Douglas PARTNERS

GROUNDED EXPERTISE

Report on Geotechnical Investigation

Proposed Residential Development

1 Warung Street, McMahons Point NSW

Prepared for Highbury Warung Pty Ltd

Project 203182.01

31 May 2024

Douglas PARTNERS | GROUNDED EXPERTISE

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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		Date
Author	Craig Stemp	31 May 2024
Reviewer	Charles Marais	31 May 2024

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Report on Geotechnical Investigation
Proposed Residential Development
1 Warung Street, McMahons Point NSW

1. Introduction

This report presents the results of a Geotechnical Investigation undertaken for a **Error! Unknown document property name.** at **Error! Unknown document property name.**. The report has been revised to include new basement details and the latest architectural drawings and was undertaken in accordance with Douglas Partners' proposal 203182.01.P.001.Rev1**Error! Unknown document property name.**, dated 14 December 2023.

It is understood that the proposed development comprises the demolition of the existing four storey apartment building, excavation of a single storey basement and construction of new a four storey residential development. Bulk excavation will extend to RL 8.15 m[1] with a locally deeper lift pit.

The aim of the investigation was to provide comment on the following:

- The indicative geological profile for the site, including anticipated subsurface conditions and comment on groundwater levels.
- Excavatability of materials and suitable methods of excavation.
- Shoring/boundary support and potential impact on adjacent buildings.
- Foundation options and allowable bearing pressures.
- Groundwater.
- Other anticipated geotechnical issues, including comments relating to developments near TfNSW infrastructure.

The investigation included the drilling of three boreholes. The details of the field work are presented in this report, together with comments on the items listed above.

2. Site Description

The site is located at **Error! Unknown document property name.** and has a plan area of approximately 983 m^2. The site is bounded by Warung Street to the north, Blues Point Rd to the west, Henry Lawson Avenue to the south and 3 Warung Street to the east (see Figure 1). The property boundary of the Blues Point Metro Access Shaft Site is located approximately 15 m to the south of the site. The actual shaft is understood to be more than 20 m from the site boundary.

[1] Reduced Level in metres relative to Australian Height Datum.

No information has been provided regarding any other adjacent basements or founding levels of neighboring buildings.

Figure 1: Site Location and Site Boundary

The surface level varies across the site, sloping from the north east to the south west, with a 4 m fall across the site, dropping abruptly at the retaining, located just to the northwest of the building, then sloping gently down across the building footprint and carpark towards the south west corner.

The survey drawing provided indicates that Blues Point Road had been progressively cut into the rock, with a fall of about 3 m at the corner of Blues Point Road and Henry Lawson Avenue, with a further progressive cut along Henry Lawson Avenue, with a total fall of about 5 m at the eastern end of the southern site boundary. The resulting rock face has been left unsupported, except for weathered areas and where the dyke has been intersected.

The existing structures on the site comprise a four-storey brick building with a ground level carpark. To the east of the site (3 Warung Street) is a two storey brick house with a carport constructed adjoining the eastern boundary.

The TfNSW Sydney Metro City and Southwest tunnels is shown to run beneath the site (see Appendix D).

3. Regional Geology

Reference to the Sydney 1:100 000 Geological Series Sheet indicates that the site (refer Figure 2) is underlain by the Hawkesbury Sandstone of Triassic age, comprising medium to coarse-grained quartz sandstone with minor shale lenses. The Hawkesbury Sandstone typically is pale to mid grey in colour, when fresh, and has both massive and cross bedded units with strength properties mainly in the medium to high strength range. The rock is prone to weathering with red brown or brown iron staining common in the upper beds.

Geological mapping carried out in the Sydney region identified two main joint sets which will most likely be present on this site:

- **Set 1** - NNE striking joints dipping 75° to 90° to the east and west, generally widely spaced but can be as close as 100 mm apart, generally persistent over many metres; and
- **Set 2** - ESE striking joints dipping 75° to 90° to the north and south, generally widely spaced but can be as close a 100 mm apart. These joints are generally strata bound.

Low angle (25° to 35°) thrust faults, dipping to the west are also relatively common. Bedding and cross bedding is also common in the Hawkesbury Sandstone.

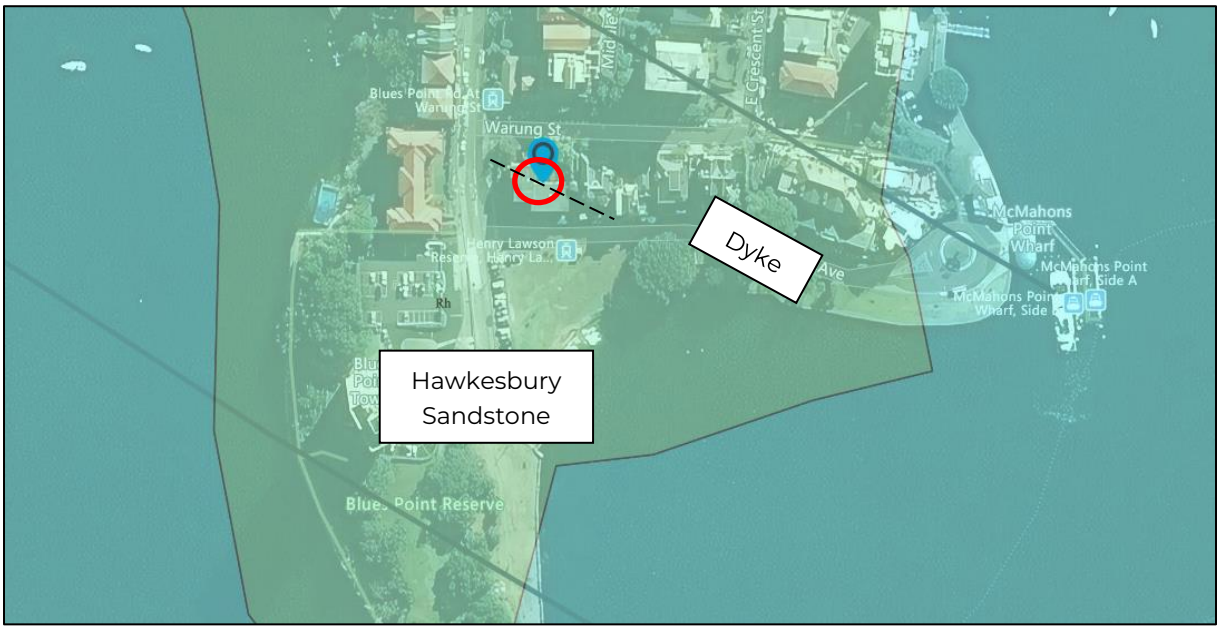


Figure 2: Regional Geology of the Site with the located Dyke Extrapolated.

Two Dykes are shown on the regional geology map (a dyke was encountered on site during the geotechnical investigation, though not on the location shown on the drawing). Dykes within the Sydney region generally trend in an east-west direction[2]. The dyke was previously encountered by DP during the geotechnical investigation for the TfNSW tunnels. Intrusive igneous dykes within the Hawkesbury Sandstone are typically less than 1 m to 3 m in width and usually comprise

[2] The Geology and Engineering Geology of the "Great Sydney Dyke", Sydney NSW (Dale, Rickwood & Won)

extensively and deeply weathered basaltic rock, weathered to a 'heavy', high plasticity clay. Associated with the dyke, the immediately adjacent sandstone is often 'cooked' and commonly closely jointed with the sandstone weathered to a significantly greater depth than the unaffected sandstone.

The Hawkesbury soil landscape generally consists of medium dense to dense residual clayey sand, associated with the underlying bedrock.

The 1:25 000 Acid Sulphate Soil Risk map for Botany Bay indicates the site does not lie within an area known for acid sulphate soils. The site also does not occur within areas known for soil salinity issues.

4. Field Work

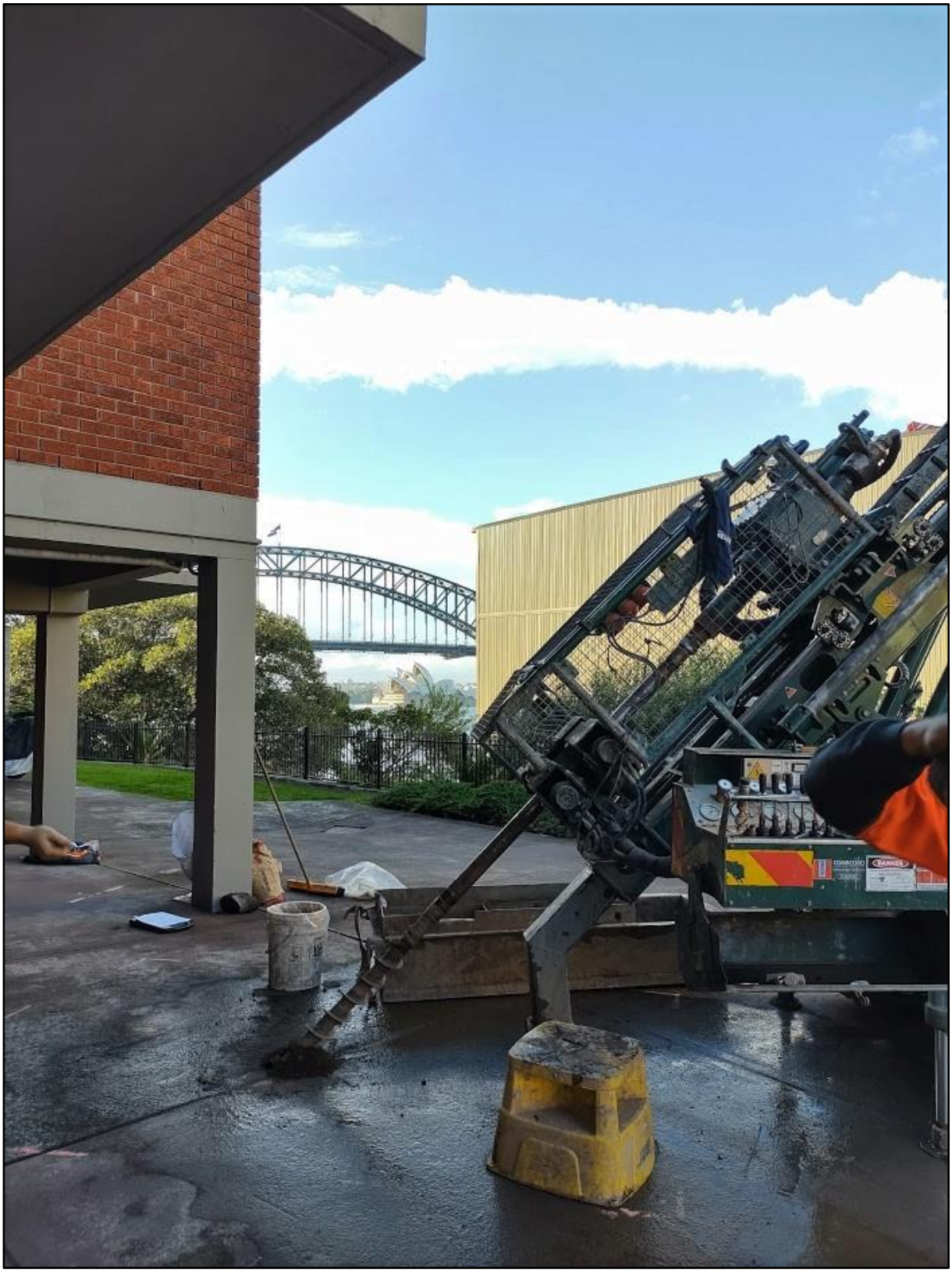
Field work comprised the drilling of two vertical boreholes (BH01 and BH02) and an inclined borehole (BH03), striking north northeast, angled at 45^{0}. The two vertical boreholes were both drilled to depth of 10.0 m (RL 3.1 m for BH01 and RL 4.0 m for BH02). The inclined borehole was drilled slightly longer (to determine the width of the dyke), to an inclined depth of 14.4 m (RL 3.0 m). The borehole locations are shown in Drawing 1 (refer Appendix D). Boreholes BH01 and BH02 were drilled using a bobcat-mounted drilling rig. Borehole BH03 was drilled using a track-mounted drilling rig (see Photograph 1).

