
**Report on Geotechnical Investigation
Report**

Proposed Commercial Development

6-8 Julius Ave, North Ryde NSW

Prepared for ISPT Pty Ltd

Project 233059.01

19 June 2025

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The undersigned, on behalf of Douglas Partners Pty Ltd, confirm that this document and all attached drawings, logs and test results have been checked and reviewed for errors, omissions and inaccuracies.

Signature

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Report on Geotechnical Investigation Report Proposed Commercial Development 6-8 Julius Ave, North Ryde NSW

1. Introduction

This report prepared by Douglas Partners Pty Ltd (Douglas) presents the results of a geotechnical investigation report undertaken for a proposed commercial development at 6-8 Julius Ave, North Ryde NSW (the site). The investigation was commissioned by email instructing Douglas to proceed dated 11 February 2025 from Dan D'Ambrosio on behalf of ISPT Pty Ltd and was undertaken in accordance with Douglas' proposal 233059.00.P.001.Rev1 dated 6 February 2025.

It is understood that the proposed development of the site includes the construction of a five-level data centre with basement structures with a finished floor slab at approximately RL 30 m and RL 32.2. The site has been excavated to RL 36 m as part of a previous development scheme.

The aim of the investigation was to provide geotechnical comments on site preparation, excavation, anchoring, excavation support, groundwater and foundations.

The investigation included drilling six boreholes and installing three groundwater monitoring wells. The details of the field work are presented in this report, together with comments and recommendations on the items listed above. Note that this report will be revised and updated when additional data such as standing groundwater levels, permeability testing and aggressivity testing becomes available.

This report must be read in conjunction with all appendices including the notes provided in Appendix A.

2. Site description

The site is located at 6-8 Julius Avenue, North Ryde within the Riverside Corporate Park (see Figure 1). The site is an irregular shaped block with an area of approximately 3 hectares bound by Julius Avenue to the north, private driveways of office developments on the east and west, and a walking track in Lane Cove National Park and Lane Cove River to the south. The site generally slopes towards the south-east.

The site has been excavated to RL 36 m for a previous development and currently consists of a sandstone platform over most of the site with cut sandstone rock faces along the northern and parts of the western and eastern boundaries.



Figure 1: Aerial of site, site boundary marked in red dashed line.

3. Published data

3.1 Geology

Reference to the Sydney 1:100 000 Series Geological Sheet (9130) indicates that the site is underlain by Hawkesbury Sandstone of Triassic Age (see Figure 2). Hawkesbury Sandstone typically comprises medium to coarse grained quartz sandstone with some shale and laminite bands or lenses.

Two major joint sets are present in the Sydney region trending approximately NNE (020°) and ESE (110°). NNE joints are typically continuous for up to about 150 m in length and about 15 m in height, are sub-vertically dipping and are typically spaced at 5 to 8 m horizontally. ESE joints are less common than NNE joints, typically less than 4 m long, strata-bound to 2 to 4 m vertically and spaced at 1 to 5 m or more.

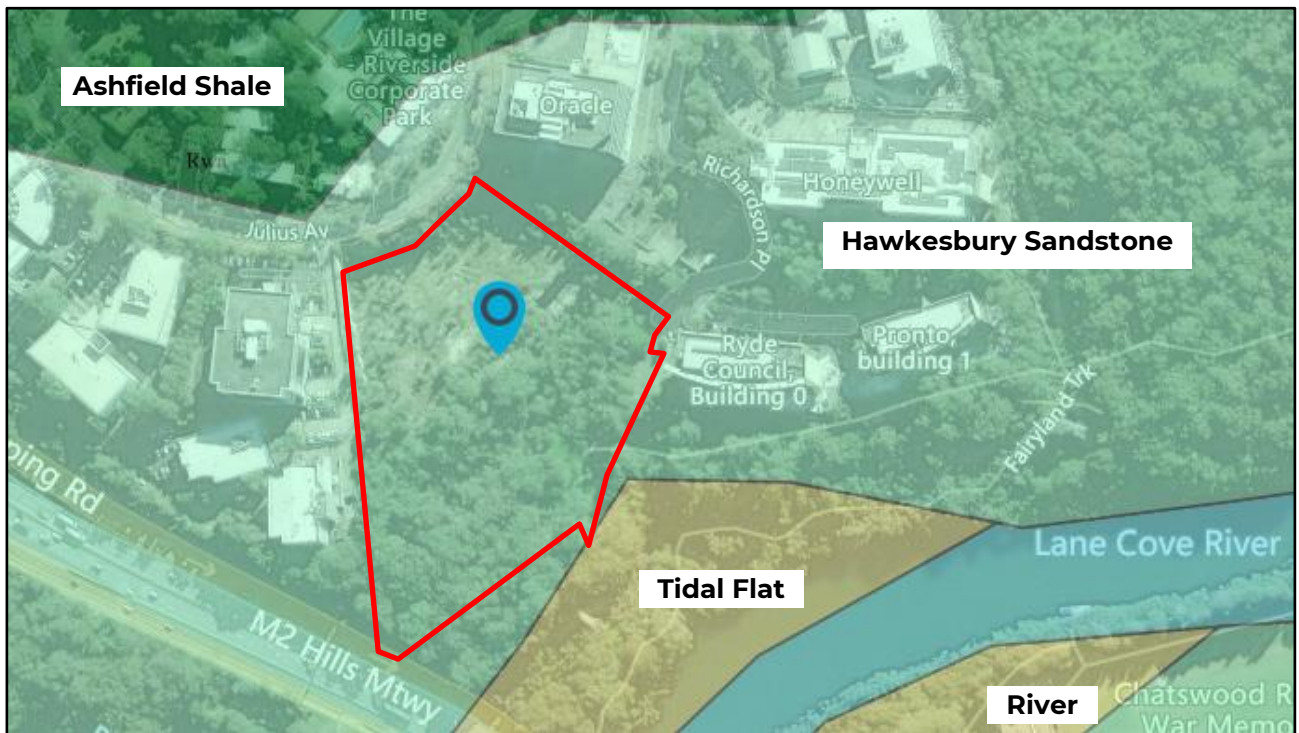


Figure 2: Excerpt of Sydney 1:100,000 Geological Series sheet, with site indicated with blue marker.

3.2 Soil Landscape

Reference to the Sydney 1:100,000 Soils Landscape Sheet shows the site is located in an area that was once underlain by Hawkesbury colluvium soil (see Figure 3).

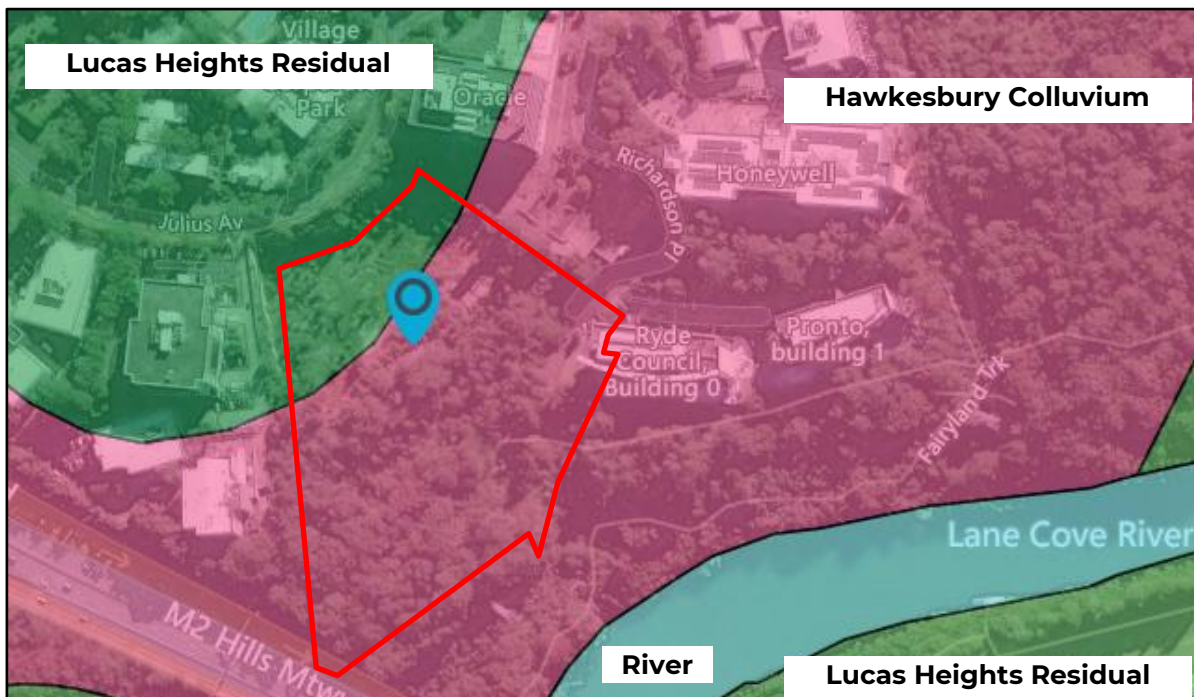


Figure 3: Excerpt of Sydney 1:100,000 Soils Landscape Sheet with site indicated with blue marker.

3.3 Salinity

Reference to the Map of Salinity Potential in Western Sydney indicates the site is not situated within the map boundaries and is therefore not in an area with potential for dryland salinity.

3.4 Acid Sulphate Soils

The Central Resource for Sharing and Enabling Environment Data (SEED) in New South Wales (NSW) has mapped the occurrence of Acid Sulphate Soils (ASS) along the coast of NSW. The information has been added to the eSPADE (electronic Soil Profile Attribute Data Environment) online map, which provides access to a wide range of soil-related data.

Douglas has reviewed the site location in relation to the mapped areas for presence and probability of ASS (see NSW Acid Sulphate Soil Risk extract, Figure 4). Based on the data provided by eSPADE, the site is located outside of any mapped Acid Sulphate Soils (ASS) risk areas. The critical elevation of the upper level of ASS occurrence is RL 1 m, indicating that the depth of the ground surface (RL 36 m) to the ASS layer is about 35 m or more metres depth.



Figure 4: Excerpt of Sydney 1:100,000 Soils Landscape Sheet with site indicated with blue marker.

Douglas has also reviewed the Atlas of Australian Acid Sulphate Soils provided by the CSIRO (Commonwealth Scientific and Industrial Research Organisation) Data Access Portal¹ (see Figure 5). The Atlas indicates that the site is mapped as C4 Extremely low probability of ASS occurrence, with a very low confidence (provisional classification inferred from surrogate data with no on ground verification).

¹ Fitzpatrick, Rob; Powell, Bernie; & Marvanek, Steve (2011): Atlas of Australian Acid Sulfate Soils. v3. CSIRO. Data Collection. <https://doi.org/10.4225/08/512E79A0BC589>

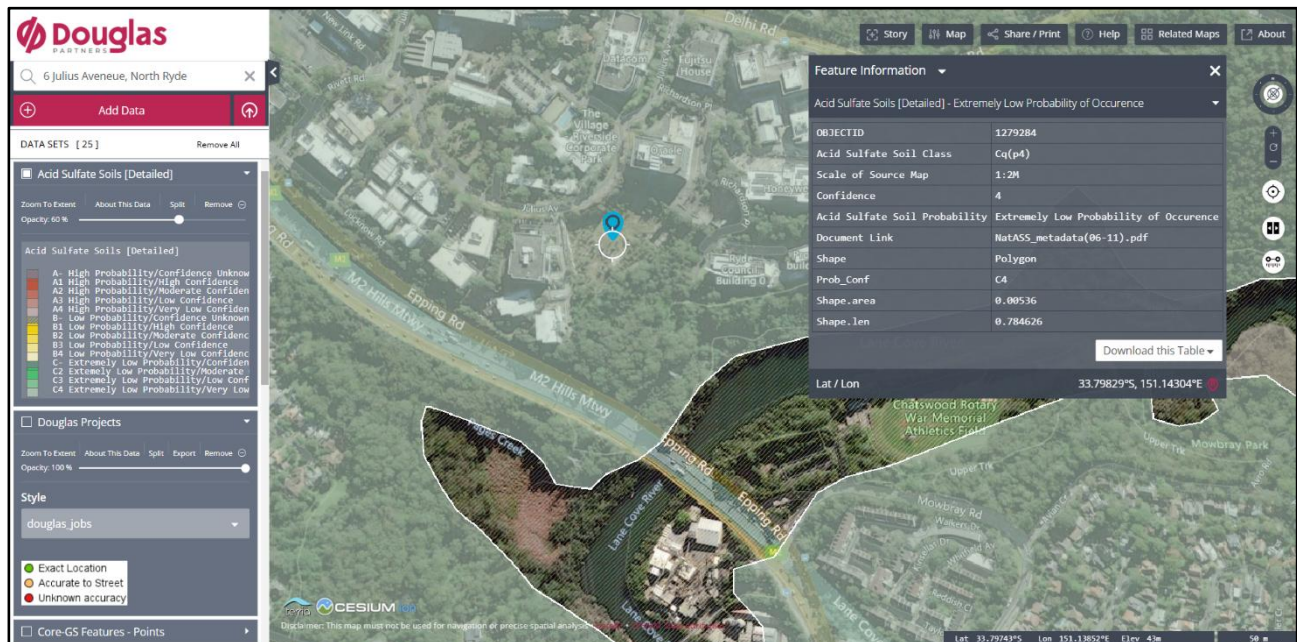


Figure 5: Excerpt of Sydney 1:100,000 Soils Landscape Sheet with site indicated with blue marker.

The Atlas of Australian Acid Sulphate Soils shows the site with an extremely low probability of ASS occurrence. The potential for ASS to be present at the site is therefore considered to be low and it is not thought to present a constraint to the proposed development.

4. Field work

4.1 Field work methods

Field work comprised five (5) boreholes (BHs 101, 102, 103, 105 and 106) drilled for geotechnical purposes and one (1) borehole (BH101A) solely for well installation purpose. The locations of the boreholes and wells are shown on Drawing 1 in Appendix C, with the logs provided in Appendix D. The bores were drilled to depths between 9.55 m and 15.7 m using a Bobcat drilling rig.

Boreholes (BH101 to BH103, BH105 and BH106) commenced using rock roller drilling techniques to establish the hole and were continued with diamond drilling to obtain NMLC sized core samples of the bedrock for geotechnical logging and strength testing. Point Load Strength Index ($IS_{(50)}$) tests were carried out on cores at approximately 1 m depth intervals, where the rock core was suitable for testing.

BH101A was drilled adjacent to BH101 using a 96 mm rock roller drill bit to install a temporary groundwater observational well. No core samples were retrieved due to the destructive nature of the drilling. Temporary groundwater observation wells were also installed in BH103 and BH106 after the NMLC sized cored hole was reamed out to 96 mm. The wells will be used for groundwater sampling, hydraulic conductivity testing and long-term measurement of groundwater levels (refer Appendix C for well locations and Appendix D for well construction details).

Wells were constructed using 60 mm external diameter (50 mm internal diameter) Class 18 unplasticised poly-vinyl (uPVC) casing. Slotted screen sections comprised 0.4 mm aperture, machine-slotted, Class 18 uPVC pipe, finished with a bottom cap. A durable single sized (poorly graded) quartzose sand filter was placed around the screened section and sealed with a minimum 4 m bentonite seal from the top of the sand filter to ground surface to reduce the chance of any surface water from entering the borehole. The wells were finished with a stick up of approximately 1.0 m above ground surface.

Groundwater sampling and measurement of groundwater levels were carried out in the temporary observation wells.

The ground surface levels at the bores were measured as Reduced Levels (RL) in metres relative to Australian Height Datum using a high-accuracy digital GPS.

4.2 Field work results

4.2.1 Boreholes

Details of the subsurface conditions encountered in each borehole are given in the logs in Appendix D together with notes defining classification methods and descriptive terms. Photographs of the recovered core are also included.

