



REPORT TO
GRINDLEY CONSTRUCTION PTY LTD

ON
VALIDATION ASSESSMENT

FOR
PROPOSED SCHOOL REDEVELOPMENT

AT
PENSHURST PUBLIC SCHOOL,
510 FOREST ROAD, PENSHURST, NSW

Date: 20 January 2021
Ref: E30104Prpt-VAL

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Executive Summary

Grindley Construction Pty Ltd ('the client') commissioned JK Environments (JKE) to provide validation consultant services and undertake a site validation assessment for the proposed Penshurst Public School redevelopment at 510 Forest Road, Penshurst, NSW. The site location and the site boundaries are shown on the validation figures and survey attached in the Appendix A.

The development included the demolition of structures and removal of pavements associated with the former Penshurst Public School, followed by construction of a new primary school comprising various buildings/structures, an assembly courtyard, paved and unpaved play areas, and a car park. Cut/fill earthworks were required to achieve the desired site levels. The deepest areas of cut were in the western/north-western area of the site and extended to depths of approximately 3-4m below the former site levels.

Previous investigations at the site identified relatively small quantities of bonded/non-friable asbestos containing material (ACM) at the ground surface. The remedial strategy included a combination of excavation/off-site disposal of ACM-impacted soil, and removal of visible ACM from the ground surface via picking followed by placement of landscaping materials.

This report addresses development consent condition B8 of the State Significant Development (SSD) approval 8365 (dated 26 February 2019) which relates to the carrying out of remediation/validation in accordance with the approved Remediation Action Plan (RAP), and development consent condition C26 relating to importation of materials. The remediation and site validation are being audited by Melissa Porter (NSW EPA Accredited Site Auditor) of Senversa to address development consent condition B9 of the SSD approval.

The primary aim of the validation assessment is to demonstrate that the site has been appropriately remediated and that the site is suitable for the development, from a contamination viewpoint. The objectives of the validation assessment were to:

- Document the remediation works and any deviations to the RAP;
- Document the implementation of the validation plan and the validation results;
- Document any unexpected finds; and
- Prepare a site validation report to assess site suitability for the development.

The overall scope of work included the following:

- Review of the RAP and other relevant documents prepared for the site;
- Provision of consulting advice throughout the project on matters relevant to the remediation and validation;
- Implementation of the validation plan;
- Review of documentation and validation associated with imported materials and exportation of waste; and
- Preparation of a site validation assessment report.

The remedial approach was simplified by excavating the fill from the majority of the site and disposing of the fill to licenced landfills. A series of asbestos clearance inspections/certificates were undertaken/issued to validate these areas as documented in this report.

Areas where fill remained were validated for asbestos/ACM via sampling/quantification and ACM was found to be absent or at very low concentrations (i.e. below the validation criteria) in the remaining fill. The areas where fill remains primarily include the southern area and a tree protection zone (TPZ) in the north-eastern corner. Some fill also remains beneath the capping beam that extends along the top of the retaining wall at the western and northern boundaries, however this fill is covered by concrete/shotcrete and is not accessible. The remaining fill is not considered to pose a risk to human health.

Imported materials were validated in accordance with the RAP and the materials were found to be suitable for use on site.

Based on the results of the validation, JKE are of the opinion that the site has been suitably remediated and validated, and the goal and objectives of the remediation have been achieved. The site is therefore considered to be suitable for the development described in Section 1.1, from a contamination viewpoint.

There is a potential for low concentrations of asbestos (non-friable ACM) to be present in fill remaining beneath the capping beam and in the fill (beneath the landscaping materials) within the TPZs and in the southern area of the site. JKE recommend that this be reviewed by the NSW Department of Education so that a suitable contingency plan/strategy can be developed and implemented where deemed necessary to align with the department's current requirements for managing low concentrations of ACM in soil.



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Abbreviations

Asbestos Fines/Fibrous Asbestos	AF/FA
Ambient Background Concentrations	ABC
Added Contaminant Limits	ACL
Asbestos Containing Material	ACM
Area of Environmental Concern	AEC
Australian Height Datum	AHD
Acid Sulfate Soil	ASS
Asbestos Works Management Plan	AWMP
Below Ground Level	BGL
Benzo(a)pyrene Toxicity Equivalent Factor	BaP TEQ
Benzene, Toluene, Ethylbenzene, Xylene	BTEX
Cation Exchange Capacity	CEC
Contaminated Land Management	CLM
Contaminant(s) of Potential Concern	CoPC
Chain of Custody	COC
Covered Outdoor Learning Area	COLA
Conceptual Site Model	CSM
Department of Education (NSW)	DoE
Data Quality Indicator	DQI
Data Quality Objective	DQO
Detailed Site Investigation	DSI
Data Gap Investigation	DGI
Ecological Investigation Level	EIL
Environmental Investigation Services	EIS
Ecological Screening Level	ESL
Long-Term Environmental Management Plan	LTEMP
Environment Protection Authority	EPA
Environmental Site Assessment	ESA
Fibre Cement Fragment(s)	FCF
Health Investigation Level	HIL
Health Screening Level	HSL
International Organisation of Standardisation	ISO
JK Environments	JKE
JK Geotechnics	JKG
Lab Control Spike	LCS
National Association of Testing Authorities	NATA
National Environmental Protection Measure	NEPM
Organochlorine Pesticides	OCP
Organophosphate Pesticides	OPP
Polycyclic Aromatic Hydrocarbons	PAH
Polychlorinated Biphenyls	PCBs
Photo-ionisation Detector	PID
Protection of the Environment Operations	POEO
Practical Quantitation Limit	PQL
Quality Assurance	QA
Quality Control	QC
Remediation Action Plan	RAP
Relative Percentage Difference	RPD
Sampling, Analysis and Quality Plan	SAQP
Site Assessment Criteria	SAC
Source, Pathway, Receptor	SPR
State Significant Development	SSD
Standing Water Level	SWL



Trip Blank	TB
Tree Protection Zone	TPZ
Toxicity Characteristic Leaching Procedure	TCLP
Total Recoverable Hydrocarbons	TRH
Trip Spike	TS
Upper Confidence Limit	UCL
Validation Assessment Criteria	VAC
Virgin Excavated Natural Material	VENM
Volatile Organic Compounds	VOC

Units

Litres	L
Metres BGL	mBGL
Metres	m
Micrograms per Litre	µg/L
Milligrams per Kilogram	mg/kg
Percentage	%
Percentage weight for weight	%w/w

1 INTRODUCTION

Grindley Construction Pty Ltd ('the client') commissioned JK Environments (JKE) to provide validation consultant services and undertake a site validation assessment for the proposed Penshurst Public School redevelopment at 510 Forest Road, Penshurst, NSW. The site location and the site boundaries are shown on the validation figures and survey attached in the Appendix A.

This report addresses development consent condition B8 of the State Significant Development (SSD) approval 8365 (dated 26 February 2019) which relates to the carrying out of remediation/validation in accordance with the approved Remediation Action Plan (RAP), and development consent condition C26 relating to importation of materials. The remediation and site validation are being audited by Melissa Porter (NSW EPA Accredited Site Auditor) of Senversa to address development consent condition B9 of the SSD approval.

Previous investigations at the site identified relatively small quantities of bonded/non-friable asbestos containing material (ACM) at the ground surface. The remedial strategy included a combination of excavation/off-site disposal of ACM-impacted soil, and removal of visible ACM from the ground surface via picking followed by placement of landscaping materials. A summary of the previous investigations is provided in Section 2.2.

It is noted that some of the initial site work was undertaken by Environmental Investigation Services (EIS). EIS re-branded to JKE in mid-2019 after commencement of the site validation assessment.

1.1 Development Details

The development included the demolition of structures and removal of pavements associated with the former Penshurst Public School, followed by construction of a new primary school comprising various buildings/structures, an assembly courtyard, paved and unpaved play areas, and a car park.

Cut/fill earthworks were required to achieve the desired site levels. The deepest areas of cut were in the western/north-western area of the site and extended to depths of approximately 3-4m below the former site levels.

A copy of the stamped SSD approved plans are attached in Appendix B.

1.2 Aims and Objectives

The primary aim of the validation assessment is to demonstrate that the site has been appropriately remediated and that the site is suitable for the development described in Section 1.1, from a contamination viewpoint. The objectives of the validation assessment were to:

- Document the remediation works and any deviations to the RAP;
- Document the implementation of the validation plan and the validation results;
- Document any unexpected finds; and
- Prepare a site validation report to assess site suitability for the development.

1.3 Scope of Work

The validation assessment was undertaken generally in accordance with an EIS proposal (Ref: EP49270P-rev1) of 5 April 2019, a signed Consultants Agreement (dated 9 May 2019) and variations to the validation scope issued under the proposal. The overall scope of work included the following:

- Review of the RAP and other relevant documents prepared for the site;
- Provision of consulting advice throughout the project on matters relevant to the remediation and validation;
- Implementation of the validation plan;
- Review of documentation and validation associated with imported materials and exportation of waste; and
- Preparation of a site validation assessment report.

The scope of work was undertaken with reference to the National Environmental Protection (Assessment of Site Contamination) Measure 1999 as amended (2013)¹, other guidelines made under or with regards to the Contaminated Land Management Act (1997)² and State Environmental Planning Policy No.55 – Remediation of Land (1998)³. A list of reference documents/guidelines is included in the appendices.

1.4 JKE Documents Applicable to the Site

Our engagement on the project commenced in February 2014 with a desktop investigation. A series of additional investigations, RAPs, management plans, waste classification reports and asbestos clearance certificates were subsequently prepared as the project progressed through the planning and construction phases. The documents prepared by JKE previously to and during the remediation works at the site are listed in the following table:

Table 1-1: JKE Reports and Letters

Reference/ Date	Title	Comments
E30104KPrptRev1, dated 14 February 2017 (referred to as the 'preliminary ESA')	Report to Perumal Pedavoli Pty Ltd on Preliminary Environmental Site Assessment (Contamination) for Proposed Alterations and Additions to Existing School at Penshurst Public School, 510 Forest Road, Penshurst, NSW	Summarised in Section 2.2
E30104KPrpt2 Rev1, dated 25 September 2018 (referred to as the 'preliminary Stage 2 investigation' or 'initial RAP')	Report to Perumal Pedavoli Pty Ltd on Preliminary Stage 2 Site Investigation and Remediation Action Plan for Proposed School Development at Penshurst Public School, 510 Forest Road, Penshurst, NSW	The report was initially prepared in October 2017 and was revised to address Site Auditor comments. Summarised in Section 2.2

¹ National Environment Protection Council (NEPC), (2013). *National Environmental Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013)*. (referred to as NEPM 2013)

² Contaminated Land Management Act 1997 (NSW) (referred to as CLM Act 1997)

³ *State Environmental Planning Policy No. 55 – Remediation of Land 1998* (NSW) (referred to as SEPP55)



Reference/ Date	Title	Comments
E30104Prpt3, dated 2 July 2019 (referred to as the 'DGI' or 'updated RAP')	Report to Grindley Construction on Data Gap Investigation and Updated Remediation Action Plan for Proposed New School at Penshurst Public School, 510 Forest Road, Penshurst, NSW	Summarised in Section 2.2
E30104Prpt4Rev1, dated 30 July 2019 (referred to as the 'AWMP')	Report to Grindley Construction on Asbestos Works Management Plan for Proposed New School at Penshurst Public School, 510 Forest Road, Penshurst, NSW	The report was initially prepared in June 2019 and was revised to address changes to the asbestos management approach. Summarised in Section 2.2 and discussed in Section 10.
E30104Plet-WC1, dated 15 July 2019 (referred to as 'waste classification letter WC1')	Addendum to Waste Classification, Proposed New School, Penshurst Public School, 510 Forest Road, Penshurst	Summarised in Section 2.2, attached in Appendix J2.
E30104Plet-WC2rev1, draft dated 22 July 2019 (referred to as 'waste classification letter WC2rev1')	Additional Visual Assessment of Waste, Proposed New School, Penshurst Public School, 510 Forest Road, Penshurst	Summarised in Section 2.2, attached in Appendix J2.
E30104Plet-WC3, dated 13 August 2019 (referred to as 'waste classification letter WC3')	Confirmation of Waste Classification and Estimate of Waste Quantities, Proposed New School, Penshurst Public School, 510 Forest Road, Penshurst	Documented in Section 10, attached in Appendix J2.
E30104Plet-Clr1, dated 27 August 2019 (referred to as 'Asbestos Clearance No. 1')	Asbestos Clearance Certificate No. 1, Proposed New School, Penshurst Public School, 510 Forest Road, Penshurst, NSW	Documented in Sections 5 and 10, attached in Appendix J1.5.
E30104Plet-Clr2, dated 29 August 2019 (referred to as 'Asbestos Clearance No. 2')	Asbestos Clearance Certificate No. 2, Proposed New School, Penshurst Public School, 510 Forest Road, Penshurst, NSW	Documented in Sections 5 and 10, attached in Appendix J1.5.
E30104Plet-Clr3, dated 4 September 2019 (referred to as 'Asbestos Clearance No. 3')	Asbestos Clearance Certificate No. 3, Proposed New School, Penshurst Public School, 510 Forest Road, Penshurst, NSW	Documented in Sections 5 and 10, attached in Appendix J1.5.
E30104Plet-WC4, dated 4 September 2019 (referred to as 'waste classification letter WC4')	Addendum to Waste Classification Assessment, Virgin Excavated Natural Material (VENM), Proposed New School, Penshurst Public School, 510 Forest Road, Penshurst	Documented in Sections 5 and 10, attached in Appendix J2.
E30104Plet-Clr4, dated 24 October 2019 (referred to as 'Asbestos Clearance No. 4')	Asbestos Clearance Certificate No. 4, Proposed New School, Penshurst Public School, 510 Forest Road, Penshurst, NSW	Documented in Sections 5 and 10, attached in Appendix J1.5.
E30104Plet-Clr5, dated 15 November 2019 (referred to as 'Asbestos Clearance No. 5')	Asbestos Clearance Certificate No. 5, Proposed New School, Penshurst Public School, 510 Forest Road, Penshurst, NSW	Documented in Sections 5 and 10, attached in Appendix J1.5.

Reference/ Date	Title	Comments
E30104Plet-Clr6, dated 19 March 2020 (referred to as 'Asbestos Clearance No. 6')	Asbestos Clearance Certificate No. 6, Proposed New School – Substation Kiosk Excavation, Penshurst Public School, 510 Forest Road, Penshurst, NSW	Documented in Section 10, attached in Appendix J1.5.
E30104Plet-WC5, dated 16 October 2020 (referred to as 'waste classification letter WC5')	Addendum to Waste Classification Assessment – Stockpiles #1 and #2, Proposed New School, Penshurst Public School, 510 Forest Road, Penshurst	Documented in Section 10, attached in Appendix J2.
E30104Plet-WC6, dated 16 October 2020 (referred to as 'waste classification letter WC6')	Waste Classification Assessment – Stockpiles #3/SP1 Material, Proposed New School, Penshurst Public School, 510 Forest Road, Penshurst	Documented in Section 10, attached in Appendix J2.
E30104Plet-WC7, dated 2 November 2020 (referred to as 'waste classification letter WC7')	Waste Classification Assessment – Southern Site Area, Proposed New School, Penshurst Public School, 510 Forest Road, Penshurst	Documented in Section 10, attached in Appendix J2.
E30104Plet-Clr7, dated 4 November 2020 (referred to as 'Asbestos Clearance No. 7')	Asbestos Clearance Certificate No. 7, Proposed New School – Zone 1 Southern Area, Penshurst Public School, 510 Forest Road, Penshurst, NSW	Documented in Section 10, attached in Appendix J1.5.
E30104Plet-Clr8, dated 9 November 2020 (referred to as 'Asbestos Clearance No. 8')	Asbestos Clearance Certificate No. 8, Proposed New School – Scaffold Access Way, Penshurst Public School, 510 Forest Road, Penshurst, NSW	Documented in Section 10, attached in Appendix J1.5.
E30104Plet-Clr9, dated 18 November 2020 (referred to as 'Asbestos Clearance No. 9')	Asbestos Clearance Certificate No. 9, Proposed New School – Swale to Southern Area, Penshurst Public School, 510 Forest Road, Penshurst, NSW	Documented in Section 10, attached in Appendix J1.5.
E30104Plet-WC8, dated 18 November 2020 (referred to as 'waste classification letter WC8')	Waste Classification Assessment – Southern Swale Area, Proposed New School, Penshurst Public School, 510 Forest Road, Penshurst	Documented in Section 10, attached in Appendix J2.
E30104Plet-Clr10, dated 20 November 2020 (referred to as 'Asbestos Clearance No. 10')	Asbestos Clearance Certificate No. 10, Proposed New School – Southern Area and Stair 4, Penshurst Public School, 510 Forest Road, Penshurst, NSW	Documented in Section 10, attached in Appendix 1.5.
E30104Plet-Clr11, dated 24 November 2020 (referred to as 'Asbestos Clearance No. 11')	Asbestos Clearance Certificate No. 11, Proposed New School – Southern Area and Stair, Penshurst Public School, 510 Forest Road, Penshurst, NSW	Documented in Section 10, attached in Appendix J1.5.
E30104Plet-Clr12, dated 30 November 2020 (referred to as 'Asbestos Clearance No. 12')	Asbestos Clearance Certificate No. 12, Proposed New School – South-Eastern Area, Penshurst Public School, 510 Forest Road, Penshurst, NSW	Documented in Section 10, attached in Appendix J1.5.
E30104Plet-Clr13, dated 3 December 2020 (referred to	Asbestos Clearance Certificate No. 13, Proposed New School – North-East Driveway,	Documented in Section 10, attached in Appendix J1.5.



Reference/ Date	Title	Comments
as 'Asbestos Clearance No. 13')	Penshurst Public School, 510 Forest Road, Penshurst, NSW	
E30104Plet-Clr14, dated 16 December 2020 (referred to as 'Asbestos Clearance No. 14')	Asbestos Clearance Certificate No. 14, Proposed New School – Southern Area and Driveway and Tree Protection Zones, Penshurst Public School, 510 Forest Road, Penshurst, NSW	Documented in Section 10, attached in Appendix J1.5.

Our geotechnical division, JK Geotechnics (JKG), has also prepared a geotechnical report for the site (Ref: 30104Srptrev1, dated 3 October 2018).

2 SITE INFORMATION

2.1 Site Identification

Table 2-1: Site Identification

Site Address:	510 Forest Road, Penshurst, NSW
Lot & Deposited Plan:	Lots 3-15 (inclusive) in DP8173
Proposed Land Use:	Primary School
Local Government Authority:	Georges River Council (previously Hurstville Council)
Current Zoning:	SP2 (Infrastructure) – church and educational establishment
Site Area (m²) (approx.):	10,000
RL (AHD in m) (approx.):	48-52
Geographical Location (decimal degrees) (approx.):	Latitude: -33.962648 Longitude: 151.087535
Site Location Plan:	Figure 1
Site Layout Plan:	Figure 2

2.2 Summary of Previous Reports and Results

2.2.1 Preliminary ESA

The preliminary ESA included a site walkover, limited site history assessment and soil sampling in conjunction with the JKG investigation. At the time of the walkover inspection (23 January 2017), the site was occupied by Penshurst Public School and comprised paved and grassed playground areas, and various buildings used as class rooms and offices. A number of Fibre Cement Fragments (FCF), some of which were subsequently confirmed to be ACM, were observed at the ground surface during the inspection. There were no other visual or olfactory indicators of contamination observed during the inspection.

The preliminary historical assessment indicated that the site was most likely used as an educational establishment from the early 1900s. Zig-zag air raid trenches were evident at the site in 1943 and these were subsequently infilled prior to 1956. The site did not appear to have been used for any potentially contaminating activities, including those activities listed in Table 1 of the Managing Land Contamination, Planning Guidelines SEPP55 – Remediation of Land (1998)⁴.

The preliminary ESA included soil sampling from five boreholes (BH1 to BH5 inclusive) and four test pits (TP101 to TP104 inclusive). A selection of fill samples was analysed for the contaminants of potential concern

⁴ Department of Urban Affairs and Planning, and Environment Protection Authority, (1998). *Managing Land Contamination, Planning Guidelines SEPP55 – Remediation of Land*. (SEPP55 Planning Guidelines)

(CoPC) identified in the Conceptual Site Model (CSM). Samples of FCF collected from the ground surface during the site inspection, and from the soil in TP104, were also analysed for asbestos.

The fill in TP104 was found to contain ACM and elevated carcinogenic polycyclic aromatic hydrocarbons (PAHs) above the human health-based site assessment criterion (SAC) in BH3 and TP103. Total recoverable hydrocarbons (TRH) (F3), were also encountered in fill above the environmental/ecological SAC at two locations.

2.2.2 Preliminary Stage 2 Investigation and Initial RAP

The preliminary Stage 2 investigation included soil sampling from 10 additional boreholes (BH201 to BH210 inclusive) and sampling from one groundwater monitoring well (MW208, installed in BH208) to gather additional data to assess contamination risks and facilitate the preparation of an initial RAP. Asbestos quantification was undertaken on bulk field samples from all boreholes.

The additional soil sampling for the preliminary Stage 2 investigation identified TRH (F3) in fill above the environmental/ecological SAC at two locations. Further occurrence of asbestos and benzo(a)pyrene above the SAC was not identified. Nickel and zinc were identified in groundwater in MW208, however these metals were attributed to regional factors and were not considered to be associated with site-specific contamination impacts.

The initial RAP proposed excavation and off-site disposal of soil within a garden bed area at the TP103 location where the highest concentration of benzo(a)pyrene was identified. Raking and picking of bonded FCF/ACM from the surface soils was also proposed following demolition. The initial RAP outlined the requirement for a data gap investigation following demolition and indicated that an overall assessment of the data was required to confirm the remedial strategy.

2.2.3 DGI and Updated RAP

The DGI was undertaken to address the requirements of the initial RAP and development consent condition B5 of the SSD approval. The DGI included sampling from an additional 17 test pits (TP301 to TP317 inclusive). Following evaluation of the data, the updated remediation strategy focussed on remediation of ACM. Risks from hydrocarbons (PAHs and TRHs) and other contaminants were assessed to be low and did not require remediation.

The DGI concluded that *"....the presence of surficial asbestos and low concentrations of ACM in fill are considered to pose a low risk in the context of the future land use, as the existing surface levels will not be the final levels on completion of the development. Nevertheless, remediation and management of ACM at the surface (i.e. top 0.1m) is required to minimise risks during construction and to reduce the potential for adverse legacy issues during future intrusive works within the proposed school. In the areas where all fill is removed as part of the bulk earthworks, the potential (or actual) presence of ACM will be addressed in the context of waste classification and waste disposal"*.

The DGI included preliminary waste classifications for fill and natural soil/rock. The following was concluded in relation to the fill: *“....a preliminary classification of General Solid Waste (non-putrescible) containing Special Waste (asbestos) applies to the fill soil. This is based on the previous identification of surficial fragments of ACM at the site, the presence of ACM in fill in TP312/TP104, and the presence of demolition waste inclusions throughout the fill.*

There is a potential for this classification to be revised to General Solid Waste (non-putrescible) subject to the development and implementation of a robust inspection and reporting procedure during (and/or prior to the commencement) of excavation. If this is to be attempted, an appropriate plan is to be prepared by the validation consultant (or another appropriately qualified consultant) and reviewed/approved by the site auditor prior to commencement of excavation. Revision of the classification in the vicinity of TP312/TP104 is not recommended, particularly if the surface soils in this area are not remediated for asbestos.

Given the relatively small difference in disposal fees (at some landfills) between General Solid Waste (non-putrescible) containing Special Waste (asbestos) and General Solid Waste (non-putrescible), the client should consult with the other stakeholders to establish whether it is viable to attempt to revise the waste classification for fill.”

In relation to the natural soil/bedrock, the DGI concluded *“....the natural soil and bedrock at the site is likely to meet the definition of VENM for off-site disposal or re-use purposes. Given the presence of manmade contaminants in the overlying fill, this classification must be confirmed following removal of the fill, and prior to off-site disposal or any on-site re-use of the material”.*

The updated RAP addressed development consent condition B5 of the SSD approval and was designed to align with the proposed cut/fill earthworks. Off-site disposal of fill (i.e. historically imported soil) was proposed in the ‘cut zone’ in the high side of the site. Raking and picking of asbestos was proposed in the ‘fill zone’ (i.e. the zone where filling is required as part of the proposed development to raise the levels) in the low and southern sides of the site. The updated RAP acknowledged that additional fill may be excavated and removed from the ‘fill zone’ to optimise the waste classification of excavated natural material during detailed excavation and piling works.

2.2.4 AWMP

The AWMP was prepared to address development consent condition B7 of the SSD approval and to align with the findings of the DGI and the strategy proposed in the updated RAP. The AWMP provided management recommendations for excavation and off-site disposal of fill from the ‘cut zone’ and raking and picking of asbestos in the ‘fill zone’.

The AWMP was subsequently revised based on the findings reported in waste classification letter WC1 and waste classification letter WC2rev1 (summarised in the following section).

2.2.5 Waste Classification Letters WC1 and WC2rev1

The client and principal client (School Infrastructure NSW) requested an alternative approach for waste assessment in an attempt to minimise the disposal costs associated with surplus fill containing asbestos. To facilitate this, JKE undertook an additional waste classification assessment and documented this in waste classification letter WC1 (attached in Appendix J).

For the purpose of waste classification letter WC1, the site was divided into a series of grids to facilitate further assessment of the waste. The waste assessment focussed on those grids that fell within the main building area and excluded the areas to the south of the building area (see Figure 2 in Appendix A).

Within the building area, ACM had previously been identified in three of the grids (3, 10 and 12), therefore further waste classification assessment was not undertaken in these grids. In the remaining grids within the building area, an excavator was used to disturb the top 0.1m of soil and a systematic walkover and visual inspection occurred to check for the presence/absence of visible FCF/ACM. Following the surface inspection, 5-6m long trenches were excavated through the entire fill profile within each grid and the systematic inspection process occurred for the surface of the stockpiled trench spoil and also for the fill along the trench walls. Any observed FCF were collected during the inspection and were analysed for asbestos at the laboratory.

A summary of the additional soil assessment and inspection findings is provided in the table below:

Table 2-2: Findings Documented in Waste Classification Letter WC1

Grid	Findings
1, 2, 4, 5, 6, 7	No visible FCF/ACM in the top 0.1m. No visible FCF/ACM in trench walls or surface of trench spoil.
8	One fragment of ACM in the top 0.1m (sample HWF101 Grid 8). No visible FCF/ACM in trench walls or surface of trench spoil.
9	One FCF in the top 0.1m (sample HWF102 Grid 9). The FCF did not contain asbestos and was therefore not ACM. No visible ACM in trench walls or surface of trench spoil.
11	No visible ACM in the top 0.1m. No visible ACM in trench walls or surface of trench spoil.

Based on the results of the assessment, and at the time of reporting, the fill material was classified as follows:

- Grids 1, 2, 4, 5, 6, 7, 9 and 11 - General Solid Waste (non-putrescible) (Waste Stream 1); and
- Grids 3, 8, 10 and 12 - General Solid Waste (non-putrescible) containing Special Waste (asbestos) (Waste Stream 2).

The report stated that the site validation consultant is to maintain a full-time presence during the excavation works to inspect the excavations and monitor the movement of materials from each relevant grid.

As documented in waste classification letter WC2rev1 (attached in Appendix J), excavation works associated with Waste Stream 1 (General Solid Waste) commenced on 17 July 2019 and the works were inspected by JKE' environmental scientist. The excavation initially included stripping and stockpiling of fill in Grids 1, 2, 4 and 5. During the works, fragments of fibre cement were identified, including one fragment in Grid 1, five clustered fragments on the northern boundary in Grid 4 (these were all together under an area covered by tree stumps that was not accessible during the previous inspections), and one fragment in Grid 5. All fragments were in good condition (i.e. were bonded/non-friable). A selection of fragments was submitted for the analysis and the results are presented in laboratory reports 221234 and 221235 in Appendix J4.

Based on all previous investigation and inspection data, JKE documented in waste classification letter WC2rev1 that further occurrence of FCF (including ACM) in Waste Stream 1 could not be ruled out. A procedure was subsequently proposed to further inspect/treat the waste and confirm the waste classification for each relevant grid. A treatment trial occurred in late September 2019 and continued for several days before being abandoned. This process and the validation results are documented in Section 10.2.1.

Waste classification letter WC3 was prepared to document the waste classification of a relatively small quantity of treated soil remaining at the time in Grids 1 and 2, and to confirm the classification of the remaining in-situ fill as General Solid Waste (non-putrescible) containing Special Waste (asbestos) for off-site disposal purposes. Waste classification letter WC3 effectively superseded waste classification letters WC1 and WC2rev1 at the date of its preparation.

2.2.6 Additional Waste Classification and Asbestos Clearances

Various waste classification documentation and asbestos clearance certificates were prepared throughout the project to address the requirements of the updated RAP and provide the necessary documentation to dispose of the waste. Individual documents are discussed and referenced throughout this report where relevant and attached in Appendix J2.

2.3 Summary of Site Conditions and Environment

2.3.1 Site Description

The site is located in a predominantly residential area of Penshurst and is bound by Forest Road and Arcadia Street to the south and east respectively. Penshurst Park and Hurstville Aquatic Leisure Centre are located approximately 200m to the east of the site.

The regional topography is undulating. The site lies on a gently sloping hillside that falls towards the east and south-east at approximately 3-4° in the vicinity of the site. The site levels appeared were altered to accommodate the former Penshurst Public School and were altered further via cut/fill earthworks to accommodate the new development.

At the time of preparing this report, the development works were in the final stages. The main structures were largely complete and internal fit out was continuing. Civil works were underway in the southern area and the majority of the landscaping was yet to occur.

2.3.2 Summary of Regional Geology and Hydrogeology

Regional geological information presented in the preliminary ESA indicated that the site is underlain by Ashfield Shale of the Wianamatta Group, which typically consists of black to dark grey shale and laminite. Site investigations have identified predominantly clayey fill soils overlying residual clays and siltstone/shale bedrock.

Hydrogeological information reviewed for the preliminary ESA indicated that the regional aquifer on-site and in the areas immediately surrounding the site includes porous, extensive aquifers of low to moderate productivity. There was a total of 12 registered bores within 2,000m of the site. In summary:

- The nearest registered bore was located approximately 1,400m from the site. This was utilised for monitoring purposes; and
- The bores were registered for either monitoring or domestic purposes.

Considering the site geology and the proximity of the registered bores, the proposed development activities at the site (or any site-specific contamination issues) were not expected to impact adjacent groundwater users. The potential for viable groundwater abstraction and use of groundwater at the site or in the immediate vicinity was considered to be low and it is noted that groundwater use is not proposed as part of the development.

Surface water bodies were not identified in the immediate vicinity of the site. The closest, down-gradient surface water body is Renown Creek located approximately 1km to the south of the site. This creek flows into the Georges River. It was considered likely that groundwater flows towards the east and south-east, in sympathy with the topography and towards the nearest down-gradient water bodies.

3 CONCEPTUAL SITE MODEL

3.1 Contaminant of Concern

The contaminant of concern for site remediation was asbestos. Asbestos was identified in non-friable/bonded fragments of ACM in fill and at the ground surface. The risk assessment in the DGI established that PAHs/TRHs posed a low risk and did not warrant remediation.

Investigations identified that asbestos (ACM) concentrations in bulk samples were predominantly 0%w/w (i.e. ACM was absent), with the exception of TP312 which identified asbestos (ACM) at a concentration that marginally exceeded the SAC of 0.01%w/w.

Asbestos was not identified in any soil samples analysed at the laboratory. Although gravimetric analysis was not undertaken to quantify asbestos fines and fibrous asbestos (AF/FA) concentrations, JKE note that the laboratory (EnviroLab) did not detect any asbestos above limit of reporting for the analytical method. Given that EnviroLab also comment when they identify asbestos in soil at concentrations below the limit of reporting, the lack of such comments confirms that there was no AF/FA identified in the samples.

Asbestos air fibre monitoring results during the DGI confirmed there was a low potential for release of asbestos fibres into the air and reported concentrations of <0.01 fibres/mL of air.

3.2 Contaminant Source(s), Receptors and Exposure Pathways

The source of the asbestos was considered to be historically imported fill and/or demolition of former buildings containing fibre cement (ACM) sheeting. The primary receptors included construction workers, future site users and off-site land users.

The exposure mechanism for asbestos include disturbance of asbestos-impacted soil, mobilisation of asbestos fibres into air, and subsequent inhalation of airborne respirable fibres. The potential for exposure was assessed to be low based on the low concentrations of ACM identified at the site and the non-friable nature of the asbestos.

4 IMPLEMENTATION OF UPDATED RAP AND VALIDATION REQUIREMENTS

A summary of the remediation and validation requirements presented in the updated RAP is provided in the following table:

Table 4-1: Summary of Remedial Action and Validation Requirements in Updated RAP

Aspect	Proposed Remedial Actions	Validation Requirements	Comments
Removal of fill from cut zone	Excavate the fill down to the surface of the natural soil, load the soil directly into trucks and dispose of the fill to the assigned landfill.	- Initial inspection required following removal of demountable buildings and Covered Outdoor Learning Area (COLA) to confirm conditions are consistent with expectations for these areas; - Inspection to document that all fill has been removed and natural soil is exposed at the surface; - Surface clearance to be provided by licensed asbestos assessor; - Photographs to be taken; - VENM classification to be provided for natural soil/bedrock; - Horizontal extent of validated area to be surveyed by the earthworks contractor or clients chosen sub-contractor; and - Air monitoring results to be reviewed (if applicable).	Fill was removed from the building area (not just the cut zone) to limit the duration of works involving asbestos disturbance. Documented in Section 5.
Remediation of ACM in remaining fill	Rake and pick ACM from the top 0.1m of surficial soil. Additional validation sampling around TP312 to confirm remedial actions.	Initial inspection required following removal of demountable buildings and COLA to confirm conditions are consistent with expectations for this area. Surface clearance to be provided by licensed asbestos assessor. Field records to be maintained documenting the following: - The extent of each treatment area; - The area identifier; and - Number of passes and the number of ACM fragments identified during each pass (clearly showing zero fragments on the final pass). Surface clearance to be provided by licensed asbestos assessor. Air monitoring results to be reviewed (if applicable). Photographs to be taken. The in-situ sampling/validation around TP312 requires the following documentation: - Test pit logs; - Sample locations shown on a plan; - Weighing scale check documentation; and - Analysis results for ACM fragments.	Soil treatment via raking and picking did not occur due to the extent of fill removal across the majority of the site. Additional in-situ asbestos quantification data was collected to demonstrate that raking and picking the top 0.1m of soil would not materially reduce the risks posed by asbestos in the remaining fill (as documented in Section 6). Additional in-situ validation sampling did not occur around TP312 as all fill in this area was excavated and disposed off-site.

Aspect	Proposed Remedial Actions	Validation Requirements	Comments
Imported materials – VENM backfill	Not applicable.	- Minimum of three samples per source to be analysed for heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc), TRHs, benzene toluene BTEX PAHs, organochlorine pesticides (OCP), organophosphate pesticides (OPPs), polychlorinated biphenyls (PCBs) and asbestos (500mL). Additional analysis may be required depending on site history; - VENM documentation/ report required (should include source site history to demonstrate analytes are appropriate); and - Material to be inspected upon importation to confirm it is free of visible/olfactory indicators of contamination and is consistent with documentation.	VENM was not imported and therefore has not been validated.
Imported materials – engineering materials such as recycled aggregate, road base etc	Not applicable.	- Minimum of three samples per source/material type, or at least one sample per 100m³ (whichever is greater) for heavy metals (as above), TRHs, BTEX, PAHs, PCBs and asbestos (500mL); - Documentation required to confirm material has been classified with reference to a relevant exemption and is fit for purpose on site; - Material to be inspected upon importation to confirm it is free of visible/olfactory indicators of contamination and is consistent with documentation; and - Dockets for imported material to be provided.	Documented in Section 9.
Imported materials – comprising only natural quarried products such as blue metal etc	Not applicable.	- Minimum of one sample per source/material type, or at least one sample per 200m³ (whichever is greater) for heavy metals (as above), TRHs, BTEX PAHs, OCPs, OPPs, PCBs and asbestos (500mL); - Documentation to be provided from the supplier confirming the material is a product comprising only natural material (i.e. quarried product); - Review of quarry POEO licence; - Material to be inspected upon importation to confirm it is free of anthropogenic materials, visible and olfactory indicators of contamination, and is consistent with documentation; and - Dockets for imported material to be provided.	Documented in Section 9.
Imported materials – landscaping materials	Not applicable.	- Minimum of three samples per source/material type for heavy metals (as above), TRHs, BTEX, PAHs, OCPs, OPPs, PCBs and asbestos (500mL); - Documentation required to confirm material has been produced under an appropriate standard and is fit for purpose on site; - Material to be inspected upon importation to confirm it is free of visible/olfactory indicators of contamination and is consistent with documentation; and	Documented in Section 9.

Aspect	Proposed Remedial Actions	Validation Requirements	Comments
		Dockets for imported material to be provided.	

4.1 Validation Methodology and Assessment Criteria

A validation methodology (sampling, analysis and quality plan - SAQP) was prepared with regards to the framework outlined in NEPM (2013) and data quality objectives (DQOs) were established based on the seven-step process. The overarching validation methodology, including the DQOs and subsequent evaluation, is presented in the Appendix C. Specific validation sampling details are also discussed throughout the results sections.

The primary validation assessment criteria (VAC) used throughout the works in relation to human-health risks were as follows:

- No visible asbestos during surface clearance inspections for asbestos; and
- Health Investigation Levels (HILs) and Health Screening Levels (HSLs) for land use Type A as outlined in Schedule B1 of NEPM 2013.

Additional criteria were used for imported materials as outlined in Section 9.

4.2 High-level Summary and Sequence of Works as Executed

A high-level summary of the sequence of remediation and validation tasks is provided below:

- Demolition of former Penshurst Public School;
- Completion of DGI;
- Piling along the western and northern boundaries;
- Excavation and removal of fill from the majority of the building area (see Figure 2 in Appendix A), facilitated by various asbestos clearance inspections and waste classification assessments;
- VENM assessment of the natural soil/rock following removal of fill and prior to commencement of bulk excavation/filling in the building area;
- Bulk cut/fill works, followed by the commencement of construction in the building area;
- Validation of imported materials used during construction;
- Additional validation sampling (asbestos quantification) in the southern area (south of the building area) and in the tree protection zones (TPZs) to facilitate decision-making for remediation; and
- Asbestos clearance inspections and validation of imported landscaping materials south of the building area and in the TPZs.

Remediation and validation details for the above are discussed in the subsequent sections of this report. A site inspection log including photographs and further summary information regarding the works is attached in Appendix D.

5 RESULTS – FILL REMOVAL FROM BUILDING AREA

The results associated with remediation and validation of the building area are outlined in the following subsections. Reference should be made to Appendix E for supporting documentation. The waste classification assessment reports and asbestos clearance certificates are attached in Appendix J.

5.1 Remediation

The remediation included excavation and off-site disposal of fill from the building area. Areas where fill had not been removed include: part of the driveway in the north-eastern corner of the site; the TPZ in the north-eastern corner of the site; and beneath parts of the capping beam along the northern and western boundaries.

Remnant fill/soil surfaces were progressively inspected during the works and asbestos clearances were provided. The asbestos clearances for the north-eastern driveway/TPZ and the capping beam areas include Asbestos Clearance No. 2, Asbestos Clearance No. 13 and Asbestos Clearance No. 14.

5.2 Validation Assessment

The validation assessment is outlined in the following table:

Table 5-1: Validation Summary – Fill Removal from Building Area

Validation Requirement	Assessment / Comment
Initial inspection required following removal of demountable buildings and COLA to confirm conditions are consistent with expectations for these areas.	An inspection occurred following removal/demolition as documented in the inspection log in Appendix D. The conditions were consistent with expectations. An unexpected asbestos find occurred beneath one of the staircase structures in Building A discussed in Section 8.
Inspection to document that all fill has been removed and natural soil is exposed at the surface.	Completed, as documented in waste classification WC4. Some areas of fill remain, as discussed in Section 5.4.
Surface clearance to be provided by licensed asbestos assessor.	Completed, as documented in Asbestos Clearance No. 1, Asbestos Clearance No. 2, Asbestos Clearance No. 3, Asbestos Clearance No. 4, Asbestos Clearance No. 5, Asbestos Clearance No. 13 and Asbestos Clearance No. 14. JKE note that due to project time constraints, some clearances were not undertaken by a licensed asbestos assessor, but rather were carried out by other JKE staff all of whom are deemed to be a 'competent person' experienced with identifying bonded ACM as defined in the Safe Work Australia (2020) <i>How to manage and control asbestos in the work place Code of Practice</i>. This is a minor deviation to the RAP and does not compromise the veracity of the validation data.

Validation Requirement	Assessment / Comment
Photographs to be taken.	Completed, as presented in the above referenced documents and in the inspection log presented in Appendix D.
VENM classification to be provided for natural soil/bedrock.	Completed, as documented in waste classification WC4.
Horizontal extent of validated area to be surveyed by the earthworks contractor or clients chosen sub-contractor.	Not completed. The purpose of the proposed survey was to establish a clear delineation between the 'cut zone' and the 'fill zone'. Given all fill was removed from the building area, there was no need to delineate the cut/fill zone.
Air monitoring results to be reviewed (if applicable).	Completed, as documented in Section 10.1.

5.3 Off-site Disposal of Fill

The fill material was progressively excavated and disposed of off-site. Reference should be made to Section 10.2 for further details regarding waste disposal documentation and regulatory compliance.

5.4 Discussion

Minor amounts of fill remained beneath parts of the capping beam that extends along the northern and western boundaries (as documented in Asbestos Clearance No. 2). There was no FCF observed in the exposed fill during Asbestos Clearance No. 2 and it is noted that the fill beneath the capping beam has since been covered by shotcrete and is not exposed (refer to the final inspection photographs dated 8 January 2021 in Appendix D). On this basis, the remnant fill beneath the capping beam is not considered to pose a risk in relation to asbestos.

Minor amounts of fill also remained in the north-eastern driveway area and in a TPZ in the north-eastern corner of the site adjacent to Arcadia Street (see Figure 2 in Appendix A). Exposed fill/ground surfaces in these areas were inspected as documented in Asbestos Clearance No. 13 and Asbestos Clearance No. 14. There was no visible asbestos observed during these clearances.

The soils in the TPZ and driveway were further validated for asbestos as documented in Section 6. The remaining fill in these areas is considered to pose a low risk to site users and further remediation or removal of fill is not considered to be required to achieve the overall aims and objectives of the remediation.

6 RESULTS – ADDITIONAL ASBESTOS QUANTIFICATION

The results associated with the additional asbestos quantification validation (outside the building area) are outlined in the following subsections. Reference should be made to Appendix F for supporting documentation.

6.1 Background

Based on the investigation data from the preliminary ESA and DGI, observations made throughout the site works involving the excavation and off-site disposal of fill from the building area, and observations made in the southern area following removal of the buildings and COLA, JKE were of the opinion that presence of ACM was not only confined to the surficial soils and remediation of the top 0.1m of soil would not materially reduce the risks posed by ACM. ACM concentrations in the fill remaining on site (based on available data) were below 0.01%w/w for asbestos/ACM.

On that basis, JKE documented in email correspondence to the client and site auditor (dated 13 August 2020) that there were sufficient lines of evidence to conclude that ACM concentrations in fill were low and acceptable, and that asbestos treatment was not required for the remaining fill provided that:

- A surface pick of ACM (rather than treatment of the top 0.1m) occurs in any areas where fill remains, and an asbestos clearance certificate is issued; and
- Any of these areas not subsequently covered in concrete or other hardstand are finished with at least 0.1m of clean imported material (e.g. topsoil, mulch etc).

Based on the Site Auditor's opinion that was provided in response to the above proposal, additional data were collected to support the validation assessment. The additional validation data were collected prior to the commencement of excavation works that were required in the southern area to achieve the design levels. The sampling plan and results are documented in the following subsections.

6.2 Summary of Sampling Analysis and Quality Plan

6.2.1 Soil Sampling Plan and Sampling Methods

The soil sampling plan and procedure is outlined in the following table:

Table 6-1: Soil Sampling Plan and Methodology

Aspect	Input
Sampling Plan and Density	The sampling plan proposed bulk asbestos quantification sampling from 15 locations (AQAV1 to AQAV15 inclusive, as shown on Figure F1 in Appendix F1). AQAV1 was in the TPZ in the north-eastern corner of the site. AQAV2 was in the north-eastern driveway. AQAV3 to AQAV15 were in the southern area of the site and were positioned on grid-based plan with a spacing of approximately 15-20m between each sampling point. The final position of each location was governed to some extent by the sequencing of the site works, underground services and access constraints.

Aspect	Input
	Considering the data collected during the preliminary ESA and the DGI (i.e. data from five boreholes and two test pits in the southern area), the sampling density was considered to be adequate.
Set-out and Sampling Equipment	Locations AQAV1, AQAV7, AQAV13, AQAV14 and AQAV15 were positioned in the TPZs and were hand excavated using a shovel. The remaining locations (except AQAV2) were excavated using a 5T tracked excavator provided by the client's subcontractor. Sampling locations were set out using a tape measure.
Sample Collection and Field Screening	Bulk (10L) samples were collected from the top 0.1m of soil at each location, then from each distinct fill profile (at least every 1m). The field screening for asbestos quantification included the following: • Each sample was weighed using an electronic scale; • Bulk sample was passed through a sieve with a 7.1mm aperture and inspected for the presence of fibre cement. Due to the cohesive nature of the soils, some material was subsequently placed on a contrasting support (blue tarpaulin) and inspected for the presence of fibre cement. Any soil clumps/nodules were disaggregated; • The condition of fibre cement or any other suspected asbestos materials was noted on the field records; and • If observed, any fragments of fibre cement in the bulk sample were collected, placed in a zip-lock bag and assigned a unique identifier. Calculations for asbestos content were undertaken based on the requirements outlined in Schedule B1 of NEPM (2013). A calibration/check of the accuracy of the scale used for weighing the fibre cement fragments was undertaken using a set of calibration weights. Calibration/check records are attached in Appendix F4. The scale used to weigh the 10L samples was not calibrated, however this is not considered significant as this method of providing a weight for the bulk sample is considered to be considerably more accurate than applying a nominal soil density conversion.

6.2.2 Validation Assessment Criteria

The validation assessment criteria adopted was 0.01%w/w asbestos in soil (from ACM).

6.3 Results

6.3.1 Sub-surface Conditions

The subsurface conditions were consistent with observations made during the initial investigations and typically included clayey fill overlying natural (residual) silty clay soils. Surficial fill in the south-eastern areas included some sandy soils with igneous gravels and recycled aggregates associated with materials imported during construction. Reference should be made to the test pit logs in Appendix F2 for further details.

6.3.2 Bulk Field Screening Results

ACM was not identified in any bulk samples. One FCF (observed to be in good condition) was identified in the TPZ at location AQAV14. This was found at a depth of >0.1m and was found in the test pit spoil after completion of the bulk screening at the 0.2-0.6m interval. The FCF was submitted for laboratory analysis.

A summary of the bulk screening results is provided in the following table. The sample weights are shown on the test pit logs.

Table 6-2: Bulk Asbestos Quantification Results

Location	Sample Depths	Asbestos Concentrations in Bulk Samples
AQAV1	0-0.1m, 0.1-0.5m, 0.5-1.1m	0%w/w
AQAV2	0-0.1m	0%w/w
AQAV3	0-0.1m, 0.1-0.2m	0%w/w
AQAV4	0-0.1m, 0.1-0.4m, 0.4-1.0m	0%w/w
AQAV5	0-0.1m, 0.1-0.5m, 0.5-0.7m	0%w/w
AQAV6	0-0.1m, 0.1-0.4m, 0.4-0.8m	0%w/w
AQAV7	0-0.1m, 0.1-0.5m, 0.5-0.7m	0%w/w
AQAV8	0-0.1m, 0.5-1.1m	0%w/w
AQAV9	0-0.1m, 0.1-0.35m, 0.35-0.85m	0%w/w
AQAV10	0-0.1m, 0.1-0.6m	0%w/w
AQAV11	0-0.1m, 0.2-0.5m, 0.5-0.9m, 0.9-1.2	0%w/w
AQAV12	0-0.1m, 0.1-0.3m, 0.3-0.6m	0%w/w
AQAV13	0-0.05m, 0.05-0.3m, 0.3-0.7m, 0.7-0.9m	0%w/w
AQAV14	0-0.1m, 0.1-0.2m, 0.2-0.6m, 0.6-0.85m	0%w/w
AQAV15	0-0.1m, 0.1-0.8m	0%w/w

6.3.3 Laboratory Results

The FCF found in the test pit spoil at location AQAV14 (sample AQAV14 Spoil F1 0.3-0.4m) was submitted for laboratory analysis. The results are presented in Envirolab report 254663 attached in Appendix F3. The fragment contained asbestos and was therefore ACM.

It is noted that the bulk (10L) sample collected from the fill profile in AQAV14 that extended from 0.2m to 0.6m weighed 12.1kg, as indicated on the test pit log in Appendix F2. Although the ACM fragment was not identified in the bulk sample collected from this interval, JKE has carried out a hypothetical calculation assuming this ACM was found in the bulk sample. Based on the bulk sample weight of 12.1kg and the fragment weight of 5.02g, the asbestos concentration in that bulk sample would have been well below the SAC of 0.01% had that ACM been found within the bulk sample. The calculation is based on the following: 0.15 (15% asbestos in ACM) multiplied by 5.02 (ACM weight in g) divided by 12,100 (bulk sample weight in grams) then multiplied by 100, resulting in an asbestos/ACM concentration of 0.0062%w/w.

6.4 Discussion

The additional asbestos quantification sampling confirmed the initial findings that low quantities of ACM may be present in fill in some areas. Considering all available data, the sporadic occurrence of ACM in fill at low concentrations is not considered to pose an unacceptable risk or a risk that warrants on-going management via a long-term environmental management plan (LTEMP).

JKE are of the opinion that the potential for FCF/ACM to be exposed at the ground surface during day-to-day use of the site is very low. JKE consulted with the client and the School Infrastructure NSW project Director and advised them of the findings. It was agreed that the approach of surface pick, asbestos clearance and cover with at least 0.1m of landscaping material or hardstand etc would be acceptable and that the low concentrations of ACM in soil could be managed during any future intrusive works using their established processes under the generic asbestos management plans and asbestos registers etc.

It is noted that following the additional asbestos quantification validation activities, substantial excavation works occurred in the southern area of the site (excluding within the TPZs) to achieve the design levels for the development, and prior to the commencement of landscaping in these areas. This resulted in the excavation and off-site disposal of fill which exposed the natural soils in some areas. Asbestos surface clearances were undertaken throughout this process and there was no visible asbestos observed during any of the clearances. Reference can be made to Asbestos Clearance No. 9, Asbestos Clearance No. 10, Asbestos Clearance No. 11 and Asbestos Clearance No. 14 in Appendix J1.5 for details. The ground surface of the TPZs was also inspected (see Asbestos Clearance No. 14) and there was no asbestos observed.

The southern area and TPZs were subsequently landscaped. This included the placement of at least 0.1m of imported landscaping materials throughout these areas, as documented in Section 7. The north-eastern driveway was subsequently paved with concrete.

Reference should also be made to the overall validation conclusions and recommendations presented in Section 11.

7 RESULTS – TPZ AND REMAINING FILL

The results associated with the TPZs and remaining fill (i.e. outside the building area) are outlined in the following subsections. Reference should be made to Appendix G for supporting documentation. The asbestos clearance certificates are attached in Appendix J.

7.1 Validation Procedures

The validation procedure for the TPZs and the remaining fill (as documented in Section 6) included a surface pick and asbestos clearances, followed by completion of the landscaping and installation of any remaining soft fall or hardstand. The final surface layers were documented via a review of development drawings and spot checks in landscaped areas/TPZs to confirm the minimum 0.1m thick clean cover requirement. At the date of this draft report, these works were largely complete.

As documented in Section 5, fill also remains beneath the capping beam along the northern and western boundaries. This fill is not exposed/accessible.

7.2 Validation Results

7.2.1 Surface Pick and Asbestos Clearances

Asbestos Clearance No. 7 to Asbestos Clearance No. 11 (inclusive) and Asbestos Clearance No. 14 were prepared for the southern parts of the site (attached in Appendix J). There were no visible FCF/ACM observed during any of these clearances. It is understood that no visible ACM was observed during the excavation works that occurred to achieve the design levels in these areas, therefore a pick of FCF/ACM from the surface did not occur.

There was no visible asbestos observed in the fill beneath the capping beam prior to this material being covered by shotcrete (as documented in Asbestos Clearance No. 2).

7.2.2 Validation of Clean Cover Requirements

JKE completed a final site inspection on 8 January 2021. At the time of the inspection, the majority of the landscaping materials had been imported and placed in the relevant areas. JKE completed a walkover inspection of the areas where verification of the minimum 100mm of clean cover was required (including the north-eastern TPZ and the southern parts of the site). Photographs from the inspection are included in the inspection log in Appendix D.

JKE hand-excavated nine locations (C1 to C9 inclusive) to verify the minimum cover thickness had been achieved in the relevant areas. These locations are shown on Figure G1 in Appendix G and included the following:

- C1 to C6 inclusive – mulch cover (forest fines) in the TPZs;
- C7 and C8 – turf underlay in the southern area; and
- C9 – enviro sand in the proposed soft fall area.

The minimum cover requirement of >100mm had been achieved at all nine locations.

A relatively small area of the southern driveway (see Figure G1 in Appendix G) was yet to be covered at the time of the inspection as this area was still being used for access/deliveries. The area was estimated to cover approximately 50m².

A selection of the landscape drawings is included in Appendix G2. This information confirms that the minimum cover of >100mm according to the landscaping specification. The TPZs are not captured in the drawings, however the client advised that the mulch cover requirements were increased from 75mm to >100mm to address the validation requirements. This was checked by JKE as documented above.

7.3 Discussion

A minimum of 100mm of clean cover was to be applied to the landscaped areas where fill remained after the excavation works. The validation demonstrated that this requirement was achieved.

As noted above, a relatively small area of the southern driveway (see Figure G1 in Appendix G) was yet to be covered at the time of the final JKE inspection as this area was still being used for access/deliveries. The area was estimated to cover approximately 50m². As this area was relatively limited, and as the area is proposed to be landscaped when possible (and prior to occupation/use of the site), it is not considered significant in the overall context of the site validation that the landscaping materials had not been placed and verified in this area at the date of the inspection. It is noted that this area was captured by Asbestos Clearance No. 14.

8 RESULTS - UNEXPECTED FINDS

There was one unexpected find during project which included a 'cluster' of FCF/ACM found at the surface beneath the stairwell of the former Building A during demolition. This occurred in May 2019. A summary of the remedial actions and validation documentation is provided below. The documentation associated with the unexpected find is presented in Appendix H.

8.1 Summary of Remedial Actions and Documentation

The cluster of FCF/ACM and the surrounding soil was consolidated into a small stockpile, covered with builder's plastic and isolated using temporary fencing. Photographs are included in the inspection log in Appendix D. The location of the find is shown on Figure H1 in Appendix H1.

The waste (total quantity 27.26t) was disposed to the Genesis Eastern Creek Landfill (Dial A Dump Industries) on 30 May 2019. The contractor's sub-consultant, P. Clifton & Associates Pty Ltd, completed a waste classification assessment and an asbestos clearance inspection beneath the stockpile. The clearance and waste documentation are included in Appendix H2 and Appendix H3. Asbestos and waste-related compliance is discussed further in Section 10.

8.2 Discussion

The unexpected find was identified in an area of the site where a fragment of ACM had previously been identified in fill during the DGI. Whilst the cluster of ACM was unexpected based on other observations/findings to that point in time, the occurrence of ACM in the area was not unexpected. The find was appropriately managed with regards to the requirements of the RAP.

9 RESULTS – IMPORTED MATERIALS

The results associated with the validation of imported materials are outlined in the following subsections. Reference should be made to Appendix I which includes the relevant documentation. Reference is also to be made to the inspection log presented in Appendix D for photographs and inspection observations.

9.1 Summary of Sampling and Analysis Plan

Section 12.1 of the updated RAP outlined the validation requirements for imported materials. These requirements are also summarised in Section 4.

9.1.1 Sampling Plan

The sampling plan and procedures for imported materials is outlined in the following table:

Table 9-1: Soil Sampling Plan and Methodology – Imported Materials

Aspect	Input
Sampling Plan and Density	As per the updated RAP, the sampling plan included: a minimum of three samples per source or at least one sample per 100m ³ (whichever is greater) for recycled engineering materials; a minimum of three samples per source or at least one sample per 200m ³ (whichever is greater) for quarried (natural source) engineering materials; and a minimum of three samples per source for landscaping materials.
Sampling Equipment	Samples were collected directly by hand from a depth of approximately 0.1-0.2m below the surface of the stockpiles.
Sample Collection and Field QA/QC	Soil samples were obtained in accordance with standard field procedures. Samples were placed in glass jars with plastic caps and teflon seals with minimal headspace. Samples for asbestos analysis were placed in zip-lock plastic bags. During sampling, soil at selected depths was split into primary and duplicate samples for field QA/QC analysis. The field splitting procedure included splitting the soil by hand and alternately filling the sampling containers to obtain a representative split sample.
Field Screening	A portable Photoionisation Detector (PID) fitted with a 10.6mV lamp was used to screen the samples for the presence of volatile organic compounds (VOCs). PID screening for VOCs was undertaken on soil samples using the soil sample headspace method. VOC data was obtained from partly filled zip-lock plastic bags following equilibration of the headspace gases. PID calibration records are maintained on file by JKE. A consolidated calibration certificate is included in Appendix L. The material being sampled was visually inspected during the works for the presence of FCF.
Decontamination and Sample Preservation	Sampling personnel used disposable nitrile gloves during sampling activities. Re-usable sampling equipment was not used therefore decontamination did not occur. Soil samples were preserved by immediate storage in an insulated sample container with ice or ice bricks. On completion of the fieldwork, some samples were stored temporarily in fridges in the JKE warehouse before being delivered in the insulated sample container to a NATA registered laboratory for analysis under standard chain of custody (COC) procedures.

9.1.2 Validation Assessment Criteria

The VAC for imported materials were described as follows in the updated RAP: *“Heavy metal concentrations are to be consistent with background concentrations and/or those concentrations specified under any relevant exemptions. Organic compounds to be less than the laboratory PQLs and asbestos to be absent. Results for VENM and other imported materials will need to be consistent with expectations for those materials. Aesthetics: soils to be free of staining and odours.”*

For screening purposes, we have adopted the background values for old suburbs in high traffic areas presented in the document titled Trace Element Concentrations in Soils from Rural and Urban Areas of Australia (1995)⁵.

Although not a requirement specified in the updated RAP, the auditor requested that the results for imported materials be screened against the generic land use criteria for assessment of human health and ecological risks, as outlined in the DGI. These include the following and are based on the criteria in Schedule B1 of NEPM 2013:

- HIL-A for a ‘residential with accessible soils’ exposure scenario which is applicable for primary schools;
- HSL-A/B for a ‘low-high density residential’ exposure scenario. HSLs were calculated based on conservative assumptions including a ‘sand’ type and a depth interval of 0m to 1m;
- HSLs for direct contact presented in the CRC Care Technical Report No. 10 – Health screening levels for hydrocarbons in soil and groundwater Part 1: Technical development document (2011)⁶;
- Asbestos in soil samples were assessed as present/absent;
- Ecological Investigation Levels (EILs) and Ecological Screening Levels (ESLs) for an ‘urban residential and public open space’ (URPOS) exposure scenario. The criterion for benzo(a)pyrene has been increased from the value presented in NEPM (2013) based on the Canadian Soil Quality Guidelines⁷. ESLs were adopted based on the soil type (i.e. coarse/fine);
- EILs for selected metals were calculated using site specific soil parameters for pH and cation exchange capacity presented in the DGI (pH of 6.8 and CEC of 14 cmol_c/kg). These data were used to select the added contaminant limit (ACL) values presented in Schedule B(1) of NEPM (2013). Published ambient background concentration (ABC) presented in the document titled Trace Element Concentrations in Soils from Rural and Urban Areas of Australia (1995)⁸ were also adopted; and
- Management limits for petroleum hydrocarbons

The VAC are presented in the summary tables in Appendix I1.

⁵ Olszowy, H., Torr, P., and Imray, P., (1995), *Trace Element Concentrations in Soils from Rural and Urban Areas of Australia. Contaminated Sites Monograph Series No. 4.* Department of Human Services and Health, Environment Protection Agency, and South Australian Health Commission

⁶ Cooperative Research Centre for Contamination Assessment and Remediation of the Environment (CRC Care), (2011). Technical Report No. 10 - *Health screening levels for hydrocarbons in soil and groundwater Part 1: Technical development document*

⁷ Canadian Council of Ministers of the Environment, (1999). *Canadian soil quality guidelines for the protection of environmental and human health: Benzo(a)Pyrene (1997)* (referred to as the Canadian Soil Quality Guidelines)

⁸ Olszowy, H., Torr, P., and Imray, P., (1995), *Trace Element Concentrations in Soils from Rural and Urban Areas of Australia. Contaminated Sites Monograph Series No. 4.* Department of Human Services and Health, Environment Protection Agency, and South Australian Health Commission.

9.2 Results

A summary of the imported 'engineering materials' (i.e. excluding landscaping materials) is provided in the following table and the validation results for each specific material are provided in the following subsections:

Table 9-2: Landscaping Material Summary

Material	Description and Intended Use	Supplier Details	Samples	Approximate Quantity Imported
Source 1 – 40/70	Coarse recycled gravel, utilised for temporary placement in driveway areas during construction	Metropolitan Demolition and Recycling Pty Ltd, 396 Princes Highway St Peters, NSW 2044.	No samples	39.4m ³
Source 2 – DGB Recycled	Recycled gravel, used beneath pavements in external building areas (e.g. the car park)	Operating under EPL 11483	DGB20 V1 to DGB20 V7 inclusive	873.6m ³
Source 3 – 10mm Recycled	Recycled gravel, used beneath building slabs		10mm V1 to 10mm V3 inclusive	320.4m ³
Source 4 – Blue Quarry Sand (Natural Quarry Product)	Natural quarry sand used to backfill hydraulic service trenches	Lynwood Quarry operated by HOLCIM (Australia) Pty Ltd. Operating under EPL 12939	BQS V1 BQS V2	187.7t
Source 5 – 10mm Drainage (Natural Quarry Product)	Natural quarry gravel used to backfill hydraulic service trenches	Albion Park quarry operated by Cleary Bros Pty Ltd. Operating under EPL 299	10mmD V1 10mmD V2	447t

9.2.1 Source 1 – 40/70

Aggregate (40/70mm) was imported from the Metropolitan Demolition and Recycling Facility in St Peters to place beneath the cattle grids at the site entry and exist points. Due to the coarse nature of the material, samples were not collected. Given that JKE were only advised of the importation after it had occurred, we carried out a visual inspection of the material only. There were no indicators of contamination such as staining, odours or FCF.

A register for the imported 40/70 was maintained by the client's subcontractor and was provided to JKE along with the dockets. This information is included in Appendix I3.1.

The client provided a copy of a resource recovery exemption and order relating to the material and the source facility (Metropolitan Demolition and Recycling) which operates under EPL 11483. A copy of the order/exemption is provided in Appendix I4.1 and also relates to the recycled DGB and 10mm recycled aggregate as discussed in the subsequent sections.

The 40/70 was progressively excavated and disposed with the GSW asbestos and was not disposed off-site as a separate waste stream (as discussed in Section 10).

9.2.2 Source 2 – DGB Recycled

Recycled DGB was imported from the Metropolitan Demolition and Recycling Facility in St Peters to place beneath the hardstand areas (i.e. paved areas outside the main building footprint). Samples of this material were progressively collected (samples DGB20 V1 to DGB20 V7) and were analysed as required in the updated RAP. The results were compared to the specific recovered aggregate order as outlined in Table A1 in Appendix I1. The results were also assessed against the human health and ecological-based VAC as outlined in Tables A3 to A7 inclusive in Appendix I1. All results were below the VAC. Asbestos was not detected in any of the samples.

The laboratory reports are attached in Appendix I2 and it is noted that Table A1 in Appendix I1 includes the respective laboratory report reference applicable to each validation sample.

It is noted that the recovered aggregate order (see Appendix I4) does not include criteria for organics. Detectable concentrations of mid to heavy fraction TRHs and some PAH compounds were encountered in some samples, however these concentrations were minor and were not unexpected in recycled materials.

A register for the imported recycled DGB was maintained by the client's subcontractor and was provided to JKE along with the dockets. This information is included in Appendix I3.2.

The recycled DGB was inspected periodically throughout the project as documented in the inspection log presented in Appendix D. There were no indicators of contamination such as staining, odours or FCF.

9.2.3 Source 3 – 10mm Recycled

Recycled 10mm aggregate was imported from the Metropolitan Demolition and Recycling Facility in St Peters to place beneath the buildings. Samples of this material were progressively collected (samples 10mm V1 to 10mm V3 inclusive) and were analysed as required under the updated RAP. The results were compared to the specific recovered aggregate order as outlined in Table A1 in Appendix I1. The results were also assessed against the human health and ecological-based VAC as outlined in Tables A3 to A7 inclusive in Appendix I1. All results were below the VAC. Asbestos was not detected in any of the samples.

It is noted that the recovered aggregate order (see Appendix I4.1) does not include criteria for organic contaminants. Detectable concentrations of mid to heavy fraction TRHs and some PAH compounds were encountered in some samples, however these concentrations were minor (i.e. they were below the human

health and ecological-based VAC) and were not unexpected in recycled materials. A minor detection (i.e. below the human health and ecological-based VAC) of the OCP compound HCB was also detected in one sample. The HCB concentrations was only marginally above the laboratory PQL.

The laboratory reports are attached in Appendix I2 and it is noted that Table A1 in Appendix I1 includes the respective laboratory report reference applicable to each validation sample.

A register for the imported recycled 10mm aggregate was maintained by the client's subcontractor and was provided to JKE along with the dockets. This information is included in Appendix I3.3.

The 10mm recycled aggregate was inspected periodically throughout the project as documented in the inspection log presented in Appendix D. There were no indicators of contamination such as staining, odours or FCF.

9.2.4 Source 4 – Blue Quarry Sand (Natural Quarry Product)

Blue quarry sand (a natural product understood to be produced from crushed granite) was imported via distribution centre in Rooty Hill, with the raw materials sourced from the Lynwood Quarry. This material was used by the plumbing contractor for backfilling hydraulic services trenches. Lynwood Quarry is operated by HOLCIM (Australia) Pty Ltd under EPL 12939.

Samples of the blue quarry sand were collected (samples BQS V1 and BQS V2) and were analysed as required under the updated RAP. As this material was not a waste, there was no relevant resource recovery order/exemption. However, for completeness, the results were compared to the imported engineering material criteria outlined in Table A1 (Appendix I1). The results were also assessed against the human health and ecological-based VAC as outlined in Tables A3 to A7 inclusive in Appendix I1. All heavy metals concentrations were low and below the VAC. Organic contaminants were not detected above the laboratory PQLs (i.e. were also below the VAC) and asbestos was not detected.

The laboratory reports are attached in Appendix I2 and it is noted that Table A1 in Appendix I1 includes the respective laboratory report reference applicable to each validation sample.

A register for the imported blue quarry sand was maintained by the client's subcontractor and was provided to JKE along with the dockets. This information is included in Appendix I3.4.

The blue quarry sand was inspected periodically throughout the project as documented in the inspection log presented in Appendix D. There were no indicators of contamination such as staining, odours or FCF. All material inspected was consistent with a natural quarry product and contained no recycled waste.

9.2.5 Source 5 – 10mm Drainage (Natural Quarry Product)

10mm drainage gravel (a natural product understood to be produced from crushed granite) was imported from a quarry in Albion Park. This material was used by the plumbing contractor for backfilling hydraulic services trenches. The Albion Park quarry is operated by Cleary Bros Pty Ltd under EPL 299.

Samples of the 10mm drainage gravel were collected (samples 10mmD V1 and 10mmD V2) and were analysed as required under the updated RAP. As this material was not a waste, there was no relevant resource recovery order/exemption. However, for completeness, the results were compared to the imported engineering material criteria outlined in Table A1 (Appendix I1). The results were also assessed against the human health and ecological-based VAC as outlined in Tables A3 to A7 inclusive in Appendix I1. All heavy metals concentrations were low and below the VAC. Organic contaminants were not detected above the laboratory PQLs (i.e. were also below the VAC) and asbestos was not detected.

The laboratory reports are attached in Appendix I2 and it is noted that Table A1 in Appendix I1 includes the respective laboratory report reference applicable to each validation sample.

A register for the imported 10mm drainage gravel was maintained by the client's subcontractor and was provided to JKE along with the dockets. This information is included in Appendix I3.4.

The 10mm drainage gravel was inspected periodically throughout the project as documented in the inspection log presented in Appendix D. There were no indicators of contamination such as staining, odours or FCF. All material inspected was consistent with a natural quarry product and contained no recycled waste.

9.2.6 Landscaping Materials

Various materials are to be imported as part of the landscaping works. Details of these materials and the sampling that has occurred to date are summarised in the following table:

Table 9-3: Landscaping Material Summary

Material	Description and Intended Use	Supplier Details	Samples	Approximate Quantity Imported
Organic garden mix	Blend of soil, coarse sand, composted sawdust, composted pine bark, spent coffee grounds and composted organics. Use: garden beds (on grade).	Australian Native Landscapes, 210 Martin Road, Badgerys Creek NSW.	OGM1 OGM2 OGM3	125.5m ³
Planter box mix	Blend of soil, graded ash, coarse sand, Nepean sand, composted sawdust, Botany Humus Mix and Composted Pine Bark. Use: planter pots levels 1 and 3.	Operating under EPL 5625. Some material distributed via Skippens Landscape and	PBM 1 PBM 2 PBM 3	22m ³
Turf underlay	Blend of sand, soil, composted organics. Free draining medium.		TU 1 TU 2 TU 3	13m ³

Material	Description and Intended Use	Supplier Details	Samples	Approximate Quantity Imported
	Use: turf (on grade).	Building Supplies		
Forest fines(mulch)	Fine (15mm) 100% recycled Grade a wood waste. Use: all gardens.		Inspection only	28m ³
Enviro sand	A crushed recycled bedding/fill sand. Use: synthetic turf base course (southern area).	Concrete Recyclers Depot 300 Captain Cook Drive, Kurnell NSW. It is understood the depot does not operate under an EPL as the material is produced in the Camellia facility operating under EPL 6664.	ES1 ES2 ES3	34.45t
ACI dry sand (kiln dried sand)	Dried sand. Use: synthetic turf infill (southern area).	BC Sands Depo 26 Atkinson Road, Taren Point. It is understood the depot does not operate under an EPL. We were unable to ascertain where the material was originally sourced/ produced	ADS 1 ADS 2 ADS 3	5m ³

Samples were collected from the imported landscaping materials at the respective source facilities and were analysed as required in the updated RAP. The results were compared to the imported landscaping material criteria outlined in Table A2 (Appendix I1). The results were also assessed against the human health and ecological-based VAC as outlined in Tables A3 to A7 inclusive in Appendix I1. Although some of the imported materials sources to be utilised for landscaping are engineering materials (i.e. enviro sand and ACI dry sand), all laboratory data has been compared to the landscaping VAC.

Chromium, copper, nickel and/or zinc were detected in organic garden mix and planter box mix above the VAC (i.e. the nominated background criteria in Table A2). Traces of PAHs and detections of mid to heavy

fraction TRHs were also detected in the organic garden mix, turf underlay and planter box mix at concentrations above the VAC (i.e. the laboratory PQLs in Table A2).

In relation to the human health and ecological-based VAC, the following exceedances were reported:

- TRH F3 above the management limit VAC (see Table A5 in Appendix I1) in the planter box mix sample PBM 3. The reported concentration of 2,600mg/kg was only marginally above the VAC of 2,500mg/kg; and
- TRH F3 above the ESL URPOS VAC (see Table A7 in Appendix I1) in the organic garden mix samples (OGM1, OGM2 and OGM3), turf underlay samples (TU 1, TU2 and TU3), and planter box mix samples (PBM 1, PBM 2 and PBM 3).

The laboratory reports are attached in Appendix I2 and it is noted that Table A1 in Appendix I1 includes the respective laboratory report reference applicable to each validation sample.

It is understood that as of 8 January 2021, all landscaping materials had been imported. JKE carried out various inspections of the imported landscaping materials upon importation to the site as documented in Appendix D. There were no indicators of contamination such as staining, odours or FCF. All material inspected was consistent with expectations.

At the time of our final inspection on 8 January 2021, the load of the ACI dry sand had not been delivered. This material was delivered later that day and was inspected and photographed by the client.

9.3 Validation Assessment

The validation assessment for imported materials is outlined in the following table:

Table 9-4: Validation Summary – Imported Materials

Validation Requirement	Assessment / Comment
Sampling for the analytes and at the frequencies specified in the updated RAP.	Completed.
Review of supplier documentation and EPL. Material inspected upon importation.	Completed. The inspection of the ACI dry sand was completed by the client and photographs were supplied to JKE. This was considered to be acceptable.
Dockets for imported materials to be provided.	Completed.

9.4 Discussion

Exceedances of the VAC occurred for most imported materials. JKE are of the opinion that these exceedances do not preclude the importation of the materials to site. Detections of heavy metals, PAHs and TRHs are not uncommon in blended/manufactured landscaping materials. The elevated TRHs are considered likely to be associated with organic materials rather than petroleum. This is supported by the lack of petroleum odours,

staining and low PID results for the samples. Traces of PAHs are also not uncommon and are likely to be attributed to ash and other organic material in the samples.

It is noted that some samples of the imported recycled materials were not analysed for 500ml asbestos during first round. This was a scheduling error made by JKE and was subsequently rectified during the later sampling/analysis rounds.

JKE has reviewed a representative portion (approximately 40-50%) of the imported materials dockets provided with the registers to date and we consider that the dockets adequately correlate with the registers.

It is noted that a 20mm drainage product was also imported from the Albion Park quarry. Sampling/analysis of this material did not occur as JKE were not advised that two coarse gravels were being imported from this source. Based on the fact that the 20mm drainage material is a natural quarry product, there is considered to be a low potential for the material to be impacted by contamination.

10 WASTE MANAGEMENT AND REGULATORY COMPLIANCE

Details regarding regulatory compliance for asbestos management and waste disposal are provided in the following subsections. Reference should be made to Appendix J which includes the relevant supporting documents and waste disposal dockets.

10.1 Asbestos Removal Works

EIS (JKE) prepared an Asbestos Works Management Plan (AWMP) for the project. A copy of the AWMP is included in Appendix J1.1. The AWMP was prepared prior to the decision being made to dispose of all fill from the building area, however the AWMP was not updated after that decision was made as the plan already included suitable provisions for managing such works. The client's subcontractor also completed an Asbestos Removal Control Plan (ARCP) which was attached to the AWMP.

The client's subcontractor utilised P. Clifton & Associates Pty Ltd for asbestos air fibre monitoring and to complete various asbestos clearances to facilitate safe working conditions throughout the piling and fill excavation/removal. Copies of the clearance certificates and air monitoring reports are included in Appendix J1.2 and Appendix J1.3 respectively. JKE has completed a high-level review of this information and note that:

- The dates of the asbestos air fibre monitoring correlate with the dates of fill disturbance and fill removal from the site. There was a small quantity of fill (GSW Asbestos) disposed off-site on 9 December 2020 (two loads), 10 December 2020 (one load) and 11 December 2020 (one load) when asbestos air monitoring did not occur. This was an error made by the subcontractor and was deemed by JKE to be a minor non-conformance. However, given the waste was generated from the area to the south of the building where the additional validation sampling found no asbestos (as documented in Section 6) this non-conformance is not considered to be of concern and does not alter the overall conclusions of the site validation;
- With the exception of one result for the asbestos air fibre monitoring that report a concentration of 0.01fibres/ml, all reported concentrations throughout the project were <0.01fibres/ml. These results are consistent with expectations based on the non-friable nature of asbestos and the infrequent occurrence of ACM in the fill; and
- The asbestos clearance certificates were largely prepared to facilitate safe working conditions and have not been relied upon for the purpose of the overall validation assessment.

The asbestos removal was undertaken by Remedial Civil Solutions Pty Ltd who have a current Asbestos Removal Licence (No. AD212137). A notice (dated 2 July 2019) of the intent to remove non-friable asbestos was submitted to SafeWork NSW. A copy of the removal licence and notification is attached in Appendix J1.4. It is noted that the date for completion of the original removal works was exceeded. JKE were not supplied with an updated notice.

JKE also carried out numerous asbestos clearances as referenced in Section 1.4. The JKE asbestos clearance certificates are attached in Appendix J1.5.

10.2 Off-Site Disposal of Waste

JKE completed additional inspections, sampling and analysis of fill/soil to facilitate the off-site disposal of waste for the project. All waste classification documents are referenced in Section 1.4 and the waste classification reports/letters are attached in Appendix J2.

10.2.1 Waste Treatment

10.2.1.1 Treatment and Validation Process

As noted in Section 2.2.5, a treatment trial commenced to assess and remove visible fibre cement from fill in a section of the established grids. Waste classification letter WC2rev1 proposed the following procedure for the fill in Grids 1, 2, 4, 5, 6, 7, 9 and 11:

- The fill is to be stripped and stockpiled within each respective grid (it was noted that this had largely occurred already in Grids 1, 2, 4 and 5);
- An excavator equipped with a shaker bucket (or similar) is to be used to facilitate the inspection of the stockpiled soil via the following procedure:
 - The area adjacent to the stockpile is to be stripped back to natural ground level (i.e. so natural clayey soil is exposed at the surface);
 - The excavator is to collect a bucket of soil from the stockpile and shake/spread the soil onto the adjacent area. This will result in the soil being spread out thinly to facilitate a thorough visual inspection;
 - The soil from each bucket will then be inspected by the JKE environmental scientist and the contractor's asbestos supervisor concurrently. Any fragments of fibre cement will be collected and appropriately stored during the process, then disposed of in accordance with the requirements already documented for the project;
- Every 30-50m³ 'parcel' of inspected material will be validated via bulk sampling/screening. Where the bulk sampling/screening confirms there is no fibre cement, the material will be deemed to have passed the visual assessment. If the bulk sampling/screening identifies fibre cement, the 30-50m³ parcel of inspected soil is to be placed back with the stockpile of soil yet to be assessed, reinspected via the above steps, and re-validated; and
- On completion, the inspected soil from each grid will be disposed off-site under the appropriate waste classification.

The following validation documentation was maintained for each relevant grid with respect to the additional visual assessment procedure (in addition to the validation already proposed in the updated RAP):

- Inspection dates and times;
- A unique parcel identifier for each 30-50m³ parcel of inspected material;
- The number of FCF collected from each parcel;
- The bulk sampling/screening results for each parcel. Each bulk screening sample is to be a minimum volume of 10L (confirmed on the field documentation) and is to be screened through a 7mm sieve or disaggregated on a contrasting support. The soil sample weight will not be recorded as the validation will be based on presence/absence of fibre cement (i.e. asbestos concentrations will not be calculated);

- A letter documenting compliance with the visual inspection procedure and validation sampling for each relevant grid; and
- Date of waste removal associated with each grid.

10.2.1.2 Treatment Results

A treatment trial commenced in Grids 1 and 2 in late July/early August 2019. The purpose of the trial was to establish the viability of the treatment method. As the fill had already been scraped up and consolidated in large stockpiles in the southern parts of Grids 1 and 2, the method of treating 30-50m³ parcels was abandoned. Alternatively, the treatment occurred on smaller parcels excavated directly from the larger stockpile. These smaller parcels were generally 6-12m³ in volume.

A copy of the field records is attached in Appendix J3. Treatment in Grid 1 occurred on 31 July 2019, and on 1, 2, 6, 7, 8, 9 August 2019. Treatment in Grid 2 occurred on 9 and 12 August 2019. Reference is to be made to the summary table below:

Table 10-1: Grids 1 and 2 – Treatment Summary

Number of Parcels	Estimate Volume (approximate)	Treatment Results
Grid 1 70 parcels (G1 P1 to G1 P70 inclusive)	895-1,128	Approximately 41 fragments of FCF/suspected ACM were removed during the treatment process. All fragments were in good condition and were deemed to be non-friable. Parcels G1 P16 and G1 P37 failed the bulk validation and were returned to the larger stockpile for re-treatment/re-inspection. Parcel G1 P25 was also rejected and re-treated, although this was due to a request from the field scientist due to the shaking method being rushed which reduced confidence in the treatment process.
Grid 2 20 parcels (G2 P1 to G2 P20 inclusive)	180-245	Approximately 31 fragments of FCF/suspected ACM were removed during the treatment process. All fragments were in good condition and were deemed to be non-friable. Parcel G2 P10 failed the bulk validation and were returned to the larger stockpile for re-treatment/re-inspection. The treatment trial ceased at G2 P20 at the request of the client as the procedure was not economically viable.

It is noted that two FCF found during the initial exploration of the grids (prior to treatment) were analysed for asbestos. These results have been attached in Appendix J4 for completeness.

10.2.2 Disposal of GSW

Due to the timing and sequencing of the site works, treatment trial and disposal requirements, it is understood that the GSW treated from Grids 1 and 2 were disposed utilising waste classification letter WC1 and waste classification letter WC3. The waste disposal register and waste dockets supplied by the client are attached in Appendix J5.1 and J5.2 respectively. Supporting documentation from the receiving facility is attached in Appendix J6.

The register indicates that approximately 880 tonnes of general solid waste (GSW) was disposed to the Breen Resources landfill in Kurnell. The landfill operates under EPL 4608. The documentation in Appendix J6 indicates that waste was accepted by the facility and was disposed to landfill (not recycled).

10.2.3 Disposal of GSW Asbestos

The waste disposal register and waste dockets supplied by the client are attached in Appendix J5.1 and J5.2 respectively. Supporting documentation from the receiving facilities is attached in Appendix J6.

The register indicates that approximately 6,862 tonnes of general solid waste containing asbestos (GSW A) was disposed to the Cleanaway (Enviroguard) landfill in Erskine Park. The landfill operates under EPL 4865. The documentation in Appendix J6 indicates that waste was accepted by the facility. The tonnage in the initial acceptance letter (1,200 tonnes) was substantially exceeded due to the changing scope of the project. An updated letter was not sought by the client's subcontractor.

The register indicates that approximately 5,763 tonnes of GSW A was disposed to the Dial a Dump (Bingo) / Genesis landfill in Eastern Creek. The landfill operates under EPL 13426. The documentation in Appendix J6 indicates that waste was accepted by the facility. The tonnage in the initial acceptance letter (5,000 tonnes) was marginally exceeded due to the changing scope of the project. An updated letter was not sought by the client's subcontractor.

10.2.4 Disposal of VENM

Waste classification letter WC4 was prepared to facilitate the off-site disposal of surplus VENM. Natural soils/bedrock excavated from the site was used as fill in the eastern areas. The excavation of natural soil/bedrock occurred in the western and northern sections of the site (as noted in Section 1.1).

