Proposed Mixed-Use Development, 711 Hunter Street, Newcastle NSW

Remedial Action Plan

Hunter Street JV Co Pty Ltd

Reference: 754-NTLGE293239-AH

18 May 2023

PROPOSED MIXED-USE DEVELOPMENT, 711 HUNTER STREET, NEWCASTLE NSW

Remedial Action Plan

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This report should be read in conjunction with the attached "*Important information about your Tetra Tech Coffey Environmental Report*".

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EXECUTIVE SUMMARY

Tetra Tech Coffey Pty Ltd (Tetra Tech) was engaged by Hunter Street JV Co Pty Ltd (the Applicant) to prepare a Remedial Action Plan (RAP) to support the Development Application (DA) at 711 Hunter Street, Newcastle West New South Wales (NSW) (Lot 1 DP867617) (the Site).

The Site is owned by the Spotlight Group and is being developed as a joint venture (the Applicant) with St Hilliers Pty Ltd (St Hilliers). It is slated for redevelopment into a mixed-use development, with commercial on the ground floor and residential above. The Site is currently partially leased to two tenants and is considered an active site.

A Detailed Site Investigation (DSI) was undertaken at the Site by Tetra Tech in late 2022; reference: Tetra Tech (2022) *Detailed Site Investigation Report: Proposed Development, 711 Hunter Street, Newcastle West NSW (Reference No. 754-NTLGE293239-AB, dated 18 October 2022)* (Tetra Tech DSI (2022)). Due to existing buildings and operational commercial businesses, the DSI was completed within accessible areas outside of the current building footprints. For the sampling locations assessed as part of the DSI, results for soil were reported below the adopted assessment criteria. Tetra Tech recommended that additional assessment works be completed following the demolition of existing buildings and structures.

As part of the DA approval process, City of Newcastle (Council) require that a RAP be developed which outlines the methodology for additional contamination assessment once buildings have been demolished and removed from Site.

The objective of the RAP is to provide the methodology for an additional contamination assessment as well as guidance on the remediation and validation activities required to make the Site suitable for the proposed commercial and residential purposes.

The additional contamination assessment involves the investigation of soil and groundwater conditions within the existing building footprints, post-demolition. Any contamination in fill materials that may be identified during the additional contamination assessment is to be capped, as the preferred remedial strategy. This involves hard capping within the proposed building, hardstand and soft capping of in-ground landscaped areas. A site validation report must be prepared following implementation of the remedial works. Validation will be confirmed primarily by survey of capped areas but will also include tracking of imported exported materials.

In the event that volatile hydrocarbon contamination is encountered during the additional contamination assessment, excavation and off-site disposal of material that does not comply with relevant assessment criteria would be required. Should there be an inability to achieve the effective remediation criteria at the selected locations, a risk assessment would be undertaken to address the residual risk to the proposed development and, if required, alternate risk strategy would be developed. This would need to be included in an amended RAP.

1. INTRODUCTION

Tetra Tech Coffey Pty Ltd (Tetra Tech) was engaged by Hunter Street JV Co Pty Ltd (the Applicant) to prepare a Remedial Action Plan (RAP) to support the Development Application (DA) at 711 Hunter Street, Newcastle West New South Wales (NSW) (Lot 1 DP867617) (the Site). The Site location and Site layout are presented in Figure 1 and Figure 2 of Appendix A, respectively.

The Site is owned by the Spotlight Group and is being developed as a joint venture (the Applicant) with St Hilliers Pty Ltd (St Hilliers). It is slated for redevelopment into a mixed-use development, with commercial on the ground floor and residential above. The Site is currently partially leased to two tenants and is considered an active site. The proposed re-development concept plans are presented in Appendix B.

A Detailed Site Investigation (DSI) was undertaken at the Site by Tetra Tech in late 2022; reference: Tetra Tech (2022) *Detailed Site Investigation Report: Proposed Development, 711 Hunter Street, Newcastle West NSW (Reference No. 754-NTLGE293239-AB, dated 18 October 2022)* (Tetra Tech DSI (2022)). Due to existing buildings and operational commercial businesses, the DSI was completed within accessible areas outside of the current building footprints. For the sampling locations assessed as part of the DSI, results for soil were reported below the adopted assessment criteria. Tetra Tech recommended that additional assessment works be completed following the demolition of existing buildings and structures.

As part of the DA approval process, City of Newcastle (Council) require that a RAP be developed which outlines the methodology for additional contamination assessment once buildings have been demolished and removed from Site.

This report must be read in conjunction with the attached sheet "*Important information about your Tetra Tech Coffey Environmental Report*".

1.1 OBJECTIVES

The objective of the RAP is to provide the methodology for an additional contamination assessment as well as guidance on the remediation and validation activities required to make the Site suitable for the proposed commercial and residential purposes.

1.2 SCOPE OF WORKS

The scope of works to meet the objective were to:

- Provide procedural guidance to undertake additional assessment works to assess the potential for contamination to exist within soils and/ or groundwater from areas which are currently beneath existing buildings and structures.
- Set remediation goals and outline a strategy to manage unacceptable risks associated with Contaminants of Potential Concern (COPCs) within soil (or groundwater) reported as part of additional assessment works.
- Provide procedures and plans for remedial and validation works.
- Outline minimum controls necessary to complete the proposed remedial works in a manner that minimises negative impacts upon worker health and safety (WHS) and the environment.
- Provide a procedure to manage unexpected contamination finds during construction earthworks.

As soil contamination has not yet been assessed at the Site, remedial options will be discussed, however the strategy, steps and approach will be required within a revision to this RAP based on the contamination encountered.

1.3 GUIDING FRAMEWORK

The RAP has been prepared in accordance with the following guidance:

- Contaminated Land Management Act 1997.
- Work Health and Safety (WHS) Act 2011.
- WHS Regulation 2011.
- Newcastle Local Environmental Plan 2012.
- New South Wales Environment Protection Authority (NSW EPA) (2020) Consultants Reporting on Contaminated Land Guidelines (CRCL).
- Chapter 4, State Environmental Planning Policy (Resilience and Hazards) 2021 (Resilience and Hazards SEPP).
- National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended in 2013 (ASC NEPM).
- NSW EPA (2017) Guidelines for the NSW site auditor scheme (3rd edition).
- NSW EPA (2014) Waste Classification Guidelines.
- NSW EPA (2022) Contaminated Land Guidelines: Sampling Design Part 1 – Application (SDG).
- Australian Standard (2017) AS1726:2017 Geotechnical Site Investigations.

2. SITE DESCRIPTION

2.1 SITE IDENTIFICATION

Site identification details are presented in Table 2.1.

Table 2.1: Site identification details

Site Address	711 Hunter Street, Newcastle West, NSW 2302
Title Identification Details	as Lot 1 of deposited plan (DP) 867617
Site Area	4,724m^2
Heritage Significance	Not identified as a heritage item but is adjoining an identified local heritage item to the south-west, namely the Army Drill Hall (I508) located at 498 King Street and is diagonally adjacent to the Bank Corner which is a locally listed heritage item located at 744 Hunter Street. The Site is also located within the Newcastle City Centre Heritage Conservation Area.
Current Land Zoning	The Site is zoned as: B3: Commercial Core
Current Land Use	Retail Commercial Building
Proposed Land Use	Mixed-Use Commercial-Residential Building (Ground floor commercial, residential above)
Adjoining Site Uses	West – Commercial, residential buildings. East – National Park Street, commercial, residential buildings. South – King Street and further south, commercial buildings and tenancies. North – Hunter Street and commercial buildings and tenancies.
Site Coordinates	Southern corner: 384136.21 m E, 6356104.14 m S

2.2 SITE HISTORY

The Site has been used primarily for commercial/retail trading since the beginning of the twentieth century. The Site historically comprised 6 individual land parcels, the majority of which were commercially owned. A small number of the lots were privately owned.

Based on the findings from the desktop study, there was the potential for some changes to the Site not captured by the aerial photographs reviewed, based on the gaps in time between each image. Given the unbroken commercial use of the Site these time gaps were not considered to unduly impact the conclusions reached.

Since the Site had been used for commercial land use, there may have been activities carried out within each building not included in the records at hand. Based on the known commercial and retail uses suggested that chemical use or storage, if it had occurred, would have been minimal.

2.3 SITE CONDITION AND ENVIRONMENTAL SETTING

A summary of the Site condition as presented in the Tetra Tech DSI (2022) is as follows:

- The Site is occupied by an existing two storey building comprising above ground parking and lower and upper-level retail occupancies.
- The majority of the commercial tenancies are vacant. There are two remaining tenants in the building, Anytime Fitness health club and Musos Corner music store.

- There are no areas within the footprint of the Site where soil was visible. The entire area was covered by either concrete pavement, tiling or buildings.
- National Park Street runs north to west to the east of the Site. 1 National Park Street, comprising a group of commercial buildings is currently being demolished to make way for a future commercial/residential development.
- West of the Site was an in-construction retail and commercial high-rise building.
- Hunter Street runs east to west to the north of the Site.
- King Street runs east to west to the south of the Site.

A summary of the Site environmental setting completed as part of the Tetra Tech DSI (2022) is provided as follows:

- Topography – Site topography is about 12 metres in Australian Height Datum (mAHD) and based on observations during the Tetra Tech DSI (2022), the Site elevation was generally flat with minimal elevation change.
- Geology – The Site was underlain by Quaternary Alluvium comprising sands, silts, clays and gravels which overlies the Newcastle Coal Measures. It was understood that Hunter Street was constructed on reclaimed land with fill over natural sand plain sediments. Based on observations from the Tetra Tech DSI (2022), fill was encountered from beneath hardstand surfaces to a depth of about 1.5m below ground surface (mbgs) and comprised medium to coarse grained dark grey to black, gravelly sand, with sub-rounded to sub-angular, trace cobbles, with brick fines/ coal wash inclusions. Natural soils were encountered from a depth of about 1.0mbgs and consisted of dark brown to grey, fine to medium grained sands with trace cobbles.
- Acid Sulfate Soils – The Site was located within an area with a low probability classification of Acid Sulfate Soils, from depths greater than 3 mbgs.
- Surface Water – Stormwater runoff generated at the Site was expected to discharge into the local municipal stormwater drainage system along Hunter Street, National Park Street and/ or King Street, then into Throsby Creek located approximately 400m to the northeast of the Site.
- Groundwater – Groundwater was anticipated to be present within an unconfined aquifer at a depth of about 1.5mbgs to 2mbgs. Tetra Tech encountered groundwater during the DSI (2022) at a depth of 1.95mbgs, which was observed to be turbid, brackish-brown in colour with no visible odours or sheen.

2.4 SUMMARY OF PREVIOUS ENVIRONMENTAL INVESTIGATIONS

It is understood that other than the Tetra Tech DSI (2022), no other contaminated land investigations have been conducted at the Site.

A summary of the Tetra Tech DSI is as follows:

- Desktop study – key findings from the desktop study have been presented in Sections 2.2 and 2.3 including the site history and environmental setting. In addition, the Site and nearby surrounds were not listed as contaminated in the NSW EPA contaminated land record databases.
- Fieldworks consisted of the assessment of soils from fifteen borehole locations (BH01-BH03, BH05-BH06, BH08-BH13, BH12-1, CPT-01 and CBR-1), which were positioned across the Site in accessible locations around the building footprints. Boreholes were advanced to a maximum depth of approximately 2mbgs with soil samples collected at depths of 0.5mbgs, 1.0mbgs and 1.5mbgs.
- Borehole location BH03 was converted into a groundwater monitoring well, one groundwater monitoring event completed on 28 September 2022.
- Analytical results from the analysed soil samples were below the adopted health and ecological criteria.

- Copper, lead, nickel and zinc concentrations in the groundwater sample were reported to exceed the adopted Australian and New Zealand Guidelines (ANZG) marine water assessment criteria. The exceedances were assessed to be related to the historic use of slag-based fill throughout the surrounding area and was not directly related to historic activities occurring at the Site.
- Based on the results from the DSI, Tetra Tech considered that there was a low risk of widespread contamination within fill and groundwater beneath the Site. The preliminary CSM indicated that there was one potentially complete human health exposure pathway to construction workers.
- Additional contamination assessment was recommended following the demolition of buildings and structures at the Site, which would include the installation of two additional groundwater wells.
- Tetra Tech also recommended that the development be undertaken under the guidance of an Unexpected Finds Protocol (UFP) and Contaminated Materials Management Plan (CMMP) and that any material disposed of off-site be classified in accordance with the NSW EPA (2014) Waste Classification Guidelines: Part 1 Classifying Waste.

2.5 DATA GAPS

Given that the assessment was completed within accessible locations around the existing Site buildings, there was a significant area underlying the existing building footprint that remained unassessed. The assessment of fill materials at the periphery of the Site and within accessible areas were shown to not pose significant human health risk in a commercial/ industrial setting as proposed for the development. The lack of data on the condition of the unassessed material beneath the Site buildings must be confirmed to close the data gap.

The presence of the buildings limited the assessment of groundwater to one on-site location. Given that there was no proposed basement excavation at the Site and future groundwater disturbance was therefore likely to be minimal, the potential for exposure to groundwater for construction workers and future site users remained low.

The groundwater exceedances in copper, lead, nickel and zinc were considered typical of the area, given the historical use of slag-based fill in the Honeysuckle area of Newcastle. Confirmation of the general water quality should be completed with the installation of additional wells placed within the existing building footprint once the buildings are demolished. This will confirm that impacts to the groundwater quality across the Site are limited to heavy metals.

Once these soil and groundwater data gaps have been addressed, the CSM can be updated and the risk to human receptors assessed.

3. CONCEPTUAL SITE MODEL

3.1 AREAS OF ENVIRONMENTAL CONCERN AND CONTAMINANTS OF POTENTIAL CONCERN

A summary of the potential contamination sources and the associated COPCs is presented in Table 3.1.

Table 3.1: Potential Contamination Sources and COPCs

AEC	Potentially Contaminating Activity	COPCs	Likelihood of Contamination*	Comments
Whole Site	Potentially contains fill of unknown quality and origin	Heavy metals, TRH, BTEX, PAH, Phenols, asbestos	Medium	Fill will most likely be localised to areas associated with buildings, pavements, building slabs and foundations.
Previous historical Site activities	Successive demolition of buildings and redevelopments over the years potentially resulting in residual contamination.	Heavy metals, TRH, BTEX, PAH, Phenols, asbestos	Medium	The Site has been occupied by several large commercial structures since the 1950's. Progressive redevelopment of the Site including sectional demolitions may have resulted in residual contamination within fill materials.

Heavy metals - arsenic, cadmium, chromium III, copper, nickel, lead, zinc, mercury; BTEX - benzene, toluene, ethylbenzene and xylenes; TRH - total recoverable hydrocarbons; PAH - polycyclic aromatic hydrocarbons.

3.2 AFFECTED MEDIA, RECEPTORS AND TRANSPORT MECHANISMS

A summary of the potentially affected media, key potential receptors and transport mechanisms relevant to the proposed development is presented in Table 3.2.

Table 3.2: Source Contamination, Transport Mechanisms, Pathways and Receptors

Primary Sources (COPCs)	Secondary Sources	Transport Mechanisms	Exposure Routes	Potential Receptors
Potential fill of unknown origin	None	• Direct contact • Ingestion and inhalation • Leaching from soil to groundwater • Surface water runoff	• Soil ingestion • Dermal contact with soil • Outdoor dust inhalation • Surface transport (runoff) • Vertical transport (groundwater)	• Site users and neighbours • On-site workers (construction) • Maintenance workers • Ecological – aquatic ecosystems of Throsby Creek, transitory wildlife
Previous historical Site activities	None	• Direct contact • Ingestion and inhalation • Leaching from soil to groundwater	• Soil ingestion • Dermal contact with soil • Outdoor dust inhalation • Surface transport (runoff)	• Site users and neighbours • On-site workers • Maintenance workers • Ecological – aquatic ecosystems of

Primary Sources (COPCs)	Secondary Sources	Transport Mechanisms	Exposure Routes	Potential Receptors
		• Surface water runoff through soil pore space. • Leachate migration into groundwater and plume migration.	• Vertical transport (groundwater)	Throsby Creek, transitory wildlife

3.3 KEY POTENTIAL EXPOSURE PATHWAYS

A summary of the key potential exposure pathways is presented in Table 3.3.

Table 3.3: Key Exposure Pathways

Receptor/ Media	Exposure Pathway	Comment
Maintenance/ Construction Worker	Potentially Complete	There is a potential for workers conducting subsurface and surface disturbance to be exposed to soils containing contaminants via dermal contact, ingestion and inhalation pathways during development and maintenance works.
Current and Future Site Users	Incomplete	Currently the Site is sealed (no accessible soils). Final development will also be sealed with no access to native soils (landscaping in raised planters or imported landscaping media). In its final developed state there will be no exposure route from Site soils to the users.
Site Neighbours	Incomplete	Currently the Site is sealed (no exposed soils) and will remain sealed following development. In its final developed state there will be no exposure route from Site soils to the neighbours.
Ecological	Potentially incomplete	Currently no transport route for contaminants in soils given the sealed surface. Limited opportunity for impact may exist during construction which should be minimised by development controls (erosion and sediment controls, fencing). Final developed surface will be sealed with landscaping completed in raised planters or imported media. There will be no interface between site soils and ecological receptors.
Groundwater	Potentially incomplete	No vertical percolation of water can currently occur given the sealed concrete surface. The final development will retain hardstand cover across the Site, also eliminating a vertical migration pathway. The groundwater is expected to be relatively shallow and as such there may be some contact between existing fill and tidally fluctuating groundwater. Given the age of fill the potential residual leachability of in place materials is likely to be low.

4. ADDITIONAL CONTAMINATION ASSESSMENT

After the existing Site buildings have been demolished, an additional contamination assessment (CA) within the footprint of the existing buildings is required.

4.1 SAMPLE ANALYSIS AND QUALITY PLAN

Additional CA works required at the Site following the demolition and removal of existing buildings are outlined below in Table 4.1.

Table 4.1: Additional Contamination Assessment Methodology

Task	Method
Service Location	Dial-Before-You-Dig (DBYD) service plans for the Site and immediately surrounding area will be reviewed prior to commencement of intrusive investigation works. Investigation locations will be cleared by an experienced underground service locating sub-contractor using an electromagnetic detector.
Soil Sampling Rationale and Methodology	To meet the minimum number of sample points required for site characterisation to detect a hotspot, as per the NSW EPA (2022) *Sampling Design Part 1 - Application* within building footprint areas, with an area of about 4,000m^2, 11 sample points are required. In order to adequately assess the building footprint, gird-based, systematic sampling will be completed. The assessment locations will be test pitted (9) and drilled (2) with the aid of an excavator with bucket attachment and drilling rig with solid flight auger attachments. Tetra Tech's proposed soil sampling methodology will consist of the following: • Samples collected to assess potential contamination will be taken from fill and natural material. Soil samples will be collected at specific intervals within the soil profile, including: ▪ One in fill (or shallow soils <0.3mbgs). ▪ Depths of 0.5mbgs, 1.0mbgs and 1.5mbgs. ▪ On the basis of field observations, evidence of staining, chemical odours or black slag material. ▪ At changes in the strata targeting fill and natural material. • Soil samples for chemical analysis will be placed into laboratory-supplied glass jars, fitted with Teflon lined seals to limit possible volatile loss. Soil samples scheduled for asbestos analysis will be collected into ziplock bags. • Care will be taken to not collect soil in contact with the excavator bucket or auger and the auger tip will be cleaned of adhering sediment between sampling locations. • Logging of soils encountered in each bore in accordance with the Australian Standard (2017) AS1726:2017 Geotechnical Site Investigations. • Test pits and borehole locations will be surveyed with a handheld GPS unit. • At the completion of sampling at each test pit and borehole, the material will be backfilled and compacted with the aid of the excavator tracks or auger. Proposed additional assessment locations are presented in Figure 3 of Appendix A.
Soil Logging	Soil samples will be logged by suitably qualified and experienced Tetra Tech scientists in accordance with Tetra Tech's Standard Operating Practice (SOP), which is consistent with the Australian Standard AS1726:2017 Geotechnical Site Investigations and Section 7.3, Field Description of Soils, in Schedule B2 of the ASC NEPM. The presence or absence of anthropogenic material and indicators of contamination (i.e. odours or staining) will be included on borehole logs.
Soil Screening	Soil samples will be screened in the field for the presence of ionisable volatile organic compounds (VOCs) using a Photoionisation Detector (PID) fitted with a 10.6eV lamp.

Task	Method
	The PID will be bump tested using 100ppm isobutylene in air and also in fresh air at the start of each day. Headspace screening results will be recorded on test pit and borehole log sheets as applicable, and groundwater sampling sheets.
Groundwater Monitoring Well Installation	The 2 boreholes drilled as part of the CA will be converted into groundwater monitoring wells by a licensed driller under Tetra Tech's guidance. Wells will be constructed with screening at depths to intercept local groundwater levels, this will likely be from the surface based on the Tetra Tech DSI (2022). Tetra Tech will develop the newly installed wells to remove residual sediment from the installation process and provide hydraulic connection to the local aquifer. Monitoring well collars will be surveyed in plan and elevation by a licensed surveyor to allow interpretation of groundwater flow direction.
Groundwater Screening	Monitoring wells will be screened with a PID to detect the presence of VOCs immediately after the well cap was removed. The PID will be bump tested using 100ppm isobutylene in air gas and also in fresh air at the start of each day. Headspace screening results will be recorded on groundwater monitoring field sheets.
Groundwater Monitoring	After a week of installation, Tetra Tech will sample ground water from the two newly installed and one existing groundwater monitoring wells, as passive grab samples using Hydrasleeve™ samplers. The groundwater monitoring method is as follows: • Monitoring wells will be gauged using an air-oil-water interface probe to determine the depth to water as metres below top of casing (mBTOC), total well depth and the presence/ absence of non-aqueous phase liquids (NAPLs). • Using bailer cord, Hydrasleeves™ will be gently lowered so that the Hydrasleeve™ weight is positioned at the base of each well. • The Hydrasleeve™ will then be retrieved in one smooth motion, pulling the cord up at a rate of approximately 0.5m per second to allow the top check valve to open and fill with groundwater. • Dispose of water above the check valve. • Groundwater from the Hydrasleeve™ will be decanted into laboratory-supplied containers, containing appropriate preservatives. Volatile and semi-volatile samples will be collected first, containers of which will be fitted with Teflon lined seals to limit possible volatile loss • Samples collected for heavy metal analysis will be field-filtered with a 25micron filter prior to transfer into appropriate containers. • Water quality parameters will be measured using a down-hole water quality meter, for temperature, pH, dissolved oxygen (DO), oxidation-reduction (redox) potential and electrical conductivity (EC). Boreholes proposed to be converted to groundwater monitoring wells are presented in Figure 3 of Appendix A.
Sample Handling and Transportation	Sample storage and transport will be in accordance with Tetra Tech's SOPs. The samples will be placed into ice chilled coolers and dispatched to National Association of Testing Authorities (NATA) accredited laboratories for analysis under chain of custody control.
Decontamination Procedures	If reusable sampling equipment is used for sample collection (e.g. hand tools), it will be decontaminated in between sampling locations as follows: • Rinse with potable water to remove any adhering soil/ groundwater. • Rinse with Decon90 or phosphate free detergent. • Rinse with deionised water and then air dry. Dedicated nitrile gloves will be used to collect each sample; these will be changed between locations to prevent cross-contamination. Where decontamination of reusable equipment is not practical, as is in the case of the excavator bucket and solid flight augers, care will be taken to not collect soil in contact with the excavator bucket or auger.

Task	Method
Quality Assurance / Quality Control (QA/ QC) Samples	To measure the accuracy and precision of the data generated by the field and laboratory procedures for this assessment, Tetra Tech will collect and analyse the following QA/QC samples: • Intra-laboratory duplicate – One duplicate QA/QC sample will be collected per twenty primary samples collected. • Inter-laboratory triplicate – One triplicate QA/QC sample will be collected per twenty primary samples collected. • Trip blank – One trip blank sample will be included within each batch of samples submitted to the laboratory for analysis, where total recoverable hydrocarbons (TRH) and benzene, toluene, ethylbenzene and xylenes (BTEX) are the target contaminants. • Trip spike – One trip spike sample will be included within each batch of samples submitted to the laboratory for analysis, where TRH and BTEX are the target contaminant. • Rinsate – One rinsate sample will be collected each day that re-usable sampling equipment are used.
Laboratory Analysis – Soil	Samples will be submitted to a NATA accredited environmental laboratory for analysis of the following COPCs: • TRH. • BTEX. • Polycyclic Aromatic Hydrocarbons (PAHs). • Phenols. • Heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc). • Asbestos.
Laboratory Analysis – Groundwater	Samples will be submitted to a NATA registered environmental laboratory for analysis of one or more of the following COPCs: • TRH. • BTEX. • PAH. • Phenols. • Heavy metals.

4.2 ASSESSMENT CRITERIA

4.2.1 Soil Assessment Criteria

Schedule B1 of the ASC NEPM (2013) contains health and environmental criteria appropriate for the assessment of contamination based on a variety of land use settings. Health-based criteria have been developed for different generic exposure settings, including residential, recreational and industrial/commercial. Ecological criteria have been prepared for three generic exposure settings, including national parks and areas with high ecological value, urban residential and public open space and commercial and industrial.

Ecological criteria for benzo(a)pyrene have been adopted from The Canadian Council of Ministers of the Environment Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health – Polycyclic Aromatic Hydrocarbons (CCME, 2010).

4.2.1.1 Health

Health Investigation Levels (HILs) are applicable for assessing human health risk via relevant exposure pathways. HILs were developed for a broad range of metals and organic substances. These are generic to all soil types and apply generally to a depth of 3m below the soil surface.

Health screening levels (HSLs) have been developed for selected petroleum compounds and fractions and are applicable to assessing human health risk via inhalation after vapour intrusion into indoor air and direct contact with soil and groundwater. These HSLs depend on general soil type (sand, silt and clay mixture), building configurations and land use scenarios.

The Site is currently used for commercial retail operations and will be developed as mixed-use commercial-residential towers. The proposal is the development of commercial operations at ground level with the entire ground sealed with hardstand. Residential units will be constructed above the commercial retail spaces. The proposed development will eliminate the exposure pathway for the residential dwellers and as a result, the adopted criteria is as per the ASC NEPM Schedule B1 for *"Commercial/industrial such as shops, offices, factories and industrial sites."*.

As further described in the ASC NEPM Schedule B7 *"The land use scenario considered for the HIL D values is commercial/industrial, which assumes typical commercial or light industrial properties, consisting of single or multistorey buildings where work areas are on the ground floor (constructed on a ground level slab) or above subsurface structures (such as basement car parks or storage areas)."*

The final development will also be sealed with no access to existing soils, with landscaping in raised planters or imported landscaping media.

The adopted HIL and HSLs are summarised in Table 4.2 and Table 4.3 respectively. As a conservative measure, HSLs have been compared against coarse grained soils.