Boreholes were commenced by concrete coring through the pavement (BH01 and BH02 only), followed by solid flight augering through the filling, residual soil and weathered rock. NMLC sized diamond core drilling techniques were used in the underlying rock. The boreholes were reinstated on completion of the drilling works.

Standard penetration tests (SPT), at a depth of 0.5 m, were carried out in the vertical boreholes (BH01 and BH02 - Refer Appendix D, Drawing 1 for results).

The rock cores recovered from the boreholes were logged on site before being returned to DP's workshop where they were photographed and Point Load Strength Index ($Is_{(50)}$) tests carried out on selected samples of the rock core, in accordance with AS4133.4.1.

Surface levels at borehole locations were interpolated from CMS Surveyors PTY LTD survey plan.



Photograph 1: Track-mounted drilling rig on 45º angled borehole (BH03)

5. Field Work Results

5.1 Subsurface Conditions

Details of the subsurface conditions encountered are given in the borehole logs included in Appendix C, with notes, defining classification methods and descriptive terms. Photographs of the rock cores were taken and are presented with the borehole logs. A geotechnical cross-section showing the encountered ground profile is provided in drawings 2 and 3, presented in Appendix D.

The general sequence of materials encountered at the borehole locations (based on BH01 and BH02 only – asphalt not included) can be summarised as follows:

Filling: Generally, medium dense sand Filling containing medium to coarse sandstone gravel to a depth between 0.80 m and 1.0 m, overlying;

Residual Soil: Typically, medium dense to dense, clayey sand to 1.0 m depth, overlying;

Very Low Strength Sandstone: Inferred very low strength, extremely weathered to highly weathered, Hawkesbury Sandstone to 2.0 m (BH01) and 1.3 m (BH02) depth, overlying;

Low Strength Sandstone: Low strength, highly weathered and moderately weathered, fractured and slightly fractured Hawkesbury Sandstone, encountered in BH01, down to 3.0 m , overlying;

Medium Strength Sandstone: Medium strength, moderately weathered to slightly weathered, fractured to unbroken Hawkesbury Sandstone to depths of 10 m (BH01) and 8.0 m (BH02), overlying;

High Strength Sandstone: High strength, fresh, unbroken to slightly fractured Hawkesbury Sandstone in BH02.

Depths to the top of the strata are shown below in Table 1.

Table 1: Summary of Strata Levels at Each Borehole

Stratum	Top of Stratum Depth m (RL in brackets)		
	BH01	**BH02**	**BH03***
Asphalt	0.00 (RL 13.20)	Not Encountered	0.00 (RL 13.20)
FILL	0.03 (RL 13.17)	0.00 (RL 14.00)	0.03 (RL 13.17)
Clayey SAND (Residual Soil)	0.80 (RL 12.40)	0.80 (RL 13.20)	1.40 (RL 12.20)
Very Low Strength Sandstone (Hawkesbury Sandstone)	1.00 (RL 12.20)	1.00 (RL 13.00)	1.80 (RL 11.80)
Low Strength Sandstone (Hawksbury Sandstone)	2.00 (RL 11.20)	Not Encountered	2.80 (RL 11.20)
Medium Strength Sandstone (Hawksbury Sandstone)	3.00 (RL 10.20)	1.40 (RL 12.60)	6.05 (RL 8.90)
High Strength (Hawksbury Sandstone)	Not Encountered	8.15 (RL 6.00)	13.70 (RL 3.50)
End of Borehole	**10.00 (RL 3.20)**	**10.00 (RL 4.00)**	**14.40 (RL 3.00)**

* Borehole angled at 45°

5.2 Igneous Dyke

An igneous dyke was encountered in borehole BH03. Coring commenced at a depth of 2.8 m. The inferred 1.4 m wide dyke was encountered at a depth of 6.93 m (RL 8.30 m), extending down to 8.87 m (RL 6.85 m). Recovery of the dyke material was difficult, which resulted in some core loss, inferred to be either highly fractured weak rock or hard clay. The inferred location of the igneous dyke is shown in Drawing 1 in Appendix D.

5.3 Groundwater

No free groundwater was observed during augering. Groundwater level not observed during rock coring due to the introduction of water during the drilling process.

6. Laboratory Testing

6.1 Point Load Tests

The results of Point Load Strength Index testing ($Is_{(50)}$), carried out on selected rock cores, are shown on the respective borehole logs, and summarised in Figure 3 below.

The $Is_{(50)}$ values from axial tests were used to provide an estimate of the Unconfined Compressive Strength (UCS) of the sandstone, based on a UCS:$Is_{(50)}$ ratio of 20:1. The $Is_{(50)}$ values for the sandstone typically ranged from ~0.1 MPa to 1.6 MPa, indicating that the rock tested ranged from very low strength to high strength (estimated UCS ranging from 2 MPa to 32 MPa). Note that the point load samples which recorded 1.2 MPa $Is_{(50)}$ values at depths of 4.0 m (BH02) and 5.9 m (BH03) appeared to be iron cemented associated with weathering. We also note that point load testing can be inaccurate in very low strength materials (i.e. below $Is_{(50)}$ values of 0.1 MPa).

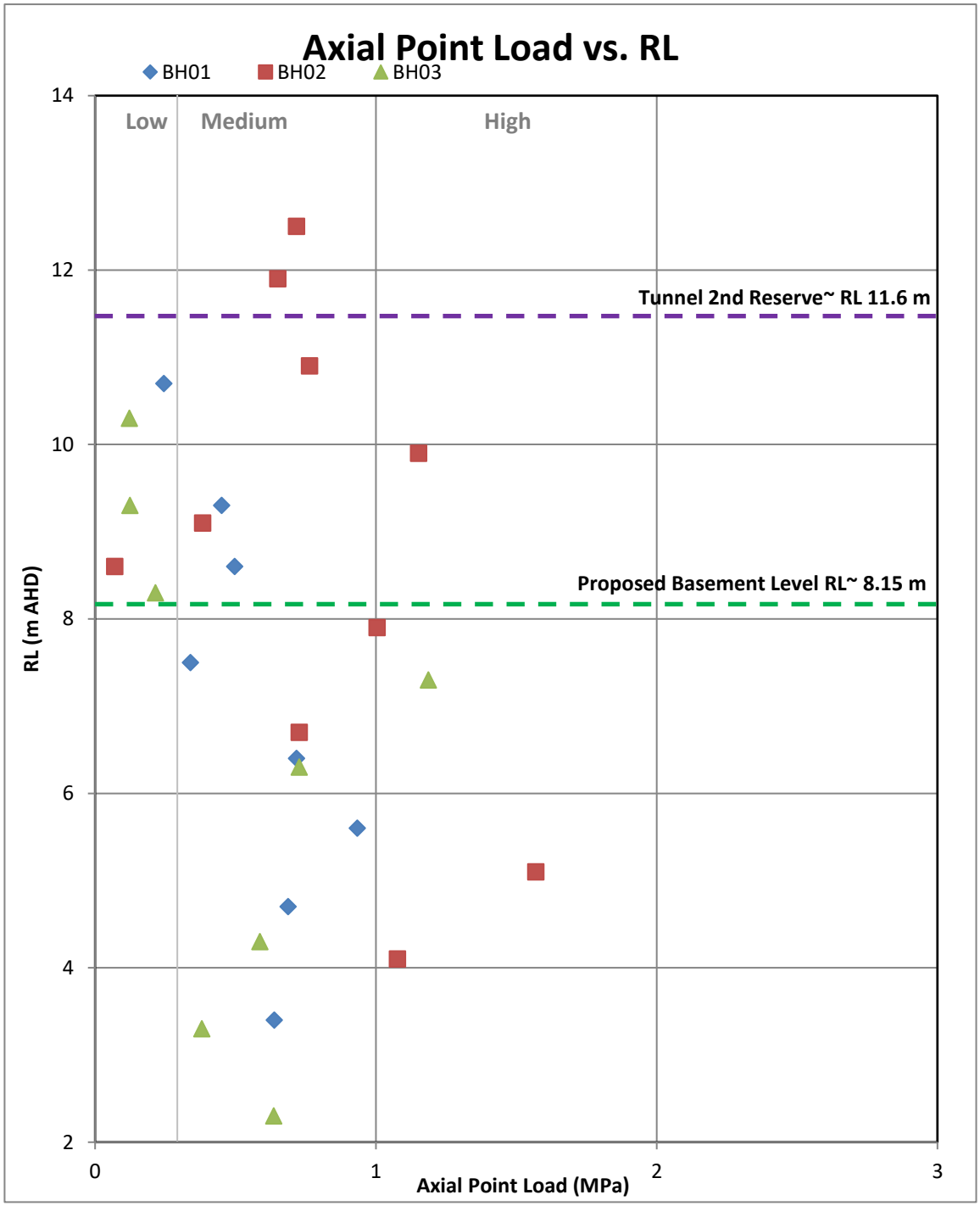


Figure 3: Point Load test VS RL

7. Geotechnical Model

The geotechnical model for the site derived from boreholes BH01 to BH02 is shown in Table 2.

Table 2: Geotechnical Model of the Site (BH01 & BH02)

Unit	Material Description	Approximate Underside of Stratum (RL)
1	Filling (medium dense sand)	14.00 to 13.17
	Residual Soil (Clayey SAND)/ Very Low Strength Sandstone	13.00 to 12.20
2	Very low to Low Strength Sandstone	12.60 to 10.20
3	Medium Strength Sandstone	7.15 to 3.20
4	High Strength Sandstone	4.00 (end of boreholes)

A geotechnical cross-section between BH01 and BH03 (Section B-B') showing the inferred subsurface profile together with the proposed basement excavation is provided in Appendix D, Drawing 3. Note that the above stratum RL's do not reflect the conditions in close proximity to the dyke (Refer Borehole BH3 log for details).

8. Proposed Development

It is understood that the proposed development comprises demolition of the existing building to allow for excavation of a single level basement and the construction of a new four storey building (refer to Appendix E for drawings). The basement set back at its minimum is approximately 0.9 m, along the eastern boundary. Elsewhere the site is setback from 2.5 m to 4 m from the boundary. A new driveway entrance is proposed on the southeastern corner of the site, cut into the rock face along Henry Lawson Avenue. Bulk excavation will extend to RL 8.15 m with locally deeper excavation required for the lift pit. Architectural Drawings by Squillace have been attached in Appendix D.

Currently no information is available on adjacent building foundations and basement levels. These levels should be confirmed prior to proceeding with detailed design and basement excavation.

The site is located directly over the Sydney Metro City and Southwest Tunnels (up and down line), owned and operated by Sydney Metro (see information provided in Appendix B).

9. Comments

9.1 Earthworks

9.1.1 Excavation

The proposed bulk excavation level is assumed to be about RL 8.15 m, requiring bulk excavation to about 5 m below the existing level at the south-eastern end of the site, to about 10 m below the existing levels at the north-eastern end. Based on the likely subsurface conditions, excavations to depths of up to 1.5 m is likely to be in soil and very low and low strength sandstone. Note, medium strength sandstone is exposed at surface in some areas. Also note that the weathering will be much deeper in close proximity to the dyke. These materials should be readily excavated using conventional earthmoving equipment, such as excavators. Below this level, the type of excavation equipment will largely be dependent on the rock's strength and discontinuity spacing. Excavation of medium and high strength, fractured to unbroken sandstone, as encountered in the boreholes, can be achieved by heavy ripping and by use of excavator mounted hydraulic rock hammers. Rock saws may be used to reduce vibration and overbreak.

The use of excavation equipment will generally cause dust, noise and vibration, the latter which has the potential to affect adjacent buildings and below ground infrastructure, as well as the occupants of nearby buildings. Where rock hammers are required in the vicinity of adjacent structures (closer than 20 m) it would be important to monitor and limit vibrations on these structures, as further discussed in Section 9.1.3.

The dyke, running through the site, is likely to be highly weathered to substantial depth and will require special consideration. The dyke should be readily excavated using conventional earthmoving equipment such as excavators.

9.1.2 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 beneficial reuse; or,
- 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 taken to a recycling facility licenced to receive the waste; 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 surplus excavated material.

9.1.3 Ground-borne Vibration

During excavation, it will be necessary to use appropriate methods and equipment to keep ground vibration at adjacent buildings and structures within acceptable limits. The level of acceptable vibration is dependent on various factors including the type of structure (e.g. reinforced concrete, brick, etc.), its structural condition, founding conditions, the frequency range of vibrations produced by the construction equipment, the natural frequency of the building and the vibration transmitting medium.

