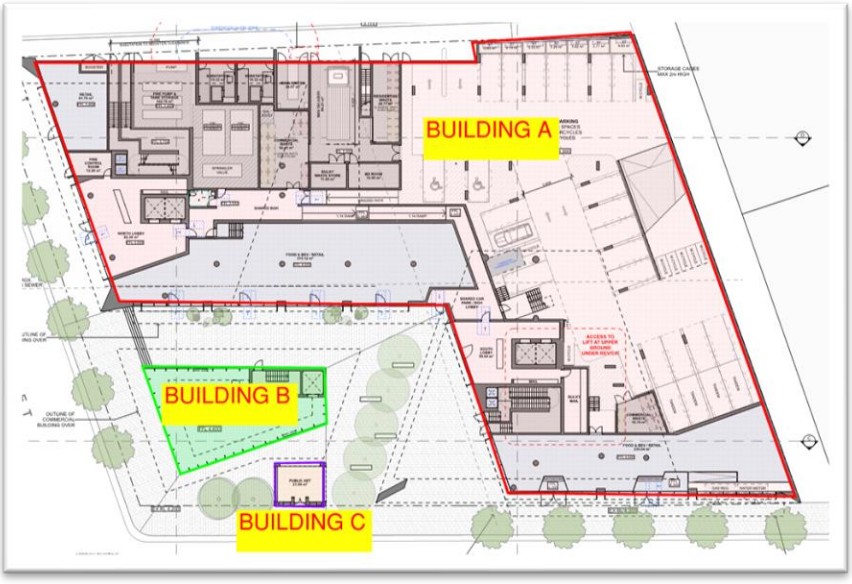
From level 5 and above this building will divide into two (2) residential blocks that will solely comprise of residential units.

Building B

Is a commercial/office building, containing a total of six (6) storeys. Each storey is served by a single passenger lift and a fire stair that discharges to the ground floor public walkway.

Building C

Is a single storey building that will be used as a public art space. This is the only existing part of the proposed development as this building will integrate the Dairy Farmers Corner clock tower which is a heritage item



1.2 Objectives

The purpose of this Report is to outline an assessment of the proposed development against the National Construction Code, Volume 1, Building Code of Australia, 2019, Amendment 1 (the "NCC"). The assessment addresses all relevant Deemed-To-Satisfy (DTS) clauses of the NCC and provides comment on the compliance status of the proposed development. If the development does not comply with a DTS clause, where appropriate, a recommendation to prepare/obtain a Performance Solution is specified. Where a clause is not relevant to the proposed development it is not discussed.

It is presumed the assumptions, content, and limitations of this Report are reviewed and understood by the reader. Credwell Consulting should be contacted to clarify any queries or assumptions made in relation to the contents of this Report. Furthermore, Credwell Consulting take no responsibility for misinterpretation of any of the content herein.

1.3 Limitations

This Report does not include or imply any audit, assessment, or upgrading of the proposed development regarding:

1. The structural design;
2. The capacity or design of any electrical, fire, hydraulic or mechanical services; and
3. The accessibility provisions of Part D3 of NCC2019 Amendment 1

This Report does not include or imply, any assessment of, or compliance with:

1. any development consent conditions;
2. the Liquor Licensing Act 2007;
3. the Work Health and Safety Act 2011;
4. the Swimming Pools Act 1992; and
5. requirements of authorities including, but not limited to, WorkCover, Roads and Maritime Services, Council, telecommunications supply authority, electricity supply authority, water supply authority, gas supply authority, and the like.

Interpretations

Numerous clauses within the NCC require interpretation. Where interpretation of a clause is required, Credwell Consulting apply what is believed to be the current standard industry practice (at the time the Report is written).

Dimensions and Tolerances

The NCC regularly specifies minimum dimensions for construction. The assessment outlined in this Report includes a review of such minimum dimensions that are relevant to the proposed development. However, Credwell Consulting does not guarantee that all relevant minimum dimensions have been assessed where they are not clearly and explicitly denoted/marked on the architectural drawings reviewed. Also, it remains the responsibility of the designer(s) and builder(s) to confirm that all minimum dimensions are achievable on site prior to work commencing.

1.4 Reviewed Documentation

The assessment outline in the Report is based on review of the documentation referenced in Annexure A.

2 Building Description

For the purposes of the NCC, the building is described as follows:

2.1 Classification

Building A

Class	Use	Area
Class 7a	Carparking	Part Ground Floor Upper Ground Floor Part Level 1 Part Level 2 Part Level 3
Class 7b	Loading Dock/Residential Storage	Part Ground Floor Part Level 1 Part Level 2
Class 6	Retail Tenancies (x3)	Part Ground Floor
Class 2	Residential Sole-Occupancy Units (SOUs); Residential Lobbies; and Including the communal Gym and Pilates studio	Part Ground Floor Part Level 2 Part Level 3 Level 4 Level 5 and above (both towers)

Building B

Class	Use	Area
Class 5	Commercial/Office Tenancies	Ground Floor and Above

Building C

Class	Use	Area
Class 9b	Public Art Building	Ground Floor

2.2 Rise in Storeys

Building A

This building has a rise in storeys of thirty (30).

Building B

This building has a rise in storeys of six (6)

Building C

This building has a rise in storeys of one (1)

2.3 Type of Construction

Buildings A and B

Buildings A and B are required to be of Type A construction. This type of construction requires the highest levels of fire-resistance.

Building C

Building C is required to be of Type C construction. This type of construction requires the lowest levels of fire resistance.

2.4 Effective Height

Building A

The effective height is calculated to be 92.5m (97.100- 4.600= 92.5m), being greater than 25m and greater than 50m.

Building B

The effective height is calculated to be 18.4m (23.00 - 4.600 = 18.4m), being less than 25m and more than 12m.

Building C

As this building is a single storey there is no effective height applicable.

2.5 Fire Compartments

For the purposes of the assessment outlined in this Report, the following fire compartments are assumed within buildings A, B, C:

Building A

1. The whole ground floor and upper ground floor will form a fire compartment
2. Each level from level 1 and above will form a fire compartment
   Note: This includes each level of the residential tower blocks from levels 5 and above.

Building B

This building can be considered as a single fire compartment.

Building C

This building can be considered as a single fire compartment.

2.6 Required Exits

For the purposes of the assessment outlined in this Report, the following are considered as the exits from buildings A,B,C:

Building A

Ground Floor:

- The doorways serving the retail tenancies that lead to open space
- The doorways serving the southern and northern lobbies that lead to open space
- The doorway serving the shared carpark/BOH lobby that leads to open space
- The doorway that leads from the carpark to Tighe Street
- The doorways serving the pump room, switch room, loading dock and waste room that lead to Tighe Street

Upper Ground Floor:

- The top riser of two (2) stairs that lead to the ground floor

Levels 2 and Above:

- All doorways that into the “scissor” fire isolated stairs.

Building B

Ground Floor

- The automatic sliding doors that lead to the public walkway opposite the public art building

Level 1 and Above:

- The doorway that leads to the single fire isolated stairway

Building C

- The main entrance doorways that lead to open space.

2.7 Climate Zone

The building is located within Climate Zone 5, being within the Newcastle City Council local government area.

3 Fire Safety Measures

Given the assessment in this Report, the following fire safety measures are required to be installed in the building. This list is subject to minor change if Performance Solutions are proposed, or other options are taken during the Construction Certificate (CC) and/or construction stages.

Building A

	Fire Safety Measure	Standard of Performance
1.	Access panels, doors and hoppers to fire-resisting shaft	NCC clause C3.13 Manufacturer's Specifications
2.	Automatic fire detection and alarm systems	NCC clause E2.2 and Specification E2.2a clause 3,4 AS 1670.1-2018 AS 3786-2014
3.	Building occupant warning system	NCC clause E2.2 and Specification E2.2a clause 7 AS 1670.1-2018
4.	Automatic fire suppression systems (sprinklers)	NCC clause E1.5 and Specification E1.5 AS 2118.1-2017 AS 2118.4
5.	Emergency lifts	NCC clause E3.4
6.	Emergency lighting	NCC clause E4.2 & E4.4 AS/NZS 2293.1-2018
7.	Exit signs	NCC clause E4.5, E4.6 & E4.8 AS/NZS 2293.1-2018
8.	Fire control centres and rooms	NCC clause E1.8 and Specification E1.8
9.	Fire dampers	NCC clause C3.15 AS 1668.1-2015 Manufacturer's Specification
10.	Fire doors	NCC clause C3.7, C3.8, C3.11, C2.12, C2.13, D3.5, Specification E1.8 and Specification C3.4 clause 2 AS 1905.1-2015
11.	Fire hose reel systems	NCC clause E1.4 AS 2441-2005
12.	Fire hydrant systems	NCC clause E1.3 AS 2419.1-2005
13.	Fire seals protecting openings in fire-resisting components of the building	NCC clause C3.15 and Specification C3.15 AS 1530.4-2014 AS 4072.1-2005 Manufacturer's Specification
14.	Lightweight construction (fire rated)	NCC clause C1.8 and Specification C1.8 Manufacturer's Specification
15.	Mechanical air handling systems (automatic shutdown)	NCC clause E2.2 and Specification E2.2a AS 1668.1-2015
16.	Portable fire extinguishers	NCC clause E1.6 AS 2444-2001
17.	Sound system and intercom system for emergency purposes (SSISEP)	NCC clause E4.9 AS 1670.4-2018
18.	Stair pressurisation system	NCC clause D1.7, clause E2.2, and Specification E2.2a AS 1668.1-2015
19.	Warning and operational signs	NCC clause D2.23 & E3.3 Environmental Planning and Assessment Regulation 2000 clause 183
20.	Zone smoke control	NCC clause E2.2 AS 1668.1-2015

	Fire Safety Measure	Standard of Performance
21.	Paths of travel	NCC Parts D1 & D2 Environmental Planning and Assessment Regulation 2000 clause 186
22.	Fire alarm monitoring	NCC clause E2.2 and Specification E2.2a clause 8 AS 1670.3-2018

Building B

	Fire Safety Measure	Standard of Performance
1.	Automatic fire detection and alarm systems	NCC clause E2.2 and Specification E2.2a clause 4 AS 1670.1-2018 AS 3786-2014
2.	Building occupant warning system	NCC clause E2.2 and Specification E2.2a clause 7 AS 1670.1-2018
3.	Emergency lighting	NCC clause E4.2 & E4.4 AS/NZS 2293.1-2018
4.	Exit signs	NCC clause E4.5, E4.6 & E4.8 AS/NZS 2293.1-2018
5.	Fire dampers	NCC clause C3.15 AS 1668.1-2015 Manufacturer's Specification
6.	Fire doors	NCC clause C3.8 and Specification C3.4 clause 2 AS 1905.1-2015
7.	Fire hydrant systems	NCC clause E1.3 AS 2419.1-2005
8.	Fire seals protecting openings in fire-resisting components of the building	NCC clause C3.15 and Specification C3.15 AS 1530.4-2014 AS 4072.1-2005 Manufacturer's Specification
9.	Lightweight construction (fire rated)	NCC clause C1.8 and Specification C1.8 Manufacturer's Specification
10.	Portable fire extinguishers	NCC clause E1.6 AS 2444-2001
11.	Paths of travel	NCC Parts D1 & D2 Environmental Planning and Assessment Regulation 2000 clause 186

Building C

	Fire Safety Measure	Standard of Performance
1.	Exit signs	NCC clause E4.5, E4.6 & E4.8 AS/NZS 2293.1-2018
2.	Portable fire extinguishers	NCC clause E1.6 AS 2444-2001
3.	Paths of travel	NCC Parts D1 & D2 Environmental Planning and Assessment Regulation 2000 clause 186

4 Fire Resistance Levels

The following fire resistance levels (FRLs) are required for the various elements of the building. Where the table below refers to a fire source feature (FSF), this is as defined in the NCC as the far boundary of a road, river, lake or the like adjoining the allotment, or a side or rear boundary of the allotment, or an external wall of another building on the allotment which is not a Class 10 building.

Buildings A and B

Building Element - Type A Construction	Class 2	Class 5 &7a	Class 6	Class 7b
Loadbearing External Walls				
- Less than 1.5m from a FSF	90/90/90	120/120/120	180/180/180	240/240/240
- 1.5-3m from a FSF	90/60/60	120/90/90	180/180/120	240/240/180
- 3m or more from a FSF	90/60/30	120/60/30	180/120/90	240/180/90
Non-Loadbearing External Walls				
- Less than 1.5m from a FSF	-/90/90	-/120/120	-/180/180	-/240/240
- 1.5-3m from a FSF	-/60/60	-/90/90	-/180/120	-/240/180
- 3m or more from a FSF	-/-/-	-/-/-	-/-/-	-/-/-
External Columns (not incorporated into an external wall)				
- Loadbearing	90/-/-	120/-/-	180/-/-	240/-/-
- Non-Loadbearing	-/-/-	-/-/-	-/-/-	-/-/-
Common Walls and Fire Walls	90/90/90	120/120/120	180/180/180	240/240/240
Internal Walls - Fire resisting lift and stair shafts				
- Loadbearing	90/90/90	120/120/120	180/120/120	240/120/120
- Non-Loadbearing	-/90/90/90	-/120/120	-/120/120	-/120/120
Internal Walls - Bounding public corridors, public lobbies and the like				
- Loadbearing	90/90/90	120/-/-	180/-/-	240/-/-
- Non-Loadbearing	-/60/60	-/-/-	-/-/-	-/-/-
Internal Walls - Between or bounding sole-occupancy units				
- Loadbearing	90/90/90	120/-/-	180/-/-	240/-/-
- Non-Loadbearing	-/60/60	-/-/-	-/-/-	-/-/-
Internal Walls - Ventilating, pipe, garbage and the like, shafts not used for discharge of hot products of combustion				
- Loadbearing	90/90/90	120/90/90	180/120/120	240/120/120
- Non-Loadbearing	-/90/90	-/90/90	-/120/120	-/120/120
Other loadbearing internal walls, internal beams, trusses and columns	90/-/-	120/-/-	180/-/-	240/-/-

Building Element - Type A Construction	Class 2	Class 5 &7a	Class 6	Class 7b
Floors	90/90/90	120/120/120	180/180/180	240/240/240
Roofs	90/60/30	120/60/30	180/60/30	240/90/60

Notes:

1. Within the ground floor of this building Fire Engineered Performance Solutions prepared by Minerva will be undertaken to rationalise the FRLs. All performance solutions will be further clarified throughout this report

2. On levels 1 and 2 of the building there will be residential storage on the western ends of each floor. As the floor area of these storage areas will equate to less than 10% of the total floor of the levels that are situated, NCC Clause A6.0 will allow for the storage to be considered as a Class 7a part with no separation required.

Building C

Building Element - Type C Construction	Class 9b
External Walls - Less than 1.5m from a FSF - 1.5-3m from a FSF - 3m or more from a FSF	 90/90/90 60/60/60 -/-/-
External Columns (not incorporated into an external wall) - Less than 1.5m from a FSF - 1.5 - 3m from a FSF - 3m or more from a FSF	 90/-/- 60/-/- -/-/-
Common Walls and Fire Walls	90/90/90
Internal Walls - Fire resisting stair shafts	60/60/60
Internal Walls - Bounding public corridors, public lobbies and the like -	 -/-/-
Internal Walls - Between or bounding sole-occupancy units	-/-/-
Roofs	-/-/-

5 Statement of Compliance

Credwell Consulting have completed a detailed assessment of the subject proposed development, as indicated on the drawings referenced in Annexure A of this Report, against the relevant requirements of the NCC. The details of this are specified in the Assessment Table provided in Annexure B of this Report. Subject to this assessment, Credwell Consulting advise that the design of the proposed development complies, or is capable of complying, with the relevant requirements of the NCC subject to the following being addressed:

5.1 Current Performance Solutions that will be Addressed with Fire Engineering

At this stage Minerva Fire Engineers have been engaged to start preparing performance solutions for a number of non-compliances that have been identified on the DA stage plans.

The following items relate to areas where a Performance Solution may be available to justify a deviation from the DtS requirements of the NCC. This Report does not form a Performance Solution.

Item	Possible Performance Solution	DtS Provision
1.	**Building A** It is proposed to rationalise Fire Resistance Levels (FRLs) in specific areas, as follows: a. Retail FRLs reduced from 180 mins b. Class 7b storage / loading dock FRLs reduced from 240 mins (exact areas TBC as some may be <10% of overall floorplate and will therefore not need assessment)	C1.1 and Specification C1.1
2.	**Building A** It is proposed to assess the northern wall of the Building B office space as providing two way fire protection between compartments due to unprotected openings within the residential tower being <6 m away.	C3.2 and C3.4
3.	**Building A** The following areas only have a single exit available from them, in lieu of the two required for abuilding >25 m in effective height: - Retail tenancies (subject to final design) - North residential lobby - Loading dock - Main switch room	D1.2
4.	**Building A** The carpark exits on each floor (other than Ground Level) are deemed horizontal exits by BCA definition, in lieu of the horizontal exits being in addition to the minimum requirement of two exits from each floor when the building is >25 m in effective height.	D1.2 (b)
5.	**Building A** The building has been found to contain the following travel distance non-compliances: a. Extended distances to an exit and between alternative exits from the communal outdoor and pool area on Level 4: 33 m to a point of choice (in lieu of 20 m)	D1.4
6.	**Building A**	D1.5

	- The scissor stairs within the residential towers are <9 m apart, which is considered a non-compliance within the BCA as a single fire could block both means of escape.	
7.	**Building A** Occupants discharging from the fire stairs beside the South residential lobby at Ground Level will be within 6 m of unprotected openings. It is proposed for this to be addressed through a performance-based assessment.	D1.7
8.	**Building A** There are multiple doorways serving retail tenancies on the ground floor that swing inwards in lieu of the required outward direction.	D2.20
9.	**Buildings A,B,C** The fire hydrant booster will not be visible from the main entries into each of the residential towers, which results in a non-compliance with AS 2419.1-2005. Two lengths of hydrant hose (60 m) may be required to reach the far corners of the carparking areas on Ground to Level 3	E1.3
10.	**Building A** The building's Fire Control Room (FCR) will be accessible from the main entry into one of the two residential towers but will not be accessible from the other.	E1.8
11.	**Building A** Assess the omission of Zone Smoke Control System (ZSCS) within office, retail, and bike store portions of a building >25 m in effective height (bike storage may not be required, subject to being <10% of floorplate on these levels)	E2.2

Note: At this stage there are no Performance Solutions that will be applied to Buildings B & C apart from the fire hydrant performance solution (item 9) noted above.

5.2 Additional Performance Solutions required to be Undertaken

The following items relate to areas where additional Performance Solutions may be available to justify a deviation from the DtS requirements of the NCC. This Report does not form a Performance Solution.

Item	Possible Performance Solution	DtS Provision
1.	To demonstrate that the construction of the external walls is such that they will prevent the penetration of water that could cause unhealthy or dangerous conditions or loss of amenity to occupants and undue dampness or deterioration of building elements.	F1.0 (No DtS Provisions)

5.3 Clarification of Current Non-Compliances

The below will further clarify a number of non-compliances that have been identified at this stage of the development:

Rationalisation of FRLs within Building A- Clause C1.1 & Specification C1.1

Within the ground floor of building A there are multiple building classifications (Class 2,6,7a and 7b). Under the requirements of Clause C2.8 these differing classes are to either be separated with intricate firewalls or the whole floor is to have 240min FRLs applied to all elements that require fire resistance which in this instance is considered unnecessary as the building will be sprinkler protected.

As such, it has been agreed at this stage that Minerva will undertake a fire engineered performance solution to have rationalised FRL of 120mins across the whole ground and upper floors of the building.

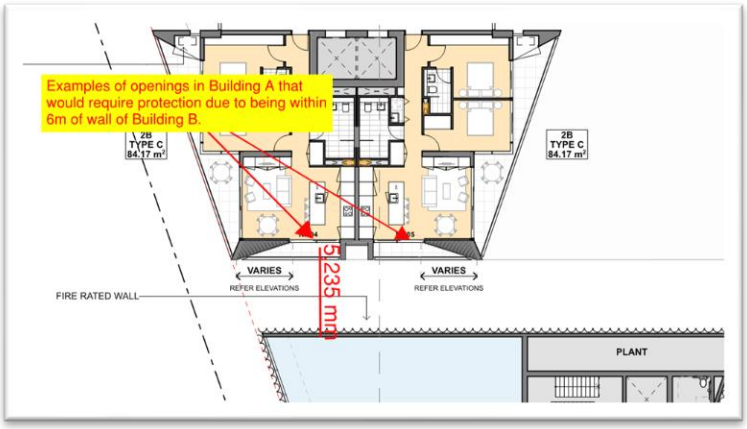
Protection of Openings between Buildings A and B- Clause C3.2

It is noted that the southern external wall of building A is within 6m of the northern external wall of building B.

As such NCC Clause C3.2 will require that any openings in these walls are required to be protected by a method specified in NCC Clause C3.4 (i.e. drenchers, fixed fire rated glass or shutter).

It has been found that there are multiple openings in the external wall of building A spanning from levels 2 and above where the above protection provisions would need to be applied.

It has been agreed at this stage that Minerva will prepare a fire engineered performance solution to justify eliminating the protection required to the openings on the provision a more robust level of fire rating is applied to the external wall of building B.



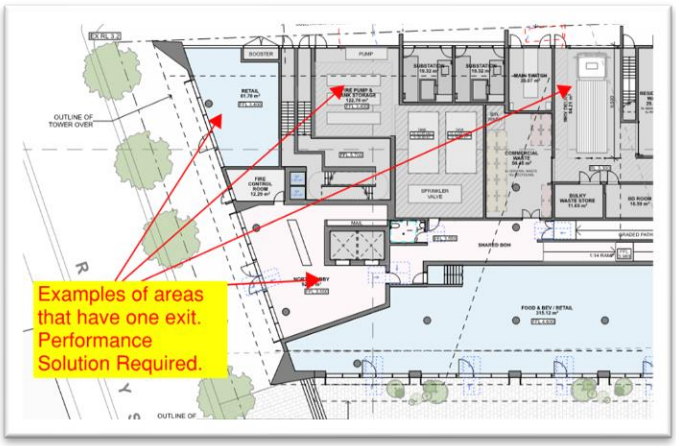
Number of Required Exits within Building A- Clause D1.2

On the ground floor of Building A the following areas have provided with only a single exit which is technically non-compliant:

- Retail tenancy on the corner of Tighe Street
- Food and Beverage tenancy on Hunter Street
- North residential lobby
- Loading dock (MRV Delivery)
- Main switch room
- Fire Pump Room

Under the requirements of this Clause as the building is sprinkler protected all areas of the building must be provided with two (2) required exits.

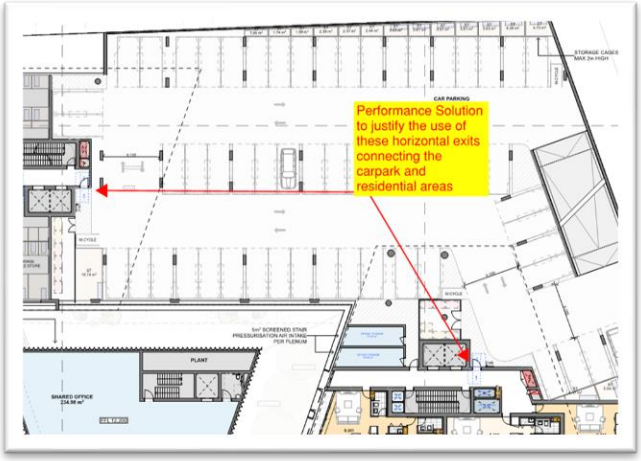
As providing two (2) exits to the above areas will be unnecessary due to such items as exit travel compliance, it has been agreed at this stage that Minerva will prepare a fire engineered performance solution to justify the single exits.



Horizontal Exits within Building A- Clause D1.2

The carpark exits on each floor (other than Ground Level) are deemed horizontal exits by BCA definition, in lieu of the horizontal exits being in addition to the minimum requirement of two exits from each floor when the building has an effective height of greater than 25m.

It has been agreed at this stage that Minerva will prepare a fire engineered performance solution to justify the configuration of the horizontal exits

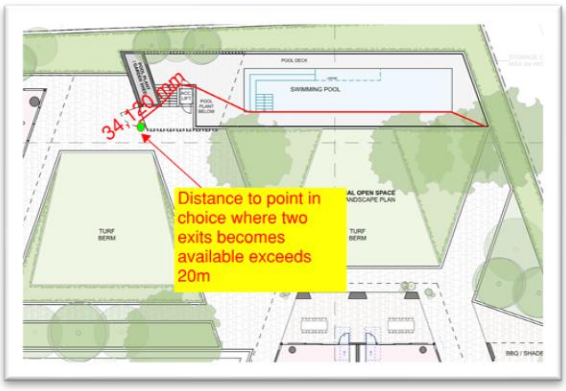


Extended Exit Travel Distances within Building A- Clause D1.4

Within the level 4 external communal area the exit travel distance from the eastern part of the pool deck is measured to be approximately 34m which is non-compliant.

Under the requirements of Clause D1.4 the maximum distance from area of a Class 2 part not within a sole occupancy unit must not exceed 20m.

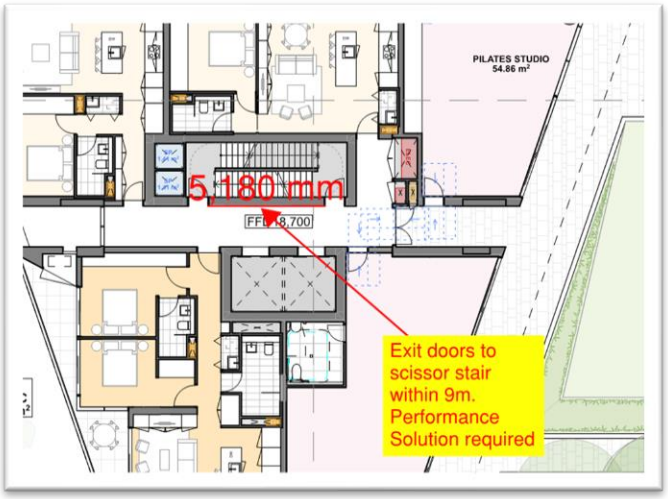
It has been agreed at this stage that Minerva will prepare a fire engineered performance solution to justify this extended travel distance.



Distance between Alternative Exits within Building A- Clause D1.5

It is noted that the building will be provided with two (2) sets of scissor stairs. As scissors are separated from each other at each level with fire rated construction they are technically deemed as two (2) differing required exits. As the doorways leading to these stairs at each level are within 9m (approx. 5m measured) a technical non-compliance with this Clause has been triggered.

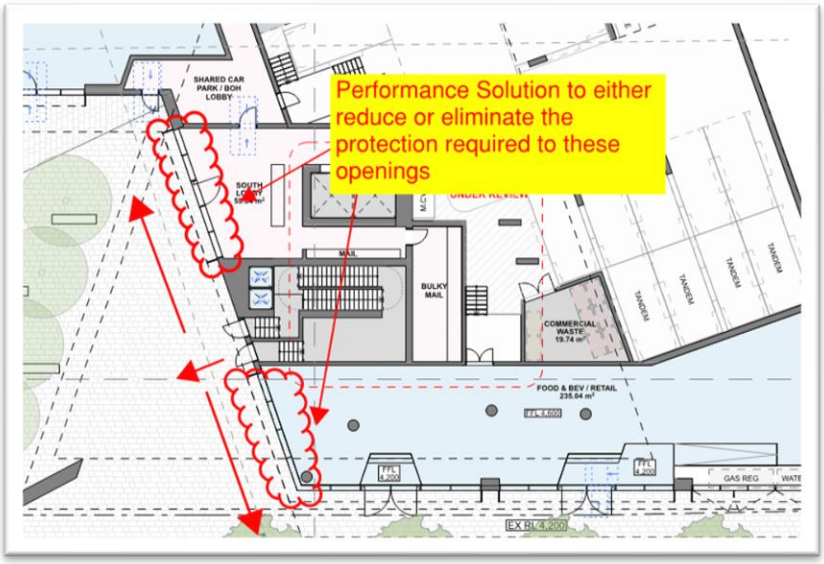
It has been agreed at this stage that Minerva will undertake a fire engineered performance solution to justify the non-compliance.



