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Construction Soil and Water Management Plan

UNSW Health Translation Hub

Prepared for: Hansen Yuncken

Document no: B-ACO-CEC-RPT-0001

Revision no: Revision 03





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Revisions

Revision	Description	Date	Prepared by	Approved by
00	Draft Issue	08.02.2023	SC	SN
01	90% CWC 1 Draft	03.03.2023	SC	SN
02	90% CWC 1	27.03.2023	SC	SN
03	IFC1	21.06.2023	SC	SN

Review Panel

Division/ office	Name		
Civil	Stephen Naughton		

Unless otherwise advised, the parties who have undertaken the Review and Endorsement confirm that the information contained in this document adequately describes the conditions of the site located at UNSW HTH, 49 Botany Street, Randwick NSW 2052

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1 Introduction

ACOR has been engaged by Hansen Yuncken to prepare a Construction Soil and Water Management Plan (CSWMP) for the UNSW Health Translation Hub (HTH) at 49 Botany Street, Randwick NSW 2052.

This CSWMP forms part of the Construction Environmental Management Plan (CEMP) to satisfy the SSDA Conditions of Consent, outlined in Section 1.2.

1.1 Client

Hansen Yuncken

1.2 Purpose and Scope of Report

This CSWMP addresses stormwater & sediment/ erosion control related items (bolded below) in Condition B15 and all of Condition B20 under 'Part B Prior to Commencement of Construction' in the State Significant Development Application (SSDA) Conditions of Consent, which states the following:

Condition B15

Prior to the commencement of construction, the Applicant must submit a Construction Environmental Management Plan (CEMP) to the Certifier and provide a copy to the Planning Secretary. The CEMP must include, but not be limited to, the following:

(a) Details of:

(i) hours of work; NSW Government 13 UNSW Health Translation Hub

Department of Planning, Industry and Environment (SSD 10822510)

(ii) 24-hour contact details of site manager;

(iii) management of dust and odour to protect the amenity of the neighbourhood;

(iv) stormwater control and discharge;

(v) measures to ensure that sediment and other materials are not tracked onto the roadway by vehicles leaving the site;

(vi) groundwater management plan including measures to prevent groundwater contamination;

(vii) external lighting in compliance with AS 4282-2019 Control of the obtrusive effects of outdoor lighting; and

(viii) community consultation and complaints handling;

(b) an unexpected finds protocol for contamination, asbestos or other unexpected finds and associated communications procedure;

(c) an unexpected finds protocol for Aboriginal and non-Aboriginal heritage and associated communications procedure; and

(d) waste classification (for materials to be removed) and validation (for materials to remain) be undertaken to confirm the contamination status in these areas of the site.

Reference to Douglas Partners Geotechnical Report, Reference No. 99852.00 and Hansen Yuncken Emergency Response Plan (ERP), Reference No. PLN-CORP-HSE-0003, has been made to address Item (vi) of Condition B15 above.



Condition B20

The Applicant must prepare a Construction Soil and Water Management Plan (CSWMP) and the plan must address, but not be limited to the following:

- (a) be prepared by a suitably qualified expert, in consultation with Council;
- (b) describe all erosion and sediment controls to be implemented during construction;

(c) provide a plan of how all construction works will be managed in a wet-weather events (i.e. storage of equipment, stabilisation of the Site);

(d) detail all off-Site flows from the Site; and

(e) describe the measures that must be implemented to manage stormwater and flood flows for small and large sized events, including, but not limited to 1 in 1-year ARI, 1 in 5-year ARI and 1 in 100-year ARI).

1.3 Project Description

Expansion of existing hospital facilities at Randwick Hospitals Campus (RHC) with the partnership between NSW Government and UNSW Sydney to provide additional health education, training and research with acute healthcare services. The UNSW HTH is proposed to include:

- A 15-storey building accommodating research and health education use (incl. one basement level),
- Pedestrian link bridge between UNSW Kensington Campus to RHC via Wallace Wurth Building,
- Education, training and research rooms,
- Clinical schools,
- Ambulatory care clinics,
- Support facilities including retail premises,
- More than 2,500 square metres of landscaping and public domain works for publicly accessible open space for staff, students, patients and the community.

1.4 Approving Authority

NSW Department of Planning, Industry and Environment (NSW DPIE)

1.5 Preparation of this Plan

This plan was prepared by Shana Cai and reviewed by Stephen Naughton. Details of their qualifications are provided below:

Shana Cai BE(Civil)BSc, MIEAust

Stephen Naughton

CPEng NER RPEQ MIEAust NSW Design Practitioner NSW Registered Engineer



1.6 Available Data

The following available information was utilised in the preparation of this report.

- Randwick City Council (RCC) DCP, 2013
- Randwick City Council (RCC) Private Stormwater Code, 2013
- Landcom Managing Urban Stormwater Soils and Construction 2004 ('Blue Book')
- Australian Rainfall and Runoff (AR&R), 2019
- NSW Government spatial information exchange (SIX) topographic maps
- Geotechnical Report by Douglas Partners dated February 2021 (Reference Project 99852.00)



2 Site

2.1 Location

The Site is located on the corner of High Street and Botany Street, Randwick, within the Randwick City Council (RCC) Local Government Area (LGA).



Figure 1 – Site Location (Source: Sixmaps)

2.2 Property Description

Lot A1, DP1282403



2.3 Topography

The Site generally falls from North-West to South-East and lies within the Birds Gully and Bunnerong Road Catchment area.



Figure 2 – Randwick City Council Flood Study Areas (Source: RCC, 2019)



2.4 Existing Land Use and Vegetation

The existing land use is R2 Low Density Residential and R3 Medium Density Residential with minimal vegetation, see Figure 3 below.



Figure 3 - Land Use Map (Source: NSW ePlanning Spatial Viewer)



3 Construction Soil and Water Management

Landcom Managing Urban Stormwater – Soils and Construction ('Blue Book') contains erosion, sediment and waste control measures are required to mitigate the impacts of land disturbance activities on soils, landforms and receiving water, including:

- Reduce pollution to downstream areas and receiving waters;
- Reduce land degradation;
- Raise an awareness of ecologically sustainable development (ESD) principles and their application to the development.

Chapter 2 of the Blue Book states that a Soil and Water Management Plan (SWMP) should be prepared for all development works where more than 2,500sqm of land is disturbed.

Section 9.3 of the Blue Book states that all SWMPs should include relevant calculations of capacities for any sediment basins and other structures. These calculations should be:

- Based on an assessment of site-specific area
- Account for the pollution potential of the site
- Consider the sensitivity of receiving waters and other ESD matters

3.1 Flood Impact Assessment

The Site is located within the flood zone where RCC DCP requirements for the Site development's habitable spaces (Critical Use Infrastructure) is to be above the Probable Maximum Flood (PMF) with an additional 500mm freeboard.

The PMF level on High Street is RL55.738¹, as such, the habitable spaces of HTH are to be at minimum RL56.238².

As part of the SCH Stage 1 & CCCC construction works (staged prior to the HTH Site's proposed works), a temporary flood wall has been constructed along the Northern boundary to prevent external catchment flows from the North (High Street) and protects the Site from flooding and overland flow for events up to and including the PMF.

The temporary flood wall along the Northern edge of the Site (with top of wall higher than RL56.238) provides flood protection up to and including the PMF event. As such, the entire site is flood free during the PMF event as shown in the modelling results in Figure 4, for the developed option (adjacent site, protected by Northern flood wall).

¹ Provided by adjacent Sydney Children's hospital (SCH) Stage 1 and Comprehensive Children's Cancer Centre (CCCC) project team – based on flood model developed for Integrated Acute Services Building (IASB) ² RL55.738 + 500mm freeboard = RL56.238





Figure 4 – Peak Water Level Impacts during PMF Event – Developed Option (Source: BMT, 2018)



3.2 Soil and Water Management

A Soil and Water Management Plan (SWMP) has been prepared in accordance with the Blue Book and included in Appendix 6A.1. The plan details the following control measures during construction to minimise the risk of sediment laden water leaving the site.

- Sediment diverting measures to minimise sediment in Council's stormwater drainage networks (i.e., sandbags and/or geo-textile filter fabric protecting existing and proposed drainage pits);
- Overland flow;
- Indicative temporary stockpile locations;
- Sediment control fencing location & extents;
- Covering and revegetating disturbed areas (as soon as practicable & as required to prevent sediment laden runoff from leaving the site); and
- Provision of temporary sediment basins (provided by excavated basement & underground On-Site Detention [OSD) tank, during construction)

3.3 Site Constraints and Characteristics

Site constraints were calculated using the Revised Universal Soil Loss Equation (RUSLE) to size sediment basins, see Appendix 6B.1.

Constraint/ Opportunity	Value
Rainfall erosivity (R-factor)	3,110
Soil erodibility (K-factor)	0.013 (from Appendix C – North Head Soil Landscape, USCS Class: SC)
Slope gradients	< 10% (average 4%)
Potential erosion hazard	Low (from Figure 4.6 in Blue Book)
Rainfall Zone	1
Calculated soil loss	41 t/ha/yr = 32 m ³ /ha/yr
Soil Loss Class	1
Soil texture group	Туре С
Precent dispersible (subsoil)	Assumed > 10%
Runoff coefficient	0.76
Disturbed site area	9,000m ²

Based on the calculated R-factor of 3,110, slope gradients less than 10% falls below the A-line in Figure 4.6 of the Blue Book is classified as low erosion hazard.



It is noted that the 75th percentile has been adopted for the design rainfall depth as earthworks are anticipated to take place over a period of less than 6 months. Protection for battered areas is to be implemented by the contractor if portions of the site are intended to be unvegetated for an extended amount of time (i.e., > 6 months).

3.3.1 Calculations

Catchment Name	Area (Ha)	Soil Loss (m³/ha/yr)	Soil Loss Class	Average Yearly Soil Loss ³ (m ³ /yr)
Site area	0.9	32	1	28.8
			Total	28.8

According to the Blue Book, a sediment basin isn't required for average yearly soil losses of less than 150 cubic metres per year. However, despite there being no requirement for the provision of a sediment basin for the site, the excavated lower basement and underground OSD will be utilised as temporary sediment basins during construction works for soil and water management.

3.4 Off-Site Flow Management

Potential off-site flows from the site will be contained by temporary sediment basins (excavated basement). The flood wall along the Northern property boundary (located approximately 2.2m from boundary line) prevents external flows from entering site for flood events up to and including the PMF event.

It is anticipated for flows (based on a time of concentration of circa 15 minutes) up to the 1 in 1-year ARI (peak flow circa 64 L/s), 1 in 5-year ARI (peak flow circa 195 L/s) and 1 in 100-year ARI (peak flow circa 414 L/s) critical storm events be contained within the temporary sediment basin (contaminated water), where construction site grading will direct disturbed area flows (i.e., site area minus sediment basin area) to the temporary sediment basins.

It is noted the above estimated peak flows for the respective storm events are for stage 1 works only (disturbed area includes the basement excavation area and external). Disturbed area will be significantly reduced and limited to external areas after the basement has been constructed and the podium will be constructed subsequently above, in stage 2 works.

The provision of a temporary sediment basin (approximately 11,050m³ of fully excavated lower basement volume and 300m³ of excavated underground OSD) despite RUSLE calculations demonstrating that the development does not warrant the introduction, will ensure construction soil and water will be adequately managed on site.

Clean runoff from completed/ stabilised areas is to be directed downstream of sediment measures.

3.5 General

During the construction phase of the development, a Soil and Water Management Plan will be implemented to minimise water quality impacts. A detailed Soil and Water Management Plan will be prepared at the detailed

³ Soil catchment area (ha) x soil loss (m³/ha/yr) = 0.9 x 32 = 28.8



design stage and will be employed throughout the site. The control measures shall include silt fences, cut-off drains for polluted stormwater and diversion channels for clean stormwater run-off, gully pit sediment barriers, field inlet sediment traps and temporary bioretention filter protection.

Details of the required construction phase control measures will be provided on the detailed engineering drawings and shall be in accordance with the required standards. However, the contractor shall be responsible for the provision of the construction phase water quality objectives which shall be enforced by the preparation and implementation of a Soil and Water Management Plan.

The following information is provided to identify controls and procedures, and who is responsible for them, and should be incorporated into the Soil and Water Management Plan.

3.5.1 Pre-Construction

- Establish two (2) stabilised entry/exit points for each stage of construction. These points should also include a vehicle shakedown device to mitigate the transportation of dust and dirt.
- Sediment fences are to be placed along the low side of the site to slow flows, reduce scour and capture some sediment runoff.
- Sediment fences are to be constructed at the base of fill embankments.
- Divert up-slope water around the work site and appropriately stabilise any drainage channels.
- Areas for plant and construction material storage are to be designated along with associated diversion drains and spillage holding ponds.
- Diversion banks are to be created at the upstream boundary of construction activities to ensure upstream runoff is diverted around any areas to be exposed. Catch drains are to be created at the downstream boundary of construction activities.
- Construction of temporary sediment basins where required.
- Site personnel are to be educated to the sediment and erosion control measures implemented on site.

3.5.2 During Construction

- Progressive stabilization of filled areas and fill batters.
- Construction activities are to be confined to the necessary construction areas.
- The provision of a construction entry/exit to prevent the tracking of debris from tyres of vehicles onto public roads and to limit the movement of construction equipment.
- The topsoil stockpile location will be nominated to coincide with areas previously disturbed. A sediment fence is to be constructed around the bottom of the stockpile to trap sediment. A diversion drain is to be installed upstream of the stockpile if required.
- Roof downpipes should be installed as soon as practicable after the roof is constructed.
- Transport loads that are subject to loss through wind or spillage shall be covered or sealed to prevent entry of pollutants to the stormwater system.
- Regular inspection and maintenance of slit fences, sediment basins and other erosion control measures. Following rainfall events greater than 50mm inspection of erosion control measures and removal of collected material should be undertaken. Replacement of any damaged equipment should be performed immediately.



3.5.3 Post Construction

- The Contractor/ Developer will be responsible for the maintenance of erosion and sediment control devices from the possession of the site until stabilisation has occurred to the satisfaction of the superintendent and Principal.
- The Erosion and Sediment Control Management Plans should be provided to all people involved with the site, including sub-contractors, private certifiers, body corporates and regulators.



4 Groundwater Management

Based on the Geotechnical Report by Douglas Partners dated February 2021 (Reference Project 99852.00.R.001.Rev2) and additional borehole logs undertaken in March 2023 (locations shown in Figure 5), groundwater levels on the site have been identified.

Detected groundwater levels in the borehole logs on the HTH site are summarised below (and identified by a blue circle in Figure 5 below):

- BH105 (dated February 2019) detected groundwater at RL47.70 located in Southern HTH basement,
- BH1002 (dated March 2023) detected groundwater at RL49.50 located in Northern HTH basement,
- BH1003 (dated March 2023) detected groundwater at RL49.00 located in Northern HTH basement,
- BH1008 (dated March 2023) detected groundwater at RL49.20 located in Northern HTH basement,
- BH1009 (dated March 2023) detected groundwater at RL49.30 located in Northern HTH basement.

All other borehole logs (BH7, BH103-104, BH607-608, BH16-17, BH1001, BH1004-1007) at the HTH site recorded did not detect groundwater.

Previous borehole logs contained within the appendices of the Geotechnical report dated February 2021 detected groundwater levels. However, these boreholes are not relevant to the project as they lie outside of the HTH site and therefore not assessed for groundwater management.

Refer to Groundwater Management Plan prepared by Douglas Partners (reference 99852.02.R.003.Rev0 dated March 2023) for more information on management of Groundwater.





Figure 5 – Locations of boreholes (Source: Douglas Partners, 2023)

The Southern (lower) basement for HTH is proposed at RL50.21 (BEL⁴47.71) and the Northern (upper) basement at RL51.94 (BEL51.59), which lie above the highest detected level of groundwater (RL49.50 at BH1002). As such, it is not anticipated there will be contamination to groundwater due to groundwater interception.

⁴ BEL = Bulk Earthworks Level



4.1 Groundwater Management Methodology

Potential spillage on site (i.e., fuel spills, chemical spills) are to be identified in the construction site's risk register & management plan to mitigate groundwater contamination via seepage in sandy soils. Section 3.5 Major Fuel Spill and Section 3.6 Chemical Spill of Hansen Yuncken's Emergency Response Plan (ERP) details the methodology to respond to spills that may occur on site.

4.1.1 Spill Prevention

All construction personnel are to undertake essential induction and training before accessing the construction site. Prior to handling chemicals and major fuels, additional training and induction is to be undertaken to ensure safe handling of chemicals and fuels to prevent potential spillage.

In the unlikely event of spillage, assessment and response is to be actioned as per Hansen Yuncken's ERP procedures – refer to Section 4.1.1 and 4.1.1.1 for major fuel and chemical spillage management/ response procedures extracted from Hansen Yuncken's ERP.



4.1.1.1 Major Fuel Spill



Figure 6 - Major Fuel Spill Response Part 1 Flow Chart (Source: Hansen Yuncken, 2022)





Figure 7 – Major Fuel Response Part 2 Flow Chart (Source: Hansen Yuncken, 2022)



4.1.1.2 Chemical Spills



Figure 8 – Chemical Spills Response Flow Chart (Source: Hansen Yuncken, 2022)



5 Conclusion

This CSWMP addresses Condition 20 by describing all erosion and sediment controls to be implemented during construction, and details of how construction works will be managed in wet-weather events through measures of equipment storage, site stabilisation, etc.).

Item (iv) of Condition B15 has been addressed in this SWMSP where all flows are anticipated to be contained within the site. The flood wall along the North for flood protection up to the PMF event in conjunction with sediment fencing will ensure flows from upstream areas are diverted around the construction site. Construction site grading will direct disturbed area flows to sediment control measures (temporary sediment basins at the excavated basement and underground OSD) illustrated on the SWMP attached in Appendix 6A.1.

The provision of temporary sediment basins despite RUSLE calculations demonstrating that the development does not warrant the introduction, will ensure construction soil and water will be adequately managed on site for small and large sized events including, but not limited to 1 in 1-year ARI, 1 in 5-year ARI and 1 in 100-year ARI.

Item (v) of Condition B15 has also been addressed in the SWMP (refer drawing no B-ACO-CEC-0600) via the provision of stabilised vehicular entry/ exit locations with vehicle shakedown systems (i.e., vehicle shake down devices at localised construction vehicle access/ egress points).

Item (vi) of Condition B15 has been addressed in Section 4 with reference to the Geotechnical Report borehole logs prepared by Douglas Partners dated February 2021. Water detected in the Southern borehole log (BH105) to be below the lower basement level of RL50.21 (Bulk Earthworks Level BEL47.71) on the HTH site and therefore it is not anticipated that excavation works will result in groundwater contamination.

Essential construction personnel training and induction to mitigate potential spillage and assessment/ response methodology per Hansen Yuncken's ERP is to be implemented, as sandy soils allow seepage and may lead to groundwater contamination.

Yours faithfully,

X least

Stephen Naughton CPEng NER RPEQ

For,

ACOR Consultants Pty Ltd



6 References

- UNSW Health Translation Hub Development Application Report (Warren Smith & Partners, 2021)
- Randwick Campus Redevelopment (RCR) ASB Project Flood Summary Flood Report (BMT, 2018)
- RCR Prince of Wales, Randwick Flood and Stormwater Modelling Response letter (BMT, 2019) Reference mpg: L.B23176.011.Council Query.docx



Appendix A Drawings

A.1 Soil and Water Management Plan & Details (Drawing No. B-ACO-CEC-0600 & B-ACO-CEC-0601)





<u>STAGING:</u> STAGE 1 - EXCAVATION AND SITE SHEDS TO EXTERNAL EXTERNAL AREAS

EX SURFACE LEVEL EX SURFACE CONTOUR

EXISTING BERM (INDICATIVE EXTENTS, TBC ON SITE)

TEMPORARY SHAKER RAMP ON ENTRY/EXIT

BASEMENT EXCAVATION AREA

PODIUM LEVEL EXTENTS (ABOVE)

SITE SHED AREA SHOWN INDICATIVELY

TEMPORARY STOCKPILE AREA SHOWN INDICATIVELY

OVERLAND FLOW

GEOTEXTILE PIT FILTER 2

SANDBAG INLET SEDIMENT TRAP (AT APPROX. 15-20 METRE SPACING)

STRAW BALE MINI SEDIMENT BASIN (STAGE 2)

1. REFER TO SPECIFICATIONS NOTES FOR SEDIMENT AND SOIL EROSION

2. ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH COUNCIL / RELEVANT AUTHORITY SPECIFICATIONS AND DETAILS. 3. ALL SEDIMENT AND SOIL EROSION CONTROL MEASURES TO BE INSTALLED IN ACCORDANCE WITH THE 'BLUE BOOK'. CONTRACTOR TO ENSURE THESE

MEASURES ARE IN PLACE AND MAINTAINED AT ALL TIMES DURING 4. CONTRACTOR TO PROVIDE 'WIRE MESH AND GRAVEL SEDIMENT FILTER' TO ALL PAVED / ROAD AREAS (BOTH PROPOSED AND EXISTING) IN ACCORDANCE

5. REFER TO CONSTRUCTION DRAWINGS FOR FURTHER INFORMATION ON SITE

6. IT IS EXPECTED TO HAVE SITE FENCE/HOARDING ON SITE BOUNDARIES. PORTABLE PUMP & LAY FLAT HOSE REQUIRED TO PUMP OUT WATER FROM EXCAVATED BASEMENT TEMPORARY SEDIMENT BASIN TO OSD TANK TO ALLOW FURTHER SETTLING OF SEDIMENTS. REFER TO APPENDIX E3.3 OF THE "BLUE BOOK" FOR ROUGH FIELD TEST METHODOLOGY TO MONITOR WATER QUALITY, PRIOR TO CONTROLLED DISCHARGE OF "CLEAN" WATER OFFSITE.

STAGE 2 - PODIUM OVER BASEMENT BUILT, DISTURBED AREA LIMITED TO

Do not scale drawings. Verify all dimensions on site

issue	amendment	date
0	ISSUED FOR INFORMATION	28.11.2022
1	ISSUED FOR TENDER	01.12.2022
2	ISSUED FOR SUBMISSION	15.12.2022
3	ISSUED FOR SUBMISSION	21.12.2022
4	ISSUED FOR SUBMISSION	22.12.2022
5	90% CWC 1 DRAFT	03.03.2023
6	90% CWC 1 DRAFT	09.03.2023
7	90% CWC 1 DRAFT	22.03.2023
8	90% CWC 1 DRAFT	27.03.2023
9	ISSUED FOR 100% CWC1	03.04.2023
10	ISSUED FOR 100% CWC1	05.04.2023
А	ISSUED FOR AFC1	06.04.2023
В	ISSUED FOR IFC1	14.04.2023
С	ISSUED FOR IFC1	17.04.2023





UNSW HEALTH TRANSITION HUB

Drawing SOIL A PLAN	AND WATEF	RMANAGEMENT
Scale	1:250@B1	drawing no.
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Checked	S. Cai	issue
Project no	NSW212828	С

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0	ISSUED FOR INFORMATION	28.11.2022
1	ISSUED FOR SUBMISSION	01.12.2022
2	90% CWC 1 DRAFT	15.12.2022
3	90% CWC 1 DRAFT	21.12.2022
4	90% CWC 1 DRAFT	03.03.2023
5	90% CWC 1 DRAFT	09.03.2023
6	90% CWC 1 DRAFT	22.03.2023
7	90% CWC 1 DRAFT	27.03.2023
8	ISSUED FOR 100% CWC1	03.04.2023
9	ISSUED FOR 100% CWC1	05.04.2023
Α	ISSUED FOR AFC1	06.04.2023
В	ISSUED FOR IFC1	14.04.2023





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Project no	NSW212828	В

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Appendix B Calculations

B.1 RUSLE Calculations

Note: These "Detailed Calculation" spreadsheets relate only to high erosion hazard lands as identified in figure 4.6 or where the designer chooses to use the RUSLE to size sediment basins. The "Standard Calculation" spreadsheets should be used on low erosion hazard lands as identified by figure 4.6 and where the designer chooses not to run the RUSLE in calculations.

1. Site Data Sheet

Site Name: UNSW Health Translation Hub (HTH)

Site Location: 49 Botany Street, Randwick NSW 2031

Precinct:

Description of Site:

Sito area	Site					Bomarks	
Site alea	1	2	3	4	5	6	Remarks
Total catchment area (ha)	0.9						
Disturbed catchment area (ha)	0.9						

Soil analysis

% sand (faction 0.02 to 2.00 mm	90			Soil texture should be assessed through
% silt (fraction 0.002 to 0.02 mm)	5			mechanical dispersion only. Dispersing
% clay (fraction finer than 0.002 mm)	5			agents (e.g. Calgon) should not be used
Dispersion percentage	10.0			E.g. enter 10 for dispersion of 10%
% of whole soil dispersible	0.75			See Section 6.3.3(e)
Soil Texture Group	С			See Section 6.3.3(c), (d) and (e)

Rainfall data

Design rainfall depth (days)	5			See Sections 6.3.4 (d) and (e)
Design rainfall depth (percentile)	75			See Sections 6.3.4 (f) and (g)
x-day, y-percentile rainfall event	25			See Section 6.3.4 (h)
Rainfall intensity: 2-year, 6-hour storm	12			See IFD chart for the site

RUSLE Factors

Rainfall erosivity (R -factor)	3110						Automatic calculation from above data
Soil erodibility (K-factor)	0.013						
Slope length (m)	60						
Slope gradient (%)	4						RUSLE data can be obtained from
Length/gradient (LS -factor)	0.78						Appendixes A, B and C
Erosion control practice (P-factor)	1.3						
Ground cover (C -factor)	1	1	1	1	1	1	

Calculations

Soil loss (t/ha/yr)	41			
Soil Loss Class	1			See Section 4.4.2(b)
Soil loss (m³/ha/yr)	32			
Sediment basin storage volume, m ³	5			See Sections 6.3.4(i) and 6.3.5 (e)

2. Storm Flow Calculations

Peak flow is given by the Rational Formula:

 Q_v

$$Qy = 0.00278 \times C_{10} \times F_{Y} \times I_{y, tc} \times A$$

where:

is peak flow rate (m³/sec) of average recurrence interval (ARI) of "Y" years

- C₁₀ is the runoff coefficient (dimensionless) for ARI of 10 years. Rural runoff coefficients are given in Volume 2, figure 5 of Pilgrim (1998), while urban runoff coefficients are given in Volume 1, Book VIII, figure 1.13 of Pilgrim (1998) and construction runoff coefficients are given in Appendix F
- Fy is a frequency factor for "Y" years. Rural values are given in Volume 1, Book IV, Table 1.1 of Pilgrim (1998) while urban coefficients are given in Volume 1, Book VIII, Table 1.6 of Pilgrim (1998)
- A is the catchment area in hectares (ha)
- I_{y, tc} is the average rainfall intensity (mm/hr) for an ARI of "Y" years and a design duration of "tc" (minutes or hours)

Time of concentration (t_c) = 0.76 x (A/100)^{0.38} hrs (Volume 1, Book IV of Pilgrim, 1998)

Note: For urban catchments the time of concentration should be determined by more precise calculations or reduced by a factor of 50 per cent.

Peak flow calculations, 1

Site	Α	tc	Rainfall intensity, I, mm/hr									
Sile	(ha)	(mins)	1 _{yr,tc}	5 _{yr,tc}	10 _{yr,tc}	20 _{yr,tc}	50 _{yr,tc}	100 _{yr,tc}	U ₁₀			
1	0.9	8	87	132	152	174	202	224	0.76			
2												
3												
4												
5												
6												

Peak flow calculations, 2

	Frequency			Peak	flows			
ARI (vrs)	factor	1	2	3	4	5	6	Comment
(9:0)	(F _y)	(m ³ /s)	(m³/s)	(m ³ /s)	(m³/s)	(m ³ /s)	(m3/s)	
1 yr,tc	0.8	0.132						
5 yr,tc	0.95	0.238						
10 yr,tc	1	0.289						
20 yr,tc	1.05	0.347						
50 yr,tc	1.15	0.442						
100 yr,tc	1.2	0.511						

3. Volume of Sediment Basins: Type C Soils

Basin volume = settling zone volume + sediment storage volume

Settling Zone Volume

The settling zone volume for Type C soils is calculated to provide capacity to allow the design particle (e.g. 0.02 mm in diameter) to settle in the peak flow expected from the design storm (e.g. 0.25-year ARI). The volume of the basin's settling zone (V) can be determined as a function of the basin's surface area and depth to allow for particles to settle. Peak flow/discharge for the 0.25-year, ARI storm is given by the Rational Formula:

Q tc.0.25 = 0.5 x [0.00278 x C10 x Fy x I 1yr, tc x A] (m3/sec)

where:

 $Q_{tc.0.25}$ = flow rate (m³/sec) for the 0.25 ARI storm event

 C_{10} = runoff coefficient (dimensionless for ARI of 10 years)

 F_y = frequency factor for 1 year ARI storm

I 1 yr,tc = average rainfall intensity (mm/hr) for the 1-year ARI storm

A = area of catchment in hectares (ha)

Basin surface area (A) = area factor x Q tc, 0.25 m2

Particle settling velocities under ideal conditions (Section 6.3.5(e))

Particle Size	Area Factor
0.100	170
0.050	635
0.020	4100

Volume of settling zone = basin surface area x depth (Section 6.3.5(e)(ii))

Sediment Storage Zone Volume

In the detailed calculation on Soil Loss Classes 1 to 4 lands, the sediment storage zone can be taken as 100 percent of the settling zone capacity. Alternately designers can design the zone to store the 2-month soil loss as calculated by the RUSLE (Section 6.3.5(e)(iv)). However, on Soil Loss Classes 5, 6 and 7 lands, the zone must contain the 2-month soil loss as calculated by the RUSLE (Section 6.3.5(e)(v)).

Place an "X" in the box below to show the sediment storage zone design parameters used here:

100% of settling zone capacity, 2 months soil loss calculated by RUSLE

Total Basin Volume

	0	Area	Area	Basin	Depth of	Settling	Sediment	Total basin	E	Basin shape		
Site	(m ³ /s)	factor	area (m²)	zone (m)	volume (m ³)	volume (m ³)	volume (m ³)	L:W Ratio	Width (m)			
1	0.066	4100	271	0.6	163	5	168					
2		4100										
3		4100										
4		4100										
5		4100										
6		4100										

4. Volume of Sediment Basins, Type D and Type F Soils

Basin volume = settling zone volume + sediment storage zone volume

Settling Zone Volume

The settling zone volume for *Type F* and *Type D* soils is calculated to provide capacity to contain all runoff expected from up to the y-percentile rainfall event. The volume of the basin's settling zone (V) can be determined as a function of the basin's surface area and depth to allow for particles to settle and can be determined by the following equation:

 $V = 10 \times C_v \times A \times R_{x-dav, v-\% ile} (m^3)$

where:

10 = a unit conversion factor

C_v = the volumetric runoff coefficient defined as that portion of rainfall that runs off as stormwater over the x-day period

R_{x-day, y-%ile} = is the x-day total rainfall depth (mm) that is not exceeded in y percent of rainfall events. (See Sections 6.3.4(d), (e), (f), (g) and (h)).

A = total catchment area (ha)

Sediment Storage Zone Volume

In the detailed calculation on Soil Loss Classes 1 to 4 lands, the sediment storage zone can be taken as 50 percent of the settling zone capacity. Alternately designers can design the zone to store the 2-month soil loss as calculated by the RUSLE (Section 6.3.4(i)(ii)). However, on Soil Loss Classes 5, 6 and 7 lands, the zone must contain the 2-month soil loss as calculated by the RUSLE (Section 6.3.4(i)(iii).

