

Montessori Academy Group

Detailed Site Investigation

Proposed Development at:

170 Derby Street

Penrith NSW 2750

Lot 2 / - / DP109053

E2079-1-Rev B

15th December 2020

Report Distribution

Detailed Site Investigation

Address: 170 Derby Street Penrith NSW 2750

GCA Report No.: E2079-1-Rev B

Date: 15th December 2020

Copies	Recipient/Custodian
1 Soft Copy (PDF) – Secured and issued by email	Montessori Academy Group Charles Assaf c/o – Daniella Assaf daniella@montessoriacademy.com.au
1 Original – Saved to GCA Archives	Secured and Saved by GCA on Register

Version	Prepared By	Reviewed By	Date Issue
Draft	Luke Breva Graduate Environmental Scientist 	Nick Caltabiano Project Manager	9 th September 2020
FINAL	Luke Breva Graduate Environmental Scientist 	Nick Caltabiano Project Manager	15 th December 2020

Report Revision	Details	Report No.	Date	Amended By
0	FINAL Report	E2079-1	17 th June 2020	-
1	Revision A Report	E2079-1-Rev A	9 th September 2020	NC
2	Revision B Report	E2079-1-Rev B	15 th December 2020	NC

<i>Issued By:</i>	 Joe Nader
-------------------	---

Geotechnical Consultants Australia Pty Ltd

Suite 5, 5-7 Villiers Street
 Parramatta NSW 2151
 (02) 9788 2829
www.geoconsultants.com.au
info@geoconsultants.com.au

© Geotechnical Consultants Australia Pty Ltd

This report may only be reproduced or reissued in electronic or hard copy format by its rightful custodians listed above, with written permission by GCA. This report is protected by copyright law.

EXECUTIVE SUMMARY

Geotechnical Consultants Australia Pty Ltd (GCA) were commissioned by Mr. Charles Assaf of Montessori Academy Group (the client) to undertake a Detailed Site Investigation (DSI) for the property located at No. 170 Derby Street Penrith NSW 2750 (the site). Location of the sampling conducted can be seen in **Appendix A** of this report.

GCA understands that the proposed development includes demolition of the existing infrastructures onsite, and the construction of a two (2) storey childcare centre facility. The childcare centre will also include a basement carpark, which will require large volumes of the current soil to be removed offsite. Current and proposed plans are attached in **Appendix C**.

The objectives of this DSI were to provide an assessment of potential contaminating activities that may have impacted the site. Hence, this report will include the following:

- Review of environmental, architectural and/or engineering reports previously prepared for the site;
- Investigate the site through desktop research and a site inspection;
- Implement a soil investigation program in accordance with the NSW Environment Protection Authority (NSW EPA) *Sampling design Guidelines (1995)* to investigate the degree of contamination (if present). This will be conducted by means of intrusive soil sampling and laboratory analysis on relevant contaminants: Total Recoverable Hydrocarbons (TRH), Benzene Toluene Ethylbenzene Xylenes (BTEX) and heavy metals;
- Implement standard Quality Assurance (QA) and Quality Control (QC) which will be conducted by collecting a blind duplicate sample;
- Laboratory analysis of samples collected from the site by a National Association of Testing Authorities, Australia (NATA) accredited laboratory;
- Assessment of laboratory analytical data; and
- Provide an assessment of site contamination and recommendations for remediation and/or management.

A site inspection was conducted on the 4th June 2020. GCA found that the property at No. 170 Derby Street Penrith NSW 2750 is composed of a 1,307m² block with a single storey residential weatherboard dwelling. The property is currently being used as a professional practice. The site contains healthy grass, shrubbery and vegetation located north and south of the site.

In addition, a fibro shed is located South of the residential property which is approximately 21m² in size. A concrete driveway is located west of the residential property. The site is underlain by a thin stratum of organic-rich silt, followed by dense, moist clay. The back yard of the property is used for temporary parking of client vehicles.

During the site inspection, a soil investigation program was undertaken with a systematic approach in accessing locations across the site to identify areas of contamination. Soil samples were submitted to a NATA accredited laboratory for analysis of Chemicals of Potential Concern (COPC) which may have impacted the site during historical or present activities.

Soil sampling and analysis were conducted to thirteen (13) samples which were collected at six (6) locations within the site (See **Appendix A**). One (1) duplicate sample was taken to be used for QA/QC to ensure laboratory testing was done accurately and to ensure there was no bias conducted within the tests. The soil sampling regime was the most appropriate for this detailed site investigation as it provides a systematic sampling pattern, and it allows consultants to overcome structural boundaries (building walls and physical obstructions). The surface layers of the site are composed of soft loose brown soils.

Based on historical aerial photos, the site has had the same main building in place since 1943. Based on the historical ownership, the site was used as a shop front in 1886, which shows that the site has not been used for any farming or industrial land uses.

No Asbestos Containing Material (ACM) was identified on the surface or throughout any of the drilling onsite, nor was any foreign material identified within the soil. Based on the age of the onsite structures it is assumed both have potential ACM, however only through a Hazardous Materials Survey (HMS) can this be confirmed.

Laboratory analysis of the soil samples indicate that the levels of TRH, BTEX and heavy metals were below the Health Investigation and Screening Levels for Residential Land Use A, which is the most appropriate and stringent for the proposed land use. Therefore, GCA finds that the site is suitable for the proposed development and land use, providing the recommendations within Section 10 of this report are undertaken.

LIST OF ABBREVIATIONS

A list of the common abbreviations used throughout this report is provided below.

ACM - Asbestos Containing Material
AEC - Area of Environmental Concern
AGST - Above Ground Storage Tank
AHD - Australian Height Datum
BGS - Below ground surface
CSM - Conceptual site model
BTEX - Benzene, toluene, ethylbenzene and xylenes
B(a)P - Benzo(a)pyrene
CCA - Copper Chromate Arsenate
COC - Contaminants of Concern
DEC - NSW Department of Environment and Conservation
DECCW - NSW Department of Environment, Climate Change and Water DQI - Data quality indicator
DQOs - Data Quality Objectives
DWE - NSW Department of Water and Energy
EPA - NSW Environment Protection Authority
ESA - Environmental Site Assessment
ha - Hectare
HIL - Health based investigation level
HMS - Hazardous Materials Survey
LOR - Limit of Reporting
OEH - Office of Environment and Heritage
PAHs - Polycyclic aromatic hydrocarbons
PID - Photo-ionisation Detector
PCB - Polychlorinated Biphenyl
PQL - Practical Quantitation Limit
QA/QC - Quality Assurance/Quality Control
RPD - Relative Percentage Difference
SAQP - Sampling, Analysis and Quality Plan
TRH - Total Recoverable Hydrocarbons (previously Total Petroleum Hydrocarbons)
TSS - Total Suspended Solids
UST - Underground Storage Tank
VOC - Volatile Organic Compound

TABLE OF CONTENTS

1. INTRODUCTION.....	7
1.1 BACKGROUND AND PURPOSE	7
1.2 PROPOSED DEVELOPMENT	7
1.3 REGULATORY FRAMEWORK	7
1.4 PROJECT OBJECTIVES	7
1.5 SCOPE OF WORKS	8
1.5.1 DESKTOP STUDY	8
1.5.2 FIELDWORK AND LABORATORY ANALYSIS	8
1.5.3 DATA ANALYSIS AND REPORTING	8
2. SITE INFORMATION	9
2.1 SITE IDENTIFICATION	9
2.2 SITE DESCRIPTION	9
2.3 SURROUNDING LAND USE	9
2.4 SURFACE WATER RECEPTORS.....	10
2.5 GEOLOGY.....	10
2.6 SITE HISTORY.....	10
2.6.1 HISTORY OF REGION AND SITE	10
2.6.2 SECTION 10.7 (2) PLANNING CERTIFICATES	11
2.6.3 NSW EPA CONTAMINATED LAND REGISTER.....	11
2.6.4 PROTECTION OF THE ENVIRONMENT OPERATIONS ACT (POEO) PUBLIC REGISTER	11
2.6.5 SAFEWORK NSW HAZADROUS GOODS	11
2.6.6 PRODUCT SPILL AND LOSS HISTORY	12
2.6.7 DIAL BEFORE YOU DIG	12
3. PREVIOUS INVESTIGATIONS.....	12
4. CONCEPTUAL SITE MODEL.....	12
4.1 POTENTIAL CONTAMINATION	12
4.2 CONTAMINATION SOURCES, EXPOSURE PATHWAYS & RECEPTORS.....	13
4.3 DATA GAPS.....	14
5. DATA QUALITY OBJECTIVES	14
6. INVESTIGATION METHODOLOGIES.....	15
6.1 SAMPLING ANALYSIS PLAN.....	15
6.2 SOIL SAMPLING METHODOLOGY	15

6.3 QUALITY ASSURANCE.....	15
7. ASSESSMENT CRITERIA	15
8. INVESTIGATION RESULTS	16
8.1 SOIL ANALYTICAL RESULTS	16
9. CONCLUSIONS	19
10. RECOMMENDATIONS.....	19
11. LIMITATIONS	20
12. REFERENCES.....	21

APPENDICES

Appendix A – Figures and Photo Log

Appendix B – Current and Historical Certificates of Title

Appendix C – Current and Proposed Plans

Appendix D – Laboratory Reports (NATA)

1. INTRODUCTION

1.1 BACKGROUND AND PURPOSE

Geotechnical Consultants Australia Pty Ltd (GCA) were commissioned by Mr. Charles Assaf (the client) to undertake a Detailed Site Investigation (DSI) for the property located at No. 170 Derby Street Penrith NSW 2750 (the site). Location of the sampling conducted can be seen in **Appendix A** of this report.

As shown in **Figure 1**, the site is located approximately 41.90km west of the Sydney Central Business District (CBD), within the Local Government Area of Penrith City Council. The site covers an approximate area of 1,307m² (as shown in the site survey plan, **Appendix C**), and is identified Lot 2 / - / DP109053. The site is zoned as a R3 - Low Density Residential.

This report is provided in support of a Development Application (DA) to the Penrith City Council and for the purpose of enabling the developer to meet its obligations under the *Contaminated Land Management Act 1997* (CLM Act), for the assessment and management of contaminated soil and/or groundwater.

1.2 PROPOSED DEVELOPMENT

GCA understands that the proposed development includes demolition of the existing infrastructures onsite, and the construction of a two (2) storey childcare centre facility. The childcare centre will also include a basement carpark, which will require large volumes of the current soil to be removed offsite. Current and proposed plans are attached in **Appendix C**.

1.3 REGULATORY FRAMEWORK

The following regulatory framework and guidelines were considered during the preparation of this report:

- ANZECC & ARMCANZ (2000) Australian and New Zealand Guidelines for Fresh and Marine Water Quality;
- DEC (2007) Guidelines for the Assessment and Management of Groundwater Contamination;
- NSW EPA (1995) Sampling Design Guidelines;
- NEPC (2013) Schedule B (1) Guideline on Investigation Levels for Soil and Groundwater;
- NEPC (2013) Schedule B (2) Guideline on Site Characterisation;
- Contaminated Land Management Act 1997;
- State Environment Protection Policy 55 (SEPP 55) – Remediation of Land; and
- Office of Environment and Heritage (2011) Guidelines for Consultants Reporting on Contaminated Sites.

1.4 PROJECT OBJECTIVES

The objectives of this DSI were to provide an assessment of potential contaminating activities that may have impacted the site. Hence, this report will include the following:

- Review of previous environmental, architectural and/or engineering reports previously prepared for the site;
- Investigate the site through desktop research and visiting the site;
- Implement a soil investigation program in accordance with the NSW Environment Protection Authority (NSW EPA) *Sampling design Guidelines (1995)* to investigate the degree of contamination (if present). This will be conducted by means of intrusive soil sampling and laboratory analysis on relevant contaminants: Total Recoverable Hydrocarbons (TRH), Benzene Toluene Ethylbenzene Xylenes (BTEX) and heavy metals;
- Implement standard Quality Assurance (QA) and Quality Control (QC) which will be conducted by collecting a blind duplicate sample;

- Laboratory analysis of samples collected from the site by a National Association of Testing Authorities, Australia (NATA) accredited laboratory;
- Assessment of laboratory analytical data; and
- Provide an assessment of site contamination and recommendations for remediation and/or management.

1.5 SCOPE OF WORKS

To achieve the above listed project objectives, the following scope of works were undertaken to produce this DSI.

1.5.1 DESKTOP STUDY

Review of available environmental, architectural and/or engineering reports. Conduct the following:

- Historical investigations relating to the site (if any);
- Current and historical aerial photographs of the site and neighbouring properties;
- Current and Historical Certificates of Title;
- Local Council records and planning certificates;
- NSW Environment Protection Authority (EPA) environmental contaminated lands register;
- Protection of the Environment Operations (POEO) Act public register;
- Dial-Before-You-Dig enquiry for an evaluation into local underground services and assets;
- Review of local geological and hydrogeological information, including an evaluation of the WaterNSW registered groundwater bore database; and
- Acid Sulphate Soils (ASS) data maps.

1.5.2 FIELDWORK AND LABORATORY ANALYSIS

A site inspection and soil investigation program were undertaken on 4th June 2020 and included:

- Six (6) boreholes were drilled across the site (BH1 to BH6 inclusive) using a hand auger. The boreholes were evenly spread across the site in a systematic approach to identify areas of contamination. See **Appendix A** for location of soil samples.
- Multiple level soil sampling within fill and natural soils was conducted. Thirteen (13) soil samples (BH1.1 to BH6.2 inclusive) were collected including one (1) blind duplicate sample (D1 - Duplicate of BH2.1). The collected samples were submitted to a NATA accredited laboratory for analysis of Chemicals of Potential Concern (COPC).

1.5.3 DATA ANALYSIS AND REPORTING

The preparation of this DSI report will also document desktop study findings, a Conceptual Site Model (CSM), data quality objectives, investigation methodologies and analytical results. In addition, a discussion of laboratory analytical results and recommendations for remediation of contamination are presented.

2. SITE INFORMATION

2.1 SITE IDENTIFICATION

The location of the site is shown in **Figure 1** with a detailed site plan shown in **Figure 2**.

Table 1: Site Details

Address	170 Derby Street Penrith NSW 2750
Deposited Plan	Lot 2 / - / DP109053
Locality Map	Figure 1
Site Plan	Figure 2
Site Photographs	Appendix A
Area (approx.)	1,307m ²

2.2 SITE DESCRIPTION

A qualified environmental consultant inspected the site on 4th June 2020. Site photographs are provided in **Appendix A**. Observations noted during the inspection are summarised below.

- The site is composed of a single residential property located within a 1,307m² land. The site is currently being used as an associate psychology practice.
- Healthy grass, shrubbery and small trees is located north and south of the site.
- A shed is located west of the residential property which is approximately 21m² in size
- A concrete driveway is located west of the residential property
- The terrain is flat, with the site no ridges or raised sections were found across the site.
- The soil at this site is comprised of a top-layer of brown loose silty soil and below that is a moist thick clay.
- There were no visibility or olfactory indicators of potential contamination. There were no obvious features associated with any underground tanks (bowsers, breather pipe, inlet valve and piping) or odour that would indicate the potential for contamination.

2.3 SURROUNDING LAND USE

A site inspection was conducted on the 4th June 2020. GCA found that the property at No. 170 Derby Street Penrith NSW 2750 is composed of a 1,307m² block with a single storey residential weatherboard dwelling. The property is currently being used as a professional practice. The site contains healthy grass, shrubbery and vegetation located north and south of the site.

In addition, a fibro shed is located South of the residential property which is approximately 21m² in size. A concrete driveway is located west of the residential property. The site is underlain by a thin stratum of organic-rich silt, followed by dense, moist clay. The back yard of the property is used for temporary parking of client vehicles.

The surrounding areas of the site includes residential dwellings, Penrith Selective High School, Spence Park, Bright Stars Kindergarten – Penrith, Church of Christ, Penrith RSL Club and Penrith Police Station. The closest water body is Nepean River which is approximately 1.4km west of the site.

The land use proximal to the site is described in **Table 2**.

Table 2: Surrounding Land Use adjacent to the Site of Interest

Direction from Site	Land Use
North	Derby Street followed by residential property
East	Residential property
South	Residential property
West	Evan Street followed by residential property

2.4 SURFACE WATER RECEPTORS

Based on regional topography and the nearest surface water source, Nepean River (approximately 1.4km west of the site), groundwater is expected to flow towards the west.

A groundwater bore search was conducted on 15th June 2020 and no sites were present within a 500m radius of the site.

2.5 GEOLOGY

The Geological Map of Penrith (Geological Series Sheet 9030, Scale 1:100,000, Edition 1, 1991) published by the Department of Minerals and Energy indicates that the geology within the site is anticipated to be modern, fine-grained sand, silt and clay, as well as Wianamatta group sediments including Shale, carbonaceous claystone, claystone, laminate, fine to medium grained lithic sandstone, rare coal and tuff. Specifically:

- Rwa: Ashfield Shale of the Wianamatta Group, dark grey to black claystone – siltstone and fine sandstone – siltstone laminite.
- Alluvial deposits.

The following depicts the description of the soils encountered during field sampling carried out on 4th June 2020. Based on information from the boreholes, the soil profile across the site is generalised as followed:

- Topsoil: Dry, loose brown silty soil, with organic matter (0.0m to 0.45m)
- Natural soil: Dense, moist, clay (0.45m and beyond)

2.6 SITE HISTORY

2.6.1 HISTORY OF REGION AND SITE

A brief review of the history of the region is contained below. A documentary review of the owners of the site is summarised within **Table 3**.

- 1789: The area now called Penrith is walked over by Captain Watkin Trench and a group of Marines.
- 1815: Great Western Road is constructed connecting Penrith to Emu
- 1815: Public crossing of the Nepean River permitted.
- 1856: first traffic bridge built over the Nepean River, which is washed away a year later.
- 1963: Penrith Court House is constructed.
- 1963-Present: Residential dwellings, businesses and infrastructure are built, creating the modern suburb of Penrith.

Table 3: Land Ownership History of Lot 2 / - / DP109053

Year	Proprietor (s)
	(Lot 2 DP 109053)
2019 – date	CCA Investments – Penrith Pty Ltd (ACN 634 672 049)
(2016 – date)	<i>(current lease to Grosvenor Psychology Pty Limited, shown on Folio Identifier 2/109053)</i>
2009 – 2019	Ruxley Bay Pty Limited (ACN 120 663 229)
2004 – 2009	LND Holdings Pty Limited (ACN 110 154 642)
1998 – 2004	Western Sydney Physiotherapy Pty Limited (ACN 081 416 355)
1991 – 1998	Sherril Rae Farquharson
1989 – 1991	Richard James Martin
(1989 – date)	<i>(various leases shown on Historical Folio 2/109053)</i>
	(Lot 2 DP 109053 – Area 1 Rood 11 ¼ Perches – CTVol 6975 Fol 111)
1986 – 1989	Richard James Martin
1979 – 1986	Peter Thomas Hill, solicitor Sue Elizabeth Hill, his wife
1964 – 1979	Thomas Guy Waldin, retired
1957 – 1964	Brian Hirst Waldin, public relations officer
1955 – 1957	Dorothy Clara Fulton Lee, wife of John William Lee, water board inspector
	(Lot 1 DP 14367 – Area 2 Roods 18 Perches – CTVol 4694 Fol 125)
1938 – 1955	Dorothy Clara Fulton Neale, spinster
1938 – 1938	Henry James Fulton Neale, retired storekeeper
	(Lots 1 & 10 Section 11 DP 1582 – Area 2 Acres 1 Rood 28 Perches – CTVol 786 Fol 10)
1886 – 1938	Henry James Fulton Neale, storekeeper

2.6.2 SECTION 10.7 (2) PLANNING CERTIFICATES

A Section 10.7 Planning Certificate describes how a property may be used and the restrictions on development. The Planning Certificate is issued under Section 149 of the Environmental Planning and Assessment Act 1979. At the time of reporting, GCA could not get access to the Planning Certificate.