Based on DP's experience of and with reference to AS/ISO 2631.2, it is suggested that a maximum peak particle velocity vector sum (PPVi) of 8 mm/s (measured at the first occupied level of neighbouring buildings) be employed at this site for both architectural and human comfort considerations (it should be noted that lower allowable values may be required for heritage or sensitive buildings).

As the magnitude of vibration transmission is site specific, it is recommended that a vibration trial be carried out at the commencement of rock excavation. These trials may indicate that smaller or different types of excavation equipment are required to reduce vibration to acceptable levels. It may also be necessary to install vibration monitors to monitor the vibration during the works.

All heritage structures in close proximity should be identified prior to proceeding with site work. Depending on the condition of these buildings, it may be necessary to limit vibration to 3 to 5 mm/s, which may limit the size and type of the plant that can be used on site.

DP maintains an extensive construction vibration database. As a preliminary estimate, Table 3 provides approximate minimum buffer distances for selected equipment, based on a set vibration limit of 8 mm/s. Ongoing vibration monitoring may be required to reduce the risk of exceeding the set limits during the excavation phase.

Table 3: 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 DP Trial Maxima[1]**	**From DP 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	7 m	5 m

Notes:

1. *Smaller 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 boundary saw cuts with few exceedances.*

9.2 Excavation Support

To reduce the risks of causing instability and damage to adjacent structures, surrounding public footpaths/roads, or impact the metro tunnels, careful consideration must be given to the planning and design of any excavation, including any underpinning and excavation retention required to shore the faces.

Prior to commencing bulk excavation, it will be necessary to obtain accurate information on the foundations and founding conditions of the adjacent neighbouring building. This process is critical as excavation of the proposed new basement could destabilise existing structures, including existing retaining walls.

Based on current information it is likely that a contiguous pile wall along the eastern boundary and soldier piles along the remaining boundaries will be required (it is understood that the contiguous pile wall is preferred instead of underpinning any high-level neighbouring footings). Similarly, if a neighbouring basement extends below the new founding levels, consideration will need to be given to taking the new footings down to the adjacent excavation level, unless it can be confirmed that the founding material is of adequate strength to allow founding at the higher level.

Vertically excavated faces in the overburden materials and rock of less than medium strength (Units 1 and 2) will not be self-supporting. Temporary batters may be feasible where space permits and the groundwater table is not intersected. These batters should be cut no steeper than 1.5(H):1(V) for Unit 1 and 2, up to a maximum excavation height of 3 m. Permanent Batters above the water table should be no steeper than 2(H):1(V) for Unit 1 and 2, limited to a maximum height of 3 m.

Where battering of the overburden materials and rock of less than medium strength (Units 1 and 2) is not feasible, temporary shoring will be required. The structure will have to provide permanent support to these faces in the long term.

Vertical excavated faces in medium strength or stronger sandstone (Units 3 and 4) are generally self-supporting, apart from where adversely oriented jointing is present. Due to the orientation of the site, the eastern and western excavation faces are more likely to be affected by the prominent NNE trending joint set, as mentioned in Section 3. These joints (where present) will only become evident once the faces have been cut, except on the eastern face where contiguous piles are proposed. The contiguous pile wall will therefore need to be designed to support the pressures from a 45°rock wedge.

Bedding planes and low strength seams are also common in the Hawkesbury Sandstone, even within high strength rock. These joints, bedding planes and seams can adversely affect the rock mass and form unstable rock slivers, blocks, wedges and weak layers. The excavated faces in the medium strength or stronger sandstone can therefore only be considered self-supporting once mapped and assessed to be free of adverse defects.

Rock mass support can only be finalised during excavation, once the actual defect location, dip and dip direction have been determined. It is therefore recommended that all rock faces be inspected/mapped by a suitably experienced geotechnical engineer/engineering geologist at 1.5 m drops in excavation level to confirm that the site conditions are consistent with the

geotechnical model and to ensure that suitable support is designed, and installed, in a timely manner (prior to proceeding with the next drop in excavation).

Substantial anchor support (see Figure 4), sometimes in conjunction with shotcrete, may be required to stabilise wedges formed by adversely oriented joints, faults and shear zones. Permanent reinforced concrete walls, supported by the floor slabs, may be required if it is not possible to permanently anchor these wedges.

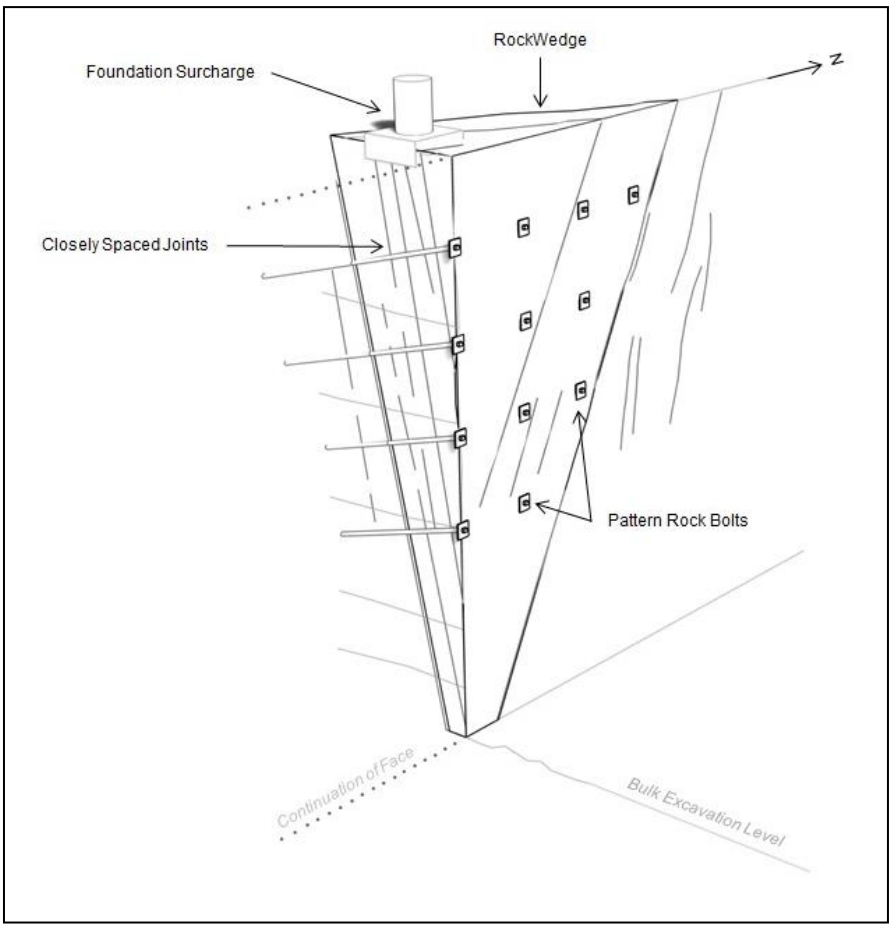


Figure 4: Example of Rock Wedge Support

Anchor/rockbolt support, in conjunction with shotcrete, may also be required to support the dolerite dyke material exposed in the vertical cut faces.

The design for the excavation support should take all surcharge loads into account, including any structure, neighbouring buildings loads, traffic loads, construction surcharge loads, etc.

Should ground anchors or soil nails/dowels that extend beyond the site boundary be required, it will be necessary to obtain permission from neighbouring landowners and authorities prior to installation. In addition, care should be taken to avoid damaging buried services and pipes during installation.

Care should be taken when excavating the south-eastern boundary, towards Henry Lawson Avenue, where the dyke may affect the stability of the is situ rock wall.

9.2.1 Earth Pressures for Shoring Design

It is suggested that the design of cantilevered shoring systems (or shoring systems with one row of support) be based on a triangular earth pressure distribution, using the earth pressure coefficients provided in Table 4. 'Active' earth pressure coefficient (K_a) values may be used where some wall movement is acceptable. 'At Rest' earth pressure coefficient (K_o) values should be used where the wall movement needs to be limited.

Table 4: Recommended Design Parameters for Shoring Systems

Material	Unit Weight (kN/m^3)	Earth Pressure Coefficient	
		Active (K_a)	At Rest (K_o)
Fill, Clayey Sand	20	0.35	0.5
Very Low to Low Strength Sandstone	22	0.2	0.3
Medium Strength or better Sandstone	24	0	0

Notes: The values above assume a level surface behind the wall.
It is assumed that the medium strength rock mass is free of adverse dipping joints and seams.
It should also be noted that the K_a and the K_o designs will not prevent stress relief movement.

The following equation can be used to calculate the horizontal or lateral pressures earth pressure distribution, acting on the wall:

$$H_z = K (g z + p)$$

Where: H_z = horizontal pressure at depth z
g = unit weight of soil or rock
K = earth pressure coefficient (see Table 5).
z = depth (m)
p = vertical surcharge pressure

For braced walls or where two or more rows of support are used, the shoring can be designed using a rectangular or trapezoidal earth pressure distribution. Where there are no movement-sensitive structures an earth pressure distribution equal to 4H kPa can be used, where H, in metres, is equal to the height to be supported. Where the wall movement is to be minimised (i.e. close to adjacent buildings or services) the lateral earth pressure can be calculated using 6H kPa. For movement-sensitive structures, where it is critical that deformation is controlled, it may be necessary to calculate the pressure using 8H kPa. These pressures can be applied as either rectangular or trapezoidal earth pressure distributions, depending on support requirements. Note these earth pressure distributions are "pressure envelopes", selected to ensure that no row of support is overloaded during the temporary support phase. The actual magnitude and distribution of lateral earth pressures for the building in its final (long term) condition may differ from the uniform distributions given above.

In all cases, additional surcharge loads such as new and existing footings, construction loads, hoarding loads, pedestrian loads etc., must be allowed for in the design, where appropriate, applied as a rectangular earth pressure distribution over the depth of influence.

The earth pressure loading described above does not include earthquake loads or hydrostatic pressures. Unless positive drainage measures are incorporated to prevent water pressure build-up behind the walls, the full hydrostatic head should be allowed for in design, while at the same time reducing the unit weight to account for the buoyant condition.

9.2.2 Anchor Design

Post-stressed ground anchors, rockbolts and dowels (support elements) can be used to laterally support new shoring, underpinning works or unstable rock blocks and wedges. Anchors could also be used vertically as hold-down anchors to resist uplift forces. Support elements used for lateral support should be bonded in the stronger rock, inclined as required, but preferably not steeper than 30° below the horizontal. Table 5 provides ultimate and allowable bond stresses for design and estimating purposes.

Table 5: Allowable Bond Stresses

Material	Allowable Bond Stress (kPa)	Ultimate Bond Stress (kPa)
Medium Strength Sandstone	350	800
Medium to High Strength Sandstone	600	1,500
High Strength Sandstone	1,200	3,000

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 tested to at least 125% of their nominal working load. Where stress relief or further unavoidable movement of the shoring is expected, it is recommended that the support elements are locked-off between 60% and 80% of their working loads to accommodate the additional movement and subsequent increase in stress in the support elements. Consideration should, however, be given to the immediate design requirements. The capacity of the anchor may have to be increased if a lower initial lock-off is not feasible. Checks 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.

Shorter support elements (i.e. rockbolts, dowels and pins) may be required to support any unstable rock wedges, slivers or blocks. Short dowels and pins may be required to support feather edges where sub-parallel joints intersect the face. Shotcrete with mesh (or fibrecrete) may be required where beds/seams of extremely low or very low strength rock are encountered within higher strength sandstone/laminite, secured with anchors, rockbolts, dowels or pins, as required.

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 always maintained.

It is anticipated that the new structure will support the shoring walls over the long term and therefore the support elements are expected to be temporary only. The use of permanent rockbolts and ground anchors, if required, will need careful attention to corrosion protection.

It should be noted that permission will be required from authorities and adjacent property owners prior to installing rockbolts/ground anchors below their land. Due consideration should also be given to below-ground excavations, services, etc.

9.3 Stress Relief

As with most excavations in Hawkesbury Sandstone in Sydney, there will be inward movement of excavated faces due to stress relief effects during excavation. The locked-in stress in the rock is generally higher in the N-S direction than in the E-W direction, apart from where affected by localised anomalies.