Surplus excavated natural clayey soils and siltstone bedrock was disposed as VENM to various properties/facilities as documented in Appendix J5.3. Quantities of VENM were not recorded, although the number of loads were recorded on the run sheets.

The client's subcontractor advised that approximately 8,000t of VENM was disposed off-site based on an estimated 266 truck and dog loads of approximately 30t per load. Approximately 3,300t of natural

soil/bedrock sourced from the western (cut) areas on site was used as fill in the eastern areas of the site. Supporting documentation provided by the client's subcontractor is included in Appendix J5.3.

10.3 Discussion of Waste Compliance and Waste Quantities

Based on an overall review of the documentation supplied by the client/subcontractors and the waste classification reports prepared by JKE:

- There were discrepancies between quantities documented in the waste classification reports and the waste quantities disposed to landfill. In relation to the GSW A waste stream, the increase in quantities is likely to be attributed to:
 - The additional material generated via piling along the western and northern boundaries that included a mixed waste stream of VENM and GSW A (and therefore defaulted to the GSW A classification);
 - Difficulties associated with completely removing the GSW A from the underlying VENM due to service trenches, the former zig zag air raid trenches and former foundations/footings;
 - Project timing constraints in the southern area of the site which were not conducive to separating the overlying GSW A from the underlying VENM in some areas, especially where fill depths were variable and separation of the waste streams was difficult (and therefore all material defaulted to the GSW A classification);
- The total volume of treated material (GSW) recorded on the field logs was higher than what was expected based on the actual tonnage of GSW that was disposed. This disparity is likely to be due to the fact that the treated soil volumes were estimates made in the field on uncompacted material;
- The receiving facilities were licenced to receive the GSW and GSW A waste streams and were satisfied with the waste classification documentation supplied for the project;
- Regarding the WasteLocate information, we note:
 - There was a total of 452 entries on the WasteLocate register dating from 22 July 2019 to 11 December 2020. The date range generally correlates with the waste register;
 - Of the 452 WasteLocate entries, 15 had nominated pick-up dates/consignments where the pick-up never occurred. This can happen as pick-ups are often registered the day prior to collection and occasionally there is less material to be transported than anticipated;
 - The waste register includes a total of 462 asbestos loads/dockets. Considering the points above, this indicates that there were 25 asbestos waste disposal dockets (~5%) where there is no WasteLocate consignment;
 - Of the 436 loads where a collection occurred, 57 (~13%) had no delivery confirmation. The client's subcontractor advised that this was due to driver error, with the drivers not properly registering their deliveries. JKE cross-checked the weighbridge dockets for a sample (approximately 50%) of these entries and found that in all instances the waste dockets were supplied. This confirms the waste was disposed of to licensed facilities. In our view this supports the subcontractor's explanation of driver error and does not indicate that there was a systematic attempt to dispose of waste contrary to the regulations.
- The quantities of GSW disposed under waste classification letter WC6 exceeded the estimated quantity of waste covered by the documentation. It is understood that additional material generated during localised excavations late in the project from the building area (i.e. the areas where all fill had

previously been removed and the areas had been cleared for asbestos) was added to the stockpile and loaded out concurrently. Hence the increase in waste volume;

- The GSW A covered by waste classification letter WC7 was consolidated with additional GSW A excavated from the southern area. Therefore, the total quantity appears higher than what was documented in the initial letter; and
- The VENM waste quantity and the quantity of re-used, site-won natural soil/bedrock, are considered to be broadly consistent with expectations based on our initial understanding of the bulk earthworks requirements for the project.

10.4 Duty to Report Contamination

An evaluation of the remediation and validation in relation to the NSW EPA Guidelines on the Duty to Report Contamination under Section 60 of the CLM Act 1997 (2015)⁹ was undertaken as part of the validation assessment. JKE are of the opinion that the notification triggers have not been met and therefore there is no duty to report to the EPA.

10.5 Remediation Category / SEPP55

We understand the remediation was Category 1 and was approved under SSD 8365 (dated 26 February 2019). Notice of completion of remediation works is required under Clauses 17 and 18 of SEPP55.

⁹ NSW EPA, (2015). *Guidelines on the Duty to Report Contamination under Section 60 of the CLM Act 1997*. (referred to as Duty to Report Contamination)

11 CONCLUSIONS AND RECOMMENDATIONS

11.1 Summary of Findings

The DGI confirmed that the primary driver for the remediation was the presence of non-friable ACM in fill. The remedial approach was simplified by excavating the fill from the majority of the site and disposing of the fill to licenced landfills. A series of asbestos clearance inspections/certificates were undertaken/issued to validate these areas as documented in this report.

Areas where fill remained were validated for asbestos/ACM via sampling/quantification and ACM was found to be absent or at very low concentrations in the remaining fill, below the VAC. The areas where fill remains primarily include the southern area and a TPZ in the north-eastern corner. Some fill also remains beneath the capping beam that extends along the top of the retaining wall at the western and northern boundaries. The remaining fill is not considered to pose a risk to human health.

Imported materials were validated in accordance with the RAP and the materials were found to be suitable for use on site.

11.2 Conclusions

JKE are of the opinion that the site has been suitably remediated and validated. The goal and objectives of the remediation have been achieved. The site is therefore considered to be suitable for the development described in Section 1.1, from a contamination viewpoint.

11.3 Recommendations

There is a potential for low concentrations of asbestos (non-friable ACM) to be present in fill remaining beneath the capping beam and in the fill (beneath the landscaping materials) within the TPZs and in the southern area of the site. JKE recommend that this be reviewed by the NSW Department of Education so that a suitable contingency plan/strategy can be developed and implemented where deemed necessary to align with the department's current requirements for managing low concentrations of ACM in soil. For example, this should align with the requirements in the *Asbestos Management Plan for NSW Government Schools* or, if preferred, a site-specific *Asbestos in-grounds Management Plan*.

12 LIMITATIONS

The report limitations are outlined below:

- JKE accepts no responsibility for any unidentified contamination issues at the site. Any unexpected problems/subsurface features that may be encountered during the final stages of the development work or during future works should be inspected by an environmental consultant as soon as possible;
- Previous use of this site may have involved excavation for the foundations of buildings, services, and similar facilities. In addition, unrecorded excavation and burial of material may have occurred on the site. Backfilling of excavations could have been undertaken with potentially contaminated material that may be discovered in discrete, isolated locations across the site during construction work;
- This report has been prepared based on site conditions which existed at the time of the validation; scope of work and limitation outlined in the JKE proposal; and terms of contract between JKE and the client (as applicable);
- The conclusions presented in this report are based on investigation of conditions at specific locations, chosen to be as representative as possible under the given circumstances, visual observations of the site and immediate surrounds and documents reviewed as described in the report;
- Subsurface soil and rock conditions encountered between investigation locations may be found to be different from those expected. Groundwater conditions may also vary, especially after climatic changes;
- The investigation and preparation of this report have been undertaken in accordance with accepted practice for environmental consultants, with reference to applicable environmental regulatory authority and industry standards, guidelines and the validation assessment criteria outlined in the report;
- Where information has been provided by third parties, JKE has not undertaken any verification process, except where specifically stated in the report;
- JKE accept no responsibility for potentially asbestos containing materials that may exist at the site;
- JKE have not and will not make any determination regarding finances associated with the site;
- Additional investigation work may be required in the event of changes to the landform, development or landuse. JKE should be contacted immediately in such circumstances;
- Material considered to be suitable from a geotechnical point of view may be unsatisfactory from a soil contamination viewpoint, and vice versa; and
- This report has been prepared for the particular project described and no responsibility is accepted for the use of any part of this report in any other context or for any other purpose.

Important Information About This Report

These notes have been prepared by JKE to assist with the assessment and interpretation of this report.

The Report is based on a Unique Set of Project Specific Factors

This report has been prepared in response to specific project requirements as stated in the JKE proposal document which may have been limited by instructions from the client. This report should be reviewed, and if necessary, revised if any of the following occur:

- The proposed land use is altered;
- The defined subject site is increased or sub-divided;
- The proposed development details including size, configuration, location, orientation of the structures or landscaped areas are modified;
- The proposed development levels are altered, eg addition of basement levels; or
- Ownership of the site changes.

JKE/J&K will not accept any responsibility whatsoever for situations where one or more of the above factors have changed since completion of the assessment. If the subject site is sold, ownership of the assessment report should be transferred by JKE to the new site owners who will be informed of the conditions and limitations under which the assessment was undertaken. No person should apply an assessment for any purpose other than that originally intended without first conferring with the consultant.

Changes in Subsurface Conditions

Subsurface conditions are influenced by natural geological and hydrogeological process and human activities. Groundwater conditions are likely to vary over time with changes in climatic conditions and human activities within the catchment (e.g. water extraction for irrigation or industrial uses, subsurface waste water disposal, construction related dewatering). Soil and groundwater contaminant concentrations may also vary over time through contaminant migration, natural attenuation of organic contaminants, ongoing contaminating activities and placement or removal of fill material. The conclusions of an assessment report may have been affected by the above factors if a significant period of time has elapsed prior to commencement of the proposed development.

This Report is based on Professional Interpretations of Factual Data

Site assessments identify actual subsurface conditions at the actual sampling locations at the time of the investigation. Data obtained from the sampling and subsequent laboratory analyses, available site history information and published regional information is interpreted by geologists, engineers or environmental scientists and opinions are drawn about the overall subsurface conditions, the nature and extent of contamination, the likely impact on the proposed development and appropriate remediation measures.

Actual conditions may differ from those inferred, because no professional, no matter how qualified, and no subsurface exploration program, no matter how comprehensive, can reveal what is hidden by earth, rock and time. The actual interface between materials may be far more gradual or abrupt than an assessment indicates. Actual conditions in areas not sampled may differ from predictions. Nothing can be done to prevent the unanticipated, but steps can be taken to help minimise the impact. For this reason, site owners should retain the services of their consultants throughout the development stage of the project, to identify variances, conduct additional tests which may be needed, and to recommend solutions to problems encountered on site.

Assessment Limitations

Although information provided by a site assessment can reduce exposure to the risk of the presence of contamination, no environmental site assessment can eliminate the risk. Even a rigorous professional assessment may not detect all contamination on a site. Contaminants may be present in areas that were not surveyed or sampled, or may migrate to areas which showed no signs of contamination when sampled. Contaminant analysis cannot possibly cover every type of contaminant which may occur; only the most likely contaminants are screened.

Misinterpretation of Site Assessments by Design Professionals

Costly problems can occur when other design professionals develop plans based on misinterpretation of an assessment report. To minimise problems associated with misinterpretations, the environmental consultant should be retained to work with appropriate professionals to explain relevant findings and to review the adequacy of plans and specifications relevant to contamination issues.

Logs Should not be Separated from the Assessment Report

Borehole and test pit logs are prepared by environmental scientists, engineers or geologists based upon interpretation of field conditions and laboratory evaluation of field samples. Logs are normally provided in our reports and these should not be re-drawn for inclusion in site remediation or other design drawings, as subtle but significant drafting errors or omissions may occur in the transfer process. Photographic reproduction can eliminate this problem, however contractors can still misinterpret the logs during bid preparation if separated from the text of the assessment. If this occurs, delays, disputes and unanticipated costs may result. In all cases it is necessary to refer to the rest of the report to obtain a proper understanding of the assessment. Please note that logs with the 'Environmental Log' header are not suitable for geotechnical purposes as they have not been peer reviewed by a Senior Geotechnical Engineer.

To reduce the likelihood of borehole and test pit log misinterpretation, the complete assessment should be available to persons or organisations involved in the project, such as contractors, for their use. Denial of such access and disclaiming responsibility for the accuracy of subsurface information does not insulate an owner from the attendant liability. It is critical that the site owner provides all available site information to persons and organisations such as contractors.

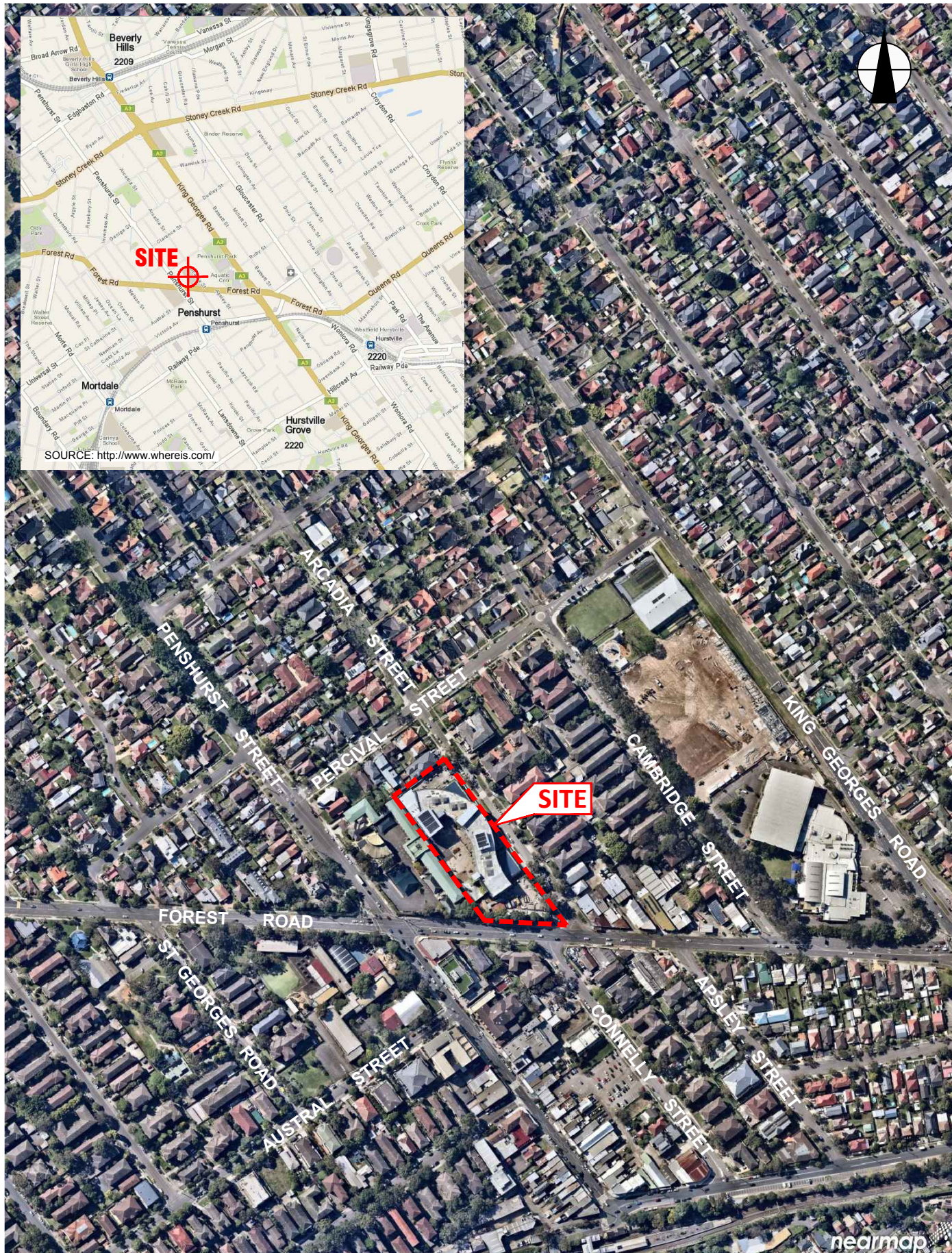
Read Responsibility Clauses Closely

Because an environmental site assessment is based extensively on judgement and opinion, it is necessarily less exact than other disciplines. This situation has resulted in wholly unwarranted claims being lodged against consultants. To help prevent this problem, model clauses have been developed for use in written transmittals. These are definitive clauses designed to indicate consultant responsibility. Their use helps all parties involved recognise individual responsibilities and formulate appropriate action. Some of these definitive clauses are likely to appear in the environmental site assessment, and you are encouraged to read them closely. Your consultant will be pleased to give full and frank answers to any questions.



Appendix A: General Validation Figures and Site Survey

A1 – JKE Figures (General)



AERIAL IMAGE SOURCE: MAPS.AU.NEARMAP.COM, 26 SEP 2020.

Title:

SITE LOCATION PLAN

Location:

PENSHURST PUBLIC SCHOOL
510 FOREST ROAD, PENSHURST, NSW

Report No:

E30104Prpt-VAL

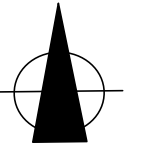
Figure No:

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JKEnvironments

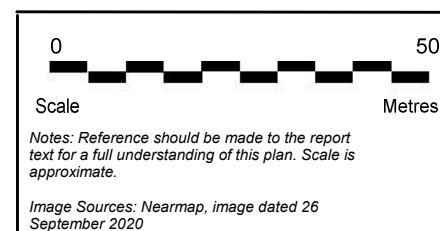


This plan should be read in conjunction with the Environmental report.



LEGEND:

- APPROXIMATE SITE BOUNDARY
- ▨ APPROXIMATE 'BUILDING AREA'
- ▨ APPROXIMATE 'TPZ'
- GRIDS USED DURING WASTE MANAGEMENT



Title: SITE LAYOUT PLAN	
Location: PENSHURST PUBLIC SCHOOL, 510 FOREST ROAD, PENSHURST, NSW	
Report No: E30104Prpt-VAL	Figure No: 2
JK ENVIRONMENTS	



A2 – Survey Southern Area Boundary Amendment

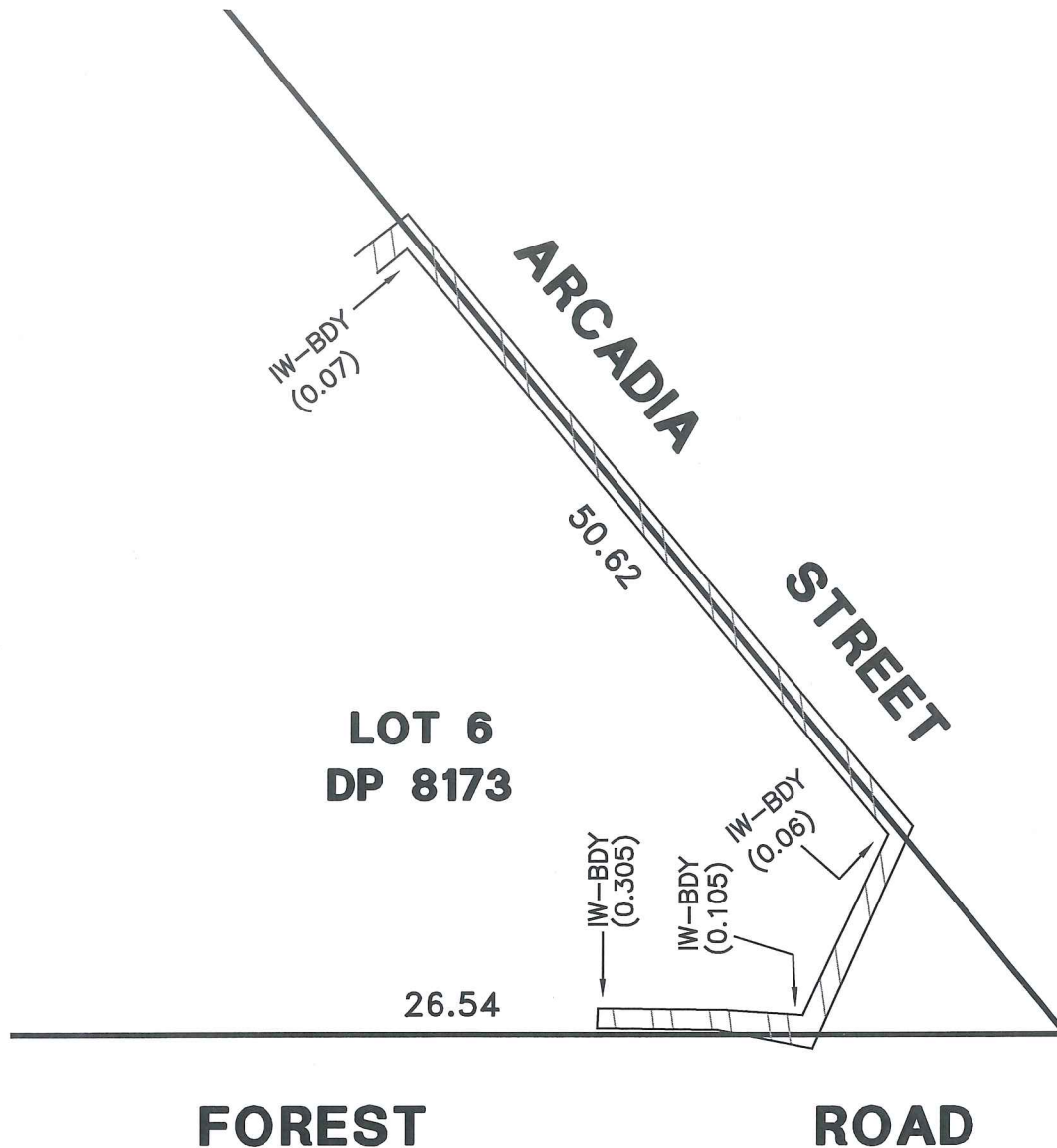


SKETCH

SHOWING POSITION OF INTERNAL FACE OF WALL
TO BOUNDARIES AT PENSURST PUBLIC SCHOOL,
PENSURST

REF: 8701

DATE: 1/12/2020



LEGEND

IW—INTERNAL FACE OF WALL

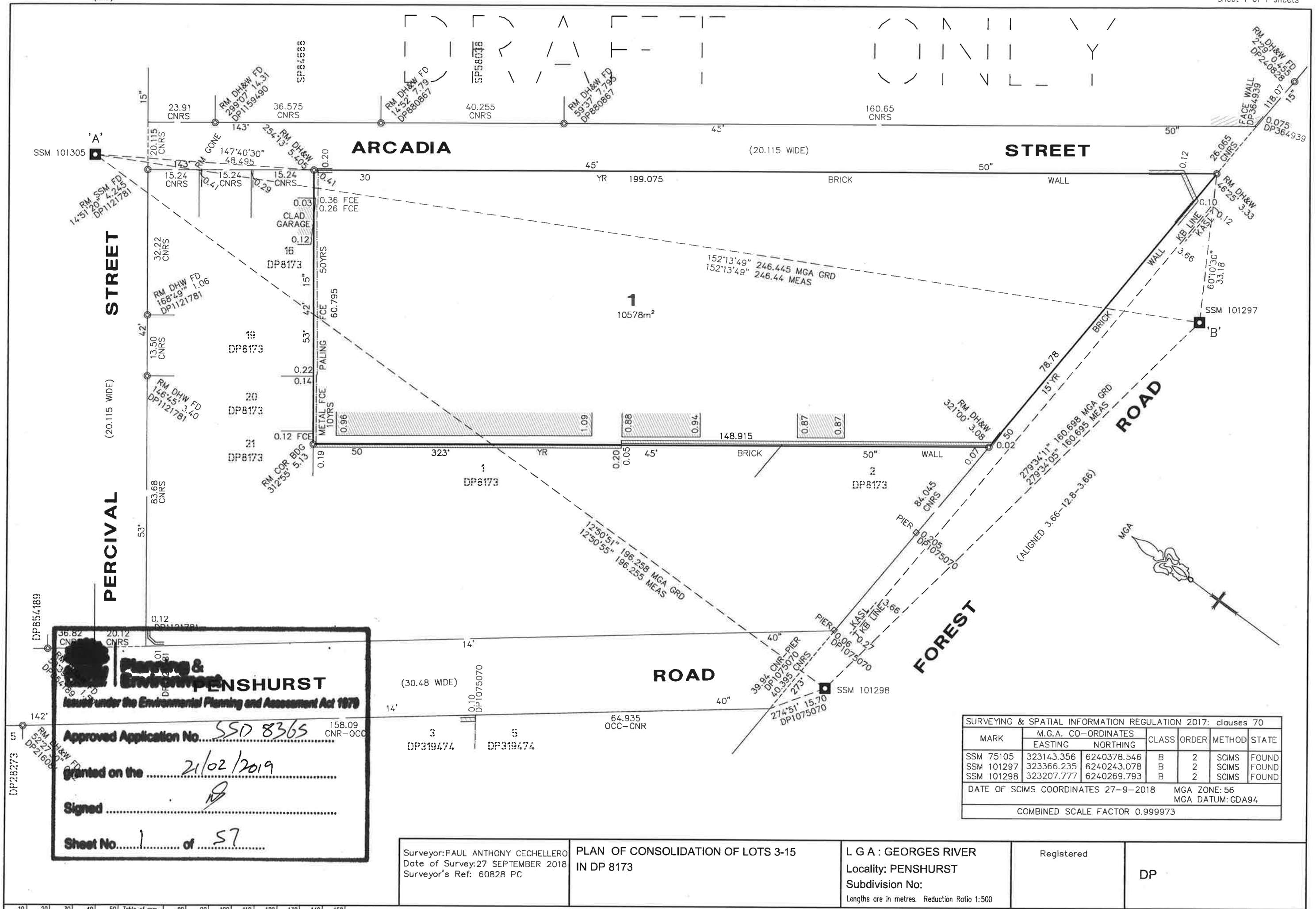
gill
AARON DOUGLAS MILLARD
REGISTERED SURVEYOR #8794

Ramsay Surveyors Pty Limited ABN 98 607 389 748

Carlingford Central - Suite 15/ No.241 - 245 Pennant Hills Road CARLINGFORD NSW 2118
PO BOX 2244 CARLINGFORD NSW 2118 PHONE 02 9635 5840 FAX 02 9806 0027
surveyor@hramsay.com.au www.hramsay.com.au



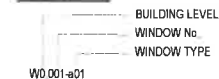
Appendix B: Development Plans



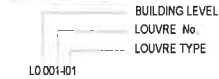
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AWP1	ACOUSTIC WALL PANEL 25mm
AWP2	ACOUSTIC WALL PANEL 50mm
BAL1	BALUSTRADE - TYPE 1
BAL2	BALUSTRADE - TYPE 2
BAL3	BALUSTRADE - TYPE 3
BL	BOLLARD
BPR1	BICYCLE PARKING RACK - TYPE 1
BPR2	BICYCLE PARKING RACK - TYPE 2
BSN	BIN WASTE
BN-W	CONCRETE COLUMN
CC	CONCRETE DUST SEAL
CFC	COMPRESSED FIBRE CEMENT
CO	CONCRETE
CP1	CARPET
CT1	CERAMIC TILE - FLOOR
CT2	CERAMIC TILE - WALL
CU1	CEILING UNIT - DROP-IN TILE
DM	DOOR MAT
DP1	DOWNPIPE - 100 Ø
DP2	DOWNPIPE - 150 Ø
DP2S	DOWNPIPE - 150 Ø WITH SPREADER
DP3	DOWNPIPE - 225 Ø
DPT	DISPENSER FOR PAPER TOWEL
DTP1	DISPENSER FOR TOILET PAPER STUDENT
DTP2	DISPENSER FOR TOILET PAPER STAFF
FB1	FACE BRICK - TYPE 1
FB2	FACE BRICK - TYPE 2
FC	FIBRE CEMENT LINING
FD	FOLDING SEAT
FG	FIXED GLAZING
FLP	FLAG POLE
FP	FIXED PANEL
FW	FLOOR WASTE
GH	GARDEN HOSE
GR	GRAB RAIL
HC	HOOK FOR CLOTHES
HD	HAND DRYER
HR1	HAND RAIL - TYPE 1
HR2	HAND RAIL - TYPE 2
MC	METAL CAPPING
MI	MIRROR
MR1	METAL ROOFING - TYPE 1
MWC1	METAL WALL CLADDING - TYPE 1
MWC2	METAL WALL CLADDING - TYPE 2
P	PAINT
PB1	PLASTERBOARD - STANDARD 13mm
PB2	PLASTERBOARD - IMPACT RESISTANT 13mm
PB3	PLASTERBOARD - FIRE RATED 13mm
PB4	PLASTERBOARD - FIRE RATED 16mm
PB5	PLASTERBOARD - PERFORATED
PB6	PLASTERBOARD - MOISTURE / WATER RESISTANT
PCP	PRECAST CONCRETE PANEL
PCM	PERFORATED CORRUGATED METAL
PLY1	PLYWOOD LINING
PLY2	PLYWOOD LINING - PERFORATED
P-PAVE	PAINTED - PAVING
PVP	PHOTOVOLTAIC PANEL
R	RENDER
RF1	INDUSTRIAL SHEET FLOORING
RF2	ANTI-STATIC VINYL / LINOLEUM
RWO	RAINWATER OUTLET
SC	STEEL COLUMN
SD1	SOAP DISPENSER STUDENT
SD2	SOAP DISPENSER STAFF
SF	SOFT FALL
SH	SHOWER HEAD
SK1	SKIRTING - VINYL
SK2	SKIRTING - CERAMIC TILE
SK3	SKIRTING - TIMBER
SCB1	SUN CONTROL BLADE - TYPE 1
SCB2	SUN CONTROL BLADE - TYPE 2
SCB3	SUN CONTROL BLADE - TYPE 3
SCB4	SUN CONTROL BLADE - TYPE 4
SS1	SHADE STRUCTURE - TYPE 1
SS2	SHADE STRUCTURE - TYPE 2
STC	STEEL TROWELLED CONCRETE
TI	TACTILE INDICATOR
TF1	SPRUNG TIMBER FLOOR
TFM	TRAFFICABLE MEMBRANE
TH	TREE HOLE
WM1	WATERPROOF MEMBRANE - INTERNAL AREAS
WM2	WATERPROOF MEMBRANE - EXTERNAL AREAS
WS	WHEEL STOP

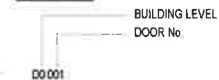
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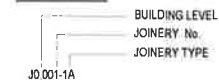
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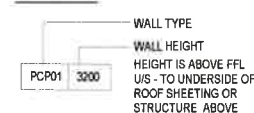
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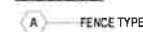
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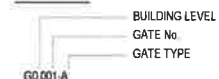
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FENCE TYPE TAG



GATE NUMBER



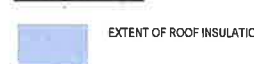
SELECTED CEILING PLAN TAG



3600 AFL



UNDER SLAB INSULATION



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granted on the 21/02/2019

Signed B

Sheet No... 2 of 57

31/08/2018 6:13:04 PM

REV	BY	DATE	DESCRIPTION
1	MM	20/07/18	PROGRESS ISSUE
2	MM	10/08/18	PROGRESS ISSUE
3	MM	17/08/18	FOR REVIEW
4	MM	24/08/18	PROGRESS ISSUE
5	MM	31/08/18	ISSUED FOR TENDER

LEGEND
FOR MASTER LEGEND OF FF&E CODES SEE DRAWING - 3199-ARC-DD-20-001

KEY PLAN



STRUCTURE, CIVIL & HYDRAULIC WOOLACOTT ENGINEERS T 02 9203 1000	PERUMAL PEDAVOLI ARCHITECTS T 02 9261 0000 WWW.PPARCHITECTS.COM.AU Perumal Pedavoli Architects Vince Pedavoli NSW Reg No 5045
MEDICAL, ELECTRICAL, CIVIL & SEC JMS CONSULTING T 02 9437 1000	
BCA CHECK P.D.A. T 02 9355 7190	
LANDSCAPE LORNA HARRISON P/L T 02 9355 5567	STATUTORY PLANNER DOUGLAS PLANNING PT T 02 9355 5567



PENSHURST PUBLIC SCHOOL 18 Arcadia Street, Penhurst
DRAWING NAME LEGEND SHEET

CONTRACT NUMBER SINSW-18-1257	SCALE 1:200 @ A1
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DRAWN	CHECKED
Author	Checker
VERIFIED	DATE
Approver	31 AUGUST 2018
DRAWING NUMBER	REVISION
PROJECT CODE	DISCIPLINE
PHASE	SERIES NUMBER
3199-ARC-DD-00_001	A

ISSUED FOR TENDER



Planning &
Environment

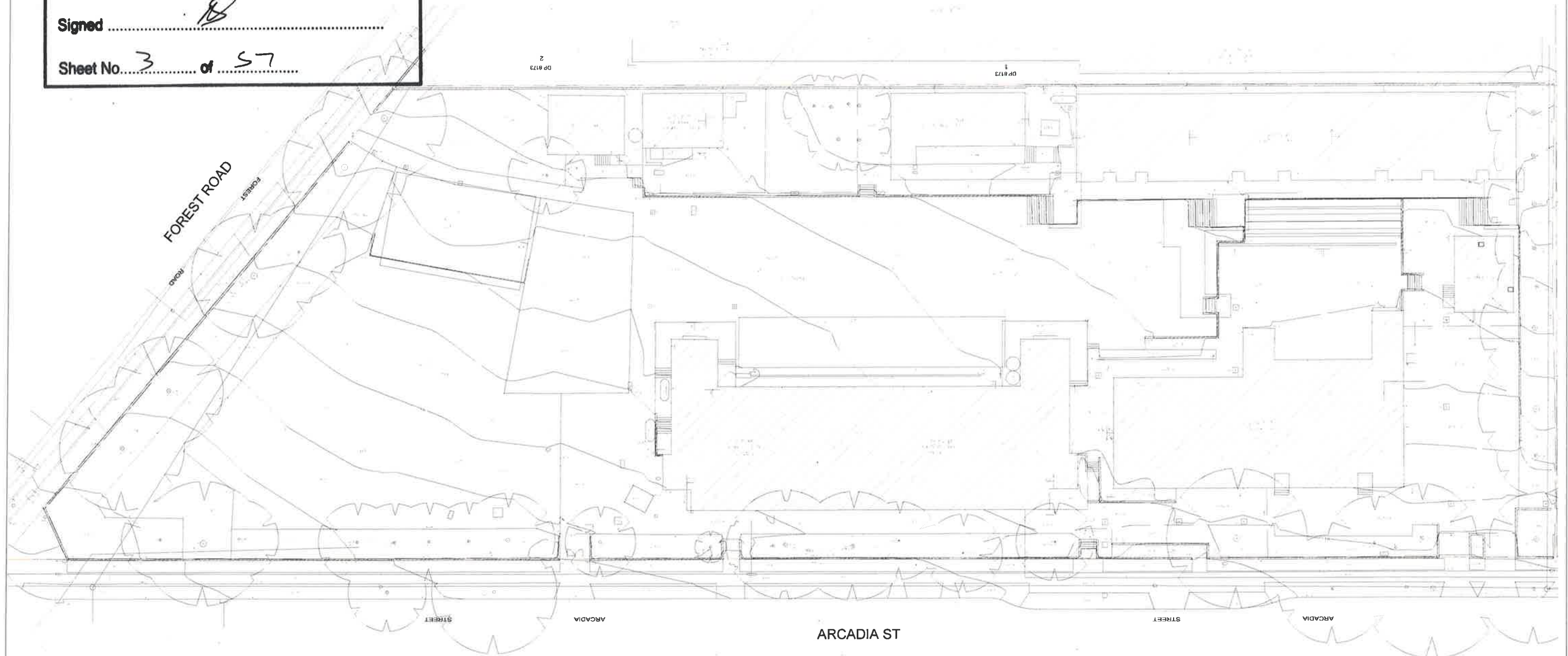
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granted on the 21/02/2019

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Sheet No. 3 of 57



AMENDMENTS				DESCRIPTION
REV	BY	DATE	ISSUE FOR DA	
CH		28-03-18		

LEGEND



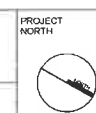
Education

STRUC CIVIL & HYD
WOOLACOTT'S ENGINEERS
T: 02 8341 990
REC'D: ELEC, IT, COMMS &
BRIE CONSULTING
T: 02 8437 1000
DCA
GROUP DIA
T: 02 8355 3160
LANDSCAPE
LORNA HARRISON P/L
T: 02 9555 1147

PERUMAL PEDAVOLI
ARCHITECTS
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WEB: www.pp8.com.au
Nominated Architect
Victor Perumal NSW reg no 5245
STATUTORY PLANNER
DON FOX PLANNING P/L
T: 02 9473 4914

PERUMAL
PEDAVOLI
ARCHITECTS

PENSHURST PUBLIC SCHOOL
18 Arcadia Street, Peshurst
DRAWING NAME
SITE SURVEY PLAN



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3199-ARC-DA_00_002				



Planning &
Environment

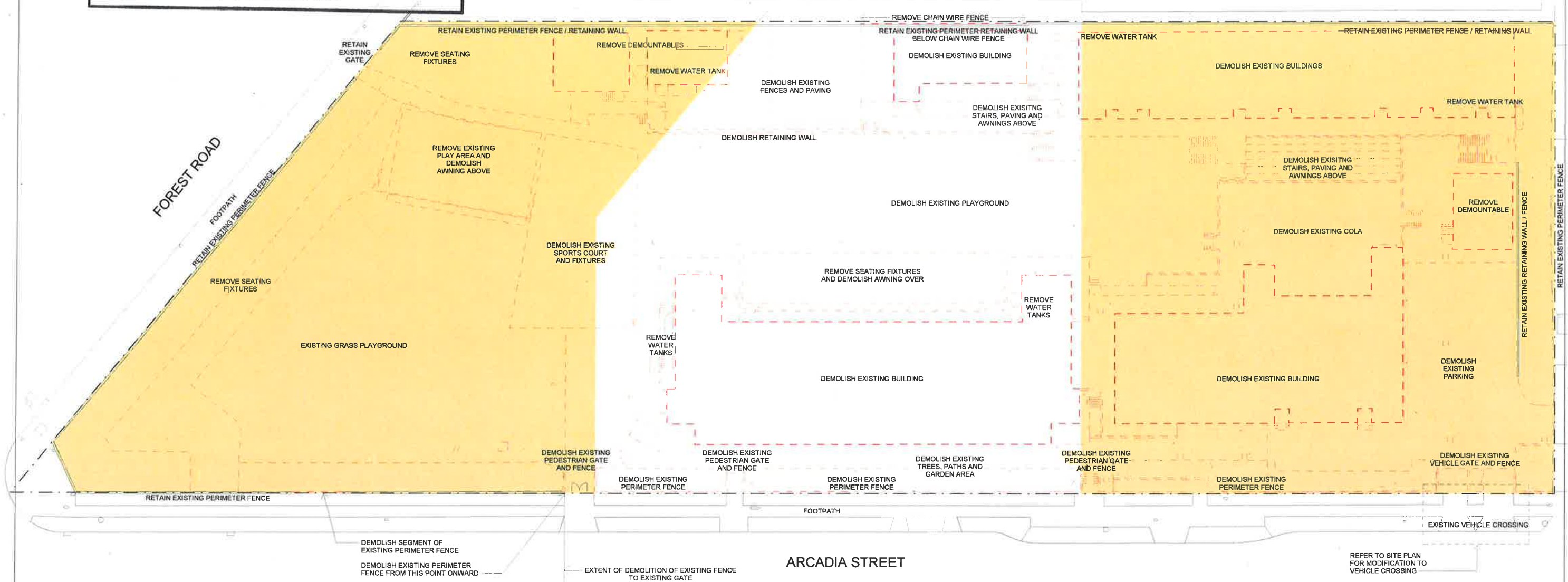
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Signed [Signature]

Sheet No. 4 of 57



NOTE:
TREES AND VEGETATION NOT SHOWN.
REFER TO LANDSCAPE DRAWINGS FOR
TREE AND VEGETATION REMOVAL

29/03/2018 10:37:42 AM

REV	BY	DATE	DESCRIPTION
CH	CH	28-03-18	ISSUE FOR DA

LEGEND
EXTENT OF DEMOLITION WORKS TO BE SOUGHT UNDER SEPARATE COMPLYING DEVELOPMENT CERTIFICATE



Education

STRUC. CIVIL & HYD.
WOOLACOTT ENGINEERS
T: 02 8341 890
MECH. ELEC. IT, COMMS &
S&M CONSULTING
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RCA
GROUP DLA
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LANDSCAPE
LORNA HARRISON PL
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WEB: www.pp-a.com.au
Nominated Architect
Victor Perumal NSW reg. no. 30465
STATUTORY PLANNER
DON FOX PLANNING PL
T: 02 9473 4816

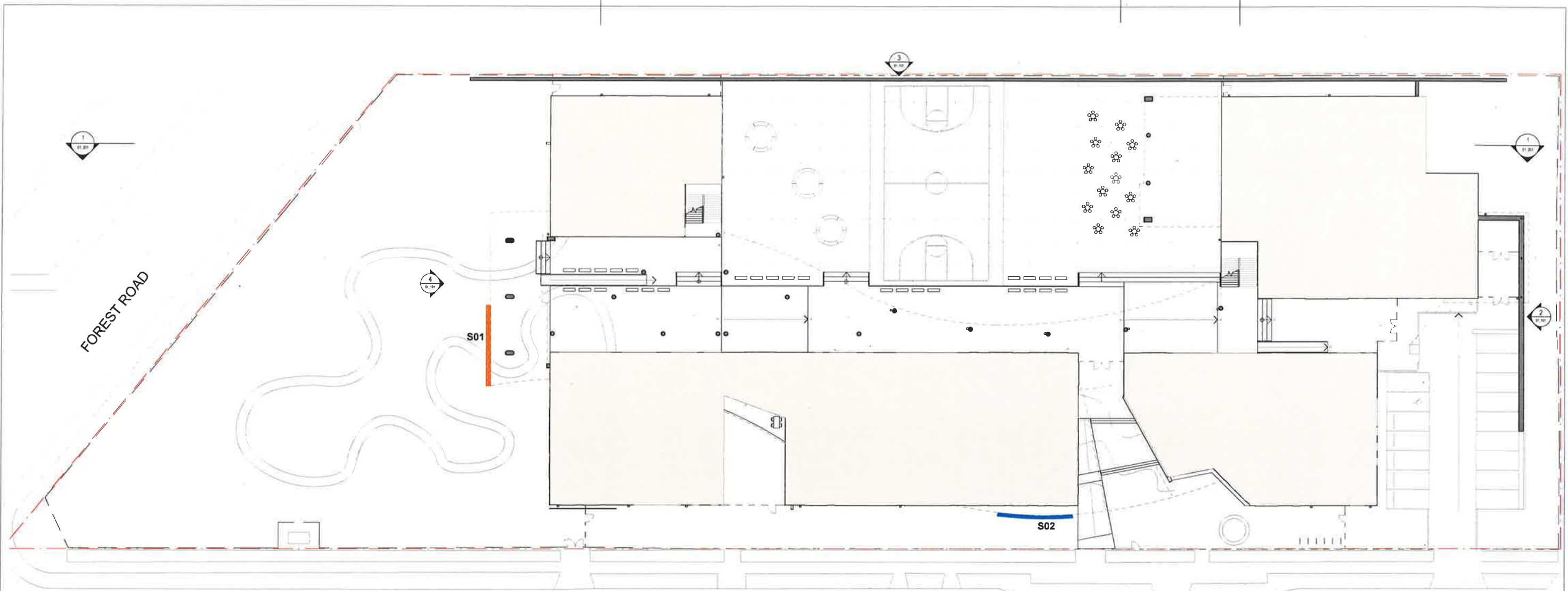
PERUMAL
PEDAVOLI
ARCHITECTS

PENSHURST PUBLIC SCHOOL
18 Arcadia Street, Penhurst
DEMOLITION PLAN



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DRAWING NUMBER: 3199-ARC-DA_00_003	DISCIPLINE: PHASE: SERIES NUMBER:	REVISION:

ISSUE FOR DA



1 DA SITE SIGNAGE PLAN
1:250



2 S01 SOUTH
S02 EAST
1:50

NSW Planning & Environment
GOVERNMENT

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Sheet No. 5 of 57

29/03/2018 10:40:30 AM

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LEGEND

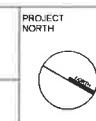


STRUC. CIVIL & HYD.
WOOLADOTTES ENGINEERS
T: 02 8341 990
MEDICAL ELEC. IT, COMM &
BMS CONSULTING
T: 02 9437 1000
DCA
GROUP DIA
T: 02 8355 3160
LANDSCAPE
LORNA HARRISON PL
T: 02 9555 1147

PERUMAL PEDAVOLI
ARCHITECTS
T: 02 8291 0000
WEB: www.pp-a.com.au
Nominated Architect
Since Practice NSW reg no 2045
STATUTORY PLANNER
DON FOX PLANNING PL
T: 02 9473 4814

PERUMAL
PEDAVOLI
ARCHITECTS

PENSHURST PUBLIC SCHOOL
18 Arcadia Street, Penshurst
DRAWING NAME
SITE SIGNAGE PLAN



DRAWN	CHECKED	VERIFIED	DATE
SM	DW	-	28-03-18
DRAWING NUMBER	DISCIPLINE	PHASE	SERIES NUMBER
3199-ARC-DA_00_011			

ISSUE FOR DA



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granted on the 21/02/2019

Signed

Sheet No. 6 of 57

FOREST ROAD

EMERGENCY EXIT
G0.009-A1

PLAY AREA / NATURAL

ASSEMBLY / COURTYARD

STREET PLAY

COLA

WASTE BIN AREA
RECYCLABLE WASTE AREA
G0.007-A2

STAFF BICYCLE PARKING - BPR1

SECONDARY ENTRY / EMERGENCY EXIT
G0.004-A2

CAR PARK

PROPOSED SUB STATION

G0.011-A2
EMERGENCY EXIT

G0.013-A1

G0.003-A2
STUDENT GATE

G0.001-B1
G0.002-B3
MAIN PEDESTRIAN ENTRY

STUDENT BICYCLE PARKING - BPR2

G0.004-A1

G0.005-B4
VEHICLE ENTRY

MODIFY EXISTING VEHICLE CROSSING

ARCADIA STREET

FENCE TYPES

- TYPE A - PALISADE FENCE - 1500H
- TYPE B - PALISADE FENCE - 2150H TO MATCH EXISTING
- TYPE C - EXISTING FENCE
- TYPE D - EXISTING FENCE REMOVED DURING CONSTRUCTION PERIOD AND REINSTATED

GATE TYPES

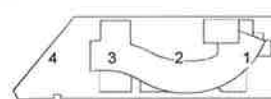
- TYPE A1 - 1000 CLEAR OPENING, SINGLE SWING, 1500H PALISADE FENCE
- TYPE A2 - 2000 CLEAR OPENING, DOUBLE SWING, 1500H PALISADE FENCE
- TYPE B1 - 1000 CLEAR OPENING, SINGLE SWING, 2150H TO MATCH EXISTING
- TYPE B2 - 2000 CLEAR OPENING, DOUBLE SWING, 2150H TO MATCH EXISTING
- TYPE B3 - 2000 CLEAR OPENING, SINGLE SLIDING, 2150H TO MATCH EXISTING
- TYPE B4 - 6000 CLEAR OPENING, DOUBLE SLIDING, 2150H TO MATCH EXISTING
- TYPE C - EXISTING

3/09/2018 11:31:26 AM

REV	BY	DATE	DESCRIPTION
1	MAW	20/07/18	PROGRESS ISSUE
2	MAW	10/08/18	PROGRESS ISSUE
3	MAW	17/08/18	HOW REVIEW
4	MAW	28/08/18	PROGRESS ISSUE
5	MAW	31/08/18	ISSUED FOR TENDER

LEGEND

KEY PLAN



Education

STRUCTURE, CIVIL & HYDRAULIC
WOODWARD ENGINEERS
T: 02 9220 1500
MECH, ELECTR, IT, COMMS & SEC.
PWA CONSULTING
T: 02 9437 1000
BCA
GROUP DIA
T: 02 6096 5360
LANDSCAPE
LINDA HARRISON PL
T: 02 9554 1347

PERUMAL PEDAVOLI ARCHITECTS
T: 02 9281 0000
WEBS: www.ppa.com.au
Accredited Architect
Vice President NSW reg No 5045

PENSHURST PUBLIC SCHOOL
18 Arcadia Street, Penhurst
OVERALL SITE FENCE PLAN

CONTRACT NUMBER
SINSW-18-1257

PROJECT NORTH

DRAWING NUMBER

PROJECT CODE

DISCIPLINE

3199-ARC-DD-00_100

AUTHOR

CHECKER

APPROVER

DATE

31 AUGUST 2018

REVISION

1

A

ISSUED FOR TENDER



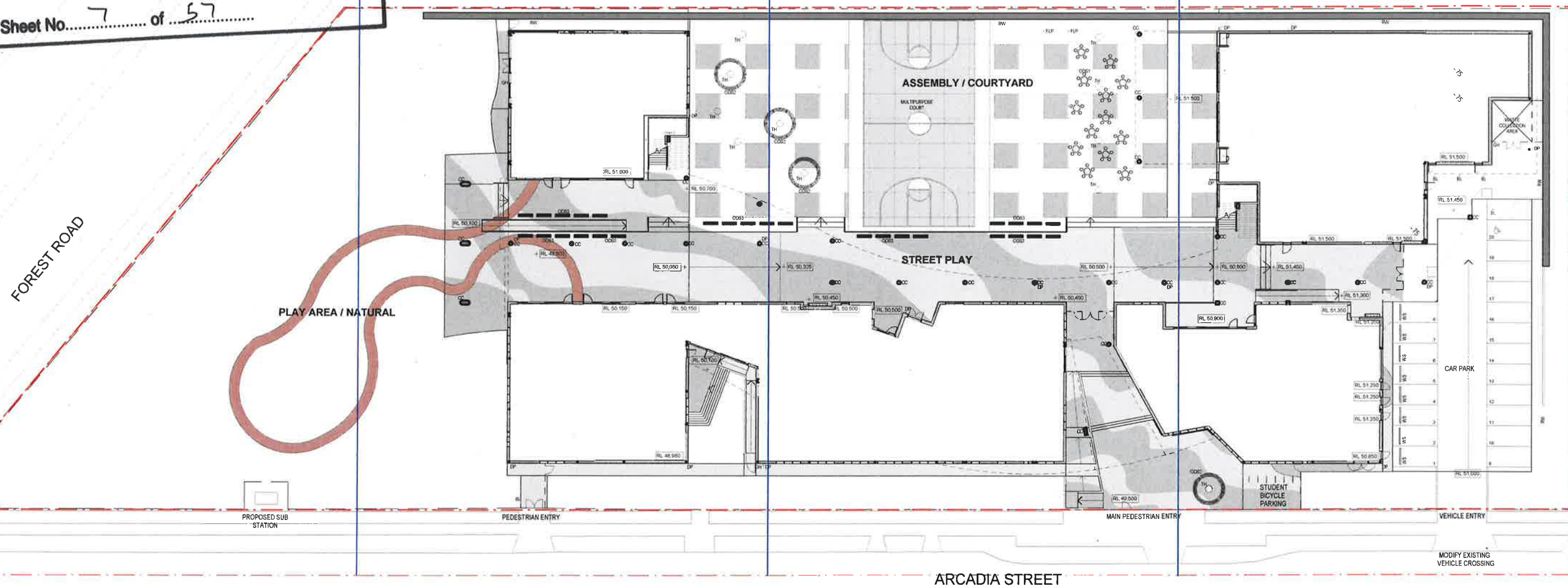
NSW GOVERNMENT | Environment
Issued under the Environmental Planning and Assessment Act 1979

Approved Application No. SSD 8365

granted on the 21/02/2019

Signed _____

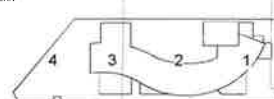
Sheet No. 7 of 57



ISSUE FOR TENDER

AMENDMENTS			
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	MW	10.08.18	PROGRESS ISSUE
	MW	10.08.18	FOR REVIEW
	MW	20.08.18	PROGRESS ISSUE
A	MW	31.08.18	TECHNICAL ISSUE

LEGEND



Education

STRUCTURE, CIVIL & HYDRAULIC WOLACOTT ENGINEERS 1. 02 8250 1520
MECH, ELECT, IT, COMMS & SEC JHR CONSULTING T. 02 9467 1000
BCA GROUP/DLA 1. 02 8358 2160
LANDSCAPE LORNA HARRISON/P/L

PERUMAL PEDAYOLI ARCHITECTS
T 02 9281 0000
WEB www.pp-a.com.au
Nominated Architect
Vince Pedayoli NSW reg No 5045

STATUTORY PLANNER
DON FOX PLANNING P/L

PERUMAL
PEDAVOL
ARCHITECT

PENSHURST PUBLIC SCHOOL
18 Arcadia Street, Penshurst

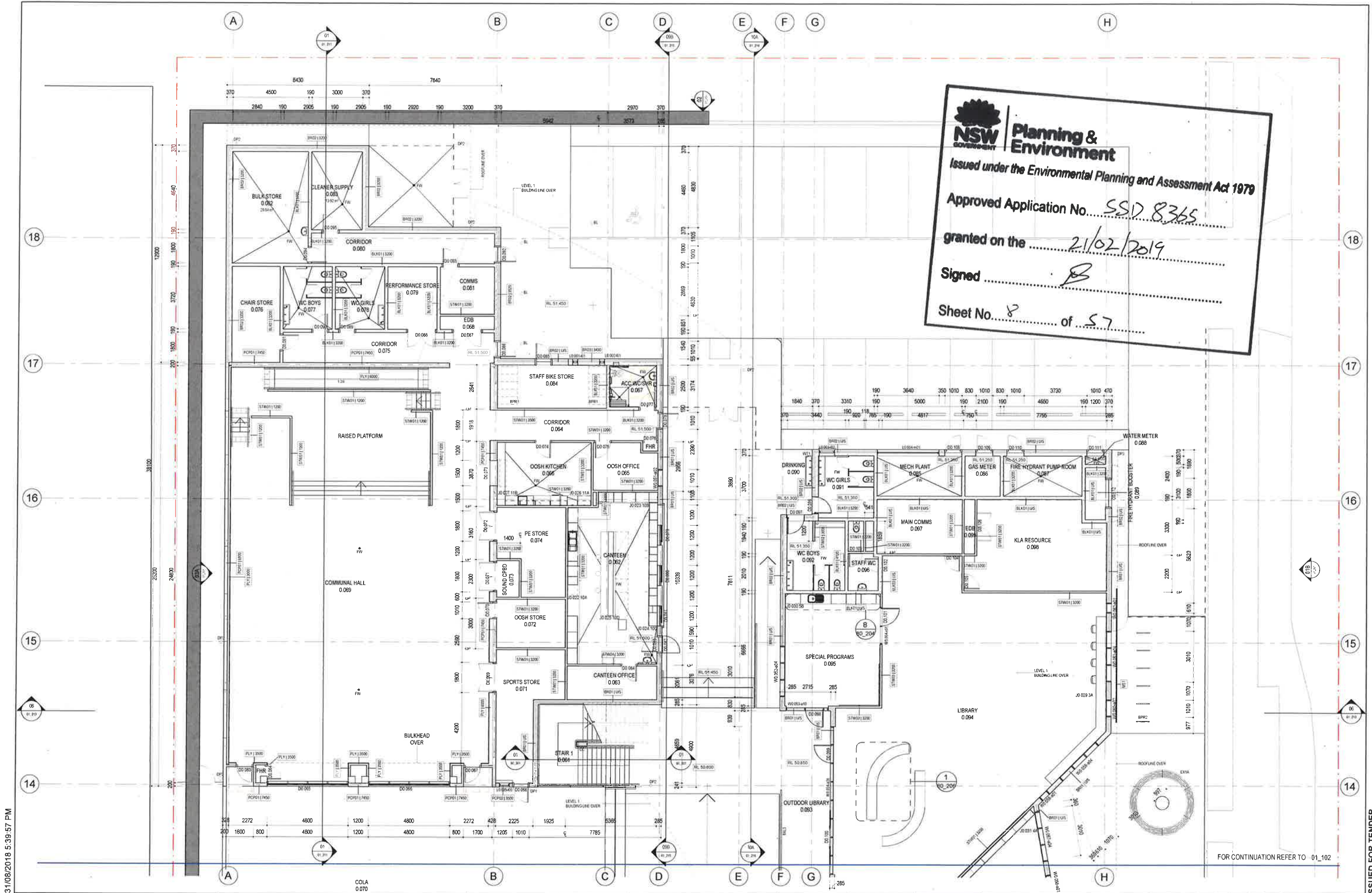
DRAWING NAME
OVERALL SITE MASTERPLAN

CONTRACT NUMBER	SINSW-18-1257
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DRAWN		CHECKED		VERIFIED		DATE	
Author		Checker		Approver		31 AUGUST 2018	
DRAWING NUMBER						REVISION	
PROJECT CODE		DISCIPLINE		PHASE		SERIES NUMBER	
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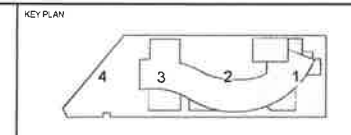
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NSW Planning & Environment
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Approved Application No. SS17 8365
granted on the 21/02/2019
Signed [Signature]
Sheet No. 8 of 57

REV	BY	DATE	DESCRIPTION
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2	MM	10/08/18	PROGRESS ISSUE
3	MM	17/08/18	FOR REVIEW
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5	MM	31/08/18	ISSUED FOR TENDER

LEGEND
COLA 0.070



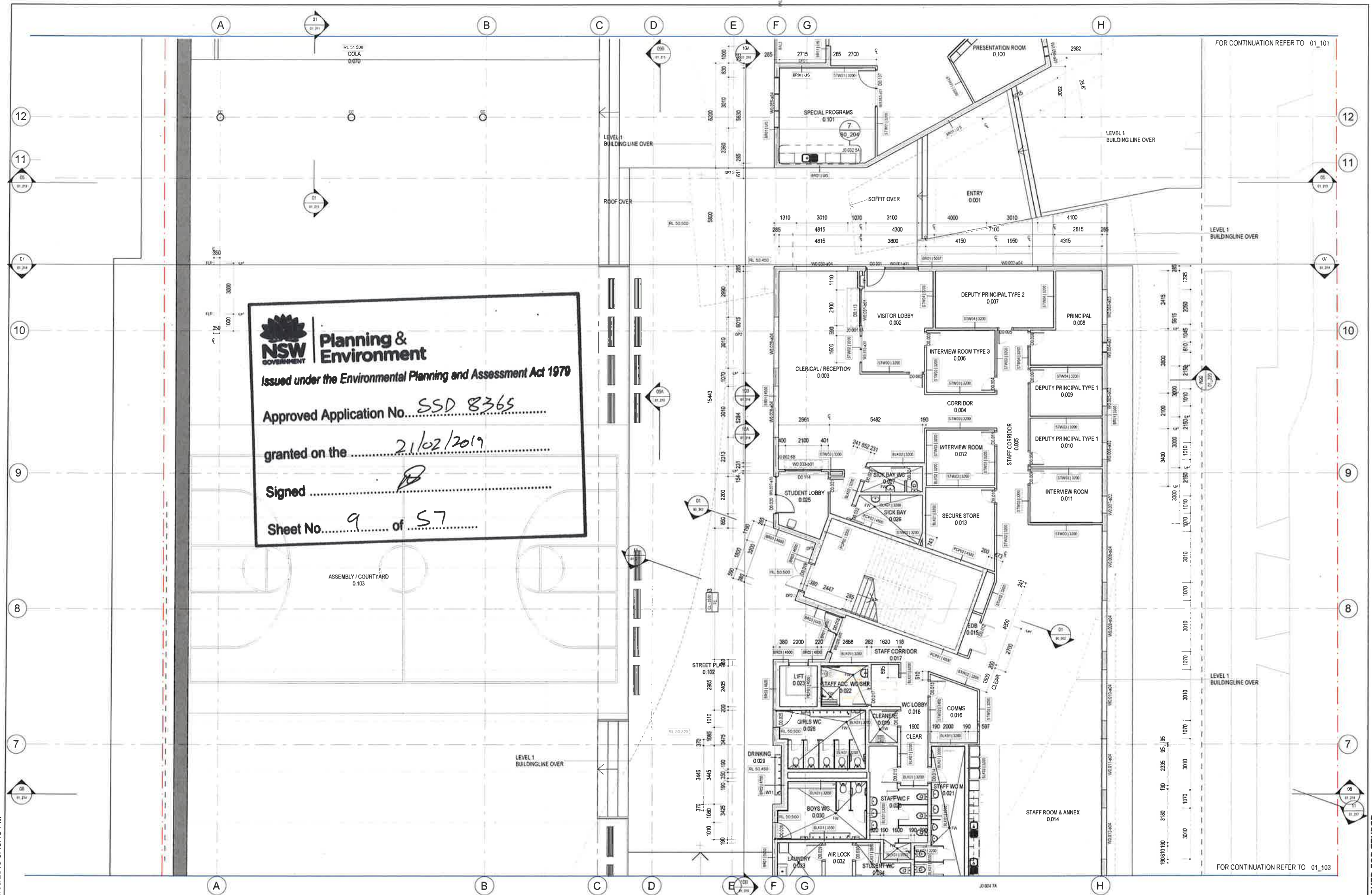
STRUCTURE, CIVIL & HYDRAULIC
HOCKEY & ASSOCIATES ENGINEERS
1/02/2018 1500
MECH, ELECT, IT, COMMS & SEC
JUN CONSULTING
1/02/2018 1500
BICA GROUP P/L
1/02/2018 1500
LANDSCAPE
LORNA HARRISON P/L
1/02/2018 1500

PERUMAL PEDAVOLI ARCHITECTS
1/02/2018 1500
WEB: www.pp.a.com.au
Phone: 02 9437 1000
Fax: 02 9437 1000
STATUTORY PLANNER
DON FOX PLANNING P/L
1/02/2018 1500

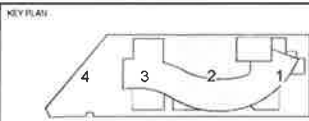
PENSHURST PUBLIC SCHOOL
18 Arcadia Street, Penshurst
DRAWING NAME
FLOOR PLAN - LEVEL 0 - PART 1

CONTRACT NUMBER SINSW-18-1257	PROJECT NORTH	DRAWING NUMBER	DISCIPLINE	PHASE	SERIES NUMBER	REVISION
Author	Checker	Approver	DATE	31 AUGUST 2018		
3199-ARC-DD-01_101						A

ISSUED FOR TENDER



AMENDMENTS				
REV	BY	DATE	DESCRIPTION	
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Education

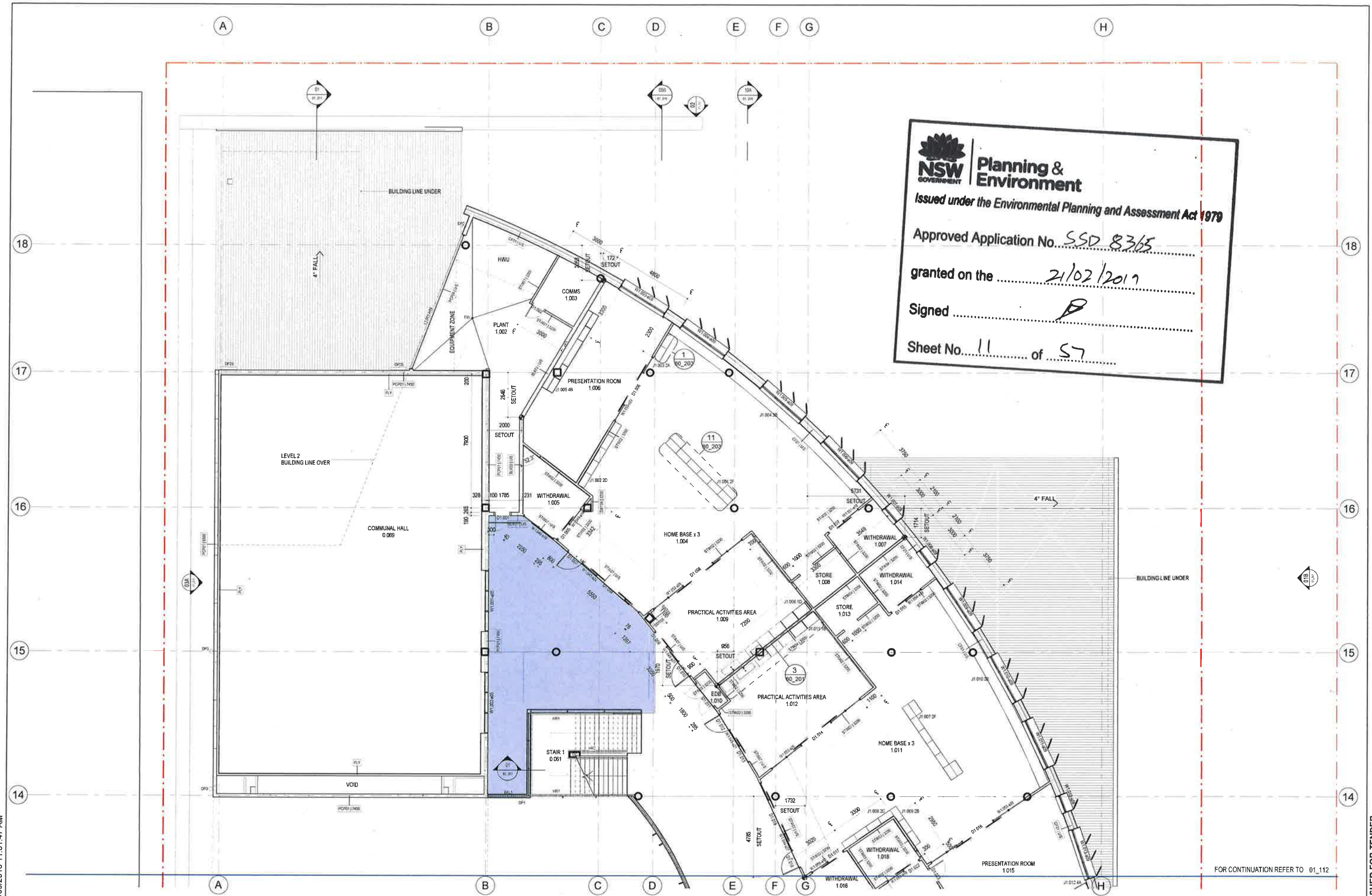
STRUCTURE, CIVIL & HYDRAULIC ENGINEERING T 02 6200 1500	PERMAL PEDIYOLI ARCHITECTS T 02 9291 0000 WEB: www.pp-a.com.au Nominated Architect Victor Pedeyoli NSW reg No 5045
MECH, ELECT, IT, COMMS & SEC JPA CONSULTING T 02 9437 1000	
BICA GROUP/DLA T 02 8252 3160	
LANDSCAPE LORNA WOODROOPE	STATUTORY PLANNER DON FOR PLANNING PLS

PERUMAL
PEDAVOLI
ARCHITECTS

PENSHURST PUBLIC SCHOOL
18 Arcadia Street, Penshurst
DRAWING NAME
FLOOR PLAN - LEVEL 0 - PART 2

CONTRACT NUMBER SINSW-18-1257		1000 2000 3000 4000 5000 10000		SCALE 1:100 @ A1	
PROJECT NORTH		DRAWN Author	CHECKED Checker	VERIFIED Approver	DATE 31 August 2018
DRAWING NUMBER				REVISION	
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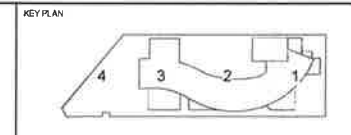
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Issued under the Environmental Planning and Assessment Act 1979
Approved Application No. SSD 8365
granted on the 21/02/2017
Signed [Signature]
Sheet No. 11 of 57

REV	BY	DATE	DESCRIPTION
1	MM	20.07.16	PROGRESS ISSUE
2	MM	10.08.16	PROGRESS ISSUE
3	MM	17.08.16	FOR REVIEW
4	MM	29.08.16	PROGRESS ISSUE
5	MM	31.08.16	ISSUED FOR TENDER

KEY PLAN



STRUCTURE, CIVIL & HYDRAULIC CONSULTANTS ENGINEERS 1 02 9291 0000 WEB: www.pp-a.com.au E: info@pp-a.com.au P: 02 9477 1000	PERUMAL PEDAVOLI ARCHITECTS 1 02 9291 0000 WEB: www.pp-a.com.au E: info@pp-a.com.au P: 02 9477 1000
MECH, ELECTR, IT, COMMS & SEC CONSULTANTS 1 02 9477 1000	PERUMAL PEDAVOLI ARCHITECTS 1 02 9291 0000 WEB: www.pp-a.com.au E: info@pp-a.com.au P: 02 9477 1000
BCA CONSULTANTS 1 02 9291 0000	PERUMAL PEDAVOLI ARCHITECTS 1 02 9291 0000 WEB: www.pp-a.com.au E: info@pp-a.com.au P: 02 9477 1000
LANDSCAPE CONSULTANTS 1 02 9291 0000	PERUMAL PEDAVOLI ARCHITECTS 1 02 9291 0000 WEB: www.pp-a.com.au E: info@pp-a.com.au P: 02 9477 1000

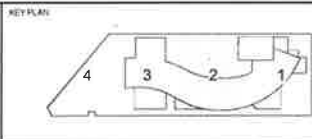
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PENSHURST PUBLIC SCHOOL
18 Arcadia Street, Penhurst
DRAWING NAME:
FLOOR PLAN - LEVEL 1 - PART 1

CONTRACT NUMBER SINSW-18-1257	PROJECT NORTH
DRAWN Author	CHECKED Checker
VERIFIED Approver	DATE 31 AUGUST 2018
DRAWING NUMBER 3199-ARC-DD-01_111	REVISION A

ISSUED FOR TENDER



AMENDMENTS			
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Education

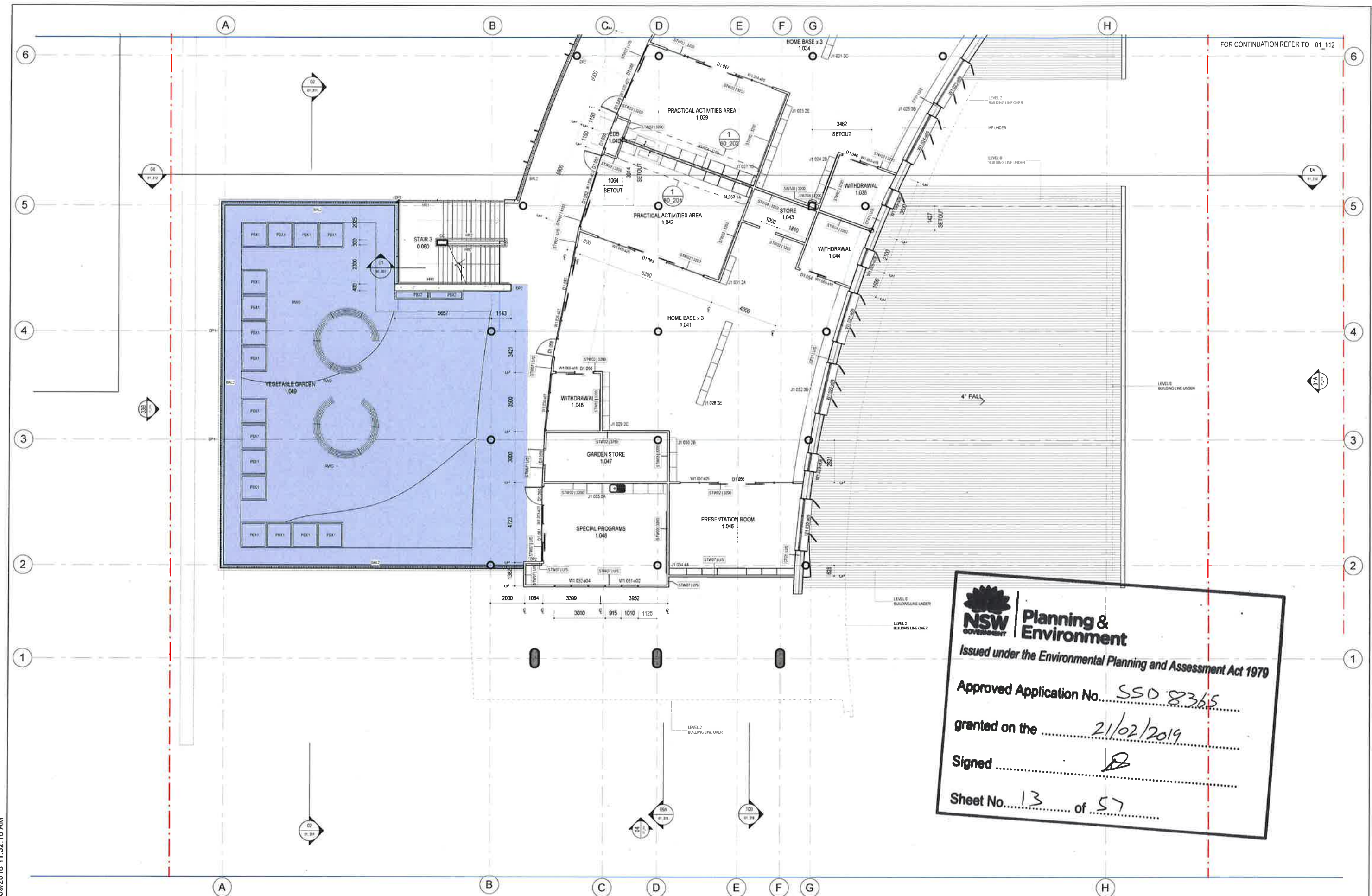
STRUCTURE, CIVIL & HYDRAULIC WOODCOTT'S ENGINEERS T 02 9339 1500	PERUMAL PEDAVOLI ARCHITECTS T 02 9291 0000 WEB www.pp.com.au Nominated Architect Vince Pedavoli NSW reg No 5045
MECH, ELECT, IT, COMMS & SEC. JUN CONSULTING T 02 9437 1000	
BCA GROUP 04A T 02 8356 3160	
LANDSCAPE LORNA HARRISON P/L	STATUTORY PLANNER DON FOX PLANNING P/L

PERUMAL
PEDAVOLI
ARCHITECTS

PENSHURST PUBLIC SCHOOL
18 Arcadia Street, Penshurst
DRAWING NAME
FLOOR PLAN - LEVEL 1 - PART 2

CONTRACT NUMBER		0 1000 2000 3000 4000 5000 10000				
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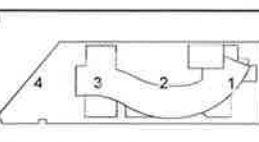
NSW GOVERNMENT | **Planning & Environment**
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Approved Application No. SSD 8365
granted on the 21/02/2019
Signed [Signature]
Sheet No. 13 of 57

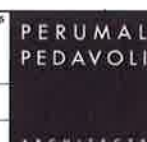
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LEGEND

KEY PLAN



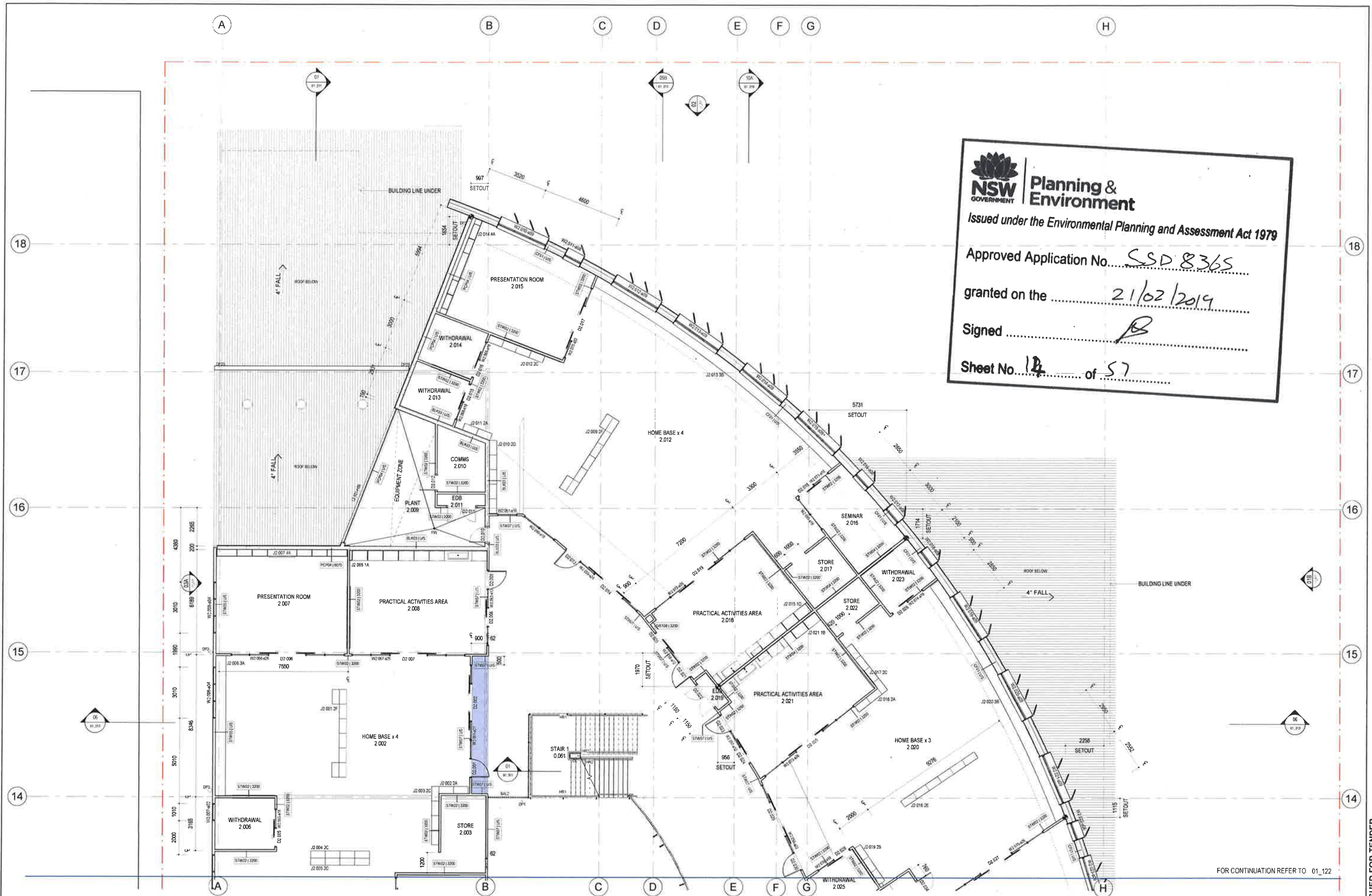
STRUCTURE, CIVIL & HYDRAULIC WOODWARD ENGINEERS T: 02 8201 1000 W: www.woodward-engineers.com.au MECH, ELECTR, IT, COMM & SEC JAW CONSOLE LTD T: 02 9437 1000	PERUMAL PEDAVOLI ARCHITECTS T: 02 8081 0000 W: www.pp-a.com.au Principal Architect Vince Pedavoli NSW reg no 5045
SCA GROUP P/L T: 02 8355 3400 LANDSCAPE LORNA HARRISON P/L T: 02 9555 1161	STATUTORY PLANNER CHRISTINA HARRISON P/L T: 02 9555 1161



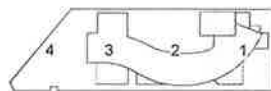
PENSHURST PUBLIC SCHOOL
18 Arcadia Street, Penshurst
DRAWING NAME:
FLOOR PLAN - LEVEL 1 - PART 3

CONTRACT NUMBER SINSW-18-1257	PROJECT NORTH	SCALE 1:100 @ A3
DRAWN Author	CHECKED Checker	VERIFIED Approver
DATE 31 AUGUST 2018	REVISION	
PROJECT CODE DISCIPLINE PHASE SERIES NUMBER		
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ISSUED FOR TENDER

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Education

STRUCTURE, CIVIL & HYDRAULIC
WOOLACOTT'S ENGINEERS
T: 02 6993 1500

MECH, ELECT, IT, COMMS & SEC
JWA CONSULTING
T: 02 9437 1000

BCA
CIRCULARA
T: 02 6356 3160

LANDSCAPE
LORNA HARRISON PLS

PERUMAL PEDAVOLI ARCHITECTS 1, 202 5291 5000 WEB: www.pp-a.com.au Nominated Architect Vince Pedavoli MSMA reg No 5045	
STATUTORY PLANNER CON FOR PLANNING PL	

PERUMAL
PEDAVOLI
ARCHITECTS

PENSHURST PUBLIC SCHOOL
18 Arcadia Street, Penshurst

DRAWING NAME
FLOOR PLAN - LEVEL 2 - PART 1

CONTRACT NUMBER		0 1000 2000 3000 4000 5000 10000				
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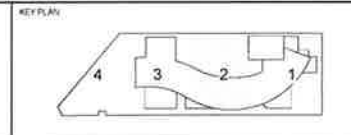
NSW GOVERNMENT | **Planning & Environment**
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Approved Application No. SSD 8365
granted on the 21/02/2019
Signed [Signature]
Sheet No. 15 of 57



REV	BY	DATE	DESCRIPTION
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2	MM	10/08/18	PROGRESS ISSUE
3	MM	17/08/18	FOR REVIEW
4	MM	28/08/18	PROGRESS ISSUE
5	MM	31/08/18	ISSUED FOR TENDER

LEGEND
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2
3
4



PERUMAL PEDAVOLI ARCHITECTS
STRUCTURE, CIVIL & HYDRAULIC
WOODACOTT ENGINEERS
1/10/2018 1500
MECH, ELECTR, CIV, COMMS & SEC
JWA CONSULTING
1/10/2018 1500
BCK
GROUP DLA
1/10/2018 1500
LANDSCAPE
CORNA HARRISON P/L
1/10/2018 1500

PERUMAL PEDAVOLI ARCHITECTS
1/10/2018 1500
MECH, ELECTR, CIV, COMMS & SEC
JWA CONSULTING
1/10/2018 1500
BCK
GROUP DLA
1/10/2018 1500
LANDSCAPE
CORNA HARRISON P/L
1/10/2018 1500

PERUMAL PEDAVOLI ARCHITECTS
1/10/2018 1500
MECH, ELECTR, CIV, COMMS & SEC
JWA CONSULTING
1/10/2018 1500
BCK
GROUP DLA
1/10/2018 1500
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CORNA HARRISON P/L
1/10/2018 1500

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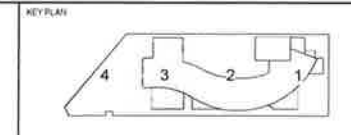
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NSW GOVERNMENT | **Planning & Environment**
Issued under the Environmental Planning and Assessment Act 1979
Approved Application No. SSD 8365
granted on the 21/02/2019
Signed [Signature]
Sheet No. 16 of 57

AMENDMENTS			DESCRIPTION
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03	MM	17/01/18	FOR REVIEW
04	MM	26/01/18	PROGRESS ISSUE
05	MM	31/01/18	ISSUED FOR TENDER

LEGEND	
1	KEY PLAN



STRUCTURE, CIVIL & HYDRAULIC
WOLACOTT ENGINEERS
T: 02 8331 1500
W: www.wolacott.com.au
MECH, ELECTR, IT, COMMS & SEC
JAW CONSOLE ENGINEERING
T: 02 9437 1000
BCA
CHECKUP (LA)
T: 02 8330 3100
LANDSCAPE
LORNA HARRISON PL
T: 02 9556 1347