The general sequence of materials encountered in the boreholes drilled from excavated surface can be summarised as follows:

Hawkesbury Sandstone

Medium, medium/high and high strength sandstone, medium grained, very thickly bedded, cross-bedded, with some areas with carbonaceous flecks and bands, mostly unbroken.

Bedding planes in the rock core generally dipped at less than 15° from horizontal which is typical for the Hawkesbury Sandstone. No weak seams were encountered. Defect spacing typically ranged from 1.0 m to >5.0 m. Rock Quality Designation (RQD) can be classified as excellent (i.e., 97% to 100%).

Detailed summary including depths to the top of strata are shown below in Table 1.

Table 1: Summary of Top of Strata Levels at Each Borehole

Stratum	Top of Stratum Depth (m)				
	BH101	BH102	BH103	BH105	BH106
High Strength Sandstone	0.0 (RL 35.9)	0.0 (RL 35.9)	0.0 (RL 35.9)		
Medium Strength Sandstone	4.8 (RL 31.1)	-	-	0.0 (RL 35.9)	
Medium/High Strength Sandstone	-	-	-	-	0.0 (RL 36.0)
High Strength Sandstone	6.7 (RL 29.2)	-	-	11.0 (RL 24.9)	
End of Borehole	9.55 (RL 26.35)	10.0 (RL 25.9)	10.0 (RL 25.9)	15.71 (RL 20.19)	10 (RL 26.0)

4.2.2 Groundwater Wells and Readings

The use of water for rotary drilling and coring prevented observation of groundwater within the rock whilst drilling.

Groundwater monitoring wells were installed at BH101A, BH103 and BH106 (see Table 2 for well installation details). The three (3) wells were developed (purged dry of drilling contaminated water) and groundwater levels were manually taken using an electronic dipmeter. A downhole data-logger was subsequently installed in all holes after the initial reading to allow continuous long-term monitoring. Groundwater levels were monitored between 26th February and 19 May 2025. The collected data, shown with with daily rainfall records obtained from Weather Station No. 66211 at Wahroonga (ref: Bureau of Meteorology Station, <http://www.bom.gov.au>), are provided in Plots 1 to 3 in Appendix D.

Table 2: Summary of Well Installation Details

Borehole No.	Depth of Filter Zone	Rock Strata at Filter Zone
	Depth, m [Reduced Level, m]	
BH101A	4.5 – 9.0 [31.4 – 26.9]	Medium to slightly weathered, mostly unbroken medium and high strength sandstone
BH103	4.0 – 7.5 [31.9 – 28.4]	Fresh, unbroken high strength sandstone
BH106	4.5 – 9.0 [31.5 – 27.0]	Fresh, unbroken medium to high strength sandstone

Manual water level readings have also been taken in each well, see Table 3.

Table 3: Standing Water Levels in Observation Wells

Borehole No.	Date	Surface RL (m, AHD)	Manual Water Level Measurements in Wells	
			Depth (m, bgl)	Reduced Level (m, AHD)
BH101A	26/02/2025	RL 35.9	0.65	35.25
	21/03/2025		0.74	35.16
	19/05/2025		0.64	35.26
BH103	26/02/2025	RL 35.9	4.75	31.15
	21/03/2025		1.95	33.95
	19/05/2025		2.13	33.77
BH106	26/02/2025	RL 36.0	6.55	29.45
	21/03/2025		6.81	29.19
	19/05/2025		6.37	29.53

4.2.1 Hydraulic Conductivity Testing

Rising head permeability testing in BH101A, BH103, and BH10605 was carried out on 26 February 2025 and again on 21 March 2025 to estimate the rock mass hydraulic conductivity.

The rising head permeability test involves removing water from the standpipe and measuring the change in water level with time. The calculated results of the permeability tests using Hvorslev's (1951) method are summarised in Table 4 with the calculations provided in Appendix D.

Table 4: Summary of Permeability Test in Wells

Borehole	Hydraulic Conductivity, k (m/s)	
	Test 1	Test 2
BH101A	6.8×10^{-9}	8.7×10^{-9}
BH103	3.8×10^{-10}	4.2×10^{-10}
BH106	1.3×10^{-9}	2.8×10^{-9}

5. Laboratory testing

5.1 Aggressivity Testing

Aggressivity tests on water samples are summarised in Table 5 and attached in Appendix E.

Table 5: Summary of Laboratory Groundwater Aggressivity Test Results

Borehole/Sample - Depth	pH	Chloride as Cl ⁻ (mg/kg)	Sulphate as SO ₄ (mg/kg)	Electrical Conductivity (μS/cm)
BH101A	4.4	190	25	830
BH106	6.9	93	35	720

The results of the aggressivity testing have been compared with Australian Standard (AS 2159-2009), Table 6.4.2 (C): "Exposure Classification for Concrete Piles – Piles in Water". The results indicate the water samples are non-aggressive, with the exception of the lower PH of 4.4.

5.2 Point Load Testing

The results of point load index testing ($I_{s(50)}$) carried out at regular intervals on rock cores are shown on the respective borehole logs in Appendix D. The results show $I_{s(50)}$ values in the range of 0.55 to 1.9 MPa, indicating that the rock tested ranged from medium strength to high strength (refer Figure 4).

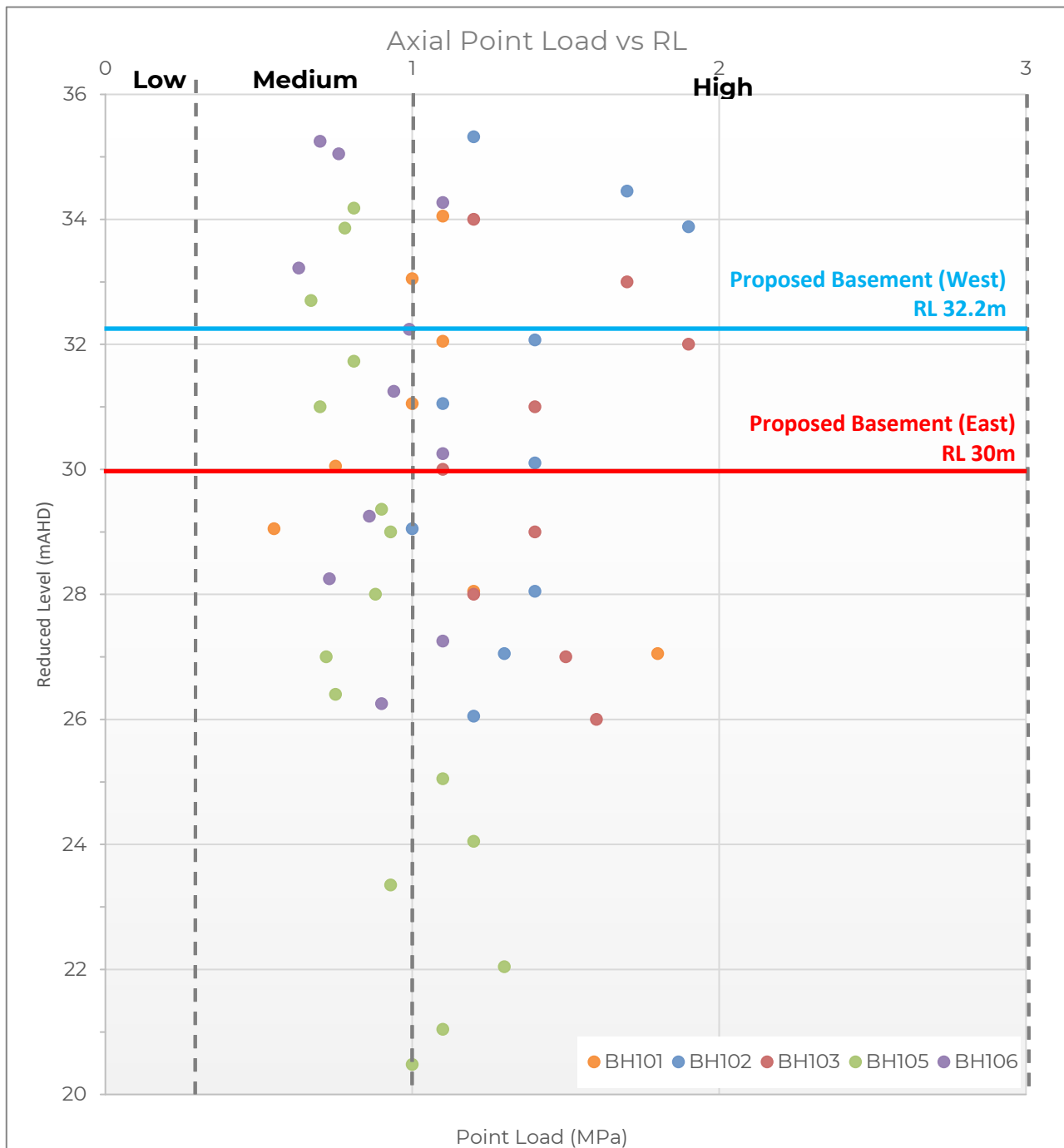


Figure 4: Summary graph of point load test results from BH101 to BH103, BH105 and BH106.

6. Proposed development

It is understood from plans provided by Logic Project Management that the proposed development involves the construction of a 5-level data centre with a basement structure involving between 3.8 m and 6 m of excavation for a finished floor level of RL 30 and RL 32.2 from the current level of RL 36 m. An access road is proposed to be constructed from the private driveway to the west of the site towards Richardson Place.

7. Geotechnical Model

Based on the investigation results, the geotechnical profile of the site in its current excavated state can be summarised as shown in Table 6.

Table 6: Geotechnical Model below Street Level and Proposed Basement

Unit	Material Description	Rock Mass Description	Reduced Level at Top of Stratum ¹ m AHD
1	Medium and High Strength Sandstone	Slightly to moderately weathered or fresh, zones of slightly fractured rock but mostly unbroken (very thickly bedded Sandstone)	More present towards the south of the excavated platform; from Surface ~RL 36
2	High Strength Sandstone	Slightly to moderately weathered or fresh, zones of slightly fractured rock but mostly unbroken (very thickly bedded Sandstone)	More present towards the North of the excavated platform; from Surface ~RL 36

The sandstone encountered in the boreholes can be described as very thickly bedded. The recovered core was mostly unbroken with very occasional mostly sub-horizontal bedding planes and only one (1) subvertical joint logged. The few defects that were encountered in the boreholes are typical of the structural geological features of the Hawkesbury Sandstone. Note that, despite the lack of defects in the recovered core, joints predominantly striking north-south may still be encountered in the excavation.

An inferred geological model of the subsurface profile at the site is provided in the form of interpreted geological cross-sections in Drawing 2 (see Appendix C).

Groundwater levels were initially measured between 0.7 and 6.5 m depth.

8. Comments

8.1 Excavation Conditions

It is understood that bulk excavation down to approximately RL 32.2 and RL 30 m (FFL²) will be required across the existing platform as part of the proposed works.

Trafficability of the sandstone at BEL is not expected to be problematic for tracked general construction machinery. Should heavy plant be required, such as piling rigs or very heavy cranes, a working platform is likely to be required, and an assessment should be carried out based on the approach set out by the Federation of Piling Specialist (UK).

² Finished Floor Level

8.1.1 Excavatability

The proposed basement structure (assumed FFL of RL 32.2 and RL 30 m) will require an excavation of up to 6 m depth (refer proposed development documents in Appendix B).

Excavation is likely to be predominantly in very thickly bedded medium and high strength sandstone. Excavation of bedrock is largely dependent on rock strength and defect spacing encountered. The very thickly bedded and medium to high and high strength properties of the sandstone encountered in the boreholes will require large excavators equipped with heavy hydraulic rock hammers and rock saws. Given the intact strength range of the rock cores of 10 to 40 MPa and very thickly bedded nature of the rock mass (refer to Figure 4), it is strongly recommended that excavation contractors carry out independent excavatability assessment prior to tendering for excavation works.

Rock saws will also be required to reduce the risk of vibration causing damage to adjacent structures such as services and neighbouring buildings.

8.1.2 Excavation Induced Ground Movement (Stress Relief)

Locked-in compressive stresses are likely to be present within the rock based on our experience in Sydney. During excavation and very shortly after, these stresses are released which generally results in lateral movement of the rock face towards the excavation, dragging the overburden (and any structures) with it as movement occurs. Generally, units of stiffer rock (medium strength or stronger rock) will have higher horizontal locked-in compressive stresses, which should be expected for this site. The amount of displacement that may occur depends on the excavation depth of at least medium strength sandstone, locations of bedding planes and joints in the rock mass, excavation face length and face orientation. As the maximum principal compressive stress in Sydney rock is generally in the north-south direction, the north and south faces are expected to experience more stress relief movement into the excavation than the east and west faces. Stress relief movement in Hawkesbury Sandstone can be up to 2 mm per metre of excavated medium strength or stronger sandstone.

It is understood that the proposed basement excavation will not extend to the site boundaries (minimum setback 5 m) and therefore neighbouring buildings are not expected to be within the zone of influence of the excavation.

8.1.3 Disposal of Excavated Material

All surplus excavated materials will need to be disposed of in accordance with the Protection of the Environment Operations Act 1997 (POEO Act). All materials removed from the site are defined as waste under the POEO Act and must be disposed of in accordance with one of the following:

- virgin excavated natural materials (VENM) as defined under the POEO Act, permitting reuse on site;
- a waste category meeting the criteria set out in the NSW EPA Waste Classification Guidelines 2014, with the materials disposed to a landfill licenced to receive the waste under the assigned classification; or,
- material complying with a Resource Recovery Order (RRO) as defined under the Protection of the Environment Operations (Waste) Regulation 2014, with complying materials able to be reused under certain conditions.

Accordingly, environmental testing will need to be carried out to determine the most appropriate off-site destination(s) for the excavated material.

8.1.4 Ground-borne Vibration

The use of excavation equipment such as heavy rock hammers in bedrock will generate vibration and depending on the proximity, could possibly cause damage to nearby structures and in-ground services and effect building inhabitants. It will be necessary to use appropriate excavation methods and equipment to keep ground-borne vibration at these structures/services within acceptable limits. The level of acceptable vibration is dependent on various factors including the type of building structure (e.g., reinforced concrete, brick, etc.), its structural condition, founding conditions, the frequency range of vibration produced by the construction equipment, the natural frequency of the building and the vibration transmitting medium.

Ground-borne vibration can be strongly perceptible to humans at levels above 2.5 mm/s peak particle velocity (PPV). This is generally much lower than the vibration levels required to cause structural damage to most buildings. The Standard AS/ISO 2631.2 – 2014 “Mechanical vibration and shock – Evaluation of human exposure to whole-body vibration – Vibration in buildings (1 Hz to 80 Hz)” suggests an acceptable daytime limit of 8 mm/s PPVi for human comfort.

Based on Douglas’ experience of and with reference to AS/ISO 2631.2, it is suggested that a maximum PPVi of 8 mm/s (measured at the first occupied level of the neighbouring building) be employed at this site for both architectural and human comfort considerations. The vibration limit may need to be reduced if there are sensitive buildings or equipment in the area.

Douglas maintains an extensive construction vibration database. As a preliminary estimate, Table 7 provides approximate minimum buffer distances for selected equipment, based on a set vibration limit of 8 mm/s (assuming that plant is appropriately sized for the ground conditions).

Table 7: Approximate buffer distances for selected Plant (PPVi 8 mm/s)

Excavation Plant		Distance from plant at which vibration attenuates to 8 mm/s	
Type	Operating Weight	From Douglas Trial Maxima ¹	From Douglas Trial Average
Rock saw on excavator ²	-	1 m	0.5 m
Ripper on 20 t excavator	-	3 m	0.7 m
Rock Hammer	<500 kg	7 m	3 m
	501 – 1000 kg	8 m	3 m
	1001 – 2000 kg	13 m	5 m
	>2000 kg	>13 m	>5 m

Notes:

1. Shorter distances can generally be determined from individual trials, as indicated by those from trial averages.
2. Buffer distances for rock hammers may be slightly reduced by prior saw cutting along, or parallel to, excavation boundaries.
3. Loading effects from adjacent buildings may reduce vibration levels, to enable excavation saw cuts with few exceedances.