Based on previous experience in the Sydney area, it is estimated that at the midpoint of the crest of an excavated rock face, stress relief may result in a horizontal movement of approximately 0.5 to 1 mm per metre depth of excavated rock (defined as medium strength or stronger sandstone). In some cases, movement up to 2 mm per metre depth of excavated rock can occur (more commonly in the north-south direction, where the locked-in stress is higher).

The amount of horizontal movement typically diminishes towards the corners of the excavation and down to the base. Back from the crest, movement occurs over a distance of up to three times the excavated rock depth, with an initial reduction of approximately 1 mm per metre, reducing with distance from the face. This differential movement will give rise to strain in both the rock mass and overburden beyond the excavation and may open up existing cracks or develop new cracks in susceptible structures (buildings, underground service tunnels, etc.).

9.4 Foundations

It is understood that the building is to be founded on pad footings below the basement slab. It is assumed that the footings will be designed for medium strength or stronger sandstone.

Pad and strip foundations should be located at least 1.5 m clear of the dyke. Additional investigation will be required to confirm the exact extent of the dyke and the effect on founding conditions, especially of the sandstone directly either side of the dyke. The investigation could involve test pitting after demolition.

Pad/strip footings located closer than 1.5 m from the dyke should be downgraded by 1/3 of the estimated bearing capacity to allow for the additional weathering, generally associated with the dyke. The dyke should be suitable to support light pressures, such as that exerted by floor slabs.

9.4.1 Pad or Strip Footings

The design of pad or strip foundations may be carried out using the values given in Table 6.

Table 6: Foundation Design Parameters (after Pells et al[3])

Material	Ultimate End Bearing Pressure (kPa)	Allowable End Bearing Pressure (kPa)	Testing Requirements
Dyke	300	150	Site Inspection
Medium strength sandstone	20,000	3,500	Minimum 4 cored bores with spoon testing or cores in at least ⅓ of footings.
Medium to High strength sandstone	60,000	6,000	Cored bores at max 10 m grid spacing or cored bores for 50% of footings and spoon testing of remainder

Note:

- Bearing pressure values assume a minimum embedment of one footing width into the relevant bearing stratum.
- Ultimate parameters are mobilized 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.

The foundation design parameters given in Table 6 assume that the foundation excavations are clean and free of loose debris prior to concrete placement.

Prior to placing rebar or blinding, the base of all footings should be inspected by a geotechnical engineer to confirm that founding conditions are suitable for the design parameters.

Foundations proportioned on the basis of the allowable bearing pressures provided in Table 6 would be expected to experience total settlements of less than 1% of the foundation width under the applied working load, with differential settlements between adjacent foundations (excluding footings on the dyke) expected to be less than half of this value.

9.4.2 Piled Foundations

The design of pile foundations may be carried out using the values given in Table 7. Shaft adhesion values for uplift (tension) may be taken as being equal to 70% of the values for compression.

[3] Design Values for Foundations on Sandstone and Shale in the Sydney Region – Pells, Moyston & Walker. AGS 1998

Table 7: Recommended Design Parameters for Foundation Design

Material	Maximum Allowable Pressure		Maximum Ultimate Pressure		Field Elastic Modulus (MPa)
	End Bearing (kPa)	Shaft Adhesion (Compression) (kPa)	End Bearing (kPa)	Shaft Adhesion (Compression) (kPa)	
Medium strength sandstone	3,500	350	20,000	800	350
Medium to High strength sandstone	6,000	600	60,000	1,500	900

- Shaft adhesion applicable to the design of bored piles, uncased over the rock socket length, where adequate sidewall cleanliness and roughness category "R2", or better are achieved.
- Ultimate parameters are mobilized at large settlements (i.e., >5% of pile diameter or foundation width).
- Side friction values can also be used for pad footing design.
- Allowable end bearing pressures to cause settlement of less than 1% of minimum pile diameter.

Foundations proportioned on the basis of the allowable bearing pressure in Table 7 would be expected to experience total settlements of less than 1% of the pile diameter under the applied working load, with differential settlements between adjacent columns expected to be less than half of this value.

For design of piles using the ultimate values provided in Table 7, a geotechnical strength reduction factor (Øg) should be determined by the designer in accordance with the piling code AS 2159-2009. Serviceability criteria will also need to be met when using ultimate design parameters.

The drilling of all foundation piles should be inspected by a geotechnical engineer to confirm that foundation conditions are suitable for the design parameters.

9.5 Ground Slabs and Pavements

The field investigation indicates that the basement excavation will expose fill and residual clayey sand. Due to the likelihood of some variability of soils across the site, a CBR value of 3% is suggested for the design of all pavements on soil. In situ fill material should not be relied upon and should be replaced by suitable properly compacted material.

Subgrade preparation for the ground slabs should allow for proof rolling and compacting of the subgrade to minimum 98% standard maximum density.

All pavements should be designed with good surface drainage (e.g., gradients and surface drains) and subsoil drainage to capture and direct any subsurface water away from the subgrade or pavement.

The floor at basement level can be designed as a slab on ground, assuming proper compaction is given to the subgrade (if not on rock) on which the slabs are cast. Only suitable material should be used to backfill over-excavated areas, compacted to a minimum 98% standard maximum density. In these areas CBR testing may be required for slab design.

It will be necessary to provide under-floor drainage to safeguard against uplift pressures if the basement is designed as drained. This can comprise a 100 mm thick durable open graded durable crushed rock with subsoil drains and sumps.

9.6 Groundwater

The regional groundwater table is expected to be below the proposed basement level. Seepage, however, should be expected along the soil/rock interface and through the joints in the rock. Seepage is expected to be minor, controllable by pumping from sumps around the excavation.

For the permanent construction, if a drained system is to be adopted, it should allow for water collection of seepage and flows from rock, with sumps and pumps suitably sized to dispose of the water in accordance with council and EPA regulations. Such groundwater may have significant concentrations of iron which will tend to precipitate on exposure to air giving rise to gelatinous iron oxide/hydroxide sludge. This will need to be taken into account when designing permanent drainage lines and pump-out systems.

9.7 Sydney Metro City and Southwest Tunnels (MNW) – Considerations Relating to Tunnel Infrastructure

The 7 m (outer) diameter TfNSW Sydney Metro City and Southwest tunnels run beneath the site with approximate tunnel crown level at RL -22.5 m. The top of the closest 1 st Reserve starts from RL -13.4 m, some 26 m below the existing ground surface. The Blues Point Shaft is also located some 20 m to the south of the site. Drawings of the Sydney Metro Tunnels are shown in the TfNSW and CMS Surveyors Drawings, attached in Appendix B.

DP has undertaken numerical analysis to assess the effect that the proposed development will have on the MNW tunnels at this early stage. Sydney Metro will need to be consulted on the specific project requirements once the design has been finalised.

9.8 Design for Earthquake Loading

When assessed in accordance with the Earthquake Loading Standard (AS1170.4 – 2007), the site has a hazard factor (Z) of 0.08 provided all superstructure loads are carried to rock of at least very low strength. The site sub-soil class would be a rock site, Be, as the soil surface layer is not more than 3 m in depth.

9.9 Geotechnical Inspection

It is suggested that the following geotechnical inspections are carried out by a suitably qualified geotechnical engineer:

- Regular inspections during excavation and any underpinning and shoring/piling works. Inspection of excavated faces to check for instability and to identify any adversely dipping joints that could form wedges and determine if any support or underpinning of adjacent footings is required. In addition to the above it is also recommended that drilling, installation, grouting and stressing of rockbolts and anchors are witnessed; and
- Inspections and spoon tests in the base of proposed pad footings to identify seams or defects in the rock to assess the effect that it has on the bearing capacity. The frequency of these inspections and tests are provided in Section 9.4.1

The level and frequency of inspections should be outlined in an Inspection and Test Plan (ITP), to be prepared once the design has been finalised.

9.10 Monitoring

It is recommended that survey points be installed on the neighbouring building (Structural Engineer to advise) and in situ rock walls. Base readings need to be taken prior to demolition and excavation. Monitoring frequency to be advised by the structural and geotechnical Engineers.

Prior to commencing with demolition or excavation work, a dilapidation survey should be carried out on the adjacent building and pavements to document any existing defects and ensure that claims for damage due to construction related activities can be accurately assessed.

9.11 Additional Geotechnical Investigation

We recommend the following additional geotechnical investigation be carried out:

- Test pit/trench excavation perpendicular to the assumed strike direction of the dyke to map its orientation. This information will be required to optimise foundation design.

10. References

Pells PGN, Mostyn G and Walker BF, 1998, Foundation on sandstone and shale in the Sydney region, *Australian Geomechanics*, December 1998, p 17-29.

Dale, Rickwood and Won, The Geology and Engineering Geology of the “Great Sydney Dyke”, Sydney NSW

11. Limitations

Douglas Partners (DP) has prepared this report for this project at 1 Warung Street, McMahons Point in accordance with work conducted under proposal 203182.01.P.001.Rev1 and acceptance received by Joe Dusevic of Highbury Warung on 16 January 2024. The work was carried out under DP's Conditions of Engagement. This report is provided for the exclusive use 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 DP, does so entirely at its own risk and without recourse to DP for any loss or damage. In preparing this report DP 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 DP's field testing has been completed.

DP's advice is based upon the conditions encountered during this investigation. The accuracy of the advice provided by DP 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. DP cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion stated in this 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 DP. This is because this report has been written as advice and opinion rather than instructions for construction.

Appendix A

About this Report

About this Report

November 2023

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

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.

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Appendix B

Surveyor and TfNSW Drawings

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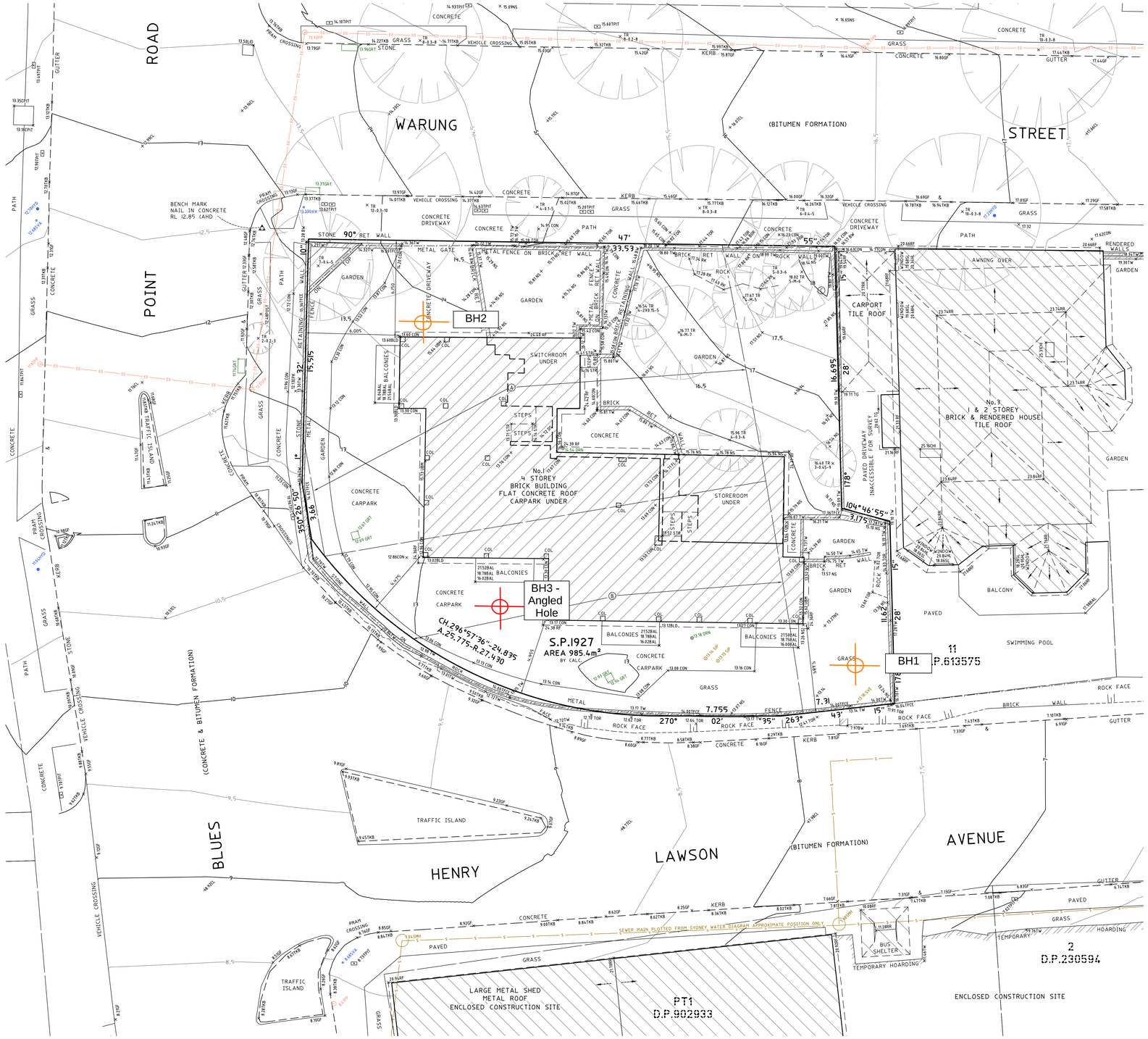
APPROX TRUE NORTH
MGA NORTH