2.6.3 NSW EPA CONTAMINATED LAND REGISTER

A search of the NSW EPA contaminated land register was undertaken for the subject site. A result was showing that a site, located at No. 2115 Castlereagh Road is a contaminated site. This was the only result returned for the suburb of Penrith, and is located over 2km from the site. This this can be considered negligible.

2.6.4 PROTECTION OF THE ENVIRONMENT OPERATIONS ACT (POEO) PUBLIC REGISTER

A search on the POEO public register of licensed and delicensed premises (DECC) returned one hundred and twenty (120) results in the suburb of Penrith. None of the sites are located within 200m of the site and can be considered negligible.

2.6.5 SAFEWORK NSW HAZADROUS GOODS

A search was not undertaken with NSW WorkSafe for historical dangerous goods stored onsite. However, based on the historical ownership and historical aerial photos of the site, no evidence of historical storage of dangerous goods were identified.

2.6.6 PRODUCT SPILL AND LOSS HISTORY

The site inspection carried out found no evidence to suggest chemical contamination impact on the site (i.e. chemical staining, unhealthy vegetation). It is reasonable to assume there is no significant soil, surface water and/or groundwater contamination impacting the site. A soil sampling program was carried out in order to ascertain the accuracy of these observations.

2.6.7 DIAL BEFORE YOU DIG

A review of assets and services via Dial-Before-You-Dig request suggests no contamination is expected to impact the site via underground services and assets or act as a portal to transport potential contamination offsite.

3. PREVIOUS INVESTIGATIONS

GCA have not been informed of any historical environmental reports completed for the site. Existing site survey and proposed plans can be found within **Appendix C**.

4. CONCEPTUAL SITE MODEL

In accordance with NEPM (2013) Schedule B2 – Guideline on Site Characterisation, and to aid in the assessment of data collection for the site, a CSM was created to assess the plausible pollutant linkages between potential contamination sources, migration pathways and receptors. The CSM provides a framework for the review of the reliability and useability of the data collected and to identify data gaps in the existing site characterisation. The CSM can be seen in **Table 4** in Section 4.2.

4.1 POTENTIAL CONTAMINATION

The COPC at the site are considered to be:

Petroleum hydrocarbon contamination from car parking:

- TRH.
- BTEX.
- Heavy metals.

General residential land use:

- Waste building materials.
- Asbestos.

4.2 CONTAMINATION SOURCES, EXPOSURE PATHWAYS & RECEPTORS

Potential contamination sources, exposure pathways and human and environmental receptors that were considered relevant for this assessment are summarised along with a qualitative assessment of the potential risks posed by complete exposure pathways in **Table 4**.

Table 4: Conceptual Site Model

Potential Sources	Potential Receptor	Potential Exposure Pathway	Complete Connection	Risk	Justification
Contaminated soil from importation of uncontrolled fill across the site. ACM	Site occupants, workers, general public	Dermal contact, inhalation/ingestion of particulates	Limited (current)	Low	Direct contact with potentially contaminated soils is limited.
			No (future)	Negligible	If present, impacted soils are likely to be disposed of off-site.
	Nepean River	Migration of impacted groundwater and surface water run-off.	Limited (current)	Low	No obvious sources of inorganic contamination were observed on site that could migrate offsite with surface water runoff.
			No (future)	Negligible	If present, contaminated soils and groundwater are likely to be remediated. Unlikely contamination would reach Nepean River due to distance from site.
	Underlying aquifer	Leaching and migration of contaminants through groundwater infiltration.	Limited (current)	Low	Due to existing sealed surfaces, expected shallow bedrock, leachability of CoCs, migration of CoCs is likely to be limited.
			No (future)	Low	If present, contaminated soil and/or groundwater is likely to be remediated.

4.3 DATA GAPS

Based on information on the site history and the site investigation on 4th June 2020, a program of intrusive investigation was required to address the following data gaps:

- Potential presence of onsite contamination (as listed in Section 4.1).

5. DATA QUALITY OBJECTIVES

In accordance with the US EPA (2006) Data Quality Assessment and the DEC (2006) Guidelines for the NSW Site Auditor Scheme, the process of developing Data Quality Objectives (DQO) was used to determine the appropriate level of data quality needed for the specific data requirements of the project. The DQO process that was applied for this assessment is documented below.

- **Step 1:** State the problem.
The subject site may be contaminated as a result of previous and current land use which may impact suitability of the site for proposed development.
- **Step 2:** Identify the decision.
The site is suitable for the proposed development without the requirement for remediation and/or management.
- **Step 3:** Identify inputs into the decision.
 - Identification of issues of potential environmental concern;
 - Appropriate identification of COPC;
 - Systematic soil sampling and analysis programs of shallow soil across the site
 - Visual inspection of systematic shallow soil samples for presence of ACM;
 - Appropriate quality assurance / control to enable an evaluation of the reliability of the analytical data; and
 - Screening sample analytical results against appropriate assessment criteria for the intended land use.
- **Step 4:** Define the boundaries of the site. The project boundary is defined as the area within extent of the site.
- **Step 5:** Develop a decision rule.
 - To accept the assessment decision the following decision rules apply:
For systematic grid based soil sampling the sampling data must meet the following qualifiers;
 - The 95% Upper Confidence Limit of COPC concentration data does not exceed the soil assessment criteria;
 - No single sample exceeds 250% of the soil COPC assessment criteria;
 - The standard deviation of COPC analytical results is less than 50% of the soil assessment criteria; and
 - There is no visible identification of ACM in soil samples or on the ground surface.
- **Step 6:** Specify acceptable limits on decision errors.
 - The field sampling methodology, sample preservation techniques, and laboratory analytical procedures must be appropriate to provide confidence in data quality so any comparison against assessment criteria can be considered reliable. This is achieved by defining and comparing results against the Data Quality Indicators (DQIs).
- **Step 7:** Optimise the design for obtaining data.
This is achieved by sampling plan design in consideration of the available site history information, area of investigation, contaminant behaviour in the environment, and likely spatial distribution of contamination.

6. INVESTIGATION METHODOLOGIES

GCA conducted the onsite investigation and soil sampling program on the 4th June 2020. Sample locations for the site are presented on **Figure 2**. The investigation methodology is presented below.

6.1 SAMPLING ANALYSIS PLAN

To assess the potential for soil contamination within the targeted area, GCA completed the following scope of works:

- Collection of thirteen (13) soil samples including one blind duplicate (D1 - Duplicate of BH2.1) sample for quality analysis. The soil samples were collected from six (6) locations (BH1 to BH6 inclusive) at depths of approximately 0.4m to 0.6m below ground level (bgl). Refer to **Figure 2** for sample depths and locations;
- Visual inspection of the ground surface and excavated soil for asbestos; and
- Submission of thirteen (13) soil samples (BH1.1 to D1 inclusive) to a NATA accredited laboratory for analysis of COPC comprising TRH, BTEX and heavy metals.

6.2 SOIL SAMPLING METHODOLOGY

Boreholes BH1 to BH6 inclusive were completed using a hand auger to depths of approximately 0.6m bgl.

The thirteen (13) soil samples were collected directly from the hand auger, placed in laboratory prepared 250mL soil jars, labelled and placed on ice in an esky for transport under Chain of Custody (COC) to a NATA accredited laboratory for the analysis of the COPC.

6.3 QUALITY ASSURANCE

QC sampling was undertaken in general accordance with specifications outlined in Australian Standards (AS) 4482.1, *Guide to Sampling and Investigation of Potentially Contaminated Soil*. Field QC samples were collected and are documented within **Table 5**.

Table 5: Duplicate Sample

Primary Sample ID	Duplicate sample ID	Sample Matrix	Rate of Collection
GCA Reference: BH2.1	GCA Reference: D1	Soil	1 in 13 Samples

The laboratory internal QC procedures are consistent with NEPM policy on laboratory analysis of contaminated soils.

7. ASSESSMENT CRITERIA

The following soil assessment criteria were adopted for the investigation.

NEPM Health Based Investigation Level A (HILs A)

HILs are Tier 1 risk based generic assessment criteria used for the assessment of potential risks to human health from chronic exposure to contaminants in soil. They are intentionally conservative and based on a reasonable worst-case scenario for generic land use settings including Residential (HILs A/B), Open Space/Recreational (HILs C) and Commercial Industrial (HILs D). HILs A soil assessment criteria were adopted on the basis of the proposed site.

NEPM Health Screening Levels A (HSLs A)

HSLs are Tier 1 risk based generic soil assessment criteria used for the assessment of potential risks to human health from chronic inhalation exposure of petroleum vapour emanating off petroleum contaminated soils (Vapour Risk). They are intentionally conservative and based on a reasonable worst-

case scenario for generic soil types, contamination depth and land use settings including Residential (HSLs A/B), Open Space/Recreational (HSLs C) and Commercial Industrial (HSLs D). HSLs A soil assessment criteria were adopted on the basis of the proposed development.

NEPM Management Limits – Residential, parkland and public open space

Management Limits for petroleum have been developed for prevention of explosive vapour accumulation, prevention of the formation of observable Light Non-Aqueous Phase Liquids (LNAPL) and protection against effects on buried infrastructure. Residential, parkland and public open space limits have been adopted based on the proposed land use.

NEPM Soil Ecological Assessment Levels

Soil ecological assessment was not considered warranted based on the following:

- There are no onsite or nearby offsite sensitive ecological receptors.

8. INVESTIGATION RESULTS

8.1 SOIL ANALYTICAL RESULTS

The soil analytical results are summarised below. Soil analytical results are presented in the laboratory reports in **Appendix D**.

Total Recoverable Hydrocarbons

The laboratory results for the thirteen (13) samples tested for TRH negligible amounts of TRH. This is shown **Table 6** below. Overall, all samples were below the Health Screening Levels.

Table 6: Summary of TRH Values

Chemical	Health Screening Levels (HSL-A) Residential (Low Density)	Sample	BH1.1	BH1.2	BH2.1	BH2.2	BH3.1	BH3.2	D1
			C ₆ – C ₁₀	4,400	<25	<25	<25	<25	
> C ₁₀ – C ₁₆	3,300	<25	<25	<25	<25	<25	<25	<25	
>C ₁₆ – C ₃₄	4,500	<90	<90	<90	<90	<90	<90	<90	
>C ₃₄ – C ₄₀	6,300	<120	<120	<120	<120	<120	<120	<120	
Chemical	Health Screening Levels (HSL-A) Residential (Low Density)	Sample	BH4.1	BH4.2	BH5.1	BH5.2	BH6.1	BH6.2	
			C ₆ – C ₁₀	4,400	<25	<25	<25	<25	
> C ₁₀ – C ₁₆	3,300	<25	<25	<25	<25	<25	<25	<25	
>C ₁₆ – C ₃₄	4,500	130	<90	<90	<90	<90	<90	<90	
>C ₃₄ – C ₄₀	6,300	<120	<120	<120	<120	<120	<120	<120	

Benzene Toluene Ethylbenzene Xylenes

The majority of samples tested for BTEX at this site produced results below the laboratory limits of reporting (LOR). These results are shown in **Table 7**.

Table 7: Summary of BTEX Values

Chemical	Health Screening Levels (HSL-A) Residential (Low Density)	Sample	BH1.1	BH1.2	BH2.1	BH2.2	BH3.1	BH3.2	D1
Benzene	100		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	14,000		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	4,500		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Xylenes	12,000		<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Chemical	Health Screening Levels (HSL-A) Residential (Low Density)	Sample	BH4.1	BH4.2	BH5.1	BH5.2	BH6.1	BH6.2	
Benzene	100		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
Toluene	14,000		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
Ethylbenzene	4,500		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
Total Xylenes	12,000		<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	

Heavy Metals

Many of the samples contained results above the laboratory LOR for heavy metals, however none of these values approached Health Investigation Levels. Some metals are naturally occurring within soils, and the levels recorded at this site are considered low. This information is summarised below in **Table 8**.

Table 8: Summary of Heavy Metal Values

Chemical	Health Investigation Levels (HIL-A) Residential (Low Density)	Sample	BH1.1	BH1.2	BH2.1	BH2.2	BH3.1
Arsenic	100		9	9	10	8	9
Cadmium	20		<0.3	<0.3	<0.3	<0.3	<0.3
Chromium	100		17	19	19	15	16
Copper	7,000		10	8.3	17	15	9.5
Lead	300		39	27	28	22	29
Mercury	200		<0.05	<0.05	<0.05	<0.05	<0.05
Nickel	400		5.0	4.9	4.7	5.1	6.1
Zinc	8,000		42	26	53	42	39

Chemical	Health Investigation Levels (HIL-A) Residential (Low Density)	Sample	BH3.2	BH4.1	BH4.2	BH5.1	BH5.2
Arsenic	100		9	10	10	12	13
Cadmium	20		<0.3	<0.3	<0.3	<0.3	<0.3
Chromium	100		16	10	11	17	13
Copper	7,000		8.8	12	10	23	24
Lead	300		24	22	12	130	140
Mercury	200		<0.05	<0.05	<0.05	<0.05	<0.05
Nickel	400		5.5	4.7	4.9	6.8	8.1
Zinc	8,000		30	37	23	160	100

Chemical	Health Investigation Levels (HIL-A) Residential (Low Density)	Sample	BH6.1	BH6.2	D1	
Arsenic	100		9	11	9	
Cadmium	20		0.4	0.4	<0.3	
Chromium	100		17	17	15	
Copper	7,000		49	58	8.7	
Lead	300		180	150	26	
Mercury	200		<0.05	<0.05	<0.05	
Nickel	400		8.0	13	5.2	
Zinc	8,000		280	280	28	

9. CONCLUSIONS

The property located at No. 170 Derby Street Penrith NSW 2750 was the subject of a DSI to assess if there is a presence of contamination associated with current and historical use of the property.

Based on historical aerial photos, the site has had the same main building in place since 1943. Based on the historical ownership, the site was used as a shop front in 1886, which shows that the site has not been used for any farming or industrial land uses.

No Asbestos Containing Material (ACM) was identified on the surface or throughout any of the drilling onsite, nor was any foreign material identified within the soil. Based on the age of the onsite structures it is assumed both have potential ACM, however only through a Hazardous Materials Survey (HMS) can this be confirmed.

Laboratory analysis of the soil samples indicate that the levels of TRH, BTEX and heavy metals were below the Health Investigation and Screening Levels for Residential Land Use A, which is the most appropriate and stringent for the proposed land use.

Therefore, GCA finds that the site is suitable for the proposed development and land use, providing the recommendations within Section 10 of this report are undertaken.

10. RECOMMENDATIONS

GCA recommends that the following be implemented:

- Any soils requiring excavation, onsite reuse and/or removal must be classified in accordance with "Waste Classification Guidelines Part 1: Classifying Waste" NSW EPA (2014);
- All structures on the site should have a HMS conducted by a qualified occupational hygienist and/or environmental consultant for the site prior to any demolition or renovation works in accordance with relevant Australian Standards, SafeWork NSW codes of practice and any other applicable requirements;
- The demolition of any structures and excavation activity on site be undertaken in accordance with relevant Australian Standards, SafeWork NSW codes of practice and any other applicable requirements;
- A site specific 'Unexpected Finds Protocol' is to be made available for reference for all occupants and/or site workers in the event unanticipated contamination is discovered, including asbestos.
- If any unexpected occurrence happens on the site, all work activity should be ceased temporarily and an environmental consultant should be notified immediately.

11. LIMITATIONS

The findings of this report are based on the scope of work outlined in Section 1.5. GCA performed the services in a manner consistent with the normal level of care and expertise exercised by members of the environmental consulting profession. No warranties, express or implied are made.

The results of this assessment are based upon the information documented and presented in this report. All conclusions and recommendations regarding the site are the professional opinions of GCA personnel involved with the project, subject to the qualifications made above. While normal assessments of data reliability have been made, GCA assumes no responsibility or liability for errors in any data obtained from regulatory agencies, statements from sources outside of GCA, or developments resulting from situations outside the scope of this project.

The results of this assessment are based on the site conditions identified at the time of the site inspection and validation sampling. GCA will not be liable to revise the report to account for any changes in site characteristics, regulatory requirements, assessment criteria or the availability of additional information, subsequent to the issue date of this report.

GCA is not engaged in environmental consulting and reporting for the purpose of advertising sales promoting, or endorsement of any client interests, including raising investment capital, recommending investment decisions, or other publicity purposes.

Geotechnical Consultants Australia Pty Ltd (GCA)

Prepared by:

Reviewed by:

Luke Brevia
Graduate Environmental Scientist

Nick Caltabiano
Project Manager

12. REFERENCES

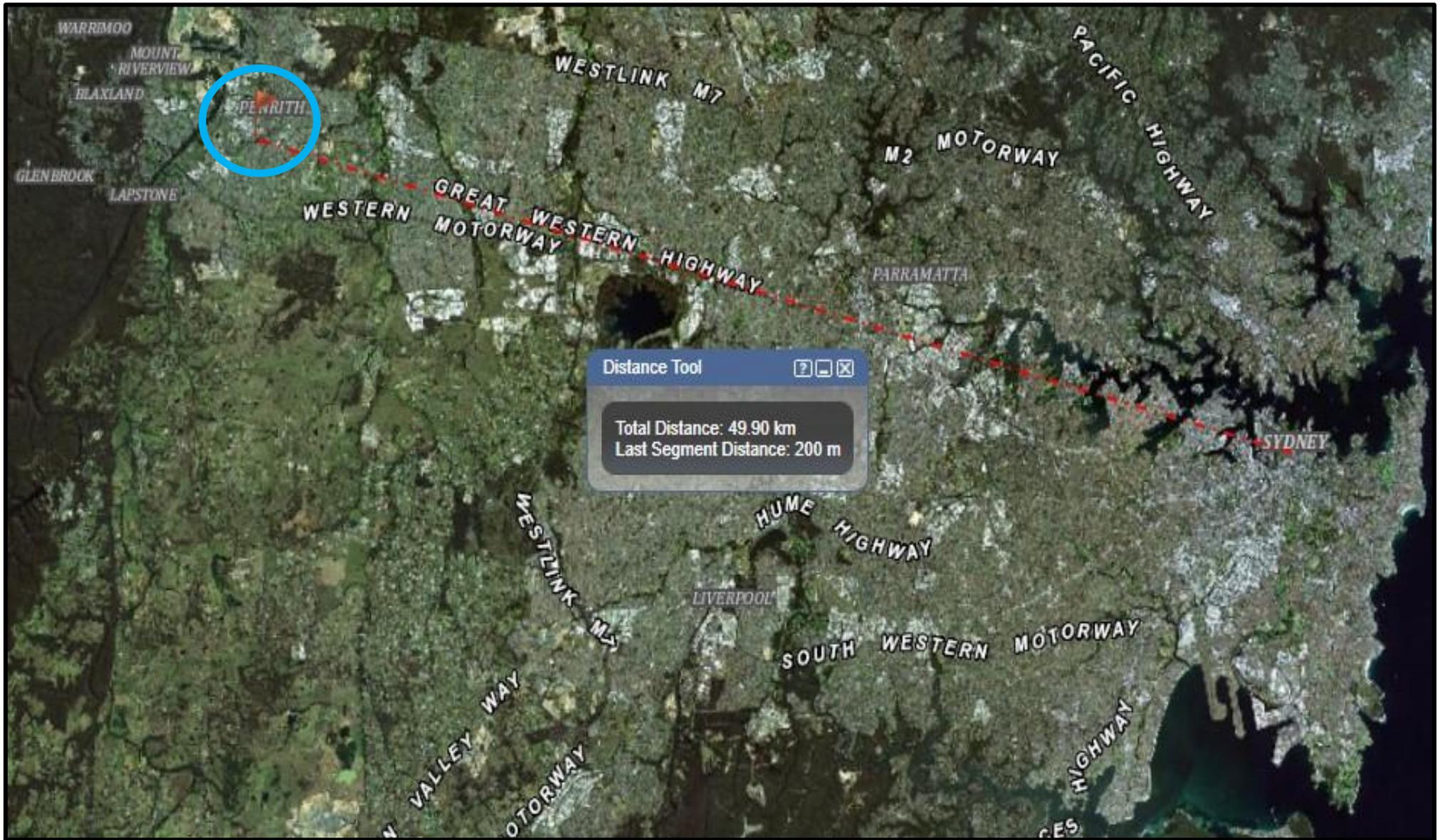
- NSW Environmental Protection Authority, *Waste Classification Guidelines Part 1: Classifying Waste*, 2014.
- Google Earth, <https://www.google.com/earth>.
- National Environment Protection Measures (2013), *Schedule B1 – Guideline on Investigation Levels for Soil and Groundwater*.
- National Environment Protection Measures (2013), *Schedule B2 – Guideline on Site Characterisation*.
- NSW Environmental Protection Authority, *Guidelines for Consultants Reporting on Contaminated Sites*, 2011.
- NSW Environmental Protection Authority, *Sampling Design Guidelines*, 1995
- Six Maps, <https://www.maps.six.nsw.gov.au>.
- State Environment Protection Policy 55 (SEPP 55). *Remediation of Land Under the Environmental Planning and Assessment Act*.
- WaterNSW, waterNSW.com.au.