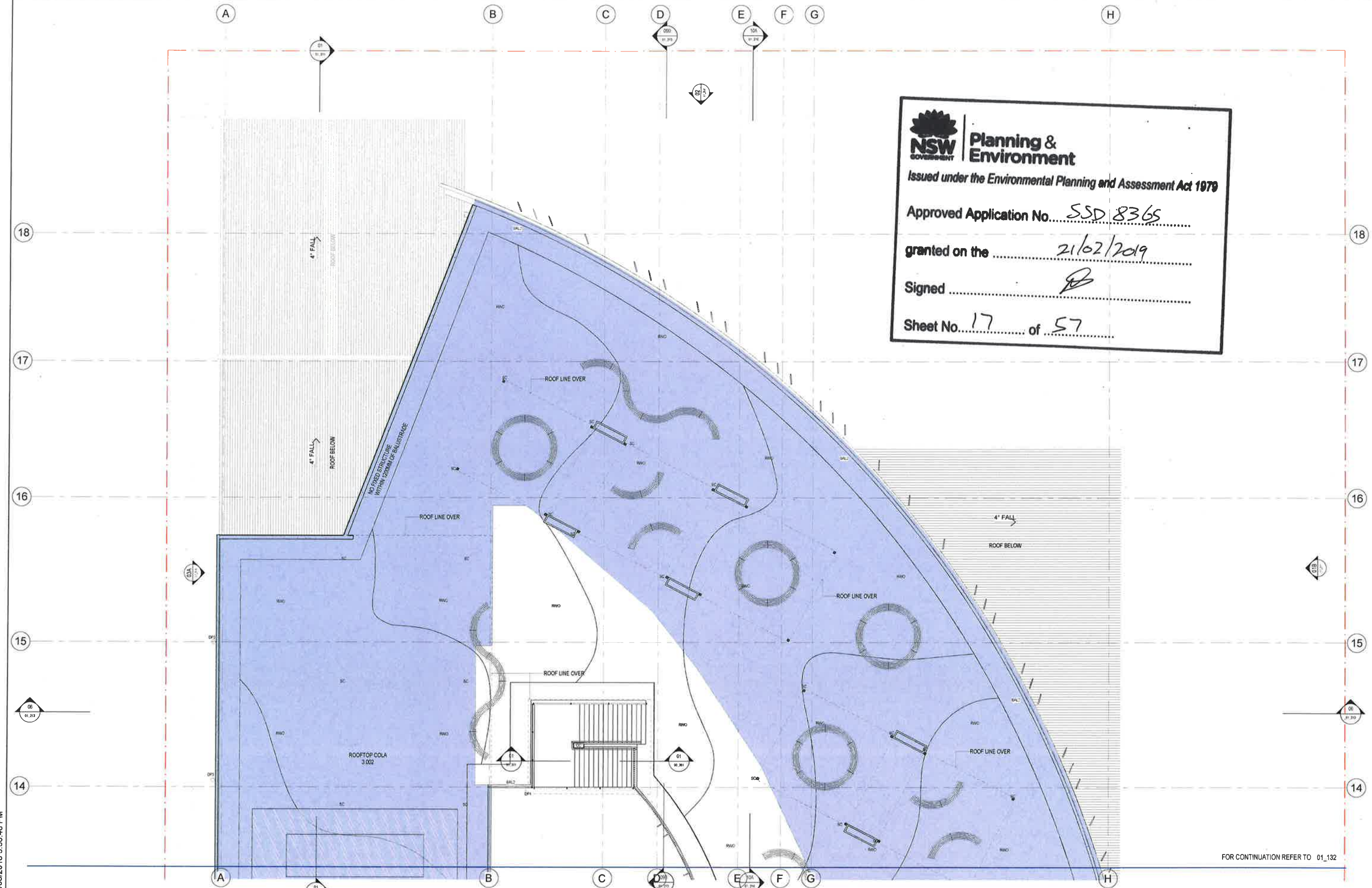
PERUMAL PEDAVOLI ARCHITECTS
T: 02 9291 0000
W: www.pp-a.com.au
H: 10/2018
Voice: Perumal Pedavoli 0411 704545

PERUMAL PEDAVOLI
PENSHURST PUBLIC SCHOOL
18 Arcadia Street, Penhurst
FLOOR PLAN - LEVEL 2 - PART 3

CONTRACT NUMBER SINSW-18-1257		SCALE: 1:100 @ A1	
PROJECT NORTH		DATE 31 AUGUST 2018	
DRAWN	CHECKED	VERIFIED	DATE
Author	Checker	Approver	
DRAWING NUMBER 3199-ARC-DD-01_123		REVISION A	

ISSUED FOR TENDER

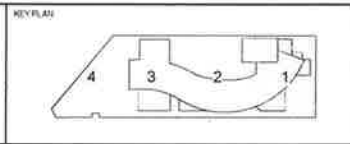
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NSW **GOVERNMENT** **Planning & Environment**
Issued under the Environmental Planning and Assessment Act 1979
Approved Application No. SSD 8365
granted on the 21/02/2019
Signed [Signature]
Sheet No. 17 of 57

REV	BY	DATE	DESCRIPTION
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2	MM	10/08/18	PROGRESS ISSUE
3	MM	17/08/18	FOR REVIEW
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3
4



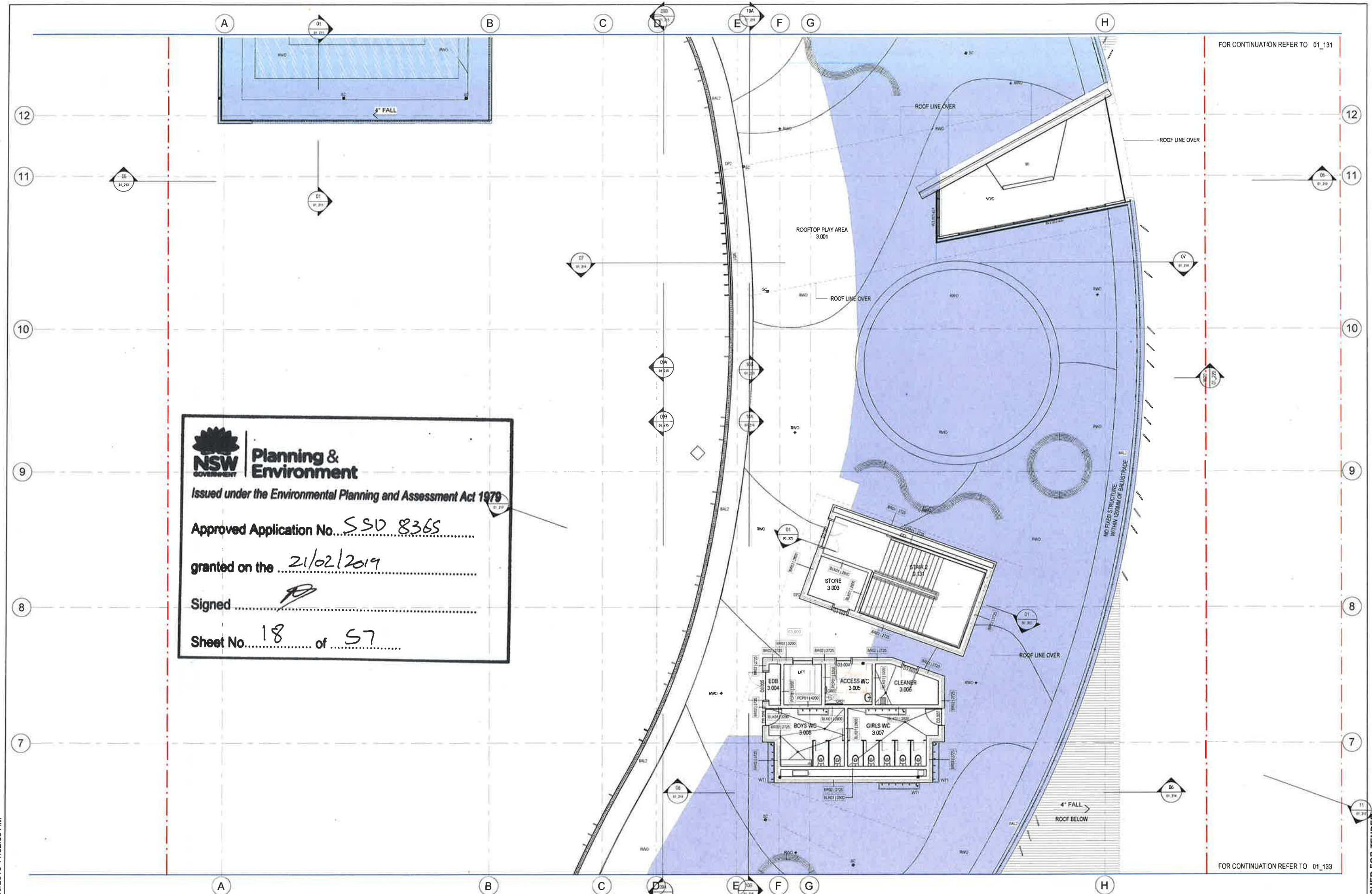
STRUCTURE, CIVIL & HYDRAULIC
POOLACOTT'S ENGINEERS
1 82 823 1000
MECH, ELECT, IT, CIVILS & SEC.
JWA CONSULTING
1 82 843 1000
BCA
COUNCIL
1 82 850 2100
LANDSCAPE
LORRA HARRISON PL
1 82 850 1547

PERUMAL PEDAVOLI ARCHITECTS
1 82 8291 0000
WEB: www.pp.a.com.au
Notarised Architect
Vocal Pedestal NSW reg no 5045
STATUTORY PLANNER
DONOR PLANNING PL
1 82 850 1547
PENSHURST PUBLIC SCHOOL
18 Arcadia Street, Penhurst
DRAWING NAME
FLOOR PLAN - LEVEL 3 - PART 1

CONTRACT NUMBER	SCALE	DATE
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PROJECT NORTH	Author	Checker
	Author	Checker
DRAWING NUMBER	Approver	DATE
3199-ARC-DD-01_131	Approver	31 AUGUST 2018
REVISION	PROJECT CODE	DISCIPLINE
A	3199-ARC-DD-01_131	PHASE

ISSUED FOR TENDER

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Issued under the Environmental Planning and Assessment Act 1979

Approved Application No. SSD 8365

granted on the 21/02/2019

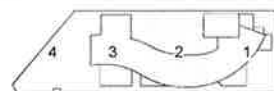
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Sheet No. 18 of 57

AMENDMENTS			
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3	MM	13/08/18	FOR REVIEW
4	MM	26/08/18	PROGRESS ISSUE
5	MM	31/08/18	ISSUED FOR TENDER

LEGEND

KEY PLAN



Education

STRUCTURE, CIVIL & HYDRAULIC
WOODCOTT ENGINEERS
T: 02 9091 0000
W: www.woodcotte.com.au
MECH, ELEC, IT, COMS & SEC.
JWA CONSULTING
T: 02 9437 1000
RCA
GROUP P/L
T: 02 8000 3960
LANDSCAPE
LORNA HARRISON P/L
T: 02 9602 1342

PERUMAL PEDAVOLI ARCHITECTS
T: 02 9091 0000
W: www.perumalpedavoli.com.au
Perumal Pedavoli
Vince Pedavoli NSW reg No 5045

PENSHURST PUBLIC SCHOOL
18 Arcadia Street, Penhurst
DRAWING NAME
FLOOR PLAN - LEVEL 3 - PART 2

CONTRACT NUMBER
SINSW-18-1257

PROJECT NORTH

Author

Checker

Approver

DATE

31 AUGUST 2018

REVISION

PROJECT CODE

DISCIPLINE

PHASE

SERIES NUMBER

3199-ARC-DD-01_132

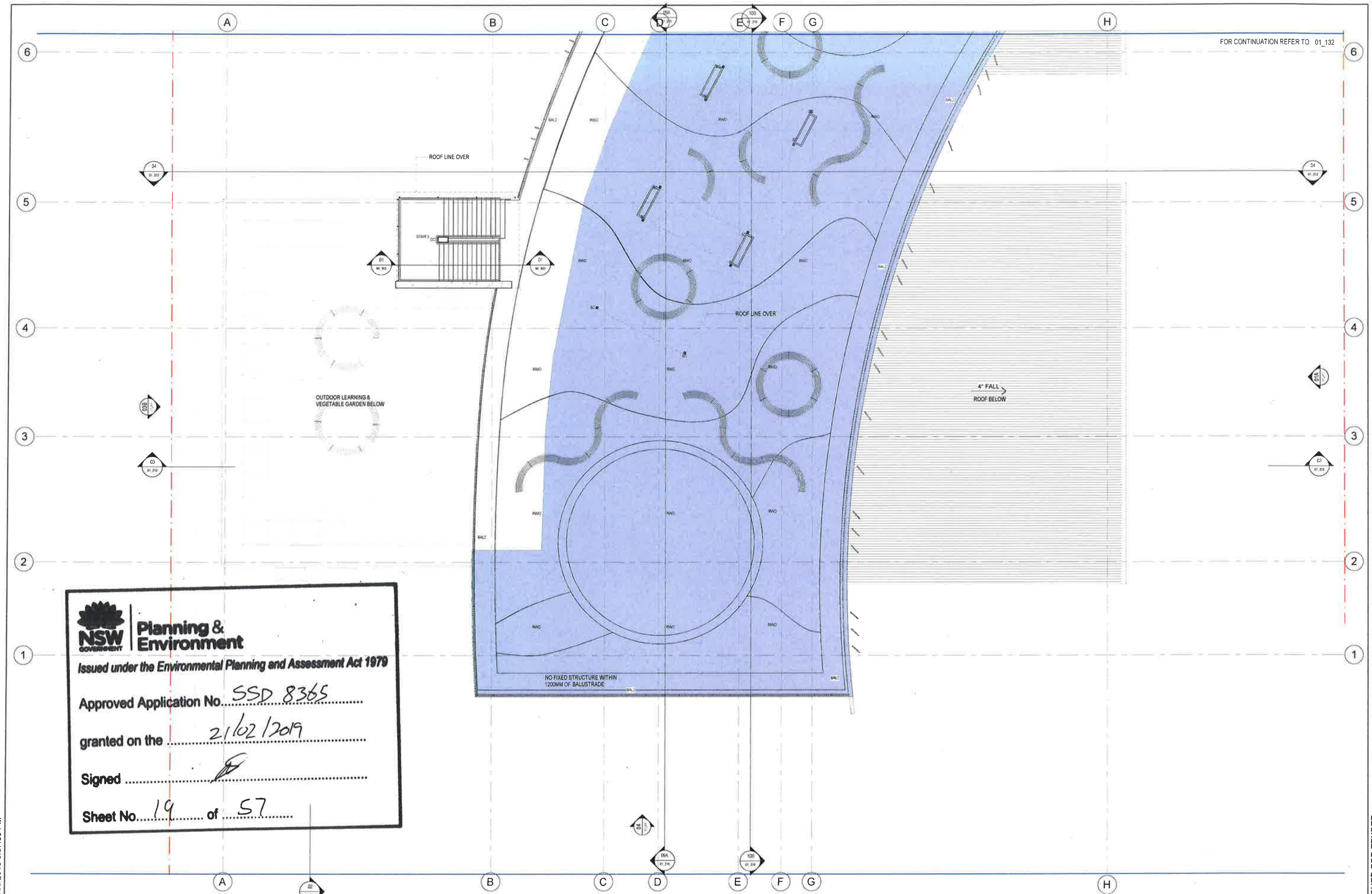
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FOR CONTINUATION REFER TO 01_131

FOR CONTINUATION REFER TO 01_133

ISSUED FOR TENDER

31/08/2018 5:57:33 PM

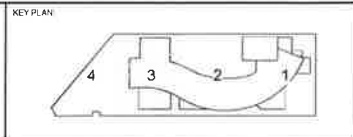


ISSUED FOR TENDER

AMENDMENTS		DATE	DESCRIPTION
REV	BY		
1	MM	20/07/18	PROGRESS ISSUE
2	MM	10/08/18	PROGRESS ISSUE
3	MM	17/08/18	FOR REVIEW
4	MM	29/08/18	PROGRESS ISSUE
5	MM	31/08/18	ISSUED FOR TENDER

LEGEND

KEY PLAN



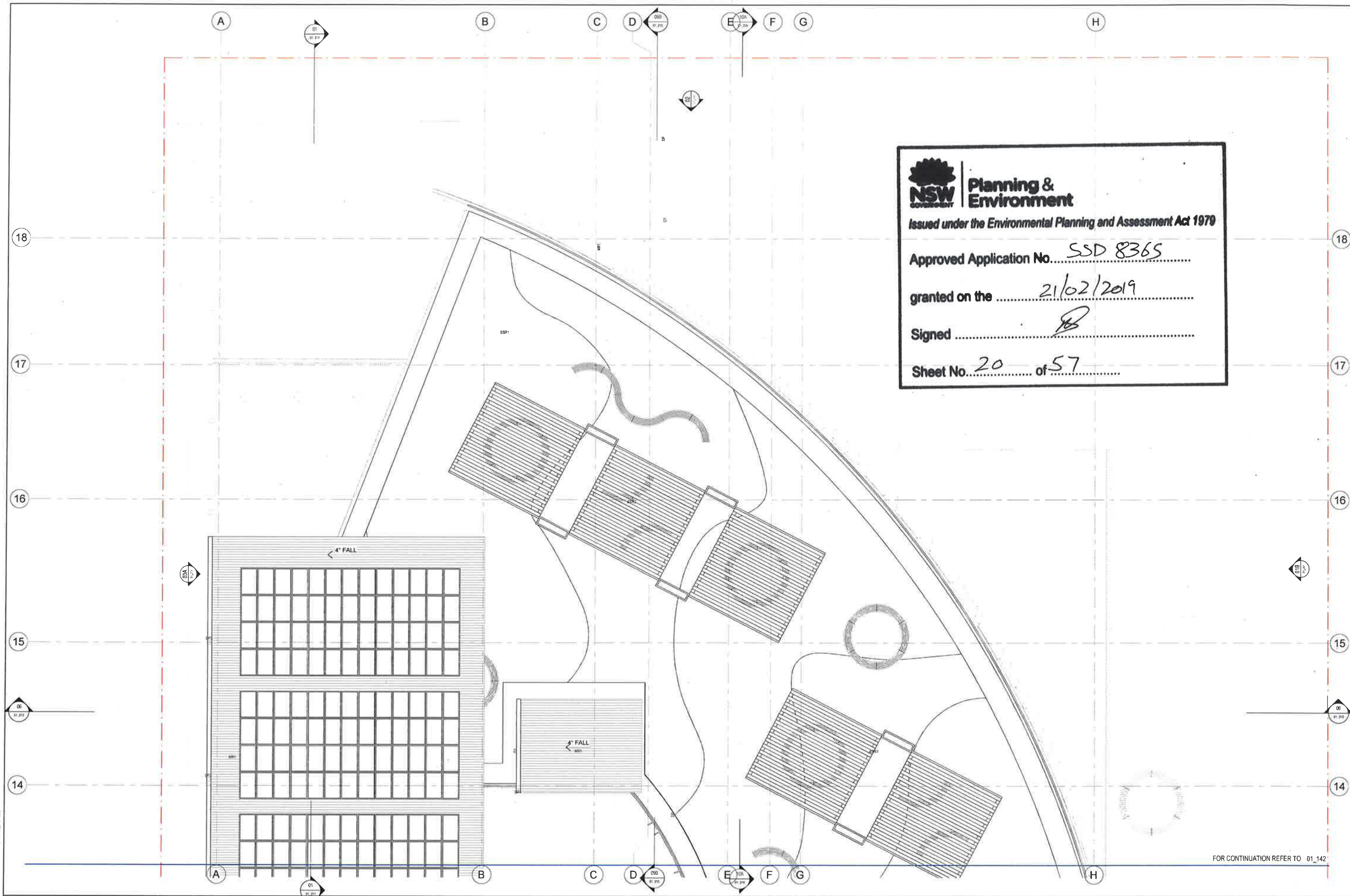
STRUCTURE, CIVIL & HYDRAULIC
WOODCOTT ENGINEERS
T: 02 9251 0000
F: 02 9251 1500
MECH, ELECT, IT, COMMS & SEC.
JHA CONSULTING
T: 02 9437 1000

PERUMAL PEDAVOLI ARCHITECTS
T: 02 9251 0000
F: 02 9251 1500
MECH, ELECT, IT, COMMS & SEC.
JHA CONSULTING
T: 02 9437 1000

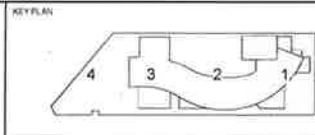
PERUMAL PEDAVOLI ARCHITECTS
T: 02 9251 0000
F: 02 9251 1500
MECH, ELECT, IT, COMMS & SEC.
JHA CONSULTING
T: 02 9437 1000

PENSHURST PUBLIC SCHOOL
18 Arcadia Street, Penhurst
FLOOR PLAN - LEVEL 3 - PART 3

CONTRACT NUMBER SINSW-18-1257	PROJECT NORTH	Author	Checked	Verified	DATE 31 AUGUST 2018
DRAWING NUMBER 3199-ARC-DD-01_133	DISCIPLINE ARCHITECTS	Author	Checker	Approver	REVISION A

[illegible]

LEGEND



Education

STRUCTURE, CIVIL & HYDRA WOLLOCHOTT ENGINEERS T 02 8203 1500
MECH, ELECT, IT, COMMS & JHA CONSULTING T 02 9437 1000
BCA GROUPOIA T 02 8356 3160
LANDSCAPE LORNA HARRISON PLS

PERUMAL PEDAVOLI ARCHITECTS T. 02 9291 0000 Website: www.pp-a.com.au Nominated Architect since Pedavoli & Son reg No 5045	
STATUTORY PLANNER DON FOX PLANNING PL	

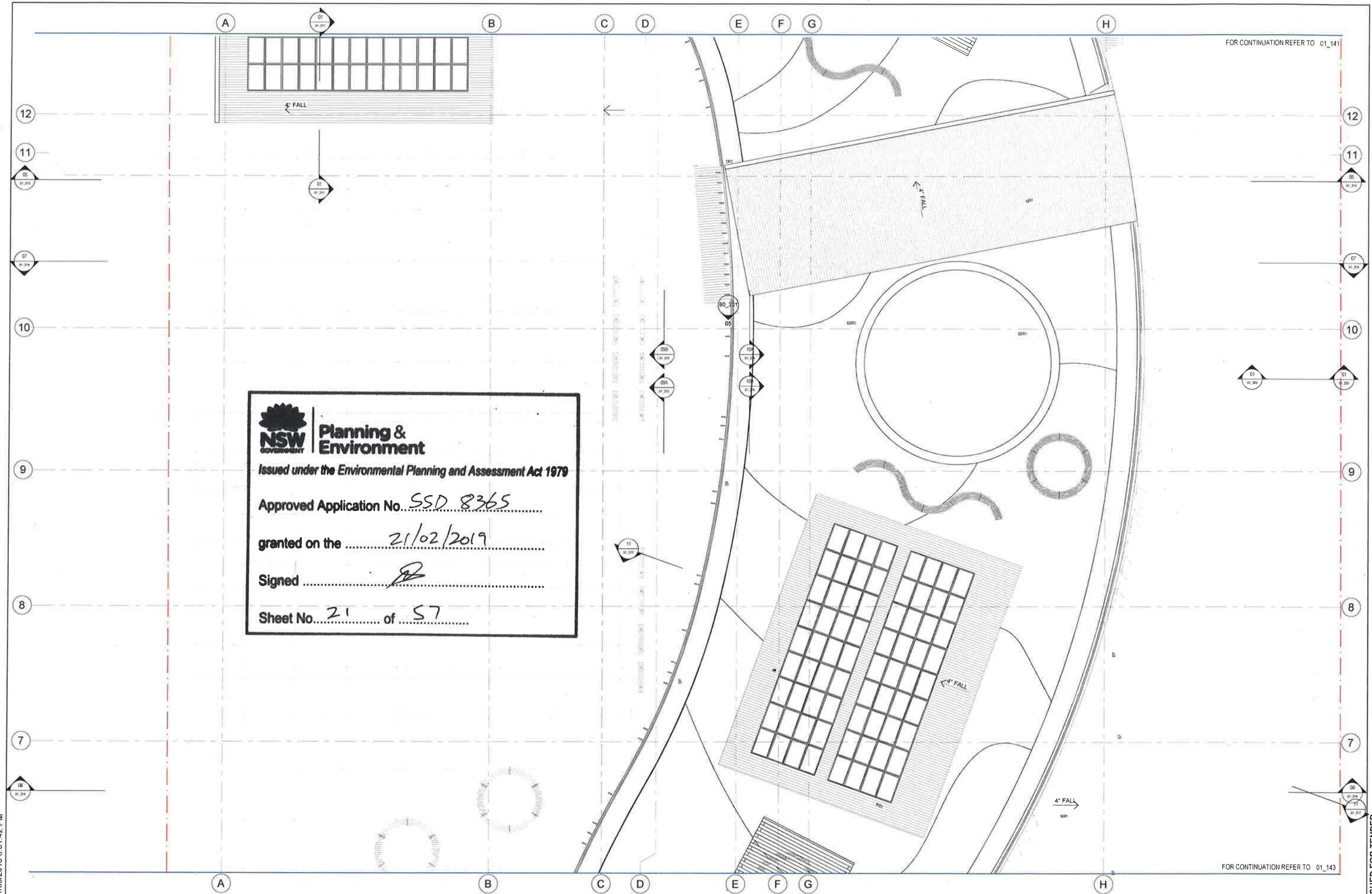
PERUMAL
PEDAVOLI
ARCHITECTS

PENSHURST PUBLIC SCHOOL
18 Arcadia Street, Penshurst
DRAWING NAME
ROOF PLAN - PART 1

CONTRACT NUMBER	SINSW-18-1257
PROJECT NORTH	

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SCALE 1"=100'			
DRAWN	CHECKED	VERIFIED	DATE
Author	Checker	Approver	31 AUGUST 2014
DRAWING NUMBER			REVISION
PROJECT CODE		DISC/PURSE	PHYSICAL SERIES NUMBER
3199-ARC-DD-01		141	A

31/08/2018 6:01:42 PM



NSW Planning & Environment
GOVERNMENT
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Approved Application No. SSD 8365

granted on the 21/02/2019

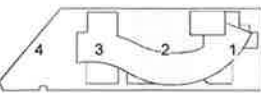
Signed [Signature]

Sheet No. 21 of 57

AMENDMENTS		DATE	DESCRIPTION
REV	BY	DATE	DESCRIPTION
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2	MM	10/08/18	PROGRESS ISSUE
3	MM	17/08/18	FOR REVIEW
4	MM	26/08/18	PROGRESS ISSUE
5	MM	31/08/18	ISSUED FOR TENDER

LEGEND

KEY PLAN



Education

STRUCTURE, CIVIL & HYDRAULIC
WOODCOTT ENGINEERS
T: 02 8291 1500
F: 02 8291 1501
WWW.WOODCOTTENGINEERS.COM.AU
NOMINATED ARCHITECT
Vince Pedavoli NSW reg no 5045

PERUMAL PEDAVOLI ARCHITECTS
T: 02 8291 0000
F: 02 8291 0001
WWW.PEDAVOLIARCHITECTS.COM.AU
NOMINATED ARCHITECT
Vince Pedavoli NSW reg no 5045

PERUMAL PEDAVOLI
ARCHITECTS

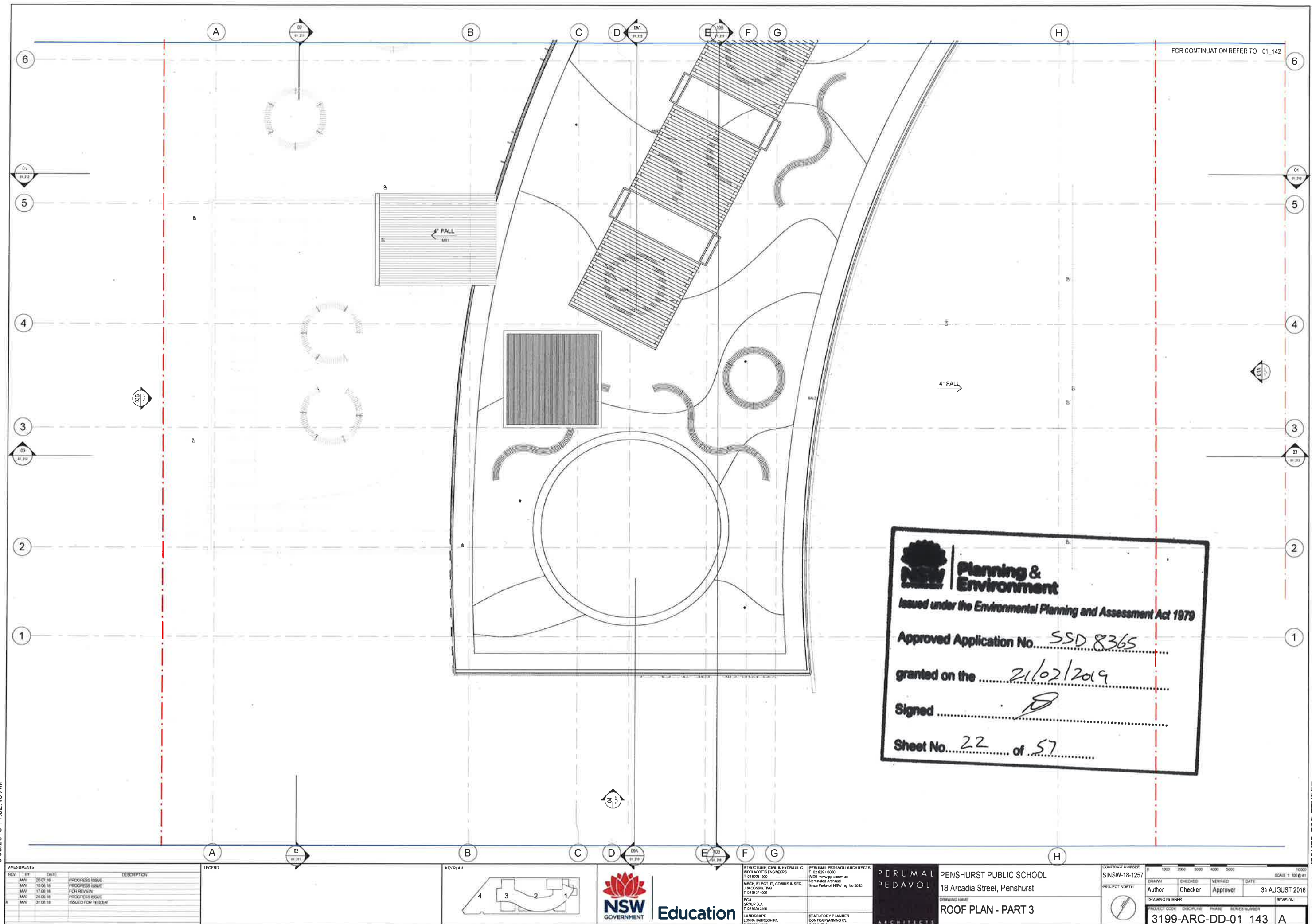
PENSHURST PUBLIC SCHOOL
18 Arcadia Street, Penhurst
DRAWING NAME
ROOF PLAN - PART 2

CONTRACT NUMBER
SINSW-18-1257
PROJECT NORTH

DRAWING NUMBER		DATE		REVISION	
Author	Checked	Verified	DATE	REVISION	
Author	Checked	Approver	31 AUGUST 2018		
PROJECT CODE		DISCIPLINE		SERIES NUMBER	
3199-ARC-DD-01_142		A			

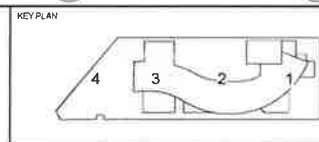
ISSUED FOR TENDER

3/09/2018 11:32:45 AM



AMENDMENTS			
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3	MM	17/08/18	FOR REVIEW
4	MM	26/08/18	PROGRESS ISSUE
5	MM	31/08/18	ISSUED FOR TENDER

LEGEND	
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2	MECH, ELECT, IT, COMMS & SEC
3	PLUMBING
4	LANDSCAPE



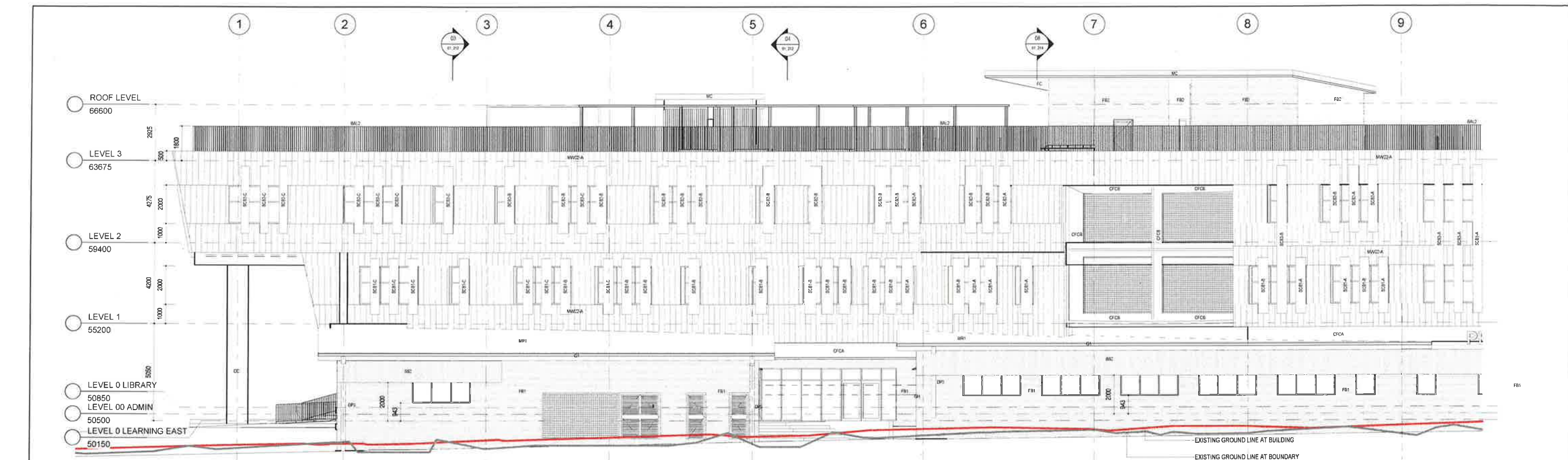
STRUCTURE, CIVIL & HYDRAULIC
WOODLEY ENGINEERS
T 02 9291 0000
F 02 9291 0000
WWW.WOODLEY.COM.AU
HOMESIDE ARCHITECT
Price: Federal NSW reg No 5045

PERUMAL
PEDAVOLI
ARCHITECTS

PENSHURST PUBLIC SCHOOL
18 Arcadia Street, Penhurst
DRAWING NAME
ROOF PLAN - PART 3

CONTRACT NUMBER SINSW-18-1257		PROJECT NORTH	
DRAWN	CHECKED	VERIFIED	DATE
Author	Checker	Approver	31 AUGUST 2018
DRAWING NUMBER 3199-ARC-DD-01_143		REVISION A	

ISSUED FOR TENDER



ELEVATION - PART A 01A
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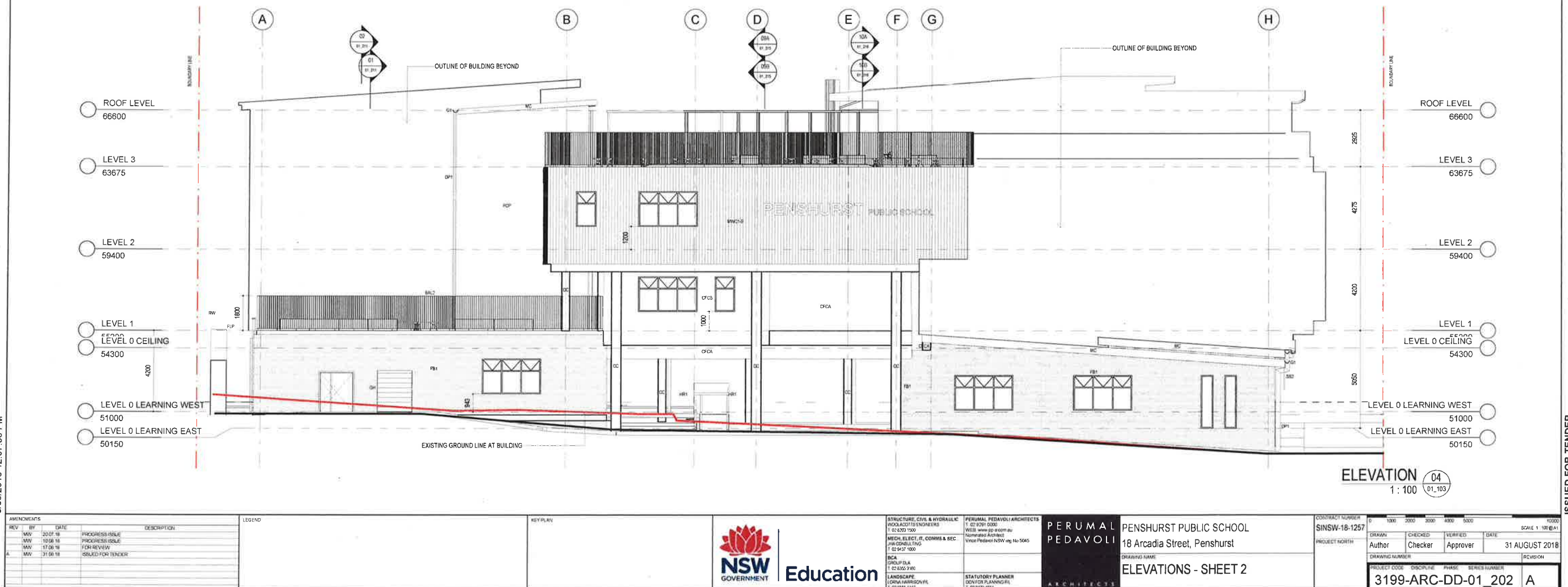


ELEVATION - PART B 01B
1 : 100 01.101

NSW Planning & Environment
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Approved Application No. SSD 8365
ENSHURST PUBLIC SCHOOL
granted on the 21/02/2019
Signed [Signature]
Sheet No. 23 of 57

AMENDMENTS				LEGEND		KEY PLAN				STRUCTURE, CIVIL & HYDRAULIC WOODCOTT ENGINEERS T: 02 9291 1000 F: 02 9291 1000 MECH, ELECTR, IT, COMMS & SEC JWA CONSULTING T: 02 9407 1000 F: 02 9407 1000 PECA GROUP P/L T: 02 8055 3160 F: 02 8055 3160 LANDSCAPE CORN HARRISON P/L T: 02 9550 1182 F: 02 9550 1182		PERUMAL PEDAVOLI ARCHITECTS T: 02 9291 0000 F: 02 9291 0000 Vice President of the Institute of Architects Vice President of the NSW and VIC SOPS STATUTORY PLANNER DON FOX PLANNING PTY T: 02 9551 4514 F: 02 9551 4514		PERUMAL PEDAVOLI ARCHITECTS PENSHURST PUBLIC SCHOOL 18 Arcadia Street, Penshurst ELEVATIONS - SHEET 1		CONTRACT NUMBER SINSW-18-1257 PROJECT NORTH DRAWING NUMBER 3199-ARC-DD-01_201 Author Checker Approver 31 AUGUST 2018 REVISION A																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
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Approved Application No. SSD 8365

granted on the 21/02/2019

Signed [Signature]

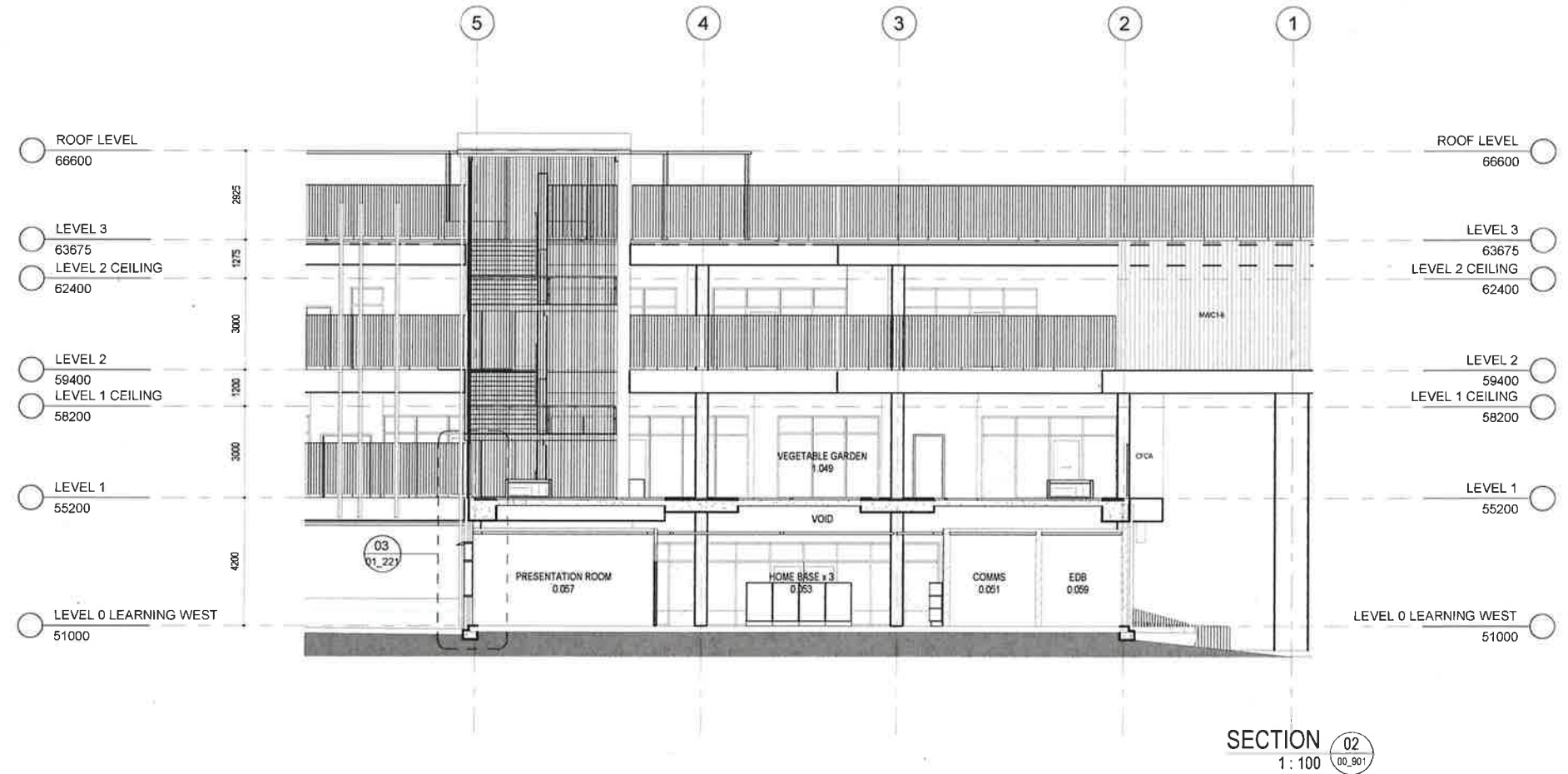
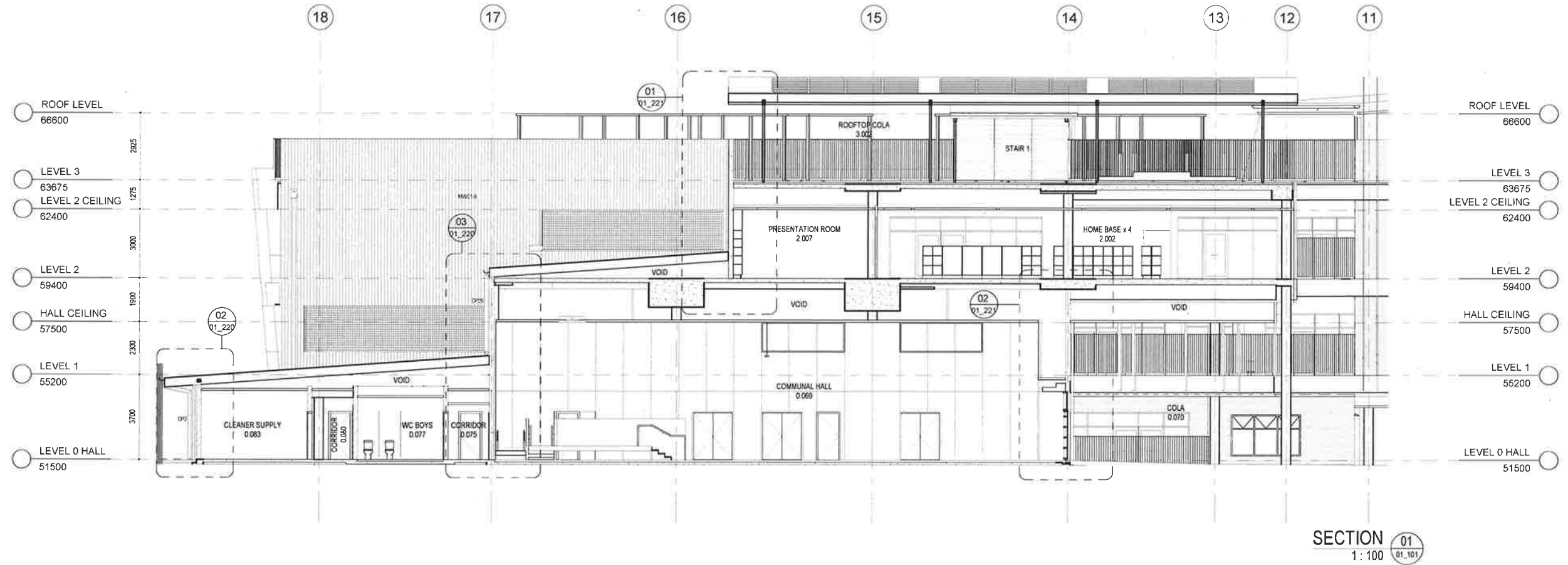
Sheet No. 24 of 57

AMENDMENTS				LEGEND	KEY PLAN	STRUCTURE, CIVIL & HYDRAULIC WOLLOCHT ENGINEERS 1/02/2018 1500 MECH. ELECT. JT. COMM & SEC. JWA CONSULTING 1/02/2018 1000	PERUMAL PEDAVOLI ARCHITECTS 1/02/2018 5000 WWW.PERUMALPEDAVOLI.COM.AU Nominated Architect Vince Pedavoli NSW reg. No 5045	PERUMAL PEDAVOLI PENSURST PUBLIC SCHOOL 18 Arcadia Street, Penshurst ELEVATIONS - SHEET 2	CONTRACT NUMBER SINSW-18-1257				PROJECT NORTH	SCALE 1:100 @ A1			
REV	BY	DATE	DESCRIPTION														
1	MW	20.07.18	PROGRESS ISSUE														
2	MW	10.08.18	PROGRESS ISSUE														
3	MW	17.08.18	FOR REVIEW														
4	MW	31.08.18	ISSUED FOR TENDER														

Author	Checked	Verified	Date
			31 AUGUST 2018

Project Code	Discipline	Phase	Series Number
3199-ARC-DD-01_202			A

ISSUED FOR TENDER



Planning & Environment

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Sheet No. 26 of 57

31/08/2018 4:47:58 PM

REV	BY	DATE	DESCRIPTION
1	MM	20/07/18	PROGRESS ISSUE
2	MM	10/08/18	PROGRESS ISSUE
3	MM	17/08/18	FOR REVIEW
4	MM	31/08/18	ISSUED FOR TENDER

LEGEND

KEY PLAN



Education

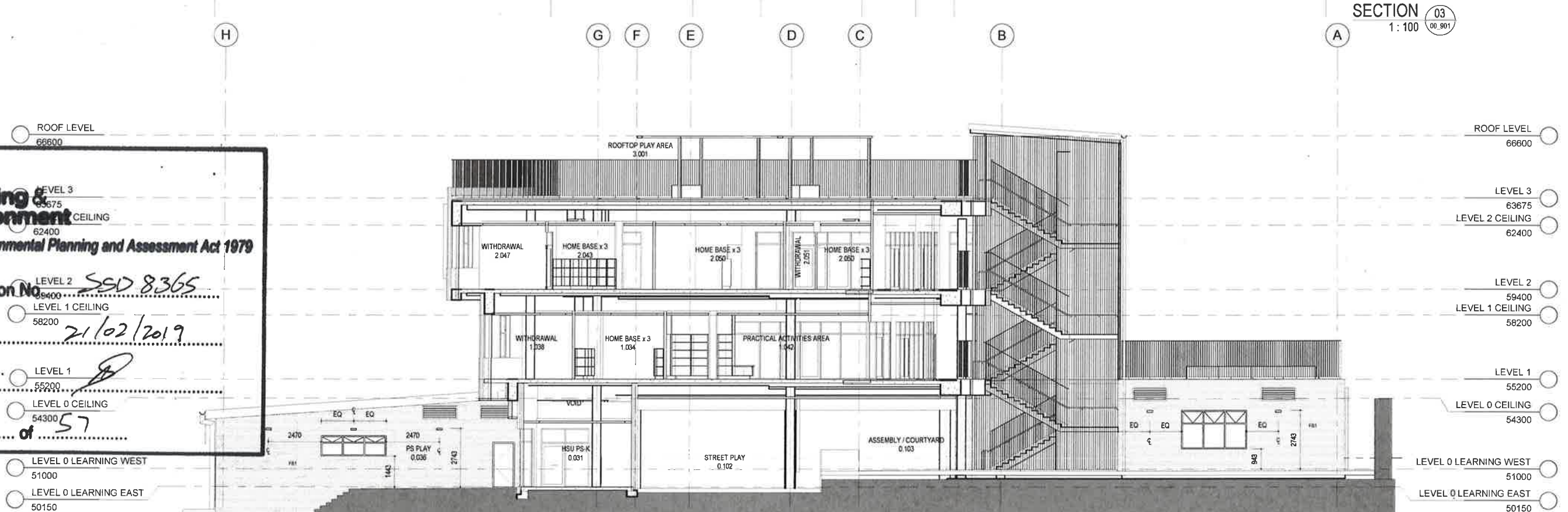
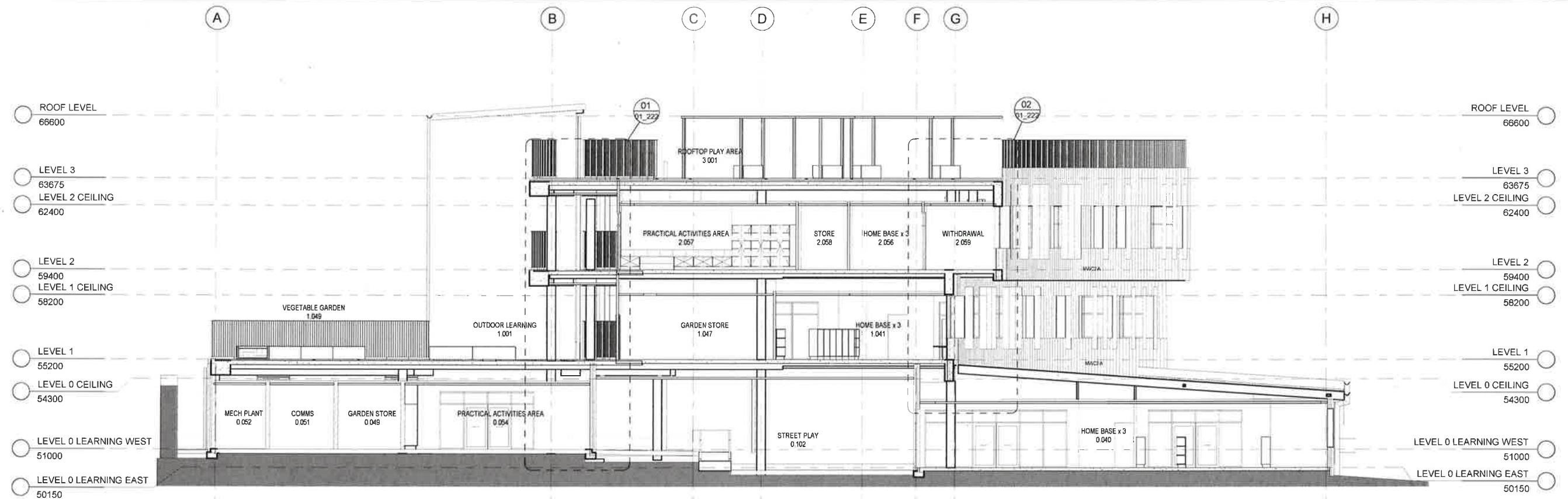
STRUCTURE, CIVIL & HYDRAULIC
WOODWARD ENGINEERS
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1/02/2018 1000
MECH, ELECTR, IT, COMMS & SEC
JWA CONSULTING
1/02/2018 1000
BCA
GROUP P/L
1/02/2018 1000
LANDSCAPE
LORNA HARRISON P/L
1/02/2018 1000

PERUMAL PEDAVOLI ARCHITECTS
1/02/2018 0000
1/02/2018 1000
1/02/2018 1000
STATUTORY PLANNER
DOUGLAS PLANNING P/L
1/02/2018 1000

PENSHURST PUBLIC SCHOOL
18 Arcadia Street, Penshurst
DRAWING NAME
SECTIONS - SHEET 1

CONTRACT NUMBER SINSW-18-1257	PROJECT NUMBER	DRAWN Author	CHECKED Checker	VERIFIED Approver	DATE 31 AUGUST 2018	SCALE 1:100 (E.A.)
DRAWING NUMBER 3199-ARC-DD-01_211						REVISION A

ISSUED FOR TENDER



NSW Planning & Environment
Issued under the Environmental Planning and Assessment Act 1979

Approved Application No. **SSD 8365**
granted on the **21/02/2019**

Signed **[Signature]**
Sheet No. **27** of **57**

31/08/2018 4:48:12 PM

REV	BY	DATE	DESCRIPTION
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2	MM	10.08.18	PROGRESS ISSUE
3	MM	17.08.18	FOR REVIEW
4	MM	31.08.18	ISSUED FOR TENDER

LEGEND

KEY PLAN

STRUCTURE, CIVIL & HYDRAULIC
WOLACOTT ENGINEERS 1 82 828 1500 www.wolacott.com.au
Mech, Elect, IT, Comms & Sec
JVA CONSULTING 1 82 947 1800
BCA
CRISP DLA 1 82 828 3160
LANDSCAPE
CORNA HARRISON 1 82 300 1142

PERUMAL PEDAVOLI ARCHITECTS
1 82 509 0000 www.pp-a.com.au Permal Pedavoli Victor Pedavoli NSW reg No 5045
STATUTORY PLANNER
DOUGLAS PLANNING 1 82 509 0000

PERUMAL PEDAVOLI ARCHITECTS
PENSHURST PUBLIC SCHOOL 18 Arcadia Street, Penhurst
SECTIONS - SHEET 2

CONTRACT NUMBER
SINISW-18-1257
PROJECT NORTH
Author
Checker
Approver
DATE
31 AUGUST 2018
DRAWING NUMBER
3199-ARC-DD-01_212
REVISION
A

SCALE
1:1000 1:500 1:250 1:125 1:62.5 1:31.25 1:15.625 1:7.8125 1:3.90625 1:1.953125 1:0.9765625 1:0.48828125 1:0.244140625 1:0.1220703125 1:0.06103515625 1:0.030517578125 1:0.0152587890625 1:0.00762939453125 1:0.003814697265625 1:0.0019073486328125 1:0.00095367431640625 1:0.000476837158203125 1:0.0002384185791015625 1:0.00011920928955078125 1:0.000059604644775390625 1:0.0000298023223876953125 1:0.00001490116119384765625 1:0.000007450580596923828125 1:0.0000037252902984619140625 1:0.00000186264514923095703125 1:0.000000931322574615478515625 1:0.0000004656612873077392578125 1:0.00000023283064365386962890625 1:0.000000116415321826934814453125 1:0.0000000582076609134674072265625 1:0.00000002910383045673370361328125 1:0.000000014551915228366851806640625 1:0.0000000072759576141834259033203125 1:0.00000000363797880709171295166015625 1:0.000000001818989403545856475830078125 1:0.0000000009094947017729282379150390625 1:0.00000000045474735088646411895751953125 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- ROOF LEVEL
66600
- LEVEL 3
63675
- LEVEL 2 CEILING
62400
- LEVEL 2
59400
- LEVEL 1 CEILING
58200
- HALL CEILING
57500
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55200
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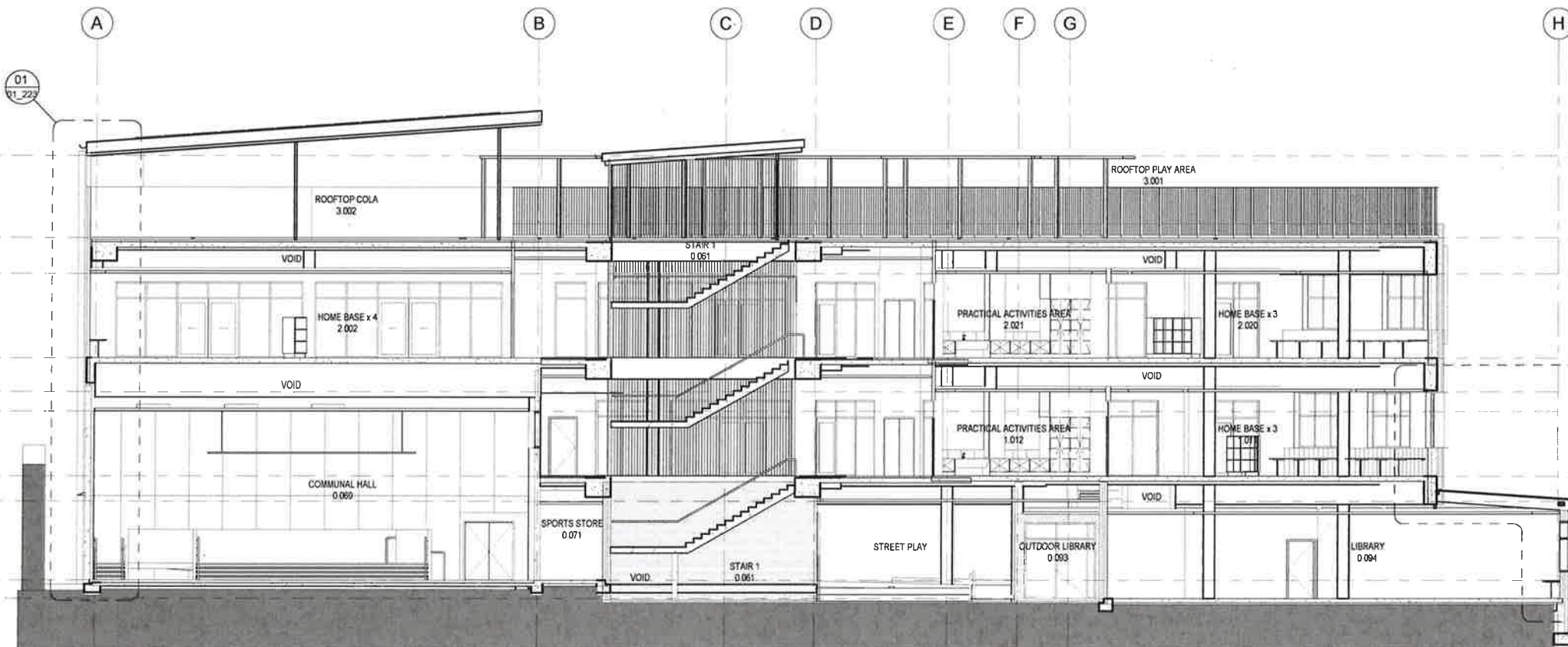


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 Approved Application No. SSD 8365
 granted on the 21/02/2019
 Signed [Signature]
 Sheet No. 28 of 57

- ROOF LEVEL
66600
- LEVEL 3
63675
- LEVEL 2 CEILING
62400
- LEVEL 2
59400
- LEVEL 1 CEILING
58200
- HALL CEILING
57500
- LEVEL 1
55200
- LEVEL 0 CEILING
54300
- LEVEL 0 HALL
51500
- LEVEL 0 LIBRARY
50850

SECTION 05
1:100

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- LEVEL 2 CEILING
62400
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- LEVEL 1 CEILING
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- HALL CEILING
57500
- LEVEL 1
55200
- LEVEL 0 CEILING
54300
- LEVEL 0 HALL
51500
- LEVEL 0 LIBRARY
50850



- ROOF LEVEL
66600
- LEVEL 3
63675
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59400
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58200
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SECTION 06
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31/08/2018 4:48:33 PM

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2	MM	15/08/18	PROGRESS ISSUE
3	MM	17/08/18	FOR REVIEW
4	MM	31/08/18	ISSUED FOR TENDER

LEGEND	KEY PLAN

STRUCTURE, CIVIL & HYDRAULIC WOODACOTT ENGINEERS T: 02 9232 1500 MECH, ELEC, IT, COMMS & SEC JWA CONSULTING T: 02 9437 1000 BICA GROUP/DA T: 02 9355 3360 LANDSCAPE CORNA HARRISON/RE T: 02 9355 1162	PERUMAL PEDAVOLI ARCHITECTS T: 02 9391 0000 VLS/LLI www.ppa.com.au Registered Architect Vince Pedavoli NSW reg no 5045 STATUTORY PLANNER CECILIA PLANNING/RE T: 02 9353 8814
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PERUMAL PEDAVOLI ARCHITECTS
 18 Arcadia Street, Penshurst
 SECTIONS - SHEET 3

CONTRACT NUMBER SINSW-18-1257	PROJECT NORTH	DRAWING NUMBER 3199-ARC-DD-01_213	REVISIONS A
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Author	Checked	Verified	Date
Author	Checker	Approver	31 AUGUST 2018

ISSUED FOR TENDER

31/08/2018 4:48:50 PM



Planning & Environment

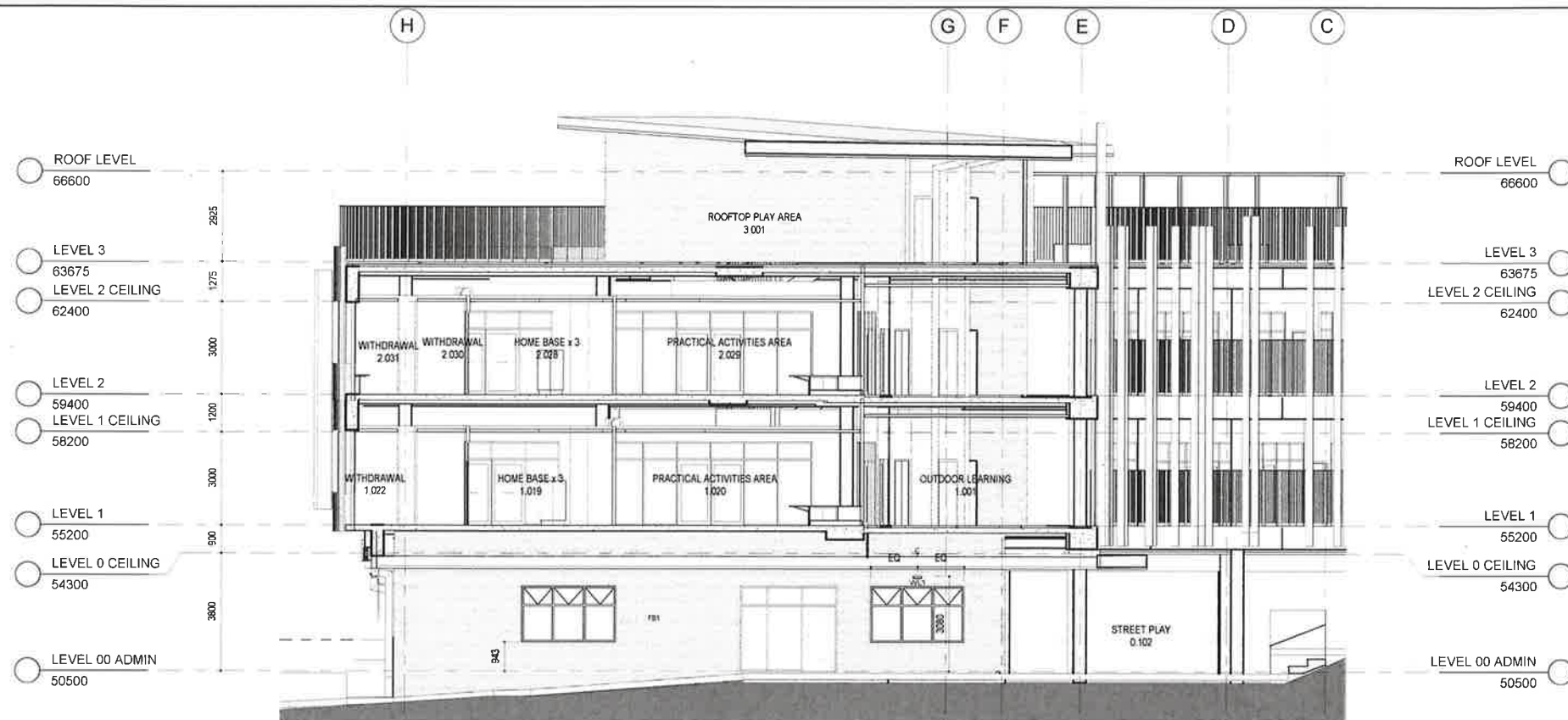
Issued under the Environmental Planning and Assessment Act 1979

Approved Application No. SSD 8365

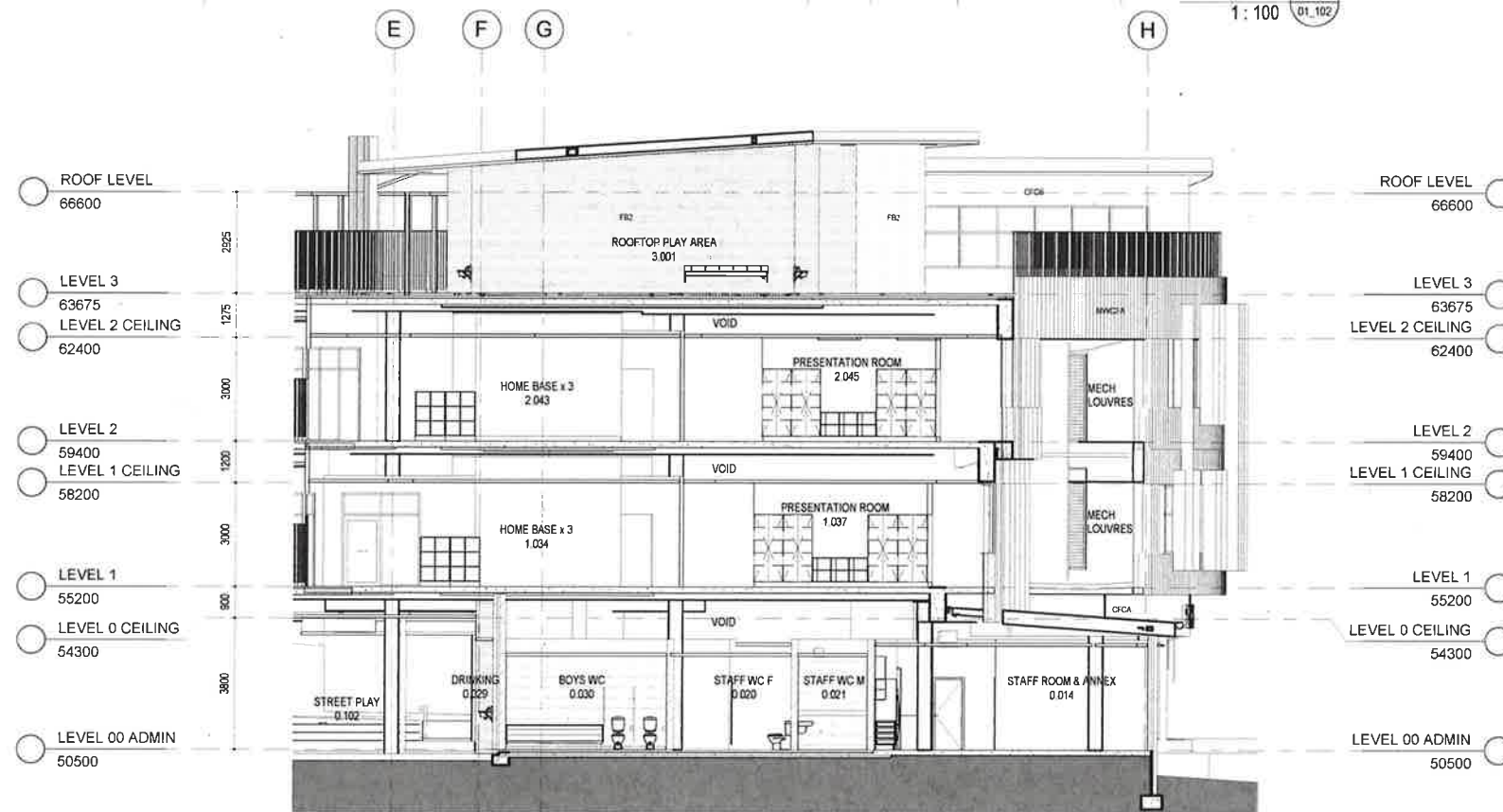
granted on the 21/02/2019

Signed [Signature]

Sheet No. 29 of 57



SECTION 07
1:100



SECTION 08
1:100



Education

STRUCTURE, CIVIL & HYDRAULIC
WOOLACOTT ENGINEERS
1/23/2018 1000
MECH, ELEC, IT, COMM & SEC.
JVA CONSULTING
1/23/2018 1000
BACK
GROUP DIA
1/23/2018 1000
LANDSCAPE
1/23/2018 1000

PERUMAL PEDAVOLI ARCHITECTS
1/23/2018 1000
VITEC - www.vitec.com.au
Vice President NSW Reg No 5045
STATUTORY PLANNER
1/23/2018 1000

PERUMAL PEDAVOLI
ARCHITECTS

PENSHURST PUBLIC SCHOOL
18 Arcadia Street, Penshurst

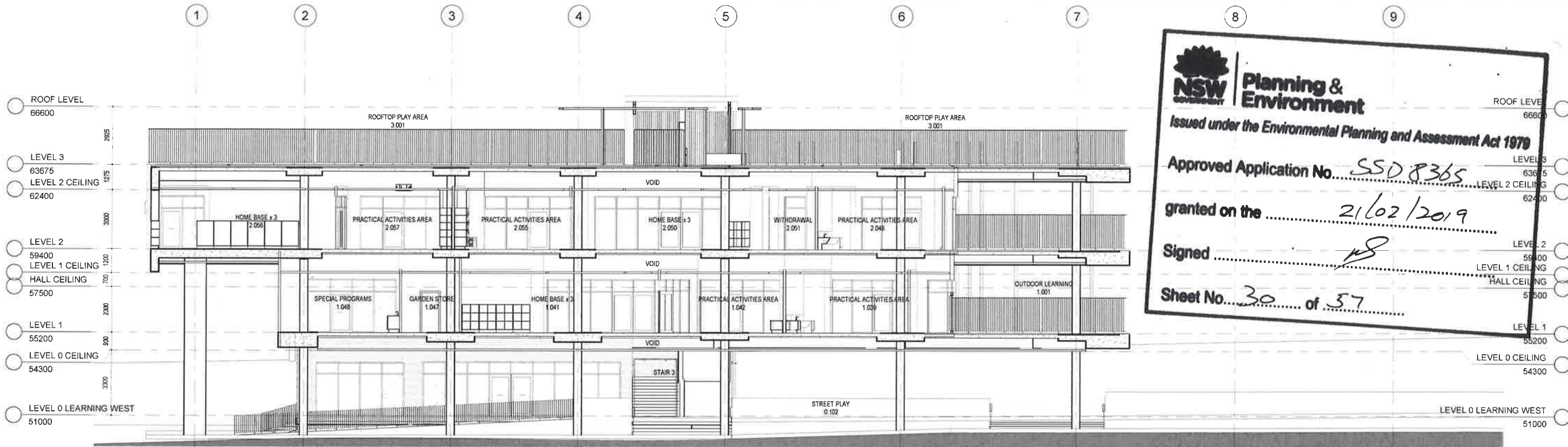
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CONTRACT NUMBER
SINSW-18-1257

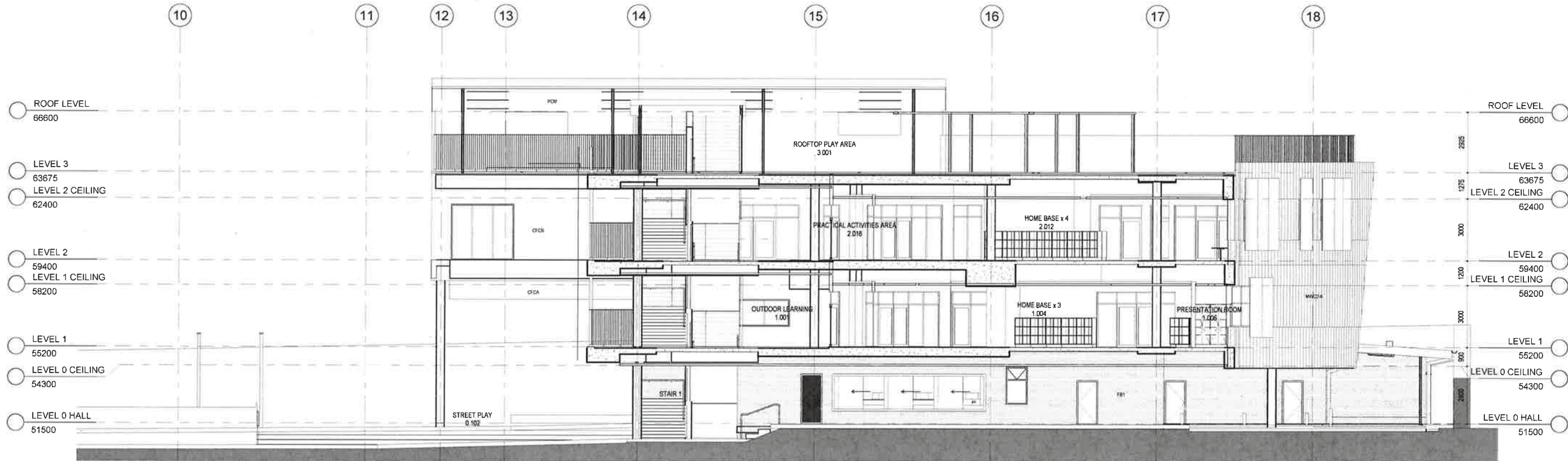
PROJECT NORTH

PROJECT CODE	DISCIPLINE	PHASE	SERIES NUMBER	REVISION
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ISSUED FOR TENDER



SECTION - PART A (09A)
1:100 (01_102)



SECTION - PART B (09B)
1:100 (01_101)

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 Sheet No. 30 of 57

31/08/2018 4:49:05 PM

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2	MM	10.08.18	PROGRESS ISSUE
3	MM	17.08.18	FOR REVIEW
4	MM	31.08.18	ISSUED FOR TENDER

LEGEND

KEY PLAN



STRUCTURE, CIVIL & HYDRAULIC
 WOOLACOTT ENGINEERS
 T: 02 9391 0000
 F: 02 9391 0000
 www.woolacott.com.au
 Nominated Architect
 Since Federal NSW reg for 5045

PERUMAL PEDAVOLI ARCHITECTS
 T: 02 9391 0000
 F: 02 9391 0000
 www.perumalpedavoli.com.au
 Nominated Architect
 Since Federal NSW reg for 5045

PERUMAL PEDAVOLI ARCHITECTS
 T: 02 9391 0000
 F: 02 9391 0000
 www.perumalpedavoli.com.au
 Nominated Architect
 Since Federal NSW reg for 5045

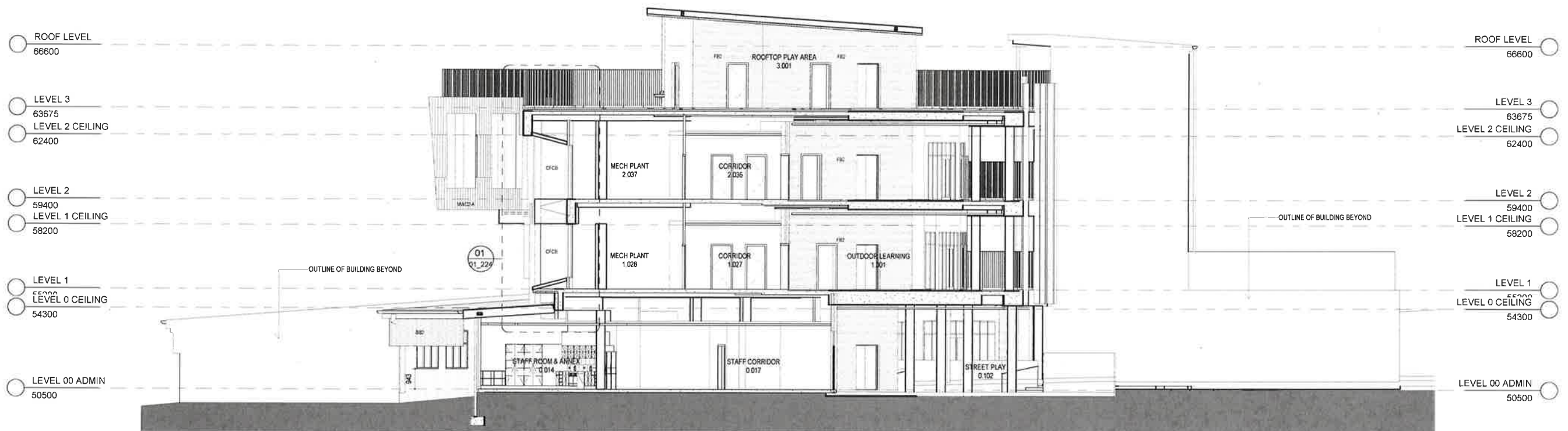
PENSHURST PUBLIC SCHOOL
 18 Arcadia Street, Penhurst
 SECTIONS - SHEET 5

CONTRACT NUMBER
 SINSW-18-1257
 PROJECT NORTH

DRAWN	CHECKED	VERIFIED	DATE	SCALE
Author	Checker	Approver	31 AUGUST 2018	1:100 @ A1
DRAWING NUMBER	PROJECT CODE	DISCIPLINE	PHASE	SERIES NUMBER
3199-ARC-DD-01_215	A			

ISSUED FOR TENDER

ISSUED FOR TENDER



SECTION 11
1 : 100 01_102

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 Approved Application No. SSD 8365
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 Sheet No. 32 of 57

31/08/2018 4:49:49 PM

REV	BY	DATE	DESCRIPTION
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2	MM	31/08/18	ISSUED FOR TENDER

LEGEND	KEY PLAN

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NSW Education

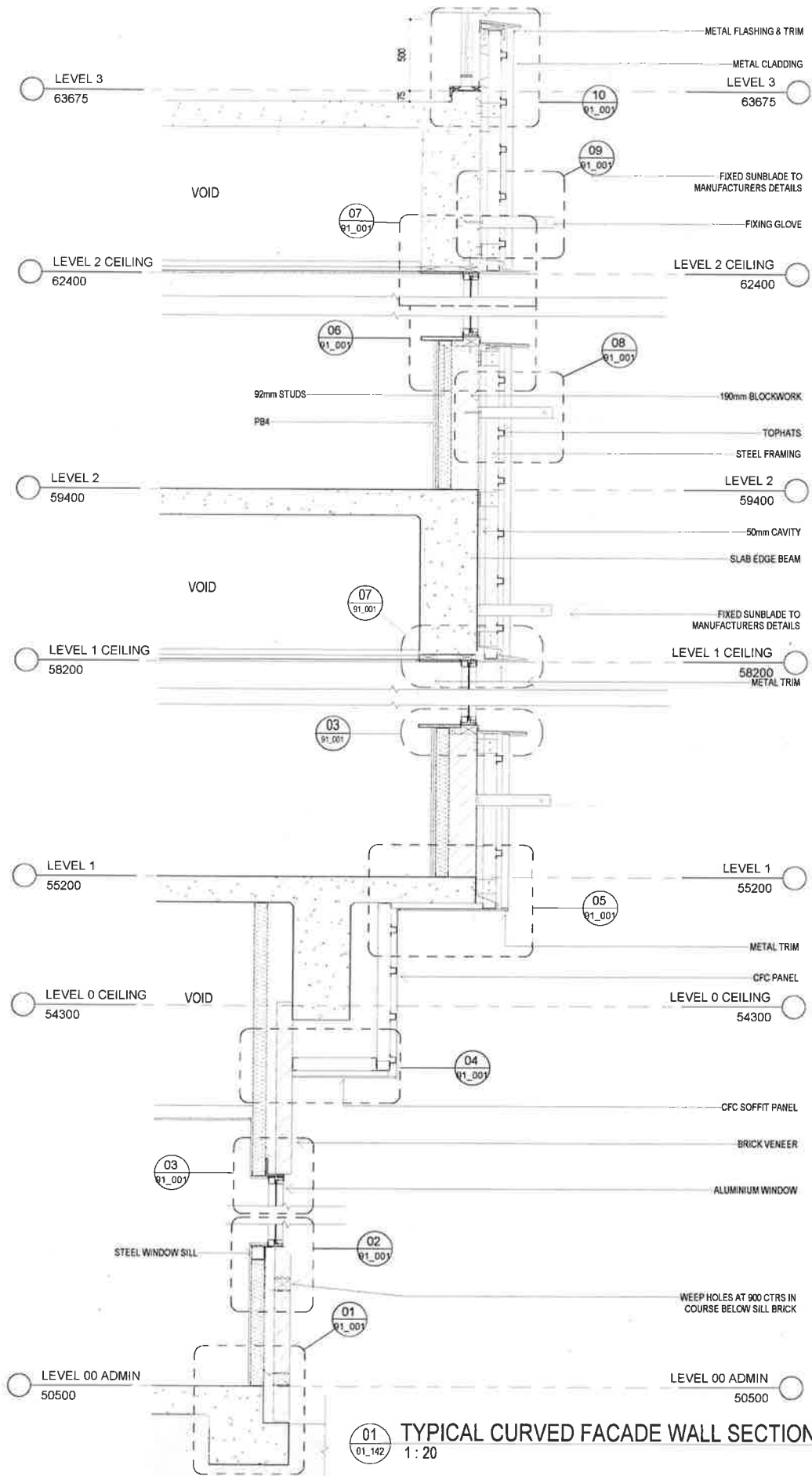
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PERUMAL PEDAVOLI ARCHITECTS	PENSHURST PUBLIC SCHOOL 18 Arcadia Street, Peshurst SECTIONS - SHEET 7
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CONTRACT NUMBER SINSW-18-1257 PROJECT NORTH	DRAWN Author	CHECKED Checker	VERIFIED Approver	DATE 31 AUGUST 2018	SCALE 1 : 100 @ A1
DRAWING NUMBER 3199-ARC-DD-01_217	DISCIPLINE A	PHASE	SERIES NUMBER	REVISION	

