

Geotechnical Investigation Report 142-160 Oxford, 13 Gipps & 6 Shadforth Streets, Paddington NSW

Prepared for: TM No.8 Pty Ltd

Reference: P3569_02 Rev4

Date: 4 June 2026

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PROJECT DETAILS

PROJECT NAME

Application number	SSD-97528708
Address of subject land	142-160 Oxford, 13 Gipps & 6 Shadforth Streets, Paddington NSW
Legal Description	Lot 1 in DP 70235, Lots 1, 2, 3, 4 and 5 in DP263685 and Lot //SP13018

APPLICANT DETAILS

Applicant name	The Trustee for TM No. 8 DEVELOPMENT UNIT TRUST
Applicant address	Suite 2, Level 5, 19 Harris Street, Pyrmont NSW 2009

REPORT DETAILS

Name of report this declaration relates	Geotechnical Investigations Report for 142-160 Oxford, 13 Gipps & 6 Shadforth Streets, Paddington NSW
Report reference no.	P3569_02 Rev4
Report date	4/06/2026
Company name	Morrow Geotechnics Pty Ltd
Author name	Alan Morrow
Author qualifications	BE, BSc, MIEAust, CPEng, NER
Author address	2/5-7 Malta Street, Fairfield East NSW

DECLARATION BY CONSULTANT

Name	Alan Morrow
Registration no.	2474672
Organisation	Engineers Australia

Declaration The undersigned declares that the Geotechnical Investigation Report:

- has been prepared in accordance with the following policy, guidelines, or legislative requirements:
 - SEARS Environmental Assessment Requirements (Item 12)
- contains all available information relevant to the environmental assessment of the development, activity or infrastructure to which the Geotechnical Report relates;
- does not contain information that is false or misleading;
- identifies and addresses the relevant Planning Secretary's environmental assessment requirements (SEARS) for the project;
- identifies and addresses the relevant statutory requirements for the project, including any relevant matters for consideration in environmental planning instruments to which the Geotechnical Report relates;
- contains a consolidated summary of the proposed or necessary mitigation measures

Signature



4/06/2026

Document Control

Document details:

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1. Executive Summary

This Geotechnical Investigation Report has been prepared by Morrow Geotechnics Pty Ltd to accompany a detailed State Significant Development Application (SSDA) for the proposed mixed use residential flat building and shop development proposal at 142-160 Oxford Street, 13 Gipps Street and 6 Shadforth Street, Paddington. The site is legally described as Lot 1 DP26385, Lot 2 DP26385, Lot 3 DP26385, Lot 4 DP26385, Lot 1 DP70235, Lot 5 DP26385 and SP13018.

This report has been prepared to accompany the EIS submitted for SSD DA, SSD-97528708.

This report concludes that the proposed development is suitable, and warrants approval subject to implementation of the following mitigation measures.

Specifically, this report has been prepared to address the following SEARS Compliance Requirements as presented in **Table 1**:

Table 1 SEARS Compliance Requirement

Item	SEARS Requirement	Relevant Section of Report
12	Ground and Groundwater Conditions	
	- Assess potential impacts on soil resources and related infrastructure and riparian lands on and near the site and including soil erosion. - Where required provide a Groundwater Impact Assessment in accordance with relevant Groundwater Guidelines. If the proposed development is on land identified as having high salinity or acid sulfate soil potential in an EPI provide a Salinity Management Plan or Acid Sulfate Soil Management Plan that includes appropriate management measures and strategies.	The site is not in an area of riparian lands. 2.3 Long-term groundwater monitoring has been undertaken from December 2025 to February 2026. Findings were reported in the Site Hydrogeology Report dated 26 February 2026 and include a Groundwater Impact Assessment for submission. 3.6 Based on the laboratory aggressivity testing, the site soil is non-saline and non-aggressive to buried steel and concrete. 1.6 The site is zoned Class 5 Acid Sulfate Soils in the Woollahra LEP 2014 Acid Sulfate Soils Maps Sheet ASS_001. Acid Sulfate Soils are not typically found in Class 5 zoned areas or in residual soil over sandstone bedrock. Further assessment is not required.

The following geotechnical reports have been prepared for the site:

- Morrow Geotechnics Pty Ltd, *Preliminary Geotechnical Investigation Report 160 Oxford Street, Paddington NSW*, referenced P3569_01, dated 11 July 2025 (MG 2025).
- Morrow Geotechnics Pty Ltd, *Site Hydrogeology Report 160 Oxford Street, Paddington NSW*, referenced P3569_04, dated 26 February 2026 (MG 2026a).
- Morrow Geotechnics Pty Ltd, *Dewatering Management Plan 160 Oxford Street, Paddington NSW*, referenced P3569_05, dated 26 February 2026 (MG 2026b).

These geotechnical reports present the results of investigations at the site and provide geotechnical and hydrogeological advice and recommendations for the development.

1.1 Project Description

The application seeks development consent for a SSDA that will facilitate the redevelopment of the site for residential flat buildings using the in-fill affordable housing and mid-rise housing controls in accordance with the recently introduced provisions under the State Environmental Planning Policy (Housing) 2021 (Housing SEPP).

Based on the supplied initial Architectural plans prepared by Smart Design Studio, referenced "Project 2510 160 Oxford St, Paddington" and dated 21 May 2026, Morrow Geotechnics understands that the project seeks consent for:

- the demolition of existing structures;
- construction of a multi-storey building, over four levels of basement carpark, requiring excavation ranging from approximately 14.7 to 11.7 m with an approximate FFL of 39.98 mAHD; and
- incorporation of utilities in addition to eight storeys of residential dwellings, communal open spaces and associated landscaping.

1.2 The Site

The site is located at 142-160 Oxford, 13 Gipps & 6 Shadforth Streets, Paddington NSW.

The site occupies seven lots legally described as Lot 1 in DP 70235, Lots 1, 2, 3, 4 and 5 in DP263685 and Lot //SP13018. The site area is approximately 2211sqm.

The site is located to the north of Oxford Street and existing structures are occupied detached residences.

1.3 Investigation Intent

The intent of the investigation is to provide geotechnical advice and recommendations specific to the ground conditions observed at the site for the proposed development. These recommendations include:

- Expected subsurface conditions;
- Site classification in accordance with AS2870;
- Geotechnical parameters for foundation design;
- Excavation support options, including lateral earth pressures and pile design parameters;
- Advice on possible seepage water associated with construction;
- Earthquake site classification in accordance with AS1170.4; and
- Geotechnical construction considerations.

1.4 Published Geological Mapping

Information on regional sub-surface conditions, referenced from the Department of Mineral Resources Geological Map Sydney 1:100,000 (Geological Series Sheet 9130) indicate that the site is underlain by (Rh) Hawkesbury Sandstone, which is typically comprised of medium to coarse-grained quartz sandstone, with very minor shale and laminite lenses.

1.5 Published Soil Landscapes

The Soil Conservation Service of NSW Sydney 1:100,000 Soil Landscapes Series Sheet 9130 (2nd Edition) indicates that the erosional landscape at the site likely comprises the GyMEA Landscape. This landscape typically includes undulating to rolling rises and low hills on Hawkesbury Sandstone. Soils are generally shallow to moderately deep (0.3 – 1 m) yellow earths and earthy sands. These soils are noted to present localized steep slopes, high soil erosion hazard, rock outcrops and shallow highly permeable soil.

1.6 Acid Sulfate Soils

The Woollahra Local Environmental Plan 2014 Acid Sulfate Soils Map – Sheet ASS_001 locates this site in a Class 5 zone (see **Figure 1** below), which does not typically contain acid sulfate soils.



Figure 1 Extract from Woollahra Local Environmental Plan 2014 Acid Sulfate Soils Map – Sheet ASS_001 showing site location.

The geological profile at the site comprises residual soil over sandstone bedrock, with the encountered soils derived from weathering of the sandstone bedrock. In contrast, acid sulfate soils are generally linked to alluvial and marine sediments of the Holocene era (<10,000 years ago).

No recent alluvial soils were encountered during the investigation, and the materials encountered on site comprise Hawkesbury Sandstone, which ages to the Middle Triassic epoch of the Mesozoic era (between 247.2 and 237 million years ago). It can thus be determined that the soils encountered at the site are not consistent in age or origin to produce Acid Sulfate Soils.

2. Observations

2.1 Investigation Methods

The findings of the previous investigation conducted in July 2025, which included the drilling of four boreholes (BH101 to BH104), were published in the Morrow Geotechnics report referenced P3569_01. Additional fieldwork was undertaken by Morrow Geotechnics on 13 & 14, and 20 to 22 October 2025, which included drilling of four boreholes (BH201 to BH204) and installation of three groundwater monitoring wells. Borehole locations from these investigations are shown on **Drawing 1** and the borehole logs are attached to this report in **Appendix A**.

Work carried out as part of this investigation includes:

- Review of publicly available information from previous reports in the project area, published geological and soil mapping and government agency websites;
- Site walkover inspection by an experienced Geotechnical Engineer to assess topographical features, site conditions and the condition of surrounding structures; and
- Groundwater observations within boreholes BH202, BH203 and BH204 during drilling and installation of three groundwater monitoring wells immediately following drilling.

2.2 Subsurface Conditions

The stratigraphy at the site is characterised by fill/topsoil overlying residual soil and Sandstone bedrock. Observations taken during the investigation have been used to produce a stratigraphic model of the site. The observed stratigraphy has been broadly divided into six geotechnical units.

A summary of the subsurface conditions across the site, interpreted from the investigation results, is presented in **Table 2** and **Table 3**. The details of the method of soil and rock classification, explanatory notes and abbreviations adopted in the borehole logs are presented in **Appendix A**.

Table 2 Summary of Inferred Subsurface Conditions

Unit	Material	Generalised Description
1	Fill/Topsoil	Silty SAND or Gravelly SAND to Gravelly Sandy CLAY and GRAVEL medium plasticity, very loose to loose then medium dense, fine to medium then coarse-grained, poorly graded sand, fine to medium then coarse sized gravel, angular, with construction waste concrete, brick pieces, rebar, moist to dry. Unit 1 is inferred to be uncontrolled and poorly compacted.
2	Residual Soil	Sandy CLAY to Clayey SAND: stiff to medium dense low plasticity, well graded, fine-grained sand, medium plasticity clay, moist to wet.
3	Class V Sandstone	Extremely to highly weathered Sandstone, very low to low strength, fine grained, with sandy clay seams and ironstone bands.
4	Class IV Sandstone	Highly to moderately weathered Sandstone, low strength with ironstone bands, 1° to 10° laminations at 1-10 mm spacing.
5	Class III Sandstone	Slightly weathered to fresh Sandstone, medium to high strength, fine grained with bedding partings inclined to 10°, carbonaceous laminations, and minor Shale bands and intrusions.
6	Class II Sandstone	Fresh Sandstone, medium to high strength, fine grained. Generally massive with occasional bedding partings and carbonaceous laminations.

Table 3 Summary of Inferred Subsurface Conditions

Borehole ID	Approx. Depth Range of Unit ¹ mBGL (RL mAHD)							
	Unit 1 Fill	Unit 2 Residual Soil	Unit 3 Class V Sandstone	Unit 4 Class IV Sandstone	Unit 5 Class III Sandstone	Unit 6 Class II Sandstone	Unit 5 ² Class III Sandstone	Unit 6 Class II Sandstone
BH101	0.0 to 0.4 (53.4 to 53.0)	-	-	-	-	-	-	-
BH102	0.0 to 0.4 (52.6 to 52.2)	-	-	-	-	-	-	-
BH103	0.0 to 1.4 (55.3 to 53.9)	-	-	-	-	-	-	-
BH104	0.0 to 0.9 (54.4 to 54.5)	-	-	-	-	-	-	-
BH201	0.0 to 2.6 (52.67 to 50.07)	-	-	2.6 to 4.75 (49.97 to 47.92)	4.75 to 6.0 (47.92 to 46.67)	6.0 to 10.15 (46.67 to 42.52)	10.15 to 12.00 (42.52 to 40.67)	12.00 to 15.15 (40.67 to 37.52)
BH202	0.0 to 1.3 (52.74 to 51.44)	1.3 to 2.3 (51.44 to 50.44)	2.3 to 2.7 (50.44 to 50.04)	2.7 to 4.35 (50.04 to 48.39)	4.35 to 5.75 (48.39 to 46.99)	5.75 to 13.62 (46.99 to 39.12)	13.62 to 15.17 (39.12 to 37.57)	-
BH203	0.0 to 1.1 (52.52 to 51.42)	-	-	1.1 to 5.0 (51.42 to 47.52)	-	5.0 to 25.53 (47.52 to 26.99)	-	-
BH204	0.0 to 1.8 (51.55 to 49.75)	-	-	1.8 to 3.9 (49.75 to 47.65)	3.9 to 5.0 (47.65 to 46.55)	5.0 to 15.18 (46.55 to 36.37)	-	-

Notes:

- Depth ranges shown are based on materials observed within test locations and will vary across the site.
- Unit 5 Sandstone material was present below Unit 6 Sandstone material in BH201 and BH202.

2.3 Groundwater Observations

Standpipe piezometers were installed within boreholes BH202, BH203 and BH204 as part of the geotechnical investigation, with well details found in **Table 4** below. The monitoring wells were constructed using 50 mm diameter screw threaded PVC casing, sections of which were machine slotted. The annulus between the casing and borehole was backfilled using a 2 mm filter gravel pack above the top of the screen. A bentonite plug was then installed above the gravel pack up to surface level in all boreholes. The well was finished with a cement plug and a gatic cover.

Table 4 Piezometer Details

Piezometer	BH202	BH203	BH204
Top of Piezometer approx. RL (mAHD)	52.74	52.55	51.55
Piezometer Depth (m)	15.0	25.5	15.1
Bentonite Plug Depth (mBGL)	2.0 to 3.0	4.7 to 5.5	0.3 to 2.0
Screen Depth (mBGL)	3.0 to 15.0	6.0 to 25.5	3.1 to 15.1
Base of Piezometer RL (mAHD)	37.74	27.05	36.45

A full hydrogeological assessment of the site has been carried out by Morrow Geotechnics, as referenced in **Section 1** of this report and hereafter referred to as MG 2026a and MG 2026b. This hydrogeological assessment was undertaken in accordance with the WaterNSW General Terms of Approval, the Water Management Act 2000, the Woollahra Local Environmental Plan 2014 Section 6.2 *Earthworks*, clause 3(a) and 3(g), and the hydrogeological aspects of Woollahra Development Control Plan 2015 “Chapter E2 Stormwater, Flood and Geotechnical Risk Management”. This hydrogeological reporting includes the requisite Groundwater Impact Assessment for submission to SSD-97528708.

