

Memorandum

To	Atlassian Pty Ltd, Andrew Kyriacou C/- Avenor Pty Ltd Allison Mahlberg	Andrew.Kyriacou@avenor.com.au allison.mahlberg@avenor.com.au
From	Huw Smith	Date 15 May 2020
Subject	Interim Data Release: Site Plan, Factual Data and Interpreted Cross-Sections, for a Proposed Commercial Development	Project No. 86767.00
Site Location	8-10 Lee Street, Haymarket	Document No. 86767.00.C.004.Rev0

Andrew, Allison,

Further to our recent discussions and correspondence, the first stage of supplementary geotechnical and environmental investigation works was recently completed for the proposed commercial development site at 8-10 Lee Street, Haymarket. Due to access and stakeholder requirements, a second stage of investigation works is to commence within the coming days, after which time the supplementary geotechnical investigation report will be prepared. An interim supplementary site investigation for contamination is also in preparation.

Please find attached to this memorandum the factual data obtained from the recent supplementary site investigations, along with an updated site plan and seven updated geotechnical cross-sections prepared for the site (draft). The geotechnical information is presented in a series of seven interpreted cross-sections, prepared with a focus on the 'Developer Works zone' and the eastern part of the 'State Works – Link Zone'. These will be further updated when the Stage 2 investigations are completed.

Boreholes drilled for the project indicate that fill materials (sand or clay) were present within most of the boreholes drilled within the 'Developer Works zone' (thicker on the Central Station side of the site), and that alluvial soils were encountered in some of the boreholes. A layer of residual clay was also encountered in some boreholes, overlying rock layers interpreted to belong to either the Mittagong Formation or the Hawkesbury Sandstone. Shale was not encountered in the boreholes.

Collection of groundwater level data is currently in progress, with the data downloaded from datalogger instruments (installed within standpipe piezometers) completed regularly in recent weeks, along with rising head testing in Borehole BH103 (screened within sandstone interpreted to belong to the Mittagong Formation), and within Borehole BH104 (screened within sandstone interpreted to belong to the Hawkesbury Sandstone Formation). Monitoring of groundwater level data from three other standpipes installed at the site has been carried out since late July 2019. The results of the groundwater level monitoring results are to be presented under separate cover (i.e. DP Report 86767.00.R.005.Rev0).

Preliminary groundwater level measurements from the standpipe piezometers installed recently indicate that a relatively shallow groundwater table is present within both sandstone units, within the footprint of the proposed basement (ie within the 'Developer Works' zone), and that perched groundwater is present within the overlying alluvial sediments.

Feel free to contact me if you require additional information, ahead of the finalised supplementary geotechnical investigation report.

Douglas Partners Pty Ltd



Huw Smith

Associate

Reviewed By



Brendan O'Kane

Senior Associate

Limitations

Douglas Partners (DP) has prepared this interim factual data release for this project at 8-10 Lee Street, Haymarket in general accordance with DP's proposal SYD190190.P.003.Rev4 dated 4 February 2020 and the consultancy agreement dated 11 June 2019. This interim factual data release is provided for the exclusive use of Atlassian Pty Ltd or their agents for this project only and for a planning proposal submission. It should not be used by or be relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of DP, does so entirely at its own risk and without recourse to DP for any loss or damage.

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

DP cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion stated in this memorandum.

Elements or sections from this memorandum should not be used as part of a specification for a project, without review and agreement by DP.

Attachments: Test Location Plan
Site Photographs
Interpreted Geotechnical Cross-Sections (Draft)
Borehole Logs and Core Photographs
Site Photographs during drilling from Boreholes BH101 and BH105
Groundwater Level field sheets
Groundwater Rising Head Test results
Laboratory Test Report

About this Report

Douglas Partners



Introduction

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

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

Copyright

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Borehole and Test Pit Logs

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

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

Groundwater

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

- In low permeability soils groundwater may enter the hole very slowly or perhaps not at all during the time the hole is left open;

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

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

Reports

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

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

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

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

About this Report

Site Anomalies

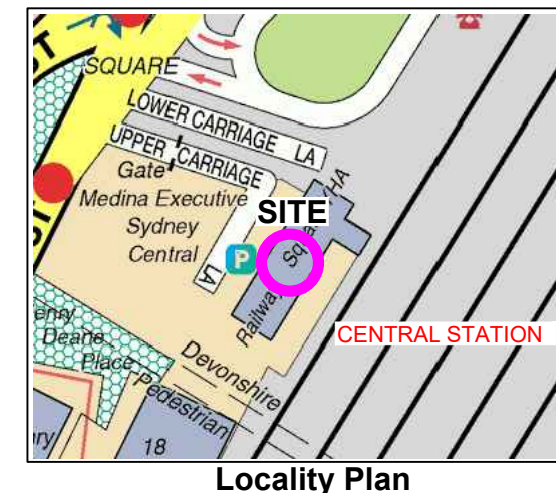
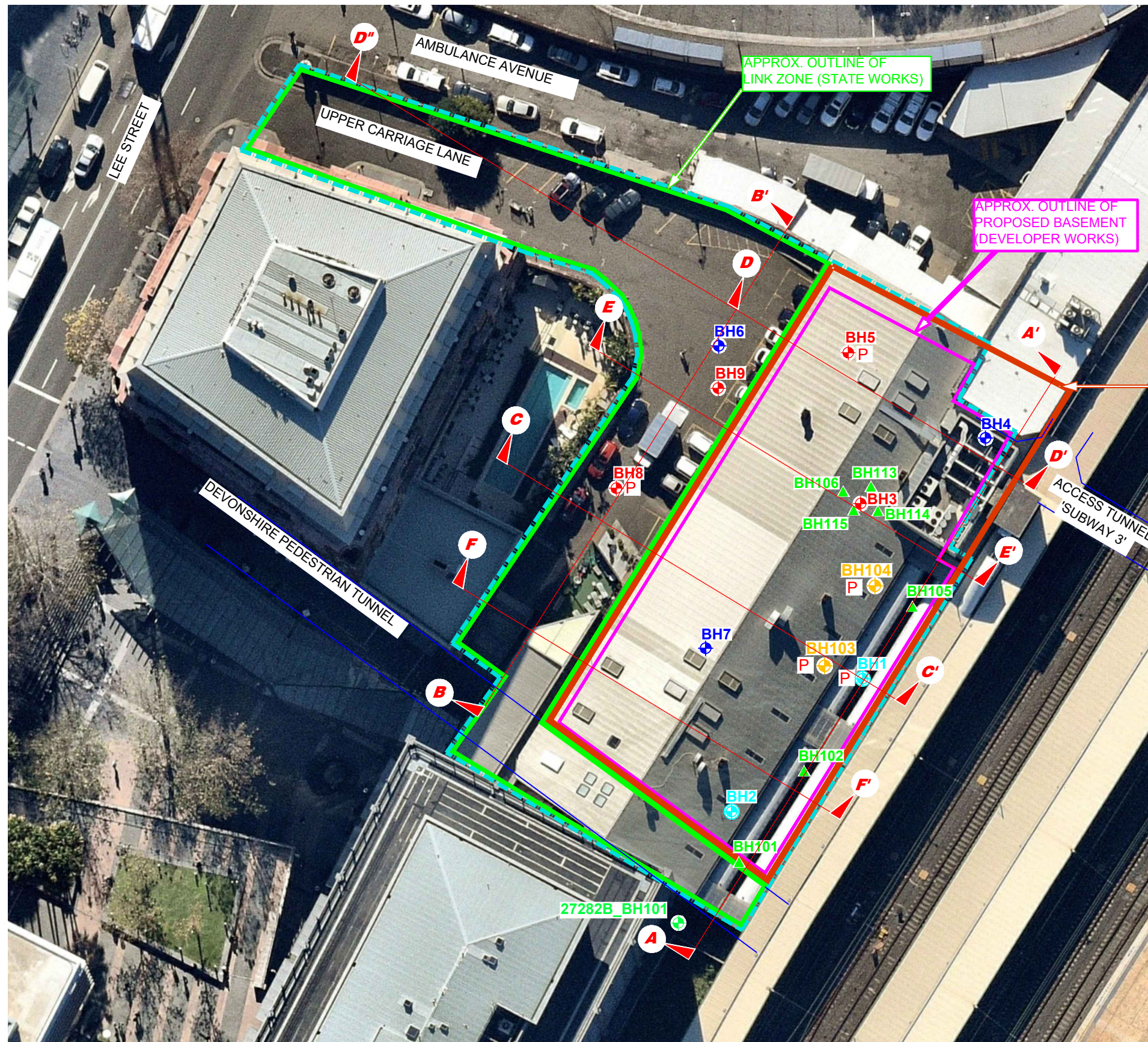
In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, DP requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed rather than at some later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

Information for Contractual Purposes

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

Site Inspection

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



APPROX. OUTLINE OF ATLASSIAN "TOWER ZONE"

LEGEND

- Previous geotechnical borehole (DP Project 27282B, dated 1999)
- Previous environmental borehole at Lower Ground Floor level (DP Report 86767.01, dated 2019)
- Previous geotechnical & environmental borehole - Lower Ground Floor
- Previous geotechnical & environmental borehole - Upper Ground Floor
- Current environmental borehole at Lower Ground Floor level
- Current geotechnical & environmental borehole - Upper Ground Floor
- Standpipe piezometer
- Geotechnical Cross Section A-A'
- Approximate site boundary

NOTE:
1: Base image from Nearmap.com (Dated 1.7.2019)
2: Test locations are approximate only and are shown with reference to existing features.
3: Approximate Development Outlines are as provided by Avenor Pty Ltd on 12 August 2019.

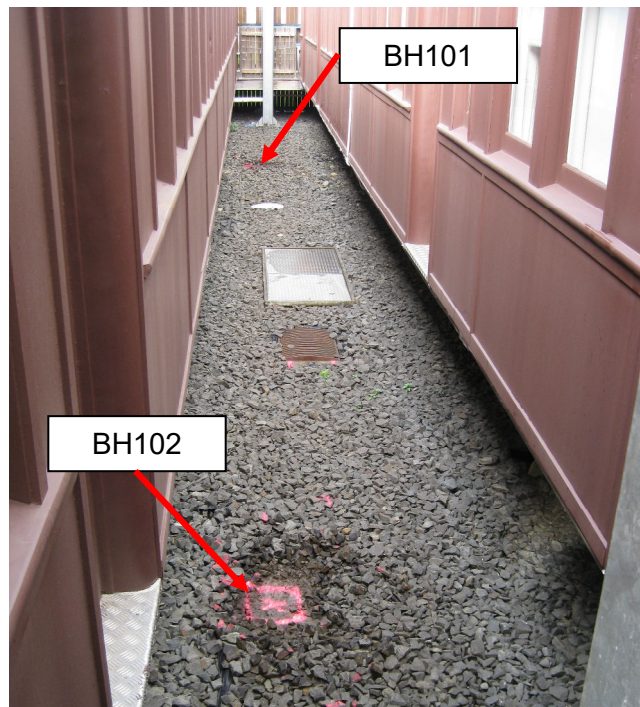


Photo 1 – View south-west between the rail dormitory carriages on the eastern side of the YHA building (Upper Ground Floor level), with the positions of environmental investigation boreholes BH101 and BH102 as shown.



Photo 2 – View south-west along a former rail platform, on the eastern side of the YHA building (Upper Ground Floor level). The locations of boreholes BH103 and BH104 are indicated as shown.