ISSUED FOR TENDER

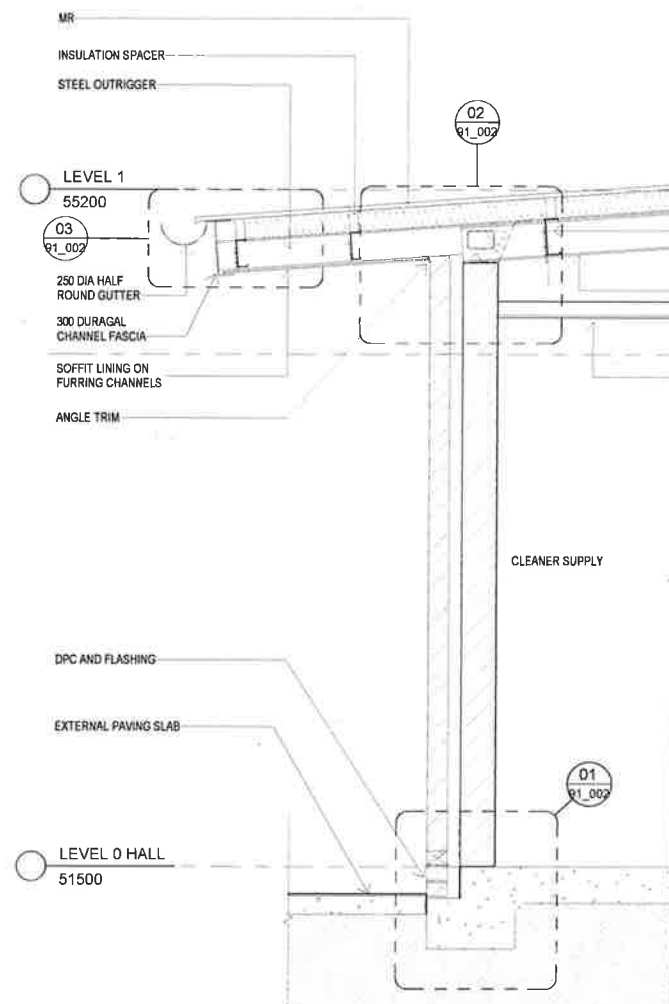
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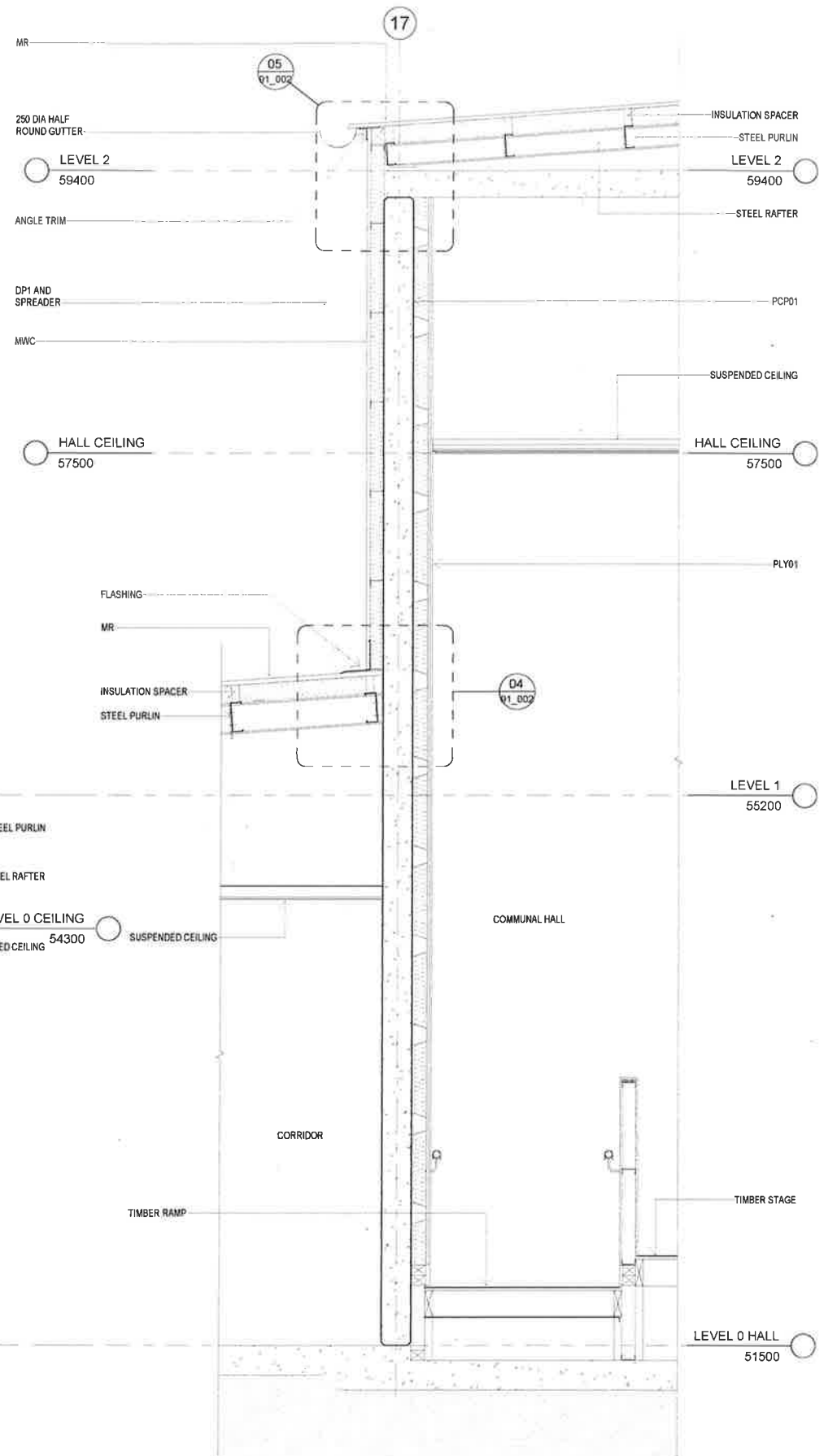
01 01.142 TYPICAL CURVED FACADE WALL SECTION 1:20

NSW Planning & Environment
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Approved Application No. SSD 8365
granted on the 21/02/2019
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02 01.211 WALL SECTION 1:20



03 01.211 WALL SECTION 1:20

REV	BY	DATE	DESCRIPTION
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MW	17/08/18		FOR REVIEW
MW	28/08/18		PROGRESS ISSUE
MW	31/08/18		ISSUED FOR TENDER

REV	BY	DATE	DESCRIPTION
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02	01.211		WALL SECTION 1:20
03	01.211		WALL SECTION 1:20

REV	BY	DATE	DESCRIPTION
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02	01.211		WALL SECTION 1:20
03	01.211		WALL SECTION 1:20

REV	BY	DATE	DESCRIPTION
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03	01.211		WALL SECTION 1:20

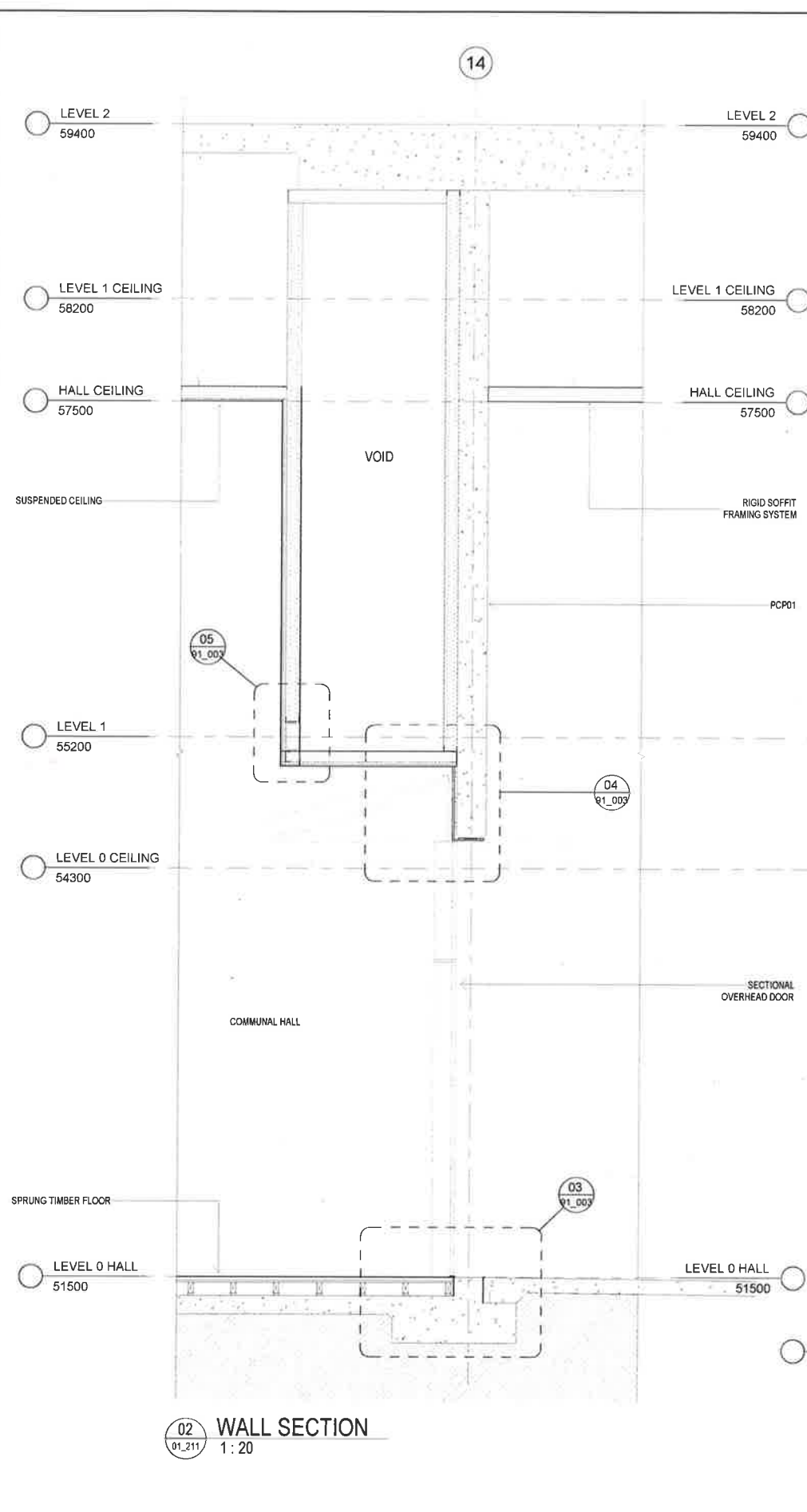
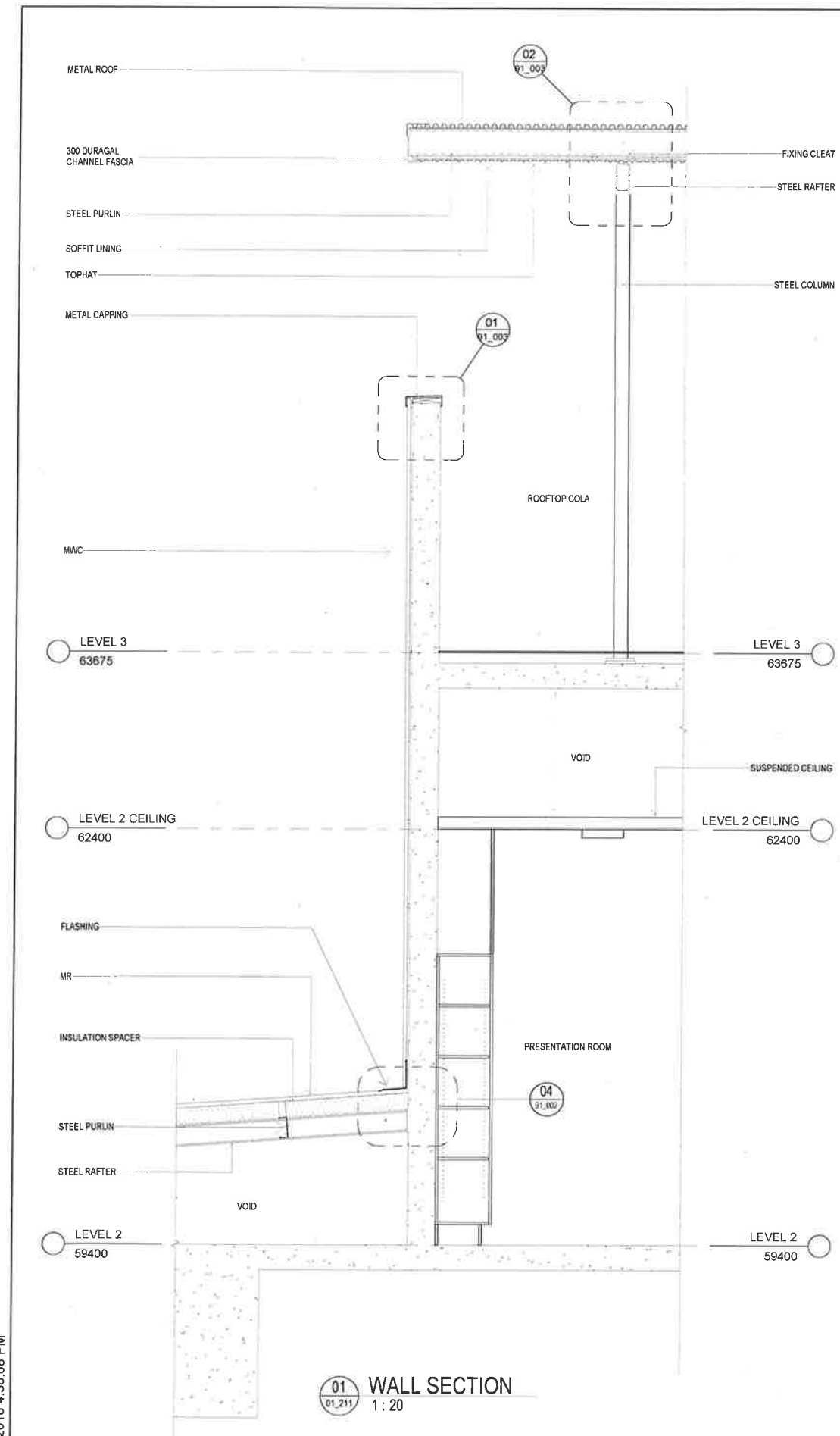
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02	01.211		WALL SECTION 1:20
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REV	BY	DATE	DESCRIPTION
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03	01.211		WALL SECTION 1:20

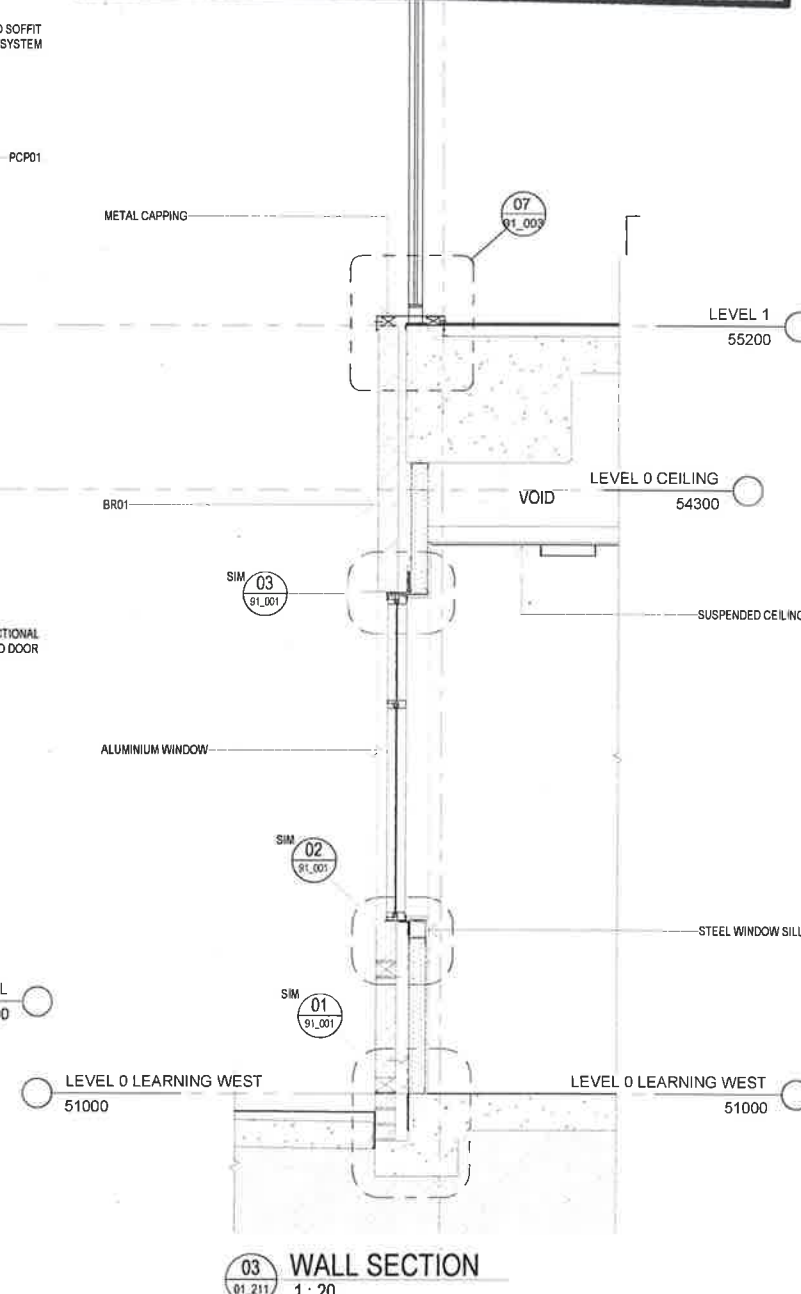
ISSUED FOR TENDER

31/08/2018 4:36:08 PM



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granted on the 21/02/2019
Signed [Signature]
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REV	BY	DATE	DESCRIPTION
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2	MM	17/08/18	FOR REVIEW
3	MM	28/08/18	PROGRESS ISSUE
4	MM	31/08/18	ISSUED FOR TENDER

REV	BY	DATE	DESCRIPTION
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2	MM	17/08/18	FOR REVIEW
3	MM	28/08/18	PROGRESS ISSUE
4	MM	31/08/18	ISSUED FOR TENDER

REV	BY	DATE	DESCRIPTION
1	MM	10/08/18	PROGRESS ISSUE
2	MM	17/08/18	FOR REVIEW
3	MM	28/08/18	PROGRESS ISSUE
4	MM	31/08/18	ISSUED FOR TENDER

REV	BY	DATE	DESCRIPTION
1	MM	10/08/18	PROGRESS ISSUE
2	MM	17/08/18	FOR REVIEW
3	MM	28/08/18	PROGRESS ISSUE
4	MM	31/08/18	ISSUED FOR TENDER

REV	BY	DATE	DESCRIPTION
1	MM	10/08/18	PROGRESS ISSUE
2	MM	17/08/18	FOR REVIEW
3	MM	28/08/18	PROGRESS ISSUE
4	MM	31/08/18	ISSUED FOR TENDER

REV	BY	DATE	DESCRIPTION
1	MM	10/08/18	PROGRESS ISSUE
2	MM	17/08/18	FOR REVIEW
3	MM	28/08/18	PROGRESS ISSUE
4	MM	31/08/18	ISSUED FOR TENDER

REV	BY	DATE	DESCRIPTION
1	MM	10/08/18	PROGRESS ISSUE
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3	MM	28/08/18	PROGRESS ISSUE
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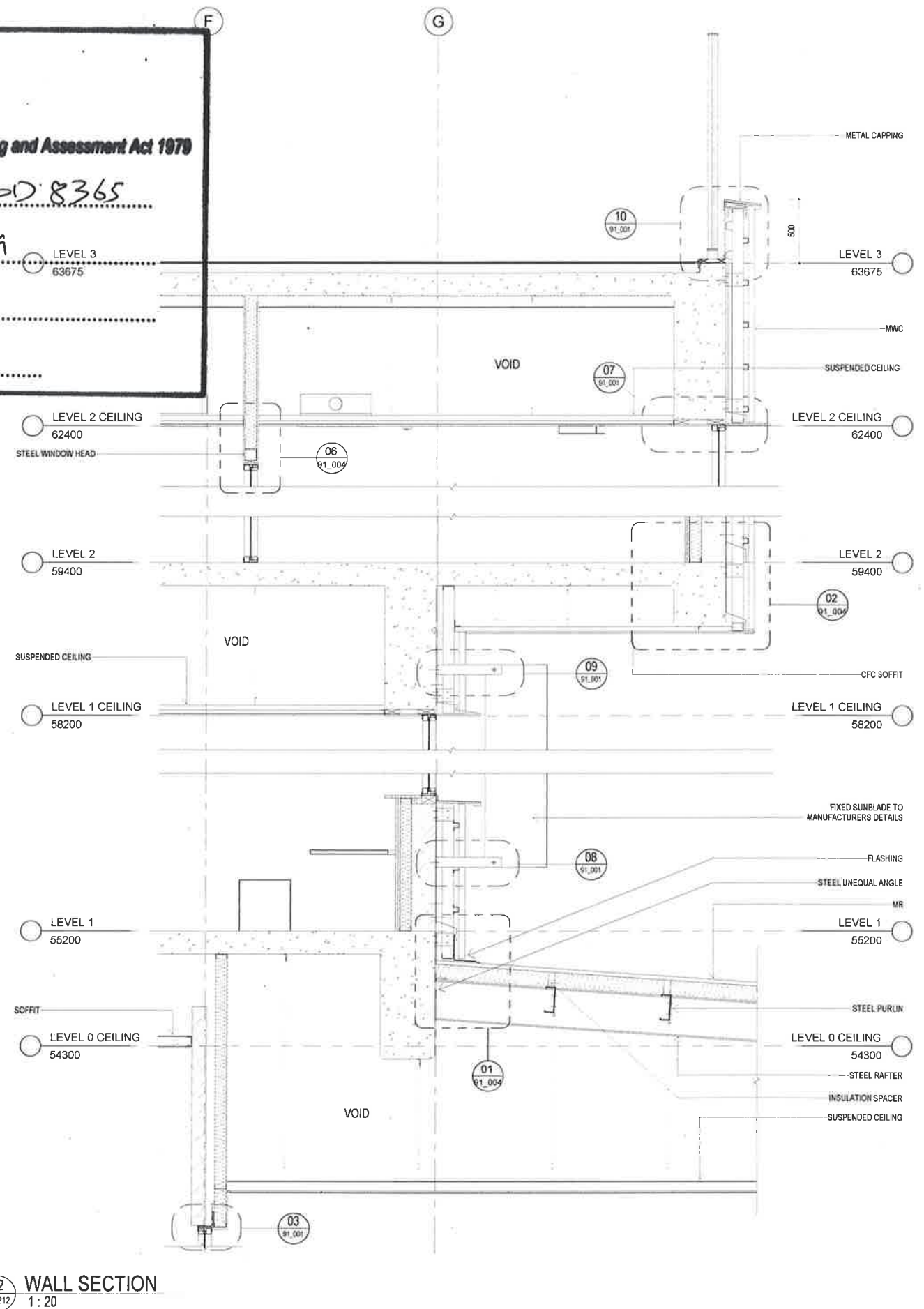
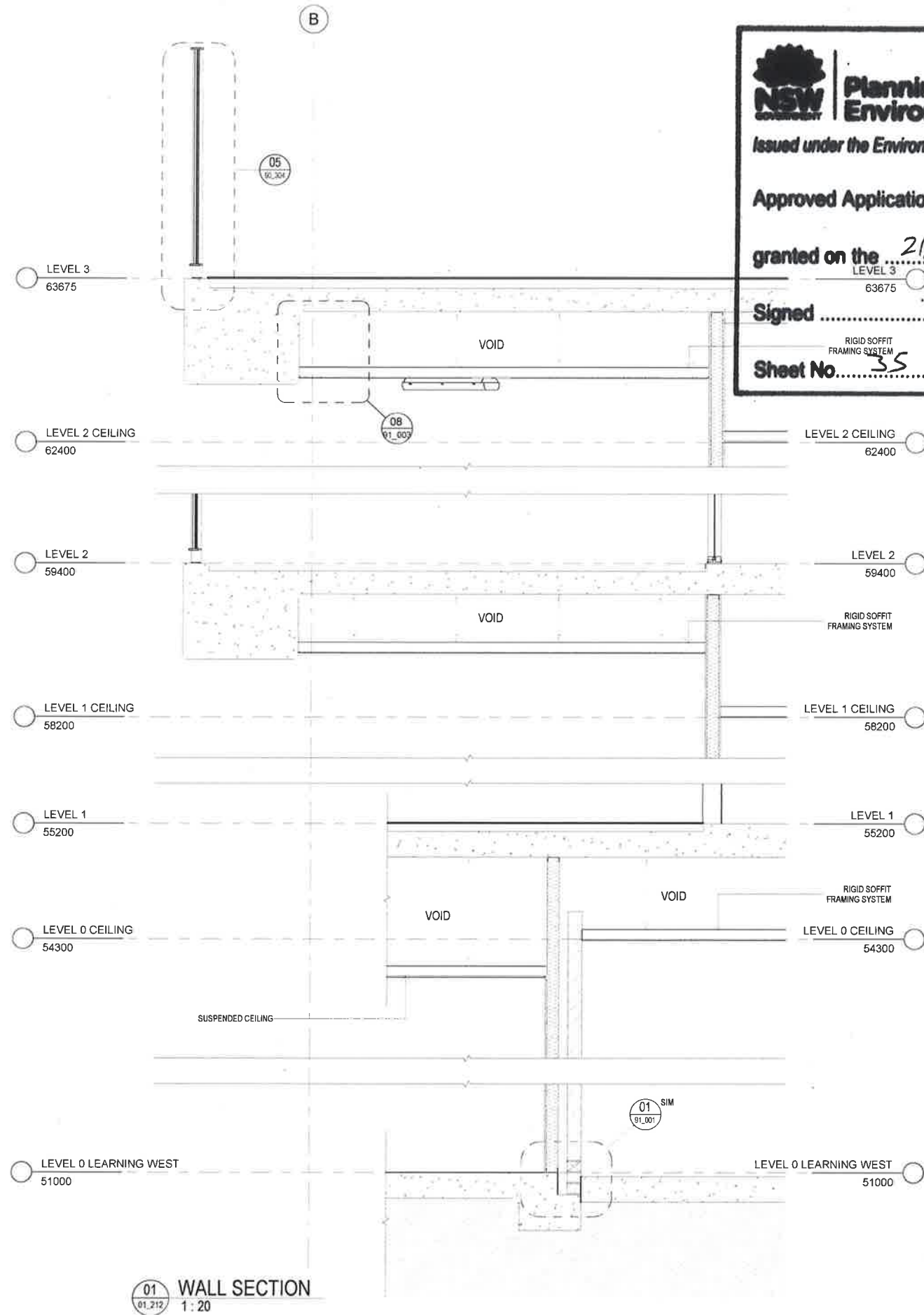
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4	MM	31/08/18	ISSUED FOR TENDER

ISSUED FOR TENDER

31/08/2018 4:36:20 PM

NSW Planning & Environment
Issued under the Environmental Planning and Assessment Act 1979

Approved Application No. SSD 8365
granted on the 21/02/2019
Signed B
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REV	BY	DATE	DESCRIPTION
1	MM	10/06/18	PROGRESS ISSUE
2	MM	17/06/18	FOR REVIEW
3	MM	28/06/18	PROGRESS ISSUE
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KEY PLAN



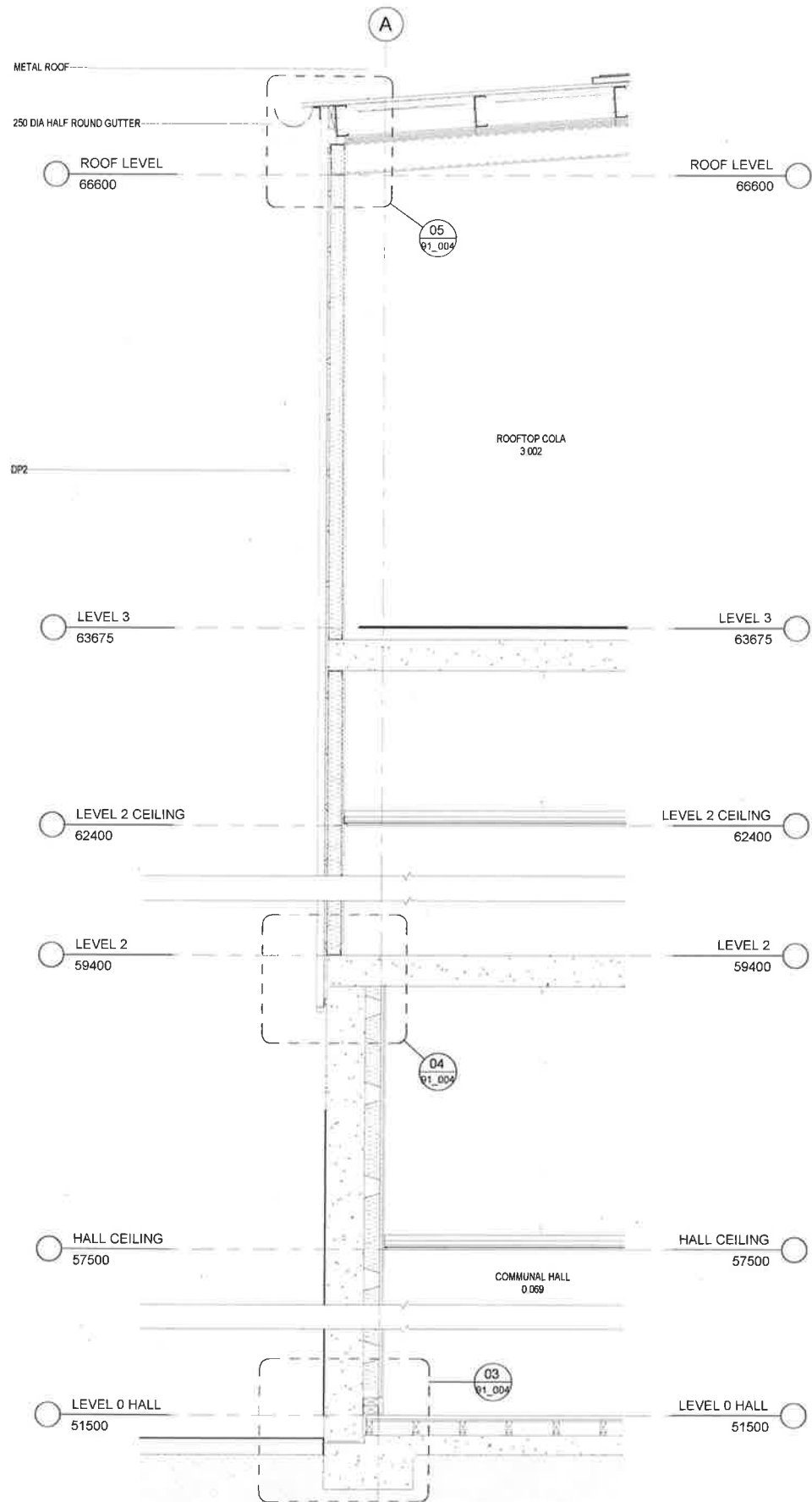
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PERUMAL PEDAVOLI ARCHITECTS	PENSHURST PUBLIC SCHOOL 18 Arcadia Street, Penshurst WALL SECTIONS SHEET 3
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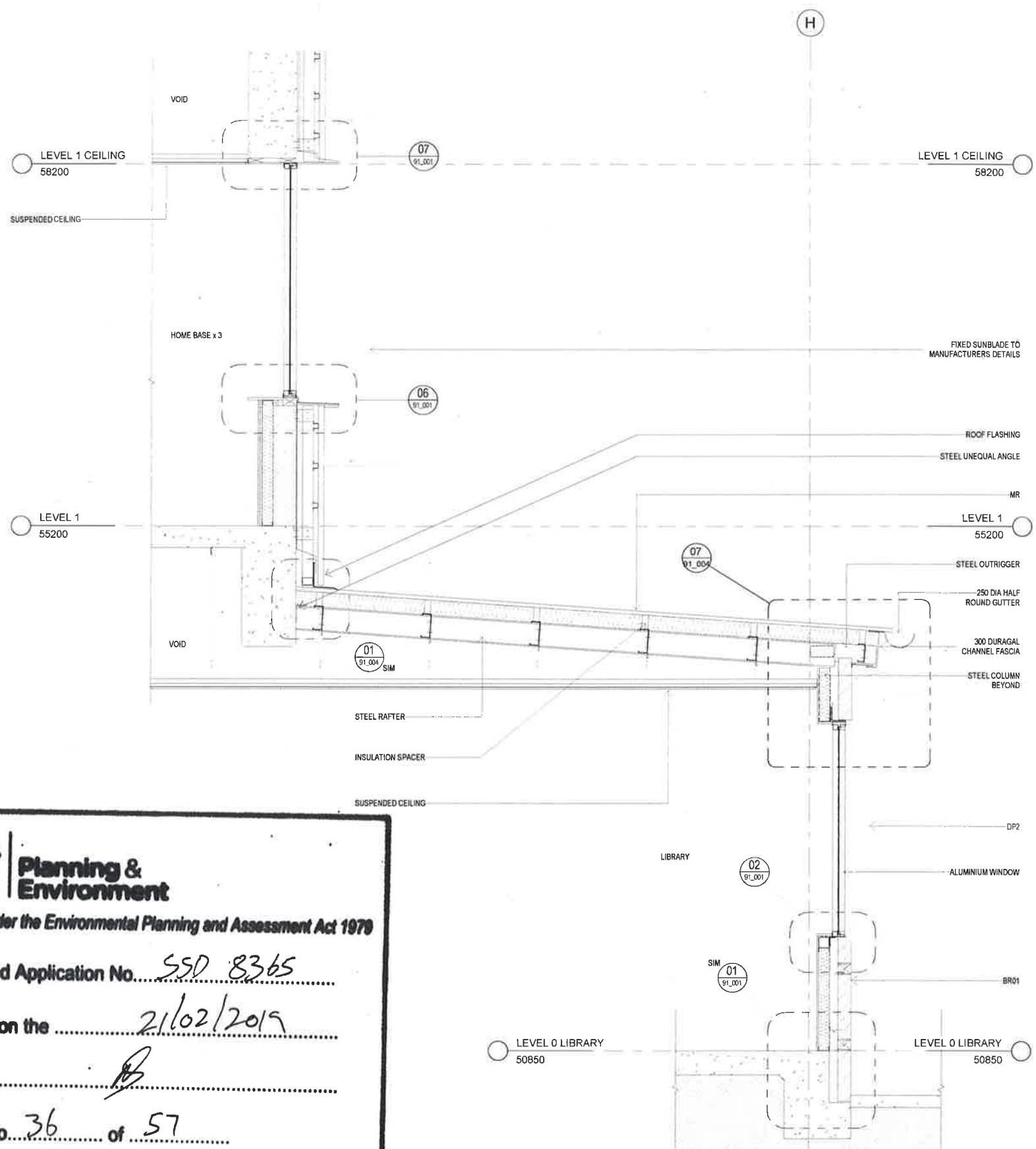
CONTRACT NUMBER SINSW-18-1257	PROJECT NORTH	Author Checked Approved	31 AUGUST 2018
PROJECT CODE 3199-ARC-DD-01_222		REVISION A	

ISSUED FOR TENDER

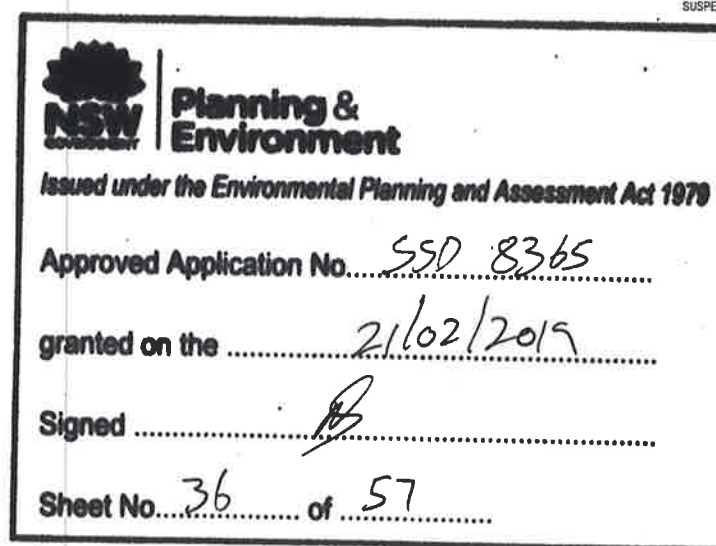
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01 WALL SECTION
01.213 1:20



02 WALL SECTION
01.213 1:20



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02	MM	17/08/18	FOR REVIEW
03	MM	26/08/18	PROGRESS ISSUE
04	MM	31/08/18	ISSUED FOR TENDER

LEGEND
01.213

KEY PLAN
01.213

NSW GOVERNMENT	Education
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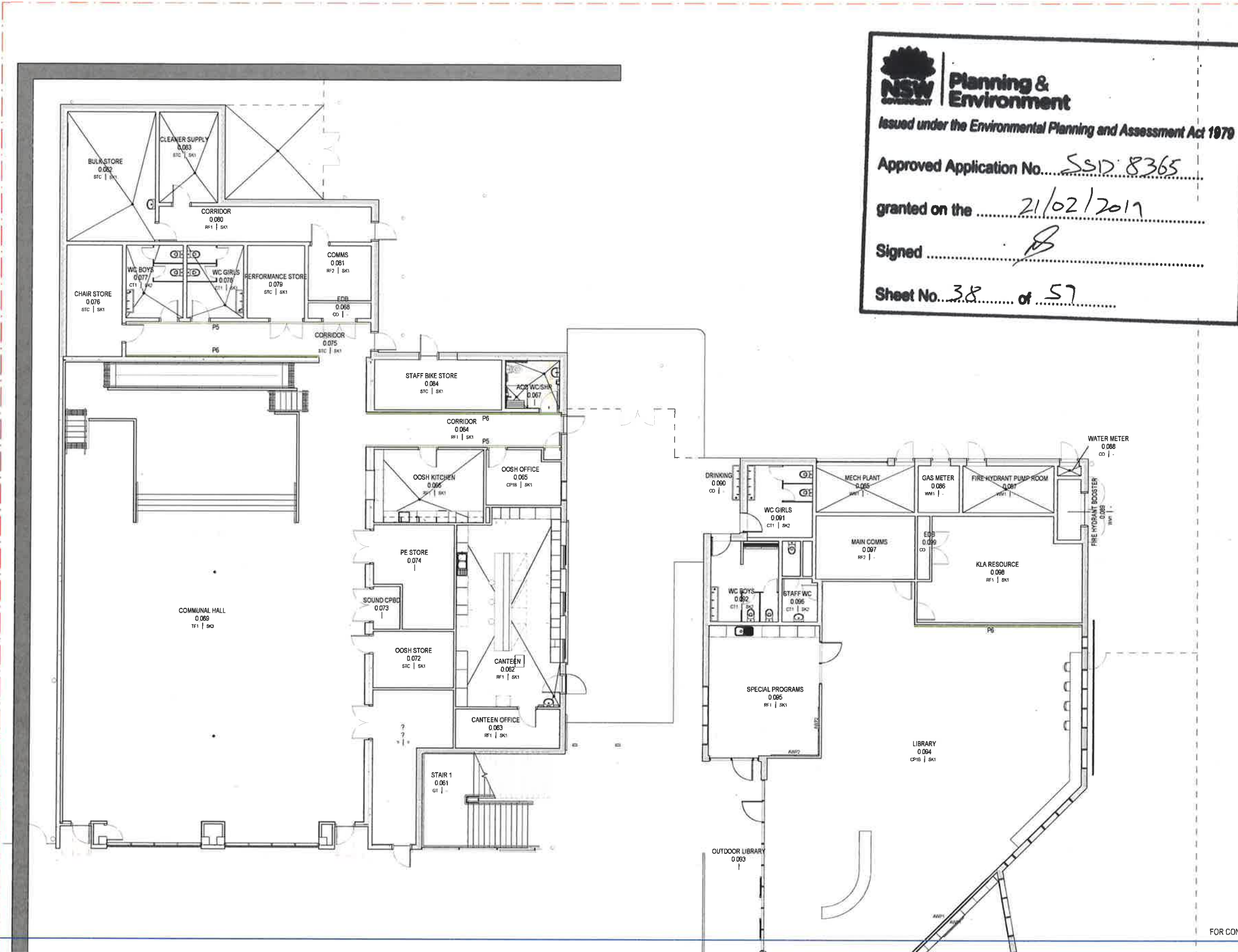
PERUMAL PEDAVOLI ARCHITECTS

PENSHURST PUBLIC SCHOOL 18 Arcadia Street, Penhurst WALL SECTIONS SHEET 4

CONTRACT NUMBER SINSW-18-1257	PROJECT NORTH	PROJECT CODE	DISCIPLINE	PHASE	SERIES NUMBER	REVISION
Author	Checker	Approver	31 AUGUST 2018			
3199-ARC-DD-01_223						A

ISSUED FOR TENDER

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NSW Planning & Environment
Issued under the Environmental Planning and Assessment Act 1979

Approved Application No. SSID 8365

granted on the 21/02/2017

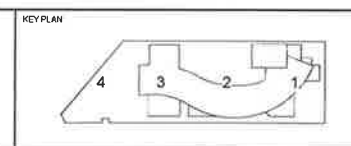
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FOR CONTINUATION REFER TO 01_402

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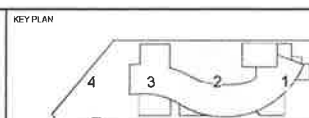
STRUCTURE, CIVIL & HYDRAULIC
WOODS ADTTS ENGINEERS
1/02/2016/1501
MECH, ELEC, IT, COMMS & SEC.
P&S CONSULTING
1/02/2017/1000
BCA
CONSULTANT
1/02/2018/2180
LANDSCAPE
CONNA HARRISON PLS
1/02/2018/1147

PERUMAL PEDAVOLI ARCHITECTS
1/02/2016/1000
WEB: www.pp-a.com.au
P&S CONSULTING
1/02/2017/1000
STATUTORY PLANNER
DOUGLAS PLANNING PLS
1/02/2018/1000

PENSHURST PUBLIC SCHOOL
18 Arcadia Street, Penhurst
FINISHES PLAN - LEVEL 0 - PART 1

CONTRACT NUMBER		0 1000 2000 3000 4000 5000 10000				SCALE: 1:100 @ A1	
SINSW-18-1257							
PROJECT MONTH		DRAWN	CHECKED	VERIFIED	DATE		
		Author	Checker	Approver	31 AUGUST 2018		
		DRAWING NUMBER				REVISION	
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		3199-ARC-DD-01		401	A		

ISSUED FOR TENDER

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Education

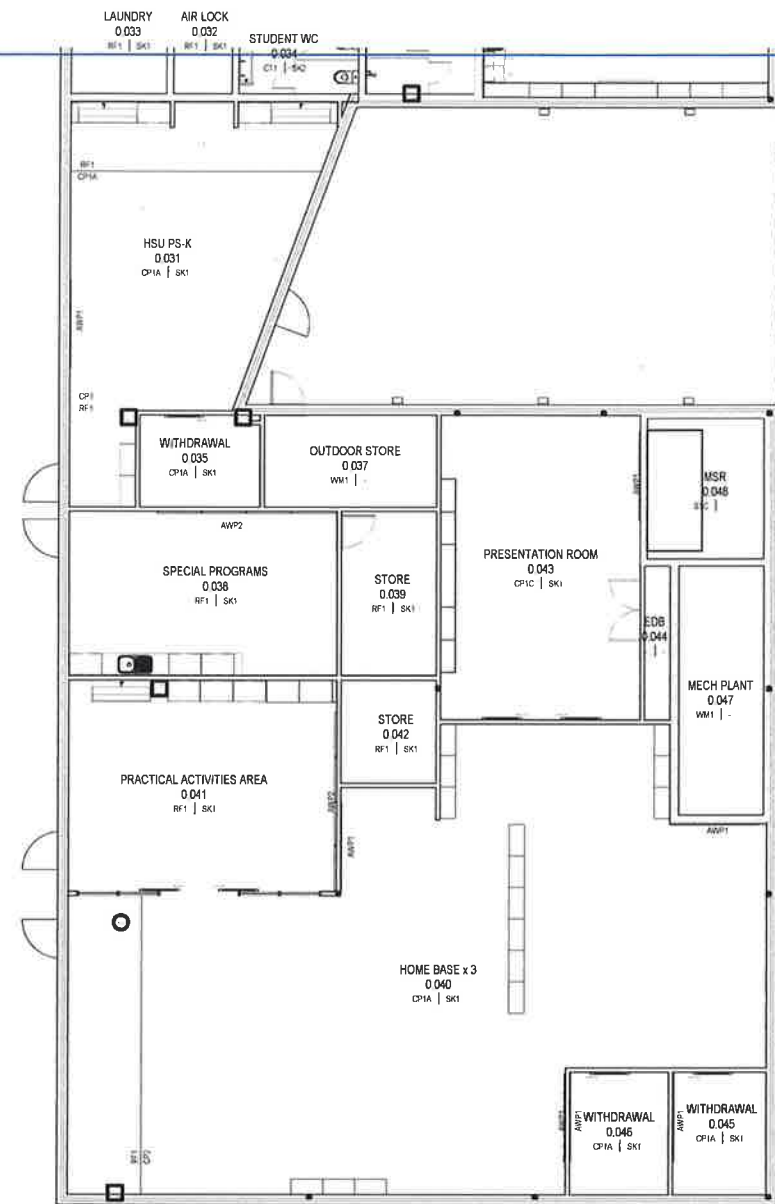
STRUCTURE, CIVIL & HYDRAULIC WOLACOTT ENGINEERS T 02 8303 1502	PERUMAL PEDAVOLI ARCHITECT T 02 8291 0000 WEB: www.pp-a.com.au International Architects White Pedeck NSW reg No 5045
MECH, ELECT, IT, COMMS & SEC JHA CONSULTING T 02 8437 1000	
BCA GROUP 23A T 02 8356 3160	
LANDSCAPE LORENA HARRISON PA	STATUTORY PLANNER DOUG FOX PLANNING PA

PERUMAL
PEDAVOLI
ARCHITECTS

PENSHURST PUBLIC SCHOOL
18 Arcadia Street, Penshurst

FINISHES PLAN - LEVEL 0 - PART 2

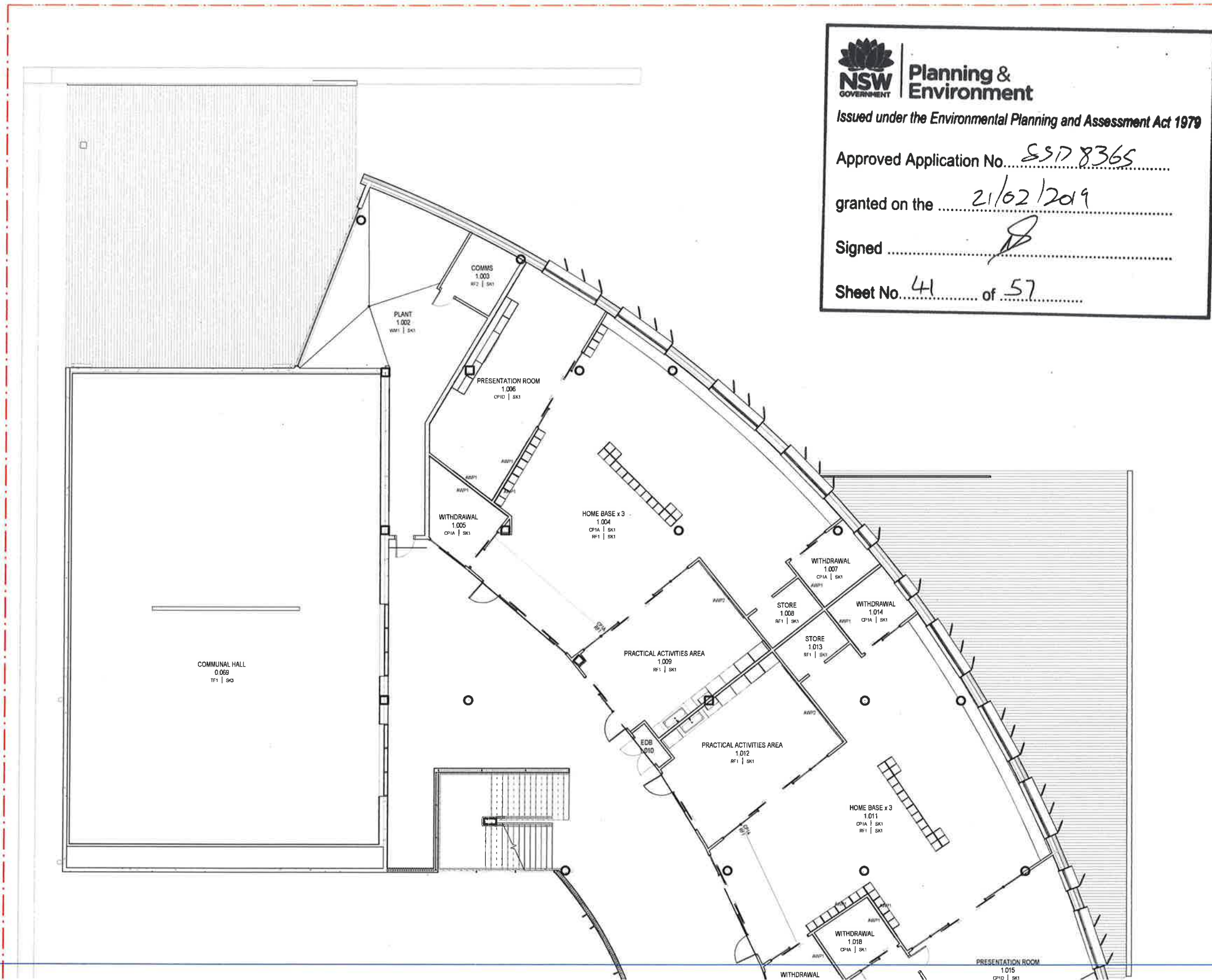
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		Author	Checker	Approver	31 AUGUST 2018	
		DRAWING NUMBER				REVISION
		PROJECT CODE	DISCIPLINE	PHASE	SERIES NUMBER	
		3199-ARC-DD-01.402				A



Sheet No. 40 of 57

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DRAWN	CHECKED	VERIFIED	DATE	
Author	Checker	Approver	31 AUGUST 2018	
DRAWING NUMBER			REVISION	
PROJECT CODE		DISCIPLINE	PHASE	SERIES NUMBER
3199-ARC-DD-01		403	A	

3/09/2018 11:39:14 AM



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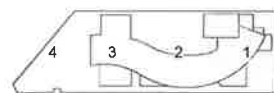
Sheet No. 41 of 57

FOR CONTINUATION REFER TO 01_412

REV	BY	DATE	DESCRIPTION
1	MM	20.07.16	PROGRESS ISSUE
2	MM	10.08.16	PROGRESS ISSUE
3	MM	17.08.16	FOR REVIEW
4	MM	31.08.16	SUBMITTED FOR TENDER

LEGEND

KEY PLAN



Education

STRUCTURE, CIVIL & HYDRAULIC
WOODACOTT'S ENGINEERS
T: 02 9291 1000
F: 02 9291 1001
MECH, ELEC, IT, COMMS & SEC.
JAH CONSULTING
T: 02 9437 1000
F: 02 9437 1001
BICA GROUP P/L
T: 02 8366 1160
F: 02 8366 1161
LANDSCAPE
CONNA HARRISON P/L
T: 02 9556 1182
F: 02 9556 1183

PERUMAL PEDAVOLI ARCHITECTS
T: 02 9291 0000
F: 02 9291 0001
WWW.PERUMALPEDAVOLI.COM.AU
Principal Architect
Victor Pedavoli NSW reg No 5045

PERUMAL PEDAVOLI ARCHITECTS
PENSHURST PUBLIC SCHOOL
18 Arcadia Street, Penhurst
DRAWING NAME
FINISHES PLAN - LEVEL 1 - PART 1

CONTRACT NUMBER
SINSW-18-1257
PROJECT NORTH
DRAWING NUMBER
3199-ARC-DD-01_411

DRAWN	CHECKED	VERIFIED	DATE	SCALE
Author	Checker	Approver	31 AUGUST 2018	1:1000
PROJECT CODE	DISCIPLINE	PHASE	SERIES NUMBER	REVISION
3199-ARC-DD-01_411	A			

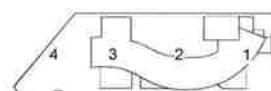
ISSUED FOR TENDER



Sheet No. 42 of 57



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	MM	10.08.19	PROGRESS ISSUE	
	MM	17.08.19	FOR REVIEW	
A	MM	31.08.19	ISSUED FOR TENDER	



Education

STRUCTURE, CIVIL & HYDRAULIC
WOLACOTT'S ENGINEERS
T 02 8203 1500

MECH, ELECT, IT, COMMS & SEC
JAL CONSULTING
T 02 9437 1000

BCA
GROUPO DIA
T 02 8356 3160

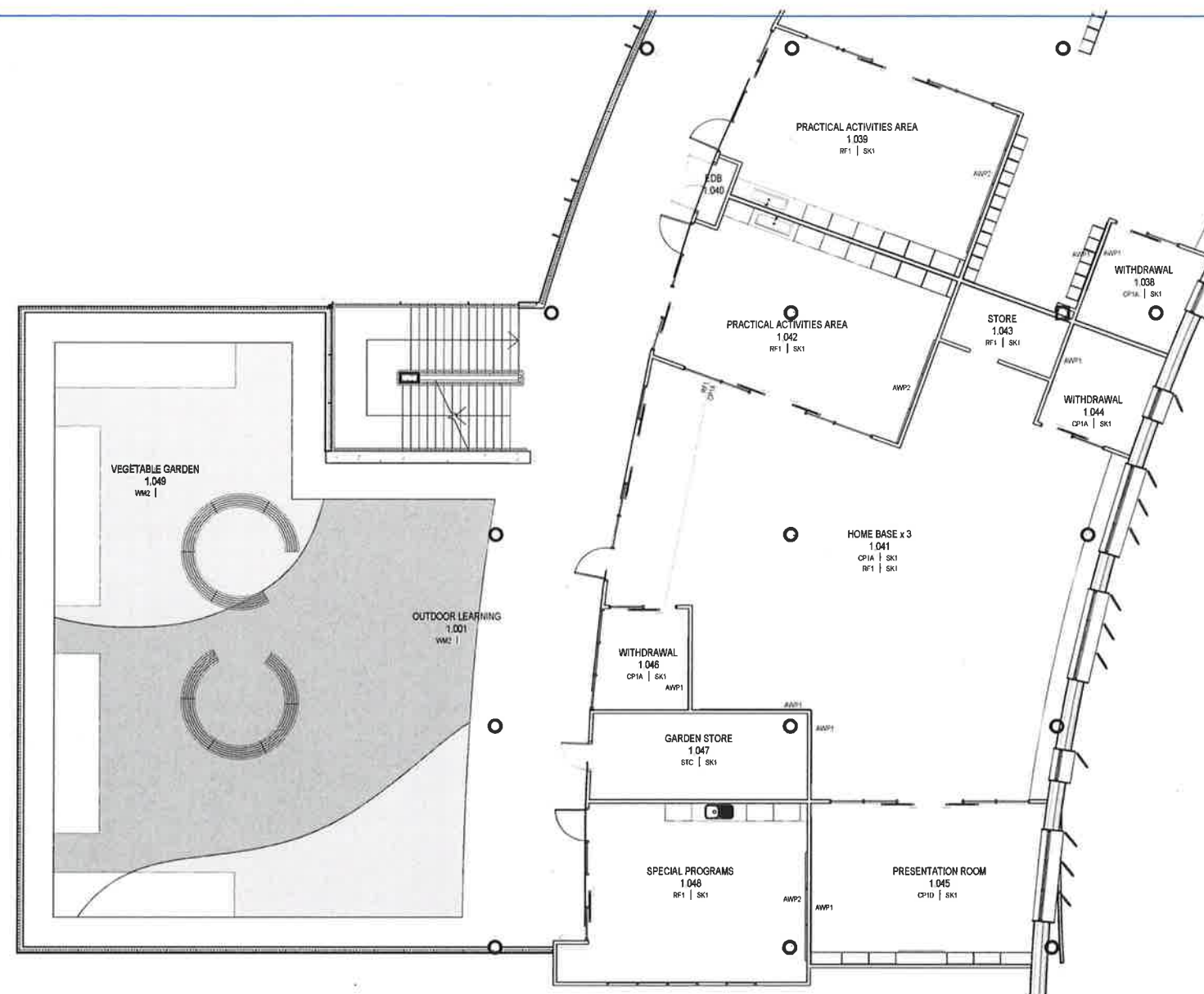
LANDSCAPE
LEFANA ASSOCIATES INC

IC	PERUMAL PEDAVOLI ARCHITECTS 1/12/91/0000
C	WEB: www.pp-a.com.au Accredited Architect Vince Pedavoli NSW reg No 5045
	STATUTORY PLANNER PERUMAL PEDAVOLI ARCHITECTS

PERUMAL
PEDAVOLI

DRAWING NAME
FINISHES PLAN - LEVEL 1 - PART 2

0 1000 2000 3000 4000 5000 10000				SCALE 1:100 @ 11mm
DRAWN	CHECKED	VERIFIED	DATE	
Author	Checker	Approver	31 AUGUST 2018	
DRAWING NUMBER				REVISION
PROJECT CODE	DISCIPLINE	PHASE	SERIES NUMBER	
3199-ARC	DD-01	412	A	



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GOVERNMENT

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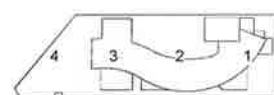
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2	MM	10/08/18	PROGRESS ISSUE
3	MM	17/08/18	FOR REVIEW
4	MM	31/08/18	ISSUED FOR TENDER

LEGEND

KEY PLAN



Education

STRUCTURE, CIVIL & HYDRAULIC WOODACOTT ENGINEERS T: 02 8333 1100 WWW.WOODACOTT.COM.AU	PERUMAL PEDAVOLI ARCHITECTS T: 02 9291 0000 WWW.PP-ARCHITECTS.COM.AU Principal Architect Since Penhurst NSW reg No 5045
MEDIA, ELECT, IT, COMMS & SEC JWA CONSULTING T: 02 9437 1000	BCA GROUP CLIA T: 02 9300 3190
LANDSCAPE LORRAINE HARRISON PL T: 02 9300 1347	STATUTORY PLANNER SONIA GRANT PL T: 02 9437 8056

PERUMAL PEDAVOLI
ARCHITECTS

PENHURST PUBLIC SCHOOL
18 Arcadia Street, Penhurst

FINISHES PLAN - LEVEL 1 - PART 3

CONTRACT NUMBER
SINSW-18-1257

PROJECT NORTH

DRAWING NUMBER

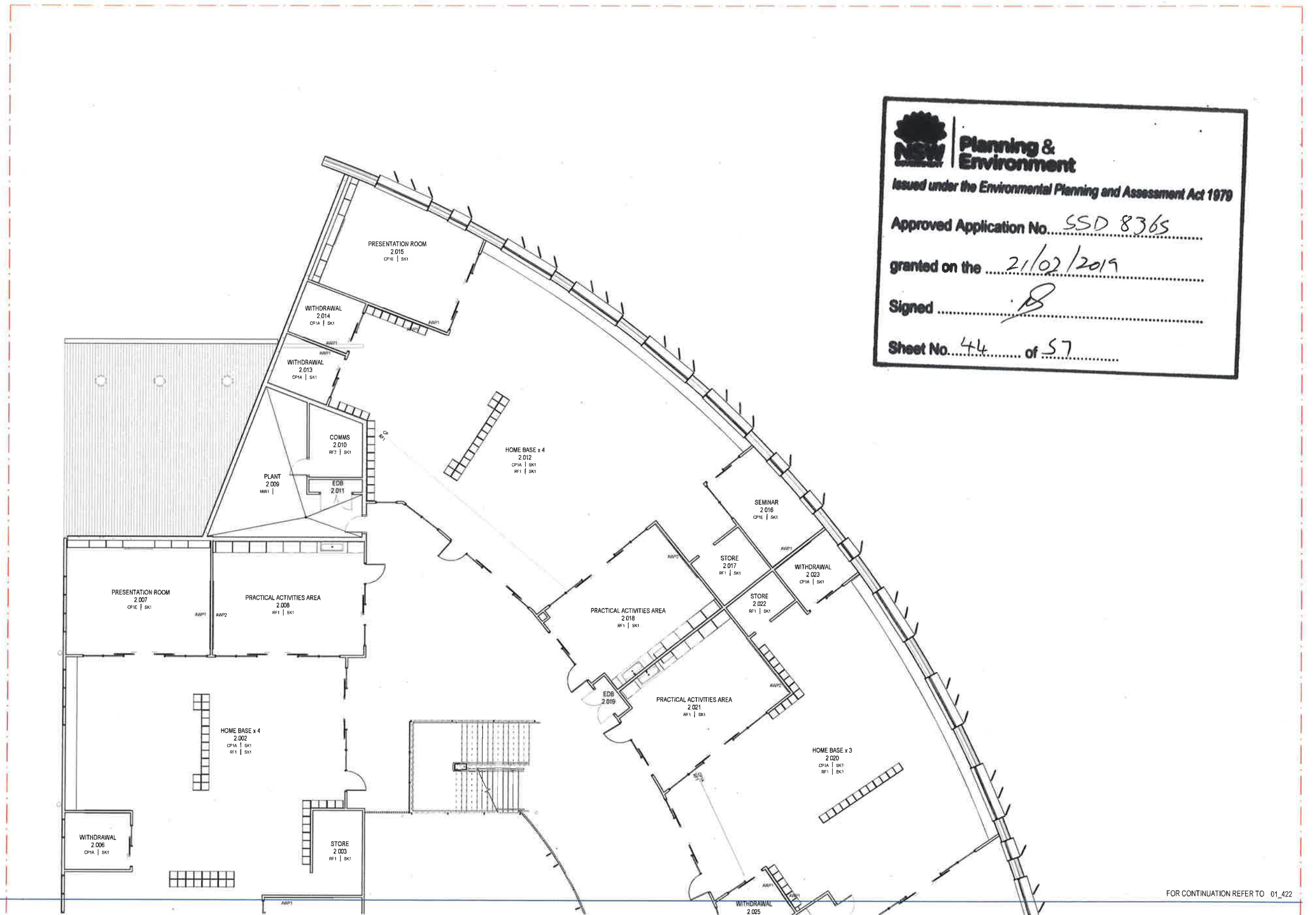
3199-ARC-DD-01_413

A

Author	Checked	Verified	Date	Scale
			31 AUGUST 2018	SCALE 1:100 @ A1
Project Code	Discipline	Phase	Series Number	Revision

ISSUED FOR TENDER

31/08/2018 5:19:47 PM



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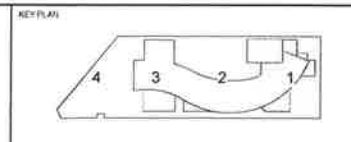
granted on the 21/02/2019

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Sheet No. 44 of 57

AMENDMENTS			
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2	MM	10/08/18	PROGRESS ISSUE
3	MM	17/08/18	FOR REVIEW
4	MM	21/08/18	ISSUED FOR TENDER

LEGEND	
[Symbol]	WITHDRAWAL
[Symbol]	STORE
[Symbol]	HOME BASE
[Symbol]	PRACTICAL ACTIVITIES AREA
[Symbol]	PRESENTATION ROOM
[Symbol]	SEMINAR
[Symbol]	PLANT
[Symbol]	COMMS
[Symbol]	EDB



STRUCTURE, CIVIL & HYDRAULIC
WOODCOCK ENGINEERS
1/02/2018 1500
MECH, ELECT, IT, COMMS & SEC
P&S CONSULTING
1/02/2018 1500
BICA
1/02/2018 1500
LANDSCAPE
LORNA WATKINSON PLS
1/02/2018 1500

PERUMAL PEDAVOLI ARCHITECTS
1/02/2018 1500
www.pp-a.com.au
Penhurst Public School
1/02/2018 1500

PENSHURST PUBLIC SCHOOL
18 Arcadia Street, Penhurst
FINISHES PLAN - LEVEL 2 - PART 1

CONTRACT NUMBER SINSW-18-1257	PROJECT NORTH [North Arrow]	SCALE 1:100 @ A1
DRAWN Author	CHECKED Checker	VERIFIED Approver
DRAWING NUMBER 3199-ARC-DD-01_421		DATE 31 AUGUST 2018
PROJECT CODE 3199-ARC-DD-01_421		REVISION A

ISSUED FOR TENDER

31/08/2018 5:19:59 PM



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Sheet No. 45 of 57

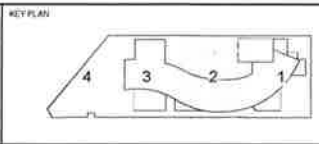


FOR CONTINUATION REFER TO 01_421

FOR CONTINUATION REFER TO 01_423

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1	MM	20/07/18	PROGRESS ISSUE
2	MM	10/08/18	PROGRESS ISSUE
3	MM	17/08/18	FOR REVIEW
4	MM	31/08/18	ISSUED FOR TENDER

LEGEND



STRUCTURE, CIVIL & HYDRAULIC
WILLACOTT ENGINEERS
1/02/2018 1200
MECH, ELECTR, IT, COMMS & SEC
JHA CONSULTING
1/02/2018 1000
SCA
GROUP 1
1/02/2018 1000
LANDSCAPE
LORNA HERRISON P/L
1/02/2018 1100

PERUMAL PEDAVOLI ARCHITECTS
02 9281 0000
WEB: www.pp-arch.com.au
Registered Architect
Voice: Perumal NSW reg No 5045

PERUMAL PEDAVOLI
PENSHURST PUBLIC SCHOOL
18 Arcadia Street, Penshurst
FINISHES PLAN - LEVEL 2 - PART 2

CONTRACT NUMBER	SINSW-18-1257	SCALE	1:100 @ A1
DRAWN	CHECKED	VERIFIED	DATE
Author	Checker	Approver	31 AUGUST 2018
DRAWING NUMBER	3199-ARC-DD-01_422	REVISION	A

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HOME BASE x 3
2.043
CP1A | SK1
RP1 | SK1

FOR CONTINUATION REFER TO 01_422



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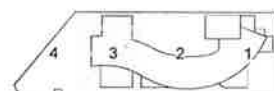
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Sheet No. 46 of 57

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2	MM	10/08/18	PROGRESS ISSUE	
3	MM	17/08/18	FOR REVIEW	
4	MM	31/08/18	ISSUED FOR TENDER	

KEY PLAN



Education

STRUCTURE, CIVIL & HYDRAULIC
WOODCOTT ENGINEERS
T: 02 8201 1500
F: 02 8201 1501
MECH, ELECT, IT, COMMS & SEC
JRM CONSULTING
T: 02 9437 1000
F: 02 9437 1001
BCA
CONSULTING
T: 02 8356 2100
F: 02 8356 2101
LANDSCAPE
LORNA HARTSHORN PT
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F: 02 8506 1563

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T: 02 8201 0000
F: 02 8201 0001
WWW.PEDAVOLI.COM.AU
PENHURST PUBLIC SCHOOL
FINISHES PLAN - LEVEL 2 - PART 3

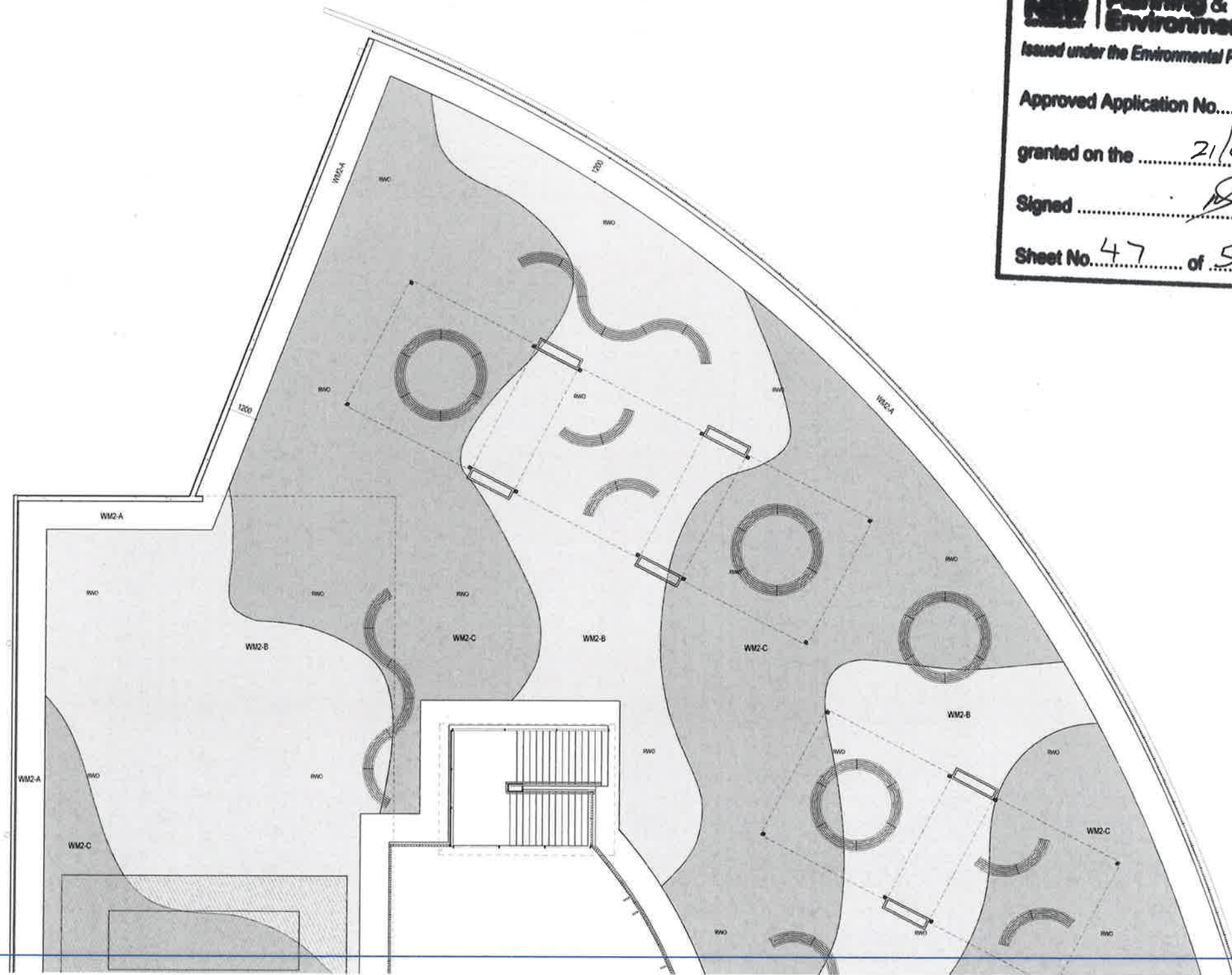
PERUMAL PEDAVOLI
ARCHITECTS

PENHURST PUBLIC SCHOOL
18 Arcadia Street, Penhurst
FINISHES PLAN - LEVEL 2 - PART 3

CONTRACT NUMBER SINSW-18-1257	PROJECT NORTH	SCALE 1:100 @ A1
DRAWN BY Author	CHECKED BY Checker	VERIFIED BY Approver
DRAWING NUMBER 3199-ARC-DD-01_423	DATE 31 AUGUST 2018	REVISION A

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31/08/2018 5:20:38 PM



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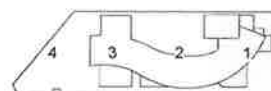
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FOR CONTINUATION REFER TO 01_432

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2	MM	19/08/18	PROGRESS/ISSUE	
3	MM	17/08/18	FOR REVIEW	
4	MM	31/08/18	ISSUED FOR TENDER	

LEGEND

KEY PLAN



Education

STRUCTURE, CIVIL & HYDRAULIC WOODCOCK ENGINEERS 1 82 822 1000 WEBA www.pp-a.com.au Nominated Architect Vero Podvol NSW reg No 5045	PERUMAL PEDAVOLI ARCHITECTS 1 82 822 1000 WEBA www.pp-a.com.au Nominated Architect Vero Podvol NSW reg No 5045
BCA GROUP 2/3 1 82 822 1000 LANDSCAPE CORIN HARRISON PL 1 82 822 1000	STATUTORY PLANNER DOUG COLEMAN PL 1 82 822 1000

PERUMAL PEDAVOLI ARCHITECTS

PENSHURST PUBLIC SCHOOL 18 Arcadia Street, Penhurst
DRAWING NAME FINISHES PLAN - LEVEL 3 - PART 1

CONTRACT NUMBER SINSW-18-1257	PROJECT NORTH	SCALE 1:1000
DRAWN Author	CHECKED Checker	VERIFIED Approver
DRAWING NUMBER 3199-ARC-DD-01_431	DATE 31 AUGUST 2018	REVISION A

ISSUED FOR TENDER

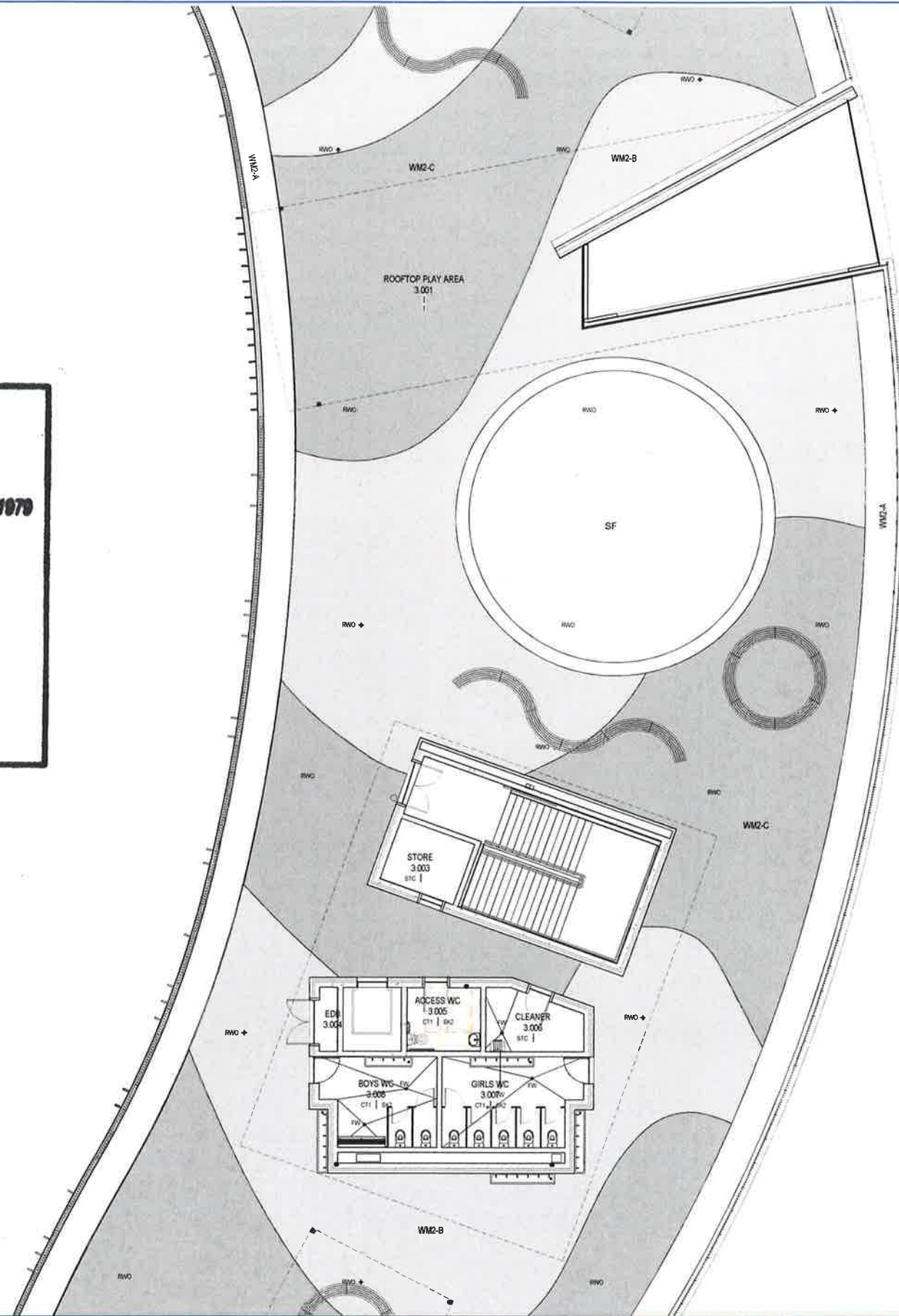
NSW Planning & Environment
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Approved Application No. SSD 8365

granted on the 21/02/2019

Signed [Signature]

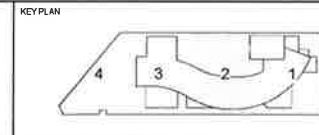
Sheet No. 48 of 57



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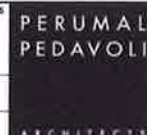
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2	MM	10/08/18	PROGRESS ISSUE
3	MM	17/08/18	FOR REVIEW
4	MM	31/08/18	ISSUED FOR TENDER

LEGEND



Education

STRUCTURE, CIVIL & HYDRAULIC WILLACOTT'S ENGINEERS T: 02 9233 1986 WEBSITE: www.willacotts.com.au F: 02 9437 1000	PERUMAL PEDAVOLI ARCHITECTS T: 02 9291 0000 WEBSITE: www.pp-a.com.au F: 02 9437 1000 Vince Pedavoli - NSW Reg No 5045
MECH, ELECT, IT, COMMS & SEC JWA CONSULTING T: 02 9437 1000	BCA GROUP DIA T: 02 8555 3160
LANDSCAPE LORRA HARRISON P/L T: 02 9555 3167	STATUTORY PLANNER DENYCE PLANNING P/L T: 02 9555 3167

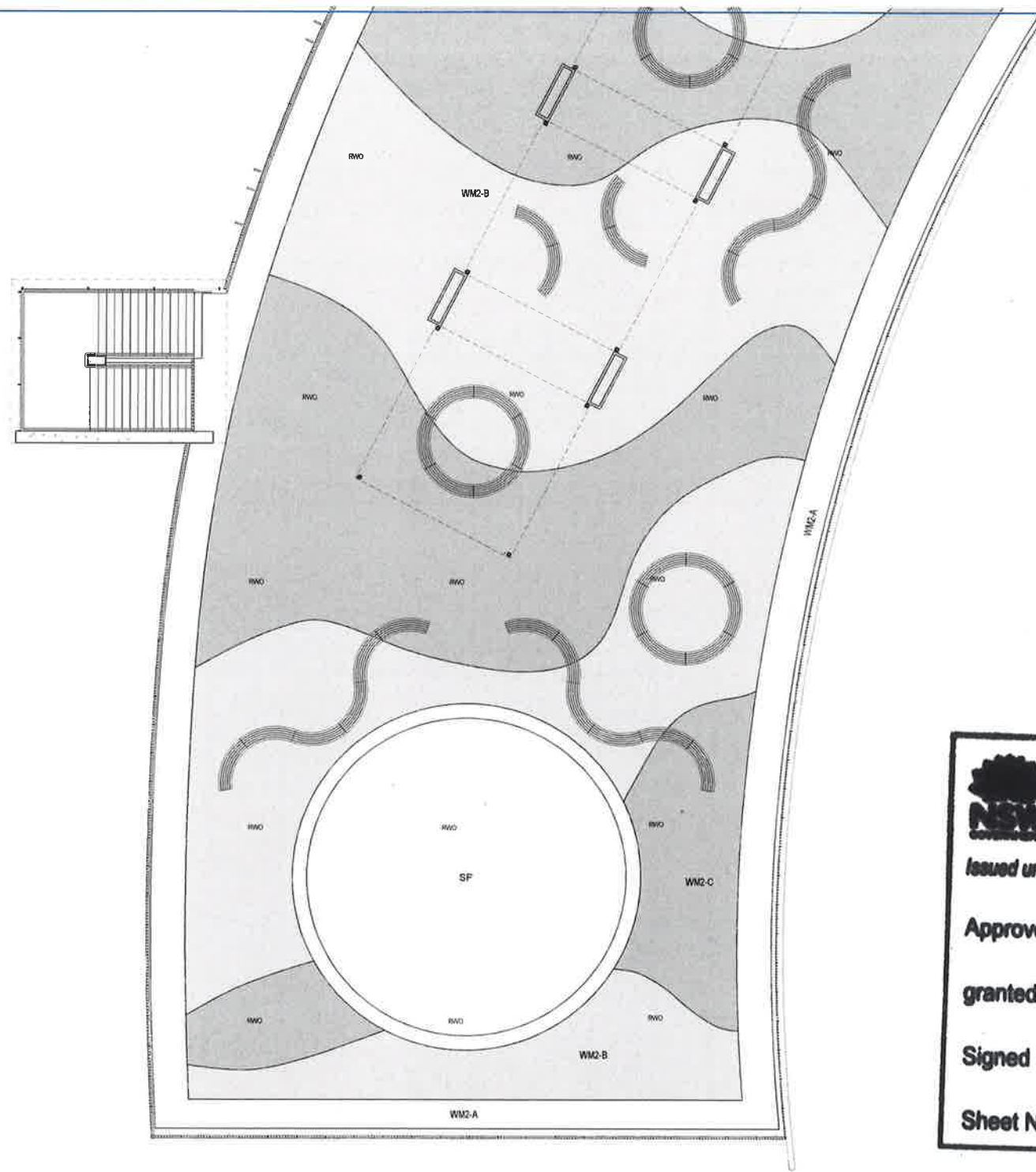


PENSHURST PUBLIC SCHOOL
18 Arcadia Street, Penhurst

FINISHES PLAN - LEVEL 3 - PART 2

CONTRACT NUMBER SINSW-18-1257	PROJECT NORTH	PROJECT CODE	DISCIPLINE	PHASE	SERIES NUMBER	REVISION
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3199-ARC-DD-01_432	A					

ISSUED FOR TENDER



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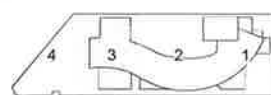
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2	MM	10/08/18	PROGRESS ISSUE
3	MM	17/08/18	FOR REVIEW
4	MM	31/08/18	ISSUED FOR TENDER

LEGEND

KEY PLAN



Education

STRUCTURE, CIVIL & HYDRAULIC POULADOTTIS ENGINEERS T 02 9200 1900	PERUMAL PEDAVOLI ARCHITECTS T 02 9201 0000 WEB: www.pp-a.com.au Homeside Architect Victor Pedavoli NSW reg No 5040
MECH, ELECT, IT, COMMS & SEC JWA CONSULTING T 02 9437 1000	BCA GROUP 1 T 02 9395 3190
LANDSCAPE JONAS HANSEN P/L T 02 9555 1182	STATUTORY PLANNER DOUG COLE PLANNING P/L T 02 9573 4014