Based on the above assessment, Morrow Geotechnics considers that the proposed development will have negligible cumulative impact to groundwater, provided that the recommendations and methodologies outlined in the referenced reports are implemented during construction, including the dewatering recommendations outlined herein.

2.4 Laboratory Test Results

Two relevant soil samples were collected from variable depths of BH201 for chemical laboratory testing. A summary of test results is provided in **Table 5** below. Laboratory test certificates are presented in **Appendix B**.

Table 5 Summary of Chemical Laboratory Test Results

Sample ID	pH	Conductivity (µS/cm)	Chloride (mg/kg)	Sulfate (mg/kg)	Moisture Content (%w/w)
BH201_ (1.0–1.5) m	8.7	81	11	9.6	19.9
BH201_ (2.0–2.5) m	8.4	120	11	9.3	19.0

3. Discussions and Recommendations

3.1 Foundation Design

The parameters given in **Table 6** may be used for the design of pad footings and bored piles. Morrow Geotechnics recommends that a Preliminary Geotechnical Strength Reduction Factor (GSRF) of 0.4 is used for the design of piles in accordance with AS 2159:2009 if no allowance is made for pile testing during construction. Should pile testing be nominated, the GSRF may be reviewed and a value of 0.55 to 0.65 may be expected.

Selection of footing types and founding depth will need to consider the risk of adverse differential ground movements within the foundation footprint and between high level and deeper footings. Unless an allowance for such movement is included in the design of the proposed development, we recommend that all new structures found on natural materials with comparable end bearing capacities and elastic moduli.

Ultimate geotechnical strengths are provided for use in limit state design. Allowable bearing pressures are provided for serviceability checks. These values have been determined to limit settlements to an acceptable level for conventional building structures, typically less than 1% of the minimum footing dimension.

Table 6 Pad Footing and Pile Design Parameters

Material		Unit 1 Fill / Topsoil	Unit 2b Residual Soil	Unit 3 Class V Sandstone	Unit 4 Class IV Sandstone	Unit 5 Class III Sandstone	Unit 6 Class II Sandstone
Allowable Bearing Pressure (kPa)		N/A	200	1000	1500	3500	6000
Ultimate Vertical End Bearing Pressure (kPa)		N/A	600	3000	4500	10500	18000
Elastic Modulus (MPa)		5	15	75	200	400	1000
Ultimate Shaft Adhesion (kPa)	Compression	0	40	80	150	300	600
	Tension	0	20	40	75	150	300
Liquefaction Potential		Med.	Low	Low	Low	Low	Low

Notes:

- Side adhesion values given assume there is intimate contact between the pile and foundation material. Design engineer to check both 'piston' pull-out and 'cone' pull-out mechanics in accordance with AS4678-2002 Earth Retaining Structures.
- Susceptibility to liquefaction during an earthquake is based on the following definition:
Low - Medium to very dense sands, stiff to hard clays, and rock
Medium - Loose to medium dense sands, soft to firm clays, or uncontrolled fill below the water table
High - Very loose sands or very soft clays below the water table
- If foundations are proposed on Class II Sandstone then spoon testing of a minimum of 50% of the foundations will be required in order to certify 6000 kPa allowable bearing pressure. Spoon testing must extend to a depth of two times the minimum footing width below the footing subgrade level.

To adopt these parameters, we have assumed that the bases of all pile excavations are cleaned of loose debris and water and inspected by a suitably qualified Geotechnical Engineer prior to pile construction to verify that ground conditions meet design assumptions. Where groundwater ingress is encountered during pile excavation, concrete is to be placed as soon as possible upon completion of pile excavation. Pile excavations should be pumped dry of water prior to pouring concrete, or alternatively, a tremie system could be used.

3.2 AS1170 Earthquake Site Risk Classification

Assessment of the material encountered during the investigation in accordance with the guidelines provided in AS1170.4-2007 indicates an earthquake subsoil class of Class B_e – Rock for the site.

3.3 Soil Aggressivity

A soil aggressivity assessment in accordance with the recommendations of Department of Land and Water Conservation has been carried out at the site. The laboratory Electrical Conductivity (EC) has been multiplied by a soil texture conversion factor of 9, based on the texture of the soil sample observed, to obtain Corrected Electrical Conductivity designated as E_{Ce} as presented in **Table 7**.

Table 7 Summary of Chemical Laboratory Tests Results

Sample	pH	Aggressivity			Moisture content (% w/w)
		Corrected Conductivity E _{Ce} (dS/m)	Sulfate SO ₄ (mg/kg)	Chloride Cl (mg/kg)	
BH201 – 1.5m	8.7	0.73	9.6	11	19.9
BH201 – 2.5m	8.4	1.08	9.3	11	19.0

Analysis of the pH, chloride and sulfate content and electrical conductivity of the soil against the guidelines provided in AS2159-2009 indicates soil at the structure locations is **Non-Saline** and **Non-Aggressive** to buried concrete and steel structural elements.

3.4 Excavation Retention

Temporary batters may be considered for retention during the basement excavation only where adequate room for full batter construction is available. Temporary batter slopes of 2H:1V will be possible for all the soil units above the water table, provided that surface water is diverted away from the batter faces and batter heights are kept to less than 4 m. Where batters extend beyond 4 m height benching may be required and further advice should be sought from a qualified geotechnical engineer. Permanent batters of 2H:1V may also be employed for excavation design above the water table. Permanent batters will require surface protection or revegetation to prevent erosion and slaking.

Unit 5 to Unit 6 rock will be self-supporting and may be cut vertically, provided that allowance is made for geotechnical inspections and spot bolting / shotcreting where required. Piles can be terminated within Class III Sandstone or better material above BEL, provided that toe anchors are installed for lateral pile restraint.

Where excavations extend beneath the zone of influence of nearby structures, services or pavements, or where site constraints do not allow the construction of temporary batters, basement retention will be required. For the design of flexible shoring systems, a triangular pressure distribution may be employed using the parameters provided in **Table 8**.

For the design of rigid anchored or braced walls, a trapezoidal earth pressure distribution should be used with a maximum pressure over the central 50% of the supported height of $0.65 \cdot K_a \cdot \gamma \cdot H$ (kPa), where 'H' is the effective vertical height of the wall in metres.

Table 8 Shoring Design Parameters

Material		Unit 1 Fill / Topsoil	Unit 2b Residual Soil	Unit 3 Class V Sandstone	Unit 4 Class IV Sandstone	Unit 5 Class III Sandstone	Unit 6 Class II Sandstone
Unit Weight (kN/m ³)		17	19	22	23	24	24
Earth Pressure Coefficients	At Rest, K _o	0.53	0.56	0.53	0.48	0.36	0.29
	Passive, K _p	2.77	2.56	2.77	3.12	4.60	5.83
	Active, K _a	0.36	0.39	0.36	0.32	0.22	0.17
Drained Cohesion, c' (kPa)		0	5	15	30	200	400
Friction Angle, φ' (°)		28	26	28	31	40	45
Elastic Modulus (MPa)		5	15	75	200	400	1000
Poisson's Ratio		0.30	0.30	0.25	0.22	0.20	0.20

Notes:

- 1 Unit Weight is based on visual assessment only and may vary by ±10%.
- 2 Earth pressures are provided on the assumption that the ground behind the retaining wall is flat and drained.

In addition, the design of retaining walls should consider the following:

- Appropriate surcharge loading from construction equipment, vehicular traffic and neighbouring structures at the finished surface level should be considered in the retention design. Surcharge loads on retention structures may be calculated using a rectangular stress block with an earth pressure coefficient of 0.5 applied to surcharge loads at ground surface level.
- Anchor design should ignore the contribution of any bonded length within a wedge which extends upwards at 45° from BEL to account for a failure wedge forming behind the shoring system.

3.5 Excavation Vibration Considerations

As a guide, safe working distances for typical items of vibration intensive plant are listed in **Table 9**. The safe working distances are quoted for both “cosmetic” damage (refer British Standard BS 7385:1993) and for human comfort (refer NSW Environmental Protection Agency Vibration Guideline). The safe working distances should be complied with at all times, unless otherwise mitigated to the satisfaction of the relevant stakeholders.

Table 9 Recommended Safe Working Distances for Vibration Intensive Plant

Plant Item	Rating/Description	Safe Working Distance	
		Cosmetic Damage (BS 7385:1993) ¹	Human Response (EPA Vibration Guideline)
Vibratory Roller	< 50 kN (typically 1-2 tonnes)	5 m	15 m to 20 m
	< 100 kN (typically 2-4 tonnes)	6 m	20 m
	< 200 kN (typically 4-6 tonnes)	12 m	40 m
	< 300 kN (typically 7-13 tonnes)	15 m	100 m
	< 300 kN (typically 13-18 tonnes)	20 m	100 m
	< 300 kN (typically >18 tonnes)	25 m	100 m
Small Hydraulic Hammer	300 kg – 5 to 12 t excavator	2 m	7 m
Med Hydraulic Hammer	900 kg – 12 to 18 t excavator	7 m	23 m
Large Hydraulic Hammer	1600 kg – 18 to 34 t excavator	22 m	73 m
Vibratory Pile Driver	Sheet Piles	2 m to 20 m	20 m
Pile Boring	≤ 800 mm British Standard BS 6472-1:2008.	2m (nominal)	N/A
Jackhammer	Handheld	1 m (nominal)	Avoid contact with structure

Notes:

- ¹ More stringent conditions may apply to heritage buildings or other sensitive structures.

In relation to human comfort (response), the safe working distances in **Table 9** relate to continuous vibration and apply to residential receivers. For most construction activities, vibration emissions are intermittent in nature and for this reason, higher vibration levels, occurring over shorter periods are permitted, as discussed in British Standard BS 6472-1:2008.

The safe working distances provided in **Table 9** are given for guidance only. Monitoring of vibration levels may be required to ensure vibrations levels remain below threshold values during the construction period.

3.6 Soil and Rock Excavatability

The expected ability of equipment to excavate the soil and rock encountered at the site is summarised in **Table 10**. This assessment is based on available site investigation data and guidance on the assessment of excavatability of rock by Pettifer and Fookes (1994). The presence of medium to high strength bands in lower strength rock and the discontinuity spacing may influence the excavatability of the rock mass.

Table 10 Soil and Rock Excavatability

Unit	Material	Excavatability
1	Fill/Topsoil	Easy digging by 20t Excavator.
2	Residual Soil	
3	Class V Sandstone	Hard ripping by 20t Excavator with hydraulic hammering required where medium strength sandstone or ironstone bands are encountered within Units 3 and 4.
4	Class IV Sandstone	
5	Class III Sandstone	Hydraulic hammering will be required within Units 5 and 6.
6	Class II Sandstone	

The excavation methodology may also be affected by the following factors:

- Scale and geometry of the excavation;
- Availability of suitable construction equipment;
- Potential reuse of material on site; and
- Acceptable excavation methods, noise, ground vibration and other environmental criteria.

3.7 Implementation and Monitoring Program

The Woollahra Development Control Plan 2015 (E2.2.10) details geotechnical and hydrogeological controls designed to minimise the adverse impacts of excavation and construction to adjoining properties, cultural and heritage items, and surrounding environment and infrastructure. Morrow Geotechnics understands that the Woollahra DCPs do not apply to SSDA proposals, however the requirements of the DCP have been used as a guide for controls to be placed on excavation. These controls include geotechnical input to excavation and construction methodologies (items C7, C8).

To ameliorate the risk of adverse impacts on adjoining properties and infrastructure, a construction methodology and monitoring program should be developed and finalised by the project team, including the temporary works designed and structural engineer, prior to the commencement of excavation. As a minimum, the program should include the following components and hold points, and should be implemented using an observational approach:

- Completion of dilapidation surveys and baseline monitoring prior to demolition and excavation
- Review of initial excavation and exposed ground conditions by the geotechnical engineer, prior to proceeding below 0.5 m depth of excavation.

- Confirmation of retention system installation and support activation (props/anchors) prior to further excavation stages.
- Review prior to excavation below the groundwater table and/or commencement of dewatering.
- Review of ground conditions prior to pouring slab on ground or footings.

Detailed items and indicative thresholds are provided in **Table 11**.

Table 11 Minimum Requirements for Monitoring Plans

Monitoring Item	Purpose	Frequency of Monitoring	Indicative Thresholds
Dilapidation surveys (neighbouring assets)	Baseline condition record of condition of neighbouring structures	Prior to commencement of works	N/A
Survey monitoring (marks on shoring wall and neighbouring structures)	Monitor ground and adjacent structure settlement	Weekly	Alert at 70% of expected movement; Action at 100%; Stop/Review at 110%
Inclinometers (behind retention)	Measure lateral deflection profile of shoring wall	Weekly	Triggers linked to predicted wall deflection from design
Groundwater monitoring (piezometers / monitoring wells)	Confirm drawdown/mounding; manage dewatering	Continuous logging (preferred) or daily manual readings	Drawdown limits as per WaterNSW approvals
Vibration monitoring (PPV/VDV) Further outlined in Section 3.8 below	Manage excavation vibration impacts	Continuous real-time during piling/demolition near sensitive receivers	Triggers per DIN 4150-3 and project-specific criteria
Site inspections and QA (geotechnical/temporary works)	Verify ground conditions and compliance with design assumptions	At each excavation stage /hold point	Hold points before each stage and prior to pouring slabs

Trigger levels and hold points must be confirmed in consultation between geotechnical and structural engineers once structural designs have been finalised. Where monitoring results indicate that trigger levels are being approached or exceeded, the excavation methodology and retention support must be reviewed by the structural and geotechnical engineers. Typical contingencies include reducing excavation lift heights, accelerating support installation, reducing surcharge loads, revising the dewatering strategy, and/or undertaking ground improvement / grouting, as directed by the temporary works designer.

3.8 Excavation Vibration Monitoring

Where vibration intensive works such as hydraulic hammering of competent rock are proposed, contractors should assess the potential impact of their works based on the information provided in the borehole logs, core photographs and point load data.

Monitoring of construction-induced vibrations must be undertaken at the commencement of such activities, located at the nearest vibration receptor and in consultation with the project superintendent and geotechnical engineer.

Recommended locations of the vibration monitors are shown on **Figure 2**.



