Douglas Partners
Geotechnics / Environment / Groundwater

Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
96 Hermitage Road
West Ryde NSW 2114
PO Box 472
West Ryde NSW 1685
Phone (02) 9809 0666

CPB Contractors Pty Limited & United Infrastructure Pty Limited
(CPBUI JV)

204814.01
7 December 2023
RAP.007.Rev1
HD / JMN:jl

Attention:

Email:

Remediation Works Plan
for Unexpected Find (UF1) at Area of Environmental Concern (AEC) 31a
Surface & Civil Alignment Works (SCAW) Package for Sydney Metro - Western Sydney Airport (SMWSA)
Sweetwater Grove, Orchard Hills

1. Introduction

Douglas Partners Pty Ltd (DP) has prepared this Remediation Works Plan (RWP) for the remediation and validation of an unexpected find (UF1), located at the southern end of Area of Environmental Concern (AEC) 31a, Sweetwater Grove, Orchard Hills.

It is understood that during earthworks for Surface & Civil Alignment Works (SCAW) for Sydney Metro – Western Sydney Airport (SMWSA), soil with notable proportions of anthropogenic materials was uncovered at the southern end of AEC 31a. The unexpected find was investigated by DP and reported in:

- DP, *Investigation of Unexpected Find (UF1) at Area of Environmental Concern (AEC) 31a, Surface & Civil Alignment Works (SCAW) Package for Sydney Metro – Western Sydney Airport (SMWSA), Sweetwater Grove, Orchard Hills*, ref.: 204814.01.WC.004.Rev0, dated 24 August 2023 (DP, 2023b).

The investigation revealed asbestos and metals contaminated fill.

The objective of this RWP is to provide a plan to remediate the asbestos and metals contaminated fill and validate the remediation.

2. Background

Technical Paper 8: Contamination, prepared as part of Sydney Metro - Western Sydney Airport, Environmental Impact Statement, 21 October 2020 (EIS), documents the AEC identified in the Sydney Metro - Western Sydney Airport project area. AEC 31a was identified and covers an area of approximately 4.6 ha. Part of AEC 31a is shown (in red) on Drawing 1, extracted from DP (2023b), attached[1].

DP has previously prepared the following contamination report for AEC 31a:

- Douglas Partners Pty Ltd (DP), *Report on Detailed Site Investigation (Contamination), Surface & Civil Alignment Works (SCAW) Package for Sydney Metro – Western Sydney Airport (SMWSA), Area of Environmental Concern (AEC) 31a, Sweetwater Grove, Orchard Hills*, ref: 204814.01.DSI.008.Rev1, dated 19 July 2023 (DP, 2023a).

The following is noted from a review of DP (2023a):

- The boundary the unexpected find area extends slightly beyond the southern boundary of AEC 31a;
- The area of the unexpected find is underlain by Bringelly Shale comprising shale, carbonaceous claystone, claystone, laminate, fine to medium-grained lithic sandstone, rare coal, and tuff (according to Penrith 1:100,000 Geology Sheet);
- The area of the unexpected find is within the South Creek soil landscape which comprises alluvial soils (Penrith 1:100,000 Soils Landscape Sheet);
- AEC 31a is not within an area or close to an area associated with a risk of acid sulfate soils (according to the NSW Acid Sulfate Soil Risk map);
- AEC 31a is at approximately 36 m Australian Height Datum. Slopes in the vicinity of the unexpected find are generally down to the south-east;
- Farm dams are at the southern end of AEC 31a, one of which is adjacent to the location of the unexpected find (as shown on Drawing 1, attached);
- According to the EIS, AEC 31a appeared to be used for rural purposes including grazing, and a waste storage area (within AEC 31a) was identified approximately 170 m to the north of the location of the unexpected find. The waste storage area was not present at the time of conducting the DSI;
- A potential source of soil contamination at the site was listed in the DSI as: c*ontaminated ground from waste storage and potential dumping at the site*. Associated contaminants of potential concern (CoPC) in soil were listed as:
  - Metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, and zinc);
  - Total recoverable hydrocarbons (TRH);
  - Benzene, toluene, ethylbenzene, and xylenes (BTEX);
  - Polycyclic aromatic hydrocarbons (PAH);
  - Organochlorine pesticides (OCP);
  - Organophosphorus pesticides (OPP);

[1] Drawing extracted from DP (2023b), which was a targeted investigation in UF1.

- Polychlorinated biphenyls (PCB);
- Phenols; and
- Asbestos.

DP (2023b) was prepared following the discovery of UF1 and provides the findings and results of the investigation of the unexpected find. The area of the unexpected find was to the south of a farm dam and slopes down from the dam. Stripping of topsoil along the proposed rail alignment had occurred nearby. The area of the unexpected find had been flagged to separate the area from other works. Much of the vegetation across the area of the unexpected find had been removed. Amongst other wase materials, fragments of fibre cement (asbestos containing materials) were observed in clusters on the soil surface across the area of the unexpected find. Sixteen test pits (AEC31ATP101 to AEC31ATP116) were utilised for the investigation. Drawing 1, test pit logs and summary results tables have been extracted from DP (2023b) and are attached for reference.

At test pits AEC31ATP102, AEC31ATP103, AEC31ATP108, AEC31ATP109, AEC31ATP110 and AEC31ATP113, grey-brown silty sand fill was observed to contain significant proportions of anthropogenic materials including metal, wire, plastic, bricks, terracotta, tiles, rope, ceramic, cloth, timber, and fibre-cement (potential ACM). Fill depths at these test pits ranged from 0.8 m to 2.3 m.

At test pits AEC31ATP101, AEC31ATP111 and AECE31ATP112, grey-brown silty sand fill with a trace proportion of anthropogenic materials were encountered to depths ranging between 0.3 m and 0.4 m. Observed anthropogenic materials included concrete, plastic, and metal.

At test pits AEC31ATP104, AEC31ATP105, AEC31ATP106, AEC31ATP107, AEC31ATP114, AEC31ATP115 and AEC31ATP116, fill comprised grey-brown silty sand (with no observed anthropogenic materials).

Fill was observed to be underlain by red-brown silty clay except at AEC31ATP109 and AEC31ATP110 where the test pits were discontinued in fill due to refusal on wire fencing material and test pit collapse, respectively.

Asbestos was detected by the laboratory in fibre cement samples (PACM1 and PACM2), and fill sample AEC31ATP111 / 0.1-0.2 m in the form of loose fibre bundles. Additionally, exceedances of the adopted site assessment criteria (SAC) were recorded for copper, lead and zinc in fill samples. Elevated concentrations of TRH $>C_{10}$-C_{16} and TRH $>C_{16}$-C_{34} were identified in the sample AEC31ATP109 / 0.5-0.6 m, however, concentrations of total petroleum hydrocarbons (TPH) $>C_{10}$-C_{16}, TPH $>C_{16}$-C_{34} and TPH $>C_{34}$-C_{40} were below the laboratory practical quantitation limits indicating that the detected TRH may have been due to 'interference' from organic matter in the heterogenous fill.

The contaminated fill was given a preliminary waste classification of special waste - asbestos, hazardous waste. It was noted that further sampling, analysis, and statistical analysis for lead may result in a lesser waste classification.

The following recommendations were made in DP (2023b):

- Works involving asbestos are to be undertaken by a contractor holding a licensed Class A asbestos removal licence. Monitoring for airborne asbestos fibres is to be carried out by a licensed asbestos assessor;
- The (contaminated) fill containing anthropogenic materials should be excavated ('chased out') based on visual observation and then stockpiled in a designated stockpiling area with measures to prevent cross contamination. The stockpile should be subject to further inspection, sampling, and analysis by an environmental consultant to provide final waste classification / characterisation. The stockpile is to be removed / disposed of in accordance with the environmental consultant's advice;
- A clearance certificate(s) for the removal of asbestos is to be provided by the licensed asbestos assessor (following the removal of asbestos from the excavation and designated stockpiling area); and
- The resultant excavation is to be validated by inspection, soil sampling and analysis by the environmental consultant. Further excavation works to chase-out contaminated material identified from there works may be required. The designated stockpiling area will also need to be validated following removal of contaminated material.

3. Remediation Strategy and Sequence

The general sequence of remediation shall be determined by the Contractor (CPBUI JV) and should consider the following:

- An asbestos removal control plan (ARCP) is to be prepared for the asbestos removal work by the licensed asbestos removal contractor. The work associated with asbestos remediation will be undertaken by an Asbestos Contractor holding a Class A licence. SafeWork NSW is to be notified in writing at least five days before the licensed asbestos removal work commences. Monitoring for airborne asbestos fibres is to be carried out by a Licensed Asbestos Assessor (Occupational Hygienist) during the excavation and removal of asbestos contaminated materials;
- All works will be conducted in a safe manner and to minimise environmental impacts;
- The initial excavation area around test pits AEC31ATP101, AEC31ATP102, AEC31ATP103, AEC31ATP108, AEC31ATP109, AEC31ATP110, AEC31ATP111, AEC31ATP112 and AEC31ATP113 will be marked out. The initial excavation area is shown in dashed yellow on Drawing 1 extracted from DP (2023b). (Note that the actual remediation area may extend beyond this arbitrary area). The initial excavation area will not, however, extend beyond the SCAW boundary which represents the practical limit of excavation and remediation;
- Excavation of identified contaminated fill (identified to contain anthropogenic materials), extending over the initial area and to a minimum depth of 0.1 m into natural soil.;
- The extent of the excavation may need to be increased (vertically or horizontally) where signs of contamination (possible asbestos containing materials or other anthropogenic materials) are identified by the licensed Asbestos Assessor and / or Environmental Consultant;

- Stockpiling of the excavated soil on an area covered with a suitable plastic membrane to minimise the potential for contaminating soils beneath. In dry and windy conditions, the stockpile will be lightly wetted and covered with plastic whilst awaiting transport / disposal;
- Upon completion of the excavation works, the excavation area will be subject to final visual clearance inspection of exposed areas, this will be undertaken by the Occupational Hygienist. Once all asbestos materials have been removed from the excavated area and this has been confirmed through visual and analytical means (where applicable), a clearance certificate report (or interim clearance report) will be prepared by the Occupational Hygienist;
- Validation soil samples from the excavation pit are to be collected by the Environmental Consultant (as per Section 5);
- Samples are to be collected from the stockpile(s) by the Environmental Consultant at the sampling frequency provided in Section 6). From the results of sampling and testing, the Environmental Consultant is to provide advice on:
  - Suitability of the materials to be reused / positioned elsewhere on the SCAW project site; and
  - The appropriate waste classification for off-site disposal to an appropriately licensed landfill.
- The excavation is to be expanded under the direction of the Environmental Consultant where test results of validation samples do not meet the remediation acceptance criteria. Subsequent clearance inspection of exposed areas of the excavation is to be undertaken by the Occupational Hygienist and an (interim) clearance certificate is to be provided. Validation sampling of the expanded excavation is to be undertaken by the Environmental Consultant. Additional testing of the excavated soil may be required to determine suitability for reuse, or to enable waste classification assessment. This process may need to be repeated (until all results meet the remediation acceptance criteria if retained on site); and
- At the completion of excavation works and removal of the contaminated stockpiles from the stockpiling area (to elsewhere within SCAW or to a licensed landfill), a final clearance inspection is to be carried out and written certification is to be provided by the Occupational Hygienist that the area is safe to be accessed for works purposes. Following clearance, the area may be reopened for further general excavation or construction work.

It is noted that the concentrations of lead were recorded above the generic health investigation levels (HIL) for both public open space and commercial / industrial land uses (NEPC, 2013) and, therefore, it is considered that the most likely outcome of the suitability assessment of stockpiled contaminated material will be that the material will not be suitable for reuse at the SCAW project site. The main purpose for stockpile sampling and testing, therefore, will likely be to obtain sufficient analytical data in order to conduct statistical analysis of chemical concentrations so as to provide final waste classification for off-site disposal.

4. Assessment Criteria

4.1 Remediation Acceptance Criteria

The remediation acceptance criteria (RAC) for validation of the excavation (and stockpile footprints) have been derived with reference to the site assessment criteria (SAC) presented in DP (2023a). Where multiple SAC exist for a particular contaminant, the more conservative value has been adopted as the RAC. The RAC are listed below:

- Copper: 210 mg/kg (ecological investigation level for passive open space);
- Lead: 600 mg/kg (health investigation level for passive open space);
- Zinc: 480 mg/kg (ecological investigation level for passive open space);
- Bonded asbestos containing materials: 0.02% w/w (health screening level for passive open space);
- Fibrous asbestos (FA) and Asbestos Fines (AF): 0.001% w/w (health screening level); and
- No visible asbestos for surface soil for all forms of asbestos (health screening level).

Test results for any other chemicals (not listed above), obtained during validation works, should be assessed against the SAC in the DSI (DP, 2023a).

