Douglas PARTNERS | GROUNDED EXPERTISE

Investigation Summary Report

Client	Western Sydney University	Project No.	227191.00
Project	P1 Carpark Relocation	Date	15 November 2024
Address	Western Sydney University, 171 Victoria Road, Parramatta NSW	Reference	R.001.Rev0

1. Proposed development

The P1 Carpark is to be temporarily relocated to the south and south-west, requiring the construction of two temporary carparks identified as the Western and Eastern carparks, as shown on Drawing 1, attached. The Western and Eastern carparks will contain 142 and 178 parking spaces, respectively.

Based on the earthworks cut and fill volume plans provided (Ref: Sheet No.02011, Revision T1 dated 8 October 2024 by Taylor Thomson Whitting), it is understood that the cut and fill contours on the drawing denote the cut and fill depth from the natural surface to the 'design finished surface', which we take to mean the top of the wearing surface. Hence, assuming a pavement thickness of 0.5 m:

- For the Western carpark, the maximum depth of cut proposed ranges from 0.4 m at the south-western end to 2.5 m at the north-eastern end of the footprint; and
- For the Eastern carpark, the maximum depth of cut proposed ranges from 0.5 m to 1.2 m.

2. Background

Douglas previously undertook bulk sampling and laboratory CBR testing of the subgrade for the re-alignment of the western end of Fifth Street, south-west of the proposed Western carpark footprint (ca. 2012). The subgrade samples comprised natural silty clay and the CBR test results ranged from 4% to 6%. It was understood at the time the new pavement was being designed for a subgrade CBR of 2.5%.

More recently, Douglas carried out geotechnical investigations for the proposed Indigenous Centre of Excellence, within the footprint of the existing P1 Carpark (Ref: 227190.00.R.001.Rev2 dated 26 June 2024) to the north-east of the site, which also included bulk sampling and CBR testing. The subgrade samples comprised natural alluvial clay and the CBR test results ranged from 4% to 6%.

3. Site description

The overall site is located on and near the floor of a shallow valley with a south-west to north-east alignment.

The Western carpark footprint is to be an irregular-shaped area that is bound by an existing sports oval to the north-west, and by existing internal roads to the east and south-east (being Bridge Street and Fifth Street, respectively). The ground surface within the proposed Western carpark footprint is mostly gently undulating with a gentle slope falling generally to the north-west but which rises more steeply to the north-east at an 11% grade at its north-eastern end, where the site appears to form part of the southern approach embankment of a bridge over Victoria Road, further to the north. The ground surface at the proposed Western carpark footprint is generally covered by lawn with some fringing trees along its south-eastern side.

The Eastern carpark will also be an irregular-shaped area that is bound by an internal road to the north and north-west (being Fifth Street), by a footpath and tennis courts to the east and by the Graduate Research School buildings (Block ED) to the south. Surface levels fall gently to the north across this part of the site at a 6% grade. The ground surface is generally covered by lawn with some fringing trees on all sides.

The tributary Vineyard Creek flows southward some 85 m east of the site to its confluence with the Parramatta River some 430 m south of the site.

4. Published data

4.1 Geology

The Geological Survey of NSW Seamless Geology Web Map indicates that the site is located at the inferred geological boundary between Ashfield Shale and Hawkesbury Sandstone of the Triassic Period. The Geological Survey of NSW 1:100 000 Geological Series Sheet 9130 (Sydney) further indicates that Hawkesbury Sandstone underlies Ashfield Shale in the geological sequence. Ashfield Shale typically comprises black to light grey shale and laminite, while Hawkesbury Sandstone typically comprises medium - to coarse-grained quartz sandstone displaying small - to large-scale, high-angle crossbedding, with minor shale and laminite lenses.

4.2 Soil landscape

The Soil Conservation Service of NSW 1:100 000 Soil Landscape Series Sheet 9130 (Sydney) indicates that most of the site is located within the 'Blacktown' residual soil landscape unit, with the northern and western ends of the proposed Western carpark footprint located within the 'Birrong' alluvial soil landscape unit.

The Blacktown residual soil landscape unit is characterised by a topography of gently undulating rises on Wianamatta Group shales and Hawkesbury Sandstone, having broad, rounded crests and ridges with gently inclined slopes. The map notes indicate that local

relief of up to 30 m is typical, with slope grade usually less than 5% and the typical soil profile comprises:

- Shallow to moderately deep (i.e., greater than 1.0 m deep) red and brown podzolic soils on crests, upper slopes and well drained areas; and
- Deep (i.e., 1.5-3.0 m deep) yellow podzolic soils and soloths on lower slopes and in areas of poor drainage.

The Birrong alluvial soil landscape unit is characterised by a topography of level to gently undulating alluvial floodplain with broad valley flats draining the Wianamatta Group shales. The map notes indicated that local relief of up to 5 m is typical with slope grade of less than 3% and the typical soil profile comprises:

- Deep (i.e., greater than 2.5 m deep) yellow podzolic soils and yellow solodic soils on older alluvial terraces; and
- Deep solodic soils and yellow solonetzic soils on current floodplain.

5. Field work

5.1 Methods

The geotechnical field work was carried out over two days (14 and 15 October 2024) as part of a larger programme of field work for contamination assessment, and comprised:

- Electromagnetic scanning and ground penetrating radar survey for buried services at proposed test pit locations;
- Excavation of four test pits (TP19, TP21, TP22 and TP23) by a six-tonne excavator using a 600 mm wide bucket through soils to depths ranging from 0.6 m to 3.2 m;
- Dynamic cone penetrometer (DCP) tests at three test pit locations (being TP21 – TP23) to depths ranging from 0.7 m to 1.7 m within the soil profile; and
- Discrete disturbed and bulk sampling of soil.

All test pits were backfilled with site spoil upon completion and made safe, with the surface restored using turf. The locations of the test pits are shown on Drawing 1, attached. The test pit locations and levels were determined by survey using a differential GPS receiver, typically accurate to ±0.1 m (MGA2020 Zone 56 and Australian Height Datum, AHD).

We note that although TP24 was one of the four originally nominated test locations for the geotechnical investigation, due to an encounter with a redundant buried service at shallow depth, TP19 was used instead.

5.2 Results

The detailed test pit logs are attached. Notes defining classification methods and terms used to describe the soils and rocks are also attached.

Based on the results of the site investigation, the ground profile within the proposed Western and Eastern carpark footprints is summarised in the following sub-sections for clarity.

5.2.1 Proposed western carpark

The ground profile within the proposed Western carpark footprint is summarised as follows:

- **FILL** – apparently variably compacted and of varying composition, including silty clay, silty sand, clayey silty sand, sandy clay, silty sandy clay and clayey sandy silt, with minor proportions of building rubble (brick, tile, terracotta, plastic, concrete and timber fragments, steel pipes and rods, and trace amounts of potential asbestos-containing material and geofabric), with minor proportions of gravel-, cobble- and boulder-sized sandstone fragments in the eastern part of the footprint, to depths ranging from 0.5 m to 3.0 m, thickening to the north-east; overlying;
- **ALLUVIUM** – a discontinuous stratum that underlies the fill near the north-eastern end of the footprint only, of predominantly medium to high plasticity silty clay and silty sandy clay to terminations depths ranging from 1.3 m to 3.7 m, deepening to the north-east; or
- **RESIDUAL SOIL** – a discontinuous stratum that underlies the fill over most of the site, of varying composition including silty clay, silty sandy clay and sandy clay of medium to high plasticity, to termination depths ranging from 1.1 m to 2.4 m.

Bedrock was not encountered in any test pit, nor was free groundwater observed in the test pits during excavation.

5.2.2 Proposed eastern carpark

The ground profile within the proposed Eastern carpark footprint is summarised as follows:

- **FILL / Silty SAND** – apparently moderately to well compacted, fine to medium, with trace proportions of rootlets and gravel to depths ranging from 0.2 m to 0.6 m; overlying
- **Fill / Silty Sandy CLAY** – apparently moderately compacted with minor proportions of cobble- and boulder-sized sandstone fragments, inclusions of boulder-sized concrete fragments and trace proportions of gravel, rootlets and ceramic pipe fragments to depths ranging from 0.4 m to 1.1 m; overlying
- **RESIDUAL SOIL** – a generally continuous stratum (absent at TP13 only) of varying composition including silty clay, silty sandy clay and sandy clay of medium to high plasticity, with minor proportions of gravel-, cobble- and boulder-sized sandstone fragments to depths ranging from 0.6 m to 1.6 m; overlying
- **SANDSTONE** – of inferred low strength, at depths ranging from 0.6 m to 1.6 m with an average depth of about 1.2 m.

Free groundwater was not observed in the test pits during excavation.

6. Laboratory test results

Laboratory testing of selected soil samples was carried out by a NATA accredited laboratory following completion of the field work. The laboratory test schedule comprised:

- Four tests for moisture content to assess the current state of the subsoil profile;
- Four Atterberg limits tests for soil classification; and
- Four California bearing ratio (CBR) tests (subjected to 4-days of soaking, compacted to a target density ratio of 100% relative to Standard compaction and surcharged with 4.5 kg) for assessment of pavement subgrade design CBR.

The details and results of the laboratory testing are provided on the test reports attached. The laboratory test results are briefly summarised in Tables 1 and 2.

Table 1: Summary of Laboratory Soil Moisture and Classification Test Results

Test Location	Depth (m)	Moisture Content (%)	Plastic Limit (%)	Liquid Limit (%)	Plasticity Index (%)
TP19	0.5 – 0.7	13.6	20	40	20
TP21	0.7 – 0.9	27.8	27	61	34
TP22	0.5 – 0.7	9.6	17	23	6
TP23	0.9 – 1.1	14.0	18	40	22

Table 2: Summary of Laboratory CBR Test Results

Test Location	Depth (m)	Soil Description	FMC[1] (%)	CBR (%)	Swell (%)	SMDD[2] (t/m³)	OMC[3] (%)
TP19	0.5 – 0.7	Sandy CLAY	13.6	10	-1.5[4]	1.78	16.5
TP21	0.7 – 0.9	Silty CLAY	27.8	4.5	2.0	1.53	26.0
TP22	0.5 – 0.7	FILL/Silty SAND	9.6	15	-0.5	1.82	15.0
TP23	0.9 – 1.1	Sandy CLAY	14.0	8	1.0	1.87	15.0

Notes: 1. Field moisture content
2. Standard maximum dry density
3. Optimum moisture content
4. Result considered to be a laboratory error.