Place an "X" in the box below to show the sediment storage zone design parameters used here: 50% of settling zone capacity, 2 months soil loss calculated by RUSLE

Total Basin Volume

Site	Cv	R _{x-day, y-%ile}	Total catchment area (ha)	Settling zone volume (m ³)	Sediment storage volume (m ³)	Total basin volume (m ³)
1	0.69	25	0.9	155.25	5	160.25
2	0.69					
3	0.69					
4	0.69					
5	0.69					
6	0.69					



Appendix C Geotechnical Investigation - Borehole Logs

SURFACE LEVEL: 52.2 AHD **EASTING**: 337032 **NORTHING**: 6245667 **DIP/AZIMUTH**: 90°/-- BORE No: 1004 PROJECT No: 99852.02 DATE: 8/3/2023 SHEET 1 OF 2

		1								
	Dawth	Description	ji Dic		Sam	npling &	& In Situ Testing	5	Well	
Ч	(m)	of	Log	e	pth	ble	Results &	Nate	Construction	
	()	Strata	G	Τ _γ	Del	San	Comments	_	Details	
52	- 0.3	FILL/Gravelly SAND: fine to medium, pale grey, medium gravel, angular, dry		A	0.0 0.2				Gatic cover	8
	. 0.7	SAND SP: fine, dark brown, trace silt, moist, aeolian		A	0.4 0.5		0.0-1.0m: Bulk Sample		Backfill 0.0-1.35m	X
	- 0.7 - 1	SAND SP: fine to medium, pale grey and mottled brown, moist, medium dense, aeolian		A	0.9				-1	X
51-	- - -			s	1 45		5,7,12 N = 19			X
	1.8 78	SANDSTONE: medium grained, dark brown, apparently low to medium strength, Hawkesbury Sandstone			1.45				Blank pipe 0.2-3.0m	
50	-2	SANDSTONE: medium to coarse grained, brown then pale grey, trace carbonaceous laminations and clay seams, medium and medium to high strength, slightly weathered then fresh, slightly fractured and unbroken, Hawkesbury Sandstone		с	1.97		PL(A) = 0.7		2 1.35-2.35m	NNN A
	- - -				2.62		PL(A) = 0.7			0000
49	-3		\sim		3.05					000
				•	3.36		PL(A) = 0.7			00,00,00
48	- - - - -			с	4.7		PL(A) = 0.7		Gravel 2.35-6.0m	00,00,00
47	- 5			•	55		PI(A) = 0.4		5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	20°0°0°0°
				•	6.0		1 L(r) - 0.4		-6 End cap	Non Con
46	6.45	5		• • • • • •	6.25		PL(A) = 0.9		Bentonite 6.0-6.7m	
45	- 7			С	7.25		PL(A) = 1.3			<u>o, co, co, cu, c</u>
44	- 8			- - - - - - - - - - - - - - - - - - -	8.55		PL(A) = 0.9		8-8-8-8-8-8-8-8-8-8-8-8-8-8-8-8-8-8-8-	<u>0,00,00,0</u>
	- - - 9 -				9.0				0000 0000 0000 0000 0000 0000 0000 0000 0000	00,00
43	- - - - -			с	9.45		PL(A) = 1.3			<u>~~~~~</u>
-	- - 10.0			:						20

RIG: Comacchio GEO 305

CLIENT:

PROJECT:

Hansen Yuncken Pty Ltd

LOCATION: High and Botany Streets, Randwick

UNSW Health Translation Hub

DRILLER: Ground Test

LOGGED: SI

CASING: HW to 1.75m, HQ to 1.75m

TYPE OF BORING: Solid Flight Auger (TC-bit) to 1.5m, Rotary (water) to 1.75m, NMLC Coring to 14.97m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Location coordinates are in MGA94 Zone 56. Standpipe installed to 6.0m (Gravel Backfill 6.7m-14.97m, Bentonite 6.0m-6.7m, Screen 3.0m-6.0m, PVC 0.2m-3.0m, Gravel 2.35m-6.0m, Bentonite 1.35m-2.35m, Backfill 0.0 to 1.35m, gatic cover at surface)

	SAMPLI	NG & IN SITU TESTIN	G LEGEND		
A Auger sample	G	Gas sample	PID Photo ionisation detector (ppm)		
B Bulk sample	P	Piston sample	PL(A) Point load axial test Is(50) (MPa)		
BLK Block sample	U	Tube sample (x mm dia.)	PL(D) Point load diametral test ls(50) (MPa)		Pariners
C Core drilling	N	Water sample	pp Pocket penetrometer (kPa)		
D Disturbed sample	⊳	Water seep	S Standard penetration test		
E Environmental sam	ple 📱	Water level	V Shear vane (kPa)	Geotecnnics Environr	ment Groundwater

SURFACE LEVEL: 52.2 AHD **EASTING:** 337032 NORTHING: 6245667 **DIP/AZIMUTH:** 90°/--

BORE No: 1004 **PROJECT No:** 99852.02 DATE: 8/3/2023 SHEET 2 OF 2

Γ		Description	. <u>ಲ</u>			Sam	pling a	& In Situ Testing	_	Well	
RL	Depth (m)	of Strata	Graph	Lug	Type	Depth	Sample	Results & Comments	Wate	Construction Details	n
42		SANDSTONE: medium to coarse grained, brown then pale grey, trace carbonaceous laminations and clay seams, medium and medium to high strength, slightly weathered then fresh, slightly fractured and unbroken, Hawkesbury Sandstone <i>(continued)</i>			С	10.25		PL(A) = 1.1		Gravel Backfill - 11 6.7-14.97m	20000000000000000000000000000000000000
41	- 12			· · · · · · · · · · · · · · · · · · ·		11.1		PL(A) = 0.9		-12	
40						12.25		PL(A) = 0.9			0,00,00,00,00,00,00,00,00,00,00,00,00,0
39.	- 13 			· · · · · · · · · · · · · · · · · · ·	с	13.0		PL(A) = 0.9		-13	00000000000000000000000000000000000000
38	- 14			· · · · · · · · · · · · · · · · · · ·		14.0		PL(A) = 1.2		- 14	
37	_ <u>15</u> 14.97	Bore discontinued at 14.97m Target Depth Reached	1: : : : :			-14.97-				- 15 - 15 	
36	- 16									- 16	
35	- 17									-17	
34	- 18									- 18	
33	- 19									- 19	
Ł	-									t i i i i i i i i i i i i i i i i i i i	

RIG: Comacchio GEO 305

CLIENT:

PROJECT:

Hansen Yuncken Pty Ltd

LOCATION: High and Botany Streets, Randwick

UNSW Health Translation Hub

DRILLER: Ground Test TYPE OF BORING: Solid Flight Auger (TC-bit) to 1.5m, Rotary (water) to 1.75m, NMLC Coring to 14.97m

LOGGED: SI

CASING: HW to 1.75m, HQ to 1.75m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Location coordinates are in MGA94 Zone 56. Standpipe installed to 6.0m (Gravel Backfill 6.7m-14.97m, Bentonite 6.0m-6.7m, Screen 3.0m-6.0m, PVC 0.2m-3.0m, Gravel 2.35m-6.0m, Bentonite 1.35m-2.35m, Backfill 0.0 to 1.35m, gatic cover at surface)

	SAM	PLIN	3 & IN SITU TESTING	LEG	END											
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)		_	_		-		_		-		
В	Bulk sample	Р	Piston sample	PL(A	A) Point load axial test Is(50) (MPa)					_	00					-
BL	K Block sample	U,	Tube sample (x mm dia.)	PL(E	D) Point load diametral test Is(50) (MPa)	1	1.								ner	5
C	Core drilling	Ŵ	Water sample	pp	Pocket penetrometer (kPa)					_		_				-
D	Disturbed sample	⊳	Water seep	S	Standard penetration test		1.			1	—			1 0		
Е	Environmental sample	Ŧ	Water level	V	Shear vane (kPa)			Ge	eotecnnics	1	Envi	roni	ment	I GI	rounawate	er

SURFACE LEVEL: 52.2 AHD EASTING: 337030 NORTHING: 6245667 DIP/AZIMUTH: 90°/-- BORE No: 1005 PROJECT No: 99852.02 DATE: 9/3/2023 SHEET 1 OF 1

Sampling & In Situ Testing Graphic Log Well Description Water Depth Ъ Construction of Sample Depth Type Results & Comments (m) Strata Details 0.0 Gatic cove FILL/Gravelly SAND: medium to coarse, pale grey, А 52 0.2 medium to coarse gravel (igneous), angular, dry 0.3 Bentonite 0.1-0.5m 0.4 0.5 SAND SP: fine, dark brown, trace silt, moist, aeolian Α Blank pipe 0.1-1.1m 0.6 SAND SP: fine to medium, pale grey and brown, moist, aeolian 0.9 А 1.0 5 Gravel 0.5-2.1m Machine slotted 1.6 SANDSTONE: medium grained, brown, apparently low to PVC screen 1.1-2.1m medium strength, Hawkesbury Sandstone 2 2.0 •2 End A 2.1 21 Bore discontinued at 2.1m 20. Target Depth Reached 3 -3 <u>-</u>9 Δ ۰4 <u>-</u>œ 5 -5 6 6 46 7 • 7 -4-8 - 8 4 9 ۰q .ლ LOGGED: SI RIG: Comacchio GEO 305 **DRILLER:** Ground Test CASING: Uncased

TYPE OF BORING: Solid Flight Auger (TC-it) to 2.1m

Hansen Yuncken Pty Ltd

UNSW Health Translation Hub

High and Botany Streets, Randwick

CLIENT: PROJECT:

LOCATION:

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Location coordinates are in MGA94 Zone 56. Standpipe installed to 2.1m (Screen 1.1m-2.1m, PVC 0.1m-1.1m, Gravel 0.5m-2.1m, Bentonite 0.1m-0.5m, gatic cover at surface)

	SAM	IPLIN	G & IN SITU TESTING	LEG	END]					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)		_		-	_	_
B	Bulk sample	P	Piston sample	PL(A) Point load axial test Is(50) (MPa)						
BL	K Block sample	U,	Tube sample (x mm dia.)	PL(C) Point load diametral test ls(50) (MPa)						
C	Core drilling	Ŵ	Water sample	pp	Pocket penetrometer (kPa)				7.40		
D	Disturbed sample	⊳	Water seep	S	Standard penetration test		11				0 1 1
E	Environmental sample	¥	Water level	V	Shear vane (kPa)			Geotechnics	s Envi	ronment	Groundwater
-	· · · · ·					-					

CLIENT:

PROJECT:

Hansen Yuncken Pty Ltd

LOCATION: High and Botany Streets, Randwick

UNSW Health Translation Hub

SURFACE LEVEL: 54.6 AHD **EASTING**: 336989 **NORTHING**: 6245651 **DIP/AZIMUTH**: 90°/-- BORE No: 1006 PROJECT No: 99852.02 DATE: 10/3/2023 SHEET 1 OF 2

	Description	lic		Sam	pling &	& In Situ Testing	5	Well
Depth (m)	of	Grapt Log	ype	epth	mple	Results &	Wate	Construction
	Strata		Ť		Sa	Comments		Details Gatic cover
0.2	medium to coarse gravel (igneous), dry	\bigotimes	A	0.2				
	FILL/SAND: fine to medium, brown, trace igneous gravel,	\bigotimes	A	0.4 0.5				
	moist	\otimes						
1.0	FILL/RIPPED SANDSTONE and SAND: fine to medium	\bigotimes	_A	0.9 1.0				1
	pale grey and brown, ripped sandstone gravel and		S			2,6,6 N = 12		
		\otimes		1.45				Backfill 0.2-3.0m
								-2
		\otimes						Blank pipe
		\mathbb{X}	0	2.5		2,1,2		
			5	2 95		N = 3		
		\otimes		2.00				-3
		\mathbb{X}						Bontonito 2.0.4.0m
		\bigotimes						Dentonite 3.0-4.0m
4.0		\bigotimes		40		20/50		-4
	SANDSTONE: medium to coarse grained, pale grey, apparently medium strength. Hawkesbury Sandstone		S	4.05		refusal		
4.45	SANDSTONE: medium grained, pale grav, grav, brown			4.45				
	and red-brown, 5-10% clay seams, medium and low to			4.7		PL(A) = 0.9		
	fresh, slightly fractured, Hawkesbury Sandstone		С					-5
				5.5				
				5.75		PL(A) = 1.1		Gravel 4.0-7.5m
								-6 Machine slotted
								4.5-7.5m
				6.45		PL(A) = 0.6		
			С	7.0		PL(A) = 0.3		-7
				8.05		PL(A) = 0.7		-8 Bentonite 7.5-8.5m
8.42		\mid		0.5				
				ō.5				
				an		$PI(\Delta) = 0.7$		- Q 0
			C	9.0		FL(A) = 0.7		
10.0								

TYPE OF BORING: Solid Flight Auger (TC-bit) to 4.0m, Rotary (water) to 4.45m, NMLC Coring to 17.45m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Location coordinates are in MGA94 Zone 56. Standpipe installed to 7.5m (Gravel Backfill 8.5m-17.45m, Bentonite 7.5m-8.5m, Screen 4.5m-7.5m, PVC 0.2m-4.5m, Gravel 4.0m-7.5m, Bentonite 3.0m-4.0m, Backfill 0.2 to 3.0m, gatic cover at surface)

SA	IPLIN	G & IN SITU TESTING	LEG	END			
A Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)		_	
B Bulk sample	Р	Piston sample	PL(/	A) Point load axial test Is(50) (MPa)			Develoo Douteoro
BLK Block sample	U,	Tube sample (x mm dia.)	PL(I	D) Point load diametral test Is(50) (MPa)	1		Douolas Parliers
C Core drilling	Ŵ	Water sample	pp	Pocket penetrometer (kPa)			
D Disturbed sample	⊳	Water seep	S	Standard penetration test			Out the basis of Freedoment & Orange during the
E Environmental sample	Ŧ	Water level	V	Shear vane (kPa)			Geotechnics Environment Groundwater
SURFACE LEVEL: 54.6 AHD **EASTING:** 336989 NORTHING: 6245651 **DIP/AZIMUTH:** 90°/--

BORE No: 1006 **PROJECT No:** 99852.02 DATE: 10/3/2023 SHEET 2 OF 2

Γ		Description	<u>.0</u>		Sam	pling a	& In Situ Testing		Well	
Ч	Depth (m)	of	Graph Log	ype	epth	ample	Results & Comments	Water	Construction	ı
44	-	Strata SANDSTONE: medium grained, pale grey, grey-brown and red-brown, 5-10% clay seams, medium and low to medium strength, moderately to slightly weathered then fresh, slightly fractured, Hawkesbury Sandstone (continued)		c	10.35	Sa	PL(A) = 0.5			0,00,00,00,00 0,00,00,00 0,00,00,00 0,00,0
-	- 11 11.0	SANDSTONE: medium grained, pale grey, high strength, fresh, slightly fractured and unbroken, Hawkesbury Sandstone			11.0		PL(A) = 1.2		- 11 - 11 	0,00,00 0,00,00 0,00,00 0,00,00
43	- 12				12.0		PL(A) = 1.4		-12	
11	- 13			С	13.0		PL(A) = 1.2		- - 13 Gravel Backfill - 8.5-17.45m -	00000000000000000000000000000000000000
7	- - - 14 - -				14.0		PL(A) = 1.7		- 14	00,00,00,00,00,00,00,00,00,00,00,00,00,
40	- 15				14.5		PL(A) = 1.1		- 15	,
39	- 16			С	16.0		PL(A) = 1.2		-16	0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
	- 17				17.0		PL(A) = 1.5		- 17	0,00,00,00 0,00,00,00 0,00,00,00 0,00,00
37	- 17.45 - - - - - - - - - - - - - - - - - - -	Bore discontinued at 17.45m Target Depth Reached			-17.45-				-18	
35	- 19								- 19	

RIG: Comacchio GEO 305

CLIENT:

PROJECT:

Hansen Yuncken Pty Ltd

LOCATION: High and Botany Streets, Randwick

UNSW Health Translation Hub

DRILLER: Ground Test

LOGGED: SI

CASING: HW to 4.45m TYPE OF BORING: Solid Flight Auger (TC-bit) to 4.0m, Rotary (water) to 4.45m, NMLC Coring to 17.45m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Location coordinates are in MGA94 Zone 56. Standpipe installed to 7.5m (Gravel Backfill 8.5m-17.45m, Bentonite 7.5m-8.5m, Screen 4.5m-7.5m, PVC 0.2m-4.5m, Gravel 4.0m-7.5m, Bentonite 3.0m-4.0m, Backfill 0.2 to 3.0m, gatic cover at surface)

	SAM	PLIN	3 & IN SITU TESTING	LEG	END			
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)		_	
В	Bulk sample	Р	Piston sample	PL(A	A) Point load axial test Is(50) (MPa)			Develop Dorthory
BL	K Block sample	U,	Tube sample (x mm dia.)	PL(E	D) Point load diametral test Is(50) (MPa)	1	1.	A Douolas Parliers
C	Core drilling	Ŵ	Water sample	pp	Pocket penetrometer (kPa)			
D	Disturbed sample	⊳	Water seep	S	Standard penetration test		1.	Or start hairs 1 Frankram and 1 Or some damater
Е	Environmental sample	Ŧ	Water level	V	Shear vane (kPa)			Geotechnics Environment Groundwater

SURFACE LEVEL: 54.6 AHD **EASTING:** 336989 **NORTHING:** 6245650 **DIP/AZIMUTH:** 90°/-- BORE No: 1007 PROJECT No: 99852.02 DATE: 16/3/2023 SHEET 1 OF 1

			Description	. <u>0</u>		San	npling &	& In Situ Testing		Well	
R	De (r	pth n)	of	raph Log	be	pth	aldr	Results &	Nater	Construction	n
	`	<i>,</i>	Strata	Ū	Тy	Det	Sam	Comments		Details	
ŀ	-	0.0	FILL/Gravelly SAND: medium to coarse, pale grey, igneous gravel, fine to medium, angular sand, dry		A	0.2				Gatic cover -	
	-	0.3	FILL/RIPPED SANDSTONE and SAND: fine to medium		A	0.5				- - - Bentonite 0.2-1.0m —	
-	-		boulders, moist		>					Blank pipe -	$-\frac{1}{2}$
ł	-1				<u>A</u>	1.0				-1	
ŀ	-					1.45				-	00.00
53	-									-	
Ē	-2	2.0			A	2.0				-2	
ŀ	-		FILL/SAND: fine to medium, brown, trace ripped sandstone gravel, moist							-	000
Ę	-					2.5				-	
20	-				s					- - Gravel 1.0-4.6m —	
Ē	-3				A	2.95 3.0				- 3 - Machine slotted -	
ŀ	-				>					PVC screen 1.6-4.6m	
51	-	3.5	SAND SP: fine, grey-brown, trace gravel, moist, aeolian		}					-	2000
Ē	-										000 000 000
Ē	-4	4.0	SANDSTONE: medium grained, brown, apparently very							-4	
ŀ	-		low and low to medium strength, Hawkesbury Sandstone							-	
20-	-	4.7								End cap —	
Ē	- 5		Bore discontinued at 4.7m Target Depth Reached								
ł	-									-	
[-									-	
-4	-										
Ē	-6									-6	
ŀ	-									-	
48	-										
Ē	-									-	
ŀ	-7									-7	
Ē	-									-	
47	-									-	
ŧ	-									-	
ŀ	-									-	
Ē	-									[
46	-										
ŀ	-9									-9	
-	-										
15	-										
Ē	-										
			1		1	1			1	1]	
RIØ TY	G: ('PE (Com OF I	acchio GEO 305 DRILLER: Ground Test 30RING: Solid Flight Auger (TC-bit) to 4.7m		LOC	GGED	: SI	CASIN	G: U	ncased	

WATER OBSERVATIONS: No free groundwater observed whilst augering

CLIENT:

PROJECT:

Hansen Yuncken Pty Ltd

LOCATION: High and Botany Streets, Randwick

UNSW Health Translation Hub

REMARKS: Location coordinates are in MGA94 Zone 56. Standpipe installed to 4.6m (Screen 1.6m-4.6m, PVC 0.1m-1.6m, Gravel 1.0m-4.6m, Bentonite 0.2m-1.0m, gatic cover at surface)

SAM	IPLIN	G & IN SITU TESTING	G LEG	END						
A Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)		_		-	_	_
B Bulk sample	P	Piston sample	PL(A) Point load axial test Is(50) (MPa)						
BLK Block sample	U,	Tube sample (x mm dia.)	PL(C) Point load diametral test ls(50) (MPa)	1			135		ners
C Core drilling	Ŵ	Water sample	pp	Pocket penetrometer (kPa)						
D Disturbed sample	⊳	Water seep	S	Standard penetration test			O and a share in a			0
E Environmental sample	Ŧ	Water level	V	Shear vane (kPa)			Geotecnnics	I Envir	onment I	Groundwater
h					-					

SURFACE LEVEL: 52.0 AHD **EASTING:** 337031 **NORTHING:** 6245622 **DIP/AZIMUTH:** 90°/-- BORE No: 1008 PROJECT No: 99852.02 DATE: 15/3/2023 SHEET 1 OF 2

									tu Testing	
	De	enth	Description	g		San	ipling a	& In Situ Testing	er	Well
RI	(r	n)	of Strata	Grap	Type	Depth	ample	Results & Comments	Wat	Construction Details
	-	0.3	FILL/Gravelly SAND: fine to medium, grey-brown, trace igneous and ripped sandstone gravel, moist, apparently loose		A	0.2	<u></u>			
-	-	0.8	FILL/SAND: fine to medium, grey-brown, moist, apparently loose		A	0.5				
51	-1		SAND SP: fine, pale grey then light brown, moist, loose to medium dense, aeolian		A S	, 1.0		4,5,4		
-	-					1.45		N = 9		
50.	-2				А	2.0				2 Blank pipe 0.7m stickup to 4.0m
-	-	2.6	- Below 2.5m: becoming wet		s	2.5		2,8/150 refusal		
49	-3	2.85	SANDS I ONE: medium grained, pale grey-brown, apparently very low strength, Hawkesbury Sandstone SANDSTONE: medium grained, pale grey and brown, indistinct bedding, low strength, highly to moderately			2.85 2.9		PL(A) = 0.2	_	-3 Bentonite 2.5-3.5m
	-		weathered, slightly fractured, Hawkesbury Sandstone			3.65		PL(A) = 0.2		\$2.00.2 \$2.00.2
48	- 4				С	4.6		PL(A) = 0.2		
47	- 5	5.0	SANDSTONE: medium grained, pale grey, thickly bedded			5.05				
46	- 6		and massive, medium to high strength, fresh, slightly fractured and unbroken, Hawkesbury Sandstone			5.6		PL(A) = 1.3		Gravel 3.5-7.0m Machine slotted PVC screen 4.0-7.0m Gravel 3.5-7.0m Classical Classical Cla
45	- - - - - 7				С	6.8		PL(A) = 0.9		7 End cap
	-					7.35		PL(A) = 1.1		
44	- 8					8.0				-8
-	-					8.65		PL(A) = 0.8		
43	-9				С	9.2		PL(A) = 1		-9
-	-	9.6	SANDSTONE: (Refer to next page)							

RIG: Comacchio GEO 205

CLIENT:

PROJECT:

Hansen Yuncken Pty Ltd

LOCATION: High and Botany Streets, Randwick

UNSW Health Translation Hub

DRILLER: Ground Test

LOGGED: SI

CASING: HW to 2.85m

TYPE OF BORING: Solid Flight Auger (TC-bit) to 2.5m, Rotary Water to 2.85m, NMLC Coring to 15.63m

WATER OBSERVATIONS: Free groundwater observed at 2.8m whilst augering

REMARKS: Location coordinates are in MGA94 Zone 56. Standpipe installed to 7.0m (Screen 4.0m-7.0m, PVC stick up 0.7m above ground level and 0.0m-4.0m, Gravel 3.5m-7.0m, Bentonite 2.5m-3.5m, Backfill to Ground Level)

	SA	MPLIN	G&INSITUTESTING	G LEG	END							
1	A Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)		_		-		_	_
E	3 Bulk sample	Р	Piston sample	PL(A	A) Point load axial test Is(50) (MPa)							
E	3LK Block sample	U,	Tube sample (x mm dia.)	PL(I	D) Point load diametral test ls(50) (MPa)	1			IRL			
0	C Core drilling	Ŵ	Water sample	pp	Pocket penetrometer (kPa)							
	D Disturbed sample	⊳	Water seep	S	Standard penetration test							• • • •
E	E Environmental sample	• ¥	Water level	V	Shear vane (kPa)			Geotechnics	I Env	/iron	ment I C	sroundwater
-												

SURFACE LEVEL: 52.0 AHD **EASTING:** 337031 NORTHING: 6245622 **DIP/AZIMUTH:** 90°/--

BORE No: 1008 PROJECT No: 99852.02 DATE: 15/3/2023 SHEET 2 OF 2

Γ		Description	Sampling & In Situ Testing			& In Situ Testing		Well	
2 RL	Depth (m)	of Strata	Graph Log	Type	Depth	Sample	Results & Comments	Water	Construction Details
	- - - - -	SANDSTONE: medium grained, pale grey and grey, thinly bedded and cross bedded, 5% clay seams, medium strength, fresh, slightly fractured and unbroken, Hawkesbury Sandstone <i>(continued)</i>		с	10.25		PL(A) = 0.9		
41	- - 11 - - - - - -				11.0 11.1		PL(A) = 1		
40	- 12			С	12.15		PL(A) = 0.8		-12
39.	- 13				13.15		PL(A) = 1		-13
38	- - 14 - - -				14.0				-14
37	- 15			С	_15.58_		PL(A) = 0.9		-15
36	- 16	Bore discontinued at 15.63m Target Depth Reached			15.63				- 16
35	- 17 - 17 								- 17
34	- 18 								- 18
33	- 19 								-19

RIG: Comacchio GEO 205

CLIENT:

PROJECT:

LOCATION:

Hansen Yuncken Pty Ltd

UNSW Health Translation Hub

High and Botany Streets, Randwick

DRILLER: Ground Test TYPE OF BORING: Solid Flight Auger (TC-bit) to 2.5m, Rotary Water to 2.85m, NMLC Coring to 15.63m

LOGGED: SI

CASING: HW to 2.85m

WATER OBSERVATIONS: Free groundwater observed at 2.8m whilst augering

REMARKS: Location coordinates are in MGA94 Zone 56. Standpipe installed to 7.0m (Screen 4.0m-7.0m, PVC stick up 0.7m above ground level and 0.0m-4.0m, Gravel 3.5m-7.0m, Bentonite 2.5m-3.5m, Backfill to Ground Level)



SURFACE LEVEL: 52.1 AHD **EASTING:** 337031 NORTHING: 6245623 **DIP/AZIMUTH:** 90°/--

BORE No: 1009 PROJECT No: 99852.02 DATE: 15/3/2023 SHEET 1 OF 1

Γ			Description	. <u>c</u>		Sam	pling &	& In Situ Testing	_	Well
R		epth (m)	of Strata	Graph Log	Type	Depth	ample	Results & Comments	Wate	Construction
-22	-		FILL/Gravelly SAND: fine to coarse, grey-brown, ripped		A	0.2	٥ ٥			
		0.3	FILL/SAND: fine to medium, pale grey and brown, trace ripped sandstone gravel, moist		A	0.5		0.0-1.0m: Bulk Sample		Bentonite 0.0-0.8m Blank pipe 1.2m stickup to 1.3m
51	-1	1.0	SAND SP: fine to medium, pale grey then pale brown,		A	1.0				1
			moist to wet, aeolian							
	-2				А	2.0				2 Gravel 0.8-3.3m
	-									Machine slotted
49	-3	2.8	SANDSTONE: fine to medium grained, pale brown, apparently very low to low strength, Hawkesbury Sandstone		А	3.0			Ţ	
		3.3	Bore discontinued at 3.3m Target Depth Reached	1						
48	-4									-4
	-									
	-5									
-	-									
-	-6									
46	-									
	-									- 7
45										
-										
-4	-8									-8
43	-9									-9
E RI	<u> </u>	Com			1.00			CASING	<u> </u>	

TYPE OF BORING: Solid Flight Auger (TC-bit) to 3.3m

CLIENT:

PROJECT:

Hansen Yuncken Pty Ltd

LOCATION: High and Botany Streets, Randwick

UNSW Health Translation Hub

LOGGED: SI

CASING: Uncased

WATER OBSERVATIONS: Free groundwater observed at 2.8m

REMARKS: Location coordinates are in MGA94 Zone 56. Standpipe installed to 3.3m (Screen 1.3m-3.3m, PVC stick up 1.2m above ground surface level and 0.0m-1.3m, Gravel 0.8m-3.3m, Bentonite 0.0m-0.8m)



Appendix C

Previous Borehole Logs

SURFACE LEVEL: 54.4 AHD **EASTING:** 337086 **NORTHING:** 6245667 **DIP/AZIMUTH:** 90°/-- BORE No: 101 PROJECT No: 72505.13 DATE: 25/2/2019 SHEET 1 OF 2

$\left[\right]$		Description	Degree of Weathering .≌	Rock Strength	Fracture	Discontinuities	Sa	amplir	ng & I	n Situ Testing
RL	Depth (m)	of	raph Sraph		(m)	B - Bedding J - Joint	/be	ore c. %	a 80%	Test Results
		Strata	M M M M M M M M M M M M M M M M M M M	Ex Low Medi D.01	0.05 0.10 1.00	S - Shear F - Fault	Ύ	Ωē	٣°	Comments
53	0.15	FILLING: grey, fine to medium sand and gravel filling, damp (roadbase) FILLING: yellow-grey, fine to medium sand with sandstone cobbles and coarse sandstone gravel filing, moist SAND: loose, brown, fine to medium sand, moist					A A A S			2,2,1 N = 3
52	- 1.8 -2 2.12	SANDSTONE: extremely low to very low strength, extremely to highly weathered, red-brown, medium to coarse grained sandstone SANDSTONE: medium strength, moderately weathered, red-brown, medium to coarse grained				2.15&2.17m: B 0°-15°, cu, ro, cly vnr 2.35m: B 0°, pl, ro, cly 10mm 2.41m: B 10°, un, ro, cly	с	100	82	PL(A) = 0.6
51	-3	sandstone with some very low strength bands	<u> </u>			co 3.25m: B 0°, pl, ro, fg 10mm				PL(A) = 0.7
49	-4 4.27 -5	SANDSTONE: medium and high strength, fresh, fractured and slightly fractured, pale grey, medium to coarse grained sandstone with some extremely low strength clay bands				4.26m: B 0°, pl, ro, cly vn 4.87-4.89m: Cs 5.10-5.11m: Cs 5.36m: B 0°, pl, ro, cln	С	100	99	PL(A) = 0.4 PL(A) = 0.8
48	- 6					5.93-5.96m: Cs				PL(A) = 1.1
47	-7					7.57m: B 5°, pl, ro, cln 7.76m: B 10°, pl, ro, cln 7.84m: J 30°, pl, ro, cly 7 86-7.89m: Cs	С	100	96	PL(A) = 1
46										PL(A) = 0.7
45	9.24					9.14-9.16m: J 30°, pl, ro, cbs co 9.16-9.21m: fg 9.21m: CORE LOSS: 30mm	С	99	96	PL(A) = 1.4
	G: Hanii		FR : BG Drilling			CASING: HW	/ to 2	05m		

TYPE OF BORING: Solid flight auger to 2.05m, NMLC-coring to 15.39m WATER OBSERVATIONS: No free groundwater observed whilst augering REMARKS:

CLIENT:

PROJECT:

LOCATION:

LendLease Building Pty Ltd

Streets, Randwick

Randwick Campus Redevelopment

Hospital Road and High, Magill and Botany



SURFACE LEVEL: 54.4 AHD **EASTING**: 337086 **NORTHING**: 6245667 **DIP/AZIMUTH**: 90°/-- BORE No: 101 PROJECT No: 72505.13 DATE: 25/2/2019 SHEET 2 OF 2

		Description	Degree of	Rock	Fracture	Discontinuities	Sa	ampli	ng &	In Situ Testing
RL	Depth (m)	of Strata			Spacing (m)	B - Bedding J - Joint S - Shear F - Fault	Type	Core Rec. %	RQD %	Test Results & Comments
43	-11	SANDSTONE: medium and high strength, fresh, fractured and slightly fractured, pale grey, medium to coarse grained sandstone with some extremely low strength clay bands (continued)				11.32-11.37m: J 60°, pl, ro, fg	С	99	96	PL(A) = 0.8 PL(A) = 1.4
42	- 12 - 13							400		PL(A) = 1.2
40 41 41	- 14							100	96	PL(A) = 0.4 PL(A) = 0.9
	- 15					14.82m: B 0°, pl, ro, cly 10mm	с	100	100	PL(A) = 0.7
36 37 38 38 38 38 38 39 39 39 39 39 39 39 39 39 39 39 39 39	- 16 - 17 - 18 - 19	Bore discontinued at 15.39m Target depth reached								

RIG: Hanjin D8

CLIENT:

PROJECT:

LOCATION:

LendLease Building Pty Ltd

Streets, Randwick

Randwick Campus Redevelopment

Hospital Road and High, Magill and Botany

DRILLER: BG Drilling

LOGGED: SLB

CASING: HW to 2.05m

TYPE OF BORING:Solid flight auger to 2.05m, NMLC-coring to 15.39mWATER OBSERVATIONS:No free groundwater observed whilst augeringREMARKS:

SAMPLI	NG & IN SITU TESTING	G LEGEND	
A Auger sample (Gas sample	PID Photo ionisation detector (ppm)	
B Bulk sample F	P Piston sample	PL(A) Point load axial test Is(50) (MPa)	
BLK Block sample l	J _x Tube sample (x mm dia.)	PL(D) Point load diametral test Is(50) (MPa)	
C Core drilling	V Water sample	pp Pocket penetrometer (kPa)	
D Disturbed sample	 Water seep 	S Standard penetration test	
E Environmental sample	Water level	V Shear vane (kPa)	



BORE: 101	PROJ	JECT: Randwick	February 2019
Contraction Contra	tners Groundwater	Project No: 72505.13 BH ID: 101 Depth: 2.05 – 7.00m Core Box No.: 1/3	
12505-13 BAILOI			
3m	Ne §		and the state of t
tm			
5m			
m			
	2	2.05 – 7.00 m	

Geotechnics Environment C	tners Groundwater	Project No: 72505.13 BH ID: 101 Depth: 7.00-12.00m Core Box No.: 2/3	
	1		
- ACCES			
	E.		