4.2 Reuse Criteria

Where excavated material is to be assessed for reuse at SCAW, results are to be assessed against the SAC presented in the DSI (DP, 2023a). Potential receival locations at SCAW may have particular assessment criteria which may also need to be used for the assessment where appropriate.

5. Validation Plan

5.1 Data Quality Objectives

The objective of the validation plan is to demonstrate that the site has been made suitable for the proposed development, and preceding works and to provide information on any environmental impacts which may have resulted from the remedial works.

The validation assessment will be conducted with reference to the seven step data quality objectives (DQOs) as outlined in NEPC (2013), described below.

Table 1: Data Quality Objectives

Step	Summary
1: State the problem	The objective of the validation plan is to confirm the successful implementation of this RWP and demonstrate that the site has been made suitable for the proposed development. A conceptual site model (CSM) for the proposed development has been prepared in DP (2023a).
2: Identify the decisions / goal of the study	The remediation strategy is described in Section 3. The key contaminants have been identified as metals (copper, lead and zinc) and asbestos. The success of the remediation and subsequent validation will be based on a comparison of the analytical results to the adopted RAC. Although not appropriate for asbestos, statistical analysis may be utilised for other contaminants.
3: Identify the information inputs	Relevant inputs to the decision include: The CSM, identifying the contaminant and affected media; Analysis using NATA accredited laboratories and methods, where possible; Field and laboratory QA / QC data to assess the suitability of the environmental data for the validation assessment; Results compared with the RAC; and Material tracking records and/or disposal dockets with associated waste classification documentation.
4: Define the study boundaries	The lateral remedial boundaries are shown on Drawing 1 extracted from DP (2023b), attached. It is noted, however, that the lateral extent of remediation may be increased depending on the extent of impacted soil (but will not be extended into neighbouring properties). The vertical boundary is the vertical extent of contamination (i.e., 0.1 m into natural soil). It is noted, however, that the vertical extent may be increased depending on the depth of impacted soil.
5: Develop the analytical approach (or decision rule)	The decision rule is to compare all analytical results with the RAC. Initial comparisons will be with individual results. Although not appropriate for asbestos, statistical analysis may be utilised for other contaminants. The field and laboratory quality assurance assessment is discussed in Section 7.
6: Specify the performance or acceptance criteria	Baseline condition: Contaminants at the site and / or statistical analysis of data exceed the RAC and pose a potentially unacceptable risk to receptors (null hypothesis). Alternative condition: Contaminants at the site and statistical analysis of data complies with the RAC and as such, do not pose a potentially unacceptable risk to receptors (alternative hypothesis).

Step	Summary
	Unless conclusive information from the collected data is sufficient to reject the null hypothesis, it is assumed that the baseline condition is true.
7: Optimise the design for obtaining data	Sampling design and procedures to be implemented to optimise data collection for achieving the DQOs include the following: Sampling frequencies in accordance with Sections 5.2, 5.3 and 6; Analysis at NATA accredited laboratories using NATA endorsed methods will be used to perform laboratory analysis whenever possible; and Adequately experienced environmental scientists/engineers will conduct field work and sample analysis interpretation.

5.2 Validation Assessment Requirements

The following validation work will be required:

- Field assessment by the Environmental Consultant comprising:
  - Visual inspections, including taking photographs for record purposes; and
  - Collection of validation samples from the remediation excavations and stockpile footprints and characterisation samples from stockpiles of contaminated material.
- Laboratory analysis of validation samples at a NATA accredited laboratory (for asbestos, copper lead and zinc);
- Comparison by the Environmental Consultant of the laboratory results with the RAC;
- Review of clearance inspection reports (prepared by the Occupational Hygienist) by the Environmental Consultant; and
- Preparation by the Environmental Consultant of a validation report detailing the methods and results of the remediation works and validation assessment.

Field assessment validation works are discussed in the Section 5.3.

5.3 Field Assessment Validation Works

Following the excavation of contaminated fill, the remediation area is to be subject to visual assessment by the Environmental Consultant. (It is noted that the Occupational Hygienist is to conduct visual inspections to provide prior clearance). The walkover of the area is to be conducted on a 1 m by 1 m grid.

Validation sampling at the remediation area will be undertaken by the Environmental Consultant. The sampling frequency will depend on the volume or area to be assessed and the previous results. The following sampling frequencies will be adopted but may be modified by the Environmental Consultant to take into account previous results, where applicable:

- Base of excavation: one sample per 25 m^2 on a general grid pattern; and
- Sides of excavation: one sample per 5 m length and per 1 m depth. Samples will be collected from the depth(s) of concern and the depth of each sample will be recorded.

The above sampling frequency may be modified by the Environmental Consultant based on observations. For natural soils, soil samples will be collected in a laboratory supplied jar for chemical analysis and a 500 mL zip-lock bag for asbestos analysis. For fill, samples will be collected in a jar for chemical analysis, a 500 mL zip-lock bag for asbestos analysis and a 10 L bulk soil sample. The bulk samples will be subject to onsite screening / sieving for asbestos containing materials.

Footprints of stockpiles of contaminated soil are to be inspected following the removal of contaminated soil. Where contaminated soils are stored on bare soils, the footprint of the stockpile will require validation following removal of the contaminated soils. The sampling frequency will be one sample per 25 m^2 on a general grid pattern across the stockpile footprint. Samples will be collected in a jar for chemical analysis and a 500 mL zip-lock bag for asbestos analysis.

Validation samples will be analysed for metals (copper, lead and zinc) and asbestos (in 500 ml soil samples). Validation sample test results will be compared to the RAC. Where the RAC are considered to have not been met, the remediation excavation(s) will be expanded to ‘chase-out’ impacted material, as instructed by the Environmental Consultant, with the validation sampling then continuing into the extended excavation. This process will continue until the impacted material has been fully chased out.

6. Stockpile Characterisation Sampling

Materials excavated during remediation works are to be stockpiled and subject to characterisation sampling prior by the Environmental Consultant.

Disposal of waste (outside of the SCAW project area) must be to an appropriately licensed waste facility, as per *Protection of the Environment Operations Act 1997* NSW (POEO Act) and the *Protection of the Environment (Waste) Regulation 2014* NSW. Any waste disposed outside of the SCAW project area must be initially classified by the Environmental Consultant in accordance with:

- NSW EPA *Waste Classification Guidelines, Part 1: Classifying Waste* (NSW EPA, 2014a);
- NSW EPA *Waste Classification Guidelines, Part 2: Immobilisation of Waste* (NSW EPA, 2014b); and
- NSW EPA *Addendum to the Waste Classification Guidelines (2014) - Part 1: Classifying Waste* (NSW EPA, 2016) [addendum for per- and poly-fluoroalkyl substances (PFAS)].

Samples will be collected from stockpiles of the contaminated material at various horizons to characterise the full depth of the material. The frequency is to be determined by the Environmental Consultant based on the risk of contamination and heterogeneity of the material.

The suggested sampling frequency for contaminants of potential concern other than asbestos, sourced from NSW EPA (2022)[2], for the initial assessment of stockpiles comprising similar materials shall be (as a minimum):

- For stockpiles up to 200 m^3: one sample per 25 m^3, with a minimum of three per stockpile;
- For stockpiles of 200 m^3 to 2500 m^3: a minimum of 10 samples for application of statistics; and
- For stockpiles of greater than 2500 m^3: one sample per 250 m^3 or part thereof.

It is noted that adopted sample densities may need to be greater that those listed above in order to facilitate statistical analysis (particularly with respect to lead).

Excavated contaminated fill will be presumed to contained asbestos. If it is to be assessed that a stockpile of fill does not contain asbestos, the following sample densities are required for asbestos testing:

- For disposal to a licensed landfill: three samples for stockpiles less than 75 m^3, plus one sample for every additional 75 m^3 with each sample comprising a 500 mL sample for AF / FA analysis and a 10 L bulk sample for asbestos sieving / screening as per the method described in NEPC (2013); and
- For transport to a licensed recycling facility: one sample per 25 m^3 with each sample comprising a 500 mL sample for AF / FA analysis and a 10 L bulk sample for asbestos sieving / screening as per the method described in NEPC (2013).

Laboratory analysis of stockpile samples will be determined by the Environmental Consultant following a review of any applicable previous results. The general analytical suite will likely comprise metals (arsenic, cadmium, chromium, lead, mercury and nickel), TRH, BTEX, PAH, OCP, OPP, PCB, phenols and asbestos. Analysis will be undertaken at NATA accredited laboratories.

Results from DP (2023b), where applicable, will be used as part of the assessment of stockpiled materials.

7. Data Quality Assurance and Quality Control

Given the sporadic nature of asbestos contamination in fill, which by nature is heterogenous, samples analysed for asbestos will not be subject to inter-laboratory or intra-laboratory replicate analysis. To avoid the need for decontamination, samples for asbestos analysis will be collected using disposable nitrile gloves, changed for the collection of each sample.

[2] The sampling densities sourced from NSW EPA (2022) are also presented in Table 2 and Table 3 of EPA Victoria, Industrial Waste Resource Guidelines, 2009.

For analysis of chemical contaminants (i.e., excluding asbestos analysis), field quality assurance and quality control (QA / QC) testing will include the following:

- 10% replicate sample analysis; and
- Rinsate samples (where re-useable sampling equipment is used), analysed for the suite of analytes analysed by the majority of the primary samples.

The use of trip spikes and blanks has not been proposed given that contamination from volatile chemicals has not been identified.

The laboratory will undertake analysis in accordance with its NATA accreditation, including in-house QA / QC procedures.

The field QC analytical results will be assessed using the following criteria:

- Sampling location rationale met the sampling objective;
- Standard operating procedures (SOP) are followed;
- Appropriate QA / QC samples are collected / prepared and analysed;
- Samples are stored under secure, temperature-controlled conditions;
- Chain of custody documentation is employed for the handling, transport and delivery of samples to the selected laboratory;
- Conformance with specified holding times;
- Field replicate samples will have a precision average of 30% relative percentage difference (RPD); and
- Rinsate samples will show that the sampling equipment (if used) is free of introduced contaminants, i.e., the analytes show that the rinsate sample is within the normal range for demineralised water.

Limits for laboratory QA / QC samples will depend on the laboratories' internal QA / QC system. Typical laboratory limits for laboratory QA / QC samples are as follows:

- Blank: less than the PQL;
- Duplicate: for >10 x PQL, the RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range of 20 - 50%;
- Matrix Spike: generally 70-130% recovery for inorganics / metals and 60-140% recovery for organics;
- Laboratory Control Sample (LCS): generally 70-130% recovery for inorganics/metals and 60-140% recovery for organics; and
- Surrogate Spike: generally 70-130% recovery for inorganics / metals and 60-140% recovery for organics.

Field and laboratory test may be considered useable for the validation assessment after evaluation against the following data quality indicators (DQIs):

- Precision – a measure of variability or reproducibility of data;
- Accuracy – a measure of closeness of the data to the 'true' value;
- Representativeness – the confidence (qualitative) of data representativeness of media present on site;
- Completeness – a measure of the amount of usable data from a data collection activity; and
- Comparability – the confidence (qualitative) that data may be considered to be equivalent for each sampling and analytical event.

8. Validation Reporting

A validation assessment report will be prepared by the Environmental Consultant to describe the remediation approach adopted, methodology, results, including any waste classification and conclusion of the assessment. The report will provide comments regarding site suitability (from a contamination perspective).

All waste must be tracked by the Remediation Contractor from 'cradle to grave'. Copies of all consignment notes / disposal dockets (or similar) and Environment Protection Licences for receipt and disposal of the materials must be maintained by the Remediation Contractor as part of the site log and must be provided to the Environmental Consultant for inclusion in the validation report.

9. References

CRC CARE. (2019). *Remediation Action Plan: Development - Guideline on Establishing Remediation Objectives.* National Remediation Framework: CRC for Contamination Assessment and Remediation of the Environment.

CRC CARE. (2019). *Remediation Action Plan: Development - Guideline on Performing Remediation Options Assessment.* National Remediation Framework: CRC for Contamination Assessment and Remediation of the Environment.

NEPC. (2013). *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM].* Australian Government Publishing Services Canberra: National Environment Protection Council.

NSW DUAP/EPA. (1998). *Managing Land Contamination, Planning Guidelines, SEPP 55 – Remediation of Land .* NSW Department of Urban Affairs and Planning / Environment Protection Authority.

NSW EPA. (2014). *Resource Recovery Order under Part 9, Clause 93 of the Protection of the Environment Operations (Waste) Regulation 2014, The excavated natural material order 2014.* NSW Environment Protection Authority.

NSW EPA. (2014). *Waste Classification Guidelines, Part 4: Acid Sulfate Soils.* NSW Environment Protection Authority.

NSW EPA. (2014a). *Waste Classification Guidelines, Part 1: Classifying Waste.* NSW Environment Protection Authority.

NSW EPA. (2014b). *Waste Classification Guidelines, Part 2: Immobilisation of Waste.* NSW Environment Protection Authority.

NSW EPA. (2016). *Addendum to the Waste Classification Guidelines (2014) - Part 1: Classifying Waste.* NSW Environment Protection Authority.