7. Comments

7.1 Site preparation and earthworks

Site preparation for the purposes of trafficking of the site by construction plant and pavement construction should be carried out in accordance with the guidelines contained in AS 3798 – 2007. This includes clearing, to the minimum extent necessary for the works,

of all materials unsuitable for incorporation into the works, as well as the removal of all debris (such as buried pipes and building rubble) to sufficient depth to prevent obstruction of subsequent excavation works.

The subgrade that will be exposed at the design subgrade levels for the proposed Western carpark will mainly comprise existing fill, although residual soil will likely be exposed at the south-eastern perimeter of the footprint (in the vicinity of TP4).

The subgrade that will be exposed at the design subgrade levels for the proposed Eastern carpark will also mainly comprise existing fill, although residual soil will likely be exposed at the western end (in the vicinity of TP11) and in the north-eastern (in the vicinity of TP16, TP19 and TP20).

Due to its variable composition, including the minor proportions of oversize material and timber fragments contained therein, the existing fill is considered to be 'uncontrolled'. Uncontrolled fill presents an elevated risk of non-uniform performance under traffic loading in the medium term, due to the possible presence of voids and the voids that will form in future as the timber fragments within the fill decay over time.

The following general procedure is suggested for site preparation and engineered filling for temporary on-grade pavements at this site:

- Strip any organic topsoil and 'uncontrolled' fill down to the design subgrade level (DSL);
- Manually and / or mechanically screen (i.e., 'hen-pick') the exposed fill subgrade to remove unsuitable material such as oversize, timber and asbestos fragments;
- Tyne the exposed subgrade and adjust the subgrade to optimum moisture content (OMC);
- Compact the moisture conditioned subgrade with at least six passes of a minimum 12-tonne deadweight roller, with a final test roll pass ('proof roll') accompanied by a careful visual inspection by a geotechnical engineer or senior geotechnician to ensure that any deleterious materials such as loose, wet or highly compressible soil and organic materials are identified for removal;
- Strip and remove the weak material and replace with select approved fill if excessive movement is observed under passage of the roller;
- Place fill, if required, in near horizontal layers of maximum 200 mm loose thickness. Fill should be approved, homogeneous, free of organic or other deleterious material, and have a maximum particle size of 75 mm;
- Compact each fill layer to a least 98% Standard maximum dry density ratio;
- Maintain moisture contents for fill exhibiting clay-like properties in the range 2% dry to 2% wet of optimum moisture content for Standard compaction; and
- Seal or cover any natural or compacted clay foundation soil, at or close to formation level, as soon as practicable, to reduce the opportunity for desiccation and cracking, or swelling and softening.

From a geotechnical engineering perspective, the existing fill material and natural soils are considered capable of re-use in an engineered fill, provided it is first screened to remove any deleterious and / or oversize material that may be present, then thoroughly mixed and moisture-conditioned to within ±2% of its optimum moisture content. An experienced geotechnical engineer should inspect and approve any stripped and stockpiled spoil material proposed for re-use in an engineered fill prior to its incorporation. With respect to the suitability of the existing fill and residual soil for incorporation in a fill from an environmental standpoint, please refer to the associated contamination report prepared by Douglas.

Level 1 inspection and testing of earthworks, as defined in Section 8 of AS 3798 – 2007 is recommended.

Due to the medium to high plasticity of the clayey soils, it is expected that rubber-tyred vehicles will have trafficability problems during and after periods of rainfall or other increases in subgrade moisture content, and in some cases tracked plant may experience some difficulty. It will be essential to keep the site well drained during construction. A granular working platform is suggested to reduce potential lost time during or following wet weather.

7.2 **Pavements**

Following site preparation in accordance with Section 7.1, the prepared surface would be expected to provide adequate support to pavements. The results of laboratory testing indicate CBR values that range between 4.5% and 15%Based on the results of previous and current laboratory testing of samples collected both close to and at the site, and Douglas' experience with subgrade materials of these types, pavement thickness design should be based on a design subgrade CBR of 3%.

8. Limitations

Douglas Partners Pty Ltd (Douglas) has prepared this report for this project at Western Sydney University, 171 Victoria Road, Parramatta NSW, in line with Douglas' proposal dated 3 October 2024 and acceptance received from Stuart Pullens of Western Sydney University dated 4 October 2024. The work was carried out under Douglas' Engagement Terms. This report is provided for the exclusive use of Western Sydney University for this project only and for the purposes as described in the report. It should not be used by or be relied upon for other projects or purposes on the same or another 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 Douglas, does so entirely at its own risk and without recourse to Douglas for any loss or damage. In preparing this report Douglas 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 as a result of human influences. Such changes may occur after Douglas' field testing has been completed.

Douglas' advice is based upon the conditions encountered during this investigation. The accuracy of the advice provided by Douglas 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 geotechnical 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 the attached notes and should be kept in its entirety without separation of individual pages or sections. Douglas 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 Douglas. This is because this report has been written as advice and opinion rather than instructions for construction.

Douglas Partners Pty Ltd

Atha Kapitanof
Associate / Geotechnical Engineer

Reviewed by

Luke James-Hall
Senior Associate / Geotechnical Engineer

Attachments:

About this Report
Drawing 1 – Test Location Plan
Borehole Logs and Explanatory Notes
Laboratory Test Reports

About this Report

October 2024

Introduction

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

Douglas' 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, Douglas 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, Douglas 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, Douglas 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, Douglas 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.

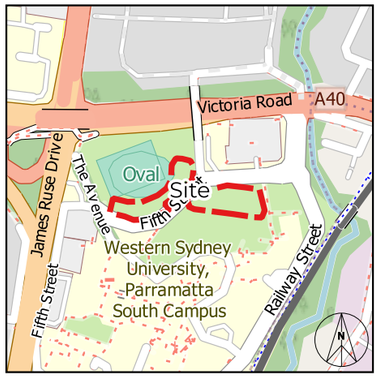
Information for Contractual Purposes

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. Douglas 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.

intentionally blank



SITE LOCATION

NOTE:
1. Drawing projection in GDA2020 / MGA zone 56, adapted from aerial imagery from "Metromap" dated 23/07/2024,
2. Features shown are approximate only.

LEGEND

- Approximate Site Boundary
- Environmental Test Pit
- Geotechnical / Environmental Test Pit

Douglas PARTNERS

CLIENT: Western Sydney University		
OFFICE: Sydney	DRAWN BY: ZW	
SCALE: 1:1000 @A3	DATE: 6/11/2024	

TITLE: **Site and Test Location Plan**
Proposed Carpark P1 Relocation
Western Sydney University, Parramatta South Campus, NSW

N

PROJECT:	227191.00
DRAWING No:	1
REVISION:	0

Terminology, Symbols and Abbreviations

November 2023

Introduction to Terminology, Symbols and Abbreviations

Douglas Partners' reports, investigation logs, and other correspondence may use terminology which has quantitative or qualitative connotations. To remove ambiguity or uncertainty surrounding the use of such terms, the following sets of notes pages may be attached Douglas Partners' reports, depending on the work performed and conditions encountered:

- Soil Descriptions;
- Rock Descriptions; and
- Sampling, insitu testing, and drilling methodologies

In addition to these pages, the following notes generally apply to most documents.

Abbreviation Codes

Site conditions may also be presented in a number of different formats, such as investigation logs, field mapping, or as a written summary. In some of these formats textual or symbolic terminology may be presented using textual abbreviation codes or graphic symbols, and, where commonly used, these are listed alongside the terminology definition. For ease of identification in these note pages, textual codes are presented in these notes in the following style XW. Code usage conforms with the following guidelines:

- Textual codes are case insensitive, although herein they are generally presented in upper case; and
- Textual codes are contextual (i.e. the same or similar combinations of characters may be used in different contexts with different meanings (for example `PL` is used for plastic limit in the context of soil moisture condition, as well as in `PL(A)` for point load test result in the testing results column)).

Data Integrity Codes

Subsurface investigation data recorded by Douglas Partners is generally managed in a highly structured database environment, where records "span" between a top and bottom depth interval. Depth interval "gaps" between records are considered to introduce ambiguity, and, where appropriate, our practice guidelines may require contiguous data sets. Recording meaningful data is not always appropriate (for example assigning a "strength" to a concrete pavement) and the following codes may be used to maintain contiguity in such circumstances.

Term	Description	Abbreviation Code
Core loss	No core recovery	KL
Unknown	Information was not available to allow classification of the property. For example, when auguring in loose, saturated sand auger cuttings may not be returned.	UK
No data	Information required to allow classification of the property was not available. For example if drilling is commenced from the base of a hole predrilled by others	ND
Not Applicable	Derivation of the properties not appropriate or beyond the scope of the investigation. For example providing a description of the strength of a concrete pavement	NA

Graphic Symbols

Douglas Partners' logs contain a "graphic" column which provides a pictorial representation of the basic composition of the material. The symbols used are directly representing the material name stated in the adjacent "Description of Strata" column, and as such no specific graphic symbology legend has been provided in these notes.

intentionally blank

Soil Descriptions

Terminology
Symbols
Abbreviations

March 2024

Introduction

All materials which are not considered to be "in-situ rock" are described in general accordance with the soil description model of AS 1726-2017 Part 6.1.3, and can be broken down into the following description structure:

The "classification" comprises a two character "group symbol" providing a general summary of dominant soil characteristics. The "name" summarises the particle sizes within the soil which most influence its behaviour. The detailed description presents more information about composition, condition, structure, and origin of the soil.

Classification, naming and description of soils require the relative proportion of particles of different sizes within the whole soil mixture to be considered.

Particle size designation and Behaviour Model

Solid particles within a soil are differentiated on the basis of size.

The engineering behaviour properties of a soil can subsequently be modelled to be either "fine grained" (also known as "cohesive" behaviour) or "coarse grained" ("non cohesive" behaviour), depending on the relative proportion of fine or coarse fractions in the soil mixture.

Particle Size Designation	Particle Size (mm)	Behaviour Model	
		Behaviour	Approximate Dry Mass
Boulder	>200	Excluded from particle behaviour model as "oversize"	
Cobble	63 - 200		
Gravel[1]	2.36 - 63	Coarse	>65%
Sand[1]	0.075 - 2.36		
Silt	0.002 - 0.075	Fine	>35%
Clay	<0.002		

[1] – refer grain size subdivision descriptions below

The behaviour model boundaries defined above are not precise, and the material behaviour should be assumed from the name given to the material (which considers the particle fraction which dominates the behaviour, refer "component proportions" below), rather than strict observance of the proportions of particle sizes. For example, if a material is named a "Sandy CLAY", this is indicative that the material exhibits fine grained behaviour, even if the dry mass of coarse grained material may exceed 65%.