SURFACE LEVEL: 53.7 AHD EASTING: 337065 **NORTHING:** 6245669 **DIP/AZIMUTH:** 90°/--

BORE No: 102 PROJECT No: 72505.13 **DATE:** 26/2/2019 SHEET 1 OF 2

\square		Description	Degree of	.º Streng	th _	Fracture	Discontinuities	Sa	amplir	ng & I	In Situ Testing
Ч	Depth (m)	of	Wednering		Nate	Spacing (m)	B - Bedding J - Joint	be	ore c. %	D D S D S	Test Results
	()	Strata	E SW MW E	Medic High		0.05	S - Shear F - Fault	Ţ	ပိမ္ရွိ	Я,	Comments
	- 0.1							A			
Ē		and gravel filling, damp (roadbase)						A			
53	-	SAND: loose, grey-brown, fine to medium sand with trace of fine									
Ē	- 1	sandstone gravel, damp (possibly						A			
	-	lilling)						s			1,1,2
Ē	- 1.4	SAND: medium dense.							-		N = 3
52	-	yellow-brown, medium to coarse									
Ē	-2	Sand with trace day, moist									
	2.15	SANDSTONE: medium strength,	╘╧┓┼┼┼	┆┊┊┊ ┇┊┊┊┇ <mark>╘╧╤╤┓</mark> ╎							
Ē		extremely then moderately weathered fragmented and						c	100	92	$PI(\Lambda) = 0.4$
- 1-2	_	fractured, red-brown and									1 L(A) = 0.4
Ē		grained sandstone with some					2.82-2.86m: CS				
	-	extremely low strength clay bands					100mm				
					i i		3.20-3.28m: Cs				PL(A) = 0.4
20-	-						°3.44-3.61m: Cs				
	- 4		╡╧┽┫╎╎╎	╞┊┊╡╪┿╡╎			3.88-3.92m: Cs				
	- 4.00				i i		4.14-4.18m: Cs		07		
	- 4.29 -	SANDSTONE: medium and high strength_fresh_slightly fractured							97	84	PI (A) = 0.5
49	-	pale grey, medium to coarse grained									(, ,) 0.0
Ē	-5	sandstone					4 00 5 00 0				
	-	5.00-8.20m: some low and extremely low strength bands					4.98-5.03m: Cs				
Ē				╺╼╼╉			5.38-5.41m: Cs				PL(A) = 0.8
48	-										
Ē	- 6										
	-				i i						$PI(\Delta) = 0.8$
Ē											1 2(7) - 0.0
47	-										
Ē	- - - 7										
	-						7.07m: B 0°, pl, ro, fg				
Ē	_						IUMM	C	100	100	PI (A) = 1 1
46	-										1 200 1.1
Ē	-										
	-						8 18m [.] B 0° pl ro fa				
Ē	-						10mm				PL(A) = 1.1
45	-										
Ē	- 9										
	-										
Ē	-							с	100	100	
4	-						9.61m: B 0°, pl, ro, cly				
Ē	-						со				PL(A) = 1.2
RIC	G• Hani	in D8 DRII I	FR. BG Dril	lina		GED: SIB	CASING: HV	V to 2	15m		

CLIENT:

PROJECT:

LOCATION:

LendLease Building Pty Ltd

Streets, Randwick

Randwick Campus Redevelopment

Hospital Road and High, Magill and Botany

DRILLER: BG Drilling

LOGGED: SLE

CASING: HW to 2.15m

TYPE OF BORING: Solid flight auger to 2.15m, NMLC-coring to 15.30m WATER OBSERVATIONS: No free groundwater observed whilst augering **REMARKS:**

	SAM	PLING	5 & IN SITU TESTING	3 LEGE	ND			
А	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)	Ι.	 _	_
В	Bulk sample	Р	Piston sample	PL(A) Point load axial test Is(50) (MPa)			
BLK	Block sample	U,	Tube sample (x mm dia.)	PL(D) Point load diametral test ls(50) (MPa)			
С	Core drilling	Ŵ	Water sample	pp	Pocket penetrometer (kPa)			
D	Disturbed sample	⊳	Water seep	S	Standard penetration test			~
Е	Environmental sample	Ŧ	Water level	V	Shear vane (kPa)			Ge
 						_		



SURFACE LEVEL: 53.7 AHD **EASTING:** 337065 **NORTHING:** 6245669 **DIP/AZIMUTH:** 90°/-- BORE No: 102 PROJECT No: 72505.13 DATE: 26/2/2019 SHEET 2 OF 2

		Description	Degree of Weathering	<u>io</u>	Rock Strength	Fracture	Discontinuities	Sa	amplii	ng & I	n Situ Testing
Я	Depth (m)	of	5	Graph Log		(m)	B - Bedding J - Joint	ype	ore sc. %	åD 800%	Test Results &
		Strata	EW HW SW FE			0.00	S-Shear F-Fault		0 2	Ľ.	Comments
42 43 43		strength, fresh, slightly fractured, pale grey, medium to coarse grained sandstone <i>(continued)</i>					10.89m: B 5°, pl, ro, cly co	с	100	100	PL(A) = 1.1 PL(A) = 1.3
41	- 12 - 12 - 13						12.63m: B 0°, pl, ro, cln 13.16m: B 0°, pl, ro, fg	с	100	100	PL(A) = 0.7
40	- - - - - - - - - - - - - - - - - - -	13.90-14.10m: indistinct siltstone laminations					13.81m: J 30°, pl, ro, cln 13.92m: B 0°, pl, ro, cbs				PL(A) = 1.1
39	14.85 15	14.85-15.30m: fine to medium grained sandstone with					14.49m: B 5°, pl, ro, cly 5mm 14.79m: B 0°, pl, ro, cly 5mm 14.84m: B 0°, pl, ro, cly	с	100	63	PL(A) = 0.9
34 37 38 38 38 38 38 38 38 37 37 38 38 38 38 38 38 38 38 38 38 38 38 38	- 15.3	graned sandstone with approximately 5% carbonaceous laminations Bore discontinued at 15.3m Target depth reached					L14.84m: B 0°, pl, ro, cly				

RIG: Hanjin D8

CLIENT:

PROJECT:

LOCATION:

LendLease Building Pty Ltd

Streets, Randwick

Randwick Campus Redevelopment

Hospital Road and High, Magill and Botany

DRILLER: BG Drilling

LOGGED: SLB

CASING: HW to 2.15m

TYPE OF BORING:Solid flight auger to 2.15m, NMLC-coring to 15.30mWATER OBSERVATIONS:No free groundwater observed whilst augeringREMARKS:

		SAMPL	ING	6 & IN SITU TESTING I	LEGE	ND			
	A Au	uger sample	G	Gas sample	PID	Photo ionisation detector (ppm)		_	_
	Β Βι	ulk sample	Р	Piston sample	PL(A)	Point load axial test Is(50) (MPa)			
	BLK Blo	ock sample	U,	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)			
	C Co	ore drilling	Ŵ	Water sample	pp	Pocket penetrometer (kPa)			
	D Di	isturbed sample	⊳	Water seep	S	Standard penetration test			0
	E Er	nvironmental sample	Ŧ	Water level	V	Shear vane (kPa)			Geote
1									









SURFACE LEVEL: 54.5 AHD **EASTING:** 336994 **NORTHING:** 6245675 **DIP/AZIMUTH:** 90°/-- BORE No: 103 PROJECT No: 72505.13 DATE: 26/2/2019 SHEET 1 OF 2

\square		Description	Degree of	Rock Strength	Fracture	Discontinuities	Sa	amplii	ng & I	n Situ Testing
RL	Depth (m)	of	ind in it in it in it is		Spacing (m)	B - Bedding J - Joint	be	ore 2. %	D SD	Test Results
	()	Strata	C R R R R R R R R R R R R R R R R R R R	Ex Lo Very Low High Ex Hij	0.01 0.10 0.50	S - Shear F - Fault	Ţ	ပိမ္ရွိ	R ~	α Comments
54	0.3	FILLING: pale grey, fine to medium sand filling with trace sandstone gravel and building rubble (terracotta, concrete, glass), humid SAND: medium dense, red-brown mottled dark grey, medium to coarse sand, moist					A A S			3,8,9 N = 17
52	- 26	2.30m: orange-brown					S			25/100
51	- 2.0 2.7 - 3 - 3.07	SANDSTONE: extremely low strength, extremely weathered, yellow-brown, medium to coarse grained sandstone SANDSTONE: low strength, extremely to highly weathered, medium to coarse grained sandstone with extremely low and very low strength bands								PL(A) = 0.3
	- 4.38 - 4.38 	SANDSTONE: medium strength, moderately weathered, fractured and slightly fractured, red-brown, medium to coarse grained sandstone SANDSTONE: medium and high strength, fresh, fractured and slightly fractured, pale grey, medium to				4.79m: B 0°, pl, ro, cly vn	С	100	93	PL(A) = 0.5
49	- 6	coarse grained sandstone with some extremely and very low strength bands				5.32-5.41m: J 70°, pl, ro, cln				PL(A) = 1.3
48						6.17-6.24m: Cs 6.37-6.49m: J 70°, pl, ro, cln				PL(A) = 1.1
47						7.26-7.36m: J 45°-90°, cu, ro, cln 7.52-7.72m: B(x4) 5°-15°, pl, ro, fe	С	100	93	PL(A) = 2.3
46	- - - - - - - 9	8.39-9.10m: low strength								PL(A) = 0.2
45	- - - - - - - - - - - - - - - - - - -					9.15m: B 0°, pl, ro, cln 9.47-9.50m: Cs	С	100	99	PL(A) = 0.8

RIG: Hanjin D8

CLIENT:

PROJECT:

LOCATION:

LendLease Building Pty Ltd

Streets, Randwick

Randwick Campus Redevelopment

Hospital Road and High, Magill and Botany

DRILLER: BG Drilling

LOGGED: SLB

CASING: HW to 2.6

TYPE OF BORING:Solid flight auger to 2.6m, NMLC-coring to 15.32mWATER OBSERVATIONS:No free groundwater observed whilst augeringREMARKS:

	S	SAMPLING	i & IN SITU TEST	TING LEGE	END			
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)			_
в	Bulk sample	P	Piston sample	PL(A) Point load axial test Is(50) (MPa)			
BLK	Block sample	U,	Tube sample (x mm o	dia.) PL(D) Point load diametral test ls(50) (MP	Pa)		1
С	Core drilling	Ŵ	Water sample	pp	Pocket penetrometer (kPa)	, i		
D	Disturbed sample	⊳	Water seep	S	Standard penetration test			
E	Environmental same	ple 📱	Water level	V	Shear vane (kPa)			



SURFACE LEVEL: 54.5 AHD **EASTING:** 336994 **NORTHING:** 6245675 **DIP/AZIMUTH:** 90°/-- BORE No: 103 PROJECT No: 72505.13 DATE: 26/2/2019 SHEET 2 OF 2

Γ		Description	Degree of	ы	Rock Strength	Fracture	Discontinuities	Sa	ampli	ng &	In Situ Testing
R	Depth (m)	of	weathering	Log		Spacing (m)	B - Bedding J - Joint	be	ore S. %	م م	Test Results
	, ,	Strata	H H M M H E M M M H M M H M M M H M M M M	U	Low Very Very Very Very	0.10	S - Shear F - Fault	Γ	с Я	R ~	Comments
	- - - - - - - - - - 11 - - - - - - - -	SANDSTONE: medium and high strength, fresh, slightly fractured, pale grey, medium to coarse grained sandstone with some extremely and very low strength bands						С	100	99	PL(A) = 0.8
-4							>>				PL(A) = 0.7
42	- 12						**				PL(A) = 1.2
41	- 13 - - - - - -						13.75m [.] B.0° pl. ro. clv	С	100	99	PL(A) = 1
40	- - 14 - - - - -						vn				PL(A) = 1.2
	- 15							с	100	100	
- 68 	- 16	Bore discontinued at 15.32m Target depth reached									
- 88 	- - - - 17										
37	- - - - - -										
36	- 18										
35	- - - - - - - - - - - - - - - - - - -										

RIG: Hanjin D8

CLIENT:

PROJECT:

LOCATION:

LendLease Building Pty Ltd

Streets, Randwick

Randwick Campus Redevelopment

Hospital Road and High, Magill and Botany

DRILLER: BG Drilling

LOGGED: SLB

CASING: HW to 2.6

TYPE OF BORING:Solid flight auger to 2.6m, NMLC-coring to 15.32mWATER OBSERVATIONS:No free groundwater observed whilst augeringREMARKS:

	SAM	IPLINC	3 & IN SITU TESTIN	G LEG	END			
1	A Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)		_	_
18	3 Bulk sample	Р	Piston sample	PL(A) Point load axial test Is(50) (MPa)			
1	3LK Block sample	Ux	Tube sample (x mm dia.)) PL(C) Point load diametral test ls(50) (MPa)			
0	C Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)			
	D Disturbed sample	⊳	Water seep	S	Standard penetration test		-	0
1	E Environmental sample	Ŧ	Water level	V	Shear vane (kPa)			Ge



Project No: 72505.13 BH ID: 103 Depth: 2.60 - 7.00m Core Box No: 1/3	BORE: 103	PROJECT: Ra	Indwick F	ebruary 2019
72505-13 26-02-19 START CORE @ 2.60m		Groundwater Project BH ID: 1 Depth: 2 Core Bo	No: 72505.13 03 2.60 – 7.00m x No.: 1/3	
Am An	72505-13 26-02-19 START CL RANDINICK BHIO3 START CL	ORE @ 2.60M		
fm	Bm			
	tm	¥)))	1	
	5m			8

BORE: 103	PROJECT: Randwick	February 2019
Douglas Partn Geotechnics Environment Grou	Project No: 72505.13 BH ID: 103 Depth: 7.00-12.00m Core Box No.: 2/3	
j. r		
4		
	7.00 – 12.00 m	

BORE: 103	PROJ	ECT: Randwick	February 2019
	Groundwater	Project No: 72505.13 BH ID: 103 Depth: 12.00 – 15.32m Core Box No.: 3/3	1.0.1.0.1.0.
2m			
Sm.			
tm			
m	END BH @	215.32m T. D.R	
m	1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 -		
	12	.00 – 15.32 m	

SURFACE LEVEL: 54.4 AHD EASTING: 336981 **NORTHING:** 6245609 **DIP/AZIMUTH:** 90°/--

BORE No: 104 PROJECT No: 72505.13 **DATE:** 27/2/2019 SHEET 1 OF 2

$\left[\right]$		Description	Degree of Weathering	<u>.0</u>	Rock Strength	Fracture	Discontinuities	Sa	amplir	ng & I	In Situ Testing
Ч	Depth (m)	of	· · · · · · · · · · · · · · · · · · ·	Sraph Log		Spacing (m)	B - Bedding J - Joint	/be	ore c. %	aD %	Test Results &
		Strata	H M M M H H		Ex L High Ex F	0.10	S - Shear F - Fault	<u>⊢</u> `	ပမ္ခ	<u>к</u> _	Comments
- 1 <u>7</u>	0.2	Sand filling with building rubble (terracotta pipe, glass), damp SAND: brown, fine to medium sand, damp (possibly filling) SAND: medium dense, yellow-brown						A A A			
53		sand, moist						S	-		2,5,7 N = 12
52	-3							s			5,8,9 N = 17
	-4	3.40m: becoming yellow						A			10/120 refusal
	4.12	SANDSTONE: low to medium									Hammer bouncing
	- 5	slightly weathered, fractured and slightly fractured, red-brown and pale grey, medium to coarse grained sandstone with some extremely to very low strength bands					4.88m: B 0°, pl, ro, cly 5.10-5.15m: B(x3) 0°, pl, ro, cly	С	100	91	PL(A) = 0.3 PL(A) = 0.6
	-6 -7										PL(A) = 0.7
47	-8 8.12	8.12-9.10m: fine to medium grained					8.12m: B 10°, pl, ro, cly	С	100	100	PL(A) = 0.8 PL(A) = 0.3
	-9 9.1	8.43-9.10m: high strength SANDSTONE: medium and high strength, fresh, fractured and slightly					9.1m: B 0°, pl, ro, fg		100	02	. 2, , , – 0.0
45		fractured, pale grey, medium to coarse grained sandstone					9.44m: B 5°-10°, st, ro, cly 8mm		100	90	PL(A) = 1.2

RIG: Hanjin D8

CLIENT:

PROJECT:

LOCATION:

LendLease Building Pty Ltd

Streets, Randwick

Randwick Campus Redevelopment

Hospital Road and High, Magill and Botany

DRILLER: BG Drilling

LOGGED: SLB

CASING: HW to 4.12m

TYPE OF BORING: Solid flight auger to 4.12m, NMLC-coring to 15.81m WATER OBSERVATIONS: No free groundwater observed whilst augering **REMARKS:**

	SAM	IPLIN	G & IN SITU TESTING	LEG	END				
	A Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)		_	_	-
	B Bulk sample	P	Piston sample	PL(/	A) Point load axial test Is(50) (MPa)				
	BLK Block sample	U,	Tube sample (x mm dia.)	PL(I	D) Point load diametral test ls(50) (MPa)				
	C Core drilling	Ŵ	Water sample	pp	Pocket penetrometer (kPa)		7.40		
	D Disturbed sample	⊳	Water seep	S	Standard penetration test				^ / /
	E Environmental sample	ž	Water level	V	Shear vane (kPa)	Geotechnics	s I Envir	onment	Groundwater
1									

SURFACE LEVEL: 54.4 AHD **EASTING:** 336981 **NORTHING:** 6245609 **DIP/AZIMUTH:** 90°/-- BORE No: 104 PROJECT No: 72505.13 DATE: 27/2/2019 SHEET 2 OF 2

		Description	Degree of Weathering	<u>0</u>	Rock Strength	Fracture	Discontinuities	Sa	amplii	ng &	In Situ Testing
R	Depth (m)	of Strata	2 2 2 2 0 ~	Graph Log		Spacing (m)	B - Bedding J - Joint S - Shear F - Fault	Type	Core tec. %	RQD %	Test Results
44		SANDSTONE: medium and high strength, fresh, fractured and slightly fractured, pale grey, medium to coarse grained sandstone (continued) 10.92m: siltstone laminations and clasts					10.93-10.96m: B(x2) 0°-20°, cu, ro, cbs 11.02m: J 90°, pl, ro, cly	С	100	98	PL(A) = 1.2 PL(A) = 0.8
42	- 12	12.00-12.35m: indistinct siltstone laminations					12.2m: B 5°, pl, ro, cly ∫5mm 12.34m: B 10°, pl, ro, fg 12.71-12.74m: Cs				PL(A) = 1.1
41	- - - - - - - - - - - - - - - - -	13.81-15.81m: indistinct siltstone					13.24-13.30m: J 70°, pl, ro, cln 13.81-13.85m: J 45°, pl, ro, clv 3mm	С	100	99	PL(A) = 0.9
40	- - - - - - - - - -						13.85m: B 5°, pl, ro, cly vn				PL(A) = 1.3
39								с	100	100	PL(A) = 0.9
38	- 16	Bore discontinued at 15.81m Target depth reached									
	- - 17 - -										
36	- - - 18 - -										
2	- - - - 19 -										
36	- - - - -										

RIG: Hanjin D8

CLIENT:

PROJECT:

LOCATION:

LendLease Building Pty Ltd

Streets, Randwick

Randwick Campus Redevelopment

Hospital Road and High, Magill and Botany

DRILLER: BG Drilling

LOGGED: SLB

CASING: HW to 4.12m

TYPE OF BORING:Solid flight auger to 4.12m, NMLC-coring to 15.81mWATER OBSERVATIONS:No free groundwater observed whilst augeringREMARKS:

	SAM	PLIN	3 & IN SITU TESTING	ILEGE	IND			
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)		_	_
B	Bulk sample	Р	Piston sample	PL(A) Point load axial test Is(50) (MPa)			
B	LK Block sample	U,	Tube sample (x mm dia.)	PL(D) Point load diametral test ls(50) (MPa)			
C	Core drilling	Ŵ	Water sample	pp	Pocket penetrometer (kPa)			
D	Disturbed sample	⊳	Water seep	S	Standard penetration test			0
E	Environmental sample	¥	Water level	V	Shear vane (kPa)			Geo



BORE: 104	PRO	JECT: Randwick	February 2019
	rtners Groundwater	Project No: 72505.13 BH ID: 104 Depth: 4.12 – 9.00m Core Box No.: 1/3	
72505-13 27-02-14 STAPT RANDUICK BHIOLOGER			
5m 6m			
7m			
		4.12 – 9.00 m	

BORE: 104	PRO	JECT: Randwick	February 2019
Ceotechnics Environment C	tners Groundwater	Project No: 72505.13 BH ID: 104 Depth: 9.00-14.00m Core Box No.: 2/3	
m			1
N			
n			
	9	.00 – 14.00 m	

BO	RE: 104	PROJ	ECT: Randwick	February 2019
(Douglas Par	tners Groundwater	Project No: 72505.13 BH ID: 104 Depth: 14.00 – 15.81m Core Box No.: 3/3	
4m .			and the second for the second former	END BH@15.81m
6m Im				
7m 1	-			
		14	.00 – 15.81 m	

CLIENT:LendLease Building Pty LtdPROJECT:Randwick Campus RedevelopmentLOCATION:Hospital Road and High, Magill and Botany
Streets, Randwick

SURFACE LEVEL: 51.6 AHD **EASTING:** 337006 **NORTHING:** 6245565 **DIP/AZIMUTH:** 90°/-- BORE No: 105 PROJECT No: 72505.13 DATE: 27 - 28/2/2019 SHEET 1 OF 2

		Description	Degree of	.0	Rock Strength		Fracture	Discontinuities	Sa	amplii	ng & I	n Situ Testing
R	Depth (m)	of	Weathering	Log		vvale	Spacing (m)	B - Bedding J - Joint	/be	ore c. %	aD %	Test Results
		Strata	H M M M M M M M M M M M M M M M M M M M		High High	6	0.05	S - Shear F - Fault	ЃГ	ΟĐ	Ϋ́ς	Comments
0 51	- 0.3	FILLING: grey-brown, fine to medium sand filling with some building rubble (concrete, terracotta [fragments], humid SAND: medium dense, yellow-brown, fine to medium sand, damp							A A A S			3,5,6 N = 11
49	-2 2.0	SAND: loose, yellow-brown mottled brown, medium to coarse sand with some clay, trace of decomposed wood and ironstone gravel, moist							A S			2,2,2 N = 4
- 48	3.9	5 SAND: loose, dark brown, fine to medium sand with some silt, wet										15/100
-	-4 4.1	3.9m: becoming saturated				n			s			refusal Hammer
6 47 47		SANDS I ONE: low to medium strength, slightly weathered and fresh, fractured and slightly fractured, medium to coarse grained, red-brown and pale grey sandstone with some extremely low strength bands				70-17		4.19-4.51m: B(x4) 5°-10°, pl, ro, cly, fe 4.93m: J 30°, pl, ro, cly	с	100	74	bouncing PL(A) = 0.2 PL(A) = 0.7
45	- 6							5.76m: B 0°, pl, ro, cly vn				PL(A) = 0.4
	- 7 - 7.2: 	³ SANDSTONE: medium and high strength, fresh, slightly fractured, pale grey, medium to coarse grained sandstone with some very low strength bands						6.88m: B 0°-10°, st, ro, cly 5mm 7.35m: B 0°, pl, ro, cly vn	С	100	97	PL(A) = 0.7
43	ļ											PL(A) = 0.9
42	- - - 9 - - - - - - - - - - - -								с	100	93	PL(A) = 1.2

RIG: Hanjin D8

DRILLER: BG Drilling

LOGGED: SLB

CASING: HW to 4.1m

TYPE OF BORING:Solid flight auger to 4.1m, NMLC-coring to 15.50mWATER OBSERVATIONS:Free groundwater observed at 3.9m whilst augeringREMARKS:

	SA	MPLING	S & IN SITU TESTING	LEGE	END	
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)	
в	Bulk sample	Р	Piston sample	PL(A) Point load axial test Is(50) (MPa)	
BLK	Block sample	U,	Tube sample (x mm dia.)	PL(D) Point load diametral test ls(50) (MPa)	
С	Core drilling	Ŵ	Water sample	pp	Pocket penetrometer (kPa)	
D	Disturbed sample	⊳	Water seep	S	Standard penetration test	
E	Environmental sample	e 📱	Water level	V	Shear vane (kPa)	



SURFACE LEVEL: 51.6 AHD **EASTING:** 337006 NORTHING: 6245565 **DIP/AZIMUTH:** 90°/--

BORE No: 105 **PROJECT No:** 72505.13 DATE: 27 - 28/2/2019 SHEET 2 OF 2

		Description	Degree of	U	Rock Strength	Fracture	Discontinuities	Sa	ampli	ng &	In Situ Testing
RL	Depth (m)	of	Weathering	Log		Spacing (m)	B - Bedding J - Joint	be	ore c. %	D D S D S	Test Results
	. ,	Strata	H H M S S R H	0	Ex Low Medi High Ex H	0.05 0.10 0.50	S - Shear F - Fault	Ê	ပိမ္ဆိ	Ж °,	Comments
0 41 1		SANDS I ONE: medium and high strength, fresh, slightly fractured, pale grey, medium to coarse grained sandstone with some very low strength bands <i>(continued)</i>					10.02m: J 30°-40°, cu, ro, cln 11.11-11.12m: B 0°, pl, ro, fg	с	100	93	PL(A) = 1 PL(A) = 0.8
39 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	- 12 - 13	13.32.14.68m indictinct and distinct						с	100	99	PL(A) = 1
	- 14	carbonaceous laminations					13.66-13.68m: Cs				PL(A) = 0.6
	- 15							с	100	95	PL(A) = 0.8
36	- 15.5	_ 15.40-15.50m: carbonaceous flecks Bore discontinued at 15.5m		[<u></u>		<u> </u> 					PL(A) = 0.8
32	- 16 - 17 - 18 - 19	Target depth reached									

RIG: Hanjin D8

CLIENT:

PROJECT:

LOCATION:

LendLease Building Pty Ltd

Streets, Randwick

Randwick Campus Redevelopment

Hospital Road and High, Magill and Botany

DRILLER: BG Drilling

LOGGED: SLB

CASING: HW to 4.1m

TYPE OF BORING: Solid flight auger to 4.1m, NMLC-coring to 15.50m WATER OBSERVATIONS: Free groundwater observed at 3.9m whilst augering **REMARKS:**

	SAN	IPLIN	G & IN SITU TESTING	LEG	END				
	A Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)		-	_	_
	B Bulk sample	Р	Piston sample	PL(A	A) Point load axial test Is(50) (MPa)				4 m o no
	BLK Block sample	U,	Tube sample (x mm dia.)	PL([D) Point load diametral test Is(50) (MPa)				Iners
	C Core drilling	Ŵ	Water sample	pp	Pocket penetrometer (kPa)		7140		
	D Disturbed sample	⊳	Water seep	S	Standard penetration test				^ / /
	E Environmental sample	Ŧ	Water level	V	Shear vane (kPa)	📕 Geotechnic	s Envir	onment I	Groundwater
•									

ry 2019	February	JECT: Randwick	PRO	BORE: 105
	. lu o ulu	Project No: 72505.13 BH ID: 105 Depth: 4.10 – 9.00m Core Box No.: 1/3	Partners	Ceotechnics Environn
				13 23-02 A STATE CORE OK BHIOSGEFION
	1	**		
• • • • • • • • • • • • • • • • • • •				
•				

BORE: 105	PRO	JECT: Randwick	February 2019
Douglas Part	ners oundwater	Project No: 72505.13 BH ID: 105 Depth: 9.00-14.00m Core Box No.: 2/3	
M			
Dm ACL			
m			
M		The second s	
m			
	9.	00 – 14.00 m	

BORE: 105	PRO	JECT: Randwick	February 2019
	artners t Groundwater	Project No: 72505.13 BH ID: 105 Depth: 14,00 – 15.50n Core Box No.: 3/3	
4m J C			
5-		END BH @ 15	5.50m T.D.R
6m			
7 _m			
18m			
	14	I.00 – 15.50 m	

SURFACE LEVEL: 56.3 AHD^ EASTING: 337123.2 NORTHING: 6245657.1 DIP/AZIMUTH: 90°/--

BORE No: 1 **PROJECT No: 85461.00 DATE:** 26/5/2016 SHEET 1 OF 1

		Description	Degree of Weathering .≌	Rock Strenath	Fracture	Discontinuities	Sa	mplir	ng & l	n Situ Testing
ᆋ	Depth (m)	of			e Spacing (m)	B - Bedding J - Joint	be	ore : %	° %	Test Results
		Strata	N N N N N N N N N N N N N N N N N N N	Ex Lo Medic Very I Very I Ex High	V 0.01 0.10 1.00	S - Shear F - Fault	Ty	Rec	R S	∝ Comments
	- 0.31	CONCRETE SLAB FILLING - apparently moderately compacted, orange-brown and grey, gravelly clayey sand filling with a				Note: Unless otherwise	E			
55	- - 1 - 1.05 -	trace of sandstone cobbles, damp SANDSTONE - extremely low and very low strength, orange-brown and				along rough planar bedding dipping 0°- 10°				
-	- 1.5	sandstone with some iron-cemented bands					E			PL(A) = 0.04
54	-2	SANDSTONE - extremely low and very low strength, extremely then highly weathered, slightly fractured, red-brown orange-brown and grey				2.06m: B0°, cly, 10mm 2.12m: B0°, cly, 30mm	С	100	76	
ŀ	- 2.58	medium to coarse grained				² .26m: B0°, cly, 30mm				PL(A) = 0.08
	-3	bands - very fine grained sandstone/siltstone below 2.3m				2.67 & 2.78m: B0°, cly vn, fe stn				PL(A) = 0.09
-83 -13	3.38	SANDSTONE - very low strength, moderately weathered, slightly fractured, pink-grey, and pale grey				3.28m: B0°, cly, 20mm 3.3-3.36m: J90°, pl, ro,				PL(A) = 0.08
-		fine to medium grained sandstone with up to 15% siltstone laminations SANDSTONE - medium and high				cly vn 3.37m: B0°, cly, 20mm 3.7m: B5°, cly vn	С	100	96	PL(A) = 0.6
52	-	strength, slightly then moderately weathered, slightly fractured, pale grey, grey and purple-brown, medium to coarse grained				4.31m: Ds, 150mm				PL(A) = 1.2
-	-5	sandstone with some extremely low strength, extremely weathered bands and some iron-cemented				4.57 & 4.74m: B5°, cly vn				
51 -	-	bands				5.11 & 5.37m: B5°, cly vn 5.14 & 5.44m: B0°, cly, 10mm				PL(A) = 0.4
-	- 5.91 - 6	SANDSTONE - medium strength,				5.45-5.52m: J45°, ir, ro 5.68m: B5°, cln				
- 9 <u>5</u>	-	medium to coarse grained sandstone with some extremely low strength bands				6.11m: B0°, cly, 15mm 6.26m: B0°, cly vn	с	100	89	PL(A) = 0.6
-	- 7					7.18m: B0°. clv vn				PL(A) = 0.7
-	-					7.89 & 7.91m: B5°, cly				
Ē	-8 7.97	Bore discontinued at 7 97m				vn				
-84	- - -	- target depth reached								
-	- - -									
47	-9 - -									
-	- - -									
Ľ	[

RIG: Bobcat

CLIENT:

PROJECT:

Health Infrastructure

LOCATION: Prince of Wales Hospital, Randwick

Site Infrastructure Investigation

DRILLER: GM

LOGGED: MP

CASING: HW to 1.5m TYPE OF BORING: Diacore to 0.31m; NDD to 1.05m; Solid flight auger to 1.55m; NMLC-Coring to 7.97m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: NDD = Non destructive suction drilling. ^Surface level provided by LTS Lockley Pty Ltd

SAMPLING & IN SITU TESTING LEGEND											
A Auger sa	mple	G	Gas sample	PID	Photo ionisation detector (ppm)						
B Bulk san	ple	Р	Piston sample	PL(A) Point load axial test Is(50) (MPa)						
BLK Block sa	nple	U,	Tube sample (x mm dia.)	PL(C) Point load diametral test Is(50) (MPa)		1.1		125		artners
C Core dri	ing	Ŵ	Water sample	pp	Pocket penetrometer (kPa)			DUGA	143		
D Disturbe	d sample	⊳	Water seep	S	Standard penetration test				1.11.11.11		
E Environn	ental sample	Ŧ	Water level	V	Shear vane (kPa)		1	Geotechnics	Envir	onmen	t Groundwate





CLIENT: **Bovis Lend Lease** PROJECT: Wallace Wurth Redevelopment LOCATION: Cnr High & Botany St, UNSW, Kensington SURFACE LEVEL: 55.8 AHD BORE No: 2 EASTING: NORTHING:

DIP/AZIMUTH: 60°/0

PROJECT No: 71543 DATE: 01 Feb 10 SHEET 1 OF 2

Douglas Partners Geotechnics · Environment · Groundwater

				Degree of	1	Rock 1						- 016 T - 1
	D	,,,,	Description	Weathering	iii –	Strength	Fracture	Discontinuities	Sar	mplin	lg & I	n Situ Testing
Ъ	el (n	וזים רו	of		Log		(m)	B - Bedding J - Joint	ed.	ore %	8~	Test Results ع
	,	Ĩ	Strata	MA MA S S MA S S S S S S S S S S S S S S S S S S S	Ø		500 100 100 100 100 100 100 100 100	S - Shear D - Drill Break	Тy	ပိန္ဆို	۳°,	Comments
98	-	0.1	FILLING - dark grey, fine grained, silty sand filling with some rootlets (topsoil)		\bigotimes				A A A			
	- 1	1.0	FILLING - dark grey brown, fine to medium grained, sand filling with a trace of gravel, humid		\bigotimes				A/E A			
			FILLING - light grey, fine to medium grained, sand filling with a trace of concrete fragments		\bigotimes				A/E			
	-2	1.8	SAND - orange and light grey, fine to medium grained sand, moist		××				A/E			
- 85												
	-3	35					 		Δ			
69	-4	0.0	SAND - orange brown, medium grained sand, moist					Note: Unless otherwise stated, rock is fractured along rough planar bedding dipping 0°- 10° or laitte				
		4.3 4.65	SANDSTONE - extremely low and very low strength, extremely to highly weathered, light grey then light grey brown medium to coarse	╡╽╽╎╿╿ │╿║╵╵╿ │ ┫┨┆╤╧			┦ ┃╎ ┤ ┃╎ ┶ <u>╾┦┤╺┼╆</u> ╾	4.65m: CORE LOSS:				
)9 	-5		grained sandstone with extremely low strength, igneous rock inclusions					4.75-4.85m: dyke	с	92	0	
	-6	6.52	SANDSTONE - medium then high					6.33-7.25m: dyke 6.53-7.25m: highly	с	100	0	PL(A) = 0.7MPa
62	-7	7.2	slightly weathered, highly fractured to fractured, grey and brown, medium to coarse grained					sandstone (dyke) in subvertical joints		 		
			sanostone with extremely low strength, igneous rock inclusions (cooked sandstone)		X			480mm 7.68-7.78m: fragmented	c	62	o	PL(A) = 1.9MPa
63	-8	8.4	IGNEOUS ROCK & SANDSTONE	┥ ┥ ┥ ┥ ┥ ┥ ┥ ┥ ┥ ┥ ┥ ┥ く く く く く く く く				7.88-8.13m: J, subvertical, rough 8.05-8.08m: clay band 8.13m: J75°, rough				PL(A) = 4.9MPa
	9		extremely low and very low strength, extremely and highly weathered, grey and orange brown, medium to coarse grained sandstone with frequent igneous rock intrusions. Some high strength fractured bands					8.28-8.31m: clay band 8.31m: J, subvertical, ironstained 8.4m: CORE LOSS: 1050mm 9.45-9.65m: fragmented to 0.02m intervals	c	34	0	PL(A) = 1.3MPa
R	- G:	Bob	cat DRIL	LER:Steve	I√: s		GGED: SI	CAS	ING:	<u> </u> нw	to 2.	<u> </u> 6m

CHECKED

//0

Initials: STE

Date: /7

TYPE OF BORING: Solid flight auger to 2.5m; Rotary to 4.65m; NMLC-Coring to 14.4m WATER OBSERVATIONS: No free groundwater observed whilst augering **REMARKS:** Standpipe installed to 14.4m

SAMPLING & IN SITU TESTING LEGEND Auger sample Disturbed sample Buik sample Tube sample (x mm dia.) Water sample Core drilling A D B U, W

- J IES I ING LEGEND

 pp
 Pocket penetrometer (kPa)

 PID Photo ionisation detector

 S
 Standard penetration test

 PL
 Point load strength Is(50) MPa

 V
 Shear Vane (kPa)

 D
 Water seep

SURFACE LEVEL: 55.8 AHD BORE No: 2 EASTING: **NORTHING:**

DIP/AZIMUTH: 60°/0

PROJECT No: 71543 **DATE:** 01 Feb 10 SHEET 2 OF 2

Г		Description	Degree of	Rock	Fracture	Discontinuities	Sa	mplir	1a &	In Situ Testina
<u>a</u>	Depth	of	Weathering E	Strength	Spacing (m)	B - Bedding J - Joint	e	e%		Test Results
	1 (11)	Strata	₩₩₩₩₩₩₩₩ ₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩	(이 이 이 이 이 이 이 이 이 이 이 이 이 이 이 이 이 이 이	0.01	S - Shear D - Drill Break	Typ	Rec. Co	R0 8	& Comments
	10.0	IGNEOUS ROCK & SANDSTONE - extremely low and very low strength, extremely and highly weathered, grey and orange brown, medium to coarse grained sandstone with frequent igneous				10m: CORE LOSS: 450mm 10.45-10.6m: fragmented to 0.01m intervals	с	50	0	
	-11 8	fractured bands (continued)				10.9m: CORE LOSS: 1100mm	с	19	0	
	-12 12.0	SANDSTONE - alternate bands of very low and medium to high strength, highly and moderately to slightly weathered, fragmented to slightly fractured, light grey and brown, coarse grained sandstone with bands of igneous rock intrusions				12.0-12.25m: fragmented 12.3m: J80°, healed 12.37m: J20°, ironstained "12.43m: J15°, ironstained 12.47-12.6m: very low strength band 12.64m: J70°, healed	с	88	0	PL(A) = 1.7MPa
	- 13.56 - 14 2 - 14 3 - 14.35	Para discontinued at 14 4m				12.8m: J65°, ironstained 12.92m: B0°, very low strength band 13.13m: J80°, healed 13.29m: J65°, ironstained very low strength band 13.4m: J30°, ironstained				
	-15					very low strength band 13.48-13.56m; fragmented in 0.02mm intervals 13.56m; CORE LOSS; 200mm 13.76m; J60°, ironstained 13.76-13.92m; fragmented 14.05				
	- 16 					14.15m: J70°, ironstained, clay band 14.25m: J50°, ironstained 14.3-14.4m: fragmented 14.3-5m: CORE LOSS: 50mm				
	- 18									

RIG: Bobcat

CLIENT:

Bovis Lend Lease

PROJECT: Wallace Wurth Redevelopment

LOCATION: Cnr High & Botany St, UNSW, Kensington

DRILLER: Steve S

LOGGED: SI

CASING: HW to 2.6m

TYPE OF BORING: Solid flight auger to 2.5m; Rotary to 4.65m; NMLC-Coring to 14.4m WATER OBSERVATIONS: No free groundwater observed whilst augering **REMARKS:** Standpipe installed to 14.4m

ADBU,WC

SAMPI Auger sample Disturbed sample Bulk sample Tube sample (x mm dia.) Water sample Core drilling

SAMPLING & IN SITU TESTING LEGEND pp Pocket penetrometer (kPa) PID Photo innisation detector S Standard penetration test mm dia.) PL Point load strength Is(50) MPa V Shear Vane (kPa) P Water seep ¥ Water level

Initials: SPEDate: 17











SURFACE LEVEL: 56.2 AHD BORE No: 3 EASTING: NORTHING:

DIP/AZIMUTH: 90°/--

PROJECT No: 71543 DATE: 3-8 Feb 2010 SHEET 1 OF 2

			Description	De	egree of		<u>u</u>		Ro	ock	th		Fracture		e	Discontinuities	Sampling &			n Situ Testing
R	Dep (m	oth i)	of	1446	anen	· ·y	iraph: Log	, ₹ -		<u>=</u> [등 로 출	Vate	8	spacing (m)	g	B - Bedding J - Joint	/pe	ore م	0%	Test Results
L			Strata	₿₹	M N N	2 8	0 ~~~	Ц Ц	ê ĕ				0.01	0.05	8	S - Shear D - Drill Break	Ĥ	ŭğ	Ϋ́, Ϋ́,	Comments
-8	-		FILLING - dark brown, sand tilling			ļ	\bigotimes	ļ		ļ			ļ		i					
È	-					i	\bigotimes	1		ļ							_ <u>A</u>			
	-	0.7	SAND - medium dense, light				SX/													
	-1		brown, fine to medium grained sand			1	· • • • •												ļ	460
-8	-			ļ	İİİ	i		İ	ii	ļ	İİ		i	ii i	i		S			4,6,9 N = 15
ŀ	-					į	••••	Ì	ii	į	ij		ļ		i					
ŀ						i				I										
-3	-2																S			3,6,11
-			- yellow below 2.2m			1				-										N = 17
ŀ				ļ	İİİ	İ		ļ	ii	į	ļ		l	ii i		Note: Unless otherwise	~			
Ē	-3									ļ	ij		i.		i	along rough planar				
-8		3.2	IGNEOUS ROCK (DYKE) -			1	 			ļ	 		1			10° or joints				
È	•		extremely low to very low strength, extremely to highly weathered, light				X								1					
ŀ	-		grey to red brown, igneous rock (dvke)			1	$ \times\rangle$						l							
[-4				i i i	1	$\langle \cdot \rangle$	lli	İ	į	İİ		i	ii i	i					
-8						ļ	X	ίĽ		Ì			l		j		с	90	0	
ł						ļ	$\langle \cdot \rangle$						l							
F		4.86			 ⊳lat	+	¥		∄	⊢ ⊢-ह≍		- T	-	┙ ╡		4.86m: CORE LOSS:				
-5	-5			T			\mathbf{X}		11			3-10	Ī	ΗĻ		140mm				
È					İİİ	į	X X		i	i	ļį	5	ļi –	ii i	İ,					
ŧ		5 9				ļ	X			I			į		ļ	5				
-	-6	5.0		N		Y	Λ	N			1	1			1	5.8m: CORE LOSS: 1200mm	с	40	0	
-8	-				\!/	1	V		N		X 			XZ	/				}	
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ŧ	È			X		ý	$ / \rangle$	ļ	4 i		Ŋ		li/	<u>1i i</u>	Ň					
ŀ.	-7	7.0	ROTARY DRILLING	ſ		$\frac{1}{1}$	ľ	ľ				ľ	Ł			7.0-9.5m: rotary drilling				
Ē								li								dyke				
Ē					 	1														
È	La																R			2
48	ľ			ļ	İİİ	į		ļį	İ		ii		ļ		İ					
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È	-9									 	11						├──	-	1	
47	Į					1	1		 	 										
Ē		9.5	IGNEOUS ROCK - description next			İ	<u> </u>	1I	İ				1							
ŧ			page		<u>ti</u> li		X	ļļ]i			ļ			9.7-9.95m: fragmented into 0.05mm intervals	C	83	0	PL(A) = 0.8MPa
L	I		L	<u>. I</u>	+• I		14,	4 1		-	11		11			into viconini interveta	1	1	1	1

RIG: Bobcat

CLIENT:

Bovis Lend Lease PROJECT: Wallace Wurth Redevelopment

LOCATION: Cnr High & Botany St, UNSW, Kensington

DRILLER: Steve S

LOGGED: SI

CASING: HW to 3.6m

TYPE OF BORING: Solid flight auger to 3.6m; NMLC-Coring to 7.0m; Rotary to 9.5m; NMLC-Coring to 13.0m; Rotary to 14.5m; NMLC-Coring to 15.15m WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Groundwater well installed to 18.0m. Water measured in well at 4.9m on 5/3/10

SAMPLING & IN SITU TESTING LEGEND Auger sample Disturbed sample Bulk sample Tube sample (x mm dia.) Water sample Core drilling A D B U,W C

 TESTING LEGEND

 pp
 Pocket penetrometer (kPa)

 PID
 Photo ionisation detector

 Standard penetration test

 PL
 Point load strength (s(50) MPa

 V
 Shear Vane (kPa)

 Vater seep
 Water level



Douglas Partners Geotechnics · Environment · Groundwater

SURFACE LEVEL: 56.2 AHD BORE No: 3 EASTING: NORTHING:

DIP/AZIMUTH: 90°/--

PROJECT No: 71543 DATE: 3-8 Feb 2010 SHEET 2 OF 2

		Description	Degree of Weathering	Rock Strength	Fracture	Discontinuities	Sa	mplir	ng & I	In Situ Testing
RL	Depth (m)	of Strata	EW HW SSW Graph Craph		5pacing (m) (m)	B - Bedding J - Joint S - Shear D - Drill Break	Type	Core Rec. %	RQD %	Test Results & Comments
46		IGNEOUS ROCK (DYKE) - extremely low to very low and medium strength, extremely to highly weathered, fractured, light grey brown to red brown, igneous rock with medium strength sandstone bands				10m: CORE LOSS: 100mm 10.6m: J70°, clay band 11.2-11.6m: fragmented in 0.02mm intervals	с	69	0	
44	-11.77 -12					11.77m: CORE LOSS: 830mm 12.6-12.8m: fragmented				PL(A) = 0.6MPa PL(A) = 0.5MPa
43	_13 ^{12.95} 13.0	ROTARY DRILLING				in 0.02 to 0.05mm intervals 12.8-12.95m: clay band 12.95m: CORE LOSS: 50mm 13.0-14.15m: rotary drilling to weathered rock	R			
42	14.15	SANDSTONE - high then medium strength, highly to moderately weathered, fractured, red brown, coarse grained sandstone (cooked sandstone)				14.23m: J10°, 30mm clay 14.23-14.43m: (x4) B0°- 5°, ironstained 14.59m: B0°, 20mm clay	c	100	0	PL(A) = 2.1MPa
, , , , , , , , , , , , , , , , , , ,	~15 15.15	extremely low to very low strength, extremely weathered, light grey brown, igneous rock (dyke) ROTARY DRILLING				[74.74-14.8m: extremely low strength dyke 14.78-15.15m: extremely low strength dyke				
40	-17						R			
38	- 17.2 - 18 - 18.3	IGNEOUS ROCK (DYKE) - high to very high strength, fresh stained, fractured to slightly fractured, light greenish grey and brown, igneous rock (dyke). Some medium strength bands				17.2m: J, subvertical, healed, ironstained 17.3m: J70°, healed, ironstained 17.4-17.6m: J, subvertical, partially healed, fragmented into	с	100	63	PL(A) = 9.2MPa PL(A) = 3MPa PL(A) = 0.7MPa
<u>4</u> 8	-19	Bore discontinued at 18.3m				17.74m: J85°, partially healed 17.85m: J70° 18.07m: J65°, rough 18.21-18.3m: J75°, clay smear & fragmented into 0.03mm intervals				

RIG: Bobcat

Core drilling

CLIENT:

PROJECT:

Bovis Lend Lease

Wallace Wurth Redevelopment

LOCATION: Cnr High & Botany St, UNSW, Kensington

DRILLER: Steve S

LOGGED: SI

CASING: HW to 3.6m

Douglas Partners Geotechnics · Environment · Groundwater

TYPE OF BORING: Solid flight auger to 3.6m; NMLC-Coring to 7.0m; Rotary to 9.5m; NMLC-Coring to 13.0m; Rotary to 14.5m; NMLC-Coring to 15.15m WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Groundwater well installed to 18.0m. Water measured in well at 4.9m on 5/3/10

SAMPLING & IN SITU TESTING LEGEND Auger sample Disturbed sample A D B U W C








CLIENT: Bovis Lend Lease PROJECT: Wallace Wurth Redevelopment LOCATION: Cnr High & Botany St, UNSW, Kensington

SURFACE LEVEL: 55.9 AHD BORE No: 5 EASTING: NORTHING: DIP/AZIMUTH: 90°/--

PROJECT No: 71543 DATE: 01 Feb 10 SHEET 1 OF 1

_					,					
	_	Description	Degree of Weathering	<u>.</u>	Rock Strength	Fracture	Discontinuities	Samp	oling &	In Situ Testing
RL	Depth	of	rounding	ap 10		Spacing (m)	B - Bedding J - Joint	o e	% O	Test Results
		Strata	≳≧≧≷ഗ⊮	త –	- [신한] 20 20 20 20 20 20 20 20 20 20 20 20 20	85 88	S - Shear D - Drill Break	Col 1	S D S	Comments
54	0. 1 0. 2 2.	FILLING - dark grey brown, fine grained, silty sand filling (topsoil) with some organic matter and a trace of concrete cobble and crushed sandstone fragments FILLING - brown, fine to medium grained, sand filling with some silt and gravel and a trace of slag and ceramic tile fragments, humid FILLING - light brown, medium grained, sand filling with some crushed sandstone SAND - medium dense, orange						A A A A A A A A A A A A A A A A A A A		3,8,8 N = 16
	- 3	and light grey, fine to medium grained sand, moist						A S		6,10,12 N = 22
51 52 52		SANDSTONE - very low strength, orange brown, medium grained					Note: Unless otherwise stated, rock is fractured along rough planar bedding dipping at 0°- 10°	S		9,10,13 N = 23 20.20/25mm
	5	sandstone			<u> </u>			S		refusal
48 49 50		SANDSTONE - medium then high strength, slightly then moderately weathered, slightly fractured, light grey brown then red brown, medium to coarse grained sandstone					6.1m: B0°, ironstained 6.62m: B0°, 5mm sandy clay 6.65m: B0°, 10mm sandy clay 7.44 & 8.28m: (x2) B0°- 5°, clay veneer	C 10	00 99	PL(A) = 0.5MPa PL(A) = 0.4MPa PL(A) = 1.1MPa
	- - - - - - - - - - - - - - - - - - -	Bore discontinued at 8.8m								PL(A) = 1.1MPa
46	-9									

RIG: Bobcat

DRILLER: Steve S

LOGGED: SI

CASING: HW to 5.8m

TYPE OF BORING: Solid flight auger to 5.5m; Rotary to 5.8m; NMLC-Coring to 8.8m WATER OBSERVATIONS: No free groundwater observed whilst augering **REMARKS:**

SAMPLING & IN SITU TESTING LEGEND Auger sample Disturbed sample Bulk sample Tube sample (x mm dia.) Water sample Core drilling A D B U, W C

 PD
 Pocket penetrometer (kPa)

 PID
 Photo tonisation detector

 S
 Standard penetration test

 PL
 Point load strength Is(50) MPa

 V
 Shear Vane (kPa)

 D
 Water seep







CLIENT: **Bovis Lend Lease** PROJECT: Wallace Wurth Redevelopment LOCATION: Cnr High & Botany St, UNSW, Kensington SURFACE LEVEL: 55.8 AHD BORE No: 7 EASTING: **NORTHING:**

DIP/AZIMUTH: 90°/--

PROJECT No: 71543 DATE: 29 Jan 10 SHEET 1 OF 1

Γ	T		Description	De	əgr	ee of			Ro	ck.	Т	}	Fracture		Discontinuities	Sa	moli	na &	n Situ Testina
	De le	epth	of	We	atł	nering	기분명	। Si ा₃ा	trei	ngth T	ater –		Spacing		D. Dadefina I. Jakat	0			Test Results
		m)	Strata	λĄ	Ň	N S I	5		<u>Vedium</u>	[특[원] [[코]		5.01	성은 명일 (m)		S - Shear D - Drill Break	Ţyp	Rec Of	RQI %	& Comments
		0.1 0.4	FILLING - brown, fine grained, silty sand filling (topsoil) with some gravel and rootlets				×									A A A/E A/E			
55	3-		sandstone filling, humid FILLING - light to dark brown, fine to medium grained sand filling, with				\bigotimes									A/E			
-	Ē		a trace of gravel, humid to moist 1.3-1.45m: concrete fragments				\bigotimes												
54	-2	1.5	FILLING - light brown, fine to medium grained sand with some sandstone gravel (possible natural)													A			
																s			4,5,5 N = 10
	-3	3.0	SAND - medium dense, orange brown, medium grained sand, moist		 														N - 10
					 							 				AA			11 15 20/10mm
															Note: Unless otherwise stated, rock is fractured along rough planar bedding dipping at 0°-	S			refusal
	-5	4.9 5.2	SANDSTONE - very low strength, light grey brown, medium grained \sandstone												10° or joints				PI (A) = 0 6MPa
	6	5.68	SANDSTONE - medium strength, moderately weathered, fractured to slightly fractured, red brown, medium grained sandstone												5.42m: B5°, clay veneer 5.58m: B10°, 10mm sandy clay 5.63m: B5°, 50mm clay				FL(A) = 0.000Fa
			SANDSTONE - medium then high strength, slightly weathered and fresh, unbroken, light grey and red brown, medium to coarse grained, massive sandstone									i 1 1			5.68-8.35m: massive sandstone				PL(A) = 0.8MPa
- 07 	₽ -7															c	100	97	
	-																•		PL(A) = 0.9MPa
	-8	8.35	Deve diversities 1 1 0 05						1 										PL(A) = 1.4MPa
			Bore discontinued at 8.35m																
	-9 - -																		
46														1					

RIG: Bobcat

DRILLER: Steve S

LOGGED: SI

CASING: HW to 5.0m

TYPE OF BORING: Solid flight auger to 5.2m; NMLC-Coring to 8.35m WATER OBSERVATIONS: No free groundwater observed whilst augering **REMARKS:**

SAMPLING & IN SITU TESTING LEGEND A D B U,W C

Auger sample Disturbed sample Bulk sample Tube sample (x mm dia.) Water sample Core drilling

p Pocket penetrometer (kPa) pPocket penetrometer (kPa) PID Photo ionisation detector S Standard penetration test PL Point load strength Is(50) MPa V Shear Vane (kPa) D Water seep ₹ Water level







SURFACE LEVEL: 55.1 AHD^ EASTING: NORTHING:

DIP/AZIMUTH: 90%--

BORE No: 5 PROJECT No: 73492 DATE: 7/6/2013 SHEET 1 OF 1

Depth (m) of Strata	5,3,2 N = 5
Image: Strata Image: Strata <thimage: strata<="" th=""> <thimage: strata<="" t<="" td=""><td>2 % & <u>Comments</u> 5,3,2 N = 5 2,2,4 N = 6</td></thimage:></thimage:>	2 % & <u>Comments</u> 5,3,2 N = 5 2,2,4 N = 6
0.1 CONCRETE Image: Solution of the soluticon of the solution of the solution of the solution of	5,3,2 N = 5 2,2,4 N = 6
0.4 FILLING - yellow brown, sand and Crushed sandstone filling, humid Image: Crushed sandstone filling, humid FILLING - poorly compacted, brown, fine to medium grained sand filling with some sandstone gravel and a trace of organic matter, humid Image: Crushed sandstone gravel and a trace of organic matter, humid -3 - with some brick fragments at 1.5m Image: Crushed sandstone gravel image: Crushed sandstone gravel and a trace of organic matter, humid Image: Crushed sandstone gravel image: Crushed sandstone gravel and a trace of organic matter, humid Image: Crushed sandstone gravel image: Crushed sandstone gravel and a trace of organic matter, humid Image: Crushed sandstone gravel image: Crushed sandstone gravel and a trace of organic matter, humid Image: Crushed sandstone gravel and a trace of organic matter, humid Image: Crushed sandstone gravel and a trace of organic matter, humid Image: Crushed sandstone gravel and a trace of organic matter, humid Image: Crushed sandstone gravel and a trace of organic matter, humid Image: Crushed sandstone gravel and a trace of organic matter, humid Image: Crushed sandstone gravel and a trace of organic matter, humid Image: Crushed sandstone gravel and a trace of organic matter, humid Image: Crushed sandstone gravel and a trace of organic matter, humid Image: Crushed sandstone gravel and a trace of organic matter, humid Image: Crushed sandstone gravel and a trace of organic matter, humid Image: Crushed sandstone gravel and a trace of organic matter, humid Image: Crushed sandstone gravel and a trace of organic matter, humid Image: Crushed sandstone gravel and a trace of	5,3,2 N = 5 2,2,4 N = 6
FILLING - poorly compacted, brown, fine to medium grained sand filling with some sandstone gravel and a trace of organic matter, humid - with some brick fragments at 1.5m - with some brick fragments at 1.5m - a - a - a - a - a - a - a - a - a - a	5,3,2 N = 5 2,2,4 N = 6
A second state in the to me	5,3,2 N = 5 2,2,4 N = 6
- with some brick fragments at 1.5m - with some brick fragment	5,3,2 N = 5 2,2,4 N = 6
- with some brick fragments at 1.5m - with some	5,3,2 N = 5 2,2,4 N = 6
- with some brick fragments at 1.5m - with some	5,3,2 N = 5 2,2,4 N = 6
2 3.4 SAND - loose becoming medium dense, yellow brown, fine to medium grained sand, humid IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	2,2,4 N = 6
3.4 SAND - loose becoming medium dense, yellow brown, fine to medium grained sand, humid IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	2,2,4 N = 6
3.4 SAND - loose becoming medium dense, yellow brown, fine to medium grained sand, humid	2,2,4 N = 6
3.4 SAND - loose becoming medium dense, yellow brown, fine to medium grained sand, humid	2,2,4 N = 6
3.4 SAND - loose becoming medium dense, yellow brown, fine to medium grained sand, humid I I I I I I I I I I 	2,2,4 N = 6
3.4 SAND - loose becoming medium dense, yellow brown, fine to medium grained sand, humid I I I I I I I I I I 	2,2,4 N = 6
SAND - loose becoming medium dense, yellow brown, fine to medium grained sand, humid	
grained sand, humid	
	5,10,15
	N = 25
6	10.05/150
6.2 SANDSTONE - extremely low then	10,35/150mm refusal
6.47 very low strength, light grey, fine to	
SANDSTONE - high strength,	PL(A) = 1.1
[] = 1 slightly then moderately weathered, $ $	
grey and light purple brown, medium	
	PL(A) = 1.3
	100
	FL(A) = 1.7
$\begin{bmatrix} \P \\ \P \end{bmatrix} 9.05m \text{ to } 9.58m: \text{ fresh} \begin{bmatrix} $	
	PL(A) = 1.8
9.58 Bore discontinued at 9.58m	

RIG: Terrier

CLIENT:

PROJECT:

The University of New South Wales

Proposed Building Upgrade

LOCATION: UNSW, Botany Road, Kensington

DRILLER: Tightsite

LOGGED: SI/AG

CASING: HQ to 6.3m

TYPE OF BORING: Diatube to 0.1m, hand auger to 1.5m, solid flight auger to 6.47m, NMLC-Coring to 9.58m **WATER OBSERVATIONS:** No free groundwater observed whilst augering

REMARKS: ^Surface level interpolated from Dwg No K-FME-2013.0002, Rev A, 31.5.13.

	SA	AMPL	ING	& IN SITU TESTING	LEG	END		
A	Auger sample		G	Gas sample	PID	Photo ionisation detector (ppm)		
B	Bulk sample		Р	Piston sample	PL(A) Point load axial test Is(50) (MPa)		
BL	K Block sample		U,	Tube sample (x mm dia.)	PL(C) Point load diametral test Is(50) (MPa)		I Dolidise Parthere
C	Core drilling		Ŵ	Water sample	pp	Pocket penetrometer (kPa)		
D	Disturbed sample		⊳	Water seep	S	Standard penetration test		
Е	Environmental sampl	le	Ŧ	Water level	V	Shear vane (kPa)	\boldsymbol{r}	Geotechnics Environment Groundwater



SURFACE LEVEL: 52.8 AHD^ EASTING: NORTHING:

DIP/AZIMUTH: 90%--

BORE No: 6 PROJECT No: 73492 DATE: 6/6/2013 SHEET 1 OF 1

		Description	Degree of		Rock	Fracture	Discontinuities	Sa	moliu	na & I	n Situ Testina
	Depth	Description	Weathering	phic 20	Strength	Spacing			»		Test Results
L R	(m)	Strata	> > > >	Gra C	High	(m)	B - Bedding J - Joint S - Shear F - Fault	Type	Core	RQD %	&
	0.08		T T T S S S E						~ ~	_	Comments
	- 0.5	FILLING - brown and yellow brown, fine to medium grained sand filling with a trace of gravel and rootlets, humid		X		 		D/E* B D/E			
52	-1 1.0	SAND - apparently loose, yellow brown, fine to medium grained sand, humid		<u> </u>				D/E			
51	-	SAND - loose to medium dense becoming medium dense, yellow brown, fine to medium grained sand, humid						E S			3,3,7 N = 10
	-2							A			
20	-3							S			4,8,14 N = 22
49		- wet below 4.0m									
48	- 4.8 - 4.9	SANDSTONE - extremely low						S			4,6,20 N = 26 PL(A) = 1.1
47	-5	strength, light grey and orange brown, fine to medium grained sandstone SANDSTONE - high strength, moderately then slightly weathered, slightly fractured and unbroken, light purple yellow brown and light grey, medium to coarse grained candetone									PL(A) = 1.6
46	-	Sandstone						С	100	100	PL(A) = 1.4
45	- 7 						7.68m: B10, cly vn				PL(A) = 1.4
ŀ	-8 8.0	Bore discontinued at 8.0m		<u></u>	╇┿┿┿┿╋┙┙						
44	- 9										
ĘĄ	-										

RIG: Terrier

CLIENT:

PROJECT:

The University of New South Wales

Proposed Building Upgrade

LOCATION: UNSW, Botany Road, Kensington

DRILLER: Tightsite

LOGGED: SI/AG

CASING: HQ to 4.9m

TYPE OF BORING: Vacuum excavation to 1.4m, solid flight auger to 4.9m, NMLC-Coring to 8.0m

WATER OBSERVATIONS: Free groundwater observed at 4.0m whilst augering

REMARKS: *Environmental sample duplicate BD2/050613, ^surface level interpolated from Dwg No K-FME-2013.0002, Rev A, 31.5.13.

	S	SAMPLI	NG & IN SITU TESTING	LEGEND	
A	Auger sample	0	Gas sample	PID Photo ionisation detector (ppm)	
В	Bulk sample	F	Piston sample	PL(A) Point load axial test Is(50) (MPa)	
BL	Block sample	ι	Tube sample (x mm dia.)	PL(D) Point load diametral test Is(50) (MPa)	Dolidize Parthere
С	Core drilling	V	Water sample	pp Pocket penetrometer (kPa)	
D	Disturbed sample		Water seep	S Standard penetration test	
Е	Environmental sam	ple	Water level	V Shear vane (kPa)	Geotechnics Environment Groundwater



SURFACE LEVEL: 55.2 AHD EASTING: 337086 NORTHING: 6245508.3 DIP/AZIMUTH: 90°/-- BORE No: 2 PROJECT No: 72505.11 DATE: 18 - 20/9/2017 SHEET 1 OF 2

Г		Description	Degree of		Rock		Fracture	Discontinuities	S	amplir	na & I	n Situ Testina
뉟	Depth	of	Weathering	phic og	Strength	ater	Spacing	P. Podding I. Joint	a	%		Test Results
	(m)	Strata	≥ ≥ ≥ s o œ	с П	x Low ow Low igh x High	Ŝ,	62 93 93 5	S - Shear F - Fault	Type	Sec.	RQI %	& Commonte
╞	_ 0.05	ASPHALTIC CONCRETE /	<u>ωτΣωκπ</u>	h. N	<u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u></u>				•			Comments
-93	- 0.3	ROADBASE - dark grey, sandy fine							A			
Ē	- 06	roadbase (possibly recycled road		\bigotimes					A^	-		
ŀ	-	surface)							A			
F	-1	FILLING - grey-brown, fine to medium sand filling with trace fine										
-2		gravel and glass fragments, damp										
ŀ	-	SAND - medium dense, yellow-brown, medium grained										
Ē	-	sand, damp							Δ	-		
ŧ	-2											
23	-	- with some dark brown silty sand bands to 2.0m							s			4,7,7
Ē	-									-		IN - 14
ŧ	-											
Ē	-											
-12	-											
-	-											
Ē	-											
ŧ	-											
È.	-4									1		6.11.13
Ē								Note: Unless otherwise stated, rock is fractured	S			N = 24
ŧ	-							along rough planar bedding dipping 0°- 20°]		
Ē	-							bedding dipping 0 - 20				
ł	-5 5.0	SANDSTONE - very low strength,	╷╷╷╷╷╷╷ ┼┼┼╁ <mark>╻</mark> ┼┼	****	╡╷┖ _{┷┷┓} ╷╷╷╷							
-23	-	light yellow-brown, medium grained						5.18m: B0°- 5°, ro, un,				PL(A) = 0.43
Ē	-	SANDSTONE - medium strength,						5.27m: B5°, ro, pl, cln				PL(A) = 0.62
ŧ	-	slightly weathered, slightly fractured										
Ē	-6	medium grained sandstone.							C	100	02	
-64	-	some distinct ironstained beds									52	
È	-											PL(A) = 0.71
E	-											
ŧ	-7											
-4	-											
ŧ	-							>>				PL(A) = 0.67
ŧ	-											. ,
Ē	-8											
-4	-											
F	-											
E									С	100	100	PL(A) = 0.94
ŀ	-											
	-9											
4	-											
ŧ	-	9.47-9.7m: ironstained cross						9.47m: B5°, he, fe stn				PL(A) = 0.91
F	-											
	1	1	1 1 1 1	1	9				1	1	I	

RIG: DT100

CLIENT:

PROJECT:

LOCATION:

LendLease Building Pty Ltd

Streets, Randwick

Randwick Campus Redevelopment

Hospital Road and High, Magill and Botany

DRILLER: SS

LOGGED: ARM/RMM CASING: HW to 2.5

TYPE OF BORING: Diatube to 0.05m; Non-destructive drilling to 1.9m; Solid flight auger (TC-bit) to 2.0m; Rotary to 5.1m; NMLC-Coring to 19.0m WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: *BD1/20170918 taken at 0.3m to 0.4m

	SA	MPLIN	G & IN SITU TESTING	LEG	END]		
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)			
B	Bulk sample	P	Piston sample	PL(A	A) Point load axial test Is(50) (MPa)			
BL	K Block sample	U,	Tube sample (x mm dia.)	PL(C	D) Point load diametral test Is(50) (MPa)			l Dollaise Partnere
C	Core drilling	Ŵ	Water sample	pp	Pocket penetrometer (kPa)			
D	Disturbed sample	⊳	Water seep	S	Standard penetration test			
E	Environmental sample	e ¥	Water level	V	Shear vane (kPa)			Geotechnics Environment Groundwater
	· · · · · ·						_	

 SURFACE LEVEL:
 55.2 AHD

 EASTING:
 337086

 NORTHING:
 6245508.3

 DIP/AZIMUTH:
 90°/-

BORE No: 2 PROJECT No: 72505.11 DATE: 18 - 20/9/2017 SHEET 2 OF 2

Γ		Description	Degree of Weathering .≅	2	Rock Strength	Fracture	Discontinuities	Sa	amplii	ng & I	In Situ Testing
R	Depth (m)	of Strata	EW HW MW FR FR Graph	bo Log	Very Low Medium High Very High Ex High	Spacing (m)	B - Bedding J - Joint S - Shear F - Fault	Type	Core Rec. %	RQD %	Test Results & Comments
44	- 11	SANDSTONE (continued) SANDSTONE - medium strength, fresh, slightly fractured, light grey medium and fine grained sandstone. Typically indistinctly bedded					10.63m: Ds, 30mm				PL(A) = 0.71
-	- 11.68 - 11.88 - 12	SILTSTONE - low strength, slightly weathered, dark grey siltstone with approximately 30% sandstone beds					11.46m: B5°, ro, pl, cly vn 11.69m: Ds, 10mm 11.87m: Ds, 10mm	с	100	97	PL(A) = 0.17
43	- - - - - - - - - - - - - -	SANDSTONE - high strength, fresh, unbroken, light grey to grey, medium and coarse grained sandstone. Typically indistinctly bedded and massive									PL(A) = 1.24
42							13.48m: Ds, 30mm 13.68m: Ds, 20mm				PL(A) = 0.9
	- 14							с	100	94	PL(A) = 1.22
	- 15	15.34-15.8m: some distinct siltstone beds					15.09-15.28m: B (x4) 10°, pl, cly, 5mm ∖15.72m: B10°, pl, he 15.76m: Ds, 20mm				PL(A) = 1.29
39	-										PL(A) = 1.31
	- 17						17.63m: Ds, 10mm	с	100	99	PL(A) = 1.52
37	- - - - - - - - - - - - - - - - - - -										PL(A) = 1.25
36		Bore discontinued at 19.0m - target depth reached									

RIG: DT100

CLIENT:

PROJECT:

LOCATION:

LendLease Building Pty Ltd

Streets, Randwick

Randwick Campus Redevelopment

Hospital Road and High, Magill and Botany

DRILLER: SS

LOGGED: ARM/RMM CASING: HW to 2.5

TYPE OF BORING: Diatube to 0.05m; Non-destructive drilling to 1.9m; Solid flight auger (TC-bit) to 2.0m; Rotary to 5.1m; NMLC-Coring to 19.0m **WATER OBSERVATIONS:** No free groundwater observed whilst augering

REMARKS: *BD1/20170918 taken at 0.3m to 0.4m

		SAMP	LING	3 & IN SITU TESTING	LEG	END	7		
A	Auger sample		G	Gas sample	PID	Photo ionisation detector (ppm)			
B	Bulk sample		Р	Piston sample	PL(A) Point load axial test Is(50) (MPa)			
BL	K Block sample		U,	Tube sample (x mm dia.)	PL(C) Point load diametral test Is(50) (MPa)		1.7	Nondiae Partnere
C	Core drilling		Ŵ	Water sample	pp	Pocket penetrometer (kPa)		1	
D	Disturbed sample		⊳	Water seep	S	Standard penetration test			
E	Environmental sar	mple	Ŧ	Water level	V	Shear vane (kPa)			Geotechnics Environment Groundwater
								_	







SURFACE LEVEL: 54.6 AHD EASTING: 337098.7 NORTHING: 6245586 DIP/AZIMUTH: 90°/-- BORE No: 3 PROJECT No: 72505.11 DATE: 21-9-2017 SHEET 1 OF 2

Rock Degree of Weathering Fracture Discontinuities Sampling & In Situ Testing Description Core Strength Water Spacing Depth g Test Results 닙 of High Type RQD % Š Ē B - Bedding J - Joint (m) (m) High NO. & ð S - Shear F - Fault Very Mediu Very Very Strata 10 20 ES W HW Comments 0.03ASPHALTIC CONCRETE - typically A/E <10mm diameter 0 ROADBASE - dark grey, sandy 0.4 A/E gravel, igneous, angular, up to -45 Note: Unless otherwise 30mm diameter, damp A/E stated, rock is fractured FILLING - light brown to brown, fine along rough planar 1.0 to medium grained sand filling with bedding dipping 0°- 20° traces of fine gravel, damp - grey-brown with trace of A/E 1.5 earthenware fragments from 0.7m -23 SAND - apparently medium dense, yellow-brown medium grained sand, PL(A) = 0.321.87m: B0°, ro, un, fe - 2 damp SANDSTONE - very low strength, 2.06-2.09m: B10°, ro, light yellow-brown, medium grained un, cly, 5mm 2.14m: B5°, ro, un, cly & sandstone PL(A) = 0.48 52 organic material, 5mm 2.22m: Ds, 10mm SANDSTONE - medium strength, slightly weathered, slightly fractured, 2.56-2.58m: B (x2) 5°, С 100 81 light grey, medium grained - 3 ro, un, fe stn sandstone with some ironstaining. 2.68m: B5°, ro, un, cly, Typically indistinctly bedded 5mm 3.16m: B5°, pl, partially he, fe stn 3.52m: J30°, un, ti 3.67 SANDSTONE - low and very low PL(A) = 0.123.68m: B5°, ro, un, fe strength, moderately then slightly stn 4 40 weathered, light grey and grey, fine 13.68m: Ds, 30mm 3.72m: J60°- 70°, ro, un, and medium grained sandstone PL(A) = 0.14SANDSTONE - low strength, slightly cln weathered, slightly fractured, light 3.85m: Ds, 10mm . 20grey, medium grained sandstone. ¹3.9m: J60°- 70°, ro, un, Typically indistinctly bedded l cIn 3.93m: Ds, 70mm 5 4.1m: Ds, 10mm 4.22-4.5m: B (x6) un, ti, PL(A) = 0.26fe stn, cly, 5-10mm 5.31 SANDSTONE - high strength, 5.09m: Ds, 10mm PL(A) = 1.42 slightly weathered then fresh, 100 85 5.3m: Cs, 10mm С <u>6</u> slightly fractured, light grey medium 5.71m: B10°, ro, pl, fe and coarse grained sandstone. Typically indistinctly bedded stn 6 PL(A) = 0.086.42m:-6.52m: very low strength 6.41m: Cs, 10mm 48 -6.52m: Cs. 20mm band PL(A) = 1.85- distinctly bedded from 6 54m 7 7 14-7 53m[•] B (x9) 10° PL(A) = 1.33 С 100 24 ro, pl, cln or cbs stn - medium strength from 7.5m PL(A) = 0.62 7.7 SANDSTONE - medium then 7.78m: B5°, ro, un, cln medium to high strength, fresh, 7.93m: Ds, 20mm - 8 slightly fractured to unbroken, light grey to grey, medium grained sandstone with some carbonaceous PL(A) = 0.52flecks. Typically massive -9 8.55m: B0°, ro, un, cly, 5mm 100 С 99 9 9.32m: B0°, ro, un, cly, PL(A) = 1.16 5mm -12

RIG: DT100

CLIENT:

PROJECT:

LOCATION:

LendLease Building Pty Ltd

Streets, Randwick

Randwick Campus Redevelopment

Hospital Road and High, Magill and Botany

DRILLER: SS

LOGGED: RMM

CASING: HW to 1.6m

 TYPE OF BORING:
 Solid flight auger (TC-bit) to 0.03m; Non-destructive drilling to 1.5m; Solid flight auger (TC-bit) to 1.6m; NMLC-Coring to 16.0m

 WATER OBSERVATIONS:
 No free groundwater observed whilst augering

	SAMPLING & IN SITU TESTING LEGEND												
Α	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)								
В	Bulk sample	Р	Piston sample	PL(A)	Point load axial test Is(50) (MPa)								
BLK	Block sample	U,	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)								
С	Core drilling	Ŵ	Water sample	pp	Pocket penetrometer (kPa)								
D	Disturbed sample	⊳	Water seep	S	Standard penetration test								
E	Environmental sample	¥	Water level	V	Shear vane (kPa)								



SURFACE LEVEL: 54.6 AHD **EASTING:** 337098.7 **NORTHING:** 6245586 **DIP/AZIMUTH:** 90°/-- BORE No: 3 PROJECT No: 72505.11 DATE: 21-9-2017 SHEET 2 OF 2

Г		Description	Degree of	Rock	Fracture	Discontinuities	Sa	amplii	ng & I	n Situ Testing
R	Depth (m)	of Strata	vveamening ≞ ≩ ≩ ≲ ∞ ≞	Graphi Com Very Low Medium High Very High	Spacing (m) 5000 0010 0010	B - Bedding J - Joint S - Shear F - Fault	Type	Core Rec. %	RQD %	Test Results & Comments
42 44 43 43 44 44	- 11	SANDSTONE - medium then medium to high strength, fresh, slightly fractured to unbroken, light grey to grey, medium grained sandstone with some carbonaceous flecks. Typically massive (continued) 10.36-10.5m: low strength band				10.45m: B0°, ro, un, cln 12.18-12.2m: B (x2) 0°- 10°, pl, ro, cln	С	100	99	PL(A) = 0.17 PL(A) = 0.82 PL(A) = 0.89 PL(A) = 1.16
39 41 41 40 40 40	-14 -14.82 -15 -16 16.0	SANDSTONE - medium to high strength, fresh, slightly fractured, light grey medium grained sandstone with some medium strength bands. Typically distinctly bedded				14.78m: Ds, 40mm 15.67m: J30°- 40°, ro, un, cln 15.75-15.9m: B (x2) 10°, ∫	С	100	96	PL(A) = 1.2 PL(A) = 1.09 PL(A) = 1.21 PL(A) = 0.76
35 35 36 36 37 37 37 38 38	- 17 - 18 - 19	- target depth reached				(ro, pl, cin				