NSW EPA. (2020). *Guidelines for Consultants Reporting on Contaminated Land.* Contaminated Land Guidelines: NSW Environment Protection Authority.

10. Limitations

Douglas Partners (DP) has prepared this report (or services) for the SCAW project for SMWSA. The work was carried out under a Services Contract. This report is provided for the exclusive use of CPBUI JV for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of DP, does so entirely at its own risk and without recourse to DP for any loss or damage. In preparing this report DP has necessarily relied upon information provided by the client and / or their agents.

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

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

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

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

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

Please contact the undersigned if you have any questions on this matter.

Yours faithfully
Douglas Partners Pty Ltd Reviewed by

Environmental Scientist Principal

Attachments: About this Report
Drawing 1 extracted from DP (2023b)
Test Pit Logs extracted from DP (2023b)
Summary Result Tables extracted from DP (2023b)

Attachment

About this Report

About this Report

Douglas Partners

Introduction

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

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

Copyright

Borehole and Test Pit Logs

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

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

Groundwater

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

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

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

Reports

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

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

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

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

About this Report

Site Anomalies

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

Information for Contractual Purposes

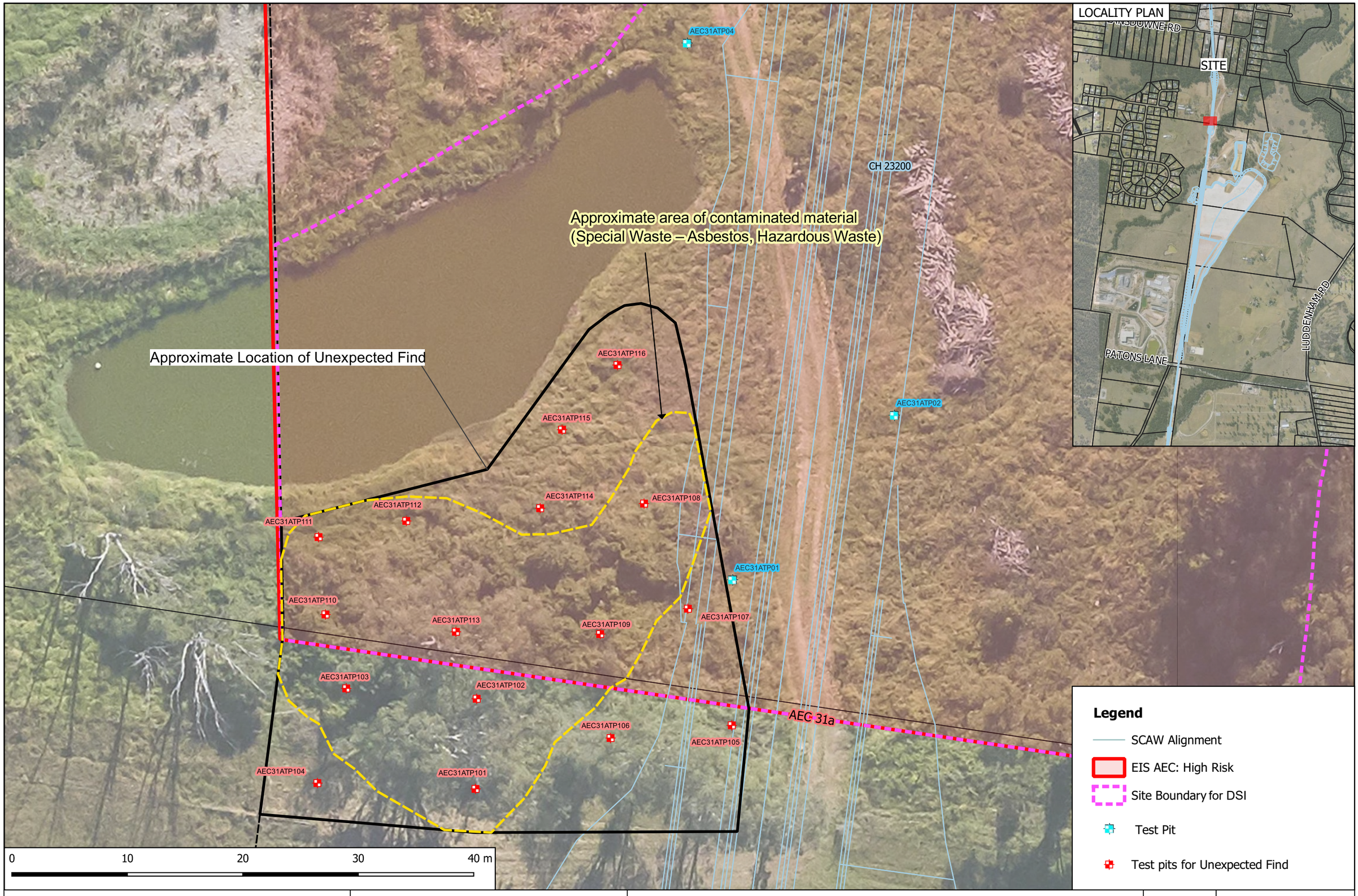
Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate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

Site Inspection

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

Attachment

Drawing 1 extracted from DP (2023a)



Douglas Partners
Geotechnics / Environment / Groundwater

CLIENT: CPBUI JV		TITLE: **Test Location Plan for Unexpected Find at AEC31a**	PROJECT No: 204814.01
OFFICE: Sydney	DRAWN BY: MN	**Sydney Metro Western Sydney Airport - SCAW**	DRAWING No: 1
SCALE: 1:300 @ A3	DATE: 18/08/2023	**Sweetwater Grove, Orchard Hills**	REVISION: 0

Attachment

Test Pit Logs extracted from DP (2023b)

EXCAVATION - GEOLOGICAL LOG

PIT NO : AEC31ATP101
FILE / JOB NO : 204814.01
SHEET : 1 OF 1

PROJECT : Sydney Metro Western Sydney Airport - Surface and Civil Alignment Works
LOCATION : Lansdowne Road - Orchard Hills

POSITION : E: 291823.7, N: 6258035.6 (56 MGA2020)	SURFACE ELEVATION : 33.20 (mAHD)	
EQUIPMENT TYPE : 20 tonne excavator	METHOD : 900mm bucket	
DATE EXCAVATED : 31/07/23	LOGGED BY : PJ	CHECKED BY : MAB
EXCAVATION DIMENSIONS : 1.00 m LONG 0.90 m WIDE		

DRILLING				MATERIAL						
PENETRATION (VE, E, F, H)	SUPPORT	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	HAND PENETRO-METER (100, 200, 300, 400)	STRUCTURE & Other Observations
		Not Encountered	0.10m E 0.20m 0.30m E 0.40m	0.0			FILL: silty SAND: grey-brown, fine to medium grained sand, trace concrete and plastic	M			FILL
				0.40m							
				0.5		CI-CH	Silty CLAY: medium to high plasticity, red-brown, trace ironstone gravel	w<PL to w~PL			RESIDUAL SOIL
				0.60m			EXCAVATION AEC31ATP101 TERMINATED AT 0.60 m Target depth				
				1.0							
				1.5							
				2.0							
				2.5							
				3.0							
				3.5							
				4.0							
				4.5							
				5.0							

PHOTOGRAPHS NOTES ☐ YES ☒ NO

METHOD
- N Natural Exposure
- E Existing Excavation
- BH Backhoe Bucket
- B Bulldozer Blade
- R Ripper

SUPPORT
- T Timbering

PENETRATION
VE E F H VH — No Resistance

WATER
10 Oct., 73 Water Level on Date shown
water inflow
water outflow

SAMPLES & FIELD TESTS
- U50 - Undisturbed Sample 50 mm diameter
- D - Disturbed Sample
- B - Bulk Disturbed Sample
- MC - Moisture Content
- HP - Hand Penetrometer (UCS kPa)
- VS - Vane Shear; P-Peak, R-Remouded (uncorrected kPa)
- PBT - Plate Bearing Test

CLASSIFICATION SYMBOLS & SOIL DESCRIPTION
Based on Unified Classification System

MOISTURE
- D - Dry
- M - Moist
- W - Wet

CONSISTENCY/ RELATIVE DENSITY

VS	- Very Soft
S	- Soft
F	- Firm
St	- Stiff
VSt	- Very Stiff
H	- Hard
VL	- Very Loose
L	- Loose
MD	- Medium Dense
D	- Dense
VD	- Very Dense

Douglas Partners
Geotechnics | Environment | Groundwater

EXCAVATION - GEOLOGICAL LOG

PIT NO : AEC31ATP102
FILE / JOB NO : 204814.01
SHEET : 1 OF 1

PROJECT : Sydney Metro Western Sydney Airport - Surface and Civil Alignment Works
LOCATION : Lansdowne Road - Orchard Hills

POSITION : E: 291823.8, N: 6258043.4 (56 MGA2020)	SURFACE ELEVATION : 34.00 (mAHD)	
EQUIPMENT TYPE : 20 tonne excavator	METHOD : 900mm bucket	
DATE EXCAVATED : 31/07/23	LOGGED BY : PJ	CHECKED BY : MAB
EXCAVATION DIMENSIONS : 1.00 m LONG 0.90 m WIDE		

DRILLING | MATERIAL

PENETRATION (VE, E, F, H)	SUPPORT	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	HAND PENETRO-METER kPa	STRUCTURE & Other Observations
		Not Encountered	0.10m E 0.20m	0.0			FILL: silty SAND: grey-brown, fine to medium grained sand, with metal, wire and plastic, trace ACM fragments (PACM2 and PACM3 collected), bricks, terracotta, tiles and rootlets				FILL
			0.50m E 0.60m	0.5							
				1.0				M			
			1.50m E 1.60m	1.5							1.50: Field Replicate BD1/20230731 taken from 1.5-1.6m depth
				2.0			2.30m				
						CI-CH	Silty CLAY: medium to high plasticity, red-brown, trace ironstone gravel 2.50m	w~PL			RESIDUAL SOIL
				2.5			EXCAVATION AEC31ATP102 TERMINATED AT 2.50 m Target depth				
				3.0							
				3.5							
				4.0							
				4.5							
				5.0							

PHOTOGRAPHS NOTES ☐ YES ☒ NO

METHOD
- N Natural Exposure
- E Existing Excavation
- BH Backhoe Bucket
- B Bulldozer Blade
- R Ripper

SUPPORT
- T Timbering

PENETRATION
VE E F H VH — No Resistance

WATER
10 Oct., 73 Water Level on Date shown
water inflow
water outflow

SAMPLES & FIELD TESTS
- U50 - Undisturbed Sample 50 mm diameter
- D - Disturbed Sample
- B - Bulk Disturbed Sample
- MC - Moisture Content
- HP - Hand Penetrometer (UCS kPa)
- VS - Vane Shear; P-Peak, R-Remouded (uncorrected kPa)
- PBT - Plate Bearing Test

CLASSIFICATION SYMBOLS & SOIL DESCRIPTION
Based on Unified Classification System

MOISTURE
- D - Dry
- M - Moist
- W - Wet

CONSISTENCY/ RELATIVE DENSITY

VS	- Very Soft
S	- Soft
F	- Firm
St	- Stiff
VSt	- Very Stiff
H	- Hard
VL	- Very Loose
L	- Loose
MD	- Medium Dense
D	- Dense
VD	- Very Dense

Douglas Partners
Geotechnics | Environment | Groundwater

EXCAVATION - GEOLOGICAL LOG

PIT NO : AEC31ATP103
FILE / JOB NO : 204814.01
SHEET : 1 OF 1

PROJECT : Sydney Metro Western Sydney Airport - Surface and Civil Alignment Works
LOCATION : Lansdowne Road - Orchard Hills

POSITION : E: 291812.5, N: 6258044.3 (56 MGA2020)	SURFACE ELEVATION : 33.90 (mAHD)	
EQUIPMENT TYPE : 20 tonne excavator	METHOD : 900mm bucket	
DATE EXCAVATED : 31/07/23	LOGGED BY : PJ	CHECKED BY : MAB
EXCAVATION DIMENSIONS : 1.00 m LONG 0.90 m WIDE		

DRILLING | MATERIAL

VE / PENETRATION (E, F, H)	SUPPORT	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	HAND PENETROMETER (kPa)	STRUCTURE & Other Observations
		Not Encountered	0.10m E 0.20m 0.50m E 0.60m 1.50m E 1.60m	0.0 0.5 1.0 1.5			FILL: silty SAND: grey-brown with dark brown, fine to medium grained sand, with wire, metal and plastic, trace ACM fragments, fabric, ceramic tiles, terracotta, rope, clay and rootlets	M		100 200 300 400	FILL
				2.0		CI-CH	2.00m Silty CLAY: medium to high plasticity, red-brown, trace ironstone gravel 2.40m	w<PL to w~PL			RESIDUAL SOIL
				2.5 3.0 3.5 4.0 4.5 5.0			EXCAVATION AEC31ATP103 TERMINATED AT 2.40 m Target depth				