Component proportions

The relative proportion of the dry mass of each particle size fraction is assessed to be a "primary", "secondary", or "minor" component of the soil mixture, depending on its influence over the soil behaviour.

Component Proportion Designation	Definition[1]	Relative Proportion	
		In Fine Grained Soil	In Coarse Grained Soil
Primary	The component (particle size designation, refer above) which dominates the engineering behaviour of the soil	The clay/silt component with the greater proportion	The sand/gravel component with the greater proportion
Secondary	Any component which is not the primary, but is significant to the engineering properties of the soil	Any component with greater than 30% proportion	Any granular component with greater than 30%; or Any fine component with greater than 12%
Minor[2]	Present in the soil, but not significant to its engineering properties	All other components	All other components

[1] As defined in AS1726-2017 6.1.4.4

[2] In the detailed material description, minor components are split into two further sub-categories. Refer "identification of minor components" below.

Composite Materials

In certain situations, a lithology description may describe more than one material, for example, collectively describing a layer of interbedded sand and clay. In such a scenario, the two materials would be described independently, with the names preceded or followed by a statement describing the arrangement by which the materials co-exist. For example, "INTERBEDDED Silty CLAY AND SAND".

Soil Descriptions

Classification

The soil classification comprises a two character group symbol. The first character identifies the primary component. The second character identifies either the grading or presence of fines in a coarse grained soil, or the plasticity in a fine grained soil. Refer AS1726-2017 6.1.6 for further clarification.

Soil Name

For most soils, the name is derived with the primary component included as the noun (in upper case), preceded by any secondary components stated in an adjective form. In this way, the soil name also describes the general composition and indicates the dominant behaviour of the material.

Component [1]	Prominence in Soil Name
Primary	Noun (eg "CLAY")
Secondary	Adjective modifier (eg "Sandy")
Minor	No influence

[1] – for determination of component proportions, refer component proportions on previous page

For materials which cannot be disaggregated, or which are not comprised of rock or mineral fragments, the names "ORGANIC MATTER" or "ARTIFICIAL MATERIAL" may be used, in accordance with AS1726-2017 Table 14.

Commercial or colloquial names are not used for the soil name where a component derived name is possible (for example "Gravelly SAND" rather than "CRACKER DUST").

Materials of "fill" or "topsoil" origin are generally assigned a name derived from the primary/secondary component (where appropriate). In log descriptions this is preceded by uppercase "FILL" or "TOPSOIL". Origin uncertainty is indicated in the description by the characters (?), with the degree of uncertainty described (using the terms "probably" or "possibly" in the origin column, or at the end of the description).

Identification of minor components

Minor components are identified in the soil description immediately following the soil name. The minor component fraction is usually preceded with a term indicating the relative proportion of the component.

Minor Component Proportion Term	Relative Proportion	
	In Fine Grained Soil	In Coarse Grained Soil
With	All fractions: 15-30%	Clay/silt: 5-12% sand/gravel: 15-30%
Trace	All fractions: 0-15%	Clay/silt: 0-5% sand/gravel: 0-15%

The terms "with" and "trace" generally apply only to gravel or fine particle fractions. Where cobbles/boulders are encountered in minor proportions (generally less than about 12%) the term "occasional" may be used. This term describes the sporadic distribution of the material within the confines of the investigation excavation only, and there may be considerable variation in proportion over a wider area which is difficult to factually characterise due to the relative size of the particles and the investigation methods.

Soil Composition

Plasticity

Descriptive Term	Laboratory liquid limit range	
	Silt	Clay
Non-plastic materials	Not applicable	Not applicable
Low plasticity	≤50	≤35
Medium plasticity	Not applicable	>35 and ≤50
High plasticity	>50	>50

Note, Plasticity descriptions generally describe the plasticity behaviour of the whole of the fine grained soil, not individual fine grained fractions.

Grain Size

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

Grading

Grading Term	Particle size (mm)
Well	A good representation of all particle sizes
Poorly	An excess or deficiency of particular sizes within the specified range
Uniformly	Essentially of one size
Gap	A deficiency of a particular size or size range within the total range

Note, AS1726-2017 provides terminology for additional attributes not listed here.

Soil Condition

Moisture

The moisture condition of soils is assessed relative to the plastic limit for fine grained soils, while for coarse grained soils it is assessed based on the appearance and feel of the material. The moisture condition of a material is considered to be independent of stratigraphy (although commonly these are related), and this data is presented in its own column on logs.

Applicability	Term	Tactile Assessment	Abbreviation code
Fine	Dry of plastic limit	Hard and friable or powdery	w<PL
	Near plastic limit	Can be moulded	w=PL
	Wet of plastic limit	Water residue remains on hands when handling	w>PL
	Near liquid limit	"oozes" when agitated	w=LL
	Wet of liquid limit	"oozes"	w>LL
Coarse	Dry	Non-cohesive and free running	D
	Moist	Feels cool, darkened in colour, particles may stick together	M
	Wet	Feels cool, darkened in colour, particles may stick together, free water forms when handling	W

The abbreviation code NDF, meaning "not-assessable due to drilling fluid use" may also be used.

Note, observations relating to free ground water or drilling fluids are provided independent of soil moisture condition.

Consistency/Density/Compaction/Cementation/Extremely Weathered Material

These concepts give an indication of how the material may respond to applied forces (when considered in conjunction with other attributes of the soil). This behaviour can vary independent of the composition of the material, and on logs these are described in an independent column and are generally mutually exclusive (i.e it is inappropriate to describe both consistency and compaction at the same time). The method by which the behaviour is described depends on the behaviour model and other characteristics of the soil as follows:

- In fine grained soils, the "consistency" describes the ease with which the soil can be remoulded, and is generally correlated against the materials undrained shear strength;
- In granular materials, the relative density describes how tightly packed the particles are, and is generally correlated against the density index;
- In anthropogenically modified materials, the compaction of the material is described qualitatively;
- In cemented soils (both natural and anthropogenic), the cemented "strength" is described qualitatively, relative to the difficulty with which the material is disaggregated; and
- In soils of extremely weathered material origin, the engineering behaviour may be governed by relic rock features, and expected behaviour needs to be assessed based the overall material description.

Quantitative engineering performance of these materials may be determined by laboratory testing or estimated by correlated field tests (for example penetration or shear vane testing). In some cases, performance may be assessed by tactile or other subjective methods, in which case investigation logs will show the estimated value enclosed in round brackets, for example (VS).

Consistency (fine grained soils)

Consistency Term	Tactile Assessment	Undrained Shear Strength (kPa)	Abbreviation Code
Very soft	Extrudes between fingers when squeezed	<12	VS
Soft	Mouldable with light finger pressure	>12 - ≤25	S
Firm	Mouldable with strong finger pressure	>25 - ≤50	F
Stiff	Cannot be moulded by fingers	>50 - ≤100	St
Very stiff	Indented by thumbnail	>100 - ≤200	VSt
Hard	Indented by thumbnail with difficulty	>200	H
Friable	Easily crumbled or broken into small pieces by hand	-	Fr

Relative Density (coarse grained soils)

Relative Density Term	Density Index	Abbreviation Code
Very loose	<15	VL
Loose	>15 - ≤35	L
Medium dense	>35 - ≤65	MD
Dense	>65 - ≤85	D
Very dense	>85	VD

Note, tactile assessment of relative density is difficult, and generally requires penetration testing, hence a tactile assessment guide is not provided.

Compaction (anthropogenically modified soil)

Compaction Term	Abbreviation Code
Well compacted	WC
Poorly compacted	PC
Moderately compacted	MC
Variably compacted	VC

Cementation (natural and anthropogenic)

Cementation Term	Abbreviation Code
Moderately cemented	MOD
Weakly cemented	WEK

Extremely Weathered Material

AS1726-2017 considers weathered material to be soil if the unconfined compressive strength is less than 0.6 MPa (i.e. less than very low strength rock). These materials may be identified as "extremely weathered material" in reports and by the abbreviation code XWM on log sheets. This identification is not correlated to any specific qualitative or quantitative behaviour, and the engineering properties of this material must therefore be assessed according to engineering principles with reference to any relic rock structure, fabric, or texture described in the description.

Soil Origin

Term	Description	Abbreviation Code
Residual	Derived from in-situ weathering of the underlying rock	RS
Extremely weathered material	Formed from in-situ weathering of geological formations. Has strength of less than 'very low' as per as1726 but retains the structure or fabric of the parent rock.	XWM
Alluvial	Deposited by streams and rivers	ALV
Fluvial	Deposited by channel fill and overbank (natural levee, crevasse splay or flood basin)	FLV
Estuarine	Deposited in coastal estuaries	EST
Marine	Deposited in a marine environment	MAR
Lacustrine	Deposited in freshwater lakes	LAC
Aeolian	Carried and deposited by wind	AEO
Colluvial	Soil and rock debris transported down slopes by gravity	COL
Slopewash	Thin layers of soil and rock debris gradually and slowly deposited by gravity and possibly water	SW
Topsoil	Mantle of surface soil, often with high levels of organic material	TOP
Fill	Any material which has been moved by man	FILL
Littoral	Deposited on the lake or seashore	LIT
Unidentifiable	Not able to be identified	UID

Cobbles and Boulders

The presence of particles considered to be "oversize" may be described using one of the following strategies:

- Oversize encountered in a minor proportion (when considered relative to the wider area) are noted in the soil description; or
- Where a significant proportion of oversize is encountered, the cobbles/boulders are described independent of the soil description, in a similar manner to composite soils (described above) but qualified with "MIXTURE OF".

intentionally blank

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

[1] Rock strength classification is based on UCS. The UCS to $I_{s(50)}$ ratio varies significantly for different rock types and specific ratios may be required for each site. The point load Index ranges shown above are as suggested in AS1726 and should not be relied upon without supporting evidence.

The following abbreviation codes are used for soil layers or seams of material "within rock" but for which the equivalent UCS strength is less than 0.6 MPa.