As the magnitude of vibration transmission is site specific, it is recommended that a vibration trial is carried out using the planned equipment prior to bulk excavation commencing. This trial may

indicate that smaller or different types of excavation equipment or operation approach are required to reduce vibration to acceptable levels. Monitoring of adjacent building footings may also be required depending on the proposed excavation equipment.

8.2 Excavation Support

Excavated faces in medium and high strength sandstone are generally self-supporting, except where affected by adversely oriented joints. Rock wedges or feather edges (sub-parallel joints intersecting the face) may occur particularly along the east and west faces of excavations where the predominant NNE-SSW steeply dipping joints are expected. Note that these joints can still be encountered in the rock faces even though they have not been encountered in the boreholes.

During excavation, it is recommended that all rock faces are inspected by a geotechnical engineer to confirm that the site conditions are consistent with design assumptions and to verify the stability of the faces and advise on any support requirements. It is recommended that the excavations are inspected every 1.5 m drop in excavation height or every 1.0 m drop where excavation is extending below adjacent foundations or structures.

Note that rock mass support can only be finalised once the actual joint location, strike and dip have been determined by the geotechnical engineer/engineering geologist during excavation.

8.2.1 Rockbolts, Dowels and Ground Anchors

Rockbolts, dowels and ground anchors (support elements) may be required for temporary lateral restraint of rock faces, where unstable rock slivers, blocks, wedges and feather edged joints are present in excavated faces (see Figure 5). The new building will need to be designed to support the basement rock face in the long term or permanent rockbolt support will be required instead.

Note that the site already has vertically excavated rock faces at the north, east and westerly boundaries which will need to be assessed for permanent support.

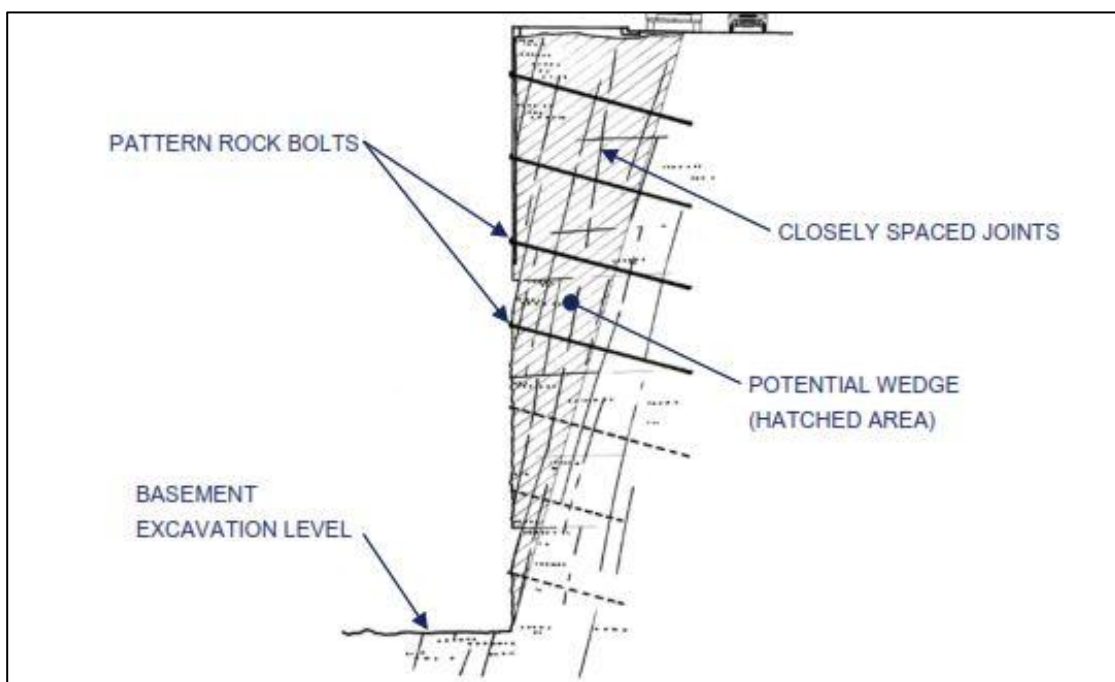


Figure 5: Example of Rock Wedge Support

Pre-stressed, permanent ground anchors can be used to hold-down building cores foundations where uplift loads are present. Hold-down anchors should be designed in accordance with AS4678. The designer should check the combined cone and pull-out failure mechanism by assuming a 90° cone in medium strength or stronger sandstone, slightly fractured sandstone (or better). The cone apex should be positioned at the mid-point of the anchor bond length. The mass of the cone must be sufficient to resist uplift. The dead load of the rock mass should be calculated using a unit weight of 24 kN/m³ for the rock. A buoyant unit weight of 14 kN / m³ should be used for any portion of the cone below the water table. It will be necessary to determine the extent to which adjacent cones intersect and share rock mass, with the capacity reduced accordingly. Where cones intersect it is usually necessary to use 3D CAD to determine the exact cone volumes. The use of permanent rockbolts and ground anchors, if required, will need careful attention to corrosion protection for which further geotechnical advice should be sought.

Pre-stressed ground anchors, rockbolts and dowels should be bonded in the strong rock, inclined as required, but preferably not steeper than 30° below the horizontal. Table 8 provides ultimate and allowable bond stresses for preliminary assessment purposes.

Table 8: Bond Stresses

Material	Ultimate Bond Stress (kPa)	Allowable Bond Stress (kPa)
Medium Strength Sandstone	800	350
Medium/High Strength Sandstone	1500	600
High Strength Sandstone	3000	1200

These values should be confirmed by pull-out tests prior to installation of support elements. Ultimately, it is the contractor's responsibility to ensure that the correct design values (specific to the support system and method of installation) are used and that the support element holes are carefully cleaned prior to grouting.

After support elements have been installed, it is recommended that they are proof tested to 125% of their nominal working load for temporary support and 150% of their nominal working load for permanent support. Where stress relief or further unavoidable movement of shoring is expected, it is recommended that the support elements are locked-off between 70% and 90% of their working loads to accommodate the additional movement and subsequent increase in stress in the support elements. Checks (lift-off tests) should be carried out to confirm that the load in the support elements has been maintained and that losses due to creep effects or other causes have not occurred.

Care should be exercised to ensure that anchors are installed progressively during excavation and stressed prior to excavation of the next drop to ensure that stability is maintained at all times. Inspections by a qualified geotechnical engineer/engineering geologist are required after each drop to determine if additional support is required.

It should be noted that permission will be required from adjacent property owners or relevant authorities prior to installing rockbolts/ground anchors into or below their land or into any rail and/or utility easements. In such cases where anchors are not permitted, alternative methods such as internal propping etc may be required. Due consideration should also be given to below-ground tunnels, basements, services, etc.

8.3 Foundations

The geotechnical model indicates medium strength and high strength sandstone is expected at the new footing excavation levels. The design of pad or strip footings on medium and high strength sandstone may be carried out using the values given in Table 9.

Table 9: Preliminary Design Parameters for Foundation Design (after Pells, Moyston and Walker³)

Foundation Stratum	Class	Ultimate End Bearing Pressure (kPa)	Allowable End Bearing Pressure (kPa)	Young's Modulus, E (MPa)	Minimum Testing Requirements
Medium Strength Sandstone	Class III	20,000	3,500	600	Spoon testing for 33% of footings
Medium to High Strength Sandstone	Class II	60,000	6,000	1200	Cored bores at max 10 m grid spacing or cored bores for 50% of footings and spoon testing of remainder.
High Strength Sandstone	Class I	100,000	10,000	2,000	Cored bores at max 10 m grid spacing or cored bores for 50% of footings and spoon testing of remainder.

*Notes about this Table:

- Ultimate parameters are mobilised at large settlements (i.e. >5% of minimum foundation width).
- Allowable end bearing pressures to cause settlement of less than 1% of minimum footing dimension.

To use a bearing pressure value for design of 6 MPa or greater, cored bores at a maximum 10 m grid spacing or cored bores for 50% of footings and spoon testing carried out on the remaining footings are required (see Table 9 above). Alternatively, the footings can be designed using the parameters for medium strength sandstone which reduces the testing requirements to 33% of footings requiring spoon testing. For spoon testing, a 50 mm diameter hole is drilled below the base of the footing to a depth of 1.5 times the footing width, followed by testing the sidewall of the hole to check for the presence of defects such as weak layers or clay bands (which should be taken into consideration in the design).

³ Design Values for Foundations on Sandstone and Shale in the Sydney Region, Pells, Moyston and Walker. Australian Geomechanics December 1998.

All foundations should be taken down to below the zone of influence of any proposed service trenches running beneath the basement floor, as well as below the zone of influence of other foundations adjacent to a drop in basement elevation (i.e. rock face between basement at RL 32.2 m and RL 30 m). Generally, the zone of influence can be defined by a plane extending upwards at 45° from the base of the service trench or adjacent footing (all footings affected to be assessed individually).

The foundation design parameters given in Table 9 assume that the foundation excavations are clean and free of loose debris prior to concrete placement. Foundations proportioned on the basis of the allowable bearing pressures in Table 9 would be expected to experience total settlements of less than 1% of the minimum foundation width under the applied working load, with differential settlement between adjacent columns expected to be less than half of this value.

All footings should be inspected by a geotechnical engineer to confirm that founding conditions are suitable for the design parameters, and proof drilled or spoon tested as appropriate. If weak seams or defects are encountered, footings may need to be deepened until suitable founding material is reached.

The allowable bearing pressure is generally reduced by half for all high-level footings bearing on competent, self-supporting (i.e. not affected by defects) medium strength or stronger sandstone near the edge of a vertical excavation. Inspection of the excavated face below the footing will be necessary to confirm that there are no observable defects or adversely dipping joints that may affect footing performance. Investigation comprising horizontal coreholes may also be required to establish whether an adversely oriented joint is present behind the face and to determine the extent of such defect in the rock mass.

If required, numerical analysis can be used to calculate the modulus of subgrade reaction for individual footings or building core base(s).

8.4 Groundwater

Water levels have been measured during the investigation and recorded during the long-term monitoring (refer Appendix F). The inferred water level slopes down across the site, ranging from about RL 35.5 m towards the Julius Avenue side to RL 29 m towards the down slope to Parramatta River. The inferred water level across the site is shown in Section A-A' in Appendix C.

As the basement is expected to extend partially below the water level (this report considers a maximum basement excavation to about RL 30 m), control of inflow is likely to be required both in the short and long term. Short term control will be required during excavation to allow construction of the substructure. Long term control will be required during the design life of the building.

Inflow rates are expected to be low due to the low hydraulic conductivity of the rock mass (the rock mass is very thickly bedded and the intact rock has low porosity). A low inflow rate of less than 3 ML/year may be eligible for a Water Access Licence exemption from WaterNSW. This will be subject to review and approval from WaterNSW.

Low inflow through the rock into the excavated rock faces should be readily controlled by perimeter and collector drains connected to sump-and-pump system for discharge to a temporary or permanent On-Site Detention (OSD) tank, if treatment is required, before periodic discharge to stormwater. A drained basement is therefore considered suitable for this site.

Construction of a drained basement will, however, be subject to review and approval from the DCCEEW and other relevant authorities.

The drawdown associated with a drained basement given the low hydraulic conductivity of the rock mass will be within the rock and would not extend too far beyond the site and without significant impact on surrounding properties.

Additional wells outside of the basement excavation and additional permeability testing and groundwater inflow modelling will be required to assess and predict groundwater inflow in the long term. It is recommended that the inflow into the excavation during and just after construction should be monitored as this will also give an indication of likely inflow for the long-term condition.

Note that a drained basement will act as a low point to which groundwater will flow. Therefore, if present, any contamination within the surrounding groundwater could flow into the basement and adversely affect the quality of the water collected on site and possibly impact the concrete structure.

Previous experience in Sydney is that seepage will likely contain relatively high levels of soluble iron that will form a precipitate in the form of a gelatinous 'sludge' when exposed to oxygen. This 'sludge' has the potential to block-up subsoil (gravel) drains and 'seize-up' pumps. Therefore, detailing of subfloor drains, sumps and pumps should incorporate provision for regular maintenance such as flushing and 'rodding' of drains and/or "baffle" pits.

8.4.1 **Legislation, Regulation, Plans and Policies**

The applicable Act of the NSW Parliament is the "Water Management Act 2000" (WMA). Reference should be made to the current version as at 1 July 2023.

The applicable Water Sharing Plan of the NSW Parliament is the "Water Sharing Plan for the Greater Metropolitan Region Groundwater Sources 2023". Reference should be made to the current version as at 1 July 2023. The Plan Map (Ref: WSP015_Version 3) indicates that the site of the proposed development is located within the Sydney Basin Central Groundwater Source.

The applicable policy of the NSW Government for the licencing and assessment of aquifer interference activities is the "Aquifer Interference Policy" (AIP) of the NSW Department of Primary Industries' Office of Water. Reference should be made to the current version as at September 2012.

8.5 **Seismicity**

A Hazard Factor (Z) of 0.08 would be appropriate for the development site in accordance with Australian Standard AS 1170.4 – 2007 *Structural design actions – Part 4: Earthquake actions in Australia*. The site sub-soil class is considered to be Class B_e based on the building being founded directly on rock.

It is recommended that the building is not designed to rely on passive resistance from the excavated rock faces surrounding the site to account for any removal of this rock by future excavation or neighbouring developments.

8.6 Dilapidation Surveys and Monitoring

Dilapidation surveys should be carried out on adjacent buildings, pavements, services and any sensitive structures that may be affected by the excavation works. A baseline (reference) survey should be carried out before the commencement of any excavation work in order to document existing defects so that any claims for damage due to construction related activities can be accurately assessed.

9. Further Investigation

At the time of the investigation, areas on the site were unable to be accessed and some planned boreholes were unable to be completed. Douglas recommends the bores in the vicinity of the proposed driveway/access road (dense bushland currently) are still carried out, at a time when they are accessible (client to advise).

Mapping of all exposed rock faces will be required and a rock face stability assessment carried out.

During construction phase, if the groundwater monitoring wells that have been installed are destroyed during the basement excavation, new wells will need to be installed outside the excavation or in safe locations in accordance to DPIE.

10. Limitations

Douglas Partners Pty Ltd (Douglas) has prepared this report for this project at 6-8 Julius Ave, North Ryde NSW in line with Douglas' proposal dated 12/02/2025 and acceptance received from Dan D'Ambrosio of ISPT Pty Ltd dated 11 February 2025. The work was carried out under Douglas' Engagement Terms. This report is provided for the exclusive use of ISPT Pty Ltd for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of Douglas, does so entirely at its own risk and without recourse to Douglas for any loss or damage. In preparing this report Douglas has necessarily relied upon information provided by the client and/or their agents.

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

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

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

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

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

Appendix A

About This Report

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

This report is the property of Douglas Partners Pty Ltd. The report may only be used for the purpose for which it was commissioned and in accordance with the Conditions of Engagement for the commission supplied at the time of proposal. Unauthorised use of this report in any form whatsoever is prohibited.