Travel via Fire Isolated Exits from Building A- Clause D1.7

Occupants evacuating via the southern fire isolated stair will discharge to a covered area of the ground floor walkway. As these occupants will pass within 6m of openings in the external wall of Building A then these openings will require protection by a method prescribed in Clause C3.4.

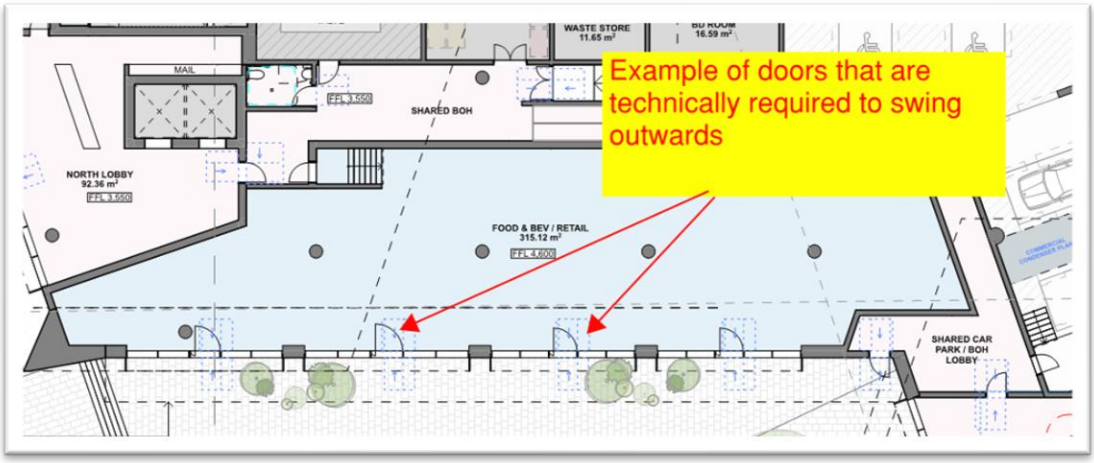
It has been agreed at this stage that Minerva will undertake a fire engineered performance solution to justify either eliminating or reducing the protection required to these openings.



Inward Swinging Exit Doors within Building A- Clause D2.20

Within the ground floor of Building A the food and beverage/retail tenancy in the middle of the allotment has multiple inward swing exit doors which is non-compliant. As this tenancy has a floor area that exceeds 200m2 this Clause requires that the doors swing outward.

It has been agreed at this stage that Minerva will undertake a fire engineered performance solution to justify the inward swinging doors.

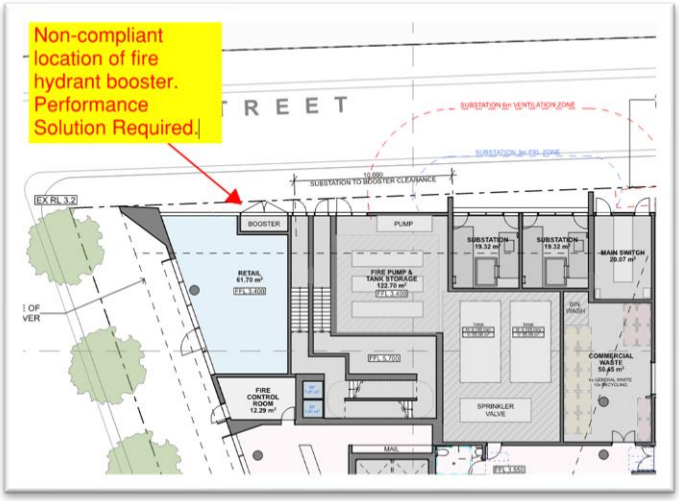


Location of Fire Hydrant Booster- Clause E1.3 & AS2419.1-2005

It is noted that the fire hydrant booster required to serve the building will be located with the external wall of the ground floor retail tenancy at the Tighe Street frontage.

As the fire hydrant booster will not be within sight of the building main entrances on Hunter and Railway Streets a technical non-compliance with AS2419.1-2005 has been triggered.

It has been agreed at this stage that Minerva will undertake a fire engineered performance solution to justify the current location of the hydrant booster.

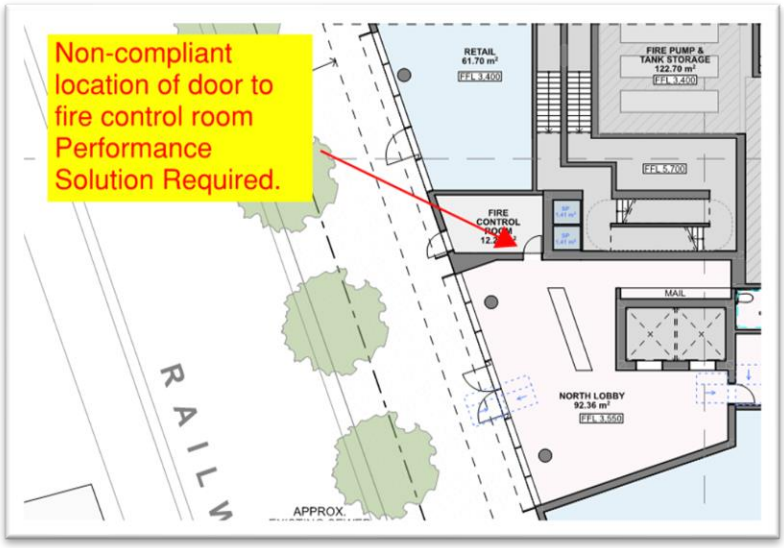


Location of Fire Control Room in Building A- Clause E1.8

As Building A has an effective height that exceeds 50m it must be provided with a fire control room.

As one of the doors to the fire control room does not open to a “public place” but rather the northern lobby a technical non-compliance with Specification E1.8 has been triggered.

It has been agreed at this stage that Minerva will undertake a fire engineered performance solution to justify the current location of the fire control centre.


Non-compliant location of door to fire control room Performance Solution Required.
RETAIL
61.70 m²
FFL 3.400
FIRE PUMP & TANK STORAGE
122.70 m²
FFL 3.400
FFL 5.700
FIRE CONTROL ROOM
MAIL
NORTH LOBBY
92.36 m²
FFL 3.550
RAILW
APPROX.

Annexure A - Reviewed Documentation

This Report is based on review of the documentation listed below:

Architectural drawings prepared by CKDS, Project reference 21014			
Drawing Number	Revision	Date	Title
A-1101	06	1/10/21	Ground Floor Plan
A-1102	06	1/10/21	Upper Ground Floor Plan
A-1103	06	1/10/21	Level 1
A-1104	06	1/10/21	Level 2
A-1105	06	1/10/21	Level 3
A-1106	06	1/10/21	Level 4
A-1107	10	1/10/21	Tower Level 5
A-1108	10	1/10/21	Tower Levels 6-14
A-1109	10	1/10/21	Tower Levels 15-21
A-1110	11	1/10/21	Tower Levels 22-24
A-1111	10	1/10/21	Tower Levels 25-26
A-1112	10	1/10/21	Tower Levels 27-29
A-2001	04	1/10/21	North Elevation
A-2002	04	1/10/21	South Elevation
A-2003	04	1/10/21	East Elevation
A-2004	04	1/10/21	West Elevation
A-3001	04	1/10/21	Section A
A-3002	04	1/10/21	Section B
A-3003	03	1/10/21	Section C
A-3004	02	1/10/21	Section D
A-1202	05	1/10/21	Unit Type F-K
A-3005	03	1/10/21	Laneway Sections
A-7001	05	1/10/21	Yield Schedule
A-8001	03	1/10/21	Perspective Views
A-1201	10	1/10/21	Unit Type A-E

Annexure B - Detailed Assessment

The following Assessment Table outlines a clause by clause review of the subject proposed development against the relevant Deemed-To-Satisfy (DTS) provisions of the NCC. Where a clause is not relevant to the proposed development, no discussion of that clause is provided.

The following abbreviations have been used in the table below:

PS **Performance Solution**
The design does not comply with the clause, however, a Performance Solution is proposed to justify the design in its current format.

CRA **Compliance Readily Achievable**
It is considered that, whilst there is insufficient information currently provided to determine strict compliance with the relevant DTS clause, the proposed design can comply in its current format.

Complies The proposed design complies with the relevant DTS clause

DNC **Does Not Comply**
The proposed design does not comply with the relevant DTS clause and requires amendment.

FI **Further Information**
Further information is required to determine whether the proposed design satisfies the requirements of the relevant DTS clause.

N/A **Not Applicable**
The relevant DTS clause is considered not applicable to the subject proposed development but requires further explanation to confirm reason(s).

Noted The relevant DTS clause specifies information only, no assessment is required.

SECTION B - STRUCTURE			
Clause		**Comments**	**Assessment**
Part B1 – Structural provisions			
B1.0	Deemed-to-Satisfy Provisions	Information only.	Noted
B1.1	Resistance to actions	Resistance to actions must be in accordance with this clause. Structural Engineer to certify.	CRA
B1.2	Determination of individual actions	The magnitude of individual actions must be determined in accordance with this clause.	CRA
B1.4	Determination of structural resistance of materials and forms of construction	The structural resistance of materials and forms of construction must be determined in accordance with this clause. Structural Engineer to certify.	CRA
B1.5	Structural software	Structural software used in computer aided design of a building or structure must comply with the ABCB Protocol for Structural Software in accordance with this clause. Structural Engineer to certify.	CRA
B1.6	Construction of buildings in flood hazard areas	A Class 2 or 3 building, Class 9a health-care building, Class 9c building or Class 4 part of a building in a flood hazard area must comply with this clause.	CRA

SECTION C - FIRE RESISTANCE			
Clause		**Comments**	**Assessment**
Part C1 - Fire resistance and stability			
C1.0	Deemed-to-Satisfy Provisions	Information only.	Noted
C1.1	Type of construction required	Building A= Type A construction Building B= Type A construction Building C= Type C construction.	Noted
C1.2	Calculation of rise in storeys	Building A This building has a rise in storeys of thirty (30). Building B This building has a rise in storeys of six (6) Building C This building has a rise in storeys of one (1)	Noted
C1.3	Buildings of multiple classification	Building A is the only building that contains multiple classifications. Class 2,6,7a,7b Type A construction required	Noted
C1.4	Mixed types of construction	No mixed types of constructions.	N/A
C1.5	Two storey Class 2, 3 or 9c buildings	-	N/A
C1.6	Class 4 parts of buildings	-	N/A
C1.8	Lightweight construction	If lightweight construction is utilised to achieve an FRL, it must comply with this clause and Specification C1.8.	CRA
C1.9	Non-combustible building elements	The building is required to be of Type A construction, therefore, the building elements listed in this clause must be non-combustible. Where a building element is required to be non-combustible, all materials forming that element are to be non-combustible. This clause also identifies building elements to which it does not apply. Also, it should be noted that wall systems utilising permanent polymer/PVC formwork (e.g. Dincel, Rediwall, etc.) used where the NCC requires the element to be non-combustible, must be justified by a Performance Solution prepared by a suitably qualified fire safety engineer.	CRA

Clause		Comments	Assessment
C1.10	Fire hazard properties	The fire hazard properties of all materials must comply with this clause and Specification C1.10.	CRA
C1.11	Performance of external walls in fire	-	N/A
C1.13	Fire-protected timber: Concession	-	N/A
C1.14	Ancillary elements	"Ancillary elements", other than those listed in this clause, must not be fixed, installed or attached to the internal parts or external face of an external wall that is required to be non-combustible.	CRA
Part C2 – Compartmentation and separation			
C2.0	Deemed-to-Satisfy Provisions	Information only.	Noted
C2.1	Application of Part	Clause C2.2, C2.3 and C2.4 do not apply to a carpark provided with a sprinkler system (other than a FPAA101D or FPAA101H system) complying with Specification E1.5 or an open-deck carpark.	Noted
C2.2	General floor area and volume limitations	Each building has a floor area and volume for fire compartments are within the limitations specified by this Clause.	Complies
C2.6	Vertical separation of openings in external walls	This Clause applies to Buildings A and B only as they are Type A construction. As building A is sprinkler protected spandrels are not required. As building B will not be sprinkler protected it is to be ensured spandrel protection is provided in compliance with this Clause.	N/A
C2.7	Separation by fire walls	If fire walls are utilised, they must comply with this clause.	CRA
C2.8	Separation of classifications in the same storey	See Part 5 of report that discusses the separation of classification on the ground floor of Building A	**PS Refer to Part 5 of Report**
C2.9	Separation of classifications in different storeys	This Clause is applicable to Buildings A and B only. Each storey must be separated from the storey below by construction having the FRL applicable to a floor for the classification in the lower storey in accordance with Table 3 of Specification C1.1	CRA
C2.10	Separation of lift shafts	The lift must be enclosed within a shaft that has the FRLs outlined in Specification C1.1 with reference to the classification in which it is located.	CRA
C2.11	Stairways and lifts in one shaft	-	N/A
C2.12	Separation of equipment	Equipment including lift motor rooms, emergency generators sustaining emergency equipment operating in emergency mode, central smoke control plan, boilers or battery areas with a voltage exceeding 24 volts and a capacity exceeding 10 ampere hours must be fire separated from the remainder of the building in accordance with this clause.	CRA
C2.13	Electricity supply system	If the main switch room sustains emergency equipment operating in emergency mode, the room is to be separated from the remainder of the building with construction having a FRL of not less than 120/120/120. Where emergency equipment is required in a building, all switchboards in the electrical installation that sustain the electricity supply to the emergency equipment must be constructed so that emergency equipment switchgear is separated from non-emergency equipment switchgear by metal partitions designed to minimise the spread of a fault from the non-emergency equipment switchgear.	CRA
C2.14	Public corridors in Class 2 and 3 buildings	This Clause applies to Building A only. There are no public corridors in this building that exceed 40m.	Complies

Clause		Comments	Assessment
Part C3 – Protection of openings			
C3.0	Deemed-to-Satisfy Provisions	Information only.	Noted
C3.1	Application of Part	Information only.	Noted
C3.2	Protection of openings in external walls	See Part 5 of report that discusses the protection of openings to Building A	**PS Refer to Part 5 of Report**
C3.3	Separation of external walls and associated openings in different fire compartments	-	N/A
C3.4	Acceptable methods of protection	See Part 5 of report that discusses the protection of openings to Building A	**PS Refer to Part 5 of Report**
C3.5	Doorways in fire walls	This Clause applies to Building A only If fire walls are utilised, any doorways through them must be protected in accordance with the requirements of this clause.	CRA
C3.6	Sliding fire doors	No sliding fire doors	N/A
C3.7	Protection of doorways in horizontal exits	This Clause applies to Building A only Horizontal exits within Building A are to comply with this Clause	CRA
C3.8	Openings in fire-isolated exits	This Clause applies to Building A and B only The doorways opening into the fire-isolated exits, that are not doorways opening to a road or open space, must be protected with self-closing -/60/30 fire door sets.	CRA
C3.9	Service penetrations in fire-isolated exits	This Clause applies to Building A and B only Fire-isolated exits must not be penetrated by any service other than electrical wiring for lighting and intercom systems, water supply for fire services, and other fire related services.	CRA
C3.10	Openings in fire-isolated lift shafts	This Clause applies to Building A and B only The lift doors must achieve an FRL of not less than -/60/- and be in accordance with this clause. Also, the lift indicator panels must comply with this clause.	CRA
C3.11	Bounding construction: Class 2 and 3 buildings and Class 4 parts	This Clause applies to Building A only The doorways to the units, and other rooms served by the public corridors, must be self-closing -/60/30 fire door sets.	CRA
C3.12	Openings in floors and ceilings for services	This Clause applies to Building A and B only All service shafts must achieve the FRLs outlined by Table 3 of Specification C1.1.	CRA
C3.13	Openings in shafts	This Clause applies to Building A and B only Openings providing access to service shafts must be protected in accordance with this clause.	CRA
C3.15	Openings for service installations	This Clause applies to Building A and B only The protection of service penetrations through fire rated building elements must comply with this clause.	CRA
C3.16	Construction joints	Construction joints in fire rated building elements must be protected in accordance with this clause.	CRA
C3.17	Columns protected with	This Clause applies to Building A and B only	CRA

Clause		Comments	Assessment
	lightweight construction to achieve an FRL	Any columns protected with lightweight fire rated materials to achieve the required FRL must comply with this clause.	
Specification C1.1 – Fire-resisting construction			
1	Scope	This Specification contains the requirements for fire resisting construction of building elements.	Noted
2	General Requirements	-	-
2.1	Exposure to fire-source-features	The development is exposed to Fire-Source-Features (FSFs), in the form of side or rear property boundaries, to the north east south west. It should be noted that a building element can be shielded from a FSF by construction having an FRL of no less than 30/-/- that is neither transparent of translucent (a blade wall).	CRA
2.2	Fire protection for support of another part	Where a part of a building required to have a FRL depends on direct vertical or lateral support from another part to maintain its FRL, that supporting part must have a FRL not less than that required for the part it is supporting.	CRA
2.3	Lintels	A lintel must have the FRL required for the part of the building in which it is situated unless it complies with the exemption requirements of this clause.	CRA
2.4	Method of attachment not to reduce the fire-resistance of building elements	The method of attaching or installing a finish, lining, ancillary element or service installation to a building element must not reduce the fire-resistance of that element to below that required.	CRA
2.5	General concessions	Informational only	Noted
2.6	Mezzanine floors: Concession	No mezzanines throughout the development.	N/A
2.7	Enclosure of shafts	Shafts required to have an FRL must be enclosed at the top and bottom by construction having an FRL not less than that required for the walls of a non-loadbearing shaft in the same building, except that these provisions need not apply to - (a) the top of a shaft extending beyond the roof covering, other than one enclosing a fire-isolated stairway or ramp; or the bottom of a shaft if it is non-combustible and laid directly on the ground.	CRA
2.8	Carparks in Class 2 and 3 buildings	This Clause applies to Building A only. As this building has more than 4 storeys this concession cannot be applied.	N/A
3	Type A Construction **Buildings A and B**	-	-
3.1	Fire-resistance of building elements	The building elements must have FRLs as determined by this clause. See Part 4 of the Report.	CRA
3.2	Concessions for floors	This clause outlines concessions for when a floor is not required to have a FRL.	Noted
3.5	Roof: Concession	The roof, being the roof of Building A, is not required to have an FRL if its covering is non-combustible due to this building being Class 2.	Noted
3.6	Roof lights	At this stage no rooflights. To be assessed at a later stage of development	N/A
3.7	Internal columns and walls: Concession	The internal columns (except those referred to in clause 3.1(f) Specification C1.1) and walls (except fire walls and shaft walls) within the storey immediately below the roof are granted a concession by this clause to have an FRL of no less than 60/60/60	Noted
3.9	Carparks	This Clause applies to Building A only. It is considered that the provisions of this concession	Noted

Clause		Comments	Assessment
3.10	Class 2 and 3 buildings: Concession	This Clause applies to Building A only. As this building has more than 4 storeys this concession cannot be applied.	Noted
5	Type C Construction **Buildings C**	-	-
5.1	Fire-resistance of building elements	This Clause applies to Building B only. The building elements must have FRLs as determined by this clause. See Part 4 of the Report.	CRA
5.2	Carparks	Building C does not have a carpark	N/A
Specification C1.8 – Structural tests for lightweight construction			
1	Scope	This Specification describes test methods to be applied to and criteria to be satisfied by a wall system of light weight construction.	Noted
2	Application	Information only.	Noted
3	Tests	Tests to walls and lift shafts to comply with this clause.	CRA
4	Test specimens	Testing to comply with this clause.	CRA
5	Test methods	Tests to be carried out in accordance with this clause.	CRA
6	Criteria for compliance	The wall system or the specimen of it must comply with this clause.	CRA
Specification C1.10 – Fire hazard properties			
1	Scope	This Specification sets out requirements in relation to the fire hazard properties of linings, materials and assemblies in buildings.	Noted
2	Application	Linings, materials and assemblies must comply with the appropriate provisions described in Table 1 of this clause.	Noted
3	Floor linings and floor coverings	Fire hazard properties of the floor linings and floor coverings are to comply with this clause.	CRA
4	Wall and ceiling linings	Fire hazard properties of the wall and ceiling linings are to comply with this clause.	CRA
5	Air-handling ductwork	Fire hazard properties of the air-handling ductwork are to comply with this clause.	CRA
6	Lift cars	Fire hazard properties of the lift cars are to comply with this clause.	CRA
7	Other materials	Fire hazard properties of other materials not covered in Clauses 3, 4, 5 or 6 above are to comply with this clause.	CRA
Specification C3.4 – Fire doors, smoke doors, fire windows and shutters			
1	Scope	This Specification sets out requirements for the construction of fire doors, smoke doors, fire windows and fire shutters.	Noted
2	Fire Doors	Fire doors must comply with AS1905.1-2015 Amendment 1 and this clause.	CRA
3	Smoke Doors	-	N/A
4	Fire Shutters	-	N/A
5	Fire Windows	-	N/A
Specification C3.15 – Penetration of walls, floors and ceilings by services			
1	Scope	This Specification prescribes material and methods of installation for services that penetrate walls, floors and ceilings required to have an FRL.	Noted
2	Application	Information only.	Noted
3	Metal pipe systems	Metal pipe system penetration must comply with this clause.	CRA
4	Pipes penetrating sanitary compartments	Pipes penetrating sanitary compartments must comply with this clause.	CRA
5	Wires and cables	Wire and cable penetrations must comply with this clause.	CRA
6	Electrical switches and outlets	Electrical switches and outlets must comply with this clause.	CRA
7	Fire-stopping	Fire-stopping must comply with this clause.	CRA

SECTION D - ACCESS AND EGRESS			
Clause		**Comments**	**Assessment**
Part D1 – Provision for escape			
D1.0	Deemed-to-Satisfy Provisions	Information only.	Noted
D1.1	Application of Part	The Deemed-to-Satisfy Provisions of this Part do not apply to the internal parts of a sole-occupancy unit in a Class 2 or 3 building or a Class 4 part of a building.	Noted
D1.2	Number of exits required	See Part 5 of report that discusses required exits applicable to Building A Both buildings B and C have been provided with compliant exits	**PS Refer to Part 5 of Report**
D1.3	When fire-isolated stairways and ramps are required	Within building A the stairs that connect all storeys are scissor fire stairs that are fire isolated as required by this Clause. The two stairs that connect the upper ground floor carpark with the ground floor are non-fire isolated stairs. As required the single stair within Building B is a fire isolated exit.	Complies
D1.4	Exit travel distances	See Part 5 of report that discusses exit travel distance non-compliances applicable to Building A Both buildings B and C have been provided with compliant exit travel distances.	**PS Refer to Part 5 of Report**
D1.5	Distance between alternative exits	See Part 5 of report that discusses alternative exit non-compliances applicable to Building A Both buildings B and C have been provided with compliant exits	**PS Refer to Part 5 of Report**
D1.6	Dimensions of exits and paths of travel to exits	The exits must have an unobstructed width (measured clear of handrails) of no less than 1,000mm. Please note a constructed width of approximately 1,100mm is required to install a compliant handrail to one (1) side of a stairway (as required for a fire-isolated stairway), and a constructed width of approximately 1,200mm is required to install compliant handrails to both sides of a stairway (as required for a non-fire-isolated stairway).	CRA
D1.7	Travel via fire-isolated exits	See Part 5 of report that discusses fire isolated exit discharges points applicable to Building A Building B has been provided with fire isolated exit discharge paths of travel.	**PS Refer to Part 5 of Report**
D1.8	External stairways or ramps in lieu of fire-isolated exits	-	N/A
D1.9	Travel by non-fire-isolated stairways or ramps	Within building A the 2x stairs that connect the ground floor carpark with the upper ground floor carpark are non-fire isolated stairs. These stairs are in complaint locations.	Complies
D1.10	Discharge from exits	The discharge from exits must comply with the requirements of this clause.	CRA
D1.11	Horizontal exits	Within building A the horizontal exits are to comply with this Clause	CRA
D1.12	Non-required stairways, ramps or escalators	-	N/A
D1.13	Number of persons accommodated	Information only	Noted
D1.14	Measurement of distances	Information only.	Noted
D1.15	Method of measurement	Information only.	Noted

Clause		Comments	Assessment
D1.16	Plant rooms, lift machine rooms, electricity network substations: concession	Information only	Noted
D1.17	Access to lift pits	If buildings A and B incorporate lift pits, access to it must comply with this clause.	CRA
Part D2 – Construction of exits			
D2.0	Deemed-to-Satisfy Provisions	Information only.	Noted
D2.1	Application of Part	Clause D2.13, D2.14(a), D2.16, D2.17(d), D2.17(e), D2.18, and D2.24 are the only clauses of this Part that apply to the internal parts of a sole-occupancy unit in a Class 2 building.	Noted
D2.2	Fire-isolated stairways and ramps	Within buildings A and B construction of the fire-isolated stairways must be – (a) of non-combustible materials; and so that if there is local failure it will not cause structural damage to, or impair the fire-resistance of, the shaft.	CRA
D2.3	Non-fire-isolated stairways and ramps	-	N/A
D2.4	Separation of rising and descending stair flights	No rising and descending stairs	N/A
D2.5	Open access ramps and balconies	-	N/A
D2.6	Smoke lobbies	-	N/A
D2.7	Installations in exits and paths of travel	Services or equipment comprising - (i) electricity meters, distribution boards or ducts; or (ii) central telecommunications distribution boards or equipment; or (iii) electrical motors or other motors serving equipment in the building may be installed in any corridor, hallway, lobby or the like leading to a required exit if the services or equipment are enclosed by non-combustible construction or a fire-protective covering with doorways or openings suitably sealed against smoke spreading from the enclosure.	CRA
D2.8	Enclosure of space under stairs and ramps	The space below the stairways located within the fire-isolated exits must not be enclosed to form a cupboard or similar enclosed space.	CRA
D2.9	Width of required stairways and ramps	-	N/A
D2.10	Pedestrian ramps	The floor surface of the ramps must have a slip-resistance classification not less than that listed in Table D2.14 when tested in accordance with AS 4586-2013.	CRA
D2.11	Fire-isolated passageways	At this stage no fire isolated passageways	N/A
D2.12	Roof as open space	No roof as open space	N/A
D2.13	Goings and risers	The geometry of the stairways and slip-resistance of the stairway treads must comply with this clause.	CRA
D2.14	Landings	The geometry and slip-resistance of landings must comply with this clause.	CRA
D2.15	Thresholds	The thresholds throughout the building comply with the requirements of this clause.	CRA