Scenario	Abbreviation Code
The material encountered has an equivalent UCS strength of less than 0.6 MPa, and therefore is considered to be soil (as per Note 1 of Table 20 of AS 1726-2017). The properties of the material encountered over this interval are described in the "Description of Strata" and soil properties columns.	SOIL
The material encountered has an equivalent UCS strength of less than 0.6 MPa, and therefore is considered to be soil (as per Note 1 of Table 20 of AS 1726-2017). The prominence of the material is such that it can be considered to be a seam (as defined in Table 22 of AS1726-2017) and the properties of the material are described in the defect column.	SEAM

Degree of Weathering

The degree of weathering of rock is classified as follows:

Weathering Term	Description	Abbreviation Code
Residual Soil[1]	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.	RS
Extremely weathered[1]	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	XW
Highly weathered	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.	HW
Moderately weathered	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.	MW
Slightly weathered	Rock is partially discoloured with staining or bleaching along joints but shows little or no change of strength from fresh rock.	SW
Fresh	No signs of decomposition or staining.	FR
Note: If HW and MW cannot be differentiated use DW (see below)		
Distinctly weathered	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.	DW

[1] The parent rock type, of which the residual/extremely weathered material is a derivative, will be stated in the description (where discernible).

Degree of Alteration

The degree of alteration of the rock material (physical or chemical changes caused by hot gasses or liquids at depth) is classified as follows:

Term	Description	Abbreviation Code
Extremely altered	Material is altered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are still visible.	XA
Highly altered	The whole of the rock material is discoloured, usually by staining or bleaching to the extent that the colour of the original rock is not recognisable. Rock strength is changed by alteration. Some primary minerals are altered to clay minerals. Porosity may be increased by leaching or may be decreased due to precipitation of secondary materials in pores.	HA
Moderately altered	The whole of the rock material is discoloured, usually by 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.	MA
Slightly altered	Rock is slightly discoloured but shows little or no change of strength from fresh rock	SA
Note: If HA and MA cannot be differentiated use DA (see below)		
Distinctly altered	Rock strength usually changed by alteration. The rock may be highly discoloured, usually by staining or bleaching. Porosity may be increased by leaching or may be decreased due to precipitation of secondary minerals in pores.	DA

Degree of Fracturing

The following descriptive classification apply to the spacing of natural occurring fractures in the rock mass. It includes bedding plane partings, joints and other defects, but excludes drilling breaks. These terms are generally not required on investigation logs where fracture spacing is presented as a histogram, and where used are presented in an unabbreviated format.

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:

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

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

These terms may be used to describe the spacing of bedding partings in sedimentary rocks. Where used, these terms are generally presented in an unabbreviated format

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

Defect Descriptions

Defect Type

Term	Abbreviation Code
Bedding plane	B
Cleavage	CL
Crushed seam	CS
Crushed zone	CZ
Drilling break	DB
Decomposed seam	DS
Drill lift	DL
Extremely Weathered seam	EW
Fault	F
Fracture	FC
Fragmented	FG
Handling break	HB
Infilled seam	IS
Joint	JT
Lamination	LAM
Shear seam	SS
Shear zone	SZ
Vein	VN
Mechanical break	MB
Parting	P
Sheared Surface	S

Rock Defect Orientation

Term	Abbreviation Code
Horizontal	H
Vertical	V
Sub-horizontal	SH
Sub-vertical	SV

Rock Defect Coating

Term	Abbreviation Code
Clean	CN
Coating	CT
Healed	HE
Infilled	INF
Stained	SN
Tight	TI
Veneer	VNR

Rock Defect Infill

Term	Abbreviation Code
Calcite	CA
Carbonaceous	CBS
Clay	CLAY
Iron oxide	FE
Manganese	MN
Pyrite	Py
Secondary material	MS
Silt	M
Quartz	Qz
Unidentified material	MU

Rock Defect Shape/Planarity

Term	Abbreviation Code
Curved	CU
Discontinuous	DIS
Irregular	IR
Planar	PR
Stepped	ST
Undulating	UN

Rock Defect Roughness

Term	Abbreviation Code
Polished	PO
Rough	RF
Smooth	SM
Slickensided	SL
Very rough	VR

Defect Orientation

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

intentionally blank

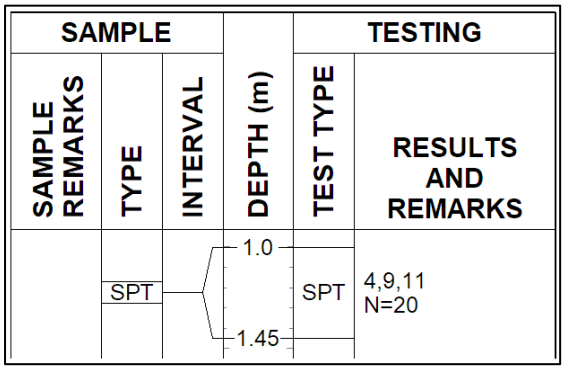
Sampling, Testing and Excavation Methodology

Terminology
Symbols
Abbreviations

October 2024

Sampling and Testing

A record of samples retained, and field testing performed is usually shown on a Douglas Partners' log with samples appearing to the left of a depth scale, and selected field and laboratory testing (including results, where relevant) appearing to the right of the scale, as illustrated below:



Sampling

The type or intended purpose for which a sample was taken is indicated by the following abbreviation codes.

Sample Type	Code
Auger sample	A
Acid Sulfate sample	ASS
Bulk sample	B
Core sample	C
Disturbed sample	D
Environmental sample	ES
Driven Tube sample	DT
Gas sample	G
Piston sample	P
Sample from SPT test	SPT
Undisturbed tube sample	U[1]
Water sample	W
Material Sample	MT
Core sample for unconfined compressive strength testing	UCS

[1] – numeric suffixes indicate tube diameter/width in mm

The above codes only indicate that a sample was retained, and not that testing was scheduled or performed.

Field and Laboratory Testing

A record that field and laboratory testing was performed is indicated by the following abbreviation codes.

Test Type	Code
Pocket penetrometer (kPa)	PP
Photo ionisation detector (ppm)	PID
Standard Penetration Test x/y =x blows for y mm penetration HB = hammer bouncing HW = fell under weight of hammer	SPT
Shear vane (kPa)	V
Unconfined compressive strength, (MPa)	UCS

Field and laboratory testing (continued)

Test Type	Code
Point load test, (MPa), axial (A), diametric (D), irregular (I)	PLT(_)
Dynamic cone penetrometer, followed by blow count penetration increment in mm (cone tip, generally in accordance with AS1289.6.3.2)	DCP9/150
Perth sand penetrometer, followed by blow count penetration increment in mm (flat tip, generally in accordance with AS1289.6.3.3)	PSP/150

Groundwater Observations

▷	seepage/inflow
▽	standing or observed water level
NFGWO	no free groundwater observed
OBS	observations obscured by drilling fluids

Drilling or Excavation Methods/Tools

The drilling/excavation methods used to perform the investigation may be shown either in a dedicated column down the left-hand edge of the log, or stated in the log footer. In some circumstances abbreviation codes may be used.

Method	Abbreviation Code
Direct Push	DP
Solid flight auger. Suffixes: /T = tungsten carbide tip, /V = v-shaped tip	AD[1]
Air Track	AT
Diatube	DT[1]
Hand auger	HA[1]
Hand tools (unspecified)	HAND
Existing exposure	X
Hollow flight auger	HSA[1]
HQ coring	HQ3
HMLC series coring	HMLC
NMLC series coring	NMLC
NQ coring	NQ3
PQ coring	PQ3
Predrilled	PD
Push tube	PT[1]
Ripping tyne/ripper	R
Rock roller	RR[1]
Rock breaker/hydraulic hammer	EH
Sonic drilling	SON[1]
Mud/blade bucket	MB[1]
Toothed bucket	TB[1]
Vibrocore	VC[1]
Vacuum excavation	VE
Wash bore (unspecified bit type)	WB[1]

[1] – numeric suffixes indicate tool diameter/width in mm

Douglas PARTNERS

TEST PIT LOG

CLIENT: Western Sydney University
PROJECT: P1 Carpark Relocation
LOCATION: Parramatta South Campus, Parramatta NSW

SURFACE LEVEL: 9.0 AHD
COORDINATE: E:317154.3, N:6257099.4
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP1
PROJECT No: 227191.00
DATE: 14/10/24
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[^] / DENSITY.[^]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
14/10/24 NFGWO			FILL / Silty CLAY: dark brown; low to medium plasticity; with roots, trace igneous gravel and building rubble (tile, plastic and concrete fragments) .		FILL		D		ES		0.20		
			0.60m: metal pipe, possible redundant water main						ES		0.50		
											0.70		
	8	0.90	Silty CLAY: orange-brown mottled grey; medium to high plasticity; trace ironstone gravel.		RS possibly ALV	ND	w=PL		ES		1.00		
		1									1.20		
									* ES		1.50		
	7	2	Test Pit discontinued at 1.80m depth. Target depth reached.								1.70		
	6												

NOTES: [#] Soil origin is "probable" unless otherwise stated. [^] Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 6T excavator
METHOD: TB (300mm wide)
REMARKS: *Field Replicate BD1/20241014 sample taken from 1.5-1.7m

OPERATOR: A & A Hire Service
LOGGED: NW

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

TEST PIT LOG

CLIENT: Western Sydney University
PROJECT: P1 Carpark Relocation
LOCATION: Parramatta South Campus, Parramatta NSW

SURFACE LEVEL: 8.8 AHD
COORDINATE: E:317170.9, N:6257104.8
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP2
PROJECT No: 227191.00
DATE: 14/10/24
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
14/10/24 NFGWO	8.8 / 0.00	FILL / Silty CLAY: dark brown; low to medium plasticity; with rootlets.		FILL		D		ES		0.20		
		From 0.20m: with red-brown possibly reworked natural										
	0.50 / 8.3	Silty CLAY: yellow-brown and dark grey; medium to high plasticity.		RS	ND	w=PL		ES		0.70		
	1 / 7.8									0.90		
								ES		1.10		
		Test Pit discontinued at 1.30m depth. Target depth reached.								1.30		
	2 / 6.8											

NOTES: (#) Soil origin is "probable" unless otherwise stated. (*) Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 6T excavator
METHOD: TB (300mm wide)
REMARKS:

OPERATOR: A & A Hire Service
LOGGED: NW

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

TEST PIT LOG

CLIENT: Western Sydney University
PROJECT: P1 Carpark Relocation
LOCATION: Parramatta South Campus, Parramatta NSW

SURFACE LEVEL: 9.6 AHD
COORDINATE: E:317208.8, N:6257100.7
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP3
PROJECT No: 227191.00
DATE: 14/10/24
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
14/10/24 NFGWO	9 / 0	FILL / Silty CLAY: dark brown ; low to medium plasticity; with rootlets.		FILL		D		ES		0.20		
		0.30m: with igneous gravel and gravel-sized concrete fragments, trace terracotta						ES		0.40		
	0.60									0.60		
	9 / 1	Silty CLAY: red-brown; medium to high plasticity; with angular to subangular ironstone gravel.		RS	ND	w=PL		ES		0.70		
										0.90		
	1									1.00		
								ES		1.20		
		Test Pit discontinued at 1.20m depth. Target depth reached.										
	8 / 2											
	7											