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.

continued next page

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

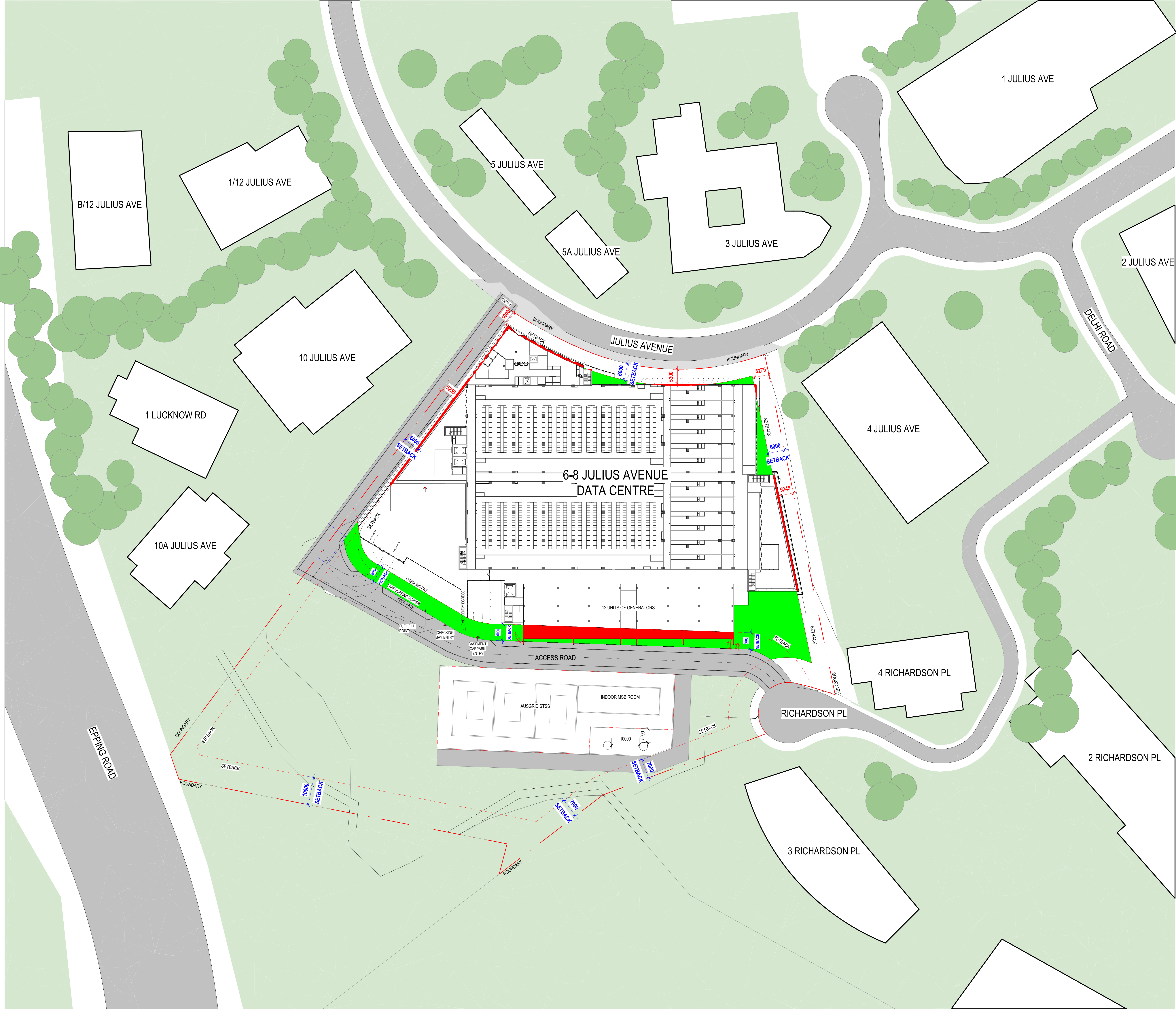
The company will always be pleased to provide engineering inspection services for geotechnical and environmental aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.

intentionally blank

intentionally blank

Appendix B

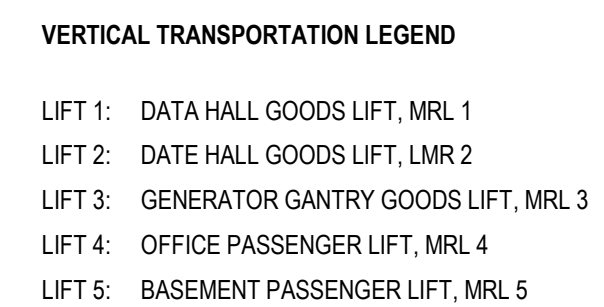
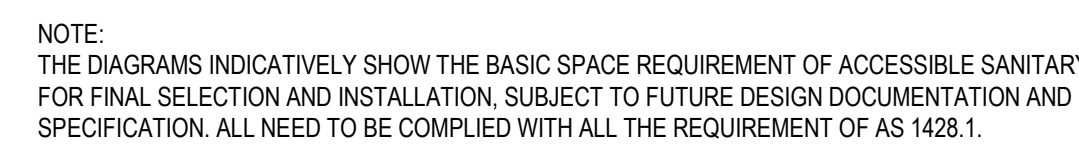
Proposed Development Drawings



1 SITE PLAN
1:500

LEGEND
ENCROACHING ZONE
COMPLIANT ZONE

	Issue	Date	Description	Notes	Key Plan	Project Manager	Client		- Use written dimensions only - Do not scale from drawing - Contractors shall confirm all dimensions on-site prior to commencing any work or producing any shop drawings - All materials to be used in accordance with the manufacturer's specifications and instructions and shall comply with the relevant Australian Standards - Copyright of this drawing and design remain the property of Greenbox Architecture Pty Ltd - Nominated Architect - Gerard Page: NSW reg No.7247, Vic reg No.17864, QLD reg No.4536	Client	Scale	Sheet	Scale Bar		Project Status	
	2	2023-06-11	FOR INFORMATION RESPOND TO TOA								1:500	A0	1:500			PRELIMINARY
										Project	Checked By					
						Construction Manager				JULIUS AVENUE DATA CENTRE	ML					SITE PLAN SETBACK
										6-8 JULIUS AVE NORTH RYDE NSW	Approved By					
											AO					
											Job Number					
											240089					
											Drawing Number					
											ASK103					
											Issue					
											2					



1 BASEMENT PLAN
1:200

- NOTES:
- THESE NOTES AND LEGEND (IF SHOWN) FORM PART OF THE PLAN AND SURVEY AND MUST REMAIN WITH THE PLAN IN ANY REPRODUCTION IN WHOLE OR PART.
 - THE CAD FILE USES METRES AS ITS BASE UNIT AND IS IN A "GROUND" COORDINATE SYSTEM. IF THE SURVEY IS STATED AS MGA, ANY POINT IN THE FILE WILL BE AN APPROXIMATE MGA COORDINATE.
 - SOME SYMBOLS REPRESENTING PHYSICAL STRUCTURES SUCH AS POWER POLES AND PITS ARE DIAGRAMMATIC ONLY AND DO NOT NECESSARILY REPRESENT THE ACTUAL SIZE AND EXTENT OF THESE FEATURES.
 - THE SURVEY INFORMATION SHOWN HERE WAS PREPARED FOR A SPECIFIC PURPOSE FOR THE CLIENT SHOWN. THIS INFORMATION IS NOT INTENDED TO BE USED FOR ANY OTHER PURPOSE OR BY ANYONE NOT AUTHORISED BY THIS CLIENT.
 - BOUNDARY DIMENSIONS AND AREAS HAVE BEEN DETERMINED BY CURRENT CADASTRAL SURVEY AND THE BOUNDARY AND EASEMENT LINES IN THE ELECTRONIC FILE HAVE BEEN INCLUDED USING THOSE SURVEYED DIMENSIONS. THE TITLE DIMENSIONS SHOWN ON THE HARD COPY PLAN TAKE PRECEDENCE OVER THE LINES IN THE ELECTRONIC FILE.
 - THE TITLE/S TO THE SUBJECT LAND HAS BEEN REVIEWED AND THE POSITION OF ALL EASEMENTS AFFECTING THE LAND ARE SHOWN. THE TERMS OF ANY EASEMENT, RESTRICTION ON THE USE OF LAND OR COVENANT AFFECTING THE LAND HAVE NOT BEEN INVESTIGATED. LEASES AND OTHER NOTATIONS MAY ALSO EXIST WHICH AFFECT THE LAND.
 - UNDERGROUND SERVICES OTHER THAN THOSE SHOWN HAVE NOT BEEN INVESTIGATED.
PRIOR TO DEMOLITION, EXCAVATION OR CONSTRUCTION WORK ON THE SITE, THE RELEVANT SERVICE AUTHORITY SHOULD BE CONTACTED TO ESTABLISH DETAILED LOCATION AND DEPTH.
 - THIS SURVEY IS LIMITED TO IMPROVEMENTS AND OTHER DETAIL WHICH WERE VISIBLE AND ACCESSIBLE AT THE TIME OF SURVEY. THE LOCATION OF DETAIL SUCH AS PRIVATE UNDERGROUND SERVICE LINES AND BUILDING FOUNDATIONS WITHIN THE SITE IS UNKNOWN.
 - THE COORDINATES WITHIN THIS DRAWING RELATE TO THE DATUM SHOWN IN THE TITLE BLOCK. REFER TO A REGISTERED LAND SURVEYOR FOR FURTHER CLARIFICATION. CAUTION SHOULD BE TAKEN WHEN IMPORTING INFORMATION OBTAINED FROM OTHER SUB-CONSULTANTS OR SOURCES TO ENSURE THAT THE DATA IS ON A MATCHING COORDINATE SYSTEM.
 - CONTOURS SHOWN HEREON DEPICT THE GENERAL TOPOGRAPHY ONLY. EXCEPT AT SPOT LEVELS SHOWN, THEY DO NOT NECESSARILY REPRESENT THE EXACT LEVEL AT ANY PARTICULAR POINT.
 - CONTOUR INTERVAL 0.5m
 - ANY GUTTER, RIDGE, ROOF AND WINDOW DETAILS AND LEVELS SHOWN HAVE BEEN OBTAINED VIA INDIRECT SURVEY METHODS WHERE VISIBLE FROM GROUND LEVEL AND ARE SHOWN ON THIS PLAN IN THEIR APPROXIMATE LOCATION FOR THE PURPOSE OF GENERAL SITE ANALYSIS ONLY.
 - ANY TREE CANOPIES, TRUNK DIAMETERS AND HEIGHTS SHOWN ARE APPROXIMATE ONLY AND SHOULD BE VERIFIED BY FURTHER SURVEY WORKS IF CRITICAL TO DESIGN OR SITE ANALYSIS.
 - SMALL TREES, SHRUBS, GARDEN FEATURES, PATHWAYS AND OTHER MINOR DETAIL MAY NOT BE SHOWN ON THIS PLAN, FOR THE PURPOSES OF THIS SURVEY.
 - PRIOR TO ANY CONSTRUCTION WORKS BEING UNDERTAKEN, BOUNDARIES SHOULD BE MARKED

ORIGIN OF LEVELS: SSM 102264
E 3328077.251
N 6258713.319
R.L. 47.000 (AHD)

LEGEND:

PAR PARAPET
PP POWER POLE
RF ROOF
RDG RIDGE
SIC SEWER INSPECTION COVER
TG TOP OF GUTTER
TK TOP OF KERB
TOG TOP OF GRATE
TW TOP OF WALL
TF TOP OF FENCE
VER VERANDAH
US UNDERSIDE OF BUILDING
SL DRAINAGE PIT SURFACE LEVEL
INV DRAINAGE PIT INVERT LEVEL
WH WINDOW HEAD
WS WINDOW SILL

Comms Pit/Manhole
Drainage Manhole
Drainage Grated Pit
Drainage Kerb Inlet Pit
Electrical Power Pole
Gas Meter
Miscellaneous Manhole
Sewer Vent
Sign Post
Tree (Canopy spread, trunk diameter, Height)
Trees (April 2005)

Water Meter
Water Tap
Water Hydrant
Water Stop Valve

Brick Walls
Stone Walls
Bottom of Bank
Top of Bank



SITE CONSISTS OF AREAS THAT ARE HEAVILY VEGETATED WITH THICK FOLIAGE WHERE R.L.'S HAVE NOT BEEN SHOWN. AREA IS INACCESSIBLE DUE TO DENSE VEGETATION. TREES SHOWN GREY COMPILED FROM SURVEY INFORMATION OBTAINED FROM DUNLOP THORPE SURVEY PLAN 12389 (DATED 12.4.2005). THE POSITION AND FEATURES OF THESE TREES HAVE NOT BEEN INVESTIGATED AND ARE FOR DIAGRAMMATIC PURPOSES ONLY. ONLY TREES WITH TRUNK DIAMETER >100MM AND HIGHER THAN 5 METRES HAVE BEEN MEASURED.

NOTATIONS SHOWN ON CERTIFICATE OF TITLE
LOT 8 D.P.1082131

AFFECTING THE LAND:

- EASEMENT FOR RECREATIONAL PURPOSES (JOGGING TRACK) DESIGNATED (A6) (DP1003588)
- EASEMENT FOR DRAINAGE 2.5 METRES WIDE DESIGNATED (G6) (DP1003588)
- RIGHT OF CARRIAGEWAY VARIABLE WIDTH DESIGNATED (ER6) (DP1003588)
- RIGHT OF CARRIAGEWAY 4 METRES WIDE DESIGNATED (Z6E) AND (Y) (DP1003588)
- RIGHT OF CARRIAGEWAY 4 METRES WIDE DESIGNATED (X7) (DP1007548)
- EASEMENT FOR OVERHEAD MAINS DESIGNATED (E06) (DP1003588)

APPURTENANT TO LAND
(NOT ALL APPURTENANT EASEMENTS SHOWN)

- RIGHT OF CARRIAGEWAY 7 METRES WIDE DESIGNATED (Y6E) (DP1003588)
- EASEMENT FOR DRAINAGE 2.5 METRES WIDE DESIGNATED (G6) (DP1003588)
- EASEMENT FOR RECREATIONAL PURPOSES (JOGGING TRACK) DESIGNATED (A6) (DP1003588)
- EASEMENT FOR DRAINAGE VARIABLE WIDTH DESIGNATED (S6) (DP1003588)
- RIGHT OF CARRIAGEWAY AND EASEMENT FOR SERVICES 7 METRES WIDE DESIGNATED (K6) (DP1003588)
- RIGHT OF CARRIAGEWAY 7.85 METRES WIDE AND VARIABLE DESIGNATED (X6E) (DP1003588)
- EASEMENT FOR DRAINAGE 7.85 METRES WIDE AND VARIABLE DESIGNATED (J6) AND (X) (DP1003588)
- EASEMENT FOR SERVICES 3 METRES WIDE AND VARIABLE DESIGNATED (YY6) AND (X)(DP1003588)
- EASEMENT FOR SERVICES 3 METRES WIDE AND VARIABLE (YY6) (DP1003588)

THE TERMS AND LOCATIONS OF COVENANTS & RESTRICTIONS HAVE NOT BEEN INVESTIGATED.

VER	BY	AMENDMENTS	DATE
A	J.G.	INITIAL ISSUE	16.12.24
B			
C			
D			
E			
F			
G			

- THE POSITION OF SERVICES SHOWN ON THIS DRAWING ARE INDICATIVE ONLY AND HAVE BEEN PLOTTED FROM PLANS AND DRAWINGS SUPPLIED BY RELEVANT AUTHORITIES.
- SERVICE AUTHORITY PITS, MANHOLES, POLES, MARKER POSTS, ETC., WHERE SIGHTED AT TIME OF SURVEY, HAVE BEEN LOCATED. THE SURVEY DOES NOT INCLUDE INVESTIGATION OR LOCATION OF UNDERGROUND INFRASTRUCTURE.
- SERVICES INFORMATION SHOWN ON THIS DRAWING HAS BEEN OBTAINED THROUGH A BEFORE YOU DIG AUSTRALIA SEARCH AND IS VALID FOR THE PERIOD OF TIME FROM THE DATE OF ISSUE NOMINATED BY THE AUTHORITY.
- PRIOR TO ANY DEMOLITION, EXCAVATION OR CONSTRUCTION ON OR ADJACENT TO THE SITE IT IS THE RESPONSIBILITY OF THE DEVELOPER AND CONTRACTORS TO APPLY FOR AND OBTAIN UP TO DATE PLANS THROUGH A NEW BEFORE YOU DIG AUSTRALIA SEARCH AND TO CONTACT ALL THE RELEVANT AUTHORITIES TO ESTABLISH AND CONFIRM THE DETAILED LOCATION AND DEPTH OF ALL UNDERGROUND SERVICES.