APPENDIX A

Site photo log and figures



Figure 1:
Depicts an
aerial map of
the site in
relation to the
CBD. The site is
located
approximately
49.90 km north -
west of
Sydney's CBD.



 Site location

Source: Six Maps

2020

Document Set ID: 9426166
Version: 1, Version Date: 23/12/2020

Figure 1	Locality Map
Project	170 Derby Street, Penrith, NSW, 2750



Photograph 1: Depicts an aerial photo of the site. The total area of this site is approximately 1307m². Thirteen soil samples were taken from the site including a QA/QC.

Name of the borehole	Depth of the sample
BH1.1	0.4
BH1.2	0.6
BH2.1	0.4
D1	0.6
BH2.2	0.6
BH3.1	0.4
BH3.2	0.6
BH4.1	0.4
BH4.2	0.6
BH5.1	0.4
BH5.2	0.6
BH6.1	0.4
BH6.2	0.6



 Site boundary

Source: Six Maps

2020

Document ID: 9426166
Version: 1, Version Date: 23/12/2020

Figure 2	Site Area
Project	170 Derby Street, Penrith, NSW, 2750



Photograph 2: Depicts an aerial image of the site in 1943. The site contained a residential property. Surrounding the property was vacant land and other residential lots.



Site Location

Source: Metro Maps

Doc ID: 9426166
Version: 1, Version Date: 23/12/2020

Figure 3	Historical Image: 1943
Project	170 Derby Street, Penrith, NSW, 2750



Photograph 3: Depicts an aerial photo of the site in 2000. The surrounding vacant lots have been developed into residential properties.



Site Location

Source: Metro Maps

Doc ID: 9426166

Version: 1, Version Date: 23/12/2020

Figure 4	Historical Image: 2000
Project	170 Derby Street, Penrith, NSW, 2750



Photograph 4: Depicts an aerial photo of the site in 2020. The site is still similar to photograph 3.



Site Location

Source: Metro Maps

Doc ID: 9426166
Version: 1, Version Date: 23/12/2020

Figure 5	Historical Image: 2020
Project	170 Derby Street, Penrith, NSW, 2750

Onsite Photographs: 04/06/2020



Image 1: Overview image of the site. The site contains a single storey bricked residential property. The property contains healthy vegetation indicating healthy soil and minimal/no soil contamination. The site is being used as an Associate Psychology Practice.



Image 2: The backyard of the property contains a tree and a shed. The backyard has been used for extra car space.



Image 3: The backyard has two large trees. The boarder around the site is colourbond fences.



Image 4: West of the site is driveway that goes to the backyard.



Image 5: At the front of the property is a concrete driveway and carpark. The driveway is elevated from the main road to the carport within the site.



Image 6: Throughout the site, the average ground cover is soft loose soil.

APPENDIX B

Current and historical certificates of title

ADVANCE LEGAL SEARCHERS PTY LTD

(ACN 147 943 842)

ABN 82 147 943 842

03rd June 2020

NEO CONSULTING PTY LIMITED

P.O. Box 279

RIVERSTONE NSW 2765

RE:

**170 Derby Street,
Penrith
Job Reference: N4341**

Current Search

Folio Identifier 2/109053 (title attached)

DP 109053 (plan attached)

Dated 03rd June 2020

Registered Proprietor:

CCA INVESTMENTS – PENRITH PTY LTD

Title Tree
Lot 2 DP 109053

Folio Identifier 2/109053

Certificate of Title Volume 6975 Folio 111

Certificate of Title Volume 4694 Folio 125

Certificate of Title Volume 786 Folio 10

Summary of proprietor(s)
Lot 2 DP 109053

Year	Proprietor(s)
	(Lot 2 DP 109053)
2019 – todate	CCA Investments – Penrith Pty Ltd (ACN 634 672 049)
(2016 – todate)	<i>(current lease to Grosvenor Psychology Pty Limited, shown on Folio Identifier 2/109053)</i>
2009 – 2019	Ruxley Bay Pty Limited (ACN 120 663 229)
2004 – 2009	LND Holdings Pty Limited (ACN 110 154 642)
1998 – 2004	Western Sydney Physiotherapy Pty Limited (ACN 081 416 355)
1991 – 1998	Sherril Rae Farquharson
1989 – 1991	Richard James Martin
(1989 – todate)	<i>(various leases shown on Historical Folio 2/109053)</i>

Cont.

Cont.

	(Lot 2 DP 109053 – Area 1 Rood 11 ¼ Perches – CTVol 6975 Fol 111)
1986 – 1989	Richard James Martin
1979 – 1986	Peter Thomas Hill, solicitor Sue Elizabeth Hill, his wife
1964 – 1979	Thomas Guy Waldin, retired
1957 – 1964	Brian Hirst Waldin, public relations officer
1955 – 1957	Dorothy Clara Fulton Lee, wife of John William Lee, water board inspector
	(Lot 1 DP 14367 – Area 2 Roods 18 Perches – CTVol 4694 Fol 125)
1938 – 1955	Dorothy Clara Fulton Neale, spinster
1938 – 1938	Henry James Fulton Neale, retired storekeeper
	(Lots 1 & 10 Section 11 DP 1582 – Area 2 Acres 1 Rood 28 Perches – CTVol 786 Fol 10)
1886 – 1938	Henry James Fulton Neale, storekeeper

	Status	Surv/Comp	Purpose
DP23829 Lot(s): 4			
 DP1259002	PRE-ALLOCATED	UNAVAILABLE	CONSOLIDATION
DP25106 Lot(s): 1			
 DP1019729	REGISTERED	COMPILATION	CONSOLIDATION
DP36418 Lot(s): 17, 18, 19			
 DP1173665	REGISTERED	COMPILATION	EASEMENT
Lot(s): 18, 19, 20, 21, 22			
 DP1052432	REGISTERED	SURVEY	REDEFINITION
Lot(s): 8			
 NSW GAZ. 11-07-2014 LOT 8 DP36418 VESTED IN BLUECHP LIMITED			Folio : 2632
Lot(s): 9			
 NSW GAZ. 11-07-2014 LOT 9 DP36418 VESTED IN BLUECHP LIMITED			Folio : 2632
DP505483 Lot(s): 2			
 DP1230116	REGISTERED	SURVEY	CONSOLIDATION
DP1019729 Lot(s): 236			
 DP36418	HISTORICAL	SURVEY	UNRESEARCHED
DP1025290 Lot(s): 100			
 DP353048	HISTORICAL	SURVEY	UNRESEARCHED
DP1119520 Lot(s): 100			
 DP247088	HISTORICAL	SURVEY	SUBDIVISION
DP1188961 Lot(s): 1			
 DP360717	HISTORICAL	COMPILATION	UNRESEARCHED
DP1192451 Lot(s): 100			
 DP35615	HISTORICAL	SURVEY	UNRESEARCHED
 DP1215368	REGISTERED	SURVEY	EASEMENT
DP1248690 Lot(s): 1			
 DP35615	HISTORICAL	SURVEY	UNRESEARCHED
SP56193 Lot(s): 1			
 SP93380	REGISTERED	COMPILATION	STRATA SUBDIVISION PLAN
SP60061 Lot(s): 1			
 DP871873	HISTORICAL	SURVEY	CONSOLIDATION
SP63495 Lot(s): 1			
 DP247088	HISTORICAL	SURVEY	SUBDIVISION
 DP1008475	HISTORICAL	COMPILATION	CONSOLIDATION
SP70565 Lot(s): 1			
 DP1047883	HISTORICAL	SURVEY	REDEFINITION
SP72317 Lot(s): 1			
 DP353048	HISTORICAL	SURVEY	UNRESEARCHED
 DP1063661	HISTORICAL	SURVEY	REDEFINITION
SP75472 Lot(s): 1			
 DP36418	HISTORICAL	SURVEY	UNRESEARCHED
 DP1052432	HISTORICAL	SURVEY	REDEFINITION
SP79785 Lot(s): 1			
 DP386820	HISTORICAL	SURVEY	UNRESEARCHED
 DP1097798	HISTORICAL	SURVEY	REDEFINITION
SP81537 Lot(s): 1			
 DP628386	HISTORICAL	COMPILATION	SUBDIVISION
 DP1133054	HISTORICAL	SURVEY	REDEFINITION

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

		Status	Surv/Comp	Purpose
SP82601	 DP102438	HISTORICAL	COMPILATION	UNRESEARCHED
	 DP1137394	HISTORICAL	SURVEY	REDEFINITION
SP85327	 DP23829	HISTORICAL	SURVEY	UNRESEARCHED
	 DP1170697	HISTORICAL	SURVEY	REDEFINITION
SP97792	 DP25106	HISTORICAL	SURVEY	UNRESEARCHED
	 DP1243916	HISTORICAL	SURVEY	REDEFINITION

Caution: 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.

Plan	Surv/Comp	Purpose
DP1582	COMPILATION	UNRESEARCHED
DP2009	SURVEY	UNRESEARCHED
DP18848	SURVEY	UNRESEARCHED
DP23829	SURVEY	UNRESEARCHED
DP25106	SURVEY	UNRESEARCHED
DP25965	SURVEY	UNRESEARCHED
DP35615	SURVEY	UNRESEARCHED
DP36418	SURVEY	UNRESEARCHED
DP102438	COMPILATION	UNRESEARCHED
DP109053	SURVEY	UNRESEARCHED
DP247088	SURVEY	SUBDIVISION
DP339414	SURVEY	UNRESEARCHED
DP340377	COMPILATION	UNRESEARCHED
DP341117	COMPILATION	UNRESEARCHED
DP350402	COMPILATION	UNRESEARCHED
DP376772	COMPILATION	UNRESEARCHED
DP386820	SURVEY	UNRESEARCHED
DP389668	SURVEY	UNRESEARCHED
DP407961	SURVEY	UNRESEARCHED
DP505483	COMPILATION	SUBDIVISION
DP569439	COMPILATION	SUBDIVISION
DP629246	SURVEY	SUBDIVISION
DP810706	COMPILATION	SUBDIVISION
DP826976	SURVEY	SUBDIVISION
DP1019729	COMPILATION	CONSOLIDATION
DP1025290	COMPILATION	CONSOLIDATION
DP1102223	COMPILATION	DEPARTMENTAL
DP1119520	COMPILATION	CONSOLIDATION
DP1150721	COMPILATION	DEPARTMENTAL
DP1188961	COMPILATION	DEPARTMENTAL
DP1192451	COMPILATION	CONSOLIDATION
DP1248690	SURVEY	CONSOLIDATION
SP1411	COMPILATION	STRATA PLAN
SP11460	COMPILATION	STRATA PLAN
SP12262	COMPILATION	STRATA PLAN
SP12761	COMPILATION	STRATA PLAN
SP15829	COMPILATION	STRATA PLAN
SP18132	COMPILATION	STRATA PLAN
SP30443	COMPILATION	STRATA PLAN
SP39332	COMPILATION	STRATA PLAN
SP41050	COMPILATION	STRATA PLAN
SP48393	COMPILATION	STRATA PLAN
SP56193	COMPILATION	STRATA PLAN
SP57785	COMPILATION	STRATA PLAN
SP60061	COMPILATION	STRATA PLAN
SP63495	COMPILATION	STRATA PLAN
SP70565	COMPILATION	STRATA PLAN
SP72317	COMPILATION	STRATA PLAN
SP75472	COMPILATION	STRATA PLAN
SP79785	COMPILATION	STRATA PLAN
SP81537	COMPILATION	STRATA PLAN
SP82601	COMPILATION	STRATA PLAN
SP85327	COMPILATION	STRATA PLAN
SP85327	UNRESEARCHED	STRATA PLAN
SP97792	COMPILATION	STRATA PLAN

Caution: 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.

APPENDIX C

Current and proposed plans

NOTES

NO BOUNDARY SURVEY HAS BEEN UNDERTAKEN. BEARINGS, DIMENSIONS AND AREAS ARE FROM TITLE ONLY AND ARE SUBJECT TO CONFIRMATION BY BOUNDARY SURVEY.

DIMENSIONS SHALL NOT BE OBTAINED BY SCALING THE DETAIL FROM THE DRAWING. SURVEYOR MUST BE CONTACTED IF THERE ARE ANY DISCREPANCIES.

SERVICES SHOWN ARE INDICATIVE ONLY. POSITIONS ARE BASED ON SURFACE INDICATOR(S) LOCATED DURING FIELD SURVEY. CONFIRMATION OF THE EXACT POSITION SHOULD BE MADE PRIOR TO ANY EXCAVATION WORK. OTHER SERVICES MAY EXIST WHICH ARE NOT SHOWN.

LEVELS ARE BASED ON AUSTRALIAN HEIGHT DATUM (A.H.D.) USING SSM 10972 39.801(AHD) RIDGE & GUTTER HEIGHTS HAVE BEEN OBTAINED BY INDIRECT METHOD AND ARE ACCURATE TO ±0.05m

ADJOINING DWELLINGS AND BUILDINGS HAVE BEEN PLOTTED FOR DIAGRAMMATIC PURPOSES ONLY. ADJOINING WINDOWS HAVE NOT BEEN SURVEYED.

CONTOURS ARE AN INDICATION OF LANDFORM AND SHOULD NOT BE TAKEN IN PREFERENCE TO SPOT LEVELS SHOWN.

CONTOUR INTERVALS 1m - 0.2m.

LEGEND

- ◻ WATER METER
- ▲ BENCH MARK
- ◻ COMMS PIT
- ELEC
- ⊙ POWER POLE
- ⊙ SIGN POST
- ⊙ STOP VALVE
- ⊙ HYDRANT
- ⊙ SEWER LAMP HOLE
- GUT : TOP OF GUTTER
- ST : DENOTES STAIRS
- US : DENOTES UNKNOWN SERVICE
- S:3 (SPREAD)
- D:0.3 (DIAMETER)
- H:10 (HEIGHT)
- SHRUB



PROJECT ADDRESS

170 DERBY STREET, PENRITH

DRAWING TYPE

PLAN SHOWING LEVELS & DETAIL OVER LOT 2 IN DP 109053

CLIENT

MONTESSORI ACADEMY

VERTEX SURVEYORS
ABN 80 763 670 528

SURVEYED BY T.M. DRAWN BY M.W.

DATE OF SURVEY 13/11/2019

HEIGHT ORIGIN SSM 10972 R.L.:39.801(AHD)