Clause		Comments	Assessment
D2.16	Barriers to prevent falls	Barriers (balustrades) must be provided in accordance, and comply, with this clause.	CRA
D2.17	Handrails	The configuration of the fire-isolated stairways must allow for the installation of a compliant handrail. To enable installation of a compliant handrail, the stairway must be configured so that there is an offset of one (1) tread width between the bottom riser of the upper flight and the top riser of the lower flight. Also, the handrails and doorways providing entry into the fire-isolated stairways must be positioned so that the requisite handrail extensions and method of termination do not encroach on the swing of the door at the point of handrail termination. The configuration of the fire-isolated stairway will not allow for the installation of a compliant handrail.	**CRA**
D2.18	Fixed platforms, walkways, stairways and ladders	A fixed platform, walkway, stairway, ladder and any going and riser, landing, handrail or barrier attached thereto may comply with AS 1657-2018 in lieu of D2.13, D2.14, D2.16 and D2.17 if it only serves: (a) machinery rooms, boiler houses, lift-machine rooms, plant-rooms, and the like; or non-habitable rooms, such as attics, storerooms and the like that are not used on a frequent or daily basis in the internal parts of a sole-occupancy unit in a Class 2 building or Class 4 part of a building.	CRA
D2.19	Doorways and doors		
D2.20	Swinging doors	See Part 5 of report that discusses inward swinging doors applicable to Building A. It is noted that the ground floor of Building B is provided with a automatic sliding door which is the exit. It is to be ensured that this doorway must automatically open on the activation of the smoke detection system or power failure.	**PS Refer to Part 5 of Report**
D2.21	Operation of latch	All doors in a required exit or forming part of a required exit AND doors in a path of travel to a required exit must be readily openable without a key from the side that faces a person seeking egress, by– a single hand downward action or pushing action on a single device which is located between 900mm and 1.1 m from the floor and if serving an area required to be accessible by Part D3 – be such that the hand of a person who cannot grip will not slip from the handle during the operation of the latch; and have a clearance between the handle and the back plate or door face at the center grip section of the handle of not less than 35mm and not more than 45mm; or a single hand pushing action on a single device which is located between 900mm and 1.2m from the floor	CRA
D2.22	Re-entry from fire-isolated exits	The provisions of re-entry into the fire isolated stairs applies to Building A only.	CRA
D2.23	Signs on doors	Signage must be located on or adjacent to all fire doors in accordance with this clause. For the self-closing doors, the sign is to say - FIRE SAFETY DOOR DO NOT OBSTRUCT DO NOT KEEP OPEN. For the doors discharging from a fire-isolated exit - FIRE SAFETY DOOR – DO NOT OBSTRUCT. The text is to be a minimum of 20mm in height and of a colour contrasting to the background of the sign.	CRA

Clause		Comments	Assessment
D2.24	Protection of openable windows	This Clause applies to Building A only The windows to the bedrooms must be protected in accordance with this clause.	CRA
D2.25	Timber stairways: Concession	-	N/A
Part D3 – Access for people with a disability			
An assessment of this Part does not form part of the scope of this Report. Rather, it is covered by an Access Report prepared with reference to the proposed development also prepared by this office.			
Part E1 – Fire fighting equipment			
E1.0	Deemed-to-Satisfy Provisions	Information only.	Noted
E1.3	Fire hydrants	Buildings A and B are required to be protected with a fire hydrant system compliant with AS2419.1-2005 as they both have a floor area that exceeds 500m2. See Part 5 of report that discusses the compliance of the fire hydrant booster location.	**PS Refer to Part 5 of Report**
E1.4	Fire hose reels	Fire hose reels to be provided to the carparking and retail area of building A only. Hose reels are to be installed in accordance with AS2441. To be further assessed at a later stage of development.	CRA
E1.5	Sprinklers	Only Building A requires a sprinkler system. As this building has an effective height that exceeds 25m then it must be provided with the following sprinkler systems: (i) AS 2118.1-2017; or (ii) AS 2118.4-2012; or	CRA
E1.6	Portable fire extinguishers	Each building must be provided with PFEs compliant with AS2444. Specifically to building A within the Class 2 parts, a 2.5kg ABE powder extinguisher must be located within 10m of all unit entry doors.	CRA
E1.8	Fire control centres	As building A has an effective height that exceeds 50m it must be provided with a fire control room. See Part 5 of report that discusses the compliance of the access into the Building A fire control room	**PS Refer to Part 5 of Report**
E1.9	Fire precautions during construction	In a building under construction, not less than one (1) fire extinguisher to suit Class A, B and C, and electrical fires must be provided on each storey adjacent to each required exit or temporary stairway or exit. After the building has reached an effective height of 12m, the fire hydrants and hose reels must be operational in at least every storey covered by a roof or floor, except the two (2) uppermost storeys. The fire hydrant booster connections must also be installed.	CRA
E1.10	Provision for special hazards	-	N/A
Specification E1.5 – Fire sprinkler systems			
1	Scope	This Specification sets out requirements for the design and installation of fire sprinkler systems.	Noted
2	Application of automatic fire sprinkler standards	Subject to this Specification a sprinkler system must comply with AS2118.1-2017, or Specification E1.5a.	CRA
3	Separation of sprinklered and	The sprinklered and non-sprinklered parts of the building must be fire separated in accordance with this clause.	CRA

Clause		Comments	Assessment
	non-sprinklered areas		
4	Protection of openings	Any openings in construction separating sprinklered and non-sprinklered areas must be protected in accordance with NCC Part C3, except where AS2118.1-2017 provides exemptions.	CRA
5	Fast response sprinklers	Fast response sprinklers may be installed only if they are suitable for the type of application proposed and it is demonstrated that the sprinkler system is designed to accommodate their use.	Noted
6	Sprinkler valve enclosures	Sprinkler alarm valves must be located in a secure room or enclosure which has direct egress to a road or open space. The room or enclosure must be secured by a system suitable for use by Fire and Rescue NSW.	CRA
7	Water supply	The Grade of water supply to the sprinkler system must be in accordance with this clause.	CRA
8	Building occupant warning system	The sprinkler system must be connected to activate a building occupant warning system complying with Clause 7 of Specification E2.2a.	CRA
9	Connection to other systems	Where a smoke hazard management system is installed and is actuated by smoke detectors, the sprinkler system must, wherever practicable, be arranged to also activate the smoke hazard management system.	CRA
10	Anti-tamper devices	Where a sprinkler system is installed in a theatre, public hall or the like, valves provided to control sprinklers over a stage area must be fitted with anti-tamper devices connected to a monitoring panel at the location normally used by the stage manager.	CRA
11	Sprinkler systems in carparks	A sprinkler system protecting a carpark complying with Table 3.9 of NCC Specification C1.1 in a multi-classified building must comply with this clause.	CRA
12	Residential care buildings	-	N/A
13	Sprinkler systems in lift installations	Where sprinklers are installed in a space housing lift electrical and control equipment, including machine rooms, secondary floors and sheave rooms, theses spaces must – (i) have heads protected from accidental damage by way of a guard that will not impair the performance of the head; and be capable of being isolated and drained, either separately or collectively, without isolating any other sprinklers within the building.	CRA
Specification E1.8 – Fire control centres			
1	Scope	This Specification describes the construction and content of fire control centres and rooms.	Noted
2	Purpose and content	A fire control centre must comply with this clause.	CRA
3	Location of fire control centre	A fire control centre must be located so that egress from any part of its floor to a road or open space does not involve changes in level which in aggregate exceed 300mm.	CRA
4	Equipment not permitted within a fire control centre	An internal combustion engine, pumps, sprinkler control valves, pipes and pipe fittings must not be located in a fire control centre but may be located in rooms access through the fire control centre.	CRA
5	Ambient sound level for a fire control centre	Ambient sound levels within the fire control centre when all fire safety equipment is operating must not exceed 65dB(A), with the sound measured in accordance with this clause.	CRA
6	Construction of a fire control room	A fire control centre in a building of more than 50m effective height must be in a separate room in accordance with this clause. Fire control centres in buildings with an effective height of less than 50m are not required to be in a specialised room, but in an area complying with clauses 2, 3, 4 and 5 of NCC Specification E1.8.	CRA

Clause		Comments	Assessment
7	Protection of openings in a fire control room	Openings in fire control rooms must be protected in accordance with this clause.	CRA
8	Doors to a fire control room	The fire control room must be accessible via two paths of travel, one from the front of the building and one direct from a public place or fire-isolated passageway. Doors are to be in accordance with this clause.	**PS Refer to Part 5 of Report**
9	Size and contents of a fire control room	A fire control room must be adequately sized to contain all equipment set out in this clause and have a floor area of not less than that set out in this clause.	CRA
10	Ventilation and power supply for a fire control room	A fire control room must be ventilated in accordance with this clause.	CRA
11	Sign for a fire control room	The external face of the door to the fire control rom must have a sign stating FIRE CONTROL ROOM in letters of not less than 50mm high and in a colour that contrasts with that of the background.	CRA
12	Lighting for a fire control room	Emergency lighting in accordance with NCC Part E4 must be provided to the fire control room in accordance with this clause.	CRA
Part E2 – Smoke hazard management			
E2.0	Deemed-to-Satisfy Provisions	Information only.	Noted
E2.1	Application of Part	Information only.	Noted
E2.2	General requirements	<u>Building A</u> The following smoke hazard management systems are required to serve Building A. <u>Residential parts</u> - Each unit to be provided with an interconnected smoke alarms installed in accordance with Clause 3 of spec E2.2a and AS3786-2014 - The residential common areas be provided with an automatic smoke detection and alarm system installed in accordance with Clause 4 of spec E2.2a and AS1670.1 - The building to be provided with a BOWS installed in accordance with Clause 7 of spec E2.2a and AS1670.1 - The fire isolated stairways are required to pressurized in accordance with AS1668.1 - The building is provided to be provide with smoke detectors to activate the stair pressurisation system installed in accordance with Clause 6 of spec E2.2a and AS1670.1 - The building is required to be provided with systems monitoring installed in accordance with AS1670.3 - The carparking levels must have a system of mechanical ventilation complying with AS 1668.2-2012 - See part 5 of this report the proposes a performance solution to eliminate the zone smoke control to the ground floor of Building A. <u>Building B</u> This building is to be provided with an automatic smoke detection system compliant with Clause 4 of Spec E2.2a and AS1670.1 <u>Building C</u> No smoke detection system required.	**PS Refer to Part 5 of Report**
E2.3	Provision for special hazards	-	n/A
Part E3 – Lift installations			
E3.0	Deemed-to-Satisfy Provisions	Information only.	Noted

Clause		Comments	Assessment
E3.1	Lift installations	An electric passenger lift installation and an electrohydraulic passenger lift installation must comply with Specification E3.1.	CRA
E3.2	Stretcher facility in lifts	This Clause applies Building A and B only. The lift serves a storey with an effective height above 12m, therefore, must be provided with a stretcher facility. A stretcher facility incorporates provision of a clear space not less than 600mm wide x 2,000mm long to a height of no less than 1,400mm above the floor.	CRA
E3.3	Warning against use of lifts in fire	Warning signage stating – DO NOT USE LIFTS IF THERE IS A FIRE must be provided in accordance with this clause.	CRA
E3.4	Emergency lifts	Building A is required to be provided with at least one (1) emergency lift	CRA
E3.5	Landings	Access and egress to and from the liftwell landing must comply with Section D. Review of this requirement has been undertaken with the assessment of Part D3 in this Report.	N/A
E3.6	Passenger lifts	An assessment of this clause does not form part of the scope of this Report.	N/A
E3.7	Fire service controls	The lift serves a storey above an effective height of 12m, therefore, must be provided with a fire service recall control switch and a lift car fire service drive control switch in accordance with this clause.	CRA
E3.9	Fire service recall control switch	A fire service recall control switch is to be provided in accordance with this clause.	CRA
E3.10	Lift car fire service drive control switch	A lift car fire service drive control switch is to be provided in accordance with this clause.	CRA
Specification E3.1 – Lift Installations			
1	Scope	This Specification contains requirements for electric passenger lift installations and electrohydraulic passenger lift installations	Noted
2	Lift cars exposed to solar radiation	A lift car exposed to solar radiation directly, or indirectly through re-radiation, must comply with this clause.	CRA
3	Lift car emergency lighting	A lift car must have emergency lighting complying with this clause.	CRA
4	Cooling of lift shaft	While in service, a lift shaft must have cooling in accordance with this clause.	CRA
5	Lift foyer access	Where there is a security foyer in a building, access may be via locked security doors provided measures are in place in accordance with this clause.	CRA
6	Emergency access doors in a single enclosed lift shaft	Emergency access doors in a single enclosed lift shaft must be in accordance with this clause.	CRA
Part E4 – Visibility in an emergency, exit signs and warning systems			
E4.0	Deemed-to-Satisfy Provisions	Information only.	Noted
E4.2	Emergency lighting requirements	Each building must be provided with emergency lighting in accordance with this clause.	CRA
E4.3	Measurement of distance	Information only.	Noted
E4.4	Design and operation of emergency lighting	The emergency lighting system must comply with AS 2293.1-2018.	CRA
E4.5	Exit signs	Each building must be provided with exit signage in accordance with this clause.	CRA
E4.6	Direction signs	Where required, the building must be provided with exit direction signage in accordance with this clause.	CRA

Clause		Comments	Assessment
E4.7	Class 2 and 3 buildings and Class 4 parts: Exemptions	The requirements of clause E4.5 do not apply to— (a) a Class 2 building in which every door referred to is clearly and legibly labelled on the side remote from the exit or balcony— (i) with the word "EXIT" in capital letters 25 mm high in a colour contrasting with that of the background; or (ii) by some other suitable method; and an entrance door of a sole-occupancy unit in a Class 2 or 3 building or Class 4 part of a building.	CRA
E4.8	Design and operation of exit signs	The exit lighting system must comply with AS 2293.1-2004 to 2018.	CRA
E4.9	Emergency warning and intercom systems	The system must be installed into Building A as it has an effective height of greater than 25m.	CRA
Specification E4.8 – Photoluminescent exit signs			
1	Scope	This Specification contains the requirements for photoluminescent exit signs	Noted
2	Application	A photoluminescent exit sign must comply with Section 6 and Appendix D of AS 2293.1-2018, except as varied by this Specification.	Noted
3	Illumination	Photoluminescent exit signage must comply with this clause.	CRA
4	Pictorial elements	Photoluminescent exit signage must comply with this clause.	CRA
5	Viewing distance	Photoluminescent exit signage must comply with this clause.	CRA
6	Smoke control systems	Photoluminescent exit signage must comply with this clause.	CRA

SECTION F - HEALTH AND AMENITY

Clause		Comments	Assessment
Part F1 – Damp and weatherproofing			
F1.0	Deemed-to-Satisfy Provisions	Information only.	Noted
F1.1	Stormwater drainage	Stormwater drainage for the building must comply with AS/NZS 3500.3-2015.	CRA
F1.4	External above ground membranes	Waterproofing membranes for external above ground use, such as balconies and roofs, must comply with AS 4654.1-2012 and AS 4654.2-2012.	CRA
F1.5	Roof coverings	The roof covering must be in accordance with this clause.	CRA
F1.6	Sarking	Sarking-type materials used for weatherproofing of roofs and walls must comply with AS 4200.1-1994 and AS 4200.2-1994.	CRA
F1.7	Waterproofing of wet areas in buildings	Waterproofing of the wet areas in the building must comply with this clause and AS 3740-2010.	CRA
F1.9	Damp-proofing	Damp-proofing is to be provided in accordance with this clause. Where a damp-proof course is provided, the material must comply with AS/NZS 2904-1995 or, for impervious termite shields, AS 3660.1-2014.	CRA
F1.10	Damp-proofing of floors on the ground	Damp-proofing of floors on the ground must be in accordance with this clause. Where required the vapour barrier is to comply with AS 2870-2011.	CRA
F1.11	Provision of floor wastes	Within Building A the bathrooms and laundries located above a sole-occupancy unit or public space mush have a floor waste, and the floor must be graded to the floor waste to permit the drainage of water.	CRA
F1.12	Subfloor ventilation	Where provided, sub-floor ventilation is to be in accordance with this clause.	CRA
F1.13	Glazed assemblies	Glazed assemblies in external walls or roofs must comply with AS 2047-2014 or AS 1288-2006 as required by this clause and NCC clause B1.4.	CRA
Part F2 – Sanitary and other facilities			

Clause		Comments	Assessment
F2.0	Deemed-to-Satisfy Provisions	Information only.	Noted
F2.1	Facilities in residential buildings	At this stage all the residential sole occupancy units within building A have been provided with compliant sanitary facilities.	Complies
F2.2	Calculation of number of occupants and facilities	Information only	Noted
F2.3	Facilities in Class 3 to 9 buildings	At this stage no sanitary facilities have been provided on the plans for the 3x retail tenancies on the ground floor of Building A. These facilities will be assessed at a later stage of the development. Building B has been provided with a single accessible sanitary facility on each floor, which is considered sufficient at this stage.,	CRA
F2.4	Accessible sanitary facilities	-	N/A
F2.5	Construction of sanitary compartments	The sanitary compartments must be provided with clearance in accordance with NCC Figure F2.5.	CRA
F2.6	Interpretation: Urinals and washbasins	Informational only	Noted
F2.7	Microbial (legionella) control	The reference to AS/NZS 3666.1-2011 is deleted from the NCC in NSW, as the need to comply with this standard is regulated in the Public Health Regulation, 2012, under the Public Health Act, 2010.	N/A
Part F3 – Room heights			
F3.0	Deemed-to-Satisfy Provisions	Information only.	Noted
F3.1	Height of rooms and other spaces	The height of all spaces and rooms must comply with the requirements of this clause.	CRA
Part F4 – Light and ventilation			
F4.0	Deemed-to-Satisfy Provisions	Information only.	Noted
F4.1	Provision of natural light	Natural light must be provided to all habitable rooms within the Class 2 parts.	CRA
F4.2	Methods and extent of natural light	The method and extent of natural light provided to all habitable rooms within the Class 2 parts must be in accordance with the requirements of this clause.	CRA
F4.3	Natural light borrowed from adjoining room	Natural light can be borrowed (where required) in accordance with the requirements of this clause.	CRA
F4.4	Artificial lighting	Artificial lighting must be provided throughout the building in accordance with the requirements of AS 1680.0-2009.	CRA
F4.5	Ventilation of rooms	All occupiable spaces throughout the building must be provided with natural or mechanical ventilation.	CRA
F4.6	Natural ventilation	If natural ventilation is utilised, a ventilating area of no less than 5% of the floor area must be provided.	CRA
F4.7	Ventilation borrowed from adjoining room	Ventilation can be borrowed from an adjacent room in accordance with the requirements of this clause.	CRA
F4.8	Restriction on location of sanitary compartments	The location of sanitary compartments will be assessed at a later stage of the development.	Complies
F4.9	Airlocks	At this stage no airlocks. to be assessed at a later stage of the development.	CRA
F4.11	Carparks	Within Building A the carpark must have a system of mechanical ventilation complying with AS 1668.2-2012	CRA

Clause		Comments	Assessment
F4.12	Kitchen local exhaust ventilation	If the commercial kitchen has – (a) any cooking apparatus has— (i) a total maximum electrical power input exceeding 8kW; or (ii) a total gas power input exceeding 29MJ/h; or (b) the total maximum power input to more than one (1) apparatus exceeds— (i) 0.5kW electrical power; or (ii) 1.8MJ/hour gas, per m^2 of floor area of the room or enclosure, it must be provided with a kitchen exhaust hood complying with As 1668.1-2015 and AS 1668.2-2012.	CRA
Part F5 – Sound transmission and insulation			
F5.0	Deemed-to-Satisfy Provisions	Information only.	Noted
F5.1	Application of Part	This Part applies to Class 2, 3 and 9c buildings.	Noted
F5.2	Determination of airborne sound insulation ratings	A form of construction required to have an airborne sound insulation rating must comply with this clause.	CRA
F5.3	Determination of impact sound insulation ratings	Building elements required to have an impact sound insulation rating must comply with this clause.	CRA
F5.4	Sound insulation rating of floors	A floor in a Class 2 or 3 building must have a $R_w + C_{tr}$ (airborne) of not less than 50 and a $L_{n,w} + C_I$ (impact) of not more than 62 if it separates sole-occupancy units (SOUs) or a SOU from plant, a lift shaft, a stairway, etc., or parts of a different classification in accordance with this clause.	CRA
F5.5	Sound insulation rating of walls	Walls must be sound insulated in accordance with this clause.	CRA
F5.6	Sound insulation rating of internal services	Ducts and waste or water supply pipes that pass through more than one SOU must be separated by construction with an $R_w + C_{tr}$ (airborne) in accordance with this clause.	CRA
F5.7	Sound isolation of pumps	A flexible coupling must be used at the point of connection between the service pipes in a building and any circulating or other pump.	CRA
Specification F5.2 – Sound insulation for building elements			
1	Scope	This Specification contains details of common forms of construction and their designated DTS weighted sound reduction index.	Noted
2	Construction Deemed-to-Satisfy	Information only.	Noted
Specification F5.5 – Impact sound – Test of equivalence			
1	Scope	This Specification describes a method of test to determine the comparative resistance of walls to the transmission of impact sound	Noted
2	Construction to be tested	Information only.	Noted
3	Method	Information only.	Noted
Part F6 – Condensation management			
F6.0	Deemed-to-Satisfy Provisions	Information only.	Noted
F6.1	Application of part	Information only.	Noted
F6.2	Pliable building membrane	Pliable building membrane must comply with this clause.	CRA
F6.3	Flow rate and discharge of exhaust systems	Flow rate and discharge of exhaust systems must comply with this clause.	CRA
F6.4	Ventilation of roof spaces	Ventilation of roof spaces must comply with this clause.	CRA

SECTION G - ANCILLARY PROVISIONS			
Clause		**Comments**	**Assessment**
Part G1 – Minor structures and components			
G1.0	Deemed-to-Satisfy Provisions	Information only.	Noted
G1.1	Swimming pools	The swimming pool must be enclosed by a barrier compliant with the Swimming Pools Act 1992, Swimming Pools Regulation 2008, AS 1926.1-2012, and AS 1926.2-2007. The swimming pool water reticulation system must comply with AS 1926.3-2010.	CRA
NSW G1.101	Provision for cleaning windows	(a) The building must provide for a safe manner of cleaning any windows located three (3) or more storeys above ground level. (b) The building satisfies (a) where - (i) the windows can be cleaned wholly from within the building; or provision is made for the cleaning of the windows by a method complying with the Work Health and Safety Act 2011 and regulations made under that Act. provision for the cleaning of the windows by a method complying with the WH&S Act 2001 and regulations made under that Act.	CRA
Part G2 – Boilers, pressure vessels, heating appliances, fireplaces, chimneys and flues			
G2.0	Deemed-to-Satisfy Provisions	Information only.	Noted
G2.2	Installation of appliances	The installation of a stove, heater or similar appliance in a building must comply with AS/NZS 2918-2001 for domestic solid fuel burning appliances or AS 1200-2000 for pressure equipment. The installation of a boilers and pressure vessels is to comply with Specification G2.2.	CRA
Part G3 – Atrium construction			
G3.1	Application of Part	No atriums	N/a
Part G6 – Occupiable outdoor areas			
G6.1	Application of Part	This Part applies to “occupiable outdoor areas”. The Communal Open Space provided on the level 4 of building A is an occupiable outdoor area.	Noted
G6.2	Fire hazard properties	The Communal Open Space provided on the level 4 of building A must comply with the fire hazard requirements of this clause.	CRA
G6.3	Fire separation	Information only	Noted
G6.4	Provision for escape	The requirements of Part D1 are applicable to the Communal Open Space provided on level 4 of building A in accordance with this clause.	Noted
G6.5	Construction of exits	The requirements of Part D2 apply to the Communal Open Space provided on level 4 of building A in accordance with this clause.	Noted
G6.6	Fire fighting equipment	Fire fighting equipment must serve the Communal Open Space provided on level 4 of building A in accordance with this clause.	CRA
G6.7	Lift installations	The requirements of Part E3 apply to the Communal Open Space provided on level 4 of building A in accordance with this clause.	CRA
G6.8	Visibility in an emergency, exit signs and warning systems	The requirements of Part E4 are applicable to the Communal Open Space provided on level 4 of building A in accordance with this clause.	CRA
G6.9	Light and ventilation	The requirements of clause F4.4, F4.8, and F4.9 are applicable to the Communal Open Space provided on level 4 of building A in accordance with this clause.	CRA

Clause	Comments	Assessment
G6.10 Fire orders	The requirements of clause G4.9 are applicable to the Communal Open Space provided on level 4 of building A in accordance with this clause.	Noted

SECTION J - ENERGY EFFICIENCY

A separate Section J Report must be obtained to confirm compliance with this Section. Please contact Credwell Energy on 02 9281 8555 or at info@credwell.com.au for further information regarding obtaining a Section J Report.

Appendix O

DESIGN COMPETITION WAIVER

21 July 2021

Craig Marler
ADW Johnson Planners

CC.
Stuart Campbell
CKDS Architects

Priscilla Emmett
Newcastle City Council

DAIRY FARMERS CORNER REDEVELOPMENT,
924 HUNTER STREET, NEWCASTLE
ALTERNATIVE DESIGN EXCELLENCE PROCESS

Dear Craig,

I am writing to you in response to your request for support of a waiver for the design competition requirements applicable to 924 Hunter St, Newcastle (also known as Dairy Farmers Corner) in the Newcastle LEP. Previous correspondence have informed the comments and recommendations below.

We note that the site in question triggers the requirement for an architectural design competition in the Newcastle LEP, to be run in accordance with the Director General's Design Excellence Guidelines. The Director General's Design Excellence Guidelines state that an exemption or waiver from a competition may be granted *"where it can be demonstrated design excellence will be achieved, such as where concept drawings are submitted for a manifestly outstanding building, and the architect has a reputation for delivering buildings of the highest quality. In such a case, a design integrity panel may be appointed to oversee implementation."*

In relationship to the request for support for a waiver we note the following:
-Council have been consulted and have verified their support for the project and the exemption to the design competition requirements in correspondence with the myself
- The proposal is based on a rigorous analysis of options used I ndetermining the preferred proposal.

Recommendation
Given the notes above, the Government Architect will grant a waiver to the requirements for a design competition dependant on the following conditions;

Government Architect
New South Wales
L24, 320 Pitt Street
Sydney NSW 2000
GPO Box 39
Sydney NSW 2001

government.architect
@planning.nsw.gov.au
T +61 (02)9860 1464

A process of design review and post assessment design integrity is to be established to ensure the scheme retains design excellence through to completion of construction. This should include continuing review by the Newcastle City Council UDRP prior to lodgement of any planning application. This review process should continue at regular intervals through documentation and construction stages of the projects, whenever a significant change is being considered (such as would require a modification application) or at the request of the UDRP themselves, the Newcastle City Council or the proponent.
Peter Webber or Philip Pollard are preferred nominees as the representatives for GANSW on the UDCG. A record of this process including UDCG meeting minutes and proponents responses should be provided as part of the Development Application.

It should be noted that the recommendations above are specific to this project. They should not be taken as a precedent for the position the GANSW may take for other projects.

Sincerely,

Rory Toomey
Architect
Principal of Design Excellence, GANSW

Government Architect
New South Wales
L24, 320 Pitt Street
Sydney NSW 2000
GPO Box 39
Sydney NSW 2001

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Appendix P

UDCG MEETING MINUTES

URBAN DESIGN REVIEW PANEL MEETING MINUTES

City of Newcastle

ITEM No: 4.3

Date of Panel Assessment:	30 June 2021
Address of Project:	924 Hunter Street Newcastle West
UDCG No:	2021/00005
No. of Buildings:	One
No. of Units:	207, 271 car spaces, and commercial space
Declaration of Conflict of Interest:	None
Attendees:	Applicant:
Council:	Luke Mahaffey Thirdi - Dairy Farmers Pty Ltd
Amy Ryan	Joel Chamberlain – CKDS Architecture
Damian Jaeger	Stewart Campbell – CKDS Architecture
William Toose	Mathew Boyle – CKDS Architecture

Background Summary

The proposal includes the partial demolition of existing buildings, erection of a mixed-use development comprised commercial premises that incorporate retail and business/office space, organised into a corner commercial/office building on four levels at the corner of Hunter with Railway, and a podium and two residential towers occupying the northeast corner (Tighe Street and rare lane on the east).