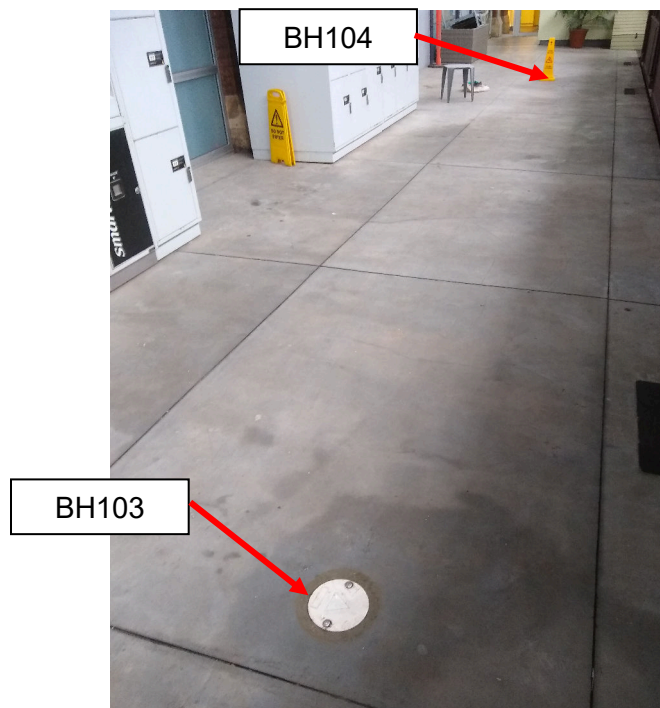


Photo 3 – View north-east along a former rail platform, on the eastern side of the YHA building (Upper Ground Floor level). The locations of boreholes BH103 and BH104 (with white lid covers) are indicated as shown.

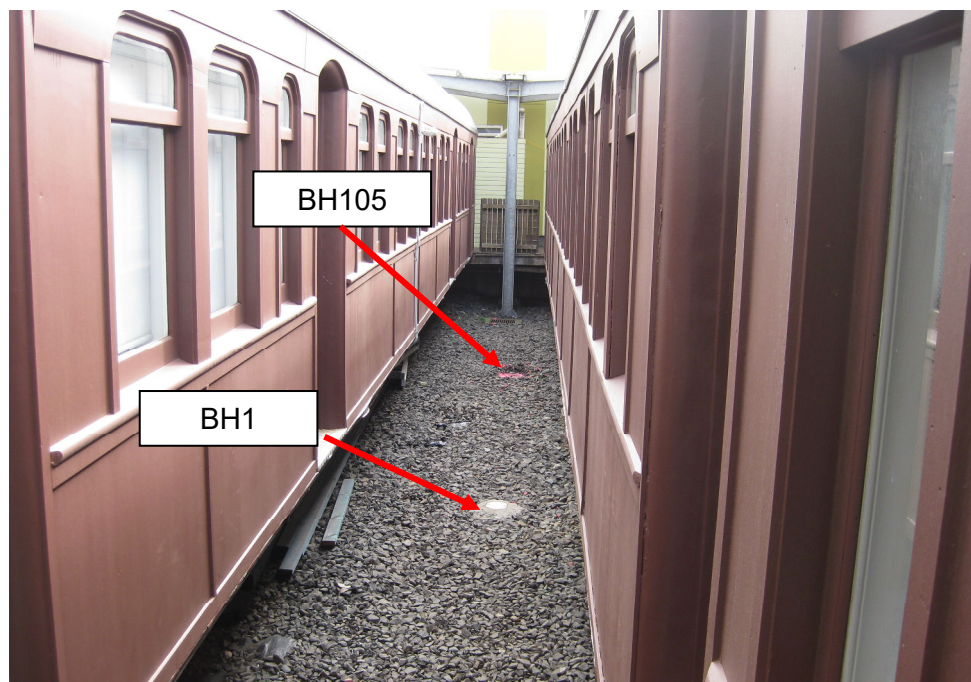


Photo 4 – View south-west between the rail dormitory carriages on the eastern side of the YHA building (Upper Ground Floor level), with the position of boreholes BH105 and BH1 (with installed standpipe) indicated as shown.