SCALE 1 : 100 @ A1

LOCAL GOVERNMENT AREA

PENRITH

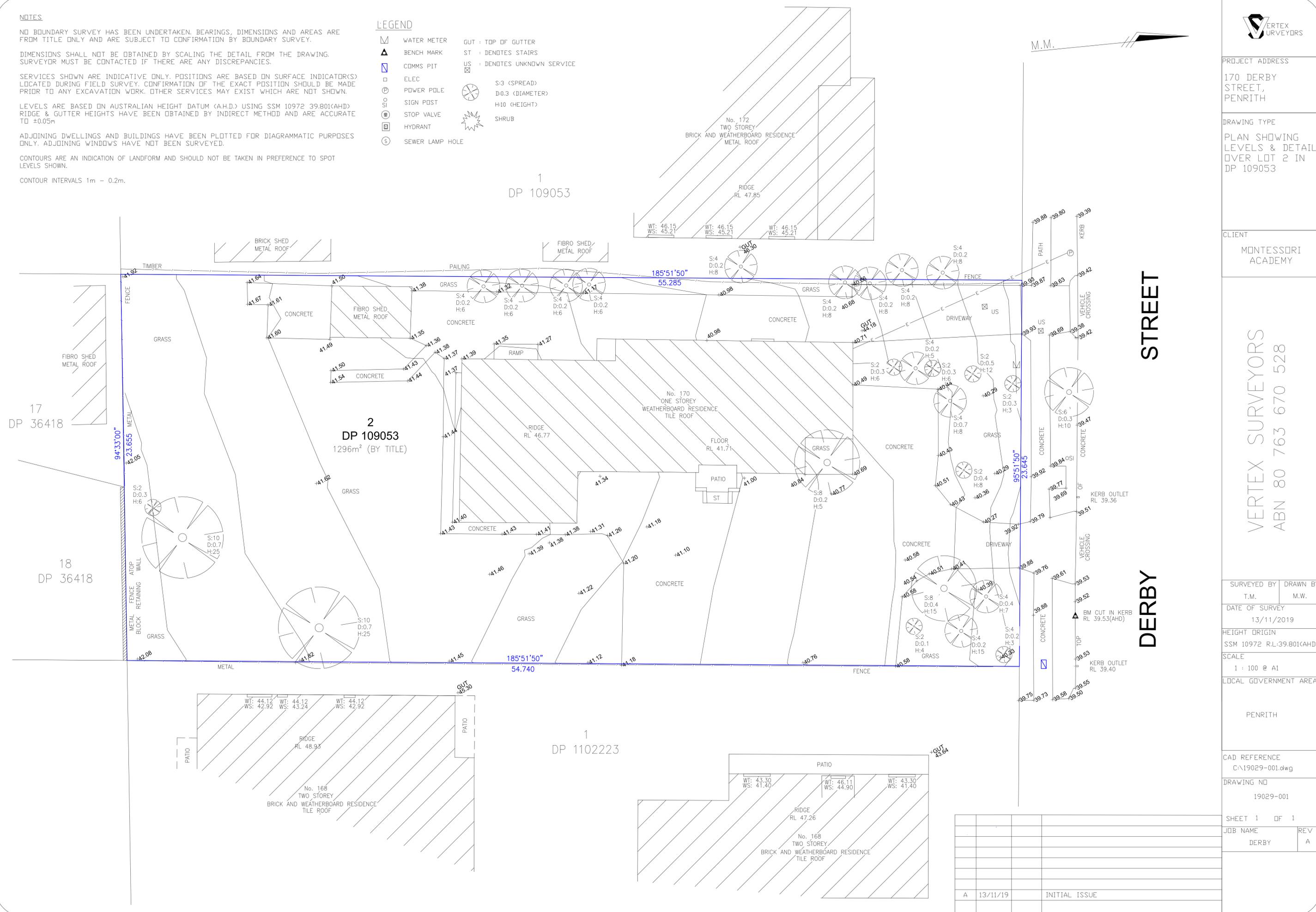
CAD REFERENCE C:\19029-001.dwg

DRAWING NO 19029-001

SHEET 1 OF 1

JOB NAME DERBY REV A

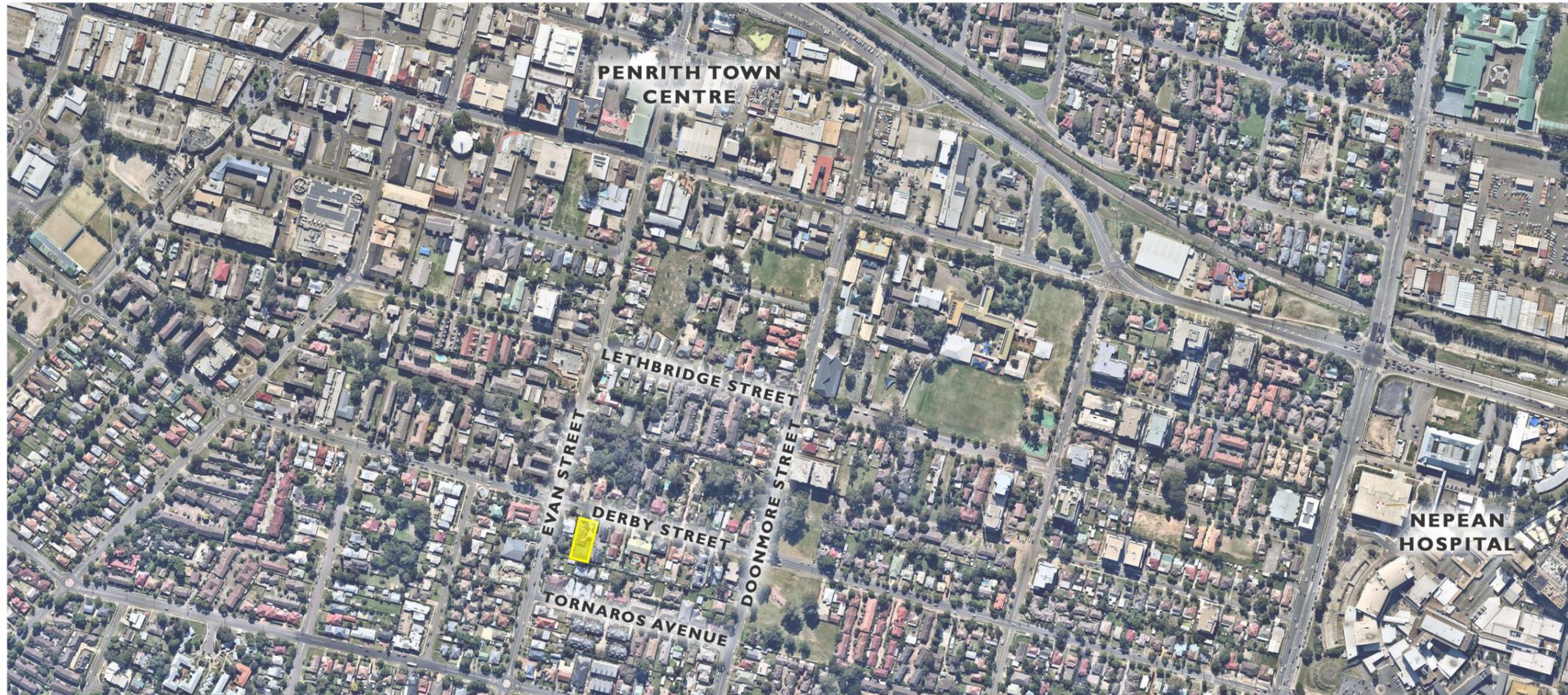
A	13/11/19	INITIAL ISSUE
---	----------	---------------





a 303 / 77 Dunning Ave
Rosebery NSW 2018
t 02 8310 2095
e cullenfeng@cullenfeng.com.au
w www.cullenfeng.com.au

**PROPOSED CHILDCARE CENTRE
170 DERBY STREET, PENRITH
FOR MONTESSORI ACADEMY**



DEVELOPMENT APPLICATION

30 NOVEMBER 2020

DRAWING LIST

DA01	SURVEY PLAN	DA08	PROPOSED FIRST FLOOR PLAN
DA02	CONTEXT PHOTOS	DA09	PROPOSED ROOF PLAN
DA03	SITE ANALYSIS PLAN	DA10	LONG & CROSS SECTION
DA04	(NOT USED)	DA11	EAST & NORTH ELEVATIONS, AND EXTERNAL COLOUR SCHEDULE
DA05	PROPOSED STREET PERSPECTIVE	DA12	WEST & SOUTH ELEVATIONS, AND EXTERNAL COLOUR SCHEDULE
DA06	PROPOSED BASEMENT PLAN	DA13	AREA CALCULATIONS
DA07	PROPOSED GROUND FLOOR PLAN	DA14	SHADOW DIAGRAMS

NOTES

NO BOUNDARY SURVEY HAS BEEN UNDERTAKEN. BEARINGS, DIMENSIONS AND AREAS ARE FROM TITLE ONLY AND ARE SUBJECT TO CONFIRMATION BY BOUNDARY SURVEY.

DIMENSIONS SHALL NOT BE OBTAINED BY SCALING THE DETAIL FROM THE DRAWING. SURVEYOR MUST BE CONTACTED IF THERE ARE ANY DISCREPANCIES.

SERVICES SHOWN ARE INDICATIVE ONLY. POSITIONS ARE BASED ON SURFACE INDICATOR(S) LOCATED DURING FIELD SURVEY. CONFIRMATION OF THE EXACT POSITION SHOULD BE MADE PRIOR TO ANY EXCAVATION WORK. OTHER SERVICES MAY EXIST WHICH ARE NOT SHOWN.

LEVELS ARE BASED ON AUSTRALIAN HEIGHT DATUM (A.H.D.) USING SSM 10972 39.801(AHD) RIDGE & GUTTER HEIGHTS HAVE BEEN OBTAINED BY INDIRECT METHOD AND ARE ACCURATE TO ±0.05m.

ADJOINING DWELLINGS AND BUILDINGS HAVE BEEN PLOTTED FOR DIAGRAMMATIC PURPOSES ONLY. ADJOINING WINDOWS HAVE NOT BEEN SURVEYED.

CONTOURS ARE AN INDICATION OF LANDFORM AND SHOULD NOT BE TAKEN IN PREFERENCE TO SPOT LEVELS SHOWN.

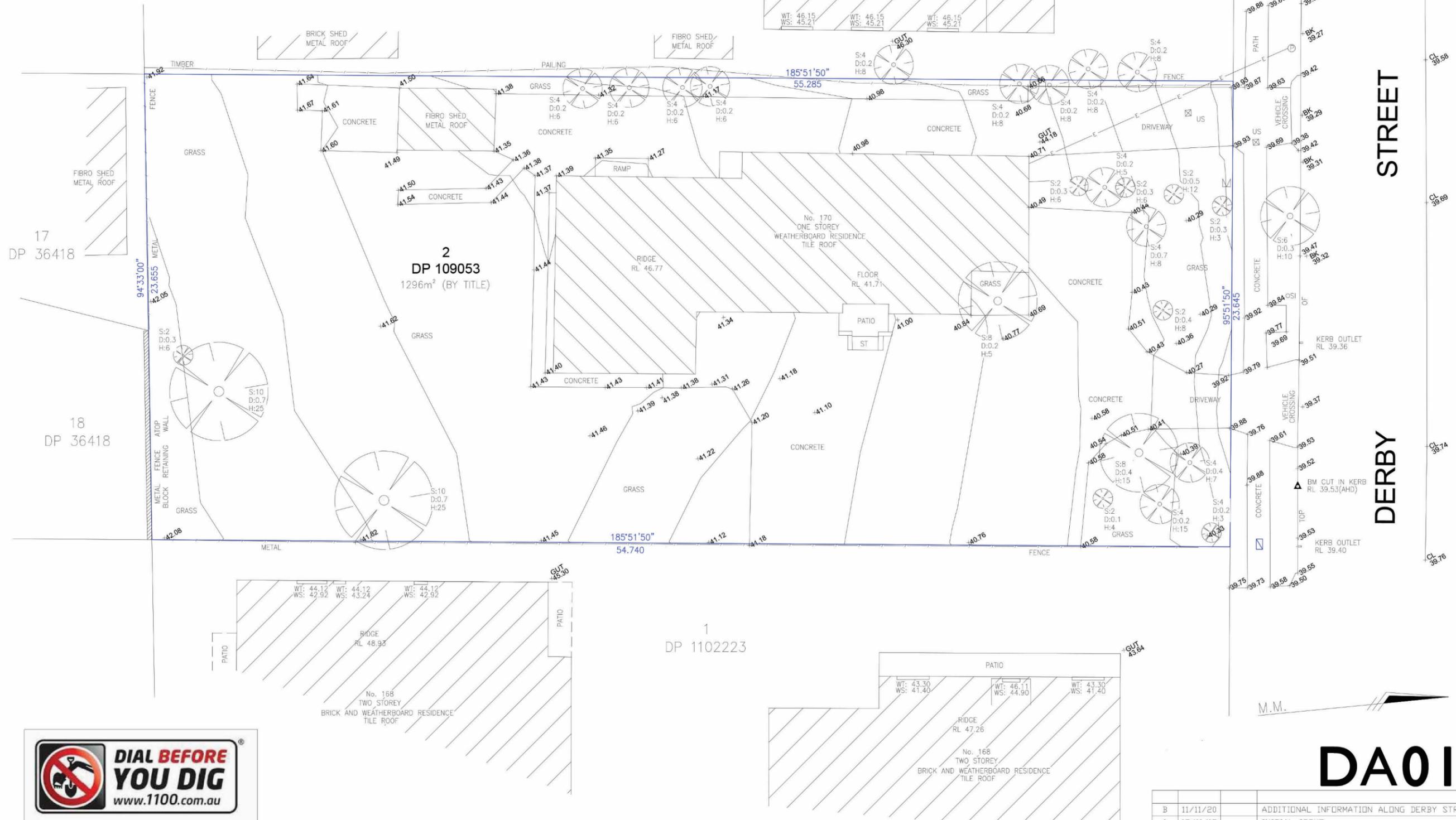
STORMWATER PIPES WITHIN THE DRAINAGE PIT ALONG DERBY STREET WERE NOT ABLE TO BE MEASURED.

CONTOUR INTERVALS 1m - 0.2m.

LEGEND

- ◻ WATER METER
- ▲ BENCH MARK
- ◻ COMMS PIT
- ◻ ELEC
- ⊙ POWER POLE
- ⊙ SIGN POST
- ⊙ STOP VALVE
- ⊙ HYDRANT
- ⊙ SEWER LAMP HOLE
- GUT : DENOTES TOP OF GUTTER
- BK : DENOTES BASE OF KERB
- ST : DENOTES STAIRS
- CL : DENOTES CENTRELINE OF ROAD
- US : DENOTES UNKNOWN SERVICE
- S:3 (SPREAD)
- D:0.3 (DIAMETER)
- H:10 (HEIGHT)
- SHRUB

ADDITIONAL INFORMATION SHOWN WITHIN 19029-001B.dwg



PROJECT ADDRESS

170 DERBY STREET, PENRITH

DRAWING TYPE

PLAN SHOWING LEVELS & DETAIL OVER LOT 2 IN DP 109053

CLIENT

MONTESSORI ACADEMY

VERTEX SURVEYORS
 ABN 80 763 670 528

SURVEYED BY M.W. DRAWN BY M.W.

DATE OF SURVEY 07/11/2020

HEIGHT ORIGIN SSM 10972 R.L:39.801(AHD)

SCALE 1 : 100 @ A1

LOCAL GOVERNMENT AREA

PENRITH

CAD REFERENCE C:\19029-001B.dwg

DRAWING NO 19029-001B

SHEET 1 OF 1

JOB NAME DERBY REV B

MARTIN R. WAHBE REGISTERED SURVEYOR

STREET DERBY



DA01



B	11/11/20	ADDITIONAL INFORMATION ALONG DERBY STREET
A	13/11/19	INITIAL ISSUE



- PROJECT SITE
- HERITAGE ITEM (STATE SIGNIFICANCE)

163 DERBY STREET - STREET VIEW



1



2



3

170 DERBY STREET - STREET VIEW



4



5

170 DERBY STREET - TREES AT REAR



6



7

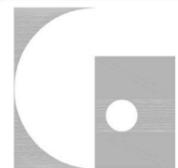


8



FOR DEVELOPMENT APPLICATION

ISSUE	DATE	FOR DA	REVISION	BY	JC	CHECK
DO	NOT	SCALE	FROM	DRAWINGS	VERIFY	ALL DIMENSIONS ON SITE BEFORE COMMENCING WORK



CULLEN FENG ARCHITECTS

PROJECT 170 DERBY STREET, PENRITH

CLIENT MONTESSORI ACADEMY

DRAWING CONTEXT PHOTOGRAPHS

DATE NOV 2020 SCALE N.T.S. DRAWN EL

JOB # 2023 DWG # DA02 REV -

RESIDENTIAL USE

RESIDENTIAL USE

RESIDENTIAL USE

TWO STOREY RESIDENTIAL USE

TWO STOREY ADJOINING DUAL OCCUPANCY RESIDENTIAL HOUSES

OUTLINE OF PROPOSED BUILDING FOOTPRINT

EXISTING SINGLE STOREY RESIDENCE
EXISTING COMMERCIAL USE AS MEDICAL CONSULTING ROOMS

PROPOSED CHILDCARE CENTRE PART ONE PART TWO STOREY + BASEMENT CARPARK

TWO-LANE LOCAL ROAD WITH STREET PARKING BOTH SIDES

STREET

DERBY

NORTHERN SUN EXPOSURE

GOOD SUNLIGHT TO ENTRY & REAR GARDEN

BUS STOP

FOOTPATH

ACTUALLY 2x LARGE PALMS

LARGE ESTABLISHED TREES

EXTG SCREEN PLANTING

2M FALL ACROSS SITE

1296 SQM

< 54.7M >

DP 109053

DP 109053

DP 1102223



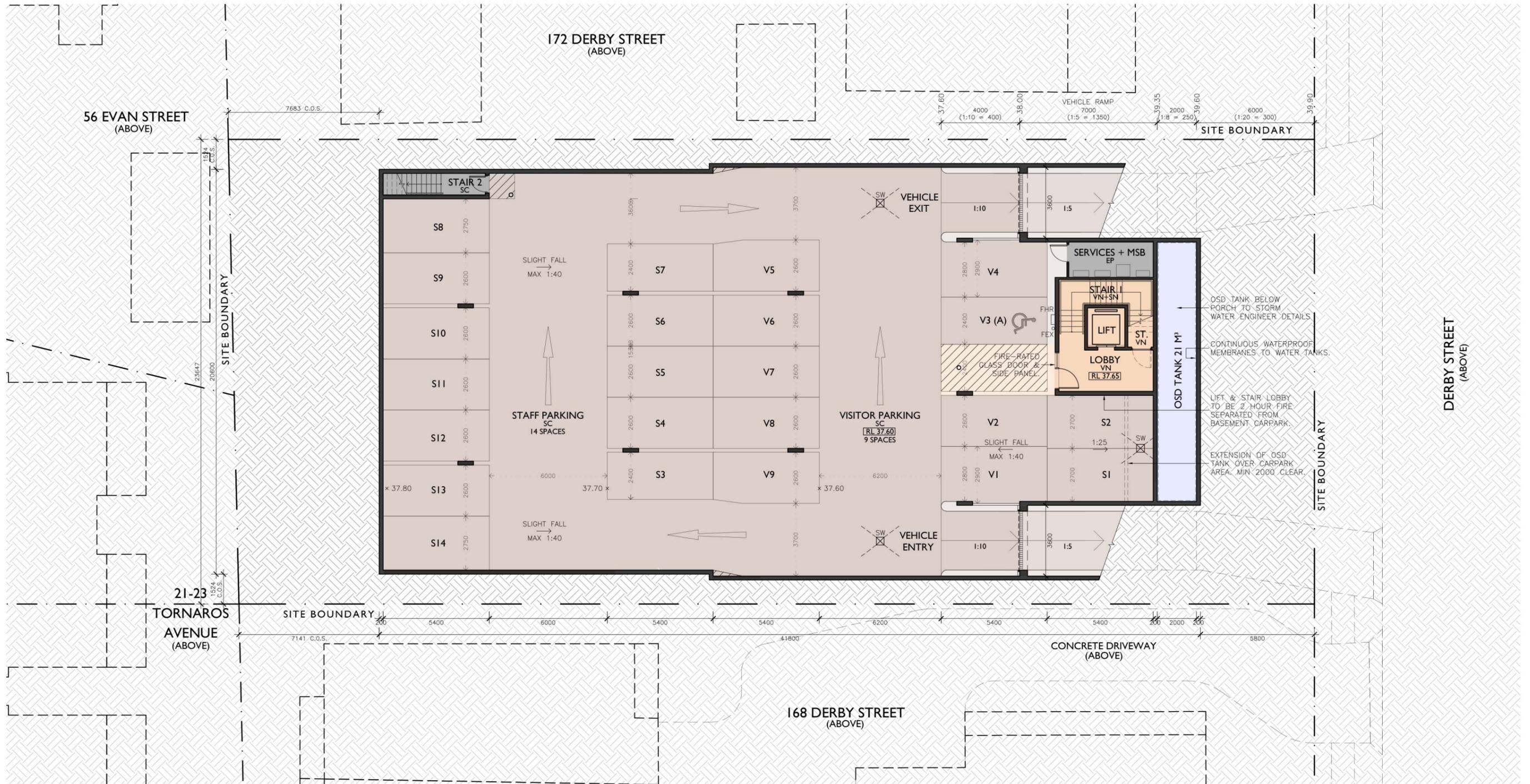


FOR DEVELOPMENT APPLICATION

ISSUE	DATE	REVISION	FOR DA	EL	JC
DO	NOT	SCALE	FROM	DRAWINGS	VERIFY ALL DIMENSIONS ON SITE BEFORE COMMENCING WORK



PROJECT 170 DERBY STREET, PENRITH
 CLIENT MONTESSORI ACADEMY
 DRAWING PROPOSED STREET PERSPECTIVE
 DATE NOV 2020 SCALE N.T.S. DRAWN EL
 JOB # 2023 DWG # DA05 REV. -