The UDRP provided comments on a previous proposal for the subject site (UD2020/00002) in February 2020 which was also at a pre-DA stage which the applicant had requested be treated as Commercial in Confidence. The previous proposal was for a different development and applicant and is not relevant to the subject proposal.

Context and Neighbourhood Character

The subject site consists of seven lots known as 924 Hunter Street Newcastle West, located towards the western end of Hunter Street, and is visually prominent as it is opposite the intersection with Tudor Street, which is a major feeder road. The site is bound to its south by Hunter Street, to its west by Railway Street, and to its north by Tighe Street (having approximate frontages of 75m, 54m, and 74m respectively). The site is zoned B3 Commercial Core under the provisions of the Newcastle Local Environmental Plan 2012 and is located within the Newcastle City Centre and Newcastle City Centre Heritage Conservation Area. Land adjoining the site to the north and east is also zoned B3 Commercial Core, with the land to the west zoned B4 Mixed Use zone and Hunter Street to the south is SP2 Classified Road zone.
The lot to the eastern side of the site is currently occupied by a low-scaled building that has recently been tenanted by a gymnasium.

This building, as well the remainder of development on the site with the exception of the Heritage item, until recently formed part of a motor vehicle showroom and car yard. Prior to its conversion in the late 1990s to a motor showroom and associated uses, the site was occupied by the Dairy Farmers Co-operative, and it is from this use that the Heritage item – the clock tower – is derived. The clock tower formed part of the former Dairy Farmers' building and was located mid-way along its Hunter Street façade, rather than on the street corner (listed heritage item "Dairy Farmers Building" (Local I505). The decision to locate the tower in this manner may have had to do with the lesser significance of Railway Street relative to Hunter Street and Tudor Street. The site was a landmark in the city and was referred to as "Dairy Farmers' corner", and being a co-operative, as well as significant employer in the region, the Dairy Farmers' site was of considerable social significance.

The Dairy Farmers site, and the Motor showroom that succeeded it, occupied a number of lots that were not amalgamated under single title at the time of the construction of the motor showroom and associated structures, and it is now proposed to rely on the separate land title of the lot currently occupied by the gymnasium, to exclude it from the overall former motor showroom site.

The former level-crossing at Railway Street has in recent years been permanently closed to motor vehicles at the railway line, as part of the creation of the new Transport Interchange, which is located a few hundred metres to the east. The short section of Railway Street to the west of the subject site therefore serves only to access the small number of properties in the immediate vicinity including Tighe Street. Pedestrian access, including recently installed lifts, provide pedestrian access to the northern section of Railway Street beyond the rail line.

The land constraints that affect the property include – contaminated land, flood prone land, Class 4 Acid sulphate soils (ASS) have not been addressed at this stage.

Built Form and Scale

The proposal amalgamates a corner commercial building, five-level podium and two residential towers. The corner commercial building (four stories and ground floor) is located at the corner of Hunter with Railway Street, entirely dedicated to commercial and shared offices and incorporates a shared workspace roof on level 5. Further clarification about the character of the shared offices is required. It is not clear if it is intended simply as an 'office premises' for the purposes of characterisation under the NLEP 2012. Similarly, it is unclear the character of the shared workspace roof, whether is a roof-top garden for users/staff/employees or it has a different anticipated usage.

The majority of the site is occupied by a podium and two residential towers, separated by an internal street that gives access to the residential lobby and intended to create a "refuge for pedestrian, users and residents." The applicants are proposing the creation of a public art installation in this area to activate the internal street, improving amenity and promoting security. The ground floor level also allocates commercial uses (retail, commercial and food and beverage), services and car parking with access from Tighe Street. The upper ground plan is entirely dedicated to parking. Level 1 contains parking and residents' storage and bike storage. Levels 2, 3 and 4 are entirely dedicated to parking and residential apartments. The podium on level 5 is residential and incorporates a communal landscape podium and a communal area per tower. The two towers of 30 storey (99 metres), and 24 storey (84 metres) are proposed as residential apartments.

Irregular in shape, the overall site has a total area of approximately 3,955 square metres, comprising 207 apartments distributed into 37 one-bedroom, 147 two-bedroom, and 21 three-bedroom apartments. The commercial floor space occupies a total of 1,440.62 m2 distributed at ground level and levels 1, 2 and 3. Parking provision is for 271 car spaces and 303.6 m2 of space allocated for bicycle and residents' storage. No motorbike spaces are shown.

The subject site is located within the Newcastle City Centre on land zoned B3 Commercial Core. Therefore, based on clause 7.3, it is required for the site to have at least one street frontage of at least 20m. The subject site has three street frontages, and all are greater than 20m. The current setbacks to Tighe Street adjacent property on the north are 9m from the street axes on the tower level, but only 6m (5 to 6 m due to geometry) on the podium level creating issues regarding overshadowing and visual/noise impact. The applicant needs to demonstrate that the proposal will not impact or be adversely impacted by adjacent properties. No setbacks are provided on the laneway at ground level while the tower on the east respects the 12m setback. The proposal suggests 3 meters setbacks in Hunter and Railway Street, allowing space for pedestrians and the planting of trees enhancing public amenity and summer solar protection. The 24m setbacks between towers are acceptable.

The applicant has submitted detailed analysis of several 'initial feasibility concept schemes' explored for the development (**Part 2** and **Part 3** of the architectural drawing set). From this, the applicants have further developed and documented the concept proposal for consideration by the Panel (**Part 4** of the architectural drawing set). The Group is generally supportive of the height, geometry, setbacks, and character of the podium and towers, but raised an issue in relation to the heritage clock tower and its relationship with the commercial/office building in the corner of Hunter with Railway Street.

It would be desirable to explore connecting the clock tower with the proposal. It has always been part of the Dairy Farmers building, and it is suggested that instead of being treated as an independent "relic" that the new building could be physically integrated with the clock tower and *vice versa*.

The panel supports activating the ground floor, providing retail and commercial uses in Hunter and Railway, and creating an internal street with public art, lobby accesses and commercial uses. Setting back the proposal 3 additional meters in Hunter and Railway Street generates a buffer for businesses and retails to activate the streetscape while providing a quality space for pedestrian and landscaping. The should be provision for safe pedestrian access along Tighe Street, and activation of the laneway on the east, providing a designated space for pedestrians to walk both in Tighe Street and the laneway: or alternatively both should be 'pedestrianized' with minimal vehicular traffic.

The land to the north of the subject site between the laneway and the railway line, has the same height control as the subject site - a maximum of 90m. Given its dimensions, it is unlikely that a development approaching this height could possibly be accommodated upon the site. However, even a relatively lower building on this site could have potential adverse impacts on the lower residential floors on the subject proposed development. The architect indicated that CKDS had separately been commissioned by the owner of this site and were in the early stages of designing a low-rise non-residential development for it. The panel indicated that greater certainty needed to be demonstrated that the height of any development on this adjacent site was limited, so as to ensure that the small setbacks of the proposed tower from the laneway would not result in adverse impacts on residential amenity arising from its proximity to development on the northern site.

Density

The site is prescribed with a maximum building height of 90m. The submitted architectural drawings show a maximum building height of 99m; equating to an exceedance of 9m or 10% of the building height prescribed for the subject site. The applicant is relying on the bonus from NLEP2012 clause c.7.5(6).
Applicant indicates the FSR is in the order of 5.5:1. The allowance for the subject site is 8:1, although is being reduced to 5:1 under Cl7.10 as the subject site. The applicant is relying on the 10% bonus under NLEP2012 clause 7.5(6).

This is supported in principle but will require review and approval by a design panel, complying with NLEP2012.

Sustainability

The form and orientation of towers are supported in principle and a detailed solar study will need to analyse the impact the development has internally and in relation to adjacent properties and the urban space.

The design should reduce excessive solar exposure and energy consumption, with sun shading, in combination with a high-performance façade, and the provision of PV panel.

Considering the scale of the communal landscape podium and shared workspace roof (corner commercial/office building), both at level 5, it is strongly recommended that rainwater should be stored and recycled to assist with landscape irrigation, combined with drip irrigation that optimizes water consumption. Selection of appropriate plant species can also help reducing the need for watering.

Landscape

As the proposal is at Pre-DA, only very preliminary landscape design is provided at this stage, including some useful sketches of ground floor and level 5 (podium) level. If a pool is being considered at the podium level, its position might be better if offset from the building edge. Any potential conflict between the communal gardens and the tower residential apartments itself or neighboring properties should be addressed, due to limited separation.

Similarly, appropriate street trees should be considered (to be coordinated with Council's requirements) and ground level landscaping. It would ideal that the landscape on ground floor is not only located in the corner of Hunter and Railway Streets but could potentially take up much of the Hunter Street frontage (see art public opportunities, page 16, *Part 4* of the architectural drawing set). Any street tree's locations should permit appropriate curtilage to the clock tower to maintain views of the tower from the street corner.

Amenity

The indicative apartment layouts are of high quality in terms of amenity, privacy (balconies, bedrooms), and solar and daylight access are the documentation states over 83.1% (a minimum of 70% ADG standard) of the apartments will achieve two hours solar access during winter. Similarly, over 91.8% (minimum of 60% ADG) of the apartments achieve cross ventilation. Confirmation of the calculations and will be required at the next stage.

Because of the potentially increasing severity of extreme weather events due to climate change, and the consequently likely more frequent loss of electricity

supplies, contingency plans for dealing with outages are recommended, especially considering the scale of the proposal. These considerations should not only include safety and security, but also to whether residents and users would be expected to continue to work in the event of an extended power outage.

A shadow study should be submitted showing the impact the development has on adjacent sites and urban streetscape.

Safety

Casual surveillance of the pedestrian laneway connecting the customer carpark accessed off Tighe Street and Hunter Street, will be important.
Safety and security in the internal street and access to lobby (towers and corner commercial/office building) will be critical.

Housing Diversity and Social Interaction

The proposal would achieve a high level of social interaction by articulating commercial, retail and residential uses. At residential levels in the tower blocks, the variety of typologies and apartments size and the small number on each floor should ensure housing diversity and stimulate informal meetings of residents.

It is highly desirable that disabled users and those with reduced mobility can access most of the facilities provided, complying with the spirit of the DDA legislation.

Aesthetics

The preliminary design forms the basis for a development of very good quality, also having the potential for a very positive contribution to the streetscape.

Amendments Required to Achieve Design Quality

Issues raised under the headings above, including matters relating to heritage, amenity, security, equity, landscape and aesthetics need to be addressed as the design is developed.

Summary Recommendation

The proposal is strongly supported in principle, as outlined above. Providing the design development addresses the issues raised, it has the potential to result in a very positive addition to this part of the city.

URBAN DESIGN REVIEW PANEL
Report

Meeting:	**UDRP – August 2021**
Date	Wednesday 25 August 2021
Chair:	**Philip Pollard**, Urban Design Review Panel
Attendees:	Justin Hamilton, Urban Design Review Panel Colin Brady, Urban Design Review Panel Amy Ryan, Development Projects Team Coordinator, City of Newcastle William Toose, Development Assessment Team Coordinator, City of Newcastle Elle Durrant, Development Officer (Planning), City of Newcastle

AGENDA	Item	Description
	2	**Matters for consideration**
1:30pm-2:30pm [60 mins]	**2.4**	**UD2021/00005.01 – Pre-Application** **924 Hunter Street Newcastle West** Partial demolition and erection of mixed use development - comprising commercial building (5 storey) and two residential towers (30 & 24 storey) **Attendees:** Applicant: Stuart Campbell, CKDS Architecture Joel Chamberlain, CKDS Architecture Mathew Boyle, CKDS Architecture Luke Mahaffey, Thirdi Dairy Farmers Pty Ltd Scott Shafren, Base Build Officer: Damian Jaeger Senior Development Officer (Planning), City of Newcastle

In the interest of providing open access to information to the public this referral will be made available on City of Newcastles' (CNs') Application Tracking system.

The content of this advice is intended to provide information for the Assessment Officer to consider in the determination of the relevant application. The Urban Design Review Panel (UDRP) is an advisory panel only and the advice provided by the panel is to inform the assessment process. It is not the purpose of the UDRP to have any role in the determination of development applications, nor are its recommendations binding on CN's determination of an application.

Scope

The following drawings / documents have been reviewed:

Plan No / Supporting Document	Prepared by	Reference/ date
UDRP presentation – Part 1 (20 pages)	CKDS Architecture	10 August 2021
UDRP presentation – Parts 2 & 3 (53 pages)	CKDS Architecture	10 August 2021
Appendix A – Preliminary drawing set (19 pages)	CKDS Architecture	10 August 2021

Background

The development proposal was previously reviewed by the UDRP on 30 June 2021 and relevant extracts from the advice provided at that time has been reiterated below in *italics*, followed by comments on the current development proposal.

1. Context and Neighbourhood Character

30 June 2021

The proposal includes the partial demolition of existing buildings, erection of a mixed-use development comprised commercial premises that incorporate retail and business/office space, organised into a corner commercial/office building on four levels at the corner of Hunter with Railway, and a podium and two residential towers occupying the northeast corner (Tighe Street and rare lane on the east).

The subject site consists of seven lots known as 924 Hunter Street Newcastle West, located towards the western end of Hunter Street, and is visually prominent as it is opposite the intersection with Tudor Street, which is a major feeder road. The site is bound to its south by Hunter Street, to its west by Railway Street, and to its north by Tighe Street (having approximate frontages of 75m, 54m, and 74m respectively). The site is zoned B3 Commercial Core under the provisions of the Newcastle Local Environmental Plan 2012 and is located within the Newcastle City Centre and Newcastle City Centre Heritage Conservation Area. Land adjoining the site to the north and east is also zoned B3 Commercial Core, with the land to the west zoned B4 Mixed Use zone and Hunter Street to the south is SP2 Classified Road zone.

The lot to the eastern side of the site is currently occupied by a low-scaled building that has recently been tenanted by a gymnasium. This building, as well the remainder of development on the site with the exception of the Heritage item, until recently formed part of a motor vehicle showroom and car yard. Prior to its conversion in the late 1990s to a motor showroom and associated uses, the site was occupied by the Dairy Farmers Co-operative, and it is from this use that the Heritage item – the clock tower – is derived. The clock tower formed part of the former Dairy Farmers' building and was located mid-way along its Hunter Street façade, rather than on the street corner (listed heritage item "Dairy Farmers Building" (Local I505). The decision to locate the tower in this manner may have had to do with the lesser significance of Railway Street relative to Hunter Street and Tudor Street. The site was a landmark in the city and was referred to as "Dairy Farmers' corner", and being a co-operative, as well as significant employer in the region, the Dairy Farmers' site was of considerable social significance.

The Dairy Farmers site, and the Motor showroom that succeeded it, occupied a number of lots that were not amalgamated under single title at the time of the construction of the motor showroom and associated structures, and it is now proposed to rely on the separate land title of the lot currently occupied by the gymnasium, to exclude it from the overall former motor showroom site.

The former level-crossing at Railway Street has in recent years been permanently closed to motor vehicles at the railway line, as part of the creation of the new Transport Interchange, which is located a few hundred metres to the east. The short section of Railway Street to the west of the subject site therefore serves only to access the small number of properties in the immediate vicinity including Tighe Street. Pedestrian access, including recently installed lifts, provide pedestrian access to the northern section of Railway Street beyond the rail line.

25 August 2021

The context of the development has not changed, but the Panel requested inclusion of 'long views' of the proposed development be submitted as part of the developed design, including

further studies from various public vantage points. For example, long view of the towers viewed from Tudor Street would be informative to the consideration of the project.

2. Built Form and Scale

30 June 2021

The proposal amalgamates a corner commercial building, five-level podium and two residential towers. The corner commercial building (four stories and ground floor) is located at the corner of Hunter with Railway Street, entirely dedicated to commercial and shared offices and incorporates a shared workspace roof on level 5.

The majority of the site is occupied by a podium and two residential towers, separated by an internal street that gives access to the residential lobby and intended to create a "refuge for pedestrian, users and residents." The applicants are proposing the creation of a public art installation in this area to activate the internal street, improving amenity and promoting security. The ground floor level also allocates commercial uses (retail, commercial and food and beverage), services and car parking with access from Tighe Street. The upper ground plan is entirely dedicated to parking. Level 1 contains parking and residents' storage and bike storage. Levels 2, 3 and 4 are entirely dedicated to parking and residential apartments. The podium on level 5 is residential and incorporates a communal landscape podium and a communal area per tower. The two towers of 30 storey (99 metres), and 24 storey (84 metres) are proposed as residential apartments…

The Group is generally supportive of the height, geometry, setbacks, and character of the podium and towers, but raised an issue in relation to the heritage clock tower and its relationship with the commercial/office building in the corner of Hunter with Railway Street.

The panel supports activating the ground floor, providing retail and commercial uses in Hunter and Railway Streets, and creating an internal street with public art, lobby accesses and commercial uses. Setting back the proposal 3 additional meters in Hunter and Railway Street generates a buffer for businesses and retails to activate the streetscape while providing a quality space for pedestrian and landscaping. There should be provision for safe pedestrian access along Tighe Street, and activation of the laneway on the east, providing a designated space for pedestrians to walk both in Tighe Street and the laneway - or alternatively both should be 'pedestrianized' with minimal vehicular traffic.

The land to the north of the subject site between the laneway and the railway line, has the same height control as the subject site - a maximum of 90m. Given its dimensions, it is unlikely that a development approaching this height could possibly be accommodated upon the site. However, even a relatively lower building on this site could have potential adverse impacts on the lower residential floors on the subject proposed development. The architect indicated that CKDS had separately been commissioned by the owner of this site and were in the early stages of designing a low-rise non-residential development for it. The panel indicated that greater certainty needed to be demonstrated that the height of any development on this adjacent site was limited, so as to ensure that the small setbacks of the proposed tower from the laneway would not result in adverse impacts on residential amenity arising from its proximity to development on the northern site.

25 August 2021

Design development of the integration of the heritage item- the former Dairy Farmers clock tower - into the ground floor of the proposal has progressed well, with the resultant relationships between the Clock Tower and its surrounding spaces considered successful, and an opportunity has been created thereby, to celebrate it by way of an interpretive artwork that would continue into the pedestrian laneway adjacent to it. The subtle changes to the massing of the adjacent office building to 'cradle' the Clock Tower, that avoids connecting into

it, are considered particularly successful, and the Panel is now supportive of having the Clock Tower standing alone on site, as proposed.

The possible future extension of the light rail network from the Newcastle Interchange westwards, was touched upon as an issue to be investigated.

The issue of more distant views to the profile of the towers' roofline forms was discussed, and the architect indicated that several options had been explored of raked rooflines. However, given the deliberate variation in the heights of the towers, a visual contrast had been created using horizontal roof planes, which the Panel considered could be a sufficient upper termination to the towers, providing the rooflines were kept clear of plant and other uncoordinated elements protruding from them.

3. Density

30 June 2021

The site is prescribed with a maximum building height of 90m. The submitted architectural drawings show a maximum building height for one tower of 99m; equating to an exceedance of 9m or 10% of the building height prescribed for the subject site.

The applicant is relying on the bonus from NLEP2012 clause c.7.5(6). Applicant indicates the FSR is in the order of 5.5:1. The allowance for the subject site is 8:1, although is being reduced to 5:1 under CI7.10 as the subject site. The applicant is relying on the 10% bonus under NLEP2012 clause 7.5(6).

This is supported in principle but will require review and approval by a design panel, complying with NLEP2012.

25 August 2021

The proposed heights and densities were considered appropriate.

4. Sustainability

30 June 2021

The form and orientation of towers are supported in principle and a detailed solar study will need to analyze the impact the development has internally and in relation to adjacent properties and the urban space.

The design should reduce excessive solar exposure and energy consumption, with sun shading, in combination with a high-performance façade, and the provision of PV panel.

Considering the scale of the communal landscape podium and shared workspace roof (corner commercial/office building), both at level 5, it is strongly recommended that rainwater should be stored and recycled to assist with landscape irrigation, combined with drip irrigation that optimizes water consumption. Selection of appropriate plant species can also help reducing the need for watering.

25 August 2021

Heat loads, particularly from the western summer sun, to the residential towers are likely to be considerable. While performance glass may potentially be sufficient to satisfy minimum BASIX standards, appropriate sun protection during hotter months is essential to achieve a good standard of sustainability for both the interiors and balcony areas.

Proposed green roofs and landscaped podium areas were supported.

As the design is further developed, further consideration should be given as to the overall sustainability of the proposal. Given its scale, thermal comfort modelling of the dwellings and commercial spaces was encouraged.

Opportunities for electric vehicle charging in the garage spaces should be provided for, along with discretely located PV generation to supplement communal area energy demands.

5. Landscape

30 June 2021

As the proposal is at Pre-DA, only very preliminary landscape design is provided at this stage, including some useful sketches of ground floor and level 5 (podium) level. If a pool is being considered at the podium level, its position might be better if offset from the building edge. Any potential conflict between the communal gardens and the tower residential apartments itself or neighboring properties should be addressed, due to limited separation.

Similarly, appropriate street trees should be considered (to be coordinated with Council's requirements) and ground level landscaping. It would ideal that the landscape on ground floor is not only located in the corner of Hunter and Railway Streets but could potentially take up much of the Hunter Street frontage (see art public opportunities, page 16, Part 4 of the architectural drawing set). Any street tree's locations should permit appropriate curtilage to the clock tower to maintain views of the tower from the street corner.

25 August 2021

At Ground level, the proposed Public Art installation associated with the heritage item was noted and supported, along with its extension into the pedestrian laneway adjacent.

The raked turf areas on the podium were considered to be interesting, but it was noted that these should be living turf – not plastic. Sufficient areas with deeper soil volumes must be provided for larger trees and shrubs to provide a living landscape context to the turfed areas. Previous comments in respect to street trees were reiterated.

6. Amenity

30 June 2021

The indicative apartment layouts are of high quality in terms of amenity, privacy (balconies, bedrooms), and solar and daylight access are the documentation states over 83.1% (a minimum of 70% ADG standard) of the apartments will achieve two hours solar access during winter. Similarly, over 91.8% (minimum of 60% ADG) of the apartments achieve cross ventilation. Confirmation of the calculations and will be required at the next stage.

Because of the potentially increasing severity of extreme weather events due to climate change, and the consequently likely more frequent loss of electricity supplies, contingency plans for dealing with outages are recommended, especially considering the scale of the proposal. These considerations should not only include safety and security, but also to whether residents and users would be expected to continue to work in the event of an extended power outage.

25 August 2021

The orientation and geometric plan form of the apartment balconies were raised. Although the balconies do not in all instances meet the Apartment Design Guidelines minimum dimensions, the provision of multiple balconies per apartment and the relationships of balconies to living room spaces were such that the balconies in many instances can serve as an extension to the living space. However, further attention was considered warranted in respect to the very

extensive areas of glass balustrading that were proposed, in combination with a lack of any protection from strong winds and summer sun. Though some units have storage for barbecues etc in the angled columns, provision should be made for screened balcony storage for all dwellings. Likewise, air conditioning compressors should not create visual impacts, and should not compromise the use of balconies by their location when they are operational. The issue of cleaning the "pointy end" of balconies as they narrow in plan to a tip, was raised, and the need noted for detailing that can allow the floor surface and the interior of any balustrades should take this into account.

A shadow study was submitted indicating the impact the development has on adjacent sites and urban streetscape. As one would expect, the shadows are quite long, given the permissible heights of the towers. However thanks to their relative slenderness, the adverse impacts of overshadowing of other properties, appears to be acceptable.

Ground level lift lobby spaces have been reduced to accommodate surrounding functional needs, and are now fairly restricted near the lift doors. Further consideration of how these spaces can be made at least moderately more generous, was considered warranted.

7. Safety

30 June 2021

Casual surveillance of the pedestrian laneway connecting the customer carpark accessed off Tighe Street and Hunter Street, will be important. Safety and security in the internal street and access to lobby (towers and corner commercial/office building) will be critical.

25 August 2021

While the design development has improved most relationships in respect to security and safety, the issues previously noted should be borne in mind as the design is further developed. The shared back-of-house area at ground level should be further considered as to how it functions in respect to CPTED. Dedicated parking should be provided for motor cycles and bicycles.

8. Housing Diversity and Social interaction

30 June 2021

The proposal would achieve a high level of social interaction by articulating commercial, retail and residential uses. At residential levels in the tower blocks, the variety of typologies and apartments size and the small number on each floor should ensure housing diversity and stimulate informal meetings of residents.

It is highly desirable that disabled users and those with reduced mobility can access most of the facilities provided, complying with the spirit of the DA legislation.

25 August 2021

The previous comments were reiterated for consideration as the design is developed.

9. Aesthetics

30 June 2021

The preliminary design forms the basis for a development of very good quality, also having the potential for a very positive contribution to the streetscape.

25 August 2021

Further consideration was encouraged of how the milk bottle and clock would be back-lit, and their integration with the interpretive public artwork – also making sure intervening objects, including street trees, do not obscure the view lines to the heritage item from public domain.

The extent of glass balustrades was again questioned, both because of the impacts upon the amenity of the balconies involved, and the exposure of items located upon the balconies, including furniture, pot plants, drying washing and stored items. The continuous clear glass balustrades also provide very little variation and depth to the facades.

With the exception of the issues of balustrading, the aesthetic treatment of the proposal was considered to be well developed and the visual interest of the tower forms themselves, was excellent.

Recommendation:

30 June 2021

Issues raised under the headings above, including matters relating to heritage, amenity, security, equity, landscape and aesthetics need to be addressed as the design is developed.

The proposal is strongly supported in principle, as outlined above. Providing the design development addresses the issues raised, it has the potential to result in a very positive addition to this part of the city.

25 August 2021

The design of the proposal has progressed well, and the major issues previously raised, which were primarily required refinements to the design, have been addressed. Providing the remaining points noted under the headings above, are taken on board during the further development of the design, the project is considered to have potential to achieve an excellent overall design.

Appendix Q

QUANTITY SURVEYOR REPORT

Napier & Blakeley
COST ▪ RISK ▪ RETURN

Level 8, 20 Hunter Street
Sydney NSW 2000
PO Box R608
Royal Exchange NSW 1225
T 02 9299 1899
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15 October 2021
File Ref.: 2302080702/AA

Anthony dArcy
Catalyst Project Consulting Pty Ltd
5/91 Hannell Street
WICKHAM NSW 2293

Dear Anthony

924 Hunter Street, Newcastle West
Registered Quantity Surveyor's Cost Estimate Report for City of Newcastle Council

We have prepared a Development Application Elemental Cost Estimate for the construction of a mix development comprising commercial building (Cold Shell) with six (6) levels, residential two towers (Tower 1 with 29 Levels and Tower 2 with 24 levels) containing a mix of one, two & three bedroom apartments (Total = 183 units), retail (Cold Shell) to ground floor and five carpark level. There is open communal space to level four and there are 5 lifts which serve the buildings. The works also include demolition of existing buildings and all associated works. Our cost estimate for the construction work is **$94,457,764 (excl GST)** and the development cost is **$110,137,753 (incl GST).** An analysis of the estimated cost is summarised below:

Preliminaries	(27.0%)	$ 19,030,156
Demolition		$ 550,000
Substructure		$ 720,223
Superstructure		$ 36,879,291
Finishes		$ 9,682,466
Fittings		$ 5,616,465
Services		$ 15,325,490
External Works		$ 663,124
External Services		$ 1,045,000
Unmeasured Works Allowance	(0.5%)	$ 447,561
Profit & Overheads	(5.0%)	$ 4,497,989
Total Construction Cost (Excl GST)		**$ 94,457,764**
Add: Professional Fees	(6.0%)	$ 5,667,466
Total Development Cost (Excl GST)		**$ 100,125,230**
Add: Total GST	(10.0%)	$ 10,012,523
Total Development Cost (Incl GST)		**$ 110,137,753**
Total Site Area		3,937m2
Total Gross Floor Area		41,023m2

We certify that we have:

- Inspected Architectural drawings 21014_A-0001_04, 21014_A-0002_02 - A-0008_02, 21014_A-1001_02, 21014_A-1101_07 - 21014_A-1106_07, 21014_A-1107_11 - 21014_A-1112_11, 21014_A-1201_11, 21014_A-1202_06, 21014_A-2002_05 - 21014_A-2004_05, 21014_A-3001_05, 21014_A-3002_05, 21014_A-3003_04, 21014_A-3004_03, 21014_A-3005_04, 21014_A-4001_04, 21014_A-5001_02, 21014_A-5002_02, 21014_A-7001_06, 21014_A-7002_03, 21014_A-7003_02, 21014_A-7004_02, 21014_A-7005_01, 21014_A-7006_01 and 21014_A-8001_04 dated 8 October 2021 as prepared by CKDS Architects
- Prepared and attached an elemental estimate generally in accordance with the Australian Cost Management Manuals from Australian Institute of Quantity Surveyors
- Calculated the development costs at current prices
- Included GST in the calculation of the development cost
- Measured Gross Floor Area (GFA) in accordance with the Method of Measurement of Building Areas in the AIQS Cost Management Manual Volume 1, Appendix A2
- Included works as indicated on the drawings and within the site boundary.
- Prepared this estimate as a requirement for a DA submission. This is not a tender estimate.