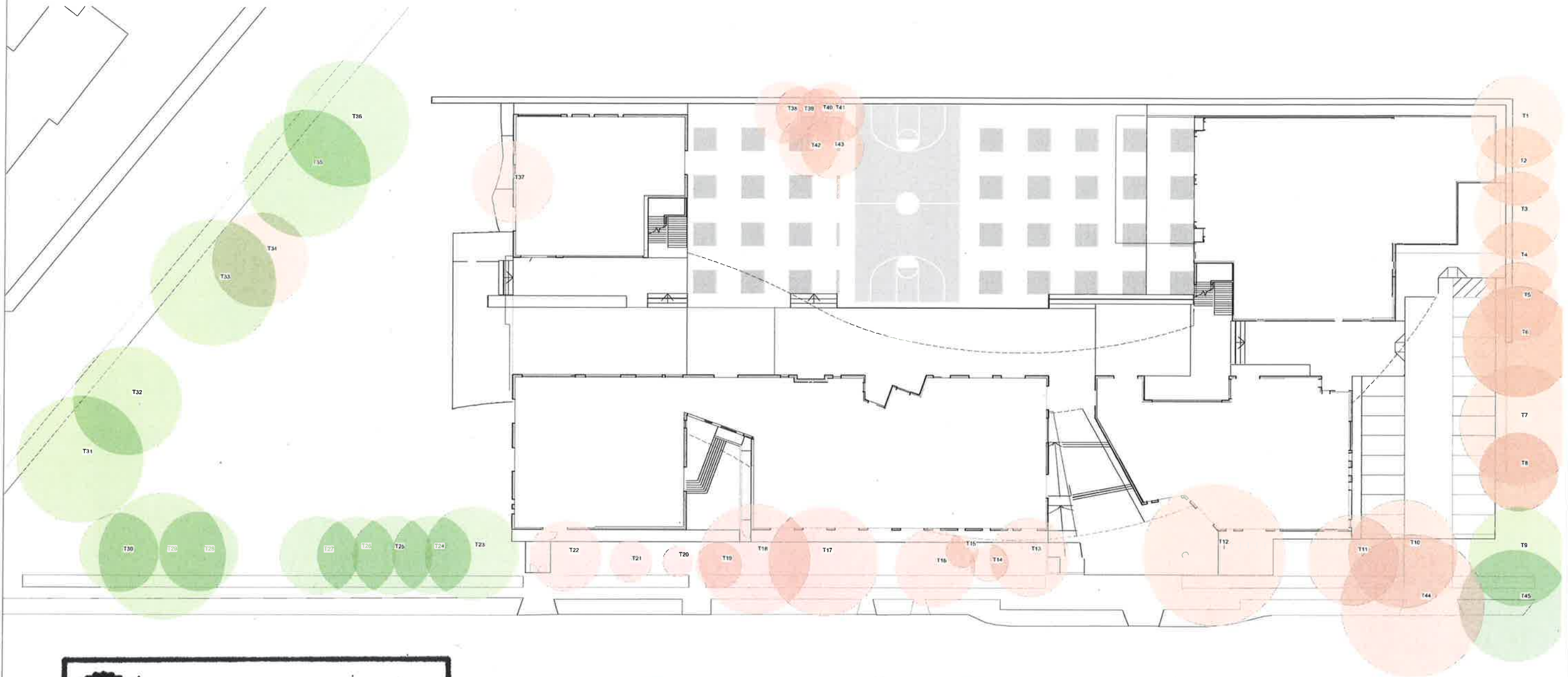
PERUMAL PEDAVOLI ARCHITECTS

PENSHURST PUBLIC SCHOOL
18 Arcadia Street, Penhurst
FINISHES PLAN - LEVEL 3 - PART 3

CONTRACT NUMBER SINSW-18-1257	PROJECT NORTH
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Author	Checked	Verified	Date	31 AUGUST 2018	Revision	
3199-ARC-DD-01_433	A					

ISSUED FOR TENDER



Planning & Environment

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Approved Application No. SSD 8365

granted on the 21/02/2019

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Sheet No. 50 of 57



TREES RETAINED

09	Lophostemon confertus	Brush Box
23	Lophostemon confertus	Brush Box
24	Lophostemon confertus	Brush Box
25	Lophostemon confertus	Brush Box
26	Lophostemon confertus	Brush Box
27	Lophostemon confertus	Brush Box
28	Lophostemon confertus	Brush Box
29	Lophostemon confertus	Brush Box
30	Lophostemon confertus	Brush Box
31	Lophostemon confertus	Brush Box
32	Lophostemon confertus	Brush Box
33	Ficus rubiginosa	Port Jackson Fig
35	Cinnamomum camphora	Camphor Laurel
36	Ficus rubiginosa	Port Jackson Fig
45	Eucalyptus microcorys	Tallowood



TREES TO BE REMOVED

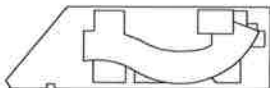
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02	Lophostemon confertus	Brush Box
03	Lophostemon confertus	Brush Box
04	Lophostemon confertus	Brush Box
05	Lophostemon confertus	Brush Box
06	Lophostemon confertus	Brush Box
07	Lophostemon confertus	Brush Box
08	Lophostemon confertus	Brush Box
10	Lophostemon confertus	Brush Box
11	Lophostemon confertus	Brush Box
12	Lophostemon confertus	Brush Box
13	Pittosporum rhombifolium	Pittosporum
14	Pittosporum rhombifolium	Pittosporum
15	Allocasuarina torulosa	Forest Oak
16	Eucalyptus botryoides	Bangalay
17	Eucalyptus species	Eucalyptus spp

TREES TO BE REMOVED (cont)

18	Corymbia citridora	Lemon Scented Gum
19	Acacia binervia	Wattle
20	Livistona australis	Cabbage Palm
21	Callistemon viminalis	Bottle Brush
22	Melaleuca lnaifolia	Snow in Summer
34	Celtis sinensis	Hackberry
37	Harpephyllum cafrum	Kaffir Plum
38	Casuarina glauca	Swamp Oak
39	Casuarina glauca	Swamp Oak
40	Casuarina glauca	Swamp Oak
41	Casuarina glauca	Swamp Oak
42	Casuarina glauca	Swamp Oak
43	Casuarina glauca	Swamp Oak
44	Eucalyptus microcorys	Tallowood

PLOT DATE 31/8/18

REV.	BY	DATE	DESCRIPTION
A	LT	31/08/18	ISSUED FOR TENDER



Education

STRUC. CIVIL & HYD.
MCDACOTT ENGINEERS
T: 02 9201 1500
MECH. ELEC. IT, COMMS & SEC.
JPA CONSULTING
T: 02 9437 1882
BCK
GROUP DLA
T: 02 9355 2160
STATISTICAL PLANNING
DON FOR PLANNING PLS
T: 02 9472 4514

PERMANENT PAVING ARCHITECTS
T: +61 2 9291 0000
WEB: www.ppa.com.au
Normalised Address
Vince Perceval NSW Reg No. 5045

CONTRACT NUMBER
SINSW-18-1257



LORNA HARRISON
LANDSCAPE ARCHITECTS
68 Beattie Street
BALMAIN
NSW 2041
M 0403350023
E lorna@landarchitects.com

PENSHURST PUBLIC SCHOOL

18 Arcadia Street, Penshurst

LANDSCAPE SITE PLAN
TREES RETAINED/REMOVED



SCALE 1:250 @ A1			
31 August 2018			
PROJECT	DISCIPLINE	PHASE	SHEET NUMBER
555	LAN	DD	01
REVISION			A

ISSUED FOR TENDER



PROPOSED PLANTING SCHEDULE
TOTAL PROJECT

BOTANICAL NAME	COMMON NAME	MATURE H x W	INSTALL POT SIZE	NO OFF
ARCADIA STREET DECIDUOUS TREES				
Sapling sebiferum	Chinese Tallowwood	8 x 8	400 litre	11
ARCADIA STREET EVERGREEN TREE				
Lophospermum confertus	Brush Box	8 x 8	400 litre	1
EVERGREEN TREES TO NORTH WEST BOUNDARY				
Lophospermum confertus	Brush Box	8 x 8	400 litre	6
Elaeocarpus reticulatus	Bluenberry Ash	5 x 4	200 litre	6
MEDIUM SCALE FLOWERING TREE TO CENTRAL COURTYARD				
Lagerstroemia 'Natchez'	Crepe Myrtle	7 x 5	200 litre	10
PAPERBARK FOREST				
Melaleuca decora	White Cloud Tree	8 x 5	100 litre	5
Melaleuca linariifolia	Snow in Summer	8 x 5	100 litre	5
Melaleuca quinquenervia	Prickly Paperbark	6 x 3	100 litre	15
Melaleuca stypheloides	Broad Leaved Paperbark	7 x 5	100 litre	5
EVERGREEN NATIVE TREES				
Backhousia myrtifolia	Cinnamon Myrtle	5 x 2	100 litre	3
Cupaniopsis ancardioides	Tuckeroo	8 x 6	100 litre	7
Hymenosporum flavum	Native frangipani	5 x 4	100 litre	3
Tristanopsis 'Luscious'	Water Gum	7 x 7	100 litre	6
MULCHED MASS PLANTING - SHRUBS				
Callistemon spp	Bottlebrush	1 x 1	200mm	130
Grevillea spp	Grevillea	1 x 1	200mm	130
Westringia spp	Coastal Rosemary spp	1 x 1	200mm	196
GRASSES + CLUMPING PLANTS				
Dianella 'Little Jess'	Blue Flax Grass	600 x 400	150mm	840
Doryanthes excelsa	Gymea Lily	1 x 1	25 litre	25
Liriope 'Just Right'	Liriope	200 x 300	150mm	200
Lomandra longifolia	Spiny Mat rush	1 x 1	150mm	65
Lomandra 'Shara'	Lomandra 'Shara'	600 x 600	150mm	1686
Lomandra 'Tanika'	Tanika	400x 400	150mm	243
GROUND COVERS				
Acacia cognate 'Limelight'	Wattle	400 x 600	150mm	100
CLIMBERS				
Solanum jasminoides	Potatoe Vince	-	200mm	29
Tracehlosperrum jasminoides	Star Jasmine	-	200mm	29
Pandorea jasminoides	Bower Vine	-	200mm	29

LEGEND

- EXISTING TREES
TO BE RETAINED
- WETLAND GRASSES PLANTED INTO BANKS
AND DRAINAGE SWALE INTO EROSION
CONTROL FABRIC
- NATURAL TURF
ON GRADE
- STREET FURNITURE
AUSTRALIA
CURVED BENCH
SEATING
- STREET FURNITURE AUSTRALIA
METAL CAFE TABLES AND STOOLS
FOR OUTDOOR EATING/GATHERING
- 3-6 YEARS HEARING IMPAIRED
COURTYARD:
ARTIFICIAL TURF

NSW Planning & Environment
Issued under the Environmental Planning and Assessment Act 1979

Approved Application No. SSD 8365

granted on the 21/02/2019

Signed [Signature]

Sheet No. 51 of 57

PLOT DATE 3/9/18

AMENDMENTS
REV. BY. DATE DESCRIPTION
A. 1. 31/08/18 ISSUED FOR TENDER



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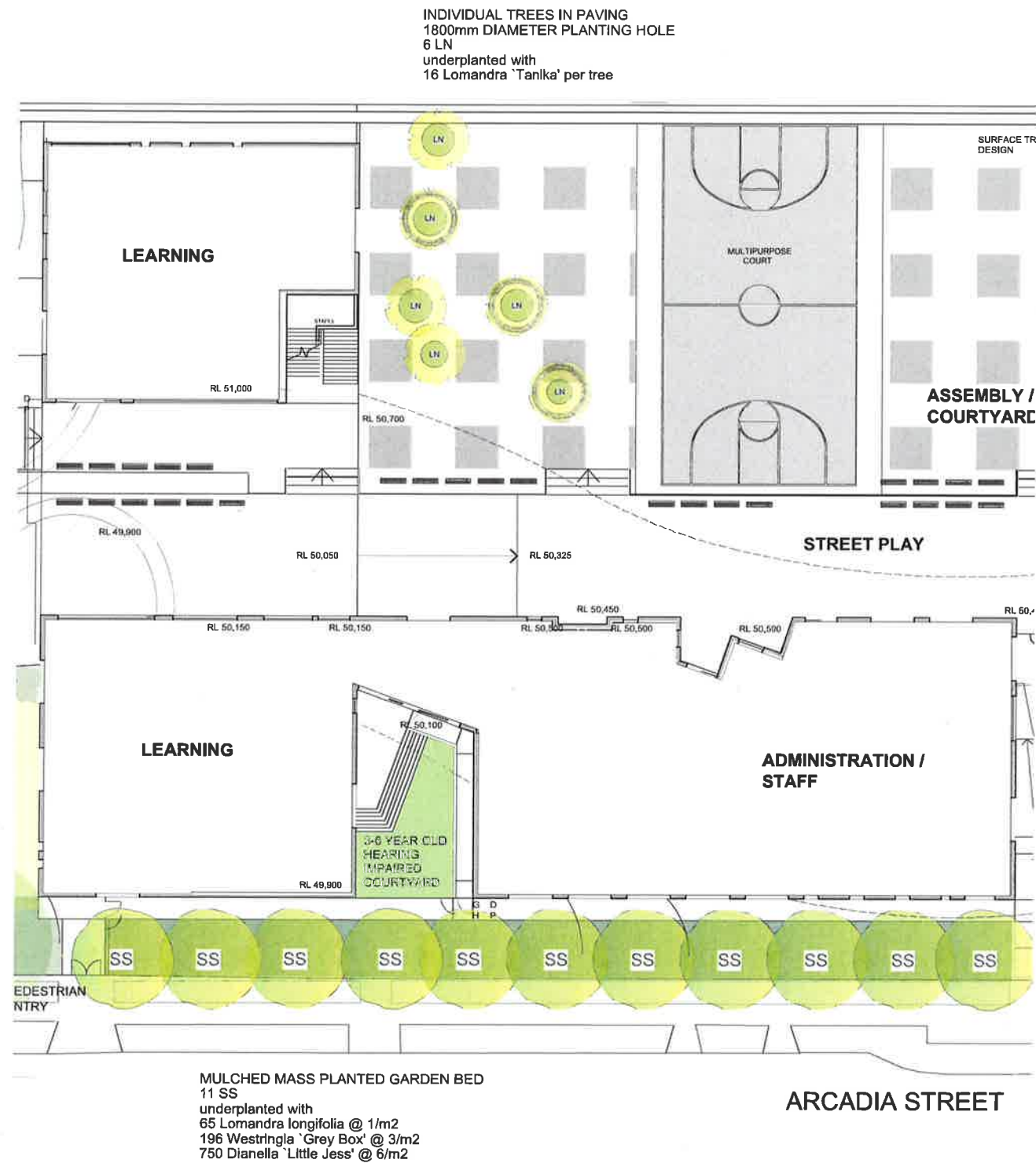
PENSHURST PUBLIC SCHOOL
18 Arcadia Street, Penshurst

LANDSCAPE SITE PLAN
GROUND LEVEL



SCALE 1:250 @ A1
31 August 2018
PROJECT 555 DISCIPLINE LAN DD PHASE 02 SHEET NUMBER A

ISSUED FOR TENDER



PROPOSED PLANTING SCHEDULE THIS SHEET

BOTANICAL NAME	COMMON NAME	MATURE H x W	INSTALL POT SIZE	NO OFF
TREES				
Lagerstroemia 'Natchez'	Crepe Myrtle	7 x 4	200 litre	6
Sapium sebiferum	Chinese Tallowood	8 x 8	400 litre	11
SHRUBS				
Westringia 'Grey Box'	Westringia 'Grey Box'	600 x 600	200mm	196
GRASSES				
Dianella 'Little Jess'	Dianella 'Little Jess'	600 x 400	150mm	750
Lomandra longifolia	Mat Rush	1 x 1	150mm	65
Lomandra 'Tanika'	Lomandra 'Tanika'	600 x 600	150mm	96

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Approved Application No. SSD 8365

granted on the 21/02/2019

Signed [Signature]

Sheet No. 52 of 57

REV. BY	DATE	DESCRIPTION
A	31/08/18	ISSUED FOR TENDER



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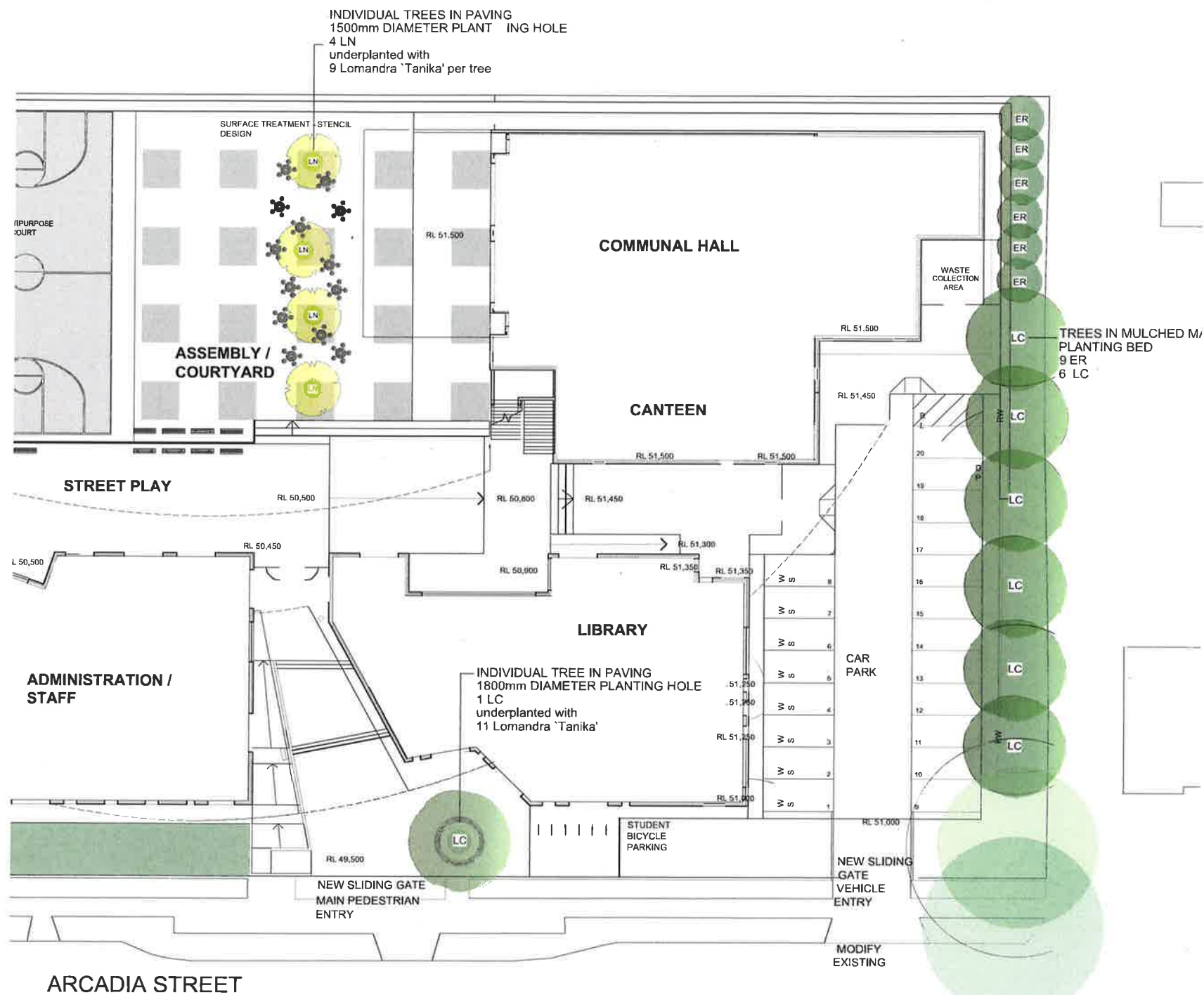


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GROUND LEVEL CENTRAL ZONE



SCALE 1:200 @ A1			
31 August 2018			
PROJECT	DISCIPLINE	PHASE	SERIES NUMBER
555	LAN	DD	02_C
			A



PROPOSED PLANTING SCHEDULE THIS SHEET

BOTANICAL NAME	COMMON NAME	MATURE H x W	INSTALL POT SIZE	NO OFF
TREES				
Elaeocarpus reticulatus	Blueberry Ash	7 x 4	200 litre	6
Lophostemon confertus	Brush Box	8 x 8	400 litre	7
Lagerstroemia 'Natchez'	Crepe Myrtle	7 x 5	200 litre	4
GRASSES				
Lomandra 'Tanika'	Lomandra 'Tanika'	600 x 600	150mm	47



NSW Planning & Environment
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Approved Application No. SSD 8365

granted on the 21/02/2019

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Sheet No. 53 of 57

PLOT DATE 3/9/18

REV. BY	DATE	DESCRIPTION
A	31/08/18	ISSUED FOR TENDER



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LANDSCAPE SITE PLAN
GROUND LEVEL NORTH



SCALE 1:200 @ A1			
31 August 2018			
PROJECT	DISCIPLINE	PHASE	SHEET NUMBER
555	LAN	DD	02_N
			A

ISSUED FOR TENDER

EXISTING GARDEN BED RETAINED AND REINFORCED WITH ADDITIONAL PLANTING OF:-
 130 Callistemon 'Scarlet Flame' @ 1/m2
 130 Grevillea 'Crimson Villea' @ 1/m2
 100 Acacia cognate 'Limelight' @ 1/m2
 100 Liriope 'Just Right'

MASS PLANTED DRAINAGE SWALE With 1:4 MAX SLOPE, STABILIZED WITH GEOTEXTILE FABRIC

Random mix of:-
 5 Melaleuca decora
 5 Melaleuca linariifolia
 15 Melaleuca quinquenervia
 5 Melaleuca styphelioides
 underplanted with
 1686 Lomandra 'Shara' @ 6/m2



INDIVIDUAL TREES IN TURF
 6 Tristaniopsis 'Luscious'
 4 Cupaniopsis anacardioides

MULCHED MASS PLANTED GARDEN BED with timber edge
 Random mix of:-
 3 Backhousia myrtifolia
 3 Cupaniopsis anacardioides
 3 Hymenosporum flavum
 underplanted with
 25 Doryanthes excelsa
 100 Lomandra 'Tanika' @ 4/m2
 90 Dianella 'Little Jess' @ 6/m2

PROPOSED PLANTING SCHEDULE THIS SHEET

BOTANICAL NAME	COMMON NAME	MATURE H x W	INSTALL POT SIZE	NO OFF
PAPERBARK FOREST				
Melaleuca decora	White Cloud Tree	8 x 5	100 litre	5
Melaleuca linariifolia	Snow in Summer	8 x 5	100 litre	5
Melaleuca quinquenervia	Prickly Paperbark	6 x 3	100 litre	15
Melaleuca styphelioides	Broad Leaved Paperbark	7 x 5	100 litre	5
EVERGREEN NATIVE TREES				
Backhousia myrtifolia	Cinnamon Myrtle	5 x 2	100 litre	3
Cupaniopsis anacardioides	Tuckeroo	8 x 6	100 litre	7
Hymenosporum flavum	Native frangipani	5 x 4	100 litre	3
Tristaniopsis 'Luscious'	Water Gum	7 x 7	100 litre	6
MULCHED MASS PLANTING - SHRUBS				
Callistemon spp	Bottlebrush	1 x 1	200mm	150
Grevillea spp	Grevillea	1 x 1	200mm	150
GRASSES + CLUMPING PLANTS				
Dianella spp	Blue Flax Grass	600 x 400	150mm	90
Doryanthes excelsa	Gynera Lily	1 x 1	25 litre	25
Liriope 'Just Right'	Liriope	200 x 300	150mm	100
Lomandra 'Tanika'	Lomandra 'Tanika'	600 x 600	150mm	100
Lomandra 'Shara'	Lomandra 'Shara'	600 x 600	150mm	1686
GROUND COVERS				
Acacia cognate 'Limelight'	Wattle	400 x 600	150mm	150

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Approved Application No. SS10-8365

granted on the 21/02/2019

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Sheet No. 54 of 57

AMENDMENTS
 REV. BY DATE DESCRIPTION
 A 1 31/08/18 ISSUED FOR TENDER



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LANDSCAPE SITE PLAN
 GROUND LEVEL SOUTH



SCALE 1:200 @ A1			
31 August 2018			
555	LAN	DD	02_S
			A



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Approved Application No. SSD R365

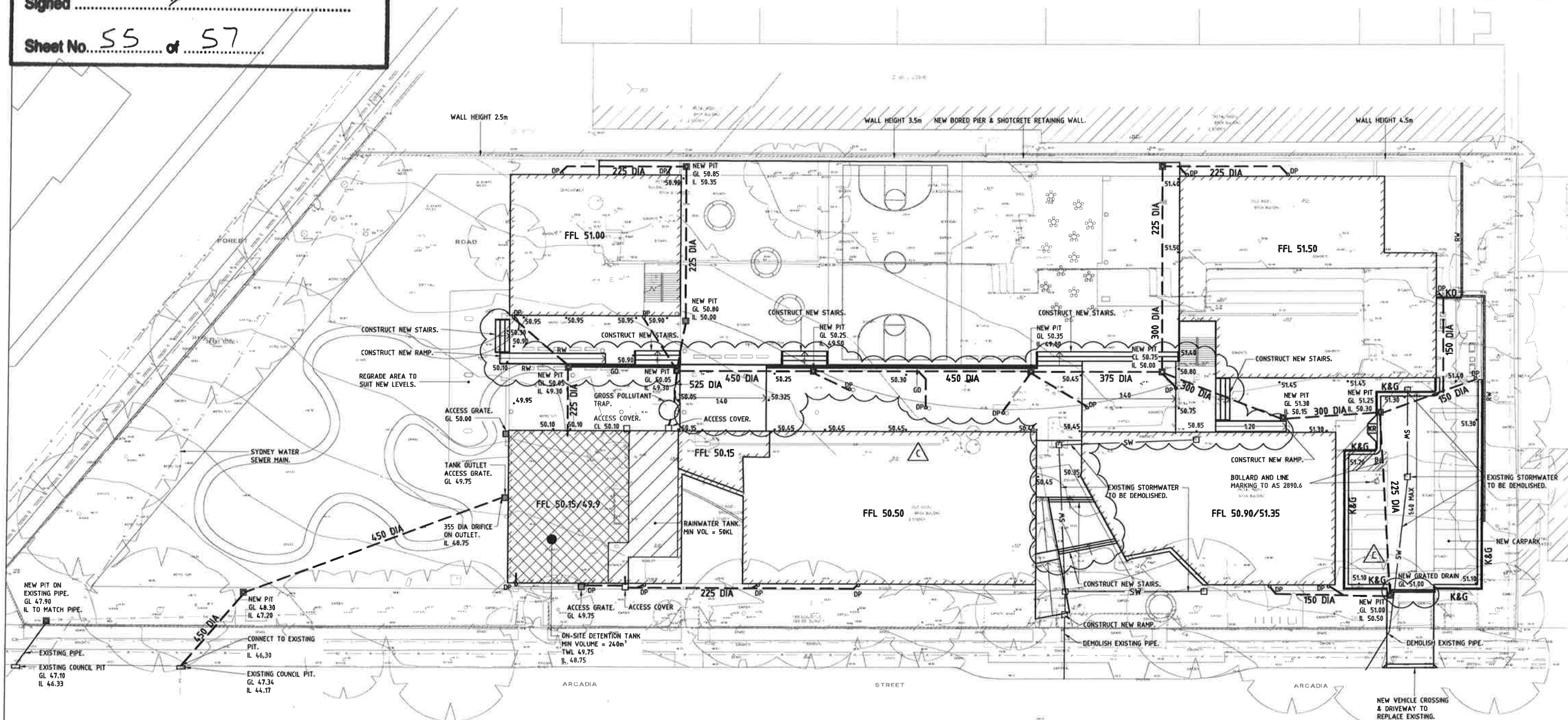
granted on the 21/02/2019

Signed [Signature]

Sheet No. 55 of 57

LEGEND

	NEW PAVEMENT
	EXISTING STORMWATER PIPE
	NEW STORMWATER PIPE
	NEW KERB & GUTTER
	NEW KERB RAMP
	KERB ONLY
	PROPOSED SPOT LEVEL
	GRATED DRAIN
	NEW STORMWATER PIPE



No.	Date	Description	Ver.	Appr.
A	13.11.17	DA ISSUE		
B	17.01.18	LAYOUT UPDATED		
C	28.03.18	SSDA SUBMISSION		

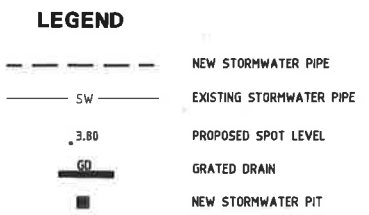
Woolacotts
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Approved: SETB 28.03.18
Verified: J.C 28.03.18
Prepared: S.C 28.03.18



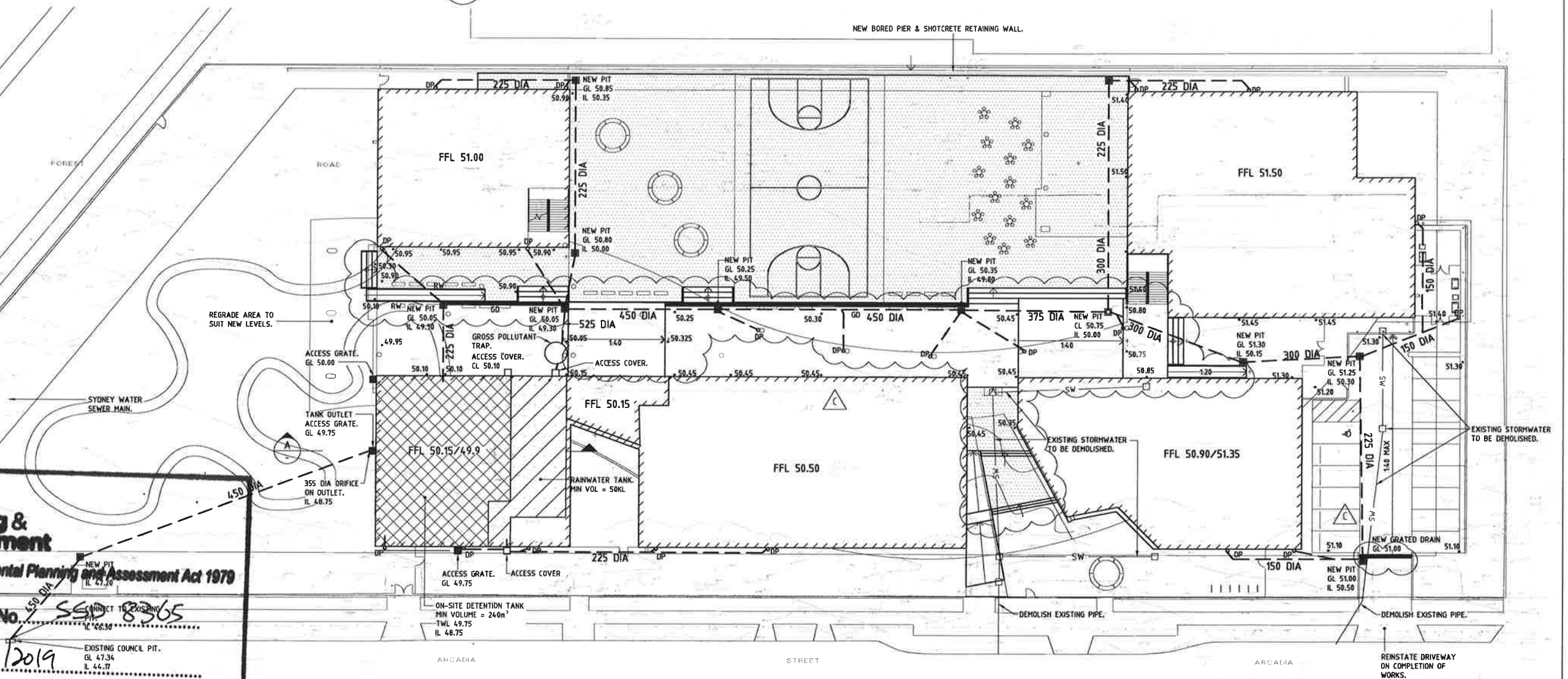
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UPGRADE
ARCADIA STREET, PENSHURST NSW
SCHEMATIC DESIGN
CIVIL WORKS
SITE PLAN

Scale @ A1
1:250
Date: SEPTEMBER 2017
PROJECT: 3199
CIVIL
AS
02_001
C



NEW BORED PIER & SHOTCRETE RETAINING WALL.



NSW
GOVERNMENT
NEW PIT ON

Planning & Environment

Issued under the Environmental Planning and Assessment Act 1979

Approved Application No. 550-SSD-8365 CONNECT TO EXISTING
PIPE

EXISTING COUNCIL PIT
GL 47.10
granted on the 2/10/2019
EXISTING COUNCIL PIT.
GL 47.34
IL 44.17

Signed 

Sheet No. 56 of 57

<u>AMENDMENTS</u>					
No.	Date	Description		Ver	Appr
A	13.11.17	DA ISSUE			
B	17.01.18	LAYOUT UPDATED			
C	28.03.18	SSDA SUBMISSION			

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PENSHURST PUBLIC SCHOOL UPGRADE ARCADIA STREET, PENSHURST NSW STORMWATER MANAGEMENT PLAN



Scale @ A1
1:250
Date
SEPTEMBER 2017

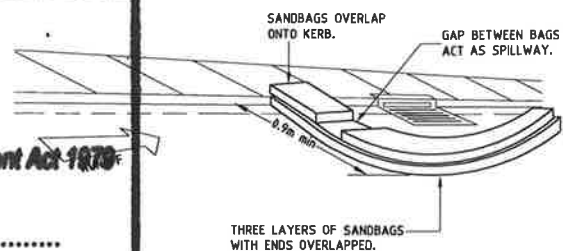
PROJECT	ORGANIZ	PHASE	STREET NUMBER	ST. MARK
3199	CIV	AS	SW1	C

Approved Application No. SSD 8365

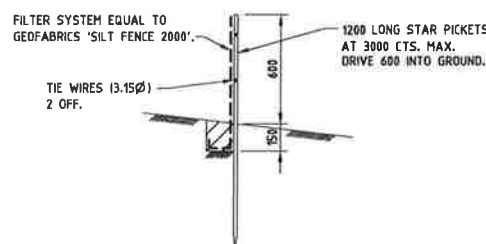
granted on the 21/02/2019

Signed [Signature]

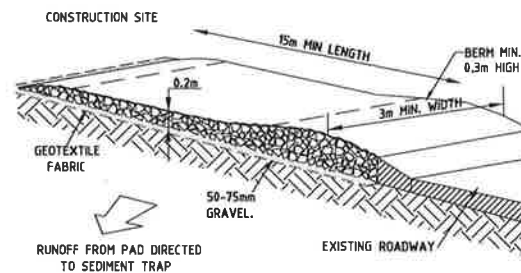
Sheet No. 57 of 57



TYPICAL SANDBAG KERB INLET SEDIMENT TRAP



SILT FENCE DETAIL
TO BE PLACED AROUND LOW SIDE OF WORKS AND
AS REQUIRED TO PREVENT SOIL WASHING OFF SITE.



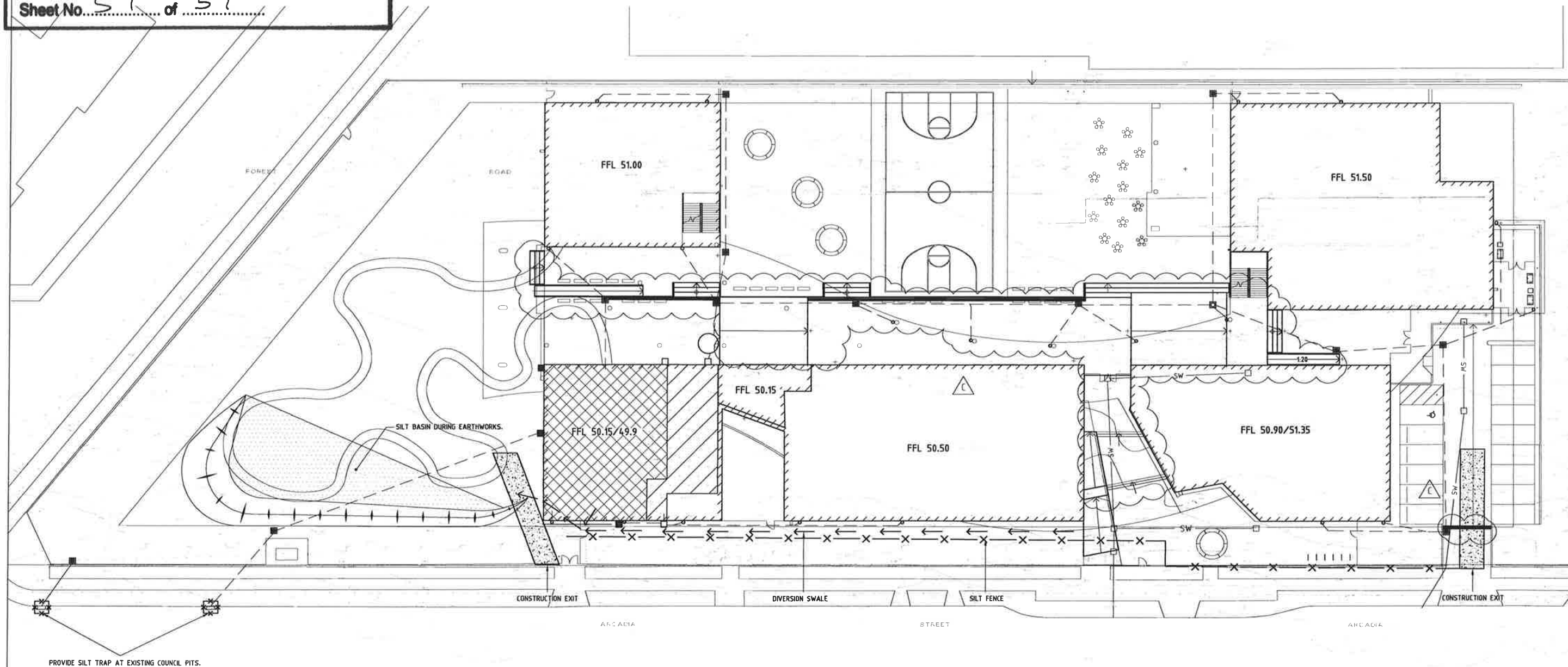
TEMPORARY CONSTRUCTION EXIT
TO BE PROVIDED WHERE CONSTRUCTION VEHICLES
LEAVE SITE.

LEGEND

- TEMPORARY SITE EXIT
- DETENTION TANK
- RAINWATER TANK
- NEW STORMWATER PIPE
- EXISTING STORMWATER PIPE
- SILT FENCE
- SILT TRAP
- NEW STORMWATER PIT
- SWALE

EROSION AND SEDIMENT CONTROL DETAILS

PROVIDE AS REQUIRED TO PREVENT SILT FROM LEAVING THE SITE.



No.	Date	Description	Ver.	Appr.
A	13.11.17	DA ISSUE		
B	17.01.18	LAYOUT UPDATED		
C	28.03.18	SSDA SUBMISSION		

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**PENSHURST PUBLIC SCHOOL
UPGRADE**
ARCADIA STREET, PENSHURST NSW
**EROSION & SEDIMENT
CONTROL PLAN**



Scale @ A1 1:250	Date NOVEMBER 2017	NOVA	NOVA	NOVA	NOVA	NOVA	NOVA	NOVA	NOVA
3199	CIV	AS	SW2	C					

Appendix C: Validation SAQP and Data Evaluation

Validation SAQP

DATA QUALITY OBJECTIVES

Data Quality Objectives (DQOs) were developed to define the type and quality of data required to achieve the project objectives outlined in Section 1.2. The DQOs were prepared with reference to the process outlined in Schedule B2 of NEPM (2013) and the Guidelines for the NSW Site Auditor Scheme, 3rd Edition (2017)¹⁰. The seven-step DQO approach for this project is outlined in the following sub-sections.

The DQO process is validated by the Data Quality Assurance/Quality Control (QA/QC) Evaluation which is presented in the subsequent section of this appendix.

Step 1 – State the Problem

ACM has been identified at the site and requires remediation to reduce potential exposure/risks to the receptors. Validation of the remediation process, together with validation of imported materials, is required to demonstrate that the remediation was successful and that the site is suitable for use.

Step 2 – Identify the Decisions

The objectives of the assessment are outlined in Section 1.2. The key decision statements are as follows:

- Has the site been adequately remediated and validated; and
- Is the site suitable for the proposed development described in Section 1.1.

Step 3 – Identify Information Inputs

The primary information inputs required to address the decisions outlined in Step 2 include the following:

- Relevant environmental data from previous reports;
- Site observations during remediation and validation;
- Asbestos removal, asbestos clearance and waste documentation; and
- Field and laboratory QA/QC data.

Define the Study Boundary

The site boundary (spatial boundary) is shown on the figures and survey presented in Appendix A. The vertical boundary is deemed to be limited to the maximum depth of site investigations undertaken by JKE on the project, which was 6m at monitoring well location MW08 (refer to the Preliminary Stage 2 investigation and DGI). The temporal boundary of the validation was established based on our final site inspection which occurred on 8 January 2021.

Develop and Analytical Approach (Decision Rule)

Validation Assessment Criteria (VAC)

The laboratory data will be assessed against relevant VAC outlined in the updated RAP. Individual results have been assessed as either above or below the VAC.

¹⁰ NSW EPA (2017). *Guidelines for the NSW Site Auditor Scheme, 3rd ed.* (referred to as Site Auditor Guidelines 2017)

Field and Laboratory QA/QC

Field QA/QC includes analysis of inter-laboratory duplicates, intra-laboratory duplicates, trip spike and trip blank samples. Further details regarding the sampling and analysis undertaken, and the acceptable limits adopted, is provided in the Data Quality (QA/QC) Evaluation.

The suitability of the laboratory data is assessed against the laboratory QA/QC criteria which is outlined in the attached laboratory reports. These criteria were developed and implemented in accordance with the laboratory's National Association of Testing Authorities, Australia (NATA) accreditation and align with the acceptable limits for QA/QC samples as outlined in NEPM (2013) and other relevant guidelines.

In the event that acceptable limits are not met by the laboratory analysis, other lines of evidence are reviewed (e.g. field observations of samples, preservation, handling etc) and, where required, consultation with the laboratory is undertaken in an effort to establish the cause of the non-conformance. Where uncertainty exists, JKE typically adopt the most conservative concentration reported.

Appropriateness of Practical Quantitation Limits (PQLs)

The PQLs of the analytical methods are considered in relation to the VAC to confirm that the PQLs are less than the VAC. In cases where the PQLs are greater than the VAC, a discussion of this is provided.

Step 6 – Specify Limits on Decision Errors

To limit the potential for decision errors, a range of quality assurance processes are adopted. A quantitative assessment of the potential for false positives and false negatives in the analytical results is undertaken with reference to Schedule B(3) of NEPM (2013) using the data quality assurance information collected.

Limits on validation decision errors have not been established as the sampling plan for the validation is not probabilistic and there are no statistical outcomes.

Decision errors can be controlled through the use of hypothesis testing. The test can be used to show either that the baseline condition is false or that there is insufficient evidence to indicate that the baseline condition is false. The null hypothesis is an assumption that is assumed to be true in the absence of contrary evidence. For this assessment, a qualitative null hypothesis has been adopted which is that, there is considered to be a complete source-pathway-receptor (SPR) linkage for the contaminants of concern unless this linkage can be proven not to (or unlikely to) exist.

Step 7 – Optimise the Design for Obtaining the Data

The most resource-effective design will be used in an optimum manner to achieve the assessment objectives. Adjustment of the assessment design will occur based on real-time assessment of results as the remediation and validation proceeds. This will promote adequate consideration of relevant contingencies throughout the works.

Sampling Plan and Methodology

The sampling plan and methods are described throughout the body of the report.

Data (QA/QC) Evaluation

A. INTRODUCTION

This Data (QA/QC) Evaluation forms part of the validation process for the DQOs documented previously. Checks were made to assess the data in terms of precision, accuracy, representativeness, comparability and completeness. These 'PARCC' parameters are referred to collectively as DQIs and are defined in the Report Explanatory Notes attached in the report appendices.

1. Field and Laboratory Considerations

The quality of the analytical data produced for this project has been considered in relation to the following:

- Sample collection, storage, transport and analysis;
- Laboratory PQLs;
- Field QA/QC results; and
- Laboratory QA/QC results.

2. Field QA/QC Samples and Analysis

A summary of the field QA/QC samples collected and analysed for this investigation are summarised in Table Q1 of Appendix I1. A total of six intra-laboratory duplicates and two inter-laboratory duplicates were analysed for imported materials. This represented duplicate sampling frequencies for intra- and inter-laboratory analysis of approximately 20% and 6.7% respectively.

Two soil trip blanks and one soil trip spike were analysed to demonstrate the adequacy of the field sampling, preservation, storage and transport methods. Whilst it is acknowledged that spikes and blanks were not analysed for each batch, the results obtained are considered to be representative of our overall field practices adopted throughout the sampling.

Rinsates were not analysed as re-usable sampling equipment was not utilised for sampling imported materials.

The results are discussed in the subsequent sections of this Data (QA/QC) Evaluation report.

3. Data Assessment Criteria

JKE adopted the following criteria for assessing the field and laboratory QA/QC analytical results:

Field Duplicates

Acceptable targets for precision of field duplicates in this report will be 30% or less, consistent with NEPM (2013). RPD failures will be considered qualitatively on a case-by-case basis taking into account factors such as the concentrations used to calculate the RPD (i.e. RPD exceedance where concentrations are close to the PQL are typically not as significant as those where concentrations are reported at least five or 10 times the PQL), sample type, collection methods and the specific analyte where the RPD exceedance was reported.

Trip Blanks

Acceptable targets for field blank samples will be less than the PQL for organic analytes.

Trip Spikes

Acceptable targets for trip spike samples in this report will be 70% to 130%.

Laboratory QA/QC

The suitability of the laboratory data is assessed against the laboratory QA/QC criteria which is outlined in the laboratory reports. These criteria were developed and implemented in accordance with the laboratory's NATA accreditation and align with the acceptable limits for QA/QC samples as outlined in NEPM (2013) and other relevant guidelines.

A summary of the acceptable limits adopted by the primary laboratory (Envirolab) is provided below:

RPDs

- Results that are <5 times the PQL, any RPD is acceptable; and
- Results >5 times the PQL, RPDs between 0-50% are acceptable.

Laboratory Control Samples (LCS) and Matrix Spikes

- 70-130% recovery acceptable for metals and inorganics;
- 60-140% recovery acceptable for organics; and
- 10-140% recovery acceptable for VOCs.

Surrogate Spikes

- 60-140% recovery acceptable for general organics; and
- 10-140% recovery acceptable for VOCs.

Method Blanks

- All results less than PQL.

B. DATA EVALUATION

1. Sample Collection, Storage, Transport and Analysis

Samples were collected by trained field staff in accordance. Field sampling procedures were designed to be consistent with relevant guidelines, including NEPM (2013) and other guidelines made under the CLM Act 1997.

Appropriate sample preservation, handling and storage procedures were adopted. Laboratory analysis was undertaken within specified holding times in accordance with Schedule B(3) of NEPM (2013) and the laboratory NATA accredited methodologies.

JKE note that the temperature on receipt of soil samples was reported to be up to 23.5°C. The high temperatures reported for some batches are attributed to the fact that samples were dropped to the laboratory immediately after sampling and were therefore still on the initial cooling cycle.

Envirolab noted that the asbestos results (for 500ml volume NEPM analysis) were reported to be consistent with the recommendations in NEPM (2013), however this level of reporting is outside the scope of their NATA accreditation. In the absence of other available analytical methods for asbestos, this was found to be acceptable for the purpose of this assessment.

Review of the project data also indicated that:

- COC documentation was adequately maintained;
- Incorrect asbestos analysis occurred for the initial round of imported recycled materials sampling (see lab report 226430 in Appendix I2). This was due to a scheduling error made by JKE and was rectified in the subsequent sampling/analysis rounds. The error is not considered to impact the dataset overall as Envirolab will provide a comment in the report if asbestos is detected below the reporting limit of the analytical method. Therefore, in the absence of such a comment it can be concluded that asbestos is absent or at a concentration of 0%w/w in the sample;
- Sample receipt advice documentation was provided for all sample batches;
- All analytical results were reported; and
- Consistent units were used to report the analysis results.

2. Laboratory PQLs

Appropriate PQLs were adopted for the analysis and all PQLs were below the VAC.

3. Field QA/QC Sample Results

Field Duplicates

The results indicated that field precision was acceptable. RPD non-conformances were reported for some analytes as discussed below:

- PAHs and lead in DGB20 V2/DGB20 Dup1, with a maximum RPD of 82%;
- TRHs (F3 and F4), PAHs, chromium, lead, nickel and zinc in 10mm V2/10mm Dup1, with a maximum RPD of 143%;
- PAHs, copper and zinc in DGB20 V4/DGB20 Dup2, with a maximum RPD of 79%;
- TRHs (F3 and F4) and PAHs in DGB20 V7/DGB20 Dup3, with a maximum RPD of 48%;
- PAHs and arsenic in TU 1/TU DUP1, with a maximum RPD of 86%;
- PAHs, arsenic, chromium, copper, lead, nickel and zinc in BPM 1/PBM DUP1, with a maximum RPD of 156%;
- Chromium and zinc in ADS 1/ADS DUP1, with a maximum RPD of 120%; and
- Lead in BQS V1/BQS DUP1, with an RPD of 46%.

With the exception of some of the RPD exceedances for heavy metals, the RPD exceedances were largely attributed to results that were close to the PQL and are therefore not considered to impact the data quality. The RPD exceedances for heavy metals suggested that there was some heterogeneity in the samples, however, this was not unexpected given the recycled and blended nature of the samples being tested.

Overall, the concentrations reported were low, and all primary and duplicate results were screened against the VAC and factored into the risk assessment for the validation. On this basis, the RPD exceedances are not considered to have had an adverse impact on the data set as a whole.

Trip Blanks

Soil trip blanks were placed in the esky during two sampling events and were transported back to the laboratory with the samples. BTEX results in the blank were all less than the PQL. BTEX was also not detected in any of the other primary samples. The potential for cross contamination associated with the imported materials validation was considered to be very low.

Trip Spikes

The results ranged from 84% to 88% and indicated that field preservation methods were appropriate.

4. Laboratory QA/QC

The analytical methods implemented by the laboratory were performed in accordance with their NATA accreditation and were consistent with Schedule B(3) of NEPM (2013). The frequency of data reported for the laboratory QA/QC (i.e. duplicates, spikes, blanks, LCS) was considered to be acceptable for the purpose of this investigation. JKE note that due to the limited number of samples submitted for analysis, duplicates and matrix spikes were not reported for some batches. This is not considered to have an impact on the data quality for this investigation.

A review of the laboratory QA/QC data identified the following minor non-conformances:

- RPD exceedances for PAHs in sample 226430-1;
- Matrix and surrogate spike interference (from analytes other than those being tested) for some OCPs in report 226430;
- Low matrix spike recover was reported for arsenic in report 227906 (sample 227906-2), however a suitable recovery was obtained for the LCS. This suggests there was minor matrix interference; and
- Matrix spike recovery for some TRH fractions in report 255959 was not possible due to matrix interference (sample 255959-2). The interference was associated with the high concentrations of TRHs in this sample.

Regarding the RPDs, JKE tabulated all laboratory replicates/duplicates and triplicates, have considered all data in the validation assessment. Therefore, the RPD exceedances are not considered to be significant in the overall context of the validation conclusions.

C. DATA QUALITY SUMMARY

JKE are of the opinion that the data are adequately precise, accurate, representative, comparable and complete to serve as a basis for interpretation to achieve the investigation objectives.

A number of results from field duplicates indicated some uncertainty in quantification for TRHs, PAHs and some heavy metals. However, this was typically attributed to results close to the PQL and therefore not of concern in the context of the overall validation conclusions.



Non-conformances were reported for some field QA/QC samples and laboratory QA/QC analysis. These non-conformances were considered to be sporadic and minor, and were not considered to be indicative of systematic sampling or analytical errors. On this basis, these non-conformances are not considered to materially impact the report findings.

The data quality has been evaluated considering the decision statements as follows:

- Has the site been adequately remediated and validated – Yes; and
- Is the site suitable for the development described in Section 1.1 – Yes.



Appendix D: Validation Inspection Log and Laboratory Report Log

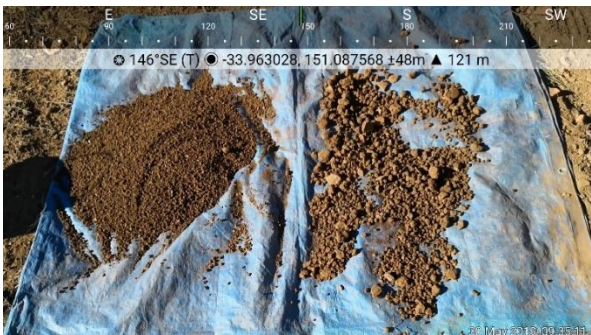


Date	Notes	Photos
10 April 2019 (BP)	• Pre-commencement meeting with Root Partnerships, Grindley, Senversa, Chalouhi and EIS/JKE. • Discussed DGI requirements, requirements for asbestos remediation (particularly regarding the TPZs), and for classifying and monitoring waste disposal. • Briefly inspected TP103 on completion of meeting. The area had been cleared of vegetation, isolated and overlain with geofabric to minimise the potential for disturbance and cross contamination. • Demolition to continue for next seven weeks.	 Photo 1: TP103 area separation
20 May 2019	• Advised by Chalouhi that there was an unexpected asbestos find that included ACM in buried fill under the 1 of 2 staircase structures in Building A. • Phil Clifton was booked by Chalouhi to visit the site the following day. • Chalouhi supplied photographs.	 Photo 2: Unexpected find No. 1, bonded ACM under Building A stairs



Date	Notes	Photos
20 May 2019 continued		 Photo 3: Unexpected find No. 1
30-31 May 2019 (HW)	• Data gap Investigation completed. • Observed adequate isolation of AEC/unexpected finds. • ACM not observed across the site surface. • Inspection beneath former demountables and around covered outdoor learning area occurred as required under the RAP.	 Photo 4: Unexpected find area, after removal



Date	Notes	Photos
30-31 May 2019 continued		 Photo 5: Site facing north, post-demolition  Photo 6: Site facing south, post-demolition  Photo 7: Typical sieved bulk sample



Date	Notes	Photos
30-31 May 2019 continued		 Photo 8: Test pit, obvious differentiation between fill and natural soil
8 July 2019 (HW)	• Exploration of Grids 1, 4, 6 and 8 in the cut zone to establish whether visible ACM was present (to inform waste classification). • Surface (0.1m deep) disturbed using teeth of excavator bucket. • Trenches excavated to facilitate inspection of full depth of fill plus trench spoil.	 Photo 9: Scraping top 0.1m of soil with teeth of excavator bucket prior to inspection



Date	Notes	Photos
8 July 2019 continued		 Photo 10: Trench through fill, prior to inspection of walls and trench spoil
11 July 2019 (HW)	• Exploration of Grids 2, 5, 7, 9 and 11 to establish whether visible ACM/fibre cement was present (to inform waste classification). • Methods as per 8 July 2019 inspection.	No photographs.
17-19 July 2019 (MMP)	• Initial scrape up and consolidation of fill in Grids 1, 2, 4 and 5. • Minor occurrence of fibre cement identified, process discussed with client. • Letter subsequently produced outlining additional visual assessment procedures (E30104Plet-WC2rev1). • Grid 8 piling platform left in-situ. Area checked and cleared by Chalouhi's asbestos supervisor 19 July 2019. • No waste left site.	 Photo 11. Initial scrape up and consolidation of fill in Grids 1, 2, 4 and 5.



Date	Notes	Photos
17-19 July 2019 continued		Photo 12. Minor occurrence of fibre cement identified. Photo 13. Grid 8 piling platform left in-situ. Area checked and cleared by Chalouhi's asbestos supervisor 19 July 2019.



Date	Notes	Photos
22-24 July 2019 (HW)	Commenced excavation and disposed GSW asbestos off-site from Grids 3 and 10. Waste disposal of GSW asbestos on 22 and 23 July only.	 Photo 14. Excavation and load out of GSW asbestos from Grids 3 and 10. Note asbestos controls and use of geofabric on haul road to minimise cross contamination.
31 Jul 2019 (BP / SW)	- Commenced treatment trial in Grid 1. Occurrence of ACM/fibre cement very minimal. - BP undertook walkover inspection. Piling largely complete along western boundary. Commencing northern boundary and due for completion 2 August 2019. All piling spoil remains in respective grids. - Sediment basin constructed in south part of site. Topsoil stockpiled adjacent to excavation. BP inspection and observed no fibre cement. - General walkover of site, no fibre cement observed.	No photographs.



Date	Notes	Photos
1 - 2 August 2019 (SW)	Continued treatment trial in Grid 1.	 Photo 15: Treated (right) and non-treated (left) stockpiles in Grid 1 at end of 2 August 2019
5 August 2019	Load out of treated GSW in Grid 1 (not inspected).	No photographs.



Date	Notes	Photos
6 August 2019	• Load out of GSW Asbestos stockpiled in Grids 3 and 10 • Continued treatment trial in Grid 1.	 Photo 16: Photo of treated stockpile end of day  Photo 17: Photo of non-treated stockpile end of day



Date	Notes	Photos
7 – 8 August 2019 (SW)	Continued treatment trial in Grid 1.	 Latitude: -33.962335 Longitude: 151.087456 Elevation: 50.3m Accuracy: 3.2m Azimuth: 44° (NE) Pitch: -16.4° (-5.0°) Time: 07-08-2019 15:25 Note: Grid 1: stockpiles - non-treated Photo 18: Grid 1 treatment
9 - 12 August 2019 (SW)	- Continued treatment trial in Grid 1. - Ceased treatment of Grid 1 and moved onto Grid 2 - Loadout of treated soil from Grid 1 on 9 August 2019. - Treatment trial discontinued after 12 August 2019.	 Latitude: -33.962354 Longitude: 151.087665 Elevation: 52.5m Accuracy: 3.2m Azimuth: 306° (NW) Pitch: 4.3° (-2.9°) Time: 09-08-2019 14:15 Note: Grid 1: Stockpiles - treated sending off site Photo 19: Grid 1 treated stockpile loaded to be sent off site



Date	Notes	Photos
14 August 2019 (HL)	• Inspection of Grid 12. Fill material still visible at the surface across the grid, but no fibre cement observed. JKE advised additional scraping to be completed. • Inspection of Grid 2 and Grid 5. Fill material identified at various locations, but no fibre cement observed. JKE advised general clean-up of both grids required. • Stockpile of material identified along south-west boundary of Grids 2 and 5.	DIRECTION 33.96388°S ACCURACY 6 m NW (T) 151.08762°E DATUM WGS84  2019-08-14 10:24:31+10:00 Photo 20: View of Grid 12 facing north-west. Note the fill material at the surface and the stockpile of material at the northern end. DIRECTION 33.96238°S ACCURACY 5 m SE (T) 151.08754°E DATUM WGS84  2019-08-14 10:30:01+10:00 Phot 21: View of Grids 2 and 5 facing south-east. Note the covered stockpile.



Date	Notes	Photos
15 August 2019 (HL)	<u>Grid 12</u> • Natural clay material visible at the surface of the grid. • Some areas of deeper fill observed along the north-east boundary. • No ACM identified. • Stockpile of material at the north-west boundary covered with geo-fabric. <u>Grid 6 & 8</u> • Large areas of fill and road base still in situ. • JKE advised to continue scraping until the natural is visible. <u>Grid 4</u> • Mostly completed, with exception of small trench along the northern boundary. • Chalouhi advised that the trench will be excavated.	 Photo 22: View of Grid 12 facing north. Note the natural clay at the surface and the stockpile of fill covered with geo-fabric.



Date	Notes	Photos
		Photo 23: View of Grids 6 and 8 facing south-east. Note the fill and road base on the surface. Photo 24: View of Grid 4, facing north-east. Note the fill at the surface along the concrete wall.



Date	Notes	Photos
20 August 2019 (HL)	<u>Grids 2 & 5</u> - Natural clay material visible at the surface across the majority of the grids, including around the footings still in-situ. - Fill material still visible along the eastern boundary. <u>Grids 6 & 8 (behind concrete capping beam)</u> - Initial inspection identified fill still at the surface. - JKE advised Grindley that an additional scrape was required which was done while on-site. - Additional 50mm was removed until natural material was visible. - The area was cleared satisfactorily. NOTE: JKE completed surface clearance (for visible asbestos) of this area, however no clearance certificate was issued.	DIRECTION 33.96232°S ACCURACY 4 m SE (T) 151.08746°E DATUM WGS84 Phot 25: View of Grids 2 and 5 facing south-east. Note the natural material at the surface and the in-situ footings.



Date	Notes	Photos
		Photo 26: View of the area behind the capping beam of Grids 6 and 8, prior to additional scrape. Photo 27: View of the area behind the capping beam, following the additional scrape. Note the natural material visible.



Date	Notes	Photos
21 August 2019 (HL)	<u>Haul Road</u> - Grindley advised the haul road was to be excavated down to natural material and levelled out using the in-situ natural material to create the haul road for truck movements. - Following a walkover, sandy fill material was still visible at the southern end of the haul road where two services trenches intersected the road. - JKE advised that a further scrape would be required in these trenches, which was done while on site. - Fill material was still in situ within several service trenches at the northern end of the haul road, adjacent the northern truck entry gate. This material was removed while JKE were on site and backfilled with adjacent natural material either side of the trenches. <u>Western Piling Wall Clearance Inspection</u> - JKE conducted an inspection of the exposed vertical wall of the fill material remaining in-situ along the western wall between the piles. - The inspection as undertaken on piles 1-8 from the southern end. - No fibre cement fragments were visible along the exposed surface of the wall.	DIRECTION 33.86280°S ACCURACY 4 m S (T) 151.08764°E DATUM WGS84 2019-08-21 14:16:44+10:00 Photo 28: View of the southern portion of the haul road facing south. Note the natural material at the surface. DIRECTION 33.96215°S ACCURACY 4 m S (T) 151.08717°E DATUM WGS84 2019-08-21 15:21:19+10:00 Photo 29: View of the northern portion of the haul road facing south.



Date	Notes	Photos
		 Photo 30: View of the western piling wall. No fibre cement identified.
26 August 2019 (HL)	<u>Grids 3 & 10</u> • Chalouhi scraped and removed excess fill spoil from along the Arcadia street boundary. • The southern boundary with the southern driveway was cleaned up and excess fill was removed and stockpiled. • Surfaces of the grids were scraped to tidy up any small patches of fill. • JKE advised that Grids 3 and 10 were successfully cleared of fill. Grindley advised a piling rig was to be parked on this area.	 Photo 31: View of Grids 3 and 10 facing north. Note the surface of the grids cleared of fill material and natural visible at the surface.



Date	Notes	Photos
27 August 2019 (BP)	• Eastern site area inspected. All fill had been removed and natural soil was exposed at ground surface. • Asbestos clearance certificate was issued for these areas, Ref: E30104Plet-Clr1, dated 27 August 2019.	 Photo 32: View of Grids 3 and 10 facing south. Surface successfully cleared.
28 August 2019 (HL)	Western Piling Wall • Piling was face was inspected, where visible until the northern end where it was below the ground surface. • No fibre cement fragments identified. North-East Clearance Inspection • Northern wall of excavation (southern boundary of driveway) was inspected exposed some fill at the top of the wall and natural clay beneath • The base and walls of the excavation was inspected. Approximately 28 footings were still in-situ. • No fibre cement fragments identified. • Natural clay soils and siltstone/shale visible across the base of the excavation.	 Photo 33: View of the western piling wall facing north-west.



Date	Notes	Photos
	Asbestos clearance certificate was issued for these areas, Ref: E30104Plet-Clr2, dated 29 August 2019.	DIRECTION 33.96217°S ACCURACY 13 m SE (T) 151.08747°E DATUM WGS84 2019-08-28 14:27:47+10:00 Photo 34: View of the north-east clearance area. Not natural at the surface and footings in-situ DIRECTION 33.96205°S ACCURACY 4 m N (T) 151.08737°E DATUM WGS84 2019-08-28 14:11:31+10:00 Photo 35: View of the northern wall of the excavation.



Date	Notes	Photos
3 September 2020 (BP)	- The building area had largely been scraped back to remove fill. - Asbestos clearance certificate was issued for these areas, Ref: E30104Plet-Clr3, dated 4 September 2019. - Piling was underway in areas covered by Asbestos Clearance No.1 and Asbestos Clearance No. 2 (generating VENM). - Small stockpiles on site had been generated by scraping back haul road after heavy rain (haul road was constructed on natural ground). The stockpiles did not contain anthropogenic material or fibre cement fragments.	 Photo 36: Fill removed, natural soil at surface in northern area  Photo 37: Fill removed, natural soil at surface along western boundary.



Date	Notes	Photos
18 September 2019 (SW)	• Sampling of 10mm and DGB20 recycled products from St Peters. • No indicators of contamination, staining, odours or fibre cement.	 Photo 38: Stockpile of DGB20 material from St Peters  Photo 39: Stockpile of 10mm Aggregate from St Peters



Date	Notes	Photos
25 September 2019 (SW)	• Sampling of 10mm quarry product from Albion Park Quarry. No indicators of contamination, staining, odours or fibre cement. • General site inspection at Penshurst. Cut earthworks and piling underway. All within zone where fill removal had occurred previously (i.e. only moving natural clay/shale).	 Latitude: -34.580294 Longitude: 150.815949 Elevation: 45.711m Accuracy: 4.3m Azimuth: 7° (N) Pitch: 1.9° (-1.6°) Time: 25-09-2019 10:10 Note: E30104P 10mmD Import Material Photo 40: 10mm Quarry Product from Albion Park Quarry  Latitude: -33.961902 Longitude: 151.087415 Elevation: 58.35m Accuracy: 8.6m Azimuth: 199° (S) Pitch: 2.0° (-2.3°) Time: 25-09-2019 13:02 Note: E30104P Site Inspection Photo 41: Overview of the site during inspection



Date	Notes	Photos
4 October 2019 (MMP)	• Inspection of imported materials including 10mm recycled and DGB20 recycled, 10mm quarry product and Blue Quarry Sand. • No indicators of contamination, staining, odours or fibre cement.	 Photo 42: Inspection of imported materials including 10mm recycled and DGBB20 recycled, 10mm quarry product and Blue Quarry Sand.
9 October 2019 (SW)	• Inspection and sampling of imported Blue Quarry Sand. • No indicators of contamination, staining, odours or fibre cement.	 Latitude: -33.962532 Longitude: 151.087327 Elevation: 52.37m Accuracy: 3.2m Azimuth: 286° (W) Pitch: -8.6° (-3.4°) Time: 09-10-2019 10:45 Note: E30104P SP2 Photo 43: One of the Stockpiles of Blue Quarry Sand



Date	Notes	Photos
		 Latitude: 33.963013 Longitude: 151.088059 Elevation: 51.24m Accuracy: 3.2m Azimuth: 288° (W) Pitch: 2.3° (-2.9°) Time: 09-10-2019 10:49 Note: E30104P Site Inspection Photo 44: Overview of site during inspection
21 October 2019 (BP)	• Called out for surface clearance of south-eastern driveway which was being relocated slightly to the south of the original driveway. Area was not ready to be inspected. • Cattle grid moving to an area where fill remained in-situ. Area to be excavated and cleared at a later date. Clearance required following fill removal from driveway area. • Imported materials inspected including 10mm recycled and DGB20 recycled, 10mm quarry product and Blue Quarry Sand. No indicators of contamination, staining, odours or fibre cement.	 DIRECTION 33.96222°S ACCURACY 16 m N (T) 151.08723°E DATUM WGS84 Northern boundary 2019-10-21 10:57:17+11:00 Photo 45: Imported materials, example of 10mm recovered aggregate



Date	Notes	Photos
22 October 2019 (BP)	- General inspection, footing and pre-slab pour preparations underway. Recovered aggregates extensively used beneath proposed building slabs. - Imported materials inspected. No indicators of contamination, staining, odours or fibre cement. - Loading out GSW Asbestos soils from the south-eastern driveway for the temporary entry realignment. Adequate controls in place (however we did not observe/check air monitors). - Site walkover with auditor.	 Photo 46: Excavation for south-eastern driveway/entry realignment
23 October 2019 (HL)	- Clearance required following fill removal from driveway area - Natural soil visible across the surface of the excavation - Natural soil visible along the northern excavation wall - Fill visible along the southern and eastern walls - No fibre cement fragments identified and the area was successfully cleared. - Asbestos clearance certificate issued Ref: E30104Plet-Clr4, dated 24 October 2019.	 Photo 47: Areas inspected for Asbestos Clearance No. 4



Date	Notes	Photos
6 November 2019 (SW)	• DBG20 Sampling at Metropolitan Demolition and Recycling Facility, St Peters (Round 2). • No indicators of contamination, staining, odours or fibre cement.	 Latitude: -33.917726 Longitude: 151.172748 Elevation: 8.69m Accuracy: 3.2m Azimuth: 287° (W) Pitch: 5.6° (-3.5°) Time: 06-11-2019 12:02 Note: E30104P DGB20 Photo 48: Stockpile of DBG20 Material
8 November 2019 (SW)	• Inspection of imported materials, including quarry metals and recycled materials. • No indicators of contamination, staining, odours or fibre cement.	 Latitude: -33.962683 Longitude: 151.087505 Elevation: 56.45m Accuracy: 3.2m Azimuth: 81° (E) Pitch: 18.7° (4.1°) Time: 08-11-2019 12:12 Note: E30104P Inspection Photo 49: Stockpile of 10mm and Blue Quarry Sand (quarry materials)



Date	Notes	Photos
		 Latitude: -33.963102 Longitude: 151.087665 Elevation: 54.24m Accuracy: 3.2m Azimuth: 29° (NE) Pitch: -4.0° (-4.5°) Time: 08-11-2019 11:40 Note: E30104P Inspection Photo 50: Recycled DGB20 beneath proposed building slabs
15 November 2019 (MMP)	• Clearance required following excavation of part of north-eastern driveway. • No fibre cement fragments identified and the area was successfully cleared. • Asbestos clearance certificate issued, Ref: E30104Plet-Clr5, dated 15 November 2019.	 DIRECTION 13 deg (T) 33.96211°S ACCURACY 5 m 151.08730°E DATUM WGS84 2019-11-15 08:30:43+11:00 Photo 51: Area inspected subject to Asbestos Clearance No. 5



Date	Notes	Photos
17 March 2020 (HL)	• Clearance required following fill removal from proposed substation kiosk in south-east corner of site. • Natural soil visible across the surface of the excavation. • Fill visible along all excavation walls to depths of 0.1-0.3m • Natural soil visible beneath fill along all excavation walls and beneath brick wall in the south-east and north-east corners (where brick wall still in-situ). • No fibre cement fragments identified and the area was successfully cleared. • Asbestos clearance certificate issued, Ref: E30104Plet-Clr6, dated 17 March 2020.	 Photos 52-53: View of the area inspected



Date	Notes	Photos
27 March 2020 (HL)	- Inspected 10mm aggregate imported to substation kiosk area - No indicators of contamination, staining, odours or fibre cement. - Material consistent with description and previously imported aggregate.	 Photos 54-55: View of imported 10mm aggregate stockpile
18 August 2020 (BP)	- Meeting on site to discuss southern area and remaining validation with Grindley. - Southern area full of site sheds, containers and amenities. - Driveway area had 10mm quarry gravel and DGB spread over it. No visible asbestos or contamination indicators. - Structure was up and well progressed. Landscaping not yet commenced.	 Photo 56: View of southern area and imported gravels/DGB over surface



Date	Notes	Photos
		 Photos 57: Main building structure
7 October 2020 (HW)	Stockpile inspections, refer to waste classification letters WC5 and WC6	Refer to waste classification letters.
29 October 2020 (MMP)	Attended site to conducted validation test pitting to the southern area of site and tree protection zones.	 Photo 58: Southern aspect of site.



Date	Notes	Photos
4 November 2020 (HL)	• Clearance required following minor excavation for propose site shed platform in south-east corner of site. • Fill visible across the base and along all excavation walls to depths of 0.25-0.4m. • North boundary sloping instead of wall. • No fibre cement fragments identified and the area was successfully cleared. • Asbestos clearance certificate issued Ref: E30104Plet-Clr7, dated 4 November 2020.	DIRECTION 33.96316°S ACCURACY 5 m NW (T) 151.08828°E DATUM WGS84 2020-11-04 07:40:10+11:00 DIRECTION 33.96292°S ACCURACY 7 m SE (T) 151.08807°E DATUM WGS84 2020-11-04 07:43:24+11:00 Photos 59-60: View of the area inspected
5 November 2020 (MMP)	• Continuation of validation test pitting to southern area and remaining tree protection zones. • Ground surface clearance inspection of area south of southern external staircase. • No fibre cement was identified on the ground surface. • Asbestos clearance certificate issued, Ref: E30104Plet-Clr8, dated 9 November 2020.	DIRECTION 33.96333°S ACCURACY 26 m 103 deg(T) 151.08760°E DATUM WGS84 2020-11-05 15:44:58+11:00 Photo 61: Eastern portion of area inspected prior to completion of works and inspection.



Date	Notes	Photos
12 November 2020 (MMP)	Overview and guidance whilst stripping and cutting of fill over swale area is conducted.	 Photo 62: Foot print of swale cut to depth of VENM pre inspection.
13 November 2020 (MMP)	- Final inspection of swale area following removal of fill material. - All fill removed to ground surface of area inspected, ground surface was observed to be natural soil. - Asbestos clearance certificate issued, Ref: E30104Plet-Clr9, dated 18 November 2020.	 Photo 63: Foot print of western portion of swale area inspected and cleared.



Date	Notes	Photos
17 November 2020 (CR)	• Sampling of imported landscaping materials at source facilities. • No indicators of contamination, staining, odours or fibre cement. •	 Photo 64: ACI Dry Sand Kiln Dried – BC Sands Taren Point  Photo 65: Enviro Sand – Concrete Recyclers Kurnell  Photo 66: Forest Fines – ANL Badgerys Creek



Date	Notes	Photos
		 Photo 67: Turf Underlay – ANL Badgerys Creek  Photo 68: Organic Garden Mix – ANL Badgerys Creek



Date	Notes	Photos
		 Photo 69: Planter Box Mix – ANL Badgerys Creek
19 November 2020 (HL)	• Clearance required following minor excavation for area south of the main building and west of the southern driveway; • Fill visible across the base in the northern portion of the area inspected; • Natural soil visible across the southern portion of the area inspected, north of the swale; and • No fibre cement fragments identified and the area was successfully cleared. • Asbestos clearance certificate issued, Ref: E30104Plet-Clr10, dated 20 November 2020. • Visual inspection of a small stockpile of imported topsoil (organic garden mix). Material was consistent with expectations. • No indicators of contamination, staining, odours or fibre cement.	 Photos 70-71: View of the area inspected

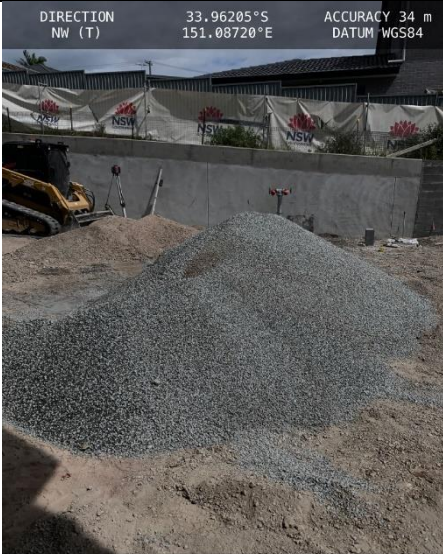


Date	Notes	Photos
		Photos 72-73: View of the imported Organic Garden Mix



Date	Notes	Photos
24 November 2020 (HL)	• Clearance required following minor excavation for area immediately north-east of the swale and small area beneath stair 4. • Natural soil visible across both areas inspected. • No fibre cement fragments identified and the area was successfully cleared. • Asbestos clearance certificate issued, Ref: E30104Plet-Clr11, dated 24 November 2020. • Visual inspection of a small stockpile of imported DGB located adjacent the Northern gate driveway. • Material consisted of igneous gravels, consisted with DGB. No indicators of contamination, staining, odours or fibre cement.	 Photos 74-75: View of the area inspected

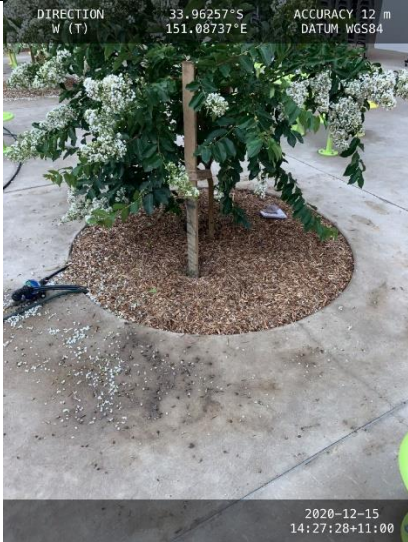


Date	Notes	Photos
		DIRECTION 33.96205°S ACCURACY 34 m NW (T) 151.08720°E DATUM WGS84  2020-11-24 10:27:41+11:00 DIRECTION 33.96208°S ACCURACY 11 m N (T) 151.08709°E DATUM WGS84  2020-11-24 10:28:01+11:00 Photos 76-77: View of the imported DGB



Date	Notes	Photos
27 November 2020 (HL)	• Clearance required following minor excavation for area immediately east of the main building. This area had previously been cleared, however an additional clearance was requested due to it's proximity with the entry driveway and overlap with previous clearances. • Natural soil visible across both areas inspected. Some 'fill' also observed, but this was consistent with site-won material. • No fibre cement fragments identified and the area was successfully cleared. • Asbestos clearance certificate issued, Ref: E30104Plet-Clr12, dated 30 November 2020.	 Photo 78: Area inspected, facing south
2 December 2020 (HL)	• Clearance required following minor excavation for the north-east driveway area. • Natural soil visible across the area inspected. Minor amounts of 'fill' also observed. • No fibre cement fragments identified and the area was successfully cleared. • Also completed in-situ asbestos quantification validation location AQAV2 in the driveway. • Asbestos clearance certificate issued, Ref: E30104Plet-Clr13, dated 3 December 2020.	 Photo 79: Area inspected, facing north



Date	Notes	Photos
15 December 2020 (HL)	• Main final clearance for southern area, prior to landscaping. • Natural soil and fill visible across the areas inspected. • No fibre cement fragments identified and the area was successfully cleared. • Asbestos clearance certificate issued, Ref: E30104Plet-Clr14, dated 16 December 2020. • Inspected imported garden mix and mulch (forest fines) placed in the areas of the site adjacent to Arcadia Street and also in the central playground area. The materials were consistent with expectations and there were no indicators of contamination, staining, odours or fibre cement.	 Photo 80: Forest fines around tree base in central playground



Date	Notes	Photos
		DIRECTION NW (T) 33.96286°S 151.08808°E ACCURACY 5 m DATUM WGS84  2020-12-15 14:29:45+11:00 Photo 81: Organic garden mix adjacent to Arcadia Street boundary



Date	Notes	Photos
		 Photo 82: Southern area inspected
22 December 2020 (MMP)	• Inspection of Enviro Sand in southern area. • The materials were consistent with expectations and there were no indicators of contamination, staining, odours or fibre cement.	 Photo 83: Enviro sand placed in southern area



Date	Notes	Photos
8 January 2021 (BP)	• Final inspection of site prior to issue of site validation report. • Inspected imported materials as listed in the photographs. The materials were consistent with expectations and there were no indicators of contamination, staining, odours or fibre cement. • Check of imported materials thicknesses in southern area/TPZs to confirm placement of >0.1m.	 Photo 84: Capping beam, western boundary  Photo 85: Southern area, including turf underlay



Date	Notes	Photos
		Photo 86: Central playground, shotcrete wall beneath capping beam on western boundary Photo 87: Planter box mix



Date	Notes	Photos
		DIRECTION: 33.96218°S, 151.08690°E NE (T) ACCURACY: 14 m DATUM: WGS84 2021-01-08 07:31:57+11:00 Photo 88: Capping beam and landscaping, northern boundary DIRECTION: 33.96328°S, 151.08842°E NW (T) ACCURACY: 15 m DATUM: WGS84 2021-01-08 07:51:59+11:00 DIRECTION: 33.96328°S, 151.08847°E W (T) ACCURACY: 8 m DATUM: WGS84 2021-01-08 07:52:09+11:00 Photos 89 and 90: Southern/south-eastern TPZs

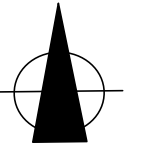


Lab report	Notes
221234	Analysis of asbestos in FCF obtained during exploratory waste classification work (Grid 8)
221535	Analysis of asbestos in FCF obtained during exploratory waste classification work (Grid 9)
226430	DGB20 and 10mm aggregate validation samples (sampled at source)
227117	10mm quarry product from Albion Park Quarry (sampled at source)
227096	Blue Quarry Sand from Rooty Hill Distribution Centre (sampled on site)
230174	DGB20 aggregate validation samples (sampled at source)
232233	DGB20 aggregate validation samples (sampled at source) – lab made error and did not send duplicate to secondary laboratory
254663	FCF analysis on material found in test pit AQAV14
255960	Organic Garden Mix – Imported Materials
255959	Imported landscaping materials (planter box mix, enviro sand, turf underlay, ACI dry kiln sand)
Inter-lab	Notes
18464	Inter-lab of Blue Quarry Sand from Rooty Hill Distribution Centre (227096)
23415	Inter-lab of imported landscaping materials (255959)

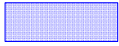
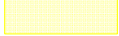


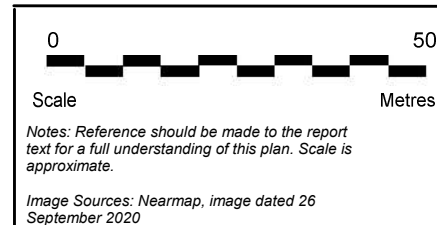
Appendix E: Fill Removal from Building Area

Figure E1



LEGEND:

-  APPROXIMATE SITE BOUNDARY
-  APPROXIMATE 'BUILDING AREA'
-  APPROXIMATE 'TPZ'
-  APPROXIMATE 'NORTH-EASTERN DRIVEWAY'



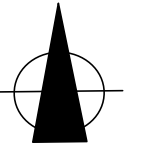
Title: BUILDING AREA PLAN	
Location: PENSURST PUBLIC SCHOOL, 510 FOREST ROAD, PENSURST, NSW	
Report No: E30104Prpt-VAL	Figure No: E1
JK ENVIRONMENTS	





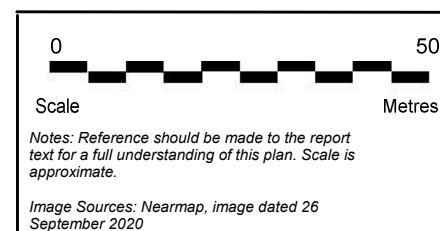
Appendix F: Additional Asbestos Quantification

F1 – Sample Location Plan



LEGEND:

- APPROXIMATE SITE BOUNDARY
- APPROXIMATE 'BUILDING AREA'
- APPROXIMATE 'TPZ'
- AQAV1 (0.3) TEST PIT IDENTIFICATION (FILL DEPTH)



Title: ADDITIONAL ASBESTOS QUANTIFICATION	
Location: PENSHURST PUBLIC SCHOOL, 510 FOREST ROAD, PENSHURST, NSW	
Report No: E30104Prpt-VAL	Figure No: F1
JK ENVIRONMENTS	



F2 – Test Pit Logs and Explanatory Notes

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes



Log No.