Table 4.2: Soil HILs

Chemical	HIL – D Commercial/Industrial (mg/kg)
Arsenic	3000
Cadmium	900
Copper	240,000
Lead	1500
Mercury	730
Nickel	6,000
Zinc	400,000
Benzo(a)pyrene TEQ (Medium Bound)	40
Total PAHs	4,000

Table 4.3: Soil HSLs

Chemical	HSL D – Commercial/ Industrial (Sand) (mg/kg)[1]		HSL-D Direct Contact[2] (mg/kg)	HSL – Intrusive Maintenance Worker (Shallow Trench) (Sand)[3] (mg/kg)
	0m to <1m	1 to <2m		0m to <2m
Benzene	3	3	430	77
Toluene	NL	NL	99,000	NL
Ethylbenzene	NL	NL	27,000	NL
Xylenes	230	NL	81,000	NL
Naphthalene	NL	NL	11,000	NL
F1 (TRH C_6-C_{10} – BTEX)	260	370	-	NL
TRH C_6-C_{10}	-	-	26,000	-
F2 (TRH >C_{10}-C_{16} – Naphthalene)	NL	NL	-	NL

Chemical	HSL D – Commercial/ Industrial (Sand) (mg/kg)[1]		HSL-D Direct Contact[2] (mg/kg)	HSL – Intrusive Maintenance Worker (Shallow Trench) (Sand)[3] (mg/kg)
	0m to <1m	1 to <2m		0m to <2m
TRH C_{10}-C_{16}	-	-	20,000	-
TRH C_{16}-C_{34}	-	-	27,000	-
TRH C_{34}-C_{40}	-	-	38,000	-

**NL= non limited*

In the event that fine grained soils (e.g. silt or clay) are observed during the assessment, HSLs will be adjusted to reflect the appropriate criteria as outlined in Table 1A(3) of Schedule B1 in the ASC NEPM.

4.2.1.2 Asbestos

In accordance with Section 4.8 of Schedule B1 of the ASC NEPM (2013), consideration to HSLs for asbestos have been included. HSLs for asbestos in soils assess three forms of asbestos, which include:

- Asbestos Containing Material (ACM) – material that is '*bound in a matrix such as cement or resin (e.g. 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) – material that '*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) – material that '*includes free fibres, small fibre bundles and also small fragments of bonded ACM that pass through a 7 mm x 7 mm sieve. (Note that for 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.)*'.

No visible forms of asbestos relating to 'All forms of asbestos' relates to the top 0.1m of soil.

Table 4.4 presents the criteria for HSLs for asbestos in soils.

Table 4.4: Asbestos HSLs

Form of Asbestos	Commercial/ Industrial D (HSL - D) (%w/w)
Bonded ACM*	0.05%
FA and AF*	0.001%
All forms of asbestos	No visible forms of asbestos

*ACM: Asbestos Containing Material, FA: Friable Asbestos, AF: Asbestos Fines; *Not applicable to the Contamination Assessment as the sampling and analysis would not corelate to the HSLs; No visible forms of asbestos related to the top 0.1m of soil.*

The proposed sampling and analytical plan discussed in Table 3.1, would not allow a comparison against HSL criteria for bonded ACM or FA and AF within Table 3.4. Sampling and laboratory testing methodology for the additional assessment is not in accordance with the ASC NEPM 2013 gravimetric approach.

The detection of asbestos within soils (as presence/absence analysis), building material within fill and/ or respirable free fibres would trigger additional assessment which would be assessed against the above HSLs.

4.2.1.3 Management Limits

In accordance with Section 2.9 of Schedule B1 of the ASC NEPM, consideration of Management Limits for petroleum hydrocarbons has been included to assess the potential for accumulation of explosive vapours, the potential risk to buried infrastructure, or the formation of phase separated hydrocarbons.

The Site will be assessed against the Public Open Space and Commercial/ Industrial Management Limits respectively. A summary of the adopted management limits for this Site is provided in Table 4.7.

Table 4.5: Management Limits for Public Open Space and Commercial/ Industrial Land Use

Chemical	Soil Type	Residential, Parkland and Public Open Space	Commercial/ Industrial (mg/kg)
F1: TRH C_6-C_{10}	Coarse	700	700
F2: TRH C_{10}-C_{16}	Coarse	1,000	1,000
F3: TRH C_{16}-C_{34}	Coarse	2,500	3,500
F4: TRH C_{34}-C_{40}	Coarse	10,000	10,000

4.2.2 Groundwater Assessment Criteria

Groundwater investigation levels presented in Schedule B1 of the ASC NEPM, supplemented with surface water values from ANZG (2018) Australian and New Zealand Guidelines for Fresh and Marine Water Quality where required, are considered applicable for the protection of fresh and marine species of the receiving waters. It is important to note that these are not threshold values at which an environmental impact is likely to occur if exceeded. Rather, if the Default Guidelines Values (DGVs) are exceeded, then further action is required which may include either further site-specific investigations to assess whether or not there is a potentially adverse effect, or the implementation of management/ remedial actions.

With consideration to potential receptors identified in the Tetra Tech DSI (2021) (namely the closest surface water receptor being Throsby Creek/ Hunter River), it is considered that the marine water DGVs are applicable for investigating contaminant concentrations in groundwater at the Site, given the discharge location downgradient is into the Newcastle Harbour.

The NSW EPA policy is that 95% protection is the default condition, regardless of the actual condition of the habitat. Guidelines indicate use of 99% protection where bio-accumulation is possible.

Annex 1 to Soil Remediation Circular 2013 – Government of the Netherlands states that the intervention level for mineral oil[1] in groundwater is 600µg/L (0.60 mg/L). Therefore, the assessment criteria adopted for TRH ASC NEPM >C_{10}-C_{40} is 600 µg/L.

HSLs for groundwater presented in Schedule B1 of the ASC NEPM (2013) have been adopted to assess vapour intrusion potential. The HSLs have been developed for selected petroleum compounds and fractions and for assessing potential human health risk via the inhalation pathway. These HSLs depend on specific soil classification and land use scenarios.

Criteria for drinking water are considered not applicable due to the presence of municipal-supplied potable water and the industrial history of the area.

The adopted groundwater assessment criteria are listed in Table 4.8 and Table 4.9, for a commercial/industrial land use based on the planned commercial ground floor use.

[1] 'Mineral oil' is defined in the analysis standard. Where the contamination is composed of mixtures (e.g. petrol or domestic heating oil), the concentration of aromatic and/or polycyclic aromatic hydrocarbons must be determined in addition to the alkane concentration. This aggregate parameter has been adopted for practical reasons.

Table 4.6: Groundwater Health Assessment Criteria

Contaminant	NEPM HSL-D Commercial/ Industrial (Sand)[1] (mg/L unless otherwise stated)	CRC Care HSL Intrusive Maintenance Worker (Shallow Trench)[2] (mg/L)
	2m to <4m	2m to <4m
F1 – TRH C6-C10 minus BTEX	6	
TRH C6-C10	-	NL
F2 – TRH C10-C16 minus Naphthalene	NL	-
TRH >C10-C16	-	NL
TRH C10-C40	0.6	-
Benzene	5	NL
Toluene	NL	NL
Ethylbenzene	NL	NL
Total-Xylene	NL	NL
Naphthalene	NL	NL

NL: non-limiting (i.e. contaminant is not considered to pose a risk to human health through vapour inhalation regardless of concentration).

Soil type is sandy based on observations during the DSI.

1. *Table 1A(4) – Groundwater Health Screening levels for Vapour Intrusion for commercial/ industrial (ASC NEPM).*
2. *Table A2 – Groundwater Health Screening Levels for Intrusive Maintenance Worker (CRC CARE, 2011).*

Table 4.7: Groundwater Environmental Assessment Criteria

Contaminant	NEPM GIL – Marine Water and ANZG Marine Water 95% Maintenance of Ecosystems[1] (mg/L)
F1 – TRH C6-C10 minus BTEX	LOR (0.02)
TRH C6-C10	-
F2 – TRH C10-C16 minus Naphthalene	LOR (0.05)
TRH >C10-C16	-
TRH C6-C40	0.6
Benzene	0.5
Toluene	LOR (0.001)
Ethylbenzene	LOR (0.001)
Total-Xylene	0.075
B(a)P	LOR (0.001)
Naphthalene	0.05
Arsenic	0.0023
Cadmium	0.0007
Chromium (III)	0.0274
Copper	0.0013
Lead	0.0044
Mercury	0.0001
Nickel	0.007
Zinc	0.015

NL: non-limiting (i.e. contaminant is not considered to pose a risk to human health through vapour inhalation regardless of concentration).

Soil type is sandy based on observations during the DSI.

1. *Table 1C – Groundwater Investigation Levels for Marine Waters (ASC NEPM).*

5. REMEDIAL STRATEGIES

No soil or groundwater contamination requiring remediation was assessed in the Tetra Tech DSI (2022), completed in areas outside the current building footprints. Contamination, if identified in the additional contamination assessment, would be associated with the fill material, and would most likely be related to heavy metals and or PAH contaminants. The site history shows no indication of hydrocarbon usage or storage on or in the vicinity of the Site so at this time, vapour intrusion is not considered to present a risk. The remedial strategies to be provided are therefore contingent on identifying material above site assessment criteria following additional assessment. The scope provided is provisional and subject to change based on the nature and concentrations of COPCs assessed.

5.1 REMEDIAL GOALS

The broad remediation goal, with respect to contamination, is to identify management measures that would ensure the site is suitable for future mixed Commercial/Residential land use (ground floor commercial, residential above).

5.1.1 Remediation Hierarchy

The ASC NEPM provides a preferred hierarchy of options for site clean-up and/or management which is outlined as follows:

- If practicable, on-site treatment for the contamination so that it is destroyed, and the concentrations are reduced to below the adopted site clean-up criteria; or
- Offsite treatment of excavated soil, so that the contamination is destroyed, or the associated risk is reduced to an acceptable level.

If the above is not practicable:

- Consolidation and isolation of the soil on site by containment within a properly designed barrier; or
- Removal of contaminated material to an approved 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.

5.1.2 Remediation Options Assessment

A summary of potential options for remediation of the identified impacts is presented in Table 5-1.

Table 5-1: Remediation Options Summary

No.	Option	Assessment
1.	Excavation and encapsulation of impacted material below capping comprising hardstand areas, building footprints (foundations) and use of imported soil in areas proposed for landscaping.	Contaminated material will be encapsulated below hardstand areas and building footprints (hard capping). Such placement will eliminate the exposure pathway to future site users. Areas proposed for landscaping in existing soils will be established in 300mm minimum of clean imported material (soft-capping) with the contaminated soil layer clearly separated and demarcated from the clean capping soils using a high-visibility marker layer. The advantage of this option is reduced use of waste disposal resources. The disadvantage of this option is that the Site may require ongoing management of the barrier layers with the implementation of a Long-Term Environmental Management Plan (LTEMP).

2.	Excavation and off-site disposal of material that does not comply with the adopted assessment criteria.	Contaminated material could be removed and disposed at an appropriately licensed facility following classification as waste in accordance with Waste Classification Guidelines. The advantages of this option include the potential for minimising long-term management of the land, as well as minimising restrictions on future land use following remediation and validation. The disadvantages of this option include significant costs associated with waste transport and disposal, potentially unnecessary use of landfill capacity, poor sustainability outcomes and importing replacement materials.

5.1.3 Preferred Remedial Strategy

The remedial options outlined in Table 5-1 were assessed in conjunction with the proposed land-use of the Site (mixed commercial/residential) and management of areas to be potentially left exposed (landscaping areas established in fill soils) following development of the Site.

Factors considered during the remediation options assessment included:

- The human health risk associated with potential contamination in fill material.
- The cost and time associated with excavation and offsite disposal of impacted fill material.
- Understanding the concentration distribution of contaminants both vertically and horizontally at the impacted locations.
- Sustainability associated with resource management (transport to landfill).
- The potential to consolidate impacted material below hardstand surfaces and the relative associated advantages and disadvantages.

Based on consideration of potential remedial options, the preferred remedial strategy for the potentially impacted soils is Option 1, encapsulation of the impacted soils beneath suitable capping layers (assuming no volatile hydrocarbons are present).

The soils will be capped with building footprints and other hardstand areas (pavement) (hard capping) with the areas proposed for landscaping established in existing fill to be placed below soft capping (300mm minimum thickness) comprised of clean imported material with the contaminated soils demarcated and identified in the sub-surface profile using a high-visibility marker layer.

The cap integrity may require maintenance and management under a Long-Term Environmental Management Plan (LTEMP) (triggered by landscaping areas in fill).

The steps to be followed are discussed in detail in Sections **Error! Reference source not found.** and 5.3.1.

5.2 TIMING

Remediation will be undertaken following the completion of demolition of existing building and structures and post-demolition surface clearance. To optimise and achieve efficiencies in the project, remediation works should be undertaken as per the general steps listed in Table 5-2.

Table 5-2: General Steps in Remediation and Validation Strategy

Step	Item	Responsible Party
1	Preparation and submission of a development application to Council seeking consent to undertake Category 2 Remedial Works (SEPP 55, Clause 9) and obtain approval to undertake works.	Site Owner

2	Remediation work undertaken by a suitably qualified Principal Contractor under the supervision of a suitably qualified environmental consultant.	Environmental Consultant/Principal Contractor
3	Validate completion of remediation and prepare a Validation Report reviewed and signed off by a Certified Environmental Professional – Site Contamination Specialist (CEnvP-SC).	Environmental Consultant/ Certified Environmental Professional
4	Prepare a Long-Term Environmental Management Plan (LTEMP) (if required). Review of the LTEMP by CEnvP-SC.	Environmental Consultant/ Certified Environmental Professional
5	Submit Validation Report and LTEMP to Council for Section 4.55 amendment to existing Development Consent	Environmental Consultant/Council
6	Confirmation from Council that the LTEMP as submitted is an appropriate mechanism for the management of residual contamination at the Site. Confirmation from Council that the Development Consent has been amended to reflect the management of residual contamination using an LTEMP.	Council/Site Owner

5.3 REMEDIATION APPROACH

The steps involved with the remediation of the Site include:

- Undertake required site preparation works including site levelling, cut to fill activities.
- Construct required foundations and hardstand surfaces.
- For landscaping areas in fill:
  - Excavate a minimum of 300mm of existing fill materials.
  - Line excavation with high visibility geotextile marker layer (sides and base).
  - Survey marker layer depth in soil profile.
  - Backfill landscaping excavation using clean imported materials (VENM, ENM or a suitable growth media).
  - Retention and tracking of all imported materials including relevant EPA compliance documentation, quarry or soil supplier specifications, etc.
- Waste classification of any material identified for offsite disposal to landfill (overburden materials following cut to fill, piling etc.).
- Retention of waste dockets including volumes and disposal location for material tracking.
- Confirmation of encapsulation by survey (hardstand cover, soft capping in landscaping areas, depth of imported fill to marker layer).

5.3.1 Remediation of Landscaping Areas

The areas proposed for landscaping in exisiting fill must be first excavated and contaminated material removed to a depth that will allow the final placement of the soft capping layer while meeting final site level requirements. Prior to the placement of the final 300mm soft capping layer (including the clean backfill and topsoil), the placement of impacted soils beneath a high-visibility geotextile marker layer is required (see Section 5.3).

For deeper rooted plants, shrubs or small trees, the required volume of fill soils must be removed to the appropriate depth and the excavation also lined with the marker layer material to the maximum depth extent. Following the installation of the plant, shrub or tree, the excavation should then be backfilled to surface using clean imported fill materials as per Section 6.4. Visual confirmation of the marker layer placement including photographs must be included in the final site validation report (Section 6.5).

In landscaped areas, as the surrounding soils (not excavated) may potentially be impacted, these require delineation from the “clean” soils to be used in the landscaping areas. A vertical barrier between “clean” and

"contaminated" soils is required to be placed in the form of the marker layer which will be used to identify the interface between the two soil types.

Excavated materials removed to facilitate the establishment of landscaping can either be placed below areas identified for hard-capping (pavement, building footprints) or waste classified as per Section **Error! Reference source not found.** for the purposes of offsite disposal to landfill.

5.3.2 Capping of the Site

The site soils will be capped primarily using the building footprints and other hardstand pavement areas primarily (hard capping). Areas proposed for landscaping must have exisiting soils capped below a minimum 300mm thick, soft capping layer. The soft capping specification will apply to all landscaping areas. The 300mm includes required topsoil thickness. Plants and any other landscaping material must then be established in the capping layer.

Marker Layer is typically comprised of geotextile material such as "Bidim". The marker layer is required to be easily recognisable in soils (i.e., bright orange in colour), be durable as a long-term marker layer (i.e., >150 grams per square metre) and maintain integrity during remedial/civil works. The marker layer will clearly identify the location of the contaminated soils in the sub-surface profile. The typical geotextile specifications are included in Table 5-3.

Table 5-3: General High-Visibility Geotextile Specifications

Property	Test Method	Unit	Typical Value
Typical Mass	AS3706.1	g/m^2	140
Grab Tensile	AS3706.2B	N	400 - 500
Pore Size	AS3706.7	mm	0.12 - 0.2
Flow Rate	AS3706.9	$l/m^2/s$	150 - 300

The location of the marker layer must be identified by survey within the sub-surface profile and the area then backfilled with clean imported materials as included in Section 6.4.

All capped areas including areas beneath both hard and soft capping must also be confirmed by survey for inclusion in the LTEMP, required to manage the integrity of the capping placed across the Site.

6. VALIDATION STRATEGY

Validation will be confirmed primarily by survey of capped areas but will also include tracking of imported exported materials. A summary of the validation areas and proposed validation method is presented in Table 6-1.

Table 6-1: Summary of validation areas and proposed validation method

Validation Area	Proposed Validation Method
Entire Site Capping	• Stage 1 (Hard Capping): Validation of the construction of permanent building footprints and pavement layers in accordance with an approved design. Complete survey of pavement area and thickness of pavement surface/wearing course, base and sub-grade layers to be completed by a licenced surveyor. Any required imported fill materials must conform with the requirements outlined in Section 6.4. • Stage 2 (Soft Capping): Confirmation of the installation of the geotextile marker layer across landscaping areas with the RL of the geotextile material marked by survey completed by a licenced surveyor. Stage 3 (Soft Capping): Validation of the placement of fill within landscaping areas above the marker layer, including confirmation the material meets the quality requirements outlined in Section 6.4. The thickness should conform to a minimum of 300mm including topsoil. The average depth across the Site must be confirmed by a licenced surveyor.
Evidence of disposal of overburden soils	Offsite disposal dockets for overburden fill materials disposed offsite must be included in the final validation report.
Retention of documentation of all imported fill materials	Retention and tracking of all imported materials including relevant EPA compliance documentation, quarry or soil supplier specifications, etc.

6.1 WASTE CLASSIFICATION OF SOILS

Where there may be uncertainty about waste classification or unexpected conditions are encountered during excavation, the material should be stockpiled on plastic sheeting or paved surface to minimise impact. Sampling to confirm waste classification should be undertaken as per the guidance included in the SDG as reproduced in Table 6-2.

Table 6-2: Minimum Number of Samples for Stockpiles 200m^3 or less

Soil Volume m^3	No of Samples
<75	3
75 – <100	4
100 – <125	5
125 – <150	6
150 – <175	7
175 – <200	8

For sample volumes > 200m^3 a sampling rate reduction can be applied subject to a comparison of the 95% $UCL_{AVERAGE}$ of the soil. The applicable sampling rate is dependent on the heterogeneity of the material being assessed. The sampling rates applicable to generally homogeneous material in excess of 200m^3 is included in Table 6-3.

Table 6-3: Minimum number of samples for soil volumes greater than 200m^3 (1:25 or 95%UCL)

Soil Volume m^3	No of Samples at 1:25m^3	Minimum Number of Samples 95%UCL$_{average}$
300	12	10
400	16	10
500	20	10
600	24	10
700	28	10
800	32	10
900	36	10
1000	40	10
1500	60	10
2000	80	10
2500	100	10
3000	120	12 (1:250)
4000	160	16 (1:250)
4500	180	18 (1:250)
5000	200	20 (1:250)
>5000	1:25	1:250

6.2 REMEDIATION ACCEPTANCE CRITERIA

The preferred remedial strategy is the capping of the entire site with a combination of buildings, hardstands (had capping) and soft capping in landscaped areas. As such, remediation acceptance criteria for fill soils have not been adopted based on the nature of the expected contamination (heavy metals and PAH). Remediation criteria has also not been considered for groundwater at this time. These will be revisited following the completion of the additional contamination assessment detailed in Section 4.

6.3 WASTE CLASSIFICATION

In order to provide a waste classification, the results of the laboratory analysis will be compared to threshold levels for General Solid Waste and Restricted Solid Waste in the *NSW EPA (2014) Waste Classification Guidelines*. If the criteria for Restricted Solid Waste is exceeded, then waste is classified as Hazardous Waste, unless a General Immobilisation Approval is able to be applied.

6.4 IMPORTED FILL REQUIREMENTS

Imported material must be assessed prior to importation meet one of the following material types:

- Virgin Excavated Natural Material (VENM).
- Suitable exempt material such as Excavated Natural Material (ENM) assessed in accordance with *The Excavated Natural Material Order 2014* and *NSW EPA The Excavated Natural Material Exemption 2014*.
- Other materials approved by NSW EPA resource recovery orders or resource recovery exemptions determined to be suitable for importation.
- Some commercial material or quarry product may be used (e.g. aggregate, topsoil, mulch, etc.) with prior approval from a suitably qualified environmental consultant.
- Imported topsoil, landscaping or soil growth media must be compliant with Australian Standard AS4419:2018 with relevant documentation provided by the supplier confirming compliance.

Material being imported to the site shall also be tracked and the following information shall also be recorded:

- Origin of material.

- Material type.
- Approximate volume.
- Relevant classification documentation.
- Proposed use onsite.
- Proposed location for use.
- Observations of material and confirmation it matches approved material.

6.4.1 Validation Requirements

Imported materials must be subject to the validation requirements summarised in Table 6-4.

Table 6-4: Validation Requirements for Imported Materials

Materials Importation	Validation Requirements
Material proposed to be imported to site as VENM will require the provision of suitable documentation from the supplier confirming the material classification as VENM. Material must meet the definition of VENM as detailed in the POEO Act and NSW EPA Waste Classification Guidelines 2014. Material must also be inspected at the suppliers' site by a suitably qualified person and written acceptance in the form of a VENM inspection checklist completed prior to being accepted for use on site. All VENM inspection checklists must be incorporated into the Validation Report at the completion of works.	• Importation as per VENM checklist completed for supplier site (inclusive of three (3) samples tested and analysed for the following analytes: TRH, BTEX, PAHs, phenols and heavy metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Zn). Results to be compared against the relevant ASC NEPM HIL/HSL B land use criteria as per Section 6.2. • Documentation requirements, inspection of material prior to receiving on site and the completion and retention of inspection checklists as described must be satisfied prior to importation of VENM.
Material proposed to be imported to site as VENM sourced from a licensed quarry will require the provision of suitable documentation from the supplier including quarry license details and documentation confirming the VENM classification of quarried material proposed for importation. Material must meet the definition of VENM as detailed in the POEO Act and NSW EPA Waste Classification Guidelines 2014. VENM classification to be documented and provided with the validation report.	• No analysis required. However, documentation requirements and VENM classification to be reviewed by Tetra Tech prior to arriving on site.
Material proposed to be imported as Landscaping Soil Mix must be sourced from imported with relevant AS4419:2018 from the supplier.	• No analysis required provided the material is AS4419:2018 certified. The material should be visually assessed, and relevant documentation reviewed by Tetra Tech prior to arriving on site.
Material documentation confirming the material conformance with the specific resource recovery exemption must be provided. Documentation must be reviewed by Tetra Tech to ensure material has been assessed in accordance with the relevant EPA order.	• No analysis required. However, documentation requirements and resource recovery exemption to be reviewed by Tetra Tech prior to arriving on site.

6.5 REPORTING

Site Validation Report

A site validation report must be prepared, following the soil remediation works, summarising the results of the remediation and validation works. The report must be written in accordance with relevant sections of the NSW EPA *Guidelines for Consultants Reporting on contaminated land: Contaminated land guidelines (2020)*. The validation report must provide a statement as to the suitability of the site for the proposed land use.

The validation report must also include evidence of the disposal of material removed from the site (e.g. waste disposal dockets).

This report will contain information including:

- Information demonstrating compliance with appropriate regulations and guidelines.
- Survey drawings showing the location of the isolated contaminated material.
- Details of the source, classification and suitability of imported materials.
- Variations to the strategy undertaken during the implementation of the remedial works.

- Details of environmental incidents and/or unexpected finds of contamination occurring during remedial works and the actions undertaken in response to these incidents.
- Details on waste classification, tracking and off-site disposal.
- Clear statement of the suitability of the site that is the subject of the validation report, for the proposed use.

The report will also serve to document the remediation works for future reference.

1.2. CONTINGENCY STRATEGY

Should the additional assessment identify volatile hydrocarbon contamination beneath the proposed building footprints, Option 2, Table 5-1, Remediation Options Summary will apply. This includes excavation and off-site disposal of material that does not comply with relevant assessment criteria (Section 4.2). Should there be an inability to achieve the effective remediation criteria at the selected locations, a risk assessment will be undertaken to address the residual risk to the proposed development and, if required, develop an alternate risk strategy. The risk assessment would involve examining whether the residual volatiles in soil presents a potential sub-slab vapour risk to the buildings and what appropriate mitigation would be required. This would need to be included in an amended RAP.

7. SITE MANAGEMENT PLAN FOR REMEDIAL WORKS

A summary of the relevant stakeholders, consultation process and other general Site management requirements prior to and during the remedial works are provided in Table 7.1.

Table 7.1: Minimum Site Management Measures

Task	Details		
Roles and Responsibilities	Contact details for the project are expected to be provided once a Principal Contractor and project management team are finalised. A summary of the roles and responsibilities relevant to the project are provided below.		
	Role	**Entity**	**Responsibilities**
	Landowner	Council	Project Manager: • To engage qualified personnel/ companies to complete the works.
	Principal Contractor	To be confirmed	Remedial Works: • To engage qualified personnel to complete the works. • Include the preferred remediation strategy into the Construction Environmental Management Plan (CEMP). • May stop works where deemed unsafe or where management plans are not being adhered to. • Oversee the use and maintenance of safety equipment, including personal protective equipment (PPE).
	Environmental Consultant	Tetra Tech	Additional contamination assessment (post-demolition): • Provide recommendations based on the outcomes of the assessment.
	Validation Consultant	To be confirmed	Validation Project Management: • Provide validation sampling and reporting, if required.
	Site Workers	To be confirmed	Completion of works: • Follow site rules and instructions. • Comply with management plans and OH&S. • Maintain a proactive safety-first culture.
Community Consultation	Impact to the surrounding community should be controlled whereby the procedures in this RAP are followed. A community consultation plan shall be developed and distributed by Council in general accordance with Schedule B8 of the amended ASC NEPM. The notice shall outline: • That remediation work will be carried out at the Site. • The time and date the work is proposed to commence. • That works are being conducted to control the risk of site contamination impacting off-site receptors during construction and future use of the Site. • The contact information and processes required for registering any complaints.		
Site Specific Safety Plan	The Principal Contractor and Council will be required to comply with the requirements of the WHS Act 2011 and the WHS Regulation 2011. Council shall prepare or update their Site-Specific Safety Plan which will include, but not be limited to: • A review of the requirements of SafeWork NSW.		

