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Engineering | Environmental | Testing

Report Type:

Combined Stage 1 Preliminary Site Investigation & Stage 2 Detailed Site Investigation

Project Address:

268-272 Fitzgerald Ave, Maroubra NSW
Portions of Lot 4370 & Lot 4916 in DP752015

Client Name:

Sydney Catholic Schools c/o JDH Architects

29 October 2019
Report No: 9194.1-ER-1-1

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EXECUTIVE SUMMARY

Alliance Geotechnical Pty Ltd (AG) was engaged by Freedom Development Group, to undertake a Combined Stage 1 Preliminary Site Investigation & Stage 2 Detailed Site Investigation for 268-272 Fitzgerald Ave, Maroubra NSW (refer **Figure 1** with the 'site' boundaries outlined in **Figure 2**).

AG has the following project appreciation:

- The site is proposed for redevelopment, comprising demolition of existing buildings and construction of a new classroom building;
- A contamination assessment of the site is required for inclusion with a development application to council.

The objectives of this investigation were to:

- Assess the potential for contamination to be present on the site as a result of past and current land use activities;
- Provide advice on whether the site would be suitable (in the context of land contamination) for the proposed land use setting; and
- Provide recommendations for further investigation, management and/or remediation (if warranted).

The scope of works undertaken to address the investigation objectives, included:

- A desktop review of relevant information pertaining to the site;
- A site walkover to understand current site conditions;
- The preparation of a Sampling and Analysis Quality Plan (SAQP);
- Conduct an intrusive site investigation to establish ground conditions and to facilitate the collection of representative soil samples;
- Laboratory analysis of selected samples collected during the field investigation; and
- An assessment of the contamination status of the site and the recommendation of any further remedial requirements associated with the redevelopment of the site (if necessary).

Conclusions

Based on AG's assessment of the desktop review information, fieldwork data and laboratory analytical data, in the context of the proposed redevelopment scenario, AG makes the following conclusions:

- The detected concentrations of identified contaminants of potential concern in the soils assessed are considered unlikely to present:
    - An unacceptable inhalation / vapour intrusion human health exposure risk; or
    - An unacceptable petroleum management limit risk.
- The detected concentrations of contaminants in the soils assessed are considered unlikely to present a direct contact human health risk;
- The detected concentrations of asbestos in the soils assessed are considered unlikely to present a direct contact human health risk;
- The detected concentrations of contaminants in the soils assessed are considered unlikely to present an unacceptable ecological health risk; l·yŘ
- Based on the assessments undertaken as part of this investigation, AG has concluded that the site is suitable for the proposed redevelopment.

This report, including its conclusions and recommendations, must be read in conjunction with the limitations presented in **Section 16.**

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LIST OF ABBREVIATIONS

AG	Alliance Geotechnical Pty Ltd
AHD	Australian Height Datum
ANZECC	Australian and New Zealand Environment and Conservation Council
AST	Aboveground storage tank
Bgs	Below ground surface
BTEX	Benzene, Toluene, Ethylbenzene, Xylene
Btoc	Below top of casing
CoC	Chain of Custody
CoT	Certificate of Title
CSM	Conceptual Site Model
DPI-W	Department of Primary Industry – Water
DSI	Detailed Site Investigation
EC	Electrical conductivity
EIL	Ecological Investigation Level
EPA	Environment Protection Authority
GS	Geological Survey of NSW
HIL	Health Investigation Levels
HSL	Health Screening Levels
IL	Investigation Levels
LOR	[Laboratory] Limit of reporting
MS	Matrix spike
NATA	National Association of Testing Laboratories
N/A	Not applicable
ND	Not detected
NEPC	National Environment Protection Council
NEPM	National Environment Protection Measure
NSW EPA	NSW Environment Protection Authority
OCP	Organochlorine Pesticide
OPP	Organophosphorus Pesticide
PAH	Polycyclic aromatic hydrocarbon
PCB	Polychlorinated biphenyl
PID	Photo-ionisation detector
PSH	Phase separated hydrocarbon
PSI	Preliminary Site Investigation
QA/QC	Quality assurance/Quality control
RPD	Relative percentage difference
SAQP	Sampling Analysis and Quality Plan
SVOC	Semi-volatile organic compound
TDS	Total dissolved solids
TPH	Total petroleum hydrocarbon

PVC	Polyvinyl Chloride
USCS	Unified Soil Classification System
UST	Underground storage tank
VOC	Volatile organic carbon

1. INTRODUCTION

1.1. Background

Alliance Geotechnical Pty Ltd (AG) was engaged by Freedom Development Group, to undertake a Combined Stage 1 Preliminary Site Investigation & Stage 2 Detailed Site Investigation for 268-272 Fitzgerald Ave, Maroubra NSW (refer **Figure 1** with the 'site' boundaries outlined in **Figure 2**).

AG has the following project appreciation:

- The site is proposed for redevelopment, comprising demolition of existing buildings and construction of a new classroom building;
- A contamination assessment of the site is required for inclusion with a development application to council.

1.2. Proposed Development

The proposed development consists of the following:

- Demolition of existing buildings and construction of a new multi storey classroom building.

The site is assessed as a school land-use setting. Currently under the *State Environmental Planning Policy (SEPP) No. 55 – Remediation of Land*, a consent authority must not consent to the carrying out of any redevelopment unless it has considered whether the land is contaminated. This report has been prepared to satisfy Clause 7 (2) and (3) of SEPP No. 55 and Randwick City Council planning policies.

1.3. Objectives

The objectives of this project were to:

- Assess the potential for contamination to be present on the site as a result of past and current land use activities;
- Provide advice on whether the site would be suitable (in the context of land contamination) for the proposed land use setting; and
- Provide recommendations for further investigation, management and/or remediation (if warranted).

1.4. Scope of Work

AG undertook the following scope of works to address the project objective:

- A desktop review of relevant information pertaining to the site;
- A site walkover to understand current site conditions;
- The preparation of a Sampling and Analysis Quality Plan (SAQP);
- Conduct an intrusive site investigation to establish ground conditions and to facilitate the collection of representative soil and groundwater samples;
- Laboratory analysis of selected samples collected during the field investigation; and
- An assessment of the contamination status of the site and the recommendation of any further remedial requirements associated with the redevelopment of the site (if necessary).

2. SITE IDENTIFICATION

The site is identified as Portions of Lot 4370 & Lot 4916 in DP752015.

The approximate geographic coordinates of the middle of the site, inferred from Google Earth were 33°56'50.2"S 151°15'08.3"E.

The locality of the site is set out in **Figure 1**.

The general layout and boundary of the site is set out in **Figure 2**.

A copy of a detail and level survey is presented in **Appendix A**.

3. GEOLOGY, ACID SULPHATE SOILS, TOPOGRAPHY AND HYDROGEOLOGY

3.1. Geology

A review of the Sydney 1:100,000 Geological Series Sheet (1st Edition, 1983), indicated that the site is likely to be underlain by Quaternary (Qhf) medium to fine "marine" sand.

3.2. Acid Sulphate Soils

A review of the Department of Land and Water Conservation NSW Acid Sulphate Soil Risk Map for the site indicates that the site lies in an area mapped as '*Low Probability*' with respect to acid sulphate soils, which in this case means that acid sulfate soils are not likely to occur above 3m bgs.

Further assessment of acid sulphate soils in the context of this investigation is considered by AG as not warranted.

3.3. Topography

The site is located at an elevation of approximately 8 m Australian Height Datum (AHD). Topography of the site slopes towards the east.

3.4. Hydrogeology

Surface water courses proximal to the site included Maroubra Beach, located approximately 520 m to the east of the site.

Based on distances to the nearest surface water course and the site topography, groundwater flow in the vicinity of the site is considered likely to be towards the east.

A review of the NSW Office of Water groundwater database undertaken on 3 October 2019 indicated there were 33 registered groundwater features located within a 500m radius of the site. The closest five are listed below (Source: www.realtimedata.waternsw.com.au/water.stm):

- GW105962;
- GW026584;
- GW025716;
- GW024206; and
- GW023841.

A copy of the NSW Office of Water search record is presented in **Appendix B**.

4. SITE HISTORY AND LAND USE

4.1. Land Titles

A search of historical land title ownership was undertaken. The search results indicate that registered proprietors of the site since 1906, have been private individuals, and the Roman Catholic Church for the Archdiocese of Sydney, and the site was held for an amusement park.

There were no easements or leases reported for the site.

The results of the land title ownership search indicate a low potential for land contaminating activities to have been undertaken on the site. Further assessment of potential land contaminating activities, however, in the context of other historical information identified during this investigation and site walkover observations, is considered warranted.

A copy of the land title search record is presented in **Appendix C**.

4.2. Aerial Imagery

A review of selected historical aerial imagery of the site was undertaken. Observations made of the imagery considered relevant to this investigation, are presented in **Table 4.2.**

Table 4.2. Aerial Imagery Observations

Image Date	Site Features	Surrounding Land Use Settings
1930	Site appears to be cleared land, surrounded by streets.	Low density residential in all directions, with a park to the east.
1955	A large dwelling has appeared in the central southern portion of the site.	Increase in low density in all directions, with potential sports fields to the north.
1971	Two buildings have appeared, one on each side of the initial dwelling.	Further increase.
1989	An adjoining building has appeared to the norther of the initial three, and the site appears to be landscaped.	Further increase.
2000	The north west corner of the site appears to have an asphalt court.	No significant change from previous image.
2012	No significant change from previous image.	No significant change from previous image.
2018 (Nearmap)	No significant change from previous image.	No significant change from previous image.

The aerial imagery review indicated a potential for land contaminating activities to have been undertaken, specifically land activities prior to 1930.

Further assessment of potential land contaminating activities, in the context of other historical information identified during this investigation and site walkover observations, is considered warranted.

4.3. Anecdotal Information

There was no anecdotal information provided to AG as part of this project.

4.4. Incident Reports

There was no anecdotal information provided to AG as part of this project.

4.5. Complaints History

There was no complaints history provided to AG during the investigation.

4.6. Previous Contamination Assessments

There were no previous contamination assessment reports made available to AG during this investigation.

5. REGULATORY RECORDS

5.1. NSW EPA CLM Act Record of Notices

A search of the publicly available online NSW EPA CLM Act Record of Notices was completed on 3 October 2019. The results indicated that the site was not the subject of any notifications under Section 58 of the *Contaminated Land Management Act 1997*.

A copy of the CLM Act Record of Notices search record is presented in **Appendix D**.

5.2. NSW EPA POEO Act Register of Licences, Applications and Notices

A search of the publicly available online NSW EPA Record of Notices was completed on 3 October 2019. The results indicated that the site was not the subject of any licences, applications, notices, audits or pollution studies or reduction programs under Section 308 of the *Protection of the Environment Operations Act 1997*.

A copy of the POEO Act Register of Licences, Applications and Notices search record is presented in **Appendix D**.

5.3. NSW EPA CLM Act Register of Notified Sites

A search of the publicly available online register of sites notified to the NSW EPA under Section 60 of the *Contaminated Land Management Act 1997*, was undertaken on 3 October 2019. The results indicated that no sites within the suburb of South Hurstville were contained on the register.

A copy of the NSW EPA CLM ACT Register of Notified Sites is presented in **Appendix D**.

5.4. Section 10.7 Planning Certificate

A copy of the planning certificate issued for the site under Section 10.7 of the Environmental Planning and Assessment Act was reviewed. The certificate indicated that, within the meaning of the Contaminated Land Management Act, the site was not:

- Significantly contaminated land;
- Subject to a management order;
- The subject of an approved voluntary management proposal;
- Subject to an ongoing maintenance order; or
- The subject of a site audit statement.

A copy of the planning certificate is presented in **Appendix E**.

5.5. SafeWork NSW Stored Chemical Information Database (SCID)

A search of Safe Work NSW stored chemical information database (SCID) was not undertaken for the site. A review of historical aerial imagery and historical land title ownership records for the site did not indicate a potential for licensable quantities of dangerous goods to have been historically stored on the site. AG considers that further assessment of storage of licensable quantities of dangerous goods on the site is not warranted.

6. SITE WALKOVER

A site walkover was undertaken on 8th October 2019 by a suitably experienced AG environmental consultant. The purpose of the site walkover was to make observations of land use activities on the site, and on properties immediately adjacent to the site.

6.1. Current Land Use Activity

The land use setting on the site appeared to be a primary school.

Image 6.1.1 View of current site conditions, facing east

6.2. Buildings and General Infrastructure

The following buildings and infrastructure were observed within the proposed site boundaries:

- Four multi storey brick office buildings;
- Demountable; and
- Artificial turfed playing fields.

Image 6.2.1 View of buildings and artificial turfed areas.

6.3. Boundary Fencing

The site boundary is securely enclosed along the entire perimeter, comprised of permanent steel fencing.

6.4. Adjacent Land Use Activities

Observations made during the site walkover indicated the following land use activities adjacent to the site:

- North - Bound by Mons Avenue, with a bowling club beyond;
- East - Broadarrow Reserve;
- West - Bound by Malabar Road with low density residential beyond; and
- South - Bound by Fitzgerald Avenue with low density residential beyond.

6.5. Odours and Staining

There were no olfactory or visual evidence of contamination observed on the site, during the site walkover.

6.6. Chemical Storage

There was no visual evidence observed of significant or widespread chemical storage on the site.

6.7. Underground and Aboveground Storage Tanks

There was no visual evidence observed of underground or aboveground petroleum storage tanks on the site.

6.8. Fill Material

Fill materials are inferred to have been used in areas including garden beds, beneath structural footings and during the construction of the site artificial turfed areas.

6.9. Wastes

Widespread storage of waste was not observed on site.

6.10. Asbestos Containing Materials

There was no visual evidence observed of potential asbestos containing materials on site.

6.11. Phytotoxicity

There was no visual evidence observed to suggest significant or widespread phytotoxic impact (in the form of dieback or plant stress) in the sparse vegetation at the site. Similar observations were made of visible vegetation on land adjacent to the site.

6.12. Surface Water and Site Drainage

Visual observations made in the context of site drainage during the walkover, indicated that drainage mechanisms on the site are likely to include:

- Downpipes from roofs and gutters into subsurface drainage infrastructure; and
- Infiltration into underlying soils, where soil permeability permits.

6.13. Adjacent Ecological Receptors

No significant ecological receptors were identified nearby the site. Specifically, the site is situated in a neighbourhood with a significant portion of the surrounding area covered in either concrete hardstand or asphaltic road. The closest surface water feature was identified as Maroubra Beach 550m to the east of the site.

7. DATA INTEGRITY ASSESSMENT

AG has relied on the following sources of data while undertaking this investigation:

- AG field observations during the site walkover;
- Randwick City Council;
- Department of Land and Water Conservations;
- Department of Minerals and Energy;
- Department of Primary Industries – Water;
- Australian Soil Resource Information System;
- Google Earth;
- National Environment Protection Council;
- Nearmap;
- NSW Environment Protection Authority;
- NSW Land and Property Information; and
- Water NSW.

Based on AG's experience and professional judgement, the data obtained from the sources relied upon, is considered to be adequately precise, accurate, representative, complete and comparable within the objectives of this investigation and for the purpose of drawing conclusions regarding land contamination risks at the site.

8. PRELIMINARY CONCEPTUAL SITE MODEL

8.1. Areas of Environmental Concern

The site history data collected and site walkover observations made were assessed within the objectives of this investigation and in the context of the proposed development works. That assessment identified areas of environmental concern (AEC) and contaminants of potential concern (COPC) which have the potential to be present on site. The AEC and associated COPC are presented in **Table 8.1**

Table 8.1: AEC and COPC

ID	Area of Environmental Concern	Land Use Activity	Contaminants of Potential Concern	Potentially affected mediums
AEC01	Site footprint	Imported fill	Heavy Metals, PAH, TRH, BTEX, OCP, PCB and Asbestos,	Soil

The potential contamination pathways are considered to be as follows:

- Inhalation/ingestion of contaminants released in dust during redevelopment by Site workers;
- Direct contact, ingestion or inhalation of soil by future site inhabitants;
- Migration of volatile compounds into proposed buildings/basements causing toxic effects, asphyxiation or risk of explosion;
- Migration of vapours into confined spaces within proposed on-site buildings/basements followed by inhalation by future residents;
- Permeation of hydrocarbons / organic contamination into underground service pits on site;
- Migration of impacted groundwater through fractures in bedrock; and
- Direct contact, ingestion or inhalation of groundwater contaminants by down groundwater gradient neighbouring residents.

Relevant potential receptors are considered to include:

- Onsite construction and maintenance workers;
- Third parties during construction (adjacent site users and adjacent residents);
- Onsite flora and fauna;
- Future residents/end users; and
- Neighbouring residential land users.

8.2. Land Use Setting

AG understands that the proposed redevelopment works comprise demolition of existing buildings and construction of a new classroom building.

Based on the proposed development works and guidance provided in NEPM ASC 2013, AG considers it reasonable to adopt the *'HIL A – residential with minimal opportunities for soil access'* land use setting for the purpose of assessing land contamination exposure risks. HIL A land uses includes children's day care centres, preschools and primary schools.

8.3. Direct Contact – Human Health

AG notes that the proposed development includes building footprints and hardstand pavement areas across most of the site, which would act as a direct contact barrier between potential land contamination and onsite receptors during operation of the site. However, some open space and landscaping areas will be established on site. In these areas, it is considered that a direct contact exposure pathway may be present between potential contamination and onsite receptors.

8.4. Inhalation / Vapour Intrusion – Human Health

In order for a potentially unacceptable inhalation / vapour intrusion human health exposure risk to exist, a primary vapour source (e.g. underground storage tank) or secondary vapour source (e.g. significantly contaminated soil or groundwater) must exist.

The site history review indicated there was no potential primary source for vapour intrusion on site.

AG consider the need for further inhalation / vapour intrusion human health risk assessment to be warranted.

8.5. Aesthetics – Human Health

Section 3.7 of Schedule B1 NEPM ASC advises that there are no specific numeric aesthetic guidelines, however site assessment requires a balanced consideration of the quantity, type and distribution of foreign material or odours in relation to the specific land use and its sensitivity.

Due to visual observations made during site visit and the nature of the proposed development concept, AG consider further aesthetics assessment and management warranted for the site.

8.6. Ecological Health - Terrestrial Ecosystems

Section 3.4.2 of schedule B1 NEPM ASC 2013, advises a pragmatic risk-based approach should be taken when assessing ecological risks in residential and commercial / industrial land use settings.

AG notes that the proposed development includes building footprints and hardstand pavement areas across most of the site, which would act as a direct contact barrier between potential land contamination and onsite receptors during operation of the site. However, some open space and deep soil areas will remain on site.

Due to the presence of these open space areas further ecological assessment is considered warranted.

8.7. Management Limits for Petroleum Hydrocarbon Compounds

NEPM ASC 2013 notes that there are a number of policy considerations which reflect the nature and properties of petroleum hydrocarbons:

- Formation of observable light non-aqueous phase liquids (LNAPL);
- Fire and explosive hazards; and
- Effects on buried infrastructure (e.g. penetration of or damage to, in-ground services by hydrocarbons).

Schedule B1 of NEPM ASC 2013 includes ‘management limits’ to avoid or minimise these potential effects. Application of the management limits requires consideration of site-specific factors such as the depth of building basements and services and depth to groundwater, to determine the maximum

depth to which the limits should apply. NEPM (2013) also notes that management limits may have less relevance at operating industrial sites which have no or limited sensitive receptors in the area of potential impact, and when management limits are exceeded, further site-specific assessment and management may enable any identified risk to be addressed.

9. DATA QUALITY OBJECTIVES

NEPM ASC 2013 provides guidance on the development of data quality objectives (DQO) using a seven-step process.

The DQO for this project are set out in **Sections 9.1** to **9.7** of this report.

9.1. Step 1: State the problem

The first step involves summarising the contamination problem that requires new environmental data and identifying resources available to solve the problem.

The objectives of this project are to:

- Assess the potential for contamination to be present on the site as a result of past and current land use activities;
- Provide advice on whether the site would be suitable (in the context of land contamination) for the proposed land use setting; and
- Provide recommendations for further investigation, management and/or remediation (if warranted).

The project is being undertaken because:

- The site is proposed for redevelopment; and
- A contamination assessment is required for inclusion with the development application to Council for the proposed redevelopment works.

The project team identified for this project consists of suitably experienced environmental consultants from AG.

The regulatory authorities identified for this project include NSW EPA and the local council.

9.2. Step 2: Identify the decision/goal of the study

The second step involves identifying decisions that need to be made about the contamination problem and the new environmental data required to make them.

The decisions that need to be made during this project include:

- Is the environmental data collected for the project, suitable for assessing relevant land contamination exposure risks?
- Do the concentrations of identified contaminants of potential concern (COPC) present an unacceptable exposure risk to identified receptors, for the proposed land use setting?
- Is the site suitable for the proposed land use setting, in the context of land contamination?

9.3. Step 3: Identify the information inputs

The third step involves identifying the information needed to support decisions and whether new environmental data will be needed.

The inputs required to make the decisions set out in **Section 9.2** for this project, will include:

- Data obtained during searches of the site's history;
- The nature and extent of sampling at the site, including both density and distribution;
- Samples of relevant site media;
- The measured physical and/or chemical parameters of the site media samples (including field screening and laboratory analysis, where relevant); and
- Assessment criteria adopted for each of the media sampled.

Taking into consideration the objectives of this project, and the conceptual site model and land use setting presented in **Section 8** of this project, the following assessment criteria relevant to the proposed land use setting have been adopted for this project:

- Human health direct contact – HILs in Table 1A (1) in NEPM ASC 2013 and HSLs in Table B4 of Friebel, E & Nadebaum, P (2011);
- Groundwater Investigation Levels - Freshwater Ecosystem Table 1 (C) of NEPM ASC 2013;
- Human health inhalation/vapour intrusion – HSLs in Table 1 (A) in NEPM ASC 2013;
- Human health (asbestos) – absence / presence for preliminary screening, and no visible ACM on surface;
- Petroleum hydrocarbon compounds (management limits) – Table 1 B (7) of NEPM ASC 2013;
- Ecological Investigation and Screening Levels as calculated per NEPM ASC 2013 Table 1 (B) 1-6; and
- Aesthetics – no highly malodorous site media (e.g. strong residual petroleum hydrocarbon odours, hydrogen sulphide in site media, organosulfur compounds), no hydrocarbon sheen on surface water, no discoloured chemical deposits or soil staining with chemical waste other than of a very minor nature, no large monolithic deposits of otherwise low risk material (e.g. gypsum as powder or plasterboard, cement kiln dust), no presence of putrescible refuse including material that may generate hazardous levels of methane such as a deep-fill profile of green waste or large quantities of timber waste, and no soils containing residue from animal burial (e.g. former abattoir sites).

9.4. Step 4: Define the boundaries of the study

The fourth step involves specifying the spatial and temporal aspects of the environmental media that the data must represent to support decisions.

The spatial extent of the project will be limited to the subject investigation area as defined by its boundaries (refer **Figure 2**).

The temporal boundaries of the project include:

- The project timeframe presented in the AG proposal for this project,
- Unacceptable weather conditions at the time of undertaking fieldwork, including rainfall, cold and/or heat;
- Access availability of the site (to be defined by the site owner/representative); and
- Availability of AG field staff (typically normal daylight working hours, Monday to Friday).

The lateral extent that contamination is expected to be distributed across, based on the conceptual site model, is defined by the inferred boundaries of the areas of environmental concern (AEC).

The vertical extent that contamination is expected to be distributed across, based on the conceptual site model and the project scope, is likely to be limited to shallow soils and fill material and shallow aquifers.

The scale of the decisions required will be based on the entire site.

Constraints which may affect the carrying out of this project may include access limitations, presence of above and below ground infrastructure, and hazards creating health and safety risks.

9.5. Step 5: Develop the analytical approach (or decision rule)

The fifth step involves defining the parameter of interest, specifying the action level, and integrating information from Steps 1 to 4 into a single statement that gives a logical basis for choosing between alternative actions.

9.5.1. Rinsate Blanks

One rinsate blank will be collected and scheduled for analysis, for each day of sampling undertaken, if non-disposable sampling equipment was used on that day. The rinsate blank will be analysed for at least one of the analytes the sample/s collected that day are being scheduled for analysis for (with the exception of asbestos).

9.5.2. Trip Spikes and Trip Blank Samples

One trip spike and trip blank sample will be used and scheduled for analysis, for each day of groundwater sampling undertaken, if site samples being collected that day are being analysed for volatile contaminants of concern (typically BTEX and/or TRH).

9.5.3. Field Duplicates and Field Triplicates

Field duplicate and field triplicates will be collected at a rate of one per twenty (5%) site samples collected. The duplicates and triplicates collected will be analysed for at least one of the analytes that the parent sample of the duplicate/triplicate is being scheduled for analysis for (with the exception of asbestos).

The relative percent difference (RPD) of concentrations of relevant analytes, between the parent sample and the duplicate/triplicate will be calculated.

9.5.4. Laboratory Analysis Quality Assurance / Quality Control

The analytical laboratory QA/QC program will typically include laboratory method blank samples, matrix spike samples, surrogate spike samples, laboratory control samples, and laboratory duplicate samples.

9.5.5. If/Then Decision Rules

AG has adopted the following ‘if/then’ decision rules for this project:

- If the result of the assessment of field data and laboratory analytical data is considered acceptable, then that field data and laboratory analytical data is suitable for interpretation within the scope of this project; and
- If the field data and laboratory analytical data is within the constraints of the assessment criteria adopted for this project (refer **Section 9.3**), then the contamination exposure risks to identified receptors, are considered acceptable.

In the event the assessment of field data and/or laboratory analytical data results in the data being not suitable for interpretation, then AG will determine if additional data is required to allow interpretation to be undertaken.

In the event that field data and/or laboratory analytical data exceeds the assessment criteria adopted for this project (refer **Section 9.3**), AG will undertake an assessment of the exceedance in the context of the project objectives to determine if additional data is required and whether management and/or remediation is required.

9.6. Step 6: Specify the performance or acceptance criteria

The sixth step involves specifying the decision maker's acceptable limits on decision errors, which are used to establish performance goals for limiting uncertainties in the data. When assessing contaminated land, there are generally two types of errors in decision making:

- Contamination exposure risks for a specific land use setting are acceptable, when they are not; and
- Contamination exposure risks for a specific land use setting are not acceptable, when they are.

AG will mitigate the risk of decision error by:

- Calculation of the 95% upper confidence limit (UCL) statistic to assess the mean concentration of relevant contaminants of potential concern;
- Assignment of fieldwork tasks to suitably experienced AG consulting staff, and suitably experienced contractors;
- Assignment of laboratory analytical tasks to reputable NATA accredited laboratories; and
- Assignment of data interpretation tasks to suitably experienced AG consulting staff, and outsourcing to technical experts where required.

AG will also adopt a range of data quality indicators (DQI) to facilitate assessment of the completeness, comparability, representativeness, precision and accuracy (bias).

Completeness			
Field Considerations	**Assessment Criterion**	**Laboratory Considerations**	**Assessment Criterion**
Critical locations sampled	Refer **Section 9.7.1**	Critical samples analysed according to DQO	Refer **Section 9.7.6**
Critical samples collected	Refer **Section 9.7.1**	Analytes analysed according to DQO	Refer **Section 9.7.6**
SOPs appropriate and complied with	100%	Appropriate laboratory analytical methods and LORs	Refer **Section 9.7.6**
Field documentation complete	All sampling point logs, calibration logs and chain of custody forms	Sample documentation complete	All sample receipt advices, all certificates of analysis

		Sample extraction and holding times complied with	Refer **Section 9.7.7**
Comparability			
Field Considerations	**Assessment Criterion**	**Laboratory Considerations**	**Assessment Criterion**
Same SOPs used on each occasion	100%	Same analytical methods used by primary laboratory	Refer **Section 9.7.7**
Climatic conditions	Samples stored in insulated containers with ice, immediately after collection	Same LORs at primary laboratory	Refer **Section 9.7.7**
Same types of samples collected, and handled/preserved in same manner	All soil samples same size, all stored in insulated containers with ice	Same laboratory for primary sample analysis	All primary samples to Eurofins | mgt
		Same analytical measurement units	Refer **Section 9.7.7**
Representativeness			
Field Considerations	**Assessment Criterion**	**Laboratory Considerations**	**Assessment Criterion**
Appropriate media sampled according to DQO	Refer **Section 9.7.6**	Samples analysed according to DQO	Refer **Section 9.7.6**
Media identified in DQO sampled	Refer **Section 9.7.6**		
Precision			
Field Considerations	**Assessment Criterion**	**Laboratory Considerations**	**Assessment Criterion**

Field duplicate / triplicate RPD	Minimum 5% duplicates and triplicates No limit for analytical results <10 times LOR 50% for analytical results 10-20 times LOR 30% for analytical results >10 times LOR	Laboratory duplicates	No exceedances of laboratory acceptance criteria
SOPs appropriate and complied with	100%		
Accuracy (bias)			
Field Considerations	**Assessment Criterion**	**Laboratory Considerations**	**Assessment Criterion**
Field trip spikes	Recoveries between 60% and 140%	Matrix spike recovery	No exceedances of laboratory acceptance criteria
Field trip blanks	Analyte concentration <LOR	Surrogate spike recovery	No exceedances of laboratory acceptance criteria

9.7. Step 7: Develop the plan for obtaining data

The seventh step involves identifying the most resource effective sampling and analysis design for generating the data that is required to satisfy the DQOs.

9.7.1. Sampling Point Density and Locations

Table A in NSW EPA *Sampling Design Guidelines* (1995) provides guidance on minimum sampling point densities required for site characterisation, based on detecting circular hot spots by using a systematic sampling pattern. This guidance assumes the investigator has little knowledge about the probable locations of the contamination, the distribution of the contamination is expected to be random (e.g. land fill sites) or the distribution of the contamination is expected to be fairly homogenous (e.g. agricultural lands).

However, Section 3.1 of NSW EPA *Sampling Design Guidelines* (1995) states that a judgemental sampling pattern can be used where there is enough information on the probable locations of contamination. Further to this, Section 6.2.1 of ASC NEPM 2013 states that the number and location or sampling points is based on knowledge of the site and professional judgement. Sampling should be localised to known or potentially contaminated areas identified from knowledge of the site either from site history or an earlier phase of site investigation. Judgemental sampling can be used to investigate sub-surface contamination issues in site assessment.

Table 1 in the *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia, May 2009*, Western Australia Department of Health (DOH (2009)) indicates that where the 'likelihood of asbestos' is assessed as "possible" or "suspect", the investigation regimen should include a sampling density that is either judgemental or the same as that set out in Table A of NSW EPA *Sampling Design Guidelines* (1995) for assessing asbestos.

As this project has included gathering data which provides a reasonable understanding of site history (in the context of potential areas of environmental concern on the site) and taking into consideration Table 1 in WA DOH (2009), it is considered reasonable to adopt a systematic sampling pattern, with up to 12 sampling points.

The locations of the sampling points are set out in **Figure 3**.

9.7.2. Sampling Methodology

The sampling point methodology presented in **Table 9.7.2** will be used for this project. The methodology is based on a range of factors considered relevant to this project, including:

- The identified contaminants of potential concern;
- The suspected laydown mechanisms for those contaminants of concern;
- The suspected likely depth of contamination; and
- Site specific constraints which affect the type of sampling techniques suited to the site.

Table 9.7.2 Proposed Sampling Methodology

AEC	Sampling Point ID	Method	Target Depth of Sampling Point (m bgl)
AEC01	BH01 to BH12	Solid flight auger / push tube	1.0m bgl, practical refusal or 0.3m into natural material, whichever occurs first.

Reference will also be made to Table 5 in WA DOH (2009) for the sampling and screening of fill soils for the presence of asbestos, where practical. The application of asbestos screening criteria published in NEPM ASC 2013 may be limited.

9.7.3. Identification, Storage and Handling of Samples

Sample identifiers will be used for each sample collected, based on the sampling point number and the depth/interval the sample was collected from, e.g. a sample collected from BH03 at a depth of 0.2m below ground level, would be identified as BH03-0.2.

Project samples will be stored in laboratory prepared glass and plastic containers (and zip lock bags if collected for asbestos or acid sulphate soil assessment).

Soil and groundwater samples analysed for organic contaminants of concern (and acid sulphate soil samples) will be placed in insulated container/s with ice.

Samples will be transported to the relevant analytical laboratory, with chain of custody (COC) documentation that includes the following information:

- AG project identification number;
- Each sample identifier;
- Date each sample was collected;
- Sample type (e.g. soil or water);
- Container type/s for each sample collected;
- Preservation method used for each sample (e.g. ice);
- Analytical requirements for each sample and turnaround times; and
- Date and time of dispatch and receipt of samples (including signatures).