NOTES: (#) Soil origin is "probable" unless otherwise stated. (*) Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 6T excavator
METHOD: TB (300mm wide)
REMARKS:

OPERATOR: A & A Hire Service

LOGGED: NW

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

TEST PIT LOG

CLIENT: Western Sydney University
PROJECT: P1 Carpark Relocation
LOCATION: Parramatta South Campus, Parramatta NSW

SURFACE LEVEL: 9.9 AHD
COORDINATE: E:317220.7, N:6257096.8
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP4
PROJECT No: 227191.00
DATE: 14/10/24
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
14/10/24 NFGWO		FILL / Silty SAND: brown to dark brown; fine to medium; trace rootlets, roots and gravel.		FILL		ND		ES		0.20		
	0.40	Silty CLAY: orange-brown, mottled red and grey; medium to high plasticity; with fine to medium sand, trace angular to subangular ironstone gravel.		RS	ND	w=PL		ES		0.50		
	9 / 1	1.00m-1.10m: boulder-sized sandstone fragments						ES		0.70 / 1.00		
		Test Pit discontinued at 1.10m depth. Target depth reached.								1.10		
	8 / 2											
	7											

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 6T excavator
METHOD: TB (300mm wide)
REMARKS:

OPERATOR: A & A Hire Service
LOGGED: JC

Refer to explanatory notes for symbol and abbreviation definitions

TEST PIT LOG

CLIENT: Western Sydney University
PROJECT: P1 Carpark Relocation
LOCATION: Parramatta South Campus, Parramatta NSW

SURFACE LEVEL: 9.4 AHD
COORDINATE: E:317224.2, N:6257111.8
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP5
PROJECT No: 227191.00
DATE: 14/10/24
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[^]	DENSITY.[^]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
14/10/24 NFGWO	9 / 0.40	FILL / Silty SAND: dark brown; fine to medium; trace rootlets, roots, gravel and cobble-sized sandstone fragments.		FILL					ES		0.20		
		FILL / Silty Sandy CLAY: orange-brown; trace ironstone gravel and cobble-sized sandstone fragments, possibly reworked natural soil. 0.70m: trace charcoal		FILL		ND	ND		ES		0.50 0.70		
	8 / 1.00	Silty Sandy CLAY: pale grey and orange mottled red ; trace angular to sub-angular ironstone gravel.		RS					ES		1 1.10		
									* ES		1.30 1.50		
	7 / 2	Test Pit discontinued at 1.70m depth. Target depth reached.									1.70		

NOTES: [#] Soil origin is "probable" unless otherwise stated. [^] Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 6T excavator
METHOD: TB (300mm wide)
REMARKS: *Field Replicate BD3/20241014 sample taken from 1.5-1.7m

OPERATOR: A & A Hire Service
LOGGED: JC

Refer to explanatory notes for symbol and abbreviation definitions

TEST PIT LOG

CLIENT: Western Sydney University
PROJECT: P1 Carpark Relocation
LOCATION: Parramatta South Campus, Parramatta NSW

SURFACE LEVEL: 9.1 AHD
COORDINATE: E:317236.2, N:6257122.7
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP6
PROJECT No: 227191.00
DATE: 14/10/24
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[*] / DENSITY.[*]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
14/10/24 NFGWO	9	0.00	FILL / Clayey Silty SAND: brown and dark brown grading to yellow-brown with depth; fine to medium; trace gravel and rootlets.		FILL	ND	ND		ES		0.20		
		0.50	FILL / Sandy CLAY: red-orange; fine to medium sand; with cobble- and boulder-sized sandstone fragments and ironstone gravel.		FILL	ND	w=PL		ES		0.50 0.70		
	8	1									1		
		1.20	Silty Sandy CLAY: pale grey mottled red; fine to medium sand.		possibly RS				ES		1.30 1.50		
	7	2	Test Pit discontinued at 1.60m depth. Target depth reached.										

NOTES: [#] Soil origin is "probable" unless otherwise stated. [*] Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 6T excavator
METHOD: TB (300mm wide)
REMARKS:

OPERATOR: A & A Hire Service

LOGGED: JC

Refer to explanatory notes for symbol and abbreviation definitions

TEST PIT LOG

CLIENT: Western Sydney University
PROJECT: P1 Carpark Relocation
LOCATION: Parramatta South Campus, Parramatta NSW

SURFACE LEVEL: 9.3 AHD
COORDINATE: E:317247.5, N:6257136.5
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP7
PROJECT No: 227191.00
DATE: 14/10/24
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[*] / DENSITY.[*]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
14/10/24 NFGWO	9	0.00	FILL / Silty SAND: dark brown and brown; fine to coarse; trace rootlets and building rubble (brick, timber, concrete, plastic fragments).		FILL		ND		ES		0.20		
		0.70	FILL / Sandy CLAY: yellow and red mottled grey; fine to coarse sand; trace ironstone and sandstone gravel, trace timber fragments.		FILL				ES		0.70 0.90		
	8	1				ND					1		
		1.30	Sandy CLAY: pale grey stained red; fine to coarse sand; with sandstone and ironstone gravel.		RS		w=PL		ES		1.30 1.50		
	7	2									2		
									ES		2.20 2.40		
			Test Pit discontinued at 2.40m depth. Target depth reached.										

NOTES: [#] Soil origin is "probable" unless otherwise stated. [*] Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 6T excavator
METHOD: TB (600mm wide)
REMARKS:

OPERATOR: A & A Hire Service

LOGGED: JC

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

TEST PIT LOG

CLIENT: Western Sydney University
PROJECT: P1 Carpark Relocation
LOCATION: Parramatta South Campus, Parramatta NSW

SURFACE LEVEL: 10.3 AHD
COORDINATE: E:317263.5, N:6257142.5
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP8
PROJECT No: 227191.00
DATE: 15/10/24
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[*] / DENSITY.[*]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
15/10/24 NFGWO	10		FILL / Silty SAND: brown and dark brown; with gravel, trace building rubble (brick, plastic, concrete and potential asbestos-containing material fragments).		FILL		M		ES		0.20		
									ES		0.50		
											0.70		
		1.00	FILL / Silty Sandy CLAY: grey brown and brown; with gravel, cobble and boulder-sized fragments of concrete, sandstone and igneous rock.								1		
	9		1.20m: geofabric with fine to coarse sand			ND			ES		1.10		
					FILL		ND				1.30		
			1.60m: dark brown-grey										
									ES		1.70		
		1.90	FILL / Silty SAND: dark brown to dark grey; trace building rubble (brick, concrete and plastic fragments).								1.90		
	2				FILL		M		ES		2.00		
											2.20		
	8	2.30	Silty Sandy CLAY: yellow-grey and grey-brown.		ALV		ND		ES		2.40		
			Test Pit discontinued at 2.60m depth. Target depth reached.								2.60		

NOTES: [#] Soil origin is "probable" unless otherwise stated. [*] Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 6T excavator
METHOD: TB (600mm wide)
REMARKS:

OPERATOR: A & A Hire Service

LOGGED: JC

Refer to explanatory notes for symbol and abbreviation definitions

Generated with CORE-GS by Geroc - Soil Log

Douglas PARTNERS

TEST PIT LOG

CLIENT: Western Sydney University
PROJECT: P1 Carpark Relocation
LOCATION: Parramatta South Campus, Parramatta NSW

SURFACE LEVEL: 10.3 AHD
COORDINATE: E:317247.8, N:6257164.7
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP9
PROJECT No: 227191.00
DATE: 14/10/24
SHEET: 1 of 2

CONDITIONS ENCOUNTERED								SAMPLE			TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[*] / DENSITY.[*]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
14/10/24 NFGWO	10	FILL / Silty SAND: dark brown and brown; fine to medium; with clay and ironstone gravel, with cobble and boulder-sized fragments of sandstone, trace building rubble (brick and PVC pipe).		FILL				ES		0.20		
	0.20	FILL / Silty Sandy CLAY: brown; trace sandstone gravel and building rubble (brick and timber fragments).						ES		0.50		
										0.70		
				FILL				ES		0.90		
	1									1		
	9									1.10		
	1.60	FILL / Clayey Sandy SILT: dark brown ; low plasticity; fine sand; trace sandstone gravel and building rubble (timber and brick fragments).						ES		1.50		
										1.60		
								ES		1.80		
	2									2.00		
	8			FILL								
								ES		2.80		

NOTES: [#] Soil origin is "probable" unless otherwise stated. [*] Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 6T excavator
METHOD: TB (300mm wide)
REMARKS:

OPERATOR: A & A Hire Service

LOGGED: JC

Refer to explanatory notes for symbol and abbreviation definitions

Generated with CORE-GS by Geroc - Soil Log

Douglas PARTNERS

TEST PIT LOG

CLIENT: Western Sydney University
PROJECT: P1 Carpark Relocation
LOCATION: Parramatta South Campus, Parramatta NSW

SURFACE LEVEL: 10.3 AHD
COORDINATE: E:317247.8, N:6257164.7
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP9
PROJECT No: 227191.00
DATE: 14/10/24
SHEET: 2 of 2

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[*] / DENSITY.[*]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
	3.00	Silty Sandy CLAY: grey-brown and yellow-brown.		ALV				ES		3.20 3.40		
		Test Pit discontinued at 3.70m depth. Target depth reached.										

NOTES: [#]Soil origin is "probable" unless otherwise stated. [*]Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 6T excavator
METHOD: TB (300mm wide)
REMARKS:

OPERATOR: A & A Hire Service

LOGGED: JC

Refer to explanatory notes for symbol and abbreviation definitions

TEST PIT LOG

CLIENT: Western Sydney University
PROJECT: P1 Carpark Relocation
LOCATION: Parramatta South Campus, Parramatta NSW

SURFACE LEVEL: 11.0 AHD
COORDINATE: E:317264.0, N:6257166.4
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP10
PROJECT No: 227191.00
DATE: 15/10/24
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
		FILL / Silty SAND: brown and dark brown; trace rootlets and igneous gravel.		FILL				ES		0.20		
	0.50	FILL / Clayey Silty SAND: brown; with sandstone gravel and building rubble (brick, concrete, plastic and timber fragments), trace rootlets .						ES		0.60 0.80		
	10 1	1.00m-1.20m: boulder-sized fragment of asphalt (possible buried pavement surface)		FILL	ND	D to M		ES		1 1.30		
	1.90	FILL / Silty CLAY: dark grey and grey-brown; with boulder-sized sandstone fragments, trace rootlets, timber, gravel, and inclusions of orange-brown clay.		FILL		w=PL possibly		ES		1.50 2.00		
	9 2	2.30m: metal rod(large)								2.20		
		Test Pit discontinued at 2.40m depth. Refusal on boulder-sized fragment .										