CLIENT:
Logic Projects Co.
c/o Dan D'Ambrosio



Beveridge Williams
Land Development Consultants
Registered Surveyors

Sydney (02) 9283 6677

www.beveridgewilliams.com.au

DETAILS:

DETAIL SURVEY PLAN FOR
DEVELOPMENT APPLICATION PURPOSES
LOT 89 DP 1082131
6-8 JULIUS AVENUE, NORTH RYDE

ORIGINAL SHEET SIZE
SCALE 1:600 A1
CAD REFERENCE: 2402997-DET-001-A
0 12 24 36 SCALE ON ORIGINAL DRAWING AT 1:600

SURVEYOR:	A.G.
DRAWN:	J.T.
CHECKED:	J.G.
SURVEY DATE:	25.11.2024
VERTICAL DATUM:	AHD
HORIZONTAL DATUM:	MGA

PROJECT No.	2402997
DRAWING REF.	DET-001
VERSION	A
SHEET	1 OF 6

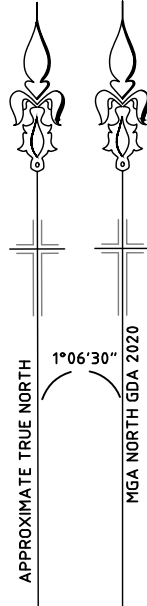
SEE SHEET 2

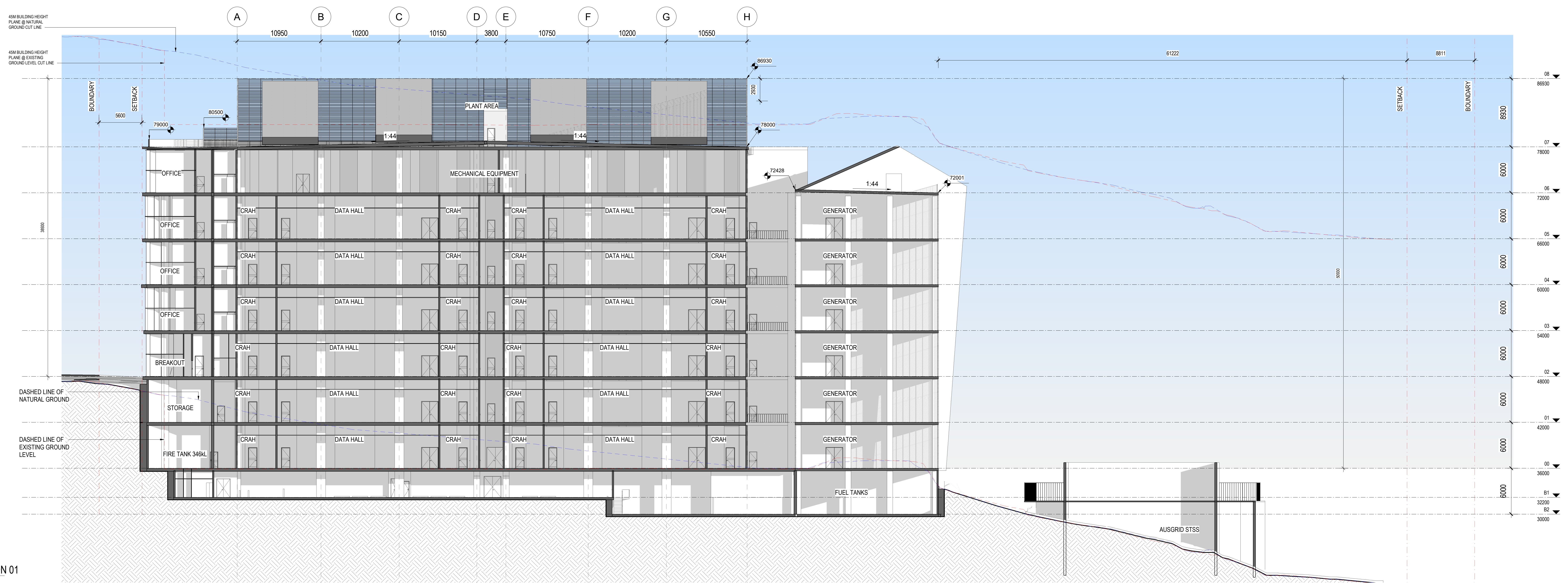
SEE SHEET 3

SEE SHEET 4

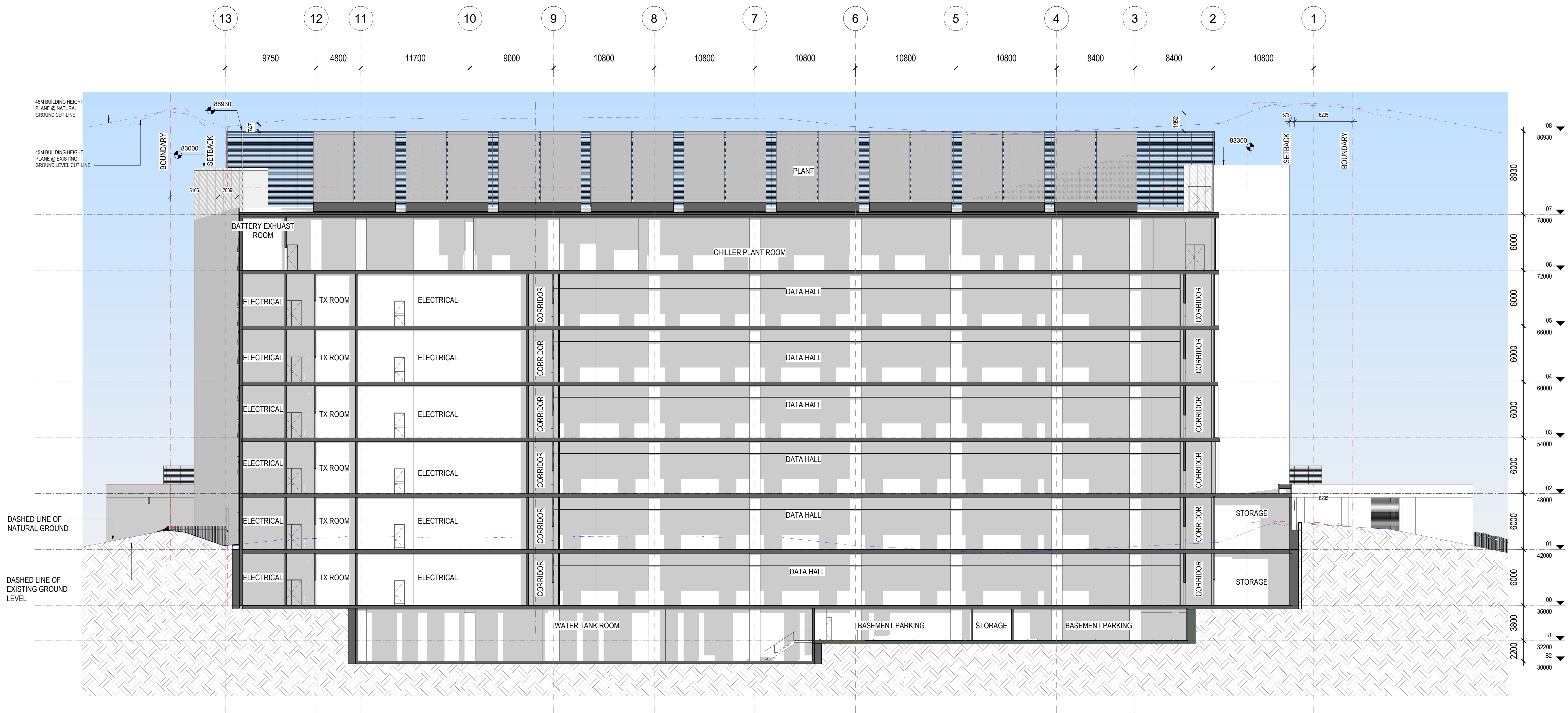
SEE SHEET 5

SEE SHEET 6





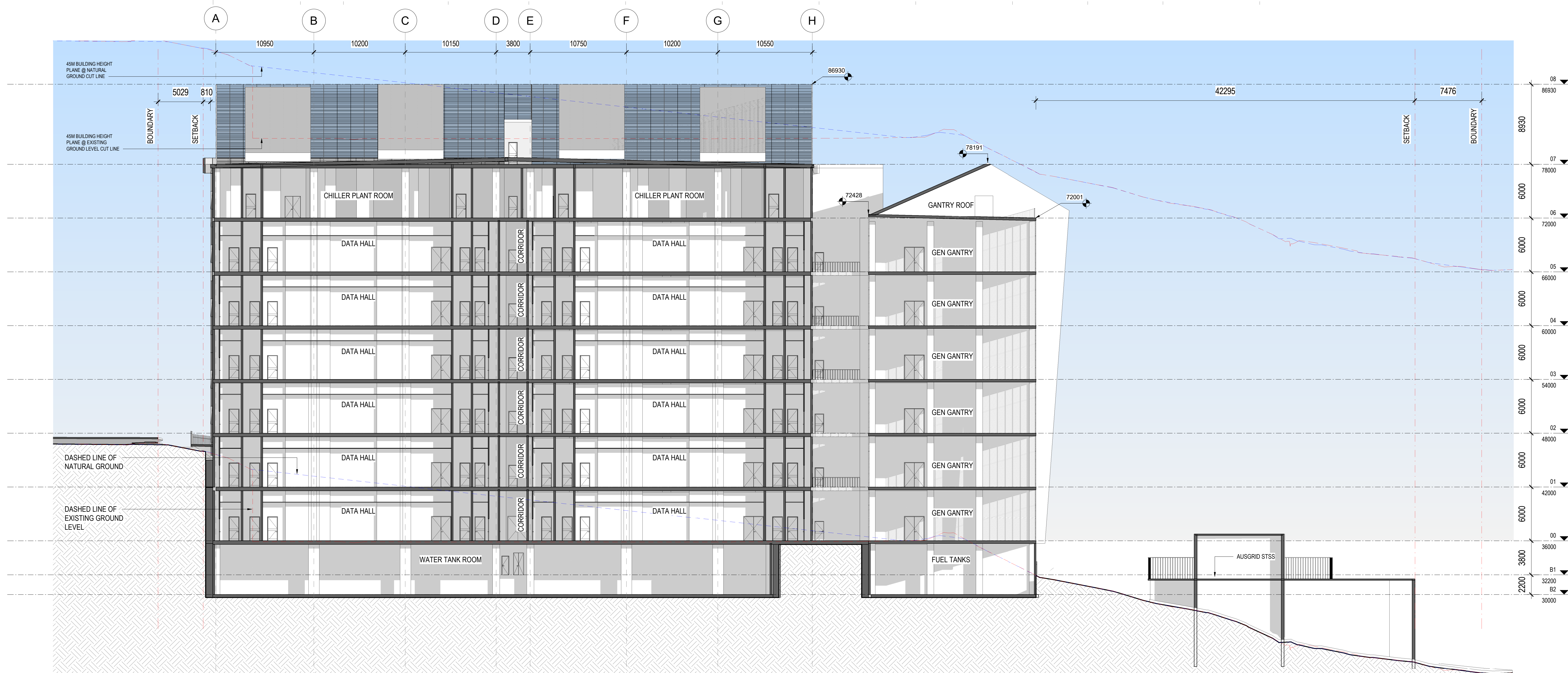
	A0	Issue DateDescription NotesKey PlanProject ManagerClient	1 2025-02-14 FOR INFORMATION 2 2025-02-17 FOR INFORMATION 3 2025-02-09 FOR INFORMATION 4 2025-03-13 FOR INFORMATION 5 2025-03-26 FOR INFORMATION 6 2025-03-31 FOR INFORMATION 7 2025-04-11 FOR INFORMATION 8 2025-05-09 ISSUE FOR SSCA. 9 2025-06-18 RESPOND TO TDA   Construction Manager	• Use written dimensions only • Do not scale from drawing • Contractors shall confirm all dimensions on-site prior to commencing any work or producing any shop drawings • All materials to be used in accordance with the manufacturer's specifications and instructions and shall comply with the relevant Australian Standards • Copyright of this drawing and design remain the property of Greenbox Architecture Pty Ltd • Normalised Acredit - General Page; NSW reg No.7247, Vic reg No.17664 QLD reg No.4538 +61 2 8069 8930 LEVEL 22 68 PITT STREET SYDNEY NSW 2000 AUSTRALIA GREENBOX ARCHITECTURE PTY LTD ABN : 79 130 770 008 ISO 9001 CERTIFIED QUALITY SYSTEM	Scale Bar 1:200  Sheet 1:200 CSP Drawn By AI Checked By ML Approved By AO Project JULIUS AVENUE DATA CENTRE 6-8 JULIUS AVE NORTH RYE VIC 3207 Drawing Title BUILDING SECTION - SHEET 01 Job Number 240089 Drawing Number 200001 Issue 9
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2 DA BUILDING SECTION 02
1:200



1 DA BUILDING SECTION 04
1: 200



2 DA BUILDING SECTION 03
1: 200

Issue	Date	Description
1	2023.04.11	FOR INFORMATION
2	2023.05.09	ISSUE FOR SSDA
3	2023.06.18	RESPOND TO TOA

Notes	Key Plan

Project Manager	Client
 Construction Manager	

Greenbox
#61 2 809 800 LEVEL 12 68 PITT STREET SYDNEY NSW 2000 AUSTRALIA

Greenbox
GREENBOX ARCHITECTURE PTY LTD ABN: 79 139 779 098 ISO 9001 CERTIFIED QUALITY SYSTEM

- Use written dimensions only - Do not scale from drawing - Contractors shall confirm all dimensions on-site prior to commencing any work or producing any shop drawings - All materials to be used in accordance with the manufacturer's specifications and instructions and shall comply with the relevant Australian Standards - Copyright of this drawing and design remain the property of Greenbox Architecture Pty Ltd - Nominated Architect - Gerard Page NSW reg No 7247, Vic reg No 17864, QLD reg No 4536

Client	Scale	Sheet	Scale Bar
ISPT	1: 200	A0	0 1 2 3 5 10m
Project JULIUS AVENUE DATA CENTRE 6-8 JULIUS AVE NORTH RYDE NSW	Project Status PRELIMINARY	Drawing Title BUILDING SECTION - SHEET 03	Drawing Number 200003
Job Number 240089	Issue 3		

Appendix C

Investigation Location Plan with Cross Section



Location Plan

LEGEND:-

-  Borehole Location and Number
-  Groundwater Monitoring Wells
-  Approximate Site Boundary
-  Proposed Basement Outline

REV	DESCRIPTION/COMMENT	DATE	DRAWN BY
0	INITIAL ISSUE	18/06/2025	JST/EC
SCALE:			

Douglas
PARTNERS
OFFICE: SYDNEY
96-98 Hermitage Rd, West Ryde NSW 2114
(02) 9809 0666

CLIENT:
ISPT Pty Ltd

NOTE:
• Base image from MetroMap (Dated 27.01.2025)
• Proposed Basement Outline adapted from Greenbox, Drawing 100101, Issue 8 (Dated 09.05.2025)