Figure 2 Location of vibration monitoring points
● Vibration Monitor Location

It is understood that the proposed development is located within the Chapter C1 Paddington Heritage Conservation Area and that adjacent structures are heritage listed, namely the Victorian-era terrace houses along Shadforth Street. Care must be taken with excavation in order to prevent damage to the heritage structures through either ground movement or ground-borne vibration.

Ground movement in response to excavation may be managed through implementation of the recommendations for excavation support provided in **Section 3.4**.

Vibration monitors are to be placed within the site boundaries directly adjacent to the northern and western boundaries. Vibration monitors are to be set up for continuous monitoring and with visual and audible alarms for exceedances of the nominated vibration threshold. It is recommended that vibration monitors are placed prior to the early works contractor mobilising to site by a registered acoustic consultant.

Trials must take place at the commencement of works to ensure that the contractor's proposed methodology can be achieved within the nominated vibration thresholds. The initial trial is to

comprise bucket excavation of soil and must be carried out in the presence of the project geotechnical and structural engineers.

A second trial is to be conducted prior to the commencement of hydraulic rock hammering and is to be carried out in the presence of the project geotechnical and structural engineers.

If vibration levels are found to be unacceptable during the trial, it may be necessary to adopt vibration mitigation measures such as:

- The use of smaller excavation plant and hydraulic hammers;
- Saw cutting of the perimeter of the excavation;
- Hammering at 50% capacity in short bursts to prevent the buildup of resonant frequencies;
- The use of low vibration techniques such as rotary grinders or chemical rock splitting.

On the basis of trials at the commencement of works, a construction methodology may be proposed to limit peak particle velocities (ppv) to acceptable levels. It is recommended that the monitoring thresholds are set to not exceed DIN4150 Category 3 limits for sensitive structures.

If vibration levels are exceeded during construction, it is necessary to cease work and alert the project geotechnical and structural engineers to determine a suitable plan for safe continuation of construction activities.

3.9 Response to Woollahra Local Environmental Plan, Part 6, Clause 6.2(1)

Woollahra LEP 6.2 (1) states:

- (1) The objective of this clause is to ensure that earthworks for which development consent is required will not have a detrimental impact on environmental functions and processes, neighbouring uses, cultural or heritage items or features of the surrounding land.

The proposed excavation support advice outlined in this report is suitable to the site conditions and is sufficient to provide adequate support to “environmental functions and processes, neighbouring uses, cultural or heritage items or features of the surrounding land.” The monitoring advice provided in Sections 3.7 and 3.8 of this report provides for adequate design and construction supervision to ensure that the requirements of the geotechnical report and good engineering practices are implemented in the detailed design and construction of the shoring to ensure that LEP 6.2 (1) is met.

Woollahra LEP 6.2 (3) states:

- (3) In deciding whether to grant development consent for earthworks (or for development involving ancillary earthworks), the consent authority must consider the following matters—
- (a) the likely disruption of, or any detrimental effect on, drainage patterns and soil stability in the locality of the development,
 - (b) the effect of the development on the likely future use or redevelopment of the land,
 - (c) the quality of the fill or the soil to be excavated, or both,

- (d) the effect of the development on the existing and likely amenity and structural integrity of adjoining properties,
- (e) the source of any fill material and the destination of any excavated material,
- (f) the likelihood of disturbing relics,
- (g) the proximity to, and potential for adverse impacts on, any waterway, drinking water catchment or environmentally sensitive area,
- (h) any appropriate measures proposed to avoid, minimise or mitigate the impacts of the development.

Responses to each point of 6.2 (3) are as follows:

- a) As discussed above, a suitable structural support method may be designed based on the recommendations of this report which will be adequate to prevent disruption of, or any detrimental effect on, drainage patterns and soil stability in the locality of the development.
- b) Not related to geotechnical matters; to be addressed by others.
- c) Excavation material has been detailed in this. Requirements for the waste classification of soils for offsite disposal following demolition are outlined in Section 4 of this report.
- d) Refer to response a)
- e) Requirements for the waste classification of soils for offsite disposal following demolition are outlined in Section 4 of this report and NSW EPA 2014 - Waste Classification Guidelines will control quality of fill from other sources and destinations of excavated material from the subject site.
- f) Not related to geotechnical matters; to be addressed by others.
- g) Groundwater impacts associated with excavation and controls are addressed in the Site Hydrogeology Report and Dewatering Management Plan prepared by Morrow Geotechnics.
- h) Appropriate measures proposed to avoid, minimise or mitigate the impacts of the development are presented in Section 3 of this report.

4. Additional Geotechnical Input

Further input from a geotechnical professional during design and construction is advised in order to ensure a cost-effective design which can be constructed safely and efficiently. Areas for geotechnical input should include:

- All excavated material transported off site should be classified in accordance with NSW EPA 2014 - Waste Classification Guideline Part 1; Classifying Waste.
- A suitably qualified geotechnical engineer is to assess the condition of exposed material at foundation or subgrade level to assess the ability of the prepared surface to act as a foundation or as a subgrade.
- Observation of the material within pile excavations should be undertaken at the start of piling works to confirm that material across the site is in accordance with the geotechnical model presented in this report.

- Regular inspections of battered excavations and vertical cuts in self-supporting rock, where proposed, to confirm geotechnical conditions and to assess the suitability of design assumptions and to provide further advice with regards to excavation retention/ support and proposed construction methodologies, if required.

5. Conclusion

Based on the findings of geotechnical and hydrogeological investigations at the site, it can be concluded that the proposed development will not adversely impact land stability, groundwater flow or present structural risk to adjoining heritage structures provided that the recommendations of this report are incorporated into design and construction of the proposed works.

This report meets the geotechnical requirements of Woollahra Municipal Council's *Local Environmental Plan 2014 Section 6.2, Development Control Plan 2015 Chapter E2.2.10 "Groundwater and Geotechnical Impacts"* and Attachment 6 *"Guidelines for Preparation of Geotechnical and Hydrogeological Reports"*.

6. Statement Of Limitations

The adopted investigation scope was limited by the investigation intent and the presence of structures onsite at the time of the investigation. Further geotechnical inspections should be carried out during construction to confirm the geotechnical model provided in this report. Morrow Geotechnics has considered and provided the abovementioned geotechnical inputs to the proposed development only; structural design and construction methodology remains the responsibilities of the associated consultants.

Your attention is drawn to the document "Important Information", which is included in **Appendix B** of this report. The statements presented in this document are intended to advise you of what your realistic expectations of this report should be. The document is not intended to reduce the level of responsibility accepted by Morrow Geotechnics, but rather to ensure that all parties who may rely on this report are aware of the responsibilities each assumes in so doing.

7. References

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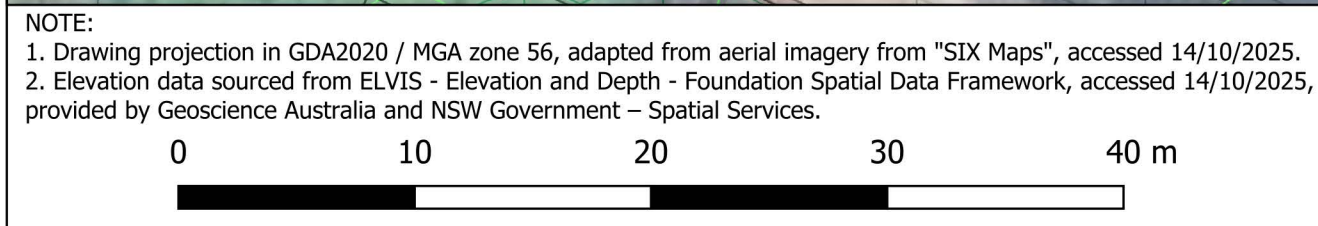
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Pettifer, G. S., & Fookes, P. G. (1994), *Guidance on the assessment of excavatability of rock*, Quarterly Journal of Engineering Geology and Hydrogeology, 27(2), 145-164

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DRAWN BY:	OAP	Toohy Miller Pty Ltd Geotechnical Investigation 142-160 Oxford Street, 13 Gipps Street & 6 Shadeforth Street, Paddington NSW Borehole Location Plan	Drawing: 1
Approved:	KS		Project: P3569
Date:	14/10/2025		Revision: 0

APPENDIX A

BOREHOLE LOGS AND EXPLANATORY NOTES



Morrow Geotechnics

Sydney Gadigal Land: 2/5-7 Malta Steet, Fairfield East NSW 2155

Phone: 02 8599 7579

Geotechnical Log - Borehole

BH101

UTM	: 56H	Excavator	: Hand Tools	Job Number	: P3569
Easting (m)	: 335696.45	Excavator Supplier	: MG	Client	: Toohey Miller
Northing (m)	: 6249306.20	Logged By	: Omer Turkarslan	Project	: Paddington
Ground Elevation	: 53.4 (m)	Reviewed By	: Ozzie Baskan	Location	: 142-148 & 160 Oxford Street, 13 Gipps Street, & 6 Shadeforth Street, P
Total Depth	: 0.4 m BGL	Date	: 07/07/2025	Loc Comment	:

Drilling Method	Water	Testing	Elevation Depth (m)	Material Type	Graphic Log	Classification Code	Material Description	Depth (m)	Consistency	Weathering	Moisture
			53.3	Non-Soil		CCT	Non-Soil - Concrete	0.1			
★Hand Auger▲			0.1	FILL		FILL	GRAVELLY SANDY CLAY medium plasticity, fine to medium grained sand, brown, pale brown and pale grey, trace silt, w < pl.				w < PL
							BH101 Refusal at 0.4 m (on sandstone bedrock)				



Morrow Geotechnics

Sydney Gadigal Land: 2/5-7 Malta Steet, Fairfield East NSW 2155
Phone: 02 8599 7579

Geotechnical Log - Borehole

BH102

UTM	: 56H	Excavator	: Hand Tools	Job Number	: P3569
Easting (m)	: 335686.15	Excavator Supplier	: MG	Client	: Toohey Miller
Northing (m)	: 6249284.41	Logged By	: Omer Turkarslan	Project	: Paddington
Ground Elevation	: 52.6 (m)	Reviewed By	: Ozzie Baskan	Location	: 142-148 & 160 Oxford Street, 13 Gipps Street, & 6 Shadeforth Street, N
Total Depth	: 0.4 m BGL	Date	: 07/07/2025	Loc Comment	:

Drilling Method	Water	Testing	Elevation Depth (m)	Material Type	Graphic Log	Classification Code	Material Description	Depth (m)	Consistency	Weathering	Moisture
			52.5 0.1	Non-Soil		CCT	Non-Soil - Concrete	0.1			
Hand Auger				FILL		FILL	GRAVELLY SANDY CLAY medium plasticity, fine to medium grained sand, brown and pale brown, trace silt, w < pl.				w < PL
							BH102 Refusal at 0.4 m (on sandstone bedrock)				



Morrow Geotechnics

Sydney Gadigal Land: 2/5-7 Malta Steet, Fairfield East NSW 2155

Phone: 02 8599 7579

Geotechnical Log - Borehole

BH103

UTM : 56H Excavator : Hand Tools Job Number : P3569
Easting (m) : 335701.78 Excavator Supplier : MG Client : Toohey Miller
Northing (m) : 6249284.62 Logged By : Omer Turkarslan Project : Paddington
Ground Elevation : 55.3 (m) Reviewed By : Ozzie Baskan Location : 142-148 & 160 Oxford Street, 13 Gipps Street, & 6 Shadeforth Street, N
Total Depth : 1.4 m BGL Date : 07/07/2025 Loc Comment :

Drilling Method	Water	Testing	Elevation Depth (m)	Material Type	Graphic Log	Classification Code	Material Description	Depth (m)	Consistency	Weathering	Moisture
		DCP									
Hand Auger		0	55.1	TOPSOIL		CI-CH	GRAVELLY SANDY CLAY medium to high plasticity, fine to medium grained sand, brown, pale brown and pale grey, trace silt, w < pl.	0.2			w < PL
		3									
		15	0.2	FILL		FILL	GRAVELLY SANDY CLAY stiff to very stiff, medium plasticity, fine to medium grained sand, brown , pale brown and pale grey, trace silt, with cobble size gravel (<70mm), w < pl.	0.5			w < PL
		5									
		2									
		14									
		6									
		3									
		1									
		1									
		1									
		2									
		3									
		2									
		5					BH103 Refusal at 1.4 m				
		2									
		3									
		8									
		4									
		13									
		11									
		12									
		+25									



Morrow Geotechnics

Sydney Gadigal Land: 2/5-7 Malta Steet, Fairfield East NSW 2155

Phone: 02 8599 7579

Geotechnical Log - Borehole

BH104

UTM	: 56H	Excavator	: Hand Tools	Job Number	: P3569
Easting (m)	: 335714.40	Excavator Supplier	: MG	Client	: Toohey Miller
Northing (m)	: 6249294.04	Logged By	: Omer Turkarslan	Project	: Paddington
Ground Elevation	: 54.4 (m)	Reviewed By	: Ozzie Baskan	Location	: 142-148 & 160 Oxford Street, 13 Gipps Street, & 6 Shadeforth Street, N
Total Depth	: 0.9 m BGL	Date	: 07/07/2025	Loc Comment	:

Drilling Method	Water	Testing	Elevation Depth (m)	Material Type	Graphic Log	Classification Code	Material Description	Depth (m)	Consistency	Weathering	Moisture
		DCP									
↑ Hand Auger ↓		0	54.3	Non-Soil		CCT	Non-Soil - Concrete	0.1			
		0	0.1	FILL		FILL	FILL GRAVELLY SANDY CLAY: medium plasticity, fine to medium grained sand, pale grey and pale brown with slightly red, trace silt, w < pl.	0.5			w < PL
		0									
		0									
		0									
		6									
		16									
		14									
		+25									
							BH104 Refusal at 0.9 m (on sandstone bedrock)				

UTM : 56H	Driller Rig : Christie Rig	Job Number : P3569
Easting : 335686.34	Driller Supplier : BG Drilling	Client : Toohey Miller
Northing : 6249317.07	Logged By : Jordan Andonoski	Project : Paddington
RL : 52.67(m)	Reviewed By : Krishna Shakya	Location : 142-148 & 160 Oxford Street, 13 Gipps Street, & 6 Shadeforth Street, 1
Total Depth : 15.15 m	Date : 13/10/2025	Loc Comment :