Task	Details
	• Risk assessments. • Safe work method statements (SWMS). • Site Specific Safety requirements associated with the remediation works detailed in this RAP including excavation and management of contaminated soil.
Hours of Work	In line with Council's LEP, remedial works on the project shall be limited to the following hours: • Monday to Friday – 7:00am to 5:00pm. • Sunday or Public Holidays – No work to be carried out. The Principal Contractor is responsible to instruct and control subcontractors regarding the hours of work.
Access	Access to the site during remediation shall be controlled by the Principal Contractor and work areas shall be off limits to all non-essential personnel. The public shall not have access.
Inductions	Relevant personnel involved in remedial works shall be inducted into this RAP. Details of contractors or other personnel who have attended the induction are to be kept on-site.
Toolbox Talks	Prior to commencing remedial works, where excavation and handling of impacted soil or following change in site conditions, all relevant site personnel should participate in a toolbox talk. The toolbox talk must incorporate details and instructions on how to manage impacted soil in accordance with this RAP. The toolbox talk can be combined with the Induction if practical.
Noise	The Principal Contractor shall minimise noise emissions, ensuring they are controlled and limited in accordance with federal and local government statutory requirements through: • Selection of low noise and vibration construction equipment where possible. • Regular servicing of equipment. • Use of equipment silencers/ mufflers. • Keeping closed the panels and covers of plant. • Switching off equipment when not in use. • Restricting the hours of work as appropriate to the maintenance activities. • Regularly monitoring equipment likely to be of concern.
Dust	The remediation works will involve excavation of the subsurface, movement of soils, and general vehicular movements across the Site. As such, dust generation is considered a potential environmental impact to the surrounding environment, Site workers and the public. The following management measures should be implemented to prevent dust impacts: • A communications and complaints register should be kept on-site to ensure that concerns of local residents and workers are recorded and addressed. • Boundary fences should be maintained around the perimeter of the Site to prevent dust from migrating laterally from these areas. • Excavated soils should be watered with mist, as required, to minimise the potential for dust generation. • If dust migration from excavation areas is considered excessive due to high winds, the works should be delayed or limited during these periods. • Trucks removing material from the Site should have loads covered. • Vehicular movements entering and exiting the Site should be kept to a minimum. • Works should be limited during times of high winds.

Task	Details
Stockpiles	The remedial strategy may involve stockpiling of soils. If so, the following procedures are to be followed: • Excavated material including contaminated material, potentially contaminated material and Site won material should be separated (if possible) and stockpiled separately from other stockpiled soils at the Site. • Access to stockpiles of contaminated material, potentially contaminated material, and Site won material will be limited by keeping the stockpiles within the Site's fencing. • Stockpiles will be placed on concrete slabs or on strong impermeable plastic sheeting such as high-density polyethylene (HDPE). If this procedure is not followed there is the potential for contaminants to migrate into the surface soils. • The stockpile heights will be kept to a maximum of approximately 2m and not be placed on slopes greater than 5°. • Stockpiles should be regularly watered to minimise dust generation. • Where stockpiles are proposed to remain in a location overnight, the stockpiles will be covered by weighted HDPE sheets or tarpaulins to prevent erosion of stockpiled materials. The sheets will be secured by the placement of heavy objects that do not contain sharp edges to prevent them from being blown by winds. • Erosion controls, such as hay bales and/or silt fences will be placed around the perimeter of the stockpile area to filter runoff from the stockpiles and prevent overland stormwater flow from affecting the base of the stockpiles. • A stormwater diversion bund will be created up gradient of the stockpiles to prevent stormwater running through the stockpiles. The additional management procedures required for stockpiled material that contains asbestos or ACM are outlined in Table 8.2.
Erosion and Sediment Control	Erosion and sediment controls must be in place prior to commencement of work. The nature of the erosion and sediment controls will depend on the amount of water generated by construction activity and dust suppression. Examples include sediment barriers and traps to mitigate sediment load entering the stormwater system or migrating offsite. Sediment controls (i.e. hay bales, sandbags and/or silt fencing) shall be installed surrounding stockpiles.
Stormwater Management	Surface water runoff resulting from rainfall must be managed by the Contractor in accordance with an approved Stormwater Management Plan prepared as part of their Construction Environmental Management Plan. Stormwater must be managed as per industry practice in accordance with Landcom, Managing Urban Stormwater: Soils and Construction – Volume1 (2004).
Personal Protection Equipment (General Remedial Duties)	In order to reduce short and long-term health risks associated with the potential exposure to the chemicals of concern, the minimum level of Personal Protective Equipment (PPE) required for people, during site preparation, placement of the geo-fabric and placement of the first layer of imported material, is listed below: **Head Protection** Personnel working around excavation equipment will be required to wear a hard-hat. The hard hat must be in date, worn properly and not altered in ways that would lessen the degree of protection offered. **Eye Protection** Eye protection is required to prevent eye injuries resulting from contact with dust, contaminated soil or liquid. Safety glasses are required to be worn by site personnel during the works. **Foot Protection** Ankle-high, steel toed boots will be worn by on-site personnel. **Skin Protection** Long sleeves and trousers are to be worn. Skin protection will be required to prevent absorption of contaminated soil into the body. Gloves will be worn by personnel involved in site activities which will come into contact with contaminated soil or liquid. Sunscreen (SPF +30) shall also be worn to protect exposed skin areas not covered by PPE from the sun. **Hearing Protection**

Task	Details
	Site workers will be required to have hearing protection (ear plugs or earmuffs) on-site during works. Personnel who are likely to be exposed to high noise levels on-site will be required to wear hearing protection. Site personnel will be made aware during induction and at toolbox meetings that PPE required to be worn may limit manual dexterity, hearing, visibility and may increase the difficulty of performing tasks. PPE places an additional strain on the user when performing work that requires physical activity.
Record Keeping	The Remedial Contractor will keep records pertaining to the remedial work activities undertaken which would include: • Excavation details (location, depths, lengths, volumes, fate etc.). • Temporary stockpiling area(s). • Stockpile surveying. • Remedial compliance with Section 4.8, Section 6.7 and Section 6.8. • Imported material certification (where required). • Material tracking, including disposal dockets of all material going off-site. • Dates where the above tasks were undertaken and completed.

8. APPROVALS AND LICENSES

This section discusses some of the regulatory compliance requirements associated with the remediation. It is important to note that this section is not exhaustive, and the Contractor must ensure they comply with all relevant and applicable legislation and guidelines.

8.1 CONSIDERATION OF REMEDIATION CATEGORY

Clause 4.8 of State Environmental Planning Policy Resilience and Health (SEPP R&H) and Clause 9 of SEPP 55 State Environmental Planning Policy No 55—Remediation of Land (SEPP 55) identified two categories of remediation works:

- Category 1 Remediation works, which is remediation works that require development consent; and
- Category 2 Remediation Works, which does not require development consent, but must be notified to Council prior to commencement and upon completion.

Category 1 remediation is:

a. designated development, or

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

c. likely to 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).

The remedial works as proposed does not fall into any of the remediation works constituted as Category 1 (remediation works requiring development consent) under SEPP R&H and SEPP 55 and is not subject to ANY of the Category 1 triggers previously outlined.

The works are therefore considered as Category 2 Remediation Works (work not requiring consent) under Clause 4.11 of SEPP R&H and Clause 9 of SEPP 55.

As outlined in Clause 4.13 of SEPP R&H, notice of commencement of works must be provided to Council at least 30 days prior to the commencement of the work. The notice must be provided in writing include the details outlined in Clause 4.13, Item 3 of SEPP R&H.

8.2 WASTE CLASSIFICATION

Surplus materials disposed from the Site must be classified in accordance with the Waste Classification Guidelines. All impacted soil and water (no groundwater remediation or management included within this RAP) requiring off-site disposal will be transported and disposed of to either a licensed landfill, liquid waste facility or to public sewer (after obtaining approvals for disposal) following on site treatment. Any wastes leaving the Site will need to be transported by a NSW EPA licensed contractor in accordance with regulation. All material leaving the Site will be tracked and documented.

8.3 OTHER REQUIREMENTS

Other legislative requirements that may be applicable include, but are not limited to:

- Contaminated Land Management Act 1997.
- Environmental Planning and Assessment Act 1979.
- Protection of the Environment Operations Act 1997.
- Waste Avoidance and Resource Recovery Act 2001.

9. UNEXPECTED FINDS PLAN

The conditions encountered during remedial works can be uncertain. A set of typical issues and proposed corrective actions associated with a remediation program is provided in Table 9.1. Should an unexpected find be identified then the unexpected finds procedure included in Appendix C shall be followed.

Table 9.1: Unexpected Finds Plan

Potential Issues	Proposed Corrective Actions, as Appropriate	Responsible Person	Communication and Additional Assessment
Suspected contaminated material is observed during earthworks	• Cease works within the affected area. • Cover the material with soil and secure the area until an appropriate course of action has been determined. • Contact Council, who then should contact an environmental consultant for further advice.	Remedial contractor/ Council	• Environmental consultant to assess the suspected contaminated material and provide advice for remediation. • A contingency strategy for capping the assessed contamination would be discussed.
Friable asbestos encountered			• LAA to assess the material and provide advice for remediation. • A contingency strategy for capping asbestos impacted soil on-site would be discussed if friable asbestos is encountered.
Excessive dust	• Use water sprays. • Stop dust generation activity until better dust control can be achieved or apply interim capping systems on stockpiles or exposed material. • Stop work in high wind conditions.	Remedial contractor	• Breaches are to be recorded in the daily site log. • Additional assessment may be required.
Heavy rain	• Ensure sediment and surface water controls are effective. • If possible, divert surface water away from active work areas or excavations. • Cover stockpiles.	Remedial contractor	None, unless contaminated material stockpiled rills beyond the sediment controls.
Equipment failures	• Maintain spare equipment or parts. • Keep rental options available or shut down affected operations until repairs are made.	Remedial contractor	Sample any impacted stockpiles, surface soils for COPCs (TRH, BTEX, PAH) and assess the appropriate management, treatment/ disposal option based on an assessment of the analytical results.
Complaints are received directly relating to the works	• Revise management plans and identify the source of the complaint e.g. dust, noise and odours. • Increase monitoring of the source of the complaint. • Implement control measures to address the complaint (if possible).	Remedial contractor	Notify relevant Council project contact following complaint and follow incident procedure.

10. CONCLUSIONS

Tetra Tech prepared this RAP to support the DA at 711 Hunter Street, Newcastle West NSW.

This RAP details the additional assessment required to close the data gap identified in the DSI, once the existing Site buildings have been demolished. The RAP also outlines the remedial approach and validation requirements should contamination be identified during the additional assessment.

The additional assessment, once completed, will inform either the site suitability for the proposed development or the remedial pathway required to make the site suitable for the proposed development. The additional assessment comprises:

- A supplemental contamination assessment be completed following demolition of the existing building. It is recommended that the assessment be undertaken across the cleared building footprint using test pits or wide diameter (350mm – 450mm bores) in order to better assess the fill both visually and chemically (to a depth of 2mbgs). The assessment should be completed systematically across the footprint of the demolished building in accordance with the Sampling Design Guidelines.
- Two additional groundwater wells be installed following the demolition of the existing buildings to better assess the groundwater quality beneath the Site.

The potential remedial strategies comprise disposal to landfill and /or containment on site. If required, the preferred remedial strategy and the validation programme will be selected based on the results of the additional assessment.

11. REFERENCES

The following references were used in the preparation of this RAP:

- Contaminated Land Management Act 1997.
- Work Health and Safety (WHS) Act 2011.
- WHS Regulation 2011.
- Newcastle Local Environmental Plan 2012.
- New South Wales Environment Protection Authority (NSW EPA) (2020) Consultants Reporting on Contaminated Land Guidelines (CRCL).
- Chapter 4, State Environmental Planning Policy (Resilience and Hazards) 2021 (Resilience and Hazards SEPP).
- National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended in 2013 (ASC NEPM).
- NSW EPA (2017) Guidelines for the NSW site auditor scheme (3rd edition).
- NSW EPA (2014) Waste Classification Guidelines.
- NSW EPA (2022) Contaminated Land Guidelines: Sampling Design Part 1 – Application (Sampling Design Guidelines).
- Australian Standard (2017) AS1726:2017 Geotechnical Site Investigations.
- Tetra Tech (2022) *Detailed Site Investigation Report: Proposed Development, 711 Hunter Street, Newcastle West NSW (Reference No. 754-NTLGE293239-AB, dated 18 October 2022.*

APPENDIX A: FIGURES

revision	no.	description	drawn	approved	date
	A	ORIGINAL ISSUE	-	-	18-10-2022

LEGEND

SITE BOUNDARY

MAP PROJECTION: GDA2020 MGA ZONE 56

50 0 50 100 150 200 250

Scale (metres) 1:5000

IMAGERY SOURCE: WORLD STREET MAP
SOURCES: ESRI, HERE, GARMIN, USGS, INTERMAP, INCREMENT P, NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI KOREA, ESRI (THAILAND), NGCC, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY

drawn	WC / DR
approved	-
date	16-05-2023
scale	AS SHOWN
original size	A3

TETRA TECH COFFEY

client: HUNTER STREET JV CO PTY LTD

project: PRELIMINARY GEOTECHNICAL, MINE SUBSIDENCE
MINE SUBSIDENCE AND ENVIRONMENTAL ASSESSMENTS
REMEDIAL ACTION PLAN
711 HUNTER STREET NEWCASTLE WEST, NSW

title: SITE LOCATION PLAN

project no: 754-NTLGE293239-AH | figure no: FIGURE 1 | rev: A

PLOT DATE: 16/5/2023 12:19:46 PM DWG FILE: F:\1 PROJECTS\4. SYD-GEOTECHNICS\2. OTHER OFFICES\9.0 NTL-GE\754-NTLGE293239\CAD\754-NTLGE293239-AH.DWG

revision no.	description	drawn	approved	date
A	ORIGINAL ISSUE	-	-	18-10-2022

LEGEND

- SITE BOUNDARY
- BOREHOLE LOCATION
- EXISTING GROUNDWATER MONITORING WELL LOCATION

MAP PROJECTION: GDA2020 MGA ZONE 56

5 0 5 15 25

Scale (metres) 1:500

AERIAL IMAGERY COPYRIGHT: ©Nearmap (01/02/2022)
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approved	-
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original size	A3

TETRA TECH COFFEY

client: HUNTER STREET JV CO PTY LTD

project: PRELIMINARY GEOTECHNICAL, MINE SUBSIDENCE
MINE SUBSIDENCE AND ENVIRONMENTAL ASSESSMENTS
REMEDIAL ACTION PLAN
711 HUNTER STREET NEWCASTLE WEST, NSW

title: TETRA TECH (2022) DSI SAMPLE LOCATION PLAN

project no: 754-NTLGE293239-AH | figure no: FIGURE 2 | rev: A

PLOT DATE: 16/5/2023 12:19:59 PM DWG FILE: F:\1 PROJECTS\4. SYD-GEOTECHNICS\2. OTHER OFFICES\9.0 NTL-GEY754-NTLGE293239\CAD\754-NTLGE293239-AH.DWG

revision no.	description	drawn	approved	date
A	ORIGINAL ISSUE	-	-	18-10-2022

LEGEND

- SITE BOUNDARY
- BOREHOLE LOCATION
- EXISTING GROUNDWATER MONITORING WELL LOCATION
- PROPOSED SOIL SAMPLE LOCATION
- PROPOSED GROUNDWATER MONITORING WELL LOCATION

MAP PROJECTION: GDA2020 MGA ZONE 56

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Scale (metres) 1:500

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original size	A3

TETRA TECH COFFEY

client: HUNTER STREET JV CO PTY LTD

project: PRELIMINARY GEOTECHNICAL, MINE SUBSIDENCE
MINE SUBSIDENCE AND ENVIRONMENTAL ASSESSMENTS
REMEDIAL ACTION PLAN
711 HUNTER STREET NEWCASTLE WEST, NSW

title: PROPOSED SAMPLE PLAN

project no: 754-NTLGE293239-AH | figure no: FIGURE 3 | rev: A

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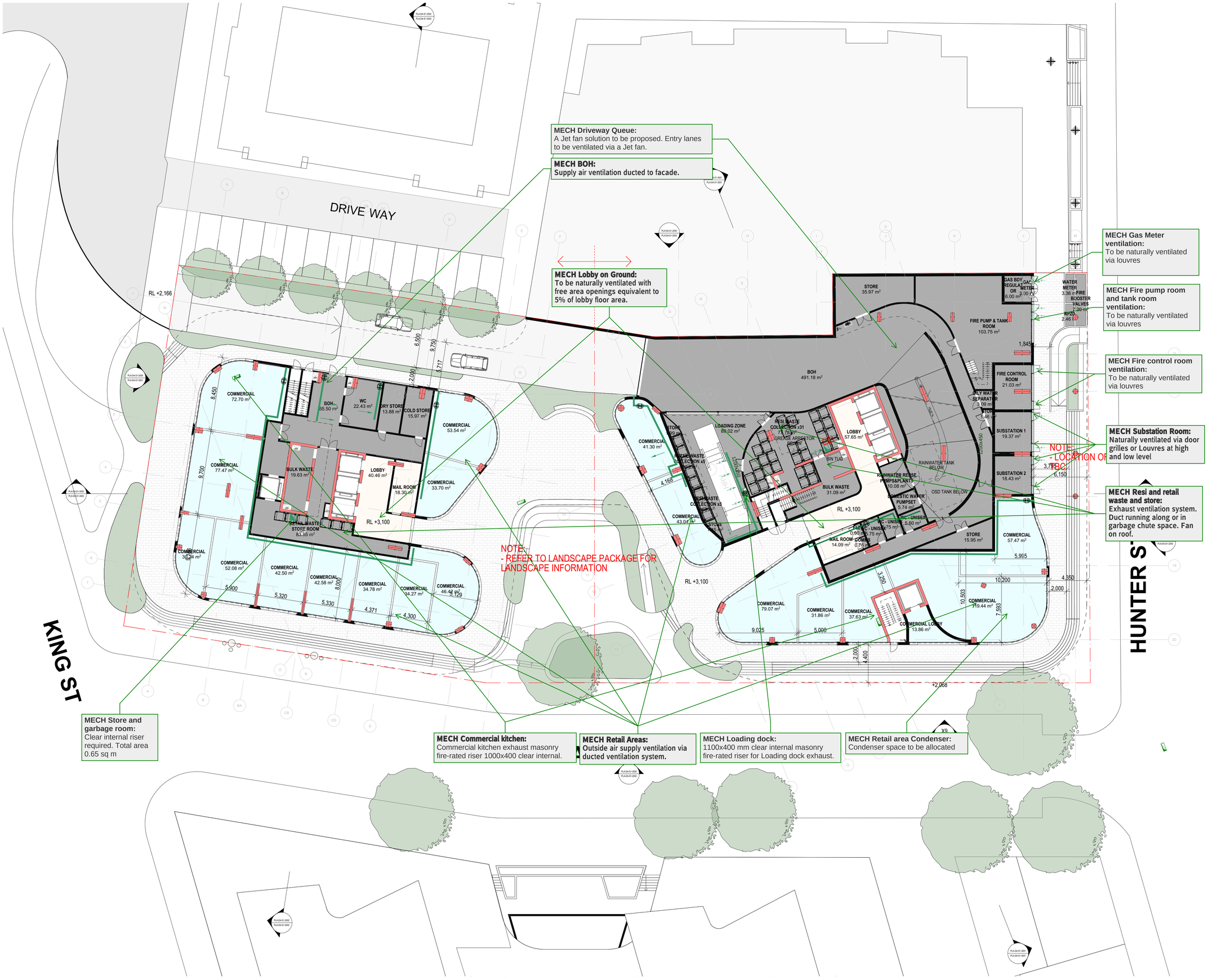
APPENDIX B: CONCEPTUAL DESIGN PLANS

DRAWING TO BE READ IN CONJUNCTION WITH A0000 LEGEND, RELEVANT SCHEDULES AND PROJECT SPECIFICATION.



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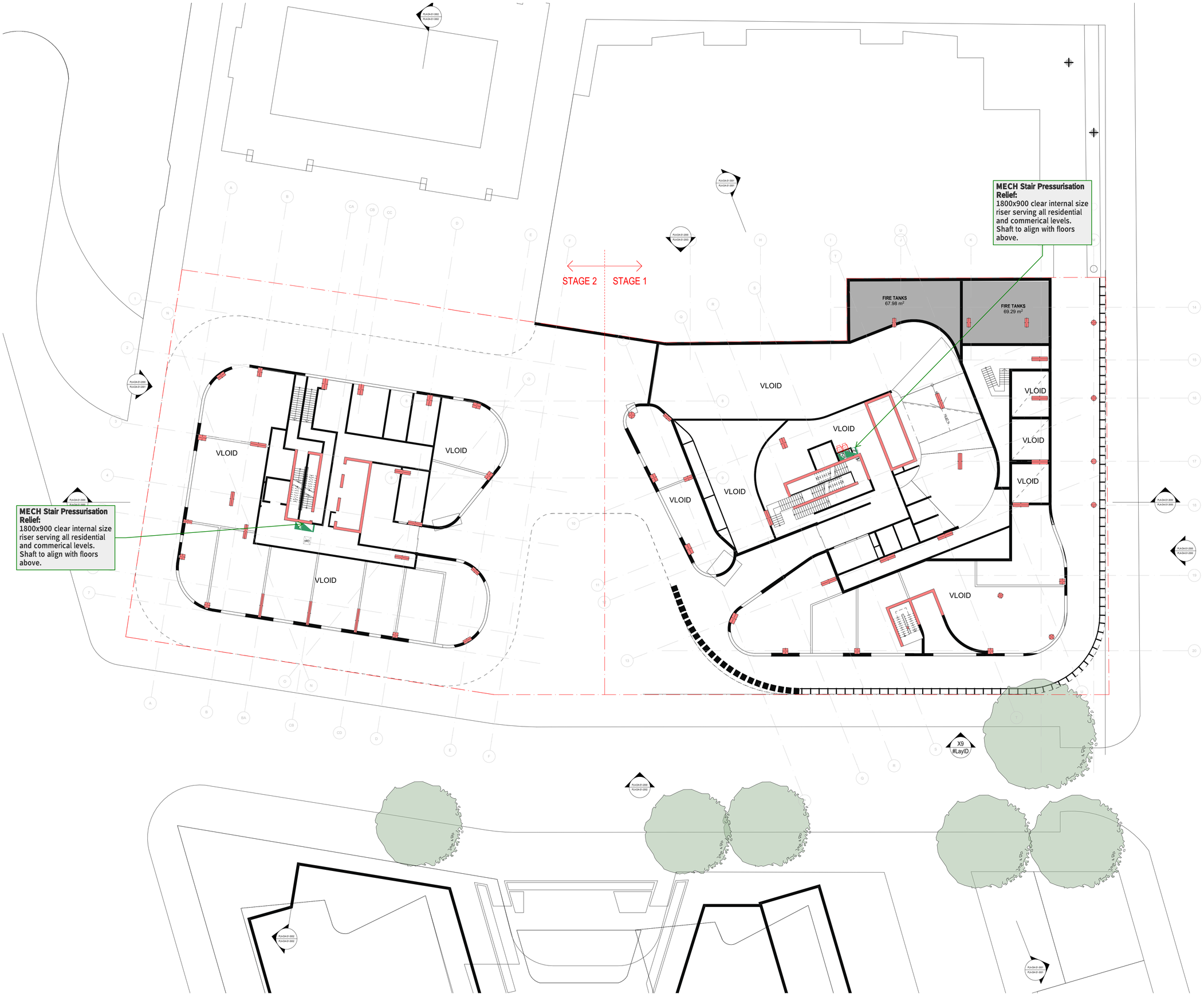

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Nominated Architect (NSW):
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CONSULTANT 2 TYPE	#CONSULTANT 2-COMPANY NAME	T CONS. 2 PHONE
CONSULTANT 3 TYPE	#CONSULTANT 3-COMPANY NAME	T CONS. 3 PHONE
CONSULTANT 4 TYPE	#CONSULTANT 4-COMPANY NAME	T CONS. 4 PHONE
CONSULTANT 5 TYPE	#CONSULTANT 5-COMPANY NAME	T CONS. 5 PHONE

PROJECT
711 HUNTER ST
NEWCASTLE WEST
NSW 2302

DRAWING TITLE
OVERALL FLOOR PLAN - LEVEL 04

FOR INFORMATION

DATE	PLOT DATE	SCALE
	20/05/2022	1:200 @A1
DRAWN FX	CHECKED FX	

JOB NO.
20623

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DRG. NO.
PLA-DA-S2-1004

REVISION
02 - WIP

DRAWING TO BE READ IN CONJUNCTION WITH A0000 LEGEND, RELEVANT SCHEDULES AND PROJECT SPECIFICATION.

MECH Stair Pressurisation: Fire-stair 1 and 2:
Each stair require a 1.4 sq m clear internal area riser for stair pressurisation system. Stair pressurisation fans at Level 26 in plantroom

MECH Stair Pressurisation Relief:
1800x900 clear internal size riser serving all residential and commerical levels. Shaft to align with floors above.

MECH Stair Pressurisation: Fire-stair 3 and 4:
Each stair require a 1.4 sq m clear internal area riser for stair pressurisation system. Stair pressurisation fans at Level 26 in plantroom

MECH Resi Apartment condensers:
Residential apartment condensers to be placed in space provided. Double stacked configuration to be adopted.

MECH Stair Pressurisation Relief:
1800x900 clear internal size riser serving all residential and commerical levels. Shaft to align with floors above.

MECH Resi and retail waste and store:
Exhaust ventilation system. Duct running along or in garbage chute space. Fan on roof. Riser to be **0.5 sq m** clear internal.

MECH Store and garbage room:
Clear internal riser required. Total area 0.65 sq m

MECH stage 2 details:
To follow same strategy as stage 1. Typical as per Stage 1.

MECH Commercial kitchen:
Commercial kitchen exhaust masonry fire-rated riser 1000x400 clear internal. To exhaust at Level 5 at high level.

MECH Residential Apartment Cooling/heating:
Wall mounted Airconditioning units to be used. Typical size 290x1050x238 (HxWxD) mm. Require 90 mm clearance from ceiling above when installed. Typical for all apartments. Extent of system to be determined based on BASIX.

Toilet/Laundry/Kitchen ventilation:
Fans ducted to facade, flex ducts used for flexible connection to fans.Typical for all apartments.

DATE	REVISION	BY	CHK	NO.
11/05/2022	ISSUE FOR PRE-DA	FX	FX	01
Work in Progress	ISSUE FOR INFORMATION	FX	FX	02 WIP

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PROJECT
711 HUNTER ST
NEWCASTLE WEST
NSW 2302

DRAWING TITLE
OVERALL FLOOR PLAN - LEVEL 05

FOR INFORMATION

DATE	PLOT DATE	SCALE
	20/05/2022	1:200 @A1
DRAWN FX	CHECKED FX	

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DRG. NO.
PLA-DA-S2-1005

REVISION
02 - WIP

DRAWING TO BE READ IN CONJUNCTION WITH A0000 LEGEND, RELEVANT SCHEDULES AND PROJECT SPECIFICATION.