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 6T excavator
METHOD: TB (300mm wide)
REMARKS:

OPERATOR: A & A Hire Service

LOGGED: JC

Refer to explanatory notes for symbol and abbreviation definitions

TEST PIT LOG

CLIENT: Western Sydney University
PROJECT: P1 Carpark Relocation
LOCATION: Parramatta South Campus, Parramatta NSW

SURFACE LEVEL: 10.5 AHD
COORDINATE: E:317276.6, N:6257108.0
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP11
PROJECT No: 227191.00
DATE: 15/10/24
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[*] / DENSITY.[*]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
15/10/24 NFGWO	10	FILL / Clayey Silty SAND: dark brown and brown; trace rootlets.		FILL				ES		0.20		
	0.40	Silty Sandy CLAY: yellow-brown and orange-brown; trace gravel.		possibly ALV	ND	ND		ES		0.50 0.70		
	1.00	Silty CLAY: pale grey mottled red and yellow; with ironstone and sandstone gravel, with cobble-sized sandstone fragments.		RS				ES		1 1.10		
	9	Test Pit discontinued at 1.30m depth. Refusal on inferred bedrock.								1.30		
	2											
	8											

NOTES: [#] Soil origin is "probable" unless otherwise stated. [*] Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 6T excavator
METHOD: TB (300mm wide)
REMARKS:

OPERATOR: A & A Hire Service
LOGGED: JC

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

TEST PIT LOG

CLIENT: Western Sydney University
PROJECT: P1 Carpark Relocation
LOCATION: Parramatta South Campus, Parramatta NSW

SURFACE LEVEL: 10.3 AHD
COORDINATE: E:317290.0, N:6257115.7
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP12
PROJECT No: 227191.00
DATE: 15/10/24
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
15/10/24 NFGWO	10	FILL / Silty SAND: brown ; trace sandstone gravel, rootlets and building rubble (brick and potential asbestos-containing material fragments).		FILL		M		ES		0.20		
	0.50	FILL / Silty Sandy CLAY: yellow-brown; with gravel-, cobble- and boulder-sized sandstone fragments, trace ironstone gravel.		FILL	ND			ES		0.50 0.70		
	1.00 / 9	Silty CLAY: pale grey mottled red and orange-brown.		probably RS		w=PL		ES		1 1.10 1.30		
	8 / 2	Test Pit discontinued at 1.40m depth. Refusal on inferred bedrock.										

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 6T excavator
METHOD: TB (300mm wide)
REMARKS:

OPERATOR: A & A Hire Service

LOGGED: JC

Refer to explanatory notes for symbol and abbreviation definitions

TEST PIT LOG

CLIENT: Western Sydney University
PROJECT: P1 Carpark Relocation
LOCATION: Parramatta South Campus, Parramatta NSW

SURFACE LEVEL: 10.9 AHD
COORDINATE: E:317298.7, N:6257101.0
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP13
PROJECT No: 227191.00
DATE: 15/10/24
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[*] / DENSITY.[*]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
15/10/24 NFGWO	0.40	FILL / Silty SAND: brown and dark brown; fine to medium; trace rootlets, trace sandstone and ironstone gravel.		FILL	ND	D to M		ES		0.20		
		FILL / Silty Sandy CLAY: yellow-brown and red-brown; fine to coarse sand; with cobble-sized sandstone fragments, trace ironstone and sandstone gravel, trace rootlets. 0.80m: ceramic pipe		FILL		w=PL		ES		0.50 0.70		
	10 / 1	Test Pit discontinued at 1.00m depth. Refusal on inferred bedrock.										
	9 / 2											
	8											

NOTES: [#] Soil origin is "probable" unless otherwise stated. [*] Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 6T excavator
METHOD: TB (300mm wide)
REMARKS:

OPERATOR: A & A Hire Service
LOGGED: JC

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

TEST PIT LOG

CLIENT: Western Sydney University
PROJECT: P1 Carpark Relocation
LOCATION: Parramatta South Campus, Parramatta NSW

SURFACE LEVEL: 10.1 AHD
COORDINATE: E:317301.9, N:6257120.3
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP14
PROJECT No: 227191.00
DATE: 15/10/24
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
15/10/24 NFGWO	10 / 0	FILL / Silty SAND: brown and dark brown; trace rootlets, ironstone gravel and building rubble (brick fragments).		FILL				* ES		0.20		
	0.40	FILL / Silty Sandy CLAY: yellow-brown; with cobble-sized sandstone fragments, trace ironstone and sandstone gravel.		FILL	ND	ND		ES		0.50 0.70		
	9 / 1.00	Silty Sandy CLAY: pale grey mottled red and orange-brown.		possibly RS				ES		1 1.10 1.30		
	8 / 2	Test Pit discontinued at 1.50m depth. Refusal on inferred bedrock.										

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 6T excavator
METHOD: TB (300mm wide)
REMARKS:

OPERATOR: A & A Hire Service

LOGGED: JC

Refer to explanatory notes for symbol and abbreviation definitions

TEST PIT LOG

CLIENT: Western Sydney University
PROJECT: P1 Carpark Relocation
LOCATION: Parramatta South Campus, Parramatta NSW

SURFACE LEVEL: 11.1 AHD
COORDINATE: E:317328.3, N:6257102.0
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP15
PROJECT No: 227191.00
DATE: 15/10/24
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[*] / DENSITY.[*]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
15/10/24 NFGWO	11		FILL / Silty SAND: brown and dark brown; fine to medium; trace rootlets, ironstone and sandstone gravel.		FILL		M		ES		0.20		
		0.40	FILL / Silty Sandy CLAY: yellow-brown; with cobble-sized sandstone fragments, trace ironstone and sandstone gravel.		FILL	ND	ND		ES		0.50		
											0.70		
		1									1		
	10	1.10	Sandy CLAY: pale grey ; fine to coarse sand.		probably RS possibly FILL								
			1.40m: with boulder-sized sandstone fragments						ES		1.20		
											1.40		
	9	2	Test Pit discontinued at 1.60m depth. Refusal on inferred bedrock .										

NOTES: [#] Soil origin is "probable" unless otherwise stated. [*] Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 6T excavator
METHOD: TB (300mm wide)
REMARKS:

OPERATOR: A & A Hire Service

LOGGED: JC

Refer to explanatory notes for symbol and abbreviation definitions

TEST PIT LOG

CLIENT: Western Sydney University
PROJECT: P1 Carpark Relocation
LOCATION: Parramatta South Campus, Parramatta NSW

SURFACE LEVEL: 10.0 AHD
COORDINATE: E:317330.5, N:6257123.6
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP16
PROJECT No: 227191.00
DATE: 15/10/24
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
15/10/24 NFGWO	10	0.00	FILL / Silty SAND: dark brown; trace ironstone and sandstone gravel.		FILL				ES		0.20		
			0.30m: clay band, fine to medium										
		0.40	FILL / Silty Sandy CLAY: yellow-brown; fine to coarse sand.		FILL	ND	M		ES		0.50		
											0.70		
		0.90	Silty CLAY: pale grey and orange mottled red; with boulder-sized sandstone fragments and ironstone gravel.		probably RS				ES		1.00		
	9	1									1.20		
			Test Pit discontinued at 1.40m depth. Refusal on inferred bedrock.										
	8	2											

NOTES: (#) Soil origin is "probable" unless otherwise stated. (*) Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 6T excavator
METHOD: TB (300mm wide)
REMARKS:

OPERATOR: A & A Hire Service

LOGGED: JC

Refer to explanatory notes for symbol and abbreviation definitions

TEST PIT LOG

CLIENT: Western Sydney University
PROJECT: P1 Carpark Relocation
LOCATION: Parramatta South Campus, Parramatta NSW

SURFACE LEVEL: 11.3 AHD
COORDINATE: E:317362.1, N:6257094.5
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP17
PROJECT No: 227191.00
DATE: 15/10/24
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
15/10/24 NFGWO	11 / 0	FILL / Silty SAND: brown and dark brown; fine to medium; trace rootlets, ironstone and sandstone gravel. 0.30m-0.40m: asphalt layer		FILL				ES		0.20		
	0.40	FILL / Silty Sandy CLAY: yellow-brown; fine to coarse sand; with cobble-sized sandstone fragments, trace ironstone and sandstone gravel.		FILL	ND	M		ES		0.50 0.70		
	1 / 1.10	Silty Sandy CLAY: pale orange-grey mottled red; fine to coarse sand.		probably RS				ES		1 1.20 1.40		
	10 / 2	Test Pit discontinued at 1.50m depth. Refusal on inferred bedrock.										
	9											

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 6T excavator
METHOD: TB (300mm wide)
REMARKS:

OPERATOR: A & A Hire Service

LOGGED: JC

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

TEST PIT LOG

CLIENT: Western Sydney University
PROJECT: P1 Carpark Relocation
LOCATION: Parramatta South Campus, Parramatta NSW

SURFACE LEVEL: 10.1 AHD
COORDINATE: E:317351.5, N:6257122.2
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP18
PROJECT No: 227191.00
DATE: 15/10/24
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
15/10/24 NFGWO	10 / 0	FILL / Silty SAND; fine to medium; trace rootlets and gravel.		FILL		M		* ES		0.20		
	0.60	FILL / Silty Sandy CLAY: yellow-brown and red; trace ironstone and sandstone gravel.		FILL	ND			ES		0.70		
	9 / 1					w=PL				0.90 / 1		
	1.10	Silty CLAY: pale grey mottled yellow and red; with cobble- and boulder-sized sandstone fragments and ironstone gravel.		RS				ES		1.20		
	8 / 2	Test Pit discontinued at 1.40m depth. Refusal at inferred bedrock .								1.40		

NOTES: (#) Soil origin is "probable" unless otherwise stated. (*) Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 6T excavator
METHOD: TB (300mm wide)
REMARKS: *Field Replicate BD6/20241015 sample taken from 0-0.2m