COORDINATE REFERENCE SYSTEM: GDA2020 / MGA ZONE 56

PROJECT NAME:
Proposed Data Centre Development

PROJECT ADDRESS:
6-8 Julius Avenue, North Ryde

DRAWING TITLE:
TEST LOCATION PLAN

PROJECT No:
233059.00

DRAWING No:
1

REVISION:
0

Appendix D

Borehole Logs with Core Box Photos and
Explanatory Notes

Introduction to Terminology, Symbols and Abbreviations

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

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

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

Abbreviation Codes

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

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

Data Integrity Codes

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

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

Graphic Symbols

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

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Rock Strength

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

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

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

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

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

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

Degree of Weathering

The degree of weathering of rock is classified as follows:

Weathering Term	Description	Abbreviation Code
Residual Soil ¹	Material is weathered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are no longer visible, but the soil has not been significantly transported.	RS
Extremely weathered ¹	Material is weathered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are still visible	XW
Highly weathered	The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognisable. Rock strength is significantly changed by weathering. Some primary minerals have weathered to clay minerals. Porosity may be increased by leaching or may be decreased due to deposition of weathering products in pores.	HW
Moderately weathered	The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognisable but shows little or no change of strength from fresh rock.	MW
Slightly weathered	Rock is partially discoloured with staining or bleaching along joints but shows little or no change of strength from fresh rock.	SW
Fresh	No signs of decomposition or staining.	FR
Note: If HW and MW cannot be differentiated use DW (see below)		
Distinctly weathered	Rock strength usually changed by weathering. The rock may be highly discoloured, usually by iron staining. Porosity may be increased by leaching or may be decreased due to deposition of weathered products in pores.	DW

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

Degree of Alteration

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

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

Degree of Fracturing

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

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

Rock Quality Designation

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

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

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

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

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

Rock Descriptions

Terminology
Symbols
Abbreviations

Defect Descriptions

Defect Type

Term	Abbreviation Code
Bedding plane	B
Infilled seam	IS
Cleavage	CV
Crushed zone	CZ
Decomposed seam	DS
Fault	F
Joint	JT
Lamination	LAM
Parting	P
Shear zone	SZ
Vein	VN
Drilling/handling break	DB , HB
Fracture	FC

Rock Defect Orientation

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

Rock Defect Coating

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

Rock Defect Infill

Term	Abbreviation Code
Calcite	CA
Carbonaceous	CBS
Clay	CLAY
Iron oxide	FE
Manganese	MN

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Rock Defect Shape/Planarity

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

Rock Defect Roughness

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

Defect Orientation

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

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Sampling and Testing

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

SAMPLE			DEPTH (m)	TESTING	
SAMPLE REMARKS	TYPE	INTERVAL		TEST TYPE	RESULTS AND REMARKS
	SPT		1.0 1.45	SPT	4,9,11 N=20

Sampling

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

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

¹ – numeric suffixes indicate tube diameter/width in mm

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

Field and Laboratory Testing

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

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

Field and laboratory testing (continued)

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

Groundwater Observations

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

Drilling or Excavation Methods/Tools

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

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

¹ – numeric suffixes indicate tool diameter/width in mm

BOREHOLE LOG

CLIENT: ISPT Pty Ltd
PROJECT: Proposed Data Centre Development
LOCATION: 6-8 Julius Avenue, North Ryde, NSW

SURFACE LEVEL: 35.9 AHD
COORDINATE: E:328051.4, N:6258683.1
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH101
PROJECT No: 233059.00
DATE: 17/02/25
SHEET: 1 of 1

[illegible]

Generated with CORE-GS by Geroc - Rock Log

NOTES: (H) Soil origin is "probable" unless otherwise stated.

PLANT: Bobcat
METHOD: RR to 0.79m, then NMLC to 9.55m
REMARKS:

OPERATOR: Groundtest (JJ)

LOGGED: E Benajmin
CASING: Uncased

CORE PHOTO LOG

CLIENT: ISPT Pty Ltd
PROJECT: Proposed Data Centre Development
LOCATION: 6-8 Julius Avenue, North Ryde, NSW

SURFACE LEVEL: 35.9 AHD
COORDINATE: E:328051.4, N:6258683.1
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH101
PROJECT No: 233059.00
DATE: 17/02/25
SHEET: 1 of 1



0.79-5.00 m depth



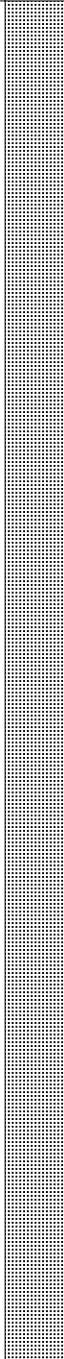
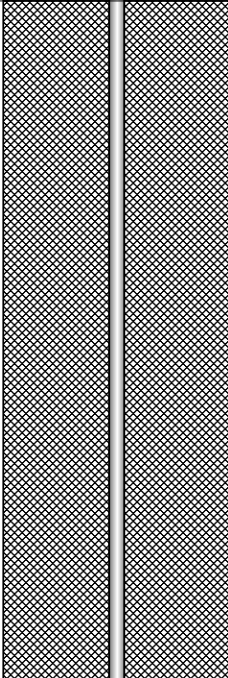
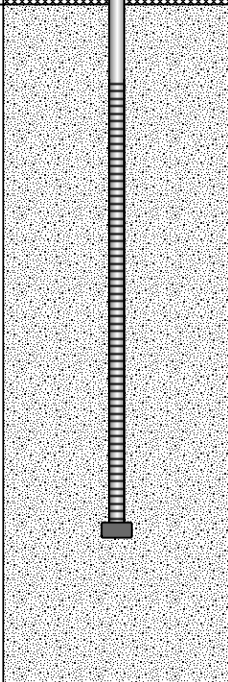
5.00-9.55 m depth

WELL INSTALLATION LOG

CLIENT: ISPT Pty Ltd
PROJECT: Proposed Data Centre Development
LOCATION: 6-8 Julius Avenue, North Ryde, NSW

SURFACE LEVEL: 35.9 AHD
COORDINATE: E:328051.6, N:6258684.7
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH101A
PROJECT No: 233059.00
DATE: 19/02/25
SHEET: 1 of 1

CONDITIONS ENCOUNTERED				WELL INSTALLATION			
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	BACKFILL	DIAGRAM	WELL DETAILS
▼ 26/02/25	35	1	SANDSTONE: see BH101 for detailed geotechnical information.		Bentonite		Plain screen
	34	2					
	33	3					
	32	4					
	31	5	Borehole discontinued at 9.00m depth. target depth reached.		Sand		Slotted screen
	30	6					
	29	7					
	28	8					
	27	9					
	26		Borehole discontinued at 9.00m depth. target depth reached.				

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

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

PLANT: Bobcat

OPERATOR: Groundtest (JJ)

LOGGED: E Benjamin

METHOD: RR to 9m

CASING: Nil

REMARKS: Well has 1.0m stick up - hole drilled for well installation.

BOREHOLE LOG

CLIENT: ISPT Pty Ltd
PROJECT: Proposed Data Centre Development
LOCATION: 6-8 Julius Avenue, North Ryde, NSW

SURFACE LEVEL: 35.9 AHD
COORDINATE: E:328100.5, N:6258671.0
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH102
PROJECT No: 233059.00
DATE: 17/02/25
SHEET: 1 of 2

CONDITIONS ENCOUNTERED											SAMPLE			TESTING		
GROUNDWATER	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	WEATH.	DEPTH (m)	STRENGTH	RECOVERY (%)	RQD	FRACTURE SPACING (m)	DEFECTS & REMARKS	SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
	0.68	SANDSTONE: fine to medium grained, pale grey, inferred from surface and cuttings		SW possibly	0.68	(H)									PLT	PL(A)=1.2MPa
	1	SANDSTONE: pale grey, medium grained, very thickly bedded with distinct crossbedding, <1% carbonaceous flecks; unbroken. Hawkesbury Sandstone													PLT	PL(A)=1.7MPa
	2						100	100							PLT	PL(A)=1.9MPa
	3															
	4														PLT	PL(A)=1.4MPa
	5			FR		H	100	100							PLT	PL(A)=1.1MPa
	6														PLT	PL(A)=1.4MPa
	7														PLT	PL(A)=1.0MPa
	8						100	100							PLT	PL(A)=1.4MPa
	9														PLT	PL(A)=1.3MPa
	10	Borehole discontinued at 10.00m depth. target depth reached.								734m B 0-5°, PR, CN, RF					PLT	PL(A)=1.2MPa

NOTES: #Soil origin is "probable" unless otherwise stated.

PLANT: Bobcat
METHOD: RR to 0.68m, then NMLC to 10m
REMARKS:

OPERATOR: Groundtest (JJ)

LOGGED: R Fernando
CASING: Uncased

Refer to explanatory notes for symbol and abbreviation definitions



CORE PHOTO LOG

CLIENT: ISPT Pty Ltd

PROJECT: Proposed Data Centre Development

LOCATION: 6-8 Julius Avenue, North Ryde, NSW

SURFACE LEVEL: 35.9 AHD

COORDINATE: E:328100.5, N:6258671.0

DATUM/GRID: MGA2020 Zone 56

DIP/AZIMUTH: 90°/---°

LOCATION ID: BH102

PROJECT No: 233059.00

DATE: 17/02/25

SHEET: 1 of 1



0.68-5.00 m depth



5.00-10.00 m depth

BOREHOLE LOG

CLIENT: ISPT Pty Ltd
PROJECT: Proposed Data Centre Development
LOCATION: 6-8 Julius Avenue, North Ryde, NSW

SURFACE LEVEL: 35.9 AHD
COORDINATE: E:328115.3, N:6258723.0
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH103
PROJECT No: 233059.00
DATE: 18/02/25
SHEET: 1 of 2

CONDITIONS ENCOUNTERED													SAMPLE			TESTING						
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	SOIL STRENGTH (Where encountered)	SOIL MOISTURE	GRAPHIC	WEATH.	DEPTH (m)	STRENGTH	RECOVERY (%)	RQD	FRACTURE SPACING (m)	DEFECTS & REMARKS	SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS	BACKFILL	WELL PIPE	
			SANDSTONE: fine to medium grained, pale orange and grey, inferred from surface and cuttings				PS XS XW H DW L M VH EH FR															
		0.75					MW possibly		(H)													
	35	1	SANDSTONE: pale grey and orange-brown, medium grained, very thickly bedded with distinct crossbedding, <1% carbonaceous flecks; slightly fractured then unbroken. Hawkesbury Sandstone					0.75					1.19m: EW, 10mm 1.31m: EW, 5mm				1	PLT	PL(A)=1.2MPa			
	34	2					MW to SW			100	99						2	PLT	PL(A)=1.7MPa	Bentonite		
	33	3															3	PLT	PL(A)=1.9MPa			
	32	4	From 4.00m: pale grey					4.00									4	PLT	PL(A)=1.4MPa			
	31	5								100	100						5	PLT	PL(A)=1.1MPa			
	30	6															6	PLT	PL(A)=1.4MPa	Sand		
	29	7					FR										7	PLT	PL(A)=1.2MPa			
	28	8								100	100						8	PLT	PL(A)=1.5MPa			
	27	9															9	PLT	PL(A)=1.6MPa	Bentonite		
	26		Borehole discontinued at 10.00m depth. target depth reached.																PL(A)=1.9MPa			

NOTES: [#]Soil origin is "probable" unless otherwise stated.

NOTES: #Soil origin is "probable" unless otherwise stated.

PLANT: Bobcat
METHOD: RR to 0.75m, then NMLC to 10m
REMARKS: RR to 8.0m after target depth reached for well installation. Well has 1.0m stick up.

OPERATOR: Groundtest (JJ)

LOGGED: L Straney
CASING: Uncased

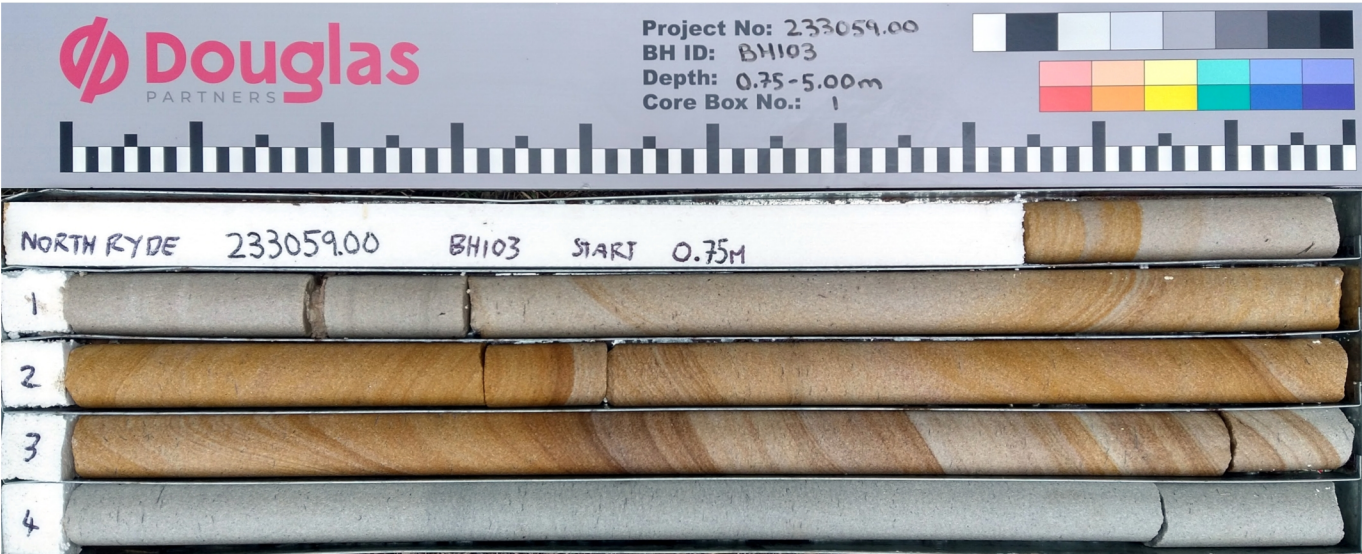
Refer to explanatory notes for symbol and abbreviation definitions

CORE PHOTO LOG

CLIENT: ISPT Pty Ltd
PROJECT: Proposed Data Centre Development
LOCATION: 6-8 Julius Avenue, North Ryde, NSW

SURFACE LEVEL: 35.9 AHD
COORDINATE: E:328115.3, N:6258723.0
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH103
PROJECT No: 233059.00
DATE: 18/02/25
SHEET: 1 of 1



0.75-5.00 m depth



5.00-10.00 m depth

BOREHOLE LOG

CLIENT: ISPT Pty Ltd
PROJECT: Proposed Data Centre Development
LOCATION: 6-8 Julius Avenue, North Ryde, NSW

SURFACE LEVEL: 35.9 AHD
COORDINATE: E:328057.3, N:6258630.1
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH105
PROJECT No: 233059.00
DATE: 14/02/25
SHEET: 1 of 2

CONDITIONS ENCOUNTERED											SAMPLE			TESTING					
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	SOIL STRENGTH (where encountered)	SOIL MOISTURE	GRAPHIC	WEATH.	DEPTH (m)	STRENGTH	RECOVERY (%)	RQD	FRACTURE SPACING (m)	DEFECTS & REMARKS	SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
				PS SW HW MW SW FR	DW				VL L M H VH EH										

NOTES: #Soil origin is "probable" unless otherwise stated.