DATE	REVISION	BY	CHK	NO.
11/05/2022	ISSUE FOR PRE-DA	FX	FX	01
Work in Progress	ISSUE FOR INFORMATION	FX	FX	02 WIP

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CONSULTANT 5 TYPE	#CONSULTANT 5-COMPANY NAME	T CONS. 5 PHONE

PROJECT
711 HUNTER ST
NEWCASTLE WEST
NSW 2302

DRAWING TITLE
OVERALL FLOOR PLAN - LEVEL 07

FOR INFORMATION

DATE	PLOT DATE	SCALE
	20/05/2022	1:200 @A1
DRAWN FX	CHECKED FX	

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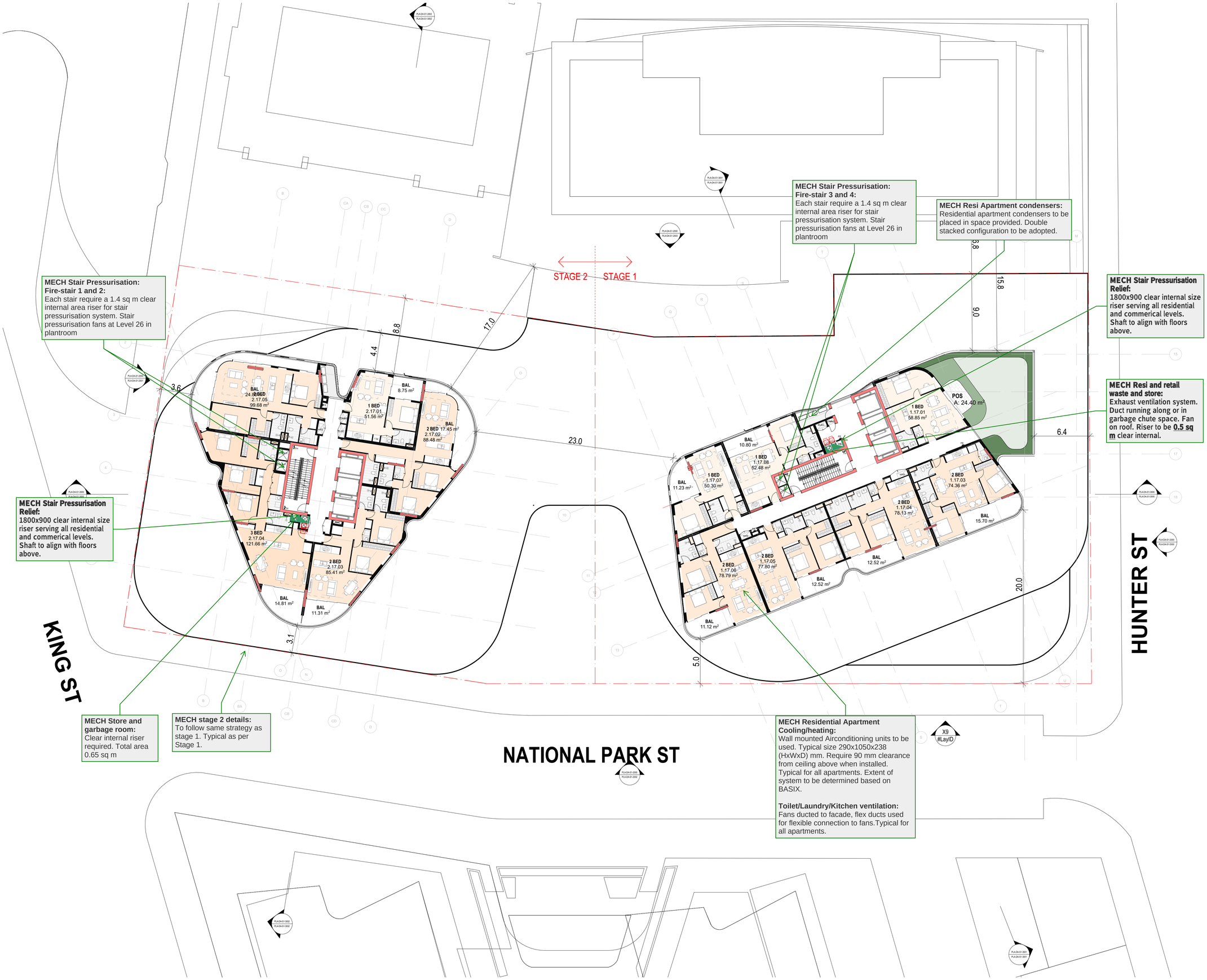
DRG. NO.
PLA-DA-S2-1007

REVISION
02 - WIP

DRAWING TO BE READ IN CONJUNCTION WITH A0000 LEGEND, RELEVANT SCHEDULES AND PROJECT SPECIFICATION.



DATE	REVISION	BY	CHK	NO.
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Work in Progress	ISSUE FOR INFORMATION	FX	FX	02 WIP

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CONSULTANT 5 TYPE	#CONSULTANT 5-COMPANY NAME	T CONS. 5 PHONE

PROJECT
711 HUNTER ST
NEWCASTLE WEST
NSW 2302

DRAWING TITLE
OVERALL FLOOR PLAN - LEVEL 17

FOR INFORMATION

DATE	PLOT DATE	SCALE
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PLA-DA-S2-1017

REVISION
02 - WIP

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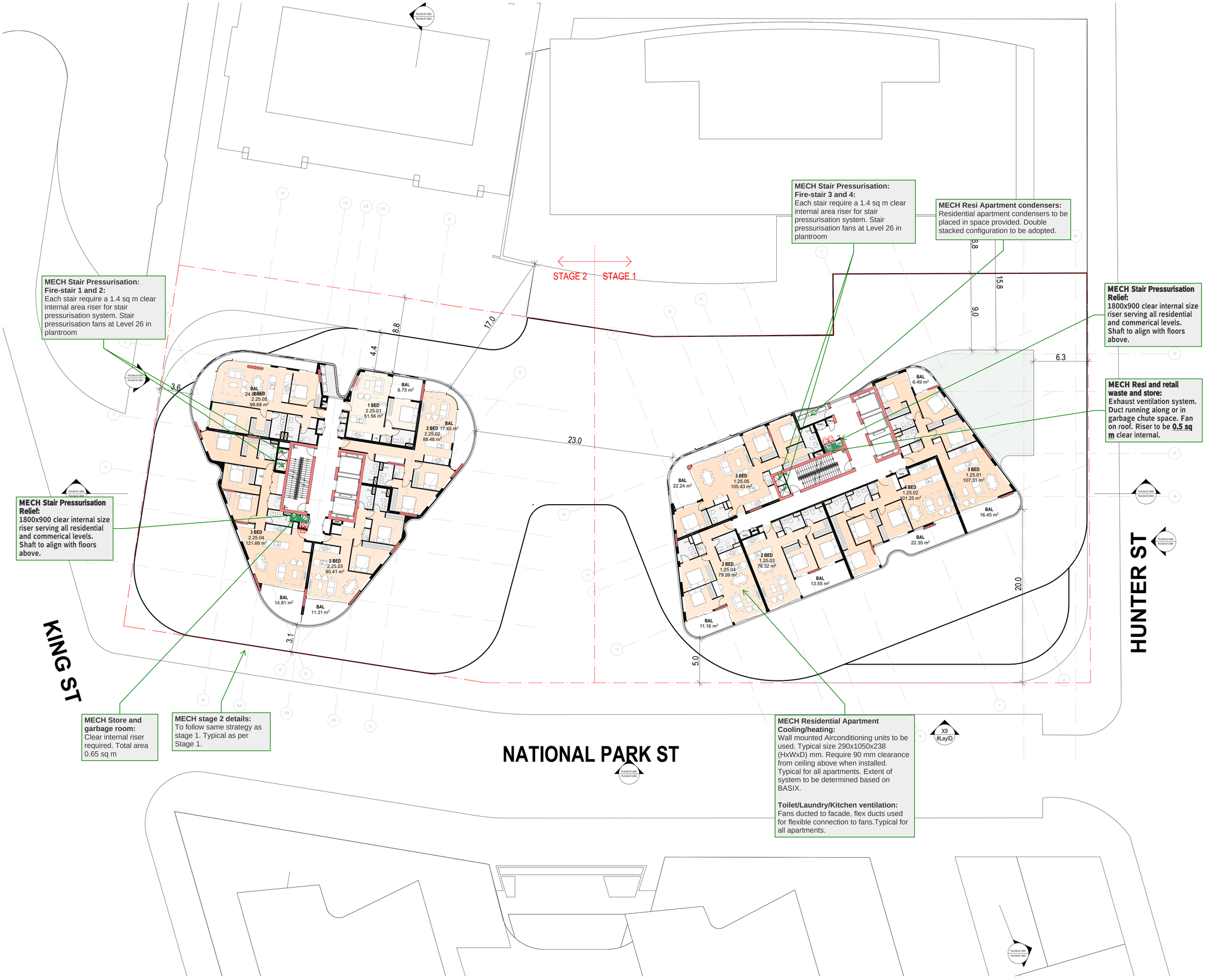

DATE	REVISION	BY	CHK	NO.
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CONSULTANT 5 TYPE	#CONSULTANT 5-COMPANY NAME	T CONS. 5 PHONE

PROJECT
711 HUNTER ST
NEWCASTLE WEST
NSW 2302

DRAWING TITLE
OVERALL FLOOR PLAN - LEVEL 25

FOR INFORMATION

DATE	PLOT DATE	SCALE
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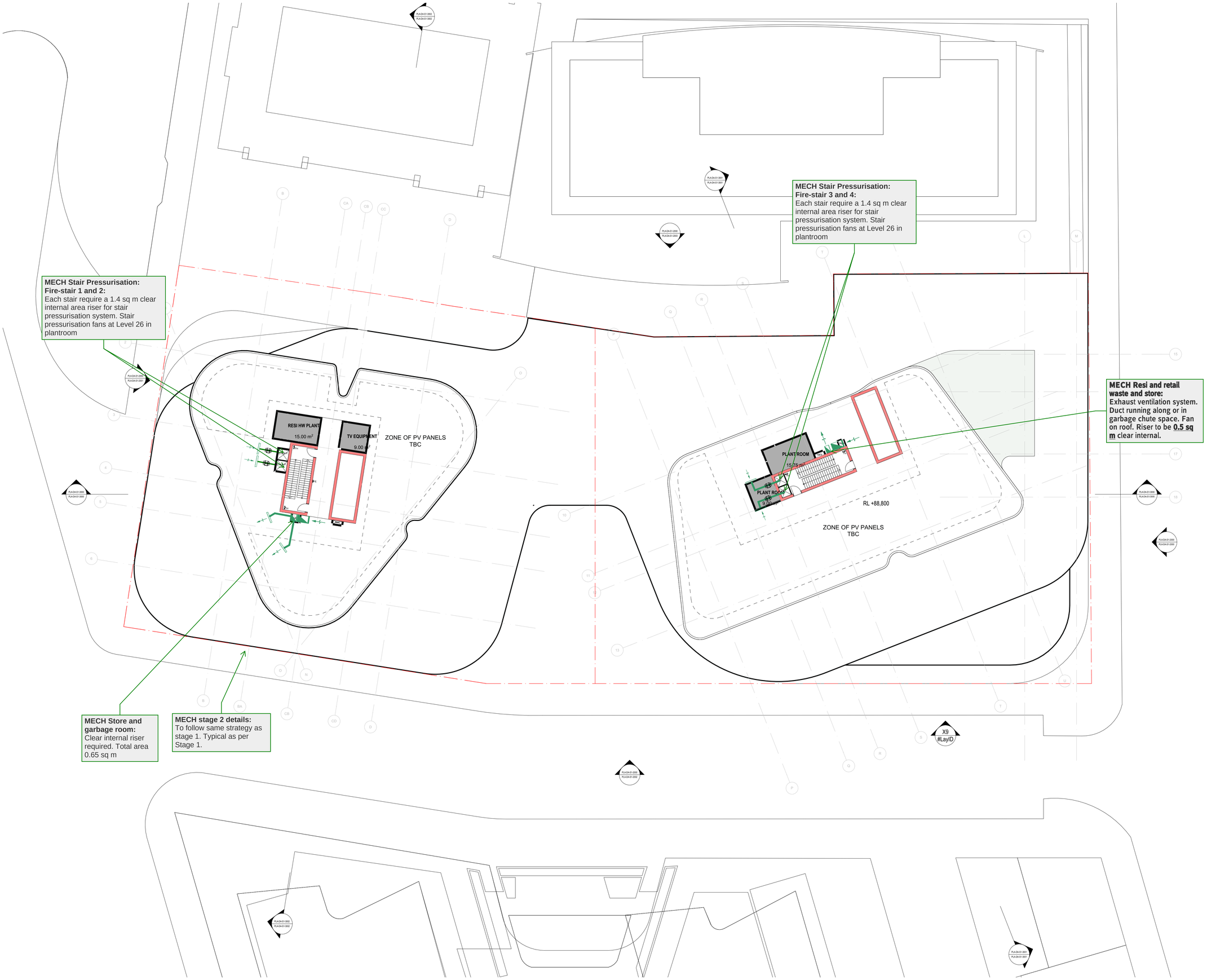

DATE	REVISION	BY	CHK	NO.
Work in Progress	ISSUE FOR INFORMATION	FX	FX	01 WIP

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CONSULTANT 4 TYPE	#CONSULTANT 4-COMPANY NAME	T CONS. 4 PHONE
CONSULTANT 5 TYPE	#CONSULTANT 5-COMPANY NAME	T CONS. 5 PHONE

PROJECT
711 HUNTER ST
NEWCASTLE WEST
NSW 2302

DRAWING TITLE
OVERALL FLOOR PLAN - LEVEL 26 PLANT

FOR INFORMATION

DATE	PLOT DATE	SCALE
	20/05/2022	1:200 @A1
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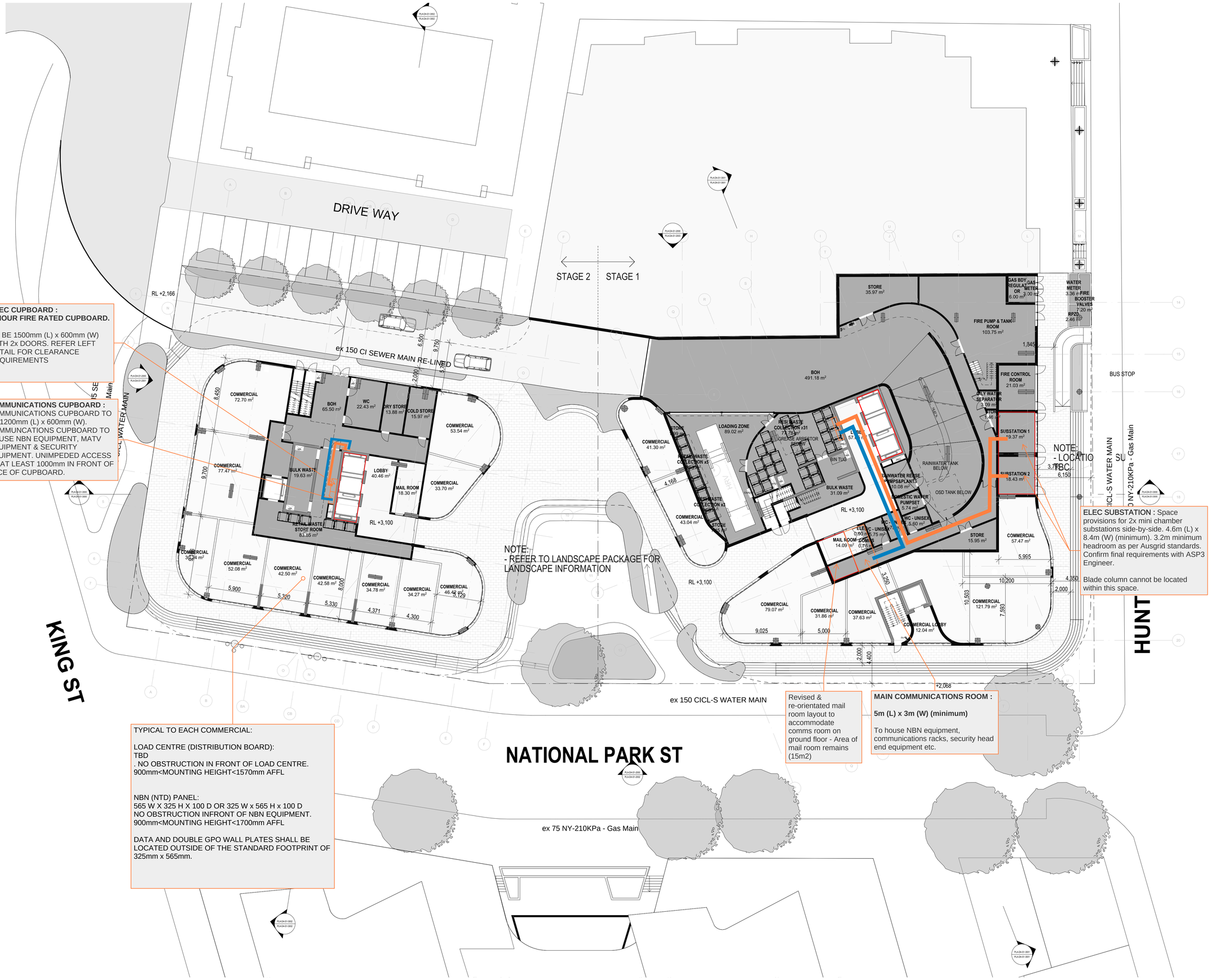
DRG. NO.
PLA-DA-S2-1026

REVISION
01 - WIP



ELEC CUPBOARD :
2-HOUR FIRE RATED CUPBOARD.

TO BE 1500mm (L) x 600mm (W) WITH 2x DOORS. REFER LEFT DETAIL FOR CLEARANCE REQUIREMENTS

COMMUNICATIONS CUPBOARD :
COMMUNICATIONS CUPBOARD TO BE 1200mm (L) x 600mm (W). COMMUNCATIONS CUPBOARD TO HOUSE NBN EQUIPMENT, MATV EQUIPMENT & SECURITY EQUIPMENT. UNIMPEDED ACCESS OF AT LEAST 1000mm IN FRONT OF FACE OF CUPBOARD.

ELEC SUBSTATION : Space provisions for 2x mini chamber substations side-by-side. 4.6m (L) x 8.4m (W) (minimum). 3.2m minimum headroom as per Ausgrid standards. Confirm final requirements with ASP3 Engineer.

Blade column cannot be located within this space.

Revised & re-orientated mail room layout to accommodate comms room on ground floor - Area of mail room remains (15m2)

MAIN COMMUNICATIONS ROOM :

5m (L) x 3m (W) (minimum)

To house NBN equipment, communications racks, security head end equipment etc.

TYPICAL TO EACH COMMERCIAL:

LOAD CENTRE (DISTRIBUTION BOARD):
TBD
. NO OBSTRUCTION IN FRONT OF LOAD CENTRE.
900mm<MOUNTING HEIGHT<1570mm AFFL

NBN (NTD) PANEL:
565 W X 325 H X 100 D OR 325 W x 565 H x 100 D
NO OBSTRUCTION INFRONT OF NBN EQUIPMENT.
900mm<MOUNTING HEIGHT<1700mm AFFL

DATA AND DOUBLE GPO WALL PLATES SHALL BE LOCATED OUTSIDE OF THE STANDARD FOOTPRINT OF 325mm x 565mm.

DRAWING TO BE READ IN CONJUNCTION WITH A0000 LEGEND, RELEVANT SCHEDULES AND PROJECT SPECIFICATION.

ISSUE	DATE	AMENDMENT	INT.	APP.
SP01	XX.XX.22	COMBINED SPATIALS	MW	CO

ISSUE	DATE	AMENDMENT	INT.	APP.
SP01	XX.XX.22	COMBINED SPATIALS	MW	CO

CO-ORDINATED REFERENCE DRAWINGS		
SERVICE	DRAWING NUMBER	DATE
ARCH		
CIVIL		
ELEC		
MECH		
RCP		
STRUCT		

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StHilliers

Services Engineers:

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e: epicentre@epicentrece.com.au
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bsi. ISO 9001 Quality Management

Project:

711 HUNTER ST
NEWCASTLE WEST
NSW 2302

Drawing Title:

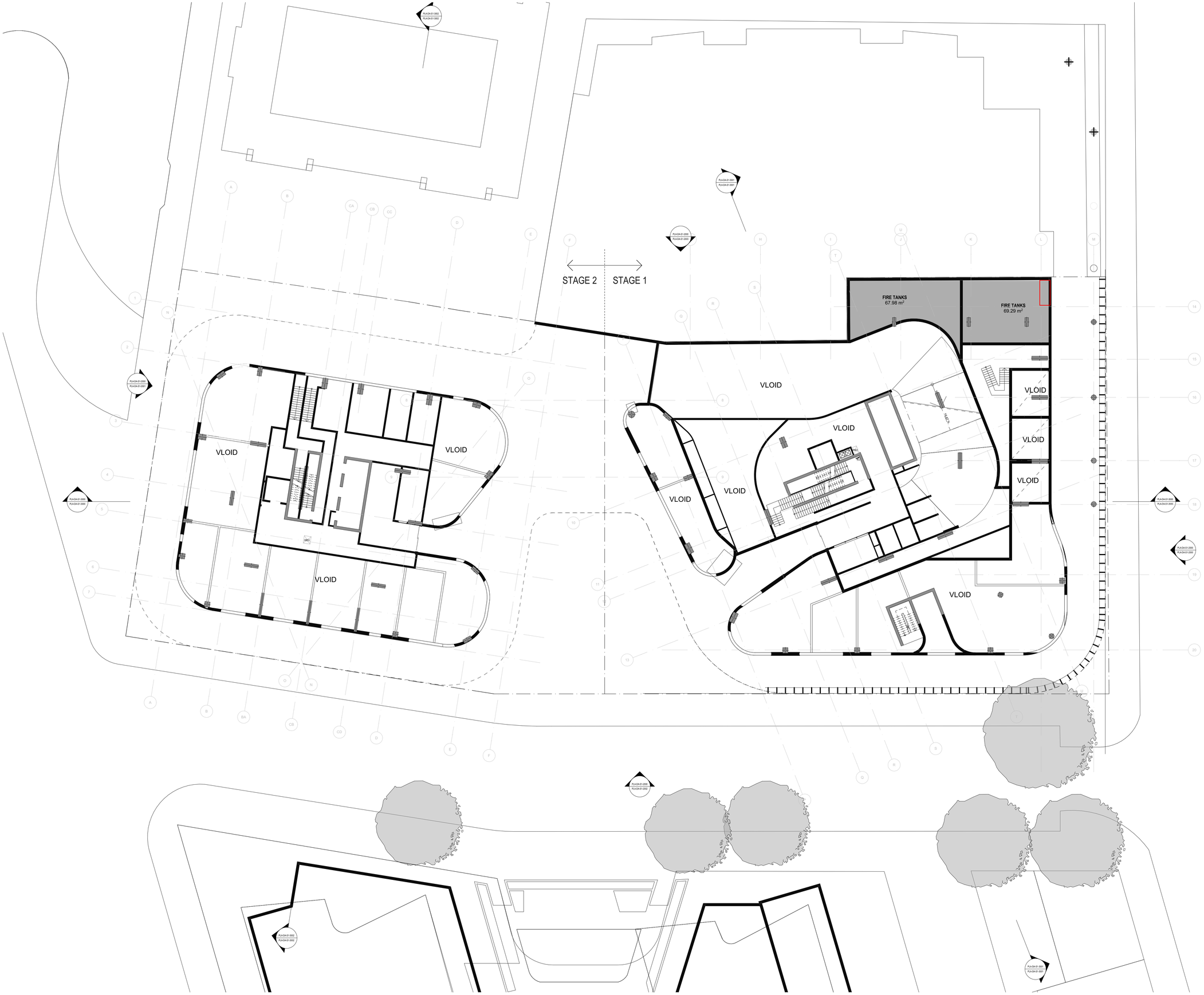
ELEC SPATIALS
GROUND

NOT FOR CONSTRUCTION

North Point:	Design: XX
	Design Validated: XX
	Amendment Approved: CO
	Drawn: XX
Date: APRIL 2022	Scale: 1:200 @A1

Job No.:	Disc:	Dwg No.:	Stage:	Issue:
22542-001	ALL	100	SP	02

ORIGINAL SIZE: A1P



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ISSUE	DATE	AMENDMENT	INT.	APP.
SP01	XX.XX.22	COMBINED SPATIALS	MW	CO

CO-ORDINATED REFERENCE DRAWINGS

SERVICE	DRAWING NUMBER	DATE
ARCH		
CIVIL		
ELEC		
MECH		
RCP		
STRUCT		

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w: www.epicentrece.com.au

bsi. ISO 9001 Quality Management

Project:

711 HUNTER ST
NEWCASTLE WEST
NSW 2302

Drawing Title:

ELEC SPATIALS
Mezzanine Level

NOT FOR CONSTRUCTION

North Point:

Design: XX
Design Validated: XX
Amendment Approved: CO
Drawn: XX
Date: APRIL 2022
Scale: **1:200 @A1**

Job No.:	Disc:	Dwg No.:	Stage:	Issue:
22542-001	ALL	101a	SP	02

ORIGINAL SIZE: A1P

DRAWING TO BE READ IN CONJUNCTION WITH A0000 LEGEND, RELEVANT SCHEDULES AND PROJECT SPECIFICATION.

ELEC & COMMS RISERS:
450mm x 250mm (TBC) Elec and comms risers for reticulation down to ground floor.

WET FIRE : Riser
1000 x 600 x full height

ELEC CUPBOARD :
Intermediate Electrical Room.

Current Length x 3500mm (W)

Must be 2 hour fire rated and have 2 hour fire rated self-closing fire doors.

Requires 2 emergency exit paths. Doors need to open in the direction of egress (outwards) without the use of a key or tool. The doors should be spaced well apart (i.e. on opposite side of the room).

SECONDARY COMMUNICATIONS ROOM :

Current Length x 2500mm (W)
To house NBN equipment, communications racks, security head end equipment etc.

Make double door

Remove this door

MAIN COMMUNICATIONS ROOM :

5m (L) x 3m (W) (minimum)

To house NBN equipment, communications racks, security head end equipment etc.

ELEC MAIN SWITCHROOM :
5m (L) x 6m (W) (minimum)

Must be 2 hour fire rated and have 2 hour fire rated self-closing fire doors.

Requires 2 emergency exit paths. Doors need to open in the direction of egress (outwards) without the use of a key or tool. The doors should be spaced well apart (i.e. on opposite side of the room).

COMMUNICATIONS CUPBOARD :
COMMUNICATIONS CUPBOARD TO BE 1200mm (L) x 600mm (W). COMMUNCATIONS CUPBOARD TO HOUSE NBN EQUIPMENT, MATV EQUIPMENT & SECURITY EQUIPMENT. UNIMPEDED ACCESS OF AT LEAST 1000mm IN FRONT OF FACE OF CUPBOARD.

ELEC CUPBOARD :
2-HOUR FIRE RATED CUPBOARD.

TO BE 1500mm (L) x 600mm (W) WITH 2x DOORS. REFER LEFT DETAIL FOR CLEARANCE REQUIREMENTS

TYPICAL TO EACH APARTMENT:

LOAD CENTRE (DISTRIBUTION BOARD):
350 W X 300 H X 100 D
(CAN BE LOCATED INSIDE LINEN CUPBOARD). NO OBSTRUCTION IN FRONT OF LOAD CENTRE.
900mm<MOUNTING HEIGHT<1570mm AFFL

NBN (NTD) PANEL:
565 W X 325 H X 100 D OR 325 W x 565 H x 100 D
(CAN BE LOCATED ON A PANEL INSIDE LINEN CUPBOARD)
NO OBSTRUCTION INFRONT OF NBN EQUIPMENT.
900mm<MOUNTING HEIGHT<1700mm AFFL

DATA AND DOUBLE GPO WALL PLATES SHALL BE LOCATED OUTSIDE OF THE STANDARD FOOTPRINT OF 325mm x 565mm.

ELEC CUPBOARD :
2-HOUR FIRE RATED CUPBOARD.