9.7.4. Decontamination

All sampling equipment used during the soil investigation consisted of location specific nitrile gloves, as such decontamination was deemed unnecessary. To avoid cross contamination via the auger, samples were collected from the centre of the soil formation, ensuring to avoid sampling materials which had come into contact with the auger.

Non-disposable equipment used during the groundwater investigation (i.e. interface probe), will be decontaminated before and in between sampling events, to mitigate potential for cross contamination between samples collected. The decontamination methodology to be adopted for this project will include:

- Washing relevant sampling equipment using potable water with a phosphate free detergent (i.e. Decon 90 or similar) mixed into the water;
- Rinsing the washed non-disposable sampling equipment with distilled or de-ionised water; and
- Air drying as required.

Disposable sampling equipment (plastic bailers) will be used during the groundwater sampling regime.

9.7.5. Laboratory Selection

The analytical laboratories used for this project will be NATA accredited for the analysis undertaken.

9.7.6. Laboratory Analytical Schedule

Project samples will be scheduled for NATA accredited laboratory analysis, using a combination of:

- Observations made in the field of the media sampled; and
- The contaminants of potential concern (COPC) identified for the area of environmental concern that the sample was collected from.

Based on site history, AG has adopted the laboratory analytical schedule (and associated upper limiting quantities) presented in **Table 9.7.6** for this project.

9.7.7. Laboratory Holding Times, Analytical Methods and Limits of Reporting

The laboratory holding times, analytical methods and limits of reporting (LOR) being used for this project, are presented in **Table 9.7.7**.

Table 9.7.7 Laboratory Holding Times, Analytical Methods and Limits of Reporting

Analyte	Holding Time	Analytical Method	Limit of Reporting
Soil			
BTEX and TRH C_6-C_{10}	14 days	USEPA 5030, 8260B and 8020	0.2-0.5 (mg/kg)
TRH >C_{10}-C_{40}	14 days	USEPA 8015B & C	20-100 (mg/kg)
VOC	14 days	USEPA 8260	0.1-0.5 (mg/kg)
PAH	14 days	USEPA 8270	0.1-0.5 (mg/kg)
OCP/OPP	14 days	USEPA 8081	0.2 (mg/kg)
PCB	28 days	USEPA 8270	0.2 (mg/kg)
PFAS	14 days	Inhouse based on USEPA 537 V1.1	0.005 (mg/kg)
Metals (ex. Hg & Cr^{VI})	6 months	USEPA 8015B & C	0.05 – 2 (mg/kg)
Hg & Cr^{VI}	28 days	USEPA 8015B & C	0.05 – 2 (mg/kg)
Asbestos	No limit	AS4964:2004	Absence / presence
Asbestos	No limit	Inhouse Method	0.001% w/w
Water			
BTEX and TRH C_6-C_{10}	14 days	NEPM Schedule B3	0.02-0.1 (mg/L)
TRH >C_{10}-C_{40}	14 days	NEPM Schedule B3	0.1 (mg/L)
VOC	714days	USEPA 8260	0.1-0.5 (mg/L)
PAH	7 days	USEPA 8270, 8100, NEPM Schedule B3	0.001 (mg/L)
OCP/OPP	7 days	USEPA 8141, USEPA 8081, USEPA 8270, NEPM Schedule B3	0.002-0.0005 (mg/L)
PCB	7 days	USEPA 8082, NEPM Schedule B3	0.001-0.005 (mg/L)
PFAS	14 days	Inhouse based on USEPA 537 V1.1	0.01-0.05 (µg/L)
Metals (ex. Hg & Cr^{VI})	6 months	USEPA 6010, 6020	0.05 – 2 (mg/L)
Hg & Cr^{VI}	28 days	USEPA 6010, 6020	0.05– 2 (mg/L)

10. DETAILED SITE INVESTIGATION METHODOLOGY

Soil sampling and analysis were undertaken with reference to the following documents:

- NSW EPA 1995. *Contaminated Sites Sampling Design Guidelines,* NSW Environment Protection Authority.
- NEPM 2013. *'National Environment Protection (Assessment of Site Contamination) Measure. Schedule B (2) Guideline on Data Collection, Sample Design and Reporting.'* National Environmental Protection Council, Adelaide.
- Standards Australia. 2005*.' AS 4482.1. Guide to the Sampling and Investigation of Potentially Contaminated Soil. Part 1: Non-volatile and Semi-volatile Compounds.'* www.standards.com.au.
- Standards Australia. 1999. *'AS 4482.2. Guide to the Sampling and Investigation of Potentially Contaminated Soil Part 2: Volatile Compounds'.* www.standards.com.au.
- Standards Australia. 1998. *'AS/NZS 5667.11:1998. Water Quality – Sampling. Part 11: Guidance on Sampling of Groundwater.'* www.standards.com.au.
- Standards Australia. 1998. *'AS/NZS 5667.1:1998. Water Quality – Sampling. Part 1: Guidance on the Design of Sampling Programs, Sampling Techniques and the Preservation and Handling of Samples'.* www.standards.com.au.
- ACS NEPM. 2013 *National Environment Protection (Assessment of Site Contamination) Measure 2013 Schedule B (1) Investigation Levels for Soil and Groundwater*

10.1. Scope of Fieldworks

To clarify and quantify the existence of the potential contaminants, a sampling analysis and quality plan (SAQP) was developed. The site works were performed on the 8th October 2019, in accordance with the SAQP and supervised by AG environmental scientists at all times.

The scope of the investigation was developed based upon the findings of the desktop investigation and the site walkover and the SAQP subsequently developed. Based upon this approach the following scope of works was performed:

- Completion of a site-specific Safe Work Method Statement in accordance with AG health and safety policy;
- Completion of twelve (12) soil sampling locations (using push tube and auger techniques);
- Collection of discrete soil samples every 1.0 m recovered or change of strata from the drilling of the soil bores;
- Collection and analysis of quality assurance/quality control (QA/QC) samples in accordance with NEPM requirements; and
- Analysis of twelve (12) primary soil and two (2) quality control samples.

10.2. Laboratory Analysis

All soil samples will be forwarded to a NATA accredited laboratory for analysis of the analytes listed below. Eurofins | Mgt shall be used for the analysis of primary samples and ALS for the analysis of interlaboratory samples.

11. FIELDWORK

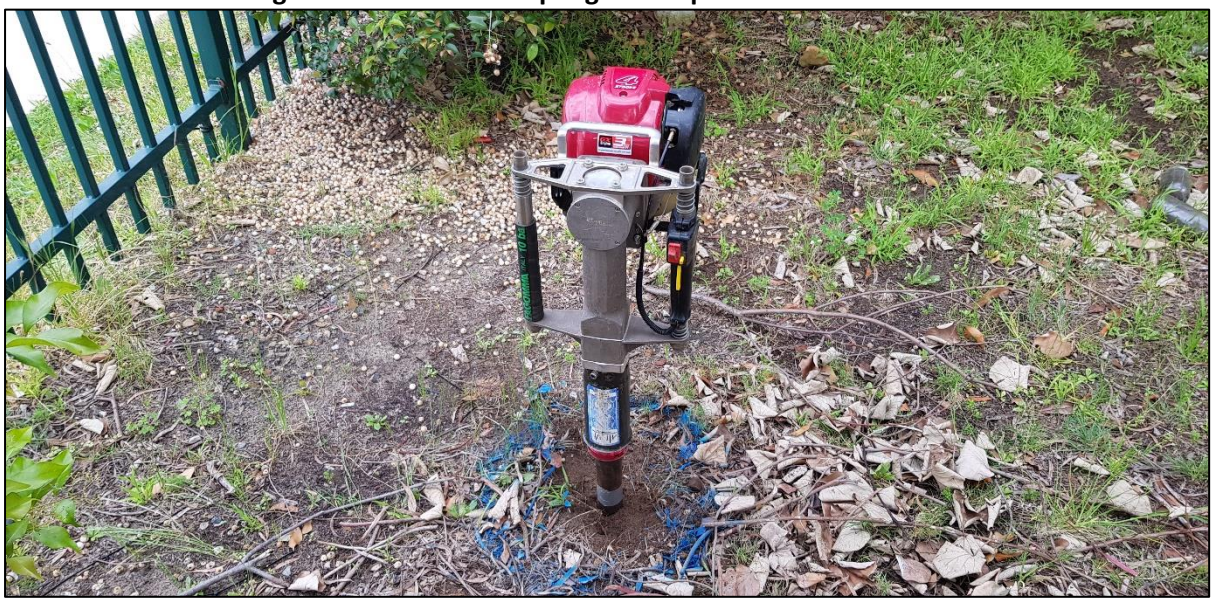
11.1. Soil Sampling

Soil sampling was undertaken by AG on 8 October 2019. A total of twelve (12) boreholes (BH01-BH12) were advanced across the site using a combination of track mounted drill rigs or hand tools until reaching inferred natural materials between 0.3-0.5m bgl. Samples for potential analysis were collected from the near surface, at 1.0 m intervals within the soil profile or with change of strata, and in areas of observed contamination. Each soil sample was collected using a new clean pair of nitrile gloves and placed in the appropriate acid rinsed sample containers provided by the laboratory.

Upon completion of the soil boring, each borehole was backfilled with excavated soils at the completion of the sampling task at each sampling point. Soil bore logs were maintained in the field by an AG environmental scientist for all exploratory holes. Field observations such as lithology, odours, staining, depth of water etc. were noted on the logs. The logs are presented within **Appendix F**.

Each sampling point established was marked on a site plan. The locations of these sampling points are presented in **Figure 4**.

Image 11.1.1 View of sampling technique as observed in BH10



11.2. Site Geology

Observations were made of soils encountered during sampling work. These observations were recorded on borehole logs. A copy of these logs is presented in **Appendix F**.

Anthropogenic materials were not observed in the fill profile of any of the locations sampled. Inferred natural material was encountered in every sampling location (BH01-BH12). Soils were generally observed to comprise fill topsoil followed by residual sand.

Image 11.24.1 Example of soil profile, as observed within BH12

11.3. Odours

Olfactory evidence of contamination was not detected in any of the soil samples collected.

11.4. Staining

Visual evidence of contamination in the soil samples collected was not detected.

11.5. Potential Asbestos Containing Materials

Visual evidence of potential asbestos containing materials (ACM) at each soil sampling point was not observed.

12. LABORATORY ANALYSIS

The samples collected were transported to the analytical laboratory, using chain of custody (COC) protocols. A selection of these samples was scheduled for analysis, with reference to the relevant COPC identified for the AEC that the samples were collected from.

All soil and groundwater samples were forwarded to the NATA accredited laboratory for analysis of the analytes listed below. Eurofins | Mgt were used for the analysis of primary samples and SGS for the analysis of interlaboratory samples.

Table 12.1 details the analysis undertaken for soil samples.

Table 12.1 Soil Analytical Schedule

Sample ID	Analytical Suite									
	TRH	BTEX	PAH	8 Metals*	Asbestos	OCP	PCBs	Phenols	VOC/SVOC	pH/CEC
BH01-0.1-0.3, BH02-0.3-0.4, BH03-0.1-0.3, BH04-0.0-0.2, BH05-0.0-0.2, BH06-0.0-0.2, BH07-0.0-0.3, BH08-0.1-0.3, BH09-0.0-0.2, BH10-0.0-0.2, BH11-0.0-0.2, BH12-0.0-0.2	x	x	x	x	x	x	x			
DUP01, DUP01A				x						

*Metals: As, Cd, Cr, Cu, Hg, Ni, Pb, Zn

A copy of the analytical laboratory certificates of analysis, is presented in **Appendix G.**

The sample analytical results were tabulated and presented in the attached **Table LAR1** and **LAR2**.

13. DATA QUALITY INDICATOR ASSESSMENT

13.1. Completeness

An assessment of the completeness of data collected was undertaken, and the results presented in **Table 13.1**.

Table 13.1 Completeness DQI

Field Considerations	**Target**	**Actual**	**Comment**
Critical locations sampled	12	12	Performance against indicator considered acceptable.
Critical samples collected	12	12	Performance against indicator considered acceptable.
SOPs appropriate and complied with	100%	100%	Performance against indicator considered acceptable.
Field documentation complete	All sampling point logs, calibration logs and chain of custody forms	All sampling point logs, calibration logs and chain of custody forms	Performance against indicator considered acceptable.
Laboratory Considerations	**Target**	**Actual**	**Comment**
Critical samples analysed according to DQO	Refer **Section 9.7.6**	100%	Performance against indicator considered acceptable.
Analytes analysed according to DQO	Refer **Section 9.7.6**	100%	Performance against indicator considered acceptable.
Appropriate laboratory analytical methods and LORs	Refer **Section 9.7.7**	100%	Performance against indicator considered acceptable.
Sample documentation complete	All sample receipt advices, all certificates of analysis	100%	Performance against indicator considered acceptable.
Sample extraction and holding times complied with	Refer **Section 9.7.7**	100%	Performance against indicator considered acceptable.

The data collected is considered to be adequately complete within the objectives and constraints of the project.

13.2. Comparability

An assessment of the comparability of data collected was undertaken, and the results presented in **Table 13.2**.

Table 13.2 Comparability DQI

Field Considerations	Target	Actual	Comment
Same SOPs used on each occasion	100%	100%	Performance against indicator considered acceptable.
Climatic conditions	Samples stored in insulated containers with ice, immediately after collection	100%	Performance against indicator considered acceptable.
Same types of samples collected, and handled/preserved in same manner	All soil samples same size, all stored in insulated containers with ice	100%	Performance against indicator considered acceptable.
Laboratory Considerations	**Target**	**Actual**	**Comment**
Same analytical methods used by primary laboratory	Refer **Section 9.7.7**	100%	Performance against indicator considered acceptable.
Same LORs at primary laboratory	Refer **Section 9.7.7**	100%	Performance against indicator considered acceptable.
Same laboratory for primary sample analysis	All primary samples to Eurofins | mgt	100%	Performance against indicator considered acceptable.
Same analytical measurement units	Refer **Section 9.7.7**	100%	Performance against indicator considered acceptable.

The data collected is considered to be adequately comparable within the objectives and constraints of the project.

13.3. Representativeness

An assessment of the representativeness of data collected was undertaken, and the results presented in **Table 13.3**.

Table 13.3 Representativeness DQI

Field Considerations	Target	Actual	Comment
Appropriate media sampled according to DQO	Refer **Section 9.7.2**	100%	Performance against indicator considered acceptable.
Media identified in DQO sampled	Refer **Section 9.7.2**	100%	Performance against indicator considered acceptable.
Laboratory Considerations	**Target**	**Actual**	**Comment**
Samples analysed according to DQO	Refer **Section 9.7.6**	Refer comments	Performance against indicator considered acceptable.

The data collected is considered to be adequately complete within the objectives and constraints of the project.

13.4. Precision

An assessment of the precision of data collected was undertaken, and the results presented in **Table 13.4**

Table 13.4 Precision DQI

Field Considerations	Target	Actual	Comment
Field duplicate / triplicate RPD	Minimum 5% duplicates and triplicates	5 % duplicates and 5 % triplicates	Parent duplicate/triplicate relationships are as follows: DUP01/DUP01A– BH10-0.0-0.2
	No limit for analytical results <10 times LOR	Nil	No exceedances >10 times the LOR were noted during the analysis Performance against indicator considered acceptable.
	50% for analytical results 10-20 times LOR	Nil	
	30% for analytical results >20 times LOR	Nil	
SOPs appropriate and complied with	100%	100%	Performance against indicator considered acceptable.

Laboratory Considerations	Target	Actual	Comment
Laboratory duplicates	No exceedances of laboratory acceptance criteria	No exceedances	Performance against indicator considered acceptable.

The data collected is considered to be adequately precise within the objectives and constraints of the project.

13.5. Accuracy

An assessment of the precision of data collected was undertaken, and the results presented in **Table 13.5**.

Table 13.5 Accuracy DQI

Laboratory Considerations	Target	Actual	Comment
Laboratory method blank	No exceedances of laboratory acceptance criteria	No exceedances of laboratory acceptance criteria	Performance against indicator considered acceptable.
Matrix spike recovery	No exceedances of laboratory acceptance criteria	No exceedances of laboratory acceptance criteria	Performance against indicator considered acceptable.
Surrogate spike recovery	No exceedances of laboratory acceptance criteria	No exceedances of laboratory acceptance criteria	Performance against indicator considered acceptable.
Laboratory control sample recovery	No exceedances of laboratory acceptance criteria	No exceedances of laboratory acceptance criteria	Performance against indicator considered acceptable.

The data collected is considered to be adequately accurate within the objectives and constraints of the project.

14. DISCUSSION

A discussion on comparison of laboratory analytical results and field observations, in the context of the assessment criteria adopted for this project, is presented in **Sections 14.1** to **14.4**.

14.1. Human Health - Direct Contact

14.1.1. TRH

The concentrations of TRH C_6-C_{10}, >C_{10}-C_{16}, >C_{16}-C_{34} and >C_{34}-C_{40} detected in the soil samples analysed, were less than the applicable adopted direct contact human health exposure criteria.

14.1.2. BTEX

The concentrations of benzene, toluene, ethyl benzene and xylenes detected in the soil samples analysed, were less than the applicable adopted direct contact human health exposure criteria.

14.1.3. PAH

The concentrations of naphthalene detected in the soil samples analysed, were less than the applicable adopted direct contact human health exposure criteria.

The concentrations of benzo(a)pyrene TEQ detected in the soil samples analysed, were less than the applicable adopted direct contact human health exposure criteria.

The concentration of total PAH detected in the soil samples analysed, were less than the applicable adopted direct contact human health exposure criteria.

14.1.4. OCP

The concentration of relevant OCP compounds detected in the soil samples analysed, were less than the applicable adopted direct contact human health exposure criteria or less than laboratory limits of reporting.

14.1.5. PCBs

The concentration of PCBs detected in the soil samples analysed, were less than laboratory limits of reporting.

14.1.6. Metals

The concentrations of arsenic, cadmium, chromium, copper, lead, nickel, zinc and mercury detected in the soil samples analysed, were less than the applicable adopted direct contact human health exposure criteria.

14.1.7. Asbestos

Asbestos was not detected in samples that were analysed or observed within any of the materials during the investigation.

14.2. Human Health – Inhalation / Vapour Intrusion (HIL A)

14.2.1. TRH

The concentrations of TRH C_6-C_{10} (minus BTEX) and >C_{10}-C_{16} (minus naphthalene) detected in the soil samples analysed, were less than the applicable adopted inhalation / vapour intrusion human health exposure criteria.

14.2.2. BTEX

The concentrations of benzene, toluene, ethyl benzene and xylenes detected in the soil samples analysed, were less than the applicable adopted inhalation / vapour intrusion human health exposure criteria.

14.2.3. PAH

The concentrations of naphthalene detected in the soil samples analysed, were less than the applicable adopted inhalation / vapour intrusion human health exposure criteria.

14.3. TPH Management Limits (Open Space / Recreational)

The concentrations of TRH C_6-C_{10}, >C_{10}-C_{16}, >C_{16}-C_{34} and >C_{34}-C_{40} detected in the soil samples analysed, were less than the applicable adopted TRH management limits or less than laboratory limits of reporting.

14.4. Aesthetics

The was limited visual evidence of foreign materials within the soil profile on site. The aesthetics assessment criteria adopted for this project, indicate that further assessment/management is not required.

14.5. Terrestrial Ecosystems

14.5.1. Ecological Screening Levels (ESLs)

The concentrations of relevant contaminants of concern detected in the soil samples analysed were less than the applicable adopted ecological screening levels (ESL) within all samples analysed.

15. CONCLUSIONS AND RECOMMENDATIONS

Based on AG's assessment of the desktop review information, fieldwork data and laboratory analytical data, in the context of the proposed redevelopment scenario, AG makes the following conclusions:

- The detected concentrations of identified contaminants of potential concern in the soils assessed are considered unlikely to present:
    - An unacceptable inhalation / vapour intrusion human health exposure risk; or
    - An unacceptable petroleum management limit risk.
- The detected concentrations of contaminants in the soils assessed are considered unlikely to present a direct contact human health risk;
- The detected concentrations of asbestos in the soils assessed are considered unlikely to present a direct contact human health risk;
- The detected concentrations of contaminants in the soils assessed are considered unlikely to present an unacceptable ecological health risk; and
- Based on the assessments undertaken as part of this investigation, AG has concluded that the site is **suitable** for the proposed redevelopment.

This report, including its conclusions and recommendations, must be read in conjunction with the limitations presented in **Section 16.**

16. STATEMENT OF LIMITATIONS

The findings presented in this report are based on specific searches of relevant, government historical databases and anecdotal information that were made available during the course of this investigation. To the best of our knowledge, these observations represent a reasonable interpretation of the general condition of the site at the time of report completion.

This report has been prepared solely for the use of the client to whom it is addressed and no other party is entitled to rely on its findings.

No warranties are made as to the information provided in this report. All conclusions and recommendations made in this report are of the professional opinions of personnel involved with the project and while normal checking of the accuracy of data has been conducted, any circumstances outside the scope of this report or which are not made known to personnel and which may impact on those opinions is not the responsibility of Alliance Geotechnical Pty Ltd. Should information become available regarding conditions at the site including previously unknown sources of contamination, AG reserves the right to review the report in the context of the additional information.

This report must be reviewed in its entirety and in conjunction with the objectives, scope and terms applicable to AG's engagement. The report must not be used for any purpose other than the purpose specified at the time AG was engaged to prepare the report.

Logs, figures, and drawings are generated for this report based on individual AG consultant interpretations of nominated data, as well as observations made at the time site walkover/s were completed.

Data and/or information presented in this report must not be redrawn for its inclusion in other reports, plans or documents, nor should that data and/or information be separated from this report in any way.

Should additional information that may impact on the findings of this report be encountered or site conditions change, AG reserves the right to review and amend this report.

17. REFERENCES

National Environment Protection Council (NEPC) 2013, 'Schedule B(1) Guideline on Investigation Levels for Soil and Groundwater, National Environment Protection (Assessment of Site Contamination) Measure (NEPM) as amended in May 2013'.

National Environment Protection Council (NEPC) 2013, 'Schedule B(2) Guideline on Site Characterisation, National Environment Protection (Assessment of Site Contamination) Measure (NEPM) as amended in May 2013'.

NSW DEC 2006, '*Contaminated Sites: Guidelines for the NSW Site Auditor Scheme (2nd edition)'.*

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NSW EPA 2012, *'Guidelines for the Assessment and Management of Sites Impacted by Hazardous Ground Gases'*

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Department of Environment and Climate Change NSW, 'Managing Dry Cleaning Waste for a Safer Environment' dated January 2009

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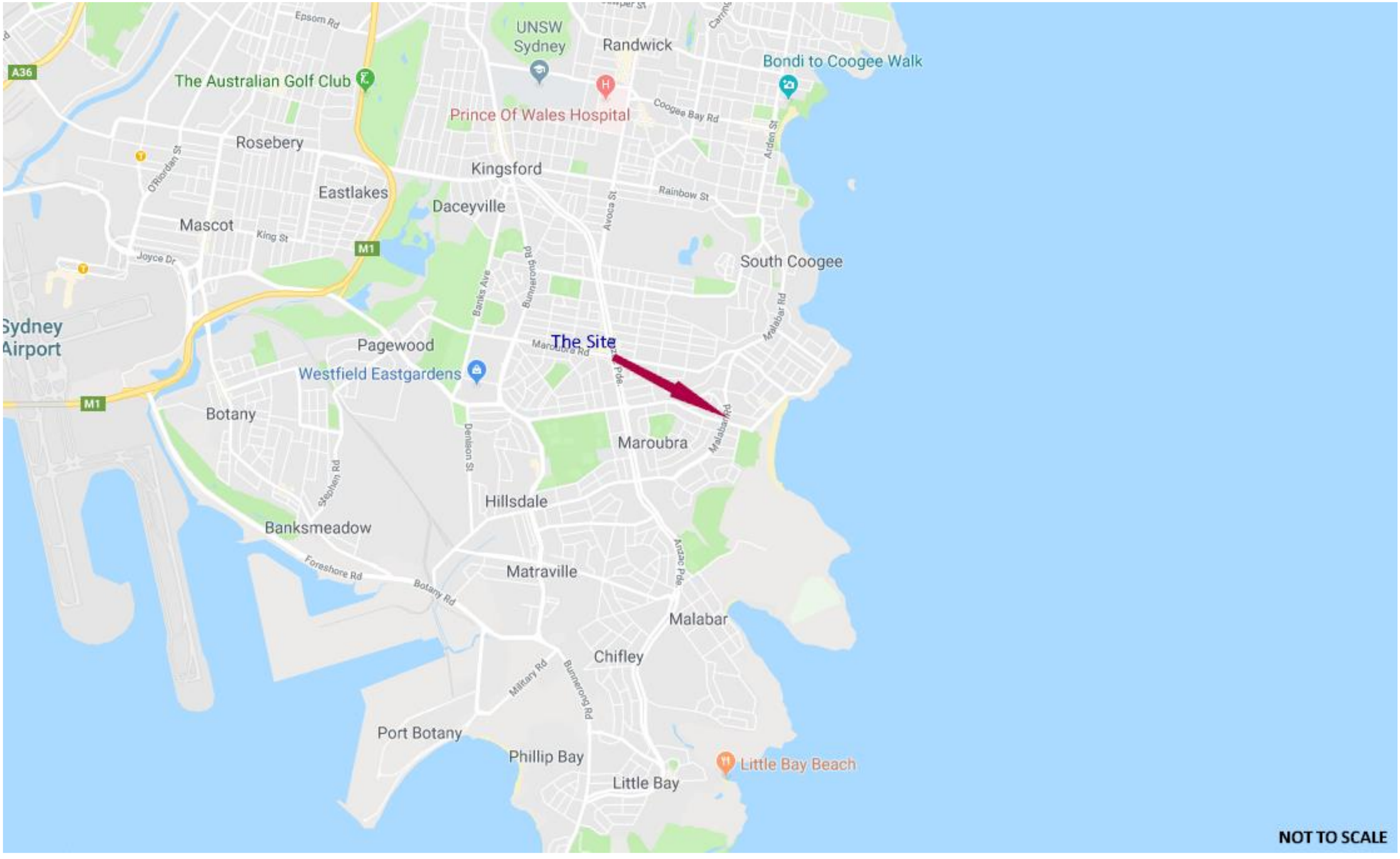
Standards Australia. 1998. *'AS/NZS 5667.1:1998. Water Quality – Sampling. Part 1: Guidance on the Design of Sampling Programs, Sampling Techniques and the Preservation and Handling of Samples'. www.standards.com.au.*

FIGURES



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Site Locality

Client Name:	Sydney Catholic Schools (c/ JDH Architects)	N	Figure Number:	1
Project Name:	Combined Stage 1 Preliminary and Stage 2 Detailed Site Investigation		Figure Date:	29 October 2019
Project Location:	St Mary – St Joseph Catholic Primary School		Report Number:	9194.1-ER-1-1

Source: NearMap (Nearmap.com)

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Site Layout

Client Name:	Sydney Catholic Schools (c/ JDH Architects)	Figure Number:	2
Project Name:	Combined Stage 1 Preliminary and Stage 2 Detailed Site Investigation	Figure Date:	29 October 2019
Project Location:	St Mary – St Joseph Catholic Primary School	Report Number:	9194.1-ER-1-1

N

Source: NearMap (Nearmap.com)

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Sampling Plan

Client Name:	Sydney Catholic Schools (c/ JDH Architects)	Figure Number:	3
Project Name:	Combined Stage 1 Preliminary and Stage 2 Detailed Site Investigation	Figure Date:	29 October 2019
Project Location:	St Mary – St Joseph Catholic Primary School	Report Number:	9194.1-ER-1-1

N

TABLES

Table LAR1
St Mary St Joseph Catholic Primary School, Maroubra
Soil Results & Adopted Site Criteria
9194-ER-1-1