1 BASEMENT FLOOR PLAN
1:200 @ A3

FINISHES LEGEND		COLOUR LEGEND	
REFER TO MATERIALS SCHEDULE FOR MORE INFORMATION			
WALL FINISH	FLOOR FINISH		CLASSROOMS / ANCILLARY
CBD COLORBOND STEEL	CPV CONCRETE FOOTPATH/ PAVEMENT		OUTDOOR PLAY AREA
EEG ENERGY EFFICIENT GLAZING	CT CERAMIC TILES		LOBBY / CIRCULATION
FBK FACE BRICKWORK	CPT CARPET TILES		ADMN / BACK OF HOUSE
FG FRAMELESS GLASS	EP EPOXY PAINTED CONCRETE		CARPARK
PCA POWDERCOATED ALUMINIUM	GRV RIVERSTONE GRAVEL		PLANT / SERVICES / STORE
PCS POWDERCOATED ALUMINIUM PERFORATED SCREEN PANELS	PGC PIGMENTED CONCRETE W/ EXPRESSED GROOVES		
PT PAINT FINISH	PV PORCELAIN PAVERS (NON-SLIP)		
PTF PAINTED TIMBER FENCE	PVS CONCRETE PAVER STEPPING STONES		
RP RENDER & PAINT	SC SEALED CONCRETE		
SSS (SATIN) STAINLESS STEEL	SFT SOFT-FALL SURFACE TO LNSP ARCH DTL		
TC NON-COMBUSTIBLE TIMBER-LOOK CLADDING	SN PROPRIETARY ALUM. NON-SLIP STAIR NOSING		
XP EXTERNAL PAINT FINISH	TDB TIMBER DECKING BOARDS		
XPS EXTERIOR GRADE PAINTED STEEL	TFB TIMBER FLOOR BOARDS		
ZN COLORBOND STEEL ZINC APPEARANCE	VN SHEET OR PLANK VINYL FLOORING		
	WPM WATERPROOF MEMBRANE		

FOR DEVELOPMENT APPLICATION

ISSUE	DATE	FOR DA REVISION	EL BY	JC CHECK
DO	NOT	SCALE	FROM	DRAWINGS VERIFY ALL DIMENSIONS ON SITE BEFORE COMMENCING WORK

PROJECT 170 DERBY STREET, PENRITH

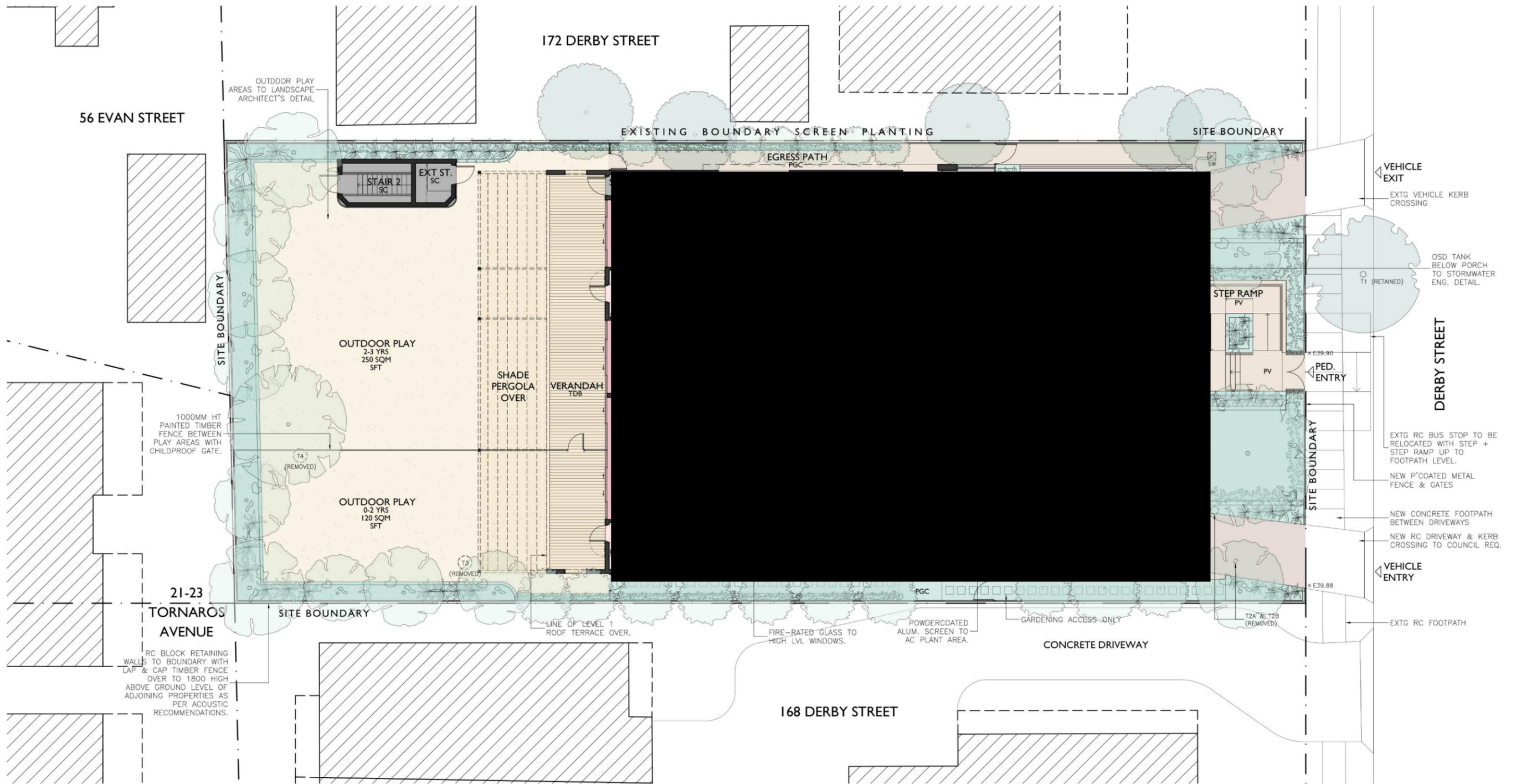
CLIENT MONTESSORI ACADEMY

DRAWING PROPOSED BASEMENT PLAN

DATE NOV 2020 **SCALE** 1:200 @ A3 **DRAWN** EL

JOB # 2023 **DWG #** DA06 **REV.** -

NOM ARCH: JON CULLEN NSW 6437 | 303 / 77 DUNNING AVENUE, ROSEBERY NSW 2018, AUSTRALIA | +612 8310 2095



1 GROUND FLOOR PLAN
1:200 @ A3

FINISHES LEGEND		COLOUR LEGEND	
REFER TO MATERIALS SCHEDULE FOR MORE INFORMATION			
WALL FINISH	FLOOR FINISH	CLASSROOMS / ANCILLARY	
CBD COLORBOND STEEL	CPV CONCRETE FOOTPATH/ PAVEMENT	OUTDOOR PLAY AREA	
EEG ENERGY EFFICIENT GLAZING	CT CERAMIC TILES	LOBBY / CIRCULATION	
FBK FACE BRICKWORK	CPT CARPET TILES	ADMIN / BACK OF HOUSE	
FG FRAMELESS GLASS	EP EPOXY PAINTED CONCRETE	CARPARK	
PCA POWDERCOATED ALUMINIUM	GRV RIVERSTONE GRAVEL	PLANT / SERVICES / STORE	
PCS POWDERCOATED ALUMINIUM PERFORATED SCREEN PANELS	PGC PIGMENTED CONCRETE W/ EXPRESSED GROOVES		
PT PAINT FINISH	PV PORCELAIN PAVERS (NON-SLIP)		
PTF PAINTED TIMBER FENCE	PVS CONCRETE PAVER STEPPING STONES		
RP RENDER & PAINT	SC SEALED CONCRETE		
SSS (SATIN) STAINLESS STEEL	SFT SOFT-FALL SURFACE TO LN5P ARCH DTL		
TC NON-COMBUSTIBLE TIMBER-LOOK CLADDING	SN PROPRIETARY ALUM. NON-SLIP STAIR NOSING		
XP EXTERNAL PAINT FINISH	TDB TIMBER DECKING BOARDS		
XPS EXTERIOR GRADE PAINTED STEEL	TFB TIMBER FLOOR BOARDS		
ZN COLORBOND STEEL ZINC APPEARANCE	WN SHEET OR PLANK VINYL FLOORING		
	WFM WATERPROOF MEMBRANE		

FOR DEVELOPMENT APPLICATION

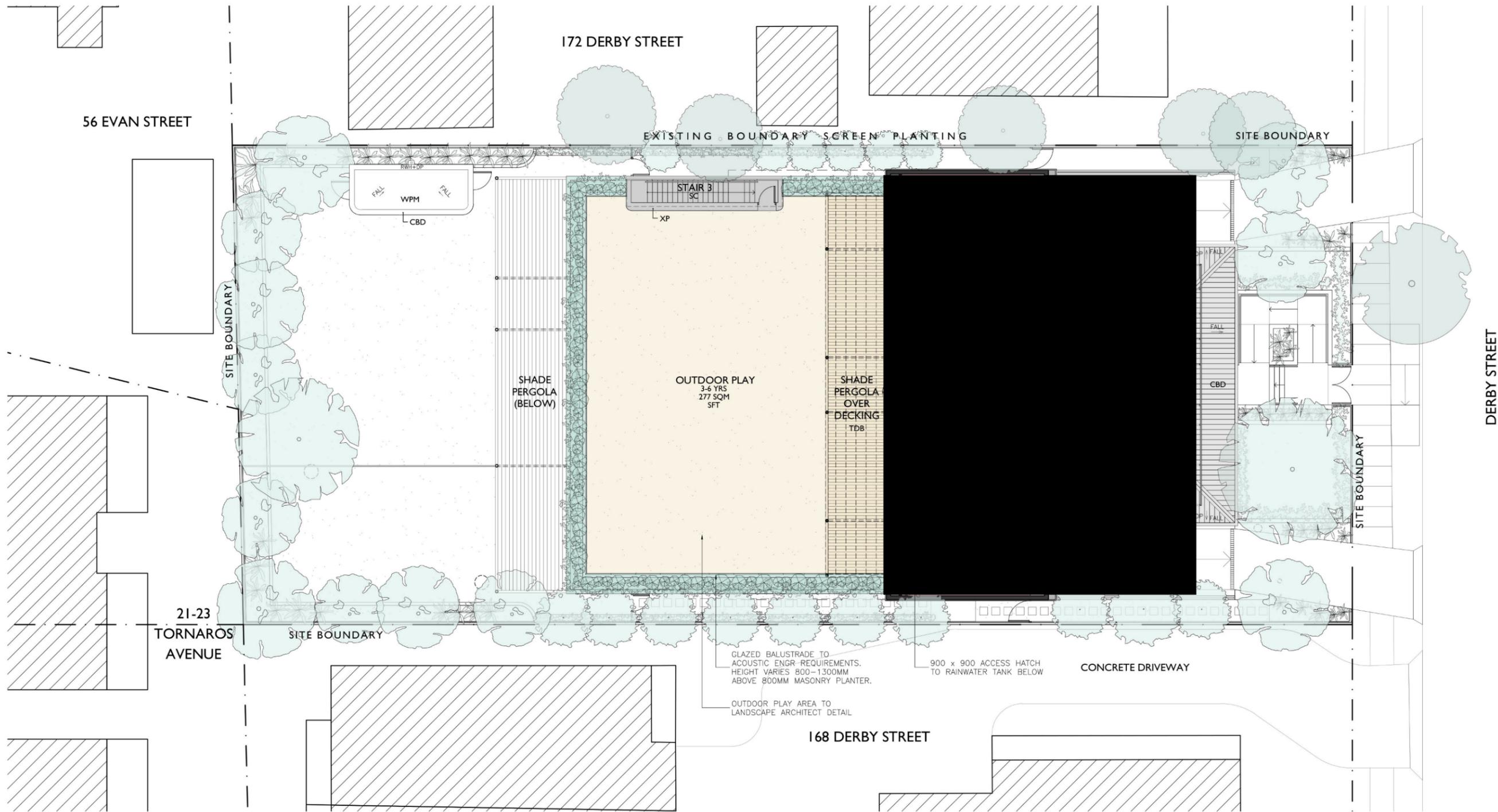
ISSUE	DATE	FOR DA REVISION	EL	JC
DO	NOT	SCALE FROM	DRAWINGS	VERIFY ALL DIMENSIONS ON SITE BEFORE COMMENCING WORK

CULLEN FENG ARCHITECTS

PROJECT 170 DERBY STREET, PENRITH
CLIENT MONTESSORI ACADEMY
DRAWING PROPOSED GROUND FLOOR PLAN
DATE NOV 2020 **SCALE** 1:200 @ A3 **DRAWN** EL
JOB # 2023 **DWG #** DA07 **REV.** -

NOM ARCH: JON CULLEN NSW 6437 | 303 / 77 DUNNING AVENUE, ROSEBERY NSW 2018, AUSTRALIA | +612 8310 2095





1 FIRST FLOOR PLAN
1:200 @ A3

FINISHES LEGEND		COLOUR LEGEND	
REFER TO MATERIALS SCHEDULE FOR MORE INFORMATION			
WALL FINISH	FLOOR FINISH	CLASSROOMS / ANCILLARY	
CBD COLORBOND STEEL	CPV CONCRETE FOOTPATH/ PAVEMENT	OUTDOOR PLAY AREA	
EEG ENERGY EFFICIENT GLAZING	CT CERAMIC TILES	LOBBY / CIRCULATION	
FBK FACE BRICKWORK	CPT CARPET TILES	ADMN / BACK OF HOUSE	
FG FRAMELESS GLASS	EP EPOXY PAINTED CONCRETE	CARPARK	
PCA POWDERCOATED ALUMINIUM	GRV RIVERSTONE GRAVEL	PLANT / SERVICES / STORE	
PCS POWDERCOATED ALUMINIUM PERFORATED SCREEN PANELS	PGC FIGMENTED CONCRETE W/ EXPRESSED GROOVES		
PT PAINT FINISH	PV PORCELAIN PAVERS (NON-SLIP)		
PTF PAINTED TIMBER FENCE	PVS CONCRETE PAVER STEPPING STONES		
RP RENDER & PAINT	SC SEALED CONCRETE		
SSS (SATIN) STAINLESS STEEL	SFT SOFT-FALL SURFACE TO LNTP ARCH DTL		
TC NON-COMBUSTIBLE	SN PROPRIETARY ALUM. NON-SLIP STAIR NOSING		
XP EXTERNAL PAINT FINISH	TDB TIMBER DECKING BOARDS		
XPS EXTERIOR GRADE PAINTED STEEL	TFB TIMBER FLOOR BOARDS		
ZN COLORBOND STEEL ZINC APPEARANCE	VN SHEET OR PLANK VINYL FLOORING		
	WPM WATERPROOF MEMBRANE		

FOR DEVELOPMENT APPLICATION

30/11/2020 FOR DA EL BY JC

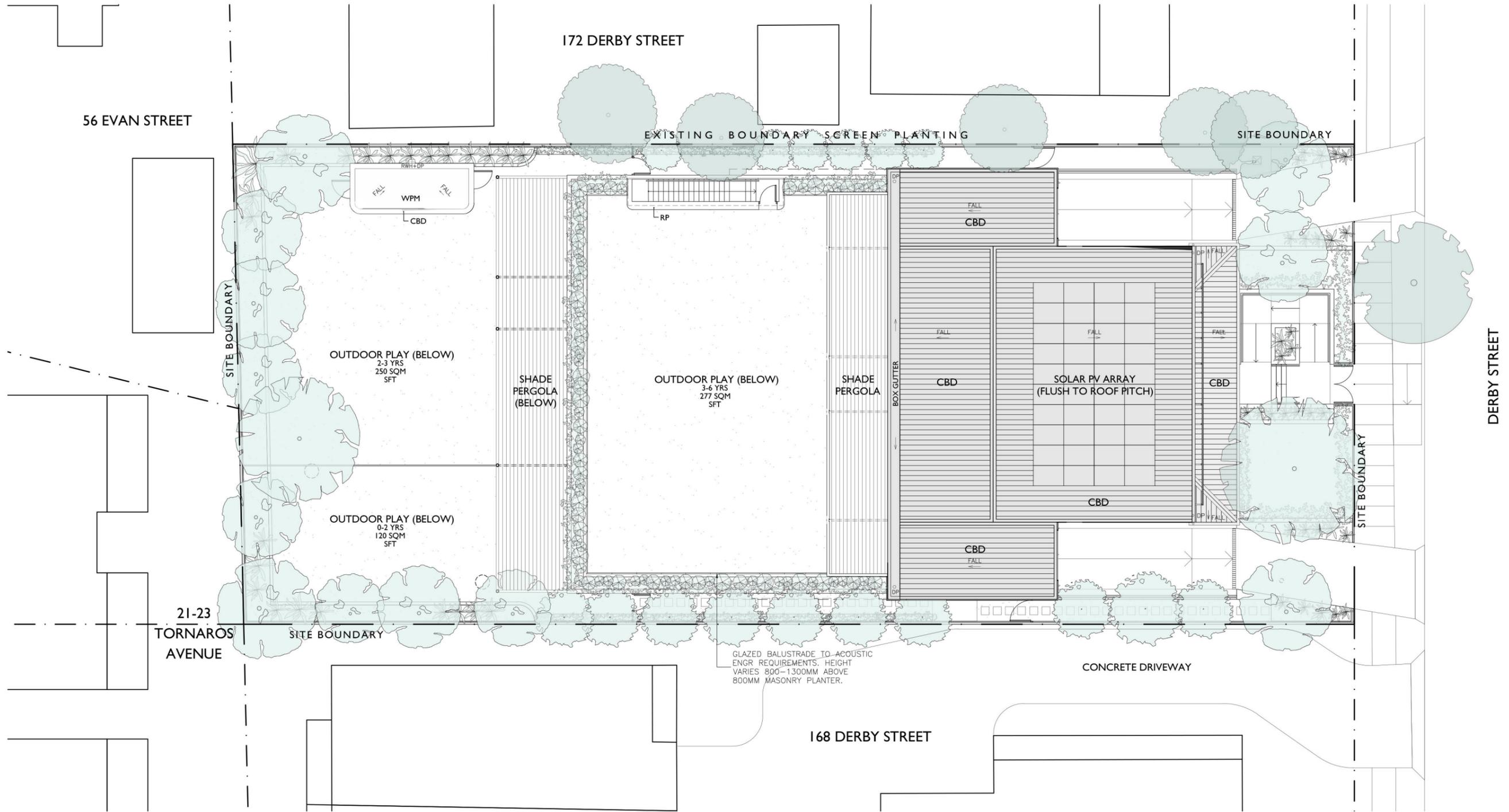
ISSUE DATE REVISION REVISION CHECK

DO NOT SCALE FROM DRAWINGS. VERIFY ALL DIMENSIONS ON SITE BEFORE COMMENCING WORK.