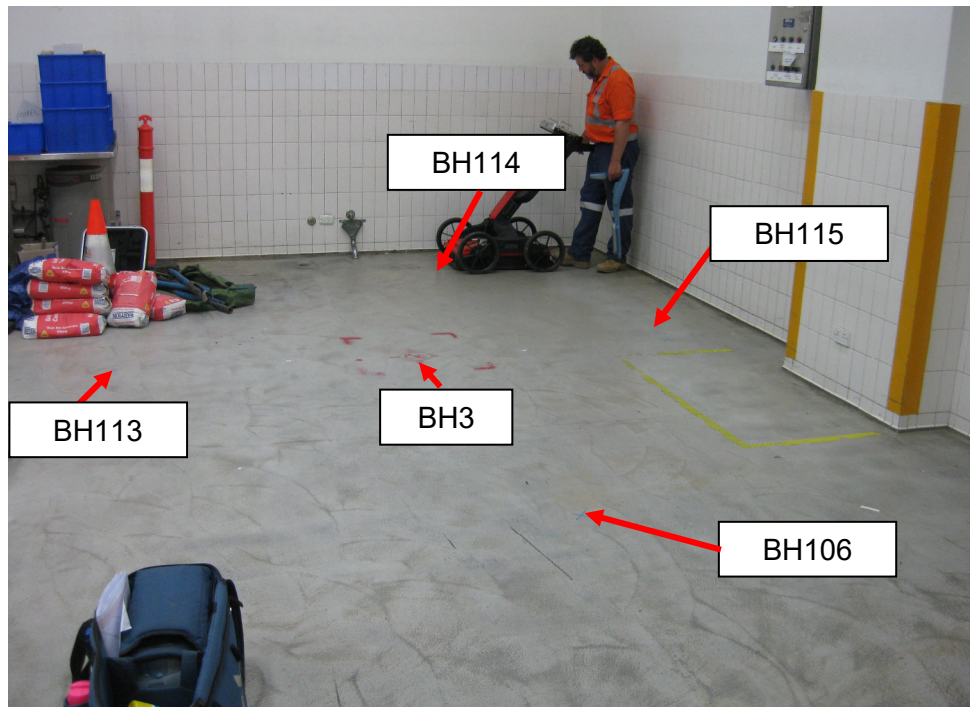
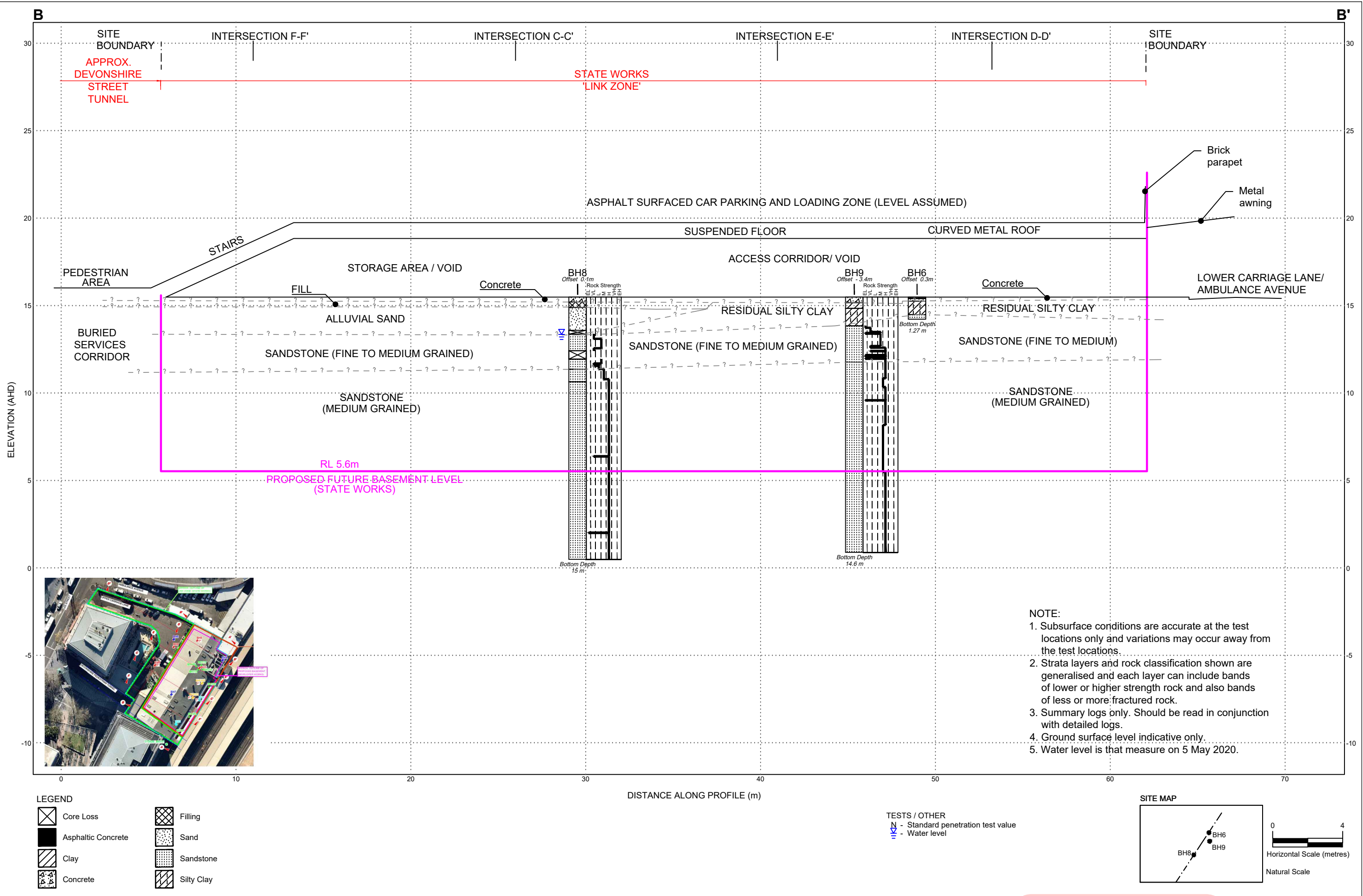
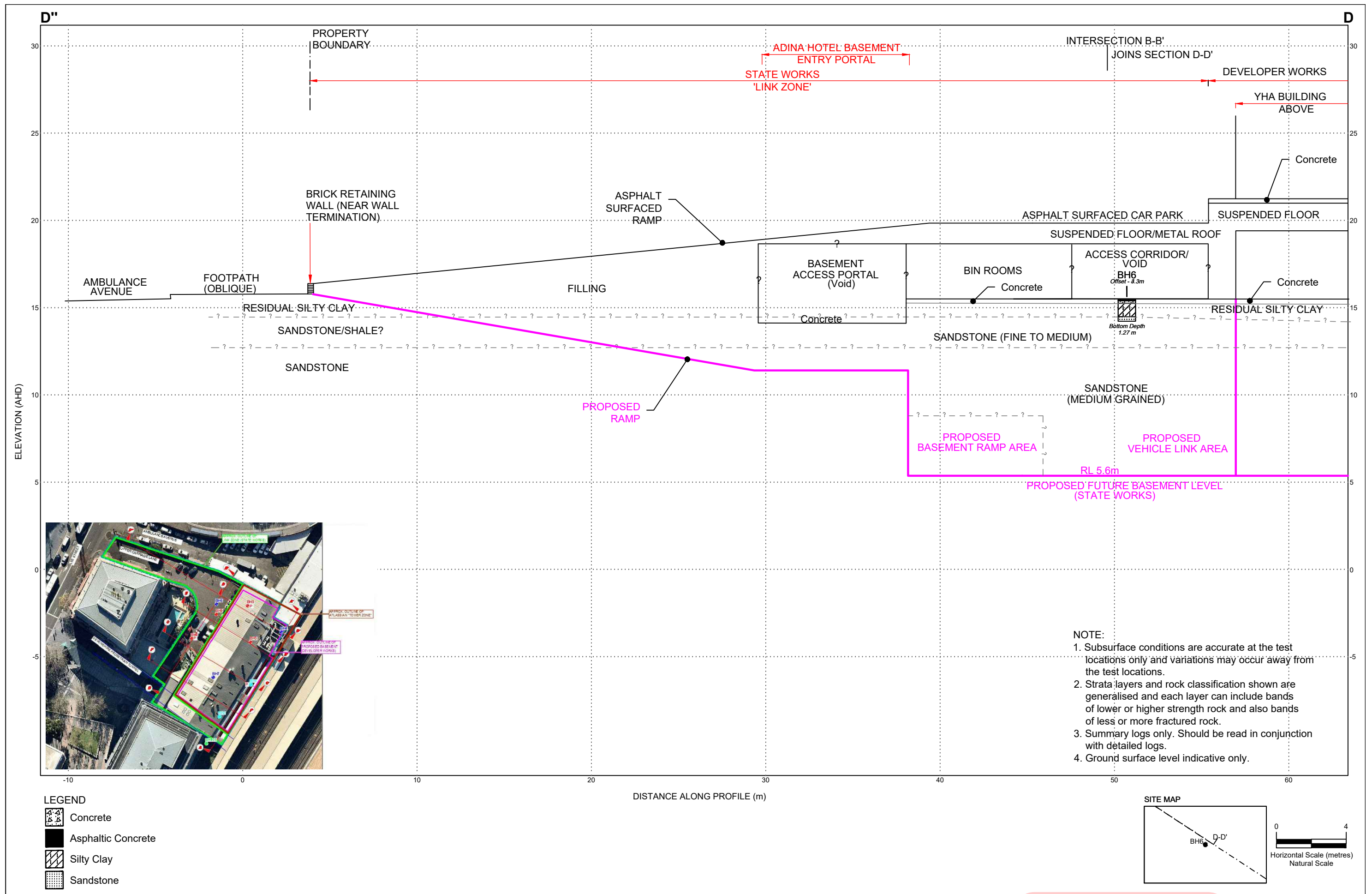
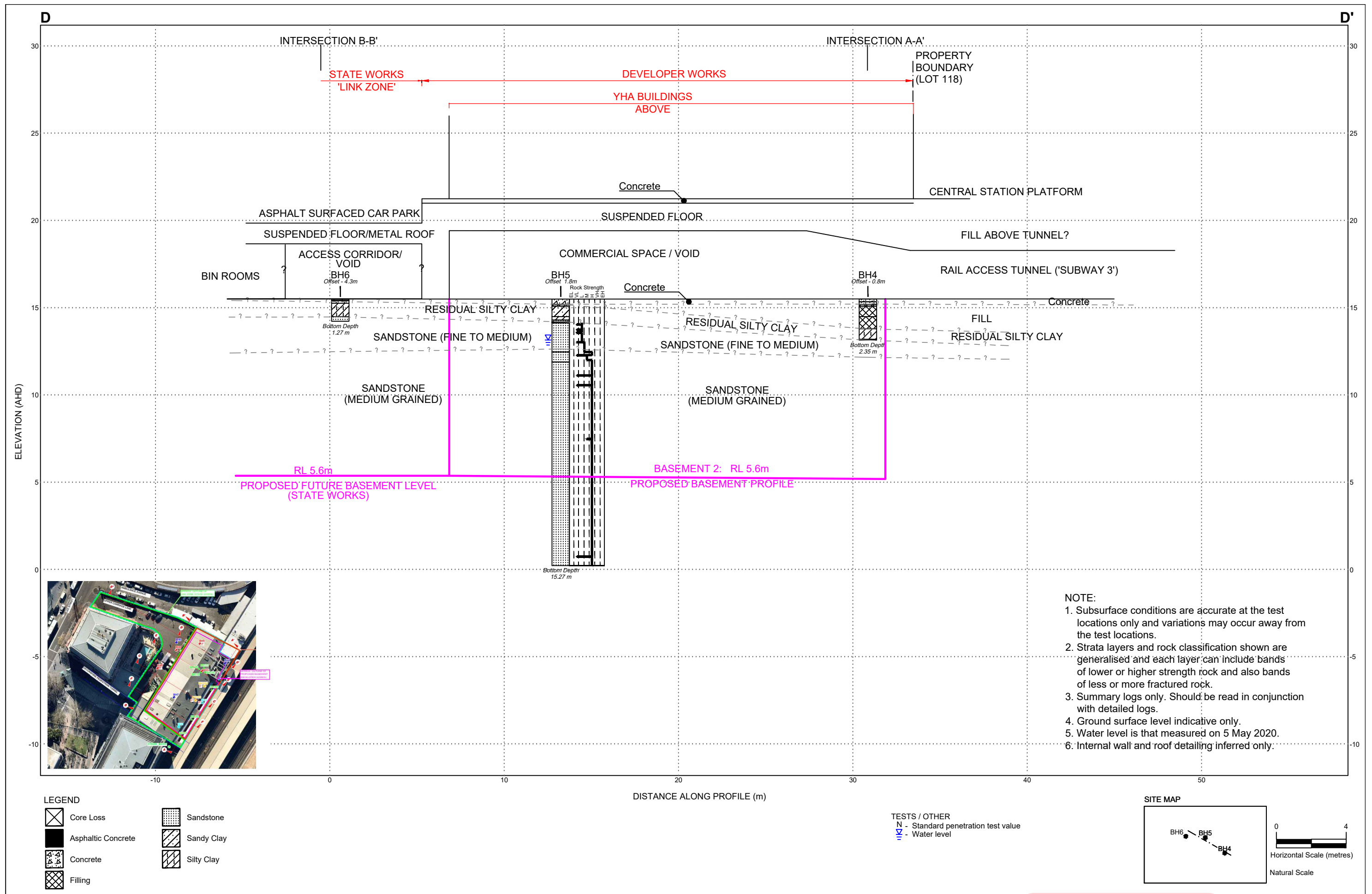
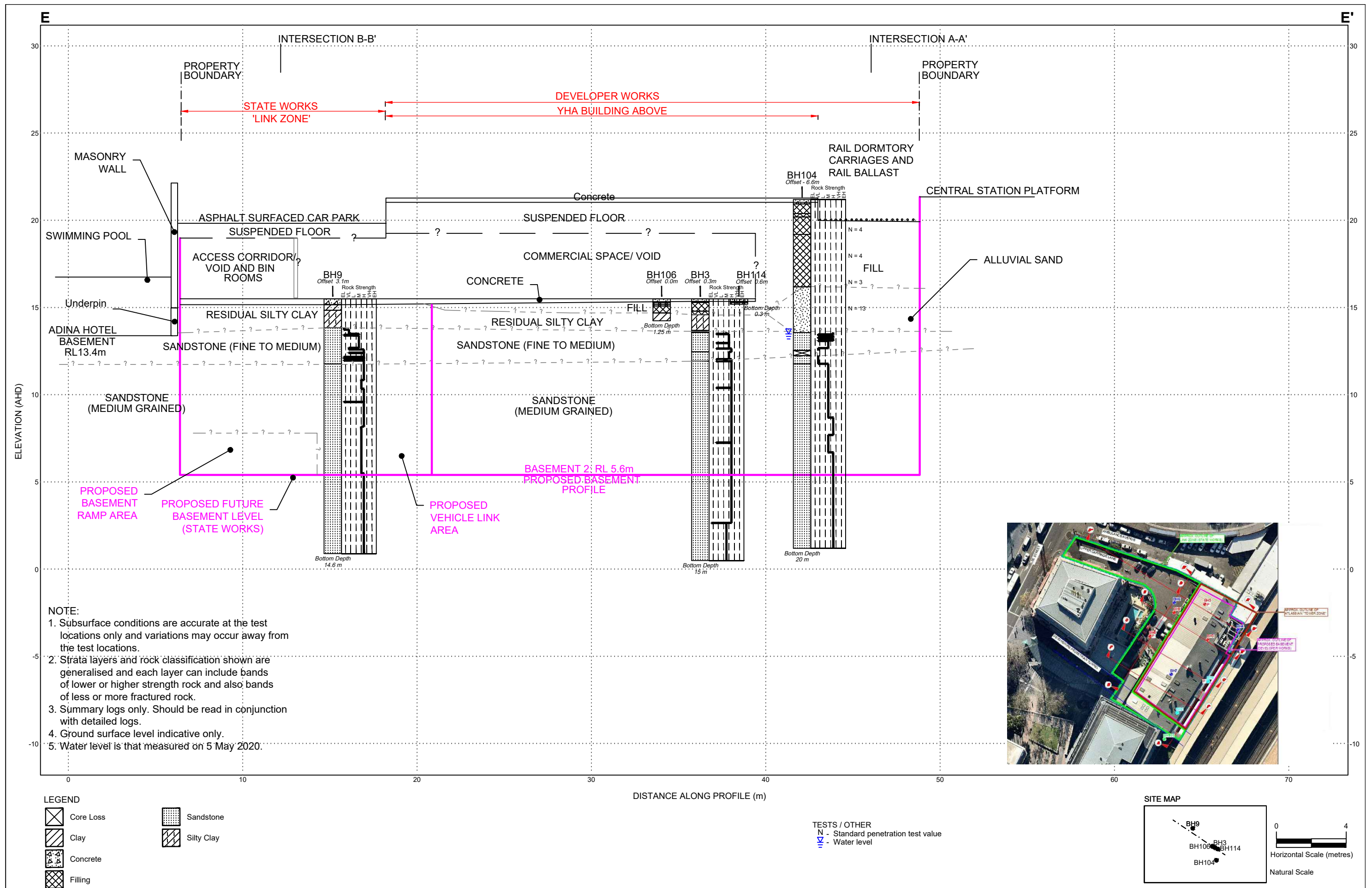