Group	Analyte	Units	PQL	Screening Levels for Direct Contact (mg/kg) - CRC Care 2011: HSL - A Residential (Low Density)	Inhalation / Vapour Intrusion HSLs (mg/kg) - NEPC 2013 (SAND): HSL A & HSL B - Low - High density Residential: 0 m to <1 m	1 m to <2 m	2 m to <4 m	4 m+	Management Limits for TPH Fractions F1 - F4 in soil (mg/Kg) - NEPC 2013: Residential, Parkland and Public Open Space: Coarse Soil Texture	ESLs for TPH Fractions F1 - F4, BTEX and Benzo(a)pyrene - NEPC 2013: Urban Residential and Public Open Space: Coarse Soil Texture	Health Investigation Levels for Soil Contaminants - NEPC 2013: Residential A	Data Set Minimum	Data Set Maximum	BH01_0.1-0.3	BH02_0.3-0.4	BH03_0.1-0.3	BH04_0.0-0.2	BH05_0.0-0.2	BH06_0.0-0.2	BH07_0.0-0.3	BH08_0.1-0.3	BH09_0.0-0.2	BH10_0.0-0.2	BH11_0.0-0.2	BH12_0.0-0.2
	Reference													S19-Oc13491	S19-Oc13492	S19-Oc13493	S19-Oc13494	S19-Oc13495	S19-Oc13496	S19-Oc13497	S19-Oc13498	S19-Oc13499	S19-Oc13500	S19-Oc13501	S19-Oc13502
	Date Sampled													8/10/2019	8/10/2019	8/10/2019	8/10/2019	8/10/2019	8/10/2019	8/10/2019	8/10/2019	8/10/2019	8/10/2019	8/10/2019	8/10/2019
	Sample Matrix													SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Metals	Arsenic, As	mg/kg	2	-	-	-	-	-	-	-	100	< 2	4	< 2	2.5	< 2	< 2	< 2	< 2	4.1	< 2	2.5	< 2	< 2	< 2
	Cadmium, Cd	mg/kg	0.4	-	-	-	-	-	-	-	20	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
	Chromium, Cr	mg/kg	5.0	-	-	-	-	-	-	-	100	< 5	29	12	29	< 5	< 5	5.7	< 5	< 5	< 5	7.2	13	< 5	< 5
	Copper, Cu	mg/kg	5.0	-	-	-	-	-	-	-	6,000	< 5	31	8.8	14	8.5	9.4	5.9	5.5	8.4	< 5	15	31	11	8.5
	Lead, Pb	mg/kg	5	-	-	-	-	-	-	-	300	6	62	14	17	11	29	11	8	8	5.6	23	62	57	36
	Mercury (inorganic)	mg/kg	0.10	-	-	-	-	-	-	-	40	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Nickel, Ni	mg/kg	5.0	-	-	-	-	-	-	-	400	< 5	8	7.9	5.2	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
	Zinc, Zn	mg/kg	5.0	-	-	-	-	-	-	-	7,400	11	300	28	39	14	300	25	19	22	11	60	88	62	31
PAH	Acenaphthene	mg/kg	0.5	-	-	-	-	-	-	-	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Acenaphthylene	mg/kg	0.5	-	-	-	-	-	-	-	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Anthracene	mg/kg	0.5	-	-	-	-	-	-	-	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Benzo(a)anthracene	mg/kg	0.5	-	-	-	-	-	-	-	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Benzo(a)pyrene	mg/kg	0.5	-	-	-	-	-	-	0.7	-	< 0.5	0.6	< 0.5	0.6	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.5	-	-	-	-	-	-	-	-	< 0.5	0.6	< 0.5	0.6	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.5	-	-	-	-	-	-	-	3	0.6	1.0	0.6	1	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
	Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.5	-	-	-	-	-	-	-	-	1.2	1.3	1.2	1.3	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	Benzo(b&j)fluoranthene	mg/kg	0.5	-	-	-	-	-	-	-	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Benzo(ghi)perylene	mg/kg	0.5	-	-	-	-	-	-	-	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Benzo(k)fluoranthene	mg/kg	0.5	-	-	-	-	-	-	-	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Chrysene	mg/kg	0.5	-	-	-	-	-	-	-	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Dibenzo(ah)anthracene	mg/kg	0.5	-	-	-	-	-	-	-	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Fluoranthene	mg/kg	0.5	-	-	-	-	-	-	-	-	< 0.5	0.9	< 0.5	0.9	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Fluorene	mg/kg	0.5	-	-	-	-	-	-	-	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Indeno(1,2,3-cd)pyrene	mg/kg	0.5	-	-	-	-	-	-	-	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Naphthalene	mg/kg	0.5	1,400	3	NL	NL	NL	-	-	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Phenanthrene	mg/kg	0.5	-	-	-	-	-	-	-	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Pyrene	mg/kg	0.5	-	-	-	-	-	-	-	-	< 0.5	1.0	< 0.5	1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Total PAH (18)	mg/kg	0.5	-	-	-	-	-	-	-	-	< 0.5	2.5	< 0.5	2.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
TRH	TRH C10-C36 Total	mg/kg	50	-	-	-	-	-	-	-	-	< 50	261	< 50	197	< 50	261	< 50	< 50	< 50	< 50	191	< 50	< 50	< 50
	TRH C10-C14	mg/kg	20	-	-	-	-	-	-	-	-	< 20	47	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	47	< 20	< 20	< 20
	TRH C15-C28	mg/kg	50	-	-	-	-	-	-	-	-	< 50	200	< 50	97	< 50	200	< 50	< 50	< 50	< 50	86	< 50	< 50	< 50
	TRH C29-C36	mg/kg	50	-	-	-	-	-	-	-	-	< 50	100	< 50	100	< 50	61	< 50	< 50	< 50	< 50	58	< 50	< 50	< 50
	TRH C6-C9	mg/kg	20	-	-	-	-	-	-	-	-	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
	Naphthalene	mg/kg	0.5	1,400	3	NL	NL	NL	-	-	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	TRH >C10-C16 (F2)	mg/kg	50	3,300	-	-	-	-	1,000	120	-	< 50	52	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	52	< 50	< 50	< 50
	TRH >C10-C16 (F2) - Naphthalene	mg/kg	50	-	110	240	440	NL	-	-	-	< 50	52	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	52	< 50	< 50	< 50
	TRH C10-C40 Total (F bands)	mg/kg	100	-	-	-	-	-	-	-	-	< 100	240	< 100	160	< 100	240	< 100	< 100	< 100	< 100	182	< 100	< 100	< 100
	TRH >C16-C34 (F3)	mg/kg	100	4,500	-	-	-	-	2,500	300	-	< 100	240	< 100	160	< 100	240	< 100	< 100	< 100	< 100	130	< 100	< 100	< 100
	TRH >C34-C40 (F4)	mg/kg	100	6,300	-	-	-	-	10,000	2,800	-	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100
	TRH C6-C10	mg/kg	20	4,400	-	-	-	-	700	180	-	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
	TRH C6-C10 minus BTEX (F1)	mg/kg	20	-	45	70	110	200	-	-	-	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
BTEX	Benzene	mg/kg	0.1	100	0.5	0.5	0.5	0.5	-	50	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Ethylbenzene	mg/kg	0.1	4,500	55	NL	NL	NL	-	70	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	m/p-xylene	mg/kg	0.2	-	-	-	-	-	-	-	-	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
	o-xylene	mg/kg	0.1	-	-	-	-	-	-	-	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Toluene	mg/kg	0.1	14,000	160	220	310	540	-	85	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Total Xylenes	mg/kg	0.3	12,000	40	60	95	170	-	105	-	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
OCP	4.4 - DDD	mg/kg	0.05	-	-	-	-	-	-	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
	4.4 - DDE	mg/kg	0.05									< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
	4.4 - DDT	mg/kg	0.05	-	-	-	-	-	-	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
	a - BHC	mg/kg	0.05	-	-	-	-	-	-	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
	Aldrin	mg/kg	0.05	-	-	-	-	-	-	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
	Aldrin + Dieldrin (total)	mg/kg	0.05	-	-	-	-	-	-	-	6	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
	b - BHC	mg/kg	0.05	-	-	-	-	-	-	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
	Chlordanes (total)	mg/kg	0.05	-	-	-	-	-	-	-	50	< 0.1	< 0.1	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-
	d - BHC	mg/kg	0.05	-	-	-	-	-	-	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
	DDT + DDE + DDD (total)	mg/kg	0.05	-	-	-	-	-	-	-	240	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
	Dieldrin	mg/kg	0.05	-	-	-	-	-	-	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
	Endosulfan 1	mg/kg	0.05	-	-	-	-	-	-	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
	Endosulfan 2	mg/kg	0.05	-	-	-	-	-	-	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
	Endosulfan sulphate	mg/kg	0.05	-	-	-	-	-	-	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
	Endrin	mg/kg	0.05	-	-	-	-	-	-	-	10	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
	Endrin Aldehyde	mg/kg	0.05	-	-	-	-	-	-	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
	Endrin Ketone	mg/kg	0.05	-	-	-	-	-	-	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
	g-BHC (Lindane)	mg/kg	0.05	-	-	-	-	-	-	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
	Heptachlor	mg/kg	0.05	-	-	-	-	-	-	-	6	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
	Heptachlor epoxide	mg/kg	0.05	-	-	-	-	-	-	-	-	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
	Hexachlorobenzene	mg/kg	0.05	-	-	-	-	-	-	-	10	< 0.05	< 0.05	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
	Methoxychlor	mg/kg	0.05	-	-	-	-	-	-	-	300	< 0.2	< 0.2	< 0.2	-	< 0.2	-	< 0.2	-	< 0.2	-	< 0.2	-	< 0.2	-
	Toxaphene	mg/kg	1.0	-	-	-	-	-	-	-	-	< 1	< 1	< 1	-	< 1	-	< 1	-	< 1	-	< 1	-	< 1	-
	Vic EPA IWRG 621 OCP 9total)	mg/kg	0.1	-	-	-	-	-	-	-	-	< 0.2	< 0.2	< 0.2	-	< 0.2	-	< 0.2	-	< 0.2	-	< 0.2	-	< 0.2	-
	Vic EPA IWRG 621 Other OCP (total)	mg/kg	0.1	-	-	-	-	-	-	-	-	< 0.2	< 0.2	< 0.2	-	< 0.2	-	< 0.2	-	< 0.2	-	< 0.2	-	< 0.2	-
	Alpha + Beta Endosulfan	mg/kg	0.05	-	-	-	-	-	-	-	270	0	0	0	-	0	-	0	-	0	-	0	-	0	-
PCB	Aroclor-1016	mg/kg	0.1	-	-	-	-	-	-	-	-	< 0.5	< 0.5	-	< 0.5	-	< 0.5	-	< 0.5	-	< 0.5	-	< 0.5	-	< 0.5
	Aroclor-1221	mg/kg	0.1	-	-	-	-	-	-	-	-	< 0.1	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1
	Aroclor-1232	mg/kg	0.1	-	-	-	-	-	-	-	-	< 0.5	< 0.5	-	< 0.5	-	< 0.5	-	< 0.5	-	< 0.5	-	< 0.5	-	< 0.5
	Aroclor-1242	mg/kg	0.1	-	-	-	-	-	-	-	-	< 0.5	< 0.5	-	< 0.5	-	< 0.5	-	< 0.5	-	< 0.5	-	< 0.5	-	< 0.5
	Aroclor-1248	mg/kg	0.1	-	-	-	-	-	-	-	-	< 0.5	< 0.5	-	< 0.5	-	< 0.5	-	< 0.5	-	< 0.5	-	< 0.5	-	< 0.5
	Aroclor-1254	mg/kg	0.1	-	-	-	-	-	-	-	-	< 0.5	< 0.5	-	< 0.5	-	< 0.5	-	< 0.5	-	< 0.5	-	< 0.5	-	< 0.5
	Aroclor-1260	mg/kg	0.1	-	-	-	-	-	-	-	-	< 0.5	< 0.5	-	< 0.5	-	< 0.5	-	< 0.5	-	< 0.5	-	< 0.5	-	< 0.5
	Total PCB*	mg/kg	0.1	-	-	-	-	-	-	-	1	< 0.5	< 0.5	-	< 0.5	-	< 0.5	-	< 0.5	-	< 0.5	-	< 0.5	-	< 0.5

Highlighted concentration exceeds the adopted site criteria - Screening Levels for Direct Contact (mg/kg) - CRC Care 2011
Highlighted concentration exceeds the adopted site criteria - Inhalation / Vapour Intrusion HSLs (mg/kg) - NEPC 2013 (SAND)
Highlighted concentration exceeds the adopted site criteria - Management Limits for TPH Fractions F1 - F4 in soil (mg/Kg) - NEPC 2013
Highlighted concentration exceeds the adopted site criteria - ESLs for TPH Fractions F1 - F4, BTEX and Benzo(a)pyrene - NEPC 2013
Highlighted concentration exceeds the adopted site criteria - Health Investigation Levels for Soil Contaminants - NEPC 2013

- No published criteria or sample not analysed

NL Not Limiting

Table 2
St Mary St Joseph Catholic School, Maroubra
Soil Results & Adopted Site Criteria
9194-ER-1-1

			Reference	BH10_0.0-0.2	DUP01		BH10_0.0-0.2	DUP01A	
			Sample ID	S19-Oc13500	S19-Oc13503		S19-Oc13500	ES1933135-001	
			Date Sampled	*8/10/2019*	*8/10/2019*		*8/10/2019*	*8/10/2019*	
			Sample Matrix	*SOIL*	*SOIL*		*SOIL*	*SOIL*	
Group	**Analyte**	**Units**	**LOR**			RPD (%)			RPD (%)
Metals	**Arsenic, As**	**mg/kg**	**2**	< 2	< 2	#VALUE!	< 2	< 5	#VALUE!
	Cadmium, Cd	**mg/kg**	**0.4**	< 0.4	< 0.4	#VALUE!	< 0.4	< 1	#VALUE!
	Chromium, Cr	**mg/kg**	**5**	13	19	38	13	8	48
	Copper, Cu	**mg/kg**	**5**	31	39	23	31	24	25
	Lead, Pb	**mg/kg**	**5**	62	64	3	62	46	30
	Nickel, Ni	**mg/kg**	**5**	< 5	< 5	#VALUE!	< 5	2	#VALUE!
	Zinc, Zn	**mg/kg**	**5**	88	110	22	88	61	36
	Mercury	**mg/kg**	**0.1**	< 0.1	< 0.1	#VALUE!	< 0.1	< 0.1	#VALUE!

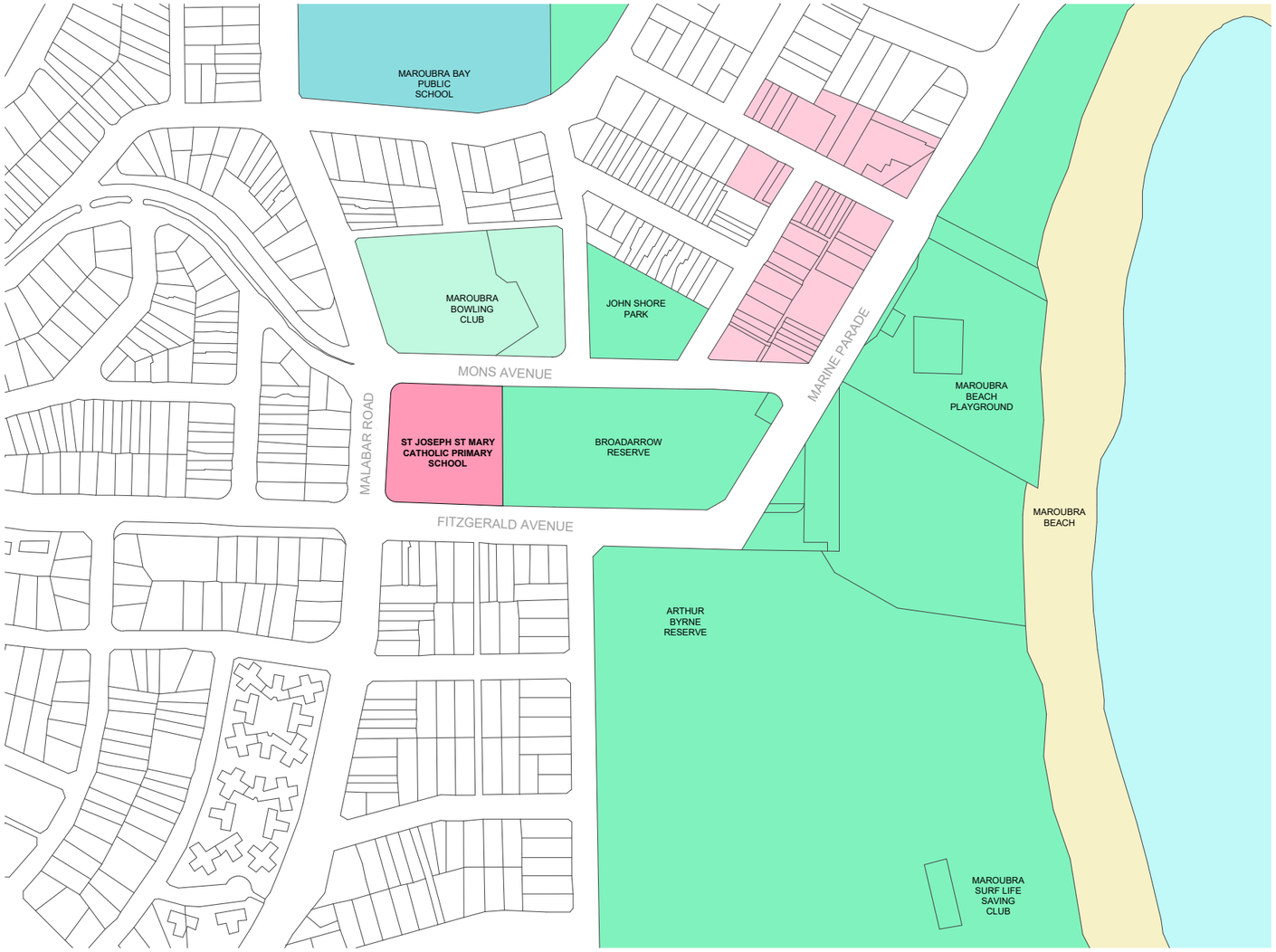
RPD exceeding criteria

VALUE **Primary, Duplicate or Triplicate less than LOR**

APPENDIX A

SURVEY

MP-01_COVER SHEET & LOCATION PLAN



PROJECT BRIEF

STAGE 1 - 2 STREAM:

- CONSTRUCTION OF A NEW 2-STOREY BUILDING FOR STAFF AND ADMINISTRATION FACILITIES AND 6 GENERAL PURPOSE LEARNING AREAS
- REFURBISHMENT OF EXISTING BLOCKS D & E INTO 8 GENERAL PURPOSE LEARNING AREAS AND LIBRARY
- DEMOLITION OF BLOCKS A, B & C
- REMOVAL OF DEMOUTABLE BUILDINGS

STAGE 2 - 3 STREAM:

- CONSTRUCTION OF A NEW 1-STOREY BUILDING FOR 9 GENERAL PURPOSE LEARNING AREAS AND BREAKOUT SPACES
- REFURBISHMENT OF EXISTING BLOCKS D & E INTO 6 GENERAL PURPOSE LEARNING AREAS AND LIBRARY OR LEARNING CENTRE

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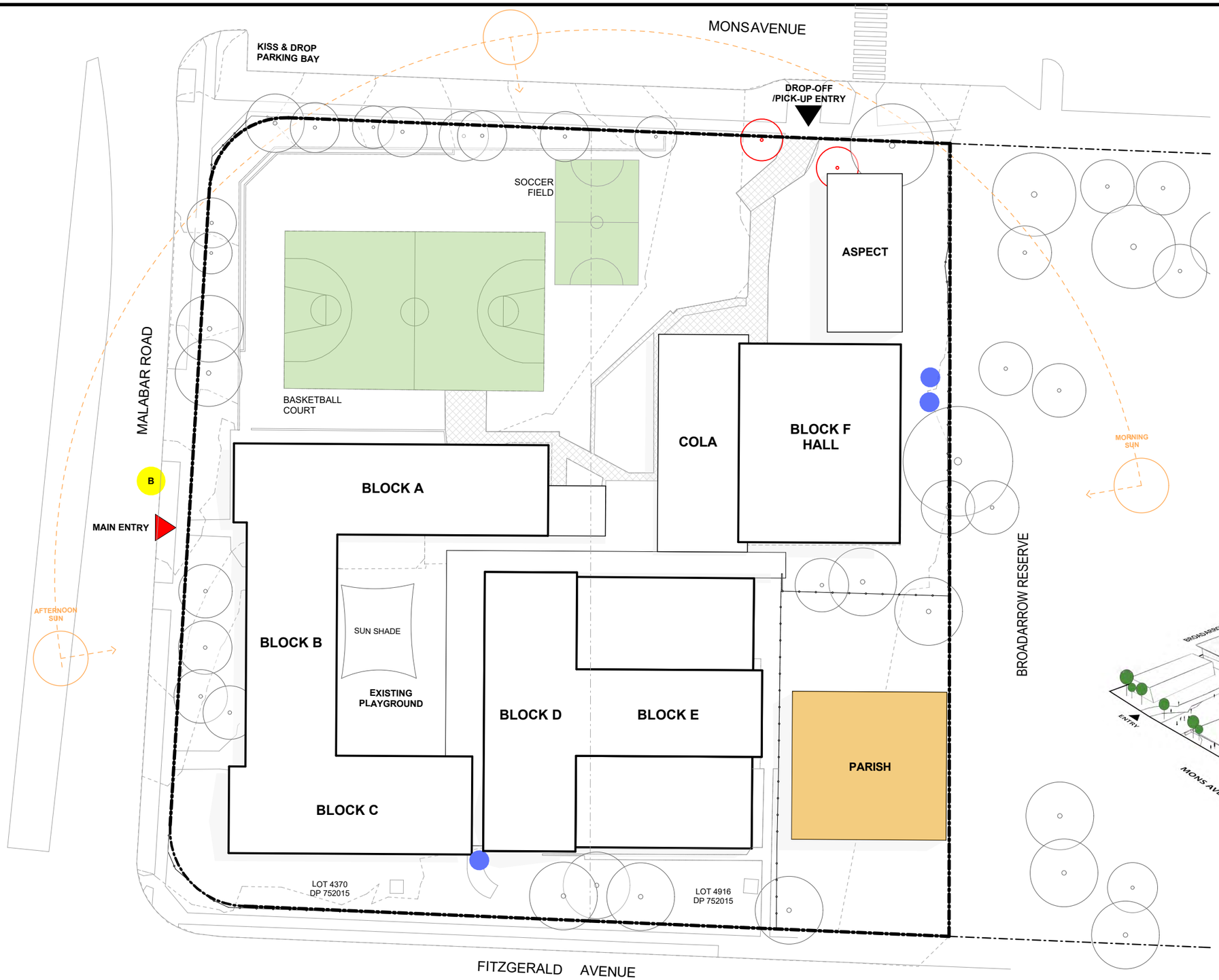
MASTERPLAN

PRELIMINARY

26/06/2019

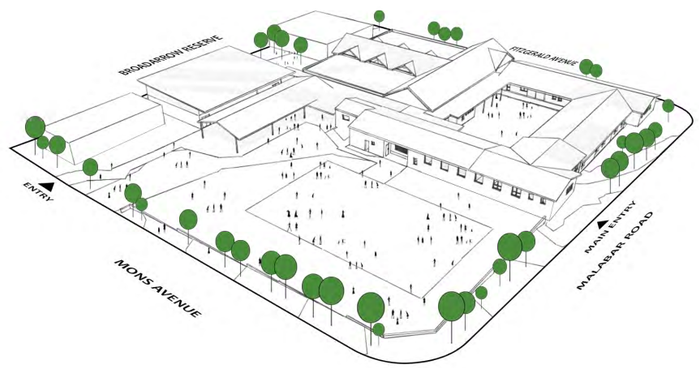
SCALE: 1:2.94 @A3

MP-02_EXISITNG SITE PLAN



SITE ANALYSIS LEGEND

- EXISTING SCHOOL BUILDINGS
- PARISH PRECINCT
- COLA (COVERED OUTDOOR LEARNING AREA) AND COVERED WALKWAYS
- SPORT COURT
- SUN PATH
- B — BUS STOP
- PEDESTRIAN CROSSING
- EXISITNG TREES
- WATER TANKS
- MAIN ENTRY TO THE SITE
- DROP-OFF / PICK-UP ENTRY
- BOUNDARY



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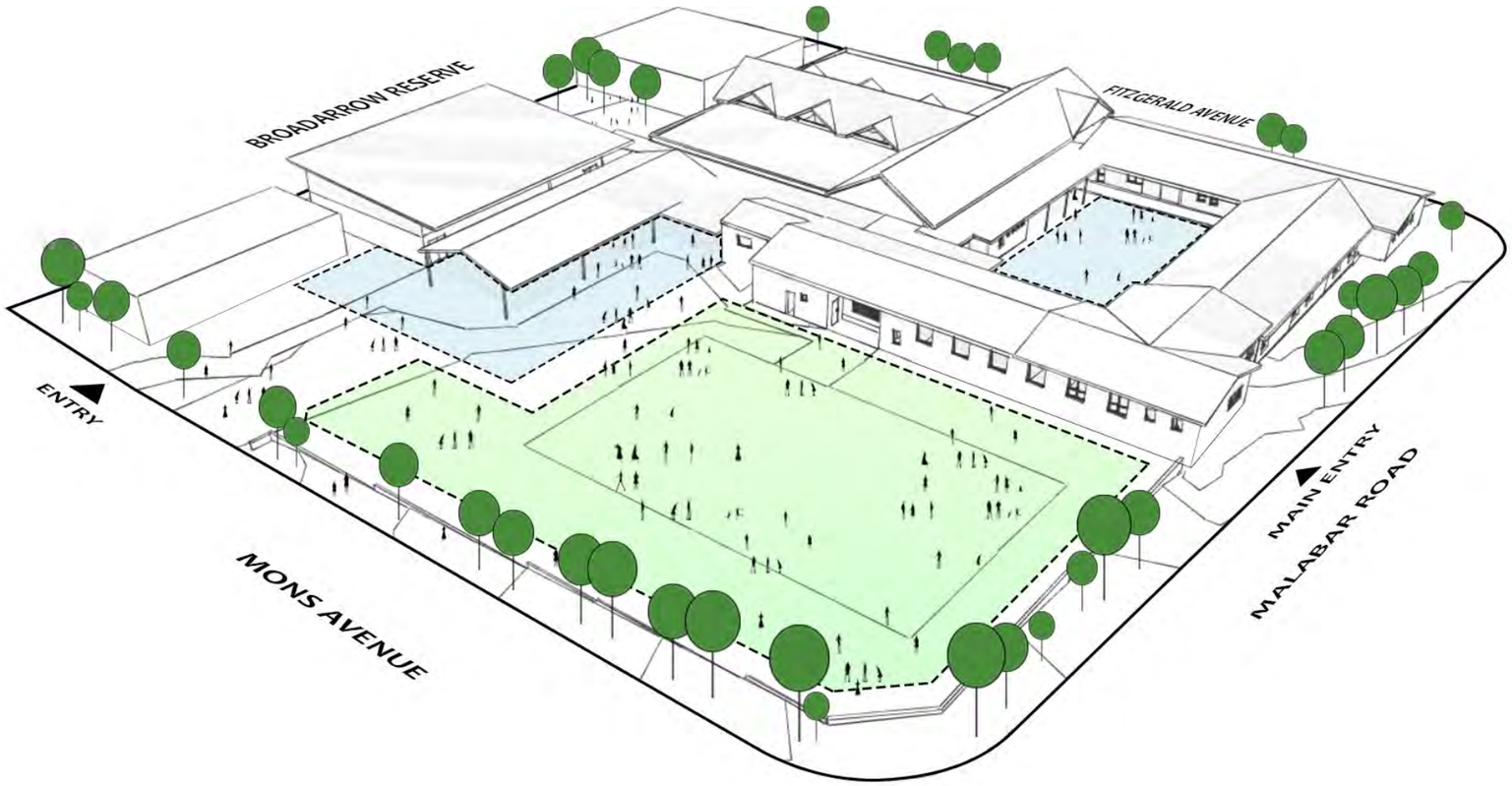
MASTERPLAN

PRELIMINARY

26/06/2019

SCALE: 1:500 @A3

MP-03_EXISTING SITE 3D AXO




EXISITNG HALL


EXISITNG PLAYGROUND/COURTYARD


EXISITNG ASPECT DEMOUNTABLES

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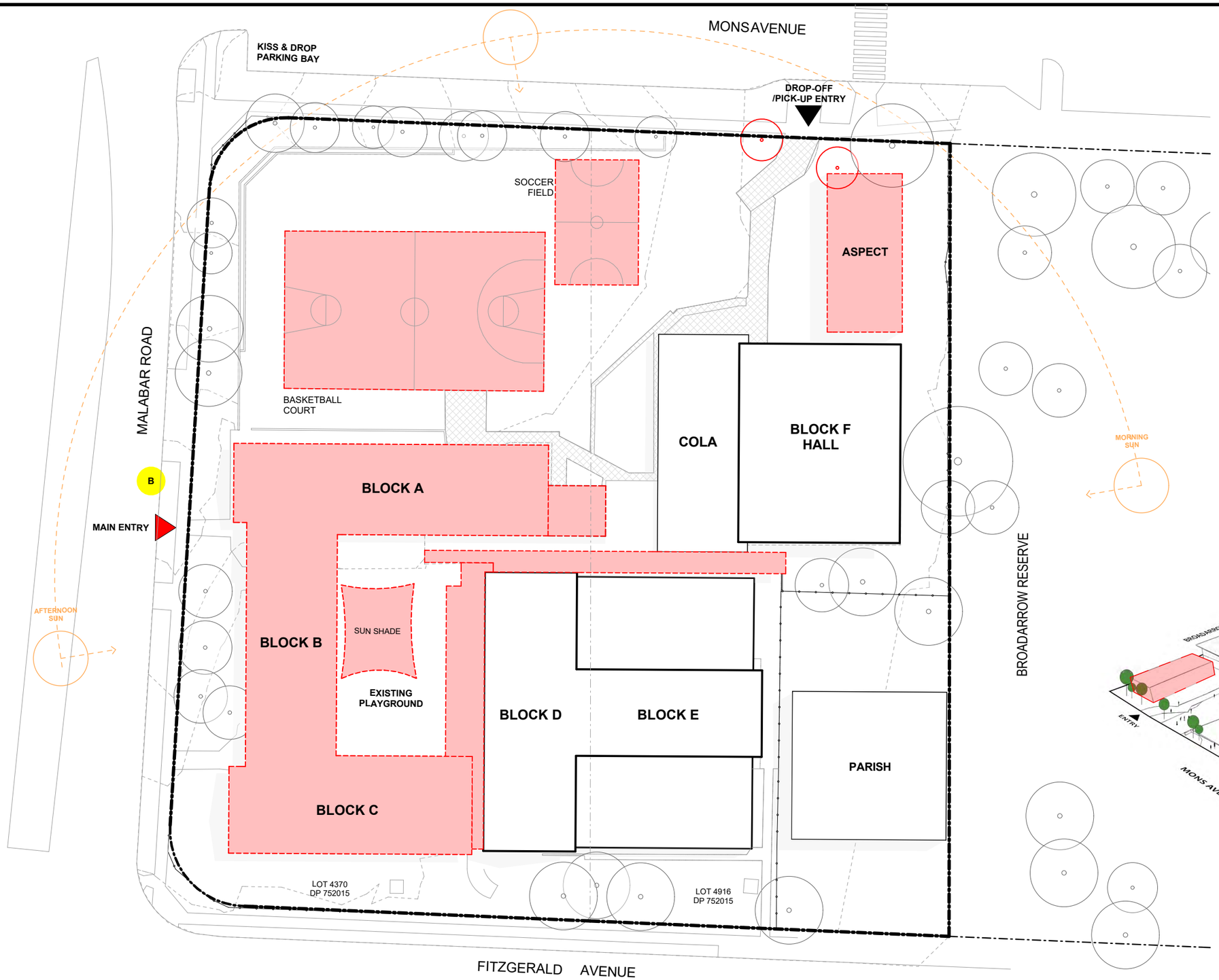
MASTERPLAN

26/06/2019

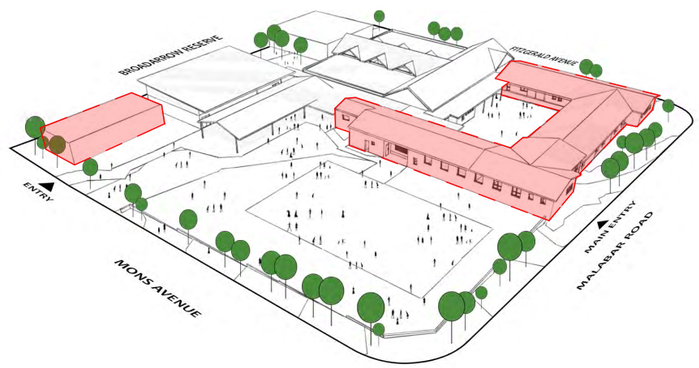
PRELIMINARY SCALE: @A3

MP-04_PROPOSED STAGE 1 DEMOLITION PLAN



LEGEND

- TO BE DEMOLISHED
- BUILDINGS TO BE RETAINED
- MAIN ENTRY TO THE SITE
- DROP-OFF / PICK-UP ENTRY
- B — BUS STOP
- BOUNDARY



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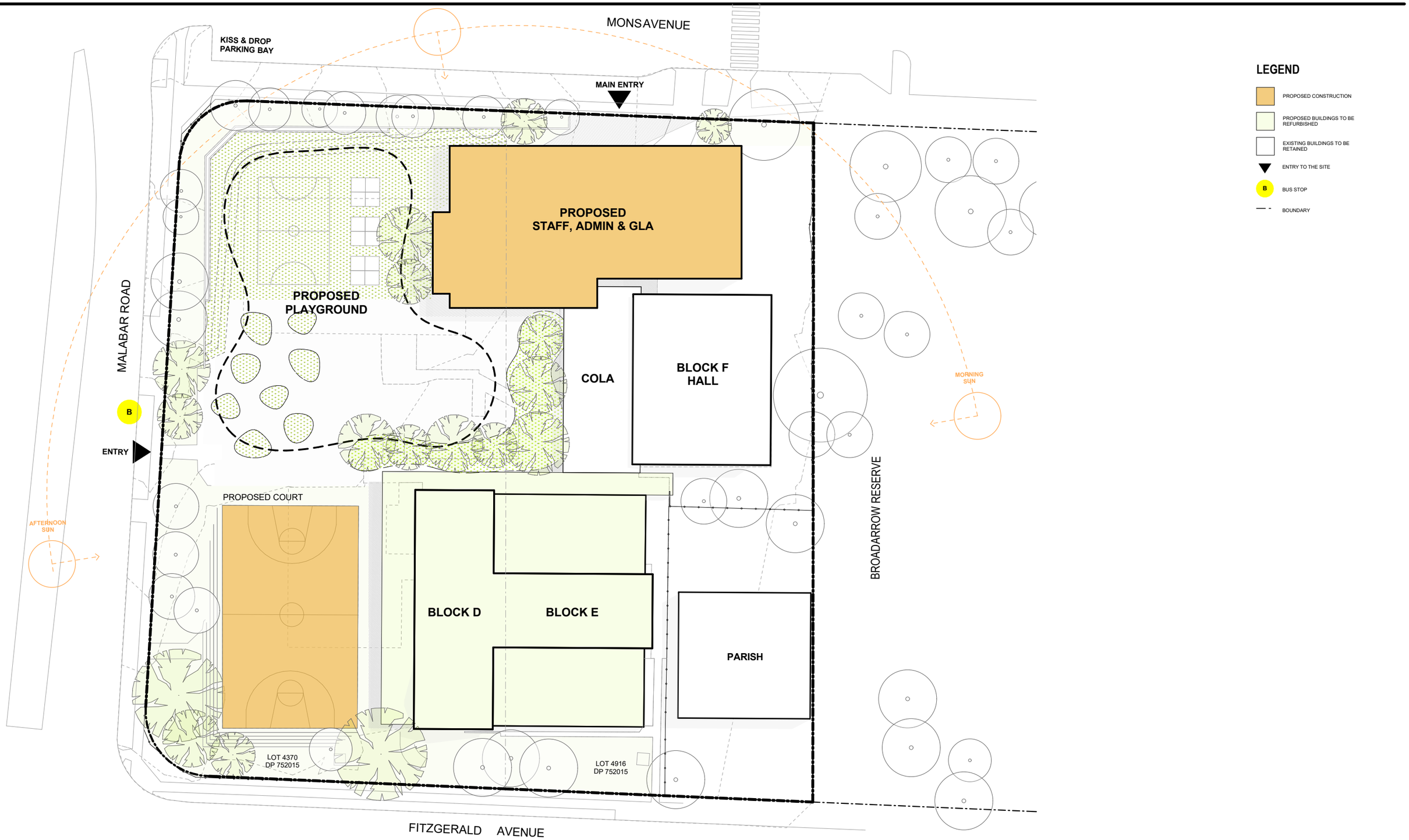
MASTERPLAN