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STEPHEN EMERY
REGISTERED SURVEYOR No.1605

LEGEND:

BAL = BALCONY
BLD = EXTERNAL BUILDING
BW = BOTTOM WALL
CHI = CHIMNEY
CL = CENTRELINE
CON = CONCRETE
CPIT = COMMUNICATIONS PIT
EPK = ELECTRICITY PILLAR
GF = GUTTER LEVEL
GRT = GRATE
HL = HOOD LEVEL
HYD = HYDRANT
LID = MISCELLANEOUS PIT LID
NS = NATURAL SURFACE
PP = POWER POLE
POST = POST BOX
RF = TOP OF ROOF
RK = ROCK
RR = ROOF RIDGE
SL = SILL LEVEL
SMH = SEWER MAN HOLE
SVA = STOP VALVE
TFCE = TOP OF FENCE
TKB = TOP OF KERB\
TOR = TOP OF ROCK
TPIT = TELSTRA PIT
TR = TREE
TW = TOP OF WALL
E/H = ELECTRICITY OVERHEAD
S = SEWER UNDERGROUND
TREE SPREAD-DIAMETER-HEIGHT

HORIZONTAL DATUM:
CO-ORDINATE SYSTEM: MGA (GDA94)
MARKS ADOPTED: PM 35753, PM 35754

VERTICAL DATUM:
DATUM: AUSTRALIAN HEIGHT DATUM (AHD)
B.M. ADOPTED: PM 35753
R.L. 19.67 (ORDER 4)
SOURCE: S.C.I.M.S. (28/01/2020)

4	EXTRA DETAIL ADDED	04/02/2021
3	STREET LEVELS ADDED	7/08/2020
2	AMEND SUBJECT BUILDING TEXT	24/02/2020
1	FIRST ISSUE	21/02/2020

CLIENT:
HIGHBURY WARUNG PTY LTD
SUITE 5/540 SYDNEY ROAD
SEAFORTH NSW 2092

SURVEY PLAN
SHOWING DETAIL & LEVELS
OVER S.P.1927
1 WARUNG STREET
McMAHONS POINT NSW 2060

(A) EXCLUDING LOT 90 IN D.P.1231644 LYING BETWEEN RL -13.4 AND RL-36.6m AHD
(B) EXCLUDING LOT 90 IN D.P.1231644 LYING BETWEEN RL -15.4 AND RL-38.7m AHD

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- (C) DP505859 CROSS EASEMENTS (SEE 18IB, CONVEYANCING ACT, 1919) CREATED BY TRANSFER J566218 AFFECTING THE PARTY WALL ON THE COMMON BOUNDARY AFFECTING THE SITE DESIGNATED (A) IN THE TITLE DIAGRAM
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- AM70719 PROPOSED ACQUISITION PURSUANT TO SECTION 11 LAND ACQUISITION (JUST TERMS COMPENSATION) ACT, 1991 AFFECTING THE LAND ABOVE DESCRIBED, ISSUED 27/6/2017
- AM937666 THIS EDITION ISSUED PURSUANT TO S.111 REAL PROPERTY ACT, 1900

C.M.S. Surveyors Pty Limited
ACN: 096 240 201
PO Box 463 Dee Why NSW 2099
2/994 South Creek Road, Dee Why NSW 2099
Telephone: (02) 9971 4802
Facsimile: (02) 9971 4822
E-mail: info@cmssurveyors.com.au

LGA: NORTH SYDNEY			SHEET 1 OF 1
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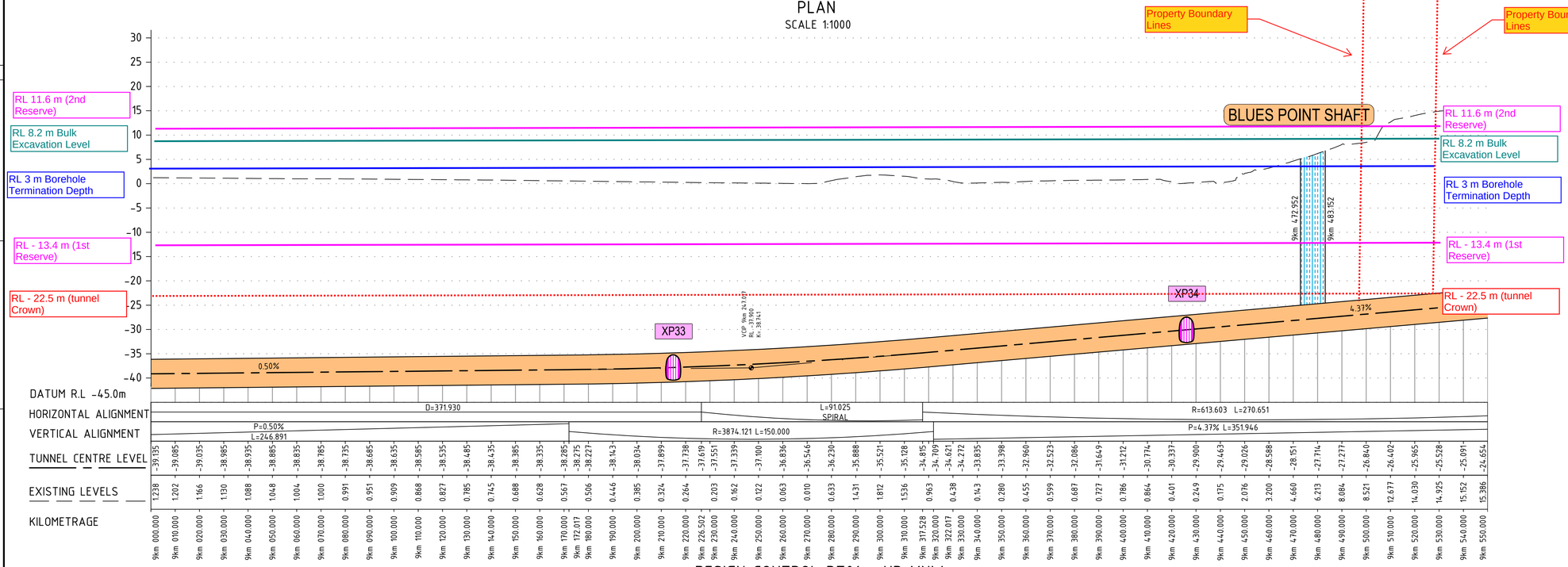

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LEGEND

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- RUNNING TUNNELS
- CROSS PASSAGES AND CROSS PASSAGES WITH SUMP
- STUB TUNNEL
- DIVE STRUCTURES
- STATION EXCAVATIONS
- NOZZLE ENLARGEMENTS
- CROSSOVER CAVERN
- STATION SHAFTS
- STATION CAVERNS
- STATION ADITS
- SHAFT
- LIFT SHAFTS

CADASTRAL MODEL (BASED ON PR124656-SACM-001-E)

- SURVEY ACCURATE CADASTRAL MODEL
- NEAR SURVEY ACCURATE CADASTRE
- DIGITAL CADASTRAL DATABASE

NOTE

1. FOR ALL ALIGNMENT NOTES REFER DRAWING NO. SMCSWTSE-JAB-TPW-AL-DRG-505005.

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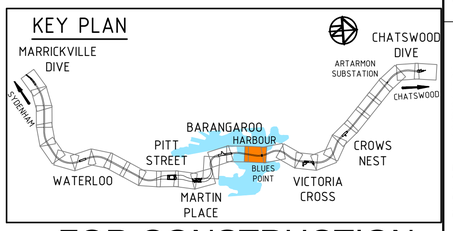

FOR CONSTRUCTION

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SCALE 1:1000 AT A1 SIZE
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SCALE 1:500 AT A1 SIZE

IC CERTIFIED - IC CERTIFICATE SMCSWTSE-IC-CER-B2-008-A

CLIENT
NSW GOVERNMENT Transport for NSW

SERVICE PROVIDERS: Metro | city&southwest | CPB | Ghella | ARCADIS | BG&E | NOMA CONSULTING | HOCHTIEF ENGINEERING | PSM | McMILLEN JACOBS ASSOCIATES

DRAWN	L. AVUK	09.01.18
DESIGNED	TfNSW	-
DRG CHECK	J. MACADANGDANG	09.01.18
DESIGN CHECK	N/A	-
APPROVED	K. LIN	09.01.18

SYDNEY METRO CITY & SOUTHWEST

TSE PROJECT WIDE
ALIGNMENT
GA PLAN AND LONGITUDINAL SECTION
TUNNEL ALIGNMENT CONTROL LINE RT01 - SHEET 18

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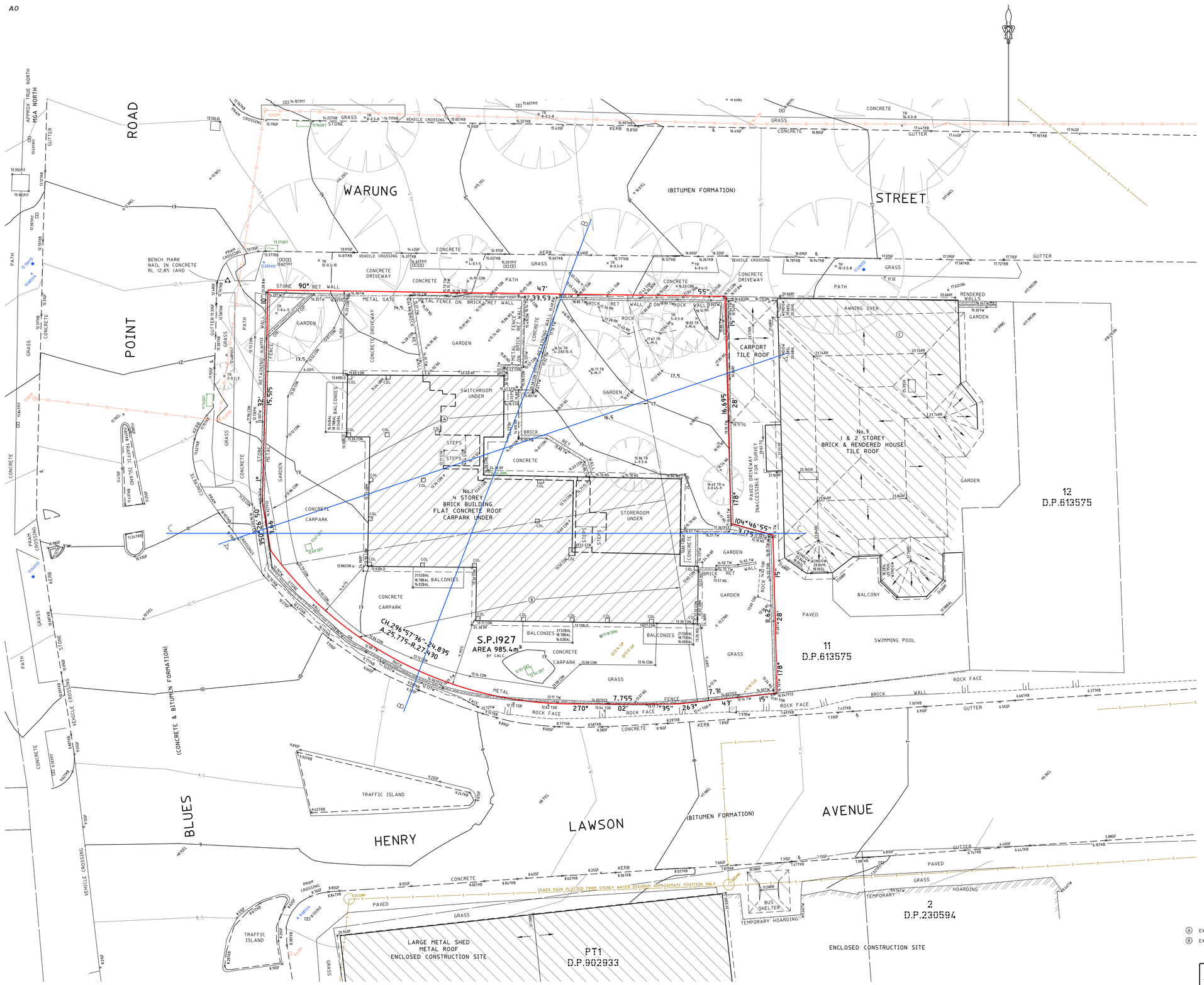