PHOTOGRAPHS NOTES ☐ YES ☒ NO

METHOD
- N Natural Exposure
- E Existing Excavation
- BH Backhoe Bucket
- B Bulldozer Blade
- R Ripper

SUPPORT
- T Timbering

PENETRATION
VE E F H VH — No Resistance

WATER
10 Oct., 73 Water Level on Date shown
water inflow
water outflow

SAMPLES & FIELD TESTS
- U50 - Undisturbed Sample 50 mm diameter
- D - Disturbed Sample
- B - Bulk Disturbed Sample
- MC - Moisture Content
- HP - Hand Penetrometer (UCS kPa)
- VS - Vane Shear; P-Peak, R-Remouded (uncorrected kPa)
- PBT - Plate Bearing Test

CLASSIFICATION SYMBOLS & SOIL DESCRIPTION
Based on Unified Classification System

MOISTURE
- D - Dry
- M - Moist
- W - Wet

CONSISTENCY/ RELATIVE DENSITY

VS	- Very Soft
S	- Soft
F	- Firm
St	- Stiff
VSt	- Very Stiff
H	- Hard
VL	- Very Loose
L	- Loose
MD	- Medium Dense
D	- Dense
VD	- Very Dense

Douglas Partners
Geotechnics | Environment | Groundwater

EXCAVATION - GEOLOGICAL LOG

PIT NO : AEC31ATP104
FILE / JOB NO : 204814.01
SHEET : 1 OF 1

PROJECT : Sydney Metro Western Sydney Airport - Surface and Civil Alignment Works
LOCATION : Lansdowne Road - Orchard Hills

POSITION : E: 291810.0, N: 6258036.1 (56 MGA2020)	SURFACE ELEVATION : 33.60 (mAHD)	
EQUIPMENT TYPE : 20 tonne excavator	METHOD : 900mm bucket	
DATE EXCAVATED : 31/07/23	LOGGED BY : PJ	CHECKED BY : MAB
EXCAVATION DIMENSIONS : 1.00 m LONG 0.90 m WIDE		

DRILLING					MATERIAL						
PENETRATION (VE, E, F, H)	SUPPORT	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	HAND PENETRO-METER (100, 200, 300, 400)	STRUCTURE & Other Observations
		Not Encountered	0.10m E 0.20m	0.0			FILL: silty SAND: grey-brown, fine to medium grained sand, trace rootlets	M			FILL
				0.30m		CI-CH	Silty CLAY: medium to high plasticity, red-brown, trace ironstone gravel	w<PL			RESIDUAL SOIL
				0.50m			EXCAVATION AEC31ATP104 TERMINATED AT 0.50 m Target depth				
				0.5							
				1.0							
				1.5							
				2.0							
				2.5							
				3.0							
				3.5							
				4.0							
				4.5							
				5.0							

PHOTOGRAPHS NOTES ☐ YES ☒ NO

METHOD
- N Natural Exposure
- E Existing Excavation
- BH Backhoe Bucket
- B Bulldozer Blade
- R Ripper

SUPPORT
- T Timbering

PENETRATION
VE, E, F, H, VH — No Resistance

WATER
10 Oct., 73 Water Level on Date shown
water inflow
water outflow

SAMPLES & FIELD TESTS
- U50 - Undisturbed Sample 50 mm diameter
- D - Disturbed Sample
- B - Bulk Disturbed Sample
- MC - Moisture Content
- HP - Hand Penetrometer (UCS kPa)
- VS - Vane Shear; P-Peak, R-Remouded (uncorrected kPa)
- PBT - Plate Bearing Test

CLASSIFICATION SYMBOLS & SOIL DESCRIPTION
Based on Unified Classification System

MOISTURE
- D - Dry
- M - Moist
- W - Wet

CONSISTENCY/ RELATIVE DENSITY

VS	- Very Soft
S	- Soft
F	- Firm
St	- Stiff
VSt	- Very Stiff
H	- Hard
VL	- Very Loose
L	- Loose
MD	- Medium Dense
D	- Dense
VD	- Very Dense

Douglas Partners
Geotechnics | Environment | Groundwater

EXCAVATION - GEOLOGICAL LOG

PIT NO : AEC31ATP105
FILE / JOB NO : 204814.01
SHEET : 1 OF 1

PROJECT : Sydney Metro Western Sydney Airport - Surface and Civil Alignment Works
LOCATION : Lansdowne Road - Orchard Hills

POSITION : E: 291845.9, N: 6258041.1 (56 MGA2020) | SURFACE ELEVATION : 34.80 (mAHD)
EQUIPMENT TYPE : 20 tonne excavator | METHOD : 900mm bucket
DATE EXCAVATED : 31/07/23 | LOGGED BY : PJ | CHECKED BY : MAB
EXCAVATION DIMENSIONS : 1.00 m LONG 0.90 m WIDE

DRILLING					MATERIAL						
PENETRATION (VE, E, F, H)	SUPPORT	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	HAND PENETRO-METER (100, 200, 300, 400)	STRUCTURE & Other Observations
		Not Encountered	0.10m E 0.20m	0.0			FILL: silty SAND: grey-brown, fine to medium grained sand, trace rootlets 0.20m	M			FILL
						CI-CH	Silty CLAY: medium to high plasticity, red-brown, trace ironstone gravel 0.40m	w<PL			RESIDUAL SOIL
				0.5			EXCAVATION AEC31ATP105 TERMINATED AT 0.40 m Target depth				
				1.0							
				1.5							
				2.0							
				2.5							
				3.0							
				3.5							
				4.0							
				4.5							
				5.0							

PHOTOGRAPHS NOTES ☐ YES ☒ NO

METHOD
- N Natural Exposure
- E Existing Excavation
- BH Backhoe Bucket
- B Bulldozer Blade
- R Ripper

SUPPORT
- T Timbering

PENETRATION
VE E F H VH — No Resistance

WATER
10 Oct., 73 Water Level on Date shown
water inflow
water outflow

SAMPLES & FIELD TESTS
- U50 - Undisturbed Sample 50 mm diameter
- D - Disturbed Sample
- B - Bulk Disturbed Sample
- MC - Moisture Content
- HP - Hand Penetrometer (UCS kPa)
- VS - Vane Shear; P-Peak, R-Remouded (uncorrected kPa)
- PBT - Plate Bearing Test

CLASSIFICATION SYMBOLS & SOIL DESCRIPTION
Based on Unified Classification System

MOISTURE
- D - Dry
- M - Moist
- W - Wet

CONSISTENCY/ RELATIVE DENSITY

VS	- Very Soft
S	- Soft
F	- Firm
St	- Stiff
VSt	- Very Stiff
H	- Hard
VL	- Very Loose
L	- Loose
MD	- Medium Dense
D	- Dense
VD	- Very Dense

Douglas Partners
Geotechnics | Environment | Groundwater

EXCAVATION - GEOLOGICAL LOG

PIT NO : AEC31ATP106
FILE / JOB NO : 204814.01
SHEET : 1 OF 1

PROJECT : Sydney Metro Western Sydney Airport - Surface and Civil Alignment Works
LOCATION : Lansdowne Road - Orchard Hills

POSITION : E: 291835.4, N: 6258040.0 (56 MGA2020)	SURFACE ELEVATION : 34.90 (mAHD)	
EQUIPMENT TYPE : 20 tonne excavator	METHOD : 900mm bucket	
DATE EXCAVATED : 31/07/23	LOGGED BY : PJ	CHECKED BY : MAB
EXCAVATION DIMENSIONS : 1.00 m LONG 0.90 m WIDE		

DRILLING					MATERIAL						
PENETRATION (VE, E, F, H)	SUPPORT	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	HAND PENETRO-METER (100, 200, 300, 400 kPa)	STRUCTURE & Other Observations
		Not Encountered	0.10m E 0.20m	0.0			FILL: silty SAND: grey-brown, fine to medium grained sand, trace rootlets 0.20m	M			FILL
						CI-CH	Silty CLAY: medium to high plasticity, red-brown, trace ironstone gravel 0.40m	w<PL			RESIDUAL SOIL
				0.5			EXCAVATION AEC31ATP106 TERMINATED AT 0.40 m Target depth				
				1.0							
				1.5							
				2.0							
				2.5							
				3.0							
				3.5							
				4.0							
				4.5							
				5.0							

PHOTOGRAPHS NOTES ☐ YES ☒ NO

METHOD
- N Natural Exposure
- E Existing Excavation
- BH Backhoe Bucket
- B Bulldozer Blade
- R Ripper

SUPPORT
- T Timbering

PENETRATION
VE E F H VH — No Resistance

WATER
10 Oct., 73 Water Level on Date shown
water inflow
water outflow

SAMPLES & FIELD TESTS
- U50 - Undisturbed Sample 50 mm diameter
- D - Disturbed Sample
- B - Bulk Disturbed Sample
- MC - Moisture Content
- HP - Hand Penetrometer (UCS kPa)
- VS - Vane Shear; P-Peak, R-Remouded (uncorrected kPa)
- PBT - Plate Bearing Test

CLASSIFICATION SYMBOLS & SOIL DESCRIPTION
Based on Unified Classification System

MOISTURE
- D - Dry
- M - Moist
- W - Wet

CONSISTENCY/ RELATIVE DENSITY

VS	- Very Soft
S	- Soft
F	- Firm
St	- Stiff
VSt	- Very Stiff
H	- Hard
VL	- Very Loose
L	- Loose
MD	- Medium Dense
D	- Dense
VD	- Very Dense

Douglas Partners
Geotechnics | Environment | Groundwater

EXCAVATION - GEOLOGICAL LOG

PIT NO : AEC31ATP107
FILE / JOB NO : 204814.01
SHEET : 1 OF 1

PROJECT : Sydney Metro Western Sydney Airport - Surface and Civil Alignment Works
LOCATION : Lansdowne Road - Orchard Hills

POSITION : E: 291842.1, N: 6258051.2 (56 MGA2020) | SURFACE ELEVATION : 35.80 (mAHD)
EQUIPMENT TYPE : 20 tonne excavator | METHOD : 900mm bucket
DATE EXCAVATED : 31/07/23 | LOGGED BY : PJ | CHECKED BY : MAB
EXCAVATION DIMENSIONS : 1.00 m LONG 0.90 m WIDE

DRILLING					MATERIAL						
PENETRATION (VE, E, F, H)	SUPPORT	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	HAND PENETROMETER (kPa)	STRUCTURE & Other Observations
		Not Encountered	0.10m E 0.20m	0.0			FILL: silty SAND: grey-brown, fine to medium grained sand, trace rootlets	M			FILL
							0.20m				
						CI-CH	Silty CLAY: medium to high plasticity, red-brown, trace ironstone gravel	w<PL			RESIDUAL SOIL
							0.40m				
				0.5			EXCAVATION AEC31ATP107 TERMINATED AT 0.40 m Target depth				
				1.0							
				1.5							
				2.0							
				2.5							
				3.0							
				3.5							
				4.0							
				4.5							
				5.0							

PHOTOGRAPHS NOTES ☐ YES ☒ NO

METHOD
- N Natural Exposure
- E Existing Excavation
- BH Backhoe Bucket
- B Bulldozer Blade
- R Ripper

SUPPORT
- T Timbering

PENETRATION
VE E F H VH — No Resistance

WATER
10 Oct., 73 Water Level on Date shown
water inflow
water outflow

SAMPLES & FIELD TESTS
- U50 - Undisturbed Sample 50 mm diameter
- D - Disturbed Sample
- B - Bulk Disturbed Sample
- MC - Moisture Content
- HP - Hand Penetrometer (UCS kPa)
- VS - Vane Shear; P-Peak, R-Remouded (uncorrected kPa)
- PBT - Plate Bearing Test

CLASSIFICATION SYMBOLS & SOIL DESCRIPTION
Based on Unified Classification System

MOISTURE
- D - Dry
- M - Moist
- W - Wet

CONSISTENCY/ RELATIVE DENSITY

VS	- Very Soft
S	- Soft
F	- Firm
St	- Stiff
VSt	- Very Stiff
H	- Hard
VL	- Very Loose
L	- Loose
MD	- Medium Dense
D	- Dense
VD	- Very Dense

Douglas Partners
Geotechnics | Environment | Groundwater

EXCAVATION - GEOLOGICAL LOG

PIT NO : AEC31ATP108
FILE / JOB NO : 204814.01
SHEET : 1 OF 1

PROJECT : Sydney Metro Western Sydney Airport - Surface and Civil Alignment Works
LOCATION : Lansdowne Road - Orchard Hills

POSITION : E: 291838.3, N: 6258060.3 (56 MGA2020)	SURFACE ELEVATION : 37.00 (mAHD)	
EQUIPMENT TYPE : 20 tonne excavator	METHOD : 900mm bucket	
DATE EXCAVATED : 31/07/23	LOGGED BY : PJ	CHECKED BY : MAB
EXCAVATION DIMENSIONS : 1.00 m LONG 0.90 m WIDE		