26/06/2019

PRELIMINARY

SCALE: 1:500 @A3

MP-05_PROPOSED STAGE 1 MASTERPLAN



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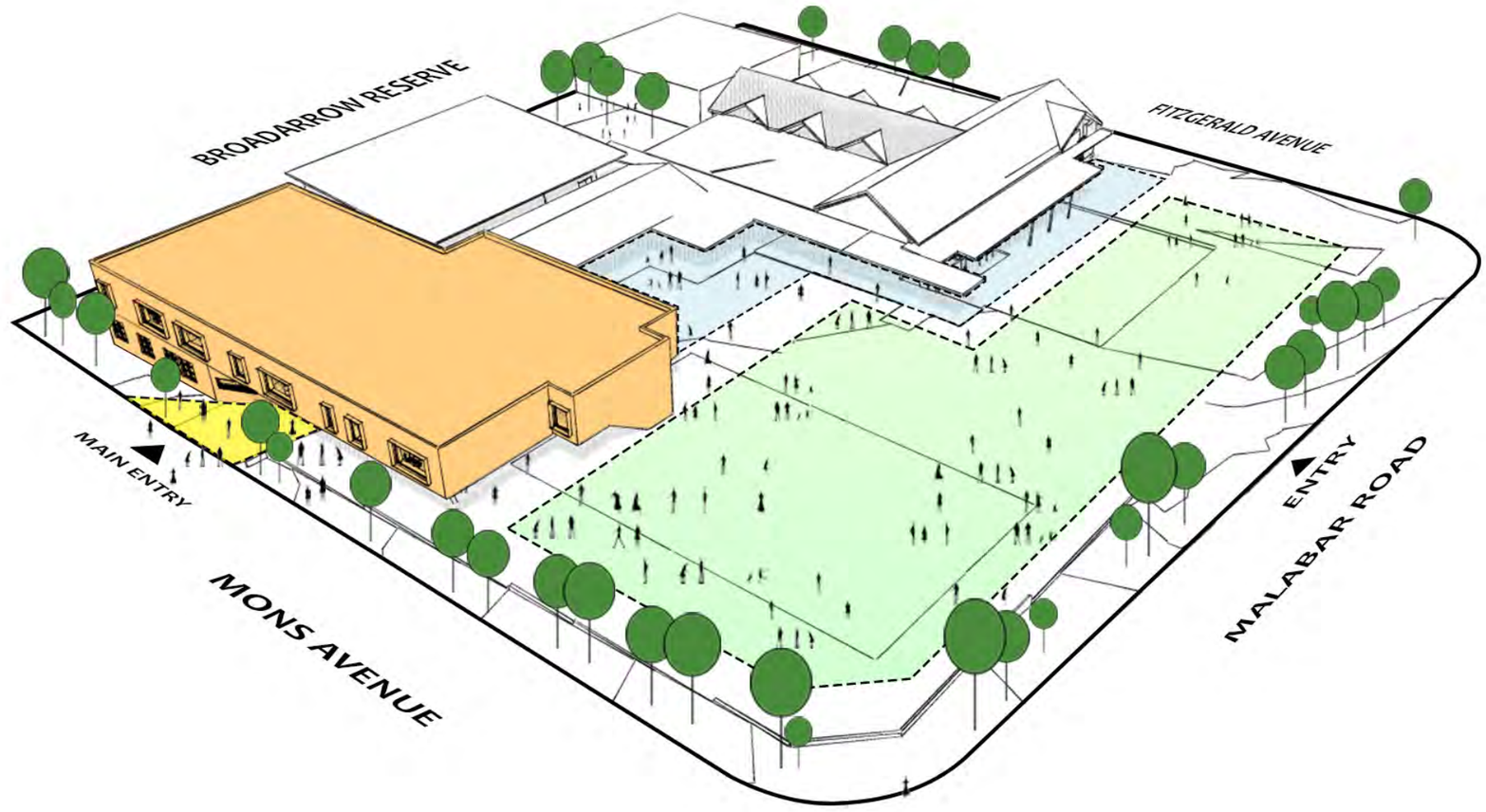
MASTERPLAN

26/06/2019

PRELIMINARY

SCALE: 1:500 @A3

MP-06_PROPOSED STAGE 1 3D AXO



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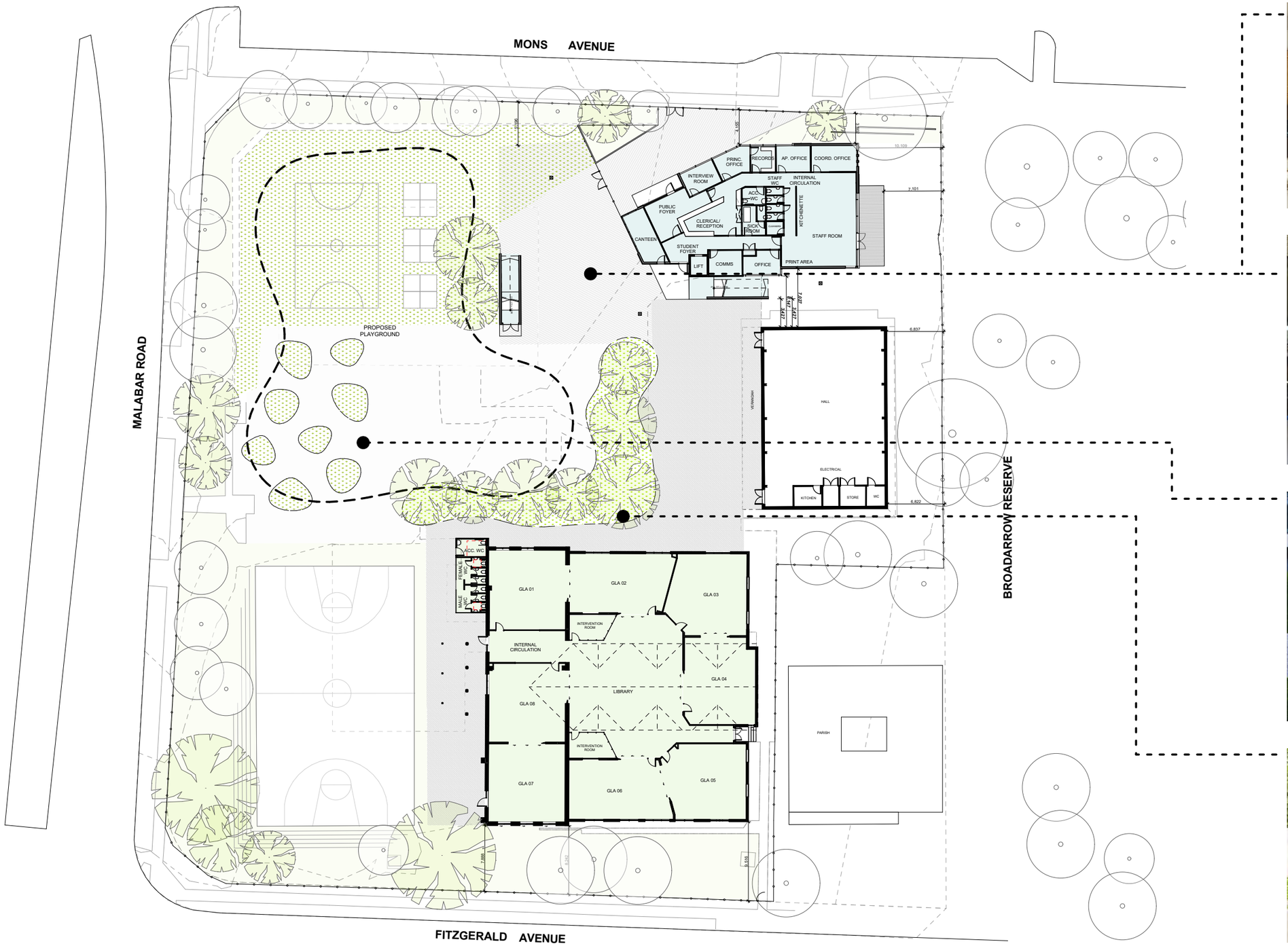
MASTERPLAN

26/06/2019

PRELIMINARY SCALE: @A3

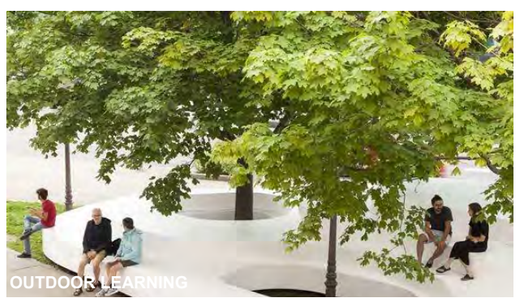
MP-07_PROPOSED GROUND FLOOR PLAN




PLAYGROUND LANDSCAPE


COLA


PLAYGROUND LANDSCAPE


OUTDOOR LEARNING

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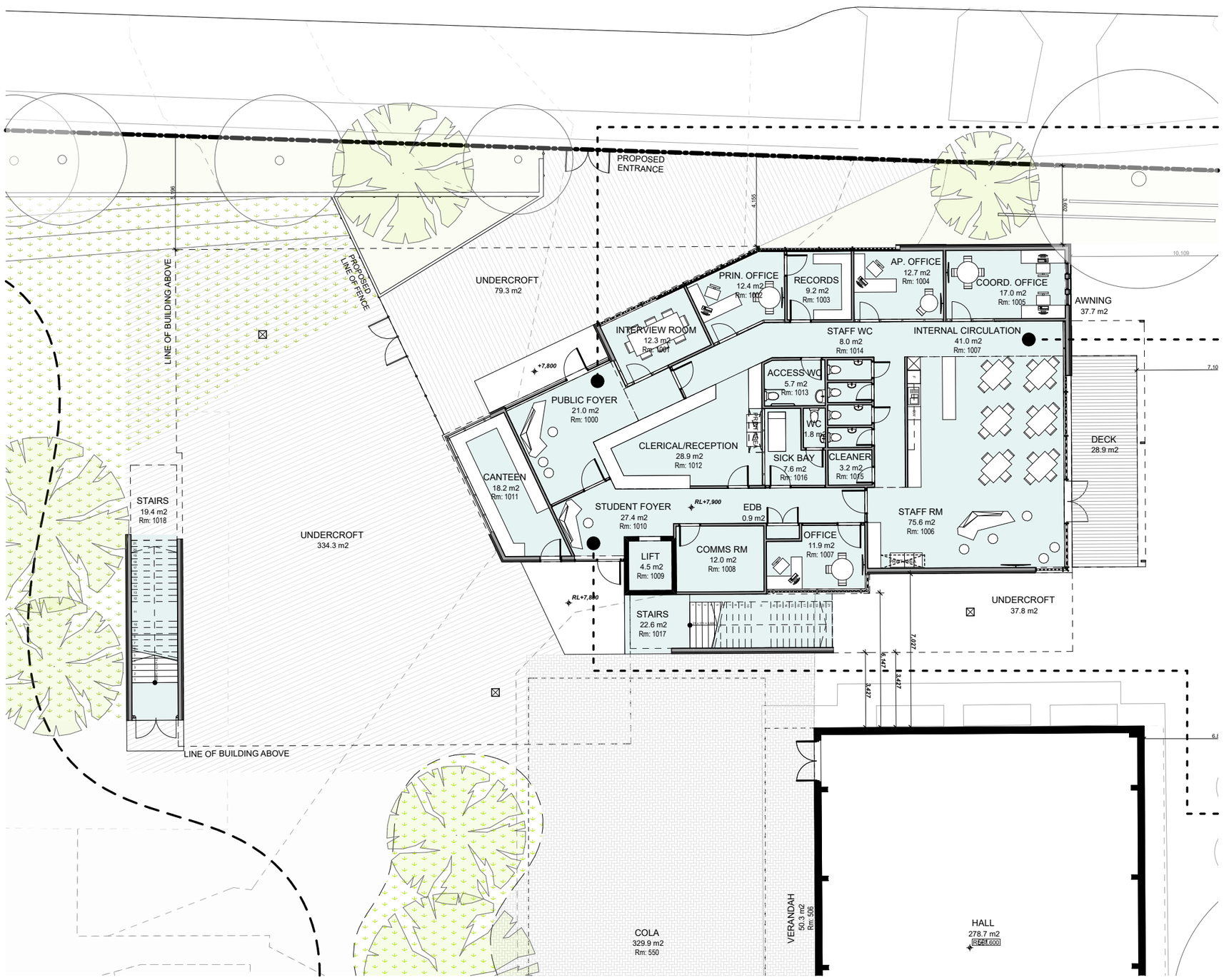
MASTERPLAN

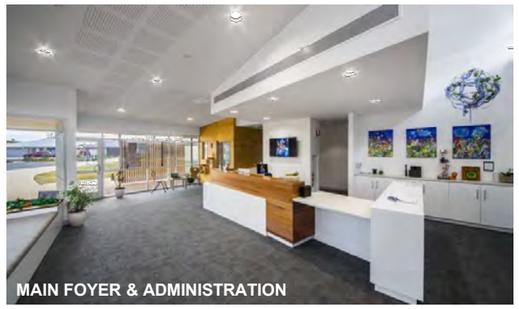
26/06/2019

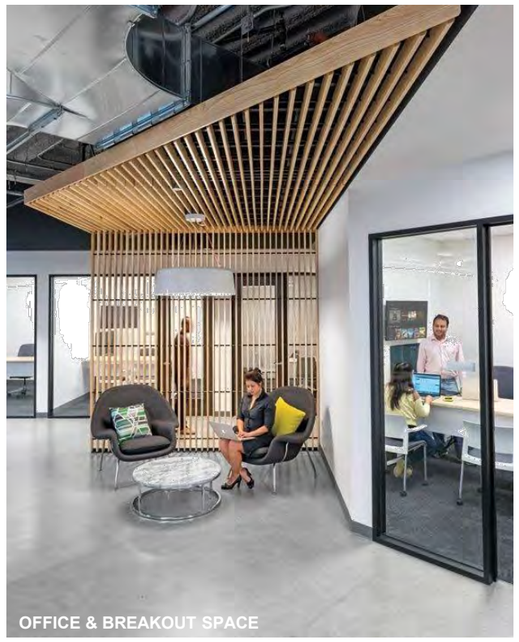
PRELIMINARY

SCALE: 1:500 @A3

MP-08_PROPOSED STAFF AND ADMINISTRATION LAYOUT







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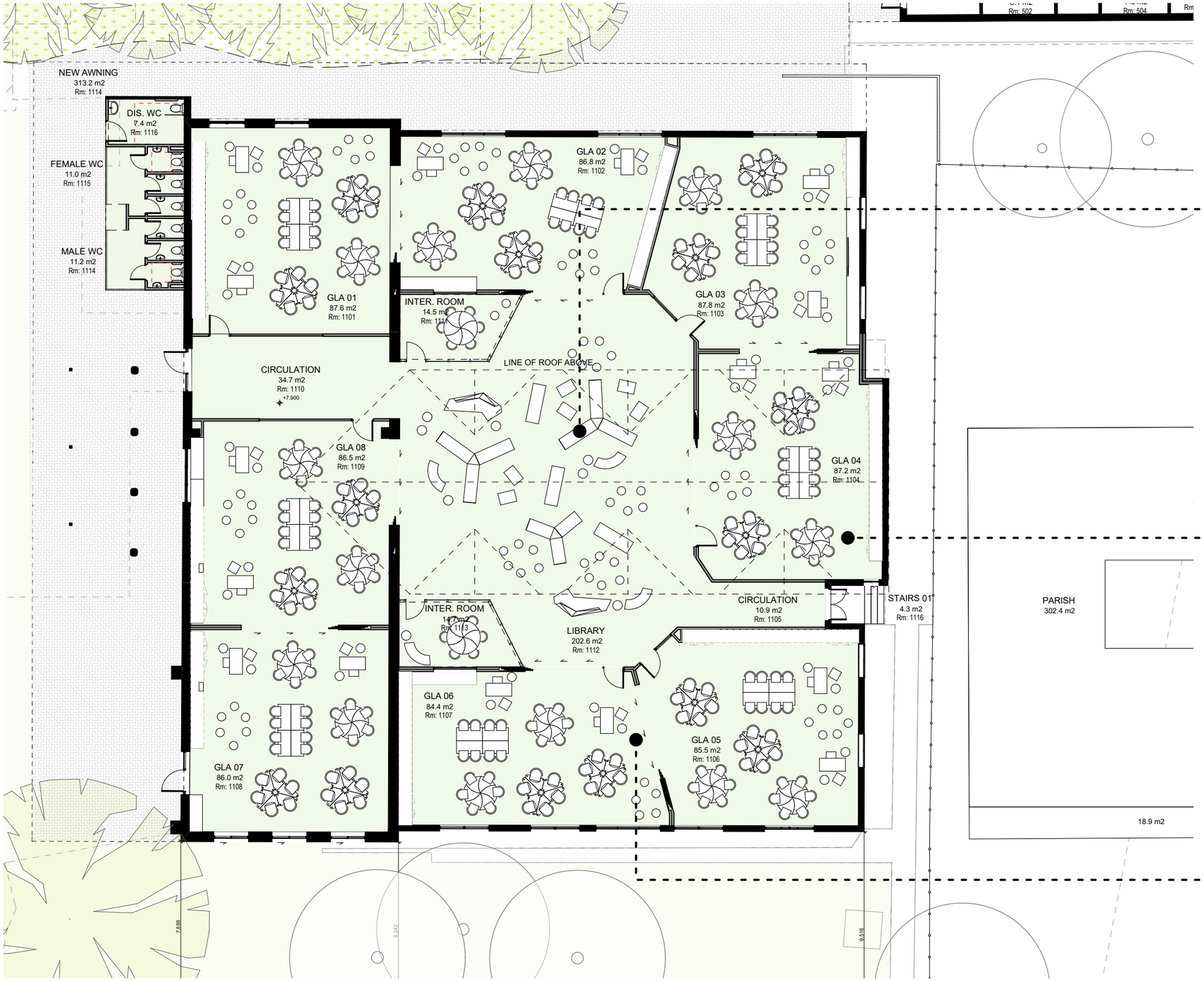
MASTERPLAN

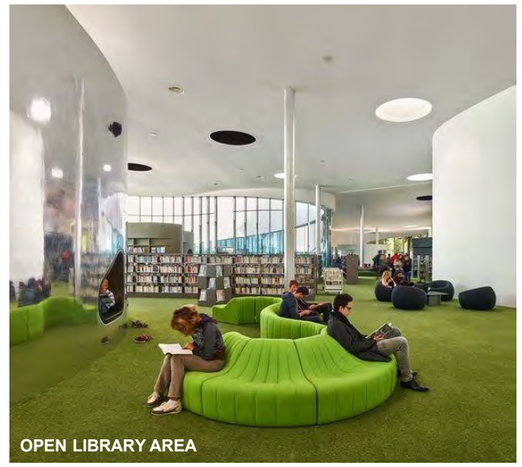
PRELIMINARY

26/06/2019

SCALE: 1:200 @A3

MP-09_REFURBISHED BLOCK D & E LAYOUT




OPEN LIBRARY AREA


BREAKOUT AREAS INSIDE GLAs


TRANSPARENCY BETWEEN CLASSROOMS

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MASTERPLAN

PRELIMINARY

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SCALE: 1:200 @A3

MP-10_REFURBISHED BLOCK D & E 3D LAYOUT

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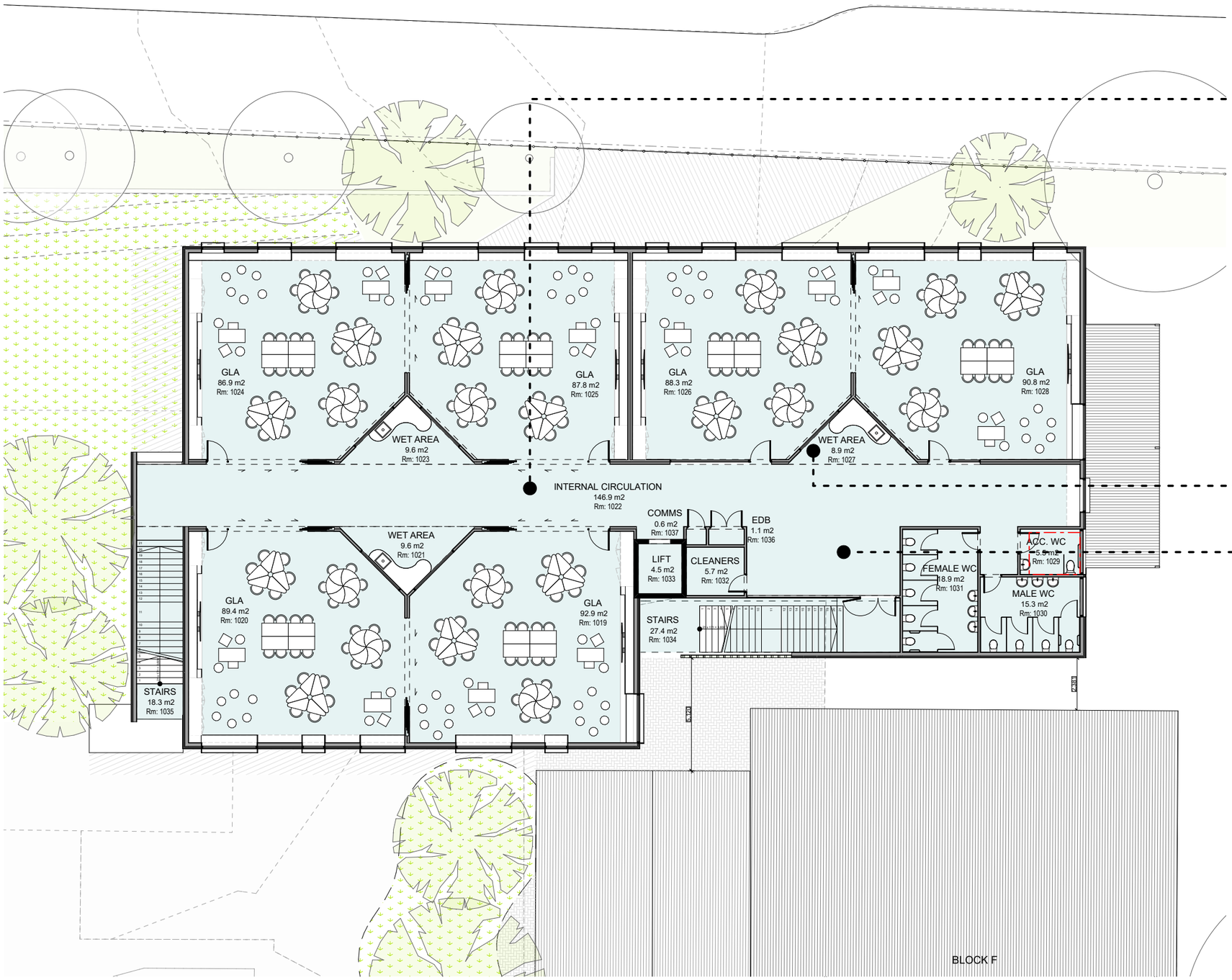
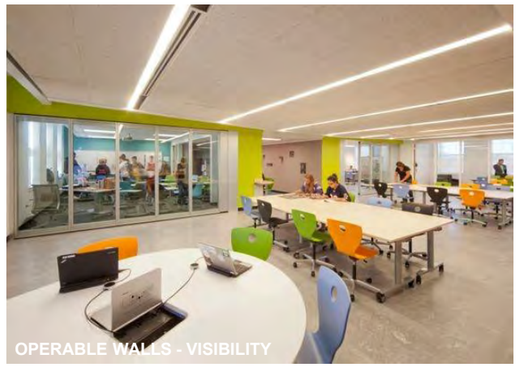
MASTERPLAN

PRELIMINARY SCALE: @A3

26/06/2019

MP-11_PROPOSED FIRST FLOOR GLA LAYOUT




OPERABLE WALLS - VISIBILITY


LEARNING ON THE CORRIDORS


RETREAT / BREAKOUT NOOKS

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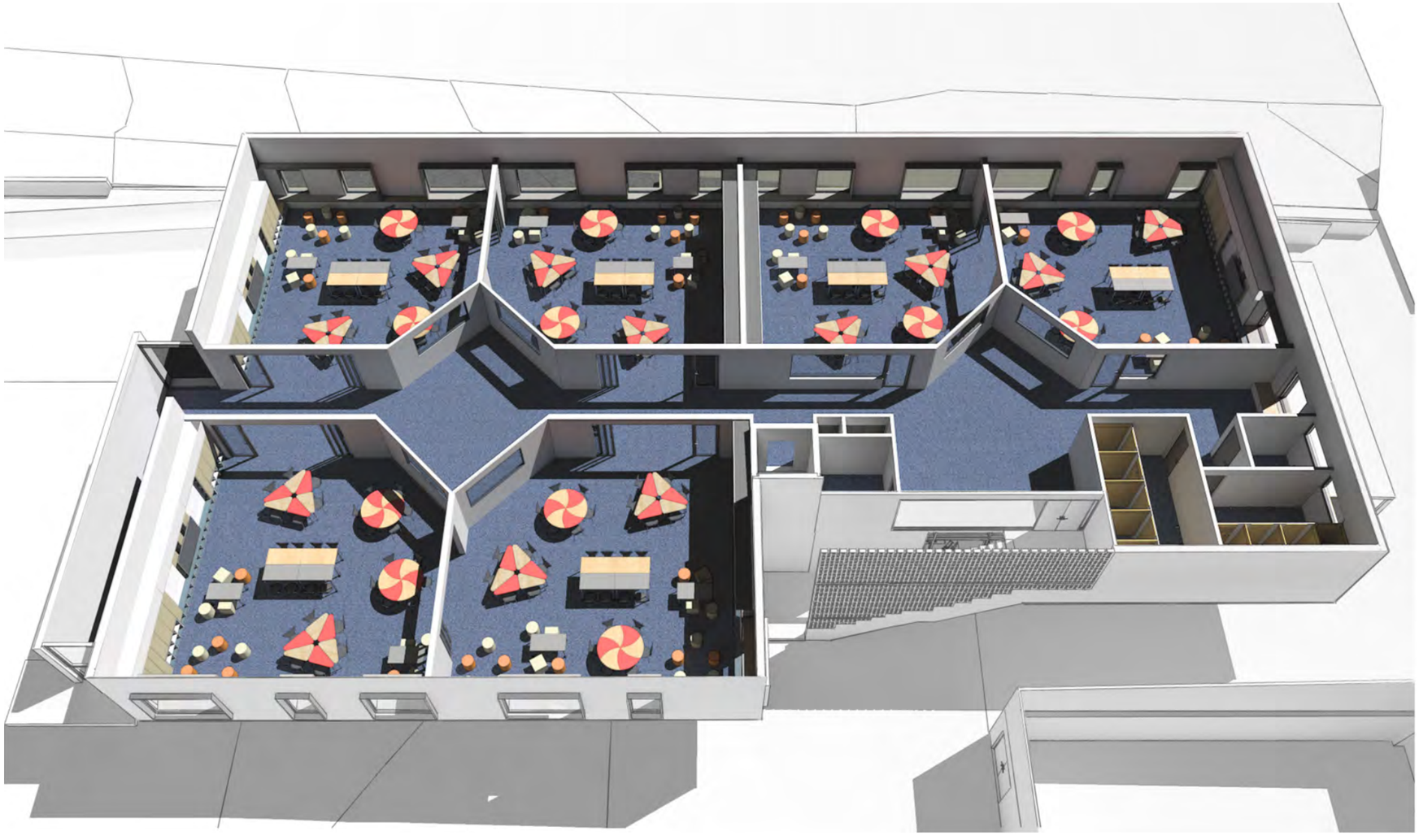
MASTERPLAN

PRELIMINARY

26/06/2019

SCALE: 1:200 @A3

MP-12_PROPOSED FIRST FLOOR GLA 3D LAYOUT



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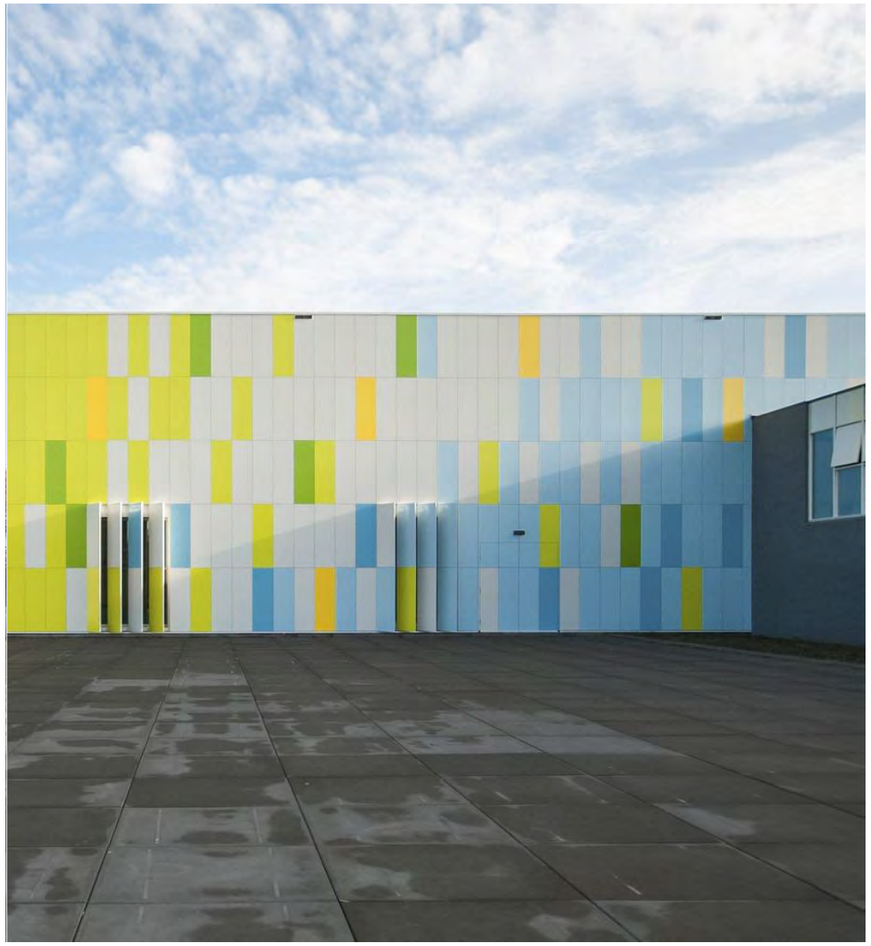
MASTERPLAN

26/06/2019

PRELIMINARY SCALE: @A3

MP-13_INSPIRATION IMAGES



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MASTERPLAN

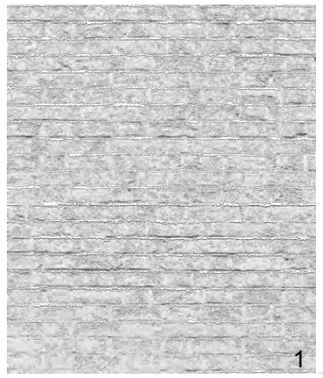
PRELIMINARY SCALE: @A3

26/06/2019

MP-14_PROPOSED MATERIAL PALETTE OPTION 1

MATERIAL PALETTE:

1. LIMESTONE COLOURED FACEBRICK WITH LIGHT GREY MORTAR JOINTS.
2. RAW CONCRETE FINISH TO COLUMNS, FEATURE WALLS AND EXPOSED SLAB EDGES.
3. TIMBER CEILING PANELS FOR UNDERCROFT AREAS.
4. NATURAL VEGATATION OF THE REGION.
5. COLOUR PALETTE RELATING TO THE OCEAN.
6. DARK GREY POWDER COATED FRAMES.



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MASTERPLAN

PRELIMINARY

26/06/2019

SCALE: 1:620.36 @A

MP-15_PROPOSED MATERIAL PALETTE OPTION 2

MATERIAL PALETTE:

1. CEMINTEL BARESTONE EXTERNAL CLADDING PANELS.
2. RAW CONCRETE FINISH TO COLUMNS, FEATURE WALLS AND EXPOSED SLAB EDGES.
3. TIMBER CEILING PANELS FOR UNDERCROFT AREAS.
4. NATURAL VEGATATION OF THE REGION.
5. COLOUR PALETTE RELATING TO THE OCEAN.
6. DARK GREY POWDER COATED FRAMES.