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(A) EXCLUDING LOT 90 IN D.P.1216644 LYING BETWEEN RL -13.4 AND RL-36.6m AHD

(B) EXCLUDING LOT 90 IN D.P.1216644 LYING BETWEEN RL -15.4 AND RL-38.7m AHD

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REGISTERED SURVEYOR No.8786

LEGEND:

BAL = BALCONY
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TREE SPREAD-DIAMETER-HEIGHT

HORIZONTAL DATUM:
CO-ORDINATE SYSTEM: MGA (GDA94)
MARKS ADOPTED: PM 35753, PM 35754

VERTICAL DATUM:
DATUM: AUSTRALIAN HEIGHT DATUM (AHD)
B.M. ADOPTED: PM 35753
R.L. 19.67 (ORDER 4)
SOURCE: S.C.I.M.S. (28/01/2020)

6	ADDED DP XSECTIONS	27/05/2024
5	SECTION ADDED: SYD METRO	07/12/2021
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CLIENT:
HIGHBURY WARUNG PTY LTD
SUITE 5/540 SYDNEY ROAD
SEAFORTH NSW 2092

SURVEY PLAN
SHOWING DETAIL & LEVELS
OVER S.P.1927
1 WARUNG STREET
McMAHONS POINT NSW 2060

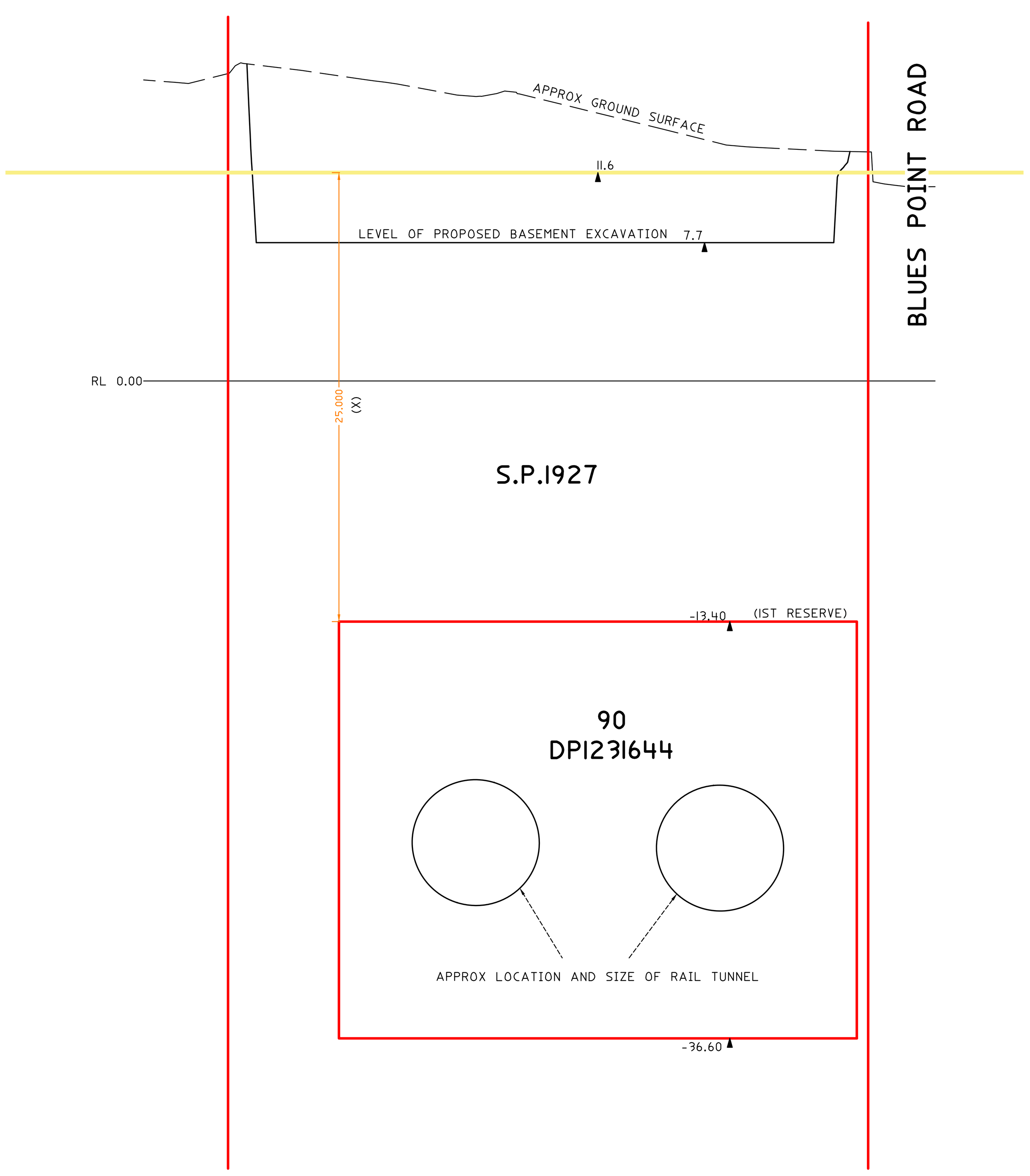
C.M.S. Surveyors Pty Limited
ACN: 096 240 201
PO Box 463 Lane Cove 1595
1/594 South Creek Road, PO Box 908 Ryde 2109
Telephone: (02) 9977 4800
Facsimile: (02) 9977 1400
email: survey@cmsurveyors.com.au

LGA: NORTH SYDNEY			SHEET 1 OF 2
SURVEYED PB,MB,ABS	DRAWN ABS/CL	CHECKED PB	APPROVED AF
SURVEY INSTRUCTION 19099	SCALE 1:100 @ A0	DATE OF SURVEY 28/01/20-25/01/21	
DRAWING NAME 19099Adetail			ISSUE 6
CAD FILE 19099Adetail 6.dwg			

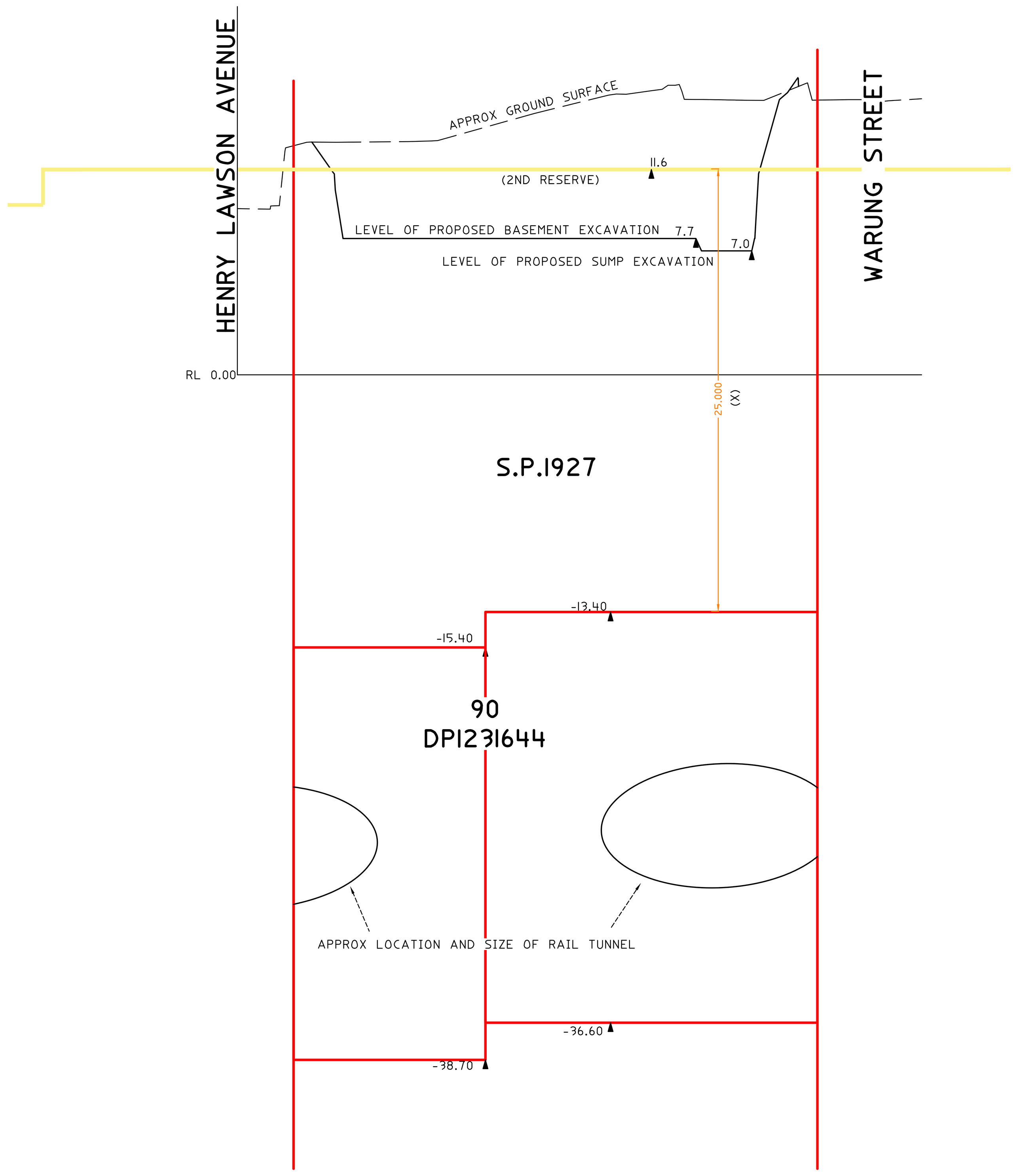
A0

THESE SECTIONS HAVE BEEN CREATED TO ALIGN WITH CROSS SECTION UNDERLAY DRAWINGS (SHOWN IN GREY) SUPPLIED BY DOUGLAS PARTNERS - DRAWING REFERENCES 203182.01.D.002 Rev0 AND 203182.01.D.003 Rev0. THESE HAVE BEEN INCLUDED TO VERIFY THE LOCATION OF THE BORE HOLES AND SUB SOIL PROFILES - PLEASE SEE DOUGLAS PARTNERS DRAWINGS FOR FURTHER INFORMATION.