If you should wish to discuss this matter further, please contact Peter Hammond of this office.

Yours faithfully

Peter Hammond MCIOB FRICS AAIQS No. 9898
Director
Napier & Blakeley Pty Ltd

ENCL

Report Parameters

This report is the opinion of Napier & Blakeley Pty Ltd ACN 006 386 278 atf Napier & Blakeley Unit Trust ABN 87 601 474 307 (**Napier & Blakeley**) and is to be read together with and is subject to the term and conditions of our engagement. Our opinions in this report are based on the information referred to in this report that has been made available to us by or on behalf of the addressee (**Information**).

Napier & Blakeley has not obtained independent verification of the Information. As such, our opinion may be different if the Information is incorrect or inaccurate in any way. This report was prepared solely for the addressee and its use is limited to the purpose for which it was provided. No third party may rely on this report without first obtaining the prior written consent of Napier & Blakeley.

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Registered Quantity Surveyor's* Detailed Cost Report
Development cost in excess of $750,000

***A member of the Australian Institute of Quantity Surveyors.**

City of Newcastle

Development Application No: _____ **Date:** _____

Complying Development Application No: _____

Applicant's name: _____

Applicant's address: _____

_____

Development Details: _____

Development Address: **924 Hunter Street, Newcastle West NSW 2302**

_____

Estimate Details

Professional Fees	**$ 5,667,466**	**Excavation**	**$116,598**
% of Development Cost	5.1%	Cost per m^3 or tonne of excavated area	$65/$m^3$
% of Construction Cost	6%	Carpark	$ 8,749,355
Demolition and site preparation	$747,645	Cost per square metre of carpark area	$1,047/$m^2$
Cost per square metre of site area	$190/$m^2$	Cost per space	$35,422/ space
Construction - commercial	$ 3,926,941	Fit-out - commercial	$ 87,377
Cost per square metre of floor area	$2,777/$m^2$	Cost per m^2 of commercial area	$62/$m^2$
Construction - residential	$ 52,079,895	Fit-out - residential	$27,887,074
Cost per square metre of residential area	$1,698/$m^2$	Cost per m^2 of residential area	$909/$m^2$
Construction - retail	$ 730,472	Fit-out - retail	$132,409
Cost per square metre of retail area	$1,268/$m^2$	Cost per m^2 of retail area	$230/$m^2$
Construction - industrial	$	Fit-out - industrial	$
Cost per square metre of floor area	$/$m^2$	Cost per m^2 of industrial area	$/$m^2$

Development Details

Gross Floor Area - commercial	1,414m^2	Gross Floor Area - other	
Gross Floor Area - residential	30,675m^2	Total Gross Floor Area	41,023m^2
Gross Floor Area - retail	576m^2	Total Site Area	3,937m^2
Gross Floor Area - carparking	8,358m^2	Total carparking spaces	237
Sub-total	$ 100,125,231		
Goods and Services Tax	$ 10,012,523		
Total Development Cost (including GST)	$ 110,137,755		

I certify that I have:

- inspected the plans the subject of the application for development consent or construction certificate
- prepared and attached an elemental estimate prepared generally in accordance with the Australian Cost Management Manuals from the Australian Institute of Quantity Surveyors and that I am a member of the Australian Institute of Quantity Surveyors or a person who can demonstrate equivalent qualifications
- calculated the development costs in accordance with the definition of development costs in clause 25J of the Environmental Planning and Assessment Regulation 2000 at current prices
- included GST in the calculation of development cost
- measured gross floor areas in accordance with the Method of Measurement of Building Area in the AIQS Cost Management Manual Volume 1, Appendix A2.

Signed:

Name: Peter Hammond

Position and qualifications: **Director** **AAIQS:** 9898

Date: 15 October 2021

Contact number: 02 9299 1899

A member of the Australian Institute of Quantity Surveyors or a person who can demonstrate equivalent qualifications.

PROJECT: 924 Hunter Street, Newcastle West
JOB NUMBER: 2302080702
DATE: 13-Oct-21

Description: The construction of a mix development comprising commercial building (Warm Shell) with six (6) levels, residential two towers (Tower 1 with 29 Levels and Tower 2 with 24 levels) containing a mix of one, two & three bedroom apartments (Total = 183 units), retail (Cold Shell) to ground floor and five carpark level. There is open communal space to level four and there are 5 lifts which serve the buildings. The works also include demoltion of existing buildings and all associated works.

ALL INSERT CELLS = This colour

27.0%		PRELIMINARIES	27.0%	Insert
0.5%		UNMEASURED WORKS ALLOWANCE	0.5%	Insert
5.0%		PROFIT & OVERHEADS	5.0%	Insert
6.0%		PROFESSIONAL FEES	6.0%	Insert

AREA NOT IN TOTAL

		FUNCTIONAL AREA =	Carpark - FECA (m2)		Retail (Cold Shell) - FECA (m2)		Commercial (Cold Shell) - FECA (m2)		Plant & BOH - FECA (m2)		Residential Tower-1 - FECA (m2)		Residential Tower-2 - FECA (m2)		Function/WFH/Gym/Studio (Level 4) - FECA (m2)		Terrace / Balcony Tower-1 - UCA (m2)		Terrace / Balcony Tower-2 - UCA (m2)		Communal Open Space - UCA (m2)		External Works (m2)		TOTAL WORKS	
			Area sqm =	8,358	Area sqm =	576	Area sqm =	1,414	Area sqm =	548	Area sqm =	11,836	Area sqm =	9,539	Area sqm =	497	Area sqm =	3,410	Area sqm =	2,875	Area sqm =	1,970	Area sqm =	785	Area sqm =	41,023
			$/SQM	$	$/SQM	$	$/SQM	$	$/SQM	$	$/SQM	$	$/SQM	$	$/SQM	$	$/SQM	$	$/SQM	$	$/SQM	$	$/SQM	$	$/SQM	$
O1	SB	SUBSTRUCTURE	$ 32.25	$269,540	$ 232.50	$133,920	$ 42.75	$60,450	$ 273.56	$149,910	$ 5.59	$66,105	$ 4.22	$40,298	-	-	-	-	-	-	-	-		-	$ 17.56	$720,223
O2	CL	Columns	$ 60.00	$501,480	$ 75.00	$43,200	$ 50.00	$70,700	$ 75.00	$41,100	$ 75.00	$887,700	$ 75.00	$715,425	$ 75.00	$37,275	$ 40.00	$136,400	$ 40.00	$115,000	$ 4.72	$9,300		-	$ 62.35	$2,557,580
O3	UF	Upper Floors	$ 301.27	$2,518,040	-	-	$ 300.57	$425,000	-	-	$ 334.43	$3,958,280	$ 337.04	$3,215,040	$ 340.00	$168,980	$ 340.00	$1,159,400	$ 340.00	$977,500	$ 340.00	$669,800		-	$ 319.14	$13,092,040
O4	SC	Staircase	$ 13.55	$113,220	-	-	$ 39.69	$56,120	$ 126.87	$69,525	$ 42.27	$500,320	$ 43.84	$418,170	-	-	-	-	-	-	-	-		-	$ 28.21	$1,157,355
O5	RF	Roof	-	-	-	-	$ 119.71	$169,275	-	-	$ 14.75	$174,577	$ 18.52	$176,652	-	-	-	-	-	-	-	-		-	$ 12.69	$520,503
O6	EW	External Walls	$ 97.53	$815,185	$ 434.72	$250,400	$ 1,209.76	$1,710,602	$ 117.39	$64,328	$ 301.16	$3,564,503	$ 281.46	$2,684,867	$ 297.28	$147,748	$ 564.81	$1,926,011	$ 558.27	$1,605,035	$ 32.83	$64,680		-	$ 312.83	$12,833,359
O7	WW	Windows		-		-		-		-		-		-		-		-		-		-		-	-	-
O8	ED	External Doors	$ 1.94	$16,250	$ 39.06	$22,500	$ 0.88	$1,250	$ 13.69	$7,500	$ 1.27	$15,000	$ 1.57	$15,000	$ 38.23	$19,000		-		-		-		-	$ 2.35	$96,500
O9	NW	Internal Walls	$ 25.59	$213,875	$ 171.53	$98,800	$ 26.61	$37,632	$ 181.94	$99,702	$ 224.74	$2,659,974	$ 230.01	$2,194,026	$ 100.00	$49,700		-		-		-		-	$ 130.51	$5,353,709
10	NS	Internal Screens & B/L	$ 9.85	$82,350	-	-	-	-	-	-	$ 24.59	$291,000	$ 14.34	$136,800	-	-		-		-		-		-	$ 12.44	$510,150
11	ND	Internal Doors	$ 3.50	$29,250	-	-	$ 5.66	$8,000	$ 50.54	$27,695	$ 41.72	$493,800	$ 20.64	$196,850	$ 5.03	$2,500		-		-		-		-	$ 18.48	$758,095
TOTAL		SUPERSTRUCTURE	$ 513.24	$4,289,650	$ 720.31	$414,900	$ 1,752.88	$2,478,579	$ 565.42	$309,850	$ 1,059.92	$12,545,154	$ 1,022.42	$9,752,830	$ 855.54	$425,203	$ 944.81	$3,221,811	$ 938.27	$2,697,535	$ 377.55	$743,780	-	-	$898.99	$36,879,291
12	WF	Wall Finishes	$ 3.07	$25,665	-	-	$ 7.70	$10,886	$ 101.08	$55,390	$ 147.39	$1,744,506	$ 142.24	$1,356,862	$ 120.00	$59,640	-	-	-	-	-	-		-	$ 79.30	$3,252,949
13	FF	Floor Finishes	$ 11.00	$91,938	-	-	$ 1.78	$2,520	$ 60.65	$33,234	$ 143.18	$1,694,712	$ 143.11	$1,365,148	$ 80.00	$39,760	$ 190.00	$647,900	$ 190.00	$546,250	$ 97.60	$192,280		-	$ 112.47	$4,613,742
14	CF	Ceiling Finishes	-	-	-	-	$ 1.53	$2,160	$ 15.00	$8,220	$ 78.40	$927,958	$ 78.19	$745,887	$ 75.00	$37,275	$ 15.00	$51,150	$ 15.00	$43,125	-	-		-	$ 44.26	$1,815,775
TOTAL		FINISHES	$ 14.07	$117,603	-	-	$ 11.01	$15,566	$ 176.72	$96,844	$ 368.97	$4,367,176	$ 363.55	$3,467,897	$ 275.00	$136,675	$ 205.00	$699,050	$ 205.00	$589,375	$ 97.60	$192,280	-	-	$236.03	$9,682,466
15	FT	Fitments	$ 11.56	$96,580	-	-	$ 2.83	$4,000	$ 10.00	$5,480	$ 185.13	$2,191,180	$ 151.95	$1,449,450	$ 25.00	$12,425	$ 10.00	$34,100	$ 10.00	$28,750	$ 7.61	$15,000		-	$ 93.53	$3,836,965
16	SE	Special Equipment		-	-	-	-	-	-	-	$ 89.77	$1,062,500	$ 75.17	$717,000	-	-		-		-		-		-	$ 43.38	$1,779,500
TOTAL		FITTINGS	$ 11.56	$96,580	-	-	$ 2.83	$4,000	$ 10.00	$5,480	$ 274.90	$3,253,680	$ 227.12	$2,166,450	$ 25.00	$12,425	$ 10.00	$34,100	$ 10.00	$28,750	$ 7.61	$15,000	-	-	$136.91	$5,616,465
17	SF	Sanitary Fixtures		-		-		-		-		-		-		-		-		-		-		-	-	-
18	PD	Sanitary Plumbing	$ 50.00	$417,900	$ 20.00	$11,520	$ 13.58	$19,200	$ 50.00	$27,400	$ 207.77	$2,459,200	$ 169.94	$1,621,100	$ 40.00	$19,880	$ 30.00	$102,300	$ 30.00	$86,250	$ 30.00	$59,100		-	$ 117.59	$4,823,850
19	WS	Water Supply		-		-		-		-		-		-		-		-		-		-		-	-	-
20	GS	Gas Service		-		-		-	-	-	$ 3.25	$38,500	$ 2.68	$25,550	-	-		-		-		-		-	$ 1.56	$64,050
21	SH	Space Heating		-		-		-		-		-		-		-		-		-		-		-	-	-
22	VE	Ventilation	$ 50.00	$417,900	$ 20.00	$11,520	$ 4.24	$6,000	$ 50.00	$27,400	$ 14.32	$169,450	$ 13.14	$125,350	$ 25.00	$12,425		-		-		-		-	$ 18.77	$770,045
23	EC	Evaporative Cooling		-		-		-		-		-		-		-		-		-		-		-	-	-
24	AC	Air Conditioning		-	$ 20.00	$11,520	$ 50.00	$70,700	-	-	$ 86.52	$1,024,000	$ 78.05	$744,500	$ 150.00	$74,550		-		-		-		-	$ 46.93	$1,925,270
25	FP	Fire Protection	$ 65.00	$543,270	$ 75.00	$43,200	$ 75.00	$106,050	$ 75.00	$41,100	$ 75.00	$887,700	$ 75.00	$715,425	$ 75.00	$37,275		-		-		-		-	$ 57.87	$2,374,020
26	LP	Electric Light & Power	$ 45.00	$376,110	$ 30.00	$17,280	$ 50.00	$70,700	$ 80.00	$43,840	$ 87.90	$1,040,380	$ 86.50	$825,170	$ 80.00	$39,760	$ 35.00	$119,350	$ 35.00	$100,625	$ 35.00	$68,950		-	$ 65.87	$2,702,165
27	CM	Communications		-		-	$ 10.00	$14,140		-	$ 15.33	$181,500	$ 12.63	$120,450	-	-		-		-		-		-	$ 7.71	$316,090
28	TS	Transportation Systems	-	-	-	-	$ 106.08	$150,000	-	-	$ 101.39	$1,200,000	$ 104.83	$1,000,000	-	-		-		-		-		-	$ 57.28	$2,350,000
29	SS	Special Services	-	-		-		-	-	-	-	-	-	-	-	-		-		-		-		-	-	-
TOTAL		SERVICES	$ 210.00	$1,755,180	$ 165.00	$95,040	$ 308.90	$436,790	$ 255.00	$139,740	$ 591.48	$7,000,730	$ 542.78	$5,177,545	$ 370.00	$183,890	$ 65.00	$221,650	$ 65.00	$186,875	$ 65.00	$128,050	-	-	$373.58	$15,325,490
30	CE	CENTRALISED ENERGY SYSTEMS		-		-		-		-		-		-		-		-		-		-		-	-	-
31	AR	DEMOLITION		-		-		-		-		-		-		-		-		-		-	$ 700.64	$550,000	$ 13.41	$550,000
		SUB-TOTAL - BUILDING	$ 781.11	$6,528,553	$ 1,117.81	$643,860	$ 2,118.38	$2,995,385	$ 1,280.70	$701,824	$ 2,300.85	$27,232,845	$ 2,160.08	$20,605,019	$ 1,525.54	$758,193	$ 1,224.81	$4,176,611	$ 1,218.27	$3,502,535	$ 547.77	$1,079,110	$ 700.64	$550,000	$ 1,676.47	$68,773,934
		PRELIMINARIES - BUILDING	$ 210.90	$1,762,709	$ 301.81	$173,842	$ 571.96	$808,754	$ 345.79	$189,492	$ 621.23	$7,352,868	$ 583.22	$5,563,355	$ 411.90	$204,712	$ 330.70	$1,127,685	$ 328.93	$945,684	$ 147.90	$291,360	$ 189.17	$148,500	$ 452.65	$18,568,962
		UNMEASURED WORKS ALLOWANCE	$ 4.96	$41,456	$ 7.10	$4,089	$ 13.45	$19,021	$ 8.13	$4,457	$ 14.61	$172,929	$ 13.72	$130,842	$ 9.69	$4,815	$ 7.78	$26,521	$ 7.74	$22,241	$ 3.48	$6,852	$ 4.45	$3,493	$ 10.65	$436,714
		SUB-TOTAL - BUILDING	$ 996.98	$8,332,719	$ 1,426.72	$821,791	$ 2,703.79	$3,823,160	$ 1,634.62	$895,773	$ 2,936.69	$34,758,641	$ 2,757.02	$26,299,216	$ 1,947.12	$967,719	$ 1,563.29	$5,330,817	$ 1,554.94	$4,470,461	$ 699.15	$1,377,322	$ 894.26	$701,993	$ 2,139.77	$87,779,611
32	XP	Site Preparation incl. excavation		-		-		-		-		-		-		-		-		-		-	$ 10.03	$7,874	$ 0.19	$7,874
33	XR	Roads, Footpaths & Paved Areas		-		-		-		-		-		-		-		-		-		-	$ 162.58	$127,625	$ 3.11	$127,625
34	XN	Boundary Walls, Fencing & Gates		-		-		-		-		-		-		-		-		-		-	-	-	-	-
35	XB	Pool, Outbuilding & Covered Ways		-		-		-		-		-		-		-		-		-	$ 82.99	$163,500	$ 127.39	$100,000	$ 6.42	$263,500
36	XL	Landscaping & Improvements		-		-		-		-		-		-		-		-		-	$ 104.19	$205,250	$ 75.00	$58,875	$ 6.44	$264,125
TOTAL		SITE WORKS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$ 187.18	$368,750	$ 375.00	$294,374	$16.16	$663,124
37	XK	Ext Stormwater Drainage		-		-		-		-		-		-		-		-		-		-	$ 318.47	$250,000	$ 6.09	$250,000
38	XD	Ext Sewer Drainage		-		-		-		-		-		-		-		-		-		-	$ 127.39	$100,000	$ 2.44	$100,000
39	XW	Ext Water Supply		-		-		-		-		-		-		-		-		-		-	$ 31.85	$25,000	$ 0.61	$25,000
40	XG	Ext Gas		-		-		-		-		-		-		-		-		-		-	$ 25.48	$20,000	$ 0.49	$20,000
41	XF	Ext Fire Protection		-		-		-		-		-		-		-		-		-		-	$ 127.39	$100,000	$ 2.44	$100,000
42	XE	Ext Electrical		-		-		-		-		-		-		-		-		-		-	$ 636.94	$500,000	$ 12.19	$500,000
43	XC	Ext Communications		-		-		-		-		-		-		-		-		-		-	$ 63.69	$50,000	$ 1.22	$50,000
44	XS	Ext Special Services		-		-		-		-		-		-		-		-		-		-		-	-	-
TOTAL		EXTERNAL SERVICES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$ 1,331.21	$1,045,000	$25.47	$1,045,000
45	XX	EXTERNAL ALTERATIONS		-		-		-		-		-		-		-		-		-		-		-	-	-
		SUB-TOTAL - EXTERNAL WORKS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$ 187.18	$368,750	$ 1,706.21	$1,339,374	$ 41.64	$1,708,124
		PRELIMINARIES - EXTERNAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$ 50.54	$99,563	$ 460.68	$361,631	$ 11.24	$461,193
		UNMEASURED WORKS ALLOWANCE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$ 1.19	$2,342	$ 10.83	$8,505	$ 0.26	$10,847
TOTAL		EXTERNAL WORKS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$ 238.91	$470,654	$ 2,177.72	$1,709,510	$ 53.14	$2,180,164
46	YY	PROFIT & OVERHEADS	$ 49.85	$416,636	$ 71.34	$41,090	$ 135.19	$191,158	$ 81.73	$44,789	$ 146.83	$1,737,932	$ 137.85	$1,314,961	$ 97.36	$48,386	$ 78.16	$266,541	$ 77.75	$223,523	$ 46.90	$92,399	$ 153.60	$120,575	$ 109.65	$4,497,989
TOTAL		BUILDING + EXTERNAL WORKS + SPECIAL PROVISIONS	$ 1,046.82	$8,749,355	$ 1,498.06	$862,880	$ 2,838.98	$4,014,318	$ 1,716.35	$940,562	$ 3,083.52	$36,496,573	$ 2,894.87	$27,614,177	$ 2,044.48	$1,016,105	$ 1,641.45	$5,597,358	$ 1,632.69	$4,693,984	$ 984.96	$1,940,375	$ 3,225.58	$2,532,078	$ 2,302.56	$94,457,764
		PROFESSIONAL FEES	$ 62.81	$524,961	$ 89.88	$51,773	$ 170.34	$240,859	$ 102.98	$56,434	$ 185.01	$2,189,794	$ 173.69	$1,656,851	$ 122.67	$60,966	$ 98.49	$335,841	$ 97.96	$281,639	$ 59.10	$116,422	$ 193.53	$151,925	$ 138.15	$5,667,466
TOTAL		GROSS WORKS	$ 1,109.63	$9,274,316	$ 1,587.94	$914,653	$ 3,009.32	$4,255,177	$ 1,819.33	$996,995	$ 3,268.53	$38,686,368	$ 3,068.56	$29,271,028	$ 2,167.15	$1,077,071	$ 1,739.94	$5,933,199	$ 1,730.65	$4,975,623	$ 1,044.06	$2,056,797	$ 3,419.11	$2,684,002	$ 2,440.71	$100,125,230

Appendix R

FLOOD INFORMATION CERTIFICATE

REQUEST FOR INFORMATION REGARDING COMPLYING DEVELOPMENT CRITERIA

City of Newcastle

04 December 2019

Mccloy Newcastle West Pty Limited
2/317 Hunter Street
Newcastle NSW 2300

Dear Sir/Madam

Flood Information Certificate No: FL2019/00248

Land: Lot 1 DP 395367
Lot 2 DP 445736
Lot 2 DP 126
Lot 1 DP 456088
Lot 1 DP 342675
Lot 1 DP 445736
Lot 23 DP 126
Lot 24 DP 126
Lot 1 DP 1091173
Lot 2 DP 1091173

Property Address: 924 Hunter Street Newcastle West NSW 2302

Thank you for your recent enquiry regarding flood behaviour at the above property. This letter confirms the property is located in a flood prone area.

The pertinent features of the flood behaviour are estimated as follows:

Ocean Flooding

Is any part of the site affected by a floodway?	No
Is any part of the site affected by a flood storage area?	No
Estimated 1% Annual Exceedance Probability event level: (equivalent to the "*Defined Flood Level*" in the Building Code of Australia)	Not Affected
Estimated Maximum Flow Velocity of floodwaters (in the "*Defined Flood Event*" as per the Building Code of Australia)	NA
Highest Property Hazard Category	NA
Estimated Probable Maximum Flood Level	3.4m AHD (velocity 0.1m/s)
Highest Life Hazard Category	L1 (H2)

Local Catchment Flooding

Is any part of the site affected by a floodway?	No
Is any part of the site affected by a flood storage area?	No
Estimated 1% Annual Exceedance Probability event level: (equivalent to the "*Defined Flood Level*" in the Building Code of Australia)	4.3m AHD (Hunter Street frontage) 3.1m AHD (Northern frontage)
Estimated Maximum Flow Velocity of floodwaters (in the "*Defined Flood Event*" as per the Building Code of Australia)	0.7m/s
Highest Property Hazard Category	P2
Estimated Probable Maximum Flood Level	4.4m AHD (Hunter Street frontage) 3.2m AHD (Northern frontage) (velocity 1.1m/s)
Highest Life Hazard Category	L2 (H2)

The flood study from which the above information is derived is part of a Newcastle City Wide Floodplain Management Plan. The above advice may change in the future, however the advice is based on the best information held by Council at the time of issue of this certificate.

The above ocean flood level estimates include a sea level rise relative to 1990 mean sea levels of 90cm by 2100, as used in the Newcastle City-wide Floodplain Risk Management Study and Plan (June 2012).

The Newcastle Development Control Plan 2012 addresses the issues of flood management for new development. You can view the development control plan at www.newcastle.nsw.gov.au. In summary, the following requirements apply for all future development applications on the site.

Development in a floodway is not generally allowable due to likely redistribution of flood water.	Not Applicable
Filling of a flood storage area by more than 20% is not generally allowable due to redistribution of flood water.	Not Applicable
Minimum floor level for occupiable rooms in a new development on this site is: (equivalent to the "*Flood Hazard Level*" in the Building Code of Australia)	4.6m AHD (Hunter Street frontage) 3.4 m AHD (Northern frontage)
Is onsite flood refuge required?	No

City of Newcastle

Council holds no information concerning floor levels of existing structures on the site. Site levels and floor levels should be verified by survey based on the Australian Height Datum.

Complying Development Criteria

1.	Is the land identified as a Flood Control Lot?	Yes
2.	Is any part of the land identified as being:	
	a) a flood storage area, or	No
	b) a floodway area, or	No
	c) a flow path, or	No
	d) a high hazard area, or	No
	e) a high risk area	No

Based on the information contained within the above table the lot meets the "*development standards for flood control lots*", to the extent specified within the relevant subclause 3.5(1) or 3A.38(1) of *State Environmental Planning Policy (Exempt and Complying Development Codes) 2008*.

Please note that the information contained in this certificate may alter in the future. The applicant should at all times ensure the currency of this information.

Should you require any further clarification please contact Alastair Peddie on 4974 2788.

Yours faithfully
Alastair Peddie
SENIOR DEVELOPMENT OFFICER (Engineering)

Appendix S

OPERATIONAL AND DEMOLITION WASTE MANAGEMENT PLAN (WASTE AUDIT AND CONSULTANCY SERVICES)

Dairy Farmers Corner, 924 Hunter Street, Newcastle West

OCTOBER 2021

Operational and Demolition Waste Management Plan

WASTE AUDIT AND CONSULTANCY SERVICES
Level 21 / 133 Castlereagh Street
Sydney, NSW 2000

Telephone (02) 9199 4521
www.wasteaudit.com.au

This report contains confidential information. It has been compiled by Waste Audit and Consultancy Services (Aust) Pty Ltd on behalf of Catalyst Project Consulting Pty Ltd for the Dairy Farmers Corner (924 Hunter Street Newcastle) development.

This Waste Management Plan is not a substitute for legal advice on the relevant environmental legislation, which applies to Catalyst Project Consulting Pty Ltd, its contractors or other bodies. Accordingly, Waste Audit and Consultancy Services (Aust) Pty Ltd will not be liable for any loss or damage that may arise out of this project, other than loss or damage caused as a direct result of Waste Audit and Consultancy Services (Aust) Pty Ltd's negligence.