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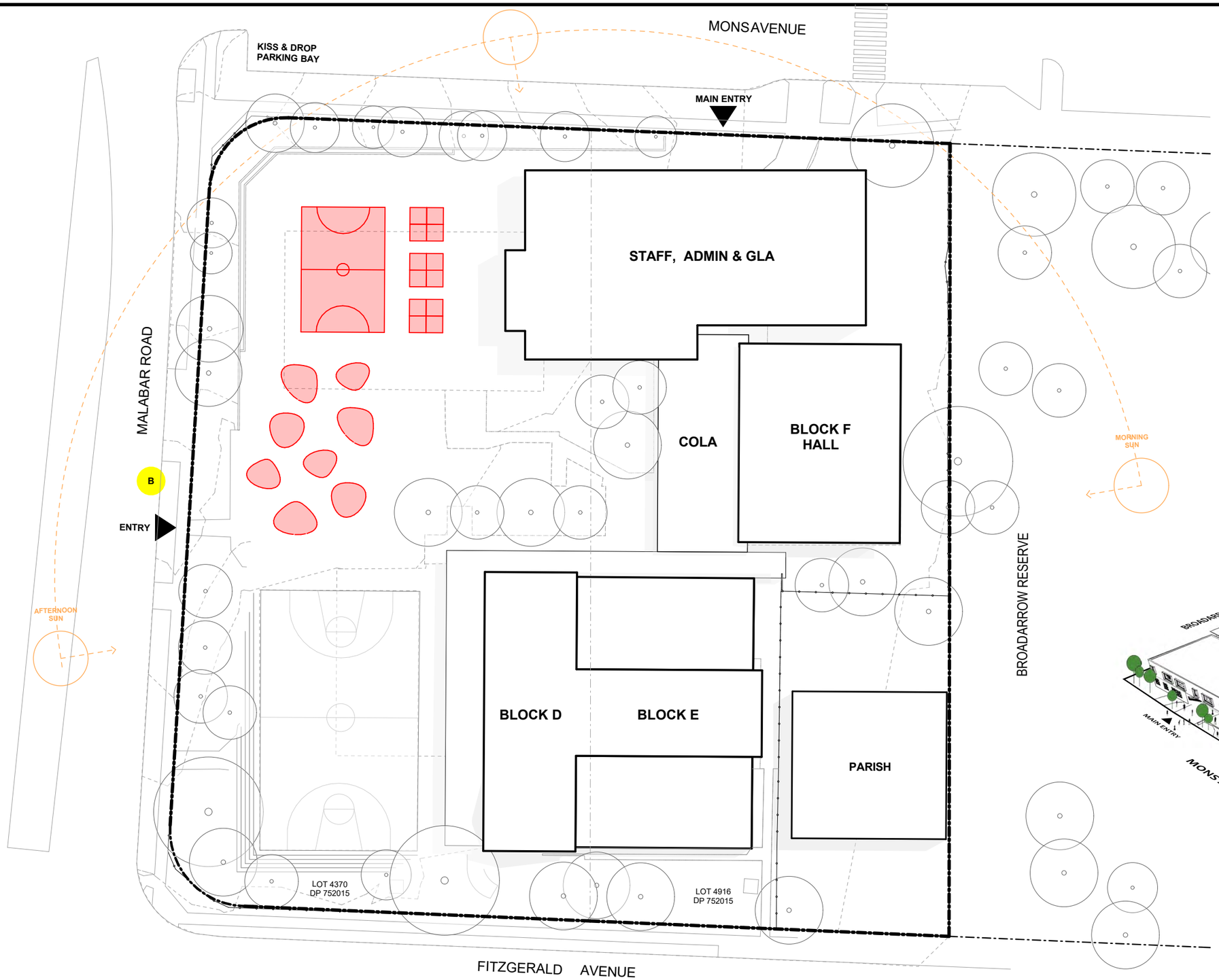
MASTERPLAN

PRELIMINARY

26/06/2019

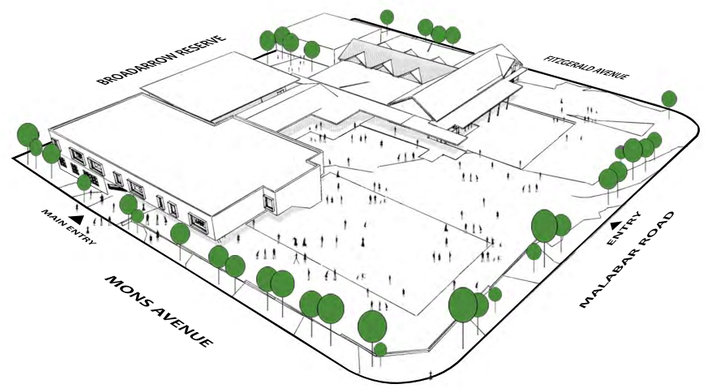
SCALE: 1:620.36 @A

MP-16_PROPOSED 3 STREAM DEMOLITION PLAN



LEGEND

- TO BE DEMOLISHED
- BUILDINGS TO BE RETAINED
- MAIN ENTRY TO THE SITE
- DROP-OFF / PICK-UP ENTRY
- B — BUS STOP
- BOUNDARY



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MASTERPLAN

26/06/2019

PRELIMINARY

SCALE: 1:500 @A3

MP-17_PROPOSED 3 STREAM GF MASTERPLAN OPTION 1

LEGEND

- PROPOSED EXTENTION TO ADMINISTRATION BUILIDNG
- PROPOSED LIBRARY
- PROPOSED CLASSROOMS
- PROPOSED BREAKOUT SPACE
- EXISTING STAGE 1 BUILDING
- BUILDING SERVICES
- ENTRY TO THE SITE
- B BUS STOP
- BOUNDARY

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MASTERPLAN

26/06/2019

PRELIMINARY SCALE: @A3

MP-18_PROPOSED 3 STREAM GF MASTERPLAN OPTION 2

LEGEND

- PROPOSED EXTENTION TO ADMINISTRATION BUILIDNG
- PROPOSED LIBRARY
- PROPOSED CLASSROOMS
- PROPOSED BREAKOUT SPACE
- EXISTING STAGE 1 BUILDING
- BUILDING SERVICES
- ENTRY TO THE SITE
- B — BUS STOP
- BOUNDARY

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MASTERPLAN

26/06/2019

PRELIMINARY SCALE: @A3

MP-19_PROPOSED 3 STREAM FF MASTERPLAN

LEGEND

- PROPOSED REFURBISHMENT
- PROPOSED STAGE 2 EXTENT
- EXISTING STAGE 1 BUILDING
- BUILDING SERVICES

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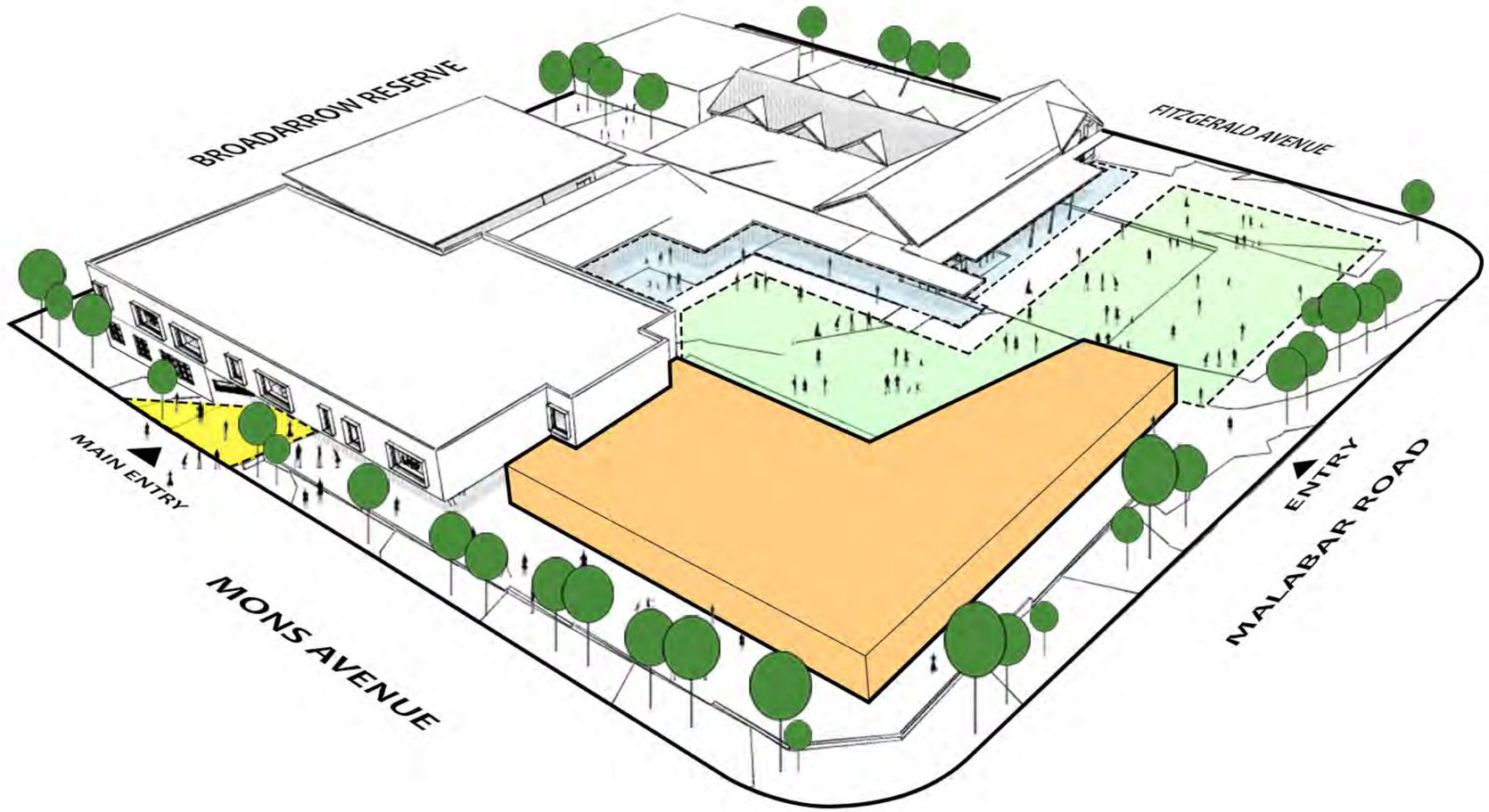
26/06/2019

PRELIMINARY SCALE: @A3

MP-20_PROPOSED 3 STREAM 3D AXONOMETRIC



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MASTERPLAN

26/06/2019

PRELIMINARY SCALE: @A3

APPENDIX B

GROUNDWATER

WaterNSW

help · contact · customise

State Overview
State Overview

Rivers and Streams
favourites · search · download sites · find a site
Real Time Data - Rivers And Streams

Daily River Reports
Daily River Reports

Dams
favourites · search · download sites · find a site
Real Time Data - Major Dams

Groundwater (Telemetered data)
favourites · search · download sites · find a site
Real Time Data - Bores

All Groundwater Site details
search · download sites · find a site
All Groundwater Map
North Coast Region
Hunter Region
Greater Sydney Region
South Coast Region
Northwest Region
Central West Region
Southwest Region
Far West Region
Great Artesian Basin
Coal Basins

Meteorology
favourites · search · download sites · find a site
Real Time Data - Weather Stations

Hunter Integrated Telemetry System
Hunter Integrated Telemetry System

bandwidth high low

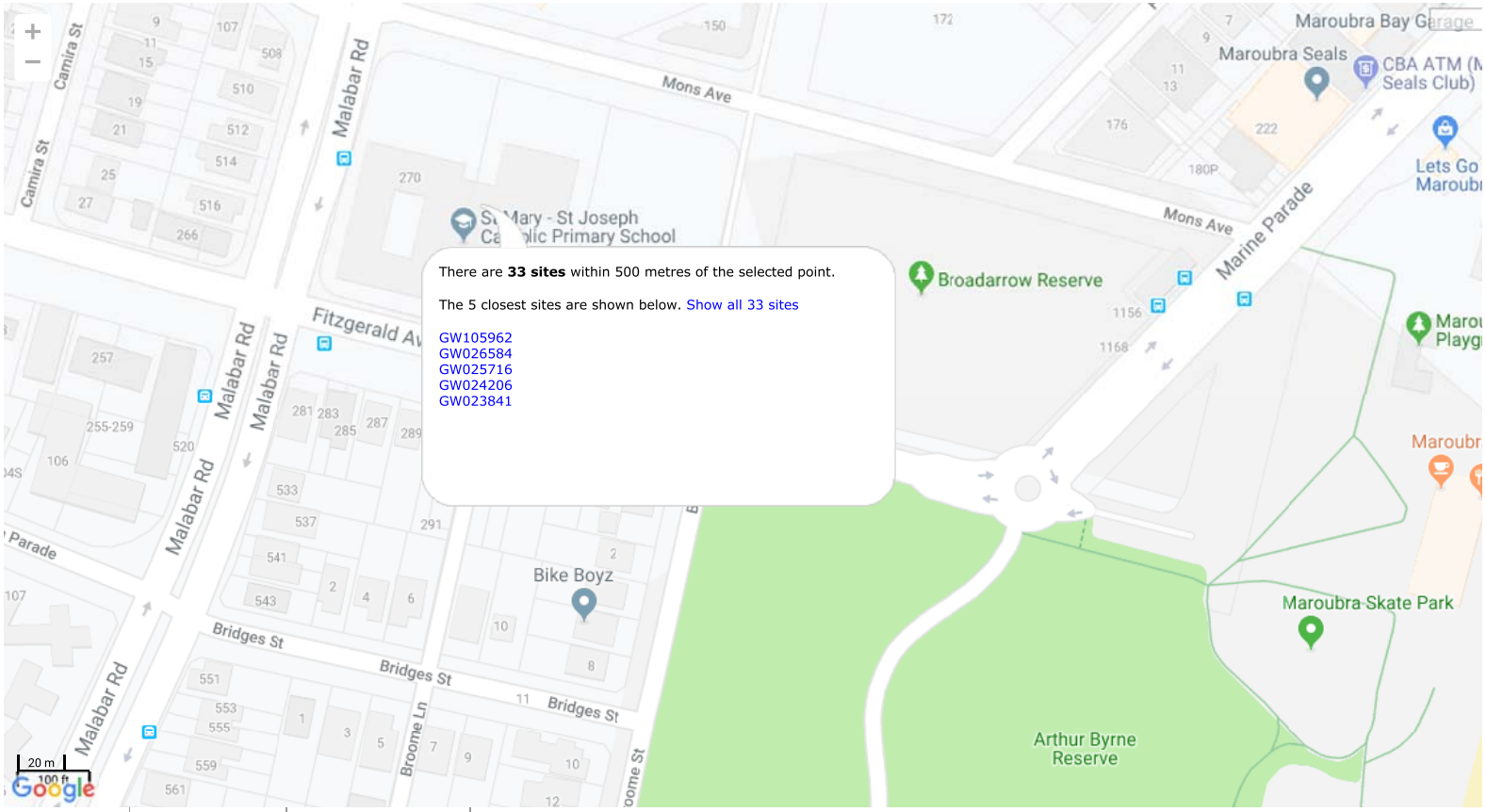
All Groundwater Site Details » All Groundwater Map

Greater Sydney Region

bookmark this page

All data times are Eastern Standard Time

Map



WaterNSW
Work Summary

GW101432

Licence: **Licence Status:**

Authorised Purpose(s):
Intended Purpose(s): DOMESTIC

Work Type: Spear
Work Status: Supply Obtained
Construct.Method: Hand Auger
Owner Type: School

Commenced Date: **Final Depth:** 7.00 m
Completion Date: 01/10/1997 **Drilled Depth:** 7.00 m

Contractor Name: (None)
Driller: Rosario Fedele
Assistant Driller:

Property: **Standing Water Level (m):**
GWMA: **Salinity Description:**
GW Zone: **Yield (L/s):**

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBERLAND	BOTANY	COR POR 4370
Licensed:			

Region: 10 - Sydney South Coast **CMA Map:**
River Basin: - Unknown **Grid Zone:** **Scale:**
Area/District:

Elevation: 0.00 m (A.H.D.) **Northing:** 6242341.000 **Latitude:** 33°56'49.3"S
Elevation Source: Unknown **Easting:** 338465.000 **Longitude:** 151°15'07.2"E

GS Map: - **MGA Zone:** 56 **Coordinate Source:** GIS - Geogra

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	7.00	90			Hand Auger
1	1	Casing	Lining	0.00	7.00				

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	7.00	7.00	SAND	Sand	

Remarks

21/03/2013: Nat Carling, 20-Mar-2013; Added rock type codes to driller's log & added missing information (based on existing data).

***** End of GW101432 *****

WaterNSW
Work Summary

GW060222

Licence: **Licence Status:**

Authorised Purpose(s):
Intended Purpose(s): RECREATION (GROUNDWATER)

Work Type: Battery Spears
Work Status: Supply Obtained
Construct.Method:
Owner Type: Local Govt

Commenced Date: **Final Depth:**
Completion Date: 01/01/1984 **Drilled Depth:**

Contractor Name: (None)
Driller:
Assistant Driller:

Property: **Standing Water Level (m):**
GWMA: **Salinity Description:**
GW Zone: **Yield (L/s):** 6.320

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBERLAND	BOTANY	7074 93738
Licensed:			

Region: 10 - Sydney South Coast **CMA Map:** 9130-2S
River Basin: 213 - SYDNEY COAST - GEORGES RIVER **Grid Zone:** **Scale:**
Area/District:

Elevation: 0.00 m (A.H.D.) **Northing:** 6242300.000 **Latitude:** 33°56'50.7"S
Elevation Source: (Unknown) **Easting:** 338668.000 **Longitude:** 151°15'15.0"E

GS Map: - **MGA Zone:** 56 **Coordinate Source:** GD.,ACC.MAP

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1	1	Casing	P.V.C.	0.00	0.00	51			

Remarks

09/03/1987: RESERVE CNR FENTON & MONS AVE MAROUBRA
09/03/1987: BATTERY OF 5 SPEARS
12/11/2009: Updated details as per existing data.

***** End of GW060222 *****

WaterNSW
Work Summary

GW110019

Licence:
Licence Status:
Authorised Purpose(s):
Intended Purpose(s): RECREATION (GROUNDWATER)

Work Type: Bore
Work Status:
Construct.Method: Percussion
Owner Type: Other Govt

Commenced Date:
Completion Date: 18/07/2008
Final Depth: 9.00 m
Drilled Depth: 9.00 m

Contractor Name: B & B DRILLING INC
Driller: Michael Gerard Barrett
Assistant Driller:

Property:
GWMA:
GW Zone:
Standing Water Level (m): 2.400
Salinity Description:
Yield (L/s): 3.000

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBERLAND	BOTANY	7075 93738
Licensed:			

Region: 10 - Sydney South Coast
River Basin: - Unknown
Area/District:
CMA Map:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6242358.000
Easting: 338690.000
Latitude: 33°56'48.9"S
Longitude: 151°15'15.9"E

GS Map: -
MGA Zone: 56
Coordinate Source: Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	9.00	350			Percussion
1		Annulus	Waterworn/Rounded	0.00	0.00				Graded, Q:0.300m3
1	1	Casing	Steel	0.00	6.00	200			Seated on Bottom, Welded
1	1	Opening	Screen	6.00	9.00	200		0	Stainless Steel, Welded, A: 0.50mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
2.40	9.00	6.60	Unknown	2.40		3.00		08:00:00	120.00

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	3.00	3.00	BROWN SAND	Breccia	
3.00	5.70	2.70	BROWN SILTY SAND	Breccia	
5.70	8.20	2.50	YELLOW SAND	Unknown	
8.20	9.00	0.80	DARK YELLOW SAND	Dacite(Tonalite)	

Remarks

06/04/2009: Previous Lic Bo:10BL602523

***** End of GW110019 *****

WaterNSW
Work Summary

GW108427

Licence:
Licence Status:
Authorised Purpose(s):
Intended Purpose(s): DOMESTIC

Work Type: Spear
Work Status: Supply Obtained
Construct.Method: Auger
Owner Type: Private

Commenced Date:
Completion Date: 04/01/2007
Final Depth: 8.00 m
Drilled Depth: 8.00 m

Contractor Name: (None)
Driller: Simon Matthew Hancock
Assistant Driller:

Property:
GWMA:
GW Zone:
Standing Water Level (m):
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBERLAND	BOTANY	16//6490
Licensed:			

Region: 10 - Sydney South Coast
River Basin: 213 - SYDNEY COAST - GEORGES RIVER
Area/District:
CMA Map: 9130-2S
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6242502.000
Easting: 338579.000
Latitude: 33°56'44.1"S
Longitude: 151°15'11.7"E

GS Map: -
MGA Zone: 56
Coordinate Source: GIS - Geogra

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	8.00	100			Auger

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	8.00	8.00	Sand	Sand	

Remarks

23/02/2010: updated from original form A

***** End of GW108427 *****

WaterNSW
Work Summary

GW107186

Licence:
Licence Status:
Authorised Purpose(s):
Intended Purpose(s): DOMESTIC

Work Type: Spear
Work Status:
Construct.Method: Auger
Owner Type: Private

Commenced Date:
Completion Date: 15/06/2005
Final Depth: 7.00 m
Drilled Depth: 7.00 m

Contractor Name:
Driller: Rosario Fedele
Assistant Driller:

Property:
GWMA:
GW Zone:
Standing Water Level (m):
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBERLAND	BOTANY	2//215511
Licensed:			

Region: 10 - Sydney South Coast
River Basin: - Unknown
Area/District:
CMA Map:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6242423.000
Easting: 338674.000
Latitude: 33°56'46.8"S
Longitude: 151°15'15.3"E

GS Map: -
MGA Zone: 56
Coordinate Source: GIS - Geogra

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	7.00	100			Auger
1	1	Casing	Lining	0.00	0.00				

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	7.00	7.00	sand	Sand	

Remarks

23/03/2010: updated from original form A

***** End of GW107186 *****

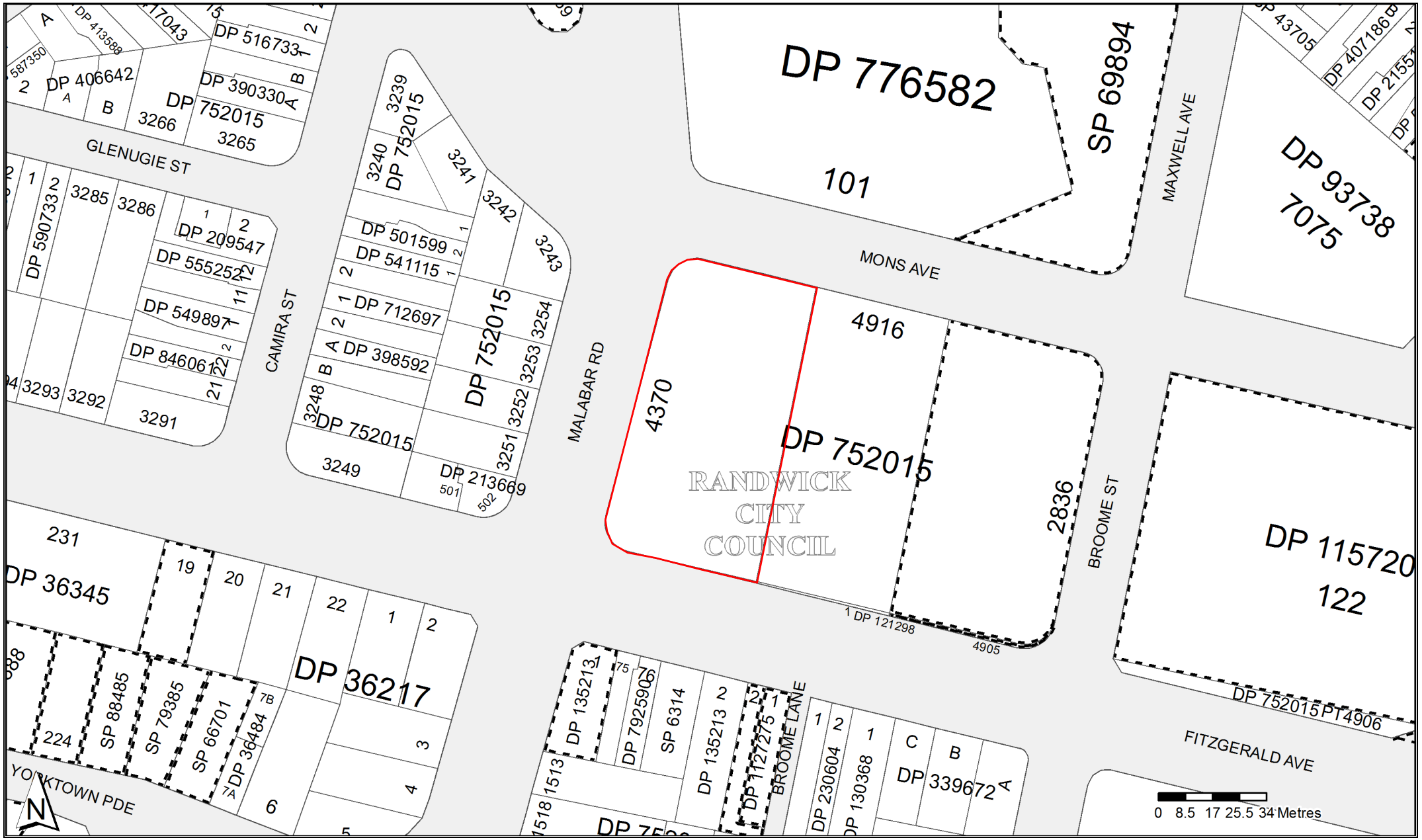
APPENDIX C

LAND TITLES

Cadastral Records Enquiry Report : Lot 4370 DP 752015

Ref : maroubra

Locality : MAROUBRA
Parish : BOTANY
LGA : RANDWICK
County : CUMBERLAND



This information is provided as a searching aid only.Whilst every endeavour is made to ensure that current map, plan and titling information is accurately reflected, the Registrar General cannot guarantee the information provided. For ALL ACTIVITY PRIOR TO SEPTEMBER 2002 you must refer to the RGs Charting and Reference Maps

Land District Metropolitan
Land Board District Sydney
Eastern Division
Within the Borough of Randwick
Notified as Suburban to the City of Sydney 21 May 98

MISC: LEASE BCH. Papers 6518 12 MAY 1906 LANDS DEPMT.

PLAN
of Portion 1083
County of Cumberland Parish of Botany

applied for under the 90th Section of the Crown Lands Act of 1884 by Douglas Arthur Jennings

Scale 4 Chains to an Inch

~~Por 1083 SLOG 7 of 23rd March Approved Sale Gaz 11th July 1906~~ ~~Expired 31.12.20 & Res from Sale & Lease Forfd & Res fr Sale & L 7th June 18~~ ~~Forfeiture Reversed 1st Nov 1918~~ Res. Sle & Lse Sec 228 Revkd 18.4.35

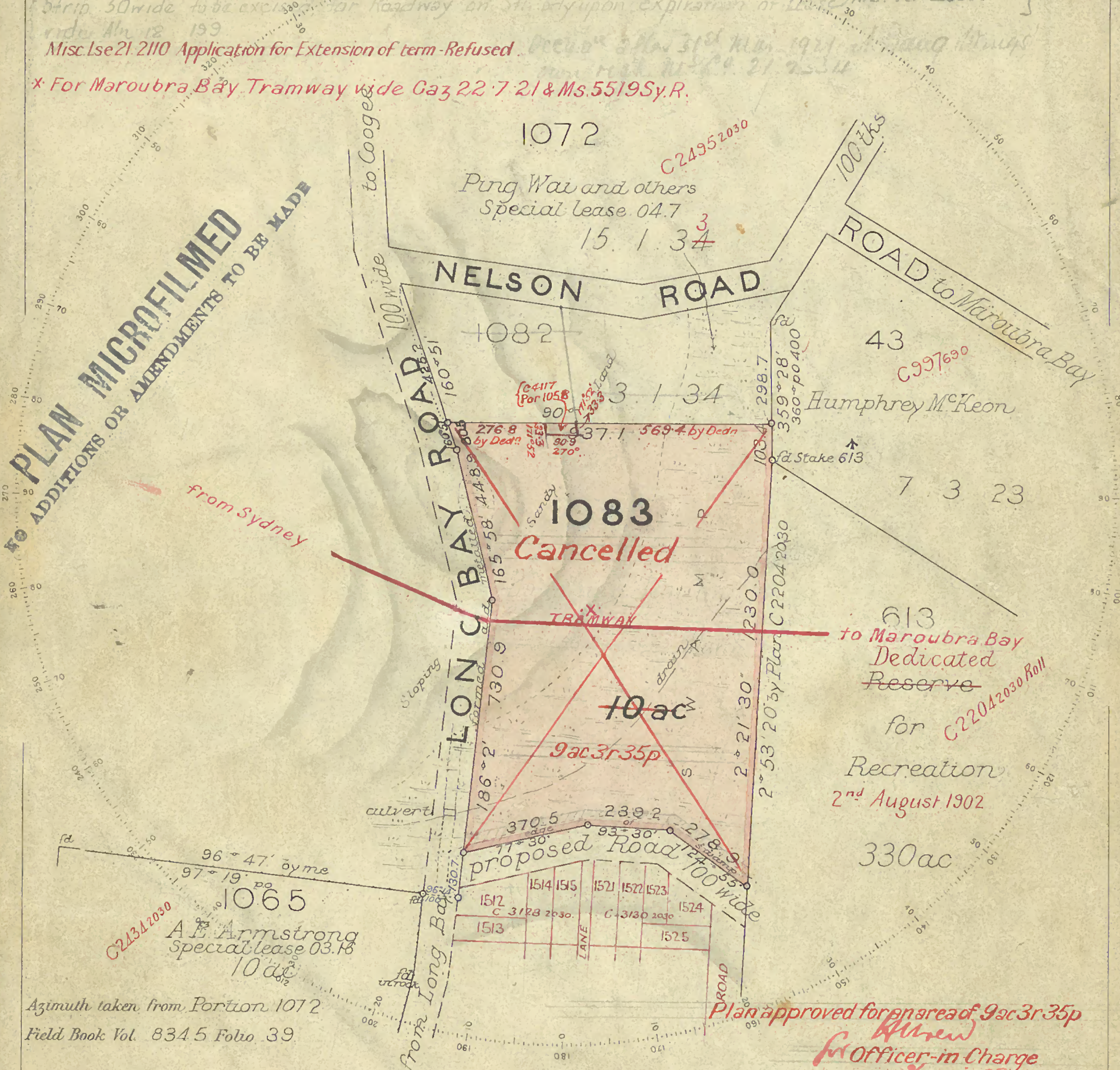
Misc Lse 10.128.93 Application to alter conditions or purchase Refused

Application by Randwick Council for Recreation Refused – to be reconsidered at expiry of Spl L No. 16.2637.

Strip 50 wide to be excised for Roadway on St. bdy upon expiration of Lease

Misc Lse 21.2110 Application for Extension of term – Refused.

× For Maroubra Bay Tramway wide Gaz 22.7.21 & Ms.5519 Sy.R.



Azimuth taken from Portion 1072
Field Book Vol. 8345 Folio 39

Plan approved for an area of 9ac 3r 35p
for Officer-in-Charge 16.11.35

Corners					Traverse					
Cor.	Bearing	From	Links	No. on tree	Line	Bearing	Distance	Line	Bearing	Distance
Numbered	stakes	at	corners							

I hereby certify that I in person made and on the 9th May 1906 completed the survey represented on this plan on which are written the bearings and lengths of the lines measured by me and I declare that the survey has been executed in accordance with the regulations published for the guidance of Licensed Surveyors and the practice of the Department of Lands.