CULLEN FENG ARCHITECTS

PROJECT 170 DERBY STREET, PENRITH
CLIENT MONTESSORI ACADEMY
DRAWING PROPOSED FIRST FLOOR PLAN
DATE NOV 2020 SCALE 1:200 @ A3 DRAWN EL
JOB # 2023 DWG # DA08 REV -

NOM ARCH: JON CULLEN NSW 6437 | 303 / 77 DUNNING AVENUE, ROSEBERY NSW 2018, AUSTRALIA | +612 8310 2095



1 ROOF PLAN
1:200 @ A3

FINISHES LEGEND		COLOUR LEGEND	
REFER TO MATERIALS SCHEDULE FOR MORE INFORMATION			
WALL FINISH	FLOOR FINISH	CLASSROOMS / ANCILLARY	
CBD COLORBOND STEEL	CPV CONCRETE FOOTPATH/ PAVEMENT	OUTDOOR PLAY AREA	
EEG ENERGY EFFICIENT GLAZING	CT CERAMIC TILES	LOBBY / CIRCULATION	
FBK FACE BRICKWORK	CPT CARPET TILES	ADMN / BACK OF HOUSE	
FG FRAMELESS GLASS	EP EPOXY PAINTED CONCRETE	CARPARK	
PCA POWDERCOATED ALUMINIUM	GRV RIVERSTONE GRAVEL	PLANT / SERVICES / STORE	
PCS POWDERCOATED ALUMINIUM PERFORATED SCREEN PANELS	PGC FIGMENTED CONCRETE W/ EXPRESSED GROOVES		
PT PAINT FINISH	PV PORCELAIN PAVERS (NON-SLIP)		
PTF PAINTED TIMBER FENCE	PVS CONCRETE PAVER STEPPING STONES		
RP RENDER & PAINT	SC SEALED CONCRETE		
SSS (SATIN) STAINLESS STEEL	SFT SOFT-FALL SURFACE TO LN5P ARCH DTL		
TC NON-COMBUSTIBLE	SN PROPRIETARY ALUM. NON-SLIP STAIR NOSING		
XP TIMBER-LOOK CLADDING	TDB TIMBER DECKING BOARDS		
XPS EXTERNAL PAINT FINISH	TFB TIMBER FLOOR BOARDS		
ZN COLORBOND STEEL ZINC APPEARANCE	VN SHEET OR PLANK VINYL FLOORING		
	WPM WATERPROOF MEMBRANE		

FOR DEVELOPMENT APPLICATION

ISSUE	20/11/2020	FOR DA	EL	JC
DO	NOT	SCALE	FROM	DRAWINGS. VERIFY ALL DIMENSIONS ON SITE BEFORE COMMENCING WORK

PROJECT 170 DERBY STREET, PENRITH

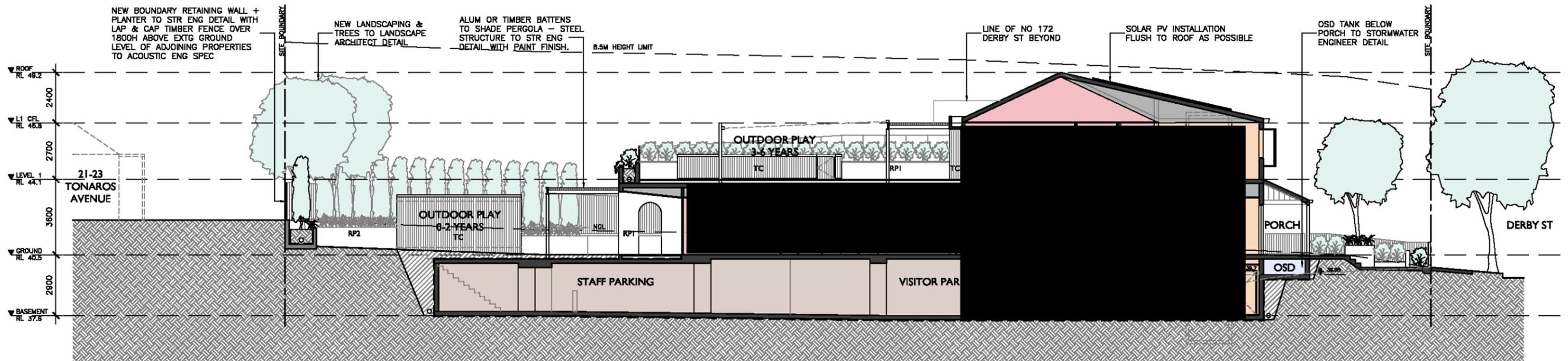
CLIENT MONTESSORI ACADEMY

DRAWING PROPOSED ROOF PLAN

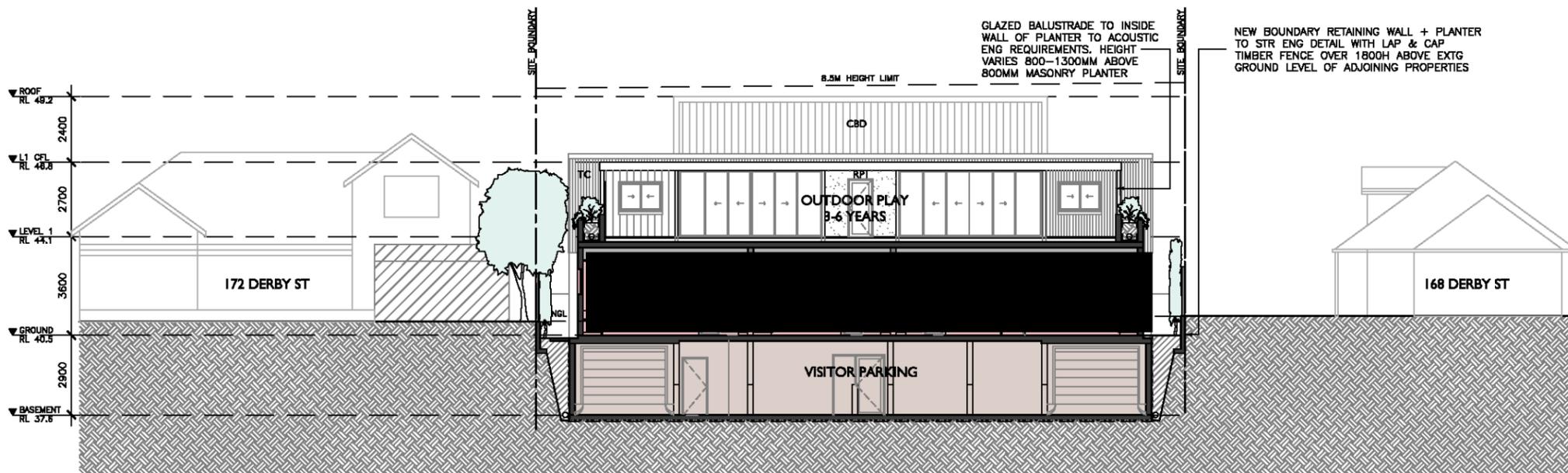
DATE NOV 2020 **SCALE** 1:200 @ A3 **DRAWN** EL

JOB # 2023 **DWG #** DA09 **REV.** -

NOM ARCH: JON CULLEN NSW 6437 | 303 / 77 DUNNING AVENUE, ROSEBERY NSW 2018, AUSTRALIA | +612 8310 2095



1 LONG SECTION
1:200 @ A3

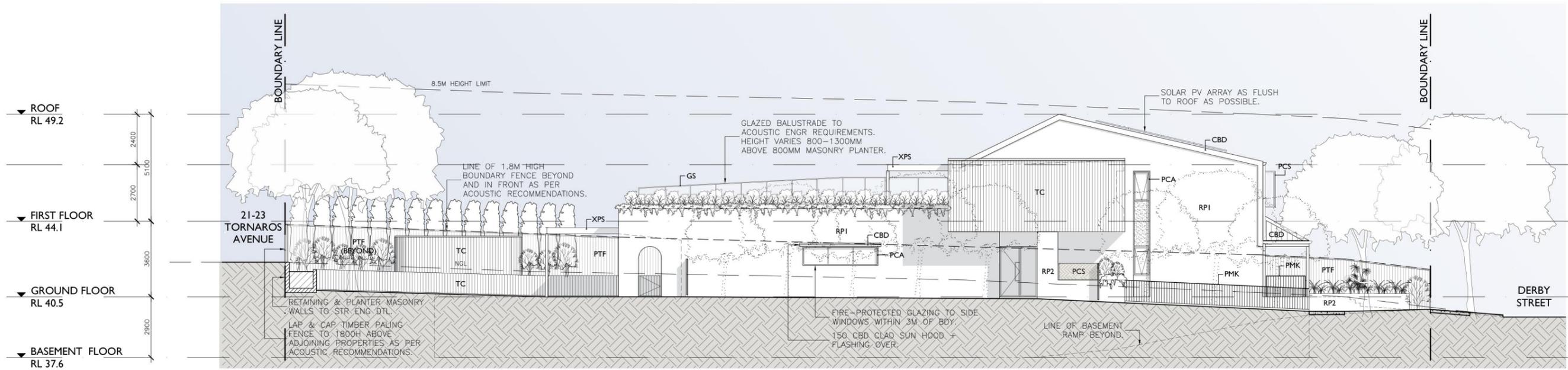


2 CROSS SECTION
1:200 @ A3

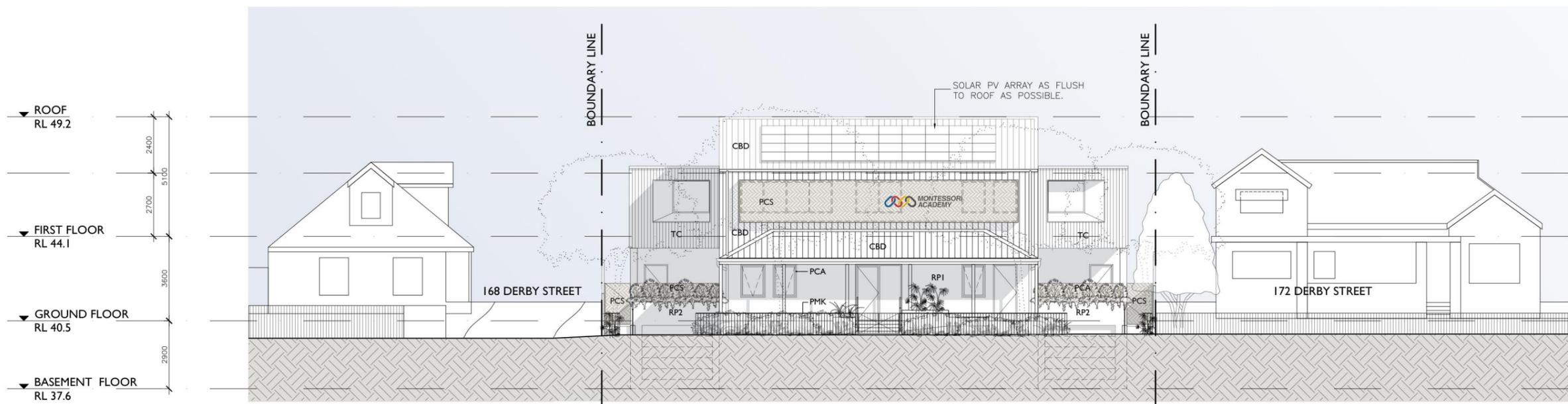
FINISHES LEGEND REFER TO MATERIALS SCHEDULE FOR MORE INFORMATION		COLOUR LEGEND	
WALL FINISH	FLOOR FINISH	CLASSROOMS / ANCILLARY	OUTDOOR PLAY AREA
CB2 COLORBOND STEEL	CPV CONCRETE FOOTPATH/ PAVEMENT	LOBBY / CIRCULATION	ADMIN / BACK OF HOUSE
EEG ENERGY EFFICIENT GLAZING	CT CERAMIC TILES	CARPARK	PLANT / SERVICES / STORE
FBK FACE BRICKWORK	CPT CARPET TILES		
FG FRAMELESS GLASS	EP EPOXY PAINTED CONCRETE		
PCA POWDERCOATED ALUMINIUM	GRV RIVERSTONE GRAVEL		
PCS POWDERCOATED ALUMINIUM PERFORATED SCREEN PANELS	PGC FIBREMENTED CONCRETE W/ EXPRESSED GROOVES		
PT PAINT FINISH	PV PORCELAIN PAVERS (NON-SLIP)		
PTF PAINTED TIMBER FENCE	PVS CONCRETE PAVES STEPPING STONES		
RP RENDER & PAINT	SC SEALED CONCRETE		
SSS (SATIN) STAINLESS STEEL	SFT SOFT-FALL SURFACE TO UNSP ARCH DTL		
TC NON-COMBUSTIBLE TIMBER-LOOK CLADDING	SN PROPRIETARY ALUM. NON-SLIP STAIR NOSING		
XP EXTERNAL PAINT FINISH	TDB TIMBER DECKING BOARDS		
XPS EXTERIOR GRADE PAINTED STEEL	TFB TIMBER FLOOR BOARDS		
ZN COLORBOND STEEL ZINC APPEARANCE	WV SHEET OR PLANK VINYL FLOORING		
	WPM WATERPROOF MEMBRANE		

FOR DEVELOPMENT APPLICATION

ISSUE	30/11/2020	FOR DA	SY	JC
DATE		REVISION	BY	CHECK
DO NOT SCALE FROM DRAWING. VERIFY ALL DIMENSIONS ON SITE BEFORE COMMENCING WORK				
	PROJECT 170 DERBY STREET, PENRITH			
	CLIENT MONTESSORI ACADEMY			
	DRAWING LONG & CROSS SECTIONS			
	DATE NOV 2020	SCALE 1:200 @ A3	DRAWN SY	
JOB # 2023		DWG # DA10	REV. -	
NOM ARCH: JON CULLEN NSW 6437 303 / 77 DUNNING AVENUE, ROSEBERY NSW 2018, AUSTRALIA +612 9310 2095				



1 EAST ELEVATION
1:200 @ A3



2 NORTH ELEVATION
1:200 @ A3

FINISHES LEGEND	
REFER TO MATERIALS SCHEDULE FOR MORE INFORMATION	
WALL FINISH	FLOOR FINISH
CBD COLORBOND STEEL	CPV CONCRETE FOOTPATH/ PAVEMENT
EEG ENERGY EFFICIENT GLAZING	CT CERAMIC TILES
FBK FACE BRICKWORK	CPT CARPET TILES
FG FRAMELESS GLASS	EP EPOXY PAINTED CONCRETE
PCA POWDERCOATED ALUMINIUM	GRV RIVERSTONE GRAVEL
PCS POWDERCOATED ALUMINIUM PERFORATED SCREEN PANELS	PGC PIGMENTED CONCRETE W/ EXPRESSED GROOVES
PT PAINT FINISH	PV PORCELAIN PAVERS (NON-SLIP)
PTF PAINTED TIMBER FENCE	PVS CONCRETE PAVER STEPPING STONES
RP RENDER & PAINT	SC SEALED CONCRETE
SSS (SATIN) STAINLESS STEEL	SFT SOFT-FALL SURFACE TO LN5P ARCH DTL
TC NON-COMBUSTIBLE TIMBER-LOOK CLADDING	SN PROPRIETARY ALUM. NON-SLIP STAIR NOSING
XP EXTERNAL PAINT FINISH	TDB TIMBER DECKING BOARDS
XPS EXTERIOR GRADE PAINTED STEEL APPEARANCE	TFB TIMBER FLOOR BOARDS
ZN COLORBOND STEEL ZINC APPEARANCE	WN SHEET OR PLANK VINYL FLOORING
	WFM WATERPROOF MEMBRANE