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1 Introduction

This Waste Management Plan (WMP) has been prepared on behalf of Catalyst Project Consulting Pty Ltd for the Dairy Farmers Corner (924 Hunter Street Newcastle) development.

This project essentially consists of[1]:

- 183 Apartments
- 513 m^2 Food & Beverage tenancies
- 67 m^2 Retail tenancies
- 148 m^2 Office/Lobby
- 1,195 m^2 Office tenancies
- 175 m^2 Work from Home space

Newcastle City Council's Development Control Plan 2012 (various Sections including Sections 3.03, 7.08 and Technical Manual – Waste Management) has been referred to in the development of the waste estimates and related requirements. Further guidance has been obtained from the Department of Environment and Climate Changes NSW's *Better Practice Guide for Waste Management in Multi-Unit Dwellings*, and the NSW Environment Protection Authority's *Better Practice Guide for Waste Management and Recycling in Commercial and Industrial Facilities*.

These sources have been referred to in the development of the waste estimates and related requirements. They are intended to inform the design of the waste services by identifying the estimated waste profile for the development and providing the total area required by the recommended equipment/systems.

Waste audit and management strategies are recommended for new developments to provide support for the building design and promote strong sustainability outcomes for the building. All recommended waste management plans will comply with council codes and any statutory requirements.

To assist building management in achieving effective waste and recycling management, this waste management plan has three key objectives:

i. **to minimise the environmental impacts of the operations of the development** – this will be achieved by ensuring maximum diversion of waste from landfill; correct containerisation and transport of materials; correct segregation of materials into appropriate management streams; awareness among tenants of waste avoidance practices.

ii. **to minimise the impact of the management of waste within the development on local residents** – this will be achieved by ensuring waste is managed so as to avoid odour and litter and collected during suitable times.

iii. **to ensure waste is managed so as to reduce the amount landfilled and to minimise the overall quantity generated** – this will be achieved by implementing systems that assist tenants to segregate appropriate materials that can be recycled; displaying signage in all tenant areas to

[1] Space for all tenancies has been rounded up.

remind and encourage avoidance and recycling to residents; and through associated signage in the communal and waste storage areas to reinforce these messages.

The Demolition Waste Management Plan has been developed to ensure that all waste resulting from demolition activities is managed in an effective, safe and environmentally aware manner. Specifically,

- To minimise the generation of waste to landfill
- To maximise waste material avoidance and reuse on site
- To ensure that where practicable, an efficient recycling procedure is applied to waste materials
- To raise awareness among employees and subcontractors of their waste management responsibilities

Management strategies reflect current best-practice requirements, and relevant Sections of the *Protection of the Environment Operations Act 1997* and the NSW Environment Protection Authority *Waste Classification Guidelines, Part 1: Classifying Waste*, as well as consideration of industry best practice for this type of development.

In particular, there will be compliance with *Australian Standard AS2601: The demolition of structures.* This in summary requires that the demolition of structures:

- sets out requirements for the planned demolition of buildings and certain other structures so that the risk of injury to workers, other site personnel and the public, and the risk of damage to adjacent property and the immediate environment is minimised;
- covers the methods and safety procedures applicable to demolition work in general as well as procedures for some types of structures;
- deals with manual and mechanical demolition techniques including those employing specialised earth-moving type machinery;
- includes informative appendices covering some contractual considerations, a checklist for contractors and qualifications for site personnel;
- safety and health issues are addressed under the headings of:
    - Health and safety of the public - covering general requirements, lighting, falling materials, fencing, hoardings and warning notices, scaffolding, overhead protection for footpaths, and hazardous materials and conditions;
    - Safety and health of site personnel - covering general safety, personal protective clothing and equipment, cutting and welding, fire protection, first aid, amenities, removal of hazardous material and electrical safety;
    - Protection of adjoining buildings and protection of immediate environment - covering requirements relating to access and egress, damage and structural integrity, vibration and concussion, weatherproofing, burning, dust control, noise control, protection of public roads and protection of sewers and water courses; and protection of the site.

Adherence to AS2601 is required under the Environmental Planning and Assessment Regulation 2000.

Section 143 of the Protection of the Environment Operations Act 1997 requires waste to be transported to a place that can lawfully accept it. It will be the responsibility of the site developers to ensure all contractors clearly specify where all wastes are to be transported, the capacity of the nominated facilities to receive/manage the waste and to ensure that reports on management aspects (types, quantities and disposal pathways) are provided.

Note: The testing and classification of any excavated material is not covered in this report. Where necessary separate specialist testing has been conducted by the project managers.

2 Operational Waste Management

2.1 Waste Streams

Based on the development profile, the following waste streams would be expected:

- General Waste
- Commingled Recycling
- Paper/Cardboard Recycling

Other wastes may be generated, but these would be in small volumes and irregular in terms of when generated. The management of the site will conduct a waste assessment once the site is operational to determine the additional types and quantities of wastes that may be generated. Following this, appropriate management systems will be implemented and where necessary generators advised of these management requirements.

It is not expected that significant quantities of garden organics will be generated. The appointed gardener will be required to manage this material by disposal at a composting facility.

2.2 Waste Generation Estimates

The following are the estimated rates of waste/recyclable generation (by volume), for the development.

Residential

For the residential component, the applicant must cater for generation rates as follows:

Waste Stream	Bin Size (MGB)	No. of Bins	Clearance Frequency/week	Capacity (weekly)	Estimated volume / week	Footprint per bin (m2)	Total Footprint
General Waste	660	17	2	22,440	21,960	0.98	16.66
Recycling	660	12	2	15,840	14,640	0.98	11.8
TOTAL		**29**		**38,280**	**36,600**		**28.4**

Commercial/Retail

For the commercial/retail aspect of the development the following summarises the estimated volumes to be generated and bin requirements.

Waste Stream	Bin Size (MGB)	No. of Bins	Clearance Frequency/week	Capacity (weekly)	Estimated volume / week	Footprint per bin (m2)	Total Footprint
General Waste	660	6	2	7,920	6,924	0.98	5.88
Recycling	660	6	2	7,920	6,924	0.98	5.9
TOTAL		**12**		**15,840**	**13,847**		**11.8**

Based on the above calculations, it is estimated that the following space is required for the storage of waste and recyclables for each aspect of the development. An additional 30% has been applied to the storage areas to allow for bin movement.

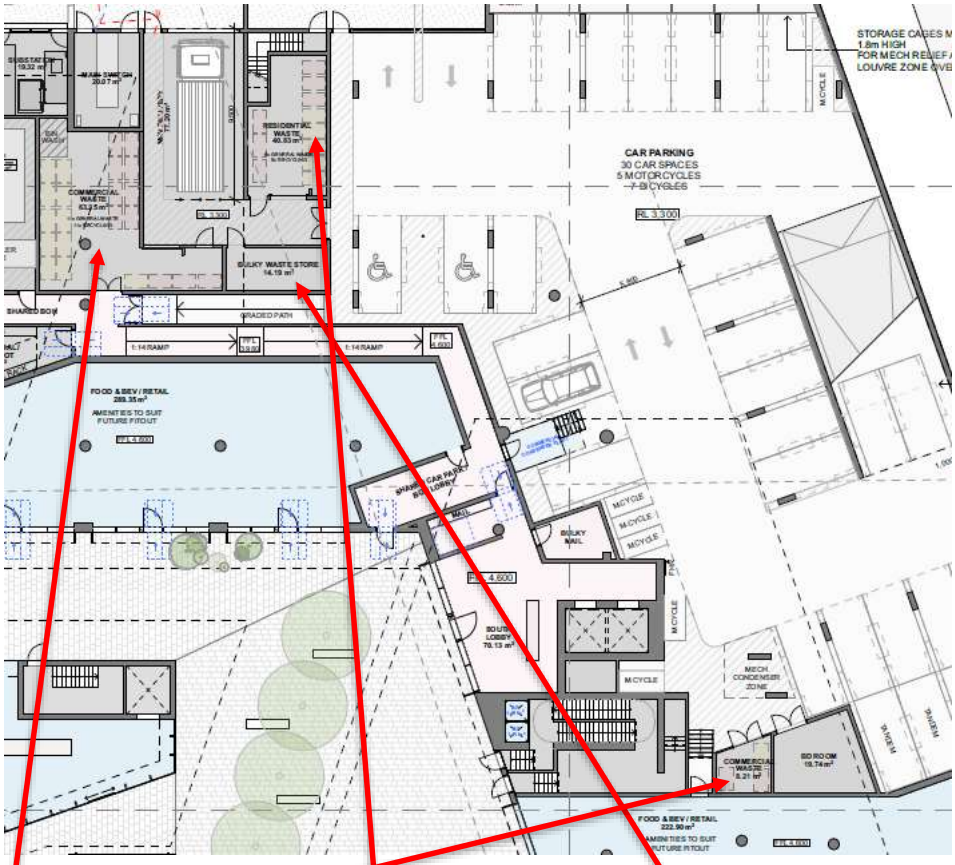
- 38 m^2 Residential
- 16 m^2 Commercial

The development has made allocations of:

- 40.83 m^2 for residential waste/recyclables
- 171.46 m^2 for commercial waste/recyclables (in two separate waste rooms)

In addition, there is an allocation of 40.83 m^2 for residential bulky waste.

The following illustrates the location of these waste rooms on the Ground Floor:



Commercial waste rooms

Residential waste room

Bulky waste room

3 Waste Management System

3.1 Proposed System

The following summarises the recommended waste and recycling systems that will be implemented. These recommendations are based on the Council's requirements and systems implemented for similar developments (ie., type of development and tenants).

Responsibility for correct waste management will be included in all tenancy agreements. This responsibility will include factors such as correct segregation and managing "ad-hoc" wastes.

Waste and recycling collection services will be provided by a commercial waste contractor (TBA). Utilising a commercial waste contractor affords the development greater flexibility regarding collection schedules and the appropriate collection frequencies will be determined in consultation with the waste contractor once appointed – however once operational, collection schedules may need to be adjusted accordingly depending on actual waste generation.

Note that servicing of the development's waste and recycling systems is currently scheduled for two services per week. Specified collection times will be included in the contract between the development's management and the contractor(s).

Note that once appointed, the contract between the development's management and the waste/recycling contractor will be submitted to Council if required. This contract will detail the responsibilities of waste management in accord with all of Council's requirements.

The appointed contractor will service the bins directly from the waste holding areas located on the Ground Floor. This is illustrated below (note that bins from the smaller commercial waste room will be transported to this collection area by the development management on collection days).

Items such as furniture/whitegoods stored within the bulky waste storage room will be managed by building management. Appropriate collection organisations will be called to collect the items for recycling/reuse as required.

Residents and commercial tenants will also be provided with ad hoc recycling systems such as e-waste; batteries etc. Systems for these streams will be located back-of-house or in common areas or be available upon request from building management.

Signage will be a crucial element of the waste management system. Appendix A contains examples of signage. These are the type of signs that should be used throughout the development and waste storage area(s).

3.2 Residential Waste System

To assist, residents (ie., each apartment), bins will be located within them for disposal of waste and recyclables. These bins will be clearly signed as to the type of materials to be deposited into them and have the capacity for a minimum 2 day's waste/recycling generation.

All residents will be provided with information on the proper use of waste management system, as it is imperative that the recycling streams remain free of contamination to ensure compliance with contractor collection protocols. Residents will be encouraged to maximise the separation of general waste and recyclables to aid the proper disposal of all materials.

Residents will dispose of general waste and recyclables into the bins located in the Ground Floor residential waste storage area.

Cleaning staff will be responsible for managing this storage area to ensure that it remains clean for residents.

3.3 Retail Waste System

The commercial tenancies will be designed so as to allow effective segregation of recyclables. These tenancies will (depending on the types of wastes/recyclables generated) be provided with sufficient smaller bins to allow for effective segregation of wastes/recyclables. This will include:

- General waste
- Paper & cardboard recycling
- Commingled recycling

To ensure that wastes and recyclables are managed correctly (ie., deposited into the correct container):

Tenancy staff will be provided with information on the proper disposal of wastes and recyclables – that is correct segregation requirements.

Tenancy staff and cleaning contractors will have the responsibility for transporting waste/recyclables from the retail premises to the bins located in the commercial waste room.

3.4 Waste Storage

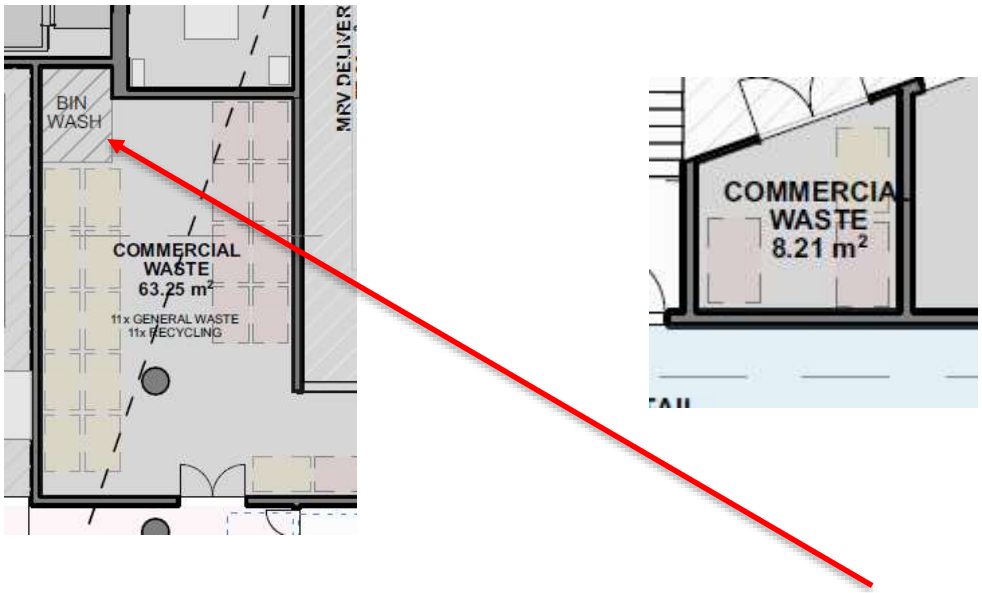
In keeping with best practice sustainability programs, all waste areas and waste and recycling bins will be clearly differentiated through appropriate signage and colour coding to Australia Standards to reflect the materials contained.

All waste and recycling bins that are located in the waste storage areas will be colour coded and clearly signed. Each stream will be located in a designated area. This will assist in easy identification of correct bins by cleaners.

The following illustrates the separate residential and commercial waste rooms and the number of bins to be contained within each.

Residential waste room and bulky waste room

Commercial waste rooms



In addition to the waste and recycling bin holding areas, there is also provision for a bin washer

The waste storage rooms will be locked so as to prevent unauthorised access and the incorrect dumping of waste materials.

The waste and recycling bins will be colour coded and clearly signed. Each stream will be located in a designated area. This will assist in easy identification of correct bins by cleaners and staff.

Photographs 1 & 2 - Examples of waste room colour coding

The waste rooms will contain the following to minimise odours, deter vermin, protect surrounding areas, and make it a user-friendly and safe area:

- Have a practical layout, be free of obstructions.
- Have a floor area capable of storing the required number of bins
- Be graded and drained to an approved drainage system.
- Be serviced by an easily accessible water tap.
- Have smooth rounded corners at the floor and wall intersections.
- Be clear of any service and utilities infrastructure and related activities.
- Be capable of being kept clean and tidy at all times.
- Be in accordance with the BCA, relevant Australian Standards and legislation

Occupational Health and Safety issues such as slippery floors will need to be monitored. Cleaners will monitor the storage areas and all spills will be attended to immediately by cleaners.

4 Tenant Education

All residents and commercial/retail staff of the development will receive information regarding the waste collection systems including how to use the system, which items are appropriate for each stream and collection times.

Appropriate signage and updated information will also be provided, as well as receiving feedback on issues such as contamination of the recycling stream or leakage of the recyclables into the general waste. Facilities management will have the responsibility for these tasks.

All waste receptacles will be appropriately signed and additional room signage is usually provided from most waste contractors during implementation of the waste contract.

It is recommended that all signs should:

- Clearly identify the waste/recycling stream;
- Use correct waste/recycling stream colour coding;
- Identify what can and cannot be disposed of in the receptacle; and
- Include highly visual elements to accommodate for individuals with inadequate English literacy.

All waste receptacles will be appropriately signed and additional room signage is usually provided from most waste contractors during implementation of the waste contract.

It is recommended that all signs should:

- Clearly identify the waste/recycling stream;
- Use correct waste/recycling stream colour coding;
- Identify what can and cannot be disposed of in the receptacle; and
- Include highly visual elements to accommodate for individuals with inadequate English literacy.
- An active waste monitoring program will be employed. The cleaning contracts will ensure that contractors actively participate in the waste reduction program for the site and meet regularly to identify performance and new opportunities for diversion and avoidance.

On a half-yearly basis waste and recycling performance reports will be reported back to residents so that they are aware of their performance and areas for improvement. An active waste monitoring program will be employed. The waste and cleaning contracts will ensure that contractors actively participate in the waste reduction program for the site and meet monthly to identify performance and new opportunities for diversion and avoidance.

Note that the details of tenancy agreements relating to management of wastes and education resource materials will be developed prior to any retail tenancy being occupied and residents occupying apartments. Similarly, arrangements with monitoring systems will be developed in consultation with cleaning contractor and waste/recycling service companies. If required, these can then be provided to Council.

5 Ongoing Management

Having suitable systems in place is only one element of an effective waste management system. Compliance by all stakeholders is essential.

Cleaners are a key element in the effectiveness of the systems in place. Prior to acceptance of the cleaning contract, the contractor will be required to demonstrate how the management of waste and recycling will be carried out so as to ensure that segregated materials are placed in the correct systems. This process will be agreed and a training program implemented by the cleaning contractor to ensure full understanding by all cleaners. Monitoring of the system will be carried out by the cleaning supervisor and site management throughout the term of the contract.

In addition, cleaners will be required to feed back to site management any non-compliance issues they observe during their cleaning activities. This may include contamination of recycling; non-participation in the recycling system, or missing or damaged bins. In this way issues can be promptly dealt with by management.

Waste and recycling contractors will be required to report actual volumes collected by stream so that site management can monitor performance and feed this back to stakeholders.

It is highly recommended that a reporting program be set up at the site which would include bin tally sheets that detail the number of bins collected and how full they are at the time of collection, in addition to communication procedures to allow waste contractors to provide feedback regarding contamination and leakage.

All stakeholders should be educated and made aware of any changes to the existing waste systems.

6 Public Place Recycling

With public open spaces, consideration needs to be taken regarding public place recycling (PPR). General waste and recycling facilities will be provided in public realm areas throughout the precinct.

It is difficult to accurately estimate the volume of waste/recyclables that will be generated from the public domain areas due to the uncertainty of activities, number of patrons, weather and other factors.

Estimates for waste/recyclables that could be generated range from an average generation rate of 0.02 litres to 2.0 litres per person utilising public place waste management systems (ie., waste and recyclables). However, depending on the activities being conducted, these rates could range from zero to over ten litres per person.

The number of 240 litre mobile garbage bins for waste and recyclables that are to be provided in the public domain should comfortably manage the estimated volume of materials that can be generated. It should also be noted that servicing regimes for the waste/recycling bins have been developed to ensure that bins are emptied as required. The provision of the 660 litre mobile garbage bins and the volume of the compactor located in the waste storage enclosure are also of sufficient volume to manage what wastes/recyclables and other materials that can be generated.

The key for managing wastes and recyclables will be to locate sufficient bins within the public domain and ensure that servicing schedules reflect patronage and volumes of materials generated.

Issues to consider are (based on audits of a range of public place waste management systems):

- Approximately 70% of recyclables are recoverable – that is placed in recycling bins
- Approximately 15-25% of the recycling stream is contaminants

Development staff will be responsible for collecting all public domain waste/recyclables and transporting it to the waste rooms. The schedule for this will be based on the level of “full” for bins and their location. However, operating procedures will ensure that bins are serviced prior to being filled and so as to prevent litter issues.

Simple, colour-coded and consistent representation of common recycling and waste streams makes it easier for people to know how and what to recycle - whether at work, school or a public event. Introducing a public recycling system has environmental, social and financial benefits including:

- Responding to community expectations to ‘Do the Right Thing’.
- Reducing the amount of waste sent to landfill and recovering valuable resources to be made into new products.
- Financial benefits over time as materials are diverted from landfill and into recycling.
- Contributing to triple bottom line reporting.

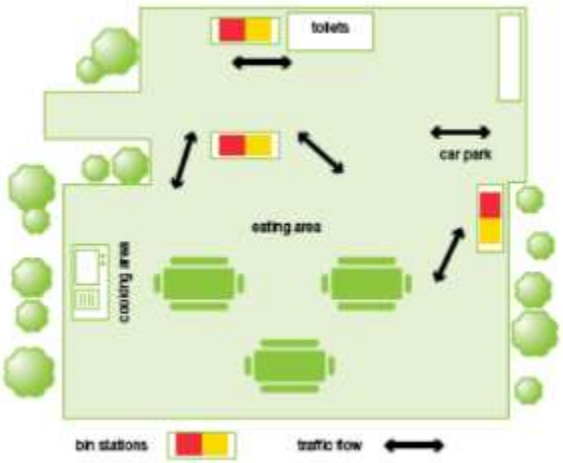
It is important that general waste and recycling bins are always located together in order to make recycling as accessible as general waste disposal. Recycling bins should never be located on their own in isolation from a general waste bin as patrons are likely to contaminate the recycling bin with general waste if there is no other option to dispose their general waste.

The implementation of organics recycling bins is not recommended in public places due to the high levels of contamination commonly observed in such systems.

All bins should be clearly signed and appropriately colour-coded to ensure the streams are readily identifiable. Signage for PPR should be:

- Colour-coded: red for general waste and yellow for recycling
- Large and easily viewed from all angles: this may mean that signs are placed on all sides of the bin or above the bin.
- Simple: don't use jargon (words such as PET, comingled, HDPE and even the recycling triangle can be confusing as this symbol can appear on a number of items that are not necessarily recyclable.
- Unambiguous and uses visual imagery

Location of bins is also something that is difficult to predetermine. However, some pre-planning can be applied to ensure that bins for waste and recyclables are placed near areas where (a) waste is generated or (b) people travel. In the below example, bins are placed near eating as well as traffic areas.



Bin capacity/size is determined by such factors as:

- the frequency of collections,
- the method of storing and emptying the bins, and
- space constraints.

Other factors are types of events, weather, supervision etc. A commonly accepted "rule of thumb" is that people will not walk more than 12 metres to a waste/recycling bin (however, this is perhaps not a valid today given more are better informed about not littering).

7 Demolition Waste Management Principles

7.1 Waste Management Principles

The following waste hierarchy will be used as a guiding principle:

Avoid and Reduce

Minimise the production of waste materials in the demolition process by:

- Assessing and taking into consideration the resultant waste from different demolition options
- Purchasing materials that will result in less waste, which have minimal packaging, are pre-cut or fabricated.
- Not over ordering products and materials

Reuse

Ensure that where ever possible, materials are reused either on site or offsite.

- Identify all waste products that can be reused
- Put systems in place to separate and store reusable items
- Identify the potential applications for reuse both onsite and offsite and facilitate reuse

Recycling

Identify all recyclable waste products to be produced on site.

- Provide systems for separating and stockpiling of recyclables
- Provide clear signage to ensure recyclable materials are separated
- Process the material for recycling either onsite or offsite

Note: In some cases, it may be more economical to send the unsorted waste to specialised waste contractors who will separate and recycle materials at an offsite location.

Disposal

Waste products which cannot be reused or recycled will be removed and disposed of. The following will need to be considered:

- Ensure the chosen waste disposal contractor complies with regulatory requirements

- Implement regular collection of bins

Section 143 of the Protection of the Environment Operations Act 1997 requires waste to be transported to a place that can lawfully accept it. It will be the responsibility of the site developers to ensure all contractors clearly specify where all wastes are to be transported, the capacity of the nominated facilities to receive/manage the waste and to ensure that reports on management aspects (types, quantities and disposal pathways) are provided.

7.2 Liquid Waste

Liquid waste may be produced on site for environmental control measures such as:

- Site and vehicle cleaning
- Dust control waste

The following measures will be taken to minimise the impact of liquid waste:

- Ensure water is used in moderation and no taps are left continuously running
- Use any grey water produced on site for irrigation or for dust suppression
- Only discharge clean water into storm water

7.3 Stormwater Pollution Prevention

All actions will be undertaken to avoid pollution entering stormwater drains and for litter generation. The following will be initiated:

i. Prior to commencement of any works a Safe Work Method Statement will be completed and reviewed to determine potential for stormwater pollution and/or litter generation

ii. The proponent (contractor), will need to develop a management strategy to manage the potential for these issues to be realised

iii. Site inspections will be conducted during the working day to monitor potential for stormwater pollution generation and where identified, works will cease until appropriate controls are implemented

iv. Waste water and storm water will be managed and disposed of in accordance with Water Authority requirements.

7.4 Litter Management

i. Daily site inspections will be conducted to identify litter, remedy the situation and investigate the cause so as to reduce the potential for the issue to occur in the future.

ii. Sufficient quantities of bins (and/or bin space), will be made available so as to avoid dumping of materials outside bins

iii. All waste/recycling bins will have covers so as to ensure that wastes cannot be blown out during windy conditions.

iv. Personnel will be allocated the role of litter management in that they will periodically inspect the site and surrounds for litter and if identified collect and dispose of it.

7.5 Records

Records will be kept of all wastes and recyclables generated and either used on site, or transported off–site during the demolition stage of the development.

It will be a condition of appointment that all waste/recycling contractors involved in the demolition stage provide these records, and that they also contain details of the facilities that the materials are transported to.

These records will be made available to Council on request.

7.6 Waste/recyclables storage (on-site)

All waste and recycling materials will be stored in bins provided by the appointed contractor(s). These bins will be appropriately coloured and signed to indicate what materials are to be deposited into them and located so as to maximise the recovery of reusable/recyclable materials.

As demolition activities progress, the designated bins will be moved so as to maximise the collection of materials that will be diverted from landfill. This will also involve relocating signage advising as to correct waste management.

8 Demolition Materials

8.1 Overview

All waste contractors/sub-contractors will be required to detail all intended disposal facilities to ensure that legislative and safety requirements are met, the guiding principles of the waste hierarchy are upheld and maximum diversion from landfill is achieved.

Records will be required to be maintained by all contractors and made available to Council so as to validate management pathways (ie., disposal facilities) and these records will be required to be maintained by all contractors and made available to Council so as to validate management pathways

The potential for reuse of materials on-site (and this will be encouraged for what could be used for the construction phase of the development), will depend on the quality of the materials once demolition proceeds.

8.2 Estimated Volumes

The following table details the estimated composition by m^3 of demolition waste to be generated and management strategy. It is important to note that these are estimates and the important issue is that the materials will be managed so as to avoid wherever possible disposal to landfill.

This process and the management of any excavation and removal of contaminated soil and waste (if identified), from the site will be undertaken and managed by qualified contractors and consultants in accordance with all the relevant standards and regulations and is not addressed in this report.

The relevant disposal/recycling facilities have not been detailed as the waste contractor and sub-contractors have not yet been appointed for the project.

A range of other materials may be present on the site once the demolition activities commence.

All potentially recyclable materials are to be separated and stored on-site for an appointed waste/recycling contractor to inspect and to determine the suitability of the material for recycling (or even reuse). If approved for either action, then the contractor can then remove the items.

For materials that are not designated as potentially able to be reused or recycled, then they are to be disposed of at a landfill (or other facility) licenced to receive those specific materials.