DRILLING					MATERIAL						
PENETRATION (VE, E, F, H)	SUPPORT	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	HAND PENETRO-METER kPa	STRUCTURE & Other Observations
		Not Encountered	0.10m E 0.20m 0.50m E 0.60m 1.50m E 1.60m	0.0 0.5 1.0 1.5 2.0			FILL: silty SAND: grey-brown, fine to medium grained sand, with plastic, fabric, wire and metal, trace timber and roots	M		100 200 300 400	FILL 0.50: Field Replicate BD2/20230731 taken from 0.5-0.6m depth
							2.00m				
						CI-CH	Silty CLAY: medium to high plasticity, red-brown, trace ironstone gravel	w<PL			RESIDUAL SOIL
							2.20m				
				2.5 3.0 3.5 4.0 4.5 5.0			EXCAVATION AEC31ATP108 TERMINATED AT 2.20 m Target depth				

PHOTOGRAPHS NOTES ☐ YES ☒ NO

METHOD
- N Natural Exposure
- E Existing Excavation
- BH Backhoe Bucket
- B Bulldozer Blade
- R Ripper

SUPPORT
- T Timbering

PENETRATION
VE E F H VH — No Resistance

WATER
10 Oct., 73 Water Level on Date shown
water inflow
water outflow

SAMPLES & FIELD TESTS
- U50 - Undisturbed Sample 50 mm diameter
- D - Disturbed Sample
- B - Bulk Disturbed Sample
- MC - Moisture Content
- HP - Hand Penetrometer (UCS kPa)
- VS - Vane Shear; P-Peak, R-Remouded (uncorrected kPa)
- PBT - Plate Bearing Test

CLASSIFICATION SYMBOLS & SOIL DESCRIPTION
Based on Unified Classification System

MOISTURE
- D - Dry
- M - Moist
- W - Wet

CONSISTENCY/ RELATIVE DENSITY

VS	- Very Soft
S	- Soft
F	- Firm
St	- Stiff
VSt	- Very Stiff
H	- Hard
VL	- Very Loose
L	- Loose
MD	- Medium Dense
D	- Dense
VD	- Very Dense

Douglas Partners
Geotechnics | Environment | Groundwater

EXCAVATION - GEOLOGICAL LOG

PIT NO : AEC31ATP109
FILE / JOB NO : 204814.01
SHEET : 1 OF 1

PROJECT : Sydney Metro Western Sydney Airport - Surface and Civil Alignment Works
LOCATION : Lansdowne Road - Orchard Hills

POSITION : E: 291834.5, N: 6258049.0 (56 MGA2020)	SURFACE ELEVATION : 35.40 (mAHD)	
EQUIPMENT TYPE : 20 tonne excavator	METHOD : 900mm bucket	
DATE EXCAVATED : 31/07/23	LOGGED BY : PJ	CHECKED BY : MAB
EXCAVATION DIMENSIONS : 1.00 m LONG 0.90 m WIDE		

DRILLING					MATERIAL						
VE E F H PENETRATION	SUPPORT	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	HAND PENETRO-METER 100 200 300 400 kPa	STRUCTURE & Other Observations
		Not Encountered	0.10m E 0.20m 0.50m E 0.60m	0.0 0.5 1.0			FILL: silty SAND: grey-brown and brown, fine to medium grained sand, with wire, metal and plastic, trace ACM fragments, fabric, bones, timber and roots	M			FILL
							1.20m EXCAVATION AEC31ATP109 TERMINATED AT 1.20 m Refusal on buried wire mesh				
				1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0							

PHOTOGRAPHS NOTES ☐ YES ☒ NO

METHOD
- N Natural Exposure
- E Existing Excavation
- BH Backhoe Bucket
- B Bulldozer Blade
- R Ripper

SUPPORT
- T Timbering

PENETRATION
VE E F H VH — No Resistance

WATER
10 Oct., 73 Water Level on Date shown
water inflow
water outflow

SAMPLES & FIELD TESTS
- U50 - Undisturbed Sample 50 mm diameter
- D - Disturbed Sample
- B - Bulk Disturbed Sample
- MC - Moisture Content
- HP - Hand Penetrometer (UCS kPa)
- VS - Vane Shear; P-Peak, R-Remouded (uncorrected kPa)
- PBT - Plate Bearing Test

CLASSIFICATION SYMBOLS & SOIL DESCRIPTION
Based on Unified Classification System

MOISTURE
- D - Dry
- M - Moist
- W - Wet

CONSISTENCY/ RELATIVE DENSITY

VS	- Very Soft
S	- Soft
F	- Firm
St	- Stiff
VSt	- Very Stiff
H	- Hard
VL	- Very Loose
L	- Loose
MD	- Medium Dense
D	- Dense
VD	- Very Dense

Douglas Partners
Geotechnics | Environment | Groundwater

EXCAVATION - GEOLOGICAL LOG

PIT NO : AEC31ATP110
FILE / JOB NO : 204814.01
SHEET : 1 OF 1

PROJECT : Sydney Metro Western Sydney Airport - Surface and Civil Alignment Works
LOCATION : Lansdowne Road - Orchard Hills

POSITION : E: 291810.7, N: 6258050.7 (56 MGA2020)	SURFACE ELEVATION : 36.00 (mAHD)	
EQUIPMENT TYPE : 20 tonne excavator	METHOD : 900mm bucket	
DATE EXCAVATED : 31/07/23	LOGGED BY : PJ	CHECKED BY : MAB
EXCAVATION DIMENSIONS : 1.00 m LONG 0.90 m WIDE		

DRILLING					MATERIAL						
PENETRATION (VE, E, F, H)	SUPPORT	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	HAND PENETRO-METER (100, 200, 300, 400)	STRUCTURE & Other Observations
		Not Encountered	0.10m E 0.20m 0.50m E 0.60m 1.50m E 1.60m	0.0 0.5 1.0 1.5			FILL: silty SAND: grey-brown and brown, fine to medium grained sand, with metal, wire and timber, trace ACM fragments, rope, fabric, plastic, bricks and rootlets	M			FILL
				1.70m			EXCAVATION AEC31ATP110 TERMINATED AT 1.70 m Collapsing building rubble				
				2.0 2.5 3.0 3.5 4.0 4.5 5.0							

PHOTOGRAPHS NOTES ☐ YES ☒ NO

METHOD
- N Natural Exposure
- E Existing Excavation
- BH Backhoe Bucket
- B Bulldozer Blade
- R Ripper

SUPPORT
- T Timbering

PENETRATION
VE E F H VH — No Resistance

WATER
10 Oct., 73 Water Level on Date shown
water inflow
water outflow

SAMPLES & FIELD TESTS
- U50 - Undisturbed Sample 50 mm diameter
- D - Disturbed Sample
- B - Bulk Disturbed Sample
- MC - Moisture Content
- HP - Hand Penetrometer (UCS kPa)
- VS - Vane Shear; P-Peak, R-Remouded (uncorrected kPa)
- PBT - Plate Bearing Test

CLASSIFICATION SYMBOLS & SOIL DESCRIPTION
Based on Unified Classification System

MOISTURE
- D - Dry
- M - Moist
- W - Wet

CONSISTENCY/ RELATIVE DENSITY

VS	- Very Soft
S	- Soft
F	- Firm
St	- Stiff
VSt	- Very Stiff
H	- Hard
VL	- Very Loose
L	- Loose
MD	- Medium Dense
D	- Dense
VD	- Very Dense

Douglas Partners
Geotechnics | Environment | Groundwater

EXCAVATION - GEOLOGICAL LOG

PIT NO : AEC31ATP111
FILE / JOB NO : 204814.01
SHEET : 1 OF 1

PROJECT : Sydney Metro Western Sydney Airport - Surface and Civil Alignment Works
LOCATION : Lansdowne Road - Orchard Hills

POSITION : E: 291810.1, N: 6258057.4 (56 MGA2020)	SURFACE ELEVATION : 36.60 (mAHD)	
EQUIPMENT TYPE : 20 tonne excavator	METHOD : 900mm bucket	
DATE EXCAVATED : 31/07/23	LOGGED BY : PJ	CHECKED BY : MAB
EXCAVATION DIMENSIONS : 1.00 m LONG 0.90 m WIDE		

DRILLING | MATERIAL

PENETRATION (VE, E, F, H)	SUPPORT	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	HAND PENETRO-METER (100, 200, 300, 400)	STRUCTURE & Other Observations
		Not Encountered	0.10m E 0.20m	0.0			FILL: silty SAND: grey-brown, fine to medium grained sand, trace metal, plastic and rootlets	M			FILL
				0.30m		CI-CH	Silty CLAY: medium to high plasticity, red-brown, trace ironstone gravel	w<PL			RESIDUAL SOIL
				0.50m			EXCAVATION AEC31ATP111 TERMINATED AT 0.50 m Target depth				
				0.5							
				1.0							
				1.5							
				2.0							
				2.5							
				3.0							
				3.5							
				4.0							
				4.5							
				5.0							

PHOTOGRAPHS NOTES ☐ YES ☒ NO

METHOD
- N Natural Exposure
- E Existing Excavation
- BH Backhoe Bucket
- B Bulldozer Blade
- R Ripper

SUPPORT
- T Timbering

PENETRATION
VE, E, F, H, VH — No Resistance

WATER
10 Oct., 73 Water Level on Date shown
water inflow
water outflow

SAMPLES & FIELD TESTS
- U50 - Undisturbed Sample 50 mm diameter
- D - Disturbed Sample
- B - Bulk Disturbed Sample
- MC - Moisture Content
- HP - Hand Penetrometer (UCS kPa)
- VS - Vane Shear; P-Peak, R-Remouded (uncorrected kPa)
- PBT - Plate Bearing Test

CLASSIFICATION SYMBOLS & SOIL DESCRIPTION
Based on Unified Classification System

MOISTURE
- D - Dry
- M - Moist
- W - Wet

CONSISTENCY/ RELATIVE DENSITY

VS	- Very Soft
S	- Soft
F	- Firm
St	- Stiff
VSt	- Very Stiff
H	- Hard
VL	- Very Loose
L	- Loose
MD	- Medium Dense
D	- Dense
VD	- Very Dense

Douglas Partners
Geotechnics | Environment | Groundwater

EXCAVATION - GEOLOGICAL LOG

PIT NO : AEC31ATP112
FILE / JOB NO : 204814.01
SHEET : 1 OF 1

PROJECT : Sydney Metro Western Sydney Airport - Surface and Civil Alignment Works
LOCATION : Lansdowne Road - Orchard Hills

POSITION : E: 291817.7, N: 6258058.8 (56 MGA2020)	SURFACE ELEVATION : 36.80 (mAHD)	
EQUIPMENT TYPE : 20 tonne excavator	METHOD : 900mm bucket	
DATE EXCAVATED : 31/07/23	LOGGED BY : PJ	CHECKED BY : MAB
EXCAVATION DIMENSIONS : 1.00 m LONG 0.90 m WIDE		

DRILLING | MATERIAL

PENETRATION (VE, E, F, H)	SUPPORT	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	HAND PENETRO-METER (100, 200, 300, 400)	STRUCTURE & Other Observations
		Not Encountered	0.10m E 0.20m	0.0			FILL: silty SAND: grey-brown, fine to medium grained sand, trace metal and rootlets	M			FILL
				0.30m		CI-CH	Silty CLAY: medium to high plasticity, red-brown, trace ironstone gravel	w<PL			RESIDUAL SOIL
				0.50m			EXCAVATION AEC31ATP112 TERMINATED AT 0.50 m Target depth				
				0.5							
				1.0							
				1.5							
				2.0							
				2.5							
				3.0							
				3.5							
				4.0							
				4.5							
				5.0							

PHOTOGRAPHS NOTES ☐ YES ☒ NO

METHOD
- N Natural Exposure
- E Existing Excavation
- BH Backhoe Bucket
- B Bulldozer Blade
- R Ripper

SUPPORT
- T Timbering

PENETRATION
VE E F H VH — No Resistance

WATER
10 Oct., 73 Water Level on Date shown
water inflow
water outflow

SAMPLES & FIELD TESTS
- U50 - Undisturbed Sample 50 mm diameter
- D - Disturbed Sample
- B - Bulk Disturbed Sample
- MC - Moisture Content
- HP - Hand Penetrometer (UCS kPa)
- VS - Vane Shear; P-Peak, R-Remouded (uncorrected kPa)
- PBT - Plate Bearing Test

CLASSIFICATION SYMBOLS & SOIL DESCRIPTION
Based on Unified Classification System

MOISTURE
- D - Dry
- M - Moist
- W - Wet

CONSISTENCY/ RELATIVE DENSITY

VS	- Very Soft
S	- Soft
F	- Firm
St	- Stiff
VSt	- Very Stiff
H	- Hard
VL	- Very Loose
L	- Loose
MD	- Medium Dense
D	- Dense
VD	- Very Dense