Drilling Method	Water	Well Diagram	Testing	Elevation Depth (m)	Graphic Log	Material Type	Classification Code	Material Description	Depth (m)	Consistency	Weathering	Moisture
			SPT									
				52.5		Non-Soil	CCT	Pavement Concrete 200mm.	0.2			
				0.2		FILL	FILL	FILL GRAVELLY SAND: medium dense, poorly graded, medium to coarse grained, medium to coarse sized gravel, black and grey, dry, high resistance.	1.0			
									2.0			
			7,10,7 (N=17)	50.1		Residual	CL	SANDY CLAY: stiff, low plasticity, fine grained sand, pale grey, w < pl.	2.6			
				2.6						St		w < PL
				50.0					2.7			
				2.7				Commenced Coring at 2.7 m				

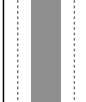
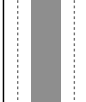
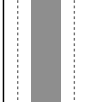
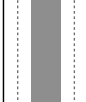
Job Number : P3569
Client : Toohey Miller
Project : Paddington
Location : 142-148 & 160 Oxford Street, 13 Gipps Street, & 6 Shadeforth Street, #
Loc Comment :

Drilling Method	Water	Well Diagram	Elevation	Graphic Log	Classification Code	Material Description	Depth (m)	Weathering	Testing		Estimated Strength Very Low Low Medium High Very High Extremely High	RQD% and TCR%	Defect Spacing (mm) 30 100 300 1000 3000	Defect Description type, inclination, planarity, roughness, coating, thickness
			Depth (m)						Is (50)					
					</									

UTM : 56H	Driller Rig : Christie Rig	Job Number : P3569
Easting : 335686.34	Driller Supplier : BG Drilling	Client : Toohey Miller
Northing : 6249317.07	Logged By : Jordan Andonoski	Project : Paddington
RL : 52.67(m)	Reviewed By : Krishna Shakya	Location : 142-148 & 160 Oxford Street, 13 Gipps Street, & 6 Shadeforth Street, Melbourne
Total Depth : 15.15 m	Date : 13/10/2025	Loc Comment :

Drilling Method	Water	Well Diagram	Elevation	Graphic Log	Classification Code	Material Description	Depth (m)	Weathering	Testing	Estimated Strength	RQD% and TCR%	Defect Spacing (mm)	Defect Description type, inclination, planarity, roughness, coating, thickness
			Depth (m)						Is(50)				
			48.7							Very Low Low Medium High Very High Extremely High		30 100 300 1000 3000	
	Outflow - 100%		4.0		SST	SANDSTONE: moderately weathered, low to medium strength, pale grey and orange, fine grained, distinct bedding fabric.	4.0	MW	D: 0.25, A: 0.35		RQD = 71.7391 % TCR = 100%		4.03, P, 5°, PL, RO, CL, OP
			48.1				4.55						4.48, P, 2°, PL, RO, STN, OP
			4.5		CL	Core Loss Core Loss 190mm.							4.5, P, 2°, PL, RO, STN, OP
			47.9				4.74						4.55-4.74, CORELOSS, 5°, PL, RO, CL, OP
			4.7		SST	SANDSTONE: moderately weathered, low to medium strength, pale grey and orange, fine grained, distinct bedding fabric.		MW					4.76, P, 5°, PL, RO, STN, OP
	Outflow - 100%		47.7			SANDSTONE: slightly weathered, medium strength, pale grey and pale brown, fine to medium grained, indistinct bedding fabric, oriented 1-10.	5.0		D: 0.32, A: 0.49		RQD = 84.93% TCR = 86.99%		
			5.0										
							6.0		D: 0.69, A: 0.68				5.95, P, 5°, PL, RO, CL, OP
													5.98, P, 5°, PL, RO, STN, OP
													6.24, P, 2°, PL, RO, CL, OP
					SST			SW					
							7.0		D: 0.82, A: 1.16		RQD = 98.36% TCR = 100%		
	Outflow - 100%												7.53, P, 5°, UN, RO, CL, OP
													7.53, P, 5°, UN, RO, CL, OP

UTM : 56H	Driller Rig : Christie Rig	Job Number : P3569
Easting : 335686.34	Driller Supplier : BG Drilling	Client : Toohey Miller
Northing : 6249317.07	Logged By : Jordan Andonoski	Project : Paddington
RL : 52.67(m)	Reviewed By : Krishna Shakya	Location : 142-148 & 160 Oxford Street, 13 Gipps Street, & 6 Shadeforth Street, Melbourne
Total Depth : 15.15 m	Date : 13/10/2025	Loc Comment :

Drilling Method	Water	Well Diagram	Elevation	Graphic Log	Classification Code	Material Description	Depth (m)	Weathering	Testing	Estimated Strength	RQD% and TCR%	Defect Spacing (mm)	Defect Description type, inclination, planarity, roughness, coating, thickness
			Depth (m)						Is(50)				
			Very Low Low Medium High Very High Extremely High										
NMLC Coring			44.7		SST	SANDSTONE: slightly weathered, high strength, pale grey and pale brown, medium grained, distinct bedding fabric, oriented 1-10.	8	SW	D: 1.01, A: 1.08		RQD = 98.36% TCR = 100%		8.03, P, 5°, PL, RO, CL, OP
			8.0										
			43.6		SST	SANDSTONE: highly weathered, medium to high strength, orange and pale grey, medium grained, indistinct bedding fabric, oriented 1-10.	9.0 9.05	HW	D: 0.71, A: 1.53		RQD = 77.53% TCR = 100%		9.47-9.52, JT, 30°, UN, RO, STN, OP
			9.1										
			42.9		SST	SANDSTONE: highly weathered, medium to high strength, orange and pale grey, medium grained, liesegang rings.	9.75 10.0	HW	D: 1.01, A: 1.67		RQD = 77.53% TCR = 100%		9.7, P, 5°, PL, RO, STN, OP 9.74-10, JT, 90°, PL, RO, CL, OP
			9.8										
			41.7		LAM	LAMINITE: slightly weathered, medium strength, pale grey and dark grey, fine to medium grained, distinct lamination fabric, oriented 1-5.	10.95 11.0	SW	D: 1.00, A: 0.56		RQD = 74.8466% % TCR = 100%		10.15, P, 5°, PL, RO, STN, OP 10.47, P, 5°, PL, RO, STN, OP 10.8, P, 5°, PL, RO, STN, OP 10.95, CS, 5°, PL, RO, STN, OP 11.15, P, 5°, PL, RO, CT, OP, clay 11.2, P, 5°, PL, RO, CT, OP, clay 11.29-11.3, XWS 11.3-11.6, XWS
10.9													
41.1	SST	SANDSTONE: moderately to slightly weathered, medium to high strength, pale grey and pale orange, fine to medium grained.	11.6	MW-SW									
			11.6										

UTM : 56H	Driller Rig : Christie Rig	Job Number : P3569
Easting : 335686.34	Driller Supplier : BG Drilling	Client : Toohey Miller
Northing : 6249317.07	Logged By : Jordan Andonoski	Project : Paddington
RL : 52.67(m)	Reviewed By : Krishna Shakya	Location : 142-148 & 160 Oxford Street, 13 Gipps Street, & 6 Shadeforth Street, P
Total Depth : 15.15 m	Date : 13/10/2025	Loc Comment :

Drilling Method	Water	Well Diagram	Elevation	Graphic Log	Classification Code	Material Description	Depth (m)	Weathering	Testing		Estimated Strength	RQD% and TCR%	Defect Spacing (mm)	Defect Description type, inclination, planarity, roughness, coating, thickness
			Depth (m)						Is(50)					
					SST	SANDSTONE: moderately to slightly weathered, medium to high strength, pale grey and pale orange, fine to medium grained. (continued)		MW-SW	D: 0.90, A: 1.09		RQD = 74.8466 % TCR = 100%			12-12.1, CRF
			39.7 13.0			As above, but: high strength, medium to coarse grained.	13.0		D: 1.22, A: 1.27					12.85-12.95, JT, 90°, PL, RO, CL, OP
					SST		14.0	MW-SW	D: 1.14, A: 1.81		RQD = 91.36% TCR = 100%			13.5, P, 5°, PL, RO, CL, OP 13.57, P, 5°, PL, RO, CT, OP, clay
							15.0		D: 0.98, A: 1.39					14, P, 5°, PL, RO, CL, OP 14.43, P, 5°, PL, RO, CT, OP 14.65, P, 5°, PL, RO, CT, OP, clay 14.74, P, 5°, PL, RO, CL, OP
						BH201 Reached Target Depth at 15.15 m								

morrow

CLIENT NAME: TM No. 8 Pty Ltd

PROJECT: Paddington

LOCATION: 160 - 142 Oxford street, Paddington NSW

JOB NUMBER: P3569

LOGGED BY: JA

BOREHOLE ID: BH201

DEPTH: 2.7m - 7.0m

CORE TRAY NO.: 1

DATE: 13/10/25



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Photo description

BH201 Box 1 of 3

Client

Toohy Miller

Location

142-148 & 160 Oxford Street, 13 Gipps Street, & 6 Shadeforth Street, Paddington NSW, Australia

Project name

Paddington

Project No

P3569

Scale

Not to Scale

BH No

BH201

BH Depth

2.7m to 7.0m

morrow

CLIENT NAME: TM No. 8 Pty Ltd

PROJECT: Paddington

LOCATION: 160 - 142 Oxford Street, Paddington NSW

JOB NUMBER: P3569

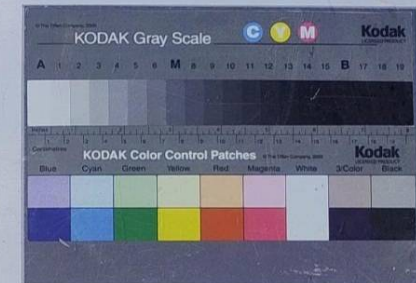
LOGGED BY: JA

BOREHOLE ID: BH201

DEPTH: 7.0m - 12.0m

CORE TRAY NO.: 2

DATE: 13/10/25



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P: 02 8599 7579

Photo description

BH201 Box 2 of 3

Client

Toohy Miller

Location

142-148 & 160 Oxford Street, 13 Gipps Street, & 6 Shadeforth Street, Paddington NSW, Australia

Project name

Paddington

Project No

P3569

Scale

Not to Scale

BH No

BH201

BH Depth

7.0m to 12.0m

morrow

CLIENT NAME: TM No. 8 Pty Ltd

PROJECT: Paddington

LOCATION: 160 - 142 Oxford street, Paddington NSW

JOB NUMBER: P3569

LOGGED BY: JA

BOREHOLE ID: BH201

DEPTH: 12.0m - 15.0m

CORE TRAY NO.: 3

DATE: 13/10/25



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E: info@morrowgeo.com.au
P: 02 8599 7579

Photo description

BH201 Box 3 of 3

Client

Toohy Miller

Location

142-148 & 160 Oxford Street, 13 Gipps Street, & 6 Shadeforth Street, Paddington NSW, Australia

Project name

Paddington

Project No

P3569

Scale

Not to Scale

BH No

BH201

BH Depth

12.0m to 15.0m

UTM : 56H	Driller Rig : Christie Rig	Job Number : P3569
Easting : 335697.62	Driller Supplier : BG Drilling	Client : Toohey Miller
Northing : 6249340.21	Logged By : Jordan Andonoski	Project : Paddington
RL : 52.74(m)	Reviewed By : Krishna Shakya	Location : 142-148 & 160 Oxford Street, 13 Gipps Street, & 6 Shadeforth Street, 1
Total Depth : 15.17 m	Date : 14/10/2025	Loc Comment :

Drilling Method	Water	Well Diagram	Testing	Elevation Depth (m)	Graphic Log	Material Type	Classification Code	Material Description	Depth (m)	Consistency	Weathering	Moisture
			SPT									
				52.6 0.1		Non-Soil	CCT	Pavement Concrete 110mm.	0.11			
						FILL	FILL	FILL GRAVEL: very loose, poorly graded, angular, coarse sized, Construction waste(bricks).		VL		
				51.4 1.3		Residual	SC	CLAYEY SAND: medium dense, well-graded, fine grained, medium plasticity clay, white and orange, wet, low resistance.	1.3			
										MD		W
			0,0,16 (N=16)	50.4 2.3		Rock	SST	SANDSTONE (XW): Sandy Clay - stiff, pale grey and orange, medium plasticity, fine grained sand, high resistance.	2.3			
										St	XW	W
								Commenced Coring at 2.6 m	2.6			

Job Number : P3569
Client : Toohy Miller
Project : Paddington
Location : 142-148 & 160 Oxford Street, 13 Gipps Street, & 6 Shadeforth Street,
Loc Comment :

Page 14 of 41

UTM : 56H	Driller Rig : Christie Rig	Job Number : P3569
Easting : 335697.62	Driller Supplier : BG Drilling	Client : Toohey Miller
Northing : 6249340.21	Logged By : Jordan Andonoski	Project : Paddington
RL : 52.74(m)	Reviewed By : Krishna Shakya	Location : 142-148 & 160 Oxford Street, 13 Gipps Street, & 6 Shadeforth Street, P
Total Depth : 15.17 m	Date : 14/10/2025	Loc Comment :

Drilling Method	Water	Well Diagram	Elevation	Graphic Log	Classification Code	Material Description	Depth (m)	Weathering	Testing	Estimated Strength	RQD% and TCR%	Defect Spacing (mm)	Defect Description type, inclination, planarity, roughness, coating, thickness
			Depth (m)						Is(50)				
			48.4		SST	SANDSTONE: highly weathered, low strength, pale grey and orange red, fine grained. (continued)	4.35	HW			RQD = 93.4783 % TCR = 100%		4.18, P, 2°, PL, RO, STN, OP 4.25-4.26, P, 10°, CV, RO, STN, OP 4.28, P, 2°, PL, RO, STN, OP
			47.4		SST	SANDSTONE: slightly to fresh weathered, low to medium strength, pale grey, fine to medium grained, oriented 1-10.	5.0	SW-F	D: 0.30, A: 0.53				4.49, P, 2°, PL, RO, CL, OP
			47.4		SST	SANDSTONE: slightly to fresh weathered, medium strength, pale grey, fine to medium grained, oriented 1-10.	5.3	SW-F	D: 0.52, A: 0.52				4.85-4.87, IS, clay
			46.7		SST	SANDSTONE: fresh weathered, medium strength, pale grey, medium grained, oriented 1-10.	6.4		D: 1.00, A: 1.11				5.65, P, 10°, PL, RO, CL, OP 5.75, P, 5°, PL, RO, CL, OP
			46.7		SST	SANDSTONE: fresh weathered, medium strength, pale grey, medium grained, oriented 1-10.	7.0	F	D: 0.85, A: 1.08				