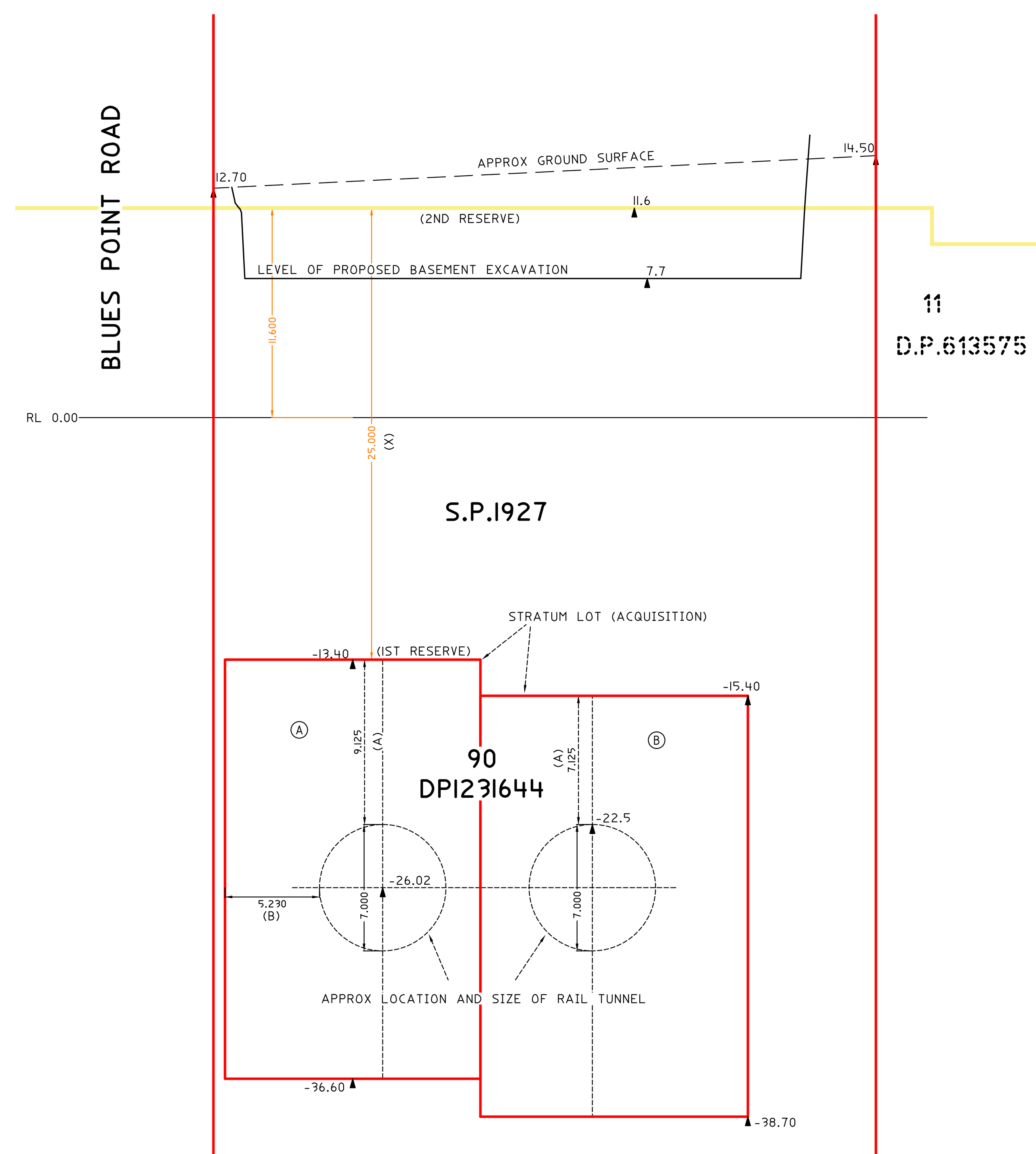
SECTION A-A SHOWING LOCATION OF SYDNEY METRO SUBSTRATUM LOTS AND PROTECTION RESERVES



SECTION B-B SHOWING LOCATION OF SYDNEY METRO SUBSTRATUM LOTS AND PROTECTION RESERVES



SECTION C-C SHOWING LOCATION OF SYDNEY METRO SUBSTRATUM LOTS AND PROTECTION RESERVES



NOTE:
RESERVE AREAS CALCULATED USING FIGURES 4.1, AND 4.2 OF TfNSW SYDNEY METRO UNDERGROUND CORRIDOR PROTECTION TECHNICAL GUIDELINES APRIL2021

TUNNELS AND CAVERNS
1ST RESERVE
TOP (A) CALCULATED TO BE EXTENT OF SYDNEY METRO SUBSTRATUM ABOVE CROWN

SIDE (B) CALCULATED TO BE LATERAL EXTENT OF SYDNEY METRO SUBSTRATUM

2ND RESERVE
TOP (A+X) CALCULATED TO BE A+25m

SIDE (B+Y) CALCULATED TO BE B+25m

0 5 10 15 20

SCALE 1:200

Ⓐ EXCLUDING LOT 90 IN D.P.1231644 LYING BETWEEN RL -13.4 AND RL-36.6m AHD

Ⓑ EXCLUDING LOT 90 IN D.P.1231644 LYING BETWEEN RL -15.4 AND RL-38.7m AHD

TITLE INDICATES THAT IN S.P.1927 IS SUBJECT TO:

- RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
- ATTENTION IS DIRECTED TO BY-LAWS SET OUT IN SCHEDULE 2 STRATA SCHEMES MANAGEMENT REGULATION 2016
Ⓒ DP505859 CROSS EASEMENTS (SEE 181B, CONVEYANCING ACT, 1919) CREATED BY TRANSFER J566248 AFFECTING THE PARTY WALL ON THE COMMON BOUNDARY AFFECTING THE SITE DESIGNATED (A) IN THE TITLE DIAGRAM
- X903567 CHANGE OF BY-LAWS
- ATTENTION IS DIRECTED TO CLAUSE 3 SCHEDULE 4 STRATA SCHEMES (FREEHOLD DEVELOPMENT) ACT 1973 REGARDING BOUNDARIES BETWEEN LOTS AND COMMON PROPERTY IN STRATA SCHEMES REGISTERED BEFORE 1-7-1974
- AM707119 PROPOSED ACQUISITION PURSUANT TO SECTION 11 LAND ACQUISITION (JUST TERMS COMPENSATION) ACT, 1991 AFFECTING THE LAND ABOVE DESCRIBED. ISSUED 27/6/2017
- AM933661 THIS EDITION ISSUED PURSUANT TO S.111 REAL PROPERTY ACT, 1900

NOTES

- **BOUNDARIES HAVE BEEN DEFINED .**
- **IF CONSTRUCTION ON OR NEAR BOUNDARIES IS REQUIRED IT IS RECOMMENDED THAT THE BOUNDARIES OF THE LAND BE MARKED.**
- **AREA IS APPROXIMATE ONLY AND HAS BEEN CALCULATED BY TITLE DIMENSIONS. ALL TITLE DIMENSIONS OF THE LAND HAVE NOT BEEN CONFIRMED BY SURVEY. IF AREAS ARE CRITICAL WE RECOMMEND A BOUNDARY SURVEY FOR PUBLIC RECORD.**
- TREE SIZES ARE ESTIMATES ONLY.

THIS PLAN HAS BEEN PREPARED FOR THE EXCLUSIVE USE OF HIGHBURY WARUNG PTY LTD

- RELATIONSHIP OF IMPROVEMENTS TO BOUNDARIES IS DIAGRAMMATIC ONLY. WHERE OFFSETS ARE CRITICAL THEY SHOULD BE CONFIRMED BY FURTHER SURVEY.
- EXCEPT WHERE SHOWN BY DIMENSION LOCATION OF DETAIL WITH RESPECT TO BOUNDARIES IS INDICATIVE ONLY.
- ONLY VISIBLE SERVICES HAVE BEEN LOCATED. UNDERGROUND SERVICES HAVE NOT BEEN LOCATED. DIAL BEFORE YOU DIG SERVICES (ph 1100) SHOULD BE USED AND A FULL UTILITY INVESTIGATION, INCLUDING A UTILITY LOCATION SURVEY, SHOULD BE UNDERTAKEN BEFORE CARRYING OUT ANY CONSTRUCTION ACTIVITY IN OR NEAR THE SURVEYED AREA.
- SEWER MAIN PLOTTED FROM SYDNEY WATER SEWER DIAGRAM. LOCATION SHOULD BE MARKED ON SITE IF CRITICAL.
- CRITICAL SPOT LEVELS SHOULD BE CONFIRMED WITH SURVEYOR.
- THIS PLAN IS ONLY TO BE USED FOR THE PURPOSE OF DESIGNING NEW CONSTRUCTIONS.
- CONTOURS SHOWN DEPICT THE TOPOGRAPHY. THEY DO NOT REPRESENT THE EXACT LEVEL AT ANY PARTICULAR POINT. ONLY SPOT LEVELS SHOULD BE USED FOR CALCULATIONS OF QUANTITIES WITH CAUTION.
- CONTOUR INTERVAL - 0.5 metre. - SPOT LEVELS SHOULD BE ADOPTED.
- POSITION OF RIDGE LINES ARE DIAGRAMMATIC ONLY (NOT TO SCALE).
- THE INFORMATION IS ONLY TO BE USED AT A SCALE ACCURACY OF 1:100.
- DO NOT SCALE OFF THIS PLAN / FIGURED DIMENSIONS TO BE TAKEN IN PREFERENCE TO SCALED READINGS.
- THIS PLAN HAS BEEN PREPARED UNDER THE SUPERVISION OF REGISTERED SURVEYOR S B McEVOY, BOSSI NUMBER 265.

CHRISTOPHER LARMOUR
REGISTERED SURVEYOR No.8786

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CMS SURVEYORS
C.M.S. Surveyors Pty Limited
ACN: 096 240 201
PO Box 463 Dee Why
NSW 2099
2/99A South Creek Road,
Dee Why NSW 2099
Telephone: (02) 9971 4802
Facsimile: (02) 9971 4822
E-mail: info@cmssurveyors.com.au

LGA: NORTH SYDNEY		SHEET 2 OF 2	
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CAD FILE 19099Adetail 6.dwg			

Document Set ID: 10156381
Version: 1, Version Date: 17/09/2024

Terminology, Symbols and Abbreviations

November 2023

Introduction to Terminology, Symbols and Abbreviations

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

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

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

Abbreviation Codes

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

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

Data Integrity Codes

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

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

Graphic Symbols

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

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Soil Descriptions

Terminology
Symbols
Abbreviations

November 2023

Introduction

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

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

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

Particle size designation and Behaviour Model

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

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

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

[1] – refer grain size subdivision descriptions below

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

Component proportions

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

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

[1] As defined in AS1726-2017 6.1.4.4

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

Composite Materials

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

Classification

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

Soil Name

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

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

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

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

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

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

Identification of minor components

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

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

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

Soil Composition

Plasticity

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

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

Grain Size

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

Grading

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

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

Soil Condition

Moisture

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

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

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

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

Consistency/Density/Compaction/Cementation/Extremely Weathered Material

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

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

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

Consistency (fine grained soils)

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

Relative Density (coarse grained soils)

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

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

Compaction (anthropogenically modified soil)

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

Cementation (natural and anthropogenic)

Cementation Term	Abbreviation Code
Moderately cemented	MOD
Weakly cemented	WEK

Extremely Weathered Material

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

Soil Origin

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

Cobbles and Boulders

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

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

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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:

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

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

Stratification Spacing

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

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

Defect Descriptions

Defect Type

Term	Abbreviation Code
Bedding plane	B
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

intentionally blank

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.

intentionally blank

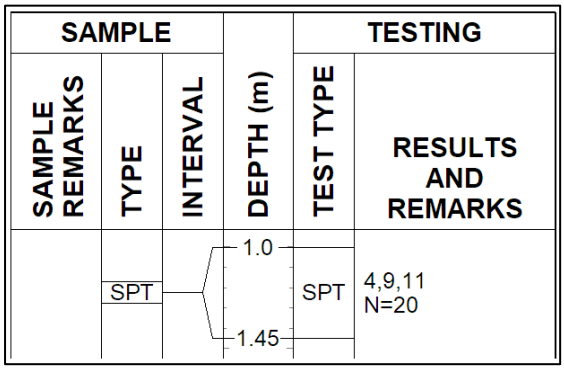
Sampling, Testing and Excavation Methodology

Terminology
Symbols
Abbreviations

November 2023

Sampling and Testing

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



Sampling

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

Sample Type	Code
Auger sample	A
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(_)
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: Highbury Warung Pty Ltd
PROJECT: Proposed Residential Redevelopment
LOCATION: 1 Warung Street, McMahon's Point