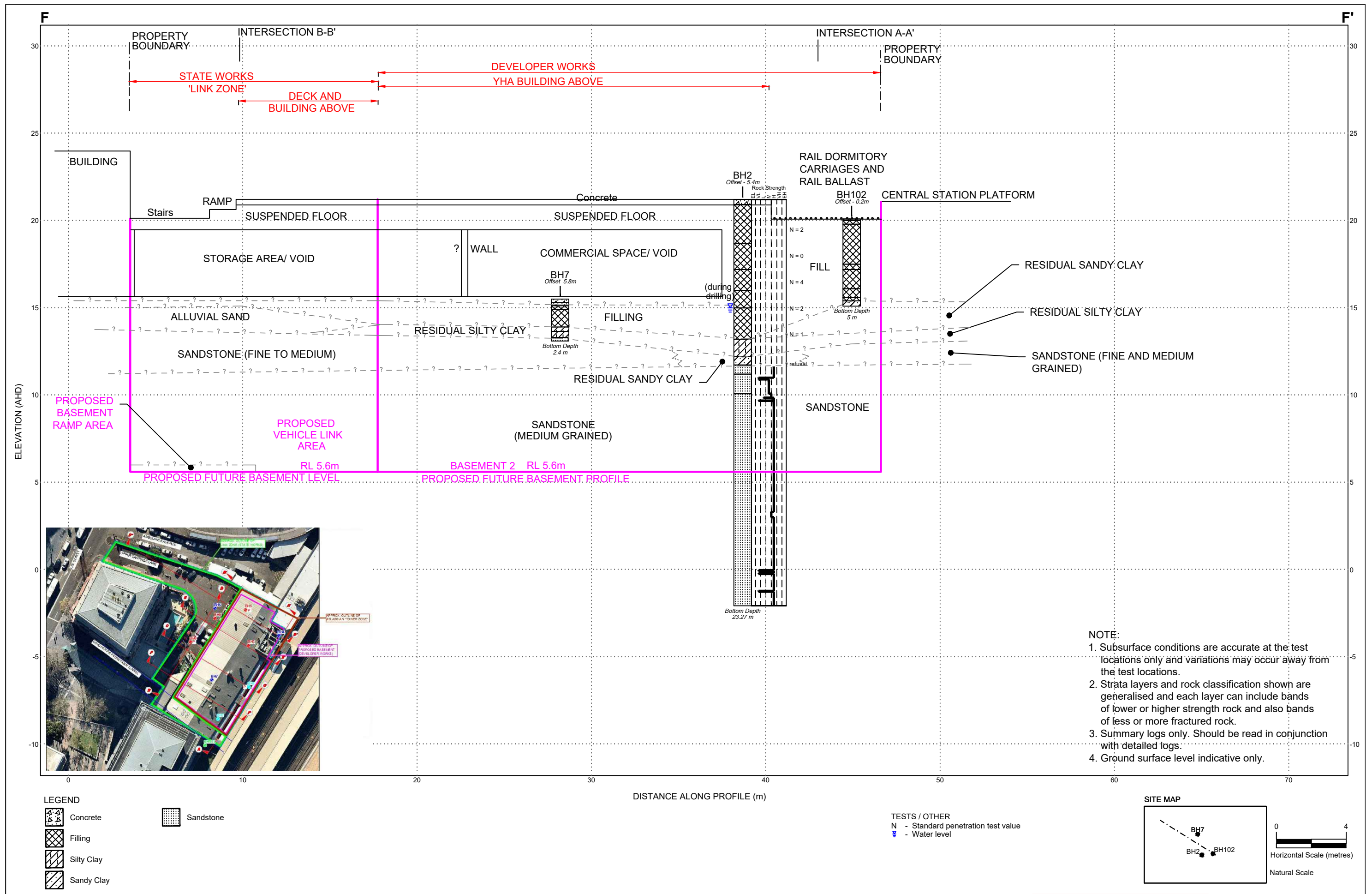
Photo 5 – View east within the Gate Gourmet Rail Catering Facility (Lower Ground Floor level). The locations of boreholes BH106, BH113, BH114 and BH115, and BH3 are indicated as shown.













Sampling

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

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

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

Test Pits

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

Large Diameter Augers

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

Continuous Spiral Flight Augers

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

reliability, due to the remoulding, possible mixing or softening of samples by groundwater.

Non-core Rotary Drilling

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

Continuous Core Drilling

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

Standard Penetration Tests

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

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

The test results are reported in the following form.

- In the case where full penetration is obtained with successive blow counts for each 150 mm of, say, 4, 6 and 7 as:
4,6,7
N=13
- In the case where the test is discontinued before the full penetration depth, say after 15 blows for the first 150 mm and 30 blows for the next 40 mm as:
15, 30/40 mm

Sampling Methods

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

Dynamic Cone Penetrometer Tests / Perth Sand Penetrometer Tests

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

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



Description and Classification Methods

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

Soil Types

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

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

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

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

Definitions of grading terms used are:

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

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

In fine grained soils (>35% fines)

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

In coarse grained soils (>65% coarse)

- with clays or silts

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

In coarse grained soils (>65% coarse)

- with coarser fraction

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

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

Soil Descriptions

Cohesive Soils

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

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

Cohesionless Soils

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

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

Soil Origin

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

- Residual soil - derived from in-situ weathering of the underlying rock;
- Extremely weathered material – formed from in-situ weathering of geological formations. Has soil strength but retains the structure or fabric of the parent rock;
- Alluvial soil – deposited by streams and rivers;

- Estuarine soil – deposited in coastal estuaries;
- Marine soil – deposited in a marine environment;
- Lacustrine soil – deposited in freshwater lakes;
- Aeolian soil – carried and deposited by wind;
- Colluvial soil – soil and rock debris transported down slopes by gravity;
- Topsoil – mantle of surface soil, often with high levels of organic material.
- Fill – any material which has been moved by man.

Moisture Condition – Coarse Grained Soils

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

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

Moisture Condition – Fine Grained Soils

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

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



Rock Strength

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

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

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

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

Degree of Weathering

The degree of weathering of rock is classified as follows:

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

Rock Descriptions

Degree of Fracturing

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

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

Rock Quality Designation

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

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

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

Stratification Spacing

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

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

Symbols & Abbreviations

Douglas Partners



Introduction

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

Drilling or Excavation Methods

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

Water

▷	Water seep
▽	Water level

Sampling and Testing

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

Description of Defects in Rock

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

Defect Type

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

Orientation

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

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

Coating or Infilling Term

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

Coating Descriptor

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

Shape

cu	curved
ir	irregular
pl	planar
st	stepped
un	undulating

Roughness

po	polished
ro	rough
sl	slickensided
sm	smooth
vr	very rough

Other

fg	fragmented
bnd	band
qtz	quartz

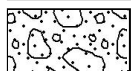
Symbols & Abbreviations

Graphic Symbols for Soil and Rock

General



Asphalt



Road base



Concrete



Filling

Soils



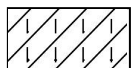
Topsoil



Peat



Clay



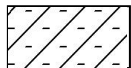
Silty clay



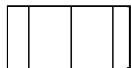
Sandy clay



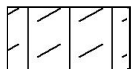
Gravelly clay



Shaly clay



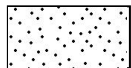
Silt



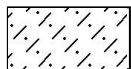
Clayey silt



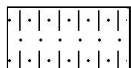
Sandy silt



Sand



Clayey sand



Silty sand



Gravel



Sandy gravel



Cobbles, boulders



Talus

Sedimentary Rocks



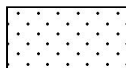
Boulder conglomerate



Conglomerate



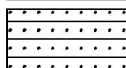
Conglomeratic sandstone



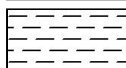
Sandstone



Siltstone



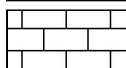
Laminite



Mudstone, claystone, shale

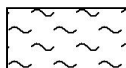


Coal

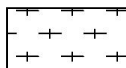


Limestone

Metamorphic Rocks



Slate, phyllite, schist

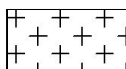


Gneiss



Quartzite

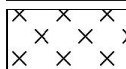
Igneous Rocks



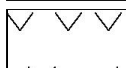
Granite



Dolerite, basalt, andesite



Dacite, epidote



Tuff, breccia




Porphyry

BOREHOLE LOG

CLIENT: Atlassian Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 8-10 Lee Street, Haymarket

SURFACE LEVEL: 20.1 AHD
EASTING: 333968
NORTHING: 6249242
DIP/AZIMUTH: 90°/--

BORE No: BH101
PROJECT No: 86767.03
DATE: 8/4/2020
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Well Construction Details	
				Type	Depth	Sample	Results & Comments			
19.5 19 18.5 18 17.5 17 16.5 16	0.1	FILL/ BALLAST		A	0.1				1	
		FILL/ Silty CLAY: medium plasticity, pale brown and grey, with fine angular sandstone gravel, trace brick and organic fragments, moist, generally in a loose condition			0.2					
	0.4	FILL/ SAND and GRAVEL: fine to medium sand, pale grey, fine to coarse angular sandstone cobbles, gravel and bricks, moist, generally in a dense condition		A	0.5					
					0.6					
				A	0.9					
					1.0					
				A	1.4					
					1.5					
	1.8	Bore discontinued at 1.8m - Target depth reached								
16.5 16 15.5 15 14.5 14 13.5 13									2	
12.5 12 11.5 11 10.5 10 9.5 9									3	
8.5 8 7.5 7 6.5 6 5.5 5									4	

RIG: Hand Tools

DRILLER: Tightsite

LOGGED: NB

CASING: NA

TYPE OF BORING: Hand auger and crowbar to 1.8m

WATER OBSERVATIONS: No free groundwater observed during drilling

REMARKS: Location coordinates are in MGA94 Zone 56.

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 diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	W	Water seep	S	Standard penetration test
E	Environmental sample	W	Water level	V	Shear vane (kPa)



DRAFT

Douglas Partners
 Geotechnics | Environment | Groundwater



Photo D1 – View within borehole BH101, showing the sand and gravel fill encountered at shallow depth below the rail ballast / ground surface level between the rail carriage dormitories.




Photo D2 – View of fill obtained from Borehole BH101.

BOREHOLE LOG

CLIENT: Atlassian Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 8-10 Lee Street, Haymarket

SURFACE LEVEL: 20.1 AHD
EASTING: 333976
NORTHING: 6249251
DIP/AZIMUTH: 90°/--

BORE No: BH102
PROJECT No: 86767.03
DATE: 8/4/2020
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Well Construction Details	
				Type	Depth	Sample	Results & Comments			
20 19 18 17	0.1	FILL/ BALLAST		A	0.1				1	
	0.2	FILL/ Silty GRAVEL: fine to medium, dark grey, trace sand and clay, moist, generally in a loose condition			0.2					
	0.3	FILL/ SAND: fine to medium, pale yellow brown and grey, with silt, trace clay lenses, moist, generally in a loose condition		A	0.5					
					0.6					
				A	1.0					
					1.1					
				A	1.5					
					1.6					
				A	2.0					
					2.1					
2 1 0 -1 -2 -3 -4 -5				A	2.4				2	
					2.5					
	2.6	FILL/ SAND: fine to medium, pale grey, trace silt, moist, generally in a loose condition		A	3.1					
					3.2					
	2.9	FILL/ Silty CLAY: medium plasticity, orange, pale yellow and black, trace sand and gravel, with ash, w>PL, generally in a stiff condition		A	3.5					
					3.6					
		Below 3.5m: grading to dark grey and black, with fine to medium sand and angular gravel		A	4.0					
					4.1					
	4.0	FILL/ Sandy GRAVEL: fine to medium gravel, dark grey and black, fine to coarse sand, trace ash, moist, generally in a medium dense condition		A	4.5					
					4.6					
4 3 2 1 0 -1 -2 -3 -4 -5	4.5	FILL/ Silty CLAY: high plasticity, orange, pale yellow and pale grey, trace ash, w<PL, generally in a firm condition		A	4.7				3	
					4.8					
	4.7	Sandy CLAY CH: high plasticity, pale grey, w<PL, appears firm, residual soil		A	4.9					
					5.0					
				A	5.0					
					5.0					
				A	5.0					
					5.0					
				A	5.0					
					5.0					

Bore discontinued at 5.0m

RIG: Hand Tools Target depth reached

DRILLER: NB

LOGGED: NB

CASING: NA

TYPE OF BORING: Hand Auger to 5m

WATER OBSERVATIONS: No free groundwater observed during drilling

REMARKS: Location coordinates are in MGA94 Zone 56.