AQAV1

1/1

Client:

GRINDLEY CONSTRUCTION PTY LTD

Project:

PROPOSED ALTERATIONS TO EXISTING SCHOOL

Location:

CNR FOREST WAY AND ARCADIA STREET, PENSHURST, NSW

Job No.:

E30104P

Method:

TEST PIT
HAND DUG

R.L. Surface:

N/A

Date:

8/11/20

Datum:

-

Plant Type:

SHOVEL

Logged/Checked by:

M.M.P./B.P.

Groundwater Record	SAMPLES				Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	ES	ASS	ASB	SAL									
DRY ON COMPLETION						0			FILL: Silty sand, fine to medium grained, brown, trace of igneous and ironstone gravel and root fibres.	M			SCREEN: 13.4kg 0.0-1m NO FCF
						0.5			FILL: Silty sand, fine to medium grained, grey, trace of igneous, ironstone and sandstone gravel, brick fragments and root fibres.	D			SCREEN: 12.8kg 0.1-0.5m NO FCF
						1			FILL: Sandy clay, low to medium plasticity, grey, fine to medium grained sand, trace of igneous gravel and root fibres.	w<PL			SCREEN: 11.3kg 0.5-1.1 NO FCF
									FILL: Sandy clay, low to medium plasticity, dark red brown, fine to medium grained sand, trace of igneous and ironstone gravel and root fibres.				SCREEN: 8.3kg 1.1-1.4m NO FCF
						1.5			END OF TEST PIT AT 1.4m				REFUSAL
						2							
						2.5							
						3							
						3.5							

JKEnvironments

ENVIRONMENTAL LOG



Log No.
AQAV2
1/1

Environmental logs are not to be used for geotechnical purposes

Client: GRINDLEY CONSTRUCTION PTY LTD													
Project: PROPOSED ALTERATIONS TO EXISTING SCHOOL													
Location: CNR FOREST WAY AND ARCADIA STREET, PENSHURST, NSW													
Job No.: E30104P				Method: TEST PIT HAND DUG				R.L. Surface: N/A					
Date: 2/12/20								Datum: -					
Plant Type: SHOVEL				Logged/Checked by: H.L./B.P.									
Groundwater Record	SAMPLES				Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	ES	ASS	ASB	SAL									
DRY ON COMPLE- TION						0		CI-CH	FILL: Sandy gravelly clay, low to medium plasticity, brown, fine to coarse grained igneous gravel, fine to medium grained sand, trace of root fibres. Silty CLAY: medium to high plasticity, orange brown and red brown, trace of root fibres. END OF TEST PIT AT 0.2m	w≤PL w<PL			SCREEN: 17.64kg 0-0.1m NO FCF
						0.5							
						1							
						1.5							
						2							
						2.5							
						3							
						3.5							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Client:

GRINDLEY CONSTRUCTION PTY LTD

Project:

PROPOSED ALTERATIONS TO EXISTING SCHOOL

Location:

CNR FOREST WAY AND ARCADIA STREET, PENSHURST, NSW

Job No.:

E30104P

Method:

EXCAVATOR

R.L. Surface:

N/A

Date:

8/11/20

Datum:

-

Plant Type:

-

Logged/Checked by:

M.M.P./B.P.

Groundwater Record	SAMPLES				Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/Weathering	Strength/Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	ES	ASS	ASB	SAL									
DRY ON COMPLETION						0		CI-CH	FILL: Sandy clay, low to medium plasticity, red brown, fine to medium grained sand, trace of igneous, ironstone and sandstone gravel and root fibres. Silty CLAY: medium to high plasticity, grey mottled yellow brown.	w~PL			SCREEN: 14.1kg 0-0.1m NO FCF SCREEN: 13.2kg 0.1-0.2m NO FCF RESIDUAL
						0.5				w~PL			
						1			END OF BOREHOLE AT 1.0m				
						1.5							
						2							
						2.5							
						3							
						3.5							

JKEnvironments

ENVIRONMENTAL LOG



Log No.
AQAV4
1/1

Environmental logs are not to be used for geotechnical purposes

Client: GRINDLEY CONSTRUCTION PTY LTD Project: PROPOSED ALTERATIONS TO EXISTING SCHOOL Location: CNR FOREST WAY AND ARCADIA STREET, PENSHURST, NSW														
Job No.: E30104P Date: 8/11/20 Plant Type: -			Method: EXCAVATOR Logged/Checked by: M.M.P./B.P.				R.L. Surface: N/A Datum: -							
Groundwater Record	SAMPLES				Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks	
	ES	ASS	ASB	SAL										DB
DRY ON COMPLETION						0			FILL: Silty gravelly sand, fine to medium grained, dark grey, fine to medium grained sub-angular igneous gravel, trace of root fibres.	M			GRASS COVER 14.8kg 0-01m NO FCF SCREEN: 13.5kg 01.-0.4m NO FCF SCREEN: 12.9kg 0.4-1.0m NO FCF	
						0.5			FILL: Sandy clay, low to medium plasticity, dark brown, fine to medium grained sand, trace of igneous gravel.	w<PL				
						1			FILL: Sandy clay, low to medium plasticity, red brown, fine to medium grained sand, trace of brick fragments, igneous and ironstone gravel.	w≈PL				
						1.5		CI-CH	Silty CLAY: medium to high plasticity, grey mottled yellow brown.	w≈PL			RESIDUAL	
						2			END OF BOREHOLE AT 1.6m					
						2.5								
						3								
						3.5								

JKEnvironments

ENVIRONMENTAL LOG



Log No.
AQAV5
1/1

Environmental logs are not to be used for geotechnical purposes

Client: GRINDLEY CONSTRUCTION PTY LTD													
Project: PROPOSED ALTERATIONS TO EXISTING SCHOOL													
Location: CNR FOREST WAY AND ARCADIA STREET, PENSHURST, NSW													
Job No.: E30104P		Method: EXCAVATOR				R.L. Surface: N/A							
Date: 29/10/20						Datum: -							
Plant Type: -		Logged/Checked by: M.M.P./B.P.											
Groundwater Record	SAMPLES				Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/Weathering	Strength/Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	ES	ASS	ASB	SAL									
DRY ON COMPLETION						0			FILL: Sandy gravel, fine to medium grained sub-angular, igneous gravel, grey, trace of sandstone gravel, and brick fragments.	W			SCREEN: 12.1kg 0-0.1m NO FCF
						0.5			FILL: Sandy clay, low to medium plasticity, dark brown, trace of igneous and ironstone gravel, and root fibres.	w≈PL			SCREEN: 13.2kg 0.1-0.4m NO FCF
						1			FILL: Silty clay, low to medium plasticity, grey mottled red brown and brown, trace of concrete, bricks, earthenware fragments, ash and slag.	w≈PL			SCREEN: 14.8kg 0.4-1.0m NO FCF
						1.5							SCREEN: 11.7kg 1.0-1.5 NO FCF
						1.5		CI-CH	Silty CLAY: medium to high plasticity, grey mottled red brown.	w≈PL			
						2			END OF TEST PIT AT 1.9m				
						2.5							
						3							
						3.5							

JKEnvironments

ENVIRONMENTAL LOG



Log No.
AQAV6
1/1

Environmental logs are not to be used for geotechnical purposes

Client: GRINDLEY CONSTRUCTION PTY LTD													
Project: PROPOSED ALTERATIONS TO EXISTING SCHOOL													
Location: CNR FOREST WAY AND ARCADIA STREET, PENSHURST, NSW													
Job No.: E30104P			Method: EXCAVATOR				R.L. Surface: N/A						
Date: 29/10/20			Datum: -										
Plant Type: -			Logged/Checked by: M.M.P./B.P.										
Groundwater Record	SAMPLES				Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	ES	ASS	ASB	SAL									
DRY ON COMPLETION						0			FILL: Sandy gravel, fine to medium grained, sub-angular igneous gravel, grey, trace of brick fragments.	M w≈PL			SCREEN: 14.4kg 0-0.1m NO FCF
						0.5		FILL: Silty clay, low to medium plasticity, grey and brown, trace of igneous and ironstone gravel.	SCREEN: 12.9kg 0.1-0.4m NO FCF				
						0.5		FILL: Sandy clay, low to medium plasticity, brown, fine to medium grained sand, trace of igneous and ironstone gravel, ash and slag.	SCREEN: 13.7kg 0.4-0.8m NO FCF				
						1		CI-CH	Silty CLAY: medium to high plasticity, grey mottled orange brown, trace of root fibres.	w<PL			
						1.5			END OF TEST PIT AT 1.3m				
						2							
						2.5							
						3							
						3.5							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Client:

GRINDLEY CONSTRUCTION PTY LTD

Project:

PROPOSED ALTERATIONS TO EXISTING SCHOOL

Location:

CNR FOREST WAY AND ARCADIA STREET, PENSHURST, NSW

Job No.:

E30104P

Method:

TEST PIT
HAND DUG

R.L. Surface:

N/A

Date:

8/11/20

Datum:

-

Plant Type:

SHOVEL

Logged/Checked by:

M.M.P./B.P.

Groundwater Record	SAMPLES				Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	ES	ASS	ASB	SAL									
DRY ON COMPLE- TION						0			FILL: Silty sand, fine to medium grained, dark brown, trace of organic matter, concrete fragments and roots.	M			SCREEN: 13.7kg 0-0.1m NO FCF
						0.5		FILL: Sandy clay, low to medium plasticity, grey, fine to medium grained sand, trace of igneous and ironstone gravel, brick fragments and roots.	w<PL			SCREEN: 12.3kg 0.1-0.5m NO FCF	
								FILL: Sandy clay, low to medium plasticity, brown, fine to medium grained sand, trace of igneous and ironstone gravel and roots.				SCREEN: 10.1kg 0.5-0.7m NO FCF	
									END OF TEST PIT AT 0.7m				SHOVEL REFUSAL ON ROOTS
						1							
						1.5							
						2							
						2.5							
						3							
						3.5							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Client: GRINDLEY CONSTRUCTION PTY LTD Project: PROPOSED ALTERATIONS TO EXISTING SCHOOL Location: CNR FOREST WAY AND ARCADIA STREET, PENSHURST, NSW													
Job No.: E30104P Method: EXCAVATOR R.L. Surface: N/A Date: 8/11/20 Datum: - Plant Type: - Logged/Checked by: M.M.P./B.P.													
Groundwater Record	SAMPLES				Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	ES	ASS	ASB	SAL									
DRY ON COMPLE- TION						0			FILL: Silty gravelly sand, fine to medium grained, brown, fine to medium grained sub-angular igneous gravel, trace of sandstone and ironstone.	M			SCREEN: 14.9kg 0-0.5m NO FCF
						0.5			FILL: Gravelly clay, low to medium plasticity, grey, fine to medium grained sub-angular igneous gravel.	w≈PL			SCREEN: 14.0kg 0.5-1.1m NO FCF
						1		CI-CH	Silty CLAY: medium to high plasticity, grey mottled yellow brown, trace of ironstone gravel.	w≈PL			RESIDUAL
						1.5			END OF BOREHOLE AT 1.4m				
						2							
						2.5							
						3							
						3.5							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Client:

GRINDLEY CONSTRUCTION PTY LTD

Project:

PROPOSED ALTERATIONS TO EXISTING SCHOOL

Location:

CNR FOREST WAY AND ARCADIA STREET, PENSHURST, NSW

Job No.:

E30104P

Method:

EXCAVATOR

R.L. Surface:

N/A

Date:

29/10/20

Datum:

-

Plant Type:

-

Logged/Checked by:

M.M.P./B.P.

Groundwater Record	SAMPLES				Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/Weathering	Strength/Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	ES	ASS	ASB	SAL									
DRY ON COMPLETION						0			FILL: Gravelly sand, fine to medium grained, grey, fine to medium grained igneous gravel, trace of brick fragments.	W			SCREEN: 11.7kg
									FILL: Sandy clay, low to medium plasticity, dark brown, fine to medium grained sand, trace of igneous and ironstone gravel, ash slag and root fibres.	w<PL			0-0.1m NO FCF
						0.5			FILL: Silty clay, low to medium plasticity, dark brown, trace of igneous, ironstone and sandstone gravel, slag and root fibres.				SCREEN: 12.6kg 0.1-0.35m NO FCF
								CI-CH	Silty CLAY: medium to high plasticity, red brown mottled grey.	w≈PL			SCREEN: 13.9kg 0.35-0.85 NO FCF
						1							
						1.5			END OF TEST PIT AT 1.5m				
						2							
						2.5							
						3							
						3.5							

JKEnvironments

ENVIRONMENTAL LOG



Log No.
AQAV10
1/1

Environmental logs are not to be used for geotechnical purposes

Client: GRINDLEY CONSTRUCTION PTY LTD													
Project: PROPOSED ALTERATIONS TO EXISTING SCHOOL													
Location: CNR FOREST WAY AND ARCADIA STREET, PENSHURST, NSW													
Job No.: E30104P			Method: EXCAVATOR				R.L. Surface: N/A						
Date: 29/10/20			Datum: -										
Plant Type: -			Logged/Checked by: M.M.P./B.P.										
Groundwater Record	SAMPLES				Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	ES	ASS	ASB	SAL									
DRY ON COMPLETION						0			FILL: Sandy gravel, fine to medium grained, sub-angular, igneous gravel, grey, trace of brick fragments.	W			SCREEN: 13.8kg
						0.5			FILL: Sandy clay, low to medium plasticity, dark brown, fine to medium grained sand, trace of igneous and ironstone gravel, ash, slag and root fibres.	w<PL			0-0.1m NO FCF
						1		CI-CH	Silty CLAY: medium to high plasticity, grey mottled red brown.	w≈PL			SCREEN: 14.7kg
													0.1-0.6m NO FCF
									END OF TEST PIT AT 1.1m				
						1.5							
						2							
						2.5							
						3							
						3.5							

JKEnvironments

ENVIRONMENTAL LOG



Log No.
AQAV11
1/1

Environmental logs are not to be used for geotechnical purposes

Client: GRINDLEY CONSTRUCTION PTY LTD Project: PROPOSED ALTERATIONS TO EXISTING SCHOOL Location: CNR FOREST WAY AND ARCADIA STREET, PENSHURST, NSW													
Job No.: E30104P Date: 5/11/20 Plant Type: SHOVEL			Method: TEST PIT HAND DUG Logged/Checked by: M.M.P./B.P.				R.L. Surface: N/A Datum: -						
Groundwater Record	SAMPLES				Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	ES	ASS	ASB	SAL									
DRY ON COMPLE- TION						0			FILL: Silty sand, fine to medium grained, brown, trace of brick fragments and root fibres.	M			SCREEN: 11.7kg 0-0.1m NO FCF
					0.5	as above, but light brown, trace of concrete and roots.		SCREEN: 12.9kg 0.1-0.2m NO FCF					
						FILL: Sandy clay, low to medium plasticity, grey, fine to medium grained sand, trace of igneous gravel, brick fragments and roots.		w<PL	SCREEN: 12.6kg 0.2-0.5m NO FCF				
					1	FILL: Sandy clay, low to medium plasticity, brown, fine to medium grained sand, trace of igneous, ironstone and sandstone gravel and roots.		SCREEN: 9.2kg 0.5-0.9m NO FCF					
						1.2		END OF TEST PIT AT 1.2					REFUSAL
						1.5							
						2							
						2.5							
						3							
						3.5							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Client: GRINDLEY CONSTRUCTION PTY LTD Project: PROPOSED ALTERATIONS TO EXISTING SCHOOL Location: CNR FOREST WAY AND ARCADIA STREET, PENSHURST, NSW													
Job No.: E30104P			Method: EXCAVATOR				R.L. Surface: N/A						
Date: 5/11/20			Datum: -										
Plant Type: -			Logged/Checked by: M.M.P./B.P.										
Groundwater Record	SAMPLES				Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	ES	ASS	ASB	SAL									
DRY ON COMPLE- TION						0			FILL: Silty sand, fine to medium grained, brown, trace of ironstone and sandstone gravel and root fibres.	M			SCREEN: 14.1kg 0-0.1m NO FCF
						0.5			FILL: Sandy clay, low to medium plasticity, dark red brown, fine to medium grained sand, trace of igneous, ironstone and sandstone gravel, and brick fragments.	w<PL			SCREEN: 12.3kg 0.1-0.3m NO FCF
								CI-CH	Silty CLAY: medium to high plasticity, grey mottled yellow brown.	w≈PL			SCREEN: 14.4kg 0.3-0.6m NO FCF RESIDUAL
						1							
						1.5			END OF BOREHOLE AT 1.4m				
						2							
						2.5							
						3							
						3.5							

JKEnvironments

ENVIRONMENTAL LOG



Log No.
AQAV13
1/1

Environmental logs are not to be used for geotechnical purposes

Client: GRINDLEY CONSTRUCTION PTY LTD Project: PROPOSED ALTERATIONS TO EXISTING SCHOOL Location: CNR FOREST WAY AND ARCADIA STREET, PENSHURST, NSW													
Job No.: E30104P Date: 29/10/20 Plant Type: SHOVEL			Method: TEST PIT HAND DUG Logged/Checked by: M.M.P./B.P.				R.L. Surface: N/A Datum: -						
Groundwater Record	SAMPLES				Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	ES	ASS	ASB	SAL									
DRY ON COMPLETION						0			FILL: Silty sand, fine to medium grained, brown, trace of organic material.	D			SCREEN: 7.2kg 0-0.5m NO FCF ASTROTURF LAYER AT 50mm.t SCREEN: 8.9kg 0.05-0.3m NO FCF SCREEN: 934kg 0.3-0.7m NO FCF SCREEN: 3.1kg 0.7-0.9m NO FCF REFUSAL
						0.5		FILL: Silty clayey sand, fine to medium grained, brown, trace of igneous and ironstone gravel and root fibres.	w<PL				
								FILL: Sandy clay, low to medium plasticity, brown, trace of igneous, ironstone and sandstone gravel, concrete and brick fragments and roots.					
								FILL: Silty clay, medium to high plasticity, dark grey and brown, trace of concrete fragments, igneous and ironstone gravel.					
						1			END OF TEST PIT AT 0.9m				
						1.5							
						2							
						2.5							
						3							
						3.5							

JKEnvironments

ENVIRONMENTAL LOG



Log No.
AQAV14
1/1

Environmental logs are not to be used for geotechnical purposes

Client: GRINDLEY CONSTRUCTION PTY LTD													
Project: PROPOSED ALTERATIONS TO EXISTING SCHOOL													
Location: CNR FOREST WAY AND ARCADIA STREET, PENSHURST, NSW													
Job No.: E30104P			Method: TEST PIT HAND DUG				R.L. Surface: N/A						
Date: 29/10/20			Datum: -										
Plant Type: SHOVEL			Logged/Checked by: M.M.P./B.P.										
Groundwater Record	SAMPLES				Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	ES	ASS	ASB	SAL									
DRY ON COMPLETION						0			FILL: Silty sand, fine to medium grained, brown, trace of root fibres.	D			SCREEN 13.21kg 0-0.1m NO FCF
						0.5		FILL: Sandy clay, low to medium plasticity, brown, trace of igneous and ironstone gravel, earthenware and brick fragments.	w<PL		SCREEN: 10.1kg 0.1-0.2 NO FCF		
								FILL: Sandy clay, low to medium plasticity, dark orange brown, fine to medium grained sand, trace of ironstone gravel.			SCREEN: 12.1kg 0.2-0.6m NO FCF 0.3-0.4m F1 SPOIL (5.02g) SCREEN: 10.3kg 0.6-0.85m NO FCF		
						1		END OF TEST PIT AT 0.85m					
						1.5							
						2							
						2.5							
						3							
						3.5							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Client: GRINDLEY CONSTRUCTION PTY LTD Project: PROPOSED ALTERATIONS TO EXISTING SCHOOL Location: CNR FOREST WAY AND ARCADIA STREET, PENSHURST, NSW													
Job No.: E30104P			Method: TEST PIT HAND DUG				R.L. Surface: N/A						
Date: 29/10/20			Datum: -										
Plant Type: SHOVEL			Logged/Checked by: M.M.P./B.P.										
Groundwater Record	SAMPLES				Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	ES	ASS	ASB	SAL									
DRY ON COMPLETION						0			FILL: Silty clayey sand, fine to medium grained, brown, trace of mulch and root fibres. FILL: Silty sandy clay, low to medium plasticity, dark orange brown, fine to medium grained sand, trace of igneous and ironstone gravel, brick and earthenware.	M w<PL			SCREEN: 11.7kg 0-0.1m NO FCF SCREEN: 0.1-0.8m NO FCF
						0.5							
						1			END OF TEST PIT AT 0.8m				REFUSAL ON CONCRETE
						1.5							
						2							
						2.5							
						3							
						3.5							



ENVIRONMENTAL LOGS EXPLANATION NOTES

INTRODUCTION

These notes have been provided to amplify the environmental report in regard to classification methods, field procedures and certain matters relating to the logging of soil and rock. Not all notes are necessarily relevant to all reports.

Where geotechnical borehole logs are utilised for environmental purpose, reference should also be made to the explanatory notes included in the geotechnical report. Environmental logs are not suitable for geotechnical purposes.

The ground is a product of continuing natural and man-made processes and therefore exhibits a variety of characteristics and properties which vary from place to place and can change with time. Environmental studies include gathering and assimilating limited facts about these characteristics and properties in order to understand or predict the behaviour of the ground on a particular site under certain conditions. This report may contain such facts obtained by inspection, excavation, probing, sampling, testing or other means of investigation. If so, they are directly relevant only to the ground at the place where and time when the investigation was carried out.

DESCRIPTION AND CLASSIFICATION METHODS

The methods of description and classification of soils and rocks used in this report are based on Australian Standard 1726:2017 'Geotechnical Site Investigations'. In general, descriptions cover the following properties – soil or rock type, colour, structure, strength or density, and inclusions. Identification and classification of soil and rock involves judgement and the Company infers accuracy only to the extent that is common in current geoenvironmental practice.

Soil types are described according to the predominating particle size and behaviour as set out in the attached soil classification table qualified by the grading of other particles present (eg. sandy clay) as set out below:

Soil Classification	Particle Size
Clay	< 0.002mm
Silt	0.002 to 0.075mm
Sand	0.075 to 2.36mm
Gravel	2.36 to 63mm
Cobbles	63 to 200mm
Boulders	> 200mm

Non-cohesive soils are classified on the basis of relative density, generally from the results of Standard Penetration Test (SPT) as below:

Relative Density	SPT 'N' Value (blows/300mm)
Very loose (VL)	< 4
Loose (L)	4 to 10
Medium dense (MD)	10 to 30
Dense (D)	30 to 50
Very Dense (VD)	> 50

Cohesive soils are classified on the basis of strength (consistency) either by use of a hand penetrometer, vane shear, laboratory testing and/or tactile engineering examination. The strength terms are defined as follows.

Classification	Unconfined Compressive Strength (kPa)	Indicative Undrained Shear Strength (kPa)
Very Soft (VS)	≤ 25	≤ 12
Soft (S)	> 25 and ≤ 50	> 12 and ≤ 25
Firm (F)	> 50 and ≤ 100	> 25 and ≤ 50
Stiff (St)	> 100 and ≤ 200	> 50 and ≤ 100
Very Stiff (VSt)	> 200 and ≤ 400	> 100 and ≤ 200
Hard (Hd)	> 400	> 200
Friable (Fr)	Strength not attainable – soil crumbles	

Rock types are classified by their geological names, together with descriptive terms regarding weathering, strength, defects, etc. Where relevant, further information regarding rock classification is given in the text of the report. In the Sydney Basin, 'shale' is used to describe fissile mudstone, with a weakness parallel to bedding. Rocks with alternating inter-laminations of different grain size (eg. siltstone/claystone and siltstone/fine grained sandstone) are referred to as 'laminite'.

INVESTIGATION METHODS

The following is a brief summary of investigation methods currently adopted by the Company and some comments on their use and application. All methods except test pits, hand auger drilling and portable Dynamic Cone Penetrometers require the use of a mechanical rig which is commonly mounted on a truck chassis or track base.

Test Pits: These are normally excavated with a backhoe or a tracked excavator, allowing close examination of the insitu soils and 'weaker' bedrock if it is safe to descend into the pit. The depth of penetration is limited to about 3m for a backhoe and up to 6m for a large excavator. Limitations of test pits are the problems associated with disturbance and difficulty of reinstatement and the consequent effects on close-by structures. Care must be taken if construction is to be carried out near test pit locations to either properly recompact the backfill during construction or to design and construct the

structure so as not to be adversely affected by poorly compacted backfill at the test pit location.

Hand Auger Drilling: A borehole of 50mm to 100mm diameter is advanced by manually operated equipment. Refusal of the hand auger can occur on a variety of materials such as obstructions within any fill, tree roots, hard clay, gravel or ironstone, cobbles and boulders, and does not necessarily indicate rock level.

Continuous Spiral Flight Augers: The borehole is advanced using 75mm to 115mm diameter continuous spiral flight augers, which are withdrawn at intervals to allow sampling and insitu testing. This is a relatively economical means of drilling in clays and in sands above the water table. Samples are returned to the surface by the flights or may be collected after withdrawal of the auger flights, but they can be very disturbed and layers may become mixed. Information from the auger sampling (as distinct from specific sampling by SPTs or undisturbed samples) is of limited reliability due to mixing or softening of samples by groundwater, or uncertainties as to the original depth of the samples. Augering below the groundwater table is of even lesser reliability than augering above the water table.

Rock Augering: Use can be made of a Tungsten Carbide (TC) bit for auger drilling into rock to indicate rock quality and continuity by variation in drilling resistance and from examination of recovered rock cuttings. This method of investigation is quick and relatively inexpensive but provides only an indication of the likely rock strength and predicted values may be in error by a strength order. Where rock strengths may have a significant impact on construction feasibility or costs, then further investigation by means of cored boreholes may be warranted.

Wash Boring: The borehole is usually advanced by a rotary bit, with water being pumped down the drill rods and returned up the annulus, carrying the drill cuttings. Only major changes in stratification can be assessed from the cuttings, together with some information from “feel” and rate of penetration.

Mud Stabilised Drilling: Either Wash Boring or Continuous Core Drilling can use drilling mud as a circulating fluid to stabilise the borehole. The term ‘mud’ encompasses a range of products ranging from bentonite to polymers. The mud tends to mask the cuttings and reliable identification is only possible from intermittent intact sampling (eg. from SPT and U50 samples) or from rock coring, etc.

Continuous Core Drilling: A continuous core sample is obtained using a diamond tipped core barrel. Provided full core recovery is achieved (which is not always possible in very low strength rocks and granular soils), this technique provides a very reliable (but relatively expensive) method of investigation. In rocks, NMLC or HQ triple tube core barrels, which give a core of about 50mm and 61mm diameter, respectively, is usually used with water flush. The length of core recovered is compared to the length drilled and any length not recovered is shown as NO CORE. The location of NO CORE recovery is determined on site by the supervising engineer; where the location is uncertain, the loss is placed at the bottom of the drill run.

Standard Penetration Tests: Standard Penetration Tests (SPT) are used mainly in non-cohesive soils, but can also be used in cohesive soils, as a means of indicating density or strength and also of obtaining a relatively undisturbed sample. The test procedure is

described in Australian Standard 1289.6.3.1–2004 (R2016) ‘*Methods of Testing Soils for Engineering Purposes, Soil Strength and Consolidation Tests – Determination of the Penetration Resistance of a Soil – Standard Penetration Test (SPT)*’.

The test is carried out in a borehole by driving a 50mm diameter split sample tube with a tapered shoe, under the impact of a 63.5kg hammer with a free fall of 760mm. It is normal for the tube to be driven in three successive 150mm increments and the ‘N’ value is taken as the number of blows for the last 300mm. In dense sands, very hard clays or weak rock, the full 450mm penetration may not be practicable and the test is discontinued.

The test results are reported in the following form:

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

N = 13
4, 6, 7

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

N > 30
15, 30/40mm

The results of the test can be related empirically to the engineering properties of the soil.

A modification to the SPT is where the same driving system is used with a solid 60° tipped steel cone of the same diameter as the SPT hollow sampler. The solid cone can be continuously driven for some distance in soft clays or loose sands, or may be used where damage would otherwise occur to the SPT. The results of this Solid Cone Penetration Test (SCPT) are shown as ‘N_c’ on the borehole logs, together with the number of blows per 150mm penetration.

LOGS

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

The terms and symbols used in preparation of the logs are defined in the following pages.

Interpretation of the information shown on the logs, and its application to design and construction, should therefore take into account the spacing of boreholes or test pits, the method of drilling or excavation, the frequency of sampling and testing and the possibility of other than ‘straight line’ variations between the boreholes or test pits. Subsurface conditions between boreholes or test pits may vary significantly from conditions encountered at the borehole or test pit locations.

GROUNDWATER

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

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

More reliable measurements can be made by installing standpipes which are read after the groundwater level has stabilised at intervals ranging from several days to perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from perched water tables or surface water.

FILL

The presence of fill materials can often be determined only by the inclusion of foreign objects (eg. bricks, steel, etc) or by distinctly unusual colour, texture or fabric. Identification of the extent of fill materials will also depend on investigation methods and frequency. Where natural soils similar to those at the site are used for fill, it may be difficult with limited testing and sampling to reliably assess the extent of the fill.

The presence of fill materials is usually regarded with caution as the possible variation in density and material type is much greater than with natural soil deposits. Consequently, there is an increased risk of adverse environmental characteristics or behaviour. If the volume and nature of fill is of importance to a project, then frequent test pit excavations are preferable to boreholes.

LABORATORY TESTING

Laboratory testing has not been undertaken to confirm the soil classification and rock strengths indicated on the environmental logs unless noted in the report.

SYMBOL LEGENDS

SOIL



FILL



TOPSOIL



CLAY (CL, CI, CH)



SILT (ML, MH)



SAND (SP, SW)



GRAVEL (GP, GW)



SANDY CLAY (CL, CI, CH)



SILTY CLAY (CL, CI, CH)



CLAYEY SAND (SC)



SILTY SAND (SM)



GRAVELLY CLAY (CL, CI, CH)



CLAYEY GRAVEL (GC)



SANDY SILT (ML, MH)



PEAT AND HIGHLY ORGANIC SOILS (Pt)

ROCK



CONGLOMERATE



SANDSTONE



SHALE/MUDSTONE



SILTSTONE



CLAYSTONE



COAL



LAMINITE



LIMESTONE



PHYLLITE, SCHIST



TUFF



GRANITE, GABBRO



DOLERITE, DIORITE



BASALT, ANDESITE



QUARTZITE

OTHER MATERIALS



BRICKS OR PAVERS



CONCRETE



ASPHALTIC CONCRETE

CLASSIFICATION OF COARSE AND FINE GRAINED SOILS

Major Divisions		Group Symbol	Typical Names	Field Classification of Sand and Gravel	Laboratory Classification	
Coarse grained soil (more than 60% of soil excluding oversize fraction is greater than 0.075mm)	GRAVEL (more than half of coarse fraction is larger than 2.36mm)	GW	Gravel and gravel-sand mixtures, little or no fines	Wide range in grain size and substantial amounts of all intermediate sizes, not enough fines to bind coarse grains, no dry strength	≤ 5% fines	$C_u > 4$ $1 < C_c < 3$
		GP	Gravel and gravel-sand mixtures, little or no fines, uniform gravels	Predominantly one size or range of sizes with some intermediate sizes missing, not enough fines to bind coarse grains, no dry strength	≤ 5% fines	Fails to comply with above
		GM	Gravel-silt mixtures and gravel-sand-silt mixtures	'Dirty' materials with excess of non-plastic fines, zero to medium dry strength	≥ 12% fines, fines are silty	Fines behave as silt
		GC	Gravel-clay mixtures and gravel-sand-clay mixtures	'Dirty' materials with excess of plastic fines, medium to high dry strength	≥ 12% fines, fines are clayey	Fines behave as clay
	SAND (more than half of coarse fraction is smaller than 2.36mm)	SW	Sand and gravel-sand mixtures, little or no fines	Wide range in grain size and substantial amounts of all intermediate sizes, not enough fines to bind coarse grains, no dry strength	≤ 5% fines	$C_u > 6$ $1 < C_c < 3$
		SP	Sand and gravel-sand mixtures, little or no fines	Predominantly one size or range of sizes with some intermediate sizes missing, not enough fines to bind coarse grains, no dry strength	≤ 5% fines	Fails to comply with above
		SM	Sand-silt mixtures	'Dirty' materials with excess of non-plastic fines, zero to medium dry strength	≥ 12% fines, fines are silty	N/A
		SC	Sand-clay mixtures	'Dirty' materials with excess of plastic fines, medium to high dry strength	≥ 12% fines, fines are clayey	

Laboratory Classification Criteria

A well graded coarse grained soil is one for which the coefficient of uniformity $C_u > 4$ and the coefficient of curvature $1 < C_c < 3$. Otherwise, the soil is poorly graded. These coefficients are given by:

$$C_u = \frac{D_{60}}{D_{10}} \quad \text{and} \quad C_c = \frac{(D_{30})^2}{D_{10} D_{60}}$$

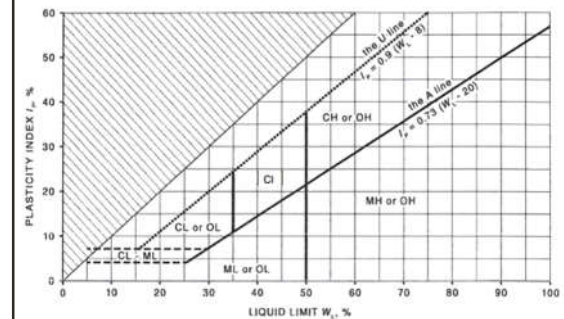
Where D_{10} , D_{30} and D_{60} are those grain sizes for which 10%, 30% and 60% of the soil grains, respectively, are smaller.

NOTES:

- For a coarse grained soil with a fines content between 5% and 12%, the soil is given a dual classification comprising the two group symbols separated by a dash; for example, for a poorly graded gravel with between 5% and 12% silt fines, the classification is GP-GM.
- Where the grading is determined from laboratory tests, it is defined by coefficients of curvature (C_c) and uniformity (C_u) derived from the particle size distribution curve.
- Clay soils with liquid limits $> 35\%$ and $\leq 50\%$ may be classified as being of medium plasticity.
- The U line on the Modified Casagrande Chart is an approximate upper bound for most natural soils.

Major Divisions		Group Symbol	Typical Names	Field Classification of Silt and Clay			Laboratory Classification
				Dry Strength	Dilatancy	Toughness	% < 0.075mm
fine grained soils (more than 35% of soil excluding oversize fraction is less than 0.075mm)	SILT and CLAY (low to medium plasticity)	ML	Inorganic silt and very fine sand, rock flour, silty or clayey fine sand or silt with low plasticity	None to low	Slow to rapid	Low	Below A line
		CL, CI	Inorganic clay of low to medium plasticity, gravelly clay, sandy clay	Medium to high	None to slow	Medium	Above A line
		OL	Organic silt	Low to medium	Slow	Low	Below A line
	SILT and CLAY (high plasticity)	MH	Inorganic silt	Low to medium	None to slow	Low to medium	Below A line
		CH	Inorganic clay of high plasticity	High to very high	None	High	Above A line
		OH	Organic clay of medium to high plasticity, organic silt	Medium to high	None to very slow	Low to medium	Below A line
	Highly organic soil	Pt	Peat, highly organic soil	–	–	–	–

Modified Casagrande Chart for Classifying Silts and Clays according to their Behaviour





LOG SYMBOLS

Log Column	Symbol	Definition
Groundwater Record		Standing water level. Time delay following completion of drilling/excavation may be shown.
		Extent of borehole/test pit collapse shortly after drilling/excavation.
		Groundwater seepage into borehole or test pit noted during drilling or excavation.
Samples	ES	Sample taken over depth indicated, for environmental analysis.
	U50	Undisturbed 50mm diameter tube sample taken over depth indicated.
	DB	Bulk disturbed sample taken over depth indicated.
	DS	Small disturbed bag sample taken over depth indicated.
	ASB	Soil sample taken over depth indicated, for asbestos analysis.
	ASS	Soil sample taken over depth indicated, for acid sulfate soil analysis.
	SAL	Soil sample taken over depth indicated, for salinity analysis.
Field Tests	N = 17 4, 7, 10	Standard Penetration Test (SPT) performed between depths indicated by lines. Individual figures show blows per 150mm penetration. 'Refusal' refers to apparent hammer refusal within the corresponding 150mm depth increment.
	N _c = 5 7 3R	Solid Cone Penetration Test (SCPT) performed between depths indicated by lines. Individual figures show blows per 150mm penetration for 60° solid cone driven by SPT hammer. 'R' refers to apparent hammer refusal within the corresponding 150mm depth increment.
	VNS = 25 PID = 100	Vane shear reading in kPa of undrained shear strength. Photoionisation detector reading in ppm (soil sample headspace test).
Moisture Condition (Fine Grained Soils)	w > PL	Moisture content estimated to be greater than plastic limit.
	w ≈ PL	Moisture content estimated to be approximately equal to plastic limit.
	w < PL	Moisture content estimated to be less than plastic limit.
	w ≈ LL	Moisture content estimated to be near liquid limit.
	w > LL	Moisture content estimated to be wet of liquid limit.
(Coarse Grained Soils)	D	DRY – runs freely through fingers.
	M	MOIST – does not run freely but no free water visible on soil surface.
	W	WET – free water visible on soil surface.
Strength (Consistency) Cohesive Soils	VS	VERY SOFT – unconfined compressive strength ≤ 25kPa.
	S	SOFT – unconfined compressive strength > 25kPa and ≤ 50kPa.
	F	FIRM – unconfined compressive strength > 50kPa and ≤ 100kPa.
	St	STIFF – unconfined compressive strength > 100kPa and ≤ 200kPa.
	VSt	VERY STIFF – unconfined compressive strength > 200kPa and ≤ 400kPa.
	Hd	HARD – unconfined compressive strength > 400kPa.
	Fr	FRIABLE – strength not attainable, soil crumbles.
	()	Bracketed symbol indicates estimated consistency based on tactile examination or other assessment.
Density Index/ Relative Density (Cohesionless Soils)	VL	VERY LOOSE
	L	LOOSE
	MD	MEDIUM DENSE
	D	DENSE
	VD	VERY DENSE
	()	Bracketed symbol indicates estimated density based on ease of drilling or other assessment.
Hand Penetrometer Readings	300	Measures reading in kPa of unconfined compressive strength. Numbers indicate individual test results on representative undisturbed material unless noted otherwise.
	250	



Log Column	Symbol	Definition
Remarks	'V' bit 'TC' bit T_{60} Soil Origin	Hardened steel 'V' shaped bit. Twin pronged tungsten carbide bit. Penetration of auger string in mm under static load of rig applied by drill head hydraulics without rotation of augers. The geological origin of the soil can generally be described as: RESIDUAL – soil formed directly from insitu weathering of the underlying rock. No visible structure or fabric of the parent rock. EXTREMELY WEATHERED – soil formed directly from insitu weathering of the underlying rock. Material is of soil strength but retains the structure and/or fabric of the parent rock. ALLUVIAL – soil deposited by creeks and rivers. ESTUARINE – soil deposited in coastal estuaries, including sediments caused by inflowing creeks and rivers, and tidal currents. MARINE – soil deposited in a marine environment. AEOLIAN – soil carried and deposited by wind. COLLUVIAL – soil and rock debris transported downslope by gravity, with or without the assistance of flowing water. Colluvium is usually a thick deposit formed from a landslide. The description 'slopewash' is used for thinner surficial deposits. LITTORAL – beach deposited soil.

Classification of Material Weathering

Term		Abbreviation		Definition
Residual Soil		RS		Material is weathered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are no longer visible, but the soil has not been significantly transported.
Extremely Weathered		XW		Material is weathered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are still visible.
Highly Weathered	Distinctly Weathered (Note 1)	HW	DW	The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognisable. Rock strength is significantly changed by weathering. Some primary minerals have weathered to clay minerals. Porosity may be increased by leaching, or may be decreased due to deposition of weathering products in pores.
Moderately Weathered		MW		The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognisable, but shows little or no change of strength from fresh rock.
Slightly Weathered		SW		Rock is partially discoloured with staining or bleaching along joints but shows little or no change of strength from fresh rock.
Fresh		FR		Rock shows no sign of decomposition of individual minerals or colour changes.

NOTE 1: The term 'Distinctly Weathered' is used where it is not practicable to distinguish between 'Highly Weathered' and 'Moderately Weathered' rock. 'Distinctly Weathered' is defined as follows: 'Rock strength usually changed by weathering. The rock may be highly discoloured, usually by iron staining. Porosity may be increased by leaching, or may be decreased due to deposition of weathering products in pores'. There is some change in rock strength.

Rock Material Strength Classification

Term	Abbreviation	Uniaxial Compressive Strength (MPa)	Guide to Strength	
			Point Load Strength Index $Is_{(50)}$ (MPa)	Field Assessment
Very Low Strength	VL	0.6 to 2	0.03 to 0.1	Material crumbles under firm blows with sharp end of pick; can be peeled with knife; too hard to cut a triaxial sample by hand. Pieces up to 30mm thick can be broken by finger pressure.
Low Strength	L	2 to 6	0.1 to 0.3	Easily scored with a knife; indentations 1mm to 3mm show in the specimen with firm blows of the pick point; has dull sound under hammer. A piece of core 150mm long by 50mm diameter may be broken by hand. Sharp edges of core may be friable and break during handling.
Medium Strength	M	6 to 20	0.3 to 1	Scored with a knife; a piece of core 150mm long by 50mm diameter can be broken by hand with difficulty.
High Strength	H	20 to 60	1 to 3	A piece of core 150mm long by 50mm diameter cannot be broken by hand but can be broken by a pick with a single firm blow; rock rings under hammer.
Very High Strength	VH	60 to 200	3 to 10	Hand specimen breaks with pick after more than one blow; rock rings under hammer.
Extremely High Strength	EH	> 200	> 10	Specimen requires many blows with geological pick to break through intact material; rock rings under hammer.

F3 – Laboratory Report

CERTIFICATE OF ANALYSIS 254663

Client Details

Client	Environmental Investigation Services
Attention	Brendan Page
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	<u>E30104P, Penshurst</u>
Number of Samples	1 Material
Date samples received	30/10/2020
Date completed instructions received	30/10/2020

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.
 Samples were analysed as received from the client. Results relate specifically to the samples as received.
 Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

Date results requested by	02/11/2020
Date of Issue	02/11/2020
NATA Accreditation Number 2901. This document shall not be reproduced except in full.	
Accredited for compliance with ISO/IEC 17025 - Testing. Tests not covered by NATA are denoted with *	

Asbestos Approved By

Analysed by Asbestos Approved Identifier: Lucy Zhu
 Authorised by Asbestos Approved Signatory: Lucy Zhu

Results Approved By

Lucy Zhu, Asbestos Supervisor

Authorised By



Nancy Zhang, Laboratory Manager

Asbestos ID - materials		
Our Reference		254663-1
Your Reference	UNITS	AQAV14 Spoil F1
Depth		0.3-0.4
Date Sampled		29/10/2020
Type of sample		Material
Date analysed	-	02/11/2020
Mass / Dimension of Sample	-	35x30x3mm
Sample Description	-	Beige fibrous sheet
Asbestos ID in materials	-	Chrysotile asbestos detected Crocidolite asbestos detected
Trace Analysis	-	[NT]

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.

Result Definitions	
NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

SAMPLE RECEIPT ADVICE

Client Details

Client	Environmental Investigation Services
Attention	Brendan Page

Sample Login Details

Your reference	E30104P, Penshurst
Envirolab Reference	254663
Date Sample Received	30/10/2020
Date Instructions Received	30/10/2020
Date Results Expected to be Reported	02/11/2020

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	1 Material
Turnaround Time Requested	1 day
Temperature on Receipt (°C)	21.2
Cooling Method	None
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	Phone: 02 9910 6200
Fax: 02 9910 6201	Fax: 02 9910 6201
Email: ahie@envirolab.com.au	Email: jhurst@envirolab.com.au

Analysis Underway, details on the following page:

**Envirolab Services Pty Ltd**

ABN 37 112 535 645

12 Ashley St Chatswood NSW 2067

ph 02 9910 6200 fax 02 9910 6201

customerservice@envirolab.com.au

www.envirolab.com.au

Sample ID	
AQAV14 Spoil F1-0.3-0.4	Asbestos ID - materials ✓

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.

Requests for longer term sample storage must be received in writing.

Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.

TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

[illegible]

F4 – Scale Check and FCF Weight Documentation

PURPOSE: Fragment weight
 LOCATION: Penshurst Public School
 GIVEN TO: -
 OF: -

JKE JOB No: E30104P
 DATE: 29/10/20
 PAGE: 1 OF 1
 INSP BY: MMP

INSPECTION REPORT No

Scale weight check

- 2g = 198g
 - 5g = 5g
 - 10g = 10g

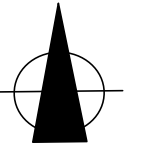
A Suspect ACM fragment }
 AQAUI4 SPILL FI } = 5.02g
 0.2-04

Given by: - Received by: -
 Time Arrive: - Time Depart: -



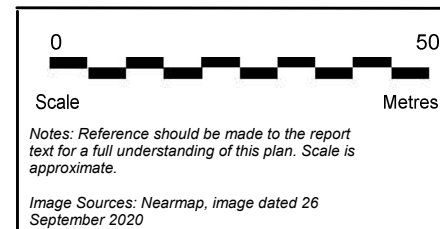
Appendix G: TPZ and Remaining Fill

G1 – Verification Location Plan



LEGEND:

- APPROXIMATE SITE BOUNDARY
- APPROXIMATE 'BUILDING AREA'
- APPROXIMATE 'TPZ'
- ▲ C1 VERIFICATION LOCATION FOR MINIMUM 100mm COVER

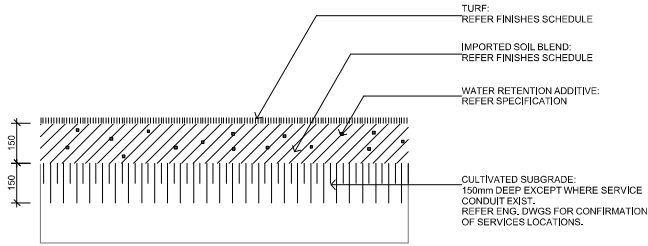


Title: LANDSCAPE COVER PLAN	
Location: PENSHURST PUBLIC SCHOOL, 510 FOREST ROAD, PENSHURST, NSW	
Report No: E30104Prpt-VAL	Figure No: G1
JK ENVIRONMENTS	

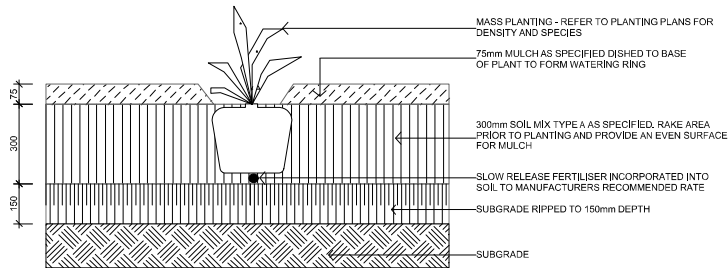


G2 – Landscape Drawings

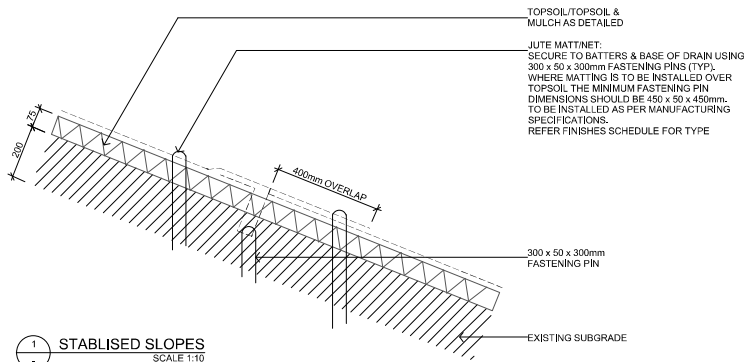
PLOT DATE 10/5/19



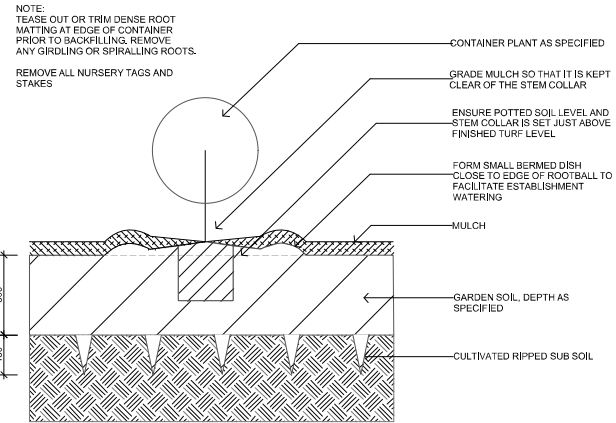
1 TURF DETAIL
SCALE 1:10



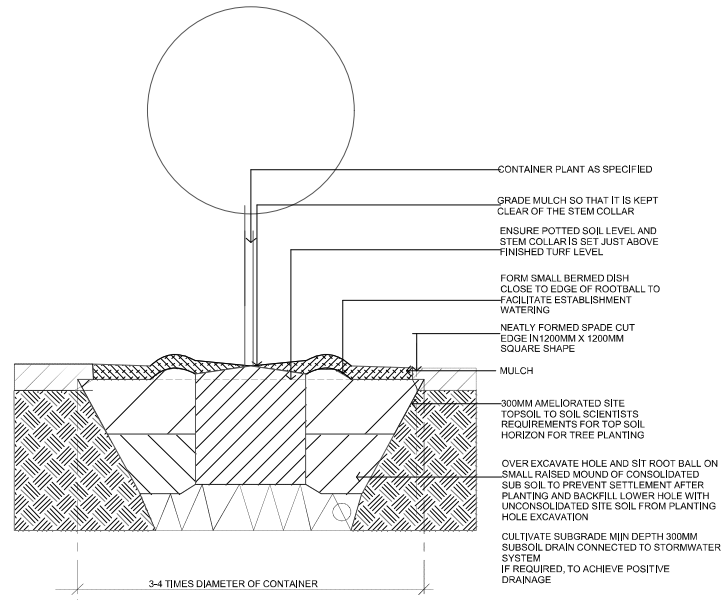
1 MASS PLANTING BEDS
SCALE 1:10



1 STABILISED SLOPES
SCALE 1:10



1 D01 TREE PLANTING IN GARDEN BED - 35 LITRE SIZE OR LESS
SCALE 1:10



00 TREE PLANTING IN TURF/PAVING - TYPICALLY 35 LITRE TO 400 LITRE
SCALE 1:10

AMENDMENTS	
NO	DATE
1	10/05/2019
2	10/05/2019
3	10/05/2019
4	10/05/2019
5	10/05/2019
6	10/05/2019
7	10/05/2019
8	10/05/2019
9	10/05/2019
10	10/05/2019



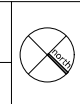
PROJECT: "JUTE & NET"
MOULACOTTIE BUSINESS
T: 02 9201 5500
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BGA
GROUP 5/6
T: 02 9201 5500
STATUTORY PLANNER
02 9201 5500
T: 02 9201 5500

CONTRACT NUMBER
SINSW-18-1257



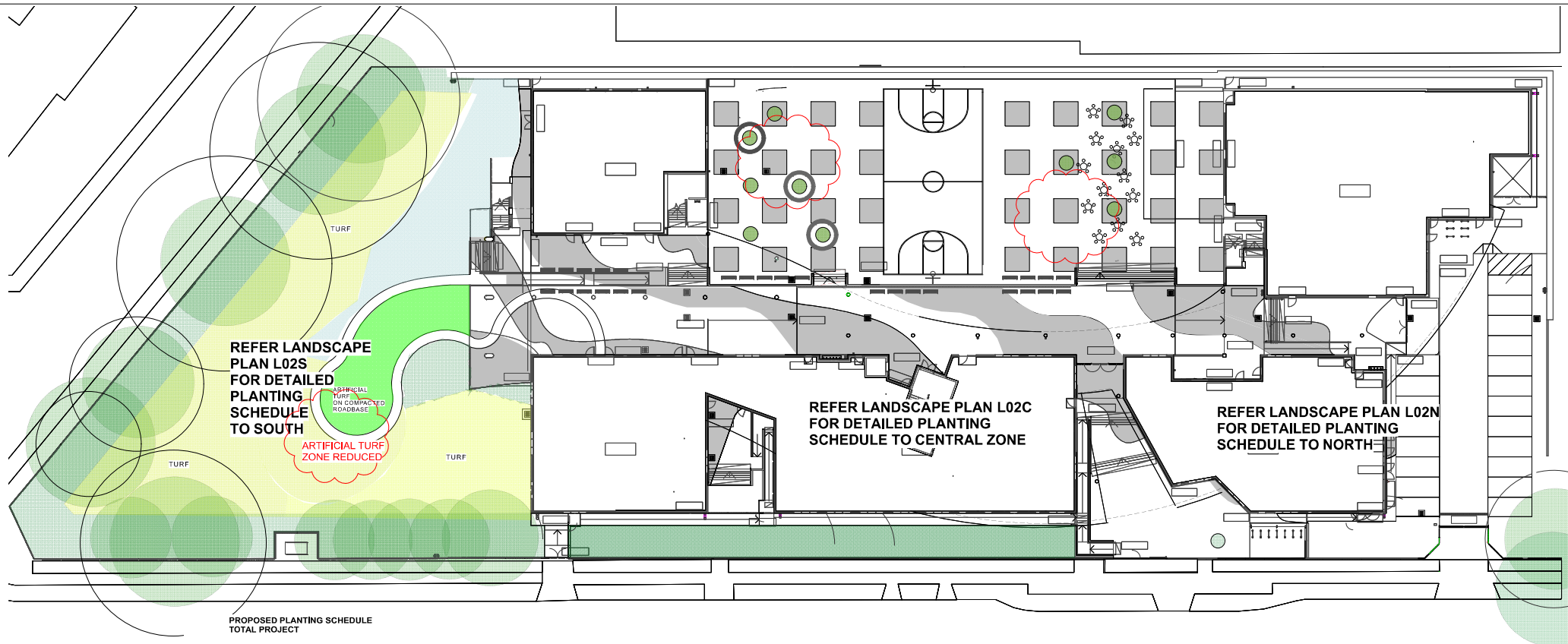
LORNA HARRISON
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E lorna@landarchitects.com

PENSHURST PUBLIC SCHOOL
18 Arcadia Street, Penshurst
LANDSCAPE DETAILS



NO	DATE	DESCRIPTION	SCALE	1:10 @ A1
1	10 MAY 2019			
2				
3				
4				
5				
6				
7				
8				
9				
10				

ISSUED FOR CONSTRUCTION



PROPOSED PLANTING SCHEDULE TOTAL PROJECT

BOTANICAL NAME	COMMON NAME	MATURE H x W	INSTALL POT SIZE	NO OFF
ARCADIA STREET DECIDUOUS TREES				
<i>Pyrus calleryana</i>	Pear Tree	11 x 3-6	400 litre	11
'Cleveland Street'				
ARCADIA STREET EVERGREEN TREE				
<i>Lophoslemon confertus</i>	Brush Box	8 x 8	400 litre	1
EVERGREEN TREES TO NORTH WEST BOUNDARY				
<i>Lophoslemon confertus</i>	Brush Box	8 x 8	400 litre	6
<i>Elaeocarpus reticulatus</i>	Bluenerry Ash	5 x 4	200 litre	6
MEDIUM SCALE FLOWERING TREE TO CENTRAL COURTYARD				
<i>Lagerstroemia 'Natchez'</i>	Crepe Myrtle	7 x 5	200 litre	10
PAPERBARK FOREST				
<i>Melaleuca decora</i>	White Cloud Tree	8 x 5	100 litre	10
<i>Melaleuca linariifolia</i>	Snow in Summer	8 x 5	100 litre	10
<i>Melaleuca quinquenervia</i>	Prickly Paperbark	6 x 3	100 litre	25
<i>Melaleuca styphelioides</i>	Broad Leaved Paperbark	7 x 5	100 litre	10
EVERGREEN NATIVE TREES				
<i>Backhousia myrtifolia</i>	Cinnamon Myrtle	5 x 2	100 litre	2
<i>Cupaniopsis ancardioides</i>	Tuckeroo	8 x 6	100 litre	5
<i>Tristania luscious</i>	Water Gum	7 x 7	100 litre	2
MULCHED MASS PLANTING - SHRUBS				
<i>Callistemon 'Scarlet Flame'</i>	Bottlebrush	1 x 1	200mm	130
<i>Grevillea 'Crimson Villa'</i>	Grevillea	1 x 1	200mm	130
<i>Westringia 'Grey Box'</i>	Coastal Rosemary spp	1 x 1	200mm	196
GRASSES + CLUMPING PLANTS				
<i>Doryanthes excelsa</i>	Gymea Lily	1 x 1	25 litre	25
<i>Liriope 'Amethyst'</i>	Liriope 'Amethyst'	40 x 40	150mm	90
<i>Liriope 'Just Right'</i>	Liriope 'Just Right'	50 x 50	150mm	680
<i>Lomandra longifolia</i>	Spiny Mat rush	1 x 1	150mm	65
<i>Lomandra 'Shara'</i>	Lomandra 'Shara'	600 x 600	150mm	1686
<i>Lomandra 'Tanika'</i>	Tanika	400 x 400	150mm	243
GROUND COVERS				
<i>Acacia cognate 'Limelight'</i>	Wattle	400 x 600	150mm	100
CLIMBERS				
<i>Tracea lopspermum jasminoides</i>	Star Jasmine	-	200mm	48
<i>Pandorea jasminoides</i>	Bower Vine	-	200mm	48

LEGEND

- EXISTING TREES TO BE RETAINED
- WETLAND GRASSES PLANTED INTO BANKS AND DRAINAGE SWALE INTO EROSION CONTROL FABRIC
- NATURAL TURF ON GRADE
- STREET FURNITURE AUSTRALIA CURVED BENCH SEATING
- STREET FURNITURE AUSTRALIA METAL CAFE TABLES AND STOOLS FOR OUTDOOR EATING/GATHERING
- 3-6 YEARS HEARING IMPAIRED COURTYARD: ARTIFICIAL TURF

AMENDMENTS	DATE	DESCRIPTION
1	15/09/20	ISSUED FOR CONSTRUCTION
2	15/09/20	ISSUED FOR CONSTRUCTION
3	15/09/20	ISSUED FOR CONSTRUCTION
4	15/09/20	ISSUED FOR CONSTRUCTION
5	15/09/20	ISSUED FOR CONSTRUCTION
6	15/09/20	ISSUED FOR CONSTRUCTION



Education

STUDIO: DAVE & WENDY WOODACOTT & PARTNERS T 02 9231 1550 W www.woodacott.com.au DESIGN REVIEW BY: CONNOR & SUE T 02 9231 1550	PERMANENT RESIDENTIAL ARCHITECTS T 02 9231 1550 W www.permanentresidential.com.au DESIGN REVIEW BY: CONNOR & SUE T 02 9231 1550
--	---

CONTRACT NUMBER
SINSW-18-1257



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PENSHURST PUBLIC SCHOOL

18 Arcadia Street, Penshurst

LANDSCAPE SITE PLAN
GROUND LEVEL



SCALE 1:250 @ A1			
10 MAY 2019			
555	LAN	CD	02
6			



PROPOSED PLANTING SCHEDULE
THIS SHEET

BOTANICAL NAME	COMMON NAME	MATURE H x W	INSTALL POT SIZE	NO OFF
PAPERBARK FOREST'				
Metaleuca decora	White Cloud Tree	8 x 5	100 litre	10
Metaleuca linariifolia	Snow in Summer	8 x 5	100 litre	10
Metaleuca quinquerivaria	Prickly Paperbark	6 x 3	100 litre	25
Metaleuca stypheoloides	Broad Leaved Paperbark	7 x 5	100 litre	10
EVERGREEN NATIVE TREES				
Backhousia myrtifolia	Cinnamon Myrtle	5 x 2	100 litre	2
Cupaniopsis anacardioides	Tuckeroo	8 x 6	100 litre	5
Tristaniopsis 'Luscious'	Water Gum	7 x 7	100 litre	2
MULCHED MASS PLANTING - SHRUBS				
Callistemon spp	Bottlebrush	1 x 1	200mm	150
Grevillea spp	Grevillea	1 x 1	200mm	150
GRASSES + CLUMPING PLANTS				
Liriope 'Amethyst'	Liriope 'Amethyst'	400 x 400	150mm	90
Doryanthes excelsa	Gymea Lily	1 x 1	25 litre	25
Liriope 'Just Right'	Liriope	200 x 300	150mm	100
Lomandra 'Tanika'	Lomandra 'Tanika'	600 x 600	150mm	100
Lomandra 'Shara'	Lomandra 'Shara'	600 x 600	150mm	1686
GROUND COVERS				
Acacia cognate 'Limelight'	Wattle	400 x 600	150mm	150

AMENDMENTS	
NO	DESCRIPTION
1	15/09/2019 LUSCIOUS FOR CONSTRUCTION
2	11/10/2019 LUSCIOUS FOR CONSTRUCTION
3	25/09/20 LUSCIOUS FOR CONSTRUCTION
4	15/09/20 LUSCIOUS FOR CONSTRUCTION
5	15/09/20 LUSCIOUS FOR CONSTRUCTION
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100	15/09/20 LUSCIOUS FOR CONSTRUCTION



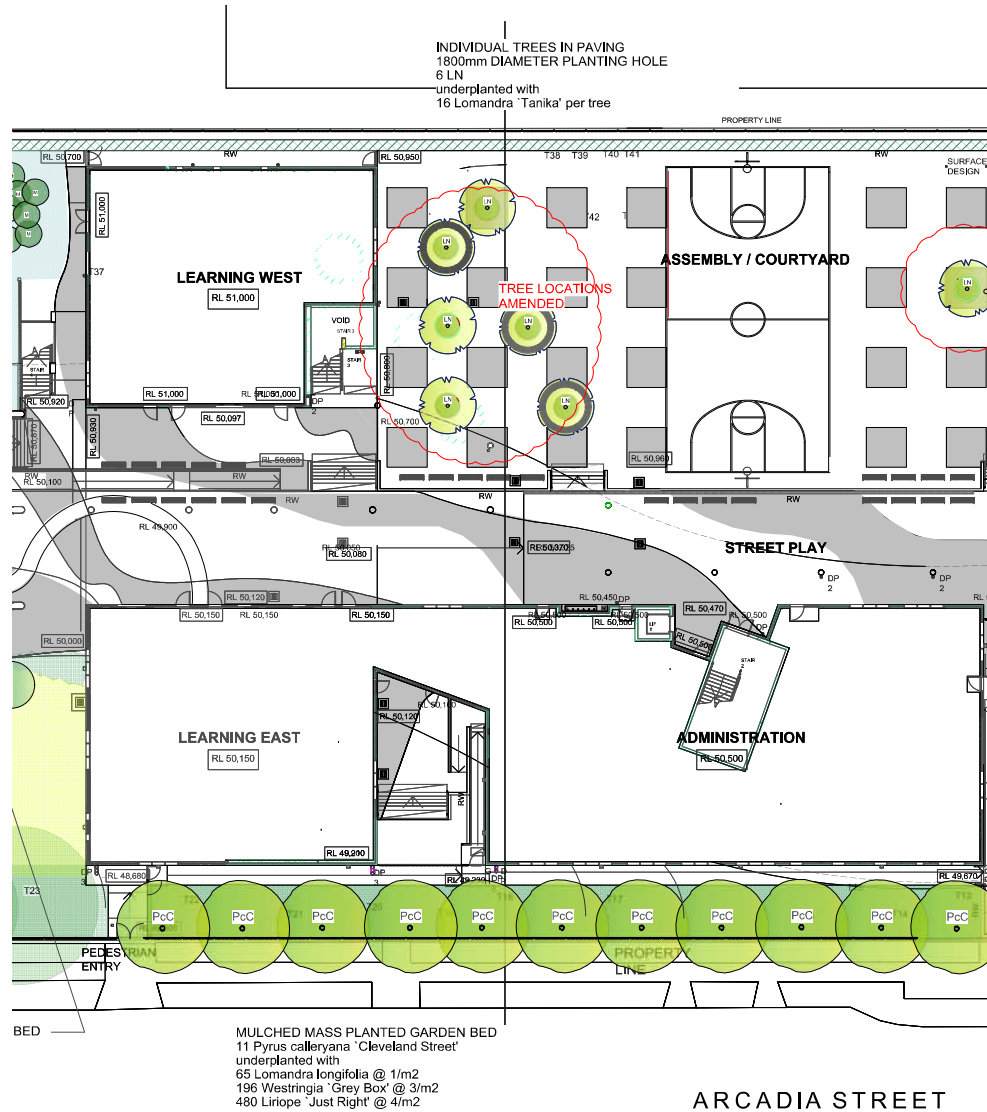
STUDIO: 15/09/2019 WOODCUTTING: 15/09/2019 T: 02 9555 5100 WWW: www.penshurst.nsw.gov.au JHA CONSULTING T: 02 9555 5100	STUDIO: 15/09/2019 WOODCUTTING: 15/09/2019 T: 02 9555 5100 WWW: www.penshurst.nsw.gov.au JHA CONSULTING T: 02 9555 5100
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CONTRACT NUMBER SINSW-18-1257

 LORNA HARRISON LANDSCAPE ARCHITECTS 68 Beattie Street BALMAIN NSW 2041 M 0403350023 E lorna@landarchitects.com

PENSHURST PUBLIC SCHOOL 18 Arcadia Street, Penshurst LANDSCAPE SITE PLAN GROUND LEVEL SOUTH

 SCALE 1:200 @ A1 10 MAY 2019 555 LAN CD 02_S 4
--



PROPOSED PLANTING SCHEDULE THIS SHEET

BOTANICAL NAME	COMMON NAME	MATURE H x W	INSTALL POT SIZE	NO OFF
TREES				
<i>Lagerstroemia</i> 'Natchez'	Crepe Myrtle	7 x 4	200 litre	6
<i>Pyrus calleryana</i> 'Cleveland Street'	Ornamental Pear	8 x 8	400 litre	11
SHRUBS				
<i>Westringia</i> 'Grey Box'	<i>Westringia</i> 'Grey Box'	600 x 600	200mm	196
GRASSES				
<i>Liriope</i> 'Just Right'	<i>Liriope</i> 'Just Right'	400 x 400	150mm	480
<i>Lomandra longifolia</i>	Mat Rush	1 x 1	150mm	65
<i>Lomandra</i> 'Tanika'	<i>Lomandra</i> 'Tanika'	600 x 600	150mm	96

AMENDMENTS	REVISION	DESCRIPTION
1	15/09/20	ISSUED FOR CONSTRUCTION
2	15/09/20	ISSUED FOR CONSTRUCTION
3	15/09/20	ISSUED FOR CONSTRUCTION
4	15/09/20	ISSUED FOR CONSTRUCTION
5	15/09/20	ISSUED FOR CONSTRUCTION
6	15/09/20	ISSUED FOR CONSTRUCTION
7	15/09/20	ISSUED FOR CONSTRUCTION
8	15/09/20	ISSUED FOR CONSTRUCTION



GLASS FIBRE REINFORCED
CONCRETE (GRC) PLANTERS X 3

CODE: Z5M155050 (REFER ARCH SPECIFICATION)
1500 X 500 X 500
EACH PLANTER PLANTED WITH RANDOM MIX OF:-
3 x Solanum jasminoides
3 x Trachelospermum jasminoides

CLIMBER SUPPORT TO WALL TO 4 METRE HEIGHT FIXED VERTICALLY AT 300 CENTRES:-
ALL FITTING MARINE GRADE 316 STAINLESS STEEL-
WIRE ROPE 2,5MM WITH SWAGED FORK TERMINAL AT ONE END, AND SS BOTTLE SCREW AT THE OTHER.
THREADED THROUGH 5MM STAINLESS STEEL SADDLES FIXED TO WALL.

BOTANICAL NAME	COMMON NAME	INSTALL POT SIZE	NO OFF
CLIMBERS			
<i>Pandorea jasminoides</i> *	Bower Vine*	200mm	14
<i>Trachelospermum jasminoides</i>	Star Jasmine	200mm	14



STRUC. CIVIL & HYD WOOLACOTT'S ENGINEERS T: 02-62031500
MECH. ELEC. (F. COMM) & SE JHA CONSULTING T: 02-9437 1000
BCA GROUP CLA T: 02-6355 3160
STATUTORY PLANNER DON FOX PLANNING P/L T: 02-9473 6914

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T: +61 2 9291 0000
WEB: www.pp-a.com.au
Nominated Architect
Vince Pedavoli | NSW reg No. 5045



PENSHURST PUBLIC SCHOOL

18 Arcadia Street, Penshurst

LANDSCAPE PLAN
LEVEL 1

0m 5m 10m 15m

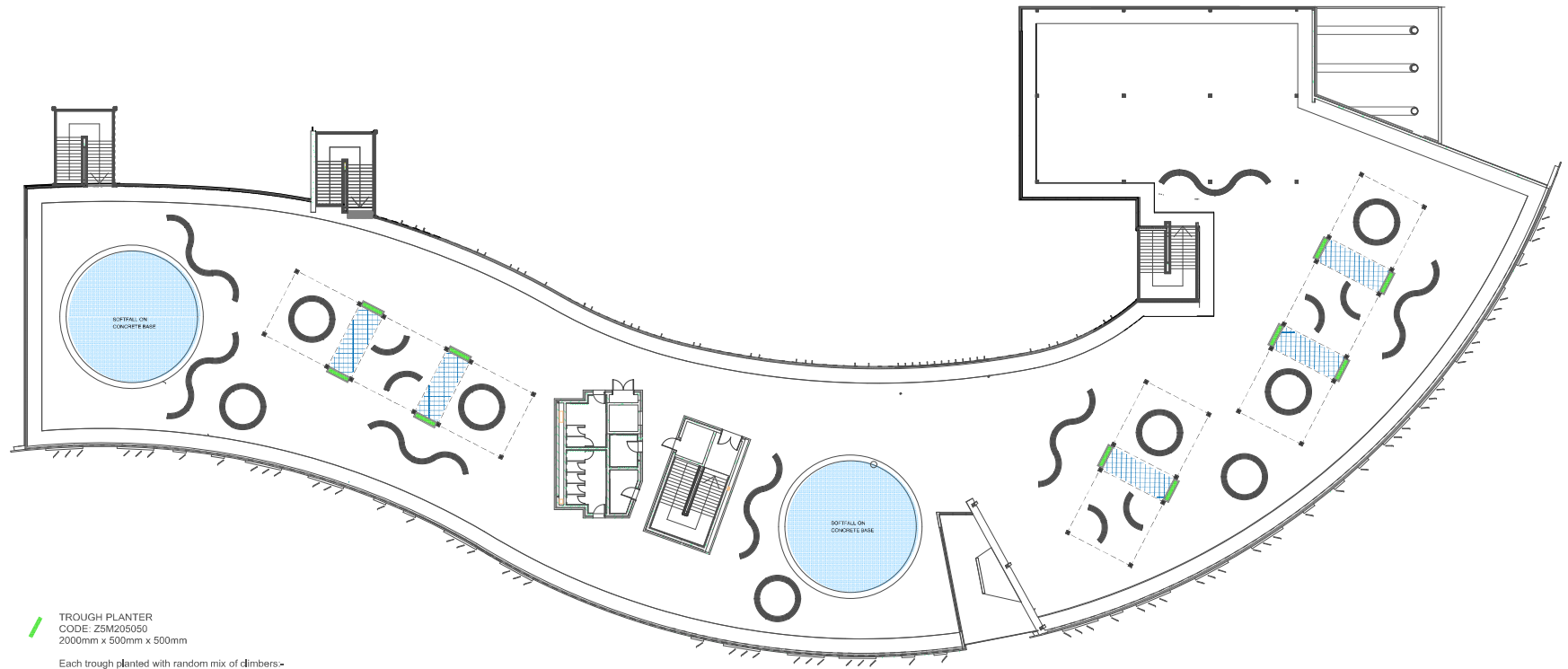
SCALE 1:200 @ A

10 MAY 201

PROJECT	DISCIPLINE	PAGE	DESIGNED BY
555	LAN	CD	03

SECTION

4



ROOFTOP PLANTING SCHEDULE

BOTANICAL NAME	COMMON NAME	INSTALL POT SIZE	NO OFF
CLIMBERS			
Pandorea jasminoides	Bower Vine	200mm	30
Trachelospermum jasminoides	Star Jasmine	200mm	30

AMENDMENTS	DATE	DESCRIPTION
1	11/05/2019	ISSUED FOR CONSTRUCTION
2	11/05/2019	ISSUED FOR CONSTRUCTION
3	11/05/2019	ISSUED FOR CONSTRUCTION
4	11/05/2019	ISSUED FOR CONSTRUCTION
5	11/05/2019	ISSUED FOR CONSTRUCTION
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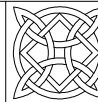


Education

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CONTRACT NUMBER
SINSW-18-1257



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PENSHURST PUBLIC SCHOOL
18 Arcadia Street, Penshurst

LANDSCAPE PLAN
LEVEL 3

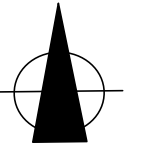


DATE	BY	CHKD	APPD	SCALE
10 MAY 2019				SCALE 1:200 @ A1
555	LAN	CD	04	4



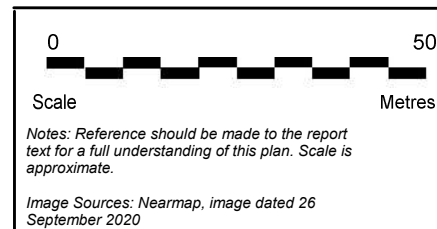
Appendix H: Unexpected Find

H1 – Figure H1 – Unexpected Find



LEGEND:

- APPROXIMATE SITE BOUNDARY
- APPROXIMATE 'BUILDING AREA'
- APPROXIMATE 'TPZ'



Title: UNEXPECTED FIND	
Location: PENSHURST PUBLIC SCHOOL, 510 FOREST ROAD, PENSHURST, NSW	
Report No: E30104Prpt-VAL	Figure No: H1
JK ENVIRONMENTS	



H2 – Asbestos Clearance Certificate and Waste Classification – Unexpected Find



PO Box 457
Turramurra NSW 2074

ABN: 69 041 751 671

PH: 0437 251 358
Email: philclifton@pclifton.com

31 May 2019

Mr Gary Tang
Chalouhi
2/22 Centenary Avenue
Moorebank NSW 2170

**RE: ASBESTOS CONTAMINATED SOIL REMOVAL CLEARANCE CERTIFICATION
BLOCK A, PENSHURST PUBLIC SCHOOL, FOREST ROAD, PENSHURST NSW**

Dear Sir,

We refer to the visual inspection undertaken on Thursday 30 May 2019 following the excavation and loading out of stockpiled soil containing asbestos cement sheet debris in the Block A area within the Penshurst Public School site in Forest Road, Penshurst NSW, corner Arcadia Street.

The asbestos removal work at the site was carried out by Remedial Civil Solutions, a SafeWork NSW Class A friable licenced asbestos removal contractor.

The visual clearance inspection, which was of a visual nature only, was carried out in accordance with the Section 3.10 of the How to Safely Remove Asbestos Code of Practice issued by Safe Work Australia and Clause 473 of the NSW Work Health and Safety Regulation 2017. This clearance certificate has been compiled in accordance with the requirements of Clause 474 of the NSW Work Health and Safety Regulation 2017.

The visual inspection undertaken at the completion of the removal of the asbestos contaminated soil stockpiles within the site on 30 May 2019 was carried out by completing a systematic walkover of the exposed soil in the stockpile removal area. The visual inspection found the exposed soil in the area from which the stockpiled soil was removed to be free of visible asbestos containing material such as fragments of asbestos cement.

See attached photograph showing the ground area at the completion of the soil removal work.

Airborne Asbestos Fibre Monitoring

Monitoring for airborne asbestos fibres was undertaken in conjunction with the asbestos removal work on 30 May 2019. This monitoring returned a result of less than 0.01 fibres per millilitre of air (<0.01 fibres/ml) which is below the lowest detectable level using the membrane filter method [NOHSC:3003(2005)].



Page 2 of 2
31 May 2019

The National Occupational Health and Safety Commission recommended maximum exposure level for airborne asbestos fibres is 0.1 fibres per millilitre of air (as an 8-hour time weighted average).

A copy of the air monitoring report is attached.

Summary

Based on the findings of the visual inspection of the exposed soil remaining in the stockpile area in the location of former Block A at the site which found there to be no visible asbestos containing material to be present and the results of the airborne asbestos fibre monitoring which were below the lowest detectable level for the estimation of airborne asbestos fibre levels, we confirm that the removal of the stockpiled asbestos contaminated soil in the Block A area at the Penshurst Public School construction site in Forest Road, Penshurst NSW, corner Arcadia Street has been satisfactorily completed and this area of the site may be accessed without the use of asbestos personal protective equipment (PPE).

If you require any further information, please contact me on 0437 251 358.

Yours faithfully

P. CLIFTON & ASSOCIATES PTY LTD

A handwritten signature in black ink, appearing to read "P. Clifton", followed by a small dot.

Philip Clifton
Principal
BOHS IP402 Certified
SafeWork NSW Licenced Asbestos Assessor LAA000119

Attachments: Photograph, Airborne Asbestos Fibre Monitoring Report



PHOTOGRAPH

31 May 2019



**Ground area on which soil was located in the Block A area at the Penshurst Public School
at completion of the visual clearance inspection on 30 May 2019**



AIRBORNE ASBESTOS FIBRE MONITORING REPORT

31 May 2019

Mr Gary Tang
Chalouhi
2/22 Centenary Avenue
Moorebank NSW 2170

**RE: RESULTS OF AIRBORNE ASBESTOS FIBRE MONITORING
BLOCK A, PENSHURST PUBLIC SCHOOL, FOREST ROAD, PENSHURST NSW**

Dear Sir,

We refer to your request to undertake monitoring for airborne asbestos fibres on Thursday 30 May 2019 during the excavation and loading out of stockpiled fill soil containing asbestos cement sheet debris from the area on which Block A was located at the Penshurst Public School site in Forest Road, Penshurst NSW, corner Arcadia Street.

This monitoring was carried out in accordance the requirements of the Safe Work Australia How to Safely Remove Asbestos Code of Practice, Section 3.11 and the Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres' 2nd edition [NOHSC 3003:2005].

The results of the monitoring are as follows:

Sample No.	Location	Time On	Time Off	Fibre Count fibres/fields	Airborne Fibre Concentration (fibres/ml)
PCA 6174 - 2019/C29/1	East side of removal area on street fence	09:40	11:00	0.0/100	<0.01
PCA 6174 - 2019/G87/2	West side of removal area	09:42	11:02	1.0/100	<0.01

The above results are below the lowest detectable level for the estimation of airborne asbestos fibres using the membrane filter method and below the NOHSC recommended exposure level for airborne asbestos fibres (8 hour TWA) of 0.1 fibres/ml.

This result indicates that there was no measurable human health risk from airborne asbestos fibres in these areas during the monitoring period.

The NATA endorsed laboratory report is attached.



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31 May 2019

If you require any further information, please contact me on 0437 251 358.

Yours faithfully

P. CLIFTON & ASSOCIATES PTY LTD

Philip Clifton

Principal

BOHS IP402 Certified

SafeWork NSW Licenced Asbestos Assessor: LAA000119

Attachment: Laboratory Report



LABORATORY REPORT

CERTIFICATE OF AIR MONITORING

Date: 31 May 2019
ESP Job Number: J40961
Customer: P. Clifton & Associates Pty Ltd
Address: PO Box 457, Turramurra, NSW
Attention: Phil Clifton
Sampled From: As received (Your ref: 6174 - 2019)
Sampled By: As received
Date Received: 31 May 2019
Date Analysed: 31 May 2019
Test Method: Filters examined in accordance with Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres 2nd Edition [NOHSC:3003(2005)] using ESP in-house Method No. 1.

ESP Lab No.	Customer Reference	Result (fibres/field)
64799	C29/1	Nil / 100
64800	G87/2	1 / 100

The results contained in this report relate only to the sample(s) submitted for testing. ESP Environmental & Safety Professionals accepts no responsibility for the representivity of the sample(s) submitted.

Approved Fibre Counter(s): Mathew Cupic
Approved Signatory: Mathew Cupic



Accreditation No. 3110

NATA Accredited Laboratory
Accredited for compliance with ISO/IEC-17025 - Testing



PO Box 457
Turramurra NSW 2074

ABN: 69 041 751 671

PH: 0437 251 358
Email: philclifton@pclifton.com

29 May 2018

Mr Norman Chalouhi
Chalouhi
2/22 Centenary Avenue
Moorebank NSW 2170

**RE: WASTE CLASSIFICATION OF STOCKPILED SURFACE FILL SOIL
BLOCK A, PENSHURST PUBLIC SCHOOL, FOREST ROAD, PENSHURST NSW**

Dear Sir,

INTRODUCTION

This letter report presents the findings of a waste classification assessment conducted on stockpiled surface fill soil that has been excavated from within the area on which Block A was located within the Penshurst Public School site located in Forest Road, Penshurst NSW. Soil sampling was undertaken within this area at the school on Tuesday 21 May 2019.

Following demolition of the Block A building, fill soil containing asbestos cement sheet debris was identified in area on which this building was located. This soil has been excavated and placed into a stockpile to allow for the soil to be classified for off-site disposal.

SITE OBSERVATIONS AND SOIL SAMPLING

Fieldwork was undertaken on Tuesday 21 May 2019 and comprised a visual inspection of the stockpiled surface fill soil in the Block A area and the collection of one soil sample. One piece of the asbestos cement sheet debris in the soil was collected for analysis to confirm the presence of asbestos in this material.

The fill soil in the stockpiled contains light brown coloured sandy clay soil. See photograph No. 1.

Within the stockpiled soil there are numerous scattered fragments of asbestos cement sheet debris. See photograph No. 1.

The fill soil within the stockpile has no noticeable odour or discoloration from oil or chemical contamination.



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One soil sample was collected during the site inspection for laboratory analysis to determine the waste classification of the stockpiled fill soil in the Block A area of the site that is to be excavated from the site for off-site disposal at a NSW EPA licenced receiving facility.

We have been advised that there is approximately 15 - 20 tonnes of fill soil containing asbestos cement sheet debris within the stockpile.