Douglas Partners
Geotechnics | Environment | Groundwater

EXCAVATION - GEOLOGICAL LOG

PIT NO : AEC31ATP113
FILE / JOB NO : 204814.01
SHEET : 1 OF 1

PROJECT : Sydney Metro Western Sydney Airport - Surface and Civil Alignment Works
LOCATION : Lansdowne Road - Orchard Hills

POSITION : E: 291822.0, N: 6258049.2 (56 MGA2020)	SURFACE ELEVATION : 34.10 (mAHD)	
EQUIPMENT TYPE : 20 tonne excavator	METHOD : 900mm bucket	
DATE EXCAVATED : 31/07/23	LOGGED BY : PJ	CHECKED BY : MAB
EXCAVATION DIMENSIONS : 1.00 m LONG 0.90 m WIDE		

DRILLING					MATERIAL						
PENETRATION (VE, E, F, H)	SUPPORT	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	HAND PENETROMETER kPa	STRUCTURE & Other Observations
		Not Encountered	0.10m E 0.20m 0.50m E 0.60m	0.0			FILL: silty SAND: grey-brown and pale grey, fine to medium grained sand, with metal, wire, plastic and fabric, trace ACM fragments, bricks, timber and rootlets	M		100 200 300 400	FILL 0.50: Field Replicate BD3/20230731 taken from 0.5-0.6m depth
				0.5							
				1.0		CI-CH	0.80m Silty CLAY: medium to high plasticity, red-brown, trace ironstone gravel 1.10m	w<PL			RESIDUAL SOIL
				1.5			EXCAVATION AEC31ATP113 TERMINATED AT 1.10 m Target depth				
				2.0							
				2.5							
				3.0							
				3.5							
				4.0							
				4.5							
				5.0							

PHOTOGRAPHS NOTES ☐ YES ☒ NO

METHOD
- N Natural Exposure
- E Existing Excavation
- BH Backhoe Bucket
- B Bulldozer Blade
- R Ripper

SUPPORT
- T Timbering

PENETRATION
VE E F H VH — No Resistance

WATER
10 Oct., 73 Water Level on Date shown
water inflow
water outflow

SAMPLES & FIELD TESTS
- U50 - Undisturbed Sample 50 mm diameter
- D - Disturbed Sample
- B - Bulk Disturbed Sample
- MC - Moisture Content
- HP - Hand Penetrometer (UCS kPa)
- VS - Vane Shear; P-Peak, R-Remouded (uncorrected kPa)
- PBT - Plate Bearing Test

CLASSIFICATION SYMBOLS & SOIL DESCRIPTION
Based on Unified Classification System

MOISTURE
- D - Dry
- M - Moist
- W - Wet

CONSISTENCY/ RELATIVE DENSITY

VS	- Very Soft
S	- Soft
F	- Firm
St	- Stiff
VSt	- Very Stiff
H	- Hard
VL	- Very Loose
L	- Loose
MD	- Medium Dense
D	- Dense
VD	- Very Dense

Douglas Partners
Geotechnics | Environment | Groundwater

EXCAVATION - GEOLOGICAL LOG

PIT NO : AEC31ATP114
FILE / JOB NO : 204814.01
SHEET : 1 OF 1

PROJECT : Sydney Metro Western Sydney Airport - Surface and Civil Alignment Works
LOCATION : Lansdowne Road - Orchard Hills

POSITION : E: 291829.3, N: 6258059.9 (56 MGA2020)	SURFACE ELEVATION : 36.60 (mAHD)	
EQUIPMENT TYPE : 20 tonne excavator	METHOD : 900mm bucket	
DATE EXCAVATED : 31/07/23	LOGGED BY : PJ	CHECKED BY : MAB
EXCAVATION DIMENSIONS : 1.00 m LONG 0.90 m WIDE		

DRILLING					MATERIAL						
PENETRATION (VE, E, F, H)	SUPPORT	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	HAND PENETRO-METER (100, 200, 300, 400)	STRUCTURE & Other Observations
		Not Encountered	0.10m E 0.20m	0.0			FILL: silty SAND: grey-brown and brown, fine to medium grained sand, trace rootlets	M			FILL
							0.40m				
				0.5		CI-CH	Silty CLAY: medium to high plasticity, red-brown, trace ironstone gravel	w<PL			RESIDUAL SOIL
							0.60m				
							EXCAVATION AEC31ATP114 TERMINATED AT 0.60 m Target depth				
				1.0							
				1.5							
				2.0							
				2.5							
				3.0							
				3.5							
				4.0							
				4.5							
				5.0							

PHOTOGRAPHS NOTES ☐ YES ☒ NO

METHOD
- N Natural Exposure
- E Existing Excavation
- BH Backhoe Bucket
- B Bulldozer Blade
- R Ripper

SUPPORT
- T Timbering

PENETRATION
VE E F H VH — No Resistance

WATER
10 Oct., 73 Water Level on Date shown
water inflow
water outflow

SAMPLES & FIELD TESTS
- U50 - Undisturbed Sample 50 mm diameter
- D - Disturbed Sample
- B - Bulk Disturbed Sample
- MC - Moisture Content
- HP - Hand Penetrometer (UCS kPa)
- VS - Vane Shear; P-Peak, R-Remouded (uncorrected kPa)
- PBT - Plate Bearing Test

CLASSIFICATION SYMBOLS & SOIL DESCRIPTION
Based on Unified Classification System

MOISTURE
- D - Dry
- M - Moist
- W - Wet

CONSISTENCY/ RELATIVE DENSITY

VS	- Very Soft
S	- Soft
F	- Firm
St	- Stiff
VSt	- Very Stiff
H	- Hard
VL	- Very Loose
L	- Loose
MD	- Medium Dense
D	- Dense
VD	- Very Dense

Douglas Partners
Geotechnics | Environment | Groundwater

EXCAVATION - GEOLOGICAL LOG

PIT NO : AEC31ATP115
FILE / JOB NO : 204814.01
SHEET : 1 OF 1

PROJECT : Sydney Metro Western Sydney Airport - Surface and Civil Alignment Works
LOCATION : Lansdowne Road - Orchard Hills

POSITION : E: 291831.2, N: 6258066.7 (56 MGA2020)	SURFACE ELEVATION : 36.20 (mAHD)	
EQUIPMENT TYPE : 20 tonne excavator	METHOD : 900mm bucket	
DATE EXCAVATED : 31/07/23	LOGGED BY : PJ	CHECKED BY : MAB
EXCAVATION DIMENSIONS : 1.00 m LONG 0.90 m WIDE		

DRILLING | MATERIAL

VE / PENETRATION / E / F / H	SUPPORT	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	HAND PENETRO-METER 100 200 300 400	STRUCTURE & Other Observations
		Not Encountered	0.10m E 0.20m	0.0			FILL: silty SAND: grey-brown and brown, fine to medium grained sand, trace rootlets	M			FILL
				0.30m		CI-CH	Silty CLAY: medium to high plasticity, red-brown, trace ironstone gravel	w<PL			RESIDUAL SOIL
				0.5			EXCAVATION AEC31ATP115 TERMINATED AT 0.50 m Target depth				
				1.0							
				1.5							
				2.0							
				2.5							
				3.0							
				3.5							
				4.0							
				4.5							
				5.0							

PHOTOGRAPHS NOTES ☐ YES ☒ NO

METHOD
- N Natural Exposure
- E Existing Excavation
- BH Backhoe Bucket
- B Bulldozer Blade
- R Ripper

SUPPORT
- T Timbering

PENETRATION
VE E F H VH — No Resistance

WATER
10 Oct., 73 Water Level on Date shown
water inflow
water outflow

SAMPLES & FIELD TESTS
- U50 - Undisturbed Sample 50 mm diameter
- D - Disturbed Sample
- B - Bulk Disturbed Sample
- MC - Moisture Content
- HP - Hand Penetrometer (UCS kPa)
- VS - Vane Shear; P-Peak, R-Remouded (uncorrected kPa)
- PBT - Plate Bearing Test

CLASSIFICATION SYMBOLS & SOIL DESCRIPTION
Based on Unified Classification System

MOISTURE
- D - Dry
- M - Moist
- W - Wet

CONSISTENCY/ RELATIVE DENSITY

VS	- Very Soft
S	- Soft
F	- Firm
St	- Stiff
VSt	- Very Stiff
H	- Hard
VL	- Very Loose
L	- Loose
MD	- Medium Dense
D	- Dense
VD	- Very Dense

Douglas Partners
Geotechnics | Environment | Groundwater

EXCAVATION - GEOLOGICAL LOG

PIT NO : AEC31ATP116
FILE / JOB NO : 204814.01
SHEET : 1 OF 1

PROJECT : Sydney Metro Western Sydney Airport - Surface and Civil Alignment Works
LOCATION : Lansdowne Road - Orchard Hills

POSITION : E: 291836.0, N: 6258072.3 (56 MGA2020) | SURFACE ELEVATION : 36.40 (mAHD)
EQUIPMENT TYPE : 20 tonne excavator | METHOD : 900mm bucket
DATE EXCAVATED : 31/07/23 | LOGGED BY : PJ | CHECKED BY : MAB
EXCAVATION DIMENSIONS : 1.00 m LONG 0.90 m WIDE

DRILLING					MATERIAL						
PENETRATION (VE, E, F, H)	SUPPORT	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	HAND PENETRO-METER (100, 200, 300, 400 kPa)	STRUCTURE & Other Observations
		Not Encountered	0.10m E 0.20m	0.0			FILL: silty SAND: grey-brown, fine to medium grained sand, trace rootlets	M			FILL
							0.20m				
						CI-CH	Silty CLAY: medium to high plasticity, red-brown, trace ironstone gravel	w<PL to w~PL			RESIDUAL SOIL
				0.5			0.40m EXCAVATION AEC31ATP116 TERMINATED AT 0.40 m Target depth				
				1.0							
				1.5							
				2.0							
				2.5							
				3.0							
				3.5							
				4.0							
				4.5							
				5.0							

PHOTOGRAPHS NOTES ☐ YES ☒ NO

METHOD
- N Natural Exposure
- E Existing Excavation
- BH Backhoe Bucket
- B Bulldozer Blade
- R Ripper

SUPPORT
- T Timbering

PENETRATION
VE E F H VH — No Resistance

WATER
10 Oct., 73 Water Level on Date shown
water inflow
water outflow

SAMPLES & FIELD TESTS
- U50 - Undisturbed Sample 50 mm diameter
- D - Disturbed Sample
- B - Bulk Disturbed Sample
- MC - Moisture Content
- HP - Hand Penetrometer (UCS kPa)
- VS - Vane Shear; P-Peak, R-Remouded (uncorrected kPa)
- PBT - Plate Bearing Test

CLASSIFICATION SYMBOLS & SOIL DESCRIPTION
Based on Unified Classification System

MOISTURE
- D - Dry
- M - Moist
- W - Wet

CONSISTENCY/ RELATIVE DENSITY

VS	- Very Soft
S	- Soft
F	- Firm
St	- Stiff
VSt	- Very Stiff
H	- Hard
VL	- Very Loose
L	- Loose
MD	- Medium Dense
D	- Dense
VD	- Very Dense

Douglas Partners
Geotechnics | Environment | Groundwater

Sampling Methods

Douglas Partners

Sampling

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

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

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

Test Pits

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

Large Diameter Augers

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

Continuous Spiral Flight Augers

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

Non-core Rotary Drilling

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

Continuous Core Drilling

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

Standard Penetration Tests

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

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

The test results are reported in the following form.

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

  4,6,7
  N=13

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

  15, 30/40 mm

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

Dynamic Cone Penetrometer Tests / Perth Sand Penetrometer Tests

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

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

Description and Classification Methods

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

Soil Types

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

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

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

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

Definitions of grading terms used are:

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

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

In fine grained soils (>35% fines)

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

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

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

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

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

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

Soil Descriptions

Cohesive Soils

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

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

Cohesionless Soils

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

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

Soil Origin

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

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

Moisture Condition – Coarse Grained Soils

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

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

Moisture Condition – Fine Grained Soils

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

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

Rock Strength

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

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

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

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

Degree of Weathering

The degree of weathering of rock is classified as follows:

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

Rock Descriptions

Degree of Fracturing

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

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

Rock Quality Designation

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

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

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

Stratification Spacing

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

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

Symbols & Abbreviations

Douglas Partners

Introduction

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

Drilling or Excavation Methods

C	Core drilling
R	Rotary drilling
SFA	Spiral flight augers
NMLC	Diamond core - 52 mm dia
NQ	Diamond core - 47 mm dia
HQ	Diamond core - 63 mm dia
PQ	Diamond core - 81 mm dia

Water

▷	Water seep
▽	Water level

Sampling and Testing

A	Auger sample
B	Bulk sample
D	Disturbed sample
E	Environmental sample
U_{50}	Undisturbed tube sample (50mm)
W	Water sample
pp	Pocket penetrometer (kPa)
PID	Photo ionisation detector
PL	Point load strength Is(50) MPa
S	Standard Penetration Test
V	Shear vane (kPa)

Description of Defects in Rock

The abbreviated descriptions of the defects should be in the following order: Depth, Type, Orientation, Coating, Shape, Roughness and Other. Drilling and handling breaks are not usually included on the logs.