R. J. Roberts ~~Licensed~~ Surveyor

Transmitted to the District Surveyor with my letter of 11th May 06 No. 46

~~Voucher No.~~ ~~Passed~~ Staff
~~Calculation Book No.~~ ~~Folio~~ Accepted
Checked and Charted H. Evans 14 May 06
Examined C Edwards 14 May 06
Plan approved 16th May 1906
A. Hare
Chief Draftsman

Drawn by S.M.
No. of Lith 01 3280

2584-2030

Lithographed and Printed at the Department of Lands, Sydney, N.S.W. 1901

Cat. No. C2584

14.5.06

Cancels C4117 2030

A. 295

Papers L.B. 34.855

PLAN OF PORTIONS 2835 & 2836

Parish of Botany County of Cumberland

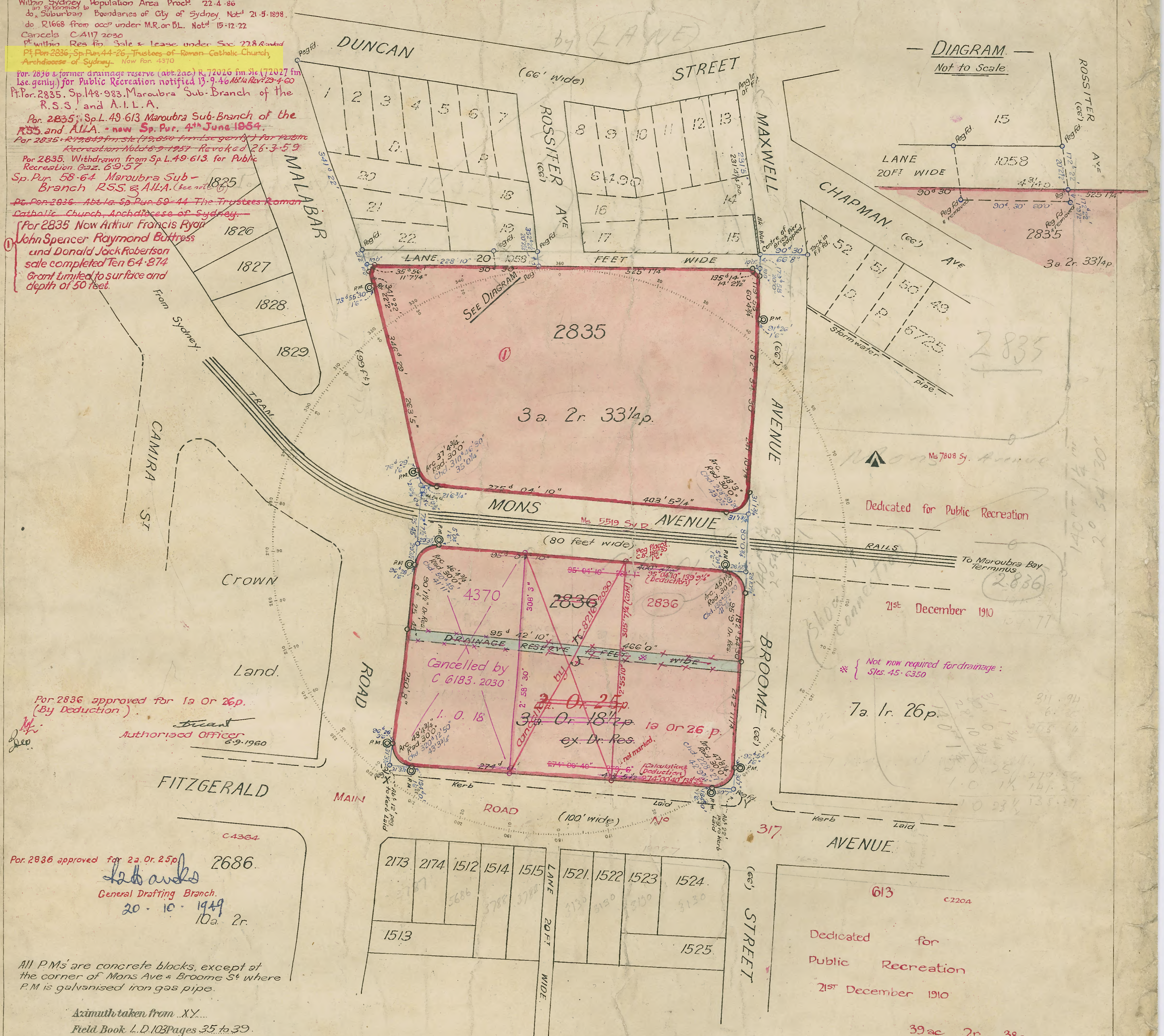
LAND DISTRICT OF METROPOLITAN LAND BOARD DISTRICT OF SYDNEY

RANDWICK ~~SHIRE~~ MUNICIPALITY

Applied for under the 75th Section of the Crown Lands Consolidation Act of 1913 by Joseph Henry J. H. Menogue

~~Porns 2835 & 2836 - Sp.L. 34.95 - Recreation & Erection of buildings (Amusement Park) Term: 18-6-35 to 31-12-62 Gaz. 21-6-35~~ Forfeited & res. fr. Sale & Lease, Gaz. 16.7.37 Por 2835 Rev 9.10.53

Within Sydney Population Area Procld. 22.4.86
do. an Extension to Suburban Boundaries of City of Sydney Notd. 21.5.1898.
do. R1668 from occn under M.R. or B.L. Notd. 15.12.22
Cancels C4117 2030
Pt within Res fm Sale & Lease under Sec. 228 Revoked
~~Pt Por 2836, Sp.Pur. 44-26, Trustees of Roman Catholic Church, Archdiocese of Sydney.~~ Now Por. 4370
Por. 2836 & former drainage reserve (abt. 2ac.) R.72026 fm. Sle (72027 fm Lse. genly) for Public Recreation notified 13.9.46 Abt 1a Revd 29-4-60
Pt.Por. 2835. Sp.148.983. Maroubra Sub-Branch of the R.S.S. and A.I.L.A.
Por. 2835; Sp.L. 49.613 Maroubra Sub-Branch of the R.S.S. and A.I.L.A. • now Sp. Pur. 4th June 1954.
~~Por 2835 • R79,849 fm. Sle (79,850 fm. Lse genly) for Public Recreation Notd 6.9.1957~~ Revoked 26.3.59
Por 2835. Withdrawn from Sp.L.49.613. for Public Recreation Gaz. 6.9.57
Sp.Pur. 58.64 Maroubra Sub-Branch R.S.S. & A.I.L.A. (See note ①)
~~Pt. Por. 2836. Abt 1a. Sp.Pur. 59-44 The Trustees Roman Catholic Church, Archdiocese of Sydney.~~
① Por 2835 Now Arthur Francis Ryan John Spencer Raymond Buttress and Donald Jack Robertson sale completed Ten 64.874 Grant limited to surface and depth of 50 feet.



All P.M's are concrete blocks, except at the corner of Mons Ave & Broome St where P.M is galvanised iron gas pipe.

Azimuth taken from XY
Field Book L.D.103 Pages 35 to 39

Reference to Corners

Corner	Bearing	From	Links	No on Tree
Numbered pegs at corners.				

PLAN MICROFILMED
NO ADDITIONS OR AMENDMENTS TO BE MADE

Improvements Nil

Reference to Traverse

Line	Bearing	Distance

Cal. Book No F80 Folio 69

Scale 100 Feet ~~20 Chains~~ to an Inch

I, Frederick Charles Della Ca of Sydney a Surveyor registered under the Surveyors Act, 1929 do hereby solemnly and sincerely declare that the survey represented in this plan has been made by me in accordance with the Survey Practice Regulations 1933 and the special requirements of the Department of Lands ~~and~~ was completed on the 1st March 1935 and the reference marks have been placed as shown hereon. And I make this solemn declaration conscientiously believing the same to be true and by virtue of the provisions of the Oaths Act, 1900.

Fred. C. Della Ca
Surveyor registered under the Surveyors Act 1929.

Subscribed and declared before me at Sydney this day of March 1935.

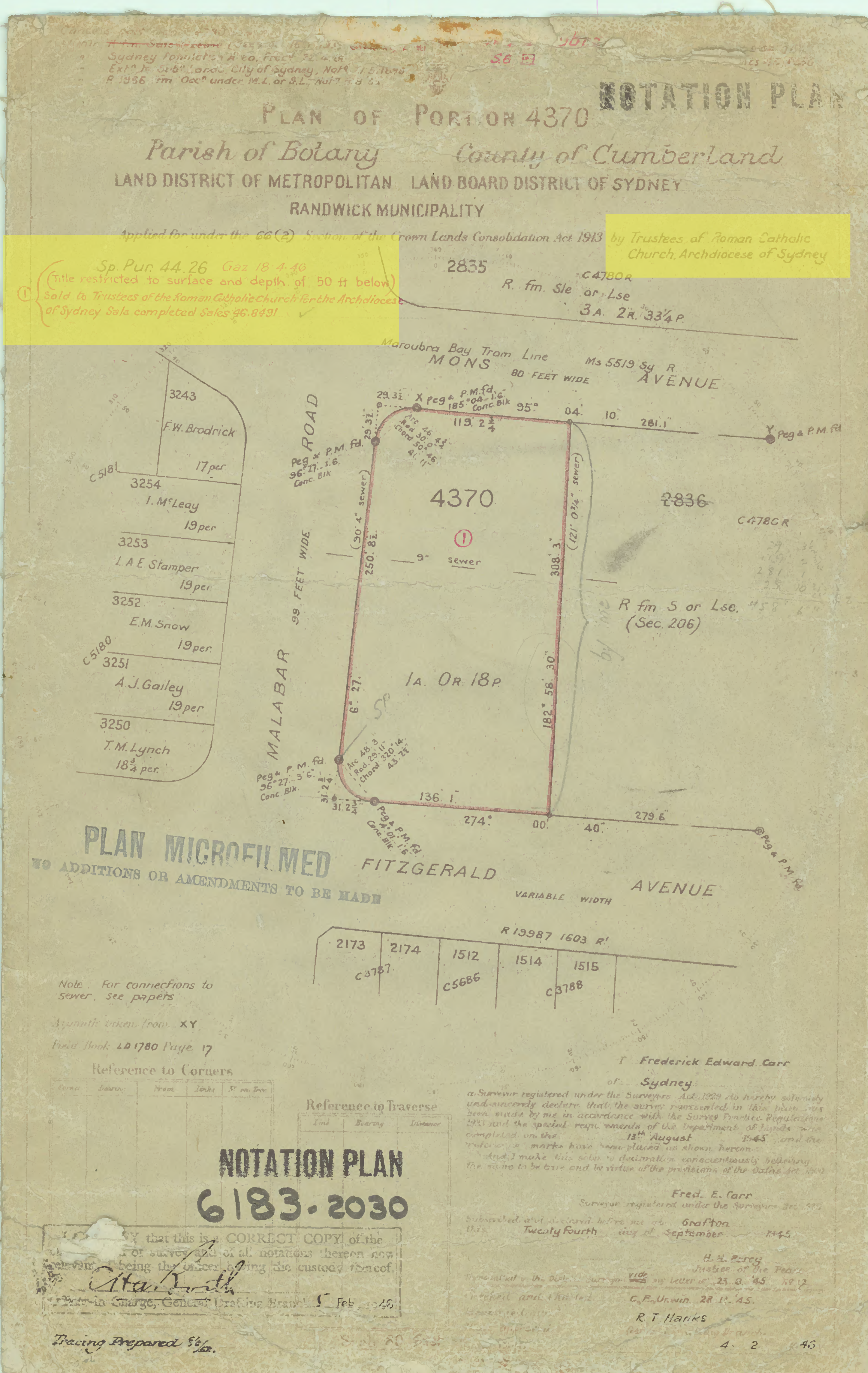
[signature] J.P.
Justice of the Peace.

Transmitted to the District Surveyor with my letter of 22nd March 1935 No 16

Checked and Charted [signature] 25th March 1935.
Examined [signature] 29th March 1935.
Plan approved [signature] Officer-in-charge 3rd April 1935

Lithographed & printed at the Department of Lands, Sydney, N.S.W. 33.1112

Cal. No C4780 2030



Title Search

NEW SOUTH WALES LAND REGISTRY SERVICES - TITLE SEARCH

FOLIO: 4370/752015

SEARCH DATE	TIME	EDITION NO	DATE
6/10/2019	7:13 AM	-	-

VOL 5615 FOL 56 IS THE CURRENT CERTIFICATE OF TITLE

LAND

LOT 4370 IN DEPOSITED PLAN 752015
AT MAROUBRA
LOCAL GOVERNMENT AREA RANDWICK
PARISH OF BOTANY COUNTY OF CUMBERLAND
(FORMERLY KNOWN AS PORTION 4370)
TITLE DIAGRAM CROWN PLAN 6183.2030

FIRST SCHEDULE

THE TRUSTEES OF THE ROMAN CATHOLIC CHURCH

SECOND SCHEDULE (2 NOTIFICATIONS)

1 LAND EXCLUDES MINERALS AND IS SUBJECT TO RESERVATIONS AND CONDITIONS IN FAVOUR OF THE CROWN - SEE CROWN GRANT(S)
2 EXCEPTING LAND BELOW A DEPTH FROM THE SURFACE OF 15.24 METRES BY THE CROWN GRANT

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

Received: 06/10/2019 07:13:32

APPENDIX D
NSW EPA

Search results

Your search for:Suburb: MAROUBRA

Search Again
Refine Search

did not find any records in our database.

If a site does not appear on the record it may still be affected by contamination. For example:

- Contamination may be present but the site has not been regulated by the EPA under the Contaminated Land Management Act 1997 or the Environmentally Hazardous Chemicals Act 1985.
- The EPA may be regulating contamination at the site through a licence or notice under the Protection of the Environment Operations Act 1997 (POEO Act).
- Contamination at the site may be being managed under the planning process.

Search TIP

To search for a specific site, search by LGA (local government area) and carefully review all sites listed.

... more search tips

More information about particular sites may be available from:

- The POEO public register
- The appropriate planning authority: for example, on a planning certificate issued by the local council under section 149 of the Environmental Planning and Assessment Act.

See What's in the record and What's not in the record.

If you want to know whether a specific site has been the subject of notices issued by the EPA under the CLM Act, we suggest that you search by Local Government Area only and carefully review the sites that are listed.
This public record provides information about sites regulated by the EPA under the Contaminated Land Management Act 1997, including sites currently and previously regulated under the Environmentally Hazardous Chemicals Act 1985. Your inquiry using the above search criteria has not matched any record of current or former regulation. You should consider searching again using different criteria. The fact that a site does not appear on the record does not necessarily mean that it is not affected by contamination. The site may have been notified to the EPA but not yet assessed, or contamination may be present but the site is not yet being regulated by the EPA. Further information about particular sites may be available from the appropriate planning authority, for example, on a planning certificate issued by the local council under section 149 of the Environmental Planning and Assessment Act. In addition the EPA may be regulating contamination at the site through a licence under the Protection of the Environment Operations Act 1997. You may wish to search the POEO public register.POEO public register

3 October 2019

For

business and industry

For local government

Contact us

131 555 (tel:131555)

info@epa.nsw.gov.au (mailto:info@epa.nsw.gov.au)

EPA Office Locations (https://www.epa.nsw.gov.au/about-us/contact-us/locations)

Find us on (https://au.linkedin.com/company/nsw-environment-protection-authority-epa) (https://www.youtube.com/channel/UCS5jrgAEsH

Search results

Your search for: **General Search** with the following criteria

Suburb - maroubra

returned 8 results

Export to excel 1 of 1 Pages Search Again

Number	Name	Location	Type	Status	Issued date
799	RANDWICK CITY COUNCIL	ROBEY STREET, MAROUBRA, NSW 2035	POEO licence	Surrendered	27 Jul 2000
1008549	RANDWICK CITY COUNCIL	ROBEY STREET, MAROUBRA, NSW 2035	s.58 Licence Variation	Issued	23 Aug 2001
1039423	RANDWICK CITY COUNCIL	ROBEY STREET, MAROUBRA, NSW 2035	s.58 Licence Variation	Issued	19 Aug 2004
1045228	RANDWICK CITY COUNCIL	ROBEY STREET, MAROUBRA, NSW 2035	s.58 Licence Variation	Issued	09 Mar 2005
1049791	RANDWICK CITY COUNCIL	ROBEY STREET, MAROUBRA, NSW 2035	s.58 Licence Variation	Issued	28 Jul 2006
1071319	RANDWICK CITY COUNCIL	ROBEY STREET, MAROUBRA, NSW 2035	s.80 Surrender of a Licence	Issued	20 Mar 2007
1559630	RANDWICK CITY COUNCIL	MAROUBRA, NSW 2035	s.91 Clean Up Notice	Issued	20 Dec 2017
1567918	RANDWICK CITY COUNCIL	MAROUBRA, NSW 2035	s.110 Variation of Clean Up Notice	Issued	05 Sep 2018

03 October 2019

APPENDIX E

PLANNING CERTIFICATE

Randwick City Council
a sense of community

Randwick City Council
30 Frances Street
Randwick NSW 2031
ABN: 77 362 844 121

Phone 1300 722 542
Fax (02) 9319 1510
council@randwick.nsw.gov.au
www.randwick.nsw.gov.au
Find us on:

PLANNING CERTIFICATE

ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

Mr J Walker
10 Welder Rd
SEVEN HILLS NSW 2147

Description of land:	Lot 4916 DP 752015, Lot 1 DP 121298
Address:	274-280 Fitzgerald Avenue, MAROUBRA NSW 2035
Date of Certificate:	8 October 2019
Certificate No:	52130
Receipt No:	4430423
Amount:	$53.00
Reference:	9194-ER-1-1:47701

This planning certificate should be read in conjunction with the Randwick City Council Local Environmental Plan 2012. This is available on the NSW Legislation website at https://www.legislation.nsw.gov.au/#/view/EPI/2013/36

The land to which this planning certificate relates, being the lot or one of the lots described in the application made for this certificate, is shown in the Council's record as being situated at the "Address" stated above. The legal "description of land" (by lot(s) and DP/SP numbers) is obtained from NSW Land Registry Services. It is the responsibility of the applicant to enquire and confirm with NSW Land Registry Services the accuracy of the lot(s) and DP/SP numbers pertaining to the land for which application is made for the certificate.

There is more information about some property conditions than is included on this property certificate.

If this case, after the condition text, there is a URL and a square bar code or 'QR code' which provides the address of a page on the Randwick City Council website.
You will need internet access and either:

1. Download a QR code scanner app to your phone and scan the QR code
or
2. Type the URL into your internet browser

INFORMATION PROVIDED UNDER SECTION 10.7 (2)

In accordance with the requirements of section 10.7 of the Environmental Planning and Assessment Act 1979 (as amended), the following prescribed matters relate to the land as at the date of this certificate. The information provided in reference to the prescribed matters has been obtained from Council's records and/or from other authorities/government department. Council provides the information in good faith but disclaims all liability for any omission or inaccuracy. Specific inquiry should be made where doubt exists as to the accuracy of the information so provided.

1 Names of relevant planning instruments and DCPs

(1) The name of each environmental planning instrument that applies to the carrying out of development on the land.

Randwick Local Environmental Plan (LEP) 2012, and relevant State Environmental Planning Policies (SEPPs) apply to the land.

- SEPP No. 19 - Bushland in Urban Areas
- SEPP No. 21 - Caravan Parks
- SEPP No. 33 - Hazardous and Offensive Development
- SEPP No. 55 - Remediation of Land
- SEPP No. 64 - Advertising and Signage
- SEPP No. 65 - Design Quality of Residential Flat Development
- SEPP No. 70 - Affordable Housing
- SEPP - (Affordable Rental Housing) 2009
- SEPP - BASIX (Building Sustainability Index) 2004
- SEPP - (Coastal Management) 2018
- SEPP - (Concurrence) 2018
- SEPP - (Educational Establishments and Child Care Facilities) 2017
- SEPP - (Exempt and Complying Development Codes) 2008
- SEPP - (Housing for Seniors or People with a Disability) 2004
- SEPP - (Infrastructure) 2007
- SEPP - (Mining, Petroleum Production and Extractive Industries) 2007
- SEPP - (Miscellaneous Consent Provisions) 2007
- SEPP - (State and Regional Development) 2011
- SEPP - (State Significant Precincts) 2005
- SEPP - (Three Ports) 2013
- SEPP - (Vegetation in Non-Rural Areas) 2017

Note: Any questions regarding State Environmental Planning Policies and Regional Environmental Plans should also be directed to the Department of Planning & Infrastructure (02) 9228 6111 or www.planning.nsw.gov.au.

Local Environmental Plan (LEP) Gazetted 15 February 2013

- Randwick LEP 2012 (Amendment No1) - Gazetted 21 November 2014
  Applies to part of Royal Randwick Racecourse (identified as "Area A" on the LEP Additional Permitted Uses Map). Permits additional uses of hotel or motel accommodation, serviced apartments and function centres with development consent.

- Randwick LEP 2012 (Amendment No2) - Gazetted 2 April 2015
  Applies to land at Young Street Randwick – Inglis Newmarket Site (shown as Area 1 on the LEP Key Sites Map). Amendment to planning controls, including zoning, height of buildings, heritage items and heritage area, FSR (subject to new Clause 6.16) and inclusion of the site as a Key Site.

- Randwick LEP 2012 (Amendment No3) - Gazetted 15 July 2016
  Amends Schedule 1 to include 'childcare centre' as an additional permitted use (with development consent) at 270 Malabar Road, Maroubra (Lot 3821, DP 752015).

- Randwick LEP 2012 (Amendment No4) - Gazetted 25 January 2018
  Applies to part of the land at 1T Romani Way, MATRAVILLE (Lot 1 DP 107189). Amendment to planning controls, including zoning, height of buildings and FSR.

- Randwick LEP 2012 (Amendment No5) - Gazetted 17 August 2018
  Applies to subdivision of dual occupancies (attached) in the Zone R2 Low Density Residential for which development consent was granted before 6 July 2018. Permits development consent to be granted for the Torrens Title or Strata subdivision of a dual occupancy if the development meets certain standards specified in State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.

- Randwick LEP 2012 (Amendment No 6) – Gazetted 22 February 2019
  Applies to the following land in Coogee, 38 Dudley Street (Lot 17 DP 6489), 40 Dudley Street (Lot 18 DP 6489), 42 Dudley Street (Lot 19 DP 6489), 44 Dudley Street (Lot 20 DP 6489 & Lot 1 DP 952229), 46 Dudley Street (Lot 2 in DP 952229) and 122 Mount Street (Lot 22 DP 6489) by incorporating these properties into the Dudley Street Heritage Conservation Area. Further, 38 Dudley Street (Lot 17 DP 6489), 42 Dudley Street (Lot 19 DP 6489), 44 Dudley Street (Lot 20 DP 6489 & Lot 1 DP 952229) and 122 Mount Street (Lot 22 DP 6489) have been listed as local heritage items in Schedule 5 the Randwick LEP 2012.

---

(2) The name of each proposed environmental planning instrument that will apply to the carrying out of development on the land and that is or has been the subject of community consultation or on public exhibition under the Act (unless the Secretary has notified the council that the making of the proposed instrument has been deferred indefinitely or has not been approved).

- draft Environment State Environmental Planning Policy (SEPP)

- On the 15th of May 2019, Council received a Gateway Determination from the Department of Planning and Environment with conditions to progress a Planning Proposal to amend Schedule 5 of the Randwick Local Environmental Plan 2012 (RLEP) which relates to Environmental Heritage. The proposal seeks to create a new Heritage Conservation Area (HCA) known as 'Edgecumbe Estate' and to list three properties (3) as Heritage Items. The proposed HCA is to incorporate properties at 142A to 152 Brook Street, COOGEE, 37 to 41 Dudley Street, COOGEE and 5 Edgecumbe Avenue, COOGEE. The proposed properties to be listed as Heritage Items are 39 Dudley Street, 41 Dudley Street and 148 Brook Street COOGEE. The proposal will be public exhibition from the 28th of May 2019 until the 25th of June 2019.

- On 28 May 2019, Council resolved to commence a 6 week community engagement program for the Kingsford and Kensington town centres Planning Proposal and supporting documents. The Planning Proposal seeks to amend the Randwick Local Environmental Plan 2012 and establish a new vision for the Kensington and Kingsford town centres. The Planning Proposal introduces a range of new provisions relating to building heights and density, community infrastructure, affordable housing, design excellence and building setbacks. The Planning Proposal applies to areas currently zoned B2 Local Centre in the Kensington and Kingsford town centres, and three locations immediately adjoining the Kingsford town centre comprising 16, 18 and 20 Barker Street, 582-584 and 586-592 Anzac Parade, 63 Harbourne Road and 12, 14, 16 and 18 Rainbow Street, Kingsford. Futher information can be obtained from Council's website at https://www.yoursay.randwick.nsw.gov.au/k2k.

---

(3) The name of each development control plan that applies to the carrying out of development on the land.

- Randwick DCP adopted by Council on the 28 May 2013 and came into effect on the 14th of June 2013

Provides detailed planning controls and guidance for development applications

- Amendment to Randwick DCP 2013 Newmarket Green, Randwick (E5)

  Site-specific DCP controls to supplement Randwick LEP 2012 (Amendment No 2)

(4) In this clause, proposed environmental planning instrument includes a planning proposal for a LEP or a draft environmental planning instrument.

2 Zoning and land use under relevant LEPs

For each environmental planning instrument or proposed instrument referred to in clause 1 (other than a SEPP or proposed SEPP) that includes the land in any zone (however described)

(a) The identity of the zone, whether by reference to a name (such as "Residential Zone" or "Heritage Area") or by reference to a number (such as "Zone No 2 (a)")

(b) The purposes for which the instrument provides that development may be carried out within the zone without the need for development consent

(c) The purposes for which the instrument provides that development may not be carried out within the zone except with development consent

(d) The purposes for which the instrument provides that development is prohibited within the zone

Zone SP2 (Infrastructure) in Randwick LEP 2012.

1. Objectives of zone

- To provide for infrastructure and related uses.
- To prevent development that is not compatible with or that may detract from the provision of infrastructure.
- To facilitate development that will not adversely affect the amenity of nearby and adjoining development.
- To protect and provide for land used for community purposes.

2. Permitted without consent

Recreation areas

3. Permitted with consent

Aquaculture; Environmental protection works; Flood mitigation works; Roads; The purpose shown on the Land Zoning Map, including any development that is ordinarily incidental or ancillary to development for that purpose

4. Prohibited

Any development not specified in item 2 or 3.

(e) Whether any development standards applying to the land fix minimum land dimensions for the erection of a dwelling - house on the land, and if so, the minimum land dimensions so fixed

The land IS NOT subject to any development standards that fix minimum land dimensions for the erection of a dwelling house.

(f) Whether the land includes or comprises critical habitat

The land DOES NOT include or comprise a critical habitat area under the Threatened Species Conservation Act 1995.

(g) Whether the land is in a conservation area (however described)

The land IS NOT located in a heritage conservation area under the Randwick LEP 2012.

(h) Whether an item of environmental heritage (however described) is situated on the land.

The land IS NOT listed as a heritage item under the Randwick LEP 2012.

The land IS NOT listed on the State Heritage Register under Heritage Act 1977.

2A Zoning and land use under State Environmental Planning Policy (Sydney Region Growth Centres) 2006

To the extent that the land is within any zone (however described) under:

(a) Part 3 of the State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (the 2006 SEPP), or

(b) a Precinct Plan (within the meaning of the 2006 SEPP), or

(c) a proposed Precinct Plan that is or has been the subject of community consultation or on public exhibition under the Act,

the particulars referred to in clause 2 (a)–(h) in relation to that land (with a reference to "the instrument" in any of those paragraphs being read as a reference to Part 3 of the 2006 SEPP, or the Precinct Plan or proposed Precinct Plan, as the case requires).

The land IS NOT within any zone (however described) under this planning policy.

3 Complying Development

(1) The extent to which the land is land on which complying development may be carried out under each of the codes for complying development because of the provisions of clauses 1.17.A (1) (c) to (e), (2), (3) and (4), 1.18(1)(c3) and 1.19 of State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.

(2) extent to which complying development may not be carried out on that land because of the provisions of clauses 1.17A (1) (c) to (e), (2), (3) and (4), 1.18(1)(c3) and 1.19 of that Policy and the reasons why it may not be carried out under those clauses.

(3) If the council does not have sufficient information to ascertain the extent to which complying development may or may not be carried out on the land, a statement that a restriction applies to the land, but it may not apply to all of the land, and that council does not have sufficient information to ascertain the extent to which complying development may or may not be carried out on the land.

Housing Code

Complying development under the Housing Code MAY be carried out on the land.

Low Rise Medium Density Housing Code

Commencement of the Low Rise Medium Density Code has been deferred in the City of Randwick until 1st of November 2019. Please contact the NSW Department of Planning and Environment for further information regarding this matter.

Rural Housing Code

Complying development under the Rural Housing Code MAY be carried out on the land.

Housing Alterations Code

Complying development under the Housing Alterations Code MAY be carried out on the land.

General Development Code

Complying development under the General Development Code MAY be carried out on the land.

Commercial and Industrial Alteration Code

Complying development under the Commercial and Industrial Alteration Code MAY be carried out on the land.

Commercial and Industrial (New Buildings and Additions) Code

Complying development under the Commercial and Industrial (New Buildings and Additions) Code MAY be carried out on the land.

Subdivisions Code

Complying development under the Subdivisions Code MAY be carried out on the land.

Demolition Code

Complying development under the Demolition Code MAY be carried out on the land.

Fire Safety Code

Complying development under the Fire Safety Code MAY be carried out on the land.

A copy of the Codes SEPP is available at www.planning.nsw.gov.au. For further information please call the Department of Planning and Infrastructure's Information Centre on Free call 1300 305 695 or 02 9228 6333.

Note: To be complying development, the development must meet the General requirements set out in clause 1.18 of the Codes SEPP. Development must also meet all development standards set out in the relevant code.

4 Coastal protection

Whether or not the land is affected by the operation of section 38 or 39 of The Coastal Protection Act 1979, but only to the extent that the council has been so notified by the Department of Services,Technology and Administration.

Council HAS NOT been notified by the Department that the land is affected by the operation of section 38 or 39 of the Coastal Protection Act 1979.

4A Certain information relating to beaches and coasts

(1) Whether an order has been made under Part 4D of the Coastal Protection Act 1979 in relation to emergency coastal protection works (within the meaning of that Act) on the land (or on public land adjacent to that land), except where the council is satisfied that such an order has been fully complied with.

An order HAS NOT been made under Part 4D of the *Coastal Protection Act 1979* in relation to emergency coastal protection works (within the meaning of that Act) on the land (or on public land adjacent to that land).

(2) (a) Whether the council has been notified under section 55X of the Coastal Protection Act 1979 that emergency coastal protection works (within the meaning of that Act) have been placed on the land (or on public land adjacent to that land), and

The council HAS NOT been notified under section 55X of the *Coastal Protection Act 1979* that emergency coastal protection works have been placed on the land (within the meaning of that Act) on the land (or on public land adjacent to that land).

(b) if works have been so placed – whether the council is satisfied that the works have been removed and the land restored in accordance with that Act.

Not applicable.

(3) (Repealed)

4B Annual charges under Local Government Act 1993 for coastal protection services that relate to existing coastal protection works

Whether the owner (or any previous owner) of the land has consented in writing to the land being subject to annual charges under section 496B of the Local Government Act 1993 for coastal protection services that relate to existing coastal protection works (within the meaning of section 553B of that Act).

Not applicable.

5 Mine subsidence

Whether or not the land is proclaimed to be a mine subsidence district within the meaning of section 15 of the Mine Subsidence Compensation Act 1961.

The land IS NOT proclaimed to be a mine subsidence district within the meaning of section 15 of the Mine Subsidence Compensation Act 1961.

6 Road widening and road realignment

Whether or not the land is affected by any road widening or road realignment under:

(a) Division 2 of Part 3 of the Roads Act 1993, or

The land IS NOT affected by any road widening or road realignment under Division 2 of Part 3 of the Roads Act 1993.

(b) Any environmental planning instrument, or

The land IS NOT affected by any road widening or road realignment under the provisions of Randwick LEP 2012.

(c) Any resolution of the council.

The land IS NOT affected by any resolution of the Council for any road widening or road realignment.

7 Council and other public authority policies on hazard risk restrictions

Whether or not the land is affected by a policy:

(a) adopted by the council

The land IS affected by a policy adopted by the Council as follows:

Contaminated Land Policy. This policy does not specifically identify the subject land (or any other land) as contaminated. The policy does, however, apply to all land in the City of Randwick. The policy requires Council to consider the possibility of land contamination and its implications for any proposed or permissible future uses of the land, including all rezoning, subdivision and development applications. This policy will restrict development of land:

(1) Which is affected by contamination; or
(2) Which has been used for certain purposes; or
(3) In respect of which there is not sufficient information about contamination; or
(4) Which is proposed to be used for certain purposes; or
(5) In other circumstances contained in the policy.

Excluding Councils Contaminated Land Policy, the subject land IS NOT affected by any other council policy relating to hazard risk restrictions.

(b) adopted by any other public authority and notified to the council for the express purpose of its adoption by that authority being referred to in planning certificates issued by the council, that restricts the development of the land because of the likelihood of land slip, bushfire, tidal inundation, subsidence, acid sulphate soils or any other risk (other than flooding).