ANALYTICAL REGIME

The soil sample collected on 21 May 2019 was placed into a clean laboratory supplied sample jar fitted with a Teflon lid that were marked with the date, sample number and project number. The sample jar was filled with soil with no airspace remaining. The sampled soil was collected using disposable surgical-type gloves. No tools requiring cleaning prior to or following sample collection were used for the sample collection.

Following collection, the sample was delivered to Envirolab Services NATA accredited laboratory at Chatswood NSW for waste classification analysis for the following suite of common contaminants including:

- 8 priority heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc);
- Polycyclic Aromatic Hydrocarbons (PAH);
- Total Recoverable Hydrocarbons (TRH);
- Monocyclic Aromatic Hydrocarbons (Benzene, Toluene, Ethyl benzene and Xylene: BTEX);
- Organochlorine pesticides (OCP);
- Polychlorinated Biphenyls (PCB).

A piece of the asbestos cement sheet debris was also collected for laboratory analysis to confirm the presence of asbestos in this material.



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ASSESSMENT CRITERIA

With regard to the stockpiled surface fill soil in the Block A area at the site which is to be excavated for disposal at a licenced landfill facility, waste classification assessment was conducted with reference to the NSW Environment Protection Authority (NSW EPA) Waste Classification Guidelines (November 2014). According to these guidelines, waste material is to be assessed by the following six step process, viz.

Steps Description

1. Is the waste Special Waste?
2. Is the waste Liquid Waste?
3. Has the waste been pre-classified?
4. Is the waste Hazardous Waste?
5. Chemical Assessment in accordance with the specified total and or leachable contaminant concentration thresholds?
6. Is the waste putrescible?

In particular, with regard to Step 6, the Guideline states that a final test may be needed to determine whether the waste is putrescible, and a number of evaluation methods have been outlined.

Nevertheless, NSW EPA has clarified that a determination of whether the putrescibles waste test has to be conducted can be made based on the observed characteristics of the material. In this case, the stockpiled surface fill soil was found by visual assessment to be free of putrescible material.

SUMMARY OF RESULTS AND WASTE CLASSIFICATION

The analytical results for the soil sample are presented in the attached table (Table 1). The NATA endorsed laboratory report is attached to this letter report.

The contaminant levels within the soil sample taken from the stockpiled fill soil located in the Block A area of the Penshurst Public School site in Forest Road, Penshurst NSW were found to be below the maximum guideline levels for classification as general solid waste (non-putrescible) (GSW).

The piece of asbestos cement sheet that was collected from the site was analysed and found to contain chrysotile asbestos.



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29 May 2019

As this fill soil contains fragments of asbestos cement sheet debris, this fill soil must be disposed of at a landfill facility licenced by the NSW EPA to accept soil classified as GSW Special waste – asbestos.

It is recommended that the receiving NSW EPA licenced landfill site should check the incoming materials and ensure that the waste received matches the material description provided in this letter report.

Important Note:

PCA's assessment is necessarily based on the result of limited site investigation and sample testing. Neither PCA, nor any other reputable consultant, can provide unqualified warranties nor does PCA assume any liability for site conditions not observed, or accessible during the time of the investigations.

Despite all reasonable care and diligence, the materials encountered and concentrations of contaminants measured may not be representative of conditions between the locations sampled and investigated.

In addition, site characteristics may change at any time in response to variations in natural conditions, chemical reactions and other events, e.g. groundwater movement and or spillages of contaminating substances. These changes may occur subsequent to PCA's investigations and assessment.

This report and associated documentation and the information herein have been prepared solely for the use of Chalouhi as well as interested parties at the time and is valid (for the purposes of transport of material) for a period of one month only from the date of issue.

Any other reliance assumed by third parties on this report shall be at such parties' own risk. Any ensuing liability resulting from use of the report by third parties cannot be transferred to PCA.

Please note that Part 5.6, Section 143 of the Protection of the Environment Operations (POEO) Act 1997 states that is an offence for waste to be transported to a place that cannot lawfully be used as a facility to accept that waste. It is the duty of the owner and transporter of the waste to ensure that the waste is disposed of appropriately. PCA accept no liability for the unlawful disposal of waste materials from any site. PCA accepts no responsibility for the material tracking, loading, management, transport or disposal of waste from the site. Before disposal of the material to a licensed landfill is undertaken, the waste producer is required to obtain consent from the landfill.



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29 May 2019

If you require any further information, please contact the undersigned on 0437 251 358.

Yours faithfully

P. CLIFTON & ASSOCIATES PTY LTD

Philip Clifton
Principal

Attachments: Photograph
 Laboratory Report and Chain of Custody
 Table 1 – Summary of Analytical Results



PHOTOGRAPH

29 May 2019



Stockpiled fill soil containing asbestos cement sheet debris in the Block A area at the Penshurst Public School, Forest Road, Penshurst NSW on 21 May 2019



LABORATORY REPORT AND CHAIN OF CUSTODY FORM

CERTIFICATE OF ANALYSIS 218038

Client Details

Client	P Clifton & Assoc
Attention	Phil Clifton
Address	PO Box 447, Pymble Business Ctre, NSW, 2073

Sample Details

Your Reference	<u>Penshurst</u>
Number of Samples	1 Material, 1 Soil
Date samples received	22/05/2019
Date completed instructions received	22/05/2019

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.
 Samples were analysed as received from the client. Results relate specifically to the samples as received.
 Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

Date results requested by	29/05/2019
Date of Issue	28/05/2019
NATA Accreditation Number 2901. This document shall not be reproduced except in full.	
Accredited for compliance with ISO/IEC 17025 - Testing. Tests not covered by NATA are denoted with *	

Asbestos Approved By

Analysed by Asbestos Approved Identifier: Lucy Zhu
 Authorised by Asbestos Approved Signatory: Matt Tang

Results Approved By

Giovanni Agosti, Group Technical Manager
 Matthew Tang, Asbestos Supervisor
 Steven Luong, Organics Supervisor

Authorised By



Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil		
Our Reference		218038-2
Your Reference	UNITS	#2 Building A
Date Sampled		21/05/2019
Type of sample		Soil
Date extracted	-	23/05/2019
Date analysed	-	25/05/2019
TRH C ₆ - C ₉	mg/kg	<25
TRH C ₆ - C ₁₀	mg/kg	<25
vTPH C ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25
Benzene	mg/kg	<0.2
Toluene	mg/kg	<0.5
Ethylbenzene	mg/kg	<1
m+p-xylene	mg/kg	<2
o-Xylene	mg/kg	<1
naphthalene	mg/kg	<1
Total +ve Xylenes	mg/kg	<1
Surrogate aaa-Trifluorotoluene	%	95

svTRH (C10-C40) in Soil		
Our Reference		218038-2
Your Reference	UNITS	#2 Building A
Date Sampled		21/05/2019
Type of sample		Soil
Date extracted	-	23/05/2019
Date analysed	-	24/05/2019
TRH C ₁₀ - C ₁₄	mg/kg	<50
TRH C ₁₅ - C ₂₈	mg/kg	<100
TRH C ₂₉ - C ₃₆	mg/kg	<100
TRH >C ₁₀ -C ₁₆	mg/kg	<50
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50
TRH >C ₁₆ -C ₃₄	mg/kg	<100
TRH >C ₃₄ -C ₄₀	mg/kg	<100
Total +ve TRH (>C10-C40)	mg/kg	<50
Surrogate o-Terphenyl	%	78

PAHs in Soil		
Our Reference		218038-2
Your Reference	UNITS	#2 Building A
Date Sampled		21/05/2019
Type of sample		Soil
Date extracted	-	23/05/2019
Date analysed	-	24/05/2019
Naphthalene	mg/kg	<0.1
Acenaphthylene	mg/kg	<0.1
Acenaphthene	mg/kg	<0.1
Fluorene	mg/kg	<0.1
Phenanthrene	mg/kg	<0.1
Anthracene	mg/kg	<0.1
Fluoranthene	mg/kg	<0.1
Pyrene	mg/kg	<0.1
Benzo(a)anthracene	mg/kg	<0.1
Chrysene	mg/kg	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2
Benzo(a)pyrene	mg/kg	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1
Total +ve PAH's	mg/kg	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5
Surrogate <i>p</i> -Terphenyl-d14	%	106

Organochlorine Pesticides in soil		
Our Reference		218038-2
Your Reference	UNITS	#2 Building A
Date Sampled		21/05/2019
Type of sample		Soil
Date extracted	-	23/05/2019
Date analysed	-	24/05/2019
HCB	mg/kg	<0.1
alpha-BHC	mg/kg	<0.1
gamma-BHC	mg/kg	<0.1
beta-BHC	mg/kg	<0.1
Heptachlor	mg/kg	<0.1
delta-BHC	mg/kg	<0.1
Aldrin	mg/kg	<0.1
Heptachlor Epoxide	mg/kg	<0.1
gamma-Chlordane	mg/kg	<0.1
alpha-chlordane	mg/kg	<0.1
Endosulfan I	mg/kg	<0.1
pp-DDE	mg/kg	<0.1
Dieldrin	mg/kg	<0.1
Endrin	mg/kg	<0.1
pp-DDD	mg/kg	<0.1
Endosulfan II	mg/kg	<0.1
pp-DDT	mg/kg	<0.1
Endrin Aldehyde	mg/kg	<0.1
Endosulfan Sulphate	mg/kg	<0.1
Methoxychlor	mg/kg	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1
Surrogate TCMX	%	95

PCBs in Soil		
Our Reference		218038-2
Your Reference	UNITS	#2 Building A
Date Sampled		21/05/2019
Type of sample		Soil
Date extracted	-	23/05/2019
Date analysed	-	24/05/2019
Aroclor 1016	mg/kg	<0.1
Aroclor 1221	mg/kg	<0.1
Aroclor 1232	mg/kg	<0.1
Aroclor 1242	mg/kg	<0.1
Aroclor 1248	mg/kg	<0.1
Aroclor 1254	mg/kg	<0.1
Aroclor 1260	mg/kg	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1
Surrogate TCLMX	%	95

Acid Extractable metals in soil		
Our Reference		218038-2
Your Reference	UNITS	#2 Building A
Date Sampled		21/05/2019
Type of sample		Soil
Date prepared	-	23/05/2019
Date analysed	-	23/05/2019
Arsenic	mg/kg	23
Cadmium	mg/kg	<0.4
Chromium	mg/kg	13
Copper	mg/kg	44
Lead	mg/kg	4
Mercury	mg/kg	<0.1
Nickel	mg/kg	7
Zinc	mg/kg	5

Moisture		
Our Reference	UNITS	218038-2
Your Reference		#2 Building A
Date Sampled		21/05/2019
Type of sample		Soil
Date prepared	-	23/05/2019
Date analysed	-	24/05/2019
Moisture	%	4.8

Asbestos ID - materials		
Our Reference	UNITS	218038-1
Your Reference		#1 Building A
Date Sampled		21/05/2019
Type of sample		Material
Date analysed	-	23/05/2019
Mass / Dimension of Sample	-	85x45x5mm
Sample Description	-	Black fibre cement material
Asbestos ID in materials	-	Chrysotile asbestos detected

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PCBs" is simply a sum of the positive individual PCBs.

Method ID	Methodology Summary
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ PQL' values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero' values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL' values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

Client Reference: Penshurst

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-10	[NT]
Date extracted	-			23/05/2019	[NT]	[NT]	[NT]	[NT]	23/05/2019	[NT]
Date analysed	-			25/05/2019	[NT]	[NT]	[NT]	[NT]	25/05/2019	[NT]
TRH C ₆ - C ₉	mg/kg	25	Org-016	<25	[NT]	[NT]	[NT]	[NT]	106	[NT]
TRH C ₆ - C ₁₀	mg/kg	25	Org-016	<25	[NT]	[NT]	[NT]	[NT]	106	[NT]
Benzene	mg/kg	0.2	Org-016	<0.2	[NT]	[NT]	[NT]	[NT]	83	[NT]
Toluene	mg/kg	0.5	Org-016	<0.5	[NT]	[NT]	[NT]	[NT]	92	[NT]
Ethylbenzene	mg/kg	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	117	[NT]
m+p-xylene	mg/kg	2	Org-016	<2	[NT]	[NT]	[NT]	[NT]	118	[NT]
o-Xylene	mg/kg	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	117	[NT]
naphthalene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	101	[NT]	[NT]	[NT]	[NT]	104	[NT]

Client Reference: Penshurst

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-10	[NT]
Date extracted	-			23/05/2019	[NT]	[NT]	[NT]	[NT]	23/05/2019	[NT]
Date analysed	-			24/05/2019	[NT]	[NT]	[NT]	[NT]	24/05/2019	[NT]
TRH C ₁₀ - C ₁₄	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	102	[NT]
TRH C ₁₅ - C ₂₈	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	110	[NT]
TRH C ₂₉ - C ₃₆	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	114	[NT]
TRH >C ₁₀ -C ₁₆	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	102	[NT]
TRH >C ₁₆ -C ₃₄	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	110	[NT]
TRH >C ₃₄ -C ₄₀	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	114	[NT]
Surrogate o-Terphenyl	%		Org-003	80	[NT]	[NT]	[NT]	[NT]	96	[NT]

Client Reference: Penshurst

QUALITY CONTROL: PAHs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-10	[NT]
Date extracted	-			23/05/2019	[NT]	[NT]	[NT]	[NT]	23/05/2019	[NT]
Date analysed	-			24/05/2019	[NT]	[NT]	[NT]	[NT]	24/05/2019	[NT]
Naphthalene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	122	[NT]
Acenaphthylene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	112	[NT]
Phenanthrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	108	[NT]
Anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	114	[NT]
Pyrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	116	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	130	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	<0.05	[NT]	[NT]	[NT]	[NT]	114	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	110	[NT]	[NT]	[NT]	[NT]	106	[NT]

Client Reference: Penshurst

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-10	[NT]
Date extracted	-			23/05/2019	[NT]	[NT]	[NT]	[NT]	23/05/2019	[NT]
Date analysed	-			24/05/2019	[NT]	[NT]	[NT]	[NT]	24/05/2019	[NT]
HCB	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	82	[NT]
gamma-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	81	[NT]
Heptachlor	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	84	[NT]
delta-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	105	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	86	[NT]
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	87	[NT]
Dieldrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	92	[NT]
Endrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	87	[NT]
pp-DDD	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	80	[NT]
Endosulfan II	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	88	[NT]
Methoxychlor	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-005	103	[NT]	[NT]	[NT]	[NT]	96	[NT]

Client Reference: Penshurst

QUALITY CONTROL: PCBs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-10	[NT]
Date extracted	-			23/05/2019	[NT]	[NT]	[NT]	[NT]	23/05/2019	[NT]
Date analysed	-			24/05/2019	[NT]	[NT]	[NT]	[NT]	24/05/2019	[NT]
Aroclor 1016	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCLMX	%		Org-006	103	[NT]	[NT]	[NT]	[NT]	102	[NT]

Client Reference: Penshurst

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-10	[NT]
Date prepared	-			23/05/2019	[NT]	[NT]	[NT]	[NT]	23/05/2019	[NT]
Date analysed	-			23/05/2019	[NT]	[NT]	[NT]	[NT]	23/05/2019	[NT]
Arsenic	mg/kg	4	Metals-020	<4	[NT]	[NT]	[NT]	[NT]	108	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	[NT]	[NT]	[NT]	[NT]	103	[NT]
Chromium	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	108	[NT]
Copper	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	105	[NT]
Lead	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	105	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Nickel	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Zinc	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	106	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.
Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.	

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.



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Signature: _____



SUMMARY TABLE OF ANALYTICAL RESULTS



Table 1 – Summary of Analytical Results 29 May 2019
 Chalouhi, Penshurst Public School, Forest Road, Penshurst NSW
 Sampled Tuesday 21 May 2019

Analyte	218038 – 1 Stockpile Building A	NSW EPA Waste Classification General Solid Waste and Restricted Solid Waste Threshold Levels					NSW EPA Waste Classification
		GSW CT1 (mg/kg)	GSW SCC1 (mg/kg)	GSW TCLP1 (mg/L)	RSW SCC2 (mg/kg)	RSW TCLP2 (mg/L)	
Arsenic	23	100	500	5	2,000	20	General solid waste
Cadmium	<0.4	20	100	1	400	4	General solid waste
Chromium	13	100	1900	5	7,600	20	General solid waste
Copper	44	-	-	-	-	-	General solid waste
Lead	4	100	1500	5	6,000	20	General solid waste
Mercury	<0.1	4	50	0.2	200	0.8	General solid waste
Nickel	7	40	1050	2	4,200	8	General solid waste
Zinc	5	-	-	-	-	-	General solid waste
Benzene	<0.2	10	18	0.5	72	2	General solid waste
Toluene	<0.5	288	1080	14.4	2,073	57.6	General solid waste
Ethyl Benzene	<1.0	600	1080	30	4,320	120	General solid waste
Total Xylenes	<2.0	1000	1800	50	7,200	200	General solid waste
TPH C6-9	<25	650	650	N/A	2,600	N/A	General solid waste
TPH C10-40	<50	10000	10000	N/A	40,000	N/A	General solid waste
Total PAH	<0.2	200	200	N/A	800	N/A	General solid waste
Benzo(a)pyrene	<0.05	0.8	10	0.04	23	0.16	General solid waste
OCP (Pesticides)	<0.1	<50	<50	N/A	<50	N/A	General solid waste
PCB	<0.1	<50	<50	N/A	<50	N/A	General solid waste
Asbestos	AC sheet containing chrysotile asbestos	Not present			Not present	-	Special waste - asbestos

H3 – Waste Disposal – Unexpected Find

Genesis Eastern Creek
Dial A Dump Industries P/L

A.B.N 75131565583

MASCOT NSW 1460

Phone: 02 9519 9999



Docket GEN0132726-1

Date: 30/05/19

Time In: 11:05:28 AM | Time Out: 11:34:35 AM

Customer

Remedial Civil Solutions Pty Ltd
Forest Rd - Penshurst Public School
PENShurst
PENShurst

Vehicle: CC15QN

Type	UOM	Qty.
Gross:	Tonne	42.94
Tare:	Tonne	15.68
Net: Incoming: Asbestos Soils	Tonne	27.26

Printed: 30/05/2019 2:11:35 PM

Signature:

Statement of Compliance

Asbestos containing materials are not accepted in the Recycling Facility.
Asbestos material is only permitted to be disposed of in the Landfill Facility

Quote Contract Reference No. 66498 for faster service.



Consignment 6CHP-79JX-6PYV



Scan the QR2id Code for the current status of this Consignment. If you don't have a QR Code reader on your Smart Phone, you can download one free from the App store (search "QR Reader"). Alternatively, you can visit [WasteLocate](#) and enter the Consignment Number: **6CHP-79JX-6PYV**

Transport details

Delivered

CONSIGNOR

Chalouhi

CREATED BY

Michael Abou-Rjeili

TRANSPORTER

Chalouhi

DRIVER

George Merkos

VEHICLE

CC15QN

PICKUP DATE

Thu 30th May 2019 GMT+10:00

COLLECTED

Thu 30th May 2019 09:52 AM GMT+10:00

DELIVERED

Thu 30th May 2019 11:05 AM GMT+10:00

PICKUP ADDRESS

Penshurst

18 Arcadia St

Penshurst NSW 2222

SOURCE OF WASTE

Penshurst

18 Arcadia St

Penshurst NSW 2222

Waste

Description	Nominated		Collected		Delivered
Asbestos Contaminated Soil	18000.0 kg		18000.0 kg		18000.0 kg
	18000.0 kg	0	18000.0 kg	0	18000.0 kg

Planned Destination: WMF4073

Genesis Landfill

Honeycomb Drive

Eastern Creek NSW 2766

Phone: 95199999

Maxzine Walters - maxzinewalters@dadi.com.au - 0418600008

Actual Destination WMF4073

Genesis Landfill

Honeycomb Drive

Eastern Creek NSW 2766

Maxzine Walters - maxzinewalters@dadi.com.au - 0418600008



Appendix I: Imported Materials

I1 – Imported Materials Data Tables and QA/QC

ABBREVIATIONS AND EXPLANATIONS

Abbreviations used in the Tables:

ABC:	Ambient Background Concentration	PCBs:	Polychlorinated Biphenyls
ACM:	Asbestos Containing Material	PCE:	Perchloroethylene (Tetrachloroethylene or Teterachloroethene)
ADWG:	Australian Drinking Water Guidelines	pH_{KCL} :	pH of filtered 1:20, 1M KCL extract, shaken overnight
AF:	Asbestos Fines	pH_{ox} :	pH of filtered 1:20 1M KCL after peroxide digestion
ANZG	Australian and New Zealand Guidelines	PQL:	Practical Quantitation Limit
B(a)P:	Benzo(a)pyrene	RS:	Rinsate Sample
CEC:	Cation Exchange Capacity	RSL:	Regional Screening Levels
CRC:	Cooperative Research Centre	RSW:	Restricted Solid Waste
CT:	Contaminant Threshold	VAC/SAC:	Validation / Site Assessment Criteria
EILs:	Ecological Investigation Levels	SCC:	Specific Contaminant Concentration
ESLs:	Ecological Screening Levels	S_{Cr}:	Chromium reducible sulfur
FA:	Fibrous Asbestos	S_{POS}:	Peroxide oxidisable Sulfur
GIL:	Groundwater Investigation Levels	SSA:	Site Specific Assessment
GSW:	General Solid Waste	SSHSLs:	Site Specific Health Screening Levels
HILs:	Health Investigation Levels	TAA:	Total Actual Acidity in 1M KCL extract titrated to pH6.5
HSLs:	Health Screening Levels	TB:	Trip Blank
HSL-SSA:	Health Screening Level-Site Specific Assessment	TCA:	1,1,1 Trichloroethane (methyl chloroform)
kg/L	kilograms per litre	TCE:	Trichloroethylene (Trichloroethene)
NA:	Not Analysed	TCLP:	Toxicity Characteristics Leaching Procedure
NC:	Not Calculated	TPA:	Total Potential Acidity, 1M KCL peroxide digest
NEPM:	National Environmental Protection Measure	TS:	Trip Spike
NHMRC:	National Health and Medical Research Council	TRH:	Total Recoverable Hydrocarbons
NL:	Not Limiting	TSA:	Total Sulfide Acidity (TPA-TAA)
NSL:	No Set Limit	UCL:	Upper Level Confidence Limit on Mean Value
OCP:	Organochlorine Pesticides	USEPA	United States Environmental Protection Agency
OPP:	Organophosphorus Pesticides	VOCC:	Volatile Organic Chlorinated Compounds
PAHs:	Polycyclic Aromatic Hydrocarbons	WHO:	World Health Organisation
%w/w:	weight per weight		
ppm:	Parts per million		

Table Specific Explanations:

HIL Tables:

- The chromium results are for Total Chromium which includes Chromium III and VI. For initial screening purposes, we have assumed that the samples contain only Chromium VI unless demonstrated otherwise by additional analysis.
- Carcinogenic PAHs is a toxicity weighted sum of analyte concentrations for a specific list of PAH compounds relative to B(a)P. It is also referred to as the B(a)P Toxic Equivalence Quotient (TEQ).
- Statistical calculations are undertaken using ProUCL (USEPA). Statistical calculation is usually undertaken using data from fill samples.

EIL/ESL Table:

- ABC Values for selected metals have been adopted from the published background concentrations presented in Olszowy et. al., (1995), Trace Element Concentrations in Soils from Rural and Urban New South Wales (the 25th percentile values for old suburbs with high traffic have been quoted).

TABLE A1 SOIL LABORATORY RESULTS - IMPORTED MATERIALS (ENGINEERING/CONSTRUCTION)																																	
All data in mg/kg unless stated otherwise			HEAVY METALS							PAHs		ORGANOCHLORINE PESTICIDES (OCPs)							Total OPPs	TOTAL PCBs	C6-C10 (F1)	>C10-C16 (F2)	>C16-C34 (F3)	>C34-C40 (F4)	Benzene	Toluene	thylbenzen	Xylenes	aphthalen	ASBESTOS FIBRES			
			Arsenic	Cadmium	Chromium total	Copper	Lead	Mercury	Nickel	Zinc	Total PAHs	Carcinogenic PAHs	HCB	Endosulfan	Methoxychlor	Aldrin & Dieldrin	Chlordane	DDT, DDD & DDE													Heptachlor		
PQL - Envirolab Services			4	0.4	1	1	1	0.1	1	1	-	0.05	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	25	50	100	100	0.2	0.5	1	1	1	As per lab reports
Screening (Recovered aggregate order) - absolute maximum			40	1.5	120	150	150	1	80	350	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	Absent (not detected)	
Sample Reference	Lab report reference	Sample Description																															
DGB20 V1	226430	DGB - Recycled	<4	<0.4	10	24	13	<0.1	6	38	5.2	0.6	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	Not Detected
DGB20 V1 - Lab replicate	226430	DGB - Recycled	<4	<0.4	10	20	12	<0.1	6	33	7.2	1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	NA
DGB20 V2	226430	DGB - Recycled	<4	<0.4	8	12	7	<0.1	5	26	0.3	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	Not Detected
DGB20 V3	226430	DGB - Recycled	<4	<0.4	9	21	15	<0.1	6	38	7	0.7	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	100	<100	<0.2	<0.5	<1	<3	<1	Not Detected
10mm V1	226430	10mm agg - Recycled	<4	<0.4	8	5	3	<0.1	4	10	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	Not Detected
10mm V2	226430	10mm agg - Recycled	<4	<0.4	3	20	3	<0.1	2	11	<0.05	<0.5	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	Not Detected
10mm V3	226430	10mm agg - Recycled	<4	<0.4	5	6	3	<0.1	2	8	0.3	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	Not Detected
10mm Dup1	226430	10mm agg - Recycled	<4	<0.4	12	15	14	<0.1	4	26	1.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	120	150	<0.2	<0.5	<1	<3	<1	NA
DGB20 Dup1	226430	DGB - Recycled	<4	<0.4	9	12	13	<0.1	6	23	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	NA
10mmD V1	227117	10mm drainage - quarry	<4	<0.4	2	140	5	<0.1	4	20	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	Not Detected
10mmD V2	227117	10mm drainage - quarry	<4	<0.4	2	68	5	<0.1	4	16	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	Not Detected
BQS V1	227906	Blue quarry sand - quarry	<4	<0.4	12	4	5	<0.1	7	37	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	Not Detected
BQS V1 - Lab Replicate	227906	Blue quarry sand - quarry	<4	<0.4	14	4	8	<0.1	7	41	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	NA
BQS V2	227906	Blue quarry sand - quarry	<4	<0.4	13	4	5	<0.1	7	39	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	Not Detected
DGB20 V4	230174	DGB - Recycled	<4	<0.4	9	16	36	<0.1	4	71	1.9	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	190	160	<0.2	<0.5	<1	<3	<1	Not Detected
DGB20 V5	230174	DGB - Recycled	<4	<0.4	10	28	19	<0.1	5	30	2.5	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	220	190	<0.2	<0.5	<1	<3	<1	Not Detected
DGB20 V6	230174	DGB - Recycled	<4	<0.4	8	20	23	<0.1	4	32	2.9	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	210	180	<0.2	<0.5	<1	<3	<1	Not Detected
DGB20 Dup2	230174	DGB - Recycled	<4	<0.4	8	37	27	<0.1	5	110	2.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	200	170	<0.2	<0.5	<1	<3	<1	NA
DGB20 V7	232233	DGB - Recycled	<4	<0.4	11	24	19	<0.1	6	45	9	0.9	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	240	260	<0.2	<0.5	<1	<3	<1	Not Detected
DGB20 Dup3	232233	DGB - Recycled	<4	<0.4	14	20	20	<0.1	6	43	8.5	0.9	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	170	160	<0.2	<0.5	<1	<3	<1	NA
BQS DUP 1	18464	Blue quarry sand - quarry	<4	<0.4	10	4	8	<0.1	6	44	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<50	<100	<0.2	<0.5	<1	<1	<1	NA
BQS DUP 1 - Lab Replicate	18464	Blue quarry sand - quarry	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Number of Samples			21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	22	21	21	21	21	21	21	21	21	21	21	14	
Maximum Value			<PQL	<PQL	14	140	36	<PQL	7	110	9	1	0.3	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	NC	
Concentration above the VAC			VALUE																														

TABLE A2 SOIL LABORATORY RESULTS - IMPORTED MATERIALS (LANDSCAPING)																																	
All data in mg/kg unless stated otherwise			HEAVY METALS							PAHs		ORGANOCHLORINE PESTICIDES (OCPs)							Total OPPs	TOTAL PCBs	C6-C10 (F1)	>C10-C16 (F2)	>C16-C34 (F3)	>C34-C40 (F4)	Benzene	Toluene	thylbenzen	Xylenes	aphthalen	ASBESTOS FIBRES			
			Arsenic	Cadmium	Chromium total	Copper	Lead	Mercury	Nickel	Zinc	Total PAHs	Carcinogenic PAHs	HCB	Endosulfan	Methoxychlor	Aldrin & Dieldrin	Chlordane	DDT, DDD & DDE													Heptachlor		
PQL - Envirolab Services			4	0.4	1	1	1	0.1	1	1	-	0.05	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	25	50	100	100	0.2	0.5	1	1	1	100
Background screening			NSL	NSL	13	28	163	NSL	5	122	0.05	0.05	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	25	50	100	100	0.2	0.5	1	1	1	Absent (not detected)
Sample Reference	Lab report reference	Sample Description																															
OGM1	255960	Organic garden mix	7	<0.4	14	61	26	<0.1	7	100	1.5	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	760	320	<0.2	<0.5	<1	<3	<1	Not Detected	
OGM2	255960	Organic garden mix	7	<0.4	19	63	28	<0.1	6	110	1.2	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	1100	400	<0.2	<0.5	<1	<3	<1	Not Detected	
OGM3	255960	Organic garden mix	11	<0.4	21	76	33	0.1	9	130	1.2	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	930	420	<0.2	<0.5	<1	<3	<1	Not Detected	
TU 1	255959	Turf underlay	5	<0.4	10	19	12	<0.1	3	35	0.3	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	320	170	<0.2	<0.5	<1	<3	<1	Not Detected	
TU 1 - Lab Replicate	255959	Turf underlay	<4	<0.4	6	20	11	<0.1	3	37	0.4	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	340	200	<0.2	<0.5	<1	<3	<1	NA	
TU 2	255959	Turf underlay	<4	<0.4	8	21	18	<0.1	4	44	0.4	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	810	450	<0.2	<0.5	<1	<3	<1	Not Detected	
TU 3	255959	Turf underlay	<4	<0.4	8	21	15	<0.1	3	41	0.2	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	520	330	<0.2	<0.5	<1	<3	<1	Not Detected	
PBM 1	255959	Planter box mix	5	<0.4	15	39	15	<0.1	4	59	0.4	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	1300	560	<0.2	<0.5	<1	<3	<1	Not Detected	
PBM 2	255959	Planter box mix	<4	<0.4	4	16	7	<0.1	2	27	0.4	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	1300	530	<0.2	<0.5	<1	<3	<1	Not Detected	
PBM 3	255959	Planter box mix	7	<0.4	16	46	18	<0.1	5	71	0.81	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	59	2600	720	<0.2	<0.5	<1	<3	<1	Not Detected	
ES1	255959	Enviro sand	<4	<0.4	5	6	14	<0.1	2	27	0.2	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	Not Detected		
ES2	255959	Enviro sand	<4	<0.4	4	5	8	<0.1	2	44	0.5	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	Not Detected		
ES3	255959	Enviro sand	<4	<0.4	4	6	7	<0.1	2	19	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	Not Detected		
ADS 1	255959	ACI Dry Sand	<4	<0.4	<1	<1	<1	<0.1	<1	<1	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	Not Detected		
ADS 2	255959	ACI Dry Sand	<4	<0.4	<1	<1	<1	<0.1	<1	<1	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	Not Detected		
ADS 2 - Lab Replicate	255959	ACI Dry Sand	<4	<0.4	1	<1	<1	<0.1	<1	<1	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	NA		
ADS 3	255959	ACI Dry Sand	<4	<0.4	<1	<1	<1	<0.1	<1	<1	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	Not Detected		
TU DUP1	255959	Turf underlay	<4	<0.4	9	22	12	<0.1	3	40	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	380	200	<0.2	<0.5	<1	<3	<1	NA		
PBM DUP1	255959	Planter box mix	<4	<0.4	2	5	2	<0.1	<1	10	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	1200	540	<0.2	<0.5	<1	<3	<1	NA		
TU 1 - Lab Triplicate	255959	Turf underlay	<4	<0.4	6	17	11	<0.1	3	34	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<25	<50	NA	NA	NA	NA	NA	NA	NA	NA		
ADS DUP1	255959	ACI Dry Sand	<4	<0.4	1	<1	<1	<0.1	<1	2	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	NA		
Total Number of Samples			21	21	21	21	21	21	21	21	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	15	
Maximum Value			11	<PQL	21	76	33	0.1	9	130	1.5	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	59	2600	720	<PQL	<PQL	<PQL	<PQL	<PQL	NC
Concentration above the VAC			VALUE																														

TABLE A3
SOIL LABORATORY RESULTS COMPARED TO NEPM 2013.
HIL-A: 'Residential with garden/accessible soils; children's day care centers; preschools; and primary schools'

All data in mg/kg unless stated otherwise			HEAVY METALS								PAHs		ORGANOCHLORINE PESTICIDES (OCPs)								OP PESTICIDES (OPPs)	TOTAL PCBs	ASBESTOS FIBRES
			Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc	Total PAHs	Carcinogenic PAHs	HCB	Endosulfan	Methoxychlor	Aldrin & Dieldrin	Chlordane	DDT, DDD & DDE	Heptachlor	Chlorpyrifos			
PQL - Envirolab Services			4	0.4	1	1	1	0.1	1	1	-	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	100
Site Assessment Criteria (SAC)			100	20	100	6000	300	40	400	7400	300	3	10	270	300	6	50	240	6	160	1	Detected/Not Detected	
Sample Reference	Sample Depth	Sample Description																					
DGB20 V1	-	DGB - Recycled	<4	<0.4	10	24	13	<0.1	6	38	5.2	0.6	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected	
DGB20 V1 - Lab	-	DGB - Recycled	<4	<0.4	10	20	12	<0.1	6	33	7.2	1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	
DGB20 V2	-	DGB - Recycled	<4	<0.4	8	12	7	<0.1	5	26	0.3	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected	
DGB20 V3	-	DGB - Recycled	<4	<0.4	9	21	15	<0.1	6	38	7	0.7	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected	
10mm V1	-	10mm agg - Recycled	<4	<0.4	8	5	3	<0.1	4	10	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected	
10mm V2	-	10mm agg - Recycled	<4	<0.4	3	20	3	<0.1	2	11	<0.05	<0.5	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected	
10mm V3	-	10mm agg - Recycled	<4	<0.4	5	6	3	<0.1	2	8	0.3	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected	
10mm Dup1	-	10mm agg - Recycled	<4	<0.4	12	15	14	<0.1	4	26	1.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	
DGB20 Dup1	-	DGB - Recycled	<4	<0.4	9	12	13	<0.1	6	23	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	
10mmD V1	-	10mm drainage - quarry	<4	<0.4	2	140	5	<0.1	4	20	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected	
10mmD V2	-	10mm drainage - quarry	<4	<0.4	2	68	5	<0.1	4	16	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected	
BQS V1	-	Blue quarry sand - quarry	<4	<0.4	12	4	5	<0.1	7	37	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected	
BQS V1 - Lab Re	-	Blue quarry sand - quarry	<4	<0.4	14	4	8	<0.1	7	41	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	
BQS V2	-	Blue quarry sand - quarry	<4	<0.4	13	4	5	<0.1	7	39	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected	
DGB20 V4	-	DGB - Recycled	<4	<0.4	9	16	36	<0.1	4	71	1.9	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected	
DGB20 V5	-	DGB - Recycled	<4	<0.4	10	28	19	<0.1	5	30	2.5	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected	
DBG20 V6	-	DGB - Recycled	<4	<0.4	8	20	23	<0.1	4	32	2.9	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected	
DGB20 Dup2	-	DGB - Recycled	<4	<0.4	8	37	27	<0.1	5	110	2.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	
DGB20 V7	-	DGB - Recycled	<4	<0.4	11	24	19	<0.1	6	45	9	0.9	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected	
DGB20 Dup3	-	DGB - Recycled	<4	<0.4	14	20	20	<0.1	6	43	8.5	0.9	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	
BQS DUP 1	-	Blue quarry sand - quarry	<4	<0.4	10	4	8	<0.1	6	44	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	
BQS DUP 1 - Lab	-	Blue quarry sand - quarry	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.1	NA	NA	
OGM1	-	Organic garden mix	7	<0.4	14	61	26	<0.1	7	100	1.5	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected	
OGM2	-	Organic garden mix	7	<0.4	19	63	28	<0.1	6	110	1.2	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected	
OGM3	-	Organic garden mix	11	<0.4	21	76	33	0.1	9	130	1.2	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected	
TU 1	-	Turf underlay	5	<0.4	10	19	12	<0.1	3	35	0.3	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected	
TU 1 - Lab Repli	-	Turf underlay	<4	<0.4	6	20	11	<0.1	3	37	0.4	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	
TU 2	-	Turf underlay	<4	<0.4	8	21	18	<0.1	4	44	0.4	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected	
TU 3	-	Turf underlay	<4	<0.4	8	21	15	<0.1	3	41	0.2	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected	
PBM 1	-	Planter box mix	5	<0.4	15	39	15	<0.1	4	59	0.4	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected	
PBM 2	-	Planter box mix	<4	<0.4	4	16	7	<0.1	2	27	0.4	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected	
PBM 3	-	Planter box mix	7	<0.4	16	46	18	<0.1	5	71	0.81	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected	
ES1	-	Enviro sand	<4	<0.4	5	6	14	<0.1	2	27	0.2	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected	
ES2	-	Enviro sand	<4	<0.4	4	5	8	<0.1	2	44	0.5	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected	
ES3	-	Enviro sand	<4	<0.4	4	6	7	<0.1	2	19	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected	
ADS 1	-	ACI Dry Sand	<4	<0.4	<1	<1	<1	<0.1	<1	<1	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected	
ADS 2	-	ACI Dry Sand	<4	<0.4	<1	<1	<1	<0.1	<1	<1	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected	
ADS 2 - Lab Rep	-	ACI Dry Sand	<4	<0.4	1	<1	<1	<0.1	<1	<1	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	
ADS 3	-	ACI Dry Sand	<4	<0.4	<1	<1	<1	<0.1	<1	<1	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected	
TU DUP1	-	Turf underlay	<4	<0.4	9	22	12	<0.1	3	40	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	
PBM DUP1	-	Planter box mix	<4	<0.4	2	5	2	<0.1	<1	10	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	
TU 1 - Lab Tripli	-	Turf underlay	<4	<0.4	6	17	11	<0.1	3	34	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
ADS DUP1	-	ACI Dry Sand	<4	<0.4	1	<1	<1	<0.1	<1	2	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	
Total Number of Samples			42	42	42	42	42	42	42	42	41	41	41	41	41	41	41	41	41	42	41	29	
Maximum Value			11	<PQL	21	140	36	0.1	9	130	9	1	0.3	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	Not Detected	

Concentration above the VAC
Concentration above the PQL

VALUE
Bold

TABLE A4 SOIL LABORATORY RESULTS COMPARED TO HSLs All data in mg/kg unless stated otherwise												
					C ₆ -C ₁₀ (F1)	>C ₁₀ -C ₁₆ (F2)	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	Field PID Measurement
PQL - Envirolab Services					25	50	0.2	0.5	1	1	1	ppm
NEPM 2013 HSL Land Use Category					HSL-A/B: LOW/HIGH DENSITY RESIDENTIAL							
Sample Reference	Sample Depth	Sample Description	Depth Category	Soil Category								
DGB20 V1	-	DGB - Recycled	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0.4
DGB20 V1 - Lab replicate	-	DGB - Recycled	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	-
DGB20 V2	-	DGB - Recycled	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0.1
DGB20 V3	-	DGB - Recycled	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0.3
10mm V1	-	10mm agg - Recycled	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0.1
10mm V2	-	10mm agg - Recycled	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0.1
10mm V3	-	10mm agg - Recycled	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0.1
10mm Dup1	-	10mm agg - Recycled	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	-
DGB20 Dup1	-	DGB - Recycled	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	-
10mmD V1	-	10mm drainage - quarry	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
10mmD V2	-	10mm drainage - quarry	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
BQS V1	-	Blue quarry sand - quarry	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
BQS V1 - Lab Replicate	-	Blue quarry sand - quarry	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
BQS V2	-	Blue quarry sand - quarry	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
DGB20 V4	-	DGB - Recycled	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
DGB20 V5	-	DGB - Recycled	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0.1
DBG20 V6	-	DGB - Recycled	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0.1
DGB20 Dup2	-	DGB - Recycled	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
DGB20 V7	-	DGB - Recycled	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0.2
DGB20 Dup3	-	DGB - Recycled	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	-
BQS DUP 1	-	Blue quarry sand - quarry	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	NA
OGM1	-	Organic garden mix	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0.1
OGM2	-	Organic garden mix	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
OGM3	-	Organic garden mix	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0.1
TU 1	-	Turf underlay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
TU 1 - Lab Replicate	-	Turf underlay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
TU 2	-	Turf underlay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
TU 3	-	Turf underlay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
PBM 1	-	Planter box mix	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
PBM 2	-	Planter box mix	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
PBM 3	-	Planter box mix	0m to <1m	Sand	<25	59	<0.2	<0.5	<1	<3	<1	0
ES1	-	Enviro sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0.2
ES2	-	Enviro sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
ES3	-	Enviro sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
ADS 1	-	ACI Dry Sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
ADS 2	-	ACI Dry Sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
ADS 2 - Lab Replicate	-	ACI Dry Sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
ADS 3	-	ACI Dry Sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
TU DUP1	-	Turf underlay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0.1
PBM DUP1	-	Planter box mix	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
ADS DUP1	-	ACI Dry Sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
Total Number of Samples					41	41	41	41	41	41	41	36
Maximum Value					<PQL	59	<PQL	<PQL	<PQL	<PQL	<PQL	0.4
Concentration above the VAC VALUE												
Concentration above the PQL Bold												
The guideline corresponding to the concentration above the SAC is highlighted in grey in the Site Assessment Criteria Table below												

HSL SOIL ASSESSMENT CRITERIA												
Sample Reference	Sample Depth	Sample Description	Depth Category	Soil Category	C ₆ -C ₁₀ (F1)	>C ₁₀ -C ₁₆ (F2)	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	
DGB20 V1	-	DGB - Recycled	0m to <1m	Sand	45	110	0.5	160	55	40	3	
DGB20 V1 - Lab replicate	-	DGB - Recycled	0m to <1m	Sand	45	110	0.5	160	55	40	3	
DGB20 V2	-	DGB - Recycled	0m to <1m	Sand	45	110	0.5	160	55	40	3	
DGB20 V3	-	DGB - Recycled	0m to <1m	Sand	45	110	0.5	160	55	40	3	
10mm V1	-	10mm agg - Recycled	0m to <1m	Sand	45	110	0.5	160	55	40	3	
10mm V2	-	10mm agg - Recycled	0m to <1m	Sand	45	110	0.5	160	55	40	3	
10mm V3	-	10mm agg - Recycled	0m to <1m	Sand	45	110	0.5	160	55	40	3	
10mm Dup1	-	10mm agg - Recycled	0m to <1m	Sand	45	110	0.5	160	55	40	3	
DGB20 Dup1	-	DGB - Recycled	0m to <1m	Sand	45	110	0.5	160	55	40	3	
10mmD V1	-	10mm drainage - quarry	0m to <1m	Sand	45	110	0.5	160	55	40	3	
10mmD V2	-	10mm drainage - quarry	0m to <1m	Sand	45	110	0.5	160	55	40	3	
BQS V1	-	Blue quarry sand - quarry	0m to <1m	Sand	45	110	0.5	160	55	40	3	
BQS V1 - Lab Replicate	-	Blue quarry sand - quarry	0m to <1m	Sand	45	110	0.5	160	55	40	3	
BQS V2	-	Blue quarry sand - quarry	0m to <1m	Sand	45	110	0.5	160	55	40	3	
DGB20 V4	-	DGB - Recycled	0m to <1m	Sand	45	110	0.5	160	55	40	3	
DGB20 V5	-	DGB - Recycled	0m to <1m	Sand	45	110	0.5	160	55	40	3	
DBG20 V6	-	DGB - Recycled	0m to <1m	Sand	45	110	0.5	160	55	40	3	
DGB20 Dup2	-	DGB - Recycled	0m to <1m	Sand	45	110	0.5	160	55	40	3	
DGB20 V7	-	DGB - Recycled	0m to <1m	Sand	45	110	0.5	160	55	40	3	
DGB20 Dup3	-	DGB - Recycled	0m to <1m	Sand	45	110	0.5	160	55	40	3	
BQS DUP 1	-	Blue quarry sand - quarry	0m to <1m	Sand	45	110	0.5	160	55	40	3	
OGM1	-	Organic garden mix	0m to <1m	Sand	45	110	0.5	160	55	40	3	
OGM2	-	Organic garden mix	0m to <1m	Sand	45	110	0.5	160	55	40	3	
OGM3	-	Organic garden mix	0m to <1m	Sand	45	110	0.5	160	55	40	3	
TU 1	-	Turf underlay	0m to <1m	Sand	45	110	0.5	160	55	40	3	
TU 1 - Lab Replicate	-	Turf underlay	0m to <1m	Sand	45	110	0.5	160	55	40	3	
TU 2	-	Turf underlay	0m to <1m	Sand	45	110	0.5	160	55	40	3	
TU 3	-	Turf underlay	0m to <1m	Sand	45	110	0.5	160	55	40	3	
PBM 1	-	Planter box mix	0m to <1m	Sand	45	110	0.5	160	55	40	3	
PBM 2	-	Planter box mix	0m to <1m	Sand	45	110	0.5	160	55	40	3	
PBM 3	-	Planter box mix	0m to <1m	Sand	45	110	0.5	160	55	40	3	
ES1	-	Enviro sand	0m to <1m	Sand	45	110	0.5	160	55	40	3	
ES2	-	Enviro sand	0m to <1m	Sand	45	110	0.5	160	55	40	3	
ES3	-	Enviro sand	0m to <1m	Sand	45	110	0.5	160	55	40	3	
ADS 1	-	ACI Dry Sand	0m to <1m	Sand	45	110	0.5	160	55	40	3	
ADS 2	-	ACI Dry Sand	0m to <1m	Sand	45	110	0.5	160	55	40	3	
ADS 2 - Lab Replicate	-	ACI Dry Sand	0m to <1m	Sand	45	110	0.5	160	55	40	3	
ADS 3	-	ACI Dry Sand	0m to <1m	Sand	45	110	0.5	160	55	40	3	
TU DUP1	-	Turf underlay	0m to <1m	Sand	45	110	0.5	160	55	40	3	
PBM DUP1	-	Planter box mix	0m to <1m	Sand	45	110	0.5	160	55	40	3	
ADS DUP1	-	ACI Dry Sand	0m to <1m	Sand	45	110	0.5	160	55	40	3	

TABLE A5 SOIL LABORATORY RESULTS COMPARED TO MANAGEMENT LIMITS All data in mg/kg unless stated otherwise						
			C ₆ -C ₁₀ (F1) plus BTEX	>C ₁₀ -C ₁₆ (F2) plus naphthalene	>C ₁₆ -C ₃₄ (F3)	>C ₃₄ -C ₄₀ (F4)
PQL - Envirolab Services			25	50	100	100
NEPM 2013 Land Use Category			RESIDENTIAL, PARKLAND & PUBLIC OPEN SPACE			
Sample Reference	Sample Depth	Soil Texture				
DGB20 V1	-	Coarse	<25	<50	<100	<100
DGB20 V1 - Lab replicate	-	Coarse	<25	<50	<100	<100
DGB20 V2	-	Coarse	<25	<50	<100	<100
DGB20 V3	-	Coarse	<25	<50	100	<100
10mm V1	-	Coarse	<25	<50	<100	<100
10mm V2	-	Coarse	<25	<50	<100	<100
10mm V3	-	Coarse	<25	<50	<100	<100
10mm Dup1	-	Coarse	<25	<50	120	150
DGB20 Dup1	-	Coarse	<25	<50	<100	<100
10mmD V1	-	Coarse	<25	<50	<100	<100
10mmD V2	-	Coarse	<25	<50	<100	<100
BQS V1	-	Coarse	<25	<50	<100	<100
BQS V1 - Lab Replicate	-	Coarse	<25	<50	<100	<100
BQS V2	-	Coarse	<25	<50	<100	<100
DGB20 V4	-	Coarse	<25	<50	190	160
DGB20 V5	-	Coarse	<25	<50	220	190
DBG20 V6	-	Coarse	<25	<50	210	180
DGB20 Dup2	-	Coarse	<25	<50	200	170
DGB20 V7	-	Coarse	<25	<50	240	260
DGB20 Dup3	-	Coarse	<25	<50	170	160
BQS DUP 1	-	Coarse	<25	<50	<100	<100
OGM1	-	Coarse	<25	<50	760	320
OGM2	-	Coarse	<25	<50	1100	400
OGM3	-	Coarse	<25	<50	930	420
TU 1	-	Coarse	<25	<50	320	170
TU 1 - Lab Replicate	-	Coarse	<25	<50	340	200
TU 2	-	Coarse	<25	<50	810	450
TU 3	-	Coarse	<25	<50	520	330
PBM 1	-	Coarse	<25	<50	1300	560
PBM 2	-	Coarse	<25	<50	1300	530
PBM 3	-	Coarse	<25	59	2600	720
ES1	-	Coarse	<25	<50	<100	<100
ES2	-	Coarse	<25	<50	<100	<100
ES3	-	Coarse	<25	<50	<100	<100
ADS 1	-	Coarse	<25	<50	<100	<100
ADS 2	-	Coarse	<25	<50	<100	<100
ADS 2 - Lab Replicate	-	Coarse	<25	<50	<100	<100
ADS 3	-	Coarse	<25	<50	<100	<100
TU DUP1	-	Coarse	<25	<50	380	200
PBM DUP1	-	Coarse	<25	<50	1200	540
ADS DUP1	-	Coarse	<25	<50	<100	<100
Total Number of Samples			41	41	41	41
Maximum Value			<PQL	59	2600	720
Concentration above the VAC			VALUE			
Concentration above the PQL			Bold			

MANAGEMENT LIMIT ASSESSMENT CRITERIA

Sample Reference	Sample Depth	Soil Texture	C ₆ -C ₁₀ (F1) plus BTEX	>C ₁₀ -C ₁₆ (F2) plus naphthalene	>C ₁₆ -C ₃₄ (F3)	>C ₃₄ -C ₄₀ (F4)
DGB20 V1	-	Coarse	700	1000	2500	10000
DGB20 V1 - Lab replicate	-	Coarse	700	1000	2500	10000
DGB20 V2	-	Coarse	700	1000	2500	10000
DGB20 V3	-	Coarse	700	1000	2500	10000
10mm V1	-	Coarse	700	1000	2500	10000
10mm V2	-	Coarse	700	1000	2500	10000
10mm V3	-	Coarse	700	1000	2500	10000
10mm Dup1	-	Coarse	700	1000	2500	10000
DGB20 Dup1	-	Coarse	700	1000	2500	10000
10mmD V1	-	Coarse	700	1000	2500	10000
10mmD V2	-	Coarse	700	1000	2500	10000
BQS V1	-	Coarse	700	1000	2500	10000
BQS V1 - Lab Replicate	-	Coarse	700	1000	2500	10000
BQS V2	-	Coarse	700	1000	2500	10000
DGB20 V4	-	Coarse	700	1000	2500	10000
DGB20 V5	-	Coarse	700	1000	2500	10000
DBG20 V6	-	Coarse	700	1000	2500	10000
DGB20 Dup2	-	Coarse	700	1000	2500	10000
DGB20 V7	-	Coarse	700	1000	2500	10000
DGB20 Dup3	-	Coarse	700	1000	2500	10000
BQS DUP 1	-	Coarse	700	1000	2500	10000
OGM1	-	Coarse	700	1000	2500	10000
OGM2	-	Coarse	700	1000	2500	10000
OGM3	-	Coarse	700	1000	2500	10000
TU 1	-	Coarse	700	1000	2500	10000
TU 1 - Lab Replicate	-	Coarse	700	1000	2500	10000
TU 2	-	Coarse	700	1000	2500	10000
TU 3	-	Coarse	700	1000	2500	10000
PBM 1	-	Coarse	700	1000	2500	10000
PBM 2	-	Coarse	700	1000	2500	10000
PBM 3	-	Coarse	700	1000	2500	10000
ES1	-	Coarse	700	1000	2500	10000
ES2	-	Coarse	700	1000	2500	10000
ES3	-	Coarse	700	1000	2500	10000
ADS 1	-	Coarse	700	1000	2500	10000
ADS 2	-	Coarse	700	1000	2500	10000
ADS 2 - Lab Replicate	-	Coarse	700	1000	2500	10000
ADS 3	-	Coarse	700	1000	2500	10000
TU DUP1	-	Coarse	700	1000	2500	10000
PBM DUP1	-	Coarse	700	1000	2500	10000
ADS DUP1	-	Coarse	700	1000	2500	10000

TABLE A6
SOIL LABORATORY RESULTS COMPARED TO DIRECT CONTACT CRITERIA
All data in mg/kg unless stated otherwise

Analyte		C ₆ -C ₁₀	>C ₁₀ -C ₁₆	>C ₁₆ -C ₃₄	>C ₃₄ -C ₄₀	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	PID
PQL - Envirolab Services		25	50	100	100	0.2	0.5	1	1	1	
CRC 2011 - Direct contact Criteria		4,400	3,300	4,500	6,300	100	14,000	4,500	12,000	1,400	
Site Use		RESIDENTIAL WITH ACCESSIBLE SOIL- DIRECT SOIL CONTACT									
Sample Reference	Sample Depth										
DGB20 V1	-	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0.4
DGB20 V1 - Lab replicate	-	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	-
DGB20 V2	-	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0.1
DGB20 V3	-	<25	<50	100	<100	<0.2	<0.5	<1	<3	<1	0.3
10mm V1	-	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0.1
10mm V2	-	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0.1
10mm V3	-	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0.1
10mm Dup1	-	<25	<50	120	150	<0.2	<0.5	<1	<3	<1	-
DGB20 Dup1	-	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	-
10mmD V1	-	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
10mmD V2	-	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
BQS V1	-	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
BQS V1 - Lab Replicate	-	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
BQS V2	-	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
DGB20 V4	-	<25	<50	190	160	<0.2	<0.5	<1	<3	<1	0
DGB20 V5	-	<25	<50	220	190	<0.2	<0.5	<1	<3	<1	0.1
DBG20 V6	-	<25	<50	210	180	<0.2	<0.5	<1	<3	<1	0.1
DGB20 Dup2	-	<25	<50	200	170	<0.2	<0.5	<1	<3	<1	0
DGB20 V7	-	<25	<50	240	260	<0.2	<0.5	<1	<3	<1	0.2
DGB20 Dup3	-	<25	<50	170	160	<0.2	<0.5	<1	<3	<1	-
BQS DUP 1	-	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	NA
OGM1	-	<25	<50	760	320	<0.2	<0.5	<1	<3	<1	0.1
OGM2	-	<25	<50	1100	400	<0.2	<0.5	<1	<3	<1	0
OGM3	-	<25	<50	930	420	<0.2	<0.5	<1	<3	<1	0.1
TU 1	-	<25	<50	320	170	<0.2	<0.5	<1	<3	<1	0
TU 1 - Lab Replicate	-	<25	<50	340	200	<0.2	<0.5	<1	<3	<1	0
TU 2	-	<25	<50	810	450	<0.2	<0.5	<1	<3	<1	0
TU 3	-	<25	<50	520	330	<0.2	<0.5	<1	<3	<1	0
PBM 1	-	<25	<50	1300	560	<0.2	<0.5	<1	<3	<1	0
PBM 2	-	<25	<50	1300	530	<0.2	<0.5	<1	<3	<1	0
PBM 3	-	<25	59	2600	720	<0.2	<0.5	<1	<3	<1	0
ES1	-	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0.2
ES2	-	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
ES3	-	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
ADS 1	-	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
ADS 2	-	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
ADS 2 - Lab Replicate	-	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
ADS 3	-	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
TU DUP1	-	<25	<50	380	200	<0.2	<0.5	<1	<3	<1	0.1
PBM DUP1	-	<25	<50	1200	540	<0.2	<0.5	<1	<3	<1	0
ADS DUP1	-	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
Total Number of Samples		41	41	41	41	41	41	41	41	41	36
Maximum Value		<PQL	59	2600	720	<PQL	<PQL	<PQL	<PQL	<PQL	0.4
Concentration above the VAC		VALUE									
Concentration above the PQL		Bold									

TABLE A7
SOIL LABORATORY RESULTS COMPARED TO NEPM 2013 EILs AND ESLs
All data in mg/kg unless stated otherwise

Land Use Category				URBAN RESIDENTIAL AND PUBLIC OPEN SPACE																				
				pH	CEC (cmolc/kg)	Clay Content (% clay)	AGED HEAVY METALS-EILs					EILs		ESLs				ESLs						
							Arsenic	Chromium	Copper	Lead	Nickel	Zinc	Naphthalene	DDT	C ₆ -C ₁₀ (F1)	>C ₁₀ -C ₁₆ (F2) plus naphthalene	>C ₁₆ -C ₃₄ (F3)	>C ₃₄ -C ₄₀ (F4)	Benzene	Toluene	Ethylbenzene	Total Xylenes	B(a)P	
PQL - Envirolab Services				-	1	-	4	1	1	1	1	1	1	0.1	25	50	100	100	0.2	0.5	1	1	0.05	
Ambient Background Concentration (ABC)				-	-	-	NSL	13	28	163	5	122	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL
Sample Reference	Sample Depth	Sample Description	Soil Texture																					
DGB20 V1	-	DGB - Recycled	Coarse	6.8	14	NA	<4	10	24	13	6	38	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	0.4	
DGB20 V1 - Lab	-	DGB - Recycled	Coarse	6.8	14	NA	<4	10	20	12	6	33	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	0.73	
DGB20 V2	-	DGB - Recycled	Coarse	6.8	14	NA	<4	8	12	7	5	26	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	0.06	
DGB20 V3	-	DGB - Recycled	Coarse	6.8	14	NA	<4	9	21	15	6	38	<1	<0.1	<25	<50	100	<100	<0.2	<0.5	<1	<3	0.5	
10mm V1	-	10mm agg - Recycled	Coarse	6.8	14	NA	<4	8	5	3	4	10	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05	
10mm V2	-	10mm agg - Recycled	Coarse	6.8	14	NA	<4	3	20	3	2	11	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05	
10mm V3	-	10mm agg - Recycled	Coarse	6.8	14	NA	<4	5	6	3	2	8	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05	
10mm Dup1	-	10mm agg - Recycled	Coarse	6.8	14	NA	<4	12	15	14	4	26	<1	<0.1	<25	<50	120	150	<0.2	<0.5	<1	<3	0.1	
DGB20 Dup1	-	DGB - Recycled	Coarse	6.8	14	NA	<4	9	12	13	6	23	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05	
10mmD V1	-	10mm drainage - quarry	Coarse	6.8	14	NA	<4	2	140	5	4	20	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05	
10mmD V2	-	10mm drainage - quarry	Coarse	6.8	14	NA	<4	2	68	5	4	16	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05	
BQS V1	-	Blue quarry sand -	Coarse	6.8	14	NA	<4	12	4	5	7	37	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05	
BQS V1 - Lab	-	Blue quarry sand -	Coarse	6.8	14	NA	<4	14	4	8	7	41	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05	
BQS V2	-	Blue quarry sand -	Coarse	6.8	14	NA	<4	13	4	5	7	39	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05	
DGB20 V4	-	DGB - Recycled	Coarse	6.8	14	NA	<4	9	16	36	4	71	<1	<0.1	<25	<50	190	160	<0.2	<0.5	<1	<3	0.2	
DGB20 V5	-	DGB - Recycled	Coarse	6.8	14	NA	<4	10	28	19	5	30	<1	<0.1	<25	<50	220	190	<0.2	<0.5	<1	<3	0.2	
DBG20 V6	-	DGB - Recycled	Coarse	6.8	14	NA	<4	8	20	23	4	32	<1	<0.1	<25	<50	210	180	<0.2	<0.5	<1	<3	0.3	
DGB20 Dup2	-	DGB - Recycled	Coarse	6.8	14	NA	<4	8	37	27	5	110	<1	<0.1	<25	<50	200	170	<0.2	<0.5	<1	<3	0.2	
DGB20 V7	-	DGB - Recycled	Coarse	6.8	14	NA	<4	11	24	19	6	45	<1	<0.1	<25	<50	240	260	<0.2	<0.5	<1	<3	0.61	
DGB20 Dup3	-	DGB - Recycled	Coarse	6.8	14	NA	<4	14	20	20	6	43	<1	<0.1	<25	<50	170	160	<0.2	<0.5	<1	<3	0.63	
BQS DUP 1	-	Blue quarry sand -	Coarse	6.8	14	NA	<4	10	4	8	6	44	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05	
OGM1	-	Organic garden mix	Coarse	6.8	14	NA	7	14	61	26	7	100	<1	<0.1	<25	<50	760	320	<0.2	<0.5	<1	<3	0.1	
OGM2	-	Organic garden mix	Coarse	6.8	14	NA	7	19	63	28	6	110	<1	<0.1	<25	<50	1100	400	<0.2	<0.5	<1	<3	0.1	
OGM3	-	Organic garden mix	Coarse	6.8	14	NA	11	21	76	33	9	130	<1	<0.1	<25	<50	930	420	<0.2	<0.5	<1	<3	0.08	
TU 1	-	Turf underlay	Coarse	6.8	14	NA	5	10	19	12	3	35	<1	<0.1	<25	<50	320	170	<0.2	<0.5	<1	<3	0.06	
TU 1 - Lab	-	Turf underlay	Coarse	6.8	14	NA	<4	6	20	11	3	37	<1	<0.1	<25	<50	340	200	<0.2	<0.5	<1	<3	0.07	
TU 2	-	Turf underlay	Coarse	6.8	14	NA	<4	8	21	18	4	44	<1	<0.1	<25	<50	810	450	<0.2	<0.5	<1	<3	0.07	
TU 3	-	Turf underlay	Coarse	6.8	14	NA	<4	8	21	15	3	41	<1	<0.1	<25	<50	520	330	<0.2	<0.5	<1	<3	<0.05	
PBM 1	-	Planter box mix	Coarse	6.8	14	NA	5	15	39	15	4	59	<1	<0.1	<25	<50	1300	560	<0.2	<0.5	<1	<3	0.06	
PBM 2	-	Planter box mix	Coarse	6.8	14	NA	<4	4	16	7	2	27	<1	<0.1	<25	<50	1300	530	<0.2	<0.5	<1	<3	0.06	
PBM 3	-	Planter box mix	Coarse	6.8	14	NA	7	16	46	18	5	71	<1	<0.1	<25	59	2600	720	<0.2	<0.5	<1	<3	0.06	
ES1	-	Enviro sand	Coarse	6.8	14	NA	<4	5	6	14	2	27	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05	
ES2	-	Enviro sand	Coarse	6.8	14	NA	<4	4	5	8	2	44	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	0.06	
ES3	-	Enviro sand	Coarse	6.8	14	NA	<4	4	6	7	2	19	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05	
ADS 1	-	ACI Dry Sand	Coarse	6.8	14	NA	<4	<1	<1	<1	<1	<1	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05	
ADS 2	-	ACI Dry Sand	Coarse	6.8	14	NA	<4	<1	<1	<1	<1	<1	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05	
ADS 2 - Lab	-	ACI Dry Sand	Coarse	6.8	14	NA	<4	1	<1	<1	<1	<1	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05	
ADS 3	-	ACI Dry Sand	Coarse	6.8	14	NA	<4	<1	<1	<1	<1	<1	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05	
TU DUP1	-	Turf underlay	Coarse	6.8	14	NA	<4	9	22	12	3	40	<1	<0.1	<25	<50	380	200	<0.2	<0.5	<1	<3	<0.05	
PBM DUP1	-	Planter box mix	Coarse	6.8	14	NA	<4	2	5	2	<1	10	<1	<0.1	<25	<50	1400	540	<0.2	<0.5	<1	<3	<0.05	
TU 1 - Lab	-	Turf underlay	Coarse	6.8	14	NA	<4	6	17	11	3	34	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
ADS DUP1	-	ACI Dry Sand	Coarse	6.8	14	NA	<4	1	<1	<1	<1	2	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05	
Total Number of Samples				42	42	0	42	42	42	42	42	42	41	41	41	41	41	41	41	41	41	41	41	
Maximum Value				6.8	14	NA	11	21	140	36	9	130	<PQL	<PQL	<PQL	59	2600	720	<PQL	<PQL	<PQL	<PQL	0.73	

Concentration above the VAC
Concentration above the PQL
The guideline corresponding to the elevated value is highlighted in grey in the EIL and ESL Assessment Criteria Table below

EIL AND ESL ASSESSMENT CRITERIA

Sample Reference	Sample Depth	Sample Description	Soil Texture	pH	CEC (cmolc/kg)	Clay Content (% clay)	Arsenic	Chromium	Copper	Lead	Nickel	Zinc	Naphthalene	DDT	C ₆ -C ₁₀ (F1)	>C ₁₀ -C ₁₆ (F2) plus naphthalene	>C ₁₆ -C ₃₄ (F3)	>C ₃₄ -C ₄₀ (F4)	Benzene	Toluene	Ethylbenzene	Total Xylenes	B(a)P
DGB20 V1	-	DGB - Recycled	Coarse	6.8	14	NA	100	200	240	1300	280	820	170	180	180	120	300	2800	50	85	70	105	20
DGB20 V1 - Lab replicate	-	DGB - Recycled	Coarse	6.8	14	NA	100	200	240	1300	280	820	170	180	180	120	300	2800	50	85	70	105	20
DGB20 V2	-	DGB - Recycled	Coarse	6.8	14	NA	100	200	240	1300	280	820	170	180	180	120	300	2800	50	85	70	105	20
DGB20 V3	-	DGB - Recycled	Coarse	6.8	14	NA	100	200	240	1300	280	820	170	180	180	120	300	2800	50	85	70	105	20
10mm V1	-	10mm agg - Recycled	Coarse	6.8	14	NA	100	200	240	1300	280	820	170	180	180	120	300	2800	50	85	70	105	20
10mm V2	-	10mm agg - Recycled	Coarse	6.8	14	NA	100	200	240	1300	280	820	170	180	180	120	300	2800	50	85	70	105	20
10mm V3	-	10mm agg - Recycled	Coarse	6.8	14	NA	100	200	240	1300	280	820	170	180	180	120	300	2800	50	85	70	105	20
10mm Dup1	-	10mm agg - Recycled	Coarse	6.8	14	NA	100	200	240	1300	280	820	170	180	180	120	300	2800	50	85	70	105	20
DGB20 Dup1	-	DGB - Recycled	Coarse	6.8	14	NA	100	200	240	1300	280	820	170	180	180	120	300	2800	50	85	70	105	20
10mmD V1	-	10mm drainage - quarry	Coarse	6.8	14	NA	100	200	240	1300	280	820	170	180	180	120	300	2800	50	85	70	105	20

Result outside of QA/QC acceptance criteria	
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I2 – Laboratory Reports

Lab report	Notes
226430	DGB20 and 10mm aggregate validation samples (sampled at source)
227117	10mm quarry product from Albion Park Quarry (sampled at source)
227096	Blue Quarry Sand from Rooty Hill Distribution Centre (sampled on site)
230174	DGB20 aggregate validation samples (sampled at source)
232233	DGB20 aggregate validation samples (sampled at source) – lab made error and did not send duplicate to secondary laboratory
255960	Organic Garden Mix – Imported Materials
255959	Imported landscaping materials (planter box mix, enviro sand, turf underlay, ACI dry kiln sand)
Inter-lab	Notes
18464	Inter-lab of Blue Quarry Sand from Rooty Hill Distribution Centre (227096)
23415	Inter-lab of imported landscaping materials (255959)

CERTIFICATE OF ANALYSIS 226430

Client Details

Client	Environmental Investigation Services
Attention	Brendan Page
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	<u>E30104P, Metropolitan Demolitions & Recycling St P</u>
Number of Samples	10 soil
Date samples received	18/09/2019
Date completed instructions received	18/09/2019

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.
 Samples were analysed as received from the client. Results relate specifically to the samples as received.
 Results are reported on a dry weight basis for solids and on an as received basis for other matrices.
Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	19/09/2019
Date of Issue	19/09/2019
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Asbestos Approved By

Analysed by Asbestos Approved Identifier: Aida Marner
 Authorised by Asbestos Approved Signatory: Lucy Zhu

Results Approved By

Jaimie Loa-Kum-Cheung, Metals Supervisor
 Josh Williams, Chemist
 Lucy Zhu, Senior Asbestos Analyst
 Steven Luong, Organics Supervisor

Authorised By



Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil

Our Reference		226430-1	226430-2	226430-3	226430-4	226430-5
Your Reference	UNITS	DGB20 V1	DGB20 V2	DGB20 V3	DGB20 Dup1	10mm V1
Date Sampled		18/09/2019	18/09/2019	18/09/2019	18/09/2019	18/09/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	18/09/2019	18/09/2019	18/09/2019	18/09/2019	18/09/2019
Date analysed	-	19/09/2019	19/09/2019	19/09/2019	19/09/2019	19/09/2019
TRH C ₆ - C ₉	mg/kg	<25	<25	<25	<25	<25
TRH C ₆ - C ₁₀	mg/kg	<25	<25	<25	<25	<25
vTPH C ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<3	<3	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	98	86	85	91	94

vTRH(C6-C10)/BTEXN in Soil

Our Reference		226430-6	226430-7	226430-8
Your Reference	UNITS	10mm V2	10mm V3	10mm Dup1
Date Sampled		18/09/2019	18/09/2019	18/09/2019
Type of sample		soil	soil	soil
Date extracted	-	18/09/2019	18/09/2019	18/09/2019
Date analysed	-	19/09/2019	19/09/2019	19/09/2019
TRH C ₆ - C ₉	mg/kg	<25	<25	<25
TRH C ₆ - C ₁₀	mg/kg	<25	<25	<25
vTPH C ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1
Total +ve Xylenes	mg/kg	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	75	87	87

svTRH (C10-C40) in Soil						
Our Reference		226430-1	226430-2	226430-3	226430-4	226430-5
Your Reference	UNITS	DGB20 V1	DGB20 V2	DGB20 V3	DGB20 Dup1	10mm V1
Date Sampled		18/09/2019	18/09/2019	18/09/2019	18/09/2019	18/09/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	18/09/2019	18/09/2019	18/09/2019	18/09/2019	18/09/2019
Date analysed	-	18/09/2019	18/09/2019	18/09/2019	19/09/2019	19/09/2019
TRH C ₁₀ - C ₁₄	mg/kg	<50	<50	<50	<50	<50
TRH C ₁₅ - C ₂₈	mg/kg	<100	<100	<100	<100	<100
TRH C ₂₉ - C ₃₆	mg/kg	<100	<100	<100	<100	<100
TRH >C ₁₀ -C ₁₆	mg/kg	<50	<50	<50	<50	<50
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C ₁₆ -C ₃₄	mg/kg	<100	<100	100	<100	<100
TRH >C ₃₄ -C ₄₀	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	100	<50	<50
Surrogate o-Terphenyl	%	83	86	86	88	92

svTRH (C10-C40) in Soil				
Our Reference		226430-6	226430-7	226430-8
Your Reference	UNITS	10mm V2	10mm V3	10mm Dup1
Date Sampled		18/09/2019	18/09/2019	18/09/2019
Type of sample		soil	soil	soil
Date extracted	-	18/09/2019	18/09/2019	18/09/2019
Date analysed	-	19/09/2019	19/09/2019	19/09/2019
TRH C ₁₀ - C ₁₄	mg/kg	<50	<50	<50
TRH C ₁₅ - C ₂₈	mg/kg	<100	<100	<100
TRH C ₂₉ - C ₃₆	mg/kg	<100	<100	130
TRH >C ₁₀ -C ₁₆	mg/kg	<50	<50	<50
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	<50
TRH >C ₁₆ -C ₃₄	mg/kg	<100	<100	120
TRH >C ₃₄ -C ₄₀	mg/kg	<100	<100	150
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	260
Surrogate o-Terphenyl	%	86	81	86

PAHs in Soil						
Our Reference		226430-1	226430-2	226430-3	226430-4	226430-5
Your Reference	UNITS	DGB20 V1	DGB20 V2	DGB20 V3	DGB20 Dup1	10mm V1
Date Sampled		18/09/2019	18/09/2019	18/09/2019	18/09/2019	18/09/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	18/09/2019	18/09/2019	18/09/2019	18/09/2019	18/09/2019
Date analysed	-	19/09/2019	19/09/2019	19/09/2019	19/09/2019	19/09/2019
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	0.2	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	0.2	<0.1	<0.1
Phenanthrene	mg/kg	0.7	<0.1	1.3	<0.1	<0.1
Anthracene	mg/kg	0.2	<0.1	0.5	<0.1	<0.1
Fluoranthene	mg/kg	1	0.1	1.3	<0.1	<0.1
Pyrene	mg/kg	0.9	0.1	1.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	0.4	<0.1	0.5	<0.1	<0.1
Chrysene	mg/kg	0.4	<0.1	0.5	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	0.6	<0.2	0.7	<0.2	<0.2
Benzo(a)pyrene	mg/kg	0.4	0.06	0.5	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	0.2	<0.1	0.2	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	0.2	<0.1	0.2	<0.1	<0.1
Total +ve PAH's	mg/kg	5.2	0.3	7.0	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	0.5	<0.5	0.6	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	0.6	<0.5	0.7	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	0.6	<0.5	0.7	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	91	86	85	92	92

PAHs in Soil				
Our Reference		226430-6	226430-7	226430-8
Your Reference	UNITS	10mm V2	10mm V3	10mm Dup1
Date Sampled		18/09/2019	18/09/2019	18/09/2019
Type of sample		soil	soil	soil
Date extracted	-	18/09/2019	18/09/2019	18/09/2019
Date analysed	-	19/09/2019	19/09/2019	19/09/2019
Naphthalene	mg/kg	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	0.2	0.1
Pyrene	mg/kg	<0.1	0.1	0.2
Benzo(a)anthracene	mg/kg	<0.1	<0.1	0.1
Chrysene	mg/kg	<0.1	<0.1	0.3
Benzo(b,j,k)fluoranthene	mg/kg	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	0.1
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	0.3
Total +ve PAH's	mg/kg	<0.05	0.3	1.1
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5
Surrogate <i>p</i> -Terphenyl-d14	%	90	92	86

Organochlorine Pesticides in soil						
Our Reference		226430-1	226430-2	226430-3	226430-4	226430-5
Your Reference	UNITS	DGB20 V1	DGB20 V2	DGB20 V3	DGB20 Dup1	10mm V1
Date Sampled		18/09/2019	18/09/2019	18/09/2019	18/09/2019	18/09/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	18/09/2019	18/09/2019	18/09/2019	18/09/2019	18/09/2019
Date analysed	-	18/09/2019	18/09/2019	18/09/2019	18/09/2019	18/09/2019
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	96	94	94	93	96

Organochlorine Pesticides in soil				
Our Reference		226430-6	226430-7	226430-8
Your Reference	UNITS	10mm V2	10mm V3	10mm Dup1
Date Sampled		18/09/2019	18/09/2019	18/09/2019
Type of sample		soil	soil	soil
Date extracted	-	18/09/2019	18/09/2019	18/09/2019
Date analysed	-	18/09/2019	18/09/2019	18/09/2019
HCB	mg/kg	0.3	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1
Surrogate TCMX	%	96	95	94

Organophosphorus Pesticides						
Our Reference		226430-1	226430-2	226430-3	226430-4	226430-5
Your Reference	UNITS	DGB20 V1	DGB20 V2	DGB20 V3	DGB20 Dup1	10mm V1
Date Sampled		18/09/2019	18/09/2019	18/09/2019	18/09/2019	18/09/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	18/09/2019	18/09/2019	18/09/2019	18/09/2019	18/09/2019
Date analysed	-	18/09/2019	18/09/2019	18/09/2019	18/09/2019	18/09/2019
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	96	94	94	93	96

Organophosphorus Pesticides				
Our Reference		226430-6	226430-7	226430-8
Your Reference	UNITS	10mm V2	10mm V3	10mm Dup1
Date Sampled		18/09/2019	18/09/2019	18/09/2019
Type of sample		soil	soil	soil
Date extracted	-	18/09/2019	18/09/2019	18/09/2019
Date analysed	-	18/09/2019	18/09/2019	18/09/2019
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1
Chlorpyrifos	mg/kg	<0.1	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1
Surrogate TCMX	%	96	95	94

PCBs in Soil						
Our Reference		226430-1	226430-2	226430-3	226430-4	226430-5
Your Reference	UNITS	DGB20 V1	DGB20 V2	DGB20 V3	DGB20 Dup1	10mm V1
Date Sampled		18/09/2019	18/09/2019	18/09/2019	18/09/2019	18/09/2019
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	18/09/2019	18/09/2019	18/09/2019	18/09/2019	18/09/2019
Date analysed	-	18/09/2019	18/09/2019	18/09/2019	18/09/2019	18/09/2019
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	96	94	94	93	96

PCBs in Soil				
Our Reference		226430-6	226430-7	226430-8
Your Reference	UNITS	10mm V2	10mm V3	10mm Dup1
Date Sampled		18/09/2019	18/09/2019	18/09/2019
Type of sample		soil	soil	soil
Date extracted	-	18/09/2019	18/09/2019	18/09/2019
Date analysed	-	18/09/2019	18/09/2019	18/09/2019
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1
Surrogate TCMX	%	96	95	94

Acid Extractable metals in soil

Our Reference		226430-1	226430-2	226430-3	226430-4	226430-5
Your Reference	UNITS	DGB20 V1	DGB20 V2	DGB20 V3	DGB20 Dup1	10mm V1
Date Sampled		18/09/2019	18/09/2019	18/09/2019	18/09/2019	18/09/2019
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	18/09/2019	18/09/2019	18/09/2019	18/09/2019	18/09/2019
Date analysed	-	18/09/2019	18/09/2019	18/09/2019	18/09/2019	18/09/2019
Arsenic	mg/kg	<4	<4	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	10	8	9	9	8
Copper	mg/kg	24	12	21	12	5
Lead	mg/kg	13	7	15	13	3
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	6	5	6	6	4
Zinc	mg/kg	38	26	38	23	10

Acid Extractable metals in soil

Our Reference		226430-6	226430-7	226430-8
Your Reference	UNITS	10mm V2	10mm V3	10mm Dup1
Date Sampled		18/09/2019	18/09/2019	18/09/2019
Type of sample		soil	soil	soil
Date prepared	-	18/09/2019	18/09/2019	18/09/2019
Date analysed	-	18/09/2019	18/09/2019	18/09/2019
Arsenic	mg/kg	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4
Chromium	mg/kg	3	5	12
Copper	mg/kg	20	6	15
Lead	mg/kg	3	3	14
Mercury	mg/kg	<0.1	<0.1	<0.1
Nickel	mg/kg	2	2	4
Zinc	mg/kg	11	8	26

Moisture						
Our Reference		226430-1	226430-2	226430-3	226430-4	226430-5
Your Reference	UNITS	DGB20 V1	DGB20 V2	DGB20 V3	DGB20 Dup1	10mm V1
Date Sampled		18/09/2019	18/09/2019	18/09/2019	18/09/2019	18/09/2019
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	18/09/2019	18/09/2019	18/09/2019	18/09/2019	18/09/2019
Date analysed	-	19/09/2019	19/09/2019	19/09/2019	19/09/2019	19/09/2019
Moisture	%	0.6	11	13	14	10

Moisture				
Our Reference		226430-6	226430-7	226430-8
Your Reference	UNITS	10mm V2	10mm V3	10mm Dup1
Date Sampled		18/09/2019	18/09/2019	18/09/2019
Type of sample		soil	soil	soil
Date prepared	-	18/09/2019	18/09/2019	18/09/2019
Date analysed	-	19/09/2019	19/09/2019	19/09/2019
Moisture	%	8.2	7.3	6.9

Asbestos ID - soils						
Our Reference	UNITS	226430-1	226430-2	226430-3	226430-5	226430-6
Your Reference		DGB20 V1	DGB20 V2	DGB20 V3	10mm V1	10mm V2
Date Sampled		18/09/2019	18/09/2019	18/09/2019	18/09/2019	18/09/2019
Type of sample		soil	soil	soil	soil	soil
Date analysed	-	19/09/2019	19/09/2019	19/09/2019	19/09/2019	19/09/2019
Sample mass tested	g	Approx. 70g	Approx. 70g	Approx. 60g	Approx. 65g	Approx. 70g
Sample Description	-	Grey coarse-grained soil & rocks	Grey coarse-grained soil & rocks	Grey coarse-grained soil & rocks	Grey coarse-grained soil & rocks	Grey coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils		
Our Reference	UNITS	226430-7
Your Reference		10mm V3
Date Sampled		18/09/2019
Type of sample		soil
Date analysed	-	19/09/2019
Sample mass tested	g	Approx. 55g
Sample Description	-	Grey coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-008	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.