OPERATOR: A & A Hire Service
LOGGED: JC

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

TEST PIT LOG

CLIENT: Western Sydney University
PROJECT: P1 Carpark Relocation
LOCATION: Parramatta South Campus, Parramatta NSW

SURFACE LEVEL: 10.2 AHD
COORDINATE: E:317368.2, N:6257111.0
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP19
PROJECT No: 227191.00
DATE: 15/10/24
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
	10 / 0	FILL / Silty SAND: brown ; trace rootlets and ironstone gravel.		FILL	ND	M		ES		0.20		
	0.50	Sandy CLAY: brown; medium plasticity.		RS		w=PL		B		0.50		
		Test Pit discontinued at 0.70m depth. Terminated.								0.70		
	9 / 1											
	8 / 2											

NOTES: (#) Soil origin is "probable" unless otherwise stated. (*) Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 6T excavator
METHOD: TB (300mm wide)
REMARKS:

OPERATOR: A & A Hire Service

LOGGED: JC

Refer to explanatory notes for symbol and abbreviation definitions

TEST PIT LOG

CLIENT: Western Sydney University
PROJECT: P1 Carpark Relocation
LOCATION: Parramatta South Campus, Parramatta NSW

SURFACE LEVEL: 10.1 AHD
COORDINATE: E:317372.4, N:6257120.3
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP20
PROJECT No: 227191.00
DATE: 15/10/24
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[*] / DENSITY.[*]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
15/10/24 NFGWO	10		FILL / Silty SAND: brown and dark brown; fine to medium; trace rootlets and ironstone gravel.		FILL		M		ES		0.20		
		0.30	FILL / Silty Sandy CLAY: yellow-brown; fine to coarse sand; trace rootlets.		FILL	ND	w=PL		ES		0.50 0.70		
	9	0.80 1	Silty Sandy CLAY: grey and orange ; fine to coarse sand; with cobble- and boulder-sized sandstone fragments, trace sandstone and ironstone gravel.		RS		w=PL		ES		0.90 1 1.10		
			Test Pit discontinued at 1.10m depth. Refusal on inferred bedrock.										
	8	2											

NOTES: [#] Soil origin is "probable" unless otherwise stated. [*] Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 6T excavator
METHOD: TB (300mm wide)
REMARKS:

OPERATOR: A & A Hire Service

LOGGED: JC

Refer to explanatory notes for symbol and abbreviation definitions

TEST PIT LOG

CLIENT: Western Sydney University
PROJECT: P1 Carpark Relocation
LOCATION: Parramatta South Campus, Parramatta NSW

SURFACE LEVEL: 9.4 AHD
COORDINATE: E:317189.9, N:6257094.3
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP21
PROJECT No: 227191.00
DATE: 14/10/24
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[*] / DENSITY.[*]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
14/10/24 NFGWO	9	FILL / Silty CLAY: dark brown; low to medium plasticity; with rootlets, with boulder-sized concrete fragment.		FILL	(VC)	w<PL		ES		0.20	DCP9/150	5 10 15
	0.70							ES		0.30		
	1	Silty CLAY: red-brown mottled grey ; high plasticity; with angular to sub angular, ironstone gravel.		RS	St to VSt	w=PL		B/ES		0.70		
										0.90		
								* ES		1		
										1.10		
	8	Test Pit discontinued at 1.30m depth. Target depth reached.								1.30		
	2											
	7											

NOTES: [#] Soil origin is "probable" unless otherwise stated. [*] Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 6T excavator
METHOD: TB (300mm wide)
REMARKS: *Field Replicate BD2/20241014 sample taken from 1.1-1.3m

OPERATOR: A & A Hire Service
LOGGED: NW

Refer to explanatory notes for symbol and abbreviation definitions

TEST PIT LOG

CLIENT: Western Sydney University
PROJECT: P1 Carpark Relocation
LOCATION: Parramatta South Campus, Parramatta NSW

SURFACE LEVEL: 10.3 AHD
COORDINATE: E:317255.5, N:6257149.7
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP22
PROJECT No: 227191.00
DATE: 14/10/24
SHEET: 1 of 2

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[*] / DENSITY.[*]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
14/10/24 NFGWO	10 / 0	FILL / Silty SAND: brown and dark brown; fine to medium; non-plastic silt; with boulder-sized sandstone fragment, trace building rubble (brick, PVC pipe, terracotta and concrete fragments), trace sandstone gravel, grass and rootlets.		FILL	(MC)	M		ES		0.20	DCP9/150	5 10 15
								B/ES		0.50		
										0.70		
	9 / 1									1		
		FILL / Clayey Silty SAND: dark brown and brown; with cobble- and boulder-sized sandstone fragments, trace sandstone gravel, trace building rubble (concrete, geofabric, rubber, tile, and plastic fragments).		FILL	ND	M		ES		1.70		
	1.60									1.90		
	8 / 2									2		
	2.50	Silty Sandy CLAY: yellow brown mottled dark grey; fine to medium sand; trace rootlets.		ALV		w=PL		ES		2.30		
										2.50		
								ES		2.70		
										2.90		

NOTES: [#] Soil origin is "probable" unless otherwise stated. [*] Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 6T excavator
METHOD: TB (600mm wide)
REMARKS:

OPERATOR: A & A Hire Service

LOGGED: NW

Generated with CORE-GS by Geroc - Soil Log

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

TEST PIT LOG

CLIENT: Western Sydney University
PROJECT: P1 Carpark Relocation
LOCATION: Parramatta South Campus, Parramatta NSW

SURFACE LEVEL: 10.3 AHD
COORDINATE: E:317255.5, N:6257149.7
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP22
PROJECT No: 227191.00
DATE: 14/10/24
SHEET: 2 of 2

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[*] / DENSITY.[*]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
		[CONT] Silty Sandy CLAY: yellow brown mottled dark grey; fine to medium sand; trace rootlets. 3.10m: wet		ALV	ND	w=PL						
		Test Pit discontinued at 3.20m depth. Target depth reached.										

NOTES: [#]Soil origin is "probable" unless otherwise stated. [*]Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 6T excavator
METHOD: TB (600mm wide)
REMARKS:

OPERATOR: A & A Hire Service

LOGGED: NW

Refer to explanatory notes for symbol and abbreviation definitions

TEST PIT LOG

CLIENT: Western Sydney University
PROJECT: P1 Carpark Relocation
LOCATION: Parramatta South Campus, Parramatta NSW

SURFACE LEVEL: 10.2 AHD
COORDINATE: E:317317.2, N:6257112.7
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP23
PROJECT No: 227191.00
DATE: 15/10/24
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[*] / DENSITY.[*]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
15/10/24 NFGWO	10 / 0	FILL / Silty SAND: brown and dark brown; fine to medium; trace rootlets and organic matter, trace ironstone and sandstone gravel.		FILL	(WC)	M		* ES		0.20	DCP9/150	5 10 15
	0.40	FILL / Sandy CLAY: yellow-brown; fine to coarse sand; with cobble-sized sandstone fragments, trace ironstone gravel.		FILL		w=PL		ES		0.50		Refusal 13/95mm
	0.90	Sandy CLAY: pale grey and orange mottled red; medium plasticity.		RS	ND	w=PL		B		0.90 1.00 1.10		
	9 / 1	Test Pit discontinued at 1.20m depth. Refusal at inferred bedrock.						ES		1.20		
	8 / 2											

NOTES: [#] Soil origin is "probable" unless otherwise stated. [*] Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 6T excavator
METHOD: TB (300mm wide)
REMARKS:

OPERATOR: A & A Hire Service
LOGGED: JC

Refer to explanatory notes for symbol and abbreviation definitions

TEST PIT LOG

CLIENT: Western Sydney University
PROJECT: P1 Carpark Relocation
LOCATION: Parramatta South Campus, Parramatta NSW

SURFACE LEVEL: 10.2 AHD
COORDINATE: E:317379.0, N:6257104.4
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP24
PROJECT No: 227191.00
DATE: 15/10/24
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
15/10/24 NFGWO	10 / 0.20	FILL / Silty SAND: brown; trace rootlets and ironstone gravel.		FILL	(MC)	D		ES		0.20	DCP9/150	5 10 15 bouncing
		FILL / Silty CLAY: grey and pale grey; medium to high plasticity; trace ironstone and siltstone gravel.		FILL		w<PL		ES		0.40		
		Test Pit discontinued at 0.50m depth. Terminated on possible redundant buried service.								0.50		

NOTES: (#) Soil origin is "probable" unless otherwise stated. (*) Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hand tools
METHOD: HAND
REMARKS:

OPERATOR: JC

LOGGED: JC

Refer to explanatory notes for symbol and abbreviation definitions

Material Test Report

Douglas Partners Pty Ltd
Sydney Laboratory
96 Hermitage Road West Ryde NSW 2114
Phone: (02) 9809 0666
Email: mick.gref@douglaspartners.com.au

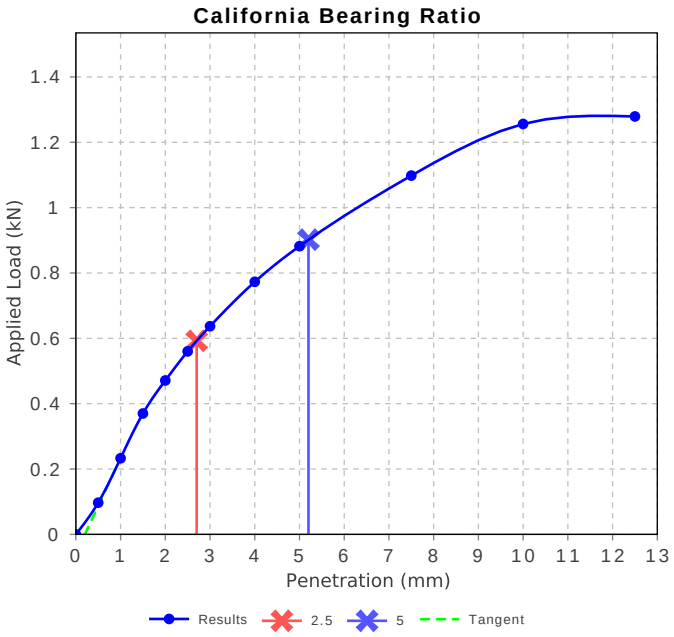
Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Mick Gref
Assistant Laboratory Manager
Laboratory Accreditation Number: 828

Report Number:	**227191.00-1**
Issue Number:	1
Date Issued:	13/11/2024
Client:	Western Sydney University
	Victoria Road, Rydalmere NSW
Contact:	Stuart Pullens
Project Number:	227191.00
Project Name:	P1 Carpark Relocation
Project Location:	Western Sydney University, Rydalmere NSW
Work Request:	11895
Sample Number:	SY-11895A
Date Sampled:	14/10/2024
Dates Tested:	21/10/2024 - 12/11/2024
Sampling Method:	Sampled by Engineering Department
	The results apply to the sample as received
Sample Location:	**TP21 (0.7-0.9m)**
Material:	Silty CLAY: red-brown mottled grey, with angular to sub angular, ironstone gravel.