PLANT: Bobcat
METHOD: RR to 0.66m, then NMLC to 15.71m
REMARKS:

OPERATOR: Groundtest (JJ)

LOGGED: R Fernando
CASING: Uncased

BOREHOLE LOG

CLIENT: ISPT Pty Ltd
PROJECT: Proposed Data Centre Development
LOCATION: 6-8 Julius Avenue, North Ryde, NSW

SURFACE LEVEL: 35.9 AHD
COORDINATE: E:328057.3, N:6258630.1
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH105
PROJECT No: 233059.00
DATE: 14/02/25
SHEET: 2 of 2

CONDITIONS ENCOUNTERED													SAMPLE			TESTING				
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	SOIL STRENGTH (where encountered)	SOIL MOISTURE	GRAPHIC	WEATH.	DEPTH (m)	STRENGTH	RECOVERY (%)	RQD	FRACTURE SPACING (m)	DEFECTS & REMARKS	SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS	
							RS XW LW HW MW SW FR		VL L M H VH											
		25	[CONT] SANDSTONE: pale grey, medium grained, massive; unbroken. Hawkesbury Sandstone						M											
		24						11.00		100	90							11	PLT	PL(A)=1.1MPa
		24																12	PLT	PL(A)=1.2MPa
		25																	PLT	PL(A)=0.93MPa
		13.00					FR											13		
		22	SANDSTONE: pale grey, medium grained, very thickly bedded, with carbonaceous flecks and 5-15mm ø siltstone clasts; unbroken. Hawkesbury Sandstone						H										PLT	PL(A)=1.3MPa
		21								100	100							14		
		15																15	PLT	PL(A)=1.1MPa
			15.56m: siltstone band 20mm																PLT	PL(A)=1.0MPa
		20	Borehole discontinued at 15.71m depth. target depth reached.																	
		19																		
		18																		
		17																		
		16																		
NOTES: #Soil origin is "probable" unless otherwise stated.																				

NOTES: #Soil origin is "probable" unless otherwise stated.

PLANT: Bobcat
METHOD: RR to 0.66m, then NMLC to 15.71m
REMARKS:

OPERATOR: Groundtest (JJ)

LOGGED: R Fernando
CASING: Uncased

CORE PHOTO LOG

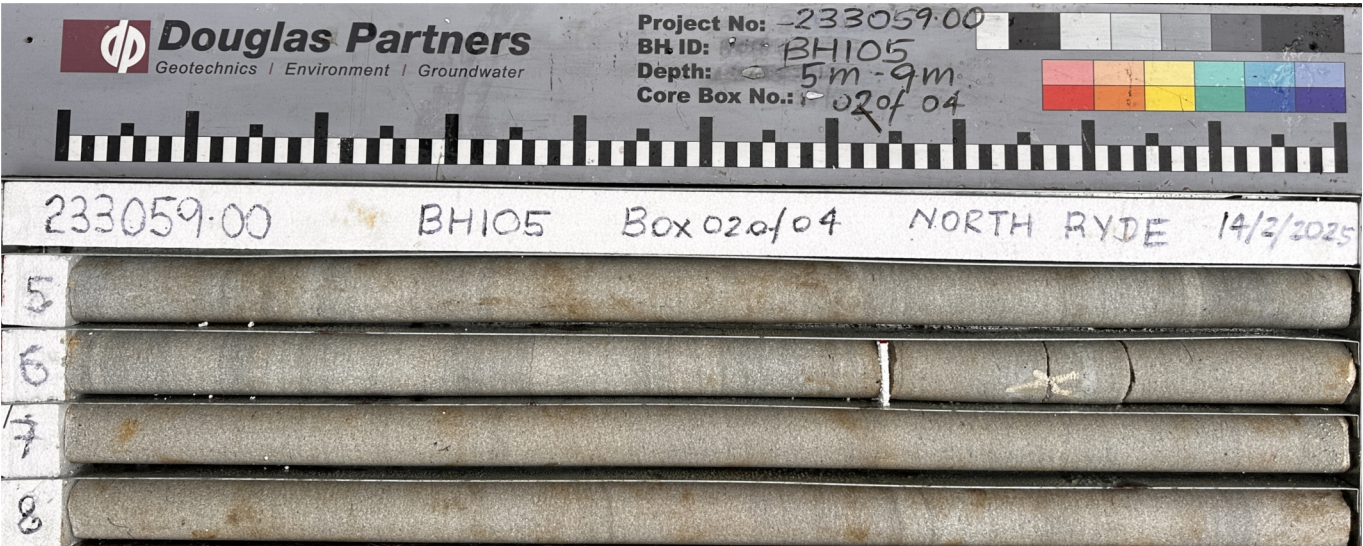
CLIENT: ISPT Pty Ltd
PROJECT: Proposed Data Centre Development
LOCATION: 6-8 Julius Avenue, North Ryde, NSW

SURFACE LEVEL: 35.9 AHD
COORDINATE: E:328057.3, N:6258630.1
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH105
PROJECT No: 233059.00
DATE: 14/02/25
SHEET: 1 of 2



0.66-5.00 m depth



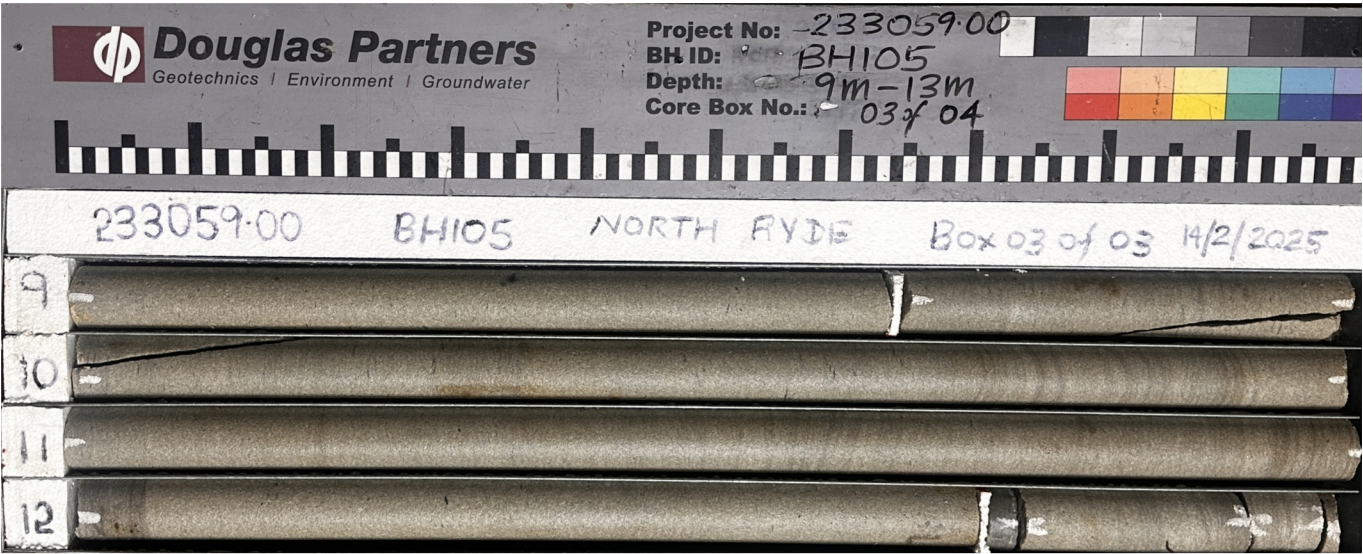
5.00-9.00 m depth

CORE PHOTO LOG

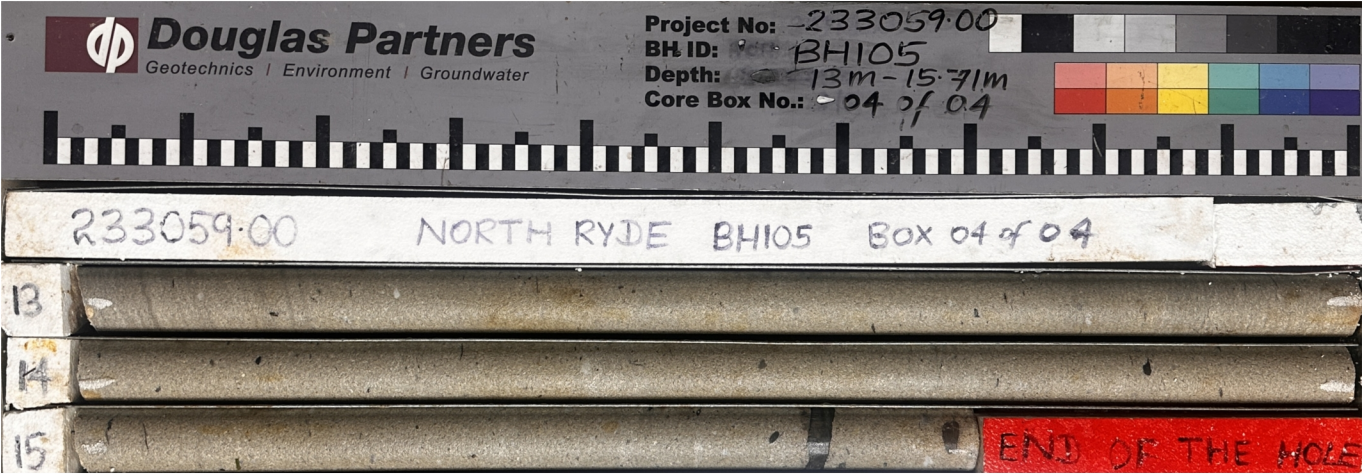
CLIENT: ISPT Pty Ltd
PROJECT: Proposed Data Centre Development
LOCATION: 6-8 Julius Avenue, North Ryde, NSW

SURFACE LEVEL: 35.9 AHD
COORDINATE: E:328057.3, N:6258630.1
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH105
PROJECT No: 233059.00
DATE: 14/02/25
SHEET: 2 of 2



9.00-13.00 m depth



13.00-15.71 m depth

BOREHOLE LOG

CLIENT: ISPT Pty Ltd
PROJECT: Proposed Data Centre Development
LOCATION: 6-8 Julius Avenue, North Ryde, NSW

SURFACE LEVEL: 36.0 AHD
COORDINATE: E:328100.8, N:6258638.2
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH106
PROJECT No: 233059.00
DATE: 19/02/25
SHEET: 1 of 2

CONDITIONS ENCOUNTERED											SAMPLE			TESTING							
GROUNDWATER	DEPTH (m)	DESCRIPTION OF STRATA	SOIL STRENGTH (where encountered)	SOIL MOISTURE	GRAPHIC	WEATH.	DEPTH (m)	STRENGTH	RECOVERY (%)	RQD	FRACTURE SPACING (m)	DEFECTS & REMARKS	SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS	BACKFILL	WELL PIPE	
	0.68	SANDSTONE: fine to medium grained, pale orange and grey, inferred from surface and cuttings				FR possibly	0.68	(M) (H)				0.68m: All breaks are handling and drilling breaks					PLT	PL(A)=0.70MPa			
	1	SANDSTONE: pale grey, medium grained, very thickly bedded, <1% carbonaceous flecks; unbroken. Hawkesbury Sandstone				FR			100	100							1	PLT	PL(A)=0.76MPa		
	2																2	PLT	PL(A)=1.1MPa		
	3																3	PLT	PL(A)=0.63MPa		
	4	3.64m-4.12m: orange-brown and pale grey, distinct bedding				MW	3.64										4	PLT	PL(A)=0.99MPa		
	5						4.12										5	PLT	PL(A)=0.94MPa		
	6							M to H	100	100							6	PLT	PL(A)=1.1MPa		
	7					FR											7	PLT	PL(A)=0.86MPa		
	8								100	100							8	PLT	PL(A)=0.73MPa		
	9																9	PLT	PL(A)=1.1MPa		
		Borehole discontinued at 10.00m depth. target depth reached.															PLT	PL(A)=0.90MPa			

NOTES: #Soil origin is "probable" unless otherwise stated.

PLANT: Bobcat

OPERATOR: Groundtest (JJ)

LOGGED: E Vega

METHOD: RR to 0.68m, then NMLC to 10m

CASING: Uncased

REMARKS: RR to 9.0m after target depth reached for well installation. Well has 1.0m stick up.

CORE PHOTO LOG

CLIENT: ISPT Pty Ltd

PROJECT: Proposed Data Centre Development

LOCATION: 6-8 Julius Avenue, North Ryde, NSW

SURFACE LEVEL: 36.0 AHD

COORDINATE: E:328100.8, N:6258638.2

DATUM/GRID: MGA2020 Zone 56

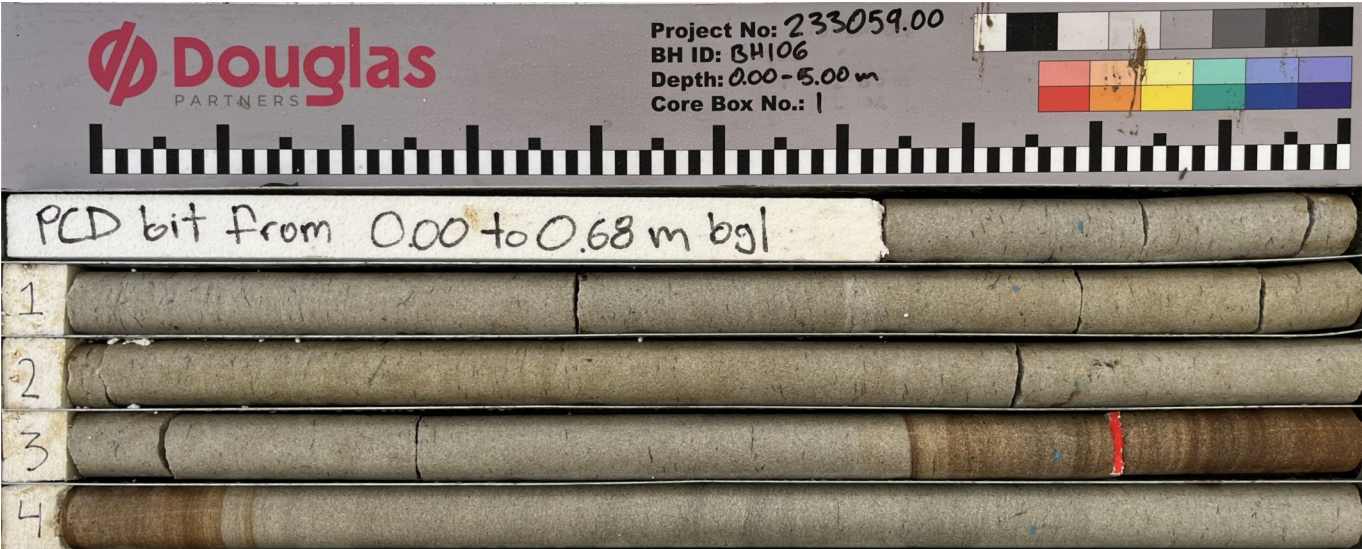
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH106