TO BE 1500mm (L) x 600mm (W) WITH 2x DOORS. REFER LEFT DETAIL FOR CLEARANCE REQUIREMENTS

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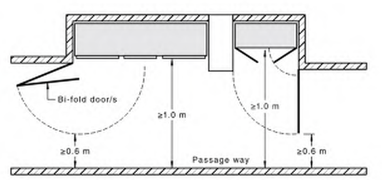

FIGURE 2.22 ACCESS TO SWITCHBOARDS—SWITCHBOARD DOORS THAT OPEN INTO ACCESS WAYS OR NARROW PASSAGE WAYS

ISSUE	DATE	AMENDMENT	INT.	APP.
SP01	XX.XX.22	COMBINED SPATIALS	MW	CO

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Services Engineers:

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e: epicentre@epicentrece.com.au
w: www.epicentrece.com.au
ISO 9001 Quality Management

Project:

711 HUNTER ST
NEWCASTLE WEST
NSW 2302

Drawing Title:

ELEC SPATIALS
LEVEL 1

NOT FOR CONSTRUCTION

North Point:	Design: XX
	Design Validated: XX
	Amendment Approved: CO
	Drawn: XX
Date: APRIL 2022	Scale: **1:200 @A1**

Job No.:	Disc:	Dwg No.:	Stage:	Issue:
22542-001	ALL	102	SP	02

ORIGINAL SIZE A1P

DRAWING TO BE READ IN CONJUNCTION WITH A0000 LEGEND, RELEVANT SCHEDULES AND PROJECT SPECIFICATION.

COMMUNICATIONS CUPBOARD :
COMMUNICATIONS CUPBOARD TO BE 1200mm (L) x 600mm (W). COMMUNCATIONS CUPBOARD TO HOUSE NBN EQUIPMENT, MATV EQUIPMENT & SECURITY EQUIPMENT. UNIMPEDED ACCESS OF AT LEAST 1000mm IN FRONT OF FACE OF CUPBOARD.

ELEC CUPBOARD :
2-HOUR FIRE RATED CUPBOARD.

TO BE 1500mm (L) x 600mm (W) WITH 2x DOORS. REFER LEFT DETAIL FOR CLEARANCE REQUIREMENTS

TYPICAL TO EACH APARTMENT:

LOAD CENTRE (DISTRIBUTION BOARD):
350 W X 300 H X 100 D
(CAN BE LOCATED INSIDE LINEN CUPBOARD). NO OBSTRUCTION IN FRONT OF LOAD CENTRE.
900mm<MOUNTING HEIGHT<1570mm AFFL

NBN (NTD) PANEL:
565 W X 325 H X 100 D OR 325 W x 565 H x 100 D
(CAN BE LOCATED ON A PANEL INSIDE LINEN CUPBOARD)
NO OBSTRUCTION INFRONT OF NBN EQUIPMENT.
900mm<MOUNTING HEIGHT<1700mm AFFL

DATA AND DOUBLE GPO WALL PLATES SHALL BE LOCATED OUTSIDE OF THE STANDARD FOOTPRINT OF 325mm x 565mm.

ELEC CUPBOARD :
2-HOUR FIRE RATED CUPBOARD.

TO BE 1500mm (L) x 600mm (W) WITH 2x DOORS. REFER LEFT DETAIL FOR CLEARANCE REQUIREMENTS

COMMUNICATIONS CUPBOARD :
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FIGURE 2.22 ACCESS TO SWITCHBOARDS—SWITCHBOARD DOORS THAT OPEN INTO ACCESS WAYS OR NARROW PASSAGE WAYS

ISSUE	DATE	AMENDMENT	INT.	APP.
SP01	XX.XX.22	COMBINED SPATIALS	MW	CO

CO-ORDINATED REFERENCE DRAWINGS		
SERVICE	DRAWING NUMBER	DATE
ARCH		
CIVIL		
ELEC		
MECH		
RCP		
STRUCT		

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- DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED ON DRAWING.

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ISO 9001 Quality Management

Project:

711 HUNTER ST
NEWCASTLE WEST
NSW 2302

Drawing Title:

ELEC SPATIALS
LEVEL 2

NOT FOR CONSTRUCTION

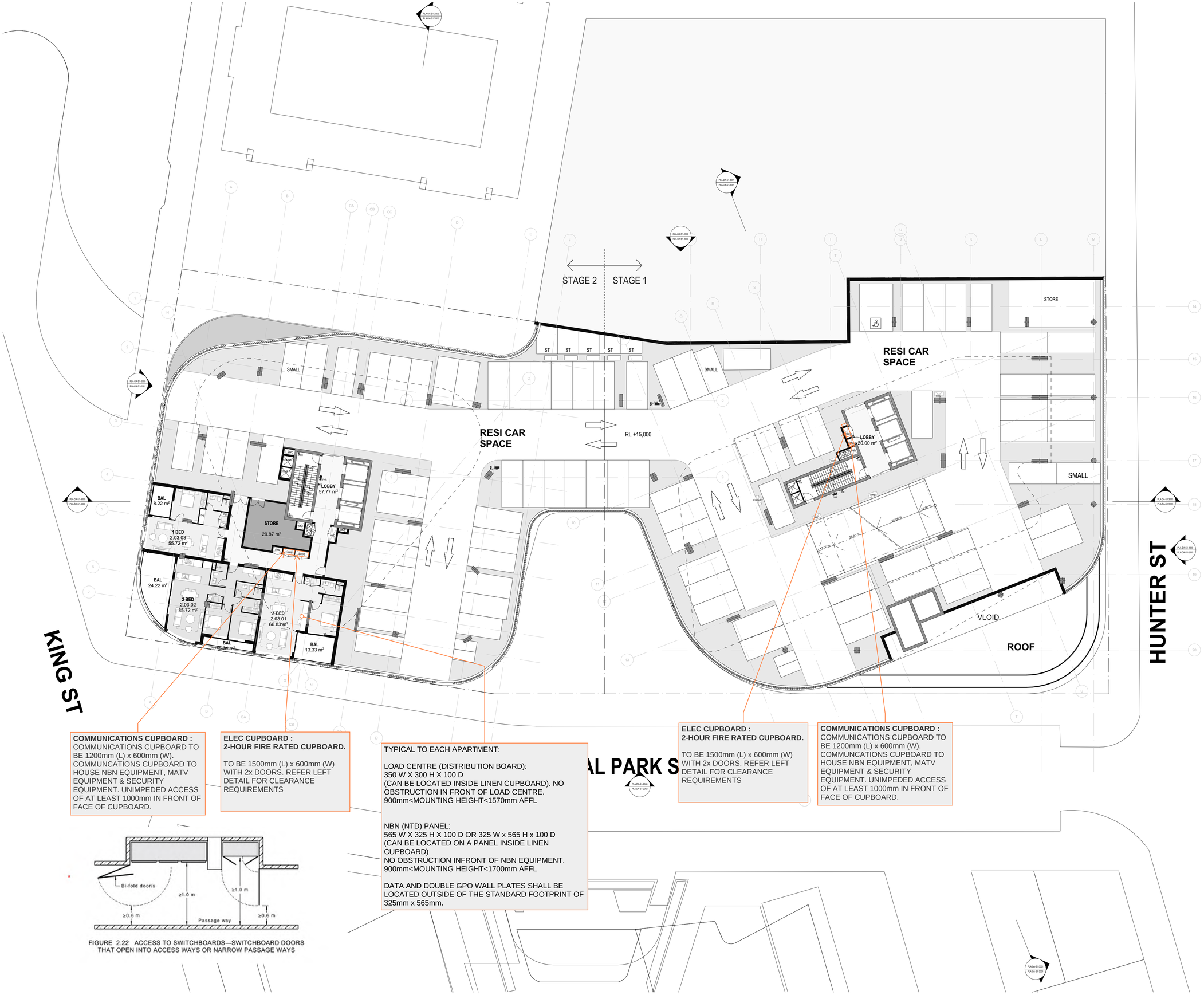
North Point:

Date: APRIL 2022	Design: XX
	Design Validated: XX
	Amendment Approved: CO
	Drawn: XX
	Scale: **1:200 @A1**

Job No.:	Disc:	Dwg No.:	Stage:	Issue:
22542-001	ALL	103	SP 02	

ORIGINAL SIZE A1P

DRAWING TO BE READ IN CONJUNCTION WITH A0000 LEGEND, RELEVANT SCHEDULES AND PROJECT SPECIFICATION.



COMMUNICATIONS CUPBOARD :
COMMUNICATIONS CUPBOARD TO BE 1200mm (L) x 600mm (W). COMMUNCATIONS CUPBOARD TO HOUSE NBN EQUIPMENT, MATV EQUIPMENT & SECURITY EQUIPMENT. UNIMPEDED ACCESS OF AT LEAST 1000mm IN FRONT OF FACE OF CUPBOARD.

ELEC CUPBOARD :
2-HOUR FIRE RATED CUPBOARD.

TO BE 1500mm (L) x 600mm (W) WITH 2x DOORS. REFER LEFT DETAIL FOR CLEARANCE REQUIREMENTS

TYPICAL TO EACH APARTMENT:

LOAD CENTRE (DISTRIBUTION BOARD):
350 W X 300 H X 100 D
(CAN BE LOCATED INSIDE LINEN CUPBOARD). NO OBSTRUCTION IN FRONT OF LOAD CENTRE.
900mm<MOUNTING HEIGHT<1570mm AFFL

NBN (NTD) PANEL:
565 W X 325 H X 100 D OR 325 W x 565 H x 100 D
(CAN BE LOCATED ON A PANEL INSIDE LINEN CUPBOARD)
NO OBSTRUCTION INFRONT OF NBN EQUIPMENT.
900mm<MOUNTING HEIGHT<1700mm AFFL

DATA AND DOUBLE GPO WALL PLATES SHALL BE LOCATED OUTSIDE OF THE STANDARD FOOTPRINT OF 325mm x 565mm.

ELEC CUPBOARD :
2-HOUR FIRE RATED CUPBOARD.

TO BE 1500mm (L) x 600mm (W) WITH 2x DOORS. REFER LEFT DETAIL FOR CLEARANCE REQUIREMENTS

COMMUNICATIONS CUPBOARD :
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FIGURE 2.22 ACCESS TO SWITCHBOARDS—SWITCHBOARD DOORS THAT OPEN INTO ACCESS WAYS OR NARROW PASSAGE WAYS

ISSUE	DATE	AMENDMENT	INT.	APP.
SP01	XX.XX.22	COMBINED SPATIALS	MW	CO

CO-ORDINATED REFERENCE DRAWINGS		
SERVICE	DRAWING NUMBER	DATE
ARCH		
CIVIL		
ELEC		
MECH		
RCP		
STRUCT		

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ISO 9001 Quality Management

Project:

711 HUNTER ST
NEWCASTLE WEST
NSW 2302

Drawing Title:

ELEC SPATIALS
LEVEL 3

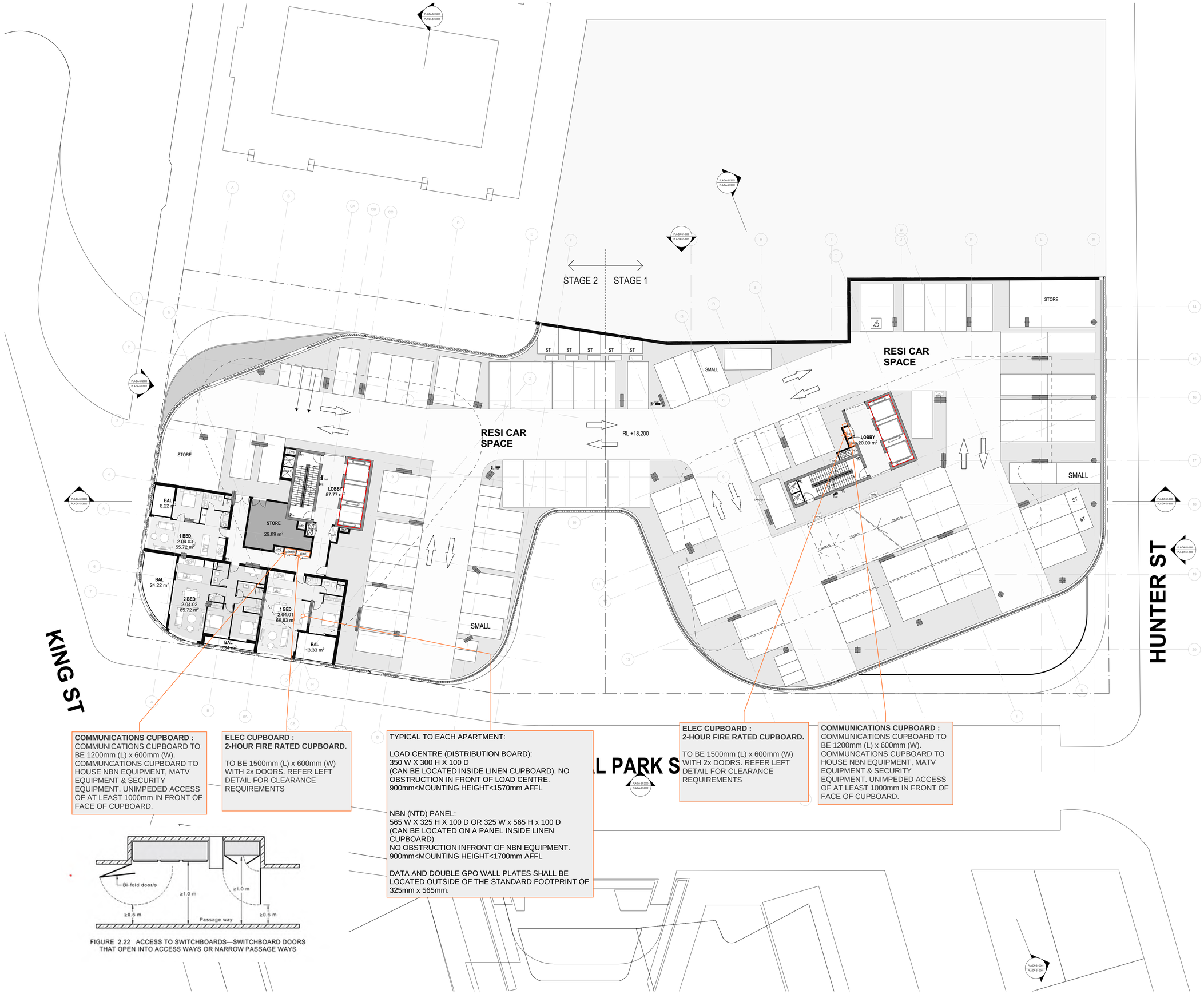
NOT FOR CONSTRUCTION

North Point:

Date: APRIL 2022	Design: XX
	Design Validated: XX
	Amendment Approved: CO
	Drawn: XX
	Scale: **1:200 @A1**

Job No.:	Disc:	Dwg No.:	Stage:	Issue:
22542-001	ALL	104	SP 02	

ORIGINAL SIZE A1P



COMMUNICATIONS CUPBOARD :
COMMUNICATIONS CUPBOARD TO BE 1200mm (L) x 600mm (W). COMMUNCATIONS CUPBOARD TO HOUSE NBN EQUIPMENT, MATV EQUIPMENT & SECURITY EQUIPMENT. UNIMPEDED ACCESS OF AT LEAST 1000mm IN FRONT OF FACE OF CUPBOARD.

ELEC CUPBOARD :
2-HOUR FIRE RATED CUPBOARD.

TO BE 1500mm (L) x 600mm (W) WITH 2x DOORS. REFER LEFT DETAIL FOR CLEARANCE REQUIREMENTS

TYPICAL TO EACH APARTMENT:

LOAD CENTRE (DISTRIBUTION BOARD):
350 W X 300 H X 100 D
(CAN BE LOCATED INSIDE LINEN CUPBOARD). NO OBSTRUCTION IN FRONT OF LOAD CENTRE.
900mm<MOUNTING HEIGHT<1570mm AFFL

NBN (NTD) PANEL:
565 W X 325 H X 100 D OR 325 W x 565 H x 100 D
(CAN BE LOCATED ON A PANEL INSIDE LINEN CUPBOARD)
NO OBSTRUCTION INFRONT OF NBN EQUIPMENT.
900mm<MOUNTING HEIGHT<1700mm AFFL

DATA AND DOUBLE GPO WALL PLATES SHALL BE LOCATED OUTSIDE OF THE STANDARD FOOTPRINT OF 325mm x 565mm.

ELEC CUPBOARD :
2-HOUR FIRE RATED CUPBOARD.

TO BE 1500mm (L) x 600mm (W) WITH 2x DOORS. REFER LEFT DETAIL FOR CLEARANCE REQUIREMENTS

COMMUNICATIONS CUPBOARD :
COMMUNICATIONS CUPBOARD TO BE 1200mm (L) x 600mm (W). COMMUNCATIONS CUPBOARD TO HOUSE NBN EQUIPMENT, MATV EQUIPMENT & SECURITY EQUIPMENT. UNIMPEDED ACCESS OF AT LEAST 1000mm IN FRONT OF FACE OF CUPBOARD.

FIGURE 2.22 ACCESS TO SWITCHBOARDS—SWITCHBOARD DOORS THAT OPEN INTO ACCESS WAYS OR NARROW PASSAGE WAYS

DRAWING TO BE READ IN CONJUNCTION WITH A0000 LEGEND, RELEVANT SCHEDULES AND PROJECT SPECIFICATION.

ISSUE	DATE	AMENDMENT	INT.	APP.
SP01	XX.XX.22	COMBINED SPATIALS	MW	CO

CO-ORDINATED REFERENCE DRAWINGS

SERVICE	DRAWING NUMBER	DATE
ARCH		
CIVIL		
ELEC		
MECH		
RCP		
STRUCT		

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ISO 9001 Quality Management

Project:

711 HUNTER ST
NEWCASTLE WEST
NSW 2302

Drawing Title:

ELEC SPATIALS
LEVEL 4

NOT FOR CONSTRUCTION

North Point:

Design: XX
Design Validated: XX
Amendment Approved: CO
Drawn: XX
Date: APRIL 2022
Scale: **1:200 @A1**

Job No.:	Disc:	Dwg No.:	Stage:	Issue:
22542-001	ALL	105	SP 02	

ORIGINAL SIZE A1P

DRAWING TO BE READ IN CONJUNCTION WITH A0000 LEGEND, RELEVANT SCHEDULES AND PROJECT SPECIFICATION.

COMMUNICATIONS CUPBOARD :
COMMUNICATIONS CUPBOARD TO BE 1200mm (L) x 600mm (W). COMMUNCATIONS CUPBOARD TO HOUSE NBN EQUIPMENT, MATV EQUIPMENT & SECURITY EQUIPMENT. UNIMPEDED ACCESS OF AT LEAST 1000mm IN FRONT OF FACE OF CUPBOARD.

ELEC CUPBOARD :
2-HOUR FIRE RATED CUPBOARD.

TO BE 1500mm (L) x 600mm (W) WITH 2x DOORS. REFER LEFT DETAIL FOR CLEARANCE REQUIREMENTS

TYPICAL TO EACH APARTMENT:

LOAD CENTRE (DISTRIBUTION BOARD):
350 W X 300 H X 100 D
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TO BE 1200mm (L) x 600mm (W) WITH 2x DOORS. REFER LEFT DETAIL FOR CLEARANCE REQUIREMENTS

COMMUNICATIONS CUPBOARD :
COMMUNICATIONS CUPBOARD TO BE 800mm (L) x 600mm (W). COMMUNCATIONS CUPBOARD TO HOUSE NBN EQUIPMENT, MATV EQUIPMENT & SECURITY EQUIPMENT. UNIMPEDED ACCESS OF AT LEAST 1000mm IN FRONT OF FACE OF CUPBOARD.

PLUS NOTE: - UNITS LAYOUT TO BE UPDATED

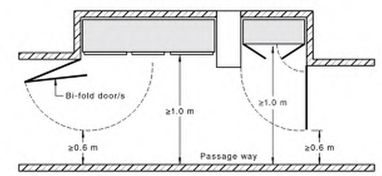

FIGURE 2.22 ACCESS TO SWITCHBOARDS—SWITCHBOARD DOORS THAT OPEN INTO ACCESS WAYS OR NARROW PASSAGE WAYS

ISSUE	DATE	AMENDMENT	INT.	APP.
SP01	XX.XX.22	COMBINED SPATIALS	MW	CO

RENCE DRAWINGS

	DRAWING NUMBER	DATE
ARCH		
CIVIL		
ELEC		
MECH		
RCP		
STRUCT		

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ISO 9001 Quality Management

Project:

711 HUNTER ST
NEWCASTLE WEST
NSW 2302

Drawing Title:

ELEC SPATIALS
LEVEL 5

NOT FOR CONSTRUCTION

North Point:

Design:	XX
Design Validated:	XX
Amendment Approved:	CO
Drawn:	XX
Date: APRIL 2022	Scale: **1:200 @A1**

Job No.:	Disc:	Dwg No.:	Stage:	Issue:
22542-001	ALL	106	SP	02

ORIGINAL SIZE A1P

DRAWING TO BE READ IN CONJUNCTION WITH A0000 LEGEND, RELEVANT SCHEDULES AND PROJECT SPECIFICATION.

COMMUNICATIONS CUPBOARD :
COMMUNICATIONS CUPBOARD TO BE 1200mm (L) x 600mm (W). COMMUNCATIONS CUPBOARD TO HOUSE NBN EQUIPMENT, MATV EQUIPMENT & SECURITY EQUIPMENT. UNIMPEDED ACCESS OF AT LEAST 1000mm IN FRONT OF FACE OF CUPBOARD.

ELEC CUPBOARD :
2-HOUR FIRE RATED CUPBOARD.

TO BE 1500mm (L) x 600mm (W) WITH 2x DOORS. REFER LEFT DETAIL FOR CLEARANCE REQUIREMENTS

TYPICAL TO EACH APARTMENT:

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350 W X 300 H X 100 D
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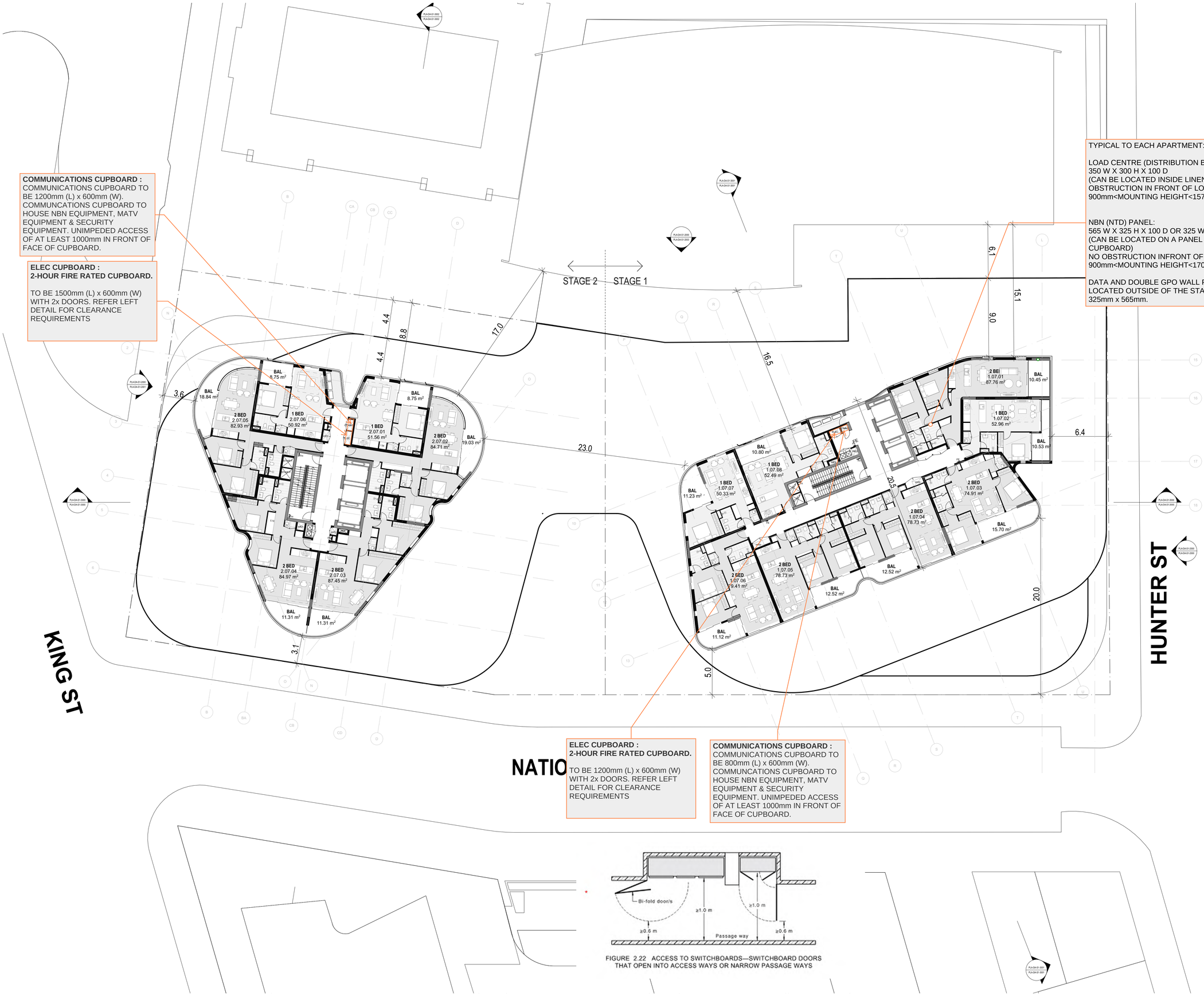

ELEC CUPBOARD :
2-HOUR FIRE RATED CUPBOARD.

TO BE 1200mm (L) x 600mm (W) WITH 2x DOORS. REFER LEFT DETAIL FOR CLEARANCE REQUIREMENTS

COMMUNICATIONS CUPBOARD :
COMMUNICATIONS CUPBOARD TO BE 800mm (L) x 600mm (W). COMMUNCATIONS CUPBOARD TO HOUSE NBN EQUIPMENT, MATV EQUIPMENT & SECURITY EQUIPMENT. UNIMPEDED ACCESS OF AT LEAST 1000mm IN FRONT OF FACE OF CUPBOARD.

FIGURE 2.22 ACCESS TO SWITCHBOARDS—SWITCHBOARD DOORS THAT OPEN INTO ACCESS WAYS OR NARROW PASSAGE WAYS

ISSUE	DATE	AMENDMENT	INT.	APP.
SP01	XX.XX.22	COMBINED SPATIALS	MW	CO

REFERENCE DRAWINGS

	DRAWING NUMBER	DATE
ARCH		
CIVIL		
ELEC		
MECH		
RCP		
STRUCT		

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Project:

711 HUNTER ST
NEWCASTLE WEST
NSW 2302

Drawing Title:

ELEC SPATIALS
LEVEL 7

NOT FOR CONSTRUCTION

North Point:

Date: APRIL 2022	Design: XX
	Design Validated: XX
	Amendment Approved: CO
	Drawn: XX
	Scale: **1:200 @A1**

Job No.:	Disc:	Dwg No.:	Stage:	Issue:
22542-001	ALL	107a	SP	02

ORIGINAL SIZE A1P

DRAWING TO BE READ IN CONJUNCTION WITH A0000 LEGEND, RELEVANT SCHEDULES AND PROJECT SPECIFICATION.

COMMUNICATIONS CUPBOARD :
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TYPICAL TO EACH APARTMENT:

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(CAN BE LOCATED INSIDE LINEN CUPBOARD). NO OBSTRUCTION IN FRONT OF LOAD CENTRE.
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ELEC CUPBOARD :
2-HOUR FIRE RATED CUPBOARD.