Defect Type

B	Bedding plane
Cs	Clay seam
Cv	Cleavage
Cz	Crushed zone
Ds	Decomposed seam
F	Fault
J	Joint
Lam	Lamination
Pt	Parting
Sz	Sheared Zone
V	Vein

Orientation

The inclination of defects is always measured from the perpendicular to the core axis.

h	horizontal
v	vertical
sh	sub-horizontal
sv	sub-vertical

Coating or Infilling Term

cln	clean
co	coating
he	healed
inf	infilled
stn	stained
ti	tight
vn	veneer

Coating Descriptor

ca	calcite
cbs	carbonaceous
cly	clay
fe	iron oxide
mn	manganese
slt	silty

Shape

cu	curved
ir	irregular
pl	planar
st	stepped
un	undulating

Roughness

po	polished
ro	rough
sl	slickensided
sm	smooth
vr	very rough

Other

fg	fragmented
bnd	band
qtz	quartz

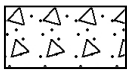
Symbols & Abbreviations

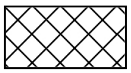
Graphic Symbols for Soil and Rock

General


Asphalt


Road base

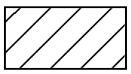

Concrete

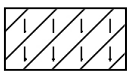

Filling

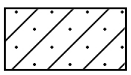
Soils


Topsoil

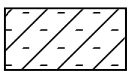

Peat

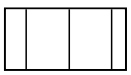

Clay

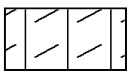

Silty clay

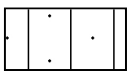

Sandy clay

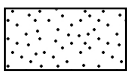

Gravelly clay

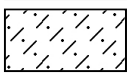

Shaly clay

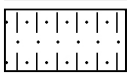

Silt


Clayey silt


Sandy silt

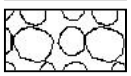

Sand

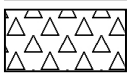

Clayey sand


Silty sand


Gravel

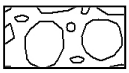

Sandy gravel


Cobbles, boulders

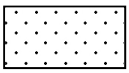

Talus

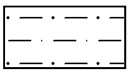
Sedimentary Rocks

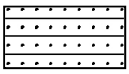

Boulder conglomerate

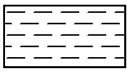

Conglomerate


Conglomeratic sandstone

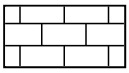

Sandstone


Siltstone

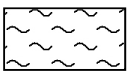

Laminite

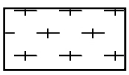

Mudstone, claystone, shale


Coal


Limestone

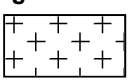
Metamorphic Rocks

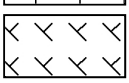

Slate, phyllite, schist

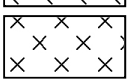

Gneiss

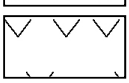

Quartzite

Igneous Rocks


Granite


Dolerite, basalt, andesite


Dacite, epidote


Tuff, breccia


Porphyry

Attachment

Summary Result Tables extracted from DP (2023b)

Douglas Partners
Geotechnics | Environment | Groundwater

Table A1: Summary of Laboratory Results (Contamination) – Metals, TRH, BTEX, PAH

			Metals															TRH						TPH				BTEX				PAH			
			Arsenic	ASLP Arsenic	Cadmium	ASLP Cadmium	Total Chromium	ASLP Chromium	Copper	ASLP Copper	Lead	ASLP Lead	Mercury (inorganic)	ASLP Mercury	Nickel	ASLP Nickel	Zinc	ASLP Zinc	TRH C6 - C10	TRH >C10-C16	TRH C6-C10-BTEX	TRH >C10-C16 less Naphthalene	TRH >C16-C34	TRH >C34-C40	TPH >C10-C16	TPH >C10-C16 less Naphthalene	TPH >C16-C34	TPH >C34-C40	Benzene	Toluene	Ethylbenzene	Total Xylenes	Naphthalene	Benzo(a)pyrene (BaP)	Benzo(a)pyrene TEQ	Total PAHs
Sample ID	Depth	Sample Date	mg/kg	ug/L	mg/kg	ug/L	mg/kg	ug/L	mg/kg	ug/L	mg/kg	ug/L	mg/kg	ug/L	mg/kg	ug/L	mg/kg	ug/L	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
AEC31ATP101	0.3 - 0.4 m	31/07/23	34	-	<0.4	-	26	-	200	-	32	-	0.1	-	11	-	310	-	<25	<50	<25	<50	200	<100	-	-	-	-	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	0.2
			300	100	-	90	-	-	300	190	-	17000	210	-	600	1100	-	80	-	-	-	120	310	180	NL	-	-	1300	-	5600	120	NL	-	1300	-	5600	4	65	NL	105	NL	125	NL	45	NL	170	-	0.7	3	-	300	-
AEC31ATP102	1.5 - 1.6 m	31/07/23	14	4	0.6	<0.1	24	3	170	19	120	2	<0.1	<0.05	35	1	610	26	<25	<50	<25	<50	110	<100	-	-	-	-	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
			300	100	-	90	-	-	300	190	-	17000	210	-	600	1100	-	80	-	-	-	120	480	180	NL	-	-	1300	-	5600	120	NL	-	1300	-	5600	6	65	NL	105	NL	125	NL	45	NL	170	-	0.7	3	-	300	-
AEC31ATP102 - [TRIPLICATE]	1.5 - 1.6 m	31/07/23	16	-	0.9	-	31	-	170	-	130	-	<0.1	-	16	-	660	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			300	100	-	90	-	-	300	190	-	17000	210	-	600	1100	-	80	-	-	-	120	480	180	NL	-	-	1300	-	5600	120	NL	-	1300	-	5600	6	65	NL	105	NL	125	NL	45	NL	170	-	0.7	3	-	300	-
AEC31ATP103	0.5 - 0.6 m	31/07/23	23	2	3	<0.1	27	<1	97	4	570	4	<0.1	<0.05	14	<1	710	30	<25	<50	<25	<50	<100	<100	-	-	-	-	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
			300	100	-	90	-	-	300	190	-	17000	210	-	600	1100	-	80	-	-	-	120	310	180	NL	-	-	1300	-	5600	120	NL	-	1300	-	5600	4	65	NL	105	NL	125	NL	45	NL	170	-	0.7	3	-	300	-
AEC31ATP108	0.5 - 0.6 m	31/07/23	20	<1	4.8	<0.1	89	2	1400	7	1400	9	2.3	0.1	73	<1	3700	21	<25	<50	<25	<50	110	<100	-	-	-	-	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
			300	100	-	90	-	-	300	190	-	17000	210	-	600	1100	-	80	-	-	-	120	310	180	NL	-	-	1300	-	5600	120	NL	-	1300	-	5600	4	65	NL	105	NL	125	NL	45	NL	170	-	0.7	3	-	300	-
BD2/20230731	0.5 - 0.6 m	31/07/23	61	<1	6	<0.1	94	2	2700	11	7700	17	0.7	0.05	58	<1	3500	39	<25	<50	<25	<50	170	<100	-	-	-	-	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
			300	100	-	90	-	-	300	190	-	17000	210	-	600	1100	-	80	-	-	-	120	310	180	NL	-	-	1300	-	5600	120	NL	-	1300	-	5600	4	65	NL	105	NL	125	NL	45	NL	170	-	0.7	3	-	300	-
BD2/20230731 - [TRIPLICATE]	0.5 - 0.6 m	31/07/23	18	-	6.1	-	80	-	3200	-	2900	-	0.7	-	44	-	3700	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			300	100	-	90	-	-	300	190	-	17000	210	-	600	1100	-	80	-	-	-	120	310	180	NL	-	-	1300	-	5600	120	NL	-	1300	-	5600	4	65	NL	105	NL	125	NL	45	NL	170	-	0.7	3	-	300	-
AEC31ATP109	0.5 - 0.6 m	31/07/23	10	1	0.4	<0.1	39	5	87	7	25	2	0.1	<0.05	20	2	920	45	<25	10000	<25	10000	30000	3200	<50	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
			300	100	-	90	-	-	300	190	-	17000	210	-	600	1100	-	80	-	-	-	120	310	180	NL	-	-	1300	-	5600	120	NL	-	1300	-	5600	4	65	NL	105	NL	125	NL	45	NL	170	-	0.7	3	-	300	-
AEC31ATP110	0.5 - 0.6 m	31/07/23	11	-	<0.4	-	74	-	110	-	28	-	<0.1	-	10	-	380	-	<25	<50	<25	<50	<100	<100	-	-	-	-	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
			300	100	-	90	-	-	300	190	-	17000	210	-	600	1100	-	80	-	-	-	120	310	180	NL	-	-	1300	-	5600	120	NL	-	1300	-	5600	4	65	NL	105	NL	125	NL	45	NL	170	-	0.7	3	-	300	-
AEC31ATP111	0.1 - 0.2 m	31/07/23	10	-	<0.4	-	25	-	15	-	19	-	<0.1	-	6	-	32	-	<25	<50	<25	<50	<100	<100	-	-	-	-	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
			300	100	-	90	-	-	300	190	-	17000	210	-	600	1100	-	80	-	-	-	120	310	180	NL	-	-	1300	-	5600	120	NL	-	1300	-	5600	4	65	NL	105	NL	125	NL	45	NL	170	-	0.7	3	-	300	-
AEC31ATP113	0.5 - 0.6 m	31/07/23	7	-	<0.4	-	32	-	51	-	18	-	<0.1	-	3	-	150	-	<25	<50	<25	<50	<100	<100	-	-	-	-	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
			300	100	-	90	-	-	300	190	-	17000	210	-	600	1100	-	80	-	-	-	120	310	180	NL	-	-	1300	-	5600	120	NL	-	1300	-	5600	4	65	NL	105	NL	125	NL	45	NL	170	-	0.7	3	-	300	-
AEC31ATP115	0.1 - 0.2 m	31/07/23	7	-	<0.4	-	27	-	12	-	16	-	<0.1	-	3	-	14	-	<25	<50	<25	<50	<100	<100	-	-	-	-	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
			300	100	-	90	-	-	300	190	-	17000	210	-	600	1100	-	80	-	-	-	120	310	180	NL	-	-	1300	-	5600	120	NL	-	1300	-	5600	4	65	NL	105	NL	125	NL	45	NL	170	-	0.7	3	-	300	-
PACM1		31/07/23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			300	100	-	90	-	-	300	190	-	17000	210	-	600	1100	-	80	-	-	-	120	310	180	NL	-	-	1300	-	5600	120	NL	-	1300	-	5600	4	65	NL	105	NL	125	NL	45	NL	170	-	0.7	3	-	300	-
PACM2		31/07/23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			300	100	-	90	-	-	300	190	-	17000	210	-	600	1100	-	80	-	-	-	120	310	180	NL	-	-	1300	-	5600	120	NL	-	1300	-	5600	4	65	NL	105	NL	125	NL	45	NL	170	-	0.7	3	-	300	-

Lab result

HIL/HSL value EIL/ESL value

HIL/HSL exceedance EIL/ESL exceedance HIL/HSL and EIL/ESL exceedance ML exceedance ML and HIL/HSL or EIL/ESL exceedance

Indicates that asbestos has been detected by the lab, refer to the lab report **Blue** = DC exceedance HSL 0-<1 Exceedance

Bold = Lab detections - = Not tested or No HIL/HSL/EIL/ESL (as applicable) or Not applicable NL = Non limiting AD = Asbestos detected NAD = No Asbestos detected

HIL = Health investigation level HSL = Health screening level (excluding DC) EIL = Ecological investigation level ESL = Ecological screening level ML = Management Limit DC = Direct Contact HSL

Notes:

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

Site Assessment Criteria (SAC):

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

SAC based on generic land use thresholds for Recreational C including public open space with amenities buildings

HIL C	Recreational / Public Open Space (NEPC, 2013/ HEPA, 2020 (PFAS))
HSL D	Commercial / Industrial (vapour intrusion) (NEPC, 2013)
DC HSL C	Direct contact HSL C Recreational /Open space (direct contact) (CRC CARE, 2011)
EIL/ESL UR/POS	Urban Residential and Public Open Space (NEPC, 2013)
ML R/P/POS	Residential, Parkland and Public Open Space (NEPC, 2013)

Douglas Partners
Geotechnics | Environment | Groundwater

Table A1 (continued): Summary of Laboratory Results (Contamination) – Phenol, OCP, OPP, PCB, Asbestos, Asbestos