California Bearing Ratio (AS 1289 6.1.1 & 2.1.1)		Min	Max
CBR taken at	5 mm		
CBR %	**4.5**		
Method of Compactive Effort	Standard		
Method used to Determine MDD	AS 1289 5.1.1 & 2.1.1		
Method used to Determine Plasticity	Visual Assessment		
Maximum Dry Density (t/m^3)	1.53		
Optimum Moisture Content (%)	26.0		
Laboratory Density Ratio (%)	100.0		
Laboratory Moisture Ratio (%)	101.0		
Dry Density after Soaking (t/m^3)	1.50		
Field Moisture Content (%)	27.8		
Moisture Content at Placement (%)	26.1		
Moisture Content Top 30mm (%)	31.5		
Moisture Content Rest of Sample (%)	27.8		
Mass Surcharge (kg)	4.5		
Soaking Period (days)	4		
Curing Hours (h)	66.7		
Swell (%)	2.0		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)	0.4		

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Oven Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	61		
Plastic Limit (%)	27		
Plasticity Index (%)	**34**		



Material Test Report

Douglas Partners Pty Ltd
Sydney Laboratory
96 Hermitage Road West Ryde NSW 2114
Phone: (02) 9809 0666
Email: mick.gref@douglaspartners.com.au

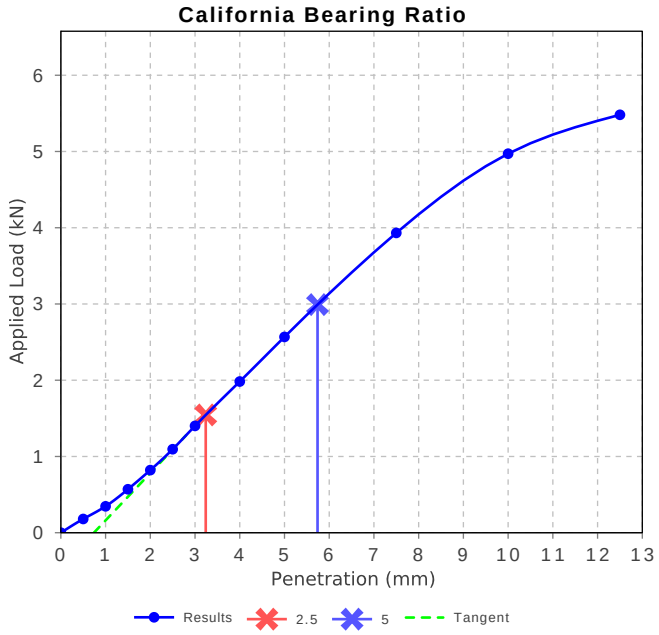
Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Mick Gref
Assistant Laboratory Manager
Laboratory Accreditation Number: 828

Report Number:	**227191.00-1**
Issue Number:	1
Date Issued:	13/11/2024
Client:	Western Sydney University
	Victoria Road, Rydalmere NSW
Contact:	Stuart Pullens
Project Number:	227191.00
Project Name:	P1 Carpark Relocation
Project Location:	Western Sydney University, Rydalmere NSW
Work Request:	11895
Sample Number:	SY-11895B
Date Sampled:	14/10/2024
Dates Tested:	21/10/2024 - 12/11/2024
Sampling Method:	Sampled by Engineering Department
	The results apply to the sample as received
Sample Location:	**TP22 (0.5-0.7m)**
Material:	FILL / Silty SAND: brown and dark brown, fine to medium, trace brick, pvc pipe, rootlets, gravel, sandstone boulder, terracotta, concrete and grass.

California Bearing Ratio (AS 1289 6.1.1 & 2.1.1)		Min	Max
CBR taken at	5 mm		
CBR %	**15**		
Method of Compactive Effort	Standard		
Method used to Determine MDD	AS 1289 5.1.1 & 2.1.1		
Method used to Determine Plasticity	Visual Assessment		
Maximum Dry Density (t/m^3)	1.82		
Optimum Moisture Content (%)	15.0		
Laboratory Density Ratio (%)	100.0		
Laboratory Moisture Ratio (%)	98.5		
Dry Density after Soaking (t/m^3)	1.82		
Field Moisture Content (%)	9.6		
Moisture Content at Placement (%)	14.8		
Moisture Content Top 30mm (%)	16.2		
Moisture Content Rest of Sample (%)	14.9		
Mass Surcharge (kg)	4.5		
Soaking Period (days)	4		
Curing Hours (h)	67.0		
Swell (%)	-0.5		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)	6.5		
C2			

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Oven Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	23		
Plastic Limit (%)	17		
Plasticity Index (%)	**6**		



Material Test Report

Report Number: **227191.00-1**
Issue Number: 1
Date Issued: 13/11/2024
Client: Western Sydney University
Victoria Road, Rydalmere NSW
Contact: Stuart Pullens
Project Number: 227191.00
Project Name: P1 Carpark Relocation
Project Location: Western Sydney University, Rydalmere NSW
Work Request: 11895
Sample Number: SY-11895C
Date Sampled: 14/10/2024
Dates Tested: 21/10/2024 - 12/11/2024
Sampling Method: Sampled by Engineering Department
The results apply to the sample as received
Sample Location: **TP23 (0.9-1.1m)**
Material: Sandy CLAY: pale grey and orange mottled red

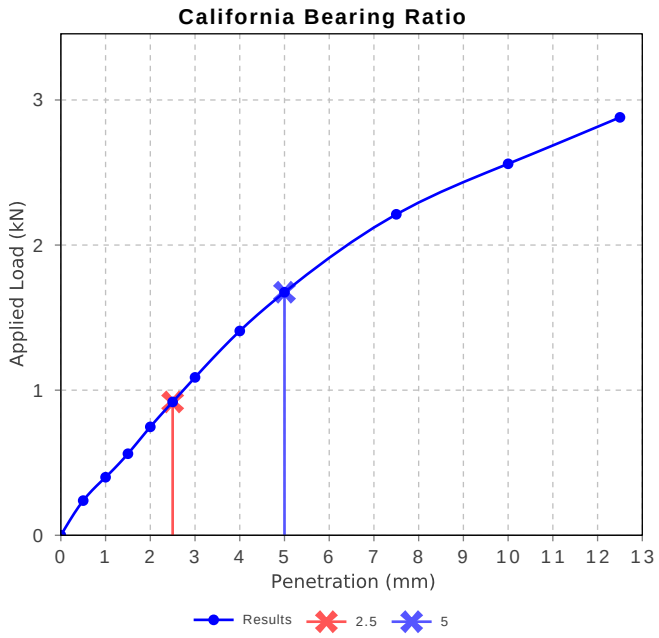
Douglas Partners Pty Ltd
Sydney Laboratory
96 Hermitage Road West Ryde NSW 2114
Phone: (02) 9809 0666
Email: mick.gref@douglaspartners.com.au

Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Mick Gref
Assistant Laboratory Manager
Laboratory Accreditation Number: 828

California Bearing Ratio (AS 1289 6.1.1 & 2.1.1)		Min	Max
CBR taken at	5 mm		
CBR %	**8**		
Method of Compactive Effort	Standard		
Method used to Determine MDD	AS 1289 5.1.1 & 2.1.1		
Method used to Determine Plasticity	Visual Assessment		
Maximum Dry Density (t/m^3)	1.87		
Optimum Moisture Content (%)	15.0		
Laboratory Density Ratio (%)	100.5		
Laboratory Moisture Ratio (%)	97.5		
Dry Density after Soaking (t/m^3)	1.86		
Field Moisture Content (%)	14.0		
Moisture Content at Placement (%)	14.5		
Moisture Content Top 30mm (%)	17.1		
Moisture Content Rest of Sample (%)	15.9		
Mass Surcharge (kg)	4.5		
Soaking Period (days)	4		
Curing Hours (h)	67.0		
Swell (%)	1.0		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)	2.7		

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Oven Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	40		
Plastic Limit (%)	18		
Plasticity Index (%)	**22**		



Material Test Report

Douglas Partners Pty Ltd
Sydney Laboratory
96 Hermitage Road West Ryde NSW 2114
Phone: (02) 9809 0666
Email: mick.gref@douglaspartners.com.au

Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Mick Gref
Assistant Laboratory Manager
Laboratory Accreditation Number: 828

Report Number: **227191.00-1**
Issue Number: 1
Date Issued: 13/11/2024
Client: Western Sydney University
Victoria Road, Rydalmere NSW
Contact: Stuart Pullens
Project Number: 227191.00
Project Name: P1 Carpark Relocation
Project Location: Western Sydney University, Rydalmere NSW
Work Request: 11895
Sample Number: SY-11895D
Date Sampled: 14/10/2024
Dates Tested: 21/10/2024 - 12/11/2024
Sampling Method: Sampled by Engineering Department
The results apply to the sample as received
Preparation Method: AS 1289.1.1 - Sampling and Preparation of Soils
Sample Location: **TP19 (0.5-0.7m)**
Material: Sandy CLAY: brown, trace rootlets and ironstone gravel

California Bearing Ratio (AS 1289 6.1.1 & 2.1.1)		Min	Max
CBR taken at	5 mm		
CBR %	**10**		
Method of Compactive Effort	Standard		
Method used to Determine MDD	AS 1289 5.1.1 & 2.1.1		
Method used to Determine Plasticity	Visual Assessment		
Maximum Dry Density (t/m^3)	1.78		
Optimum Moisture Content (%)	16.5		
Laboratory Density Ratio (%)	100.0		
Laboratory Moisture Ratio (%)	100.5		
Dry Density after Soaking (t/m^3)	1.80		
Field Moisture Content (%)	13.6		
Moisture Content at Placement (%)	16.7		
Moisture Content Top 30mm (%)	19.3		
Moisture Content Rest of Sample (%)	18.1		
Mass Surcharge (kg)	4.5		
Soaking Period (days)	4		
Curing Hours (h)	96.2		
Swell (%)	-1.5		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)	8.2		

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Oven Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	40		
Plastic Limit (%)	20		
Plasticity Index (%)	**20**