TO BE 1200mm (L) x 600mm (W) WITH 2x DOORS. REFER LEFT DETAIL FOR CLEARANCE REQUIREMENTS

COMMUNICATIONS CUPBOARD :
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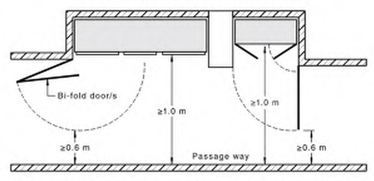

FIGURE 2.22 ACCESS TO SWITCHBOARDS—SWITCHBOARD DOORS THAT OPEN INTO ACCESS WAYS OR NARROW PASSAGE WAYS

ISSUE	DATE	AMENDMENT	INT.	APP.
SP01	XX.XX.22	COMBINED SPATIALS	MW	CO

REFERENCE DRAWINGS

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ISO 9001 Quality Management

Project:

711 HUNTER ST
NEWCASTLE WEST
NSW 2302

Drawing Title:

ELEC SPATIALS
LEVELS 17

NOT FOR CONSTRUCTION

North Point:

Design: XX
Design Validated: XX
Amendment Approved: CO
Drawn: XX
Date: APRIL 2022
Scale: **1:200 @A1**

Job No.:	Disc:	Dwg No.:	Stage:	Issue:
22542-001	ALL	109	SP 02	

ORIGINAL SIZE A1P

DRAWING TO BE READ IN CONJUNCTION WITH A0000 LEGEND, RELEVANT SCHEDULES AND PROJECT SPECIFICATION.

COMMUNICATIONS CUPBOARD :
COMMUNICATIONS CUPBOARD TO BE 1200mm (L) x 600mm (W). COMMUNCATIONS CUPBOARD TO HOUSE NBN EQUIPMENT, MATV EQUIPMENT & SECURITY EQUIPMENT. UNIMPEDED ACCESS OF AT LEAST 1000mm IN FRONT OF FACE OF CUPBOARD.

ELEC CUPBOARD :
2-HOUR FIRE RATED CUPBOARD.

TO BE 1500mm (L) x 600mm (W) WITH 2x DOORS. REFER LEFT DETAIL FOR CLEARANCE REQUIREMENTS

TYPICAL TO EACH APARTMENT:

LOAD CENTRE (DISTRIBUTION BOARD):
350 W X 300 H X 100 D
(CAN BE LOCATED INSIDE LINEN CUPBOARD). NO OBSTRUCTION IN FRONT OF LOAD CENTRE.
900mm<MOUNTING HEIGHT<1570mm AFFL

NBN (NTD) PANEL:
565 W X 325 H X 100 D OR 325 W x 565 H x 100 D
(CAN BE LOCATED ON A PANEL INSIDE LINEN CUPBOARD)
NO OBSTRUCTION INFRONT OF NBN EQUIPMENT.
900mm<MOUNTING HEIGHT<1700mm AFFL

DATA AND DOUBLE GPO WALL PLATES SHALL BE LOCATED OUTSIDE OF THE STANDARD FOOTPRINT OF 325mm x 565mm.

ELEC CUPBOARD :
2-HOUR FIRE RATED CUPBOARD.

TO BE 1200mm (L) x 600mm (W) WITH 2x DOORS. REFER LEFT DETAIL FOR CLEARANCE REQUIREMENTS

COMMUNICATIONS CUPBOARD :
COMMUNICATIONS CUPBOARD TO BE 800mm (L) x 600mm (W). COMMUNCATIONS CUPBOARD TO HOUSE NBN EQUIPMENT, MATV EQUIPMENT & SECURITY EQUIPMENT. UNIMPEDED ACCESS OF AT LEAST 1000mm IN FRONT OF FACE OF CUPBOARD.

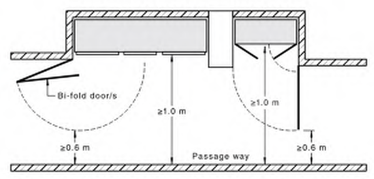

FIGURE 2.22 ACCESS TO SWITCHBOARDS—SWITCHBOARD DOORS THAT OPEN INTO ACCESS WAYS OR NARROW PASSAGE WAYS

ISSUE	DATE	AMENDMENT	INT.	APP.
SP01	XX.XX.22	COMBINED SPATIALS	MW	CO

ORDINATED REFERENCE DRAWINGS		
VICE	DRAWING NUMBER	DATE
CH		
L		
C		
CH		
STRUCT		

NOTES:
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Project:

711 HUNTER ST
NEWCASTLE WEST
NSW 2302

Drawing Title:

ELEC SPATIALS
LEVEL 25

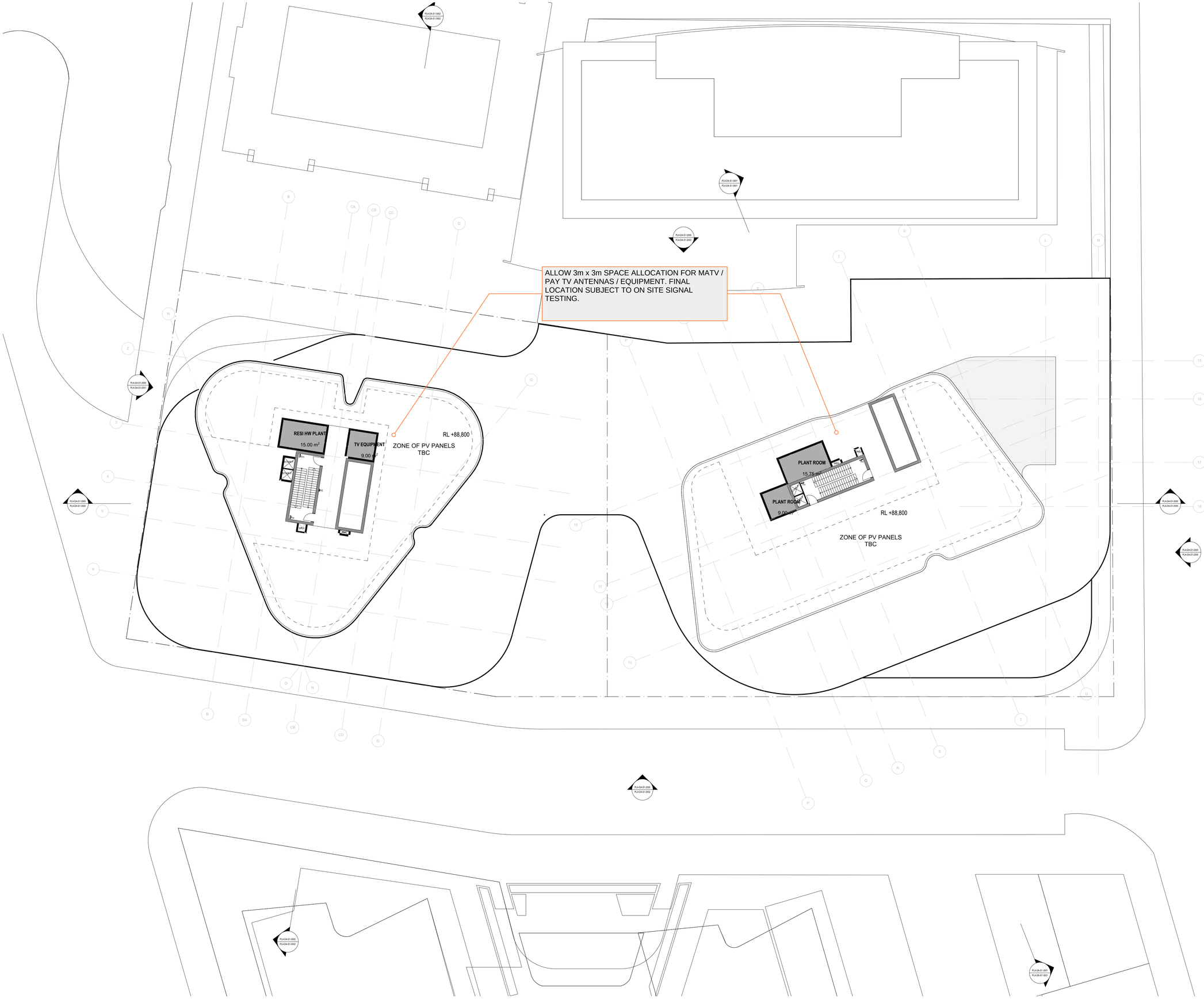
NOT FOR CONSTRUCTION

North Point:

Design: XX	
Design Validated: XX	
Amendment Approved: CO	
Drawn: XX	
Date: APRIL 2022	Scale: **1:200 @A1**

Job No.:	Disc:	Dwg No.:	Stage:	Issue:
22542-001	ALL	110a	SP 02	

ORIGINAL SIZE A1P



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ISSUE	DATE	AMENDMENT	INT.	APP.
SP01	XX.XX.22	COMBINED SPATIALS	MW	CO

CO-ORDINATED REFERENCE DRAWINGS

SERVICE	DRAWING NUMBER	DATE
ARCH		
CIVIL		
ELEC		
MECH		
RCP		
STRUCT		

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Project:

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NEWCASTLE WEST
NSW 2302

Drawing Title:

ELEC SPATIALS
LEVEL 26

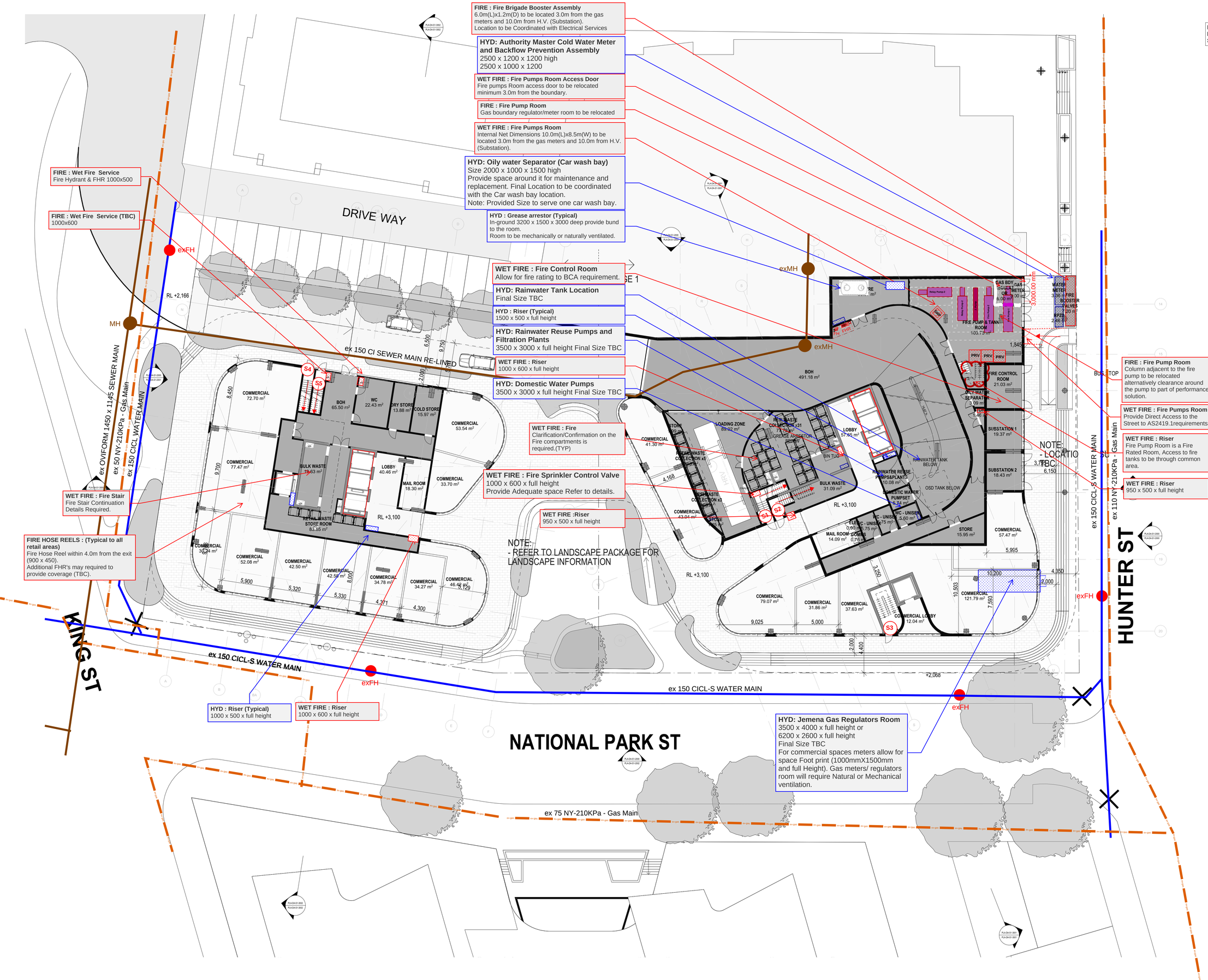
NOT FOR CONSTRUCTION

North Point:

Design: XX
Design Validated: XX
Amendment Approved: CO
Drawn: XX
Date: APRIL 2022
Scale: **1:200 @A1**

Job No.:	Disc:	Dwg No.:	Stage:	Issue:
22542-001	ALL	100	SP	02

ORIGINAL SIZE A1P



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ISSUE	DATE	AMENDMENT	INT.	APP.
SP01	XX.XX.22	COMBINED SPATIALS	MW	CO

ISSUE	DATE	AMENDMENT	INT.	APP.
SP01	XX.XX.22	COMBINED SPATIALS	MW	CO

CO-ORDINATED REFERENCE DRAWINGS		
SERVICE	DRAWING NUMBER	DATE
ARCH		
CIVIL		
ELEC		
MECH		
RCP		
STRUCT		

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Project:

711 HUNTER ST
NEWCASTLE WEST
NSW 2302

Drawing Title:

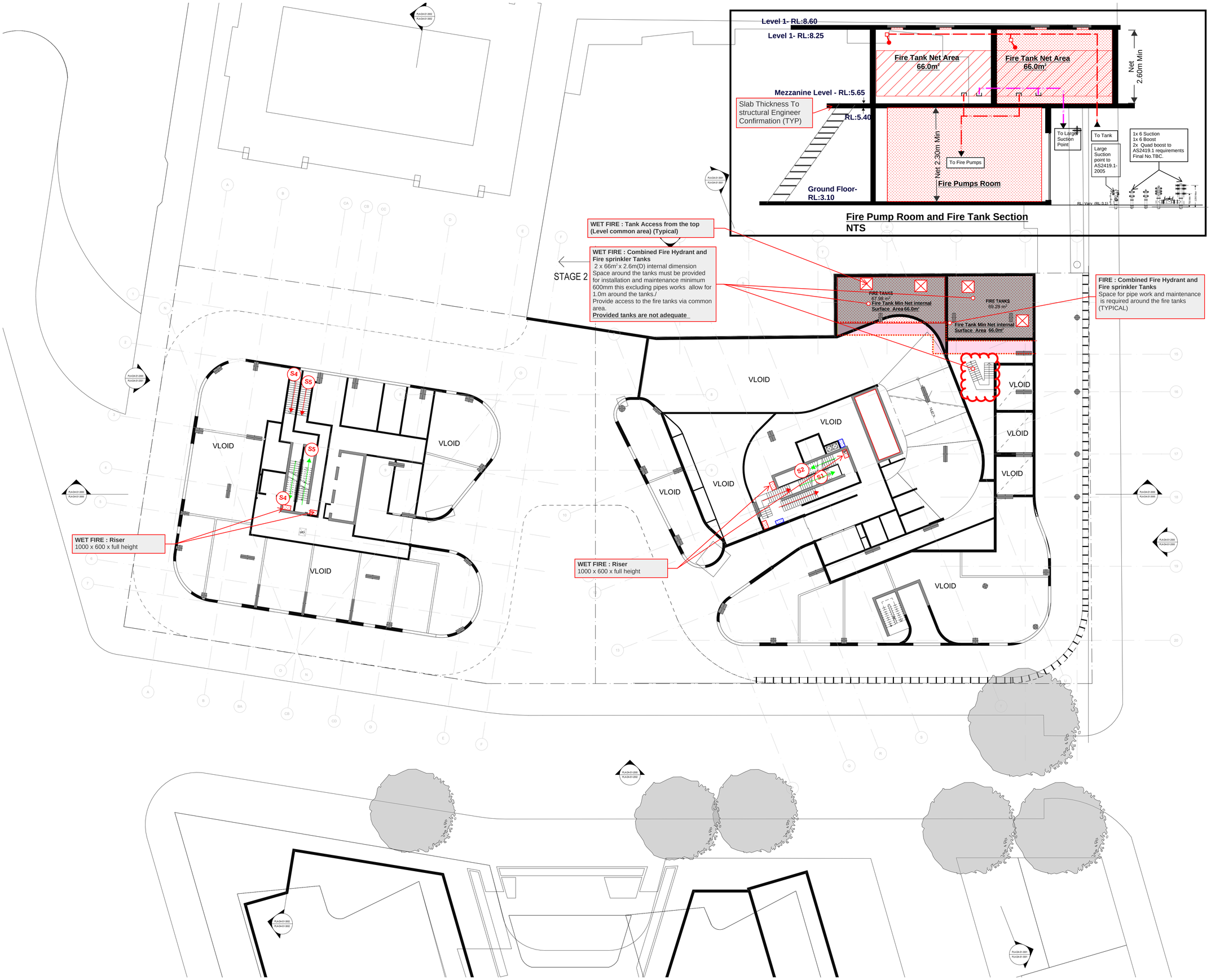
HYDRAULIC SPATIALS
GROUND

NOT FOR CONSTRUCTION

North Point:	Design: XX
	Design Validated: XX
	Amendment Approved: CO
	Drawn: XX
Date: APRIL 2022	Scale: 1:200 @A1

Job No.:	Disc:	Dwg No.:	Stage:	Issue:
22542-001	ALL	100	-	SP 02

ORIGINAL SIZE A1P



DRAWING TO BE READ IN CONJUNCTION WITH A0000 LEGEND, RELEVANT SCHEDULES AND PROJECT SPECIFICATION.

ISSUE	DATE	AMENDMENT	INT.	APP.
SP01	XX.XX.22	COMBINED SPATIALS	MW	CO

CO-ORDINATED REFERENCE DRAWINGS		
SERVICE	DRAWING NUMBER	DATE
ARCH		
CIVIL		
ELEC		
MECH		
RCP		
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NSW 2302

Drawing Title:

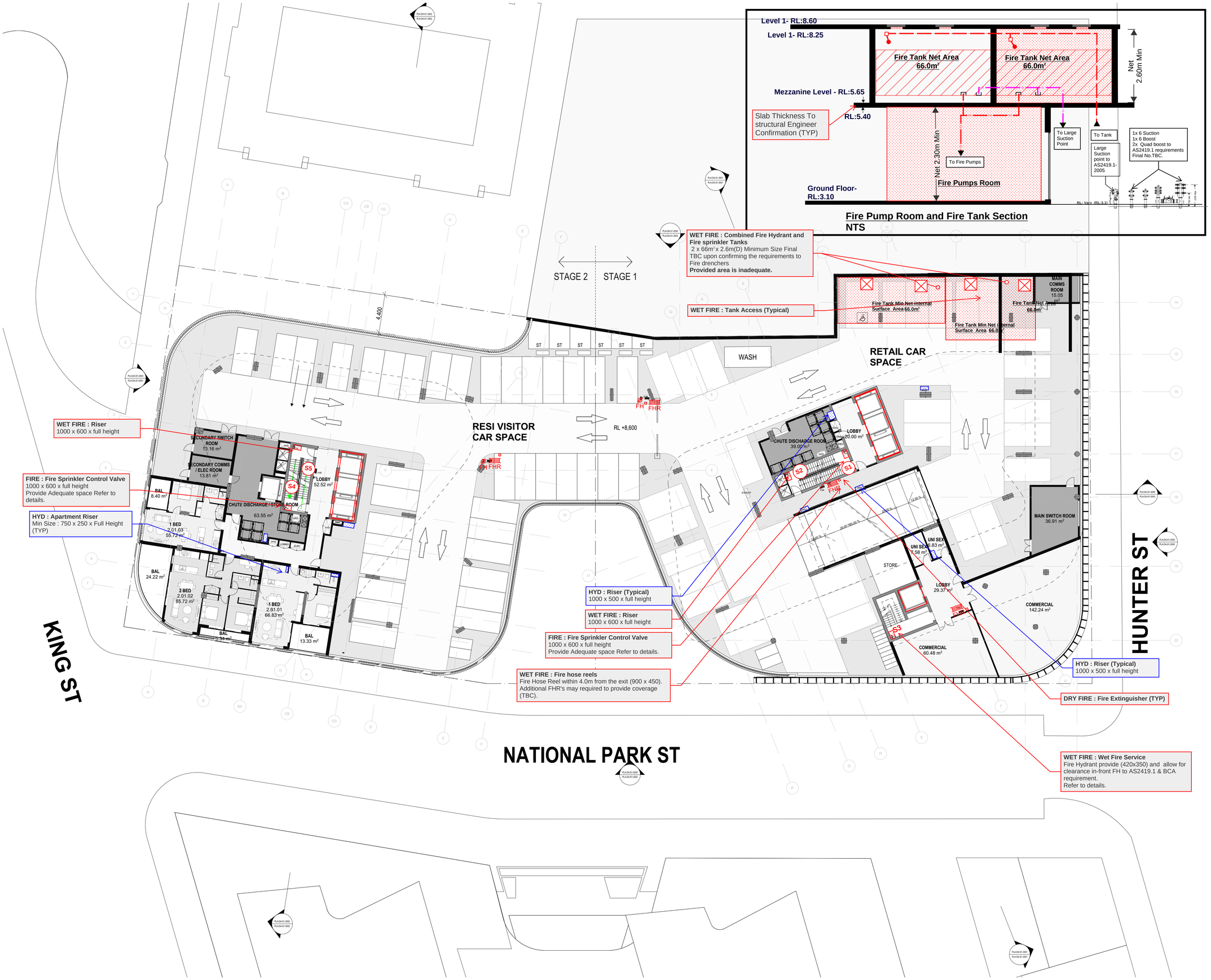
HYD / FIRE SPATIALS
Mezzanine Level

NOT FOR CONSTRUCTION

North Point:	Design: XX
	Design Validated: XX
	Amendment Approved: CO
	Drawn: XX
Date: APRIL 2022	Scale: **1:200 @A1**

Job No.:	Disc:	Dwg No.:	Stage:	Issue:
22542-001	ALL	101a	SP	02

ORIGINAL SIZE: A1P



DRAWING TO BE READ IN CONJUNCTION WITH A0000 LEGEND, RELEVANT SCHEDULES AND PROJECT SPECIFICATION.

ISSUE	DATE	AMENDMENT	INT.	APP.
SP01	XX.XX.22	COMBINED SPATIALS	MW	CO

CO-ORDINATED REFERENCE DRAWINGS

SERVICE	DRAWING NUMBER	DATE
ARCH		
CIVIL		
ELEC		
MECH		
RCP		
STRUCT		

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Drawing Title:

HYD / FIRE SPATIALS
LEVEL 1

NOT FOR CONSTRUCTION

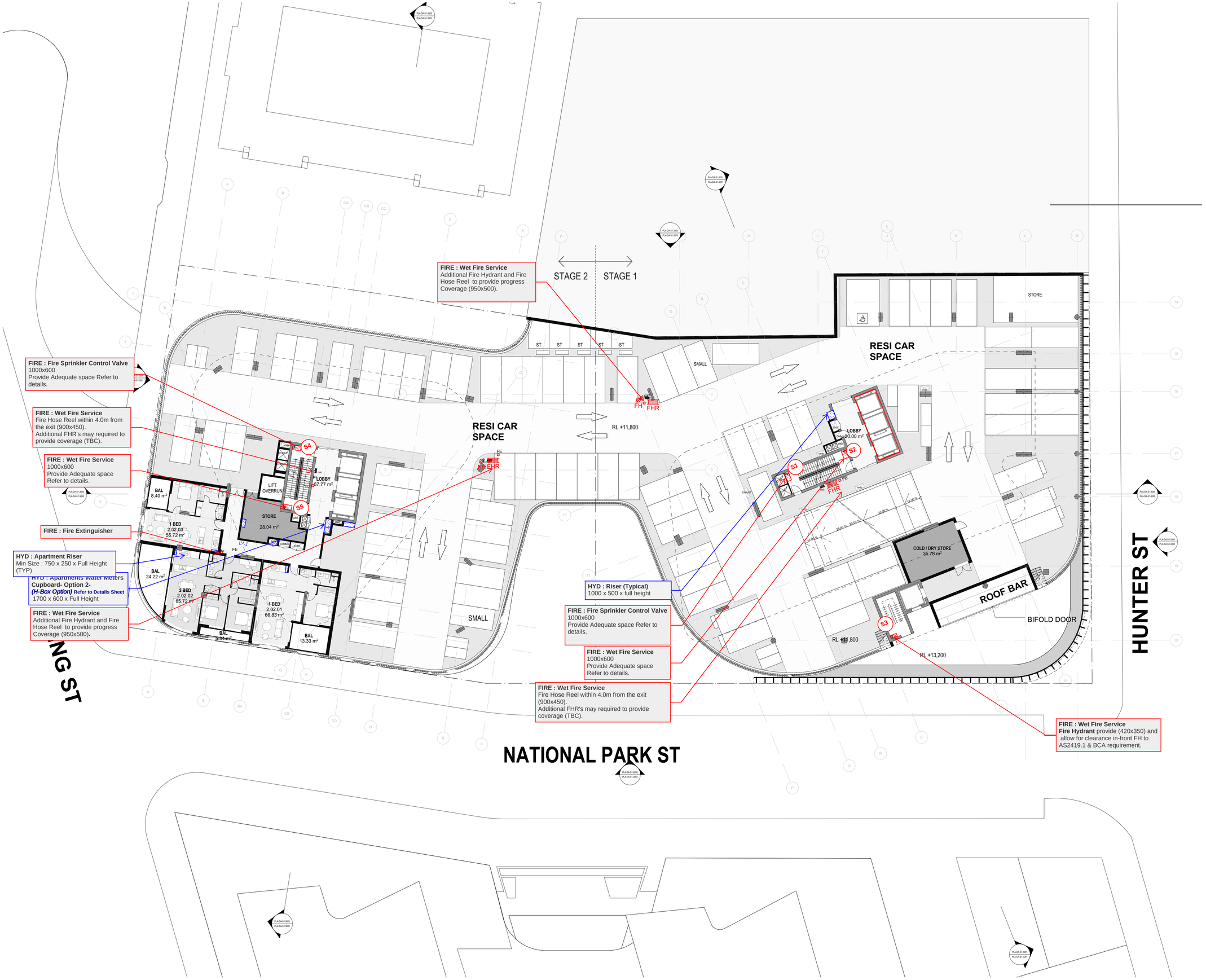
North Point:

Design:	XX
Design Validated:	XX
Amendment Approved:	CO
Drawn:	XX
Date: APRIL 2022	Scale: **1:200 @A1**

Job No.:	Disc:	Dwg No.:	Stage:	Issue:
22542-001	ALL	102	SP	02

ORIGINAL SIZE A1P

DRAWING TO BE READ IN CONJUNCTION WITH A0000 LEGEND, RELEVANT SCHEDULES AND PROJECT SPECIFICATION.