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W	Water seep
E	Environmental sample	W	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)

DRAFT

BOREHOLE LOG

CLIENT: Atlassian Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 8-10 Lee Street, Haymarket

SURFACE LEVEL: 21.2 AHD
EASTING: 333978
NORTHING: 6249263
DIP/AZIMUTH: 90°/-

BORE No: BH103
PROJECT No: 86767.00
DATE: 15 - 16/4/2020
SHEET 1 OF 2

RL	Depth (m)	Description of Strata	Degree of Weathering					Graphic Log	Rock Strength					Water	Fracture Spacing (m)	Discontinuities		Sampling & In Situ Testing																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
			EW	HW	MW	SW	FS		FR	Ex Low	Very Low	Low	Medium			High	Very High	Ex High	B - Bedding	J - Joint	S - Shear	F - Fault	Type	Core Rec. %	RQD %	Test Results & Comments																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
21	0.25	FILL/ CONCRETE																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								

RIG: XC 100

DRILLER: Terratest

LOGGED: NB

CASING: HQ to 8.5m

TYPE OF BORING: Diatube to 0.25m, Hand tools to 2.6m, SFA (TC-bit) to 8.5m, NMLC to 10.8m

WATER OBSERVATIONS: No free groundwater observed during drilling

REMARKS: Location coordinates are in MGA94 Zone 56. Standpipe installed: 0-8.5m Blank PVC pipe, 8.5-9.3m Slotted PVC pipe, End cap at 9.3m, Backfill 0-7.5m, Bentonite 7.5-8.5m, Sand filter 8.5-9.3m, Bentonite 9.3-10.8m, Gatic cover at surface. Hole pre-drilled 8 April 2020 to 2.6m

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	>	Water seep
E	Environmental sample	≡	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)
		SP	Standard penetration test
		V	Shear vane (kPa)

BOREHOLE LOG

CLIENT: Atlassian Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 8-10 Lee Street, Haymarket

SURFACE LEVEL: 21.2 AHD
EASTING: 333978
NORTHING: 6249263
DIP/AZIMUTH: 90°/-

BORE No: BH103
PROJECT No: 86767.00
DATE: 15 - 16/4/2020
SHEET 2 OF 2

RL	Depth (m)	Description of Strata	Degree of Weathering					Graphic Log	Rock Strength					Water	Fracture Spacing (m)	Discontinuities		Sampling & In Situ Testing			
			EW	HW	MW	SW	FS		FR	Ex Low	Very Low	Low	Medium			High	Very High	Ex High	B - Bedding S - Shear	J - Joint F - Fault	Type
11	10.8	SANDSTONE: fine to medium grained, pale yellow, moderately then slightly weathered, medium strength, slightly fractured, Hawkesbury Sandstone														9.86m: Ds 30mm				PL(A) = 0.65	
		Bore discontinued at 10.8m Target depth reached														10.25m: B5°, pl, ro, fe co	C	100	100	PL(A) = 0.49	
	11																				
	10																				
	12																				
	9																				
	13																				
	8																				
	14																				
	7																				
	15																				
	6																				
	16																				
	5																				
	17																				
	4																				
	18																				
	3																				
	19																				
	2																				

DRAFT

RIG: XC 100

DRILLER: Terratest

LOGGED: NB

CASING: HQ to 8.5m

TYPE OF BORING: Diatube to 0.25m, Hand tools to 2.6m, SFA (TC-bit) to 8.5m, NMLC to 10.8m

WATER OBSERVATIONS: No free groundwater observed during drilling

REMARKS: Location coordinates are in MGA94 Zone 56. Standpipe installed: 0-8.5m Blank PVC pipe, 8.5-9.3m Slotted PVC pipe, End cap at 9.3m, Backfill 0-7.5m, Bentonite 7.5-8.5m, Sand filter 8.5-9.3m, Bentonite 9.3-10.8m, Gatic cover at surface. Hole pre-drilled 8 April 2020 to 2.6m

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	>	Water seep
E	Environmental sample	≡	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)

BORE: 103

PROJECT: HAYMARKET

APRIL 2020



8.5-10.8m

BOREHOLE LOG

CLIENT: Atlassian Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 8-10 Lee Street, Haymarket

SURFACE LEVEL: 21.2 AHD
EASTING: 333978
NORTHING: 6249263
DIP/AZIMUTH: 90°/-

BORE No: BH103
PROJECT No: 86767.00
DATE: 15 - 16/4/2020
SHEET 1 OF 2

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Well Construction Details	
				Type	Depth	Sample	Results & Comments			
21.2	0.25	FILL/ CONCRETE							Gatic Cover and cap	
	0.4	FILL/ SAND: fine to medium, pale brown, trace silt, moist, generally in a very loose condition		A	0.25					
	1.0			A	1.0					
	1.1			A	1.1					
	1.5			A	1.5					
	1.6			A	1.6					
	1.7	FILL/ Silty CLAY: low plasticity, pale grey-orange and dark grey, with angular sandstone, shale, ironstone gravel, w>PL, generally in a stiff to very stiff condition		A	2.0					
	2.1			A	2.1					
	2.5	FILL/ Silty CLAY: low to medium plasticity, red brown, w<PL, generally in a firm condition		A	2.5					
	2.6			A	2.6					
	2.9			A	2.9					
	3.0			S	3.0		2,2,2 N = 4			
	3.45				3.45					
	4.5			S	4.5		1,0,0 N = 0			
	4.9	FILL/ Silty SAND: fine to coarse, dark grey and brown, trace fine gravel, moist, generally in a very loose condition		A	4.95					
	5.0			A	5.0					
	5.1				5.1					
	6.0			S	6.0		3,5,7 N = 12			
	6.3	SAND SP: fine to medium, pale grey, moist, medium dense, alluvial			6.45					
	7.0	Sandy CLAY CI-CH: medium to high plasticity, dark red-orange, w>PL, very stiff, residual		A	7.5		2,6,14 N = 20			
	7.5			A	7.5					
	7.95				7.95					
	8.5	SANDSTONE: fine grained, dark brown, pale grey and orange-grey, highly weathered with extremely weathered bands, low strength with very low strength bands, fractured, Mittagong Formation		C	8.5					
	9.15	SANDSTONE: refer following page			9.18					
				C						
	10.0									

RIG: XC 100

DRILLER: Terratest

LOGGED: NB

CASING: HQ to 8.5m

TYPE OF BORING: Diatube to 0.25m, Hand tools to 2.6m, SFA (TC-bit) to 8.5m, NMLC to 10.8m

WATER OBSERVATIONS: No free groundwater observed during drilling

REMARKS: Location coordinates are in MGA94 Zone 56. Standpipe installed: 0-8.5m Blank PVC pipe, 8.5-9.3m Slotted PVC pipe, End cap at 9.3m, Backfill 0-7.5m, Bentonite 7.5-8.5m, Sand filter 8.5-9.3m, Bentonite 9.3-10.8m, Gatic cover at surface. Hole pre-drilled 8 April 2020 to 2.6m

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	>	Water seep
E	Environmental sample	≡	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)

BOREHOLE LOG

CLIENT: Atlassian Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 8-10 Lee Street, Haymarket

SURFACE LEVEL: 21.2 AHD
EASTING: 333978
NORTHING: 6249263
DIP/AZIMUTH: 90°/--

BORE No: BH103
PROJECT No: 86767.00
DATE: 15 - 16/4/2020
SHEET 2 OF 2

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Well Construction Details
				Type	Depth	Sample	Results & Comments		
10.8	9.96	SANDSTONE: fine to medium grained, pale yellow, moderately then slightly weathered, medium strength, slightly fractured, Hawkesbury Sandstone		C	9.96		PL(A) = 0.65		Bentonite plug
10.8	10.75	Bore discontinued at 10.8m Target depth reached			10.75		PL(A) = 0.49		
11	10.8				10.8				
12									
13									
14									
15									
16									
17									
18									
19									

RIG: XC 100

DRILLER: Terratest

LOGGED: NB

CASING: HQ to 8.5m

TYPE OF BORING: Diatube to 0.25m, Hand tools to 2.6m, SFA (TC-bit) to 8.5m, NMLC to 10.8m

WATER OBSERVATIONS: No free groundwater observed during drilling

REMARKS: Location coordinates are in MGA94 Zone 56. Standpipe installed: 0-8.5m Blank PVC pipe, 8.5-9.3m Slotted PVC pipe, End cap at 9.3m, Backfill 0-7.5m, Bentonite 7.5-8.5m, Sand filter 8.5-9.3m, Bentonite 9.3-10.8m, Gatic cover at surface. Hole pre-drilled 8 April 2020 to 2.6m

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	>	Water seep
E	Environmental sample	≡	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)

BOREHOLE LOG

CLIENT: Atlassian Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 8-10 Lee Street, Haymarket

SURFACE LEVEL: 21.2 AHD
EASTING: 333983
NORTHING: 6249272
DIP/AZIMUTH: 90°/--

BORE No: BH104
PROJECT No: 86767.00
DATE: 14 - 15/4/2020
SHEET 1 OF 2

[illegible]

RIG: XC 100

DRILLER: Terratest

LOGGED: NB

CASING: HQ to 7.63m

TYPE OF BORING: Diatube to 0.25m. Hand tools to 1.1m. SFA (TC-bit) to 7.63m. NMLC to 20m

WATER OBSERVATIONS: No free groundwater observed during drilling

REMARKS: Location coordinates are in MGA94 Zone 56. Standpipe installed: 0-14.0m Blank PVC pipe, 14.0-20m Slotted PVC pipe, End cap at 20m, Backfill 0.1-6.5m, Bentonite 6.5-13.5m, Sand filter 13.5-20m, Gatic cover at surface. Hole pre-drilled 8 April 2020 to 1.1m depth

SAMPLING & IN SITU TESTING LEGEND

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



BOREHOLE LOG

CLIENT: Atlassian Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 8-10 Lee Street, Haymarket

SURFACE LEVEL: 21.2 AHD
EASTING: 333983
NORTHING: 6249272
DIP/AZIMUTH: 90°/-

BORE No: BH104
PROJECT No: 86767.00
DATE: 14 - 15/4/2020
SHEET 2 OF 2

RL	Depth (m)	Description of Strata	Degree of Weathering						Graphic Log	Rock Strength						Water	Fracture Spacing (m)	Discontinuities	Sampling & In Situ Testing			
			EW	HW	MW	SW	FS	FR		Ex Low	Very Low	Low	Medium	High	Very High			Ex High	B - Bedding S - Shear	J - Joint F - Fault	Type	Core Rec. %
11		SANDSTONE: fine to medium grained, pale grey with grey bands, fresh, medium and high strength, slightly fractured then unbroken, Hawkesbury Sandstone																				PL(A) = 0.77
11																		C	100	100		PL(A) = 0.95
10																	11.06m: Cs 2mm 11.09m: Cs 2mm					
12																	12m: Cs 4mm					PL(A) = 0.94
9																		C	100	100		
13																						PL(A) = 1.2
8																	13.37m: J60°, pl, he					
14																	13.77m-13.84m: B5° (x3), st, ro, cbs co	C	100	95		PL(A) = 0.66
7		Between 14.52m-14.58m: band of dark grey siltstone																				
15																		C	100	100		PL(A) = 1.5
16																						PL(A) = 1.2
5																						
17																		C	100	100		PL(A) = 1.3
4																						
18																		C	100	100		PL(A) = 1.3
3																						
19																						PL(A) = 2.6
2																	18.95m: Cs 2mm					
20.0		Bore discontinued at 20.0m Target depth reached																C	100	100		PL(A) = 1

RIG: XC 100

DRILLER: Terratest

LOGGED: NB

CASING: HQ to 7.63m

TYPE OF BORING: Diatube to 0.25m, Hand tools to 1.1m, SFA (TC-bit) to 7.63m, NMLC to 20m