Waste management systems - demolition

Materials on site		Destination		
Type of material	Estimated volume (m^3/tonnes)	On-site (Reuse or recycle)	Off-site (Detail contractor and recycling facility)	Disposal (Detail contractor and landfill site)
Excavation material	350m^3	Will either be stockpiled for use during construction if required and if not disposed off-site.	Excavation materials will be used as clean fill by and/or forwarded to various facilities	Facility TBA upon appointment of contractor.

Materials on site		Destination		
Type of material	Estimated volume (m^3/tonnes)	On-site (Reuse or recycle)	Off-site (Detail contractor and recycling facility)	Disposal (Detail contractor and landfill site)
Concrete	490m^3	No on-site reuse	Collected by contractor and disposed at concrete recycling facility	No disposal to landfill
Vegetation	40m^3	No on-site reuse	Collected and disposed at green waste/mulching facility	Facility TBA upon appointment of contractor. No disposal to landfill.
Bricks	130m^3	Bricks will be stockpiled and reused wherever possible.	Acceptable quality bricks collected by a contractor and sold for reuse. Unusable bricks will be collected and recycled at an appropriate brick/rubble recycling facility to be used in aggregate gravel products	Facility TBA upon appointment of contractor
Timber	75m^3	No on-site reuse	Recyclable timber (untreated) will be collected and recycled at appropriate timber yard. Unrecyclable timber will be disposed at landfill	Facility TBA upon appointment of contractor
Mixed hard plastics	55m^3	No on-site reuse	Collected by contractor for recycling. Facility TBA upon appointment of contractor.	No disposal to landfill

Materials on site		Destination		
Type of material	Estimated volume (m^3/tonnes)	On-site (Reuse or recycle)	Off-site (Detail contractor and recycling facility)	Disposal (Detail contractor and landfill site)
Plasterboard	85m^3	No on-site reuse	Collected by the waste subcontractor on a weekly basis (or as required) for recycling. Possible use as soil improver with gypsum etc removed by recycler	Facility TBA upon appointment of contractor
Metals	170m^3	No on-site reuse	Collected by specialist metal subcontractor for recycling.	No disposal to landfill. Facility TBA upon appointment of contractor.
Carpet	25m^3	No on-site reuse	This will be disposed of into a designated bin and collected regularly as required for recycling is of the required quality or disposal to landfill	Facility TBA upon appointment of contractor
Glazing	40m^3	No on-site reuse	Recyclers consulted as to potential for recycling and if suitable separated for recycling by a facility	Facility TBA upon appointment of contractor
Mixed Recyclables	100m^3	No on-site reuse or recycling	Separated onsite into dedicated receptacles. Collected by the waste subcontractor for recycling. Facility TBA upon appointment of contractor.	Facility TBA upon appointment of contractor

Materials on site		Destination		
Type of material	Estimated volume (m^3/tonnes)	On-site (Reuse or recycle)	Off-site (Detail contractor and recycling facility)	Disposal (Detail contractor and landfill site)
General waste	250m^3	No on-site reuse or recycling	Separated onsite into dedicated receptacles. Collected by the waste subcontractor for disposal to landfill with the facility TBA upon appointment of contractor.	Disposed into general waste bins onsite and collected by the waste contractor for disposal. Facility (TBA) upon appointment of contractor

8.3 Other Materials

A range of other materials may be present on the site once the demolition activities commence.

All potentially recyclable materials are to be separated and stored on-site for an appointed waste/recycling contractor to inspect and to determine the suitability of the material for recycling (or even reuse). If approved for either action, then the contractor can then remove the items.

For materials that are not designated as potentially able to be reused or recycled, then they are to be disposed of at a landfill (or other facility) licenced to receive those specific materials.

9 Hazardous Waste Materials

9.1 Management Procedures

Contractors employed to manage any identified hazardous wastes will be required (prior to appointment), to demonstrate their compliance with NSW EPA and WorkCover requirements for management of the specific materials they are contracted to manage.

The following are the recommended approaches for managing the wastes and other materials that were identified during the site analysis.

The key principles that need to be adhered to are[2]:

1. All hazardous wastes need to be correctly identified and managed in accord with all relevant legislation, Codes of Practices and the developed management actions.
2. Hazardous materials need to be separated into their individual categories and not mixed with any other materials

Prior to commencing any demolition or clean-up activities, a Workplace Health & Safety Plan will be developed, implemented and monitored with all relevant site personnel receiving specific training in management of hazardous waste materials (including suspected hazardous materials).

In regards to potentially contaminated soil, a Remedial Action Plan is being prepared to ensure that this material is to be managed in accord with applicable regulations.

9.2 Asbestos

The process for managing what has been suspected of being or containing asbestos waste is as follows:

i. Treat the material as asbestos unless proven otherwise
ii. Do not disturb the material (ie., shift or place into a container) at all
iii. Seek advice from a suitably qualified laboratory to test the material(s) to determine if it is or is not asbestos.
iv. If determined not to be asbestos, then it can be managed as an inert waste.
v. If determined to be asbestos then managed by a licenced contractor for packaging, removal and disposal.
vi. If the material has accidently been uncovered, then the area should be cleared, barriers erected to prevent access, NSW WorkCover and EPA notified, and if broken, covered with a fine spray/mist of water.

For what has been conclusively identified as asbestos containing materials (including soils), a specialist/licenced asbestos contractor will be used. As required, only workers trained in asbestos

[2] Reference should be made to the NSW EPA publication, Waste Classification Guidelines Part 1: Classifying Waste.

removal techniques will be allowed to manage the removal of asbestos contaminated soil and any contained on the buildings.

In regards to disposal of asbestos containing materials, there are regulatory requirements under clause 42 of the Protection of the Environment Operations (Waste) Regulation 2005 that apply to the management of asbestos waste, including:

- Waste must be stored on the premises in an environmentally safe manner.
- Non-friable asbestos material must be securely packaged at all times.
- Friable asbestos material must be kept in a sealed container.
- Asbestos-contaminated soil must be wetted down.
- All asbestos waste must be transported in a covered, leak-proof vehicle.
- Asbestos waste must be disposed of at a landfill site that can lawfully receive this waste. Always contact the landfill beforehand to find out whether asbestos is accepted and any requirements for delivering asbestos to the landfill.
- It is illegal to dispose of asbestos waste in domestic garbage bins.
- It is also illegal to re-use, recycle or dump asbestos waste

These requirements will be adhered to.

10 Contracts and purchasing

Each subcontractor working on the site will be required to adhere to this Waste Management Plan.

The Head Contractor will ensure each subcontractor:

- Implements procedures to ensure waste resulting from their work will be actively managed and where possible recycled, as part of the overall site recycling strategy or separately as appropriate
- Implements source separation of off cuts to facilitate reuse, resale or recycling.

The Site Manager will be responsible for:

- Ensuring there is a secure location for on-site storage of materials to be reused on site, and for separated materials for recycling off site.
- Engaging appropriate waste and recycling contractors to remove waste and recycling materials from the site
- Co-coordinating between subcontractors, to maximise on site reuse of materials
- Monitoring of bins on a regular basis by site supervisors to detect any contamination or leakage
- Ensuring the site has clear signs directing staff to the appropriate location for recycling and stockpiling station/s. And that each bin/skip/stockpile is clearly sign posted
- Proving training to all site employees and subcontractors in regards to the WMP as detailed in section 11 below.

Should a subcontractor cause a bin to be significantly contaminated, the Site Manager will be advised by a non-conformance report procedure. The offending subcontractor will then be required to take corrective action, at their own cost. The non-conformance process would be managed by the Head Contractors' Quality Management Systems

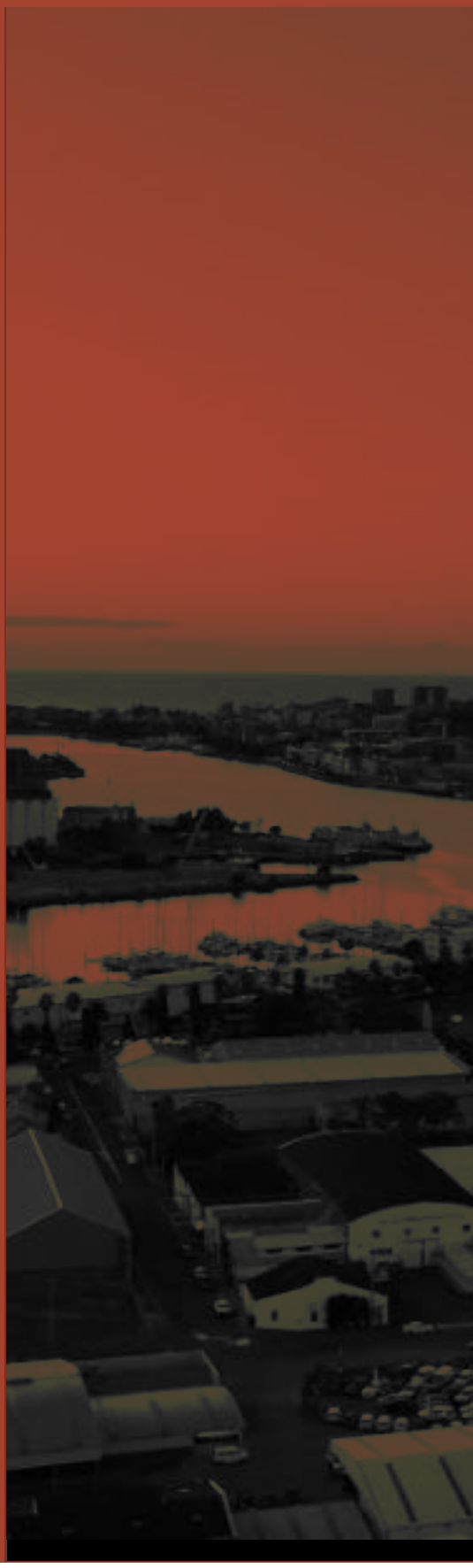
11 Training and Education

All site employees and sub-contractors will be required to attend a site specific induction that will outline the components of the WMP and explain the site specific practicalities of the waste reduction and recycling strategies outlined in the WMP.

All employees are to have a clear understanding of which products are being reused/recycled on site and where they are stockpiled. They are also to be made aware of waste reduction efforts in regards to packaging.

The site manager will post educational signage in relation the recycling activities on site in breakout areas, lunch rooms etc.

Appendix A – Waste Signage



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Dairy Farmers Corner, 924 Hunter Street, Newcastle West

MARCH 2022

Operational and Demolition Waste Management Plan

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This report contains confidential information. It has been compiled by Waste Audit and Consultancy Services (Aust) Pty Ltd on behalf of Catalyst Project Consulting Pty Ltd for the Dairy Farmers Corner (924 Hunter Street Newcastle) development.

This Waste Management Plan is not a substitute for legal advice on the relevant environmental legislation, which applies to Catalyst Project Consulting Pty Ltd, its contractors or other bodies. Accordingly, Waste Audit and Consultancy Services (Aust) Pty Ltd will not be liable for any loss or damage that may arise out of this project, other than loss or damage caused as a direct result of Waste Audit and Consultancy Services (Aust) Pty Ltd's negligence.

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1 Introduction

This Waste Management Plan (WMP) has been prepared on behalf of Catalyst Project Consulting Pty Ltd for the Dairy Farmers Corner (924 Hunter Street Newcastle) development.

This project essentially consists of[1]:

- 183 Apartments
- 513 m^2 Food & Beverage tenancies
- 67 m^2 Retail tenancies
- 148 m^2 Office/Lobby
- 1,195 m^2 Office tenancies
- 175 m^2 Work from Home space

Newcastle City Council's Development Control Plan 2012 (various Sections including Sections 3.03, 7.08 and Technical Manual – Waste Management) has been referred to in the development of the waste estimates and related requirements. Further guidance has been obtained from the Department of Environment and Climate Changes NSW's *Better Practice Guide for Waste Management in Multi-Unit Dwellings*, and the NSW Environment Protection Authority's *Better Practice Guide for Waste Management and Recycling in Commercial and Industrial Facilities*.

These sources have been referred to in the development of the waste estimates and related requirements. They are intended to inform the design of the waste services by identifying the estimated waste profile for the development and providing the total area required by the recommended equipment/systems.

In addition, comments on drafts of this Waste Management Plan made by Council Officers have been factored into the management of wastes/recyclables generated by this development.

Waste audit and management strategies are recommended for new developments to provide support for the building design and promote strong sustainability outcomes for the building. All recommended waste management plans will comply with council codes and any statutory requirements.

To assist building management in achieving effective waste and recycling management, this waste management plan has three key objectives:

i. **to minimise the environmental impacts of the operations of the development** – this will be achieved by ensuring maximum diversion of waste from landfill; correct containerisation and transport of materials; correct segregation of materials into appropriate management streams; awareness among tenants of waste avoidance practices.

ii. **to minimise the impact of the management of waste within the development on local residents** – this will be achieved by ensuring waste is managed so as to avoid odour and litter and collected during suitable times.

[1] Space for all tenancies has been rounded up.

iii. **to ensure waste is managed so as to reduce the amount landfilled and to minimise the overall quantity generated** – this will be achieved by implementing systems that assist tenants to segregate appropriate materials that can be recycled; displaying signage in all tenant areas to remind and encourage avoidance and recycling to residents; and through associated signage in the communal and waste storage areas to reinforce these messages.

The Demolition Waste Management Plan has been developed to ensure that all waste resulting from demolition activities is managed in an effective, safe and environmentally aware manner. Specifically,

- To minimise the generation of waste to landfill
- To maximise waste material avoidance and reuse on site
- To ensure that where practicable, an efficient recycling procedure is applied to waste materials
- To raise awareness among employees and subcontractors of their waste management responsibilities

Management strategies reflect current best-practice requirements, and relevant Sections of the *Protection of the Environment Operations Act 1997* and the NSW Environment Protection Authority *Waste Classification Guidelines, Part 1: Classifying Waste*, as well as consideration of industry best practice for this type of development.

In particular, there will be compliance with *Australian Standard AS2601: The demolition of structures.* This in summary requires that the demolition of structures:

- sets out requirements for the planned demolition of buildings and certain other structures so that the risk of injury to workers, other site personnel and the public, and the risk of damage to adjacent property and the immediate environment is minimised;
- covers the methods and safety procedures applicable to demolition work in general as well as procedures for some types of structures;
- deals with manual and mechanical demolition techniques including those employing specialised earth-moving type machinery;
- includes informative appendices covering some contractual considerations, a checklist for contractors and qualifications for site personnel;
- safety and health issues are addressed under the headings of:
    - Health and safety of the public - covering general requirements, lighting, falling materials, fencing, hoardings and warning notices, scaffolding, overhead protection for footpaths, and hazardous materials and conditions;
    - Safety and health of site personnel - covering general safety, personal protective clothing and equipment, cutting and welding, fire protection, first aid, amenities, removal of hazardous material and electrical safety;
    - Protection of adjoining buildings and protection of immediate environment - covering requirements relating to access and egress, damage and structural integrity, vibration and concussion, weatherproofing, burning, dust control, noise control, protection of public roads and protection of sewers and water courses; and protection of the site.

Adherence to AS2601 is required under the Environmental Planning and Assessment Regulation 2000.

Section 143 of the Protection of the Environment Operations Act 1997 requires waste to be transported to a place that can lawfully accept it. It will be the responsibility of the site developers to ensure all

contractors clearly specify where all wastes are to be transported, the capacity of the nominated facilities to receive/manage the waste and to ensure that reports on management aspects (types, quantities and disposal pathways) are provided.

Note: The testing and classification of any excavated material is not covered in this report. Where necessary separate specialist testing has been conducted by the project managers.

2 Operational Waste Management

2.1 Waste Streams

Based on the development profile, the following waste streams would be expected:

- General Waste
- Commingled Recycling
- Paper/Cardboard Recycling

Other wastes may be generated, but these would be in small volumes and irregular in terms of when generated. The management of the site will conduct a waste assessment once the site is operational to determine the additional types and quantities of wastes that may be generated. Following this, appropriate management systems will be implemented and where necessary generators advised of these management requirements.

It is not expected that significant quantities of garden organics will be generated. The appointed gardener will be required to manage this material by disposal at a composting facility.

2.2 Waste Generation Estimates

The following are the estimated rates of waste/recyclable generation (by volume), for the development.

Residential

For the residential component, the applicant must cater for generation rates as follows:

Waste Stream	Bin Size (MGB)	No. of Bins	Clearance Frequency/week	Capacity (weekly)	Estimated volume / week	Footprint per bin (m2)	Total Footprint
General Waste	660	17	2	22,440	21,960	0.98	16.66
Recycling	660	12	2	15,840	14,640	0.98	11.8
TOTAL		**29**		**38,280**	**36,600**		**28.4**

Commercial/Retail

For the commercial/retail aspect of the development the following summarises the estimated volumes to be generated and bin requirements.

Waste Stream	Bin Size (MGB)	No. of Bins	Clearance Frequency/week	Capacity (weekly)	Estimated volume / week	Footprint per bin (m2)	Total Footprint
General Waste	660	6	2	7,920	6,924	0.98	5.88
Recycling	660	6	2	7,920	6,924	0.98	5.9
TOTAL		**12**		**15,840**	**13,847**		**11.8**

Based on the above calculations, it is estimated that the following space is required for the storage of waste and recyclables for each aspect of the development. An additional 30% has been applied to the storage areas to allow for bin movement.

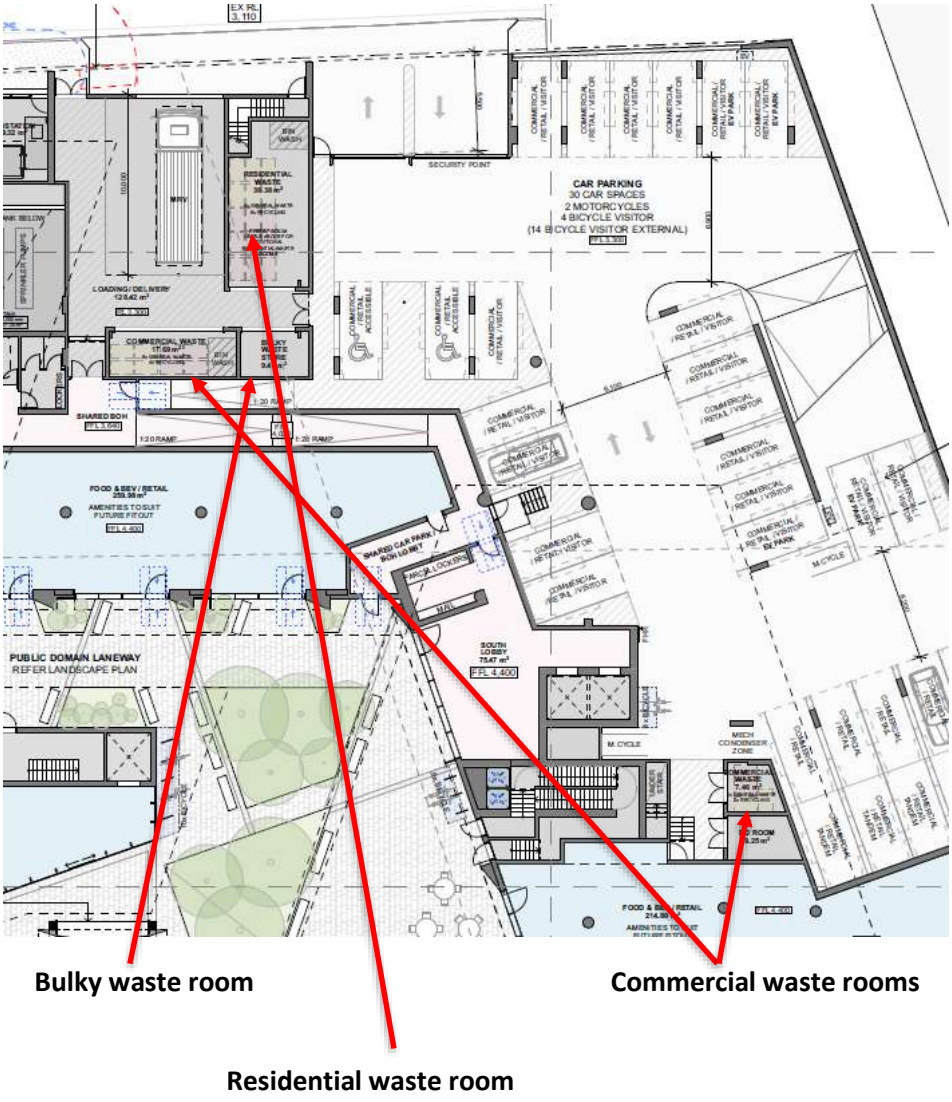
- 38 m^2 Residential
- 16 m^2 Commercial

The development has made allocations of:

- 23.86 m^2 for residential waste/recyclables
- 51.36 m^2 for commercial waste/recyclables (in two separate waste rooms)

In addition, there is an allocation of 12.13 m^2 for residential bulky waste.

The following illustrates the location of these waste rooms on the Ground Floor:



3 Waste Management System

3.1 Proposed System

The following summarises the recommended waste and recycling systems that will be implemented. These recommendations are based on the Council's requirements and systems implemented for similar developments (ie., type of development and tenants).

The system has also been developed based on discussions with Council's Waste Services Team as to the collection point and size of waste servicing vehicle.

It is proposed that the appointed contractor will service the residential and commercial waste/recycling directly from the waste rooms (bins from the waste room located in the South Lobby area, will be transported by Building Management to the central waste room prior to servicing and replaced with empty bins).

A MRV will be used for this purpose as it is the safest process for servicing the development. The MRV will travel into Tighe Street) which is a "dead-end" Street) in a forward direction. The MRV will then reverse into the loading dock area of the development and service the waste/recycling bins. Then, the MRV will depart Tighe Street into Railway Street in a forward direction. This methodology negates the need for the use of a turntable within the loading dock area.

Responsibility for correct waste management will be included in all tenancy agreements. This responsibility will include factors such as correct segregation and managing "ad-hoc" wastes.

Waste and recycling collection services will be provided by a commercial waste contractor (TBA). Utilising a commercial waste contractor affords the development greater flexibility regarding collection schedules and the appropriate collection frequencies will be determined in consultation with the waste contractor once appointed – however once operational, collection schedules may need to be adjusted accordingly depending on actual waste generation.

Note that servicing of the development's waste and recycling systems is currently scheduled for two services per week. Specified collection times will be included in the contract between the development's management and the contractor(s).

Note that once appointed, the contract between the development's management and the waste/recycling contractor will be submitted to Council if required. This contract will detail the responsibilities of waste management in accord with all of Council's requirements.

Items such as furniture/whitegoods stored within the bulky waste storage room will be managed by building management. Appropriate collection organisations will be called to collect the items for recycling/reuse as required.

Residents and commercial tenants will also be provided with ad hoc recycling systems such as e-waste; batteries etc. Systems for these streams will be located back-of-house or in common areas or be available upon request from building management.

Signage will be a crucial element of the waste management system. Appendix A contains examples of signage. These are the type of signs that should be used throughout the development and waste storage area(s).

3.2 Residential Waste System

To assist, residents (ie., each apartment), bins will be located within them for disposal of waste and recyclables. These bins will be clearly signed as to the type of materials to be deposited into them and have the capacity for a minimum 2 day's waste/recycling generation.

All residents will be provided with information on the proper use of waste management system, as it is imperative that the recycling streams remain free of contamination to ensure compliance with contractor collection protocols. Residents will be encouraged to maximise the separation of general waste and recyclables to aid the proper disposal of all materials.

Residents will dispose of general waste and recyclables into the bins located in the Ground Floor residential waste storage area.

Cleaning staff will be responsible for managing this storage area to ensure that it remains clean for residents.

3.3 Retail Waste System

The commercial tenancies will be designed so as to allow effective segregation of recyclables. These tenancies will (depending on the types of wastes/recyclables generated) be provided with sufficient smaller bins to allow for effective segregation of wastes/recyclables. This will include:

- General waste
- Paper & cardboard recycling
- Commingled recycling

To ensure that wastes and recyclables are managed correctly (ie., deposited into the correct container):

Tenancy staff will be provided with information on the proper disposal of wastes and recyclables – that is correct segregation requirements.

Tenancy staff and cleaning contractors will have the responsibility for transporting waste/recyclables from the retail premises to the bins located in the commercial waste room.

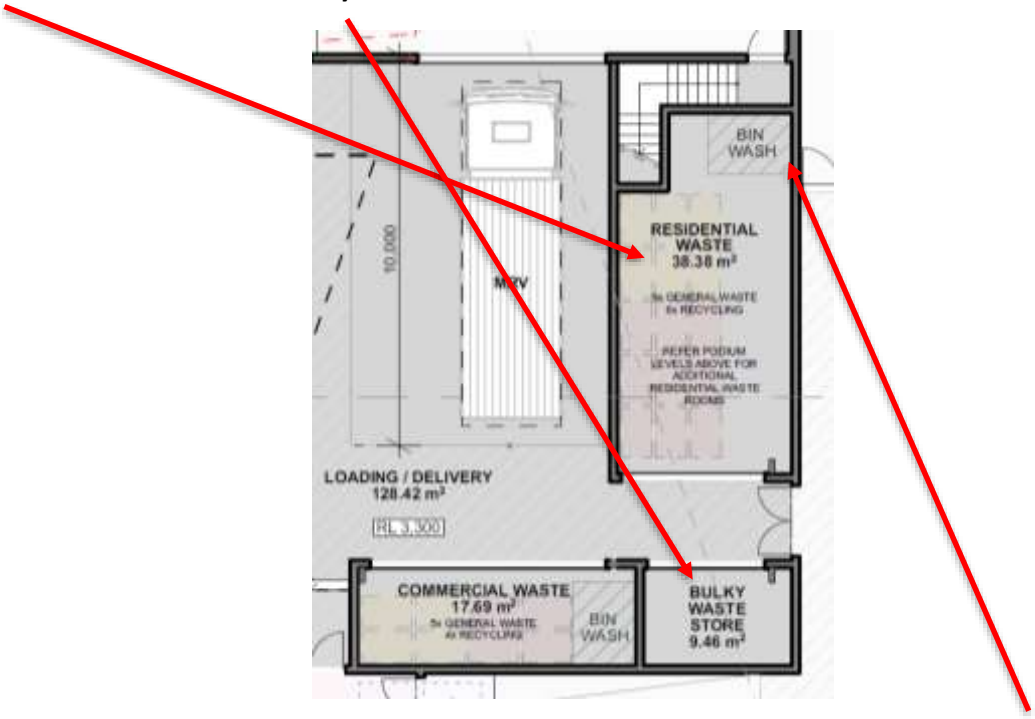
3.4 Waste Storage

In keeping with best practice sustainability programs, all waste areas and waste and recycling bins will be clearly differentiated through appropriate signage and colour coding to Australia Standards to reflect the materials contained.

All waste and recycling bins that are located in the waste storage areas will be colour coded and clearly signed. Each stream will be located in a designated area. This will assist in easy identification of correct bins by cleaners.

The following illustrates the separate residential and commercial waste rooms and the number of bins to be contained within each.

Residential waste room and bulky waste room



In addition to the waste and recycling bin holding areas, there is also provision for a bin washer

Commercial waste rooms

The waste storage rooms will be locked so as to prevent unauthorised access and the incorrect dumping of waste materials.

The waste and recycling bins will be colour coded and clearly signed. Each stream will be located in a designated area. This will assist in easy identification of correct bins by cleaners and staff.