RIG: DT100

CLIENT:

PROJECT:

LOCATION:

LendLease Building Pty Ltd

Streets, Randwick

Randwick Campus Redevelopment

Hospital Road and High, Magill and Botany

DRILLER: SS

LOGGED: RMM

CASING: HW to 1.6m

TYPE OF BORING: Solid flight auger (TC-bit) to 0.03m; Non-destructive drilling to 1.5m; Solid flight auger (TC-bit) to 1.6m; NMLC-Coring to 16.0m **WATER OBSERVATIONS:** No free groundwater observed whilst augering **REMARKS:**

SAMPLING & IN SITU TESTING LEGEND A. Auger sample G. Gas sample PID Photo ionisation detector (ppm) B. Bulk sample P Piston sample PL(A) Point load axial test Is(50) (MPa) D. Disturbed sample V Water seepe PL(D) Point load diametral test Is(50) (MPa) D. Disturbed sample P Water seepe S Standard penetrometer (KPa) D. Disturbed sample V Water seepe S Standard penetrometer (KPa) E Environmental sample V Shear vane (kPa) Standard penetrometer (kPa)

BORE: 3	PROJECT: R	ANDWICK	SEPTEMBER	2017
	onment Groundwater	Project No: 72 505-11 BH ID: 6H3 Depth: 16n - 6m Core Box No.: 1/3		
72505.11 RANDWICK	BH3 Start o	+ 1.6m	Negoti La	TAN
3-		CHEFE O	1 Harden	Ka ji
4-	M- CRAIN		ALLEY HALL	1289. Jan
5				
	1.0	6m – 6.0m		



BORE: 3	PROJECT:	RANDWICK	SEPTEMBER 2017	
Contention of the sector of th	onment Groundwater	Project No: 72 505- BH 1D: 8H3 Depth: Iln-16n Core Box No.: 3/3		
IN			1	
124				
13.				
19m				
	11.	.0m – 16.0m		

SURFACE LEVEL: 51.9 AHD **EASTING:** 337044.9 NORTHING: 6245563 DIP/AZIMUTH: 90°/--

BORE No: 4 PROJECT No: 72505.11 DATE: 19 - 21/9/2017 SHEET 1 OF 2

Γ			Description	Degree of	υ	Rock		Fracture	Discontinuities	Sa	amplii	ng & l	n Situ Testing
Ā	D)epth	of	Weathering	aphic		ater	Spacing	B - Bedding J - Joint	υ	•%		Test Results
		(m)	Strata	H H M M M M M M M M M M M M M M M M M M	5 J	Ex Low Very Lcow Mediun Very High	Ň	0.01 0.100 1.00 1.00	S - Shear F - Fault	Typ	Re C	RQI %	& Comments
-	-	0.04 0.07	ASPHALTIC CONCRETE (typically		ġ. ſ					A			
È		0.2	ASPHALTIC CONCRETE (typically		\bigotimes								
ł		0.0	<20mm diameter) ROADBASE - dark grev, angular.							<u> </u>	1		
Ē	5-1	0.0	igneous gravel typically 40-80mm diameter, slight hydrocarbon odour							A			
Ē	-		FILLING - orange-brown, medium										
ŀ	-		sandstone gravel and a trace of clay							Α			
			SAND - pale yellow-brown, fine to										
Ē	-2		medium grained sand, damp							<u> </u>	1		
-	-		2.2m: brown										
-	-	2.6	SAND - medium dense to dense,							s			8,14,17
Ę	-3		orange, fine to medium sand with some clay, damp						Note: Unless otherwise stated, rock is fractured				N = 31
ŀ									along rough planar bedding dipping 0°- 20°				
È	Ē	3.5	SANDSTONE - extremely low to										
ŀ.	-	3.65	very low strength sandstone						3.75m: B0°, pl, ro, cln				DL(A) = 0.22
-	-4	4 15	weathered, fractured to slightly						4 12 4 14m; Do 20mm				PL(A) = 0.22
Ē	-		coarse grained sandstone						4.12-4.1411. DS, 201111, cly		100	~~	
Ē	-		SANDSTONE - medium strength, slightly weathered then fresh,									90	
Ę	F -5		slightly fractured and fractured, medium to coarse grained										PL(A) = 0.76
ŧ			sandstone					╵╺┿┿╼┱┫┦╵	5.21m [·] B0° pl ro co				
ŀ	-		5 5m; dictinct irregular bedding						sandy clay, 5mm 5 23m; Ds 15mm, cly				
Ē	-		dipping 15°- 20°					╎╎┎┛╎	5.71m: B20°, pl, vn, co,				
- 4	-6								5mm sandy cly 5.92m: B20°, pl, ro, stn,				PL(A) = 0.71
Ē	-								cly 5.96m: B20°, pl, ro, vn,				
ł	-		6.4m: indistinct irregular bedding dipping 0°- 20°						cly 6.14m: B20°, pl, ro, vn,				
-¥	2	6.91		-					СІУ	С	100	99	PL(A) = 0.71
Ē	-		fresh, slightly fractured and										,
Ē	-		coarse grained sandstone, massive,										
ŧ	Ē		trace carbonaceous fiecks						7.63m: Ds, 15mm sandy				
-	-8								clay				PL(A) = 0.66
-	-												
Ē	-												
-	2												
F	-9										100	95	PL(A) = 0.95
F	-								>>				
Ē	-												
÷	ŧ												PL(A) = 0.73

RIG: Bobcat

CLIENT:

PROJECT:

LOCATION:

LendLease Building Pty Ltd

Streets, Randwick

Randwick Campus Redevelopment

Hospital Road and High, Magill and Botany

DRILLER: GM

LOGGED: ARM

CASING: HW to 3.65m

Diatube to 0.08m; NDD to 1.7m; Solid flight auger (TC-bit) to 3.65m; NMLC-Coring to 17.31m TYPE OF BORING:

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Well installed, blank to 4.0 m, screen to 7.0 m, gatic cover at surface, asphalt to 0.2 m, sand & cement to 3.0 m, bentonite to 3.8 m, sand to 7.0 m, bentonite to 8.0 m, NDD = Non-destructive drilling

	SAM	IPLIN	G & IN SITU TESTING	G LEG	END		
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)		
B	Bulk sample	Р	Piston sample	PL(A	A) Point load axial test Is(50) (MPa)		
BL	K Block sample	U,	Tube sample (x mm dia.)	PL(E	D) Point load diametral test ls(50) (MPa)	1.	Indidias Partners
C	Core drilling	Ŵ	Water sample	pp	Pocket penetrometer (kPa)		
D	Disturbed sample	⊳	Water seep	S	Standard penetration test		
E	Environmental sample	Ŧ	Water level	V	Shear vane (kPa)		Geotechnics Environment Groundwater
						 _	

SURFACE LEVEL: 51.9 AHD 337044.9 EASTING: NORTHING: 6245563 **DIP/AZIMUTH:** 90°/--

BORE No: 4 PROJECT No: 72505.11 DATE: 19 - 21/9/2017 SHEET 2 OF 2

Degree of Weathering Rock Sampling & In Situ Testing Fracture Discontinuities Description Core Strength Graphic Water Spacing Depth _ 0 Rec. % Test Results 닙 of High N Type Ē B - Bedding J - Joint (m) (m) NO. & S - Shear F - Fault /ery /ledit Strata /ery 10 20 E S W W Comments k SANDSTONE - medium strength, fresh, slightly fractured and unbroken, pale grey, medium to coarse grained sandstone, massive, trace carbonaceous flecks С 100 95 (continued) PL(A) = 0.61-4 10.91-10.94m: Ds, 11 30mm, cly 11.03-11.06m: Ds, 30mm cly -6 PL(A) = 0.6912 12.0 SANDSTONE - medium to high strength, fresh, slightly fractured to unbroken, pale grey, medium to coarse grained sandstone, indistinct bedding typically dipping 10°- 20° 12.42m: Ds, 10mm, sandy cly 100 98 С -ജ PL(A) = 1.113 13.29-13.31m: 20mm sandy cly 13.51-13.54m: Ds, 30mm, sandy cly -8 PL(A) = 0.91 14 14.6 SANDSTONE - high then medium 14.59-14.64m: Ds, 50mm, sandy cly 14.83m: B0°- 5°, un, sm, strength, fresh, unbroken, pale grey, fine to medium grained sandstone, PL(A) = 1.33 15 vn, cbs occasional carbonaceous laminations and flecks С 100 94 36 PL(A) = 0.5916 16.78-16.97m: siltstone clasts and -8 16.85m: B10°. un. sm. 17 laminations, slightly fractured co, cly, 5-10mm 16.94-16.97m: Ds, PL(A) = 0.7617.31 30mm, sandy cly Bore discontinued at 17.31m - target depth reached 34 18 -8 19

RIG: Bobcat

TYPE OF BORING:

CLIENT:

PROJECT:

LOCATION:

LendLease Building Pty Ltd

Streets, Randwick

Randwick Campus Redevelopment

Hospital Road and High, Magill and Botany

DRILLER: GM

LOGGED: ARM

CASING: HW to 3.65m Diatube to 0.08m; NDD to 1.7m; Solid flight auger (TC-bit) to 3.65m; NMLC-Coring to 17.31m

WATER OBSERVATIONS: No free groundwater observed whilst augering

Well installed, blank to 4.0 m, screen to 7.0 m, gatic cover at surface, asphalt to 0.2 m, sand & cement to 3.0 m, bentonite to 3.8 m, sand to REMARKS: 7.0 m, bentonite to 8.0 m, NDD = Non-destructive drilling

	SAM	PLIN	G & IN SITU TESTING	LEGI	END									
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)									
E	Bulk sample	Р	Piston sample	PL(A) Point load axial test Is(50) (MPa)				_					
B	BLK Block sample	U,	Tube sample (x mm dia.)	PL(C) Point load diametral test ls(50) (MPa)	1.				26		- r	тпе	3rG
0	Core drilling	Ŵ	Water sample	pp	Pocket penetrometer (kPa)	/ /		Dudy		43	_			7 3
	Disturbed sample	⊳	Water seep	S	Standard penetration test	,,								
E	Environmental sample	Ŧ	Water level	V	Shear vane (kPa)		6	Geotechnics	1	Envir	onmer	nt I	Ground	dwater
						 _								

BORE: 4	PROJECT: R	ANDWICK	SEPTEMBER	2017
	Partners	Project No: 72 505. BH ID: 6H4 Depth: 3.65 - 8.00m Core Box No.: 1		
72505.11 RANDWI	ск BH4 21/9/1	7 Start 3.65 m		
5m				DAUAL
- Trn		THE REAL PROPERTY OF		
	3.6	5m – 8.0m		



BORE: 4	PROJECT	: RANDWICK	SEPTEMBER 2017
	as Partners	Project No: 72505.11 BH ID: 6H4 Depth: 13.00 - 17.31m Core Box No.: 3	.1.0.1.0.1.0.
	* 7 - 1 + 1		
-			
r <mark>ele</mark> anno 1	EoH 13	17.3lm 3.0m - 17.31m	

CLIENT:

PROJECT:

LOCATION:

LendLease Building Pty Ltd

Streets, Randwick

Randwick Campus Redevelopment

Hospital Road and High, Magill and Botany

SURFACE LEVEL: 54.6 AHD **EASTING:** 336990.5 **NORTHING:** 6245617.7 **DIP/AZIMUTH:** 90°/-- BORE No: 7 PROJECT No: 72505.11 DATE: 6-10-2017 SHEET 1 OF 3

Γ		Description	Degree of	υ	Rock	, Fra	cture	Discontinuities	Sa	amplii	ng &	In Situ Testing
ᆋ	Depth	of	Weathering	aphic	Strength	sq2 (ater	acing	B - Bedding J - Joint	e	% و		Test Results
	(11)	Strata	H M M M M M M M M M M M M M M M M M M M	θ, η	Ex Low Very Low Mediur Very H Ex Hig	≥ > > > > > > > > > > > > >	0.50	S - Shear F - Fault	Typ	Re C	a%	& Comments
-	- 0.2	FILLING - brown, fine to medium grained sand filling with traces of rootlets humid		X					A/E			
54	-	SAND - loose to medium dense becoming medium dense,							A/E			
-	- - 1 -	fine to medium grained sand, damp				i i I I			A/E			455
Ē									S			N = 10
53	-											
-	-2											
-	-											
52	-								s			7,10,10 N = 20
	- 3					ii						N = 20
-	-							stated, rock is fractured along rough planar				
51	-	3.5m: becoming orange-brown with traces of clay						bedding dipping 0°- 20°				
-	- 3.9 -4 - 4.1	SANDSTONE - low to medium							s			10/50mm refusal
-	-	medium to coarse grained sandstone			· → ·			4.32m: Cs, 10mm				PL(A) = 0.31
20		SANDSTONE - low to medium strength, slightly weathered, slightly										PL(A) = 0.35
-	-5 - 5.09 - 5.14	fractured, orange-brown and light grey, medium to coarse grained sandstone. Bedding typically indistinct and ironstained						4.77m: Cs, 5mm 4.91m: Cs, 20mm 4.95m: Cs, 15mm 5.09m: CORE LOSS:				PL(A) = 0.19
49		SANDSTONE - medium strength, slightly weathered, slightly fractured to unbroken, orange-brown and light grey, medium to coarse grained						50mm	С	98	97	PL(A) = 0.72
-	-	sandstone 5.14-5.7m: cross bedding at approximately 40°, bedding typically										PL(A) = 0.75
48	-	Indistinct										PI(A) = 0.81
-	-7											1 2(11) - 0.01
47	-	7 77-7 94m; extremely low to yery										
	- 8 7.94	low strength ironstained seam	┤┣┿┿┛╎╎		╡ <mark>┍</mark> ┿╼┛╵╷╷╷			7.77m: Ds, 170mm				PL(A) = 0.25
-	-	strength, slightly weathered, slightly fractured, light grey, medium			 			8.26m: B0°- 10°, un, clv,				
46	-	grained sandstone. Bedding typically indistinct						5mm 8.62m: B0°- 10° ro un	С	100	92	PL(A) = 0.26
ł	-9							cly vn				
-	-											PL(A) = 0.17
45	9.48	SANDSTONE - see next page						9.42m: Cs, 60mm				PL(A) = 0.48
Ĺ	-											
RI	G : DT10	DO DRILI	ER: RKE		LC	GGED:	RMM	Casing: HW	/ to 4	.0m;	HQ to	o 4.1m

TYPE OF BORING: Solid flight auger (TC-bit) to 4.0m; Rotary to 4.1m; NMLC-Coring to 20.47m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Groundwater monitoring well installed (screen 4.0-20.47m; gravel 5.0-20.47m; bentonite 3.5-5.0m; backfill surface to 3.5m with concrete set gatic cover). Groundwater well purged >3 well volumes following installation

SAME	PLIN	G & IN SITU TESTING	LEG	END		
A Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)		
B Bulk sample	Р	Piston sample	PL(A) Point load axial test Is(50) (MPa)		
BLK Block sample	U,	Tube sample (x mm dia.)	PL(C) Point load diametral test ls(50) (MPa)	1.	Nolidiae Partnere
C Core drilling	Ŵ	Water sample	pp	Pocket penetrometer (kPa)	/ /	Dugias rai licis
D Disturbed sample	\triangleright	Water seep	S	Standard penetration test	,,	
E Environmental sample	Ŧ	Water level	V	Shear vane (kPa)		Geotechnics Environment Groundwater
					 _	

CLIENT:

PROJECT:

LOCATION:

LendLease Building Pty Ltd

Streets, Randwick

Randwick Campus Redevelopment

Hospital Road and High, Magill and Botany

SURFACE LEVEL: 54.6 AHD **EASTING:** 336990.5 **NORTHING:** 6245617.7 **DIP/AZIMUTH:** 90°/-- BORE No: 7 PROJECT No: 72505.11 DATE: 6-10-2017 SHEET 2 OF 3

Γ		Description	Degree of	Rock Strength	Fracture	Discontinuities	Sa	mplir	ng & I	n Situ Testing
씸	Depth (m)	of	ucancing ide		Spacing (m)	B - Bedding J - Joint	be	re . %	D Q ,	Test Results
	()	Strata	D MAN ANA EN ANA	Ex Lo Very Low Very Lex High	0.01 0.10 0.50	S - Shear F - Fault	Ту	S S	RC %	Comments
44	- - - - - - - - - - 11 - - - - - - - -	SANDSTONE - medium strength, slightly weathered to fresh, slightly fractured to unbroken, light grey medium to coarse grained sandstone. Massive with some siltstone flecking to indistinctly bedded with approximately 5% siltstone bands (continued)				10.46m: J15°- 20°, ro, un, cln	С	100	99	PL(A) = 0.84 PL(A) = 0.62
ŧ		SANDSTONE - high strength				11.11m: Ds, 10mm				PL(A) = 3.2
43	- 12	fractured to unbroken, light grey medium to coarse grained sandstone with some low and very high strength bands. Massive with some siltstone flecking, to indistinctly bedded with					С	100	99	PL(A) = 1.37
42	- 13	approximately 10% siltstone bands				12.44m: Ds, 20mm				PL(A) = 3.56
41	-	13.33-13.6m: fine grained band				13.3-13.31m: B (x2) 0°, ro, un, cbs vn 13.61m: Ds, 30mm				PL(A) = 1.9 PL(A) = 0.12
39 40 40	- 14					14.58m: B20°, pl, he	С	100	98	PL(A) = 1.86 PL(A) = 1.13
38	- 10 					16.32m: J45°, ro, un, cln 16.32-16.34m: B (x2) 5°- 10°, ro, un, cbs vn				PL(A) = 0.74 PL(A) = 1.26
-	- 17	16.95-18.05m: fine grained band with some carbonaceous laminations				17m: Ds, 10mm				PL(A) = 0.16
. 42	- - - 18					17.39m: B0°- 5°, ro, un, cbs vn 17.59m: B0°- 5°, ro, pl, cbs vn 17.9m: B0°- 5°, ro, pl, cbs vn 17.9m: Ds, 20mm	С	100	97	PL(A) = 1.22
36	-					18.39-18.45m: J30°- 60°,un, he, cbs, 1mm				1 L(N) - 1.40
35	- 19 - 19 					18.77m: Ds, 20mm 19.19m: B5°, ro, pl, cln 19.77m: B0°- 5°, ro, un, cbs vn	С	100	100	PL(A) = 1.39
RI T`	g : DT10 /PE of e	00 DRILL 30RING: Solid flight auger (TC-bit)	.ER: RKE) to 4.0m; Rota	LOG ry to 4.1m; NMLC-	GED: RMM Coring to 20.4	CASING: HW	' to 4.	.0m; l	HQ to	94.1m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Groundwater monitoring well installed (screen 4.0-20.47m; gravel 5.0-20.47m; bentonite 3.5-5.0m; backfill surface to 3.5m with concrete set gatic cover). Groundwater well purged >3 well volumes following installation

SAMF	PLIN	G & IN SITU TESTING	LEG	END								
A Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)								
B Bulk sample	Р	Piston sample	PL(A	 Point load axial test Is(50) (MPa) 					n	-		
BLK Block sample	U,	Tube sample (x mm dia.)	PL(E	 Point load diametral test Is(50) (MPa) 	1.			26		ar	тпе	arc
C Core drilling	Ŵ	Water sample	pp	Pocket penetrometer (kPa)	/ /	Dudy		43				7 3
D Disturbed sample	⊳	Water seep	S	Standard penetration test	,,							
E Environmental sample	Ŧ	Water level	V	Shear vane (kPa)		Geotechnics	1	Envir	onmer	nt I	Ground	dwater
					 _	 					0.00	



B	ORE: 7	PROJECT:	RANDWICK	OCTOBER 2017
	OUGIAS Pal	rtners Groundwater	Project No: 72505.1 BH ID: 8417 Depth: 8m - 13m Core Box No.: 2/4	
-				
		9 		



Project No: 72 50 5-11 BH ID: 8/17 Depth: 18
End at 20.47 m

SURFACE LEVEL: 54.6 AHD **EASTING:** 336990.5 **NORTHING:** 6245617.7 **DIP/AZIMUTH:** 90°/-- BORE No: 7 PROJECT No: 72505.11 DATE: 6-10-2017 SHEET 3 OF 3

Γ		Description	Degree of Weathering	<u>.</u>	Rock	th 🖕	Fracture	Discontinuities	Sa	amplii	ng & I	n Situ Testing
Ъ	Depth (m)	of Strata	>>>>	Graph	e contraction of the contraction	Nate	Spacing (m)	B - Bedding J - Joint S - Shear F - Fault	Type	Core ec. %	RQD %	Test Results
-	-	SANDSTONE (continued)	D F ≷ S E E				0.00			- 22		Comments
ŀ	-				╏╎╎╎┢┙			20.24m: B5°, ro, pl, cln	С	100	100	PI(A) = 0.88
34	- 20.47	Bore discontinued at 20.47m						20.42m: J20°, ro, un, cln				1 L(7) = 0.00
-	-	- target depth reached										
Ē	-21											
ŀ	-											
-8	-											
È	- 22											
Ē												
Ē	-											
32-	-											
E	- 23											
Ē	-											
È_	-											
Ē	-											
È	- 24											
ŀ	-											
100	-											
Ē	-											
ŀ	- 25											
Ē	-											
59-	-											
F	-											
Ē	- 26											
ŀ	-											
-8-	-											
Ē	- 27											
ŀ	-											
Ē	-											
57	-											
ŀ	- 28											
F	-											
E ga	-											
F	-											
F	- 29											
ŀ												
25	-											
-	-											
								CASING. 184		0~		1 1m
T)	PE OF E	BORING: Solid flight auger (TC-bit) to 4.0m; F	Rotary	r to 4.1m;	NMLC-0	Coring to 20.4	47m	10 4	.011,	1102 (() 4 . IIII

WATER OBSERVATIONS: No free groundwater observed whilst augering

CLIENT:

PROJECT:

LOCATION:

LendLease Building Pty Ltd

Streets, Randwick

Randwick Campus Redevelopment

Hospital Road and High, Magill and Botany

REMARKS: Groundwater monitoring well installed (screen 4.0-20.47m; gravel 5.0-20.47m; bentonite 3.5-5.0m; backfill surface to 3.5m with concrete set gatic cover). Groundwater well purged >3 well volumes following installation

	SAN	IPLIN	3 & IN SITU TESTING	LEG	END		
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)		
B	Bulk sample	Р	Piston sample	PL(A	A) Point load axial test Is(50) (MPa)		Berrylee Bertwere
BL	K Block sample	U,	Tube sample (x mm dia.)	PL(E	D) Point load diametral test ls(50) (MPa)	1.	I Dollalas Partners
C	Core drilling	Ŵ	Water sample	pp	Pocket penetrometer (kPa)	/ /	Dugias rai licis
D	Disturbed sample	⊳	Water seep	S	Standard penetration test		
E	Environmental sample	Ŧ	Water level	V	Shear vane (kPa)		Geotechnics Environment Groundwater
						 _	

SURFACE LEVEL: 50.5 AHD EASTING: 337038.1 NORTHING: 6245507 DIP/AZIMUTH: 90°/-- BORE No: 8 PROJECT No: 72505.11 DATE: 23 - 24/1/2018 SHEET 1 OF 2

\square		Description	Degree of Weathering	<u>.</u>	Rock Strength	Fracture	Discontinuities	Sa	amplii	ng & I	n Situ Testing
뭑	Depth (m)	of		Graph Log	Vate	Spacing (m)	B - Bedding J - Joint	ype	ore c. %	ao 80	Test Results &
	0.4		H M M M M M M M M M M M M M M M M M M M	0	Low Med High Ex H	0.05	S - Shear F - Fault	⊢ 	0 %	æ	Comments
20	- 0.1 0.25 - 0.6 - 1	Content of the con						 			
49	- - - -	SAND - pale brown, medium grained sand with a trace of fine gravel, damp						A			
48	- 2 	SANDSTONE - extremely low					Note: Unless otherwise stated, rock is fractured along rough planar bedding dipping 0°- 20°	S			7,10/10mm refusal
47	- 2.77 - 3 	SANDSTONE - low to medium SANDSTONE - low to medium strength, slightly weathered, fractured to slightly fractured, orange and grey, medium to coarse grained sandstone						с	100	100	PL(A) = 0.26
	- - - 4 -						3.71m: B15°, vn, cly				PL(A) = 0.43
46							4.15m. B10, vir, ciy 4.38m: B20°, co, cly, 2mm 4.61m: B20°, co, sandy cly, 1mm 4.64m: B15°, co, cly, 2mm 4.72m: B0°, sm, co, cly, 2mm	6	100	95	PL(A) = 0.6
45	5.45 	SANDSTONE - high then medium strength, fresh, slightly fractured to unbroken, pale grey, medium to coarse grained sandstone with a trace of carbonaceous flecks		• •			Shim	0		33	PL(A) = 1.12
-4	- 7	6.4-6.9m: red-brown iron staining					6.49m: B0-5°, cu, co, cly, 10mm 6.69-6.76m: J50°, un, ro, vn, fe				PL(A) = 0.69
43	- - - -										
	- 8	8.1-8.55m: low strength band							400	400	PL(A) = 0.63
42	- - - -						>>	C	100	100	PL(A) = 0.22
	- 9 -										PL(A) = 0.63
41	-										
Ŀ	-										PL(A) = 1.03

RIG: Bobcat

CLIENT:

PROJECT:

LOCATION:

LendLease Building Pty Ltd

Streets, Randwick

Randwick Campus Redevelopment

Hospital Road and High, Magill and Botany

DRILLER: GM

LOGGED: ARM

CASING: HW to 2.5m; HQ to 2.7m

TYPE OF BORING: Diatube to 0.10m; Non-destructive drilling to 1.7m; Solid flight auger (TC-bit) to 2.77m; NMLC-Coring to 17.39m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Well installed, blank to 2.0 m, screen to 3.0 m, gatic cover at surface, asphalt to 0.2 m, sand & cement to 0.8 m, bentonite to 1.5 m, sand to 3.0 m, bentonite to 3.5 m, *BD1/20180123 replicate taken at 0.4m to 0.5m

	SAN	/IPLIN	G & IN SITU TESTING	i LEG	END			
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)			
B	Bulk sample	P	Piston sample	PL(A	A) Point load axial test Is(50) (MPa)			
BL	K Block sample	U,	Tube sample (x mm dia.)	PL(C	D) Point load diametral test Is(50) (MPa)			Dollalae Partnere
C	Core drilling	Ŵ	Water sample	pp	Pocket penetrometer (kPa)		A 1	
D	Disturbed sample	⊳	Water seep	S	Standard penetration test	11		
E	Environmental sample	Ŧ	Water level	V	Shear vane (kPa)			Geotechnics Environment Groundwater
•								

E	BORE: 8	PROJECT:	RANDWICK	JANUARY 2	018
	Douglas Pal	rtners Groundwater	Project No: 723 BH ID: 6H8 Depth: 277-7. Core Box No.: 1	505.11 00m	
72505.11	RANDWICK	3H8 24/1/18	START 2.77m		1
3		THE A			
5-0					
5		2.7	7m – 7.0 <u>m</u>		





_			
BORE: 8	PROJECT:	RANDWICK	JANUARY 2018
		Purchase Towned II	
Douglas Pa	rtners	BH ID: 616	
Geotechnics / Environment		Core Box No.:	
իսնեննեն	սեսնութ	nin nin hu	ահանդիրություն
		-11 10 10	
17		0H 17,34m	- Constant of a second s
	17	0m = 17.39m	

SURFACE LEVEL: 50.5 AHD **EASTING:** 337038.1 **NORTHING:** 6245507 **DIP/AZIMUTH:** 90°/-- BORE No: 8 PROJECT No: 72505.11 DATE: 23 - 24/1/2018 SHEET 2 OF 2

Γ		Description	Degree of	Rock	Fracture	Discontinuities	Sa	amplir	ng & l	In Situ Testing
묍	Depth (m)	of Strata	W M M M M M M M M M M M M M M M M M M M	Graph Log Log Very Low Medium High Ex High	Spacing (m) 5000 0000	B - Bedding J - Joint S - Shear F - Fault	Type	Core Rec. %	RQD %	Test Results & Comments
	- 11.45	10.2-10.41m: with 25% siltstone clasts up to 20mm diameter, fragmented (possibly drilling induced) LAMINITE - low strength, fresh, slightly fractured, dark grey siltstone interlaminated and interbedded with 40% pale grey, fine grained sandstone				10.14-10.41m: fg, 270mm 10.41m: B0°, sm, co, cly, 5mm 10.73m: J35°, sm, co, cly, 1mm 11.04m: J30°x2, sm, vn, cly 11.38-11.45m:	C	100	88	PL(A) = 0.18
38	-12	SANDSTONE - high strength, fresh, slightly fractured to unbroken, pale grey, medium to coarse grained sandstone, massive				J30-45 ⁺ x3, sm, vn, cly 11.57m: B0°, vn, cly 11.78m: B0°, vn, cly		100	00	PL(A) = 2.23
-	- 13	12.84-13.03m: with 50% ∖ carbonaceous laminations				12.79m: Ds, 20mm,				PL(A) = 1.54
37	- - - - - 14	13.03-13.21: fine to medium grained 13.21m: medium to coarse grained, irregular bedding dipping 10-20°				13.29m: Ds, 20mm, sandy cly 13.21m: B10°, vn, cly 13.97m: Ds, 15mm, cly				PL(A) = 1.19
36	- 15	14.8m: massive				14.38m: B20°, vn, cly	С	100	99	PL(A) = 1.27
35	- - - - - 16									PL(A) = 1.36
	- - - - - - - 17	16.44m: irregular bedding dipping 10-20°				16.44m: B0-10°, cu, co, sandy cly, 10mm	с	100	99	PL(A) = 1.57
33 -	17.39	Bore discontinued at 17.39m - target depth reached				17.29m: B20°, vn, cly				
-	- 18									
32	- - - -									
31	- 19									

RIG: Bobcat

CLIENT:

PROJECT:

LOCATION:

LendLease Building Pty Ltd

Streets, Randwick

Randwick Campus Redevelopment

Hospital Road and High, Magill and Botany

DRILLER: GM

LOGGED: ARM

CASING: HW to 2.5m; HQ to 2.7m

TYPE OF BORING: Diatube to 0.10m; Non-destructive drilling to 1.7m; Solid flight auger (TC-bit) to 2.77m; NMLC-Coring to 17.39m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Well installed, blank to 2.0 m, screen to 3.0 m, gatic cover at surface, asphalt to 0.2 m, sand & cement to 0.8 m, bentonite to 1.5 m, sand to 3.0 m, bentonite to 3.5 m, *BD1/20180123 replicate taken at 0.4m to 0.5m

	SAMF	PLING	G & IN SITU TESTING	LEG	END		
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)		
B	Bulk sample	Р	Piston sample	PL(A	A) Point load axial test Is(50) (MPa)		
BLI	K Block sample	U,	Tube sample (x mm dia.)	PL(C	D) Point load diametral test ls(50) (MPa)	1.	I DAIIdiae Parthere
C	Core drilling	Ŵ	Water sample	pp	Pocket penetrometer (kPa)		Dugias rai licis
D	Disturbed sample	\triangleright	Water seep	S	Standard penetration test		
E	Environmental sample	Ŧ	Water level	V	Shear vane (kPa)		Geotechnics Environment Groundwater
						_	

CLIENT:LendLease Building Pty LtdPROJECT:Randwick Campus RedevelopmentLOCATION:Hospital Road and High, Magill and Botany
Streets, Randwick

SURFACE LEVEL: 55.7 AHD **EASTING:** 337090 **NORTHING:** 6245535 **DIP/AZIMUTH:** 90°/-- BORE No: 12 PROJECT No: 72505.13 DATE: 30-4-2018 SHEET 1 OF 2

Γ		Description	Degree of Weathering .≌	Rock Strength	Fracture	Discontinuities	Sa	mplin	g & I	n Situ Testing
ᆋ	Depth (m)	of			g Spacing (m)	B - Bedding J - Joint	e	e."	۵°	Test Results
	(,	Strata	Q FISS S H F	Low Medic Ex Low Very I Ex High	0.05	S - Shear F - Fault	<u>≻</u>	ပိမ္ရွိ	8~	∝ Comments
E	0.09	ASPHALTIC CONCRETE	b.				D			
-	- 0.6	ROADBASE: dark grey, sandy fine to coarse grain igneous gravel, damp								
52	- - - 1	FILLING: brown, medium to coarse sand filling, with some silt, damp 0.8-1.2m: with some roots.					D			
-	- 1.2	SAND: medium dense, yellow brown, medium sand with trace of silt, damp								
54	-2						S			2,7,9 N = 16
	-									
- 20	-3									5.10.13
5	-						5			N = 23
- 22	-4									
-	-									6 11 13
- - -	-5						S			N = 24
20	-									
Ē	-6									11/110
49	- 6.1 - - -	SANDSTONE: high strength, slightly weathered becoming fresh, slightly fractured to unbroken, pale grey, medium to coarse grained								refusal
-	- 7	Sandstone, some non stanning								PL(A) = 2.42
48	-					7.44m: B5⁰, pl, ro, cly ∫5mm 7.6m: Ds. 50mm	С	100	100	PL(A) = 2.29
-	-8					7.0m. 03, 00mm				
47										PI (A) = 1.24
-	-9 -	' SANDSTONE: high strength, fresh, unbroken, pale grey, medium grained sandstone								i⁻∟(n) = 1.24
46	-						С	100	100	PL(A) = 1.9
	L									

RIG: Han Jin 8D

DRILLER: BG Drilling

LOGGED: JAP

CASING: HW to 5.5 m

TYPE OF BORING: Diatube to 0.09 m, NDD to 1.5 m, Solid flight auger (TC-bit) to 4.0 m, Rotary to 6.1 m, HQ-Coring to 14.15 m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Well installed, blank to 3.8 m, screen to 6.8 m, gatic cover at surface, concrete to 0.2 m, sand & cement to 2.0 m, bentonite to 3.0 m, sand to 6.8 m, bentonite to 7.8 m, sand to 14.15 m

SAMP	PLIN	G & IN SITU TESTING	G LEG	END		
A Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)		
B Bulk sample	Р	Piston sample	PL(/	A) Point load axial test Is(50) (MPa)		
BLK Block sample	U,	Tube sample (x mm dia.)	PL(I	D) Point load diametral test Is(50) (MPa)	1.	Dolidiae Partnere
C Core drilling	Ŵ	Water sample	pp	Pocket penetrometer (kPa)		
D Disturbed sample	⊳	Water seep	S	Standard penetration test		
E Environmental sample	Ŧ	Water level	V	Shear vane (kPa)		Geotechnics Environment Groundwater
					 _	

CLIENT:LendLease Building Pty LtdPROJECT:Randwick Campus RedevelopmentLOCATION:Hospital Road and High, Magill and Botany
Streets, Randwick

SURFACE LEVEL: 55.7 AHD **EASTING:** 337090 **NORTHING:** 6245535 **DIP/AZIMUTH:** 90°/-- BORE No: 12 PROJECT No: 72505.13 DATE: 30-4-2018 SHEET 2 OF 2