WATER OBSERVATIONS: No free groundwater observed during drilling

REMARKS: Location coordinates are in MGA94 Zone 56. Standpipe installed: 0-14.0m Blank PVC pipe, 14.0-20m Slotted PVC pipe, End cap at 20m, Backfill 0.1-6.5m, Bentonite 6.5-13.5m, Sand filter 13.5-20m, Gatic cover at surface. Hole pre-drilled 8 April 2020 to 1.1m depth

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 diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	W	Water seep	S	Standard penetration test
E	Environmental sample	W	Water level	V	Shear vane (kPa)

BORE: 104

PROJECT: HAYMARKET

APRIL 2020



Project No: 86767-03
BH ID: BH104
Depth: 7.63-12
Core Box No.: 1



7.63-12.0m

BORE: 104

PROJECT: HAYMARKET

APRIL 2020



Project No: 86767-03
BH ID: BH104
Depth: 12-17
Core Box No.: 2



12.0-17.0m

BORE: 104

PROJECT: HAYMARKET

APRIL 2020



Project No: 86767-03
BH ID: BH104
Depth: 17-20
Core Box No.: 3



17-20.0m

BOREHOLE LOG

CLIENT: Atlassian Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 8-10 Lee Street, Haymarket

SURFACE LEVEL: 21.2 AHD
EASTING: 333983
NORTHING: 6249272
DIP/AZIMUTH: 90°/--

BORE No: BH104
PROJECT No: 86767.00
DATE: 14 - 15/4/2020
SHEET 1 OF 2

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Well Construction Details	
				Type	Depth	Sample	Results & Comments			
21	0.25	FILL/ CONCRETE							Gatic Cover and cap	
	0.4	FILL/ SAND: fine to medium, pale brown, trace silt, moist, generally in a very loose condition		A						
	0.8									
1	0.9	FILL/ Silty CLAY: medium plasticity, pale orange, trace fine sand, w>PL, generally in a stiff condition		A						
	1.0			A						
	1.1									
	1.4	FILL/ Silty CLAY: low plasticity, pale grey-orange and dark grey, with angular sandstone, shale and ironstone gravel, w>PL, generally in a soft to firm condition		A						
	1.5			S			2,2,2 N = 4			
	1.95									
2	2.0	FILL/ Silty CLAY: medium plasticity, red-brown mottled orange, trace fine sand and gravel, w<PL, generally in a soft to firm condition								
	2.8			A						
	2.9									
	3.0			S			1,2,2 N = 4			
	3.45									
	4.5			S			2,1,2 N = 3			
	4.95	Below 4.8m: trace ash and medium sand								
5	5.0	SAND SP: dark yellow-orange, 10% non plastic fines, moist, medium dense, alluvial								
	6.0			S			3,5,8 N = 13			
	6.45									
	7.63	SANDSTONE: fine grained, dark brown, pale grey and orange-grey, highly then moderately weathered with extremely weathered bands, high and medium strength with very low strength bands, fractured, Mittagong Formation		C			PL(A) = 0.84			
	8.24									
	8.65	Between 8.52m-9.42m: very low strength								
	8.95									
	9.42	SANDSTONE: refer following page		C						

RIG: XC 100

DRILLER: Terratest

LOGGED: NB

CASING: HQ to 7.63m

TYPE OF BORING: Diatube to 0.25m, Hand tools to 1.1m, SFA (TC-bit) to 7.63m, NMLC to 20m

WATER OBSERVATIONS: No free groundwater observed during drilling

REMARKS: Location coordinates are in MGA94 Zone 56. Standpipe installed: 0-14.0m Blank PVC pipe, 14.0-20m Slotted PVC pipe, End cap at 20m, Backfill 0.1-6.5m, Bentonite 6.5-13.5m, Sand filter 13.5-20m, Gatic cover at surface. Hole pre-drilled 8 April 2020 to 1.1m depth

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 diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	S	Standard penetration test
E	Environmental sample	≡	Water level	V	Shear vane (kPa)

BOREHOLE LOG

CLIENT: Atlassian Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 8-10 Lee Street, Haymarket

SURFACE LEVEL: 21.2 AHD
EASTING: 333983
NORTHING: 6249272
DIP/AZIMUTH: 90°/--

BORE No: BH104
PROJECT No: 86767.00
DATE: 14 - 15/4/2020
SHEET 2 OF 2

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Well Construction Details	
				Type	Depth	Sample	Results & Comments			
11	9.96	SANDSTONE: fine to medium grained, pale grey with grey bands, fresh, medium and high strength, slightly fractured then unbroken, Hawkesbury Sandstone			9.96		PL(A) = 0.77		Bentonite Seal	
	10.1				10.1					
11	10.96			C	10.96		PL(A) = 0.95			
	11.65				11.65					
12	11.96				11.96		PL(A) = 0.94			
	12.96				12.96		PL(A) = 1.2			
	13.2				13.2					
14	13.96			C	13.96		PL(A) = 0.66			
	14.69	Between 14.52m-14.58m: band of dark grey siltstone			14.69					
	14.96				14.96		PL(A) = 1.5			
16	15.96				15.96		PL(A) = 1.2			
	16.23				16.23					
17	16.96			C	16.96		PL(A) = 1.3		Sand filter Slotted PVC pipe	
	17.61				17.61					
18	17.96				17.96		PL(A) = 1.3			
	18.96				18.96		PL(A) = 2.6			
19	19.23				19.23					
	19.96			C	19.96		PL(A) = 1			
20.0		Bore discontinued at 20.0m Target depth reached							End cap	

DRAFT

RIG: XC 100

DRILLER: Terratest

LOGGED: NB

CASING: HQ to 7.63m

TYPE OF BORING: Diatube to 0.25m, Hand tools to 1.1m, SFA (TC-bit) to 7.63m, NMLC to 20m

WATER OBSERVATIONS: No free groundwater observed during drilling

REMARKS: Location coordinates are in MGA94 Zone 56. Standpipe installed: 0-14.0m Blank PVC pipe, 14.0-20m Slotted PVC pipe, End cap at 20m, Backfill 0.1-6.5m, Bentonite 6.5-13.5m, Sand filter 13.5-20m, Gatic cover at surface. Hole pre-drilled 8 April 2020 to 1.1m depth

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 diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	W	Water seep	S	Standard penetration test
E	Environmental sample	W	Water level	V	Shear vane (kPa)

BOREHOLE LOG

CLIENT: Atlassian Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 8-10 Lee Street, Haymarket

SURFACE LEVEL: 20.1 AHD
EASTING: 333988
NORTHING: 6249270
DIP/AZIMUTH: 90°/--

BORE No: BH105
PROJECT No: 86767.03
DATE: 7/4/2020
SHEET 1 OF 2

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Well Construction Details	
				Type	Depth	Sample	Results & Comments			
20.05	0.05	FILL/ BALLAST		A	0.05					
20.1	0.1	FILL/ Silty CLAY: medium plasticity, dark grey, with angular gravel and organic matter and fragments of plastic, moist, generally in a firm condition			0.1					
20.37	0.37	BRICK PAVEMENT								
		CONCRETE: grey, orange and yellow-brown, with inclusions of sub-angular to sub-rounded, high strength sandstone								
19.1	1									
18.1	2									
17.1	3									
16.1	4									

RIG: Proline

DRILLER: Tightsite

LOGGED: NB

CASING: HW to 3.1m

TYPE OF BORING: Diatube to 3.1m, NMLC to 6.5m

WATER OBSERVATIONS: No free groundwater observed during drilling

REMARKS: Location coordinates are in MGA94 Zone 56.

DRAFT

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)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	S	Standard penetration test
E	Environmental sample	≡	Water level	V	Shear vane (kPa)

BOREHOLE LOG

CLIENT: Atlassian Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 8-10 Lee Street, Haymarket

SURFACE LEVEL: 20.1 AHD
EASTING: 333988
NORTHING: 6249270
DIP/AZIMUTH: 90°/--

BORE No: BH105
PROJECT No: 86767.03
DATE: 7/4/2020
SHEET 2 OF 2

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Well Construction Details	
				Type	Depth	Sample	Results & Comments			
15		CONCRETE: grey, orange and yellow-brown, with inclusions of sub-angular to sub-rounded, high strength sandstone (<i>continued</i>)								
6										
14										
6.3		SANDSTONE: fine to medium grained, pale yellow, highly weathered, medium to high strength, Mittagong Formation								
6.5		Bore discontinued at 6.5m - Target depth reached								
7										
13										
8										
12										
9										
11										

RIG: Proline

DRILLER: Tightsite

LOGGED: NB

CASING: HW to 3.1m

TYPE OF BORING: Diatube to 3.1m, NMLC to 6.5m

WATER OBSERVATIONS: No free groundwater observed during drilling

REMARKS: Location coordinates are in MGA94 Zone 56.

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	>	Water seep
E	Environmental sample	≡	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)

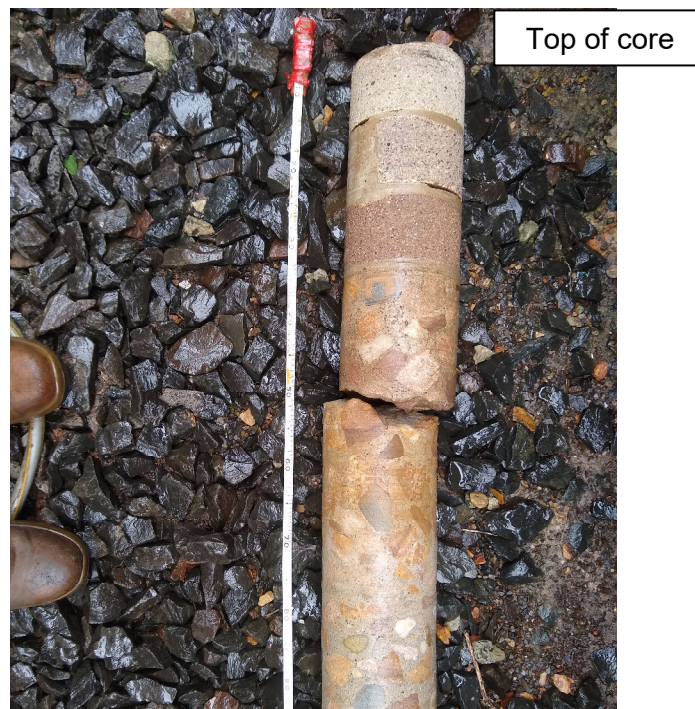


Photo D3 – View of concrete core from Borehole BH105 (below 0.1 m depth), showing a brick pavement mortared onto concrete with high strength sandstone inclusions (cyclopean concrete).

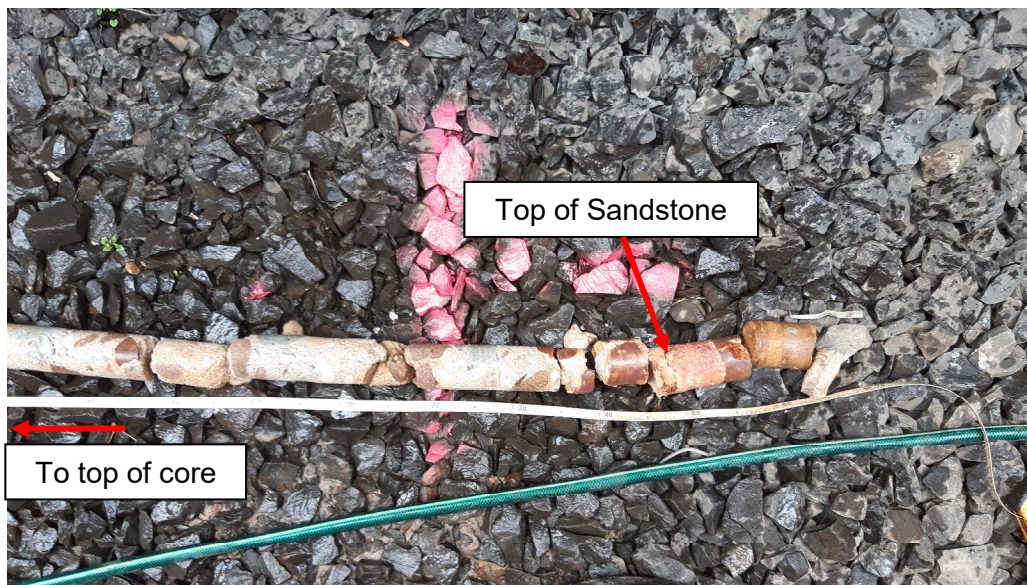


Photo D4 – View of concrete core from Borehole BH105 (below about 5.6 m depth), showing concrete with high strength sandstone inclusions (cyclopean concrete) overlying weathered fine to medium grained sandstone.