UTM : 56H
 Easting : 335697.62
 Northing : 6249340.21
 RL : 52.74(m)
 Total Depth : 15.17 m

Driller Rig : Christie Rig
 Driller Supplier : BG Drilling
 Logged By : Jordan Andonoski
 Reviewed By : Krishna Shakya
 Date : 14/10/2025

Job Number : P3569
 Client : Toohey Miller
 Project : Paddington
 Location : 142-148 & 160 Oxford Street, 13 Gipps Street, & 6 Shadeforth Street, P
 Loc Comment :

Drilling Method	Water	Well Diagram	Elevation	Graphic Log	Classification Code	Material Description	Depth (m)	Weathering	Testing	Estimated Strength	RQD% and TCR%	Defect Spacing (mm)	Defect Description type, inclination, planarity, roughness, coating, thickness
			Depth (m)						Is(50)				
NMLC Coring	Outflow - 10%	50mm PVC Slotted			SST	SANDSTONE: fresh weathered, medium strength, pale grey, medium grained, oriented 1-10. (continued)		F	D: 1.07, A: 1.05	Very Low Low Medium High Very High Extremely High	RQD = 100% TCR = 100%		
							9.0	F	D: 1.32, A: 1.62				8.76, P, 5°, PL, RO, CT, OP, clay
			42.5 10.2			SANDSTONE: fresh weathered, high strength, pale grey and dark grey, medium grained, generally massive with shale lenses.	10.2	F	D: 1.77, A: 1.78		RQD = 97.76% TCR = 100%		10.55-10.59, XWS, clay
			41.7 11.0			SANDSTONE: fresh weathered, high strength, pale grey, medium grained, generally massive.	11.0	F	D: 1.27, A: 1.66		RQD = 96.52% TCR = 100%		

UTM : 56H	Driller Rig : Christie Rig	Job Number : P3569
Easting : 335697.62	Driller Supplier : BG Drilling	Client : Toohey Miller
Northing : 6249340.21	Logged By : Jordan Andonoski	Project : Paddington
RL : 52.74(m)	Reviewed By : Krishna Shakya	Location : 142-148 & 160 Oxford Street, 13 Gipps Street, & 6 Shadeforth Street, P
Total Depth : 15.17 m	Date : 14/10/2025	Loc Comment :

Drilling Method	Water	Well Diagram	Elevation	Graphic Log	Classification Code	Material Description	Depth (m)	Weathering	Testing		Estimated Strength	RQD% and TCR%	Defect Spacing (mm)	Defect Description type, inclination, planarity, roughness, coating, thickness
			Depth (m)						Is(50)					
					SST	SANDSTONE: fresh weathered, high strength, pale grey, medium grained, generally massive. (continued)		F			Very Low Low Medium High Very High Extremely High	RQD = 96.52% TCR = 100%		12, P, 3°, PL, RO, CL, OP 12.1, P, 3°, PL, RO, CL, OP
									D: 1.50, A: 1.28					
									D: 1.27, A: 1.54					
									D: 2.33, A: 1.98					
									D: 2.11, A: 2.18					
						BH202 Reached Target Depth at 15.17 m								

morrow

CLIENT NAME: TM No. 8 Pty Ltd

PROJECT: Paddington

LOCATION: 160 - 142 Oxford Street, Paddington NSW

JOB NUMBER: P3569

LOGGED BY: JA

BOREHOLE ID: BH202

DEPTH: 2.6m - 7.0m

CORE TRAY NO.: 1

DATE: 14/10/25



morrow

Morrow Geotechnics Pty Ltd ABN 42 605 892 126
2/5-7 Malta Street, Fairfield East NSW 2165
79/6 Bellambi Lane, Bellambi NSW 2518
E: info@morrowgeo.com.au
P: 02 8599 7579

Photo description

BH202 Box 1 of 3

Client

Toohy Miller

Location

142-148 & 160 Oxford Street, 13 Gipps Street, & 6 Shadeforth Street, Paddington NSW, Australia

Project name

Paddington

Project No

P3569

Scale

Not to Scale

BH No

BH202

BH Depth

2.60m to 7.0m

morrow

CLIENT NAME: TM No. 8 Pty Ltd

PROJECT: Paddington

LOCATION: 160 - 142 Oxford Street, Paddington NSW

JOB NUMBER: P3569

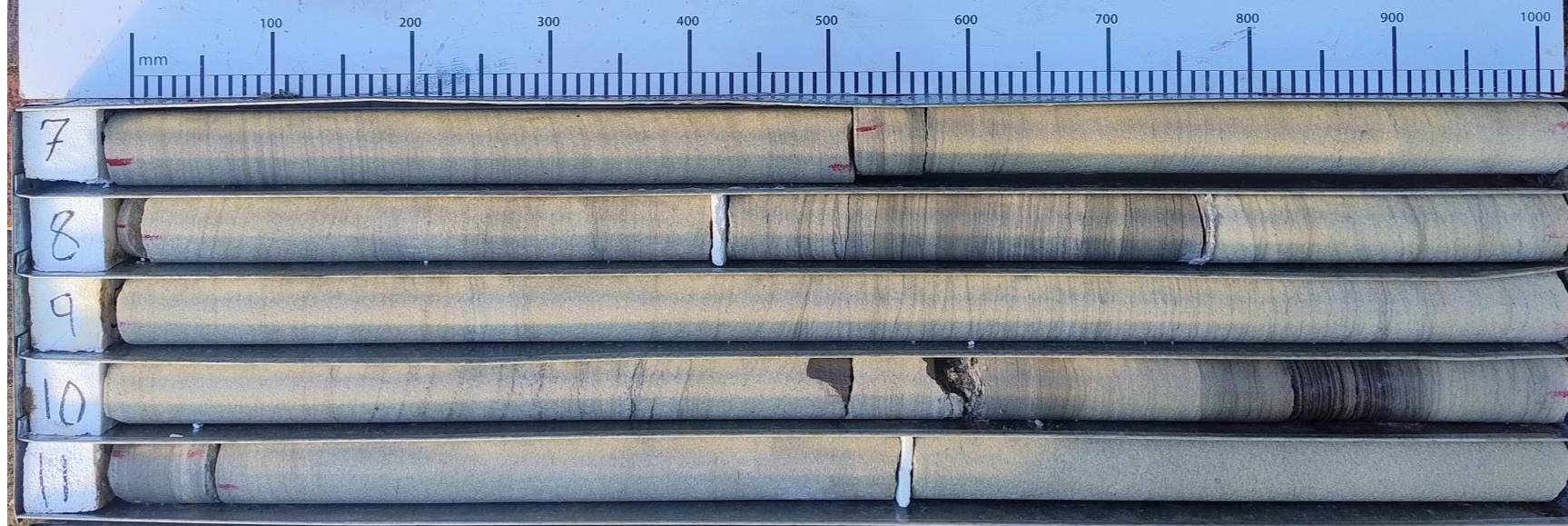
LOGGED BY: JA

BOREHOLE ID: BH202

DEPTH: 7.0m - 12.0m

CORE TRAY NO.: 2

DATE: 14/10/25



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Photo description

BH202 Box 2 of 3

Client

Toohey Miller

Location

142-148 & 160 Oxford Street, 13 Gipps Street, & 6 Shadeforth Street, Paddington NSW, Australia

Project name

Paddington

Project No

P3569

Scale

Not to Scale

BH No

BH202

BH Depth

7.0m to 12.0m

morrow

CLIENT NAME: TM No. 8 Pty Ltd

PROJECT: Paddington

LOCATION: 160 - 142 Oxford Street, Paddington NSW

JOB NUMBER: P3569

LOGGED BY: JA

BOREHOLE ID: BH202

DEPTH: 12.0m - 15.17m

CORE TRAY NO.: 3

DATE: 14/10/25



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Morrow Geotechnics Pty Ltd ABN 42 605 892 126
2/5-7 Malta Street, Fairfield East NSW 2165
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Photo description

BH202 Box 3 of 3

Client

Toohy Miller

Location

142-148 & 160 Oxford Street, 13 Gipps Street, & 6 Shadeforth Street, Paddington NSW, Australia

Project name

Paddington

Project No

P3569

Scale

Not to Scale

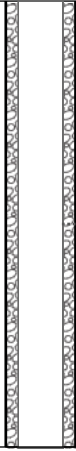
BH No

BH202

BH Depth

12.0m to 15.17m

UTM : 56H	Driller Rig : Man-Portable	Job Number : P3569
Easting : 335681.56	Driller Supplier : Geoassist Pty Ltd	Client : Toohey Miller
Northing : 6249285.82	Logged By : Jordan Andonoski	Project : Paddington
RL : 52.52(m)	Reviewed By : Krishna Shakya	Location : 142-148 & 160 Oxford Street, 13 Gipps Street, & 6 Shadeforth Street, 1
Total Depth : 25.53 m	Date : 20/10/2025	Loc Comment :

Drilling Method	Water	Well Diagram	Testing	Elevation Depth (m)	Graphic Log	Material Type	Classification Code	Material Description	Depth (m)	Consistency	Weathering	Moisture
Hand Auger				52.2		TOPSOIL	SM	SILTY SAND: loose, poorly graded, fine grained, brown and black, dry, no resistance.	0.3	L		D
				52.0		FILL	FILL	FILL GRAVELLY SAND: loose, poorly graded, fine grained, medium to coarse sized gravel, pale grey and brown, with silt, dry, low resistance.	0.5	L		D
Diatube				51.4		Non-Soil	CCT	Pavement Concrete.	1.0			
				1.1				Commenced Coring at 1.15 m	1.15			

UTM : 56H	Driller Rig : Man-Portable	Job Number : P3569
Easting : 335681.56	Driller Supplier : Geoassist Pty Ltd	Client : Toohey Miller
Northing : 6249285.82	Logged By : Jordan Andonoski	Project : Paddington
RL : 52.52(m)	Reviewed By : Krishna Shakya	Location : 142-148 & 160 Oxford Street, 13 Gipps Street, & 6 Shadeforth Street, P
Total Depth : 25.53 m	Date : 20/10/2025	Loc Comment :

Drilling Method	Water	Well Diagram	Elevation	Graphic Log	Classification Code	Material Description	Depth (m)	Weathering	Testing	Estimated Strength	RQD% and TCR%	Defect Spacing (mm)	Defect Description type, inclination, planarity, roughness, coating, thickness
			Depth (m)						Is(50)				
		BH203											
						Commenced Coring at 1.15 m	1.0						
			51.3		SST	SANDSTONE: highly weathered, very low to low strength, red and orange, fine grained, indistinct bedding fabric, dry, high resistance. Core Loss Core Loss. SANDSTONE: highly weathered, low strength, pale grey and red orange, fine to medium grained, distinct bedding fabric, oriented 1-10.	1.2	HW					
			1.2		CL		1.35						1.2-1.35, CORELOSS
			51.2										1.43-1.44, P, 20°, PL, RO, STN, OP 1.47, P, 10°, PL, RO, STN, OP 1.5, P, 2°, PL, RO, CL, OP
			1.4						D:0.05, A:0.25				
					SST		2.0	HW	D:0.06, A:0.20				1.77, P, 5°, PL, RO, STN, OP 1.9, P, 5°, PL, RO, STN, OP
									D:0.11, A:0.19				2.6, P, 5°, PL, RO, STN, OP
													2.74-2.75, P, 10°, PL, RO, STN, OP
													2.94, P, 2°, PL, RO, STN, OP 2.96, P, 2°, PL, RO, STN, OP 2.98, P, 2°, PL, RO, STN, OP
			49.4				3.0		D:0.33, A:2.80				
			3.1		SST	SANDSTONE: highly weathered, low strength, pale grey and orange red, fine grained, indistinct bedding fabric, dry, oriented 1-10.	3.1	HW					3.42-3.43, P, 10°, PL, RO, STN, OP
									D:0.21, A:0.37				3.68, P, 2°, PL, RO, STN, OP

UTM : 56H	Driller Rig : Man-Portable	Job Number : P3569
Easting : 335681.56	Driller Supplier : Geoassist Pty Ltd	Client : Toohey Miller
Northing : 6249285.82	Logged By : Jordan Andonoski	Project : Paddington
RL : 52.52(m)	Reviewed By : Krishna Shakya	Location : 142-148 & 160 Oxford Street, 13 Gipps Street, & 6 Shadeforth Street, Melbourne
Total Depth : 25.53 m	Date : 20/10/2025	Loc Comment :

Drilling Method	Water	Well Diagram	Elevation	Graphic Log	Classification Code	Material Description	Depth (m)	Weathering	Testing	Estimated Strength	RQD% and TCR%	Defect Spacing (mm)	Defect Description
			Depth (m)						Is(50)				
NMLC Coring													

UTM : 56H	Driller Rig : Man-Portable	Job Number : P3569
Easting : 335681.56	Driller Supplier : Geoassist Pty Ltd	Client : Toohey Miller
Northing : 6249285.82	Logged By : Jordan Andonoski	Project : Paddington
RL : 52.52(m)	Reviewed By : Krishna Shakya	Location : 142-148 & 160 Oxford Street, 13 Gipps Street, & 6 Shadeforth Street, Melbourne
Total Depth : 25.53 m	Date : 20/10/2025	Loc Comment :

Drilling Method	Water	Well Diagram	Elevation	Graphic Log	Classification Code	Material Description	Depth (m)	Weathering	Testing	Estimated Strength	RQD% and TCR%	Defect Spacing (mm)	Defect Description type, inclination, planarity, roughness, coating, thickness
			Depth (m)						Is(50)				
			42.5 10.0		SST	SANDSTONE: slightly to fresh weathered, medium strength, pale grey and grey, medium grained, distinct bedding fabric, oriented 1-10. (continued)	9.0	SW-F	D:0.84, A:1.03		RQD = 100% TCR = 100%		
					SST	SANDSTONE: slightly weathered, medium to high strength, pale grey, fine to medium grained, distinct bedding fabric, oriented 1-10°, with carbonaceous inclusions.	10.0	SW	D:0.67, A:1.00		RQD = 90.48% TCR = 100%		10.4, P, 5°, UN, RO, CL, OP 10.48-10.49, P, 10°, UN, RO, CL, OP
					SST		11.0	SW	D:0.70, A:1.30		RQD = 98.75% TCR = 100%		11.19, P, 2°, UN, RO, CL, OP 11.33, P, 2°, UN, RO, CL, OP
					SST				D:0.28, A:1.05				