EXTERNAL FINISHES PALETTE									

FOR DEVELOPMENT APPLICATION

ISSUE	DATE	FOR DA REVISION	EL	JC
DO	NOT	SCALE	FROM	DRAWINGS. VERIFY ALL DIMENSIONS ON SITE BEFORE COMMENCING WORK

CULLEN FENG
ARCHITECTS

PROJECT 170 DERBY STREET, PENRITH

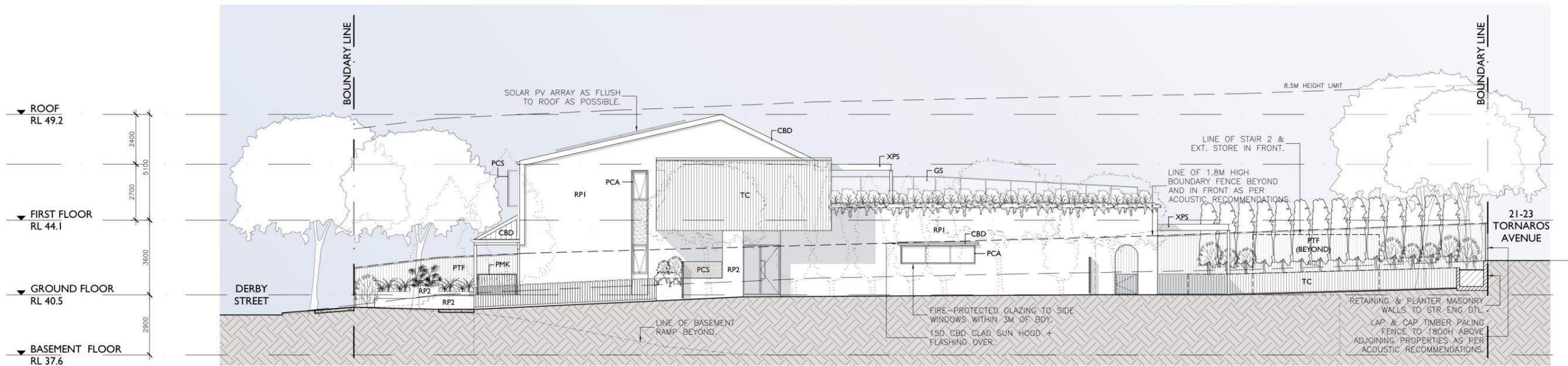
CLIENT MONTESSORI ACADEMY

DRAWING EAST & NORTH ELEVATIONS, AND EXTERNAL COLOUR SCHEDULE

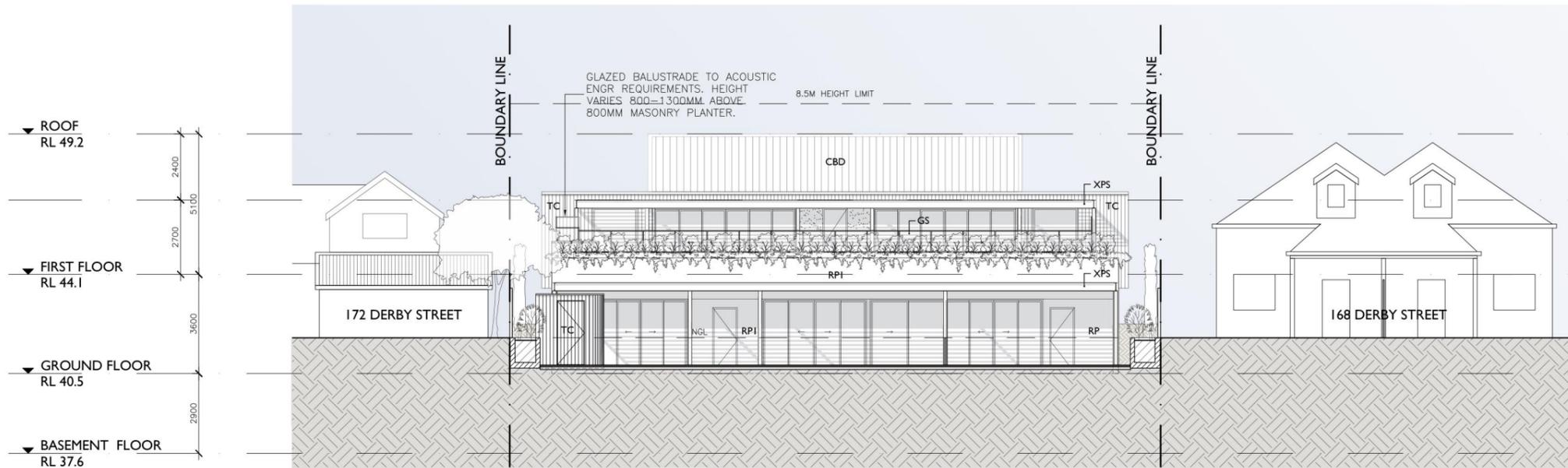
DATE NOV 2020 SCALE 1:200 @ A3 DRAWN EL

JOB# 2023 DWG# DA11 REV. -

NOM ARCH: JON CULLEN NSW 6437 | 303 / 77 DUNNING AVENUE, ROSEBERY NSW 2018, AUSTRALIA | +612 8310 2095



1 WEST ELEVATION
1:200 @ A3



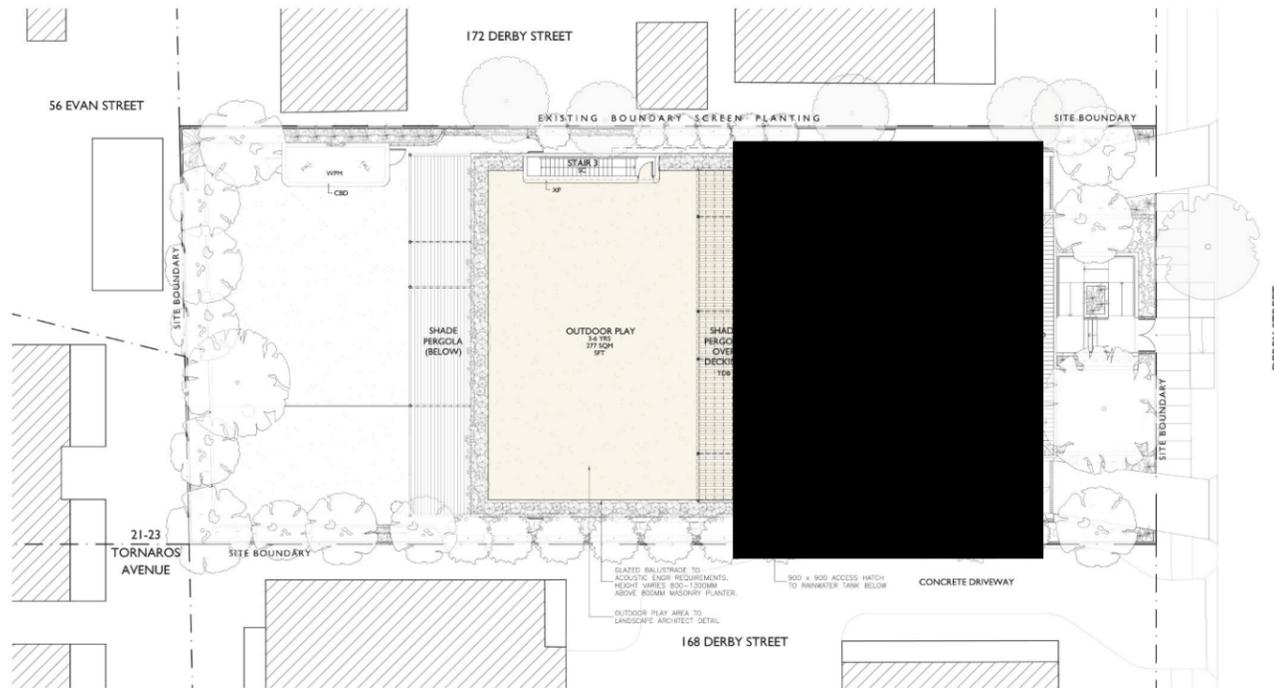
2 SOUTH ELEVATION
1:200 @ A3

FINISHES LEGEND	
REFER TO MATERIALS SCHEDULE FOR MORE INFORMATION	
WALL FINISH	FLOOR FINISH
CBD COLORBOND STEEL	CPV CONCRETE FOOTPATH/ PAVEMENT
EEG ENERGY EFFICIENT GLAZING	CT CERAMIC TILES
FBK FACE BRICKWORK	CPT CARPET TILES
FG FRAMELESS GLASS	EP EPOXY PAINTED CONCRETE
PCA POWDERCOATED ALUMINIUM	GRV RIVERSTONE GRAVEL
PCS POWDERCOATED ALUMINIUM PERFORATED SCREEN PANELS	PGC PIGMENTED CONCRETE W/ EXPRESSED GROOVES
PT PAINT FINISH	PV PORCELAIN PAVERS (NON-SLIP)
PTF PAINTED TIMBER FENCE	PVS CONCRETE PAVER STEPPING STONES
RP RENDER & PAINT	SC SEALED CONCRETE
SSS (SATIN) STAINLESS STEEL	SFT SOFT-FALL SURFACE TO LNSP ARCH DTL
TC NON-COMBUSTIBLE	SN PROPRIETARY ALUM. NON-SLIP STAIR NOSING
XP TIMBER-LOOK CLADDING	TDB TIMBER DECKING BOARDS
XP EXTERNAL PAINT FINISH	TFB TIMBER FLOOR BOARDS
XPS EXTERIOR GRADE PAINTED STEEL	WN SHEET OR PLANK VINYL FLOORING
ZN COLORBOND STEEL ZINC APPEARANCE	WFM WATERPROOF MEMBRANE

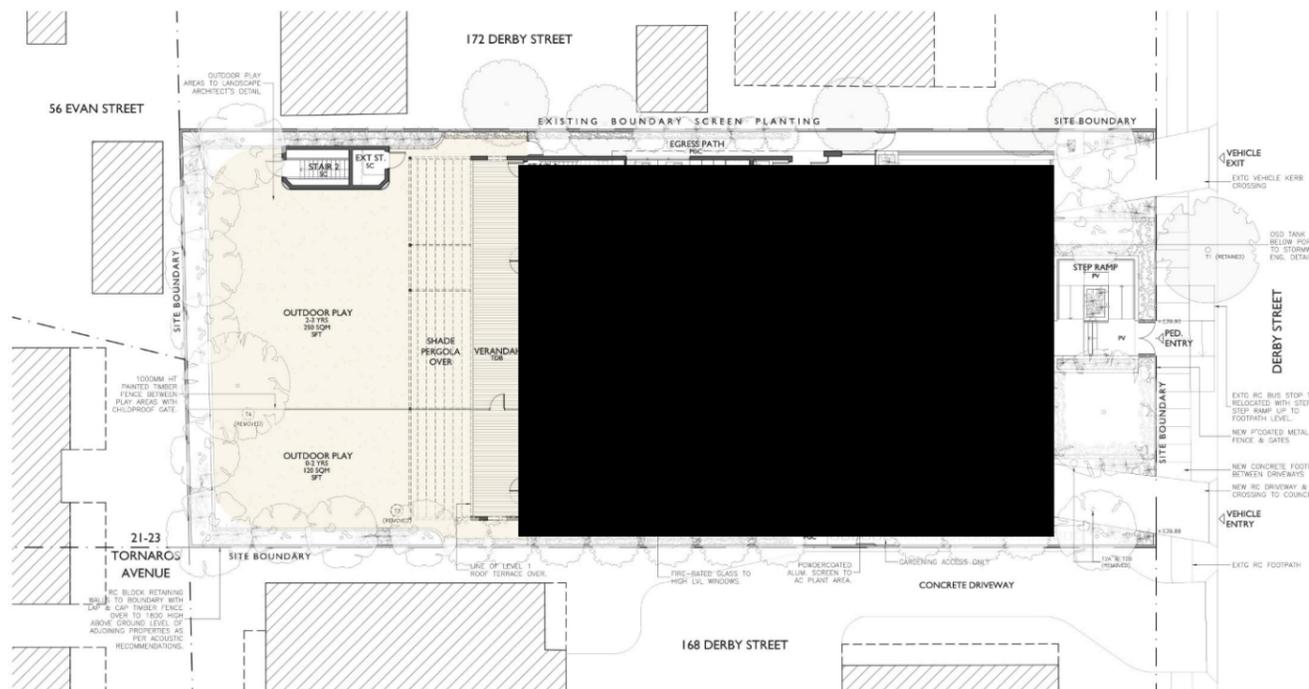
EXTERNAL FINISHES PALETTE									
RP Warm grey rendered and painted walls.	XP Exterior grade paint to metalwork - charcoal grey.	TC Timber-look cladding - similar tone to Western Red Cedar.	CBD Standing seam roofing/wall cladding - Colorbond Matt Basalt.	PCS P-coated alum. perforated screen - light bronze.	PCA P-coated alum. windows & doors - Dulux Platypus Kinetic Pearl or sim.	PMK Painted or p-coated metal balustrade.	GS Aluminium framed glass screen.	PTF Painted timber lapped & capped fence.	

FOR DEVELOPMENT APPLICATION

ISSUE	DATE	FOR DA REVISION	EL	JC
DO	NOT	SCALE	FROM	DRAWINGS. VERIFY ALL DIMENSIONS ON SITE BEFORE COMMENCING WORK
<p>PROJECT 170 DERBY STREET, PENRITH</p> <p>CLIENT MONTESSORI ACADEMY</p> <p>DRAWING WEST & SOUTH ELEVATIONS, AND EXTERNAL COLOUR SCHEDULE</p> <p>DATE NOV 2020 SCALE 1:200 @ A3 DRAWN EL</p> <p>JOB# 2023 DWG# DA12 REV. -</p>				
<p>CULLEN FENG ARCHITECTS</p> <p>NOM ARCH: JON CULLEN NSW 6437 303 / 77 DUNNING AVENUE, ROSEBERY NSW 2018, AUSTRALIA +612 8310 2095</p>				



**LEVEL I PLAN
1:400**



**GROUND FLOOR PLAN
1:400**

CHILDREN & REQUIRED PLAY SPACE AREA REQ PER CHILD: 3.25sqm (indoor) / 7sqm (outdoor)					
CLASSROOM	AGE	NO.	INDOOR PLAY	OUTDOOR PLAY	TEACHERS
1	0-2	16	52.0 SQM	112.0 SQM	4
2	2-3	15	97.5 SQM	210.0 SQM	6
3		15			
4	3-6	20	130.0 SQM	280.0 SQM	4
5		20			
TOTAL		86	279.5 SQM	602.0 SQM	14

CARPARKING REQUIREMENTS PENRITH DCP 2014 PART C10		
CHILDREN / CARERS	1 SPACE PER 10 CHILDREN 86 CHILDREN = 9 SPACES	9
STAFF	1 SPACE PER EMPLOYEE 14 EMPLOYEES = 14 SPACES	14
	TOTAL CAR SPACES REQUIRED	23

PROPOSED DEVELOPMENT		
INDOOR PLAY SPACE	330 SQM	COMPLIES
OUTDOOR PLAY SPACE	647 SQM	COMPLIES
CARPARKING SPACES	24 SPACES	COMPLIES

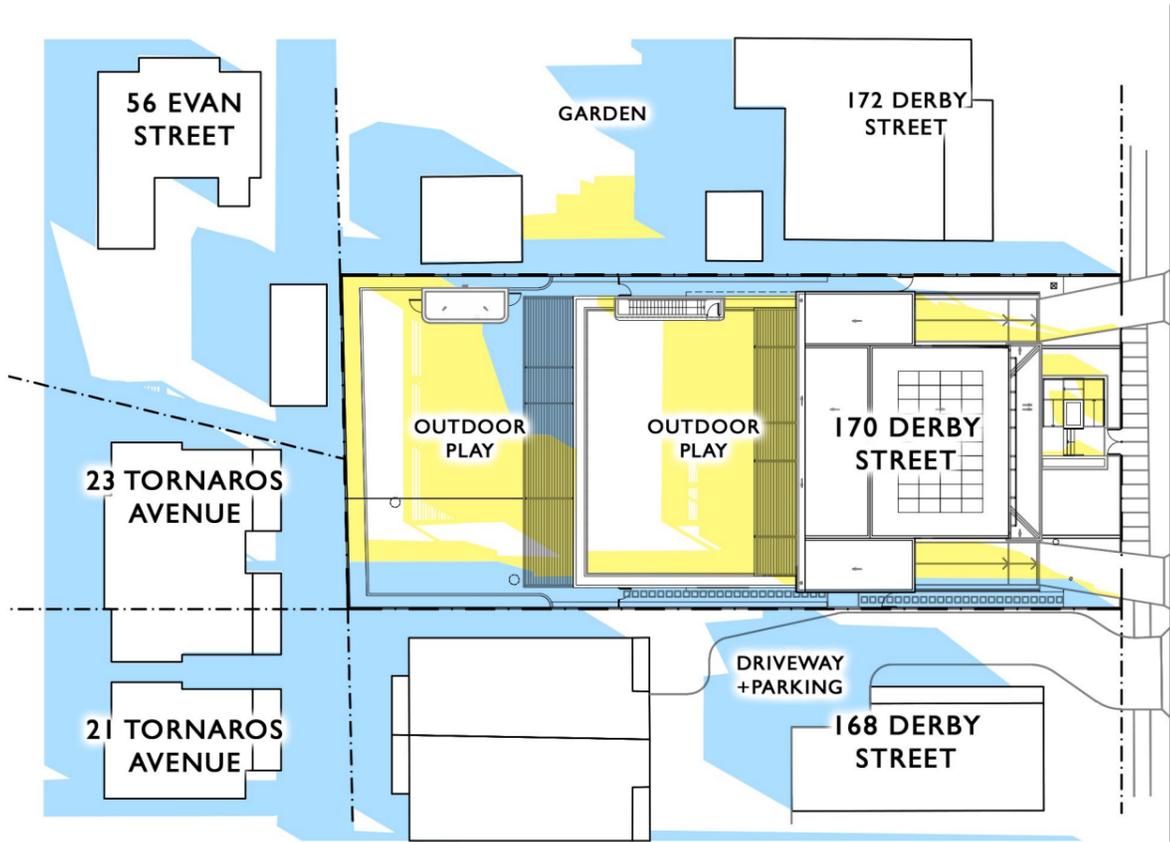


FOR DEVELOPMENT APPLICATION

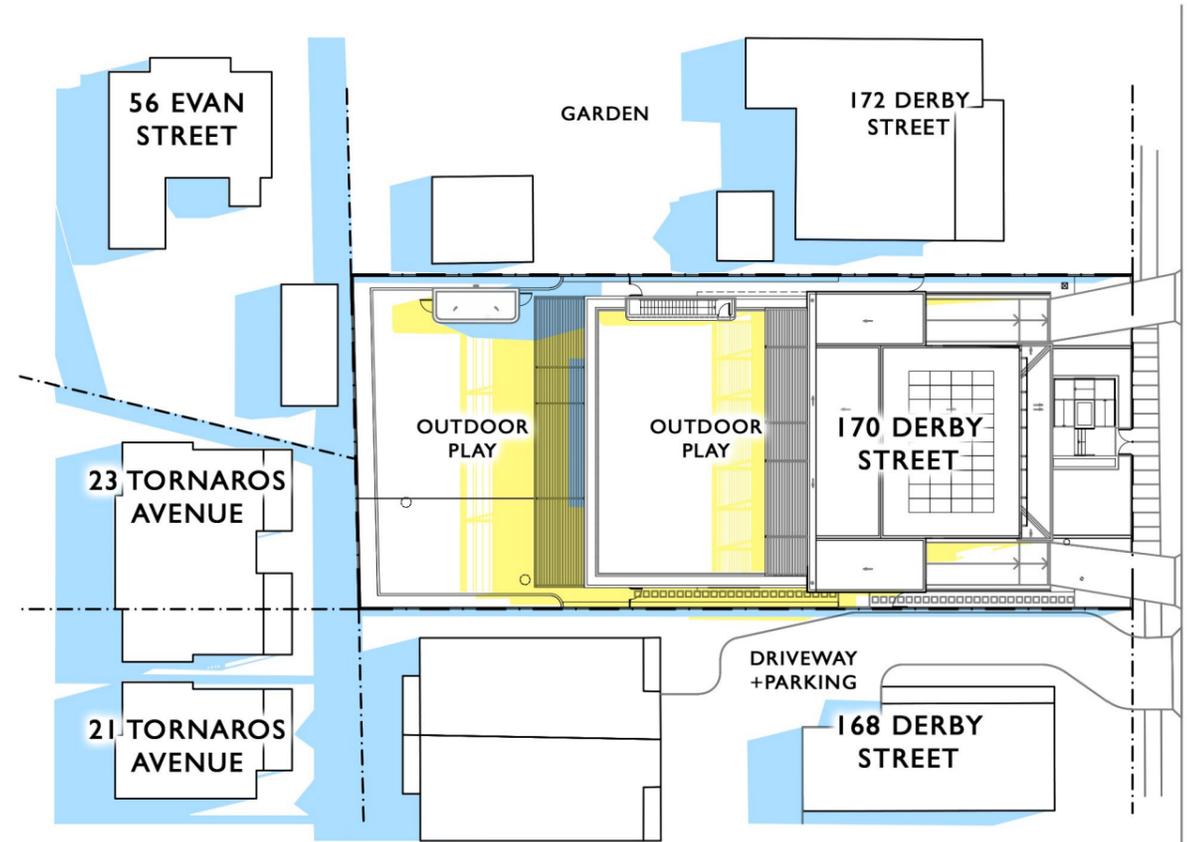
ISSUE	DATE	REVISION	FOR DA	EL	JC
DO	NOT	SCALE	FROM	DRAWINGS	VERIFY ALL DIMENSIONS ON SITE BEFORE COMMENCING WORK

CULLEN FENG ARCHITECTS

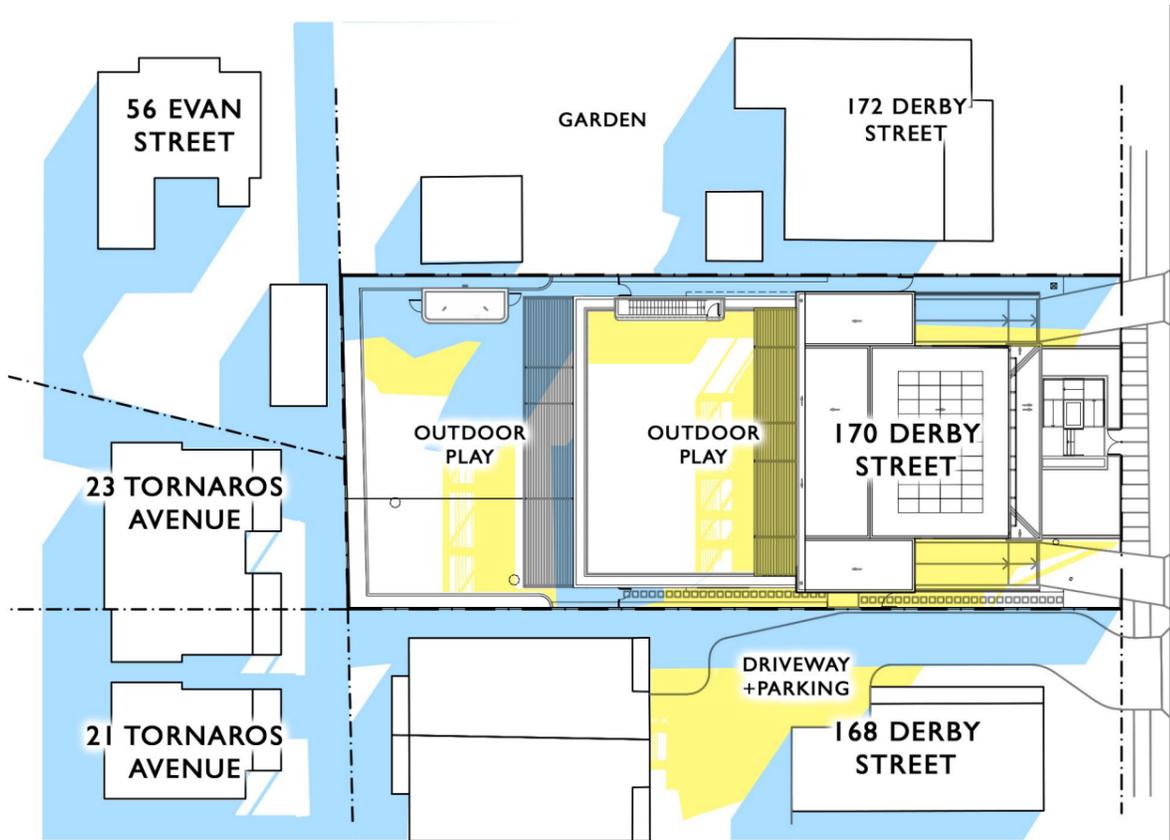
PROJECT 170 DERBY STREET, PENRITH
 CLIENT MONTESSORI ACADEMY
 DRAWING AREA CALCULATIONS
 DATE NOV 2020 SCALE AS SHOWN DRAWN EL
 JOB # 2023 DWG # DAI3 REV -