BOREHOLE LOG

CLIENT: Atlassian Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 8-10 Lee Street, Haymarket

SURFACE LEVEL: 15.5 AHD
EASTING: 333980
NORTHING: 6249282
DIP/AZIMUTH: 90°/--

BORE No: BH106
PROJECT No: 86767.03
DATE: 7/4/2020
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Well Construction Details	
				Type	Depth	Sample	Results & Comments			
		CONCRETE: grey, 2-10mm igneous aggregate								
	0.16			E	0.16		PID=1.9 ppm			
	0.2	FILL/ SAND: fine to coarse, pale brown, trace seashells, moist		E	0.2					
	0.3			E	0.3		PID=1.3 ppm			
	0.4	FILL/ CLAY: medium plasticity, brown, red and grey, with fine to coarse sand, trace fine to medium gravel, fine to medium igneous rail ballast and seashells, w~PL		E	0.4		PID=1.4 ppm			
	0.5				0.5					
	0.8	FILL/ SAND: fine to coarse, dark brown, with igneous rail ballast, dry								
	0.9	FILL/ CLAY: medium plasticity, pale grey, red and brown, trace fine to medium gravel, w~PL		E	0.9		PID=1.4 ppm			
	1.0	Below 0.5m: apparently in a stiff condition			1.0					
	1.15	At 0.6m: tile fragment			1.15					
	1.25	CLAY CI-CH: medium to high plasticity, pale grey mottled red, trace fine to medium ironstone gravel, w<PL to w~PL, apparently very stiff, residual		E	1.25		PID=0.6 ppm			
		Below 1.1m: w<PL								
		Bore discontinued at 1.25m								
		- Target depth reached								

DRAFT

RIG: Hand Tools

DRILLER: AS/AMS

LOGGED: AS

CASING: N/A

TYPE OF BORING: Diatube to 0.16m, Hand auger to 1.25m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Location coordinates are in MGA94 Zone 56.

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	>	Water seep
E	Environmental sample	≡	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)

BOREHOLE LOG

CLIENT: Atlassian Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 8-10 Lee Street, Haymarket

SURFACE LEVEL: 15.5 AHD
EASTING: 333983
NORTHING: 6249283
DIP/AZIMUTH: 90°/--

BORE No: BH113
PROJECT No: 86767.03
DATE: 7/4/2020
SHEET 1 OF 1

[illegible]

RIG: Hand Tools

DRILLER: AS/AMS

LOGGED: AS

CASING: N/A

TYPE OF BORING: Diatube to 0.15m, Hand auger to 1.3m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Location coordinates are in MGA94 Zone 56. * Field replicate BD2/20200407 taken at 0.15-0.25m

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U _s	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	▷	Water seep
E	Environmental sample	≡	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)



BOREHOLE LOG

CLIENT: Atlassian Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 8-10 Lee Street, Haymarket

SURFACE LEVEL: 15.5 AHD
EASTING: 333984
NORTHING: 6249280
DIP/AZIMUTH: 90°/--

BORE No: BH114
PROJECT No: 86767.03
DATE: 7/4/2020
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Well Construction Details	
				Type	Depth	Sample	Results & Comments			
	0.15	CONCRETE: grey, 2-10mm igneous aggregate								
	0.2	FILL/ SAND: fine to coarse, pale brown and brown, trace fine gravel, moist			0.15		PIDPID = 9.8 ppm			
	0.3	FILL/ CLAY: medium plasticity, brown, pale grey and red, with fine to coarse sand, trace fine gravel, igneous rail ballast and plastic, w~PL Bore discontinued at 0.3m - Refusal on ballast			0.2		PIDjar sample only			
					0.3					
15										
1										
14										
2										
13										
3										
12										
4										
11										

DRAFT

RIG: Hand Tools

DRILLER: AS/AMS

LOGGED: AS

CASING: N/A

TYPE OF BORING: Diatube to 0.15m, Hand auger to 0.3m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Location coordinates are in MGA94 Zone 56.

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 diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	S	Standard penetration test
E	Environmental sample	≡	Water level	V	Shear vane (kPa)

BOREHOLE LOG

CLIENT: Atlassian Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 8-10 Lee Street, Haymarket

SURFACE LEVEL: 15.5 AHD
EASTING: 333981
NORTHING: 6249280
DIP/AZIMUTH: 90°/--

BORE No: BH115
PROJECT No: 86767.03
DATE: 7/4/2020
SHEET 1 OF 1

[illegible]

RIG: Hand Tools

DRILLER: AS/AMS

LOGGED: AS

CASING: N/A

TYPE OF BORING: Diatube to 0.17m. Hand auger to 1.3m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Location coordinates are in MGA94 Zone 56. * Field replicate BD1/20200408 taken from 0.23-0.3m

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W	Water seep
E	Environmental sample	W	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)



Groundwater Field Sheet

Project and Bore Installation Details

Bore / Standpipe ID:	BH103
Project Name:	
Project Number:	86767.03
Site Location:	Haymarket
Bore GPS Co-ord:	
Installation Date:	
GW Level (during drilling):	- m bgl
Well Depth:	m bgl
Screened Interval:	m bgl
Contaminants/Comments:	-

$$\text{Bore Volume} = \text{casing volume} + \text{filter pack volume}$$

$$= \pi h_1 d_1^2 / 4 + n(\pi h_2 d_1^2 / 4 - \pi h_2 d_2^2 / 4)$$

Where: $\pi = 3.14$

n = porosity (0.3 for most filter pack material)

h_1 = height of water column

d_1 = diameter of annulus

h_2 = length of filter pack

d_2 = diameter of casing

Bore Vol Normally: $7.2 * h$

Bore Development Details

Date/Time:	24/04/20
Purged By:	AS
GW Level (pre-purge):	7.5 m bgl
GW Level (post-purge):	8.98 m bgl
PSH observed:	Yes / No (interface / visual). Thickness if observed:
Observed Well Depth:	9.4 m bgl
Estimated Bore Volume:	13.68 L
Total Volume Purged:	(target: no drill mud, min 3 well vol. or dry) ~10L, dry
Equipment:	twister pump, int. meter, bailer

Micropurge and Sampling Details

Date/Time:	24/04/20
Sampled By:	AS
Weather Conditions:	clear, warm
GW Level (pre-purge):	7.5 m bgl
GW Level (post sample):	8.7 m bgl
PSH observed:	Yes / No (interface / visual). Thickness if observed:
Observed Well Depth:	9.4 m bgl
Estimated Bore Volume:	13.68 L
Total Volume Purged:	~15 L
Equipment:	WQM, peripump, int. meter

Water Quality Parameters

Time / Volume	Temp (°C)	DO (mg/L)	EC (µS or mS/cm)	pH	Turbidity	Redox (mV)
Stabilisation Criteria (3 readings)	0.1 °C	+/- 0.3 mg/L	+/- 3%	+/- 0.1	+/- 10%	+/- 10 mV
15:43	22.3	5.14	172.9	6.05	334	119
15:44	21.7	1.77	450	5.99	239	116
15:45	21.4	2.64	444	5.99	181	114
15:46	21.3	0.78	439	5.99	123.3	113
15:47	21.3	0.73	439	5.99	100.5	112
15:48	21.3	0.79	435	5.99	84.7	111
15:49	21.3	0.78	434	5.99	64.9	110
					↓	
Additional Readings Following stabilisation:	DO % Sat	SPC	TDS		39.5	

Sample Details

Sampling Depth (rationale):	9.0 m bgl, midpoint
Sample Appearance (e.g. colour, siltiness, odour):	Clear-brown, odourless, slightly silty
Sample ID:	BH103
QA/QC Samples:	BD1/20200424
Sampling Containers and filtration:	see green sheet
Comments / Observations:	-

GW level

* 7.5m bgl at 11:40

8.98m bgl at 16:10

24/04/20 (pre-purge)

(post - purge)

Rev March 2012

Groundwater Field Sheet

Project and Bore Installation Details

Bore / Standpipe ID:	BH104
Project Name:	
Project Number:	86767.03
Site Location:	Haymarket
Bore GPS Co-ord:	
Installation Date:	
GW Level (during drilling):	- m bgl
Well Depth:	m bgl
Screened Interval:	m bgl
Contaminants/Comments:	-

Bore Volume = casing volume + filter pack volume
 $= \pi h_1 d_1^2 / 4 + n(\pi h_2 d_1^2 / 4 - \pi h_2 d_2^2 / 4)$

Where: $\pi = 3.14$

n = porosity (0.3 for most filter pack material)

h_1 = height of water column

d_1 = diameter of annulus

h_2 = length of filter pack

d_2 = diameter of casing

Bore Vol Normally: $7.2 * h$

Bore Development Details

(For data logger purposes)

Date/Time:	24/04/20
Purged By:	AS
GW Level (pre-purge):	7.75 m bgl
GW Level (post-purge):	11.15 m bgl
PSH observed:	Yes / No (interface / visual). Thickness if observed:
Observed Well Depth:	20.35 m bgl
Estimated Bore Volume:	91 L
Total Volume Purged:	(target: no drill mud, min 3 well vol. or dry) ~40L
Equipment:	twister pump, int. meter

Micropurge and Sampling Details

Date/Time:	24/04/20
Sampled By:	AS
Weather Conditions:	warm, clear
GW Level (pre-purge):	7.6 m bgl
GW Level (post sample):	7.75 m bgl
PSH observed:	Yes / No (interface / visual). Thickness if observed:
Observed Well Depth:	20.35 m bgl
Estimated Bore Volume:	92 L
Total Volume Purged:	~15 L
Equipment:	WQM, peripump, int. meter

Water Quality Parameters

Time / Volume	Temp (°C)	DO (mg/L)	EC (µS or mS/cm)	pH	Turbidity	Redox (mV)
Stabilisation Criteria (3 readings)	0.1 °C	+/- 0.3 mg/L	+/- 3%	+/- 0.1	+/- 10%	+/- 10 mV
14:57	24.8	6.74	541	5.20	10.3	167
14:58	23.6	1.29	525	5.25	9.6	161
14:59	21.6	1.16	481	5.25	13.2	153
15:00	21.1	0.98	457	5.25	28.5	149
15:01	20.9	0.79	445	5.24	23.6	142
15:02	20.9	0.74	439	5.23	24.9	140
15:03	20.8	0.71	438	5.22	23.5	138
Additional Readings Following stabilisation:	DO % Sat	SPC	TDS			

Sample Details

Sampling Depth (rationale):	15 m bgl, ~midpoint
Sample Appearance (e.g. colour, siltiness, odour):	clear, odourless
Sample ID:	BH104
QA/QC Samples:	-
Sampling Containers and filtration:	see green sheet
Comments / Observations:	-