ISSUE	DATE	AMENDMENT	INT.	APP.
SP01	XX.XX.22	COMBINED SPATIALS	MW	CO

CO-ORDINATED REFERENCE DRAWINGS		
SERVICE	DRAWING NUMBER	DATE
ARCH		
CIVIL		
ELEC		
MECH		
RCP		
STRUCT		

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Drawing Title:

HYD / FIRE SPATIALS
LEVEL 2

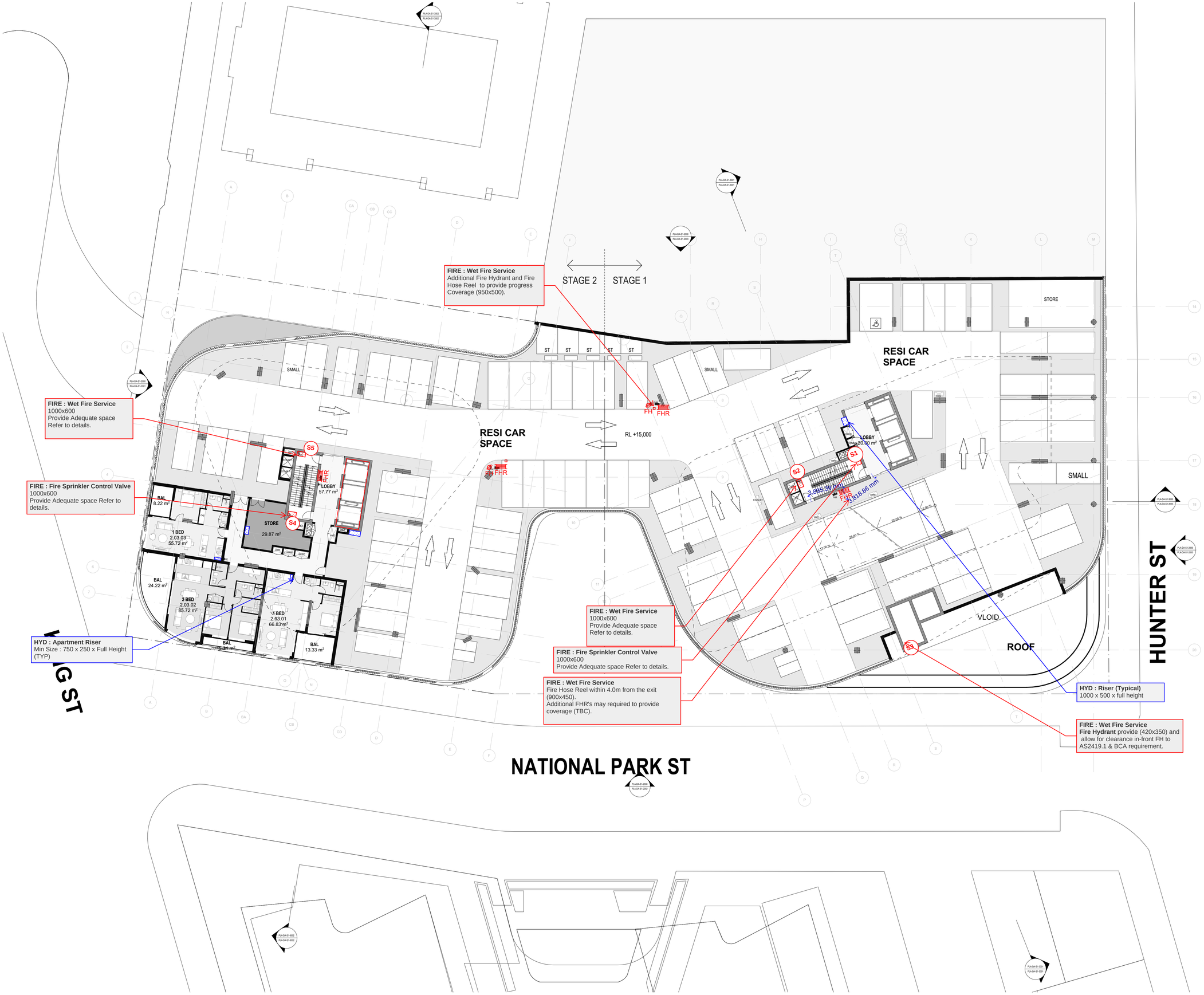
NOT FOR CONSTRUCTION

North Point:	Design: XX
	Design Validated: XX
	Amendment Approved: CO
	Drawn: XX
Date: APRIL 2022	Scale: **1:200 @A1**

Job No.:	Disc:	Dwg No.:	Stage:	Issue:
22542-001	ALL	103	SP 02	

ORIGINAL SIZE A1P

DRAWING TO BE READ IN CONJUNCTION WITH A0000 LEGEND, RELEVANT SCHEDULES AND PROJECT SPECIFICATION.



ISSUE	DATE	AMENDMENT	INT.	APP.
SP01	XX.XX.22	COMBINED SPATIALS	MW	CO

CO-ORDINATED REFERENCE DRAWINGS		
SERVICE	DRAWING NUMBER	DATE
ARCH		
CIVIL		
ELEC		
MECH		
RCP		
STRUCT		

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Drawing Title:

HYD / FIRE SPATIALS
LEVEL 3

NOT FOR CONSTRUCTION

North Point:	Design: XX
	Design Validated: XX
	Amendment Approved: CO
	Drawn: XX
Date: APRIL 2022	Scale: **1:200 @A1**

Job No.:	Disc:	Dwg No.:	Stage:	Issue:
22542-001	ALL	104	SP	02

ORIGINAL SIZE A1P

DRAWING TO BE READ IN CONJUNCTION WITH A0000 LEGEND, RELEVANT SCHEDULES AND PROJECT SPECIFICATION.

ISSUE	DATE	AMENDMENT	INT.	APP.
SP01	XX.XX.22	COMBINED SPATIALS	MW	CO

CO-ORDINATED REFERENCE DRAWINGS

SERVICE	DRAWING NUMBER	DATE
ARCH		
CIVIL		
ELEC		
MECH		
RCP		
STRUCT		

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Drawing Title:

HYD / FIRE SPATIALS
LEVEL 4

NOT FOR CONSTRUCTION

North Point:

Design:	XX
Design Validated:	XX
Amendment Approved:	CO
Drawn:	XX
Date: APRIL 2022	Scale: **1:200 @A1**

Job No.:	Disc:	Dwg No.:	Stage:	Issue:
22542-001	ALL	105	SP 02	

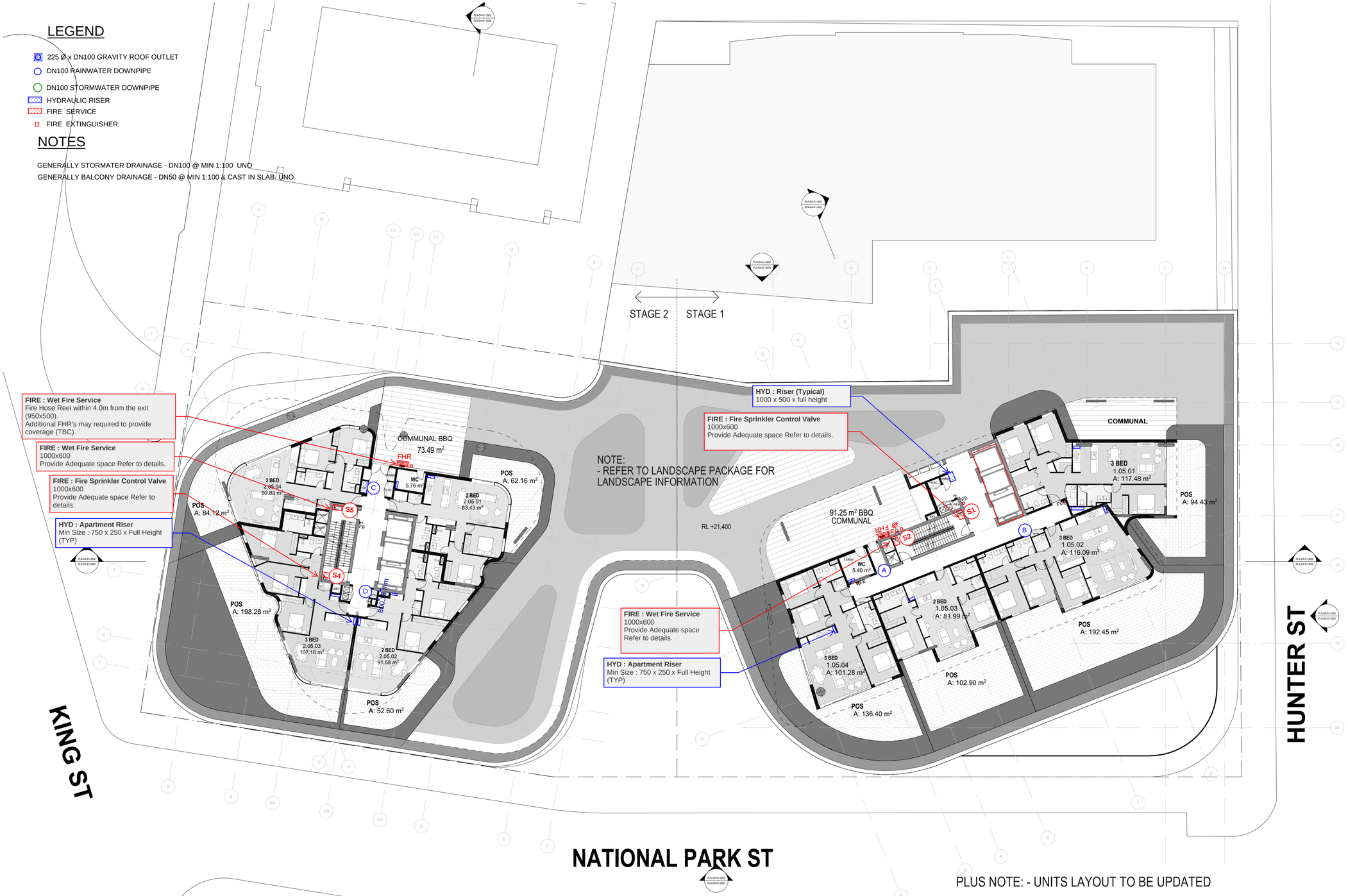
ORIGINAL SIZE A1P

LEGEND

- 225 Ø x DN100 GRAVITY ROOF OUTLET
- DN100 RAINWATER DOWNPIPE
- DN100 STORMWATER DOWNPIPE
- HYDRAULIC RISER
- FIRE SERVICE
- FIRE EXTINGUISHER

NOTES

GENERALLY STORMATER DRAINAGE - DN100 @ MIN 1:100 UNO
GENERALLY BALCONY DRAINAGE - DN50 @ MIN 1:100 & CAST IN SLAB UNO



PLUS NOTE: - UNITS LAYOUT TO BE UPDATED

DRAWING TO BE READ IN CONJUNCTION WITH A0000 LEGEND, RELEVANT SCHEDULES AND PROJECT SPECIFICATION.

ISSUE	DATE	AMENDMENT	INT.	APP.
SP01	XX.XX.22	COMBINED SPATIALS	MW	CO

CO-ORDINATED REFERENCE DRAWINGS		
SERVICE	DRAWING NUMBER	DATE
ARCH		
CIVIL		
ELEC		
MECH		
RCP		
STRUCT		

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Project:

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NSW 2302

Drawing Title:

HYD / FIRE SPATIALS
LEVEL 5

NOT FOR CONSTRUCTION

North Point:	Design: XX
	Design Validated: XX
	Amendment Approved: CO
	Drawn: XX
Date APRIL 2022	Scale: **1:200 @A1**

Job No.:	Disc:	Dwg No.:	Stage:	Issue:
22542-001	ALL	106	SP 02	

ORIGINAL SIZE A1P

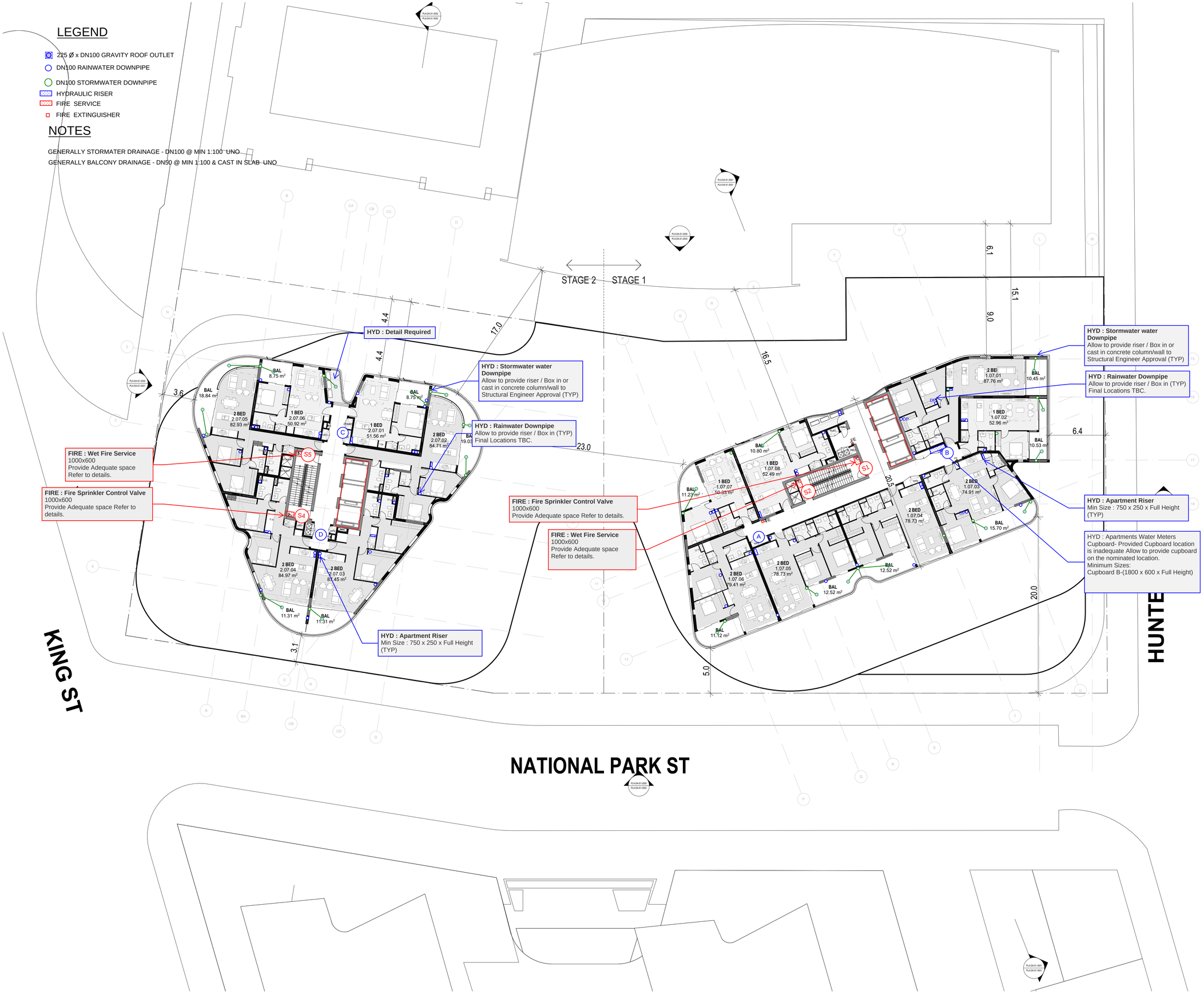
LEGEND

- 225 Ø x DN100 GRAVITY ROOF OUTLET
- DN100 RAINWATER DOWNPIPE
- DN100 STORMWATER DOWNPIPE
- HYDRAULIC RISER
- FIRE SERVICE
- FIRE EXTINGUISHER

NOTES

GENERALLY STORMATER DRAINAGE - DN100 @ MIN 1:100 UNO

GENERALLY BALCONY DRAINAGE - DN50 @ MIN 1:100 & CAST IN SLAB UNO



DRAWING TO BE READ IN CONJUNCTION WITH A0000 LEGEND, RELEVANT SCHEDULES AND PROJECT SPECIFICATION.

ISSUE	DATE	AMENDMENT	INT.	APP.
SP01	XX.XX.22	COMBINED SPATIALS	MW	CO

CO-ORDINATED REFERENCE DRAWINGS

SERVICE	DRAWING NUMBER	DATE
ARCH		
CIVIL		
ELEC		
MECH		
RCP		
STRUCT		

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StHilliers

Services Engineers:

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e: epicentre@epicentrece.com.au
w: www.epicentrece.com.au

ISO 9001 Quality Management

Project:

711 HUNTER ST
NEWCASTLE WEST
NSW 2302

Drawing Title:

HYD / FIRE SPATIALS
LEVEL 7

NOT FOR CONSTRUCTION

North Point:

Design: XX

Design Validated: XX

Amendment Approved: CO

Drawn: XX

Date: APRIL 2022

Scale: **1:200 @A1**

Job No.:	Disc:	Dwg No.:	Stage:	Issue:
22542-001	ALL	107a	SP 02	

ORIGINAL SIZE A1P

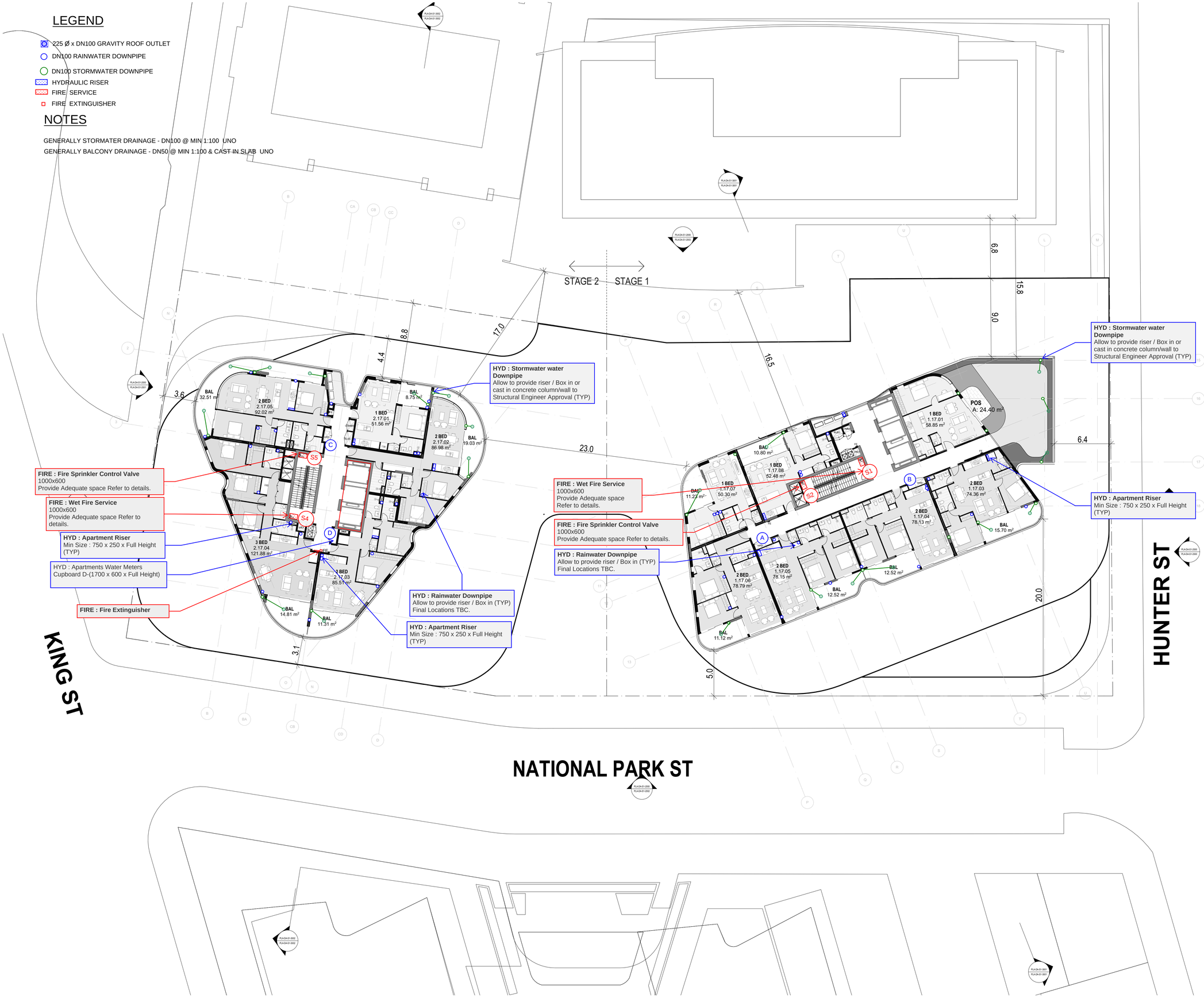
LEGEND

- 225 Ø x DN100 GRAVITY ROOF OUTLET
- DN100 RAINWATER DOWNPIPE
- DN100 STORMWATER DOWNPIPE
- HYDRAULIC RISER
- FIRE SERVICE
- FIRE EXTINGUISHER

NOTES

GENERALLY STORMATER DRAINAGE - DN100 @ MIN 1:100 UNO

GENERALLY BALCONY DRAINAGE - DN50 @ MIN 1:100 & CAST IN SLAB UNO



DRAWING TO BE READ IN CONJUNCTION WITH A0000 LEGEND, RELEVANT SCHEDULES AND PROJECT SPECIFICATION.

ISSUE	DATE	AMENDMENT	INT.	APP.
SP01	XX.XX.22	COMBINED SPATIALS	MW	CO

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ELEC		
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RCP		
STRUCT		

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Drawing Title:

HYD / FIRE SPATIALS
LEVELS 17

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	Amendment Approved: CO
	Drawn: XX
	Scale: 1:200 @A1

Job No.:	Disc:	Dwg No.:	Stage:	Issue:
22542-001	ALL	109	SP	02

ORIGINAL SIZE A1P

LEGEND

- 225 Ø x DN100 GRAVITY ROOF OUTLET
- DN100 RAINWATER DOWNPIPE
- DN100 STORMWATER DOWNPIPE
- HYDRAULIC RISER
- FIRE SERVICE
- FIRE EXTINGUISHER

NOTES

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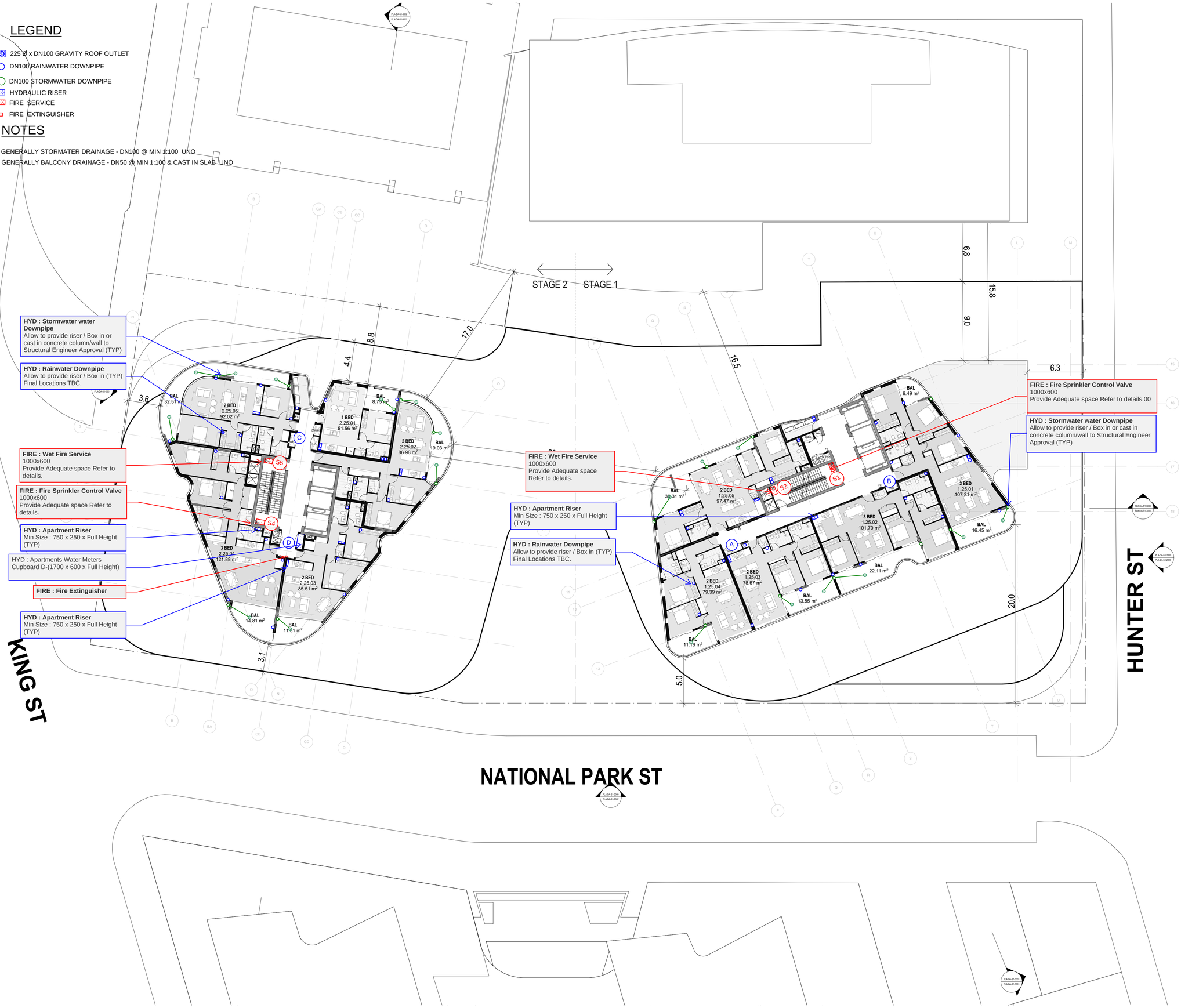
GENERALLY BALCONY DRAINAGE - DN50 @ MIN 1:100 & CAST IN SLAB UNO



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Drawing Title:

HYD / FIRE SPATIALS
LEVEL 25

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North Point:

Date: APRIL 2022	Design: XX
	Design Validated: XX
	Amendment Approved: CO
	Drawn: XX
	Scale: **1:200 @A1**