Γ	Description		Degree of Weathering ≧		Rock Strength	Fracture	Discontinuities	Sa	mplir	ng & I	n Situ Testing
⊾	Depth (m)	of		Sraph Log		Spacing (m)	B - Bedding J - Joint	/be	ore c. %	00% 00%	Test Results
		Strata	H M M M M M M M M M M M M M M M M M M M	0	Ex L Ned High Ex H	0.05	S - Shear F - Fault	ŕ	ပီနို	Ψ°	Comments
45	- - - - - - - - - - - - - - - - - - -	unbroken, pale grey, medium grained sandstone <i>(continued)</i>						С	100	100	PL(A) = 2.54
44	- - - -										PL(A) = 0.93
-	- 12							С	100	100	PL(A) = 1.33
-	-							С	100	100	
43	12										
-	-							с	100	100	
4-	-	13.57m: becoming slightly fractured		· · · · · · · · · · · · · · · · · · ·			13.57m: B5° pl, ro, cly vn				PL(A) = 1.2
	- 14 14.15	Deep discontinued at 14.15m		· · · · · · · · · · · · · · · · · · ·							PL(A) = 1.04
-	-	Target depth reached									
-4	-										
-	- 15										
-	-										
-4	-										
-	- 16										
	-										
-8											
-											
F F m	-										
Ē	- 18										
-	-										
Ē	- 19										
Ē											
36	-										
Ŀ	-										

RIG: Han Jin 8D

DRILLER: BG Drilling

LOGGED: JAP

CASING: HW to 5.5 m

TYPE OF BORING: Diatube to 0.09 m, NDD to 1.5 m, Solid flight auger (TC-bit) to 4.0 m, Rotary to 6.1 m, HQ-Coring to 14.15 m

 $\textbf{WATER OBSERVATIONS:} \quad \text{No free groundwater observed whilst augering}$

REMARKS: Well installed, blank to 3.8 m, screen to 6.8 m, gatic cover at surface, concrete to 0.2 m, sand & cement to 2.0 m, bentonite to 3.0 m, sand to 6.8 m, bentonite to 7.8 m, sand to 14.15 m

	SAM	PLIN	3 & IN SITU TESTING	LEG	END		
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)		
B	Bulk sample	Р	Piston sample	PL(A	A) Point load axial test Is(50) (MPa)		
BL	K Block sample	U,	Tube sample (x mm dia.)	PL(E	D) Point load diametral test Is(50) (MPa)	1.	Lininge Partnere
C	Core drilling	Ŵ	Water sample	pp	Pocket penetrometer (kPa)	/ 🖌	
D	Disturbed sample	⊳	Water seep	S	Standard penetration test		
E	Environmental sample	Ŧ	Water level	V	Shear vane (kPa)		Geotechnics Environment Groundwater
•						 _	

BORE: 12	PROJECT: RANDWICK	APRIL 2018
Douglas P Geolechnics Environme	artners H ID: Depth: Core Box No.:	
72505.13 BI	HIZ START G.10m	
5.10m	B	
	6.10 – 9.00 m	

BORE: 12	PROJECT: RANDWICK	APRIL 2018
	Thers Groundwater Project No: BH 1D: Depth: Core Box No.:	
1.0		
		11
	9.00– 13.00 m	



SURFACE LEVEL: 52.0 AHD **EASTING:** 337045 NORTHING: 6245565 **DIP/AZIMUTH:** 90°/--

BORE No: 13 **PROJECT No:** 72505.13 **DATE:** 3-5-2018 SHEET 1 OF 1

Γ			Description	Degree of Weathering	<u>.0</u>	Ro Stre	nck nath	<u>_</u>	Fracture	Discontinuities	Sa	amplir	ng & I	In Situ Testing
뭑	De (r	epth m)	of	literation	Log		H H H	Vate	Spacing (m)	B - Bedding J - Joint	be	Sre S. %	Da °	Test Results
			Strata	F S S M M M M M M M M M M M M M M M M M	U	Low Low	High Very H H	- 10.0	0.05 0.10 0.50 1.00	S - Shear F - Fault	Тy	ပိမ္ရွိ	<u>ж</u> ,	Comments
Ē	-	0.05	ASPHALT: (typically <10 mm		ġ. ſ									
E		0.4	ASPHALT: (typically <20 mm diameter)		°°. X									
-	-	0.0	ROADBASE: dark grey, angular igneous gravels (30-80 mm)		\bigotimes									
-	-1		FILLING: grey-brown, ripped sandstone filling, (40-80mm)					į						
-	-		FILLING: orange brown, medium sandy gravel filling with some coarse sandstone gravel, damp											
20	-2		SAND: medium dense, pale yellow, medium sand, damp								S			2,6,9 N = 15
F	-							į						
-		2.5	SAND: medium dense to dense, brown orange, fine to medium sand with some silt, damp								D			
49	-3	32						Ì			S			14,8/80 refusal
-	-	0.2	SANDSTONE: extremely low to very low strength, orange brown sandstone											
-	-	3.8	Bore discontinued at 3.8m					Ţ						
48	-4		Limit of investigation											
ŀ	-													
ŀ	-													
47	-5							İ						
ŀ	-							į						
	-													
ŀ	-													
46	-6													
F	-													
ŀ	-							į						
12	-7							ļ						
ľ	-													
ŀ	-													
-	-													
-4	-8													
ŀ	-							Ì						
ŀ	-													
-	-							į						
4														
F	-													
-	-													
Ł	t													

RIG: Han Jin 8D TYPE OF BORING: Diatube to 0.15 m, Non-destructive drilling to 1.6 m, solid flight auge (TC-bit) to 3.8 m

CLIENT:

PROJECT:

LOCATION:

LendLease Building Pty Ltd

Streets, Randwick

Randwick Campus Redevelopment

Hospital Road and High, Magill and Botany

DRILLER: BG Drilling

LOGGED: JAP

CASING: Uncased

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Well installed, blank to 1.3 m, screen to 3.8 m, gatic cover at surface, asphalt to 0.2 m, sand & cement to 0.4 m, bentonite to 1.0 m, sand to 3.8 m

SAMP	PLIN	G & IN SITU TESTING	LEG	END										
A Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)										
B Bulk sample	Ρ	Piston sample	PL(A	A) Point load axial test Is(50) (MPa)								-	L	
BLK Block sample	U,	Tube sample (x mm dia.)	PL(E	D) Point load diametral test Is(50) (MPa)	4	1.1				26			тпег	-6
C Core drilling	Ŵ	Water sample	pp	Pocket penetrometer (kPa)		/ /		Dudy		43	– –			J
D Disturbed sample	⊳	Water seep	S	Standard penetration test		//								
E Environmental sample	Ŧ	Water level	V	Shear vane (kPa)			_ (Geotechnics	1	Enviro	onment	t	Groundwa	iter
						_						• •		

LendLease Building Pty Ltd Randwick Campus Redevelopment **PROJECT:** LOCATION: Hospital Road and High, Magill and Botany Streets, Randwick

CLIENT:

SURFACE LEVEL: 55.2 AHD **EASTING:** 336986 NORTHING: 6245643 **DIP/AZIMUTH:** 90°/--

BORE No: 16 PROJECT No: 72505.13 DATE: 8-5-2018 SHEET 1 OF 1

		Description		С	Rock Strength	Fract	ure	Discontinuities	Sa	ampling &	In Situ Testing
님	Depth (m)	of	Laph			e Spacing (m)		B - Bedding J - Joint	ы	e%.O%	Test Results
	(,	Strata	E S W M W	Ū	Kery L Mediu Very L	0.05	0.50	S - Shear F - Fault	Ţ	S S S S &	Comments
- ic	0.12	_ CONCRETE SLAB		$\langle \langle \cdot \rangle \rangle$							
-	0.55	FILLING: brown, fine to medium sand filling with some silt and trace of igneous gravel, humid									
	- - 1 - - - -	SAND: yellow, fine to medium sand, damp									
53	-2 2.0	SAND: medium dense, yellow, fine to medium sand, damp							s		4,9,11 N = 20
52	-3	SAND: modium dongo, brown, figo									N - 20
	-	to medium sand with trace of clay, damp							S		7,9,20 N = 29
-	-4										
51.	4.1	SANDSTONE: very low strength, orange-brown and light grey, medium to coarse grained sandstone							S		6/30, Bouncing
ŀ	- 4.7	Bore discontinued at 4.7m									
20 -	- 5										
-	-										
49	-6										
-											
48	-										
47	- 8										
4	-										
46	-9										
-	-										

RIG: Han Jin 8D

DRILLER: BG Drilling

LOGGED: JAP

CASING: HW to 4.0 m TYPE OF BORING: Diatube to 0.12 m, Non-destructive drilling to 1.8 m, solid flight auger (TC-bit) to 2.0 m, Rotary to 4.7 m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Well installed, blank to 2.1 m, screen to 4.7 m, gatic cover at surface, concrete to 0.2 m, sand & cement to 1.2 m, bentonite to 2.0 m, sand to 4.7 m



CLIENT:LendLease Building Pty LtdPROJECT:Randwick Campus RedevelopmentLOCATION:Hospital Road and High, Magill and Botany
Streets, Randwick

SURFACE LEVEL: 55.2 AHD **EASTING:** 336983 **NORTHING:** 6245644 **DIP/AZIMUTH:** 90°/-- BORE No: 17 PROJECT No: 72505.13 DATE: 8-5-2018 SHEET 1 OF 2

Γ		Description	Degree of Weathering	<u>.0</u>	Rock Strength	Fracture	Discontinuities	Sampling &			n Situ Testing
뉟	Depth (m)	of	rioutioning	Log	Vate Vate	Spacing (m)	B - Bedding J - Joint	ре	re %	۵°	Test Results
	(,	Strata	H M M M M M M M M M M M M M M M M M M M	Ū	Ex Low Mediu Very High	0.01 0.10 0.50	S - Shear F - Fault	Ţ	ပိမ္မ	SR ⊘%	& Comments
5	- 0.11	CONCRETE SLAB									
-	0.6	FILLING: brown, fine to medium sand filling with some silt and trace of igneous and sandstone gravel, humid		\bigotimes							
	-1	SAND: yellow-brown, fine to medium sand, damp									
54	-										
53	-2 2.0	SAND: medium dense yellow-brown fine to medium sand, damp						s			4,6,9 N = 15
-											
-22	- 3.3	SAND: medium dense, brown, fine									
-	-	to medium sand with trace of clay, damp						s			9,10,14 N = 24
51	-4								-		
-	4.4	SANDSTONE: very low to low strength, orange-brown and light grey, medium to coarse grained sandstone									
-	-5 5.08			 			5m: CORE LOSS:				
- 20-	-	slightly weathered, slightly fractured, light grey and red-brown, medium to coarse grained sandstone					\80mm 5.13m: J25° pl, ro, cln	с	90	83	
49	-6						6.05m: J20° pl, ro, fe, stn				PL(A) = 0.6
-	-										PL(A) = 0.8
48	-7							с	100	100	
47	- 8						7.54-7.57m: B5-10°, he, cu, ro, fe, stn x2 7.92-8.05m: B0-10°, pl, ro, fe, stn x3 8m: J30°, pl, ro 8.31m: Ds, 110mm				PL(A) = 1.1
-	-										PL(A) = 0.5
46	-9						0.22.0.50 m. D0.40°		100	00	PL(A) = 0.5
-	9.5	SANDSTONE (see over page)					9.32-9.30 m. B0-10 , un, ro fe, stn x5 9.36m: Cs, 20mm			90	

RIG: Han Jin 8DDRILLER: BG DrillingLOGGED: JAPCASING: HW to 4.5 mTYPE OF BORING:Diatube to 0.11 m, Non-destructive drilling to 1.8 m, Auger to 2.0 m, Rotary to 5.0 m, NMLC Coring to 14.80 m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Well installed, blank to 5.1 m, screen to 9.6 m, gatic cover at surface, concrete to 0.2 m, sand & cement to 1.5 m, sand to 4.0 m, bentonite to 5.0 m, sand to 10.0 m, bentonite to 11.0 m, sand to 15.0 m

	SAM	PLIN	G & IN SITU TESTING	LEG	END	7				
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)					
B BL	Bulk sample K Block sample	P U,	Piston sample Tube sample (x mm dia.)	PL(A PL(D) Point load axial test Is(50) (MPa)) Point load diametral test Is(50) (MPa)		Ποιισ	ilae	Part	nerc
C	Core drilling	W	Water sample	рр	Pocket penetrometer (kPa)		Dug	143		103
10	Disturbed sample	⊵	Water seep	S	Standard penetration test			· - ·		
E	Environmental sample	Ŧ	Water level	V	Shear vane (kPa)		Geotechnics	Enviro	onment G	roundwater
SURFACE LEVEL: 55.2 AHD **EASTING:** 336983 **NORTHING:** 6245644 **DIP/AZIMUTH:** 90°/-- BORE No: 17 PROJECT No: 72505.13 DATE: 8-5-2018 SHEET 2 OF 2

Π		Description	Degree of Weathering	Rock	Fracture	Discontinuities	Sa	amplii	ng & I	n Situ Testing
RL	Depth (m)	of Strata	FR SW W	Graph Log Log Low Very Low Medium High Ex High Rex High	(m) (m)	B - Bedding J - Joint S - Shear F - Fault	Type	Core Rec. %	RQD %	Test Results & Comments
44 45 45		SANDSTONE: medium strength, fresh, slightly fractured to unbroken, light grey, fine to medium grained sandstone with some low strength bands, cross bedding at 10-15° (continued)				10.69m: Ds, 10mm	С	100	90	PL(A) = 0.8 PL(A) = 0.12
	- 12					11.99-12.09m: J60°, pl,				PL(A) = 0.39
43	12.24	SANDSTONE: medium and high strength, fresh, unbroken, light grey, medium grained sandstone				ro, cln 12.41m: J20°, pl, ro, cln				PL(A) = 1.38
42	- 13						с	100	100	PL(A) = 0.69
41	- 14									
	- 14.8 - 15	Bore discontinued at 14.8m Target depth reached								PL(A) = 1.16
40	- 16									
39	-									
38	- 17									
37	- 18									
36	- 19 - 19 									
Ŀ	-									

RIG: Han Jin 8DDRILLER: BG Drilling

CLIENT:

PROJECT:

LOCATION:

LendLease Building Pty Ltd

Streets, Randwick

Randwick Campus Redevelopment

Hospital Road and High, Magill and Botany

LOGGED: JAP

CASING: HW to 4.5 m

TYPE OF BORING: Diatube to 0.11 m, Non-destructive drilling to 1.8 m, Auger to 2.0 m, Rotary to 5.0 m, NMLC Coring to 14.80 m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Well installed, blank to 5.1 m, screen to 9.6 m, gatic cover at surface, concrete to 0.2 m, sand & cement to 1.5 m, sand to 4.0 m, bentonite to 5.0 m, sand to 10.0 m, bentonite to 11.0 m, sand to 15.0 m



BORE: 17	PROJECT: RANDWICK	MAY 2018
Douglas Parti Geotechnics / Environment / Gro	Project No: BH ID: Undwater Depth: Core Box No.:	
72505.13 RANDWICK	BH17 START 5.0 m	
5.0 [tiss to an]		
70		
		1
Contractions of the second sec		
	5.00 – 9.00 m	





CLIENT:

PROJECT:

LOCATION:

Lendlease Building Pty Ltd

SCH Stage 1 / CCCC Project

High Street and Hospital Road, Randwick

SURFACE LEVEL: 55.7 AHD **EASTING:** 337095 **NORTHING:** 6245556.4 **DIP/AZIMUTH:** 90°/-- BORE No: BH601 PROJECT No: 72505.18 DATE: 19 & 27/08/2020 SHEET 1 OF 2

		Description	Degree of	υ	Rock Strength	Fracture	Discontinuities	Sa	ampli	ng &	In Situ Testing
R	Depth (m)	of	weathening	aphi Log		Spacing (m)	B - Bedding J - Joint	e	e %.	Q.,	Test Results
		Strata	XW MW SW FR	<u>ତ</u> _	High Low	0.05 0.100	S - Shear F - Fault	۲ ۲	ပိမ္စ	8 8 8	& Comments
F	- 0.09			ö. °C				F	-		
ŀ	- 0.3	FILL/ROADBASE: Sandy GRAVEL, sub-angular, fine igneous gravel,		×							
22	- 0.6	FILL/Gravelly SAND: medium.							1		
-	- - -1	brown, fine igneous subangular and subrounded, fine sandstone gravel, moist				 		E/D			
-		SAND SP: fine to medium, pale grey, moist, loose, aeolian									
-54	;- - 1.8										
ŧ	-2	yellow-brown, trace silt, moist,							-		
E	E	medium dense, aeolian						s			4,5,6 N = 11
ŧ	-								-		
-23	F										
Ē	-3										
ŧ	-	Below 3.0m: dark red-brown, apparently dense					Unless noted otherwise, rock is fractured along				
Ē	Ē						rough, planar bedding				
E	ļ.						planes apping at 5 25	D			
ŀ	ŧ,	Below 4.0m: wet									18/50
Ē	4.05 4.11	SANDSTONE: medium to coarse		**			4.05m: CORE LOSS:	S			refusal
ŧ	ŀ	grained, pale grey and yellow brown, with 10% decomposed seams, very					60mm				PL(A) = 0.04
Ē.		low then low and medium strength,									PL(A) = 0.4
Ē	'E	slightly fractured, Hawkesbury			│ │ │ ┎┼┚ │ │ │ │						
ŧ	-5	Sandstone									PL(A) = 0.28
Ē	E		╎┟┼┦╎╎		╽┎┼╌┛╎╷╷╷╎╎		5.29m: Ds 140mm				
ŧ	-					i ih ii	5.5m: Ds 10mm	с	98	77	
-22	-		│ ╎ <mark>└</mark> ┿┿┓╎				5.68m: Ds 90mm				
Ē	6 6.0	SANDSTONE: medium to coarse									PL(A) = 0.85
ŧ	-	grained, pale grey, cross bedded at									
ŧ	-	weathered then fresh, slightly									
-64 -64	2	fractured, Hawkesbury Sandstone	╎╎╎╎╚┓				6.65m: Ds 10mm, fe, st				
ŧ	-7										PL(A) = 0.72
F	F		i i i i i i								
Ē	75										
4	2	SANDSTONE: medium grained, pale grey, medium to high strength,					7.59m: B10°, pl, ro, cly				
Ē	L.	fresh, unbroken, Hawkesbury					1mm				PI(A) = 0.88
E	F°	Sandstone	<u> </u>			i ii i					FL(A) = 0.00
ŧ	ŧ										
Ē	.[: !! ! 5	8.6m: Ds 20mm	С	100	99	
-	ļ										
ŧ	-9										PL(A) = 1.2
Ē	E										
ŧ	ļ										
46	Ē										
	1	1					1	1	1	1	1

 RIG:
 Vac Truck, Hand Tools & Bobcat
 DRILLER:
 VAC Group
 LOGGED:
 KR/JJH/TM
 CASING:
 HW to 4.0m, HQ to 4.0m

 TYPE OF BORING:
 Diatube to 0.1m, Non-Destructive-Drilling (NDD) and Hand-Auger to 1.5m, Solid flight auger to 4.0m, NMLC Coring to 16.02m

 WATER OBSERVATIONS:
 Water seepage at 3.95m, 20% water loss below 8.0m

 REMARKS:
 Bulk samples taken 0.5-1.5m, 1.5-2.0m & 2.0-3.8m

SAN	IPLIN	G & IN SITU TESTING	G LEGEND	
A Auger sample	G	Gas sample	PID Photo ionisation detector (ppm)	
B Bulk sample	P	Piston sample	PL(A) Point load axial test Is(50) (MPa)	
BLK Block sample	U,	Tube sample (x mm dia.)	PL(D) Point load diametral test ls(50) (MPa)	
C Core drilling	Ŵ	Water sample	pp Pocket penetrometer (kPa)	
D Disturbed sample	⊳	Water seep	S Standard penetration test	
E Environmental sample	Ŧ	Water level	V Shear vane (kPa)	Geotechnics Environment Groundwate

CLIENT:

PROJECT:

LOCATION:

Lendlease Building Pty Ltd

SCH Stage 1 / CCCC Project

High Street and Hospital Road, Randwick

SURFACE LEVEL: 55.7 AHD EASTING: 337095 NORTHING: 6245556.4 DIP/AZIMUTH: 90°/-- BORE No: BH601 PROJECT No: 72505.18 DATE: 19 & 27/08/2020 SHEET 2 OF 2

Γ		Description	Degree of Weathering	<u>.0</u>	Rock Strength		Fracture	Discontinuities	Sa	mpli	ng & I	In Situ Testing
ā	Depth (m)	of Strata	W M M S H M S H M S H M S H M S H M S H M S H M S H M S H M S H M S H M S H M S H M S H M S H M S H M S H M S H	Graph Log	Very Low Medulum Very High Very High Ex High	0.01	(m) (m)	B - Bedding J - Joint S - Shear F - Fault	Type	Core Rec. %	RQD %	Test Results & Comments
	-11	SANDSTONE: medium grained, pale grey, medium to high strength, fresh, unbroken, Hawkesbury Sandstone <i>(continued)</i>						10.68m: B0°, pl, ro, cly vn & J80-90°, un, ro, cln 10.76m: B0°, pl, ro, cly co	С	100	98	PL(A) = 1.3 PL(A) = 0.96 PL(A) = 1.3
· · · · · · · · · · · · · ·	- 13 	Between 14.2-15.85m: cross bedded at 5-15°						14.35m: B5°, pl. ro. clv				PL(A) = 0.97 PL(A) = 1
	- 15							vn 15.17m: B (x2) 5°, pl, ro, cly vn	С	100	97	PL(A) = 0.98 PL(A) = 0.68
	- 17	Bore discontinued at 16.02m Target depth reached										
	- 18 - 18 											

 RIG:
 Vac Truck, Hand Tools & Bobcat
 DRILLER:
 VAC Group
 LOGGED:
 KR/JJH/TM
 CASING:
 HW to 4.0m, HQ to 4.0m

 TYPE OF BORING:
 Diatube to 0.1m, Non-Destructive-Drilling (NDD) and Hand-Auger to 1.5m, Solid flight auger to 4.0m, NMLC Coring to 16.02m

 WATER OBSERVATIONS:
 Water seepage at 3.95m, 20% water loss below 8.0m

 REMARKS:
 Bulk samples taken 0.5-1.5m, 1.5-2.0m & 2.0-3.8m

 SAMPLING & IN SITU TESTING LEGEND

 A
 Auger sample
 G
 Gas sample
 Plicton sample

 B
 Bulk sample
 Piston sample
 Plicton sample
 Plicton sample

 BLK Block sample
 U
 Tube sample (x mm dia.)
 PL(A) Point load axial test Is(50) (MPa)

 C
 Core drilling
 W
 Water sample
 Public North cond diametral test Is(50) (MPa)

 D
 Disturbed sample
 P
 Water seep
 S
 Standard penetration test

 E
 Environmental sample
 Water level
 V
 Shear vane (kPa)

	BORE: 6	01 PRC	JECT:	RANDWICK	AUGU	ST 2020	
	ouglas	Partners	;	Project No: 72505. BH ID: BH 601 Depth: 14.05-8.0*	18		
him	hinh	milia			տոհ	ndun	uluiu
72 505.18	Randwick	BH 601	START	4.05m		Addited	and the second
4	C						
5							
6							E I STORA
7	and the second						1
			4.05	-8.00m			





CLIENT:

PROJECT:

LOCATION:

Lendlease Building Pty Ltd

SCH Stage 1 / CCCC Project

High Street and Hospital Road, Randwick

SURFACE LEVEL: 55 AHD EASTING: 337097.5 NORTHING: 6245571.8 DIP/AZIMUTH: 90°/-- BORE No: BH602 PROJECT No: 72505.18 DATE: 19 & 24/08/2020 SHEET 1 OF 1

Γ		Description	Degree of		Rock	Fracture	Discontinuities	Sa	mpling	& In Situ Testing
	Depth	of	Weathering	phi Did		Spacing			p	Test Results
ľ	(m)	Strata	>>>>	Gra L a		(m)	B - Bedding J - Joint S - Shear F - Fault	Type		% &
12	0.00		X H M S S H		Ŭ S S S S S S S S S S S S S S S S S S S	0.0		-	~~~	Comments
Ē	0.09	FILL/ROADBASE: Sandy GRAVEL		ġ. Ċ				Е		
E	- 0.20	sub-angular, fine igneous gravel,		\bigotimes				E/D		
Ł	07			\bigotimes						
ŧ	-	FILL/SAND: fine to medium, dark						E/D		
-24	-1	SAND SP: fine to medium, pale								
ŧ	-	grey, moist, aeolian								
F	-									
E	Ē					i ii ii				
-	2									
1	- 22							G		4,3,5
ŧ		SAND SP: fine to medium,						3		N = 8
ŧ	2.6	iron indurated, ("coffee rock"),		[D		
ŧ	-		i i i i i			i ii ii				
-6	-3	vellow-brown, moist, aeolian								5 25/125
E	3.2	Below 3.1m: becoming wet						S		refusal
Ł	3.35	SANDSTONE: medium grained,								
ŧ	-	low to low strength, Hawkesbury								
È.	-	Sandstone								
- 20	-4	Bore discontinued at 3.35m								
F	F	raiget deptil reached				i ii ii				
E	E									
Ł	-									
-92	- 5									
Ē	F									
F	-					1 11 11				
F	F									
E	E									
49	-6									
Ł	-									
ŧ	-									
ŧ	-									
F.	-					i ii ii				
E A	Ē									
Ł	-									
ŧ	ŀ									
ŧ	-									
-4	-8									
ŧ	F									
Ē	E									
ŀ	Ł									
Ł	ŀ									
46	-9									
ŧ	ļ.									
ŧ	F									
E	E									
ł	ŀ									

 RIG:
 Vac Truck, Hand Tools & Bobcat
 DRILLER:
 VAC Group
 LOGGED:
 KR/JJH
 CASING:
 None

 TYPE OF BORING:
 Diatube to 0.1m, Non-Destructive-Drilling (NDD) and Hand-Auger to 1.5m, Solid flight auger to 3.35m
 WATER OBSERVATIONS:
 No free groundwater observed whilst augering

 REMARKS:
 Bulk sample taken at 0.7-1.5m, Groundwater well installed, refer to Well Log for construction details, Data logger 2121809 installed in well

	SAM	PLIN	G & IN SITU TESTING	LEG	END	1		
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)			
B	Bulk sample	Р	Piston sample	PL(A	A) Point load axial test Is(50) (MPa)			Develoe Develoero
B	LK Block sample	U,	Tube sample (x mm dia.)	PL(I	D) Point load diametral test ls(50) (MPa)	1	1.	Douolas Pariners
C	Core drilling	Ŵ	Water sample	pp	Pocket penetrometer (kPa)			Dougiuo i ui tiitioi o
D	Disturbed sample	⊳	Water seep	S	Standard penetration test			
E	Environmental sample	Ŧ	Water level	V	Shear vane (kPa)			Geotechnics Environment Groundwater

Lendlease Building Pty Ltd

LOCATION: High Street and Hospital Road, Randwick

SCH Stage 1 / CCCC Project

CLIENT: PROJECT: SURFACE LEVEL: 54.2 AHD EASTING: 337102.9 NORTHING: 6245608 **DIP/AZIMUTH:** 90°/--

BORE No: BH603 PROJECT No: 72505.18 DATE: 19 & 26/08/2020 SHEET 1 OF 2

Γ		Description	Degree of	. <u>0</u>	Rock Strength	Fracture	Discontinuities	Sa	mpli	ng & I	In Situ Testing
R	Depth (m)	of	Weathering	Log		Spacing (m)	B - Bedding J - Joint	be	ore S. %	D %	Test Results
		Strata	X A M A X A X A X A X A X A X A X A X A	U	Very Very Very	0.01 0.10 0.10 1.00	S - Shear F - Fault	Ţ	ပိမ္မိ	Я,	Comments
-25	0.04	ASPHALTIC CONCRETE		ġ. ℃ ' œ' .				E			
ŧ	0.45	sub-angular, fine igneous gravel, ∖grey, medium, moist						E/D			
ł	- 0.8	FILL/Gravelly SAND: medium,		\bigotimes							
[-1	subrounded, fine sandstone gravel,		\bigotimes							
- 20	- 1.3	FILL/Silty SAND: fine to medium,		\mathcal{F}			Unless noted otherwise, rock is fractured along	E/D			
Ē	- 1.7	dark brown, non-plastic fines, with subangular, fine sandstone gravel,		·/./			rough, planar bedding planes dipping at 0-20°				
Ē	-2	Clayey SAND SC: fine to medium,									PL(A) = 0.28
22	-	orange-brown, low plasticity, moist, residual									
Ē	-	below 1.5m: pale orange-brown					2.56m: B0°, pl. ro. clv vn				PL(A) = 0.62
Ē	Ę	grained, orange-brown and pale grey, low and medium strength with					2.73m: Ds 10mm	с	96	76	
- 10	-3	extremely low strength bands, highly weathered, slightly fractured.									PL(A) = 0.33
Ē	-	Hawkesbury Sandstone					3.3m: Cs 60mm				
Ē	-										
Ē	- 3.91 -4						3.600. CORE LOSS. 110mm 3.94m [·] B0° pl. sm. clv				PL(A) = 0.26
-33	- 4.2	SANDSTONE: medium to coarse grained, pale grey with some					1mm				
Ē	-	yellow-brown, cross bedded at 20°, medium then high strength, slightly					4.61m: B0°, pl, sm, cly				
Ē	-5	weathered,					1mm				PL(A) = 0.55
-64	-						5 28m [.] B (x3) 10° pl ro	C	100	88	
Ē	-						cly vn		100		
Ē											
48	-6										PL(A) = 1.8
Ē	-						6.31m: Ds 50mm				
Ē	-						6.56m: J40°, pl, ro, cln 6.64m: Ds 10mm				
Ē	-7 7.04			\geq			6.92m: CORE LOSS: 120mm				PL(A) = 1
-	7.25	SANDSTONE: medium grained,									
F	-	strength, fresh, slightly fractured to unbroken. Hawkesbury Sandstone					7.75 D. 10				
E	-8						7.75m: Ds Tumm				PL(A) = 0.92
46	Ē										
E	E						8.46m: B0°, un, cly co	C	97	97	
E	Ļ										
45	-										1 =(7) = 0.40
ł											
ŀ											

RIG: Vac Truck, Hand Tools & Bobcat DRILLER: VAC Group LOGGED: KR/JJH/TM CASING: HW to 1.8m, HQ to 1.8m TYPE OF BORING: Diatube to 0.1m, Non-Destructive-Drilling (NDD) and Hand-Auger to 1.7m, Solid flight auger to 1.8m, NMLC Coring to 16.00m WATER OBSERVATIONS: Water seepage at 1.8m REMARKS: Bulk sample taken 0.45-0.8m

A Auger sample G Gas sample PID Photo ionisation detector (ppm) B Bulk sample P Piston sample PL(A) Point load axial test Is(50) (MPa) BLK Block sample U _x Tube sample (x mm dia.) PL(D) Point load diametral test Is(50) (MPa)	
B Bulk sample P Piston sample PL(A) Point load axial test Is(50) (MPa) BLK Block sample U _x Tube sample (x mm dia.) PL(D) Point load diametral test Is(50) (MPa)	١.
BLK Block sample U _x Tube sample (x mm dia.) PL(D) Point load diametral test Is(50) (MPa)	
C Core drilling W Water sample pp Pocket penetrometer (kPa)	
D Disturbed sample D Water seep S Standard penetration test	
E Environmental sample V Shear vane (kPa)	

Douglas Partners Geotechnics | Environment | Groundwater

SURFACE LEVEL: 54.2 AHD EASTING: 337102.9 NORTHING: 6245608 **DIP/AZIMUTH:** 90°/--

BORE No: BH603 PROJECT No: 72505.18 DATE: 19 & 26/08/2020 SHEET 2 OF 2

Γ		Description	Degree of Weathering	<u>.0</u>	Rock Strength	Fracture	Discontinuities	Sa	amplii	ng &	In Situ Testing
R	j Depth (m)	of Strata	XW MW SSW FR SW	Graph Log	Very Low Medium Very High Ex High	500 (m) (m) 500 000 (m)	B - Bedding J - Joint S - Shear F - Fault	Type	Core Rec. %	RQD %	Test Results & Comments
	- 10.09	SANDSTONE: medium grained, pale grey, medium then high strength, fresh, slightly fractured to unbroken, Hawkesbury Sandstone (continued)					10.02m: CORE LOSS: 70mm	С	98	98	PL(A) = 0.92 PL(A) = 0.84
	- 12										PL(A) = 0.48
	- 14						13.55m: J30°, pl, ro, cln 14.2m: B0°, pl, ro, cly vn	С	100	99	PL(A) = 0.01
30	- 15						14.65m: J30°, pl, ro, cly vn 14.68m: B0°, pl, ro, cly vn				PL(A) = 1.1 PL(A) = 1.1
38		Bore discontinued at 16.0m Target depth reached									
	- 17										
	- 19										
35											

RIG: Vac Truck, Hand Tools & Bobcat DRILLER: VAC Group LOGGED: KR/JJH/TM CASING: HW to 1.8m, HQ to 1.8m TYPE OF BORING: Diatube to 0.1m, Non-Destructive-Drilling (NDD) and Hand-Auger to 1.7m, Solid flight auger to 1.8m, NMLC Coring to 16.00m WATER OBSERVATIONS: Water seepage at 1.8m REMARKS: Bulk sample taken 0.45-0.8m

	SAM	PLING	S & IN SITU TESTING	LEGE	END	
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)	
В	Bulk sample	Р	Piston sample	PL(A) Point load axial test Is(50) (MPa)	
BLK	Block sample	U,	Tube sample (x mm dia.)	PL(D) Point load diametral test Is(50) (MPa)	
C	Core drilling	Ŵ	Water sample	pp	Pocket penetrometer (kPa)	
D	Disturbed sample	⊳	Water seep	S	Standard penetration test	
E	Environmental sample	ž	Water level	V	Shear vane (kPa)	

Douglas Partners Geotechnics | Environment | Groundwater

CLIENT:

PROJECT:

SCH Stage 1 / CCCC Project LOCATION: High Street and Hospital Road, Randwick

Lendlease Building Pty Ltd







CLIENT:Lendlease Building Pty LtdPROJECT:SCH Stage 1 / CCCC ProjectLOCATION:High Street and Hospital Road, Randwick

SURFACE LEVEL: 54.9 AHD **EASTING:** 337107 **NORTHING:** 6245631.8 **DIP/AZIMUTH:** 90°/-- BORE No: BH604 PROJECT No: 72505.18 DATE: 19 & 24/08/2020 SHEET 1 OF 1

Γ		Description	Degree of	Rock Strength	Fracture	Discontinuities	Sampling &	n Situ Testing
R	Depth (m)	of	Inde inde		Spacing (m)	B - Bedding J - Joint	e e% Q	Test Results
	(,	Strata	G FR SW W FR		0.05	S - Shear F - Fault		ھ Comments
E	0.075	ASPHALTIC CONCRETE					F	
-	0.24	FILL/ROADBASE: Sandy GRAVEL, sub-angular, fine igneous gravel, grey, medium, moist					E	
	- 1	FILL/Gravelly SAND: medium, brown, subangular, fine igneous gravel, moist					E	
-	16	FILL/SAND: fine to medium, brown, trace subrounded, fine to coarse sandstone gravel, moist						
53	-1.0 -1.9	Between 1.0-1.2m: large brick fragment, dark brown silty sand, with charcoal					E/D D	
-	-	Clayey SAND SC: fine to medium, orange-brown, low plasticity, moist, residual					S	3,2,3 N = 5
	- 3	SAND: fine to medium, orange-brown, with clay, moist, loose, residual					D	
-	- 3.4 - 3.45 [/]	Below 2.7m: wet Below 2.95m: with pale grey sand, medium dense					S	10,11,17 N = 28
	-4	SANDSTONE: meaium grained, pale grey, very low to low strength, Hawkesbury Sandstone Bore discontinued at 3.45m						
-	-	Target depth reached						
- 09	-5							
-	-							
49	-6							
-								
1	-7 -7 -							
	- - - -							
	-8							
46								
-	-9 - - -							
45								