GW

* 7.6m bgl at 11:37

7.75mbgl at 15:13

11.15mbgl at 15:37

24/04/20 (pre-purge) Sampling
 (post-sampling)
 (post-purge)

Groundwater Field Sheet

Project and Bore Installation Details

Bore / Standpipe ID:	BH1
Project Name:	
Project Number:	86767.03
Site Location:	Haymarket
Bore GPS Co-ord:	
Installation Date:	
GW Level (during drilling):	- m bgl
Well Depth:	m bgl
Screened Interval:	m bgl
Contaminants/Comments:	-

Bore Volume = casing volume + filter pack volume

$$= \pi h_1 d_1^2 / 4 + n(\pi h_2 d_1^2 / 4 - \pi h_2 d_2^2 / 4)$$

Where: $\pi = 3.14$

n = porosity (0.3 for most filter pack material)

h_1 = height of water column

d_1 = diameter of annulus

h_2 = length of filter pack

d_2 = diameter of casing

Bore Vol Normally: $7.2 * h$

Bore Development Details

Date/Time:	
Purged By:	
GW Level (pre-purge):	m bgl
GW Level (post-purge):	m bgl
PSH observed:	Yes / No (interface / visual). Thickness if observed:
Observed Well Depth:	m bgl
Estimated Bore Volume:	L
Total Volume Purged:	(target: no drill mud, min 3 well vol. or dry)
Equipment:	

Micropurge and Sampling Details

Date/Time:	
Sampled By:	
Weather Conditions:	
GW Level (pre-purge):	m bgl
GW Level (post sample):	m bgl
PSH observed:	Yes / No (interface / visual). Thickness if observed:
Observed Well Depth:	m bgl
Estimated Bore Volume:	L
Total Volume Purged:	L
Equipment:	

Water Quality Parameters

Time / Volume	Temp (°C)	DO (mg/L)	EC (µS or mS/cm)	pH	Turbidity	Redox (mV)
Stabilisation Criteria (3 readings)	0.1 °C	+/- 0.3 mg/L	+/- 3%	+/- 0.1	+/- 10%	+/- 10 mV
14:57	24.0	6.74	541	5.20	10.3	167
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14:59	21.6	1.16	491	5.26	13.2	153
15:00						
15:01						
15:02						
15:03						
Additional Readings Following stabilisation:	DO % Sat	SPC	TDS			

Sample Details

Sampling Depth (rationale):	m bgl,
Sample Appearance (e.g. colour, siltiness, odour):	
Sample ID:	
QA/QC Samples:	
Sampling Containers and filtration:	
Comments / Observations:	

GW level

* 6.4m bgl (no GW - well depth) 1145 24104120

* 

Permeability Testing - Rising or Falling Head Test Report

Client:	Atlassian Pty Ltd	Project No:	86767.00
Project:	Proposed Commercial Development	Test date:	16-Apr-20
Location:	8-10 Lee Street, Haymarket	Tested by:	NB

Test Location	Test No.	
Description: Standpipe in borehole	BH103	
Material type: Sandstone	Easting: 333978	m
	Northing: 6249263	m
	Surface Level: 21.2	m AHD

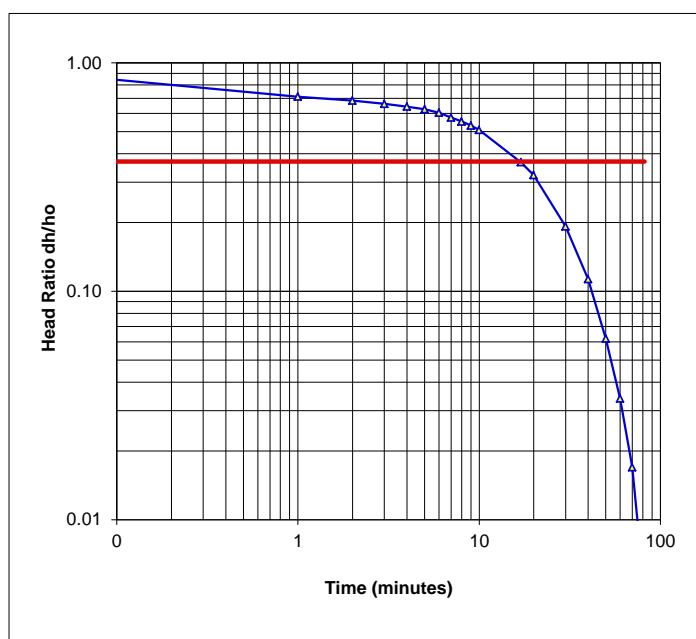
Details of Well Installation

Well casing diameter (2r)	50	mm	Depth to water before test	7.5	m
Well screen diameter (2R)	76	mm	Depth to water at start of test	9.27	m
Length of well screen (Le)	0.8	m			

Test Results

Time (min)	Depth (m)	Change in Head: dH (m)	dH/Ho
0	9.27	1.77	1.000
1	8.76	1.26	0.712
2	8.71	1.21	0.684
3	8.67	1.17	0.661
4	8.64	1.14	0.644
5	8.61	1.11	0.627
6	8.57	1.07	0.605
7	8.52	1.02	0.576
8	8.48	0.98	0.554
9	8.44	0.94	0.531
10	8.4	0.90	0.508
17	8.15	0.65	0.367
20	8.07	0.57	0.322
30	7.84	0.34	0.192
40	7.7	0.2	0.113
50	7.61	0.11	0.062
60	7.56	0.06	0.034
70	7.53	0.03	0.017
80	7.51	0.01	0.006
82	7.5	0	0.000

DRAFT



To = 17 mins
1020 secs

Theory:

Falling Head Permeability calculated using equation by Hvorslev

$$k = [r^2 \ln(Le/R)] / 2Le To$$

where r = radius of casing

R = radius of well screen

Le = length of well screen

To = time taken to rise or fall to 37% of initial change

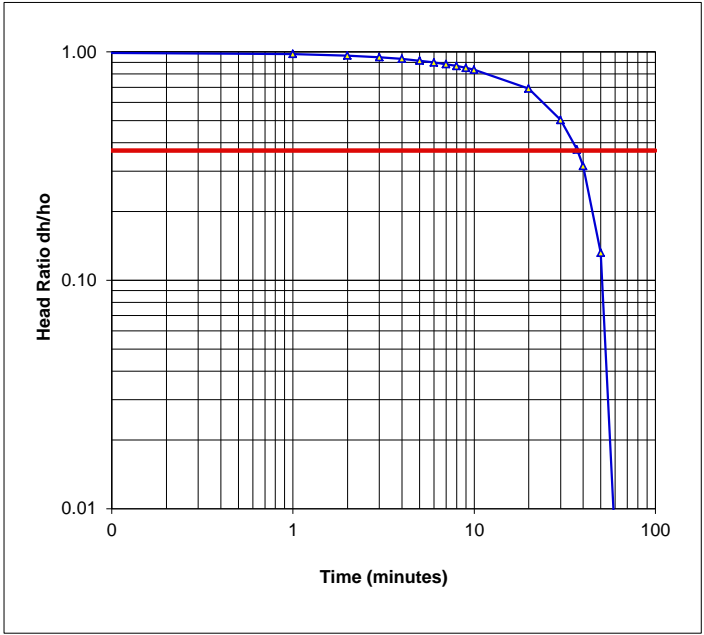
Hydraulic Conductivity

k = 1.2E-06 m/sec
= 0.420 cm/hour

Permeability Testing - Rising or Falling Head Test Report

<p>Client: Atlassian Pty Ltd</p> <p>Project: Proposed Commercial Development</p> <p>Location: 8-10 Lee Street, Haymarket</p>	<p>Project No: 86767.00</p> <p>Test date: 24-Apr-20</p> <p>Tested by: AS</p>																																																																																																																
<p>Test Location</p> <p>Description: Standpipe in borehole</p> <p>Material type: Sandstone</p>	<p>Test No. BH103</p> <p>Easting: 333978 m</p> <p>Northing: 6249263 m</p> <p>Surface Level: 21.2 m AHD</p>																																																																																																																
<p>Details of Well Installation</p> <table style="width: 100%;"> <tr> <td style="width: 40%;">Well casing diameter (2r)</td> <td style="width: 10%; text-align: center;">50</td> <td style="width: 10%;">mm</td> <td style="width: 40%;">Depth to water before test</td> <td style="width: 10%; text-align: center;">7.44</td> <td style="width: 10%;">m</td> </tr> <tr> <td>Well screen diameter (2R)</td> <td style="text-align: center;">76</td> <td>mm</td> <td>Depth to water at start of test</td> <td style="text-align: center;">8.63</td> <td>m</td> </tr> <tr> <td>Length of well screen (Le)</td> <td style="text-align: center;">0.8</td> <td>m</td> <td></td> <td></td> <td></td> </tr> </table>		Well casing diameter (2r)	50	mm	Depth to water before test	7.44	m	Well screen diameter (2R)	76	mm	Depth to water at start of test	8.63	m	Length of well screen (Le)	0.8	m																																																																																																	
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Permeability Testing - Rising or Falling Head Test Report

Client: Atlassian Pty Ltd Project: Proposed Commercial Development Location: 8-10 Lee Street, Haymarket	Project No: 86767.00 Test date: 16-Apr-20 Tested by: NB																																																																																																												
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CERTIFICATE OF ANALYSIS 241152

Client Details

Client	Douglas Partners Pty Ltd
Attention	Huw Smith
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	<u>86767.00, Haymarket, 8-10 Lee Street, Geo</u>
Number of Samples	4 Soil
Date samples received	20/04/2020
Date completed instructions received	20/04/2020

Analysis Details

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

Report Details

Date results requested by	27/04/2020
Date of Issue	27/04/2020
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Results Approved By

Priya Samarawickrama, Senior Chemist

Authorised By



Nancy Zhang, Laboratory Manager

Soil Aggressivity					
Our Reference		241152-1	241152-2	241152-3	241152-4
Your Reference	UNITS	BH103	BH103	BH104	BH104
Depth		2.9-3	5-5.1	2.8-2.9	6.3-6.45
Date Sampled		16/04/2020	16/04/2020	16/04/2020	16/04/2020
Type of sample		Soil	Soil	Soil	Soil
pH 1:5 soil:water	pH Units	4.8	6.3	4.7	6.4
Electrical Conductivity 1:5 soil:water	µS/cm	42	19	68	11
Chloride, Cl 1:5 soil:water	mg/kg	<10	<10	20	<10
Sulphate, SO4 1:5 soil:water	mg/kg	51	20	52	10

Method ID	Methodology Summary
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-002	Conductivity and Salinity - measured using a conductivity cell at 25°C in accordance with APHA latest edition 2510 and Rayment & Lyons.
Inorg-081	Anions - a range of Anions are determined by Ion Chromatography, in accordance with APHA latest edition, 4110-B. Waters samples are filtered on receipt prior to analysis. Alternatively determined by colourimetry/turbidity using Discrete Analyser.

QUALITY CONTROL: Soil Aggressivity					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	2	6.3	6.3	0	101	[NT]
Electrical Conductivity 1:5 soil:water	µS/cm	1	Inorg-002	<1	2	19	20	5	99	[NT]
Chloride, Cl 1:5 soil:water	mg/kg	10	Inorg-081	<10	2	<10	<10	0	91	[NT]
Sulphate, SO4 1:5 soil:water	mg/kg	10	Inorg-081	<10	2	20	20	0	95	[NT]

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

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.
Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.	
The recommended maximums for analytes in urine are taken from "2018 TLVs and BEIs", as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.	
Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2	

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

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