			Phenols	OCP												OPP		PCB	Asbestos			
			Total Phenolics	DDD	DDT+DDE+DDD	DDE	DDT	Aldrin & Dieldrin	Total Chlordane	Endrin	Total Endosulfan	Heptachlor	Hexachlorobenzene	Methoxychlor	Other OCP	Chlorpyriphos	Other OPP	Total PCB	Asbestos Identification in material	ACM >7mm Estimation	FA and AF Estimation	FA and AF Estimation
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	-	g	g	%(w/w)
AEC31ATP101	0.3 - 0.4 m	31/07/23	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<PQL	<0.1	<PQL	<0.1	-	-	-	<0.001
			- -	- -	400 -	- -	- 180	10 -	70 -	20 -	340 -	10 -	10 -	400 -	- -	250 -	- -	1 -				
AEC31ATP102	1.5 - 1.6 m	31/07/23	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<PQL	<0.1	<PQL	<0.1	-	-	-	<0.001
			- -	- -	400 -	- -	- 180	10 -	70 -	20 -	340 -	10 -	10 -	400 -	- -	250 -	- -	1 -				
AEC31ATP102 - [TRIPLICATE]	1.5 - 1.6 m	31/07/23	-	-	-	-	-	-	-	-	-	-	-	-	<PQL	-	<PQL	-	-	-	-	-
			- -	- -	400 -	- -	- 180	10 -	70 -	20 -	340 -	10 -	10 -	400 -	- -	250 -	- -	1 -				
AEC31ATP103	0.5 - 0.6 m	31/07/23	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<PQL	<0.1	<PQL	<0.1	-	-	-	<0.001
			- -	- -	400 -	- -	- 180	10 -	70 -	20 -	340 -	10 -	10 -	400 -	- -	250 -	- -	1 -				
AEC31ATP108	0.5 - 0.6 m	31/07/23	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<PQL	<0.1	<PQL	<0.1	-	-	-	<0.001
			- -	- -	400 -	- -	- 180	10 -	70 -	20 -	340 -	10 -	10 -	400 -	- -	250 -	- -	1 -				
BD2/20230731	0.5 - 0.6 m	31/07/23	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<PQL	<0.1	<PQL	<0.1	-	-	-	-
			- -	- -	400 -	- -	- 180	10 -	70 -	20 -	340 -	10 -	10 -	400 -	- -	250 -	- -	1 -				
BD2/20230731 - [TRIPLICATE]	0.5 - 0.6 m	31/07/23	-	-	-	-	-	-	-	-	-	-	-	-	<PQL	-	<PQL	-	-	-	-	-
			- -	- -	400 -	- -	- 180	10 -	70 -	20 -	340 -	10 -	10 -	400 -	- -	250 -	- -	1 -				
AEC31ATP109	0.5 - 0.6 m	31/07/23	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<PQL	<0.1	<PQL	<0.1	-	-	-	<0.001
			- -	- -	400 -	- -	- 180	10 -	70 -	20 -	340 -	10 -	10 -	400 -	- -	250 -	- -	1 -				
AEC31ATP110	0.5 - 0.6 m	31/07/23	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<PQL	<0.1	<PQL	<0.1	-	-	-	<0.001
			- -	- -	400 -	- -	- 180	10 -	70 -	20 -	340 -	10 -	10 -	400 -	- -	250 -	- -	1 -				
AEC31ATP111	0.1 - 0.2 m	31/07/23	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<PQL	<0.1	<PQL	<0.1	-	-	0.0008	<0.001
			- -	- -	400 -	- -	- 180	10 -	70 -	20 -	340 -	10 -	10 -	400 -	- -	250 -	- -	1 -				
AEC31ATP113	0.5 - 0.6 m	31/07/23	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<PQL	<0.1	<PQL	<0.1	-	-	-	<0.001
			- -	- -	400 -	- -	- 180	10 -	70 -	20 -	340 -	10 -	10 -	400 -	- -	250 -	- -	1 -				
AEC31ATP115	0.1 - 0.2 m	31/07/23	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<PQL	<0.1	<PQL	<0.1	-	-	-	<0.001
			- -	- -	400 -	- -	- 180	10 -	70 -	20 -	340 -	10 -	10 -	400 -	- -	250 -	- -	1 -				
PACM1		31/07/23	-	-	-	-	-	-	-	-	-	-	-	-	<PQL	-	<PQL	-	**AD**	-	-	-
			- -	- -	400 -	- -	- 180	10 -	70 -	20 -	340 -	10 -	10 -	400 -	- -	250 -	- -	1 -				
PACM2		31/07/23	-	-	-	-	-	-	-	-	-	-	-	-	<PQL	-	<PQL	-	**AD**	-	-	-
			- -	- -	400 -	- -	- 180	10 -	70 -	20 -	340 -	10 -	10 -	400 -	- -	250 -	- -	1 -				

Lab result

HIL/HSL value EIL/ESL value

HIL/HSL exceedance EIL/ESL exceedance HIL/HSL and EIL/ESL exceedance ML exceedance ML and HIL/HSL or EIL/ESL exceedance

Indicates that asbestos has been detected by the lab, refer to the lab report **Blue** = DC exceedance HSL 0-<1 Exceedance

Bold = Lab detections - = Not tested or No HIL/HSL/EIL/ESL (as applicable) or Not applicable NL = Non limiting AD = Asbestos detected NAD = No Asbestos detected

HIL = Health investigation level HSL = Health screening level (excluding DC) EIL = Ecological investigation level ESL = Ecological screening level ML = Management Limit DC = Direct Contact HSL

Notes:

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

Site Assessment Criteria (SAC):

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

SAC based on generic land use thresholds for Recreational C including public open space with amenities buildings

HIL C	Recreational / Public Open Space (NEPC, 2013/ HEPA, 2020 (PFAS))
HSL D	Commercial / Industrial (vapour intrusion) (NEPC, 2013)
DC HSL C	Direct contact HSL C Recreational /Open space (direct contact) (CRC CARE, 2011)
EIL/ESL UR/POS	Urban Residential and Public Open Space (NEPC, 2013)
ML R/P/POS	Residential, Parkland and Public Open Space (NEPC, 2013)

Douglas Partners
Geotechnics | Environment | Groundwater

Table : Summary of Laboratory Results (Waste Classification) – Metals, TRH, TPH, BTEX, PAH, Phenol, OCP, OPP, PCB, Asbestos

			Metals																TRH					TPH				BTEX				PAH		Phenols	OCP		OPP		PCB	Asbestos			
			Arsenic	TCLP Arsenic	Cadmium	TCLP Cadmium	Total Chromium	TCLP Total Chromium	Copper	TCLP Copper	Lead	TCLP Lead	Mercury (inorganic)	TCLP Mercury (inorganic)	Nickel	TCLP Nickel	Zinc	TCLP Zinc	TRH C6 - C9	TRH C10 - C14	TRH C15 - C28	TRH C29 - C36	C10-C36 recoverable hydrocarbons	TPH C10 - C14	TPH C15 - C28	TPH C29 - C36	C10-C36 petroleum hydrocarbons	Benzene	Toluene	Ethylbenzene	Xylenes (total)	Benzo(a)pyrene (BaP)	Total PAHs	Total Phenolics	Total Endosulfan	Total Analysed OCP	Chlorpyriphos	Total Analysed OPP	Total PCB	Asbestos Identification in material	ACM >7mm Estimation	FA and AF Estimation	FA and AF Estimation
Sample ID	Depth	Sample Date	mg/kg	mg/l	mg/kg	mg/l	mg/kg	mg/l	mg/kg	mg/l	mg/kg	mg/l	mg/kg	mg/l	mg/kg	mg/l	mg/kg	mg/l	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	-	g	g	%(w/w)
AEC31ATP101	0.3 - 0.4 m	31/07/23	34	-	<0.4	-	26	-	200	-	32	-	0.1	-	11	-	310	-	<25	<50	<100	180	180	-	-	-	-	<0.2	<0.5	<1	<1	<0.05	0.2	<5	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	<0.001
AEC31ATP102	1.5 - 1.6 m	31/07/23	14	<0.05	0.6	<0.01	24	<0.01	170	0.04	120	<0.03	<0.1	<0.0005	35	<0.02	610	2.1	<25	<50	<100	<100	<50	-	-	-	-	<0.2	<0.5	<1	<1	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	<0.001
AEC31ATP102 - [TRIPLICATE]	1.5 - 1.6 m	31/07/23	16	-	0.9	-	31	-	170	-	130	-	<0.1	-	16	-	660	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AEC31ATP103	0.5 - 0.6 m	31/07/23	23	<0.05	3	<0.01	27	<0.01	97	0.02	570	0.32	<0.1	<0.0005	14	<0.02	710	5.1	<25	<50	<100	<100	<50	-	-	-	-	<0.2	<0.5	<1	<1	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	<0.001
AEC31ATP108	0.5 - 0.6 m	31/07/23	20	<0.05	4.8	<0.01	89	<0.01	1400	0.18	1400	0.05	2.3	<0.0005	73	0.05	3700	4.3	<25	<50	<100	<100	<50	-	-	-	-	<0.2	<0.5	<1	<1	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	<0.001
BD2/20230731	0.5 - 0.6 m	31/07/23	61	<0.05	6	<0.01	94	<0.01	2700	0.06	7700	0.08	0.7	<0.0005	58	<0.02	3500	4.8	<25	<50	110	<100	110	-	-	-	-	<0.2	<0.5	<1	<1	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-
BD2/20230731 - [TRIPLICATE]	0.5 - 0.6 m	31/07/23	18	-	6.1	-	80	-	3200	-	2900	-	0.7	-	44	-	3700	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AEC31ATP109	0.5 - 0.6 m	31/07/23	10	-	0.4	-	39	-	87	-	25	-	0.1	-	20	-	920	-	<25	670	170000	5800	170000	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	<0.001
AEC31ATP110	0.5 - 0.6 m	31/07/23	11	-	<0.4	-	74	-	110	-	28	-	<0.1	-	10	-	380	-	<25	<50	<100	<100	<50	-	-	-	-	<0.2	<0.5	<1	<1	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	<0.001
AEC31ATP111	0.1 - 0.2 m	31/07/23	10	-	<0.4	-	25	-	15	-	19	-	<0.1	-	6	-	32	-	<25	<50	<100	<100	<50	-	-	-	-	<0.2	<0.5	<1	<1	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	0.0008	<0.001
AEC31ATP113	0.5 - 0.6 m	31/07/23	7	-	<0.4	-	32	-	51	-	18	-	<0.1	-	3	-	150	-	<25	<50	<100	<100	<50	-	-	-	-	<0.2	<0.5	<1	<1	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	<0.001
AEC31ATP115	0.1 - 0.2 m	31/07/23	7	-	<0.4	-	27	-	12	-	16	-	<0.1	-	3	-	14	-	<25	<50	<100	<100	<50	-	-	-	-	<0.2	<0.5	<1	<1	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	<0.001
PACM1	0 m	31/07/23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	AD	-	-	-
PACM2	0 m	31/07/23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	AD	-	-	-
Waste Classification Criteria																																										
CT1			100	N/A	20	N/A	100	N/A	NC	NC	100	N/A	4	N/A	40	N/A	NC	NC	650	NC	NC	NC	10000	NC	NC	NC	10000	10	288	600	1000	0.8	200	-	60	-	4	-	<50	NC	NC	NC	NC
SCC1			500	N/A	100	N/A	1900	N/A	NC	NC	1500	N/A	50	N/A	1050	N/A	NC	NC	650	NC	NC	NC	10000	NC	NC	NC	10000	18	518	1080	1800	10	200	-	108	-	7.5	-	<50	NC	NC	NC	NC
TCLP1			N/A	5	N/A	1	N/A	5	NC	NC	N/A	5	N/A	0.2	N/A	2	NC	NC	N/A	NC	NC	NC	N/A	NC	NC	NC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-	N/A	-	N/A	-	N/A	NC	NC	NC	NC
CT2			400	N/A	80	N/A	400	N/A	NC	NC	400	N/A	16	N/A	160	N/A	NC	NC	2600	NC	NC	NC	40000	NC	NC	NC	40000	40	1152	2400	4000	3.2	800	-	240	-	16	-	<50	NC	NC	NC	NC
SCC2			2000	N/A	400	N/A	7600	N/A	NC	NC	6000	N/A	200	N/A	4200	N/A	NC	NC	2600	NC	NC	NC	40000	NC	NC	NC	40000	72	2073	4320	7200	23	800	-	432	-	30	-	<50	NC	NC	NC	NC
TCLP2			N/A	20	N/A	4	N/A	20	NC	NC	N/A	20	N/A	0.8	N/A	8	NC	NC	N/A	NC	NC	NC	N/A	NC	NC	NC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-	N/A	-	N/A	-	N/A	NC	NC	NC	NC

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

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

Notes:

	QA/QC replicate of sample listed directly below the primary sample
PQL	Practical quantitation limit
CT1	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values of specific contaminant concentration (SCC) for classification without TCLP: General solid waste
SCC1	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: General solid waste
TCLP1	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: General solid waste
CT2	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values of specific contaminant concentration (SCC) for classification without TCLP: Restricted solid waste
SCC2	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: Restricted solid waste
TCLP2	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: Restricted solid waste