The land IS affected by a policy adopted by a public authority as follows:

Acid Sulphate Soils Manual, which forms part of an 'all of government' approach to the management of acid sulphate soils in NSW. The manual provides information on the formation of acid sulphate soil, the likely effects if it is to be disturbed and best practice in the assessment and management of works undertaken in acid sulphate area. Acid Sulphate Soils Planning Maps have been prepared by the Department of Land and Water Conservation, and apply to Randwick City. The Manual and Maps are available to view at Council.

For more information please see

www.randwick.nsw.gov.au/149-AcidSulfate

7A Flood related development controls information

(1) Whether or not development on that land or part of the land for the purposes of dwelling houses, dual occupancies, multi dwelling housing or residential flat buildings (not including development for the purposes of group homes or seniors housing) is subject to flood related development controls.

Development on the land subject of this planning certificate for the purposes of dwelling houses, dual occupancies, multi dwelling housing or residential flat buildings IS subject to flood related development controls (provided that such development is permissible on the land with or without development consent).

(2) Whether or not development on that land or part of the land for any other purpose is subject to flood related development controls.

Development on the land subject of this planning certificate for purposes other than dwelling houses, dual occupancies, multi dwelling housing or residential flat buildings IS subject to flood related development controls (provided that such development is permissible on the land with or without development consent).

(3) Words and expressions in this clause have the same meanings as in the Standard Instrument.

The expressions "dwelling houses", "dual occupancies", "multi dwelling housing" and "residential flat buildings" as used in clauses (1) and (2) above have the same meanings as in the instrument set out in the Schedule to the Standard Instrument (Local Environmental Plans) Order 2006 but do not include development for the purposes of group homes or seniors housing.

8 Land reserved for acquisition

Whether or not any environmental planning instrument or proposed environmental planning instrument referred to in clause 1 makes provision in relation to the acquisition of the land by a public authority, as referred to in section 27 of the Act.

The land IS NOT affected by any environmental planning instrument or proposed environmental planning instrument referred to in clause 1 that makes provision in relation to the acquisition of the land by a public authority, as referred to in Section 27 of the Act.

9 Contributions plans

The name of each contributions plan applying to the land.

Randwick City Council Section 94A Development Contributions Plan (effective 21 April 2015).

9A Biodiversity certified land

If the land is biodiversity certified land under Part 8 of the Biodiversity Conservation Act 2016, a statement to that effect.

The land IS NOT biodiversity certified land.

Note. Biodiversity certified land includes land certified under Part 7AA of the Threatened Species Conservation Act 1995 that is taken to be certified under Part 8 of the Biodiversity Conservation Act 2016. (within the meaning of Part 7AA of the Threatened Species Conservation Act 1995).

10 Biodiversity stewardship sites

If the land is a biodiversity stewardship site under a biodiversity stewardship agreement under Part 5 of the Biodiversity Conservation Act 2016, a statement to that effect (but only if the council has been notified of the existence of the agreement by the Chief Executive of the Office of Environment and Heritage).

Council HAS NOT been notified that the land is a biodiversity stewardship site by the Chief Executive of the Office of Environment and Heritage.

Note. Biodiversity stewardship agreements include biobanking agreements under Part 7A of the Threatened Species Conservation Act 1995 that are taken to be biodiversity stewardship agreements under Part 5 of the Biodiversity Conservation Act 2016.

10A Native vegetation clearing set asides

If the land contains a set aside area under section 60ZC of the Local Land Services Act 2013, a statement to that effect (but only if the council has been notified of the existence of the set aside area by Local Land Services or it is registered in the public register under that section).

The land DOES NOT contain a set aside area under section 60ZC of the Local Land Services Act 2013.

11 Bush fire prone land

If any of the land is bush fire prone land (as defined in the Act), a statement that all or, as the case may be, some of the land is bush fire prone land.

If none of the land is bush fire prone land, a statement to that effect.

The land IS NOT bush fire prone land (as defined in the act).

12 Property vegetation plans

If the land is land to which a property vegetation plan approved under Part 4 of the Native Vegetation Act 2003 (and that continues in force) applies, a statement to that effect (but only if the council has been notified of the existence of the plan by the person or body that approved the plan under that Act).

Council HAS NOT been notified of any property vegetation plan under the Native Vegetation Act 2003 applying to the land.

13 Orders under Trees (Disputes Between Neighbours) Act 2006

Whether an order has been made under Trees (Disputes Between Neighbours) Act 2006 to carry out work in relation to a tree on the land (but only if the council has been notified of the order).

The land IS NOT land to which an order under Trees (Disputes Between Neighbours) Act 2006 applies.

14 Directions under Part 3A

If there is a direction by the Minister in force under section 75P (2) (c1) of the Act that a provision of an environmental planning instrument prohibiting or restricting the carrying out of a project or a stage of a project on the land under Part 4 of the Act does not have effect, a statement to that effect identifying the provision that does not have effect.

There IS NOT a direction by the Minister under section 75P (2) (c1) of the Act that a provision of an environmental planning instrument does not have effect.

15 Site compatibility certificates and conditions for seniors housing

If the land is land to which State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004 applies:

(a) a statement of whether there is a current site compatibility certificate (seniors housing), of which the council is aware, in respect of proposed development on the land and, if there is a certificate, the statement is to include:
(i) the period for which the certificate is current, and
(ii) that a copy may be obtained from the head office of the Department, and

(b) a statement setting out any terms of a kind referred to in clause 18 (2) of that Policy that have been imposed as a condition of consent to a development application granted after 11 October 2007 in respect of the land.

The land IS NOT subject of a current site compatibility certificate (of which the Council is aware) that has been issued under the State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004.

16 Site compatibility certificates for infrastructure

A statement of whether there is a valid site compatibility certificate (of which the council is aware), issued under clause 19 of State Environmental Planning Policy (Infrastructure) 2007 in respect of proposed development on the land and, if there is a certificate, the statement is to include:
(a) the period for which the certificate is valid, and
(b) that a copy may be obtained from the head office of the Department of Planning.

The land IS NOT subject to a valid site compatibility certificate (of which the Council is aware), issued under clause 19 of State Environmental Planning Policy (Infrastructure) 2007.

17 Site compatibility certificates and conditions for affordable rental housing

(1) A statement of whether there is a current site compatibility certificate (affordable rental housing), of which the council is aware, in respect of proposed development on the land and, if there is a certificate, the statement is to include:
(a) the period for which the certificate is current, and
(b) that a copy may be obtained from the head office of the Department of Planning.
(2) A statement setting out any terms of a kind referred to in clause 17 (1) or 38 (1) of State Environmental Planning Policy (Affordable Rental Housing) 2009 that have been imposed as a condition of consent to a development application in respect of the land.

The land IS NOT subject to a current site compatibility certificate (of which the council is aware) for affordable rental housing.

18 Paper subdivision information

(1) The name of any development plan adopted by a relevant authority that applies to the land or that is proposed to be subject to a consent ballot.
(2) The date of any subdivision order that applies to the land.
(3) Words and expressions used in this clause have the same meaning as they have in Part 16C of this Regulation.

The land IS NOT land to which a development plan or subdivision order applies.

19 Site verification certificates

A statement of whether there is a current site verification certificate, of which the council is aware, in respect of the land and, if there is a certificate, the statement is to include:
(a) the matter certified by the certificate, and

Note. A site verification certificate sets out the Secretary's opinion as to whether the land concerned is or is not biophysical strategic agricultural land or critical industry cluster land—see Division 3 of Part 4AA of *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007*.

(b) the date on which the certificate ceases to be current (if any), and
(c) that a copy may be obtained from the head office of the Department of Planning and Environment.

The land IS NOT subject to a current site verification certificate (of which the council is aware), in relation to State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007.

20 Loose-fill asbestos insulation

If the land includes any residential premises (within the meaning of Division 1A of Part 8 of the Home Building Act 1989) that are listed on the register that is required to be maintained under that Division, a statement to that effect.

The land DOES NOT include any residential premises (within the meaning of Division 1A of Part 8 of the Home Building Act 1989) that are listed on the register that is required to be maintained under that Division.

21 Affected building notices and building product rectification orders

(1) A statement of whether there is any affected building notice of which the council is aware that is in force in respect of the land
(2) A statement of:

(a) *whether there is any building product rectification order of which the council is aware that is in force in respect of the land and has not been fully complied with, and*
(b) *whether any notice of intention to make a building product rectification order of which the council is aware has been given in respect of the land and is outstanding.*

(3) In this clause:
Affected building notice has the same meaning as in Part 4 of the Building Products (Safety) Act 2017.
Building product rectification order has the same meaning as in the Building Products (Safety) Act 2017.

The land IS NOT affected by any notice or order within the meaning of the Building Products (Safety) Act 2017.

Contaminated Land Management Act 1997

Note. The following matters are prescribed by section 59 (2) of the Contaminated Land Management Act 1997 as additional matters to be specified in a planning certificate:

(a) that the land to which the certificate relates is significantly contaminated land within the meaning of that Act—if the land (or part of the land) is significantly contaminated land at the date when the certificate is issued,

The land IS NOT significantly contaminated land within the meaning of the Contaminated Land Management Act 1997.

(b) that the land to which the certificate relates is subject to a management order within the meaning of that Act—if it is subject to such an order at the date when the certificate is issued,

The land IS NOT subject to a management order within the meaning of the Contaminated Land Management Act 1997.

(c) that the land to which the certificate relates is the subject of an approved voluntary management proposal within the meaning of that Act—if it is the subject of such an approved proposal at the date when the certificate is issued,

The land IS NOT the subject of an approved voluntary management proposal within the meaning of the Contaminated Land Management Act 1997.

(d) that the land to which the certificate relates is subject to an ongoing maintenance order within the meaning of that Act—if it is subject to such an order at the date when the certificate is issued,

The land IS NOT the subject to an ongoing maintenance order within the meaning of the Contaminated Land Management Act 1997.

(e) that the land to which the certificate relates is the subject of a site audit statement within the meaning of that Act—if a copy of such a statement has been provided at any time to the local authority issuing the certificate,

Council HAS NOT received a copy of a site audit statement, within the meaning of the Contaminated Land Management Act 1997, for this land.

Note. Section 26 of the Nation Building and Jobs Plan (State Infrastructure Delivery) Act 2009 provides that a planning certificate must include advice about any exemption under section 23 or authorisation under section 24 of that Act if the council is provided with a copy of the exemption or authorisation by the Co-ordinator General under that Act.

Alan Bright
Manager Strategic Planning
1300 722 542

Date:08-Oct-2019

NOTE:
Section 10.7(5) Matters:
You may also wish to obtain advice on additional relevant matters affecting the land, under section 10.7(5) of the Environmental Planning and Assessment Act 1979. This advice relates to the following matters:

- Council resolutions to prepare draft local Environmental Plans.
- Terrestrial Biodiversity
- Foreshore Scenic Protection Areas
- Foreshore Building Line
- Ground Water extraction embargo or water shortage area
- Aircraft Noise (ANEF)
- Ground water investigations of 128 Barker St. Randwick (Service Station)
- Flood Studies
- Resident Parking Schemes

APPENDIX F

BOREHOLE LOGS

Alliance Geotechnical
Manage the earth, eliminate the risk

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BH No: BH01
Sheet: 1 of 1
Job No: 9194

Borehole Log

Client: Sydney Catholic Schools
Project: Combined PSI & DSI
Location: St Mary St Joseph Primary School, Maroubra NSW **Hole Location:** Refer to figure 3.
Started: 8/10/19
Finished: 8/10/19
Borehole Size mm

Rig Type: Push Tube **Hole Coordinates** , m **Driller:** AG **Logged:** JW
RL Surface: m **Contractor:** **Bearing:** --- **Checked:** SW

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition	Consistency/ Density Index	Additional Observations
PT						Artificial Turf with gravel underlay.				
						FILL: Clayey SAND, brown/yellow, soft, moist,	0.1-0.3m	M		No Potential ACM, odours or staining noted.
			0.5							
						Borehole BH01 terminated at 0.8m				
			1.0							

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BH No: BH04
Sheet: 1 of 1
Job No: 9194

Borehole Log

Client: Sydney Catholic Schools
Project: Combined PSI & DSI
Location: St Mary St Joseph Primary School, Maroubra NSW **Hole Location:** Refer to figure 3.
Started: 8/10/19
Finished: 8/10/19
Borehole Size mm

Rig Type: Push Tube
Hole Coordinates , m
Driller: AG
Logged: JW
RL Surface: m
Contractor:
Bearing: ---
Checked: SW

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition	Consistency/ Density Index	Additional Observations
PT						FILL: SAND with trace clay, dark brown, soft, moist.	0.0-0.2m	M		No Potential ACM, odours or staining noted.
			0.5		SW	SAND, pale yellow, soft, moist.	0.4-0.6m	M		No Potential ACM, odours or staining noted.
			1.0			Borehole BH04 terminated at 1.2m				

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BH No: BH05
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Job No: 9194

Borehole Log

Client: Sydney Catholic Schools
Project: Combined PSI & DSI
Location: St Mary St Joseph Primary School, Maroubra NSW **Hole Location:** Refer to figure 3.
Started: 8/10/19
Finished: 8/10/19
Borehole Size mm

Rig Type: Push Tube
Hole Coordinates , m
Driller: AG
Logged: JW
RL Surface: m
Contractor:
Bearing: ---
Checked: SW

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition	Consistency/ Density Index	Additional Observations
PT						FILL: Silty SAND with trace clay, dark brown, soft, moist.	0.0-0.2m	M		No Potential ACM, odours or staining noted.
			0.5		SW	SAND, pale yellow, soft, moist.	0.5-0.7m	M		No Potential ACM, odours or staining noted.
			1.0			Borehole BH05 terminated at 1.2m				

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BH No: BH06
Sheet: 1 of 1
Job No: 9194

Borehole Log

Client: Sydney Catholic Schools
Project: Combined PSI & DSI
Location: St Mary St Joseph Primary School, Maroubra NSW **Hole Location:** Refer to figure 3.
Started: 8/10/19
Finished: 8/10/19
Borehole Size mm

Rig Type: Push Tube **Hole Coordinates** , m **Driller:** AG **Logged:** JW
RL Surface: m **Contractor:** **Bearing:** --- **Checked:** SW

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition	Consistency/ Density Index	Additional Observations
PT						FILL: SAND with trace clay, dark brown, soft, moist.	0.0-0.2m	M		No Potential ACM, odours or staining noted.
			0.5		SW	SAND, pale yellow, soft, moist.	0.5-0.7m	M		No Potential ACM, odours or staining noted.
			1.0			Borehole BH06 terminated at 1.2m				

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BH No: BH08
Sheet: 1 of 1
Job No: 9194

Borehole Log

Client: Sydney Catholic Schools
Project: Combined PSI & DSI
Location: St Mary St Joseph Primary School, Maroubra NSW **Hole Location:** Refer to figure 3.
Started: 8/10/19
Finished: 8/10/19
Borehole Size mm

Rig Type: Push Tube
Hole Coordinates , m
Driller: AG
Logged: JW
RL Surface: m
Contractor:
Bearing: ---
Checked: SW

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition	Consistency/ Density Index	Additional Observations
PT						Artificial Turf with gravel underlay.				
						FILL: SAND with trace clay, dark brown, soft, moist.	0.1-0.3m	M		No Potential ACM, odours or staining noted.
			0.5		SW	SAND, pale yellow, soft, moist.		M		No Potential ACM, odours or staining noted.
							0.6-0.9m			
			1.0			Borehole BH08 terminated at 1.2m				

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BH No: BH09
Sheet: 1 of 1
Job No: 9194

Borehole Log

Client: Sydney Catholic Schools
Project: Combined PSI & DSI
Location: St Mary St Joseph Primary School, Maroubra NSW **Hole Location:** Refer to figure 3.
Started: 8/10/19
Finished: 8/10/19
Borehole Size mm

Rig Type: Push Tube | **Hole Coordinates** , m | **Driller:** AG | **Logged:** JW
RL Surface: m | **Contractor:** | **Bearing:** --- | **Checked:** SW

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition	Consistency/ Density Index	Additional Observations
PT						FILL: SAND with clay, dark brown and black, soft, moist.	0.0-0.2m	M		No Potential ACM, odours or staining noted.
			0.5		SW	SAND, pale yellow, soft, moist.	0.5-0.7m	M		No Potential ACM, odours or staining noted.
			1.0			Borehole BH09 terminated at 1.2m				

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BH No: BH10
Sheet: 1 of 1
Job No: 9194

Borehole Log

Client: Sydney Catholic Schools
Project: Combined PSI & DSI
Location: St Mary St Joseph Primary School, Maroubra NSW **Hole Location:** Refer to figure 3.
Started: 8/10/19
Finished: 8/10/19
Borehole Size mm

Rig Type: Push Tube
Hole Coordinates , m
Driller: AG
Logged: JW
RL Surface: m
Contractor:
Bearing: ---
Checked: SW

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition	Consistency/ Density Index	Additional Observations
PT						FILL: SAND with trace clay, dark brown, soft, moist.	0.0-0.2m / DUP01 / DUP01A	M		No Potential ACM, odours or staining noted.
			0.5		SW	SAND, pale yellow, soft, moist.		M		
			1.0		SW	SAND, pale yellow, soft, moist.	0.9-1.1m	M		No Potential ACM, odours or staining noted.
						Borehole BH10 terminated at 1.2m				

Alliance Geotechnical
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BH No: BH11
Sheet: 1 of 1
Job No: 9194

Borehole Log

Client: Sydney Catholic Schools
Project: Combined PSI & DSI
Location: St Mary St Joseph Primary School, Maroubra NSW **Hole Location:** Refer to figure 3.
Started: 8/10/19
Finished: 8/10/19
Borehole Size mm

Rig Type: Push Tube **Hole Coordinates** , m **Driller:** AG **Logged:** JW
RL Surface: m **Contractor:** **Bearing:** --- **Checked:** SW

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition	Consistency/ Density Index	Additional Observations
PT						FILL: SAND with trace clay, dark brown, soft, moist with terracotta fragments.	0.0-0.2m	M		No Potential ACM, odours or staining noted.
			0.5		SW	SAND, pale yellow, soft, moist.	0.5-0.7m	M		No Potential ACM, odours or staining noted.
			1.0			Borehole BH11 terminated at 1.2m				

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BH No: BH12
Sheet: 1 of 1
Job No: 9194

Borehole Log

Client: Sydney Catholic Schools
Project: Combined PSI & DSI
Location: St Mary St Joseph Primary School, Maroubra NSW **Hole Location:** Refer to figure 3.
Started: 8/10/19
Finished: 8/10/19
Borehole Size mm

Rig Type: Push Tube **Hole Coordinates** , m **Driller:** AG **Logged:** JW
RL Surface: m **Contractor:** **Bearing:** --- **Checked:** SW

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition	Consistency/ Density Index	Additional Observations
PT						FILL: SAND with trace clay, dark brown, soft, moist.	0.0-0.2m	M		No Potential ACM, odours or staining noted.
			0.5		SW	SAND, pale yellow, soft, moist.		M		
			1.0		SW	SAND, pale yellow, soft, moist.	0.9-1.1m	M		No Potential ACM, odours or staining noted.
						Borehole BH12 terminated at 1.2m				

APPENDIX G

LABORATORY DOCUMENTATION

Alliance Geotechnical
10 Welder Road
Seven Hills
NSW 2147

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Steven Wallace**

Report **681566-S**
Project name MAROUBRA
Project ID 9194
Received Date Oct 09, 2019

Client Sample ID			**BH01_0.1-0.3**	**BH02_0.3-0.4**	**BH03_0.1-0.3**	**BH04_0.0-0.2**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**S19-Oc13491**	**S19-Oc13492**	**S19-Oc13493**	**S19-Oc13494**
Date Sampled			**Oct 08, 2019**	**Oct 08, 2019**	**Oct 08, 2019**	**Oct 08, 2019**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	97	< 50	200
TRH C29-C36	50	mg/kg	< 50	100	< 50	61
TRH C10-C36 (Total)	50	mg/kg	< 50	197	< 50	261
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	91	80	80	89
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	160	< 100	240
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	160	< 100	240
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	0.6	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	1.0	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.3	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	0.6	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			BH01_0.1-0.3	BH02_0.3-0.4	BH03_0.1-0.3	BH04_0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Oc13491	S19-Oc13492	S19-Oc13493	S19-Oc13494
Date Sampled			Oct 08, 2019	Oct 08, 2019	Oct 08, 2019	Oct 08, 2019
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	0.9	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	1.0	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	2.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	123	97	103	99
p-Terphenyl-d14 (surr.)	1	%	132	103	105	106
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	< 0.1	-
4.4'-DDD	0.05	mg/kg	< 0.05	-	< 0.05	-
4.4'-DDE	0.05	mg/kg	< 0.05	-	< 0.05	-
4.4'-DDT	0.05	mg/kg	< 0.05	-	< 0.05	-
a-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
Aldrin	0.05	mg/kg	< 0.05	-	< 0.05	-
b-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
d-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
Dieldrin	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan I	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan II	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin aldehyde	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin ketone	0.05	mg/kg	< 0.05	-	< 0.05	-
g-BHC (Lindane)	0.05	mg/kg	< 0.05	-	< 0.05	-
Heptachlor	0.05	mg/kg	< 0.05	-	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	< 0.05	-
Methoxychlor	0.2	mg/kg	< 0.2	-	< 0.2	-
Toxaphene	1	mg/kg	< 1	-	< 1	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	-	< 0.05	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	-	< 0.05	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.2	-	< 0.2	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.2	-	< 0.2	-
Dibutylchlorendate (surr.)	1	%	88	-	81	-
Tetrachloro-m-xylene (surr.)	1	%	93	-	84	-
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	-	< 0.5	-	< 0.5
Aroclor-1221	0.1	mg/kg	-	< 0.1	-	< 0.1
Aroclor-1232	0.5	mg/kg	-	< 0.5	-	< 0.5
Aroclor-1242	0.5	mg/kg	-	< 0.5	-	< 0.5
Aroclor-1248	0.5	mg/kg	-	< 0.5	-	< 0.5
Aroclor-1254	0.5	mg/kg	-	< 0.5	-	< 0.5
Aroclor-1260	0.5	mg/kg	-	< 0.5	-	< 0.5
Total PCB*	0.5	mg/kg	-	< 0.5	-	< 0.5
Dibutylchlorendate (surr.)	1	%	-	70	-	71
Tetrachloro-m-xylene (surr.)	1	%	-	82	-	80

Client Sample ID			BH01_0.1-0.3	BH02_0.3-0.4	BH03_0.1-0.3	BH04_0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Oc13491	S19-Oc13492	S19-Oc13493	S19-Oc13494
Date Sampled			Oct 08, 2019	Oct 08, 2019	Oct 08, 2019	Oct 08, 2019
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	< 2	2.5	< 2	< 2
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	12	29	< 5	< 5
Copper	5	mg/kg	8.8	14	8.5	9.4
Lead	5	mg/kg	14	17	11	29
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	7.9	5.2	< 5	< 5
Zinc	5	mg/kg	28	39	14	300
% Moisture	1	%	12	8.7	5.5	6.3

Client Sample ID			BH05_0.0-0.2	BH06_0.0-0.2	BH07_0.0-0.3	BH08_0.1-0.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Oc13495	S19-Oc13496	S19-Oc13497	S19-Oc13498
Date Sampled			Oct 08, 2019	Oct 08, 2019	Oct 08, 2019	Oct 08, 2019
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	88	102	87	82
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			BH05_0.0-0.2	BH06_0.0-0.2	BH07_0.0-0.3	BH08_0.1-0.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Oc13495	S19-Oc13496	S19-Oc13497	S19-Oc13498
Date Sampled			Oct 08, 2019	Oct 08, 2019	Oct 08, 2019	Oct 08, 2019
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	101	105	94	97
p-Terphenyl-d14 (surr.)	1	%	104	110	99	105
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	< 0.1	-
4.4'-DDD	0.05	mg/kg	< 0.05	-	< 0.05	-
4.4'-DDE	0.05	mg/kg	< 0.05	-	< 0.05	-
4.4'-DDT	0.05	mg/kg	< 0.05	-	< 0.05	-
a-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
Aldrin	0.05	mg/kg	< 0.05	-	< 0.05	-
b-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
d-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
Dieldrin	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan I	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan II	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin aldehyde	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin ketone	0.05	mg/kg	< 0.05	-	< 0.05	-
g-BHC (Lindane)	0.05	mg/kg	< 0.05	-	< 0.05	-
Heptachlor	0.05	mg/kg	< 0.05	-	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	< 0.05	-
Methoxychlor	0.2	mg/kg	< 0.2	-	< 0.2	-
Toxaphene	1	mg/kg	< 1	-	< 1	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	-	< 0.05	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	-	< 0.05	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.2	-	< 0.2	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.2	-	< 0.2	-
Dibutylchlorendate (surr.)	1	%	92	-	104	-
Tetrachloro-m-xylene (surr.)	1	%	92	-	102	-
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	-	< 0.5	-	< 0.5
Aroclor-1221	0.1	mg/kg	-	< 0.1	-	< 0.1
Aroclor-1232	0.5	mg/kg	-	< 0.5	-	< 0.5
Aroclor-1242	0.5	mg/kg	-	< 0.5	-	< 0.5
Aroclor-1248	0.5	mg/kg	-	< 0.5	-	< 0.5
Aroclor-1254	0.5	mg/kg	-	< 0.5	-	< 0.5

Client Sample ID			BH05_0.0-0.2	BH06_0.0-0.2	BH07_0.0-0.3	BH08_0.1-0.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Oc13495	S19-Oc13496	S19-Oc13497	S19-Oc13498
Date Sampled			Oct 08, 2019	Oct 08, 2019	Oct 08, 2019	Oct 08, 2019
Test/Reference	LOR	Unit				
Polychlorinated Biphenyls						
Aroclor-1260	0.5	mg/kg	-	< 0.5	-	< 0.5
Total PCB*	0.5	mg/kg	-	< 0.5	-	< 0.5
Dibutylchlorendate (surr.)	1	%	-	97	-	97
Tetrachloro-m-xylene (surr.)	1	%	-	105	-	114
Heavy Metals						
Arsenic	2	mg/kg	< 2	< 2	4.1	< 2
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	5.7	< 5	< 5	< 5
Copper	5	mg/kg	5.9	5.5	8.4	< 5
Lead	5	mg/kg	11	8.0	8.0	5.6
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	< 5	< 5	< 5
Zinc	5	mg/kg	25	19	22	11
% Moisture	1	%	6.8	8.3	7.7	7.4

Client Sample ID			BH09_0.0-0.2	BH10_0.0-0.2	BH11_0.0-0.2	BH12_0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Oc13499	S19-Oc13500	S19-Oc13501	S19-Oc13502
Date Sampled			Oct 08, 2019	Oct 08, 2019	Oct 08, 2019	Oct 08, 2019
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	47	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	86	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	58	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	191	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	92	123	148	99
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	52	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	52	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	130	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	182	< 100	< 100	< 100

Client Sample ID			BH09_0.0-0.2	BH10_0.0-0.2	BH11_0.0-0.2	BH12_0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Oc13499	S19-Oc13500	S19-Oc13501	S19-Oc13502
Date Sampled			Oct 08, 2019	Oct 08, 2019	Oct 08, 2019	Oct 08, 2019
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	96	92	86	106
p-Terphenyl-d14 (surr.)	1	%	103	101	102	110
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	< 0.1	-
4.4'-DDD	0.05	mg/kg	< 0.05	-	< 0.05	-
4.4'-DDE	0.05	mg/kg	< 0.05	-	< 0.05	-
4.4'-DDT	0.05	mg/kg	< 0.05	-	< 0.05	-
a-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
Aldrin	0.05	mg/kg	< 0.05	-	< 0.05	-
b-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
d-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
Dieldrin	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan I	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan II	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin aldehyde	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin ketone	0.05	mg/kg	< 0.05	-	< 0.05	-
g-BHC (Lindane)	0.05	mg/kg	< 0.05	-	< 0.05	-
Heptachlor	0.05	mg/kg	< 0.05	-	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	< 0.05	-
Methoxychlor	0.2	mg/kg	< 0.2	-	< 0.2	-
Toxaphene	1	mg/kg	< 1	-	< 1	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	-	< 0.05	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	-	< 0.05	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.2	-	< 0.2	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.2	-	< 0.2	-
Dibutylchlorendate (surr.)	1	%	119	-	89	-
Tetrachloro-m-xylene (surr.)	1	%	109	-	81	-

Client Sample ID			BH09_0.0-0.2	BH10_0.0-0.2	BH11_0.0-0.2	BH12_0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Oc13499	S19-Oc13500	S19-Oc13501	S19-Oc13502
Date Sampled			Oct 08, 2019	Oct 08, 2019	Oct 08, 2019	Oct 08, 2019
Test/Reference	LOR	Unit				
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	-	< 0.5	-	< 0.5
Aroclor-1221	0.1	mg/kg	-	< 0.1	-	< 0.1
Aroclor-1232	0.5	mg/kg	-	< 0.5	-	< 0.5
Aroclor-1242	0.5	mg/kg	-	< 0.5	-	< 0.5
Aroclor-1248	0.5	mg/kg	-	< 0.5	-	< 0.5
Aroclor-1254	0.5	mg/kg	-	< 0.5	-	< 0.5
Aroclor-1260	0.5	mg/kg	-	< 0.5	-	< 0.5
Total PCB*	0.5	mg/kg	-	< 0.5	-	< 0.5
Dibutylchlorendate (surr.)	1	%	-	103	-	86
Tetrachloro-m-xylene (surr.)	1	%	-	106	-	88
Heavy Metals						
Arsenic	2	mg/kg	2.5	< 2	< 2	< 2
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	7.2	13	< 5	< 5
Copper	5	mg/kg	15	31	11	8.5
Lead	5	mg/kg	23	62	57	36
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	< 5	< 5	< 5
Zinc	5	mg/kg	60	88	62	31
% Moisture	1	%	13	5.3	12	5.8

Client Sample ID			DUP01	TRIP SPIKE	TRIP BLANK
Sample Matrix			Soil	Soil	Soil
Eurofins Sample No.			S19-Oc13503	S19-Oc13504	S19-Oc13505
Date Sampled			Oct 08, 2019	Oct 08, 2019	Oct 08, 2019
Test/Reference	LOR	Unit			
BTEX					
Benzene	0.1	mg/kg	-	120	< 0.1
Toluene	0.1	mg/kg	-	120	< 0.1
Ethylbenzene	0.1	mg/kg	-	130	< 0.1
m&p-Xylenes	0.2	mg/kg	-	130	< 0.2
o-Xylene	0.1	mg/kg	-	140	< 0.1
Xylenes - Total	0.3	mg/kg	-	130	< 0.3
4-Bromofluorobenzene (surr.)	1	%	-	121	133
Heavy Metals					
Arsenic	2	mg/kg	< 2	-	-
Cadmium	0.4	mg/kg	< 0.4	-	-
Chromium	5	mg/kg	19	-	-
Copper	5	mg/kg	39	-	-
Lead	5	mg/kg	64	-	-
Mercury	0.1	mg/kg	< 0.1	-	-
Nickel	5	mg/kg	< 5	-	-
Zinc	5	mg/kg	110	-	-
% Moisture	1	%	6.9	-	-

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Oct 11, 2019	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Sydney	Oct 11, 2019	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Oct 11, 2019	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Oct 11, 2019	
- Method: LTM-ORG-2010 TRH C6-C40			
Polycyclic Aromatic Hydrocarbons	Sydney	Oct 11, 2019	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Metals M8	Sydney	Oct 11, 2019	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Organochlorine Pesticides	Sydney	Oct 11, 2019	14 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Polychlorinated Biphenyls	Sydney	Oct 11, 2019	28 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
% Moisture	Sydney	Oct 09, 2019	14 Days
- Method: LTM-GEN-7080 Moisture			

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NATA # 1261
Site # 23736

Company Name: Alliance Geotechnical
Address: 10 Welder Road
Seven Hills
NSW 2147

Project Name: MAROUBRA
Project ID: 9194

Order No.:
Report #: 681566
Phone: 1800 288 188
Fax: 02 9675 1888

Received: Oct 9, 2019 5:59 PM
Due: Oct 16, 2019
Priority: 5 Day
Contact Name: Steven Wallace