Method ID	Methodology Summary
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ PQL' values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero' values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL' values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

Client Reference: E30104P, Metropolitan Demolitions & Recycling St P

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-13	226430-2
Date extracted	-			18/09/2019	1	18/09/2019	18/09/2019		18/09/2019	18/09/2019
Date analysed	-			19/09/2019	1	19/09/2019	19/09/2019		19/09/2019	19/09/2019
TRH C ₆ - C ₉	mg/kg	25	Org-016	<25	1	<25	<25	0	87	99
TRH C ₆ - C ₁₀	mg/kg	25	Org-016	<25	1	<25	<25	0	87	99
Benzene	mg/kg	0.2	Org-016	<0.2	1	<0.2	<0.2	0	70	79
Toluene	mg/kg	0.5	Org-016	<0.5	1	<0.5	<0.5	0	80	91
Ethylbenzene	mg/kg	1	Org-016	<1	1	<1	<1	0	97	111
m+p-xylene	mg/kg	2	Org-016	<2	1	<2	<2	0	94	108
o-Xylene	mg/kg	1	Org-016	<1	1	<1	<1	0	91	106
naphthalene	mg/kg	1	Org-014	<1	1	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	83	1	98	76	25	81	93

Client Reference: E30104P, Metropolitan Demolitions & Recycling St P

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-13	226430-2
Date extracted	-			18/09/2019	1	18/09/2019	18/09/2019		18/09/2019	18/09/2019
Date analysed	-			18/09/2019	1	18/09/2019	18/09/2019		18/09/2019	18/09/2019
TRH C ₁₀ - C ₁₄	mg/kg	50	Org-003	<50	1	<50	<50	0	90	76
TRH C ₁₅ - C ₂₈	mg/kg	100	Org-003	<100	1	<100	<100	0	80	74
TRH C ₂₉ - C ₃₆	mg/kg	100	Org-003	<100	1	<100	<100	0	91	106
TRH >C ₁₀ -C ₁₆	mg/kg	50	Org-003	<50	1	<50	<50	0	90	76
TRH >C ₁₆ -C ₃₄	mg/kg	100	Org-003	<100	1	<100	<100	0	80	74
TRH >C ₃₄ -C ₄₀	mg/kg	100	Org-003	<100	1	<100	<100	0	91	106
Surrogate o-Terphenyl	%		Org-003	82	1	83	82	1	102	88

Client Reference: E30104P, Metropolitan Demolitions & Recycling St P

QUALITY CONTROL: PAHs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-13	226430-2
Date extracted	-			18/09/2019	1	18/09/2019	18/09/2019		18/09/2019	18/09/2019
Date analysed	-			19/09/2019	1	19/09/2019	19/09/2019		19/09/2019	19/09/2019
Naphthalene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	106	98
Acenaphthylene	mg/kg	0.1	Org-012	<0.1	1	0.1	0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	100	98
Phenanthrene	mg/kg	0.1	Org-012	<0.1	1	0.7	0.7	0	94	89
Anthracene	mg/kg	0.1	Org-012	<0.1	1	0.2	0.2	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	<0.1	1	1	1.2	18	96	95
Pyrene	mg/kg	0.1	Org-012	<0.1	1	0.9	1.2	29	98	97
Benzo(a)anthracene	mg/kg	0.1	Org-012	<0.1	1	0.4	0.7	55	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	<0.1	1	0.4	0.6	40	100	98
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	<0.2	1	0.6	1	50	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	<0.05	1	0.4	0.73	58	106	99
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	<0.1	1	0.2	0.3	40	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	<0.1	1	0.2	0.4	67	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	94	1	91	86	6	90	84

Client Reference: E30104P, Metropolitan Demolitions & Recycling St P

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-13	226430-2
Date extracted	-			18/09/2019	1	18/09/2019	18/09/2019		18/09/2019	18/09/2019
Date analysed	-			18/09/2019	1	18/09/2019	18/09/2019		18/09/2019	18/09/2019
HCB	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	100	#
gamma-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	96	103
Heptachlor	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	84	98
delta-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	104	107
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	100	105
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	107	104
Dieldrin	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	119	125
Endrin	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	97	106
pp-DDD	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	98	101
Endosulfan II	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	97	#
Methoxychlor	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-005	97	1	96	95	1	90	89

Client Reference: E30104P, Metropolitan Demolitions & Recycling St P

QUALITY CONTROL: Organophosphorus Pesticides					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-13	226430-2
Date extracted	-			18/09/2019	1	18/09/2019	18/09/2019		18/09/2019	18/09/2019
Date analysed	-			18/09/2019	1	18/09/2019	18/09/2019		18/09/2019	18/09/2019
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	93	91
Chlorpyrifos-methyl	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	98	101
Dimethoate	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	92	95
Fenitrothion	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	102	96
Malathion	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	110	70
Parathion	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	108	103
Ronnel	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	95	92
Surrogate TCMX	%		Org-008	97	1	96	95	1	90	88

Client Reference: E30104P, Metropolitan Demolitions & Recycling St P

QUALITY CONTROL: PCBs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-13	226430-2
Date extracted	-			18/09/2019	1	18/09/2019	18/09/2019		18/09/2019	18/09/2019
Date analysed	-			18/09/2019	1	18/09/2019	18/09/2019		18/09/2019	18/09/2019
Aroclor 1016	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	111	113
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-006	97	1	96	95	1	90	88

Client Reference: E30104P, Metropolitan Demolitions & Recycling St P

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-13	226430-2
Date prepared	-			18/09/2019	1	18/09/2019	18/09/2019		18/09/2019	18/09/2019
Date analysed	-			18/09/2019	1	18/09/2019	18/09/2019		18/09/2019	18/09/2019
Arsenic	mg/kg	4	Metals-020	<4	1	<4	<4	0	106	84
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	100	71
Chromium	mg/kg	1	Metals-020	<1	1	10	10	0	108	77
Copper	mg/kg	1	Metals-020	<1	1	24	20	18	104	89
Lead	mg/kg	1	Metals-020	<1	1	13	12	8	116	78
Mercury	mg/kg	0.1	Metals-021	<0.1	1	<0.1	<0.1	0	85	81
Nickel	mg/kg	1	Metals-020	<1	1	6	6	0	97	73
Zinc	mg/kg	1	Metals-020	<1	1	38	33	14	109	70

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.
Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.	

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Report Comments

Asbestos: Excessive sample volume was provided for asbestos analysis. A portion of the supplied sample was sub-sampled according to Envirolab procedures. We cannot guarantee that this sub-sample is indicative of the entire sample. Envirolab recommends supplying 40-50g (50mL) of sample in its own container as per AS4964-2004.

Note: Samples were sub-sampled from bags provided by the client.

PAHs in Soil - The RPD for duplicate results is accepted due to the non homogenous nature of samples 226430-1.

OC's in Soil - # Percent recovery for the surrogate/matrix spike is not possible to report due to interference from analytes (other than those being tested) in sample/s 226430-2ms.

SAMPLE RECEIPT ADVICE

Client Details

Client	Environmental Investigation Services
Attention	Brendan Page

Sample Login Details

Your reference	E30104P, Metropolitan Demolitions & Recycling St P
Envirolab Reference	226430
Date Sample Received	18/09/2019
Date Instructions Received	18/09/2019
Date Results Expected to be Reported	19/09/2019

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	10 soil
Turnaround Time Requested	1 day
Temperature on Receipt (°C)	12.7
Cooling Method	Ice
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	Phone: 02 9910 6200
Fax: 02 9910 6201	Fax: 02 9910 6201
Email: ahie@envirolab.com.au	Email: jhurst@envirolab.com.au

Analysis Underway, details on the following page:



EnviroLab Services Pty Ltd

ABN 37 112 535 645

12 Ashley St Chatswood NSW 2067

ph 02 9910 6200 fax 02 9910 6201

customerservice@envirolab.com.au

www.envirolab.com.au

Sample ID	VTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides	PCBs in Soil	Acid Extractable metals in soil	Asbestos ID - soils	On Hold
DGB20 V1	✓	✓	✓	✓	✓	✓	✓	✓	
DGB20 V2	✓	✓	✓	✓	✓	✓	✓	✓	
DGB20 V3	✓	✓	✓	✓	✓	✓	✓	✓	
DGB20 Dup1	✓	✓	✓	✓	✓	✓	✓		
10mm V1	✓	✓	✓	✓	✓	✓	✓	✓	
10mm V2	✓	✓	✓	✓	✓	✓	✓	✓	
10mm V3	✓	✓	✓	✓	✓	✓	✓	✓	
10mm Dup1	✓	✓	✓	✓	✓	✓	✓		
DGB20 V4									✓
DGB20 V5									✓

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.

Requests for longer term sample storage must be received in writing.

Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.

TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

SAMPLE AND CHAIN OF CUSTODY FORM

TO: ENVIROLAB SERVICES PTY LTD 12 ASHLEY STREET CHATSWOOD NSW 2067 P: (02) 99106200 F: (02) 99106201 Attention: Aileen	EIS Job E30104P Number: Date Results <u>URGENT (24 Hour)</u> Required: Page: 1 of 1	FROM:  JK Environments REAR OF 115 WICKS ROAD MACQUARIE PARK, NSW 2113 P: 02-9888 5000 F: 02-9888 5001 Attention: <u>Brendan Page</u>
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Location: Metropolitan Demolitions & Recycling, St Peters (Penshurst PS)							Sample Preserved in Esky on Ice									
Sampler: SW							Tests Required									
Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	Combo 2	Combo 3a	Combo 6	Combo 6a	8 Metals	PAHs	TRH/BTEX	BTEX	Asbestos	
18/09/2019	1	DGB20 V1	—	G, A	0.4	S. Sandy (Gravel)				X						
18/09/2019	2	DGB20 V2	—	G, A	0.1					X						
18/09/2019	3	DGB20 V3	—	G, A	0.3					X						
18/09/2019	4	DGB20 Dup1	—	G	—	↓			X							
18/09/2019	5	10mm V1	—	G, A	0.1	Gravel				X						
18/09/2019	6	10mm V2	—	G, A	0.1	↓				X						
18/09/2019	7	10mm V3	—	G, A	0.1	↓				X						
18/09/2019	8	10mm Dup1	—	G	—	↓			X							
↓	9	DGB20 V4	—	G, A	0.3	S. Sandy (Gravel)										X
↓	10	DGB20 V5	—	G, A	0.1	↓										X


Envirolab Services
 12 Ashley St
 Chatswood NSW 2067
 Ph: (02) 9910 6200
Job No: 226430
Date Received: 18/9/19
Time Received: 15:43
Received by: MD
Temp: Eco/Ambient
Cooling: Ice/ice pack
Security: Intact/Broken/None
Michael Oke

Remarks (comments/detection limits required):		Sample Containers: G - 250mg Glass Jar A - Ziplock Asbestos Bag (500ml) P - Plastic Bag	
Relinquished By: S. WARD	Date: 18 SEP 19	Time:	Received By: Date:

CERTIFICATE OF ANALYSIS 227117

Client Details

Client	Environmental Investigation Services
Attention	Brendan Page
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	<u>E30104P, Penshurst Albion Park</u>
Number of Samples	4 soil
Date samples received	27/09/2019
Date completed instructions received	27/09/2019

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	30/09/2019
Date of Issue	30/09/2019
NATA Accreditation Number 2901. This document shall not be reproduced except in full.	
Accredited for compliance with ISO/IEC 17025 - Testing. Tests not covered by NATA are denoted with *	

Asbestos Approved By

Analysed by Asbestos Approved Identifier: Lucy Zhu
 Authorised by Asbestos Approved Signatory: Lucy Zhu

Results Approved By

Jaimie Loa-Kum-Cheung, Metals Supervisor
 Josh Williams, Chemist
 Lucy Zhu, Senior Asbestos Analyst
 Steven Luong, Organics Supervisor

Authorised By



Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil			
Our Reference		227117-1	227117-2
Your Reference	UNITS	10mmD V1	10mmD V2
Date Sampled		25/09/2019	25/09/2019
Type of sample		soil	soil
Date extracted	-	27/09/2019	27/09/2019
Date analysed	-	28/09/2019	28/09/2019
TRH C ₆ - C ₉	mg/kg	<25	<25
TRH C ₆ - C ₁₀	mg/kg	<25	<25
vTPH C ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25
Benzene	mg/kg	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1
m+p-xylene	mg/kg	<2	<2
o-Xylene	mg/kg	<1	<1
naphthalene	mg/kg	<1	<1
Total +ve Xylenes	mg/kg	<3	<3
Surrogate aaa-Trifluorotoluene	%	87	88

svTRH (C10-C40) in Soil			
Our Reference		227117-1	227117-2
Your Reference	UNITS	10mmD V1	10mmD V2
Date Sampled		25/09/2019	25/09/2019
Type of sample		soil	soil
Date extracted	-	27/09/2019	27/09/2019
Date analysed	-	29/09/2019	29/09/2019
TRH C ₁₀ - C ₁₄	mg/kg	<50	<50
TRH C ₁₅ - C ₂₈	mg/kg	<100	<100
TRH C ₂₉ - C ₃₆	mg/kg	<100	<100
TRH >C ₁₀ -C ₁₆	mg/kg	<50	<50
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50
TRH >C ₁₆ -C ₃₄	mg/kg	<100	<100
TRH >C ₃₄ -C ₄₀	mg/kg	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50
Surrogate o-Terphenyl	%	80	76

PAHs in Soil			
Our Reference		227117-1	227117-2
Your Reference	UNITS	10mmD V1	10mmD V2
Date Sampled		25/09/2019	25/09/2019
Type of sample		soil	soil
Date extracted	-	27/09/2019	27/09/2019
Date analysed	-	27/09/2019	27/09/2019
Naphthalene	mg/kg	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5
Surrogate <i>p</i> -Terphenyl-d14	%	99	98

Organochlorine Pesticides in soil			
Our Reference		227117-1	227117-2
Your Reference	UNITS	10mmD V1	10mmD V2
Date Sampled		25/09/2019	25/09/2019
Type of sample		soil	soil
Date extracted	-	27/09/2019	27/09/2019
Date analysed	-	28/09/2019	28/09/2019
HCB	mg/kg	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1
Surrogate TCMX	%	103	106

Organophosphorus Pesticides in Soil			
Our Reference		227117-1	227117-2
Your Reference	UNITS	10mmD V1	10mmD V2
Date Sampled		25/09/2019	25/09/2019
Type of sample		soil	soil
Date extracted	-	27/09/2019	27/09/2019
Date analysed	-	28/09/2019	28/09/2019
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1
Chlorpyrifos	mg/kg	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1
Surrogate TCMX	%	103	106

PCBs in Soil			
Our Reference		227117-1	227117-2
Your Reference	UNITS	10mmD V1	10mmD V2
Date Sampled		25/09/2019	25/09/2019
Type of sample		soil	soil
Date extracted	-	27/09/2019	27/09/2019
Date analysed	-	28/09/2019	28/09/2019
Aroclor 1016	mg/kg	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1
Surrogate TCMX	%	103	106

Acid Extractable metals in soil			
Our Reference		227117-1	227117-2
Your Reference	UNITS	10mmD V1	10mmD V2
Date Sampled		25/09/2019	25/09/2019
Type of sample		soil	soil
Date prepared	-	27/09/2019	27/09/2019
Date analysed	-	27/09/2019	27/09/2019
Arsenic	mg/kg	<4	<4
Cadmium	mg/kg	<0.4	<0.4
Chromium	mg/kg	2	2
Copper	mg/kg	140	68
Lead	mg/kg	5	5
Mercury	mg/kg	<0.1	<0.1
Nickel	mg/kg	4	4
Zinc	mg/kg	20	16

Moisture			
Our Reference		227117-1	227117-2
Your Reference	UNITS	10mmD V1	10mmD V2
Date Sampled		25/09/2019	25/09/2019
Type of sample		soil	soil
Date prepared	-	27/09/2019	27/09/2019
Date analysed	-	30/09/2019	30/09/2019
Moisture	%	4.6	4.9

Asbestos ID - soils NEPM - ASB-001

Our Reference		227117-1	227117-2
Your Reference	UNITS	10mmD V1	10mmD V2
Date Sampled		25/09/2019	25/09/2019
Type of sample		soil	soil
Date analysed	-	29/09/2019	29/09/2019
Sample mass tested	g	891.16	902.79
Sample Description	-	Grey aggregate	Grey aggregate
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg
		Organic fibres detected	Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected
Total Asbestos ^{#1}	g/kg	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	—	—
FA and AF Estimation*	g	—	—
ACM >7mm Estimation*	%(w/w)	<0.01	<0.01
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
ASB-001	Asbestos ID - Identification of asbestos in soil samples using Polarised Light Microscopy and Dispersion Staining Techniques. Minimum 500mL soil sample was analysed as recommended by "National Environment Protection (Assessment of site contamination) Measure, Schedule B1 and "The Guidelines from the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia - May 2009" with a reporting limit of 0.1g/kg (0.01% w/w) as per Australian Standard AS4964-2004. Results reported denoted with * are outside our scope of NATA accreditation. NOTE #1 Total Asbestos g/kg was analysed and reported as per Australian Standard AS4964 (This is the sum of ACM >7mm, <7mm and FA/AF) NOTE #2 The screening level of 0.001% w/w asbestos in soil for FA and AF only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres. Estimation = Estimated asbestos weight Results reported with "--" is equivalent to no visible asbestos identified using Polarised Light microscopy and Dispersion Staining Techniques.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.

Method ID	Methodology Summary
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-008	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ PQL' values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero' values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL' values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-16	[NT]
Date extracted	-			27/09/2019	[NT]	[NT]	[NT]	[NT]	27/09/2019	[NT]
Date analysed	-			28/09/2019	[NT]	[NT]	[NT]	[NT]	28/09/2019	[NT]
TRH C ₆ - C ₉	mg/kg	25	Org-016	<25	[NT]	[NT]	[NT]	[NT]	109	[NT]
TRH C ₆ - C ₁₀	mg/kg	25	Org-016	<25	[NT]	[NT]	[NT]	[NT]	109	[NT]
Benzene	mg/kg	0.2	Org-016	<0.2	[NT]	[NT]	[NT]	[NT]	116	[NT]
Toluene	mg/kg	0.5	Org-016	<0.5	[NT]	[NT]	[NT]	[NT]	112	[NT]
Ethylbenzene	mg/kg	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	107	[NT]
m+p-xylene	mg/kg	2	Org-016	<2	[NT]	[NT]	[NT]	[NT]	105	[NT]
o-Xylene	mg/kg	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	106	[NT]
naphthalene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	70	[NT]	[NT]	[NT]	[NT]	91	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-16	[NT]
Date extracted	-			27/09/2019	[NT]	[NT]	[NT]	[NT]	27/09/2019	[NT]
Date analysed	-			29/09/2019	[NT]	[NT]	[NT]	[NT]	29/09/2019	[NT]
TRH C ₁₀ - C ₁₄	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	115	[NT]
TRH C ₁₅ - C ₂₈	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	91	[NT]
TRH C ₂₉ - C ₃₆	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	92	[NT]
TRH >C ₁₀ -C ₁₆	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	115	[NT]
TRH >C ₁₆ -C ₃₄	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	91	[NT]
TRH >C ₃₄ -C ₄₀	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	92	[NT]
Surrogate o-Terphenyl	%		Org-003	84	[NT]	[NT]	[NT]	[NT]	102	[NT]

QUALITY CONTROL: PAHs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-16	[NT]
Date extracted	-			27/09/2019	[NT]	[NT]	[NT]	[NT]	27/09/2019	[NT]
Date analysed	-			27/09/2019	[NT]	[NT]	[NT]	[NT]	27/09/2019	[NT]
Naphthalene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	124	[NT]
Acenaphthylene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	118	[NT]
Phenanthrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	116	[NT]
Anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	116	[NT]
Pyrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	118	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	124	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	<0.05	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	118	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	94	[NT]	[NT]	[NT]	[NT]	103	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-16	[NT]
Date extracted	-			27/09/2019	[NT]	[NT]	[NT]	[NT]	27/09/2019	[NT]
Date analysed	-			28/09/2019	[NT]	[NT]	[NT]	[NT]	28/09/2019	[NT]
HCB	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	102	[NT]
gamma-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Heptachlor	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	97	[NT]
delta-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	105	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	105	[NT]
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	106	[NT]
Dieldrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	122	[NT]
Endrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	101	[NT]
pp-DDD	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Endosulfan II	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	117	[NT]
Methoxychlor	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-005	97	[NT]	[NT]	[NT]	[NT]	96	[NT]

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-16	[NT]
Date extracted	-			27/09/2019	[NT]	[NT]	[NT]	[NT]	27/09/2019	[NT]
Date analysed	-			28/09/2019	[NT]	[NT]	[NT]	[NT]	28/09/2019	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chlorpyrifos	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	106	[NT]
Chlorpyrifos-methyl	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Dimethoate	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethion	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Fenitrothion	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	120	[NT]
Malathion	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	132	[NT]
Parathion	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	112	[NT]
Ronnel	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Surrogate TCMX	%		Org-008	97	[NT]	[NT]	[NT]	[NT]	96	[NT]

QUALITY CONTROL: PCBs in Soil						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-16	[NT]
Date extracted	-			27/09/2019	[NT]	[NT]	[NT]	[NT]	27/09/2019	[NT]
Date analysed	-			28/09/2019	[NT]	[NT]	[NT]	[NT]	28/09/2019	[NT]
Aroclor 1016	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	109	[NT]
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-006	97	[NT]	[NT]	[NT]	[NT]	96	[NT]

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-16	[NT]
Date prepared	-			27/09/2019	[NT]	[NT]	[NT]	[NT]	27/09/2019	[NT]
Date analysed	-			27/09/2019	[NT]	[NT]	[NT]	[NT]	27/09/2019	[NT]
Arsenic	mg/kg	4	Metals-020	<4	[NT]	[NT]	[NT]	[NT]	101	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	[NT]	[NT]	[NT]	[NT]	97	[NT]
Chromium	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	105	[NT]
Copper	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Lead	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	122	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	[NT]	[NT]	[NT]	[NT]	77	[NT]
Nickel	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	97	[NT]
Zinc	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	100	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.
Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.	

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Report Comments

Asbestos-ID in soil: NEPM

This report is consistent with the reporting recommendations in the National Environment Protection (Assessment of Site Contamination) Measure, Schedule B1, May 2013. This is reported outside our scope of NATA accreditation.

SAMPLE RECEIPT ADVICE

Client Details

Client	Environmental Investigation Services
Attention	Brendan Page

Sample Login Details

Your reference	E30104P, Penshurst Albion Park
Envirolab Reference	227117
Date Sample Received	27/09/2019
Date Instructions Received	27/09/2019
Date Results Expected to be Reported	30/09/2019

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	4 soil
Turnaround Time Requested	1 day
Temperature on Receipt (°C)	12.6
Cooling Method	Ice
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	Phone: 02 9910 6200
Fax: 02 9910 6201	Fax: 02 9910 6201
Email: ahie@envirolab.com.au	Email: jhurst@envirolab.com.au

Analysis Underway, details on the following page:



Envirolab Services Pty Ltd

ABN 37 112 535 645

12 Ashley St Chatswood NSW 2067

ph 02 9910 6200 fax 02 9910 6201

customerservice@envirolab.com.au

www.envirolab.com.au

Sample ID	VTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides in Soil	PCBs in Soil	Acid Extractable metals in soil	Asbestos ID - soils NEPM - ASB-001	On Hold
10mmD V1	✓	✓	✓	✓	✓	✓	✓	✓	
10mmD V2	✓	✓	✓	✓	✓	✓	✓	✓	
10mmD V3									✓
10mmD Dup 1									✓

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.

Requests for longer term sample storage must be received in writing.

Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.

TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

CERTIFICATE OF ANALYSIS 227906

Client Details

Client	Environmental Investigation Services
Attention	Brendan Page
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	<u>E30104P, Penshurst</u>
Number of Samples	2 Soil
Date samples received	09/10/2019
Date completed instructions received	09/10/2019

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.
 Samples were analysed as received from the client. Results relate specifically to the samples as received.
 Results are reported on a dry weight basis for solids and on an as received basis for other matrices.
Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	10/10/2019
Date of Issue	10/10/2019
NATA Accreditation Number 2901. This document shall not be reproduced except in full.	
Accredited for compliance with ISO/IEC 17025 - Testing. Tests not covered by NATA are denoted with *	

Asbestos Approved By

Analysed by Asbestos Approved Identifier: Aida Marner
 Authorised by Asbestos Approved Signatory: Lucy Zhu

Results Approved By

Loren Bardwell, Senior Chemist
 Lucy Zhu, Senior Asbestos Analyst
 Steven Luong, Organics Supervisor

Authorised By



Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil			
Our Reference		227906-1	227906-2
Your Reference	UNITS	BQS V1	BQS V2
Depth		-	-
Date Sampled		09/10/2019	09/10/2019
Type of sample		Soil	Soil
Date extracted	-	09/10/2019	09/10/2019
Date analysed	-	10/10/2019	10/10/2019
TRH C ₆ - C ₉	mg/kg	<25	<25
TRH C ₆ - C ₁₀	mg/kg	<25	<25
vTPH C ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25
Benzene	mg/kg	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1
m+p-xylene	mg/kg	<2	<2
o-Xylene	mg/kg	<1	<1
naphthalene	mg/kg	<1	<1
Total +ve Xylenes	mg/kg	<3	<3
Surrogate aaa-Trifluorotoluene	%	83	79

svTRH (C10-C40) in Soil			
Our Reference		227906-1	227906-2
Your Reference	UNITS	BQS V1	BQS V2
Depth		-	-
Date Sampled		09/10/2019	09/10/2019
Type of sample		Soil	Soil
Date extracted	-	09/10/2019	09/10/2019
Date analysed	-	09/10/2019	09/10/2019
TRH C ₁₀ - C ₁₄	mg/kg	<50	<50
TRH C ₁₅ - C ₂₈	mg/kg	<100	<100
TRH C ₂₉ - C ₃₆	mg/kg	<100	<100
TRH >C ₁₀ -C ₁₆	mg/kg	<50	<50
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50
TRH >C ₁₆ -C ₃₄	mg/kg	<100	<100
TRH >C ₃₄ -C ₄₀	mg/kg	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50
Surrogate o-Terphenyl	%	86	83

PAHs in Soil			
Our Reference		227906-1	227906-2
Your Reference	UNITS	BQS V1	BQS V2
Depth		-	-
Date Sampled		09/10/2019	09/10/2019
Type of sample		Soil	Soil
Date extracted	-	09/10/2019	09/10/2019
Date analysed	-	09/10/2019	09/10/2019
Naphthalene	mg/kg	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5
Surrogate <i>p</i> -Terphenyl-d14	%	109	97

Organochlorine Pesticides in soil			
Our Reference		227906-1	227906-2
Your Reference	UNITS	BQS V1	BQS V2
Depth		-	-
Date Sampled		09/10/2019	09/10/2019
Type of sample		Soil	Soil
Date extracted	-	09/10/2019	09/10/2019
Date analysed	-	09/10/2019	09/10/2019
HCB	mg/kg	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1
Surrogate TCMX	%	86	86

Organophosphorus Pesticides			
Our Reference		227906-1	227906-2
Your Reference	UNITS	BQS V1	BQS V2
Depth		-	-
Date Sampled		09/10/2019	09/10/2019
Type of sample		Soil	Soil
Date extracted	-	09/10/2019	09/10/2019
Date analysed	-	09/10/2019	09/10/2019
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1
Chlorpyrifos	mg/kg	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1
Surrogate TCMX	%	86	86

PCBs in Soil			
Our Reference		227906-1	227906-2
Your Reference	UNITS	BQS V1	BQS V2
Depth		-	-
Date Sampled		09/10/2019	09/10/2019
Type of sample		Soil	Soil
Date extracted	-	09/10/2019	09/10/2019
Date analysed	-	09/10/2019	09/10/2019
Aroclor 1016	mg/kg	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1
Surrogate TCMX	%	86	86

Acid Extractable metals in soil			
Our Reference		227906-1	227906-2
Your Reference	UNITS	BQS V1	BQS V2
Depth		-	-
Date Sampled		09/10/2019	09/10/2019
Type of sample		Soil	Soil
Date prepared	-	10/10/2019	10/10/2019
Date analysed	-	10/10/2019	10/10/2019
Arsenic	mg/kg	<4	<4
Cadmium	mg/kg	<0.4	<0.4
Chromium	mg/kg	12	13
Copper	mg/kg	4	4
Lead	mg/kg	5	5
Mercury	mg/kg	<0.1	<0.1
Nickel	mg/kg	7	7
Zinc	mg/kg	37	39

Moisture			
Our Reference		227906-1	227906-2
Your Reference	UNITS	BQS V1	BQS V2
Depth		-	-
Date Sampled		09/10/2019	09/10/2019
Type of sample		Soil	Soil
Date prepared	-	09/10/2019	09/10/2019
Date analysed	-	10/10/2019	10/10/2019
Moisture	%	3.3	2.3

Asbestos ID - soils NEPM - ASB-001

Our Reference		227906-1	227906-2
Your Reference	UNITS	BQS V1	BQS V2
Depth		-	-
Date Sampled		09/10/2019	09/10/2019
Type of sample		Soil	Soil
Date analysed	-	10/10/2019	10/10/2019
Sample mass tested	g	985.47	852.27
Sample Description	-	Grey fine-grained soil & rocks	Grey fine-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected
Total Asbestos ^{#1}	g/kg	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	—	—
FA and AF Estimation*	g	—	—
ACM >7mm Estimation*	%(w/w)	<0.01	<0.01
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
ASB-001	Asbestos ID - Identification of asbestos in soil samples using Polarised Light Microscopy and Dispersion Staining Techniques. Minimum 500mL soil sample was analysed as recommended by "National Environment Protection (Assessment of site contamination) Measure, Schedule B1 and "The Guidelines from the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia - May 2009" with a reporting limit of 0.1g/kg (0.01% w/w) as per Australian Standard AS4964-2004. Results reported denoted with * are outside our scope of NATA accreditation. NOTE #1 Total Asbestos g/kg was analysed and reported as per Australian Standard AS4964 (This is the sum of ACM >7mm, <7mm and FA/AF) NOTE #2 The screening level of 0.001% w/w asbestos in soil for FA and AF only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres. Estimation = Estimated asbestos weight Results reported with "--" is equivalent to no visible asbestos identified using Polarised Light microscopy and Dispersion Staining Techniques.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.

Method ID	Methodology Summary
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-008	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ PQL' values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero' values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL' values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	227906-2
Date extracted	-			09/10/2019	1	09/10/2019	09/10/2019		09/10/2019	09/10/2019
Date analysed	-			10/10/2019	1	10/10/2019	10/10/2019		10/10/2019	10/10/2019
TRH C ₆ - C ₉	mg/kg	25	Org-016	<25	1	<25	<25	0	102	96
TRH C ₆ - C ₁₀	mg/kg	25	Org-016	<25	1	<25	<25	0	102	96
Benzene	mg/kg	0.2	Org-016	<0.2	1	<0.2	<0.2	0	92	90
Toluene	mg/kg	0.5	Org-016	<0.5	1	<0.5	<0.5	0	101	98
Ethylbenzene	mg/kg	1	Org-016	<1	1	<1	<1	0	107	99
m+p-xylene	mg/kg	2	Org-016	<2	1	<2	<2	0	105	97
o-Xylene	mg/kg	1	Org-016	<1	1	<1	<1	0	107	100
naphthalene	mg/kg	1	Org-014	<1	1	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	73	1	83	90	8	88	85

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	227906-2
Date extracted	-			09/10/2019	1	09/10/2019	09/10/2019		09/10/2019	09/10/2019
Date analysed	-			09/10/2019	1	09/10/2019	09/10/2019		09/10/2019	09/10/2019
TRH C ₁₀ - C ₁₄	mg/kg	50	Org-003	<50	1	<50	<50	0	93	83
TRH C ₁₅ - C ₂₈	mg/kg	100	Org-003	<100	1	<100	<100	0	86	79
TRH C ₂₉ - C ₃₆	mg/kg	100	Org-003	<100	1	<100	<100	0	108	91
TRH >C ₁₀ -C ₁₆	mg/kg	50	Org-003	<50	1	<50	<50	0	93	83
TRH >C ₁₆ -C ₃₄	mg/kg	100	Org-003	<100	1	<100	<100	0	86	79
TRH >C ₃₄ -C ₄₀	mg/kg	100	Org-003	<100	1	<100	<100	0	108	91
Surrogate o-Terphenyl	%		Org-003	84	1	86	79	8	98	83

QUALITY CONTROL: PAHs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	227906-2
Date extracted	-			09/10/2019	1	09/10/2019	09/10/2019		09/10/2019	09/10/2019
Date analysed	-			09/10/2019	1	09/10/2019	09/10/2019		09/10/2019	09/10/2019
Naphthalene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	106	106
Acenaphthylene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	100	96
Phenanthrene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	98	94
Anthracene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	98	92
Pyrene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	100	96
Benzo(a)anthracene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	104	98
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	<0.05	1	<0.05	<0.05	0	110	102
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	100	1	109	97	12	102	98

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	227906-2
Date extracted	-			09/10/2019	1	09/10/2019	09/10/2019		09/10/2019	09/10/2019
Date analysed	-			09/10/2019	1	09/10/2019	09/10/2019		09/10/2019	09/10/2019
HCB	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	76	77
gamma-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	74	73
Heptachlor	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	70	69
delta-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	80	80
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	76	75
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	78	77
Dieldrin	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	81	80
Endrin	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	62	61
pp-DDD	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	70	68
Endosulfan II	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	71	61
Methoxychlor	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-005	87	1	86	87	1	81	81

QUALITY CONTROL: Organophosphorus Pesticides					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	227906-2
Date extracted	-			09/10/2019	1	09/10/2019	09/10/2019		09/10/2019	09/10/2019
Date analysed	-			09/10/2019	1	09/10/2019	09/10/2019		09/10/2019	09/10/2019
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	79	74
Chlorpyrifos-methyl	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	94	85
Dimethoate	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	76	68
Fenitrothion	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	88	73
Malathion	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	78	73
Parathion	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	102	90
Ronnel	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	91	84
Surrogate TCMX	%		Org-008	87	1	86	87	1	81	81

QUALITY CONTROL: PCBs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	227906-2
Date extracted	-			09/10/2019	1	09/10/2019	09/10/2019		09/10/2019	09/10/2019
Date analysed	-			09/10/2019	1	09/10/2019	09/10/2019		09/10/2019	09/10/2019
Aroclor 1016	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	103	101
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-006	87	1	86	87	1	81	81

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	227906-2
Date prepared	-			10/10/2019	1	10/10/2019	10/10/2019		10/10/2019	10/10/2019
Date analysed	-			10/10/2019	1	10/10/2019	10/10/2019		10/10/2019	10/10/2019
Arsenic	mg/kg	4	Metals-020	<4	1	<4	<4	0	102	#
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	95	79
Chromium	mg/kg	1	Metals-020	<1	1	12	14	15	108	91
Copper	mg/kg	1	Metals-020	<1	1	4	4	0	107	110
Lead	mg/kg	1	Metals-020	<1	1	5	8	46	108	83
Mercury	mg/kg	0.1	Metals-021	<0.1	1	<0.1	<0.1	0	109	100
Nickel	mg/kg	1	Metals-020	<1	1	7	7	0	99	85
Zinc	mg/kg	1	Metals-020	<1	1	37	41	10	100	74

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.
Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.	

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Report Comments

Asbestos-ID in soil: NEPM

This report is consistent with the reporting recommendations in the National Environment Protection (Assessment of Site Contamination) Measure, Schedule B1, May 2013. This is reported outside our scope of NATA accreditation.

8 metals in soil - # Low spike recovery was obtained for this sample. Sample matrix interference is suspected. However, an acceptable recovery was obtained for the LCS

SAMPLE RECEIPT ADVICE

Client Details

Client	Environmental Investigation Services
Attention	Brendan Page

Sample Login Details

Your reference	E30104P, Penshurst
Envirolab Reference	227906
Date Sample Received	09/10/2019
Date Instructions Received	09/10/2019
Date Results Expected to be Reported	10/10/2019

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	2 Soil
Turnaround Time Requested	1 day
Temperature on Receipt (°C)	8.8
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	Phone: 02 9910 6200
Fax: 02 9910 6201	Fax: 02 9910 6201
Email: ahie@envirolab.com.au	Email: jhurst@envirolab.com.au

Analysis Underway, details on the following page:



Envirolab Services Pty Ltd

ABN 37 112 535 645

12 Ashley St Chatswood NSW 2067

ph 02 9910 6200 fax 02 9910 6201

customerservice@envirolab.com.au

www.envirolab.com.au

Sample ID	VTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides	PCBs in Soil	Acid Extractable metals in soil	Asbestos ID - soils NEPM - ASB-001
BQS V1	✓	✓	✓	✓	✓	✓	✓	✓
BQS V2	✓	✓	✓	✓	✓	✓	✓	✓

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.

Requests for longer term sample storage must be received in writing.

Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.

TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

[illegible]

CERTIFICATE OF ANALYSIS 230174

Client Details

Client	Environmental Investigation Services
Attention	Brendan Page
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	<u>E30104P, Penshurst</u>
Number of Samples	6 SOIL
Date samples received	06/11/2019
Date completed instructions received	06/11/2019

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	07/11/2019
Date of Issue	07/11/2019
NATA Accreditation Number 2901. This document shall not be reproduced except in full.	
Accredited for compliance with ISO/IEC 17025 - Testing. Tests not covered by NATA are denoted with *	

Asbestos Approved By

Analysed by Asbestos Approved Identifier: Lucy Zhu
 Authorised by Asbestos Approved Signatory: Lucy Zhu

Results Approved By

Jaimie Loa-Kum-Cheung, Metals Supervisor
 Josh Williams, Senior Chemist
 Lucy Zhu, Senior Asbestos Analyst

Authorised By



Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil

Our Reference		230174-1	230174-2	230174-3	230174-4	230174-5
Your Reference	UNITS	DGB20 V4	DGB20 V5	DBG20 V6	DGB20 Dup2	TB1
Date Sampled		06/11/2019	06/11/2019	06/11/2019	06/11/2019	06/11/2019
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	06/11/2019	06/11/2019	06/11/2019	06/11/2019	06/11/2019
Date analysed	-	06/11/2019	06/11/2019	06/11/2019	06/11/2019	06/11/2019
TRH C ₆ - C ₉	mg/kg	<25	<25	<25	<25	<25
TRH C ₆ - C ₁₀	mg/kg	<25	<25	<25	<25	<25
vTPH C ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<3	<3	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	88	91	101	98	95

vTRH(C6-C10)/BTEXN in Soil

Our Reference		230174-6
Your Reference	UNITS	TS1
Date Sampled		06/11/2019
Type of sample		SOIL
Date extracted	-	06/11/2019
Date analysed	-	06/11/2019
Benzene	mg/kg	123%
Toluene	mg/kg	123%
Ethylbenzene	mg/kg	128%
m+p-xylene	mg/kg	125%
o-Xylene	mg/kg	126%
Surrogate aaa-Trifluorotoluene	%	130

svTRH (C10-C40) in Soil						
Our Reference		230174-1	230174-2	230174-3	230174-4	230174-5
Your Reference	UNITS	DGB20 V4	DGB20 V5	DBG20 V6	DGB20 Dup2	TB1
Date Sampled		06/11/2019	06/11/2019	06/11/2019	06/11/2019	06/11/2019
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	06/11/2019	06/11/2019	06/11/2019	06/11/2019	06/11/2019
Date analysed	-	06/11/2019	07/11/2019	07/11/2019	07/11/2019	07/11/2019
TRH C ₁₀ - C ₁₄	mg/kg	<50	<50	<50	<50	<50
TRH C ₁₅ - C ₂₈	mg/kg	<100	100	100	<100	<100
TRH C ₂₉ - C ₃₆	mg/kg	130	170	160	150	<100
TRH >C ₁₀ -C ₁₆	mg/kg	<50	<50	<50	<50	<50
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C ₁₆ -C ₃₄	mg/kg	190	220	210	200	<100
TRH >C ₃₄ -C ₄₀	mg/kg	160	190	180	170	<100
Total +ve TRH (>C10-C40)	mg/kg	350	410	390	370	<50
Surrogate o-Terphenyl	%	98	97	100	89	102

PAHs in Soil						
Our Reference		230174-1	230174-2	230174-3	230174-4	230174-5
Your Reference	UNITS	DGB20 V4	DGB20 V5	DBG20 V6	DGB20 Dup2	TB1
Date Sampled		06/11/2019	06/11/2019	06/11/2019	06/11/2019	06/11/2019
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	06/11/2019	06/11/2019	06/11/2019	06/11/2019	06/11/2019
Date analysed	-	07/11/2019	07/11/2019	07/11/2019	07/11/2019	07/11/2019
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.3	0.4	0.4	0.3	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.4	0.5	0.5	0.4	<0.1
Pyrene	mg/kg	0.4	0.4	0.5	0.4	<0.1
Benzo(a)anthracene	mg/kg	0.2	0.2	0.2	0.2	<0.1
Chrysene	mg/kg	0.2	0.2	0.2	0.2	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	0.2	0.3	0.4	0.3	<0.2
Benzo(a)pyrene	mg/kg	0.2	0.2	0.3	0.2	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	0.1	0.2	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	0.1	0.2	0.2	0.2	<0.1
Total +ve PAH's	mg/kg	1.9	2.5	2.9	2.1	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate <i>p</i> -Terphenyl-d14	%	97	96	96	100	96

Organochlorine Pesticides in soil					
Our Reference		230174-1	230174-2	230174-3	230174-4
Your Reference	UNITS	DGB20 V4	DGB20 V5	DBG20 V6	DGB20 Dup2
Date Sampled		06/11/2019	06/11/2019	06/11/2019	06/11/2019
Type of sample		SOIL	SOIL	SOIL	SOIL
Date extracted	-	06/11/2019	06/11/2019	06/11/2019	06/11/2019
Date analysed	-	07/11/2019	07/11/2019	07/11/2019	07/11/2019
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	92	90	90	95

Organophosphorus Pesticides in Soil					
Our Reference		230174-1	230174-2	230174-3	230174-4
Your Reference	UNITS	DGB20 V4	DGB20 V5	DBG20 V6	DGB20 Dup2
Date Sampled		06/11/2019	06/11/2019	06/11/2019	06/11/2019
Type of sample		SOIL	SOIL	SOIL	SOIL
Date extracted	-	06/11/2019	06/11/2019	06/11/2019	06/11/2019
Date analysed	-	07/11/2019	07/11/2019	07/11/2019	07/11/2019
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos	mg/kg	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	92	90	90	95

PCBs in Soil					
Our Reference		230174-1	230174-2	230174-3	230174-4
Your Reference	UNITS	DGB20 V4	DGB20 V5	DBG20 V6	DGB20 Dup2
Date Sampled		06/11/2019	06/11/2019	06/11/2019	06/11/2019
Type of sample		SOIL	SOIL	SOIL	SOIL
Date extracted	-	06/11/2019	06/11/2019	06/11/2019	06/11/2019
Date analysed	-	07/11/2019	07/11/2019	07/11/2019	07/11/2019
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	92	90	90	95

Acid Extractable metals in soil

Our Reference		230174-1	230174-2	230174-3	230174-4	230174-5
Your Reference	UNITS	DGB20 V4	DGB20 V5	DBG20 V6	DGB20 Dup2	TB1
Date Sampled		06/11/2019	06/11/2019	06/11/2019	06/11/2019	06/11/2019
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date prepared	-	06/11/2019	06/11/2019	06/11/2019	06/11/2019	06/11/2019
Date analysed	-	06/11/2019	06/11/2019	06/11/2019	06/11/2019	06/11/2019
Arsenic	mg/kg	<4	<4	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	9	10	8	8	2
Copper	mg/kg	16	28	20	37	<1
Lead	mg/kg	36	19	23	27	<1
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	4	5	4	5	<1
Zinc	mg/kg	71	30	32	110	1

Moisture						
Our Reference		230174-1	230174-2	230174-3	230174-4	230174-5
Your Reference	UNITS	DGB20 V4	DGB20 V5	DBG20 V6	DGB20 Dup2	TB1
Date Sampled		06/11/2019	06/11/2019	06/11/2019	06/11/2019	06/11/2019
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date prepared	-	06/11/2019	06/11/2019	06/11/2019	06/11/2019	06/11/2019
Date analysed	-	07/11/2019	07/11/2019	07/11/2019	07/11/2019	07/11/2019
Moisture	%	15	10	9.1	11	1.2

Asbestos ID - soils NEPM - ASB-001				
Our Reference		230174-1	230174-2	230174-3
Your Reference	UNITS	DGB20 V4	DGB20 V5	DBG20 V6
Date Sampled		06/11/2019	06/11/2019	06/11/2019
Type of sample		SOIL	SOIL	SOIL
Date analysed	-	07/11/2019	07/11/2019	07/11/2019
Sample mass tested	g	804.66	719.16	898.99
Sample Description	-	Brown sandy soil & rocks	Brown sandy soil & rocks	Brown sandy soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected
Total Asbestos ^{#1}	g/kg	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	—	—	—
FA and AF Estimation*	g	—	—	—
ACM >7mm Estimation*	%(w/w)	<0.01	<0.01	<0.01
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
ASB-001	Asbestos ID - Identification of asbestos in soil samples using Polarised Light Microscopy and Dispersion Staining Techniques. Minimum 500mL soil sample was analysed as recommended by "National Environment Protection (Assessment of site contamination) Measure, Schedule B1 and "The Guidelines from the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia - May 2009" with a reporting limit of 0.1g/kg (0.01% w/w) as per Australian Standard AS4964-2004. Results reported denoted with * are outside our scope of NATA accreditation. NOTE #1 Total Asbestos g/kg was analysed and reported as per Australian Standard AS4964 (This is the sum of ACM >7mm, <7mm and FA/AF) NOTE #2 The screening level of 0.001% w/w asbestos in soil for FA and AF only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres. Estimation = Estimated asbestos weight Results reported with "--" is equivalent to no visible asbestos identified using Polarised Light microscopy and Dispersion Staining Techniques.
AT-008	Determination of VOCs sampled onto coconut shell charcoal sorbent tubes, that can be desorbed using carbon disulphide, and analysed by GC-MS.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).

Method ID	Methodology Summary
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-012/017	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS and/or GC-MS/MS.
Org-012/017	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-MS and/or GC-MS/MS. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.
Org-012/017	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS and/or GC-MS/MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ PQL' values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero' values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL' values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-13	[NT]
Date extracted	-			06/11/2019	[NT]	[NT]	[NT]	[NT]	06/11/2019	[NT]
Date analysed	-			06/11/2019	[NT]	[NT]	[NT]	[NT]	06/11/2019	[NT]
TRH C ₆ - C ₉	mg/kg	25	Org-016	<25	[NT]	[NT]	[NT]	[NT]	73	[NT]
TRH C ₆ - C ₁₀	mg/kg	25	Org-016	<25	[NT]	[NT]	[NT]	[NT]	73	[NT]
Benzene	mg/kg	0.2	Org-016	<0.2	[NT]	[NT]	[NT]	[NT]	71	[NT]
Toluene	mg/kg	0.5	Org-016	<0.5	[NT]	[NT]	[NT]	[NT]	79	[NT]
Ethylbenzene	mg/kg	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	73	[NT]
m+p-xylene	mg/kg	2	Org-016	<2	[NT]	[NT]	[NT]	[NT]	71	[NT]
o-Xylene	mg/kg	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	70	[NT]
naphthalene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	95	[NT]	[NT]	[NT]	[NT]	91	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-13	[NT]
Date extracted	-			06/11/2019	[NT]	[NT]	[NT]	[NT]	06/11/2019	[NT]
Date analysed	-			06/11/2019	[NT]	[NT]	[NT]	[NT]	06/11/2019	[NT]
TRH C ₁₀ - C ₁₄	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	89	[NT]
TRH C ₁₅ - C ₂₈	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	86	[NT]
TRH C ₂₉ - C ₃₆	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	106	[NT]
TRH >C ₁₀ -C ₁₆	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	89	[NT]
TRH >C ₁₆ -C ₃₄	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	86	[NT]
TRH >C ₃₄ -C ₄₀	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	106	[NT]
Surrogate o-Terphenyl	%		Org-003	95	[NT]	[NT]	[NT]	[NT]	114	[NT]

QUALITY CONTROL: PAHs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-13	[NT]
Date extracted	-			06/11/2019	[NT]	[NT]	[NT]	[NT]	06/11/2019	[NT]
Date analysed	-			07/11/2019	[NT]	[NT]	[NT]	[NT]	07/11/2019	[NT]
Naphthalene	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	106	[NT]
Acenaphthylene	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Phenanthrene	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Anthracene	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Pyrene	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012/017	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012/017	<0.05	[NT]	[NT]	[NT]	[NT]	104	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012/017	96	[NT]	[NT]	[NT]	[NT]	104	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-13	[NT]
Date extracted	-			06/11/2019	[NT]	[NT]	[NT]	[NT]	06/11/2019	[NT]
Date analysed	-			07/11/2019	[NT]	[NT]	[NT]	[NT]	07/11/2019	[NT]
alpha-BHC	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	106	[NT]
HCB	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	102	[NT]
gamma-BHC	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	92	[NT]
delta-BHC	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	98	[NT]
gamma-Chlordane	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Dieldrin	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	110	[NT]
Endrin	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Endosulfan II	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Methoxychlor	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-012/017	94	[NT]	[NT]	[NT]	[NT]	96	[NT]

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-13	[NT]
Date extracted	-			06/11/2019	[NT]	[NT]	[NT]	[NT]	06/11/2019	[NT]
Date analysed	-			07/11/2019	[NT]	[NT]	[NT]	[NT]	07/11/2019	[NT]
Dichlorvos	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	120	[NT]
Dimethoate	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chlorpyrifos-methyl	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	114	[NT]
Fenitrothion	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	88	[NT]
Malathion	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	115	[NT]
Chlorpyrifos	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	118	[NT]
Parathion	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	120	[NT]
Bromophos-ethyl	mg/kg	0.1	AT-008	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethion	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	110	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-012/017	94	[NT]	[NT]	[NT]	[NT]	96	[NT]

QUALITY CONTROL: PCBs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-13	[NT]
Date extracted	-			06/11/2019	[NT]	[NT]	[NT]	[NT]	06/11/2019	[NT]
Date analysed	-			07/11/2019	[NT]	[NT]	[NT]	[NT]	07/11/2019	[NT]
Aroclor 1016	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	77	[NT]
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-006	94	[NT]	[NT]	[NT]	[NT]	96	[NT]

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-11	[NT]
Date prepared	-			06/11/2019	[NT]	[NT]	[NT]	[NT]	06/11/2019	[NT]
Date analysed	-			06/11/2019	[NT]	[NT]	[NT]	[NT]	06/11/2019	[NT]
Arsenic	mg/kg	4	Metals-020	<4	[NT]	[NT]	[NT]	[NT]	110	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	[NT]	[NT]	[NT]	[NT]	106	[NT]
Chromium	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	113	[NT]
Copper	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	108	[NT]
Lead	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	116	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	[NT]	[NT]	[NT]	[NT]	81	[NT]
Nickel	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	106	[NT]
Zinc	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	109	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.
Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.	

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the same sample will be re-analysed. When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Report Comments

Asbestos-ID in soil: NEPM

This report is consistent with the reporting recommendations in the National Environment Protection (Assessment of Site Contamination) Measure, Schedule B1, May 2013. This is reported outside our scope of NATA accreditation.

SAMPLE RECEIPT ADVICE

Client Details

Client	Environmental Investigation Services
Attention	Brendan Page

Sample Login Details

Your reference	E30104P, Penshurst
Envirolab Reference	230174
Date Sample Received	06/11/2019
Date Instructions Received	06/11/2019
Date Results Expected to be Reported	07/11/2019

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	6 SOIL
Turnaround Time Requested	1 day
Temperature on Receipt (°C)	18.4
Cooling Method	Ice
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	Phone: 02 9910 6200
Fax: 02 9910 6201	Fax: 02 9910 6201
Email: ahie@envirolab.com.au	Email: jhurst@envirolab.com.au

Analysis Underway, details on the following page:



Envirolab Services Pty Ltd

ABN 37 112 535 645

12 Ashley St Chatswood NSW 2067

ph 02 9910 6200 fax 02 9910 6201

customerservice@envirolab.com.au

www.envirolab.com.au

Sample ID	VTRH(C6-C10)/BTXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides in Soil	PCBs in Soil	Acid Extractable metals in soil	Asbestos ID - soils NEPM - ASB-001
DGB20 V4	✓	✓	✓	✓	✓	✓	✓	✓
DGB20 V5	✓	✓	✓	✓	✓	✓	✓	✓
DBG20 V6	✓	✓	✓	✓	✓	✓	✓	✓
DGB20 Dup2	✓	✓	✓	✓	✓	✓	✓	
TB1	✓	✓	✓				✓	
TS1	✓							

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

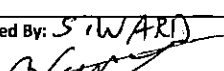
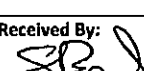
Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.

Requests for longer term sample storage must be received in writing.

Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.

TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

SAMPLE AND CHAIN OF CUSTODY FORM

TO: ENVIROLAB SERVICES PTY LTD 12 ASHLEY STREET CHATSWOOD NSW 2067 P: (02) 99106200 F: (02) 99106201 Attention: Aileen		EIS Job Number: E30104P Date Results Required: 24hr Page: 1 of 1		FROM:  JK Environments REAR OF 115 WICKS ROAD MACQUARIE PARK, NSW 2113 P: 02-9888 5000 F: 02-9888 5001 Attention: Brendan Page bpage@jkenvironments.com.au											
Location: Penshurst		Sample Preserved In Esky on Ice													
Sampler: SW		Tests Required													
Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	Combo 2	Combo 3	Combo 6	Combo 6a	8 Metals	PAHs	TRH/BTEX	BTEX	Asbestos (NEPM 500ml)
6/11/2019	1	DGB20 V4	-	G, A	0.0	Recycled sandy gravel			X						X
6/11/2019	2	DGB20 V5	-	G, A	0.1	Recycled sandy gravel			X						X
6/11/2019	3	DGB20 V6	-	G, A	0.1	Recycled sandy gravel			X						X
6/11/2019	4	DGB20 Dup2	-	G, A	0.0	Recycled sandy gravel			X						
6/11/2019	5	TB1	-	G	-	Sand blank	X								
6/11/2019	6	TS1	-	Vial	-	Trip spike								X	
							 Envirolab Services 12 Ashley St Chatswood NSW 2067 Ph: (02) 9910 6200 Job No: 230174 Date Received: 06/11/19 Time Received: 1305 Received by: SB Temp: 20.0 Ambient Cooling: Ice/icepack Security: Intact/Broken/None								
Remarks (comments/detection limits required):							Sample Containers: G - 250mg Glass Jar A - Ziplock Asbestos Bag (500ml) P - Plastic Bag								
Relinquished By: S. WARD 				Date: 06/Nov/19			Time: 1305			Received By: 			Date: 06/11/19		

CERTIFICATE OF ANALYSIS 232233

Client Details

Client	Environmental Investigation Services
Attention	Brendan Page
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	<u>E30104P, Penshurst</u>
Number of Samples	3 Soil
Date samples received	03/12/2019
Date completed instructions received	03/12/2019

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.
 Samples were analysed as received from the client. Results relate specifically to the samples as received.
 Results are reported on a dry weight basis for solids and on an as received basis for other matrices.
Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	04/12/2019
Date of Issue	04/12/2019
NATA Accreditation Number 2901. This document shall not be reproduced except in full.	
Accredited for compliance with ISO/IEC 17025 - Testing. Tests not covered by NATA are denoted with *	

Asbestos Approved By

Analysed by Asbestos Approved Identifier: Aida Marner
 Authorised by Asbestos Approved Signatory: Lucy Zhu

Results Approved By

Jaimie Loa-Kum-Cheung, Metals Supervisor
 Josh Williams, Senior Chemist
 Lucy Zhu, Senior Asbestos Analyst

Authorised By



Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil			
Our Reference		232233-1	232233-3
Your Reference	UNITS	DGB20 V7	DGB20 Dup3
Date Sampled		03/12/2019	03/12/2019
Type of sample		Soil	Soil
Date extracted	-	03/12/2019	03/12/2019
Date analysed	-	03/12/2019	03/12/2019
TRH C ₆ - C ₉	mg/kg	<25	<25
TRH C ₆ - C ₁₀	mg/kg	<25	<25
vTPH C ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25
Benzene	mg/kg	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1
m+p-xylene	mg/kg	<2	<2
o-Xylene	mg/kg	<1	<1
naphthalene	mg/kg	<1	<1
Total +ve Xylenes	mg/kg	<3	<3
Surrogate aaa-Trifluorotoluene	%	104	100

svTRH (C10-C40) in Soil			
Our Reference		232233-1	232233-3
Your Reference	UNITS	DGB20 V7	DGB20 Dup3
Date Sampled		03/12/2019	03/12/2019
Type of sample		Soil	Soil
Date extracted	-	03/12/2019	03/12/2019
Date analysed	-	04/12/2019	04/12/2019
TRH C ₁₀ - C ₁₄	mg/kg	<50	<50
TRH C ₁₅ - C ₂₈	mg/kg	110	<100
TRH C ₂₉ - C ₃₆	mg/kg	210	140
TRH >C ₁₀ -C ₁₆	mg/kg	<50	<50
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50
TRH >C ₁₆ -C ₃₄	mg/kg	240	170
TRH >C ₃₄ -C ₄₀	mg/kg	260	160
Total +ve TRH (>C10-C40)	mg/kg	500	340
Surrogate o-Terphenyl	%	76	74

PAHs in Soil			
Our Reference		232233-1	232233-3
Your Reference	UNITS	DGB20 V7	DGB20 Dup3
Date Sampled		03/12/2019	03/12/2019
Type of sample		Soil	Soil
Date extracted	-	03/12/2019	03/12/2019
Date analysed	-	04/12/2019	04/12/2019
Naphthalene	mg/kg	0.3	0.2
Acenaphthylene	mg/kg	<0.1	<0.1
Acenaphthene	mg/kg	0.2	0.2
Fluorene	mg/kg	0.2	0.2
Phenanthrene	mg/kg	1.3	1.1
Anthracene	mg/kg	0.4	0.3
Fluoranthene	mg/kg	1.5	1.5
Pyrene	mg/kg	1.5	1.4
Benzo(a)anthracene	mg/kg	0.7	0.7
Chrysene	mg/kg	0.6	0.5
Benzo(b,j+k)fluoranthene	mg/kg	1	1
Benzo(a)pyrene	mg/kg	0.61	0.63
Indeno(1,2,3-c,d)pyrene	mg/kg	0.3	0.3
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	0.4	0.4
Total +ve PAH's	mg/kg	9.0	8.5
Benzo(a)pyrene TEQ calc (zero)	mg/kg	0.8	0.8
Benzo(a)pyrene TEQ calc(half)	mg/kg	0.9	0.9
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	0.9	0.9
Surrogate <i>p</i> -Terphenyl-d14	%	103	100

Organochlorine Pesticides in soil			
Our Reference		232233-1	232233-3
Your Reference	UNITS	DGB20 V7	DGB20 Dup3
Date Sampled		03/12/2019	03/12/2019
Type of sample		Soil	Soil
Date extracted	-	03/12/2019	03/12/2019
Date analysed	-	04/12/2019	04/12/2019
alpha-BHC	mg/kg	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1
Surrogate TCMX	%	109	101

Organophosphorus Pesticides in Soil			
Our Reference		232233-1	232233-3
Your Reference	UNITS	DGB20 V7	DGB20 Dup3
Date Sampled		03/12/2019	03/12/2019
Type of sample		Soil	Soil
Date extracted	-	03/12/2019	03/12/2019
Date analysed	-	04/12/2019	04/12/2019
Dichlorvos	mg/kg	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1
Chlorpyrifos	mg/kg	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1
Surrogate TCMX	%	109	101

PCBs in Soil			
Our Reference		232233-1	232233-3
Your Reference	UNITS	DGB20 V7	DGB20 Dup3
Date Sampled		03/12/2019	03/12/2019
Type of sample		Soil	Soil
Date extracted	-	03/12/2019	03/12/2019
Date analysed	-	04/12/2019	04/12/2019
Aroclor 1016	mg/kg	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1
Surrogate TCMX	%	109	101

Acid Extractable metals in soil			
Our Reference		232233-1	232233-3
Your Reference	UNITS	DGB20 V7	DGB20 Dup3
Date Sampled		03/12/2019	03/12/2019
Type of sample		Soil	Soil
Date prepared	-	04/12/2019	04/12/2019
Date analysed	-	04/12/2019	04/12/2019
Arsenic	mg/kg	<4	<4
Cadmium	mg/kg	<0.4	<0.4
Chromium	mg/kg	11	14
Copper	mg/kg	24	20
Lead	mg/kg	19	20
Mercury	mg/kg	<0.1	<0.1
Nickel	mg/kg	6	6
Zinc	mg/kg	45	43

Moisture			
Our Reference		232233-1	232233-3
Your Reference	UNITS	DGB20 V7	DGB20 Dup3
Date Sampled		03/12/2019	03/12/2019
Type of sample		Soil	Soil
Date prepared	-	03/12/2019	03/12/2019
Date analysed	-	04/12/2019	04/12/2019
Moisture	%	6.6	6.8

Asbestos ID - soils NEPM - ASB-001		
Our Reference		232233-1
Your Reference	UNITS	DGB20 V7
Date Sampled		03/12/2019
Type of sample		Soil
Date analysed	-	04/12/2019
Sample mass tested	g	1,120.16
Sample Description	-	Brown coarse-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected
Total Asbestos ^{#1}	g/kg	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected
ACM >7mm Estimation*	g	—
FA and AF Estimation*	g	—
ACM >7mm Estimation*	%(w/w)	<0.01
FA and AF Estimation*#2	%(w/w)	<0.001

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
ASB-001	Asbestos ID - Identification of asbestos in soil samples using Polarised Light Microscopy and Dispersion Staining Techniques. Minimum 500mL soil sample was analysed as recommended by "National Environment Protection (Assessment of site contamination) Measure, Schedule B1 and "The Guidelines from the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia - May 2009" with a reporting limit of 0.1g/kg (0.01% w/w) as per Australian Standard AS4964-2004. Results reported denoted with * are outside our scope of NATA accreditation. NOTE #1 Total Asbestos g/kg was analysed and reported as per Australian Standard AS4964 (This is the sum of ACM >7mm, <7mm and FA/AF) NOTE #2 The screening level of 0.001% w/w asbestos in soil for FA and AF only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres. Estimation = Estimated asbestos weight Results reported with "--" is equivalent to no visible asbestos identified using Polarised Light microscopy and Dispersion Staining Techniques.
AT-008	Determination of VOCs sampled onto coconut shell charcoal sorbent tubes, that can be desorbed using carbon disulphide, and analysed by GC-MS.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).

Method ID	Methodology Summary
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-012/017	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS and/or GC-MS/MS.
Org-012/017	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-MS and/or GC-MS/MS. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.
Org-012/017	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS and/or GC-MS/MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ PQL' values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero' values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL' values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	[NT]
Date extracted	-			03/12/2019	[NT]	[NT]	[NT]	[NT]	03/12/2019	[NT]
Date analysed	-			03/12/2019	[NT]	[NT]	[NT]	[NT]	03/12/2019	[NT]
TRH C ₆ - C ₉	mg/kg	25	Org-016	<25	[NT]	[NT]	[NT]	[NT]	83	[NT]
TRH C ₆ - C ₁₀	mg/kg	25	Org-016	<25	[NT]	[NT]	[NT]	[NT]	83	[NT]
Benzene	mg/kg	0.2	Org-016	<0.2	[NT]	[NT]	[NT]	[NT]	90	[NT]
Toluene	mg/kg	0.5	Org-016	<0.5	[NT]	[NT]	[NT]	[NT]	86	[NT]
Ethylbenzene	mg/kg	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	76	[NT]
m+p-xylene	mg/kg	2	Org-016	<2	[NT]	[NT]	[NT]	[NT]	82	[NT]
o-Xylene	mg/kg	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	79	[NT]
naphthalene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	109	[NT]	[NT]	[NT]	[NT]	89	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	[NT]
Date extracted	-			03/12/2019	[NT]	[NT]	[NT]	[NT]	03/12/2019	[NT]
Date analysed	-			03/12/2019	[NT]	[NT]	[NT]	[NT]	03/12/2019	[NT]
TRH C ₁₀ - C ₁₄	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	115	[NT]
TRH C ₁₅ - C ₂₈	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	101	[NT]
TRH C ₂₉ - C ₃₆	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	92	[NT]
TRH >C ₁₀ -C ₁₆	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	115	[NT]
TRH >C ₁₆ -C ₃₄	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	101	[NT]
TRH >C ₃₄ -C ₄₀	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	92	[NT]
Surrogate o-Terphenyl	%		Org-003	97	[NT]	[NT]	[NT]	[NT]	97	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	[NT]
Date extracted	-			03/12/2019	[NT]	[NT]	[NT]	[NT]	03/12/2019	[NT]
Date analysed	-			04/12/2019	[NT]	[NT]	[NT]	[NT]	04/12/2019	[NT]
Naphthalene	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	114	[NT]
Acenaphthylene	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	120	[NT]
Phenanthrene	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	112	[NT]
Anthracene	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	106	[NT]
Pyrene	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	112	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	110	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012/017	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012/017	<0.05	[NT]	[NT]	[NT]	[NT]	120	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012/017	102	[NT]	[NT]	[NT]	[NT]	108	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	[NT]
Date extracted	-			03/12/2019	[NT]	[NT]	[NT]	[NT]	03/12/2019	[NT]
Date analysed	-			04/12/2019	[NT]	[NT]	[NT]	[NT]	04/12/2019	[NT]
alpha-BHC	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	120	[NT]
HCB	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	116	[NT]
gamma-BHC	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	120	[NT]
delta-BHC	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	118	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	104	[NT]
gamma-Chlordane	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	116	[NT]
Dieldrin	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	108	[NT]
Endrin	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	112	[NT]
Endosulfan II	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	116	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	116	[NT]
Methoxychlor	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-012/017	100	[NT]	[NT]	[NT]	[NT]	103	[NT]

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	[NT]
Date extracted	-			03/12/2019	[NT]	[NT]	[NT]	[NT]	03/12/2019	[NT]
Date analysed	-			04/12/2019	[NT]	[NT]	[NT]	[NT]	04/12/2019	[NT]
Dichlorvos	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	116	[NT]
Dimethoate	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chlorpyrifos-methyl	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Fenitrothion	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	92	[NT]
Malathion	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	85	[NT]
Chlorpyrifos	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Parathion	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Bromophos-ethyl	mg/kg	0.1	AT-008	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethion	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-012/017	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-012/017	100	[NT]	[NT]	[NT]	[NT]	103	[NT]

QUALITY CONTROL: PCBs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	[NT]
Date extracted	-			03/12/2019	[NT]	[NT]	[NT]	[NT]	03/12/2019	[NT]
Date analysed	-			04/12/2019	[NT]	[NT]	[NT]	[NT]	04/12/2019	[NT]
Aroclor 1016	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-006	100	[NT]	[NT]	[NT]	[NT]	103	[NT]

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	[NT]
Date prepared	-			04/12/2019	[NT]	[NT]	[NT]	[NT]	04/12/2019	[NT]
Date analysed	-			04/12/2019	[NT]	[NT]	[NT]	[NT]	04/12/2019	[NT]
Arsenic	mg/kg	4	Metals-020	<4	[NT]	[NT]	[NT]	[NT]	108	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	[NT]	[NT]	[NT]	[NT]	104	[NT]
Chromium	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	116	[NT]
Copper	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Lead	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	109	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	[NT]	[NT]	[NT]	[NT]	112	[NT]
Nickel	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Zinc	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	103	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.
Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.	

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Report Comments

Asbestos-ID in soil: NEPM

This report is consistent with the reporting recommendations in the National Environment Protection (Assessment of Site Contamination) Measure, Schedule B1, May 2013. This is reported outside our scope of NATA accreditation.

SAMPLE RECEIPT ADVICE

Client Details

Client	Environmental Investigation Services
Attention	Brendan Page

Sample Login Details

Your reference	E30104P, Penshurst
Envirolab Reference	232233
Date Sample Received	03/12/2019
Date Instructions Received	03/12/2019
Date Results Expected to be Reported	04/12/2019

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	3 Soil
Turnaround Time Requested	1 day
Temperature on Receipt (°C)	5.7
Cooling Method	Ice
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	Phone: 02 9910 6200
Fax: 02 9910 6201	Fax: 02 9910 6201
Email: ahie@envirolab.com.au	Email: jhurst@envirolab.com.au

Analysis Underway, details on the following page:



EnviroLab Services Pty Ltd

ABN 37 112 535 645

12 Ashley St Chatswood NSW 2067

ph 02 9910 6200 fax 02 9910 6201

customerservice@envirolab.com.au

www.envirolab.com.au

Sample ID	VTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides in Soil	PCBs in Soil	Acid Extractable metals in soil	Asbestos ID - soils NEPM - ASB-001	On Hold
DGB20 V7	✓	✓	✓	✓	✓	✓	✓	✓	
DGB20 V8									✓
DGB20 Dup3	✓	✓	✓	✓	✓	✓	✓		

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.

Requests for longer term sample storage must be received in writing.

Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.

TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

SAMPLE AND CHAIN OF CUSTODY FORM

[illegible]

CERTIFICATE OF ANALYSIS 255960

Client Details

Client	Environmental Investigation Services
Attention	Brendan Page
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	<u>E30104P, Badgerys Creek</u>
Number of Samples	3 Soil
Date samples received	18/11/2020
Date completed instructions received	18/11/2020

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	18/11/2020
Date of Issue	18/11/2020
NATA Accreditation Number 2901. This document shall not be reproduced except in full.	
Accredited for compliance with ISO/IEC 17025 - Testing. Tests not covered by NATA are denoted with *	

Asbestos Approved By

Analysed by Asbestos Approved Identifier: Lucy Zhu
 Authorised by Asbestos Approved Signatory: Lucy Zhu

Results Approved By

Dragana Tomas, Senior Chemist
 Jaimie Loa-Kum-Cheung, Metals Supervisor
 Lucy Zhu, Asbestos Supervisor

Authorised By



Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil				
Our Reference		255960-1	255960-2	255960-3
Your Reference	UNITS	OGM1	OGM2	OGM3
Date Sampled		17/11/2020	17/11/2020	17/11/2020
Type of sample		Soil	Soil	Soil
Date extracted	-	18/11/2020	18/11/2020	18/11/2020
Date analysed	-	18/11/2020	18/11/2020	18/11/2020
TRH C ₆ - C ₉	mg/kg	<25	<25	<25
TRH C ₆ - C ₁₀	mg/kg	<25	<25	<25
vTPH C ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1
Total +ve Xylenes	mg/kg	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	102	110	98

svTRH (C10-C40) in Soil				
Our Reference		255960-1	255960-2	255960-3
Your Reference	UNITS	OGM1	OGM2	OGM3
Date Sampled		17/11/2020	17/11/2020	17/11/2020
Type of sample		Soil	Soil	Soil
Date extracted	-	18/11/2020	18/11/2020	18/11/2020
Date analysed	-	18/11/2020	18/11/2020	18/11/2020
TRH C ₁₀ - C ₁₄	mg/kg	<50	<50	<50
TRH C ₁₅ - C ₂₈	mg/kg	280	440	330
TRH C ₂₉ - C ₃₆	mg/kg	670	830	830
TRH >C ₁₀ -C ₁₆	mg/kg	<50	<50	<50
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	<50
TRH >C ₁₆ -C ₃₄	mg/kg	760	1,100	930
TRH >C ₃₄ -C ₄₀	mg/kg	320	400	420
Total +ve TRH (>C10-C40)	mg/kg	1,100	1,400	1,400
Surrogate o-Terphenyl	%	127	130	121

PAHs in Soil				
Our Reference		255960-1	255960-2	255960-3
Your Reference	UNITS	OGM1	OGM2	OGM3
Date Sampled		17/11/2020	17/11/2020	17/11/2020
Type of sample		Soil	Soil	Soil
Date extracted	-	18/11/2020	18/11/2020	18/11/2020
Date analysed	-	18/11/2020	18/11/2020	18/11/2020
Naphthalene	mg/kg	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.2	0.2	0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.3	0.2	0.2
Pyrene	mg/kg	0.3	0.2	0.2
Benzo(a)anthracene	mg/kg	0.2	0.2	0.1
Chrysene	mg/kg	0.2	0.1	0.1
Benzo(b,j+k)fluoranthene	mg/kg	0.2	0.2	0.2
Benzo(a)pyrene	mg/kg	0.1	0.1	0.08
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	1.5	1.2	1.2
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5
Surrogate <i>p</i> -Terphenyl-d14	%	120	116	122

Organochlorine Pesticides in soil				
Our Reference		255960-1	255960-2	255960-3
Your Reference	UNITS	OGM1	OGM2	OGM3
Date Sampled		17/11/2020	17/11/2020	17/11/2020
Type of sample		Soil	Soil	Soil
Date extracted	-	18/11/2020	18/11/2020	18/11/2020
Date analysed	-	18/11/2020	18/11/2020	18/11/2020
alpha-BHC	mg/kg	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1
Surrogate TCMX	%	106	101	106

Organophosphorus Pesticides in Soil				
Our Reference		255960-1	255960-2	255960-3
Your Reference	UNITS	OGM1	OGM2	OGM3
Date Sampled		17/11/2020	17/11/2020	17/11/2020
Type of sample		Soil	Soil	Soil
Date extracted	-	18/11/2020	18/11/2020	18/11/2020
Date analysed	-	18/11/2020	18/11/2020	18/11/2020
Dichlorvos	mg/kg	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1
Chlorpyrifos	mg/kg	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1
Surrogate TCMX	%	106	101	106

PCBs in Soil				
Our Reference		255960-1	255960-2	255960-3
Your Reference	UNITS	OGM1	OGM2	OGM3
Date Sampled		17/11/2020	17/11/2020	17/11/2020
Type of sample		Soil	Soil	Soil
Date extracted	-	18/11/2020	18/11/2020	18/11/2020
Date analysed	-	18/11/2020	18/11/2020	18/11/2020
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1
Surrogate TCMX	%	106	101	106

Acid Extractable metals in soil				
Our Reference		255960-1	255960-2	255960-3
Your Reference	UNITS	OGM1	OGM2	OGM3
Date Sampled		17/11/2020	17/11/2020	17/11/2020
Type of sample		Soil	Soil	Soil
Date prepared	-	18/11/2020	18/11/2020	18/11/2020
Date analysed	-	18/11/2020	18/11/2020	18/11/2020
Arsenic	mg/kg	7	7	11
Cadmium	mg/kg	<0.4	<0.4	<0.4
Chromium	mg/kg	14	19	21
Copper	mg/kg	61	63	76
Lead	mg/kg	26	28	33
Mercury	mg/kg	<0.1	<0.1	0.1
Nickel	mg/kg	7	6	9
Zinc	mg/kg	100	110	130

Moisture				
Our Reference		255960-1	255960-2	255960-3
Your Reference	UNITS	OGM1	OGM2	OGM3
Date Sampled		17/11/2020	17/11/2020	17/11/2020
Type of sample		Soil	Soil	Soil
Date prepared	-	18/11/2020	18/11/2020	18/11/2020
Date analysed	-	18/11/2020	18/11/2020	18/11/2020
Moisture	%	28	29	30

Asbestos ID - soils NEPM - ASB-001

Our Reference		255960-1	255960-2	255960-3
Your Reference	UNITS	OGM1	OGM2	OGM3
Date Sampled		17/11/2020	17/11/2020	17/11/2020
Type of sample		Soil	Soil	Soil
Date analysed	-	18/11/2020	18/11/2020	18/11/2020
Sample mass tested	g	324.72	308.47	306.55
Sample Description	-	Brown fine-grained soil & debris	Brown fine-grained soil & debris	Brown fine-grained soil & debris
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected
Total Asbestos ^{#1}	g/kg	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	—	—	—
FA and AF Estimation*	g	—	—	—
ACM >7mm Estimation*	%(w/w)	<0.01	<0.01	<0.01
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
ASB-001	Asbestos ID - Identification of asbestos in soil samples using Polarised Light Microscopy and Dispersion Staining Techniques. Minimum 500mL soil sample was analysed as recommended by "National Environment Protection (Assessment of site contamination) Measure, Schedule B1 and "The Guidelines from the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia - May 2009" with a reporting limit of 0.1g/kg (0.01% w/w) as per Australian Standard AS4964-2004. Results reported denoted with * are outside our scope of NATA accreditation. NOTE #1 Total Asbestos g/kg was analysed and reported as per Australian Standard AS4964 (This is the sum of ACM >7mm, <7mm and FA/AF) NOTE #2 The screening level of 0.001% w/w asbestos in soil for FA and AF only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres. Estimation = Estimated asbestos weight Results reported with "--" is equivalent to no visible asbestos identified using Polarised Light microscopy and Dispersion Staining Techniques.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.

Method ID	Methodology Summary
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-022	Determination of VOCs sampled onto coconut shell charcoal sorbent tubes, that can be desorbed using carbon disulphide, and analysed by GC-MS.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.
Org-022/025	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-MS/GC-MSMS. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS and/or GC-MS/MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ PQL' values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero' values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL' values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	[NT]
Date extracted	-			18/11/2020	[NT]	[NT]	[NT]	[NT]	18/11/2020	[NT]
Date analysed	-			18/11/2020	[NT]	[NT]	[NT]	[NT]	18/11/2020	[NT]
TRH C ₆ - C ₉	mg/kg	25	Org-023	<25	[NT]	[NT]	[NT]	[NT]	109	[NT]
TRH C ₆ - C ₁₀	mg/kg	25	Org-023	<25	[NT]	[NT]	[NT]	[NT]	109	[NT]
Benzene	mg/kg	0.2	Org-023	<0.2	[NT]	[NT]	[NT]	[NT]	113	[NT]
Toluene	mg/kg	0.5	Org-023	<0.5	[NT]	[NT]	[NT]	[NT]	111	[NT]
Ethylbenzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	108	[NT]
m+p-xylene	mg/kg	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	106	[NT]
o-Xylene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	105	[NT]
naphthalene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	116	[NT]	[NT]	[NT]	[NT]	105	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	[NT]
Date extracted	-			18/11/2020	[NT]	[NT]	[NT]	[NT]	18/11/2020	[NT]
Date analysed	-			18/11/2020	[NT]	[NT]	[NT]	[NT]	18/11/2020	[NT]
TRH C ₁₀ - C ₁₄	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	118	[NT]
TRH C ₁₅ - C ₂₈	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	115	[NT]
TRH C ₂₉ - C ₃₆	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	62	[NT]
TRH >C ₁₀ -C ₁₆	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	118	[NT]
TRH >C ₁₆ -C ₃₄	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	115	[NT]
TRH >C ₃₄ -C ₄₀	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	62	[NT]
Surrogate o-Terphenyl	%		Org-020	109	[NT]	[NT]	[NT]	[NT]	115	[NT]

QUALITY CONTROL: PAHs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	[NT]
Date extracted	-			18/11/2020	[NT]	[NT]	[NT]	[NT]	18/11/2020	[NT]
Date analysed	-			18/11/2020	[NT]	[NT]	[NT]	[NT]	18/11/2020	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	105	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Fluorene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	121	[NT]
Anthracene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	112	[NT]
Pyrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	114	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	128	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	<0.05	[NT]	[NT]	[NT]	[NT]	124	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	125	[NT]	[NT]	[NT]	[NT]	104	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	[NT]
Date extracted	-			18/11/2020	[NT]	[NT]	[NT]	[NT]	18/11/2020	[NT]
Date analysed	-			18/11/2020	[NT]	[NT]	[NT]	[NT]	18/11/2020	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	85	[NT]
HCB	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	85	[NT]
gamma-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	85	[NT]
delta-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	114	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	112	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	111	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	113	[NT]
Endrin	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Endosulfan II	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	86	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	108	[NT]	[NT]	[NT]	[NT]	104	[NT]

QUALITY CONTROL: Organophosphorus Pesticides in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	[NT]
Date extracted	-			18/11/2020	[NT]	[NT]	[NT]	[NT]	18/11/2020	[NT]
Date analysed	-			18/11/2020	[NT]	[NT]	[NT]	[NT]	18/11/2020	[NT]
Dichlorvos	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Dimethoate	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chlorpyrifos-methyl	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	65	[NT]
Fenitrothion	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	75	[NT]
Malathion	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	92	[NT]
Chlorpyrifos	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	105	[NT]
Parathion	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	111	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	108	[NT]	[NT]	[NT]	[NT]	104	[NT]

Client Reference: E30104P, Badgerys Creek

QUALITY CONTROL: PCBs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	[NT]
Date extracted	-			18/11/2020	[NT]	[NT]	[NT]	[NT]	18/11/2020	[NT]
Date analysed	-			18/11/2020	[NT]	[NT]	[NT]	[NT]	18/11/2020	[NT]
Aroclor 1016	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	120	[NT]
Aroclor 1260	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-021	108	[NT]	[NT]	[NT]	[NT]	104	[NT]

Client Reference: E30104P, Badgerys Creek

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			18/11/2020	[NT]	[NT]	[NT]	[NT]	18/11/2020	[NT]
Date analysed	-			18/11/2020	[NT]	[NT]	[NT]	[NT]	18/11/2020	[NT]
Arsenic	mg/kg	4	Metals-020	<4	[NT]	[NT]	[NT]	[NT]	126	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	[NT]	[NT]	[NT]	[NT]	111	[NT]
Chromium	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	108	[NT]
Copper	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	117	[NT]
Lead	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	[NT]	[NT]	[NT]	[NT]	111	[NT]
Nickel	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	108	[NT]
Zinc	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	112	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.
Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.	
The recommended maximums for analytes in urine are taken from "2018 TLVs and BEIs", as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.	
Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2	

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Report Comments

Asbestos-ID in soil: NEPM

This report is consistent with the reporting recommendations in the National Environment Protection (Assessment of Site Contamination) Measure, Schedule B1, May 2013. This is reported outside our scope of NATA accreditation.

SAMPLE RECEIPT ADVICE

Client Details

Client	Environmental Investigation Services
Attention	Brendan Page

Sample Login Details

Your reference	E30104P, Badgerys Creek
Envirolab Reference	255960
Date Sample Received	18/11/2020
Date Instructions Received	18/11/2020
Date Results Expected to be Reported	18/11/2020

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	3 Soil
Turnaround Time Requested	Same day
Temperature on Receipt (°C)	12.4
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie

Phone: 02 9910 6200
Fax: 02 9910 6201
Email: ahie@envirolab.com.au

Jacinta Hurst

Phone: 02 9910 6200
Fax: 02 9910 6201
Email: jhurst@envirolab.com.au

Analysis Underway, details on the following page:



Envirolab Services Pty Ltd

ABN 37 112 535 645

12 Ashley St Chatswood NSW 2067

ph 02 9910 6200 fax 02 9910 6201

customerservice@envirolab.com.au

www.envirolab.com.au

Sample ID	VTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides in Soil	PCBs in Soil	Acid Extractable metals in soil	Asbestos ID - soils NEPM - ASB-001
OGM1	✓	✓	✓	✓	✓	✓	✓	✓
OGM2	✓	✓	✓	✓	✓	✓	✓	✓
OGM3	✓	✓	✓	✓	✓	✓	✓	✓

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.

Requests for longer term sample storage must be received in writing.

Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.

TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

TO: ENVIROLAB SERVICES PTY LTD 12 ASHLEY STREET CHATSWOOD NSW 2067 P: (02) 99106200 F: (02) 99106201 Attention: Aileen		JKE Job Number: E30104P Date Results Required: STANDARD SAME DAY Page: 1/1		FROM: JKE Environments REAR OF 115 WICKS ROAD MACQUARIE PARK, NSW 2113 P: 02-9888 5000 F: 02-9888 5001 Attention: BRENDAN PAGE											
Location: BADGERYS CREEK		Sample Preserved in Esky on Ice													
Sampler: CR		Tests Required													
Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	Combo 2	Combo 3a	Combo 6	Combo 6a	8 Metals	PAHs	TRH/BTEX	BTEX	Asbestos
17.11.20	1	OGM1	-	G, A	0.1	F: SILT/SAND			X						X
17.11.20	2	OGM2	-	GA	0.0	↓			X						X
17.11.20	3	OGM3	-	GA	0.1	↓			X						X
							ENVIROLAB SERVICES 12 Ashley St. Chatswood NSW 2067 Ph: (02) 9910 6200 259160 18/11/20 COOL/AMBIENT ICE/ICEPECK Intact/Broken/None								
Remarks (comments/detection limits required):							Sample Containers: G - 250mg Glass Jar A - Ziplock Asbestos Bag P - Plastic Bag								
Relinquished By:				Date: 18/11/2020			Time: 7:50			Received By: C. McIlenny			Date: 18/11/20		