1 SUN SHADOW DIAGRAM AT 9AM JUNE 21 (WINTER SOLSTICE)
1:500 @ A3; 1: 250 @ A1



2 SUN SHADOW DIAGRAM AT 12PM JUNE 21 (WINTER SOLSTICE)
1:500 @ A3; 1: 250 @ A1

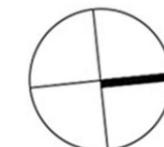


3 SUN SHADOW DIAGRAM AT 3PM JUNE 21 (WINTER SOLSTICE)
1:500 @ A3; 1: 250 @ A1

TOTAL OUTDOOR PLAY AREA	647 SQM
TOTAL AREA WITH SUNLIGHT FALLING ON GROUND	308 SQM
% AREA WITH SUNLIGHT	48%
	48% > 30% (COMPLIES)
TOTAL AREA WITH SHADE ON GROUND	339 SQM
% AREA WITH SHADE	52%
	52% > 30% (COMPLIES)

LEGEND

- EXISTING SHADOW ON GROUND
- NEW SHADOW FROM PROPOSED DEVELOPMENT



FOR DEVELOPMENT APPLICATION

ISSUE	30/11/2020	FOR DA	REVISION	SY	JC
DO	NOT	SCALE	FROM	DRAWINGS	VERIFY ALL DIMENSIONS ON SITE BEFORE COMMENCING WORK

CULLEN FENG
ARCHITECTS

PROJECT 170 DERBY STREET, PENRITH

CLIENT MONTESSORI ACADEMY

DRAWING SHADOW DIAGRAM

DATE 30/11/2020 SCALE 1:500 @ A3
1:250 @ A1

JOB # 2023 DWG # DA14 REV. -

NQM ARCH: JON CULLEN NSW 6437 | 303 / 77 DUNNING AVENUE, ROSEBERY NSW 2018, AUSTRALIA | +612 8310 2095

APPENDIX D

Laboratory reports

CLIENT DETAILS

LABORATORY DETAILS

Contact Nick Caltabiano
 Client NEO CONSULTING PTY LTD
 Address PO BOX 279
 RIVERSTONE NSW 2765

Telephone 0416 680 375
 Facsimile (Not specified)
 Email nick@neoconsulting.com.au

Project **N4341**
 Order Number (Not specified)
 Samples 13

Manager Huong Crawford
 Laboratory SGS Alexandria Environmental
 Address Unit 16, 33 Maddox St
 Alexandria NSW 2015

Telephone +61 2 8594 0400
 Facsimile +61 2 8594 0499
 Email au.environmental.sydney@sgs.com

SGS Reference **SE207236 R0**
 Date Received 5/6/2020
 Date Reported 15/6/2020

COMMENTS

Accredited for compliance with ISO/IEC 17025 - Testing. NATA accredited laboratory 2562(4354).

SIGNATORIES



Bennet LO
 Senior Organic Chemist/Metals Chemist



Dong LIANG
 Metals/Inorganics Team Leader



Ly Kim HA
 Organic Section Head

VOC's in Soil [AN433] Tested: 10/6/2020

PARAMETER	UOM	LOR	BH1.1	BH1.2	BH2.1	BH2.2	BH3.1
			SOIL	SOIL	SOIL	SOIL	SOIL
			4/6/2020 SE207236.001	4/6/2020 SE207236.002	4/6/2020 SE207236.003	4/6/2020 SE207236.004	4/6/2020 SE207236.005
Benzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	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
o-xylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Xylenes	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Total BTEX	mg/kg	0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1

PARAMETER	UOM	LOR	BH3.2	BH4.1	BH4.2	BH5.1	BH5.2
			SOIL	SOIL	SOIL	SOIL	SOIL
			4/6/2020 SE207236.006	4/6/2020 SE207236.007	4/6/2020 SE207236.008	4/6/2020 SE207236.009	4/6/2020 SE207236.010
Benzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	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
o-xylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Xylenes	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Total BTEX	mg/kg	0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1

PARAMETER	UOM	LOR	BH6.1	BH6.2	D1
			SOIL	SOIL	SOIL
			4/6/2020 SE207236.011	4/6/2020 SE207236.012	4/6/2020 SE207236.013
Benzene	mg/kg	0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2	<0.2	<0.2
o-xylene	mg/kg	0.1	<0.1	<0.1	<0.1
Total Xylenes	mg/kg	0.3	<0.3	<0.3	<0.3
Total BTEX	mg/kg	0.6	<0.6	<0.6	<0.6
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1

Volatile Petroleum Hydrocarbons in Soil [AN433] Tested: 10/6/2020

PARAMETER	UOM	LOR	BH1.1	BH1.2	BH2.1	BH2.2	BH3.1
			SOIL	SOIL	SOIL	SOIL	SOIL
			4/6/2020	4/6/2020	4/6/2020	4/6/2020	4/6/2020
			SE207236.001	SE207236.002	SE207236.003	SE207236.004	SE207236.005
TRH C6-C9	mg/kg	20	<20	<20	<20	<20	<20
Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TRH C6-C10	mg/kg	25	<25	<25	<25	<25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25	<25	<25

PARAMETER	UOM	LOR	BH3.2	BH4.1	BH4.2	BH5.1	BH5.2
			SOIL	SOIL	SOIL	SOIL	SOIL
			4/6/2020	4/6/2020	4/6/2020	4/6/2020	4/6/2020
			SE207236.006	SE207236.007	SE207236.008	SE207236.009	SE207236.010
TRH C6-C9	mg/kg	20	<20	<20	<20	<20	<20
Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TRH C6-C10	mg/kg	25	<25	<25	<25	<25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25	<25	<25

PARAMETER	UOM	LOR	BH6.1	BH6.2	D1
			SOIL	SOIL	SOIL
			4/6/2020	4/6/2020	4/6/2020
			SE207236.011	SE207236.012	SE207236.013
TRH C6-C9	mg/kg	20	<20	<20	<20
Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1
TRH C6-C10	mg/kg	25	<25	<25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25

TRH (Total Recoverable Hydrocarbons) in Soil [AN403] Tested: 10/6/2020

PARAMETER	UOM	LOR	BH1.1	BH1.2	BH2.1	BH2.2	BH3.1
			SOIL	SOIL	SOIL	SOIL	SOIL
			4/6/2020 SE207236.001	4/6/2020 SE207236.002	4/6/2020 SE207236.003	4/6/2020 SE207236.004	4/6/2020 SE207236.005
TRH C10-C14	mg/kg	20	<20	<20	<20	<20	<20
TRH C15-C28	mg/kg	45	<45	<45	<45	<45	<45
TRH C29-C36	mg/kg	45	<45	<45	<45	51	<45
TRH C37-C40	mg/kg	100	<100	<100	<100	<100	<100
TRH >C10-C16	mg/kg	25	<25	<25	<25	<25	<25
TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90	<90	<90	<90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	<120	<120	<120
TRH C10-C36 Total	mg/kg	110	<110	<110	<110	<110	<110
TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210	<210	<210	<210

PARAMETER	UOM	LOR	BH3.2	BH4.1	BH4.2	BH5.1	BH5.2
			SOIL	SOIL	SOIL	SOIL	SOIL
			4/6/2020 SE207236.006	4/6/2020 SE207236.007	4/6/2020 SE207236.008	4/6/2020 SE207236.009	4/6/2020 SE207236.010
TRH C10-C14	mg/kg	20	<20	<20	<20	<20	<20
TRH C15-C28	mg/kg	45	<45	74	<45	<45	<45
TRH C29-C36	mg/kg	45	<45	86	<45	<45	<45
TRH C37-C40	mg/kg	100	<100	<100	<100	<100	<100
TRH >C10-C16	mg/kg	25	<25	<25	<25	<25	<25
TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90	130	<90	<90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	<120	<120	<120
TRH C10-C36 Total	mg/kg	110	<110	160	<110	<110	<110
TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210	<210	<210	<210

PARAMETER	UOM	LOR	BH6.1	BH6.2	D1
			SOIL	SOIL	SOIL
			4/6/2020 SE207236.011	4/6/2020 SE207236.012	4/6/2020 SE207236.013
TRH C10-C14	mg/kg	20	<20	<20	<20
TRH C15-C28	mg/kg	45	<45	<45	<45
TRH C29-C36	mg/kg	45	<45	<45	<45
TRH C37-C40	mg/kg	100	<100	<100	<100
TRH >C10-C16	mg/kg	25	<25	<25	<25
TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90	<90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	<120
TRH C10-C36 Total	mg/kg	110	<110	<110	<110
TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210	<210

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES [AN040/AN320] Tested: 10/6/2020

PARAMETER	UOM	LOR	BH1.1	BH1.2	BH2.1	BH2.2	BH3.1
			SOIL	SOIL	SOIL	SOIL	SOIL
			4/6/2020 SE207236.001	4/6/2020 SE207236.002	4/6/2020 SE207236.003	4/6/2020 SE207236.004	4/6/2020 SE207236.005
Arsenic, As	mg/kg	1	9	9	10	8	9
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.5	17	19	19	15	16
Copper, Cu	mg/kg	0.5	10	8.3	17	15	9.5
Lead, Pb	mg/kg	1	39	27	28	22	29
Nickel, Ni	mg/kg	0.5	5.0	4.9	4.7	5.1	6.1
Zinc, Zn	mg/kg	2	42	26	53	42	39

PARAMETER	UOM	LOR	BH3.2	BH4.1	BH4.2	BH5.1	BH5.2
			SOIL	SOIL	SOIL	SOIL	SOIL
			4/6/2020 SE207236.006	4/6/2020 SE207236.007	4/6/2020 SE207236.008	4/6/2020 SE207236.009	4/6/2020 SE207236.010
Arsenic, As	mg/kg	1	9	10	10	12	13
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.5	16	10	11	17	13
Copper, Cu	mg/kg	0.5	8.8	12	10	23	24
Lead, Pb	mg/kg	1	24	22	12	130	140
Nickel, Ni	mg/kg	0.5	5.5	4.7	4.9	6.8	8.1
Zinc, Zn	mg/kg	2	30	37	23	160	100

PARAMETER	UOM	LOR	BH6.1	BH6.2	D1
			SOIL	SOIL	SOIL
			4/6/2020 SE207236.011	4/6/2020 SE207236.012	4/6/2020 SE207236.013
Arsenic, As	mg/kg	1	9	11	9
Cadmium, Cd	mg/kg	0.3	0.4	0.4	<0.3
Chromium, Cr	mg/kg	0.5	17	17	15
Copper, Cu	mg/kg	0.5	49	58	8.7
Lead, Pb	mg/kg	1	180	150	26
Nickel, Ni	mg/kg	0.5	8.0	13	5.2
Zinc, Zn	mg/kg	2	280	280	28

Mercury in Soil [AN312] Tested: 10/6/2020

			BH1.1	BH1.2	BH2.1	BH2.2	BH3.1
			SOIL	SOIL	SOIL	SOIL	SOIL
			-	-	-	-	-
			4/6/2020	4/6/2020	4/6/2020	4/6/2020	4/6/2020
PARAMETER	UOM	LOR	SE207236.001	SE207236.002	SE207236.003	SE207236.004	SE207236.005
Mercury	mg/kg	0.05	<0.05	0.05	<0.05	<0.05	<0.05

			BH3.2	BH4.1	BH4.2	BH5.1	BH5.2
			SOIL	SOIL	SOIL	SOIL	SOIL
			-	-	-	-	-
			4/6/2020	4/6/2020	4/6/2020	4/6/2020	4/6/2020
PARAMETER	UOM	LOR	SE207236.006	SE207236.007	SE207236.008	SE207236.009	SE207236.010
Mercury	mg/kg	0.05	<0.05	<0.05	<0.05	0.21	0.47

			BH6.1	BH6.2	D1
			SOIL	SOIL	SOIL
			-	-	-
			4/6/2020	4/6/2020	4/6/2020
PARAMETER	UOM	LOR	SE207236.011	SE207236.012	SE207236.013
Mercury	mg/kg	0.05	0.07	0.06	<0.05

Moisture Content [AN002] Tested: 10/6/2020

			BH1.1	BH1.2	BH2.1	BH2.2	BH3.1
			SOIL	SOIL	SOIL	SOIL	SOIL
			-	-	-	-	-
			4/6/2020	4/6/2020	4/6/2020	4/6/2020	4/6/2020
PARAMETER	UOM	LOR	SE207236.001	SE207236.002	SE207236.003	SE207236.004	SE207236.005
% Moisture	%w/w	1	15.7	15.7	9.4	11.8	14.9

			BH3.2	BH4.1	BH4.2	BH5.1	BH5.2
			SOIL	SOIL	SOIL	SOIL	SOIL
			-	-	-	-	-
			4/6/2020	4/6/2020	4/6/2020	4/6/2020	4/6/2020
PARAMETER	UOM	LOR	SE207236.006	SE207236.007	SE207236.008	SE207236.009	SE207236.010
% Moisture	%w/w	1	14.7	13.3	14.0	18.8	17.6

			BH6.1	BH6.2	D1
			SOIL	SOIL	SOIL
			-	-	-
			4/6/2020	4/6/2020	4/6/2020
PARAMETER	UOM	LOR	SE207236.011	SE207236.012	SE207236.013
% Moisture	%w/w	1	18.7	17.9	15.2

METHOD

METHODOLOGY SUMMARY

AN002

The test is carried out by drying (at either 40°C or 105°C) a known mass of sample in a weighed evaporating basin. After fully dry the sample is re-weighed. Samples such as sludge and sediment having high percentages of moisture will take some time in a drying oven for complete removal of water.

AN040/AN320

A portion of sample is digested with nitric acid to decompose organic matter and hydrochloric acid to complete the digestion of metals. The digest is then analysed by ICP OES with metals results reported on the dried sample basis. Based on USEPA method 200.8 and 6010C.

AN040

A portion of sample is digested with Nitric acid to decompose organic matter and Hydrochloric acid to complete the digestion of metals and then filtered for analysis by ASS or ICP as per USEPA Method 200.8.

AN312

Mercury by Cold Vapour AAS in Soils: After digestion with nitric acid, hydrogen peroxide and hydrochloric acid, mercury ions are reduced by stannous chloride reagent in acidic solution to elemental mercury. This mercury vapour is purged by nitrogen into a cold cell in an atomic absorption spectrometer or mercury analyser. Quantification is made by comparing absorbances to those of the calibration standards. Reference APHA 3112/3500

AN403

Total Recoverable Hydrocarbons: Determination of Hydrocarbons by gas chromatography after a solvent extraction. Detection is by flame ionisation detector (FID) that produces an electronic signal in proportion to the combustible matter passing through it. Total Recoverable Hydrocarbons (TRH) are routinely reported as four alkane groupings based on the carbon chain length of the compounds: C6-C9, C10-C14, C15-C28 and C29-C36 and in recognition of the NEPM 1999 (2013), >C10-C16 (F2), >C16-C34 (F3) and >C34-C40 (F4). F2 is reported directly and also corrected by subtracting Naphthalene (from VOC method AN433) where available.

AN403

Additionally, the volatile C6-C9 fraction may be determined by a purge and trap technique and GC/MS because of the potential for volatiles loss. Total Recoverable Hydrocarbons - Silica (TRH-Si) follows the same method of analysis after silica gel cleanup of the solvent extract. Aliphatic/Aromatic Speciation follows the same method of analysis after fractionation of the solvent extract over silica with differential polarity of the eluent solvents.

AN403

The GC/FID method is not well suited to the analysis of refined high boiling point materials (ie lubricating oils or greases) but is particularly suited for measuring diesel, kerosene and petrol if care to control volatility is taken. This method will detect naturally occurring hydrocarbons, lipids, animal fats, phenols and PAHs if they are present at sufficient levels, dependent on the use of specific cleanup/fractionation techniques. Reference USEPA 3510B, 8015B.

AN433

VOCs and C6-C9 Hydrocarbons by GC-MS P&T: VOC's are volatile organic compounds. The sample is presented to a gas chromatograph via a purge and trap (P&T) concentrator and autosampler and is detected with a Mass Spectrometer (MSD). Solid samples are initially extracted with methanol whilst liquid samples are processed directly. References: USEPA 5030B, 8020A, 8260.

FOOTNOTES

*	NATA accreditation does not cover the performance of this service.	-	Not analysed.	UOM	Unit of Measure.
**	Indicative data, theoretical holding time exceeded.	NVL	Not validated.	LOR	Limit of Reporting.
		IS	Insufficient sample for analysis.	↑↓	Raised/lowered Limit of Reporting.
		LNR	Sample listed, but not received.		

Unless it is reported that sampling has been performed by SGS, the samples have been analysed as received. Solid samples expressed on a dry weight basis.

Where "Total" analyte groups are reported (for example, Total PAHs, Total OC Pesticides) the total will be calculated as the sum of the individual analytes, with those analytes that are reported as <LOR being assumed to be zero. The summed (Total) limit of reporting is calculated by summing the individual analyte LORs and dividing by two. For example, where 16 individual analytes are being summed and each has an LOR of 0.1 mg/kg, the "Totals" LOR will be 1.6 / 2 (0.8 mg/kg). Where only 2 analytes are being summed, the " Total" LOR will be the sum of those two LORs.

Some totals may not appear to add up because the total is rounded after adding up the raw values.

If reported, measurement uncertainty follow the ± sign after the analytical result and is expressed as the expanded uncertainty calculated using a coverage factor of 2, providing a level of confidence of approximately 95%, unless stated otherwise in the comments section of this report.

Results reported for samples tested under test methods with codes starting with ARS-SOP, radionuclide or gross radioactivity concentrations are expressed in becquerel (Bq) per unit of mass or volume or per wipe as stated on the report. Becquerel is the SI unit for activity and equals one nuclear transformation per second.

Note that in terms of units of radioactivity:

- a. 1 Bq is equivalent to 27 pCi
- b. 37 MBq is equivalent to 1 mCi

For results reported for samples tested under test methods with codes starting with ARS-SOP, less than (<) values indicate the detection limit for each radionuclide or parameter for the measurement system used. The respective detection limits have been calculated in accordance with ISO 11929.

The QC and MU criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: www.sgs.com.au/en-gb/environment-health-and-safety.

This document is issued by the Company under its General Conditions of Service accessible at www.sgs.com/en/Terms-and-Conditions.aspx. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.

Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client only. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law .

This report must not be reproduced, except in full.