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - AS4964	HOLD	Organochlorine Pesticides	Polychlorinated Biphenyls	Metals M8	BTEX	Moisture Set	Eurofins | mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271													
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794													
Perth Laboratory - NATA Site # 23736													
External Laboratory													
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**								
1	BH01_0.1-0.3	Oct 08, 2019		Soil	S19-Oc13491	X		X				X	X
2	BH02_0.3-0.4	Oct 08, 2019		Soil	S19-Oc13492	X			X			X	X
3	BH03_0.1-0.3	Oct 08, 2019		Soil	S19-Oc13493	X		X				X	X
4	BH04_0.0-0.2	Oct 08, 2019		Soil	S19-Oc13494	X			X			X	X
5	BH05_0.0-0.2	Oct 08, 2019		Soil	S19-Oc13495	X		X				X	X
6	BH06_0.0-0.2	Oct 08, 2019		Soil	S19-Oc13496	X			X			X	X
7	BH07_0.0-0.3	Oct 08, 2019		Soil	S19-Oc13497	X		X				X	X
8	BH08_0.1-0.3	Oct 08, 2019		Soil	S19-Oc13498	X			X			X	X
9	BH09_0.0-0.2	Oct 08, 2019		Soil	S19-Oc13499	X		X				X	X

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Melbourne Laboratory - NATA Site # 1254 & 14271													
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794													
Perth Laboratory - NATA Site # 23736													
10	BH10_0.0-0.2	Oct 08, 2019		Soil	S19-Oc13500	X			X			X	X
11	BH11_0.0-0.2	Oct 08, 2019		Soil	S19-Oc13501	X		X				X	X
12	BH12_0.0-0.2	Oct 08, 2019		Soil	S19-Oc13502	X			X			X	X
13	DUP01	Oct 08, 2019		Soil	S19-Oc13503					X		X	
14	TRIP SPIKE	Oct 08, 2019		Soil	S19-Oc13504						X		
15	TRIP BLANK	Oct 08, 2019		Soil	S19-Oc13505						X		
16	SPIKELAB	Oct 08, 2019		Soil	S19-Oc13506						X		
17	BH01_0.8-1.2	Oct 08, 2019		Soil	S19-Oc13507		X						
18	BH02_0.4-0.8	Oct 08, 2019		Soil	S19-Oc13508		X						
19	BH03_0.7-0.8	Oct 08, 2019		Soil	S19-Oc13509		X						
20	BH04_0.4-0.6	Oct 08, 2019		Soil	S19-Oc13510		X						
21	BH05_0.5-0.7	Oct 08, 2019		Soil	S19-Oc13511		X						

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Melbourne Laboratory - NATA Site # 1254 & 14271													
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794													
Perth Laboratory - NATA Site # 23736													
22	BH06_0.5-0.7	Oct 08, 2019		Soil	S19-Oc13512		X						
23	BH07_1.0-1.5	Oct 08, 2019		Soil	S19-Oc13513		X						
24	BH08_0.6-0.8	Oct 08, 2019		Soil	S19-Oc13514		X						
25	BH09_0.5-0.7	Oct 08, 2019		Soil	S19-Oc13515		X						
26	BH10_0.9-1.1	Oct 08, 2019		Soil	S19-Oc13516		X						
27	BH11_0.5-0.7	Oct 08, 2019		Soil	S19-Oc13517		X						
28	BH12_0.9-1.1	Oct 08, 2019		Soil	S19-Oc13518		X						
29	BH02_1.1-1.2	Oct 08, 2019		Soil	S19-Oc13519		X						
30	BH02_2.5-2.6	Oct 08, 2019		Soil	S19-Oc13520		X						
31	BH03_1.6-1.7	Oct 08, 2019		Soil	S19-Oc13521		X						
Test Counts						12	15	6	6	1	3	13	12

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
ug/L: micrograms per litre
ppm: Parts per million
ppb: Parts per billion
%: Percentage
org/100mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-BHC	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-BHC	mg/kg	< 0.05			0.05	Pass	
d-BHC	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-BHC (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.2			0.2	Pass	
Toxaphene	mg/kg	< 1			1	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/kg	< 0.5			0.5	Pass	
Aroclor-1221	mg/kg	< 0.1			0.1	Pass	
Aroclor-1232	mg/kg	< 0.5			0.5	Pass	
Aroclor-1242	mg/kg	< 0.5			0.5	Pass	
Aroclor-1248	mg/kg	< 0.5			0.5	Pass	
Aroclor-1254	mg/kg	< 0.5			0.5	Pass	
Aroclor-1260	mg/kg	< 0.5			0.5	Pass	
Total PCB*	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	79			70-130	Pass	
TRH C10-C14	%	76			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	93			70-130	Pass	
Toluene	%	90			70-130	Pass	
Ethylbenzene	%	86			70-130	Pass	
m&p-Xylenes	%	89			70-130	Pass	
o-Xylene	%	80			70-130	Pass	
Xylenes - Total	%	86			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	83			70-130	Pass	
TRH C6-C10	%	71			70-130	Pass	
TRH >C10-C16	%	75			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	118			70-130	Pass	
Acenaphthylene	%	116			70-130	Pass	
Anthracene	%	113			70-130	Pass	
Benz(a)anthracene	%	109			70-130	Pass	
Benzo(a)pyrene	%	110			70-130	Pass	
Benzo(b&j)fluoranthene	%	104			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Benzo(g.h.i)perylene	%	106			70-130	Pass	
Benzo(k)fluoranthene	%	119			70-130	Pass	
Chrysene	%	115			70-130	Pass	
Dibenz(a.h)anthracene	%	97			70-130	Pass	
Fluoranthene	%	116			70-130	Pass	
Fluorene	%	114			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	103			70-130	Pass	
Naphthalene	%	118			70-130	Pass	
Phenanthrene	%	113			70-130	Pass	
Pyrene	%	117			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	122			70-130	Pass	
4.4'-DDD	%	120			70-130	Pass	
4.4'-DDE	%	125			70-130	Pass	
4.4'-DDT	%	105			70-130	Pass	
a-BHC	%	121			70-130	Pass	
Aldrin	%	115			70-130	Pass	
b-BHC	%	120			70-130	Pass	
d-BHC	%	119			70-130	Pass	
Dieldrin	%	126			70-130	Pass	
Endosulfan I	%	120			70-130	Pass	
Endosulfan II	%	121			70-130	Pass	
Endosulfan sulphate	%	117			70-130	Pass	
Endrin	%	127			70-130	Pass	
Endrin aldehyde	%	108			70-130	Pass	
Endrin ketone	%	107			70-130	Pass	
g-BHC (Lindane)	%	118			70-130	Pass	
Heptachlor	%	118			70-130	Pass	
Heptachlor epoxide	%	119			70-130	Pass	
Hexachlorobenzene	%	128			70-130	Pass	
Methoxychlor	%	120			70-130	Pass	
Toxaphene	%	116			70-130	Pass	
LCS - % Recovery							
Polychlorinated Biphenyls							
Aroclor-1260	%	104			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	97			70-130	Pass	
Cadmium	%	96			70-130	Pass	
Chromium	%	106			70-130	Pass	
Copper	%	107			70-130	Pass	
Lead	%	101			70-130	Pass	
Mercury	%	100			70-130	Pass	
Nickel	%	107			70-130	Pass	
Zinc	%	104			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S19-Oc15248	NCP	%	75			70-130	Pass	
TRH C10-C14	S19-Oc06522	NCP	%	97			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S19-Oc15248	NCP	%	90			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Toluene	S19-Oc15248	NCP	%	88			70-130	Pass	
Ethylbenzene	S19-Oc15248	NCP	%	84			70-130	Pass	
m&p-Xylenes	S19-Oc15248	NCP	%	89			70-130	Pass	
o-Xylene	S19-Oc15248	NCP	%	87			70-130	Pass	
Xylenes - Total	S19-Oc15248	NCP	%	89			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S19-Oc15248	NCP	%	84			70-130	Pass	
TRH C6-C10	S19-Oc18702	NCP	%	71			70-130	Pass	
TRH >C10-C16	S19-Oc06522	NCP	%	96			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S19-Oc18250	NCP	%	122			70-130	Pass	
Acenaphthylene	S19-Oc18250	NCP	%	119			70-130	Pass	
Anthracene	S19-Oc18250	NCP	%	118			70-130	Pass	
Benz(a)anthracene	S19-Oc18250	NCP	%	117			70-130	Pass	
Benzo(a)pyrene	S19-Oc18250	NCP	%	114			70-130	Pass	
Benzo(b&j)fluoranthene	S19-Oc18250	NCP	%	103			70-130	Pass	
Benzo(g.h.i)perylene	S19-Oc18250	NCP	%	125			70-130	Pass	
Benzo(k)fluoranthene	S19-Oc18250	NCP	%	116			70-130	Pass	
Chrysene	S19-Oc18250	NCP	%	122			70-130	Pass	
Dibenz(a.h)anthracene	S19-Oc18250	NCP	%	116			70-130	Pass	
Fluoranthene	S19-Oc18250	NCP	%	120			70-130	Pass	
Fluorene	S19-Oc18250	NCP	%	118			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S19-Oc18250	NCP	%	123			70-130	Pass	
Naphthalene	S19-Oc18250	NCP	%	122			70-130	Pass	
Phenanthrene	S19-Oc18250	NCP	%	119			70-130	Pass	
Pyrene	S19-Oc18250	NCP	%	121			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Chlordanes - Total	S19-Oc16930	NCP	%	126			70-130	Pass	
4.4'-DDD	S19-Oc16930	NCP	%	118			70-130	Pass	
4.4'-DDE	S19-Oc16930	NCP	%	124			70-130	Pass	
4.4'-DDT	S19-Oc16930	NCP	%	100			70-130	Pass	
a-BHC	S19-Oc16930	NCP	%	122			70-130	Pass	
Aldrin	S19-Oc05859	NCP	%	129			70-130	Pass	
b-BHC	S19-Oc16930	NCP	%	122			70-130	Pass	
d-BHC	S19-Oc16930	NCP	%	121			70-130	Pass	
Dieldrin	S19-Oc16930	NCP	%	126			70-130	Pass	
Endosulfan I	S19-Oc16930	NCP	%	129			70-130	Pass	
Endosulfan II	S19-Oc16930	NCP	%	118			70-130	Pass	
Endosulfan sulphate	S19-Oc16930	NCP	%	113			70-130	Pass	
Endrin	S19-Oc14445	NCP	%	111			70-130	Pass	
Endrin aldehyde	S19-Oc16930	NCP	%	107			70-130	Pass	
Endrin ketone	S19-Oc16930	NCP	%	104			70-130	Pass	
g-BHC (Lindane)	S19-Oc16930	NCP	%	120			70-130	Pass	
Heptachlor	S19-Oc16930	NCP	%	117			70-130	Pass	
Heptachlor epoxide	S19-Oc16930	NCP	%	130			70-130	Pass	
Hexachlorobenzene	S19-Oc16930	NCP	%	130			70-130	Pass	
Methoxychlor	S19-Oc16930	NCP	%	116			70-130	Pass	
Toxaphene	S19-Oc16930	NCP	%	114			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S19-Oc15450	NCP	%	103			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Cadmium	S19-Oc15450	NCP	%	101			70-130	Pass	
Chromium	S19-Oc15450	NCP	%	97			70-130	Pass	
Copper	S19-Oc15450	NCP	%	97			70-130	Pass	
Lead	S19-Oc15450	NCP	%	103			70-130	Pass	
Mercury	S19-Oc15450	NCP	%	103			70-130	Pass	
Nickel	S19-Oc15450	NCP	%	85			70-130	Pass	
Zinc	S19-Oc15450	NCP	%	77			70-130	Pass	
Spike - % Recovery									
Polychlorinated Biphenyls				Result 1					
Aroclor-1260	S19-Oc16930	NCP	%	96			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S19-Oc13491	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	S19-Oc15658	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S19-Oc15658	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S19-Oc15658	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S19-Oc13491	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S19-Oc13491	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S19-Oc13491	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S19-Oc13491	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S19-Oc13491	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S19-Oc13491	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S19-Oc13491	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S19-Oc13491	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH >C10-C16	S19-Oc15658	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S19-Oc15658	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	S19-Oc15658	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	M19-Oc12735	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	M19-Oc12735	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	M19-Oc12735	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	M19-Oc12735	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	M19-Oc12735	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	M19-Oc12735	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	M19-Oc12735	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	M19-Oc12735	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	M19-Oc12735	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	M19-Oc12735	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	M19-Oc12735	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	M19-Oc12735	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	M19-Oc12735	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	M19-Oc12735	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	M19-Oc12735	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	M19-Oc12735	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S19-Oc16929	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	S19-Oc16929	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	S19-Oc16929	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	S19-Oc16929	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	S19-Oc16929	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	S19-Oc16929	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	S19-Oc16929	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	S19-Oc16929	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	S19-Oc16929	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	S19-Oc16929	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	S19-Oc16929	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	S19-Oc16929	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	S19-Oc16929	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	S19-Oc16929	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	S19-Oc16929	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	S19-Oc16929	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	S19-Oc16929	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	S19-Oc16929	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	S19-Oc16929	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	S19-Oc16929	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Toxaphene	S19-Oc16929	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S19-Oc15449	NCP	mg/kg	5.4	6.6	19	30%	Pass	
Cadmium	S19-Oc15449	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S19-Oc15449	NCP	mg/kg	17	17	3.0	30%	Pass	
Copper	S19-Oc15449	NCP	mg/kg	14	13	3.0	30%	Pass	
Lead	S19-Oc15449	NCP	mg/kg	16	19	14	30%	Pass	
Mercury	S19-Oc15449	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S19-Oc15449	NCP	mg/kg	8.1	9.3	13	30%	Pass	
Zinc	S19-Oc15449	NCP	mg/kg	22	22	1.0	30%	Pass	
Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	S19-Oc16929	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1221	S19-Oc16929	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1232	S19-Oc16929	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1242	S19-Oc16929	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1248	S19-Oc16929	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1254	S19-Oc16929	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1260	S19-Oc16929	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S19-Oc13496	CP	%	8.3	8.5	3.0	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs

Authorised By

Andrew Black	Analytical Services Manager
Andrew Sullivan	Senior Analyst-Organic (NSW)
Gabriele Cordero	Senior Analyst-Metal (NSW)
Nibha Vaidya	Senior Analyst-Asbestos (NSW)

Glenn Jackson

General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Certificate of Analysis

eurofins | Environment Testing

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025–Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Alliance Geotechnical
10 Welder Road
Seven Hills
NSW 2147

Attention:	Steven Wallace
Report	681566-AID
Project Name	MAROUBRA
Project ID	9194
Received Date	Oct 09, 2019
Date Reported	Oct 16, 2019

Methodology:

Asbestos Fibre Identification	Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques. *NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.*
Unknown Mineral Fibres	Mineral fibres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity. *NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS4964 requires that these are reported as UMF unless confirmed by an independent technique.*
Subsampling Soil Samples	The whole sample submitted is first dried and then passed through a 10mm sieve followed by a 2mm sieve. All fibrous matter greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) is employed. *NOTE: Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis, in accordance with AS 4964-2004.*
Bonded asbestos-containing material (ACM)	The material is first examined and any fibres isolated for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, possibly in combination.The resultant material is then further examined in accordance with AS 4964 - 2004. *NOTE: Even after disintegration it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.*
Limit of Reporting	The performance limitation of the AS 4964 (2004) method for non-homogeneous samples is around 0.1 g/kg (equivalent to 0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis, this is considered to be at the nominal reporting limit of 0.01% (w/w). The NEPM screening level of 0.001% (w/w) is intended as an on-site determination, not a laboratory Limit of Reporting (LOR), per se. Examination of a large sample size (e.g. 500 mL) may improve the likelihood of detecting asbestos, particularly AF, to aid assessment against the NEPM criteria. Gravimetric determinations to this level of accuracy are outside of AS 4964 and hence NATA Accreditation does not cover the performance of this service (non-NATA results shown with an asterisk). *NOTE: NATA News March 2014, p.7, states in relation to AS 4964: "This is a qualitative method with a nominal reporting limit of 0.01 % " and that currently in Australia "there is no validated method available for the quantification of asbestos".This report is consistent with the analytical procedures and reporting recommendations in the NEPM and the WA DoH.*

Project Name MAROUBRA
Project ID 9194
Date Sampled Oct 08, 2019
Report 681566-AID

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
BH01_0.1-0.3	19-Oc13491	Oct 08, 2019	Approximate Sample 508g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
BH02_0.3-0.4	19-Oc13492	Oct 08, 2019	Approximate Sample 615g Sample consisted of: Brown coarse-grained soil, rocks and bituminous material	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
BH03_0.1-0.3	19-Oc13493	Oct 08, 2019	Approximate Sample 62g Sample consisted of: Brown coarse-grained soil, rocks and bituminous material	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
BH04_0.0-0.2	19-Oc13494	Oct 08, 2019	Approximate Sample 420g Sample consisted of: Brown coarse-grained soil, rocks, organic debris and bituminous material	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
BH05_0.0-0.2	19-Oc13495	Oct 08, 2019	Approximate Sample 542g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
BH06_0.0-0.2	19-Oc13496	Oct 08, 2019	Approximate Sample 488g Sample consisted of: Brown coarse-grained soil, rocks and bituminous material	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
BH07_0.0-0.3	19-Oc13497	Oct 08, 2019	Approximate Sample 465g Sample consisted of: Brown coarse-grained soil, rocks and bituminous material	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
BH08_0.1-0.3	19-Oc13498	Oct 08, 2019	Approximate Sample 517g Sample consisted of: Brown coarse-grained soil, rocks and bituminous material	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025–Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
BH09_0.0-0.2	19-Oc13499	Oct 08, 2019	Approximate Sample 497g Sample consisted of: Brown coarse-grained soil, rocks and bituminous material	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
BH10_0.0-0.2	19-Oc13500	Oct 08, 2019	Approximate Sample 456g Sample consisted of: Brown coarse-grained soil, rocks and bituminous material	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
BH11_0.0-0.2	19-Oc13501	Oct 08, 2019	Approximate Sample 561g Sample consisted of: Brown coarse-grained soil, brick fragments and bituminous material	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
BH12_0.0-0.2	19-Oc13502	Oct 08, 2019	Approximate Sample 551g Sample consisted of: Brown coarse-grained soil, rocks, organic debris and bituminous material	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Sydney	Oct 09, 2019	Indefinite

eurofins | Environment Testing
ABN – 50 005 085 521
e.mail : EnviroSales@eurofins.com
web : www.eurofins.com.au

Melbourne
6 Monterey Road
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Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Company Name: Alliance Geotechnical
Address: 10 Welder Road
Seven Hills
NSW 2147

Project Name: MAROUBRA
Project ID: 9194

Order No.:
Report #: 681566
Phone: 1800 288 188
Fax: 02 9675 1888

Received: Oct 9, 2019 5:59 PM
Due: Oct 16, 2019
Priority: 5 Day
Contact Name: Steven Wallace

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - AS4964	HOLD	Organochlorine Pesticides	Polychlorinated Biphenyls	Metals M8	BTEX	Moisture Set	Eurofins | mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271													
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794													
Perth Laboratory - NATA Site # 23736													
External Laboratory													
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**								
1	BH01_0.1-0.3	Oct 08, 2019		Soil	S19-Oc13491	X		X				X	X
2	BH02_0.3-0.4	Oct 08, 2019		Soil	S19-Oc13492	X			X			X	X
3	BH03_0.1-0.3	Oct 08, 2019		Soil	S19-Oc13493	X		X				X	X
4	BH04_0.0-0.2	Oct 08, 2019		Soil	S19-Oc13494	X			X			X	X
5	BH05_0.0-0.2	Oct 08, 2019		Soil	S19-Oc13495	X		X				X	X
6	BH06_0.0-0.2	Oct 08, 2019		Soil	S19-Oc13496	X			X			X	X
7	BH07_0.0-0.3	Oct 08, 2019		Soil	S19-Oc13497	X		X				X	X
8	BH08_0.1-0.3	Oct 08, 2019		Soil	S19-Oc13498	X			X			X	X
9	BH09_0.0-0.2	Oct 08, 2019		Soil	S19-Oc13499	X		X				X	X

eurofins | Environment Testing
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e.mail : EnviroSales@eurofins.com
web : www.eurofins.com.au

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Melbourne Laboratory - NATA Site # 1254 & 14271													
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794													
Perth Laboratory - NATA Site # 23736													
10	BH10_0.0-0.2	Oct 08, 2019		Soil	S19-Oc13500	X			X			X	X
11	BH11_0.0-0.2	Oct 08, 2019		Soil	S19-Oc13501	X		X				X	X
12	BH12_0.0-0.2	Oct 08, 2019		Soil	S19-Oc13502	X			X			X	X
13	DUP01	Oct 08, 2019		Soil	S19-Oc13503					X		X	
14	TRIP SPIKE	Oct 08, 2019		Soil	S19-Oc13504						X		
15	TRIP BLANK	Oct 08, 2019		Soil	S19-Oc13505						X		
16	BH01_0.8-1.2	Oct 08, 2019		Soil	S19-Oc13507		X						
17	BH02_0.4-0.8	Oct 08, 2019		Soil	S19-Oc13508		X						
18	BH03_0.7-0.8	Oct 08, 2019		Soil	S19-Oc13509		X						
19	BH04_0.4-0.6	Oct 08, 2019		Soil	S19-Oc13510		X						
20	BH05_0.5-0.7	Oct 08, 2019		Soil	S19-Oc13511		X						
21	BH06_0.5-0.7	Oct 08, 2019		Soil	S19-Oc13512		X						

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Melbourne Laboratory - NATA Site # 1254 & 14271													
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794													
Perth Laboratory - NATA Site # 23736													
22	BH07_1.0-1.5	Oct 08, 2019		Soil	S19-Oc13513		X						
23	BH08_0.6-0.8	Oct 08, 2019		Soil	S19-Oc13514		X						
24	BH09_0.5-0.7	Oct 08, 2019		Soil	S19-Oc13515		X						
25	BH10_0.9-1.1	Oct 08, 2019		Soil	S19-Oc13516		X						
26	BH11_0.5-0.7	Oct 08, 2019		Soil	S19-Oc13517		X						
27	BH12_0.9-1.1	Oct 08, 2019		Soil	S19-Oc13518		X						
28	BH02_1.1-1.2	Oct 08, 2019		Soil	S19-Oc13519		X						
29	BH02_2.5-2.6	Oct 08, 2019		Soil	S19-Oc13520		X						
30	BH03_1.6-1.7	Oct 08, 2019		Soil	S19-Oc13521		X						
Test Counts						12	15	6	6	1	2	13	12

Internal Quality Control Review and Glossary

General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
5. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

Units

% w/w: weight for weight basis	grams per kilogram
Filter loading:	fibres/100 graticule areas
Reported Concentration:	fibres/mL
Flowrate:	L/min

Terms

Dry	Sample is dried by heating prior to analysis
LOR	Limit of Reporting
COC	Chain of Custody
SRA	Sample Receipt Advice
ISO	International Standards Organisation
AS	Australian Standards
WA DOH	Reference document for the NEPM. Government of Western Australia, Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (2009), including supporting document Recommended Procedures for Laboratory Analysis of Asbestos in Soil (2011)
NEPM	National Environment Protection (Assessment of Site Contamination) Measure, 2013 (as amended)
ACM	Asbestos Containing Materials. Asbestos contained within a non-asbestos matrix, typically presented in bonded and/or sound condition. For the purposes of the NEPM, ACM is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
AF	Asbestos Fines. Asbestos containing materials, including friable, weathered and bonded materials, able to pass a 7mm x 7mm sieve. Considered under the NEPM as equivalent to “non-bonded / friable”.
FA	Fibrous Asbestos. Asbestos containing materials in a friable and/or severely weathered condition. For the purposes of the NEPM, FA is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
Friable	Asbestos-containing materials of any size that may be broken or crumbled by hand pressure. For the purposes of the NEPM, this includes both AF and FA. It is outside of the laboratory’s remit to assess degree of friability.
Trace Analysis	Analytical procedure used to detect the presence of respirable fibres in the matrix.

Comments

S19-Oc13493: The sample received was not collected in an approved asbestos bag and was therefore sub-sampled from the 250mL glass jar. Valid sub-sampling procedures were applied so as to ensure that the sub-sample to be analysed accurately represented the sample received.

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N/A	Not applicable

Asbestos Counter/Identifier:

Sayeed Abu	Senior Analyst-Asbestos (NSW)

Authorised by:

Laxman Dias	Senior Analyst-Asbestos (NSW)

Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES1933135**	Page	: 1 of 2
Client	: **ALLIANCE GEOTECHNICAL**	Laboratory	: Environmental Division Sydney
Contact	: Stephen Wallace	Contact	: Customer Services ES
Address	: 10 Welder Road, Seven Hills, NSW	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: 9194 MAROUBRA	Date Samples Received	: 10-Oct-2019 12:40
Order number	: ----	Date Analysis Commenced	: 11-Oct-2019
C-O-C number	: ----	Issue Date	: 14-Oct-2019 17:02
Sampler	: JW		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 1		
No. of samples analysed	: 1		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Wisam Marassa	Inorganics Coordinator	Sydney Inorganics, Smithfield, NSW

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)				Client sample ID	**DUP01A**	----	----	----	----
				Client sampling date / time	08-Oct-2019 00:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*		**ES1933135-001**	--------	--------	--------	--------
					Result	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		**5.4**	----	----	----	----
EG005(ED093)T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		<5	----	----	----	----
Cadmium	7440-43-9	1	mg/kg		<1	----	----	----	----
Chromium	7440-47-3	2	mg/kg		**8**	----	----	----	----
Copper	7440-50-8	5	mg/kg		**24**	----	----	----	----
Lead	7439-92-1	5	mg/kg		**46**	----	----	----	----
Nickel	7440-02-0	2	mg/kg		**2**	----	----	----	----
Zinc	7440-66-6	5	mg/kg		**61**	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	----	----	----	----

CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

- ☑ Sydney Laboratory — Unit F3 Bld F, 16 Mars Rd, Lane Cove West, NSW 2066 — 02 9900 8400 — EnviroSampleNSW@eurofins.com
- ☐ Brisbane Laboratory — Unit 1, 21 Smallwood Pl., Murarrie, QLD 4172 — 07 3902 4600 — EnviroSampleQLD@eurofins.com
- ☐ Perth Laboratory — Unit 2, 91 Leach Highway, Kewdale WA 6105 — 08 9251 9600
- ☐ Melbourne Laboratory — 2 Kingston Town Close, Oakleigh, VIC 3166 — 03 8564 5000 — EnviroSampleVic@eurofins.com

Company	ALLIANCE GEOTECHNICAL	Project №	9194	Project Manager	STEVEN WALLACE
Address	10 WELDER ROAD, SEVEN HILLS NSW	Project Name	MAROUBRA	EDD Format (ESdat, EQuIS, Custom)	
Contact Name		Sampler(s)	JW	Handed over by	JW
Phone №	0424066612	Email for Invoice	Enviro@allgeo.com.au	Email for Results	Enviro@allgeo.com.au
Special Directions					
Purchase Order					
Quote ID №					

Analyses (Note: Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing)

Turnaround Time (TAT) Requirements (Default will be 5 days if not ticked): ☐ Overnight (9am)* ☐ 1 Day* ☐ 2 Day* ☐ 3 Day* ☑ 5 Day ☐ Other ( ) * Surcharges apply

№	Client Sample ID	Sampled Date/Time (dd/mm/yy hh:mm)	Matrix (Solid (S) Water (W))	TRH / BTEX	PAH	OCP	PCB	METALS (8)	ASBESTOS ID (absence / presence)	BTEX	HOLD	Salinity Suite	Aggressivity	Ion Exchange Suite (B20)	1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	BH01-0.1-0.3	8/10/19	S	X	X	X		X	X												1	1	
2	BH01-0.8-1.2	8/10/19	S								X										1	1	
3	BH02-0.3-0.4	8/10/19	S	X	X		X	X	X												1	1	
4	BH02-0.4-0.8	8/10/19	S								X										1		
5	BH03-0.1-0.3	8/10/19	S	X	X	X		X	X												1		
6	BH03-0.7-0.8	8/10/19	S								X										1	1	
7	BH04-0.0-0.2	8/10/19	S	X	X		X	X	X												1	1	
8	BH04-0.4-0.6	8/10/19	S								X										1	1	
9	BH05-0.0-0.2	8/10/19	S	X	X	X		X	X												1	1	
10	BH05-0.5-0.7	8/10/19	S								X										1	1	
11	BH06-0.0-0.2	8/10/19	S	X	X		X	X	X												1	1	
12	BH06-0.5-0.7	8/10/19	S								X										1	1	
13	BH07-0-0.3	8/10/19	S	X	X	X		X	X												1	1	
14	BH07-1-1.5	8/10/19	S								X										1		
15	BH08-0.1-0.3	8/10/19	S	X	X		X	X	X												1	1	
16	BH08-0.6-0.8	8/10/19	S								X										1	1	
17	BH09-0.0-0.2	8/10/19	S	X	X	X		X	X												1	1	
18	BH09-0.5-0.7	8/10/19	S								X										1	1	
19	BH10-0.0-0.2	8/10/19	S	X	X		X	X	X												1	1	
20	BH10-0.9-1.1	8/10/19	S								X												
	Total Counts			10	10	5	5	10	10		10										19	16	

Method of Shipment	☑ Courier (#)	☐ Hand Delivered	☐ Postal	Name	P.Brown ~~Jacob Walker~~	Signature	[signature]	Date 9/10/19	Time 16:00
Eurofins | mgt Laboratory Use Only	Received By	[signature]	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date 9/10	Time 5:59 PM	Temperature	15·23°C
	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date /	Time	Report №	681566

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CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

- ☒ **Sydney Laboratory** Unit F3 Bld F, 16 Mars Rd, Lane Cove West, NSW 2066 02 9900 8400 EnviroSampleNSW@eurofins.com
- ☐ **Brisbane Laboratory** Unit 1, 21 Smallwood Pl., Murarrie, QLD 4172 07 3902 4600 EnviroSampleQLD@eurofins.com
- ☐ **Perth Laboratory** Unit 2, 91 Leach Highway, Kewdale WA 6105 08 9251 9600
- ☐ **Melbourne Laboratory** 2 Kingston Town Close, Oakleigh, VIC 3166 03 8564 5000 EnviroSampleVic@eurofins.com

Company	ALLIANCE GEOTECHNICAL	Project №	9194	Project Manager	STEVEN WALLACE
Address	10 WELDER ROAD, SEVEN HILLS NSW	Project Name	MAROUBRA	EDD Format (ESdat, EQuIS, Custom)	
Contact Name					
Phone №	0424066612				
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	JW
Handed over by	JW
Email for Invoice	Enviro@allgeo.com.au
Email for Results	Enviro@allgeo.com.au

Turnaround Time (TAT) Requirements (Default will be 5 days if not ticked)

- ☐ Overnight (9am)*
- ☐ 1 Day*
- ☐ 2 Day*
- ☐ 3 Day*
- ☒ 5 Day
- ☐ Other ( )

* Surcharges apply

Analyses (Note: Where metals are requested, please specify "Total" or "Filtered". Suite codes must be used to attract suite pricing)

№	Client Sample ID	Sampled Date/Time (dd/mm/yy hh:mm)	Matrix (Solid (S) Water (W))	TRH / BTEX	PAH	OCP	PCB	METALS (8)	ASBESTOS ID (absence / presence)	BTEX	HOLD		Aggressivity	1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	BH11-0.0-0.2	8/10/19	S	X	X	X		X	X											1	1	
2	BH11-0.5-0.7	8/10/19	S								X									1	1	
3	BH12-0.0-0.2	8/10/19	S	X	X		X	X	X											1	1	
4	BH12-0.9-1.1	8/10/19	S								X									1	1	
5	DUP01	8/10/19	S					X												1	1	
6	DUP01A	8/10/19	S					X												1		PLEASE SEND TO ALS FOR METALS ANALYSIS
7	TRIP SPIKE	8/10/19	S							X								1				
8	TRIP BLANK	8/10/19	S							X								1				
9	BH02-1.1-1.2	8/10/19	S								X									1	1	
10	BH02-2.5-2.6	8/10/19	S								X									1		
11	BH3-1.6-1.7	8/10/19	S								X									1	1	
12																						
13																						
14																						
15																						
16																						
17																						
18																						
19																						
20																						
			Total Counts	2	2	1	1	4	2	2	5											

Method of Shipment	☒ Courier (#) ☐ Hand Delivered ☐ Postal	Name	P.3pm Jacob Walker	Signature		Date	9/10/19	Time 1600
Eurofins | mgt Laboratory Use Only	Received By	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date 9/10	Time	5:5PM	Temperature
	Received By	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date	Time		Report №

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