UTM : 56H	Driller Rig : Man-Portable	Job Number : P3569
Easting : 335681.56	Driller Supplier : Geoassist Pty Ltd	Client : Toohey Miller
Northing : 6249285.82	Logged By : Jordan Andonoski	Project : Paddington
RL : 52.52(m)	Reviewed By : Krishna Shakya	Location : 142-148 & 160 Oxford Street, 13 Gipps Street, & 6 Shadeforth Street, Melbourne
Total Depth : 25.53 m	Date : 20/10/2025	Loc Comment :

Drilling Method	Water	Well Diagram	Elevation	Graphic Log	Classification Code	Material Description	Depth (m)	Weathering	Testing	Estimated Strength	RQD% and TCR%	Defect Spacing (mm)	Defect Description type, inclination, planarity, roughness, coating, thickness
			Depth (m)						Is(50)				
			40.5				12						
			12.0			SANDSTONE: slightly to fresh weathered, high strength, pale grey and grey, medium grained, distinct bedding fabric, oriented 1-10.			D:1.25, A:1.40		RQD = 98.75% TCR = 100%		
	Outflow - 100%												
							13.0		D:1.23, A:1.41		RQD = 100% TCR = 100%		
	Outflow - 100%												
					SST			SW-F					
							14.0		D:0.67, A:1.29		RQD = 100% TCR = 100%		
	Outflow - 50%	50mm PVC Slotted											
							15.0		D:0.61, A:1.00		RQD = 100% TCR = 100%		
			37.1			SANDSTONE: moderately to slightly weathered, high strength, orange and pale grey, medium to coarse grained.	15.45				RQD = 100% TCR = 100%		
			15.4		SST			MW-SW					

Job Number : P3569
Client : Toohey Miller
Project : Paddington
Location : 142-148 & 160 Oxford Street, 13 Gipps Street, & 6 Shadeforth Street, f
Loc Comment :

Page 26 of 41

UTM : 56H	Driller Rig : Man-Portable	Job Number : P3569
Easting : 335681.56	Driller Supplier : Geoassist Pty Ltd	Client : Toohey Miller
Northing : 6249285.82	Logged By : Jordan Andonoski	Project : Paddington
RL : 52.52(m)	Reviewed By : Krishna Shakya	Location : 142-148 & 160 Oxford Street, 13 Gipps Street, & 6 Shadeforth Street, Melbourne
Total Depth : 25.53 m	Date : 20/10/2025	Loc Comment :

Drilling Method	Water	Well Diagram	Elevation	Graphic Log	Classification Code	Material Description	Depth (m)	Weathering	Testing	Estimated Strength	RQD% and TCR%	Defect Spacing (mm)	Defect Description type, inclination, planarity, roughness, coating, thickness
			Depth (m)						Is(50)				
NMLC Coring	Outflow - 30%	50mm PVC Slotted			SST	SANDSTONE: moderately to slightly weathered, high strength, orange and pale grey, medium to coarse grained. (continued)		MW-SW	D:1.86, A:2.02		RQD = 100% TCR = 100%		20.65, P, 2°, PL, RO, CL, OP
	Outflow - 30%		31.2				21.0		D:1.45, A:1.95				
			21.3				21.3						21.18-21.19, P, 15°, PL, RO, STN, OP
					SST	SANDSTONE: slightly to fresh weathered, high strength, pale grey and grey, medium grained, distinct bedding fabric, oriented 1-10.	22.0	SW-F	D:1.42, A:1.43		RQD = 100% TCR = 100%		21.65-21.66, P, 15°, PL, RO, CL, OP
	Outflow - 30%						23.0		D:1.82, A:1.71				
											RQD =		

UTM : 56H	Driller Rig : Man-Portable	Job Number : P3569
Easting : 335681.56	Driller Supplier : Geoassist Pty Ltd	Client : Toohey Miller
Northing : 6249285.82	Logged By : Jordan Andonoski	Project : Paddington
RL : 52.52(m)	Reviewed By : Krishna Shakya	Location : 142-148 & 160 Oxford Street, 13 Gipps Street, & 6 Shadeforth Street, P
Total Depth : 25.53 m	Date : 20/10/2025	Loc Comment :

Drilling Method	Water	Well Diagram	Elevation	Graphic Log	Classification Code	Material Description	Depth (m)	Weathering	Testing	Estimated Strength	RQD% and TCR%	Defect Spacing (mm)	Defect Description type, inclination, planarity, roughness, coating, thickness
			Depth (m)						Is(50)				
					SST	SANDSTONE: slightly to fresh weathered, high strength, pale grey and grey, medium grained, distinct bedding fabric, oriented 1-10. (continued)	25.0	SW-F	D:1.63, A:1.43		RQD = 100% TCR = 100%		24.11, P, 7°, PL, RO, CL, OP
									D:1.05, A:1.39				
						BH203 Reached Target Depth at 25.53 m							



morrow

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Photo description

BH203 Box 1 of 5

Client

Toohy Miller

Location

142-148 & 160 Oxford Street, 13 Gipps Street, & 6 Shadeforth Street, Paddington NSW, Australia

Project name

Paddington

Project No

P3569

Scale

Not to Scale

BH No

BH203

BH Depth

1.15m to 6.0m

morrow

CLIENT NAME: TM No. 8 Pty Ltd

PROJECT: Paddington

LOCATION: 160-142 Oxford Street, Paddington NSW

JOB NUMBER: P3569

LOGGED BY: JA

BOREHOLE ID: BH203

DEPTH: 6.0m - 11.0m

CORE TRAY NO: 2

DATE: 20/10/25



morrow

Morrow Geotechnics Pty Ltd ABN 42 605 892 126
2/5-7 Malta Street, Fairfield East NSW 2165
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P: 02 8599 7579

Photo description

BH203 Box 2 of 5

Client

Toohy Miller

Location

142-148 & 160 Oxford Street, 13 Gipps Street, & 6 Shadeforth Street, Paddington NSW, Australia

Project name

Paddington

Project No

P3569

Scale

Not to Scale

BH No

BH203

BH Depth

6.0m to 11.0m

morrow

CLIENT NAME: TM No. 8 Pty Ltd

PROJECT: Paddington

LOCATION: 160-142 Oxford Street, Paddington NSW

JOB NUMBER: P3569

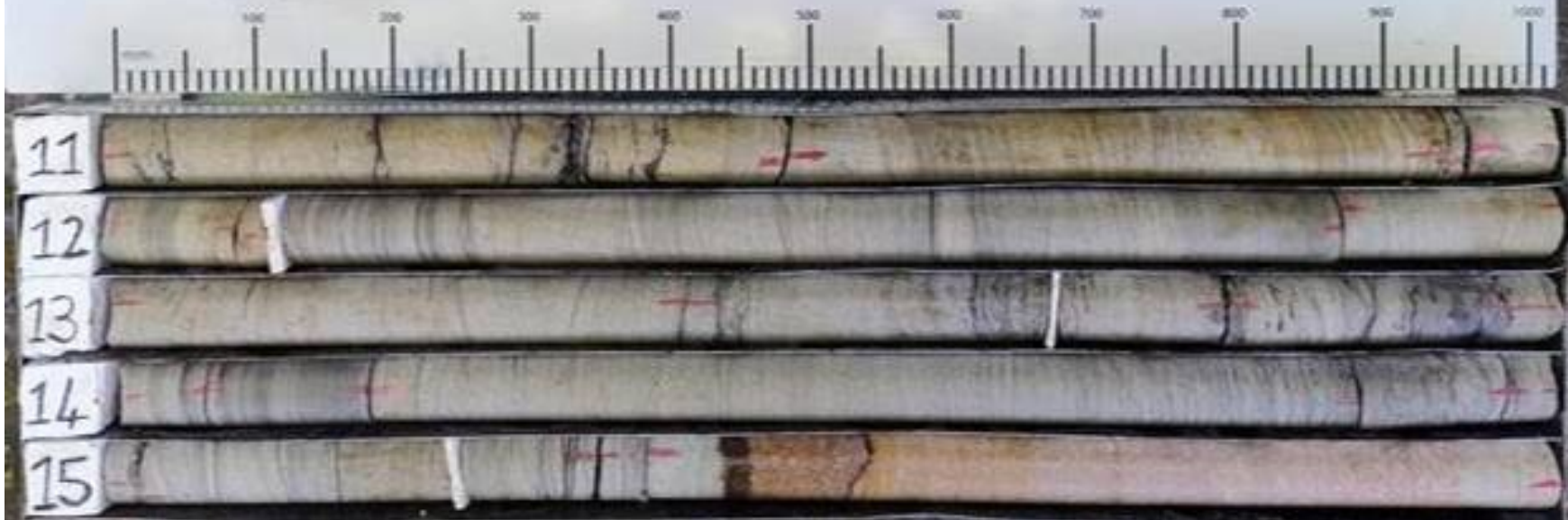
LOGGED BY: JA

BOREHOLE ID: BH203

DEPTH: 11.0m - 16.0m

CORE TRAIL NO: 3

DATE: 20/10/25



morrow

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2/5-7 Malta Street, Fairfield East NSW 2165
79/6 Bellambi Lane, Bellambi NSW 2518
E: info@morrowgeo.com.au
P: 02 8599 7579

Photo description

BH203 Box 3 of 5

Client

Toohy Miller

Location

142-148 & 160 Oxford Street, 13 Gipps Street, & 6 Shadeforth Street, Paddington NSW, Australia

Project name

Paddington

Project No

P3569

Scale

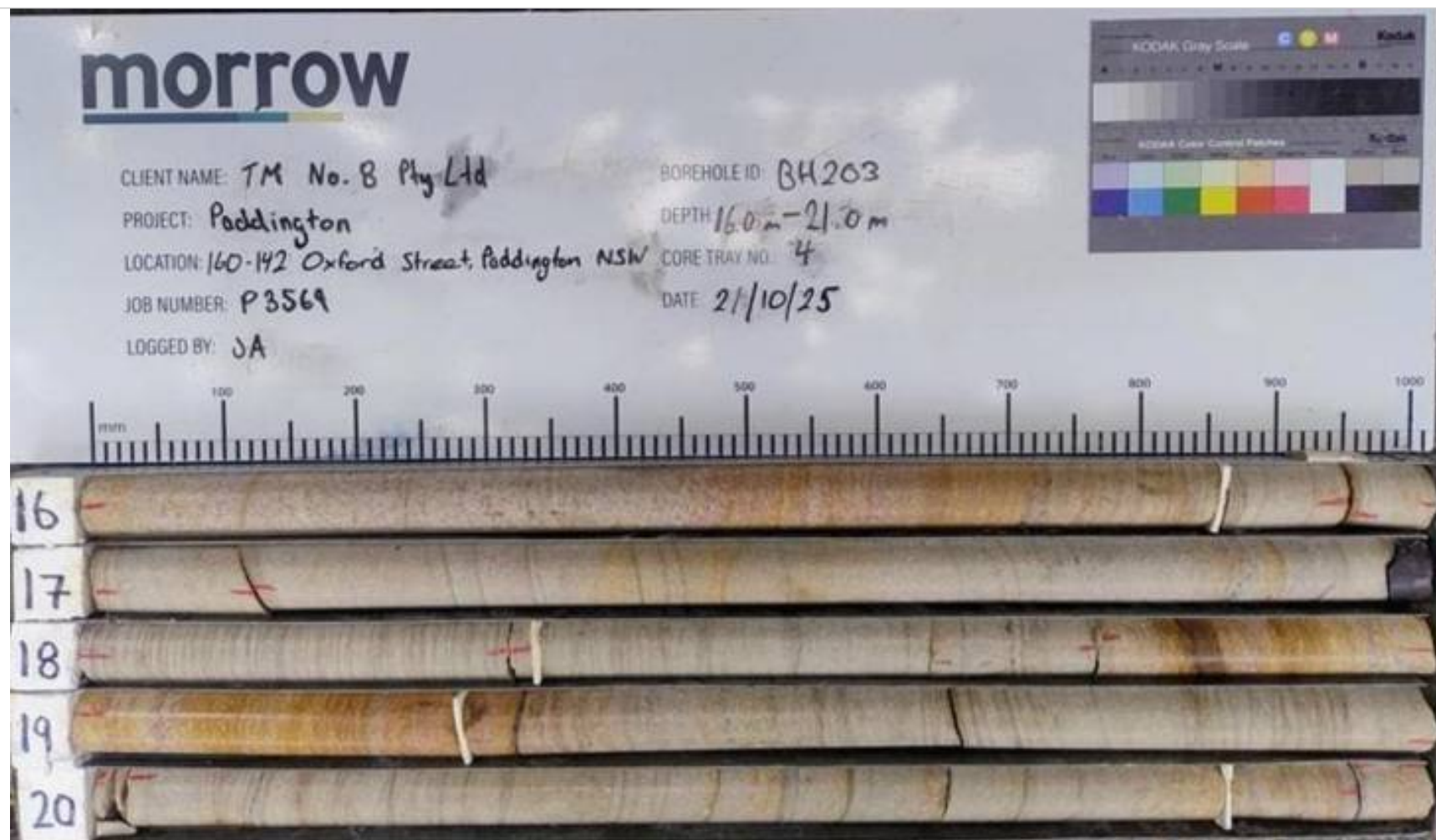
Not to Scale

BH No

BH203

BH Depth

11.0m to 16.0m



morrow

Morrow Geotechnics Pty Ltd ABN 42 605 892 126
 2/5-7 Malta Street, Fairfield East NSW 2165
 79/6 Bellambi Lane, Bellambi NSW 2518
 E: info@morrowgeo.com.au
 P: 02 8599 7579

Photo description

BH203 Box 4 of 5

Client

Toohy Miller

Location

142-148 & 160 Oxford Street, 13 Gipps Street, & 6 Shadeforth Street, Paddington NSW, Australia

Project name

Paddington

Project No

P3569

Scale

Not to Scale

BH No

BH203

BH Depth

16.0m to 21.0m



morrow

Morrow Geotechnics Pty Ltd ABN 42 605 892 126
2/5-7 Malta Street, Fairfield East NSW 2165
79/6 Bellambi Lane, Bellambi NSW 2518
E: info@morrowgeo.com.au
P: 02 8599 7579

Photo description

BH203 Box 5 of 5

Client

Toohy Miller

Location

142-148 & 160 Oxford Street, 13 Gipps Street, & 6 Shadeforth Street, Paddington NSW, Australia