Photographs 1 & 2 - Examples of waste room colour coding

The waste rooms will contain the following to minimise odours, deter vermin, protect surrounding areas, and make it a user-friendly and safe area:

- Have a practical layout, be free of obstructions.
- Have a floor area capable of storing the required number of bins
- Be graded and drained to an approved drainage system.
- Be serviced by an easily accessible water tap.
- Have smooth rounded corners at the floor and wall intersections.
- Be clear of any service and utilities infrastructure and related activities.
- Be capable of being kept clean and tidy at all times.
- Be in accordance with the BCA, relevant Australian Standards and legislation

Occupational Health and Safety issues such as slippery floors will need to be monitored. Cleaners will monitor the storage areas and all spills will be attended to immediately by cleaners.

4 Tenant Education

All residents and commercial/retail staff of the development will receive information regarding the waste collection systems including how to use the system, which items are appropriate for each stream and collection times.

Appropriate signage and updated information will also be provided, as well as receiving feedback on issues such as contamination of the recycling stream or leakage of the recyclables into the general waste. Facilities management will have the responsibility for these tasks.

All waste receptacles will be appropriately signed and additional room signage is usually provided from most waste contractors during implementation of the waste contract.

It is recommended that all signs should:

- Clearly identify the waste/recycling stream;
- Use correct waste/recycling stream colour coding;
- Identify what can and cannot be disposed of in the receptacle; and
- Include highly visual elements to accommodate for individuals with inadequate English literacy.

All waste receptacles will be appropriately signed and additional room signage is usually provided from most waste contractors during implementation of the waste contract.

It is recommended that all signs should:

- Clearly identify the waste/recycling stream;
- Use correct waste/recycling stream colour coding;
- Identify what can and cannot be disposed of in the receptacle; and
- Include highly visual elements to accommodate for individuals with inadequate English literacy.
- An active waste monitoring program will be employed. The cleaning contracts will ensure that contractors actively participate in the waste reduction program for the site and meet regularly to identify performance and new opportunities for diversion and avoidance.

On a half-yearly basis waste and recycling performance reports will be reported back to residents so that they are aware of their performance and areas for improvement. An active waste monitoring program will be employed. The waste and cleaning contracts will ensure that contractors actively participate in the waste reduction program for the site and meet monthly to identify performance and new opportunities for diversion and avoidance.

Note that the details of tenancy agreements relating to management of wastes and education resource materials will be developed prior to any retail tenancy being occupied and residents occupying apartments. Similarly, arrangements with monitoring systems will be developed in consultation with cleaning contractor and waste/recycling service companies. If required, these can then be provided to Council.

5 Ongoing Management

Having suitable systems in place is only one element of an effective waste management system. Compliance by all stakeholders is essential.

Cleaners are a key element in the effectiveness of the systems in place. Prior to acceptance of the cleaning contract, the contractor will be required to demonstrate how the management of waste and recycling will be carried out so as to ensure that segregated materials are placed in the correct systems. This process will be agreed and a training program implemented by the cleaning contractor to ensure full understanding by all cleaners. Monitoring of the system will be carried out by the cleaning supervisor and site management throughout the term of the contract.

In addition, cleaners will be required to feed back to site management any non-compliance issues they observe during their cleaning activities. This may include contamination of recycling; non-participation in the recycling system, or missing or damaged bins. In this way issues can be promptly dealt with by management.

Waste and recycling contractors will be required to report actual volumes collected by stream so that site management can monitor performance and feed this back to stakeholders.

It is highly recommended that a reporting program be set up at the site which would include bin tally sheets that detail the number of bins collected and how full they are at the time of collection, in addition to communication procedures to allow waste contractors to provide feedback regarding contamination and leakage.

All stakeholders should be educated and made aware of any changes to the existing waste systems.

6 Public Place Recycling

With public open spaces, consideration needs to be taken regarding public place recycling (PPR). General waste and recycling facilities will be provided in public realm areas throughout the precinct.

It is difficult to accurately estimate the volume of waste/recyclables that will be generated from the public domain areas due to the uncertainty of activities, number of patrons, weather and other factors.

Estimates for waste/recyclables that could be generated range from an average generation rate of 0.02 litres to 2.0 litres per person utilising public place waste management systems (ie., waste and recyclables). However, depending on the activities being conducted, these rates could range from zero to over ten litres per person.

The number of 240 litre mobile garbage bins for waste and recyclables that are to be provided in the public domain should comfortably manage the estimated volume of materials that can be generated. It should also be noted that servicing regimes for the waste/recycling bins have been developed to ensure that bins are emptied as required. The provision of the 660 litre mobile garbage bins and the volume of the compactor located in the waste storage enclosure are also of sufficient volume to manage what wastes/recyclables and other materials that can be generated.

The key for managing wastes and recyclables will be to locate sufficient bins within the public domain and ensure that servicing schedules reflect patronage and volumes of materials generated.

Issues to consider are (based on audits of a range of public place waste management systems):

- Approximately 70% of recyclables are recoverable – that is placed in recycling bins
- Approximately 15-25% of the recycling stream is contaminants

Development staff will be responsible for collecting all public domain waste/recyclables and transporting it to the waste rooms. The schedule for this will be based on the level of “full” for bins and their location. However, operating procedures will ensure that bins are serviced prior to being filled and so as to prevent litter issues.

Simple, colour-coded and consistent representation of common recycling and waste streams makes it easier for people to know how and what to recycle - whether at work, school or a public event. Introducing a public recycling system has environmental, social and financial benefits including:

- Responding to community expectations to ‘Do the Right Thing’.
- Reducing the amount of waste sent to landfill and recovering valuable resources to be made into new products.
- Financial benefits over time as materials are diverted from landfill and into recycling.
- Contributing to triple bottom line reporting.

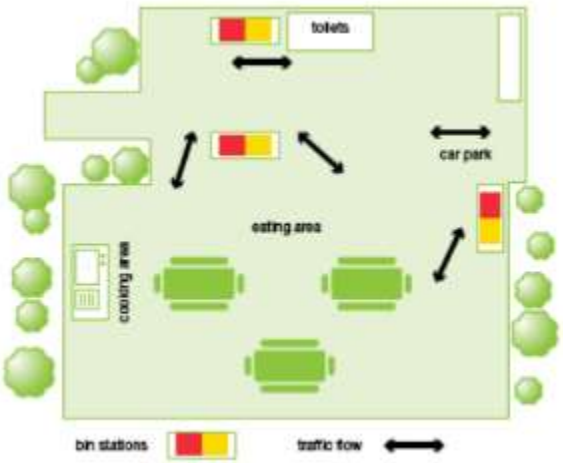
It is important that general waste and recycling bins are always located together in order to make recycling as accessible as general waste disposal. Recycling bins should never be located on their own in isolation from a general waste bin as patrons are likely to contaminate the recycling bin with general waste if there is no other option to dispose their general waste.

The implementation of organics recycling bins is not recommended in public places due to the high levels of contamination commonly observed in such systems.

All bins should be clearly signed and appropriately colour-coded to ensure the streams are readily identifiable. Signage for PPR should be:

- Colour-coded: red for general waste and yellow for recycling
- Large and easily viewed from all angles: this may mean that signs are placed on all sides of the bin or above the bin.
- Simple: don't use jargon (words such as PET, comingled, HDPE and even the recycling triangle can be confusing as this symbol can appear on a number of items that are not necessarily recyclable.
- Unambiguous and uses visual imagery

Location of bins is also something that is difficult to predetermine. However, some pre-planning can be applied to ensure that bins for waste and recyclables are placed near areas where (a) waste is generated or (b) people travel. In the below example, bins are placed near eating as well as traffic areas.



Bin capacity/size is determined by such factors as:

- the frequency of collections,
- the method of storing and emptying the bins, and
- space constraints.

Other factors are types of events, weather, supervision etc. A commonly accepted "rule of thumb" is that people will not walk more than 12 metres to a waste/recycling bin (however, this is perhaps not a valid today given more are better informed about not littering).

7 Demolition Waste Management Principles

7.1 Waste Management Principles

The following waste hierarchy will be used as a guiding principle:

Avoid and Reduce

Minimise the production of waste materials in the demolition process by:

- Assessing and taking into consideration the resultant waste from different demolition options
- Purchasing materials that will result in less waste, which have minimal packaging, are pre-cut or fabricated.
- Not over ordering products and materials

Reuse

Ensure that where ever possible, materials are reused either on site or offsite.

- Identify all waste products that can be reused
- Put systems in place to separate and store reusable items
- Identify the potential applications for reuse both onsite and offsite and facilitate reuse

Recycling

Identify all recyclable waste products to be produced on site.

- Provide systems for separating and stockpiling of recyclables
- Provide clear signage to ensure recyclable materials are separated
- Process the material for recycling either onsite or offsite

Note: In some cases, it may be more economical to send the unsorted waste to specialised waste contractors who will separate and recycle materials at an offsite location.

Disposal

Waste products which cannot be reused or recycled will be removed and disposed of. The following will need to be considered:

- Ensure the chosen waste disposal contractor complies with regulatory requirements

- Implement regular collection of bins

Section 143 of the Protection of the Environment Operations Act 1997 requires waste to be transported to a place that can lawfully accept it. It will be the responsibility of the site developers to ensure all contractors clearly specify where all wastes are to be transported, the capacity of the nominated facilities to receive/manage the waste and to ensure that reports on management aspects (types, quantities and disposal pathways) are provided.

7.2 Liquid Waste

Liquid waste may be produced on site for environmental control measures such as:

- Site and vehicle cleaning
- Dust control waste

The following measures will be taken to minimise the impact of liquid waste:

- Ensure water is used in moderation and no taps are left continuously running
- Use any grey water produced on site for irrigation or for dust suppression
- Only discharge clean water into storm water

7.3 Stormwater Pollution Prevention

All actions will be undertaken to avoid pollution entering stormwater drains and for litter generation. The following will be initiated:

i. Prior to commencement of any works a Safe Work Method Statement will be completed and reviewed to determine potential for stormwater pollution and/or litter generation

ii. The proponent (contractor), will need to develop a management strategy to manage the potential for these issues to be realised

iii. Site inspections will be conducted during the working day to monitor potential for stormwater pollution generation and where identified, works will cease until appropriate controls are implemented

iv. Waste water and storm water will be managed and disposed of in accordance with Water Authority requirements.

7.4 Litter Management

i. Daily site inspections will be conducted to identify litter, remedy the situation and investigate the cause so as to reduce the potential for the issue to occur in the future.

ii. Sufficient quantities of bins (and/or bin space), will be made available so as to avoid dumping of materials outside bins

iii. All waste/recycling bins will have covers so as to ensure that wastes cannot be blown out during windy conditions.

iv. Personnel will be allocated the role of litter management in that they will periodically inspect the site and surrounds for litter and if identified collect and dispose of it.

7.5 Records

Records will be kept of all wastes and recyclables generated and either used on site, or transported off–site during the demolition stage of the development.

It will be a condition of appointment that all waste/recycling contractors involved in the demolition stage provide these records, and that they also contain details of the facilities that the materials are transported to.

These records will be made available to Council on request.

7.6 Waste/recyclables storage (on-site)

All waste and recycling materials will be stored in bins provided by the appointed contractor(s). These bins will be appropriately coloured and signed to indicate what materials are to be deposited into them and located so as to maximise the recovery of reusable/recyclable materials.

As demolition activities progress, the designated bins will be moved so as to maximise the collection of materials that will be diverted from landfill. This will also involve relocating signage advising as to correct waste management.

8 Demolition Materials

8.1 Overview

All waste contractors/sub-contractors will be required to detail all intended disposal facilities to ensure that legislative and safety requirements are met, the guiding principles of the waste hierarchy are upheld and maximum diversion from landfill is achieved.

Records will be required to be maintained by all contractors and made available to Council so as to validate management pathways (ie., disposal facilities) and these records will be required to be maintained by all contractors and made available to Council so as to validate management pathways

The potential for reuse of materials on-site (and this will be encouraged for what could be used for the construction phase of the development), will depend on the quality of the materials once demolition proceeds.

8.2 Estimated Volumes

The following table details the estimated composition by m^3 of demolition waste to be generated and management strategy. It is important to note that these are estimates and the important issue is that the materials will be managed so as to avoid wherever possible disposal to landfill.

This process and the management of any excavation and removal of contaminated soil and waste (if identified), from the site will be undertaken and managed by qualified contractors and consultants in accordance with all the relevant standards and regulations and is not addressed in this report.

The relevant disposal/recycling facilities have not been detailed as the waste contractor and sub-contractors have not yet been appointed for the project.

A range of other materials may be present on the site once the demolition activities commence.

All potentially recyclable materials are to be separated and stored on-site for an appointed waste/recycling contractor to inspect and to determine the suitability of the material for recycling (or even reuse). If approved for either action, then the contractor can then remove the items.

For materials that are not designated as potentially able to be reused or recycled, then they are to be disposed of at a landfill (or other facility) licenced to receive those specific materials.

Waste management systems - demolition

Materials on site		Destination		
Type of material	Estimated volume (m^3/tonnes)	On-site (Reuse or recycle)	Off-site (Detail contractor and recycling facility)	Disposal (Detail contractor and landfill site)
Excavation material	350m^3	Will either be stockpiled for use during construction if required and if not disposed off-site.	Excavation materials will be used as clean fill by and/or forwarded to various facilities	Facility TBA upon appointment of contractor.

Materials on site		Destination		
Type of material	Estimated volume (m^3/tonnes)	On-site (Reuse or recycle)	Off-site (Detail contractor and recycling facility)	Disposal (Detail contractor and landfill site)
Concrete	490m^3	No on-site reuse	Collected by contractor and disposed at concrete recycling facility	No disposal to landfill
Vegetation	40m^3	No on-site reuse	Collected and disposed at green waste/mulching facility	Facility TBA upon appointment of contractor. No disposal to landfill.
Bricks	130m^3	Bricks will be stockpiled and reused wherever possible.	Acceptable quality bricks collected by a contractor and sold for reuse. Unusable bricks will be collected and recycled at an appropriate brick/rubble recycling facility to be used in aggregate gravel products	Facility TBA upon appointment of contractor
Timber	75m^3	No on-site reuse	Recyclable timber (untreated) will be collected and recycled at appropriate timber yard. Unrecyclable timber will be disposed at landfill	Facility TBA upon appointment of contractor
Mixed hard plastics	55m^3	No on-site reuse	Collected by contractor for recycling. Facility TBA upon appointment of contractor.	No disposal to landfill

Materials on site		Destination		
Type of material	Estimated volume (m^3/tonnes)	On-site (Reuse or recycle)	Off-site (Detail contractor and recycling facility)	Disposal (Detail contractor and landfill site)
Plasterboard	85m^3	No on-site reuse	Collected by the waste subcontractor on a weekly basis (or as required) for recycling. Possible use as soil improver with gypsum etc removed by recycler	Facility TBA upon appointment of contractor
Metals	170m^3	No on-site reuse	Collected by specialist metal subcontractor for recycling.	No disposal to landfill. Facility TBA upon appointment of contractor.
Carpet	25m^3	No on-site reuse	This will be disposed of into a designated bin and collected regularly as required for recycling is of the required quality or disposal to landfill	Facility TBA upon appointment of contractor
Glazing	40m^3	No on-site reuse	Recyclers consulted as to potential for recycling and if suitable separated for recycling by a facility	Facility TBA upon appointment of contractor
Mixed Recyclables	100m^3	No on-site reuse or recycling	Separated onsite into dedicated receptacles. Collected by the waste subcontractor for recycling. Facility TBA upon appointment of contractor.	Facility TBA upon appointment of contractor

Materials on site		Destination		
Type of material	Estimated volume (m^3/tonnes)	On-site (Reuse or recycle)	Off-site (Detail contractor and recycling facility)	Disposal (Detail contractor and landfill site)
General waste	250m^3	No on-site reuse or recycling	Separated onsite into dedicated receptacles. Collected by the waste subcontractor for disposal to landfill with the facility TBA upon appointment of contractor.	Disposed into general waste bins onsite and collected by the waste contractor for disposal. Facility (TBA) upon appointment of contractor

8.3 Other Materials

A range of other materials may be present on the site once the demolition activities commence.

All potentially recyclable materials are to be separated and stored on-site for an appointed waste/recycling contractor to inspect and to determine the suitability of the material for recycling (or even reuse). If approved for either action, then the contractor can then remove the items.

For materials that are not designated as potentially able to be reused or recycled, then they are to be disposed of at a landfill (or other facility) licenced to receive those specific materials.

9 Hazardous Waste Materials

9.1 Management Procedures

Contractors employed to manage any identified hazardous wastes will be required (prior to appointment), to demonstrate their compliance with NSW EPA and WorkCover requirements for management of the specific materials they are contracted to manage.

The following are the recommended approaches for managing the wastes and other materials that were identified during the site analysis.

The key principles that need to be adhered to are[2]:

1. All hazardous wastes need to be correctly identified and managed in accord with all relevant legislation, Codes of Practices and the developed management actions.
2. Hazardous materials need to be separated into their individual categories and not mixed with any other materials

Prior to commencing any demolition or clean-up activities, a Workplace Health & Safety Plan will be developed, implemented and monitored with all relevant site personnel receiving specific training in management of hazardous waste materials (including suspected hazardous materials).

In regards to potentially contaminated soil, a Remedial Action Plan is being prepared to ensure that this material is to be managed in accord with applicable regulations.

9.2 Asbestos

The process for managing what has been suspected of being or containing asbestos waste is as follows:

i. Treat the material as asbestos unless proven otherwise
ii. Do not disturb the material (ie., shift or place into a container) at all
iii. Seek advice from a suitably qualified laboratory to test the material(s) to determine if it is or is not asbestos.
iv. If determined not to be asbestos, then it can be managed as an inert waste.
v. If determined to be asbestos then managed by a licenced contractor for packaging, removal and disposal.
vi. If the material has accidently been uncovered, then the area should be cleared, barriers erected to prevent access, NSW WorkCover and EPA notified, and if broken, covered with a fine spray/mist of water.

For what has been conclusively identified as asbestos containing materials (including soils), a specialist/licenced asbestos contractor will be used. As required, only workers trained in asbestos

[2] Reference should be made to the NSW EPA publication, Waste Classification Guidelines Part 1: Classifying Waste.

removal techniques will be allowed to manage the removal of asbestos contaminated soil and any contained on the buildings.

In regards to disposal of asbestos containing materials, there are regulatory requirements under clause 42 of the Protection of the Environment Operations (Waste) Regulation 2005 that apply to the management of asbestos waste, including:

- Waste must be stored on the premises in an environmentally safe manner.
- Non-friable asbestos material must be securely packaged at all times.
- Friable asbestos material must be kept in a sealed container.
- Asbestos-contaminated soil must be wetted down.
- All asbestos waste must be transported in a covered, leak-proof vehicle.
- Asbestos waste must be disposed of at a landfill site that can lawfully receive this waste. Always contact the landfill beforehand to find out whether asbestos is accepted and any requirements for delivering asbestos to the landfill.
- It is illegal to dispose of asbestos waste in domestic garbage bins.
- It is also illegal to re-use, recycle or dump asbestos waste

These requirements will be adhered to.

10 Contracts and purchasing

Each subcontractor working on the site will be required to adhere to this Waste Management Plan.

The Head Contractor will ensure each subcontractor:

- Implements procedures to ensure waste resulting from their work will be actively managed and where possible recycled, as part of the overall site recycling strategy or separately as appropriate
- Implements source separation of off cuts to facilitate reuse, resale or recycling.

The Site Manager will be responsible for:

- Ensuring there is a secure location for on-site storage of materials to be reused on site, and for separated materials for recycling off site.
- Engaging appropriate waste and recycling contractors to remove waste and recycling materials from the site
- Co-coordinating between subcontractors, to maximise on site reuse of materials
- Monitoring of bins on a regular basis by site supervisors to detect any contamination or leakage
- Ensuring the site has clear signs directing staff to the appropriate location for recycling and stockpiling station/s. And that each bin/skip/stockpile is clearly sign posted
- Proving training to all site employees and subcontractors in regards to the WMP as detailed in section 11 below.

Should a subcontractor cause a bin to be significantly contaminated, the Site Manager will be advised by a non-conformance report procedure. The offending subcontractor will then be required to take corrective action, at their own cost. The non-conformance process would be managed by the Head Contractors' Quality Management Systems

11 Training and Education

All site employees and sub-contractors will be required to attend a site specific induction that will outline the components of the WMP and explain the site specific practicalities of the waste reduction and recycling strategies outlined in the WMP.

All employees are to have a clear understanding of which products are being reused/recycled on site and where they are stockpiled. They are also to be made aware of waste reduction efforts in regards to packaging.

The site manager will post educational signage in relation the recycling activities on site in breakout areas, lunch rooms etc.

Appendix A – Waste Signage

Pre-Development Application

Pre-Development Applications are recommended for significant or complex development proposals or if variation to one or more planning controls is being proposed	Applicants for medium and large developments are encouraged to use this service to assist in lodgement of a complete and comprehensive application resulting in quicker processing times. The service may also assist applicants for dwelling houses that are impacted by heritage controls. A Pre-DA application is not mandatory. The City of Newcastle (CN) will assess the information provided and provide advice by way of a letter, identifying any relevant issues to be addressed. We may consider it appropriate to meet with you regarding your proposal. In this instance, a CN officer will contact you to organise a meeting with you (and your consultant) at a time suitable to all parties. Any applicants seeking advice on rezonings are advised to complete the form 'Request to amend the Newcastle LEP', available on our web site.

Minimum Information	• An electronic copy of the application on either a CD, USB stick or via email, including concept plans, drawn to scale including site plan and elevations.
	• A brief description of all development options considered.
	• A statement describing the proposal and comparison with CN's planning controls. It is recommended this is presented in a table format comparing the proposal to CN's codes, policies and planning instruments.
	• It is recommended that photographs of the site and the surrounding streetscape be provided.
	• The application fee.
	CN requests all documents use the following naming convention, any naming conventions outside of the examples provided may result in a delay in the registration of your application:
	  • Application Form - 25 City Street Newcastle
	  • Architectural Plans - 25 City Street Newcastle
	
	Once you have prepared this information and completed this application form, return it to CN with the required payment. CN will then contact you to arrange a suitable meeting time or a site inspection.

Fees vary according to the type and/or value of development.

For up to date fees and charges, our website.

a) Dwelling houses and dual occupancies

b) <$500,000 and/or subdivision up to 3 lots - up to half hour meeting

c) $500,000 to $1,000,000 and/or subdivisions up to 10 lots - up to 3/4 hour meeting

d) $1,000,001 to $5,000,000 and/or subdivisions of 11 to 20 lots - up to 1 hour meeting

e) >$5,000,000 and/or subdivisions of more than 20 lots - up to 1 hour meeting

f) Additional meetings or additional written comments on plans

You Are Advised That:

- The views expressed may vary once detailed plans and information are submitted and formally assessed in the development application process, or as a result of issues contained in submissions by interested parties;
- Amending one aspect of the proposal could result in changes that create a different set of impacts from the original plans and therefore require further assessment and advice; and
- The comments do not bind CN Officers, the elected CN members, or other bodies beyond CN, in any way whatsoever.

Part 1: Applicant and site details

1. Applicant Details

All correspondence will be sent to the email address provided unless 'care of' email address is specified.

Name or company Thirdi Dairy Farmers Pty Ltd

ABN (required if company) 646 777 273

Postal Address 343 Pacific Highway,

Suburb North Sydney Postcode 2060

Phone 0403 258 807

E-mail lm@thirdigroup.com.au

Contact person (if company) Luke Mahaffey

Leave blank if not required

Will your correspondence be 'care of' another company?

☑ Yes

☐ No

Care of name or company CKDS Architecture

ABN (required if company) 12 129 231 269

Contact person Matthew Boyle

Postal Address 115 King St, Newcastle, 2300

Phone 02 4929 1843 E-mail mboyle@ckds.com.au

2. Location and title description of the property

This information is available on rates notices

Unit No..... House No..... Street 924 Hunter St

Locality Newcastle West

Lot(s)..... Section.....

Deposited Plan(s) Multiple - see below Strata Plan.....

Other Lot 2 DP445736, Lot 1 DP 342675, Lots 1&2 DP 1091173, Lot 1 DP395367, Lot 1 456088, Lot 2 DP 126

3. Who owns the land?

Give the name of every owner. Attach a list if space insufficient.

Name 1 McCloy Newcastle West Pty Ltd Phone 02 4945 7500

Address Suite 2, Ground Floor 317 Hunter St, Newcastle Postcode 2300

Name 2..... Phone.....

Address..... Postcode.....

4. Are you the owner of the subject property?

❑ Yes.

■ No, if no, state the interest in the property Developer.

Part 2: Application Details

5. Describe the proposed development

a) Give a detailed outline of what you propose in this application.

Partial demolition of existing buildings.

Construction of 2x residential towers (1x 30 stories, 1x 25 stories), 1x 5 storey co-work commercial building, retail, and associated car parking.

b) Have you applied for Pre-DA advice on this development previously?

- ❑ Yes
- ❑ No

6. What are the three key issues you would like to discuss with the officers?

1. Heritage
2. Traffic & Waste
3. RSDA & Design Excellence Pathway

7. Estimated cost of development (including GST and excluding the value of the land)

The cost of the development $Approx 70 million

Capital Investment Value $Approx 70 million

The cost of the development is the genuine estimate of: (a) the cost associated with the construction of the building, and (b) the cost associated with the preparation of the building for the purpose for which it is to be used (such as the cost of installing plants, fittings, fixtures and equipment). Owner builders will need to include a full cost of labour.

The Capital Investment Value (CIV) of a project includes all costs necessary to establish and operate the project, including the design and construction of buildings, structures, associated infrastructure and fixed or mobile plant and equipment (but excluding land costs and GST). This is not required to be completed if the CIV is less than $5,000,000.

8. Probity

Parties include owners, applicants, developers and companies.

Do parties to this application have a pecuniary or non-pecuniary interest with:

a) a staff member, councillor, contractor or related to someone who is a staff member, councillor, contractor of The City of Newcastle? or,

b) a State or Federal Member of Parliament?

i. Yes. If yes, state the relationship……

ii. (No)

Protecting your privacy

The City of Newcastle (CN) is committed to protecting your privacy. We take reasonable steps to comply with relevant legislation and CN's Privacy Management Plan.

Purpose of collection:	To enable CN as the consent authority to assess your proposal.
Intended recipients:	CN staff and other government agencies that may be required to assess the proposal.
Supply:	The information is a statutory requirement related to the assessment of the application.
Consequence of non-provision:	Your application may not be accepted or processed due to a lack of information.
Storage and Security:	The City of Newcastle, 12 Stewart Avenue Newcastle West will store details of the application. Individuals can access the details of the application under the *Government Information (Public Access) Act 2009*.
Access:	Your information can be accessed to check for accuracy by calling (02) 4974 2000.

How to lodge your application

Applications can be lodged:

1. By email meeting the following criteria:
   - Enter the address of the property and the type of application (i.e. DA, Mod) in the subject line of the email.
   - Documents are to be named in accordance with the document titled Plan Standards - Guidelines for Lodging Electronic Documents.
   - Emails are to be sent to applications@ncc.nsw.gov.au

   More information is available on the information sheet titled How to submit an application via email.

2. In person, at the Customer Contact Centre, located at 12 Stewart Avenue Newcastle West NSW 2302.

3. By mail:
   The City of Newcastle
   PO Box 489
   Newcastle NSW 2300

Fees

Your application is not considered lodged until the required fees have been paid. If the application does not include payment we will contact you when payment is required. Payments need to be made within 24 hours of contact.

Payment Methods
You can pay by cash, cheque, Credit Card or EFTPOS.

Please note a merchant fee is payable on all credit card transactions.

Cheques are to made payable to The City of Newcastle.

Acknowledgement
We will acknowledge that we have received your application. You will receive a letter and receipt specifying the amount of fees paid, and the registered number of the application.

How to contact us:
Phone: (02) 4974 2000
E-mail: mail@ncc.nsw.gov.au
In Person: 12 Stewart Avenue Newcastle West NSW 2302