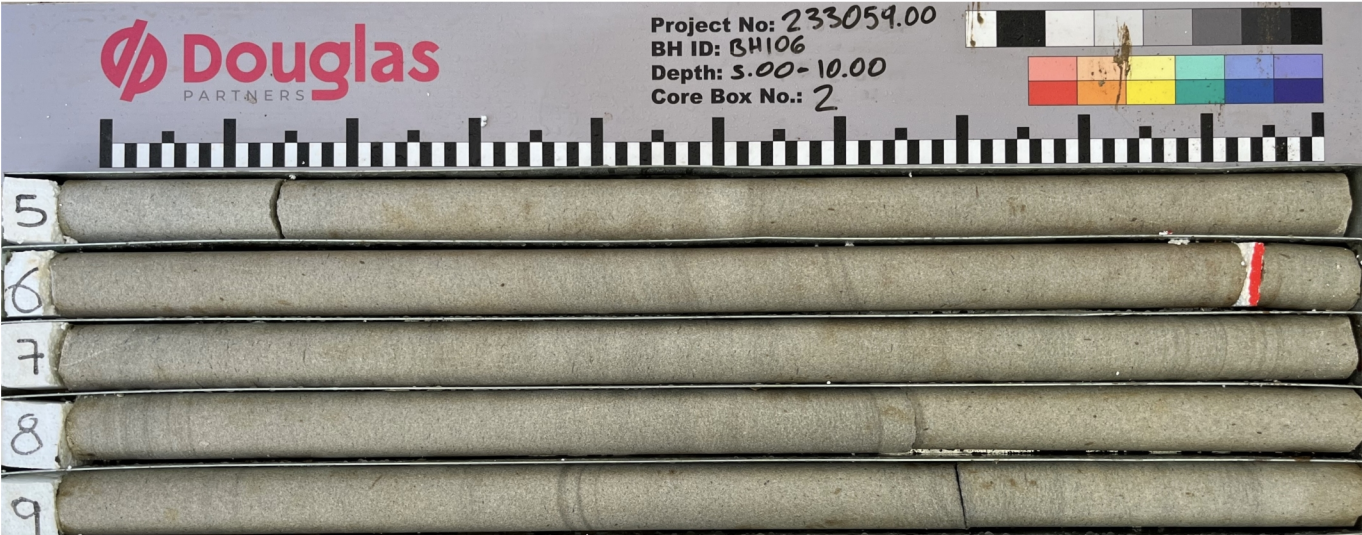
PROJECT No: 233059.00

DATE: 19/02/25

SHEET: 1 of 1



0.68-5.00 m depth

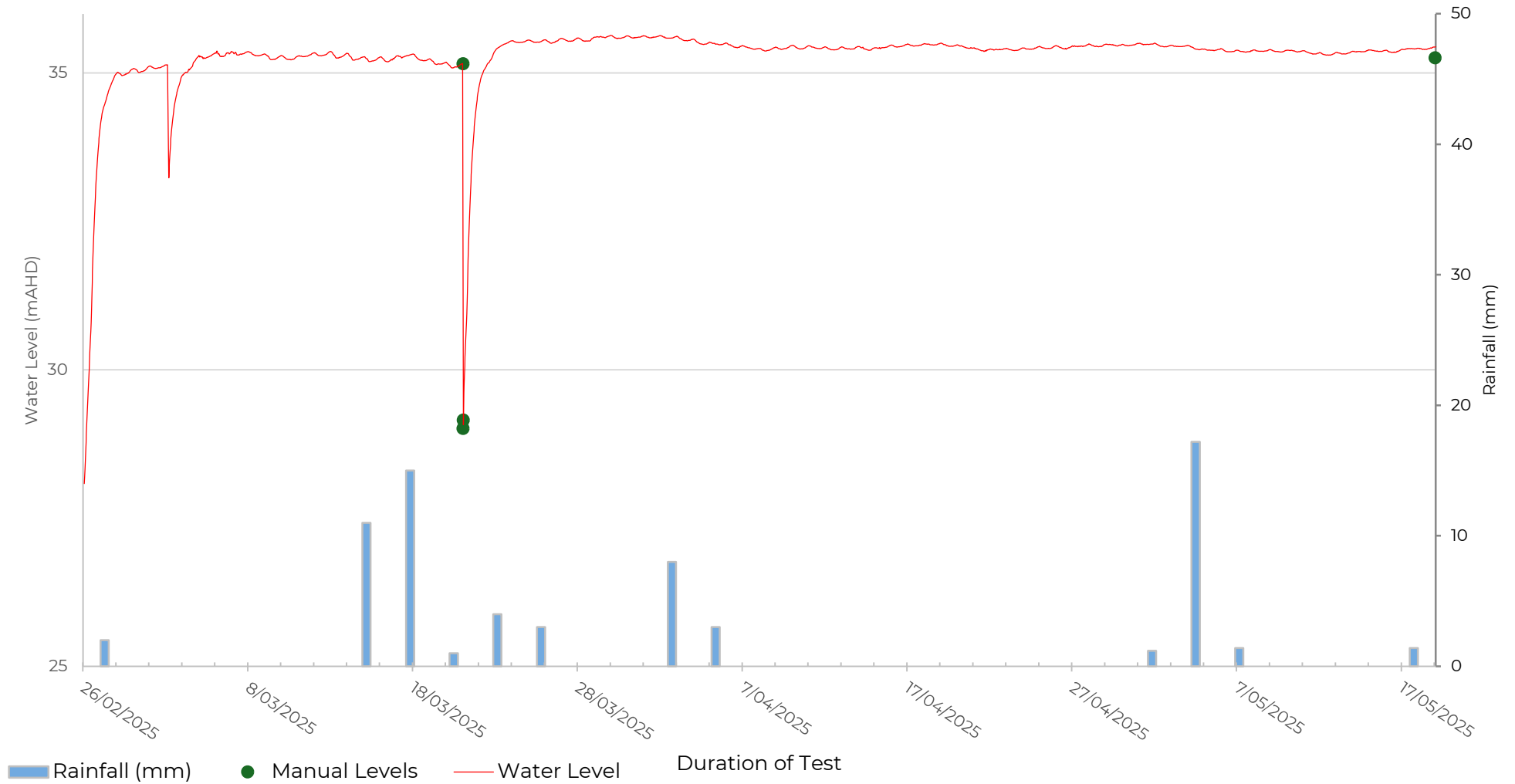


5.00-10.00 m depth

Appendix E

Water Level Graphs, Permeability Test Results and
Water Quality Testing Results

BH101A Groundwater Monitoring



GROUND
EXPERTISE

Borehole:

BH101A

**Well Depth:
(mBGL)**

9

From:

26/02/2025

Drawn:

ECB

Project:

207317.03

**Surface RL:
(mAHD)**

35.9

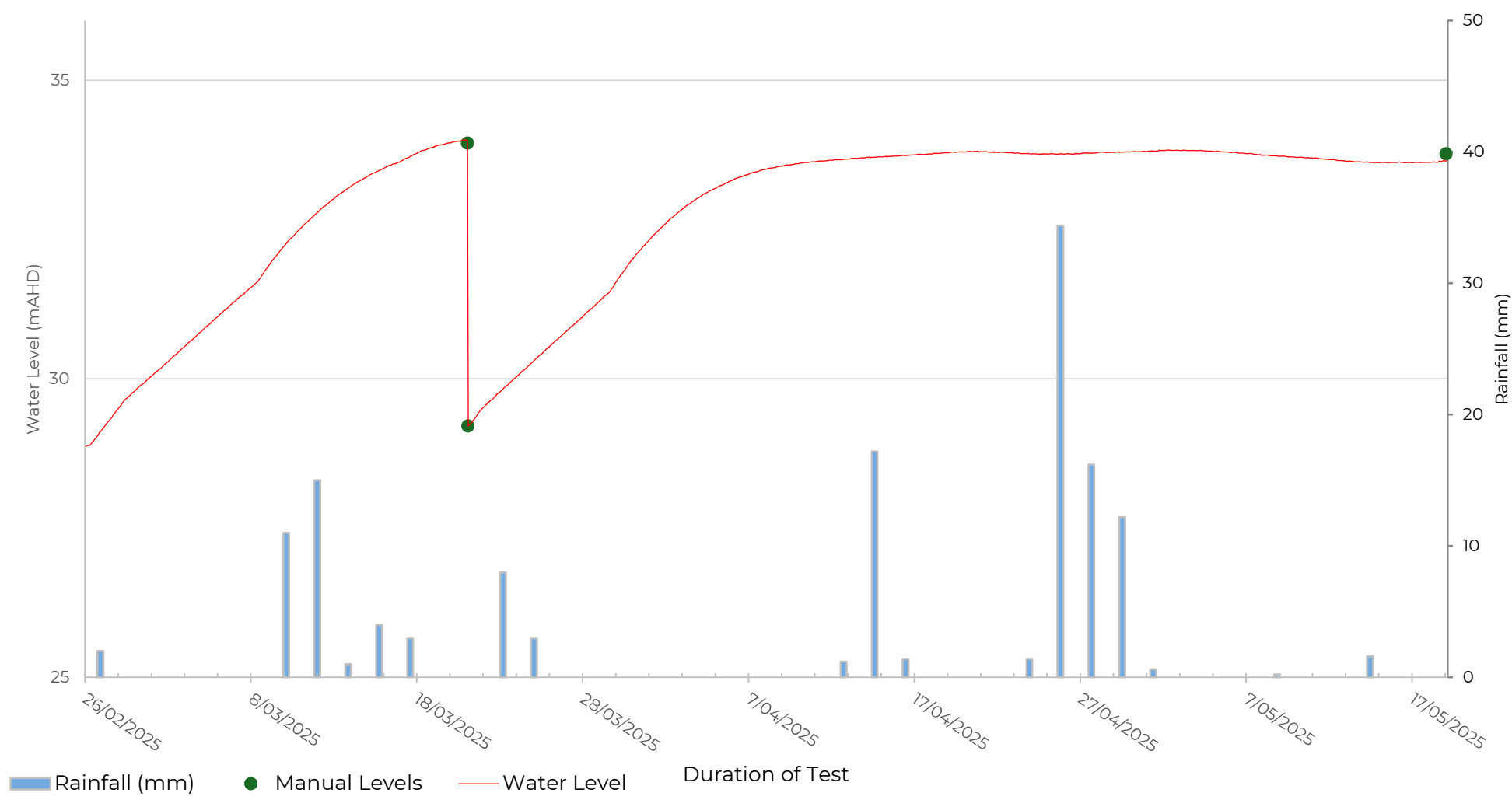
To:

19/05/025

Checked:

HB

BH103 Groundwater Monitoring



GROUND
EXPERTISE

Borehole:

BH103

Well Depth:
(mBGL)

7.5

From:

26/02/2025

Drawn:

ECB

Project:

207317.03

Surface RL:
(mAHD)

35.9

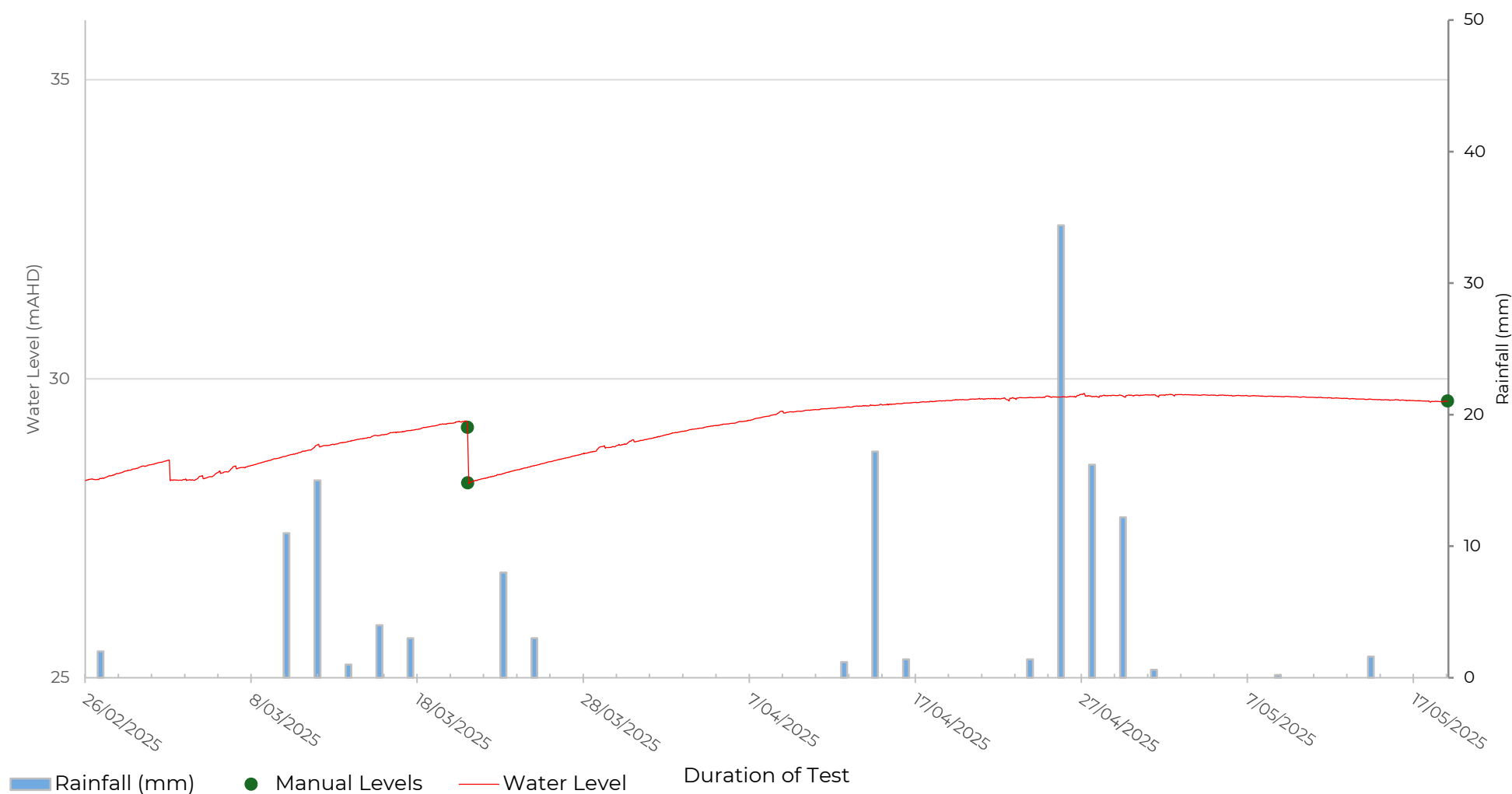
To:

25/05/2025

Checked:

HB

BH106 Groundwater Monitoring



GROUND
EXPERTISE

Borehole:	Well Depth: (mBGL)	From:	Drawn:
BH106	9	26/02/2025	ECB
Project:	Surface RL: (mAHD)	To:	Checked:
207317.03	36	19/05/2025	HB

Permeability Testing - Rising Head Test Report

[illegible]

Permeability Testing - Rising Head Test Report

[illegible]

Permeability Testing - Rising Head Test Report

[illegible]

Permeability Testing - Rising Head Test Report

[illegible]

Permeability Testing - Rising Head Test Report

[illegible]

Permeability Testing - Rising Head Test Report

[illegible]

CERTIFICATE OF ANALYSIS 374632-A

Client Details

Client	Douglas Partners Pty Ltd
Attention	Nathan Woodward
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	<u>233059.01, North Ryde</u>
Number of Samples	Additional analysis
Date samples received	03/03/2025
Date completed instructions received	18/03/2025

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.

Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	25/03/2025
Date of Issue	25/03/2025
NATA Accreditation Number 2901. This document shall not be reproduced except in full.	
Accredited for compliance with ISO/IEC 17025 - Testing. Tests not covered by NATA are denoted with *	

Results Approved By

Nick Sarlamis, Assistant Operation Manager

Authorised By

Nancy Zhang, Laboratory Manager

Miscellaneous Inorganics			
Our Reference		374632-A-1	374632-A-2
Your Reference	UNITS	101A	106
Depth		-	-
Date Sampled		03/03/2025	03/03/2025
Type of sample		Water	Water
Date prepared	-	24/03/2025	24/03/2025
Date analysed	-	24/03/2025	24/03/2025
pH	pH Units	4.4	6.9
Electrical Conductivity	µS/cm	830	720
Chloride, Cl	mg/L	190	93
Sulphate, SO ₄	mg/L	25	35

Method ID	Methodology Summary
Inorg-001	pH - Measured using pH meter and electrode. 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.
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: Miscellaneous Inorganics					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			24/03/2025	[NT]	[NT]	[NT]	[NT]	24/03/2025	[NT]
Date analysed	-			24/03/2025	[NT]	[NT]	[NT]	[NT]	24/03/2025	[NT]
pH	pH Units		Inorg-001	[NT]	[NT]	[NT]	[NT]	[NT]	101	[NT]
Electrical Conductivity	µS/cm	1	Inorg-002	<1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Chloride, Cl	mg/L	1	Inorg-081	<1	[NT]	[NT]	[NT]	[NT]	92	[NT]
Sulphate, SO4	mg/L	1	Inorg-081	<1	[NT]	[NT]	[NT]	[NT]	93	[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.

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

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.

Report Comments

Holding time exceedance for PH/EC.