Project name

Paddington

Project No

P3569

Scale

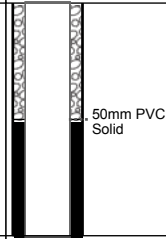
Not to Scale

BH No

BH203

BH Depth

21.0 to 25.53m

Drilling Method	Water	Well Diagram	Testing	Elevation	Graphic Log	Material Type	Classification Code	Material Description	Depth (m)	Consistency	Weathering	Moisture
				Depth (m)								
						TOPSOIL	SM	SILTY GRAVELLY SAND: loose to medium dense, poorly graded, fine grained, fine sized gravel, dark brown, moist.		L-MD		M
				51.0		FILL	FILL	FILL GRAVELLY SAND: poorly graded, moist, With over sized fill particles, concrete layer at 1.0 m.	0.5			M
				50.9					0.6			
Commenced Coring at 0.6 m												

UTM : 56H	Driller Rig : Man-Portable	Job Number : P3569
Easting : 335673.32	Driller Supplier : Hard Access Drilling	Client : Toohey Miller
Northing : 6249279.50	Logged By : Mahmoud Jangidaryan	Project : Paddington
RL : 51.55(m)	Reviewed By : Krishna Shakya	Location : 142-148 & 160 Oxford Street, 13 Gipps Street, & 6 Shadeforth Street, Melbourne
Total Depth : 15.18 m	Date : 22/10/2025	Loc Comment :

Drilling Method	Water	Well Diagram	Elevation	Graphic Log	Classification Code	Material Description	Depth (m)	Weathering	Testing	Estimated Strength	RQD% and TCR%	Defect Spacing (mm)	Defect Description type, inclination, planarity, roughness, coating, thickness
			Depth (m)						Is(50)				
		BH204											
						Commenced Coring at 0.6 m							
						Core Loss.							0.6-1.75, CORELOSS
					CL		1.0						
							1.75						1.75-1.8, CS
					FILL	FILL GRAVELLY SAND: poorly graded, moist, With oversized fill particles, concrete layer at 1.0 m.	1.81						1.85, P, 5°
						SANDSTONE: highly weathered, low strength, pale grey pale orange purple, very fine grained.	2.0		d:0.57; a:0.60				1.97-2.06, XWS
					SST			HW	d:0.24; a:0.27				
							2.79						2.73, P, 5°
					CL	Core Loss.	2.86						2.76, P, 5°, PL, SO, CL, OP
						SANDSTONE: highly weathered, low strength, pale yellow and purple, fine grained.	3.0						2.79-2.86, CORELOSS
					SST			HW					2.86-2.92, JT, 70°, PL, RO, CL, OP
							3.35		d:0.20; a:0.24				2.93, P, 10°, PL, RO, CL, OP
						As above, but: highly weathered, medium strength, pale grey pale orange purple, very fine grained.							
					SST			HW					3.36, P, 5°, PL, RO, CL, OP
													3.57, P, 5°, PL, RO, CL, OP
													3.76, P, 5°, PL, RO, CL, OP
									d:0.52; a:0.36				3.87, P, 10°, PL, RO, CL, OP
													3.9-3.92, P, 30°, PL, RO, CL, OP

UTM : 56H	Driller Rig : Man-Portable	Job Number : P3569
Easting : 335673.32	Driller Supplier : Hard Access Drilling	Client : Toohey Miller
Northing : 6249279.50	Logged By : Mahmoud Jangidaryan	Project : Paddington
RL : 51.55(m)	Reviewed By : Krishna Shakya	Location : 142-148 & 160 Oxford Street, 13 Gipps Street, & 6 Shadeforth Street, 1
Total Depth : 15.18 m	Date : 22/10/2025	Loc Comment :

Drilling Method	Water	Well Diagram	Elevation	Graphic Log	Classification Code	Material Description	Depth (m)	Weathering	Testing	Estimated Strength	RQD% and TCR%	Defect Spacing (mm)	Defect Description type, inclination, planarity, roughness, coating, thickness	
			Depth (m)						Is(50)					
NMLC Coring		50mm PVC Slotted	47.3		SST	As above, but: highly weathered, medium strength, pale grey pale orange purple, very fine grained. (continued)	4.3	HW	d:0.57; a:0.62	Very Low Low Medium High Very High Extremely High	RQD = 92.24% TCR = 97.83%	30 100 300 1000 3000	4.17-4.18, P, 10°, PL, RO, CL, OP	
			4.3										4.23-4.25, P, 15°, PL, RO, CL, OP	
			45.5		SST	SANDSTONE: slightly weathered, medium strength, pale grey grey, with carbonaceous laminations.	5.0	SW	d:0.57; a:0.71					4.37, P, 5°, PL, RO, CL, OP
									d:0.69; a:0.85					4.81, P, 5°, PL, RO, CL, OP
														4.94, P, 5°, PL, RO, CL, OP
			6.4		SST	As above, but: slightly to fresh weathered, medium to high strength.	6.6	SW-F	d:0.82; a:1.03					6.28, P, 5°, PL, RO, CL, OP
d:0.61; a:1.06		7.33, P, 10°, PL, RO, CL, OP												
		7.66, P, 5°, PL, RO, CL, OP												
								7.84, P, 5°, PL, RO, CL, OP						
								7.93, P, 5°, PL, RO, CL, OP						

UTM : 56H	Driller Rig : Man-Portable	Job Number : P3569
Easting : 335673.32	Driller Supplier : Hard Access Drilling	Client : Toohey Miller
Northing : 6249279.50	Logged By : Mahmoud Jangidaryan	Project : Paddington
RL : 51.55(m)	Reviewed By : Krishna Shakya	Location : 142-148 & 160 Oxford Street, 13 Gipps Street, & 6 Shadeforth Street, Melbourne
Total Depth : 15.18 m	Date : 22/10/2025	Loc Comment :

Drilling Method	Water	Well Diagram	Elevation	Graphic Log	Classification Code	Material Description	Depth (m)	Weathering	Testing	Estimated Strength	RQD% and TCR%	Defect Spacing (mm)	Defect Description type, inclination, planarity, roughness, coating, thickness
			Depth (m)						Is(50)				
NMLC Coring		50mm PVC Slotted			SST	As above, but: slightly to fresh weathered, medium to high strength. (continued)	9.0	SW-F	d:1.17; a:1.07	Very Low Low Medium High Very High Extremely High	RQD = 100% TCR = 100%	30 100 300 1000 3000	8.34, P, 5°, PL, RO, CL, OP
									d:0.83; a:0.75				
									d:0.88; a:1.21				
							11.0		d:1.41; a:1.35	Very Low Low Medium High Very High Extremely High	RQD = 100% TCR = 100%		11.81-11.82, P, 5°, PL, RO, CL, OP

UTM : 56H	Driller Rig : Man-Portable	Job Number : P3569
Easting : 335673.32	Driller Supplier : Hard Access Drilling	Client : Toohey Miller
Northing : 6249279.50	Logged By : Mahmoud Jangidaryan	Project : Paddington
RL : 51.55(m)	Reviewed By : Krishna Shakya	Location : 142-148 & 160 Oxford Street, 13 Gipps Street, & 6 Shadeforth Street, 1
Total Depth : 15.18 m	Date : 22/10/2025	Loc Comment :

Drilling Method	Water	Well Diagram	Elevation	Graphic Log	Classification Code	Material Description	Depth (m)	Weathering	Testing	Estimated Strength	RQD% and TCR%	Defect Spacing (mm)	Defect Description type, inclination, planarity, roughness, coating, thickness
			Depth (m)						Is(50)				
					SST	As above, but: slightly to fresh weathered, medium to high strength. (continued)		SW-F			RQD = 100% TCR = 100% RQD = 100% TCR = 100%		
									d:1.72; a:1.86				
							13.0						
									d:0.56; a:0.67				
													12.58, P, 5°, PL, RO, CL, OP
													13.09, P, 10°, PL, VR, CL, OP
													13.35, P, 15°, PL, RO, CL, OP
													13.86, P, 15°, PL, VR, CL, OP
							14.0		d:0.73; a:0.76				14.42, P, 5°, PL, RO, CL, OP
													14.6, P, 5°, PL, RO, CL, OP
			36.8 14.7		SST	As above, but: slightly weathered, high strength, brown purple, fine to medium grained.	14.72	SW			RQD = 100% TCR = 100%		14.72, P, 10°, PL, RO, CL, OP
							15.0		d:1.83; a:2.00				
						BH204 Reached Target Depth at 15.18 m							

morrow

CLIENT NAME: *TOOHEY MILLER PTY LTD*
PROJECT: *Paddington*
LOCATION: *142 Oxford Street*
JOB NUMBER: *P3569*
LOGGED BY: *MJ*

BOREHOLE ID: *BH204*
DEPTH: *1.75 to 6.0 m*
CORE TRAY NO.: *1 of 3*
DATE: *22,10,25*



morrow

Morrow Geotechnics Pty Ltd ABN 42 605 892 126
2/5-7 Malta Street, Fairfield East NSW 2165
79/6 Bellambi Lane, Bellambi NSW 2518
E: info@morrowgeo.com.au
P: 02 8599 7579

Photo description

BH204 - Box 1 of 3

Client

Toohy Miller

Location

142-148 & 160 Oxford Street, 13 Gipps Street, & 6 Shadeforth Street, Paddington NSW, Australia

Project name

Paddington

Project No

P3569

Scale

Not to Scale

BH No

BH204

BH Depth

0.6m to 6.0m

morrow

CLIENT NAME: **TOOHEY MILLER PTY LTD**
PROJECT: **Paddington**
LOCATION: **142 Oxford Street**
JOB NUMBER: **P3569**
LOGGED BY: **MJ**

BOREHOLE ID: **BH204**
DEPTH: **6.0 to 11.0 m**
CORE TRAY NO.: **2 of 3**
DATE: **22,10,25**



morrow

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Photo description

BH204 - Box 2 of 3

Client

Toohy Miller

Location

142-148 & 160 Oxford Street, 13 Gipps Street, & 6 Shadeforth Street, Paddington NSW, Australia

Project name

Paddington

Project No

P3569

Scale

Not to Scale

BH No

BH204

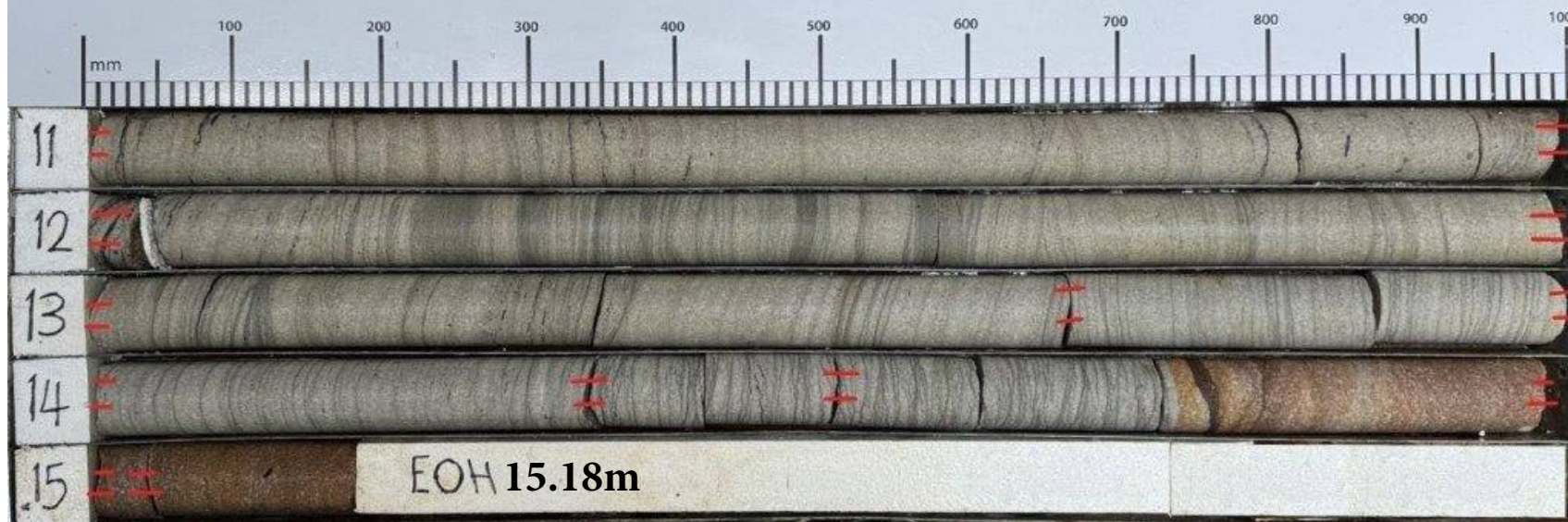
BH Depth

6.0m to 11.0m

morrow

CLIENT NAME: **TOOHEY MILLER PTY LTD**
PROJECT: **Paddington**
LOCATION: **142 Oxford Street**
JOB NUMBER: **P3569**
LOGGED BY: **MJ**

BOREHOLE ID: **BH204**
DEPTH: **11.0 to 15.18m**
CORE TRAY NO.: **3 of 3**
DATE: **22,10,25**



morrow

Morrow Geotechnics Pty Ltd ABN 42 605 892 126
2/5-7 Malta Street, Fairfield East NSW 2165
79/6 Bellambi Lane, Bellambi NSW 2518
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P: 02 8599 7579

Photo description

BH204 - Box 3 of 3

Client

Toohy Miller

Location

142-148 & 160 Oxford Street, 13 Gipps Street, & 6 Shadeforth Street, Paddington NSW, Australia

Project name

Paddington

Project No

P3569

Scale

Not to Scale

BH No

BH204

BH Depth

11.0m to 15.18m

GENERAL

Information obtained from site investigations is recorded on log sheets. The "Cored Drill Hole Log" presents data from an operation where a core barrel has been used to recover material - commonly rock. The "Non-Core Drill Hole - Geological Log" presents data from an operation where coring has not been used and information is based on a combination of regular sampling and insitu testing. The material penetrated in non-core drilling is commonly soil but may include rock. The "Excavation - Geological Log" presents data and drawings from exposures of soil and rock resulting from excavation of pits, trenches, etc.

The heading of the log sheets contains information on Project Identification, Hole or Pit Identification, Location and Elevation. The main section of the logs contains information on methods and conditions, material substance description and structure presented as a series of columns in relation to depth below the ground surface which is plotted on the left side of the log sheet. The common depth scale is 8m per drill log sheet and about 3-5m for excavation logs sheets.