 RIG:
 Vac Truck, Hand Tools & Bobcat
 DRILLER:
 VAC Group
 LOGGED:
 KR/JJH
 CASING:
 None

 TYPE OF BORING:
 Diatube to 0.1m, Non-Destructive-Drilling (NDD) and Hand-Auger to 1.9m, Solid flight auger to 3.45m

 WATER OBSERVATIONS:
 No free groundwater observed whilst augering

 REMARKS:
 Bulk samples taken 0.4-1.6m & 1.7-1.9m

 SAMPLING & IN SITU TESTING LEGEND

 A Auger sample
 G Gas sample
 PILD
 Photo ionisation detector (ppm)

 B Buk sample
 P Piston sample
 Piston sample
 PL(A) Point load axial test Is(50) (MPa)

 B.K Block sample
 U, Tube sample (x mm dia.)
 PL(D) Point load axial test Is(50) (MPa)

 C Core drilling
 W Water sample
 PD Procket penetrometer (KPa)

 D Disturbed sample
 V Water seep
 S Standard penetration test

 E Environmental sample
 W Water level
 V Shear vane (kPa)

CLIENT:Lendlease Building Pty LtdPROJECT:SCH Stage 1 / CCCC ProjectLOCATION:High Street and Hospital Road, Randwick

SURFACE LEVEL: 55.3 AHD **EASTING:** 337109.8 **NORTHING:** 6245649.5 **DIP/AZIMUTH:** 90°/-- BORE No: BH605 PROJECT No: 72505.18 DATE: 19 & 25/08/2020 SHEET 1 OF 2

Γ			Description	Deg	ree of	.u	Rock Strength	_	Fracture	Discontinuities	Sa	mpli	ng &	In Situ Testing
R	De	pth n)	of	vvcai	nemig	Log		Vate	Spacing (m)	B - Bedding J - Joint	e	re .%	Q.,	Test Results
		,	Strata	NX N M	N S R	Ū	Ex Lov Very L Mediu Very F Very F	> ¹⁰⁰	0.05 0.10 0.50 1.00	S - Shear F - Fault	Tyi	Co Rec	Ro%	& Comments
E	5	0.11	ASPHALTIC CONCRETE			<u>ю.</u> О					E/D			
55	3-	0.24	FILL/ROADBASE: Sandy GRAVEL, sub-angular, fine igneous gravel, grev medium moist								E*/D			
-	-1	0.6	FILL/Gravelly SAND: medium, brown, subangular, fine igneous gravel, moist								E/D			
- 72	5	1.35	Between 0.4-0.55m: large brick			\bigotimes								
-	-2	1.5	FILL/SAND: fine to medium, brown, trace subrounded, fine to coarse sandstone gravel, silt, and glass fragment, moist											
53	3		SAND SP: fine to medium, pale grey, moist, aeolian			V. / /.		İ			s			1,3,2 N = 5
-	- - -	2.5	Clayey SAND SC: fine to medium, orange-brown, low plasticity, moist, loose, residual			, , , , , , , , , , , , , , , , , , ,				Unless noted otherwise, rock is fractured along rough, planar bedding	D			
ŧ	-3	2 10	Below 2.2m: with ironstone bands			•/./		>		planes dipping at 0-20°	S			7,25/30 refusal
-6	5	3.10	plasticity, pale grey, w~PL, residual (Extremely weathered sandstone)											PL(A) = 0.23
È	Ę		SANDSTONE: medium to coarse grained, pale grey and red-brown,						┆┎╎	3.7m: Cs 50mm				
-	-4		low to high strength, moderately and highly weathered, slightly fractured to unbroken. Hawkesbury	İİ				i		4m: J60°, pl, ro, fe st				PL(A) = 0.94
5	-		Sandstone								с	98	96	
-	-	4.94								4.9m [·] CORE LOSS [·]				DI(A) = 1.2
- 02	- 5									40mm				FL(A) - 1.3
-														
-	-6	5.75	SANDSTONE: medium grained, pale grey, medium strength, fresh,					i		5.00m. DS 30mm				PL(A) = 0.76
4	2		slightly fractured to unbroken, Hawkesbury Sandstone											
ŀ	-									6.48m: Ds 60mm				
Ē	-7							ļ						PL(A) = 0.84
48	2										с	100	98	
Ē										7.57m: B0°, pl, ro, cly vn				
È	-8							ļ						PL(A) = 0.84
47	-							İ						
-														
	-9	9.0	SANDSTONE: medium grained,											PL(A) = 1.3
46	2 - -		slightly fractured to unbroken, Hawkesbury Sandstone								с	100	100	
-			·							»>				

 RIG:
 Vac Truck, Hand Tools & Bobcat
 DRILLER:
 VAC Group
 LOGGED:
 KR/JJH/TM
 CASING:
 HQ to 3.1m

 TYPE OF BORING:
 Diatube to 0.1m, Non-Destructive-Drilling (NDD) and Hand-Auger to 1.8m, Solid flight auger to 3.18m, NMLC Coring to 16.28m

 WATER OBSERVATIONS:
 Water seepage at 3.1m

REMARKS: *Field replicate sampleBD1/20200819, Bulk samples taken 0.4-1.0m & 1.5-1.8m, Groundwater well installed, refer to Well Log for construction details, Data logger 2119606 installed in well



CLIENT:

PROJECT:

LOCATION:

Lendlease Building Pty Ltd

SCH Stage 1 / CCCC Project

High Street and Hospital Road, Randwick

SURFACE LEVEL: 55.3 AHD EASTING: 337109.8 NORTHING: 6245649.5 DIP/AZIMUTH: 90°/-- BORE No: BH605 PROJECT No: 72505.18 DATE: 19 & 25/08/2020 SHEET 2 OF 2

Γ		Description	Degree of Weathering .9	Rock Strength	Fracture	Discontinuities	Sa	ampli	ng &	In Situ Testing
ā	Depth (m)	of Strata	Graph Graph	Ker Low Medium Medium Very High	Spacing (m)	B - Bedding J - Joint S - Shear F - Fault	Type	Core Rec. %	RQD %	Test Results & Comments
	64 	SANDSTONE: medium grained, pale grey, high strength, fresh, slightly fractured to unbroken, Hawkesbury Sandstone <i>(continued)</i> Between 10.7-12.17: cross bedded at 0-10°					С	100	100	PL(A) = 1.3 PL(A) = 1.6
	- 12 - 12 					12.15m: B0°, pl, ro, cln				PL(A) = 2
	- 13 						с	100	97	PL(A) = 1.4
	- 14 	Between 13.9-15.4m: cross bedded at 0-10°				13.97m: B5°, pl, cly 1mm 14.25m: B10°, pl, cly vn 14.33m: B10°, pl, cly vn				PL(A) = 1.4
	- 15 					15.38m: Ds 10mm	с	100	99	PL(A) = 2
	ਸ਼ੂ - 16.28	Bore discontinued at 16.28m Target depth reached			; ;; ₽; ; ;; _ -,; ; ;; ; ;;	16.11m: Ds 10mm				
	- 17 - 17 									
	- 18 									
	8 8 - - -									

 RIG:
 Vac Truck, Hand Tools & Bobcat
 DRILLER:
 VAC Group
 LOGGED:
 KR/JJH/TM
 CASING:
 HQ to 3.1m

 TYPE OF BORING:
 Diatube to 0.1m, Non-Destructive-Drilling (NDD) and Hand-Auger to 1.8m, Solid flight auger to 3.18m, NMLC Coring to 16.28m

 WATER OBSERVATIONS:
 Water seepage at 3.1m

REMARKS: *Field replicate sampleBD1/20200819, Bulk samples taken 0.4-1.0m & 1.5-1.8m, Groundwater well installed, refer to Well Log for construction details, Data logger 2119606 installed in well



	BORE: 605	PROJEC	T: RANDWICK	AUGUST 2	020
-	Douglas Part		Project No: 72,505 BH ID: BH (05 Depth: 3.19- 6, Core Box No.: V3	-15 Om	
вн605	START 3.18 M				
5m					
7mk			4-0-0-		
		3.	18-8.00m		





SURFACE LEVEL: 52.1 AHD EASTING: 337045.4 NORTHING: 6245584.9 DIP/AZIMUTH: 90°/-- BORE No: BH606 PROJECT No: 72505.18 DATE: 28 - 31/8/2020 SHEET 1 OF 2

Γ		Description	Degree of Weathering ⊖ _		Rock Strength	Fracture	e Discontinuities		amplir	ng & I	& In Situ Testing	
벅	Depth (m)	of	, resultering	Log		Spacing (m)	B - Bedding J - Joint	be	ore %:	۵°	Test Results	
		Strata	W H M S S H	G		0.01 0.10 0.50	S - Shear F - Fault	Ţ	ы К С К	R ~	∝ Comments	
52	- 0.06			ģ. \				D				
ŧ	-	FILL/ROADBASE: GRAVEL, coarse, dark grey, igneous,		\bigotimes		i ii ii						
Ē	0.6	subangular-subrounded, dry,		\bigotimes					1			
ŧ	-	FILL/ GRAVEL: medium,		\bigotimes				E/D				
-12	-1	yellow-brown, sandstone, with clay,		\bigotimes				-			344	
Ē	14	FILL/ SAND: fine to medium, pale		\boxtimes				S			N = 8	
ŧ	- 1.4	grey, dry										
ŧ	-	SAND SP: fine to medium, brown, ∖drv. loose. aeolian										
-8	-2	Below 1.8m: moist			• • • • • • • • • •	i ii ii		E/D				
F	-											
Ē		Below 2.5m; medium dense			• • • • • • • • • •							
ŧ	-							S			5,7,9 N = 16	
5	-3 21						rock is fractured along					
4	- 3.1	SANDSTONE: medium to coarse					rough, planar bedding planes dipping at 0-20°					
ŧ	-	low strength, Hawkesbury										
Ē	- 3.0										PL(A) = 0.14	
ŧ,	-4	grained, pale grey with some pale									PL(A) = 0.23	
E4	Ē	strength, slightly weathered, slightly										
ŧ	-	fractured, Hawkesbury Sandstone										
ŧ	-							с	100	99		
Ē	-5											
4											PL(A) = 0.61	
ŧ	-						5.24m: Ds 10mm					
E												
ŧ												
-8	-6										PL(A) = 0.68	
ŧ	6.25	SANDSTONE: medium grained,										
ŧ	-	slightly fractured to unbroken,										
E	Ē	Hawkesbury Sandstone										
45	-7										PL(A) = 0.46	
Ē								С	100	98		
ŧ	-						7.37m: Ds 20mm					
ŧ	-											
4	-8										PL(A) = 0.76	
ľ	-											
ŧ	-											
F	ļ					┆┊┆┎┽╝	8.68m: Ds 40mm					
ŧ,	-9					L++]	8.91m: Ds 20mm				PL(A) = 0.68	
Ę	E											
ŧ	-							С	100	96		
ŧ	È											
Ł	-											

RIG: Bobcat

CLIENT:

PROJECT:

LOCATION:

Lendlease Building Pty Ltd

SCH Stage 1 / CCCC Project

High Street and Hospital Road, Randwick

DRILLER: JE

LOGGED: TM

CASING: HW to 3.2m, HQ to 3.6m

TYPE OF BORING: Diacore to 0.06m, Solid flight auger to 3.2m, Rotary to 3.6m, NMLC Coring to 16.19m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: *Field replicate sampleBD03/20200828, Bulk samples taken 0.6-1.0m & 1.5-3.0m, Groundwater well installed, refer to Well Log for construction details, Data logger 2121808 installed in well

SAMPLING & IN SITU TESTING LEGEND	
A Auger sample G Gas sample PID Photo ionisation detector (ppm)	
B Bulk sample P Piston sample PL(A) Point load axial test Is(50) (MPa)	- Douteoro
BLK Block sample U _x Tube sample (x mm dia.) PL(D) Point load diametral test Is(50) (MPa)	s Pariners
C Core drilling W Water sample pp Pocket penetrometer (kPa)	
D Disturbed sample D Water seep S Standard penetration test	·····
E Environmental sample F Water level V Shear vane (kPa)	Ironment Groundwater

SURFACE LEVEL: 52.1 AHD EASTING: 337045.4 NORTHING: 6245584.9 DIP/AZIMUTH: 90°/-- BORE No: BH606 PROJECT No: 72505.18 DATE: 28 - 31/8/2020 SHEET 2 OF 2

Γ		Description Degree Weather		Rock Strength		Fracture	Discontinuities		Sampling		ng & In Situ Testing	
R	Depth (m)	of Strate		Graph Log		Spacing (m)	B - Bedding J - Joint S - Shear F - Fault	Type	Core ec. %	gD %	Test Results &	
5	-	Strata SANDSTONE: medium grained,	X H M S H	-		0.0		-	۳ ۳		Comments PL(A) = 0.52	
41 41 41 41 41 41 41 41 41 41 41 41 41 4	- - - - - - - - - - - - - - - - - - -	pale grey, medium strength, fresh, slightly fractured to unbroken, Hawkesbury Sandstone <i>(continued)</i>					11.09m: Ds 110mm 11.43m: Ds 60mm	с	100	96	PL(A) = 0.45	
-4	- - 12 -										PL(A) = 0.88	
39	- 13							С	100	98	PL(A) = 1	
38	- - - - - - - - - - -						14.35m: B0°, pl, ro, cly ∖vn 14.53m: Ds 40mm				PL(A) = 0.72	
	- 15							с	100	98	PL(A) = 0.64	
-%	-16						15.95m: Ds 50mm				PL(A) = 0.08	
35	- 17	Bore discontinued at 16.19m Target depth reached					<u>16.17m: Ds 20mm</u>					
34	- 18											
33	- 19 											

RIG: Bobcat

CLIENT:

PROJECT:

LOCATION:

Lendlease Building Pty Ltd

SCH Stage 1 / CCCC Project

High Street and Hospital Road, Randwick

DRILLER: JE

LOGGED: TM

CASING: HW to 3.2m, HQ to 3.6m

TYPE OF BORING: Diacore to 0.06m, Solid flight auger to 3.2m, Rotary to 3.6m, NMLC Coring to 16.19m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: *Field replicate sampleBD03/20200828, Bulk samples taken 0.6-1.0m & 1.5-3.0m, Groundwater well installed, refer to Well Log for construction details, Data logger 2121808 installed in well

		SAMP	LIN	3 & IN SITU TESTING	LEG	END			
A	Auger sample		G	Gas sample	PID	Photo ionisation detector (ppm)	_		
В	Bulk sample		Р	Piston sample	PL(A	A) Point load axial test Is(50) (MPa)			Dougloo Douteoro
BL	K Block sample		U,	Tube sample (x mm dia.)	PL(E	D) Point load diametral test ls(50) (MPa)			1 Douolas Parmers
C	Core drilling		Ŵ	Water sample	pp	Pocket penetrometer (kPa)			
D	Disturbed sample	э	⊳	Water seep	S	Standard penetration test		· _	Out the first of Freedom and the Original data to
E	Environmental sa	ample	Ŧ	Water level	V	Shear vane (kPa)			Geotecnnics Environment Groundwater
-						· · · /			

BORE: 606	PROJEC	CT: RANDWI	CK AUG	AUGUST 2020					
	FTTNETS Groundwater	Project No: 7 BH ID: 4 BH Depth: + 3.6 Core Box No.:	2505.18 60(Dm-8.0 m 1/3						
72505.18 Randwick B	H606 START	3.60m							
5									
7	A.		-						
	3.	60-8.00m							





SURFACE LEVEL: 52.6 AHD **EASTING:** 337035.3 **NORTHING:** 6245607.6 **DIP/AZIMUTH:** 90°/-- BORE No: BH607 PROJECT No: 72505.18 DATE: 31/8/2020 SHEET 1 OF 2

Γ			Description	Degree of	υ	Rock Strength	Fracture	Discontinuities	Sa	amplii	ng & I	In Situ Testing
R	De (epth m)	of	Weathening	Lod		Spacing (m)	B - Bedding J - Joint	be	ore 2. %	D 20 %	Test Results
	Ì	,	Strata	T N N N N N N N N N N N N N N N N N N N	U	Kery Very Very Kery	0.01 0.10 0.50	S - Shear F - Fault	Ļ	ပိမ္ရွိ	<u>я</u>	Comments
2	-	0.06 0.25 0.55	ASPHALTIC CONCRETE		þ. (X				E/D E/D			
- 22			roadbase FILL/SAND: fine to medium, pale						E/D			
		1.4	dry, loose						s			7,8,6 N = 14
51-	-	1.4	yellow-brown, moist, loose, aeolian / SAND SC: fine to medium, dark									
-	-2		brown, with clay, loose, moist, aeolian						E/D*			
20-	-								s			1,3,3 N = 6
-	-3							Unless noted otherwise, rock is fractured along rough planar bedding				
49								planes dipping at 0-20°				
-	-4	3.89 3.92	SANDSTONE: medium to coarse grained, pale grey and pale orange, low strength, slightly weathered, clightly fractured. Howkorkow				<u> </u>	3.89m: CORE LOSS: 30mm 4.21m: B5°, pl, ro, cln				PL(A) = 0.14
48	-		Sandstone					4.58m: B0°, pl, ro, cly vn	с	98	98	
	-5	4.9	SANDSTONE: medium grained, pale grey, low strength, fresh, unbroken, Hawkesbury Sandstone									PL(A) = 0.29
-	-6											PL(A) = 0.22
46	-	6.35	SANDSTONE: medium grained, pale grey, medium strength with high strength bands, fresh,		X			6.27m: CORE LOSS: 80mm				
-	-7		unbroken, Hawkesbury Sandstone						с	98	98	PL(A) = 0.66
45	-						L 	7.41m: Ds 10mm				
	-8											PL(A) = 0.84
44												
-	-9											PL(A) = 0.76
									С	100	98	
-	-											

RIG: Bobcat

CLIENT:

PROJECT:

Lendlease Building Pty Ltd

LOCATION: High Street and Hospital Road, Randwick

SCH Stage 1 / CCCC Project

DRILLER: JE

LOGGED: TM

CASING: HQ to 3.89m

TYPE OF BORING: Solid flight auger to 3.8m, Rotary to 3.89m, NMLC Coring to 17.59m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: *Field replicate sampleBD04/20200831, Bulk samples taken 0.6-1.4m, 1.5-3.8m

	SA	MPLING	G & IN SITU TESTING	G LEG	END						
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)		_		-	_	_
В	Bulk sample	Р	Piston sample	PL(A) Point load axial test Is(50) (MPa)						
BI	LK Block sample	U,	Tube sample (x mm dia.)	PL(C) Point load diametral test Is(50) (MPa)		11.				r ners
C	Core drilling	Ŵ	Water sample	pp	Pocket penetrometer (kPa)						
D	Disturbed sample	⊳	Water seep	S	Standard penetration test			O to a to a to a	1		1 0
E	Environmental sample	e ¥	Water level	V	Shear vane (kPa)			Geotecnnics	I Envir	onment	I Groundwater
						-					

SURFACE LEVEL: 52.6 AHD **EASTING:** 337035.3 **NORTHING:** 6245607.6 **DIP/AZIMUTH:** 90°/-- BORE No: BH607 PROJECT No: 72505.18 DATE: 31/8/2020 SHEET 2 OF 2

Γ		Description	Degree of Weathering	<u>.0</u>	Rock Strength	Fracture	Discontinuities	Sa	amplii	ng & I	In Situ Testing
RL	Depth (m)	of Strata	XW MW SES SS FR SS SS SS SS SS SS SS SS SS SS SS SS SS	Graph Log	Very Low Medium Medium Ex High Ex High	Spacing (m) 5000 0000	B - Bedding J - Joint S - Shear F - Fault	Type	Core Rec. %	RQD %	Test Results & Comments
42	- 11	SANDSTONE: medium grained, pale grey, medium strength with high strength bands, fresh, unbroken, Hawkesbury Sandstone (continued)					10.3m: B5°, pl, ro, cln 10.49m: Ds 40 mm 11.15m: B0°, pl, ro, cly, vn	С	100	98	PL(A) = 0.81 PL(A) = 0.87
41	11.64 12			X			11.58m: CORE LOSS: 60mm				PL(A) = 1.3
40	- 13							С	98	95	PL(A) = 0.5
39	- - - - - - -						13.9m: Ds 110mm 14 46m: Ds 50mm				PL(A) = 1.7
36	- - 15 										PL(A) = 0.3
36	- 16						16.33m: Ds 10mm	С	100	100	PL(A) = 0.94
2	- 17	Between 16.85-17.57: with siltstone clasts					- 17.5m°B0° pl rockyvn				PL(A) = 1.1
-	- 18	Bore discontinued at 17.59m Target depth reached					(
33 34 34	- 19										

RIG: Bobcat

CLIENT:

PROJECT:

Lendlease Building Pty Ltd

LOCATION: High Street and Hospital Road, Randwick

SCH Stage 1 / CCCC Project

DRILLER: JE

LOGGED: TM

CASING: HQ to 3.89m

TYPE OF BORING: Solid flight auger to 3.8m, Rotary to 3.89m, NMLC Coring to 17.59m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: *Field replicate sampleBD04/20200831, Bulk samples taken 0.6-1.4m, 1.5-3.8m

	SAM	PLIN	G & IN SITU TESTING	LEG	END			
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)		_	
B	Bulk sample	Р	Piston sample	PL(A	A) Point load axial test Is(50) (MPa)			Develoo Dortmore
B	LK Block sample	U,	Tube sample (x mm dia.)	PL(I	D) Point load diametral test Is(50) (MPa)	1	1	A Douolas Parliers
C	Core drilling	Ŵ	Water sample	pp	Pocket penetrometer (kPa)			
D	Disturbed sample	⊳	Water seep	S	Standard penetration test			
E	Environmental sample	Ŧ	Water level	V	Shear vane (kPa)			Geotechnics Environment Groundwater







SURFACE LEVEL: 52.9 AHD EASTING: 337054.9 NORTHING: 6245642.4 DIP/AZIMUTH: 90°/-- BORE No: BH608 PROJECT No: 72505.18 DATE: 27 - 28/8/2020 SHEET 1 OF 2

Γ			Description	De	egree of	. <u>0</u>	5	Rock Strenath	5	Fracture	Discontinuities	Sa	amplir	ng & l	n Situ Testing
R	Dep (n	oth า)	of		unionig	Log	Low		Nate	Spacing (m)	B - Bedding J - Joint	be	ore c. %	ac %	Test Results
	Ĺ		Strata	≥ ₹	M N N H	U	Ler Lo	Low Medi Very Ex H	_	0.01	S - Shear F - Fault	ŕ	с я́	Ж,	Comments
ŧ	F	0.05 0.2				ġ. ``						E/D			
Ē	Ę	0.5	dark grey, igneous,			• <u>0</u>						E/D			
È	Ē		FILL/ GRAVEL: medium,	Ì		\bigotimes									
-6	-1		yellow-brown, sandstone, with clay, sand, crushed sandstone, dry	ļ		\bigotimes	ļ					E/D*	-		
Ē	Ę		FILL/SAND: fine to medium, brown,			\bigotimes						s			1,1,1 N = 2
È	Ē	1.5	trace slit, and fine subangular γ igneous gravel, dry			<u>کې</u>							-		
ŀ.	ŀ		SAND SP: fine to medium, vellow-brown with clay moist loose								Linless noted otherwise		-		
-	2		aeolian				ļ				rock is fractured along	E/D			
ŧ	Ē										planes dipping at 0-20°				
ŧ	F	2.5	SANDSTONE: medium to coarse									s			25/90 refusal
- 02	F		grained, pale yellow and red, very low then low strength, highly												PL(A) = 0.07
ŧ	-3		weathered, slightly fractured, Hawkesbury Sandstone	ļ			i			i ii ii i	2.92m: B5°, un, ro 3.06m: J10-90°, st, ro,				
ŀ	F										cln 3.23m: Ds 5mm				
F	Ę										3.26m: Ds 40mm				
49	4										5.00m. D3 00mm				PI (A) = 0.08
ŧ	ŀ			li			ļ			i ii Ŋi	4.12m: B5°, pl, ro, st	C	97	72	1 2(7) 0.00
Ē	Ę													12	
ŧ	Ē										4 72m: CORE LOSS:				
48	-5	4.83 5.02							ľ		110mm 4.83m: Ds 20mm				
Ē	Ē		pale grey, low then medium to high				ļ				4.0011. 23 201111				PL(A) = 0.19
ŧ	E		strength, fresh, slightly fractured to unbroken, Hawkesbury Sandstone					╎┖┽┓╎╎							
ł.	ļ.														
14	6			i	iiii		İ			1 11 11					PL(A) = 0.91
ŧ	F														
E	Ę														
- 9											6.63m: Ds 60mm				
ŀ	-7			li			ļ								PL(A) = 1
Ē	Ē									┊╶┼╴┤╏	7.31m: CORE LOSS:	С	99	99	
ŧ	Ē										20mm 7.33m: Ds 10mm				
45	-			İ			Ì								
Ē	-8						ļ								PL(A) = 0.81
ŧ	F														
E	Ę														
4	-9									┊─┿┿┿┦	8.85m: CORE LOSS:	<u> </u>			PL(A) = 0.97
ŧ	Ę										30mm				(, 0.07
F	Ę											с	99	99	
ŧ	Ē														
43	2														

RIG: Bobcat

CLIENT:

PROJECT:

LOCATION:

Lendlease Building Pty Ltd

SCH Stage 1 / CCCC Project

High Street and Hospital Road, Randwick

DRILLER: JE

LOGGED: TM

CASING: HW to 2.6m, HQ to 2.75m

TYPE OF BORING: Diacore to 0.05m, Solid flight auger to 2.5m, Rotary to 2.75m, NMLC Coring to 16.0m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: *Field replicate sample BD02/20200827, Bulk samples taken 0.5-1.5m & 1.5-2.5m, Groundwater well installed, refer to Well Log for construction details, Data logger 2119607 installed in well

SAMPLING & IN SITU TESTING LE	EGEND	
A Auger sample G Gas sample F	PID Photo ionisation detector (ppm)	
B Bulk sample P Piston sample F	PL(A) Point load axial test Is(50) (MPa)	Develop Devtrore
BLK Block sample U, Tube sample (x mm dia.) F	PL(D) Point load diametral test Is(50) (MPa)	A Douglas Partners
C Core drilling W Water sample p	pp Pocket penetrometer (kPa)	
D Disturbed sample ▷ Water seep S	S Standard penetration test	Or start nice 1 Fraincast 1 Or start have
E Environmental sample F Water level V	V Shear vane (kPa)	Geotecnnics Environment Groundwater

SURFACE LEVEL: 52.9 AHD **EASTING:** 337054.9 NORTHING: 6245642.4 **DIP/AZIMUTH:** 90°/--

BORE No: BH608 PROJECT No: 72505.18 DATE: 27 - 28/8/2020 SHEET 2 OF 2

Γ		Description	Degree of Weathering	<u>.0</u>	Rock Strength	_	Fracture	Discontinuities	Sa	mpli	ng &	In Situ Testing
R	Uepth (m)	of Strata	XXH X S S S S S S S S S S S S S S S S S	Graph Log	Ex Low Very Low Medium Very High Ex High	0.01 Wate	Spacing (m)	B - Bedding J - Joint S - Shear F - Fault	Type	Core Rec. %	RQD %	Test Results & Comments
		SANDSTONE: medium grained, pale grey, low then medium to high strength, fresh, slightly fractured to unbroken, Hawkesbury Sandstone (continued)						11.12m: B0°, pl, ro, cln	С	99	99	PL(A) = 1 PL(A) = 1.1
	- 11.89 - 12 							11.83m: CORE LOSS: 60mm 12.14m: B0°, pl, ro, cln				PL(A) = 1.2
	- - 13 							12.89m: B0°, pl, ro, cly vn 13.48m: B0°, pl, ro, cly	с	98	98	PL(A) = 0.83
	- 14 - 14 							vn				PL(A) = 0.75
	- - - - - - - - - - - - - - -							15.13m: Ds 30mm 15.45m: Ds 10mm	с	100	98	PL(A) = 1.1 PL(A) = 0.15
	- 16 - 16 - 16.33	Data discontinued at 40 20m						15.98m: B0-10°, un, sm				PL(A) = 1.2
	- - - - - - - - - - - - - - - - - - -	Target depth reached										
35	- - 18 - - -											
	- - - - - - - - - - - - - - - - - - -											

RIG: Bobcat

CLIENT:

PROJECT:

LOCATION:

Lendlease Building Pty Ltd

SCH Stage 1 / CCCC Project

High Street and Hospital Road, Randwick

DRILLER: JE

LOGGED: TM

CASING: HW to 2.6m, HQ to 2.75m

TYPE OF BORING: Diacore to 0.05m, Solid flight auger to 2.5m, Rotary to 2.75m, NMLC Coring to 16.0m WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: *Field replicate sample BD02/20200827, Bulk samples taken 0.5-1.5m & 1.5-2.5m, Groundwater well installed, refer to Well Log for construction details, Data logger 2119607 installed in well

	5	SAMPL	INC	3 & IN SITU TESTING	LEG	END										
A	Auger sample		G	Gas sample	PID	Photo ionisation detector (ppm)		_	_		-		_		_	
В	Bulk sample		Р	Piston sample	PL(A	A) Point load axial test Is(50) (MPa)						00		01		-
BLł	K Block sample		U,	Tube sample (x mm dia.)	PL(E	D) Point load diametral test Is(50) (MPa)	1	1.								
C	Core drilling		Ŵ	Water sample	pp	Pocket penetrometer (kPa)					-		-			
D	Disturbed sample		⊳	Water seep	S	Standard penetration test		11		O to . to . i .	1	—			0	
E	Environmental sam	nple	Ŧ	Water level	V	Shear vane (kPa)				Geotecnnics	1	Enviro	onme	ent I	Grouna	water
-							-									







Appendix C (Continued)

Previous Groundwater Well Logs

SURFACE LEVEL: 51.9 AHD **EASTING:** 337044.9 **NORTHING:** 6245563 **DIP/AZIMUTH:** 90°/--

BORE No: 4 (72505.11) PROJECT No: 72505.13 DATE: 19 - 21/9/2017 SHEET 1 OF 1

	_		Description	.ci		Sam	npling a	& In Situ Testing	<u>ب</u>	Well
Ч	Depth (m)		of	aph Log	e	ţ	ple	Results &	Vate	Construction
	(,		Strata	Ū	۲ ۲	Dep	Sam	Comments	>	Details
F	0.0	#	ASPHALTIC CONCRETE (typically <10mm diameter)		A	0.07				Gatic Cover
Ē	0.0	2	ASPHALTIC CONCRETE (typically <20mm diameter)		A	0.15				
51	-1 -1	5-	ROADBASE - dark grey, angular, igneous gravel typically 40-80mm diameter, slight hydrocarbon odour		A	0.6				
202	2	h	FILLING - orange-brown, medium grained sand filling with some sandstone gravel and a trace of clay (ripped sandstone)		A	1.4 1.6 1.9 2.0				Backfill
49	2.	6	SAND - pale yellow-brown, fine to medium grained sand, damp 2.2m: brown		S	- 2.5 - 2.95		8,14,17 N = 31		-3 Bentonite
48	3. 3.6 4 4	5 – 5⁄	SAND - medium dense to dense, orange, fine to medium sand with some clay, damp			3.65 3.9		PL(A) = 0.22		4
			SANDSTONE - extremely low to very low strength sandstone		с					
- 4	-5		SANDSTONE - low strength, slightly weathered, fractured to slightly fractured, pale brown, medium to coarse grained sandstone			4.95 - 5.29		PL(A) = 0.76		5 Gravel
46	6		SANDSTONE - medium strength, slightly weathered then fresh, slightly fractured and fractured, medium to coarse grained sandstone			5.93		PL(A) = 0.71		6 0000147111 0000 0000147111 0000 000010000000000000000000000000
45	7 6.9	1	- limonite staining to 4.40m 5.5m: distinct irregular bedding dipping 15°- 20°		С	6.95		PL(A) = 0.71		
44	-8		*(6.4m: indistinct irregular bedding dipping 0°- 20° SANDSTONE - medium strength, fresh, slightly fractured and unbroken, pale grey, medium to coarse grained			7.95		PL(A) = 0.66		
43	9		sandstone, massive, trace carbonaceous flecks			8.95		PL(A) = 0.95		9 0000 0000 0000 0000 0000
42	- 10				с	9.95		PL(A) = 0.73		
41	- 11					10.88		PL(A) = 0.61		
40	-12 12.	0-	SANDSTONE - medium to high strength, fresh, slightly			11.39		PL(A) = 0.69		
39	-13		fractured to unbroken, pale grey, medium to coarse grained sandstone, indistinct bedding typically dipping 10°- 20°		с	12.95		PL(A) = 1.1		Backfill
38.1	14					13.95 14.37		PL(A) = 0.91		
	14. 15	6	SANDSTONE - high then medium strength, fresh, unbroken, pale grey, fine to medium grained sandstone, occasional carbonaceous laminations and flecks			14.95		PL(A) = 1.33		15 00000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0
36	16				с	15.93		PL(A) = 0.59		16
35	- 17 - 17.3	1	16.78-16.97m: siltstone clasts and laminations, slightly fractured			17.04 		PL(A) = 0.76		
34	- 18		Bore discontinued at 17.31m - target depth reached							18
-	-									

 RIG:
 Bobcat
 DRILLER:
 GM
 LOGGED:
 ARM
 CASING:
 HW to 3.65m

 TYPE OF BORING:
 Diatube to 0.08m; NDD to 1.7m; Solid flight auger (TC-bit) to 3.65m; NMLC-Coring to 17.31m
 WATER OBSERVATIONS:
 No free groundwater observed whilst augering

 REMARKS:
 CASING:
 Variation
 Variation
 Variation

SAMPLING & IN SITU TESTING LEGEND

CLIENT:

PROJECT:

LOCATION:

LendLease Building Pty Ltd

Streets, Randwick

Randwick Campus Redevelopment

Hospital Road and High, Magill and Botany





SURFACE LEVEL: 50.5 AHD **EASTING:** 337038.1 NORTHING: 6245507 **DIP/AZIMUTH:** 90°/--

BORE No: 8 (72505.11) PROJECT No: 72505.13 **DATE:** 23 - 24/1/2018 SHEET 1 OF 1

		Description	. <u>c</u>		Sam	pling 8	& In Situ Testing	_	Well	
님	Depth (m)	of	raph Log	be	pth	aldr	Results &	Nate	Construction	1
		Strata	G	Ţ	Del	San	Comments	_	Details	
	- 0.1 0.25	ASPHALTIC CONCRETE (typically <10mm diameter)			04				Gatic Cover	
202	0.6 -1	ROADBASE - dark grey, angular, igneous gravel typically 40-80mm diameter		A	0.5				Backfill -1	
49		FILLING - pale grey and brown sandstone gravel and cobbles up to 100mm diameter (ripped sandstone)			1.6					
	-2	SAND - pale brown, medium grained sand with a trace of fine gravel, damp			25		7 10/10mm		-2 Gravel	
14	2.6 2.77 3	SANDSTONE - extremely low strength, orange-brown	· · · · · · · · · · · · · · · · · · ·	S	2.66		refusal PL(A) = 0.26		-3	
47	-	SANDSTONE - low to medium strength, slightly weathered, fractured to slightly fractured, orange and grey.		С	2.95				E Bentonite	
	-4	medium to coarse grained sandstone		•	3.88 3.91		PL(A) = 0.43		4	
1	-5				4.95		PL(A) = 0.6		5	
45	5.45	SANDSTONE - high then medium strength, fresh, slightly fractured to unbroken, pale grey, medium to coarse		C	5.05					
44	-6	grained sandstone with a trace of carbonaceous flecks			5.95		PL(A) = 1.12		-6	
	-7			· · ·	6.89 6.95		PL(A) = 0.69		7	
43					7.05		PI (A) = 0.63			
Ē	-8	8.1-8.55m: low strength band			9.41		PL(A) = 0.03		-8	
-4	-				0.41		FL(A) = 0.22			
Ē	-9				8.95		PL(A) = 0.63		-9	0,00
14					0.02					
40	- 10 10.41	10.2-10.41m: with 25% siltstone clasts up to 20mm diameter, fragmented (possibly drilling induced)	• • • • •	•	9.93		PL(A) = 1.03		- 10 Backfill	
	- 11 - 11 4F	LAMINITE - low strength, fresh, slightly fractured, dark grey siltstone interlaminated and interbedded with 40% pale grey. fine grained sandstone	· · · · · · · · · · · · · · · · · · ·	С	10.95		PL(A) = 0.18		-11	0.000
Ē	-12	SANDSTONE - high strength, fresh, slightly fractured to unbroken, pale grey, medium to coarse grained			11.95		PL(A) = 2.23		-12	
38	- 13	sandstone, massive		· · · · · · · · · · · · · · · · · · ·	12.75 12.92		PL(A) = 1.54		-13	
37	- 14	13.03-13.21: fine to medium grained 13.21m: medium to coarse grained, irregular bedding dipping 10-20°			13.85		PL(A) = 1.19		- 14	0,00,00,00 0,00,00,00 0,00,00,00
36 36	- 15	14.8m: massive			14.95		PL(A) = 1.27		15	0,00,00 0,00,00 0,00,00 0,00,00
4	- 16			x x x x	15.89 15.95		PL(A) = 1.36		16	
	-17	16.44m: irregular bedding dipping 10-20°		C	16.95		PL(A) = 1.57		17	0.000 0.000 0.000
33	17.58	Bore discontinued at 17.39m			17.59					_
Ē	- 18								- 18	
32										
<u> </u>	L			1	1			1	L	

RIG: Bobcat DRILLER: GM LOGGED: ARM CASING: HW to 2.5m; HQ to 2.7m TYPE OF BORING: Diatube to 0.10m; Non-destructive drilling to 1.7m; Solid flight auger (TC-bit) to 2.77m; NMLC-Coring to 17.39m WATER OBSERVATIONS: No free groundwater observed whilst augering **REMARKS:**

SAMPLING & IN SITU TESTING LEGEND Gas sample Piston sample Tube sample (x mm dia.) Water sample Water seep Water level PID Photo ionisation detector (ppm) PL(A) Point load axial test Is(50) (MPa) PL(D) Point load diametral test Is(50) (MPa) pp Pocket penetrometer (kPa) S Standard penetration test V Shear vane (kPa) A Auger sample B Bulk sample BLK Block sample G P U, W Core drilling Disturbed sample Environmental sample CDE ₽

Douglas Partners Geotechnics | Environment | Groundwater

PROJECT:

CLIENT:

LendLease Building Pty Ltd Randwick Campus Redevelopment LOCATION: Hospital Road and High, Magill and Botany Streets, Randwick

CLIENT:

PROJECT:

LOCATION:

LendLease Building Pty Ltd

Randwick Campus Redevelopment

Hospital Road and High, Magill and Botany

SURFACE LEVEL: 55.7 AHD **EASTING:** 337090 **NORTHING:** 6245535 **DIP/AZIMUTH:** 90°/--

BORE No: 12 PROJECT No: 72505.13 DATE: 30-4-2018 SHEET 1 OF 1

	Streets, Randwick				P/AZII	MUTI	H: 90°/		SHEET 1 OF 1	
		Description	<u>.</u>		Sam	ipling &	& In Situ Testing		Well	
De (n	pth n)	of	Log	e	oth	ple	Results &	Vate	Construction	
,	<i>,</i>	Strata	Ū	Ţ	Del	San	Comments		Details	
	0.09	ASPHALTIC CONCRETE	p. O.	D	0.1				- Gatic Cover	
	0.6	ROADBASE: dark grey, sandy fine to coarse grain							-	
- 1		FILLING: brown, medium to coarse sand filling, with some		D	0.8				- - 1 Deckfill	
	1.2	silt, damp							- Dackilli	
54		0.6-1.2 m: with some roots.		s	1.6		2,7,9		-	
-2		damp			2.05		N = 16		-2	
									Bentonite	
22										
3				S	3.0		5,10,13 N = 23		-3	
					3.45		14 - 20		-	
-4									-4	
									-	
12				S	4.5		6,11,13 N = 24			
-5					4.95				-5 Gravel	
									Screen 3.8-6.8m	
22							11/110			
	6.1	SANDSTONE: high strength, slightly weathered		S	6.1		refusal			01-0
- <u>-</u>		becoming fresh, slightly fractured, pale grey, medium to coarse grained sandstone, some iron stained bedding			6.11				-	
7					7.0		PL(A) = 2.42		7	
ĒĒ				с			PL(A) = 2.29		Bentonite	-
48									-	
- 8									-8	0.000
									-	
9	8.8	SANDSTONE: high strength, fresh, unbroken, pale grey,			8.79 8.8		PL(A) = 1.24		-9	0.000
		medium grained sandstone							-	
-9-		9.40-9.45 m: bedding typically 10-20°			0.81		PI(A) = 10		-	
E = 10					0.01		1 L(N) - 1.5		- 10	
				С					-	
-8					10.72		PL(A) = 2.54			
L 4 [11.48		PL(A) = 0.93		-	0.000
12				с	11.81		PL(A) = 1.33		12	0000
				С	12.27					
43					12.55				-	0.00
-13									13	
				С						
45		13.57-14.15 m: becoming slightly fractured			13.71		PL(A) = 1.2			
	4.15	Bore discontinued at 14.15m			14.0		PL(A) = 1.04	-	- 14	000
		Target depth reached								
Ē									-	

 RIG:
 Han Jin 8D
 DRILLER:
 BG Drilling
 LOGGED:
 JAP
 CASING:
 HW to 5.5 m

 TYPE OF BORING:
 Diatube to 0.09 m, NDD to 1.5 m, Solid flight auger (TC-bit) to 4.0 m, Rotary to 6.1 m, HQ Coring to 14.15 m

 WATER OBSERVATIONS:
 No free groundwater observed whilst augering

 REMARKS:

SAMPLING & IN SITU TESTING LEGEND A Auger sample G Gas sample PLD Photo ionisation detector (ppm) B Bulk sample P Piston sample PL(A) Point load axial test Is(50) (MPa) BLK Block sample U Tube sample (x mm dia.) PL(D) Point load diametral test Is(50) (MPa) D Disturbed sample V Water sample (x mm dia.) PL D Disturbed sample V Water sample P E Environmental sample ¥ Water level V

Douglas Partners Geotechnics | Environment | Groundwater

SURFACE LEVEL: 52.0 AHD **EASTING:** 337045 **NORTHING:** 6245565 **DIP/AZIMUTH:** 90°/--

BORE No: 13 PROJECT No: 72505.13 DATE: 3-5-2018 SHEET 1 OF 1

Γ		D //	Description	Lic		San	npling &	& In Situ Testing	2	Well	
ā	2	(m)	of Strata	Grapt	Type	Depth	ample	Results & Comments	Wate	Construction Details	ו
-	-	0.05	ASPHALTIC CONCRETE: (typically <10 mm diameter) ASPHALTIC CONCRETE: (typically <20 mm diameter) ROADBASE: dark grey, angular igneous gravels,				<u></u>			Gatic Cover -	
		0.4 0.6 0.9 1	(typically 30-80 mm diameter) FILLING: grey-brown, ripped sandstone filling, (typically 40-80mm diameter) FILLING: orange brown, medium sandy gravel filling with some coarse sandstone gravel, damp SAND: medium dense, pale yellow, medium sand, damp							- Bentonite	
		2				1.8		2,6,9		-2	20000000000000000000000000000000000000
-	-				5	2.25		N = 15		- - - Gravel —	00000000000000000000000000000000000000
-	-	2.5	SAND: medium dense to dense, brown orange, fine to medium sand with some silt, damp			2.8				Screen 1.3-3.8m	0,00,0,00,00 0,00,00,00,00 111111111111
-9	- - -	3			D S	3.0		14,8/80 refusal		-3	200000 200000 111111111
-	-	3.2	SANDSTONE: extremely low to very low strength, orange brown sandstone			5.2				- - - -	
		3.8	Bore discontinued at 3.8m Limit of investigation							4 	
		5								-5	
Ē	ŀ									-	

RIG: Han Jin 8D

DRILLER: BG Drilling

LOGGED: JAP

CASING: Uncased

 TYPE OF BORING:
 Diatube to 0.15 m, Non-destructive drilling to 1.6 m, solid flight auge (TC-bit) to 3.8 m

 WATER OBSERVATIONS:
 No free groundwater observed whilst augering

 REMARKS:
 Remarks:



Douglas Partners Geotechnics | Environment | Groundwater

CLIENT: L PROJECT: F LOCATION: F

LendLease Building Pty Ltd Randwick Campus Redevelopment Hospital Road and High, Magill and Botany Streets, Randwick

SURFACE LEVEL: 55.2 AHD EASTING: 336986 **NORTHING:** 6245643 **DIP/AZIMUTH:** 90°/--

BORE No: 16 PROJECT No: 72505.13 **DATE:** 8-5-2018 SHEET 1 OF 1

Γ			Description	ic		Sam	npling &	& In Situ Testing		Well
Я	i De (r	pth n)	of	iraph Log	/be	pth	nple	Results &	Wate	Construction
			Strata	0	ŕ	ă	Sar	Comments		Details
ł	ŀ	0.12	CONCRETE SLAB							Gatic Cover
	-	0.55	and trace of igneous gravel, humid							
	1	0.55	SAND: yellow, fine to medium sand, damp							Backfill
- 72	-									Bentonite
	-2	2.0	SAND: medium dense, yellow, fine to medium sand, damp		S	2.0		4,9,11 N = 20		
-	3					2.45				
	-	3.2	SAND: medium dense, brown, fine to medium sand with trace of clay, damp			3.5				Gravel Screen 2.1-4.7m
-	-				S	3.95		7,9,20 N = 29		
ţ	-4	4.1				4.1		6/30 Bouncing		
22	- - - -		SANDSTONE: very low strength, orange-brown and light grey, medium to coarse grained sandstone			4.15		0.00, 200.00.g		
ţ	-	4.7	Bore discontinued at 4.7m	<u></u>						- <u>0.7-0.7</u>
- - - -	- 5 - 5 		Limit of investigation							5 5

RIG: Han Jin 8D DRILLER: BG Drilling LOGGED: JAP CASING: HW to 4.0 m TYPE OF BORING: Diatube to 0.12 m, Non-destructive drilling to 1.8 m, solid flight auger (TC-bit) to 2.0 m, Rotary to 4.7 m WATER OBSERVATIONS: No free groundwater observed whilst augering **REMARKS:**

SAMPLING & IN SITU TESTING LEGEND A Auger sample B Bulk sample BLK Block sample CDE





LendLease Building Pty Ltd

PROJECT: LOCATION:

CLIENT:

Randwick Campus Redevelopment Hospital Road and High, Magill and Botany Streets, Randwick

CLIENT:

PROJECT:

LOCATION:

LendLease Building Pty Ltd

Streets, Randwick

Randwick Campus Redevelopment

Hospital Road and High, Magill and Botany

SURFACE LEVEL: 55.2 AHD **EASTING:** 336983 **NORTHING:** 6245644 **DIP/AZIMUTH:** 90°/--

BORE No: 17 PROJECT No: 72505.13 DATE: 8-5-2018 SHEET 1 OF 1

Γ	Depth	Description	Di		Sam	npling &	& In Situ Testing	<u> </u>	Well	
R	Dept (m)	h	of	Graph Log	ype	epth	mple	Results &	Wate	Construction
		11	Strata				Sa			
55	E 0.	11	CONCRETE SLAB							
Ē	Ē	0.6	_ FILLING: brown, fine to medium sand filling with some silt \and trave of igneous and sandstone gravel, humid	\mathbb{R}^{\times}						
÷.	-1		SAND: yellow-brown, fine to medium sand, damp							
Ľů L	Ē									
ŧ	Ē									
5	2 2	2.0	SAND: medium dense yellow-brown fine to medium sand,		s	2.0		4,6,9		-2 Backfill
Ē	-		damp		-	2.45		N = 15		
Ē	E a									
52	Ę :	3.3								
Ē	Ē		SAND: medium dense, brown, fine to medium sand with trace of clay, damp		s	3.5		9,10,14		
Ē	4		·····			3.95		N = 24		4
51	÷ .	4.4								Dantanita
Ē	-		SANDS I ONE: very low to low strength, orange-brown and light grey, medium to coarse grained sandstone							Bentonne
- 20	5 5.	08	SANDSTONE: medium strength, slightly weathered			5.0				
Ē	-		slightly fractured, light grey and red-brown, medium to		С					
ŧ	6		coarse grained sandstone, bedding typically 0-10°			5.79		PL(A) = 0.6		
69	-					5.6				
Ē	Ē					6.71		PI(A) = 0.8		
Ē	7					0.71				
184	Ē				С					Gravel
E	Ē					7.86		PI(A) = 1.1		
- -	-8					7.00		1 (A) = 1.1		
Ē										
ŧ	Ē.					8.8		PL(A) = 0.5		
46	-					9.34		PI(A) = 0.5		
Ē	Ę	9.5	SANDSTONE: medium strength, fresh, slightly fractured			0.01		(, , , , , , , , , , , , , , , , , , ,		
Ē	10		to unbroken, light grey sandstone with some low strength bands, bedding typically 10-15° with some cross bedding			10.0		PL(A) = 0.8		
14	Ē		SANDSTONE (see over nage)		с					Bentonite
ŧ	Ę									
4	-11					11.0		PL(A) = 0.12		
Ē	Ē									
Ē	-12					11.85		PL(A) = 0.39		
43	12.	24	SANDSTONE: medium and high strength fresh			12.37		PI (A) = 1.38		
ŧ	-		unbroken, light grey and grey sandstone			12.01				
Ē	13									
14	-		12.4.12.0. Dadding turingly 5.10°		С	13.44		PL(A) = 0.69		
Ē	Ē		13.4-13.8: Bedding typically 5-10							
-14	- 14									
Ē	Ē									0.00
Ē	14 15	4.8	Bore discontinued at 14.8m	h		14.76 14.8		PL(A) = 1.16	+	-15
4	Ē		Target depth reached							
ŧ	Ē									
E	ŀ									F

 RIG: Han Jin 8D
 DRILLER: BG Drilling
 LOGGED: JAP
 CASING: HW to 4.5 m

 TYPE OF BORING:
 Diatube to 0.11 m, Non-destructive drilling to 1.8 m, Auger to 2.0 m, Rotary to 5.0 m, NMLC Coring to 14.80 m

 WATER OBSERVATIONS:
 No free groundwater observed whilst augering

 REMARKS:

 SAMPLING & IN SITU TESTING LEGEND

 A
 Auger sample
 G
 Gas sample
 PID
 Photo ionisation detector (ppm)

 B
 Bulk sample
 P
 Piston sample
 PL(A) Point load axial test Is(50) (MPa)

 BLK Block sample
 U
 Tube sample (x mm dia.)
 PL(D) Point load axial test Is(50) (MPa)

 C
 Core drilling
 W
 Water sample
 p

 D
 Disturbed sample
 V
 Water seep
 S

 E
 Environmental sample
 ¥
 Water level
 V


CLIENT:

PROJECT:

LOCATION:

Lendlease Building Pty Ltd

SCH Stage 1 / CCCC Project

High Street and Hospital Road, Randwick

SURFACE LEVEL: 55 AHD **EASTING:** 337097.5 **NORTHING:** 6245571.8 **DIP/AZIMI ITH:** 90°/-- BORE No: BH602 PROJECT No: 72505.18 DATE: 19 & 24/08/2020 SHEET 1 OF 1

_			Г				_			
			Description	.cj		San	npling 8	& In Situ Testing	L .	Well
님	De (r	epth	of	aph -og	e	ţ	ple	Poculte &	Vate	Construction
	(i	,	Strata	5	T dy	Dep	Sam	Comments	5	Details
8		0.09	- ASPHALTIC CONCRETE			0.1	05			Gatic cover
<u> </u>		0.28	□ FILL/ROADBASE: Sandy GRAVEL sub-angular fine	p. U rititi	E	0.3				
 			igneous gravel, grey, medium, moist		E/D	0.4				Grout 0.0-1.0m
F F		0.7	FILL/SAND: fine to medium, dark brown, with silt, moist	<u> </u>		0.6				
F_F			SAND SP: fine to medium, pale grey, moist, aeolian		E/D	10.8				
- 20	- 1					1.0				
EE										Bentonite 1.0-1.5m
t t										Blank pipe
t t										
- 3	-2					2.0				
 		2.2			s			4,3,5		
ļ			SAND SP: fine to medium, orange-brown, apparently cemented iron indurated ("coffee rock") aeolian			245		N = 8		
FF		2.6				2.5				screen 1.5-3.34m
FF			SAND SP: fine to medium, yellow-brown, moist, aeolian			2.6				
-23	-3					3.0		5 25/125		
EE		3.2	- Below 3.1m: becoming wet		s	3.27		refusal		
1		3.35	SANDSTONE: medium grained, pale yellow-brown,	[<u></u>						End cap
 			Sandstone							-
 			Bore discontinued at 3.35m							
-20	-4		Target depth reached							- 4
FF										-
EE										
E										-
6	-5									- 5
t T										
 										-
ļ ļ										-
FF										-
-4	-6									-6
EE										
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46	- 9									-9
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EF										
[]										

 RIG:
 Vac Truck, Hand Tools & Bobcat
 DRILLER:
 VAC Group
 LOGGED:
 KR/JJH
 CASING:
 None

 TYPE OF BORING:
 Diatube to 0.1m, Non-Destructive-Drilling (NDD) and Hand-Auger to 1.5m, Solid flight auger to 3.35m
 WATER OBSERVATIONS:
 No free groundwater observed whilst augering

REMARKS: Bulk sample taken at 0.7-1.5m, Groundwater well installed, refer to Well Log for construction details, Data logger 2121809 installed in well



CLIENT:

PROJECT:

LOCATION:

Lendlease Building Pty Ltd

SCH Stage 1 / CCCC Project

High Street and Hospital Road, Randwick

SURFACE LEVEL: 55.3 AHD **EASTING:** 337109.8 **NORTHING:** 6245649.5 **DIP/AZIMUTH:** 90°/-- BORE No: BH605 PROJECT No: 72505.18 DATE: 19 & 25/08/2020 SHEET 1 OF 2

Π		Description	. <u>u</u>		San	npling &	& In Situ Testing		Well
뉟	Depth (m)	of	aphi Log	e	oth	ple	Results &	Vater	Construction
	()	Strata	ō	Ţ	Dep	Sam	Comments	>	Details
	0.11	ASPHALTIC CONCRETE	Ö.Ö	E/D	0.1				Gatic cover
55	0.24 	FILL/ROADBASE: Sandy GRAVEL, sub-angular, fine		E*/D	0.3 0.4 0.5				
	- 1	FILL/Gravelly SAND: medium, brown, subangular, fine igneous gravel, moist Between 0.4-0.55m: large brick fragment	\bigotimes	E/D	0.9				
54	1.35 1.5	FILL/SAND: fine to medium, brown, trace subrounded, fine to coarse sandstone gravel, silt, and glass fragment, moist			1.1 1.4 1.5				Backfill 0.0-2.3m
ŀ		SAND SP: fine to medium, pale grey, moist, aeolian	1. 1.		1.6				
	-2	Clayey SAND SC: fine to medium, orange-brown, low plasticity, moist, loose, residual			2.0		1,3,2		
-23		Below 2.2m: with ironstone bands	1. 1.	5	2.45		N = 5		
	2.5	Sandy CLAY CI: low to medium plasticity, pale grey, w~PL, residual (Extremely weathered sandstone)		_D_	2.45 2.5 2.6				Bentonite 2.3-3.3m
Ē	- 3			S	3.0		7,25/30		3
52	- 3.18 - -	SANDSTONE: medium to coarse grained, pale grey and red-brown, low to high strength, moderately and highly weathered, slightly fractured to unbroken, Hawkesbury		0	3.18 3.3		refusal PL(A) = 0.23		20°24
	- 4	Sandstone							Blank pipe
51	•				4.2		PL(A) = 0.94		
				С					
	-5 4.94 -5				5.0		PL(A) = 1.3		
-22-									
49	5.75 - 6	SANDSTONE: medium grained, pale grey, medium strength, fresh, slightly fractured to unbroken, Hawkesbury Sandstone			5.84 6.0		PL(A) = 0.76		
	- - - - -7				7.0		PL(A) = 0.84		
48				С					2000 2000 2000 2000 2000 2000 2000 200
47	- 8				8.0		PL(A) = 0.84		8 2000 100
					8.85				
46	- 9 - - -			С	9.0		PL(A) = 1.3		
	-				10.0_		PL(A) = 1.3		Gravel 3.3-3.8m

 RIG: Vac Truck, Hand Tools & Bobcat
 DRILLER: VAC Group
 LOGGED:
 KR/JJH/TM
 CASING:
 HQ to 3.1m

 TYPE OF BORING:
 Diatube to 0.1m, Non-Destructive-Drilling (NDD) and Hand-Auger to 1.8m, Solid flight auger to 3.18m, NMLC Coring to 16.28m

 WATER OBSERVATIONS:
 Water seepage at 3.1m

 REMARKS:
 *Field replicate sampleBD1/20200819, Bulk samples taken 0.4-1.0m & 1.5-1.8m, Groundwater well installed, refer to Well Log for construction details, Data logger 2119606 installed in well



CLIENT:

PROJECT:

LOCATION:

Lendlease Building Pty Ltd

SCH Stage 1 / CCCC Project

High Street and Hospital Road, Randwick

SURFACE LEVEL: 55.3 AHD EASTING: 337109.8 NORTHING: 6245649.5 DIP/AZIMUTH: 90°/-- BORE No: BH605 PROJECT No: 72505.18 DATE: 19 & 25/08/2020 SHEET 2 OF 2

		Description	0		San	npling &	& In Situ Testing		Well	
R	Depth	of	aphic	ρ _φ	읖		Desults ⁹	/ater	Construction	n
	(11)	Strata	5	T	Dep	Saml	Comments	5	Details	
44 45 45	- 11	SANDSTONE: medium grained, pale grey, medium strength, fresh, slightly fractured to unbroken, Hawkesbury Sandstone <i>(continued)</i> SANDSTONE: medium grained, pale grey, high strength, fresh, slightly fractured to unbroken, Hawkesbury Sandstone SANDSTONE: medium grained, pale grey, high strength, fresh, slightly fractured to unbroken, Hawkesbury Sandstone <i>(continued)</i> Between 10.7-12.17: cross bedded at 0-10°		с	11.0	5	PL(A) = 1.6		Slotted PVC	
43	- 12				- 11.81 12.0		PL(A) = 2		- 12	
42	- 13			с	13.0		PL(A) = 1.4		- 13	00000000000000000000000000000000000000
41	- 14	Between 13.9-15.4m: cross bedded at 0-10°			14.0		PL(A) = 1.4		- 14	
40	- 15 			с	15.0		PL(A) = 2		- 15	
-	- 16 - 16 28				16.0		PL(A) = 2.2		- 16 - 	000
36 37 37 38 37 38	- 16.28	Bore discontinued at 16.28m Target depth reached	<u></u>		-16.28				- End cop	

 RIG:
 Vac Truck, Hand Tools & Bobcat
 DRILLER:
 VAC Group
 LOGGED:
 KR/JJH/TM
 CASING:
 HQ to 3.1m

 TYPE OF BORING:
 Diatube to 0.1m, Non-Destructive-Drilling (NDD) and Hand-Auger to 1.8m, Solid flight auger to 3.18m, NMLC Coring to 16.28m

 WATER OBSERVATIONS:
 Water seepage at 3.1m

 REMARKS:
 *Field replicate sampleBD1/20200819, Bulk samples taken 0.4-1.0m & 1.5-1.8m, Groundwater well installed, refer to Well Log for





SURFACE LEVEL: 52.1 AHD EASTING: 337045.4 NORTHING: 6245584.9 DIP/AZIMUTH: 90°/-- BORE No: BH606 PROJECT No: 72505.18 DATE: 28 - 31/8/2020 SHEET 1 OF 2

			Description	ji		San	npling	& In Situ Testing	<u> </u>	Well
ᆋ	Depth (m)	1	of	iraph Log	, be	pth	nple	Results &	Wate	Construction
	0.0	6	Strata	G	L	å	Sar	Comments		Details
22	0.0	2-		þ. Ó XX	, 	0.1				Grout 0.0-1.0m
	0	6-	igneous, subangular-subrounded, dry, roadbase		E/D*	0.4				0.15-0.35m Blank pipe
ŧ	0.		FILL/ GRAVEL: medium, yellow-brown, sandstone, with / clay, sand, crushed sandstone, dry			0.8				0.15-0.5m
-2	·1		FILL/ SAND: fine to medium, pale grey, dry			1.0		344		
	1.	4-			s s	1 45		N = 8		
			SAND SP: fine to medium, brown, dry, loose, aeolian			1.45				
	.2		Below 1.8m: moist		E/D	1.9				screen 0.5-3.0m
-2-	-					2.0				
Ē						2.5				
			Below 2.5m: medium dense		s			5,7,9 N = 16		
4	· 3 3.	1-				2.95				- 3 End cap
ĒĒ			SANDSTONE: medium to coarse grained, yellow-brown, very low to low strength, Hawkesbury		•					
	3.	6-	Sandstone			3.6		PL(A) = 0.14		Bentonite 3.0-4.0m
} 	4		with some pale orange staining, low then medium			10		DL(A) = 0.22		
-8F	.4		Hawkesbury Sandstone			4.0		PL(A) = 0.23		
ĒĒ										
ĒĒ					с					
	•5					51		DL(A) = 0.61		-5
4						5.1		PL(A) = 0.01		
ĒĒ						5.8				
-9	-6					6.0		PL(A) = 0.68		
	6.2	5-	SANDSTONE: medium grained, pale grey, medium							
			Hawkesbury Sandstone							
	-7					7.0		PL(A) = 0.46		7
45					C					
}										
ĒĒ										
4	8					8.0		PL(A) = 0.76		8
-										
						8.8				
43	. y					9.0		PL(A) = 0.68		
ŧ					с					
ĘĘ										
EĒ						10.0		PL(A) = 0.52		E 🕅

RIG: Bobcat

CLIENT:

PROJECT:

LOCATION:

Lendlease Building Pty Ltd

SCH Stage 1 / CCCC Project

High Street and Hospital Road, Randwick

DRILLER: JE

LOGGED: TM

CASING: HW to 3.2m, HQ to 3.6m

TYPE OF BORING: Diacore to 0.06m, Solid flight auger to 3.2m, Rotary to 3.6m, NMLC Coring to 16.19m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: *Field replicate sampleBD03/20200828, Bulk samples taken 0.6-1.0m & 1.5-3.0m, Groundwater well installed, refer to Well Log for construction details, Data logger 2121808 installed in well



SURFACE LEVEL: 52.1 AHD EASTING: 337045.4 NORTHING: 6245584.9 DIP/AZIMUTH: 90°/-- BORE No: BH606 PROJECT No: 72505.18 DATE: 28 - 31/8/2020 SHEET 2 OF 2

		Description	.cj		San	npling a	& In Situ Testing	_	Well	
씸	Depth (m)	of	Sraph Log	ype	epth	mple	Results &	Wate	Construction	
		Strata	0	ŕ	ă	Sar	Comments		Details	XX -
41 41 42	- - - - - - - - - - - - - - - - - - -	SANDSTONE: medium grained, pale grey, medium strength, fresh, slightly fractured to unbroken, Hawkesbury Sandstone <i>(continued)</i>		С	11.0		PL(A) = 0.45		-11	
40	- - - 12 - - -				11.8 12.0		PL(A) = 0.88		-12	
	- - - 13 - - -			с	13.0		PL(A) = 1		-13	
38	- - - 14 - - - -				14.0		PL(A) = 0.72		-14	
37	- - - 15 - - -			С	14.8 15.0		PL(A) = 0.64		-15	
36	- - 16 - 16.19	Bore discontinued at 16.19m Target depth reached			16.05 -16.19		PL(A) = 0.08		-16	
35	- - - 17 - - -								-17	
34	- - 18 								-18	
33	- 19 19 								-19	
ŀ	ŀ								F	

RIG: Bobcat

CLIENT:

PROJECT:

LOCATION:

Lendlease Building Pty Ltd

SCH Stage 1 / CCCC Project

High Street and Hospital Road, Randwick

DRILLER: JE

LOGGED: TM

CASING: HW to 3.2m, HQ to 3.6m

TYPE OF BORING: Diacore to 0.06m, Solid flight auger to 3.2m, Rotary to 3.6m, NMLC Coring to 16.19m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: *Field replicate sampleBD03/20200828, Bulk samples taken 0.6-1.0m & 1.5-3.0m, Groundwater well installed, refer to Well Log for construction details, Data logger 2121808 installed in well



SURFACE LEVEL: 52.9 AHD **EASTING:** 337054.9 **NORTHING:** 6245642.4 **DIP/AZIMUTH:** 90°/-- BORE No: BH608 PROJECT No: 72505.18 DATE: 27 - 28/8/2020 SHEET 1 OF 2

Γ			Description	jc		Sam	npling &	& In Situ Testing	-	Well		
Ъ	Depth	ו	of	braph Log	/pe	spth	nple	Results &	Wate	Constructio	on	
	0.0)5	Strata	0	ŕ		Saı	Comments		Details	- 	. .
Ē	- 0.0	.2	ASPHALTIC CONCRETE		E/D	0.1				Grout 0.0-1.0m		
Ē	<u></u> о.	.5	igneous, subagular-subrounded, dry	o. V.S.	E/D	0.4				-		
1			FILL/ GRAVEL: medium, yellow-brown, sandstone, with clay, sand, crushed sandstone, dry		E/D*	0.8				- - - Backfill 0 1 1 75m -		
ľ	-1		FILL/SAND: fine to medium, brown, trace silt, and fine subangular igneous gravel dry			- 1.0		1,1,1				
Ē		5		\bigotimes		1.45		N = 2		-		
ł	- ''	.0	SAND SP: fine to medium, yellow-brown, with clay, moist, loose, aeolian			10				-		
-12	-2				E/D	2.0				-2		
Ē	Ę									Bentonite -		
Ē	2.	.5	SANDSTONE: medium to coarse grained, pale yellow		s	2.5		25/90 refusal		- 0.15-0.3511		
- 20	t L		and red, very low then low strength, highly weathered, slightly fractured. Hawkesbury Sandstone		:	2.75		PL(A) = 0.07		-		
Ē	-3									- 3 Blank pipe - 0.1-2.75m		2
ł					:					-		ļ
Ē	E									-		ć
-6	-4					4.0		PL(A) = 0.08		- 4		d
F	F				с					-		
Ē	Ę									-		
48	4.8	33		\geq						-		s
ŀ	-5 5.0)2	SANDSTONE: medium grained, pale grey, low then							-5		
ł	- L		medium to high strength, fresh, slightly fractured to unbroken, Hawkesbury Sandstone			5.3		PL(A) = 0.19		-		2
ł	E					5.76				-	01-00	2
47	-6				•	6.0		PL(A) = 0.91		-6		d
F	F				:					-		ć
Ē	Ę									-		
46	Ę									-		
Ē	-7					7.0		PL(A) = 1		-7	00-00	
È					C					-		
ł	- L									-		2
45	-8					8.0		PL(A) = 0.81		- 8		
ł	-									-		ç
Ē	F									-		
44	Ē				:	8.85						
ţ	-9					9.0		PL(A) = 0.97		-9		
ŀ	ŀ				с						000	\$
ł	ŧ									Gravel 0.5-3.0m - Slotted PVC -		
43	-					10.0_		PL(A) = 1				L

RIG: Bobcat

CLIENT:

PROJECT:

LOCATION:

Lendlease Building Pty Ltd

SCH Stage 1 / CCCC Project

High Street and Hospital Road, Randwick

DRILLER: JE

LOGGED: TM

CASING: HW to 2.6m, HQ to 2.75m

TYPE OF BORING: Diacore to 0.05m, Solid flight auger to 2.5m, Rotary to 2.75m, NMLC Coring to 16.0m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: *Field replicate sample BD02/20200827, Bulk samples taken 0.5-1.5m & 1.5-2.5m, Groundwater well installed, refer to Well Log for construction details, Data logger 2119607 installed in well



SURFACE LEVEL: 52.9 AHD **EASTING:** 337054.9 **NORTHING:** 6245642.4 **DIP/AZIMUTH:** 90°/-- BORE No: BH608 PROJECT No: 72505.18 DATE: 27 - 28/8/2020 SHEET 2 OF 2

		Description	<u>ic</u>		Sam	mpling & In Situ Testing			Well	
R	Depth (m)	of Strata	Graph Log	Type	Depth	Sample	Results & Comments	Wate	Construction Details	
42		SANDSTONE: medium grained, pale grey, low then medium to high strength, fresh, slightly fractured to unbroken, Hawkesbury Sandstone <i>(continued)</i>		С					-11	20000000000000000000000000000000000000
41	- '' - - - - - - - - - - - - - - - - - -				11.1		PL(A) = 1.1			00000000000000000000000000000000000000
	- 12 - - - - - -				12.0		PL(A) = 1.2		-12	0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
40	- 13			С	13.0		PL(A) = 0.83		-13	11111111111111111111111111111111111111
	- 14 - 14 				14.0		PL(A) = 0.75		- 14	00000000000000000000000000000000000000
38	- - 15 - - - -			с	15.0 15.2		PL(A) = 1.1 PL(A) = 0.15		-15	0,00,00,00,00,00,00,00,00,00,00,00,00,0
37	- 16 - 16 - 16.33	Bore discontinued at 16.33m			16.0 -16.33-		PL(A) = 1.2		16 End cap	
36	- 17 - 17 	raiget deptimeathed							-17	
35	- 18								- 18	
34	- 19 - 19 								- 19	

RIG: Bobcat

CLIENT:

PROJECT:

LOCATION:

Lendlease Building Pty Ltd

SCH Stage 1 / CCCC Project

High Street and Hospital Road, Randwick

DRILLER: JE

LOGGED: TM

CASING: HW to 2.6m, HQ to 2.75m

TYPE OF BORING: Diacore to 0.05m, Solid flight auger to 2.5m, Rotary to 2.75m, NMLC Coring to 16.0m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: *Field replicate sample BD02/20200827, Bulk samples taken 0.5-1.5m & 1.5-2.5m, Groundwater well installed, refer to Well Log for construction details, Data logger 2119607 installed in well