Job No.:	Disc:	Dwg No.:	Stage:	Issue:
22542-001	ALL	110a	SP 02	

ORIGINAL SIZE A1P

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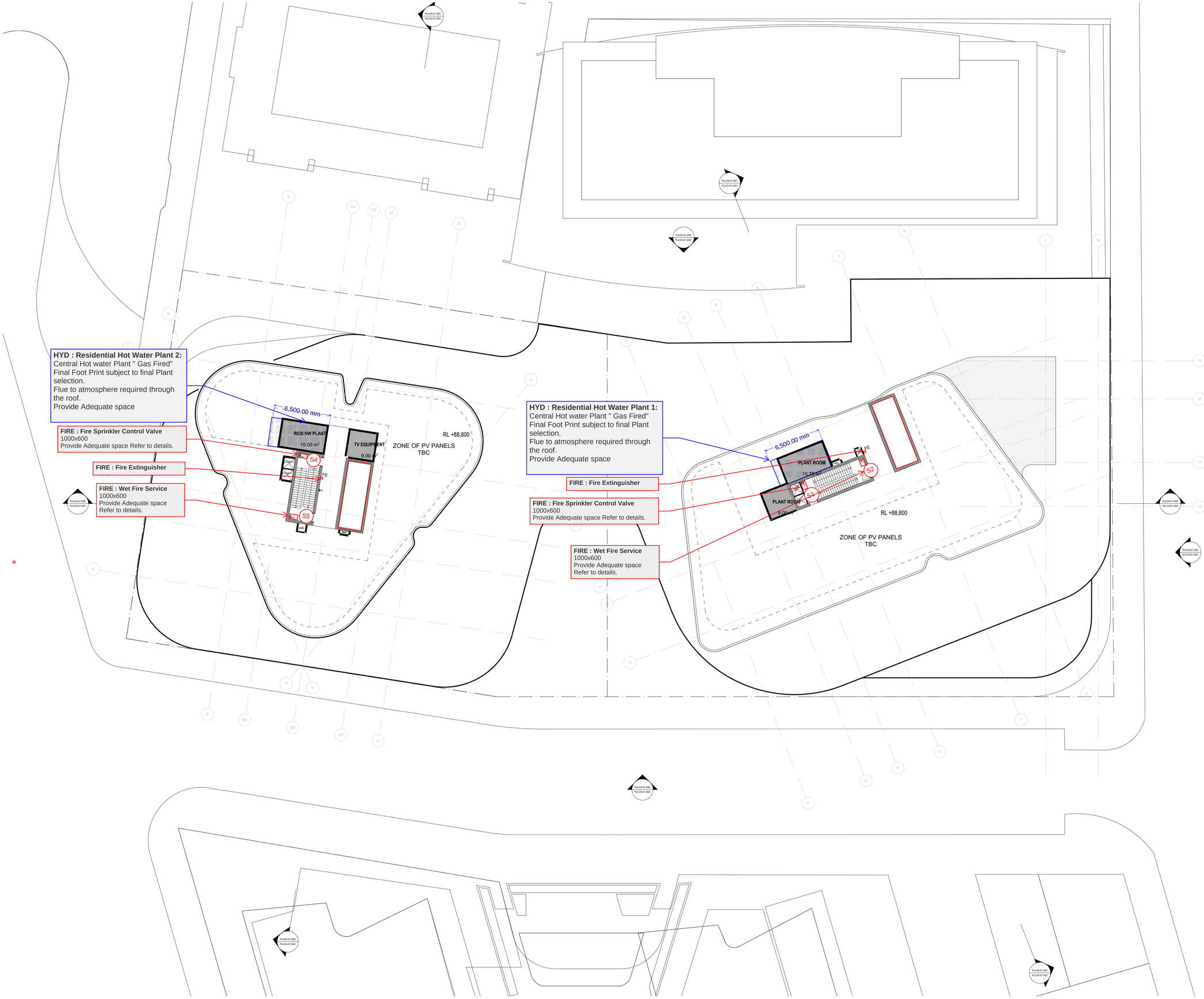

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SP01	XX.XX.22	COMBINED SPATIALS	MW	CO

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Drawing Title:

HYD / FIRE SPATIALS
LEVEL 26

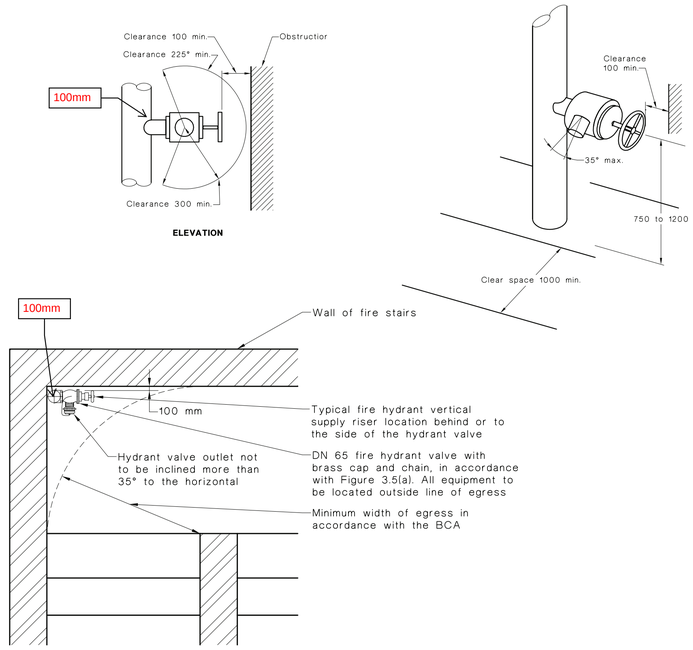
NOT FOR CONSTRUCTION

North Point:

Design: XX
Design Validated: XX
Amendment Approved: CO
Drawn: XX
Date: APRIL 2022
Scale: **1:200 @A1**

Job No.:	Disc:	Dwg No.:	Stage:	Issue:
22542-001	ALL	100	-	SP 02

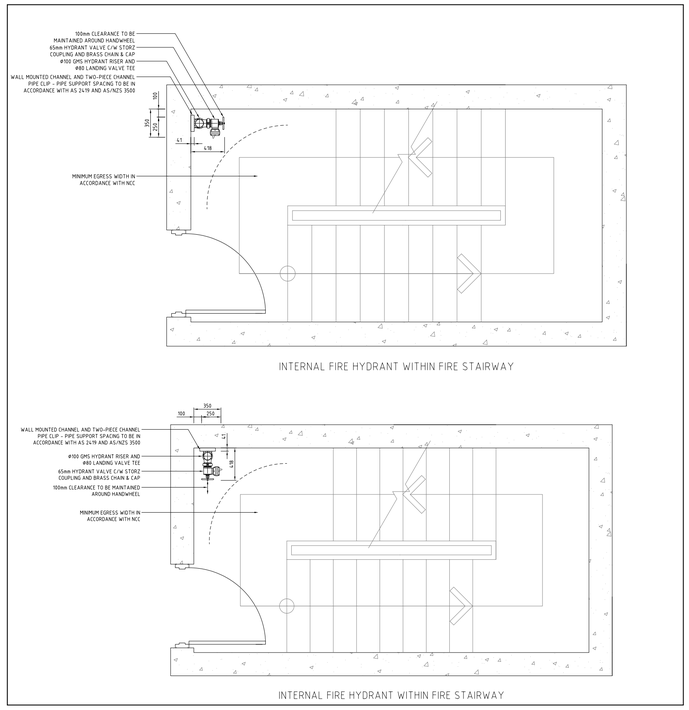
ORIGINAL SIZE A1P



DIMENSIONS IN MILLIMETRES

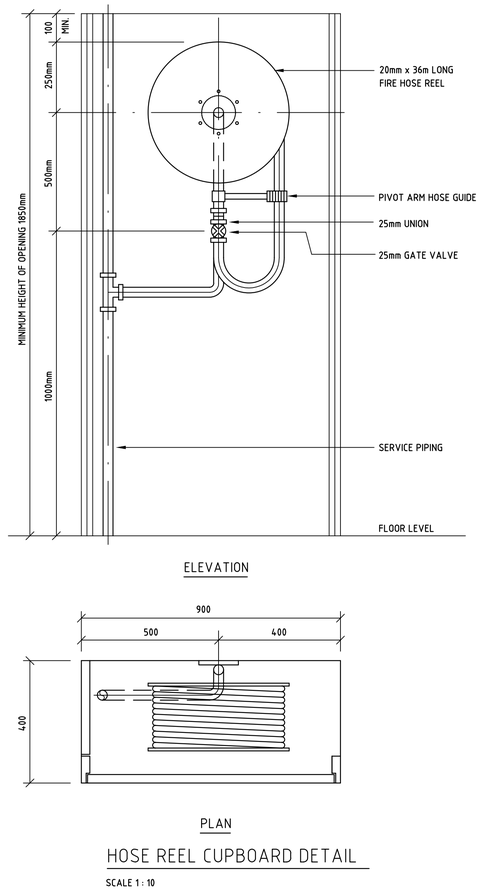
Fire: Typical Hydrant Clearance Details

NTS



DIMENSIONS:

Height x width x depth: 1180 x 760 x 420

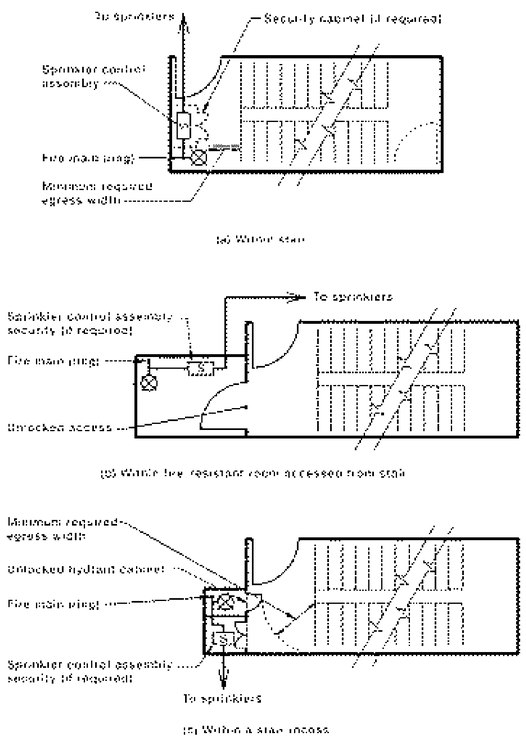


HOSE REEL CUPBOARD DETAIL

SCALE 1 : 10

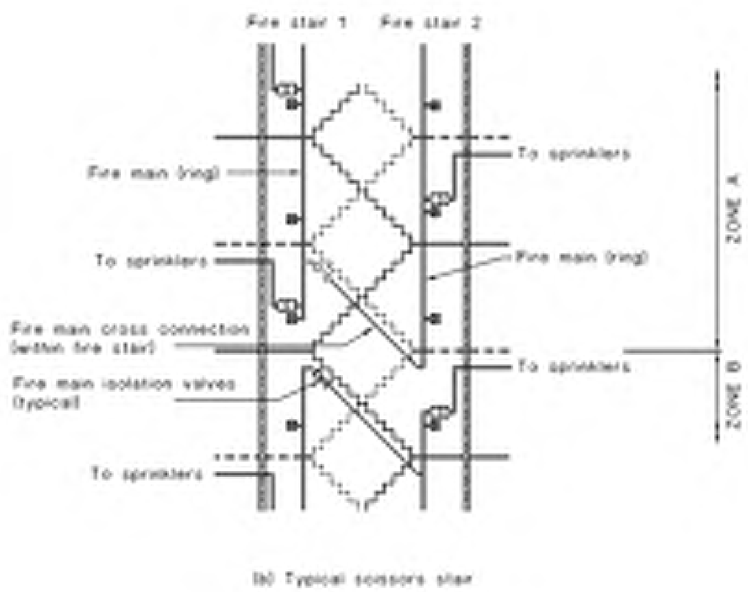
Fire: Typical FHR Clearance Details

NTS



Fire: Typical Locations Of Sprinkler Control Assemblies Details

NTS



Fire: Typical Hydrant Clearance Details

NTS

ISSUE	DATE	AMENDMENT	INT.	APP.
SP01	XX.XX.22	COMBINED SPATIALS	MW	CO

CO-ORDINATED REFERENCE DRAWINGS		
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Project:

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NEWCASTLE WEST
NSW 2302

Drawing Title:

HYD / FIRE SPATIALS DETAILS

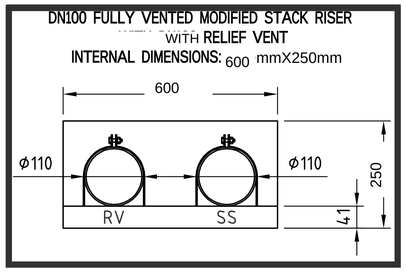
NOT FOR CONSTRUCTION

North Point:	Design: XX
	Design Validated: XX
	Amendment Approved: CO
	Drawn: XX
Date: APRIL 2022	Scale: 1:200 @A1

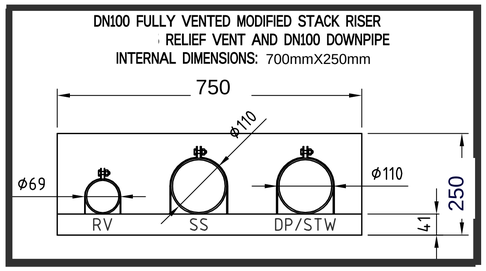
Job No.: | Disc: | Dwg No.: | Stage: | Issue:

-ALL- 113- SP -01

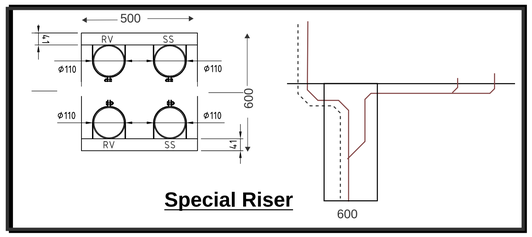
ORIGINAL SIZE - A1P



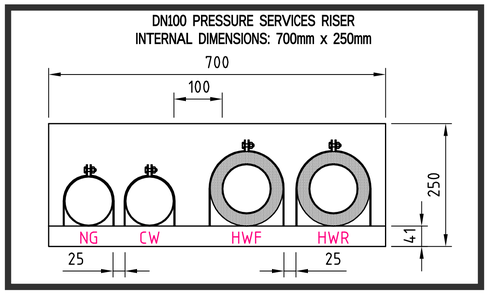
Detail - H-01



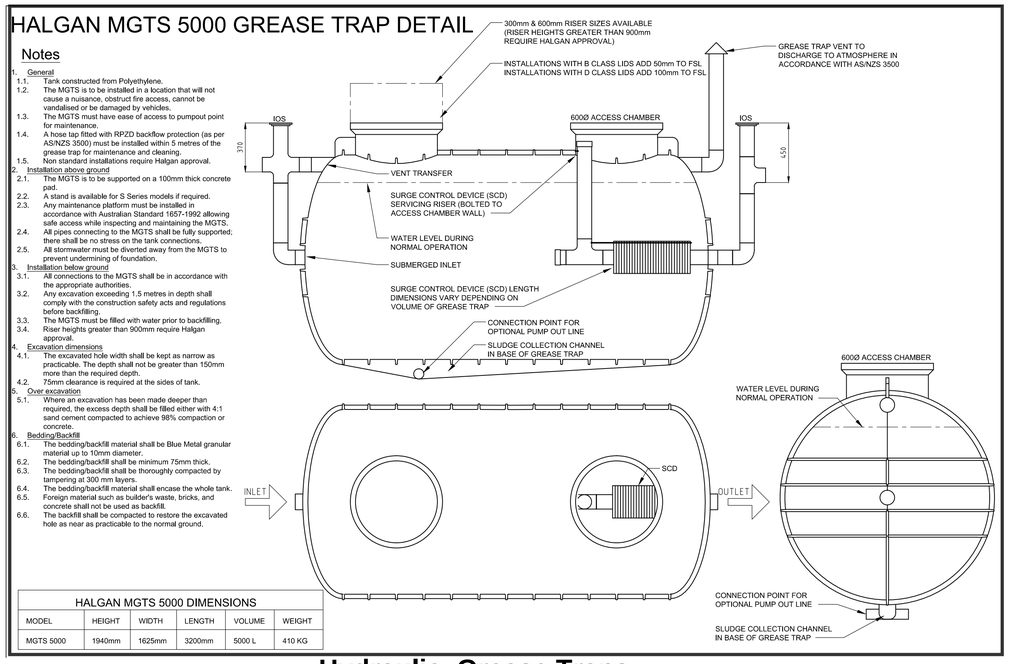
Detail - H-02



Detail - H-03



Hydraulic Riser
Spatial Requirement Typical Details



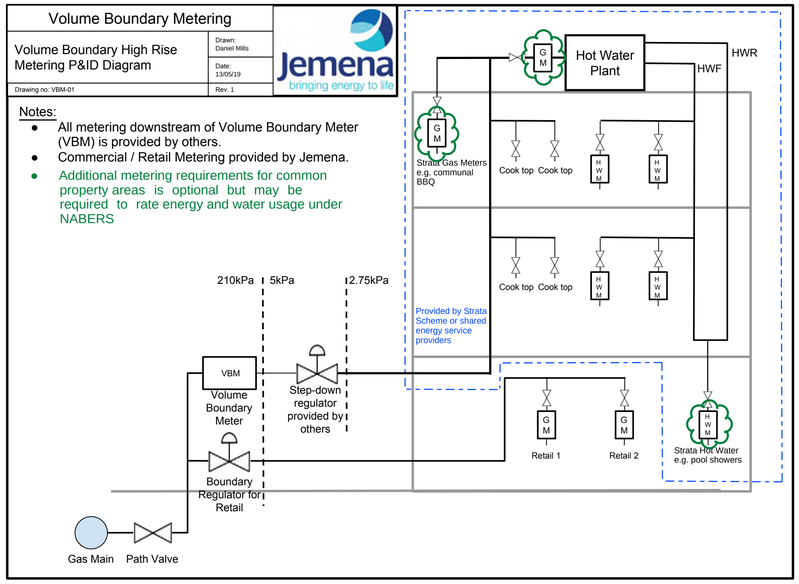
Notes

1. General
   - 1.1. Tank constructed from Polyethylene.
   - 1.2. The MGTS is to be installed in a location that will not cause a nuisance, obstruct fire access, cannot be vandalised or be damaged by vehicles.
   - 1.3. The MGTS must have ease of access to pumpout point for maintenance.
   - 1.4. A hose tap fitted with RPZD backflow protection (as per AS/NZS 3500) must be installed within 5 metres of the grease trap for maintenance and cleaning.
   - 1.5. Non standard installations require Halgan approval.
2. Installation above ground
   - 2.1. The MGTS is to be supported on a 100mm thick concrete pad.
   - 2.2. A stand is available for S Series models if required.
   - 2.3. Any maintenance platform must be installed in accordance with Australian Standard 1657-1992 allowing safe access while inspecting and maintaining the MGTS.
   - 2.4. All pipes connecting to the MGTS shall be fully supported; there shall be no stress on the tank connections.
   - 2.5. All stormwater must be diverted away from the MGTS to prevent undermining of foundation.
3. Installation below ground
   - 3.1. All connections to the MGTS shall be in accordance with the appropriate authorities.
   - 3.2. Any excavation exceeding 1.5 metres in depth shall comply with the construction safety acts and regulations before backfilling.
   - 3.3. The MGTS must be filled with water prior to backfilling.
   - 3.4. Riser heights greater than 900mm require Halgan approval.
4. Excavation dimensions
   - 4.1. The excavated hole width shall be kept as narrow as practicable. The depth shall not be greater than 150mm more than the required depth.
   - 4.2. 75mm clearance is required at the sides of tank.
5. Over excavation
   - 5.1. Where an excavation has been made deeper than required, the excess depth shall be filled either with 4:1 sand cement compacted to achieve 98% compaction or concrete.
6. Bedding/Backfill
   - 6.1. The bedding/backfill material shall be Blue Metal granular material up to 10mm diameter.
   - 6.2. The bedding/backfill shall be minimum 75mm thick.
   - 6.3. The bedding/backfill shall be thoroughly compacted by tampering at 300 mm layers.
   - 6.4. The bedding/backfill material shall encase the whole tank.
   - 6.5. Foreign material such as builder's waste, bricks, and concrete shall not be used as backfill.
   - 6.6. The backfill shall be compacted to restore the excavated hole as near as practicable to the normal ground.

HALGAN MGTS 5000 DIMENSIONS

MODEL	HEIGHT	WIDTH	LENGTH	VOLUME	WEIGHT
MGTS 5000	1940mm	1625mm	3200mm	5000 L	410 KG

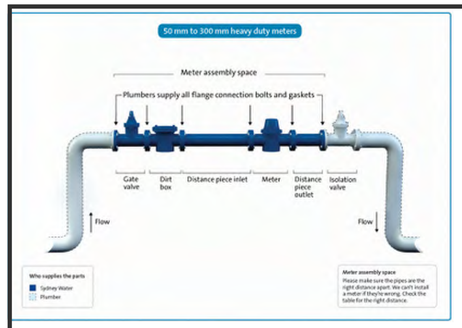
Hydraulic Grease Traps
Spatial Requirement Typical Details



Notes:

- All metering downstream of Volume Boundary Meter (VBM) is provided by others.
- Commercial / Retail Metering provided by Jemena.
- Additional metering requirements for common property areas is optional but may be required to rate energy and water usage under NABERS

Hydraulic GAS
Embedded Gas Jemena Typical Details



Meter size DN	Gate valve PN16	Dirt box	Distance piece inlet	Meter	Distance piece outlet	Meter assembly space
50 mm heavy	175 mm	208 mm	372 mm	311 mm	150 mm	1,216 mm
80 mm	203 mm	252 mm	396 mm	413 mm	240 mm	1,504 mm
100 mm	229 mm	260 mm	476 mm	483 mm	300 mm	1,748 mm
150 mm	267 mm	406 mm	762 mm	500 mm	450 mm	2,385 mm
200 mm	292 mm	428 mm	1,000 mm	520 mm	600 mm	2,840 mm
250 mm	330 mm	522 mm	1,250 mm	450 mm	750 mm	3,302 mm
300 mm	356 mm	580 mm	1,500 mm	500 mm	900 mm	3,836 mm

Water Meter & Back flow Prevention Dimension

100 HD	1463*	1373	2836	3250	500	1000
150 HD	1952*	1729	3681	4200	500	1000

Hydraulic Cold Water Master Meter
Spatial Requirement Typical Details

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SP01	XX.XX.22	COMBINED SPATIALS	MW	CO

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HYD / FIRE SPATIALS DETAILS

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	Amendment Approved: CO
	Drawn: XX
Date: APRIL 2022	Scale: 1:200 @A1

Job No.: | Disc: | Dwg No.: | Stage: | Issue:
-ALL- 114- SP -01

ORIGINAL SIZE A1P

IMPORTANT INFORMATION ABOUT YOUR TETRA TECH COFFEY ENVIRONMENTAL REPORT

Introduction

This report has been prepared by Tetra Tech Coffey for you, as Tetra Tech Coffey's client, in accordance with our agreed purpose, scope, schedule and budget.

The report has been prepared using accepted procedures and practices of the consulting profession at the time it was prepared, and the opinions, recommendations and conclusions set out in the report are made in accordance with generally accepted principles and practices of that profession.

The report is based on information gained from environmental conditions (including assessment of some or all of soil, groundwater, vapour and surface water) and supplemented by reported data of the local area and professional experience. Assessment has been scoped with consideration to industry standards, regulations, guidelines and your specific requirements, including budget and timing. The characterisation of site conditions is an interpretation of information collected during assessment, in accordance with industry practice.

This interpretation is not a complete description of all material on or in the vicinity of the site, due to the inherent variation in spatial and temporal patterns of contaminant presence and impact in the natural environment. Tetra Tech Coffey may have also relied on data and other information provided by you and other qualified individuals in preparing this report. Tetra Tech Coffey has not verified the accuracy or completeness of such data or information except as otherwise stated in the report. For these reasons the report must be regarded as interpretative, in accordance with industry standards and practice, rather than being a definitive record.

Your report has been written for a specific purpose

Your report has been developed for a specific purpose as agreed by us and applies only to the site or area investigated. Unless otherwise stated in the report, this report cannot be applied to an adjacent site or area, nor can it be used when the nature of the specific purpose changes from that which we agreed.

For each purpose, a tailored approach to the assessment of potential soil and groundwater contamination is required. In most cases, a key objective is to identify, and if possible quantify, risks that both recognised and potential contamination pose in the context of the agreed purpose. Such risks may be financial (for example, clean up costs or constraints on site use) and/or physical (for example, potential health risks to users of the site or the general public).

Limitations of the Report

The work was conducted, and the report has been prepared, in response to an agreed purpose and scope, within time and budgetary constraints, and in reliance on certain data and information made available to Tetra Tech Coffey.

The analyses, evaluations, opinions and conclusions presented in this report are based on that purpose and scope, requirements, data or information, and they could change if such requirements or data are inaccurate or incomplete.

This report is valid as of the date of preparation. The condition of the site (including subsurface conditions) and extent or nature of contamination or other environmental hazards can change over time, as a result of either natural processes or human influence. Tetra Tech Coffey should be kept appraised of any such events and should be consulted for further investigations if any changes are noted, particularly during construction activities where excavations often reveal subsurface conditions.

In addition, advancements in professional practice regarding contaminated land and changes in applicable statues and/or guidelines may affect the validity of this report. Consequently, the currency of conclusions and recommendations in this report should be verified if you propose to use this report more than 6 months after its date of issue.

The report does not include the evaluation or assessment of potential geotechnical engineering constraints of the site.

Interpretation of factual data

Environmental site assessments identify actual conditions only at those points where samples are taken and on the date collected. Data derived from indirect field measurements, and sometimes other reports on the site, are interpreted by geologists, engineers or scientists to provide an opinion about overall site conditions, their likely impact with respect to the report purpose and recommended actions.

Variations in soil and groundwater conditions may occur between test or sample locations and actual conditions may differ from those inferred to exist. No environmental assessment program, no matter how comprehensive, can reveal all subsurface details and anomalies. Similarly, no professional, no matter how well qualified, can reveal what is hidden by earth, rock or changed through time.

The actual interface between different materials may be far more gradual or abrupt than assumed based on the facts obtained. Nothing can be done to change the actual site conditions which exist, but steps can be taken to reduce the impact of unexpected conditions.

For this reason, parties involved with land acquisition, management and/or redevelopment should retain the services of a suitably qualified and experienced environmental consultant through the development and use of the site to identify variances, conduct additional tests if required, and recommend solutions to unexpected conditions or other unrecognised features encountered on site. Tetra Tech Coffey would be pleased to assist with any investigation or advice in such circumstances.

Recommendations in this report

This report assumes, in accordance with industry practice, that the site conditions recognised through discrete sampling are representative of actual conditions throughout the investigation area. Recommendations are based on the resulting interpretation.

Should further data be obtained that differs from the data on which the report recommendations are based (such as through excavation or other additional assessment), then the recommendations would need to be reviewed and may need to be revised.

Report for benefit of client

Unless otherwise agreed between us, the report has been prepared for your benefit and no other party. Other parties should not rely upon the report or the accuracy or completeness of any recommendation and should make their own enquiries and obtain independent advice in relation to such matters.

Tetra Tech Coffey assumes no responsibility and will not be liable to any other person or organisation for, or in relation to, any matter dealt with or conclusions expressed in the report, or for any loss or damage suffered by any other person or organisation arising from matters dealt with or conclusions expressed in the report.

To avoid misuse of the information presented in your report, we recommend that Tetra Tech Coffey be consulted before the report is provided to another party who may not be familiar with the background and the purpose of the report. In particular, an environmental disclosure report for a property vendor may not be suitable for satisfying the needs of that property's purchaser. This report should not be applied for any purpose other than that stated in the report.

Interpretation by other professionals

Costly problems can occur when other professionals develop their plans based on misinterpretations of a report. To help avoid misinterpretations, a suitably qualified and experienced environmental consultant should be retained to explain the implications of the report to other professionals referring to the report and then review plans and specifications produced to see how other professionals have incorporated the report findings.

Given Tetra Tech Coffey prepared the report and has familiarity with the site, Tetra Tech Coffey is well placed to provide such assistance. If another party is engaged to interpret the recommendations of the report, there is a risk that the contents of the report may be misinterpreted and Tetra Tech Coffey disowns any responsibility for such misinterpretation.

Data should not be separated from the report

The report as a whole presents the findings of the site assessment and the report should not be copied in part or altered in any way. Logs, figures, laboratory data, drawings, etc. are customarily included in our reports and are developed by scientists or engineers based on their interpretation of field logs, field testing and laboratory evaluation of samples. This information should not under any circumstances be redrawn for inclusion in other documents or separated from the report in any way.

This report should be reproduced in full. No responsibility is accepted for use of any part of this report in any other context or for any other purpose or by third parties.

Responsibility

Environmental reporting relies on interpretation of factual information using professional judgement and opinion and has a level of uncertainty attached to it, which is much less exact than other design disciplines. This has often resulted in claims being lodged against consultants, which are unfounded. As noted earlier, the recommendations and findings set out in this report should only be regarded as interpretive and should not be taken as accurate and complete information about all environmental media at all depths and locations across the site.