As far as is practicable the data contained on the log sheets is factual. Some interpretation is inevitable in the identification of material boundaries in areas of partial sampling, the location of areas of core loss, description and classification of material, estimation of strength and identification of drilling induced fractures. Material description and classifications are based on SAA Site Investigation Code AS 1726 - 1993 with some modifications as defined below.

These notes contain an explanation of the terms and abbreviations commonly used on the log sheets.

DRILLING

Drilling & Casing

ADV	Auger Drilling with V-Bit
ADT	Auger Drilling with TC Bit
WB	Wash-bore drilling
RR	Rock Roller
NMLC	NMLC core barrel
NQ	NQ core barrel
HMLC	HMLC core barrel
HQ	HQ core barrel

Drilling Fluid/Water

The drilling fluid used is identified and loss of return to the surface estimated as a percentage.

Drilling Penetration/Drill Depth

Core lifts are identified by a line and depth with core loss per run as a percentage. Ease of penetration in non-core drilling is abbreviated as follows:

VE	Very Easy
E	Easy
M	Medium
H	High
VH	Very High

Groundwater Levels

Date of measurement is shown.

Standing water level measured in completed boreholeLevel taken during or immediately after drilling

D	Disturbed
B	Bulk
U	Undisturbed
SPT	Standard Penetration Test
N	Result of SPT (sample taken)
PBT	Plate Bearing Test
PZ	Piezometer Installation
HP	Hand Penetrometer Test

EXCAVATION LOGS

Explanatory notes are provided at the bottom of drill log sheets. Information about the origin, geology and pedology may be entered in the "Structure and other Observations" column. The depth of the base of excavation (for the logged section) at the appropriate depth in the "Material Description" column. Refusal of excavation plant is noted should it occur. A sketch of the exposure may be added.

MATERIAL DESCRIPTION – SOIL

Classification Symbol - In accordance with the Unified Classification System (AS 1726-1993, Appendix A, Table A1)

Material Description - In accordance with AS 1726-1993, Appendix A2.3

Moisture Condition

D	Dry, looks and feels dry
M	Moist, No free water on remoulding
W	Wet, free water on remoulding

Consistency - In accordance with AS 1726-1993, Appendix A2.5

VS	Very Soft	< 12.5 kPa
S	Soft	12.5 – 25 kPa
F	Firm	25 – 50 kPa
St	Stiff	50 – 100 kPa
VSt	Very Stiff	100 – 200 kPa
H	Hard	> 200 kPa

Strength figures quoted are the approximate range of undrained shear strength for each class.

Density Index. (%) is estimated or is based on SPT results.

VL	Very Loose	< 15 %
L	Loose	15 – 35 %
MD	Medium Dense	35 – 65 %
D	Dense	65 – 85 %
VD	Very Dense	> 85 %

MATERIAL DESCRIPTION: ROCK

Material Description

Identification of rock type, composition and texture based on visual features in accordance with AS 1726-1993, Appendix A3.1-A3.3 and Tables A6a, A6b and A7.

Core Loss

Is shown at the bottom of the run unless otherwise indicated.

Bedding

Thinly Laminated	< 6 mm
Laminated	6 - 20
Very Thinly Bedded	20 - 60
Thinly Bedded	60 - 200
Medium Bedded	200 - 600
Thickly Bedded	600 - 2000
Very Thickly Bedded	> 2000

Weathering - No distinction is made between weathering and alteration. Weathering classification assists in identification but does not imply engineering properties.

Fresh (F)	Rock substance unaffected by weathering
Slightly Weathered (SW)	Rock substance partly stained or discoloured. Colour and texture of fresh rock recognisable.
Moderately Weathered (MW)	Staining or discolouration extends throughout rock substance. Fresh rock colour not recognisable.
Highly Weathered (HW)	Stained or discoloured throughout. Signs of chemical or physical alteration. Rock texture retained.
Extremely Weathered (EW)	Rock texture evident but material has soil properties and can be remoulded.

Strength - The following terms are used to describe rock strength:

Rock Strength Class	Abbreviation	Point Load Strength Index, $I_s(50)$ (MPa)
Extremely Low	EL	< 0.03
Very Low	VL	0.03 to 0.1
Low	L	0.1 to 0.3
Medium	M	0.3 to 1
High	H	1 to 3
Very High	VH	3 to 10
Extremely High	EH	≥ 10

Strengths are estimated and where possible supported by Point Load Index Testing of representative samples. Test results are plotted on the graphical estimated strength by using Diametral Point Load Test and Axial Point Load Test.

Where the estimated strength log covers more than one range it indicates the rock strength varies between the limits shown.

MATERIALS STRUCTURE/FRACTURES

ROCK

Natural Fracture Spacing - A plot of average fracture spacing excluding defects known or suspected to be due to drilling, core boxing or testing. Closed or cemented joints, drilling breaks and handling breaks are not included in the Natural Fracture Spacing.

Visual Log - A diagrammatic plot of defects showing type, spacing and orientation in relation to core axis.

Defects		
	-----	Defects open in-situ
		Defects closed in-situ
	_____	Breaks through rock substance

Additional Data - Description of individual defects by type, orientation, in-filling, shape and roughness in accordance with AS 1726-1993, Appendix A Table A10, notes and Figure A2.

Orientation - angle relative to the plane normal to the core axis.

Type		
	BP JT SM FZ SZ VN FL CL DL HB DB	Bedding Parting Joint Seam Fracture Zone Shear Zone Vein Foliation Cleavage Drill Lift Handling Break Drilling Break
Infilling	CN X Clay KT CA Fe QZ MS MU	Clean Carbonaceous Clay Chlorite Calcite Iron Oxide Quartz Secondary Mineral Unidentified Mineral
Shape	PR CU UN ST IR DIS	Planar Curved Undulose Stepped Irregular Discontinuous
Roughness	POL SL S RF VR	Polished Slickensided Smooth Rough Very Rough

SOIL

Structures - Fissuring and other defects are described in accordance with AS 1726-1993, Appendix A2.6, using the terminology for rock defects.

Origin - Where practicable an assessment is provided of the probable origin of the soil, eg fill, topsoil, alluvium, colluvium, residual soil.

APPENDIX B

LABORATORY CERTIFICATES



STATEMENT OF QA/QC PERFORMANCE

SE291488 R0

CLIENT DETAILS

Contact Jordan Andonoshi
Client MORROW GEOTECHNICS PTY LTD
Address 79/6 Bellambi Lane
Bellambi
NSW 2518

Telephone (Not specified)
Facsimile (Not specified)
Email jordan@morrowgeo.com.au

Project **P3569 - Paddington**
Order Number **P3569**
Samples 2

LABORATORY DETAILS

Manager Shane McDermott
Laboratory SGS Alexandria Environmental
Address Unit 16, 33 Maddox St
Alexandria NSW 2015

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

SGS Reference **SE291488 R0**
Date Received 22 Oct 2025
Date Reported 29 Oct 2025

COMMENTS

All the laboratory data for each environmental matrix was compared to SGS' stated Data Quality Objectives (DQO). Comments arising from the comparison were made and are reported below.

The data relating to sampling was taken from the Chain of Custody document.

This QA/QC Statement must be read in conjunction with the referenced Analytical Report.

The Statement and the Analytical Report must not be reproduced except in full.

All Data Quality Objectives were met with the exception of the following:

Extraction Date	Conductivity (1:2) in soil	2 items
	pH in soil (1:2)	2 items
	Soluble Anions in Soil from 1:2 DI Extract by Ion Chromatography	2 items
Analysis Date	Conductivity (1:2) in soil	2 items

SAMPLE SUMMARY

Sample counts by matrix	2 Soil	Type of documentation received	COC
Date documentation received	22/10/2025	Samples received in good order	Yes
Samples received without headspace	N/A	Sample temperature upon receipt	25°C
Sample container provider	SGS	Turnaround time requested	Standard
Samples received in correct containers	Yes	Sufficient sample for analysis	Yes
Sample cooling method	None	Samples clearly labelled	Yes
Complete documentation received	Yes		

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS "Field Sampling Guide for Containers and Holding Time" (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the

Conductivity (1:2) in soil

Method: ME-(AU)-[ENV]AN106

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
Sample 1 - 1m-1.5m	SE291488.001	LB366526	14 Oct 2025	22 Oct 2025	21 Oct 2025	28 Oct 2025†	21 Oct 2025	28 Oct 2025†
Sample 2 - 2.5m	SE291488.002	LB366526	14 Oct 2025	22 Oct 2025	21 Oct 2025	28 Oct 2025†	21 Oct 2025	28 Oct 2025†

Moisture Content

Method: ME-(AU)-[ENV]AN002

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
Sample 1 - 1m-1.5m	SE291488.001	LB366508	14 Oct 2025	22 Oct 2025	28 Oct 2025	28 Oct 2025	02 Nov 2025	28 Oct 2025
Sample 2 - 2.5m	SE291488.002	LB366508	14 Oct 2025	22 Oct 2025	28 Oct 2025	28 Oct 2025	02 Nov 2025	28 Oct 2025

pH in soil (1:2)

Method: ME-(AU)-[ENV]AN101

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
Sample 1 - 1m-1.5m	SE291488.001	LB366526	14 Oct 2025	22 Oct 2025	21 Oct 2025	28 Oct 2025†	29 Oct 2025	28 Oct 2025
Sample 2 - 2.5m	SE291488.002	LB366526	14 Oct 2025	22 Oct 2025	21 Oct 2025	28 Oct 2025†	29 Oct 2025	28 Oct 2025

Soluble Anions in Soil from 1:2 DI Extract by Ion Chromatography

Method: ME-(AU)-[ENV]AN245

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
Sample 1 - 1m-1.5m	SE291488.001	LB366640	14 Oct 2025	22 Oct 2025	21 Oct 2025	28 Oct 2025†	25 Nov 2025	29 Oct 2025
Sample 2 - 2.5m	SE291488.002	LB366640	14 Oct 2025	22 Oct 2025	21 Oct 2025	28 Oct 2025†	25 Nov 2025	29 Oct 2025

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA/QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

No surrogates were required for this job.

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Conductivity (1:2) in soil**Method: ME-(AU)-ENVJAN106**

Sample Number	Parameter	Units	LOR	Result
LB366526.001	Conductivity (1:2) @25 C*	µS/cm	1	<1

Soluble Anions in Soil from 1:2 DI Extract by Ion Chromatography**Method: ME-(AU)-ENVJAN245**

Sample Number	Parameter	Units	LOR	Result
LB366640.001	Chloride	mg/kg	0.25	<0.25
	Sulfate	mg/kg	0.5	<0.5

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: $RPD = | \text{OriginalResult} - \text{ReplicateResult} | \times 100 / \text{Mean}$

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: $MAD = 100 \times \text{SDL} / \text{Mean} + \text{LR}$

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

NOTE: The RPD reported is calculated from the unrounded data for the original and replicate result. Manual calculation of the RPD from the rounded data reported may

Conductivity (1:2) in soil

Method: ME-(AU)-[ENV]AN106

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE291488.002	LB366526.006	Conductivity (1:2) @25 C*	µS/cm	1	120	120	32	0
		Resistivity (1:2)*	ohm cm	-	8500	8500	30	0

Moisture Content

Method: ME-(AU)-[ENV]AN002

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE291488.002	LB366508.003	% Moisture	%w/w	1	19.0	19.6	35	3

pH in soil (1:2)

Method: ME-(AU)-[ENV]AN101

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE291488.002	LB366526.006	pH (1:2)	pH Units	-	8.4	8.6	31	2

Soluble Anions in Soil from 1:2 DI Extract by Ion Chromatography

Method: ME-(AU)-[ENV]AN245

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE291488.002	LB366640.006	Chloride	mg/kg	0.25	11	14	32	27
		Sulfate	mg/kg	0.5	9.3	8.1	53	14

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Conductivity (1:2) in soil

Method: ME-(AU)-[ENV]AN106

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB366526.002	Conductivity (1:2) @25 C*	µS/cm	1	1000	1015	85 - 115	100

pH in soil (1:2)

Method: ME-(AU)-[ENV]AN101

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB366526.003	pH (1:2)	pH Units	-	7.4	7.415	98 - 102	100

Soluble Anions in Soil from 1:2 DI Extract by Ion Chromatography

Method: ME-(AU)-[ENV]AN245

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB366640.002	Chloride	mg/kg	0.25	40	40	70 - 130	99
	Sulfate	mg/kg	0.5	42	40	70 - 130	105

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub-sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

No matrix spikes were required for this job.

Matrix spike duplicates are calculated as Relative Percent Difference (RPD) using the formula: $RPD = | \text{OriginalResult} - \text{ReplicateResult} | \times 100 / \text{Mean}$

The original result is the analyte concentration of the matrix spike. The Duplicate result is the analyte concentration of the matrix spike duplicate.

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: $MAD = 100 \times \text{SDL} / \text{Mean} + \text{LR}$

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifier when outside suggested criteria. Refer to the footnotes section at the

No matrix spike duplicates were required for this job.

Samples analysed as received.

Solid samples expressed on a dry weight basis.

QC criteria are subject to internal review according to the SGS QA/QC plan and may be provided on request or alternatively can be found here : <https://www.sgs.com/en-au/industry/environmental-health-and-safety>

- * NATA accreditation does not cover the performance of this service .
- ** Indicative data, theoretical holding time exceeded.
- *** Indicates that both * and ** apply.
- Sample not analysed for this analyte.
- IS Insufficient sample for analysis.
- LNR Sample listed, but not received.
- LOR Limit of reporting.
- QFH QC result is above the upper tolerance.
- QFL QC result is below the lower tolerance.
- NA Not Applicable
- ① At least 2 of 3 surrogates are within acceptance criteria.
- ② RPD failed acceptance criteria due to sample heterogeneity.
- ③ Results less than 5 times LOR preclude acceptance criteria for RPD.
- ④ Recovery failed acceptance criteria due to matrix interference.
- ⑤ Recovery failed acceptance criteria due to the presence of significant concentration of analyte (i.e. the concentration of analyte exceeds the spike level).
- ⑥ LOR was raised due to sample matrix interference.
- ⑦ LOR was raised due to dilution of significantly high concentration of analyte in sample.
- ⑧ Reanalysis of sample in duplicate confirmed sample heterogeneity and inconsistency of results.
- ⑨ Recovery failed acceptance criteria due to sample heterogeneity.
- ⑩ LOR was raised due to high conductivity of the sample (required dilution).
- † Refer to relevant report comments for further information.

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APPENDIX C

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