SURFACE LEVEL: 13.2 m AHD
EASTING: 333853
NORTHING: 6253186
DIP/AZIMUTH: 90°/--

BORE No: BH01
PROJECT No: 203182.00
DATE: 13/5/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low / Very Low / Low / Medium / High / Very High / Ex High)	Water	Fracture Spacing (m) (0.01 / 0.05 / 0.10 / 0.50 / 1.00)	Discontinuities (B - Bedding, J - Joint, S - Shear, F - Fault)	Type	Core Rec. %	RQD %	Test Results & Comments
13	0.0	FILL/SAND: fine to coarse, pale grey, with subrounded sandstone gravel, moist, apparently medium dense										
	0.8	Clayey SAND SC: medium to coarse, pale orange-grey, moist, dense, residual							S			8,24,31 N = 55
12	1.0	SANDSTONE: fine to medium grained, pale brown, inferred very low strength, extremely weathered to highly weathered, Hawkesbury Sandstone						Unless otherwise stated all discontinuities are B0°-10°, ir, ro, cln				
11	2.0	SANDSTONE: fine to medium grained, orange, partial iron cementation in upper 0.28m, thinly bedded, low strength, highly weathered grading to moderately weathered, slightly fractured, Hawkesbury Sandstone Below 2.3m: pale yellow Below 3.0m: medium strength						2.07m: B2°, ir, ro, fe stn 2.18m: B2°, ir, ro, fe stn	C	100	96	PL(A) = 0.2 PL(A) = 0.5
9	4.0	Between 4.6-4.7m: iron stained band						4.57m: B2°, ir, ro, fe stn	C	74	96	PL(A) = 0.5
8	5.0	SILTSTONE Between 5.24m and 5.78m: thinly laminated, dark grey, medium strength, moderately weathered						5.25m: J30°, un, ro, cln CORE LOSS: 390mm				PL(A) = 0.3
7	5.64	SANDSTONE: fine to medium grained, pale grey, laminated at 0°-5°, medium strength, slightly weathered, unbroken then slightly fractured, Hawkesbury Sandstone Between 6.40-6.95m: orange iron staining							C	100	100	PL(A) = 0.7 PL(A) = 0.9
6	7.0	Below 7.78m: Fractured						7.78m: B7°, ir, sm, cbs, vn 7.82m: B0°, ir, sm, cbs, vn 8.12m: J30°, ir, ro, cln 8.4m: Cs 2mm				
5	8.0	Between 8.48-9.65m: sub-vertical joint, healed below 9.14m						8.75m: J88°, ir, rf, cln 8.48-9.14 then heeled 9.14-9.65 9.1m: B4°, ir, sm, cly 3mm 9.14m: B4°, ir, sm, clay 2mm 9.65m: B4°, ir, sm, cly 15mm	C	100	100	PL(A) = 0.7 PL(A) = 0.6
4	9.0											
	10.0	Bore discontinued at 10.0m										

RIG: Bobcat- Target depth reached **DRILLER:** GM **LOGGED:** DH **CASING:** HW: 0.0-2.0m

TYPE OF BORING: Solid flight auger (TC-bit) to 2.0m; NMLC coring to 10.0m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
Geotechnics / Environment / Groundwater

BORE: 01 PROJECT: MCMAHONS POINT MAY 2021

2.00 – 6.00m

BORE: 01 PROJECT: MCMAHONS POINT MAY 2021

6.00 – 10.00m

BOREHOLE LOG

CLIENT: Highbury Warung Pty Ltd
PROJECT: Proposed Residential Redevelopment
LOCATION: 1 Warung Street, McMahon's Point

SURFACE LEVEL: 14 m AHD
EASTING: 333827
NORTHING: 6253209
DIP/AZIMUTH: 90°/--

BORE No: BH02
PROJECT No: 203182.00
DATE: 13/5/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low / Very Low / Low / Medium / High / Very High / Ex High)	Water	Fracture Spacing (m) (0.01 / 0.05 / 0.10 / 0.50 / 1.00)	Discontinuities (B - Bedding, J - Joint, S - Shear, F - Fault)	Type	Core Rec. %	RQD %	Test Results & Comments
14	0.03	ASPHALT										
		FILL/SAND: fine to coarse, pale grey, with subrounded sandstone gravel, moist, apparently medium dense						Unless otherwise stated all discontinuities are B0°-10°, ir, ro, cln	S			11,32/120 refusal
	0.8											
13	1 1.0	Clayey SAND SC: medium to coarse, pale orange-grey, moist, dense, residual										
	1.3											
	1.4	SANDSTONE: fine to medium grained, pale brown, inferred very low strength, extremely weathered to highly weathered, Hawkesbury Sandstone						1.36m: CORE LOSS: 40mm	C	96	100	PL(A) = 0.7
12	2											PL(A) = 0.7
		SANDSTONE: fine to medium grained, pale yellow, thinly bedded with occasional siltstone clasts up to 10mm, medium strength, slightly weathered, unbroken, Hawkesbury Sandstone										
11	3											PL(A) = 0.8
	3.92											
10	4	SANDSTONE: fine to medium grained, red-brown and pale brown, with iron cemented bands, thinly bedded, medium strength, moderately weathered to slightly weathered, fractured, Hawkesbury Sandstone						4.21m: B2°, ir, ro, fe stn 4.25m: B2°, ir, ro, fe stn CORE LOSS: 400mm	C	74	97	PL(A) = 1.2
	4.65											
9	5	SANDSTONE: fine to medium grained, red-brown, iron cemented, thinly bedded, medium strength, moderately weathered to slightly weathered, slightly fractured, Hawkesbury Sandstone Between 5.3m and 5.35m: low strength						4.74m: B0°, ir, ro, fe stn 4.78m: B2°, ir, ro, fe stn				PL(A) = 0.4
								5.21m: B4°, ir, ro, fe stn 5.33m: B2°, ir, ro, fe stn				PL(A) = 0.1
	5.45							5.45m: CORE LOSS: 130mm				
	5.58							5.58m: B3°, pl, ro, cln				
8	6											PL(A) = 1
		SANDSTONE: medium grained, pale grey, massive, medium strength, fresh, unbroken, Hawkesbury Sandstone										
7	7											
	7.15	SANDSTONE: medium grained, pale grey, cross-bedded, high strength, fresh, unbroken, Hawkesbury Sandstone Between 7.43-7.48m: seam of very stiff high plasticity clay, possible sub horizontal intrusive Sill Below 8.0m: pale brown and high strength						7.38m: B4°, ir, sm, cly 3mm 7.43m: B0°, pl, sm, cly 50mm	C	100	98	PL(A) = 0.7
6	8											
5	9											PL(A) = 1.6
								9.37m: B2°, pl, ro, cln	C	100	96	
	10.0											PL(A) = 1.1

Bore discontinued at 10.0m

RIG: Bobcat- Target depth reached **DRILLER:** GM **LOGGED:** DH **CASING:** HW: 0.0-1.3m

TYPE OF BORING: Diatube coring to 0.03m; Solid flight auger (TC-bit) to 1.3m; NMLC coring to 10.0m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
Geotechnics / Environment / Groundwater

BORE: 02 PROJECT: MCMAHONS POINT MAY 2021

1.30 – 6.00m

BORE: 02 PROJECT: MCMAHONS POINT MAY 2021

6.00 – 10.00m

BOREHOLE LOG

CLIENT: Highbury Warung Pty Ltd
PROJECT: Proposed Residential Redevelopment
LOCATION: 1 Warung Street, McMahon's Point

SURFACE LEVEL: 13.2 m AHD
EASTING: 333829
NORTHING: 6253191
DIP/AZIMUTH: 45°/23°

BORE No: BH03
PROJECT No: 203182.00
DATE: 12/5/2021
SHEET 1 OF 2

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low / Very Low / Low / Medium / High / Very High / Ex High)	Water	Fracture Spacing (m) (0.01 / 0.05 / 0.10 / 0.50 / 1.00)	Discontinuities (B - Bedding, J - Joint, S - Shear, F - Fault)	Type	Core Rec. %	RQD %	Test Results & Comments
13	0.03	ASPHALT										
		FILL/SAND: fine to coarse, pale grey, with subrounded sandstone gravel, moist, apparently medium dense										
12	1.4	Clayey SAND SC: medium to coarse, pale orange-grey, moist, apparently medium dense, residual										
	1.8	SANDSTONE: fine to medium grained, pale brown, inferred very low strength, extremely weathered to highly weathered, Hawkesbury Sandstone										
	2.8							2.8m: CORE LOSS: 100mm				
11	2.9	SANDSTONE: fine to medium grained, orange-brown, iron cemented, thinly bedded and cross bedded, low strength, highly weathered, fractured, Hawkesbury Sandstone						3.2m: B45°, ir, ro, fe stn 3.3m: B45°, ir, ro, fe stn 3.54m: B45°, ir, ro, fe stn 3.65m: J47°, ir, ro, fe stn	C	97	100	PL(A) = 0.1 PL(A) = 0.1
		Between 3.15-3.4m: band of very low strength sandstone										
10		Below 3.8m: red-brown and orange-brown						4.38m: B32°, ir, ro, fe stn				
9		Below 5.1m: orange to pale yellow						4.82m: B51°, ir, ro, cln 4.91m: J3°, ir, ro, fe stn 5.08m: J8°, ir, ro, cln 5.68m: B47°, ir, ro, cln				PL(A) = 0.2 PL(A) = 1.2
	6.05	At 5.9m: band of high strength sandstone						6.09m: B54°, ir, ro, cln 6.42m: Healed J55°	C	80	93	
		SANDSTONE: medium grained, pale grey, medium bedded and cross bedded, medium strength, highly weathered, fractured, Hawkesbury Sandstone						6.67m: Healed J55° 6.75m: J51°, ir, ro, cln				PL(A) = 0.7
8	6.93	DOLERITE: finely crystalline, pale grey, low strength, highly weathered, highly fractured, igneous intrusive dyke						7.17m: CORE LOSS: 620mm				
	7.79	DOLERITE: finly crystalline, pale grey, extremely weathered, recovered as high plasticity, very stiff-hard clay, igneous intrusive dyke							C	100	100	PL(A) = 0.6
7	8.87	SANDSTONE: fine to medium grained, red-brown to pale grey, laminated, medium strength, altered and highly weathered with occasional zone of carbonaceous wisps, unbroken, Hawkesbury Sandstone						9.4m: J61°, ir, ro, cln	C	100	100	PL(A) = 0.4

RIG: Comacchio Geo 305 **DRILLER:** GM **LOGGED:** DH **CASING:** HW: 0.0-2.8m

TYPE OF BORING: Diatube coring to 0.03m; Solid flight auger (TC-bit) to 2.8m; NMLC coring to 14.4m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Azimuth - Magnetic North

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Highbury Warung Pty Ltd
PROJECT: Proposed Residential Redevelopment
LOCATION: 1 Warung Street, McMahon's Point

SURFACE LEVEL: 13.2 m AHD
EASTING: 333829
NORTHING: 6253191
DIP/AZIMUTH: 45°/23°

BORE No: BH03
PROJECT No: 203182.00
DATE: 12/5/2021
SHEET 2 OF 2

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding, J - Joint, S - Shear, F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
	10.1	SANDSTONE: fine to medium grained, red-brown to pale grey, laminated, medium strength, moderately weathered, unbroken, Hawkesbury Sandstone						10.46m: J58°, ir, ro, cln	C	100	100	PL(A) = 0.6 PL(A) = 0.6
								12.8m: J55°, pl, cly, vn 12.86m: B48°, ir, ro, cln 12.95m: B54°, ir, sm, cbs vn	C	100	93	
	13.7	SANDSTONE: medium grained, red-brown to pale grey, massive, high strength, slightly weathered, slightly fractured, Hawkesbury Sandstone						13.66m: J11°, ir, ro, cln 13.76m: B56°, ir, ro, cln 14.04m: B35°, ir, ro, cln				PL(A) = 1.1
	14.4	Bore discontinued at 14.4m - Target depth reached						14.34m: J70°, ir, ro, cln 14.38m: J33°, ir, sm, cly vn				

RIG: Comacchio Geo 305 **DRILLER:** GM **LOGGED:** DH **CASING:** HW: 0.0-2.8m

TYPE OF BORING: Diatube coring to 0.03m; Solid flight auger (TC-bit) to 2.8m; NMLC coring to 14.4m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Azimuth - Magnetic North

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
Geotechnics / Environment / Groundwater

BORE: 03 PROJECT: MCMAHONS POINT MAY 2021

2.80 – 7.00m

BORE: 03 PROJECT: MCMAHONS POINT MAY 2021

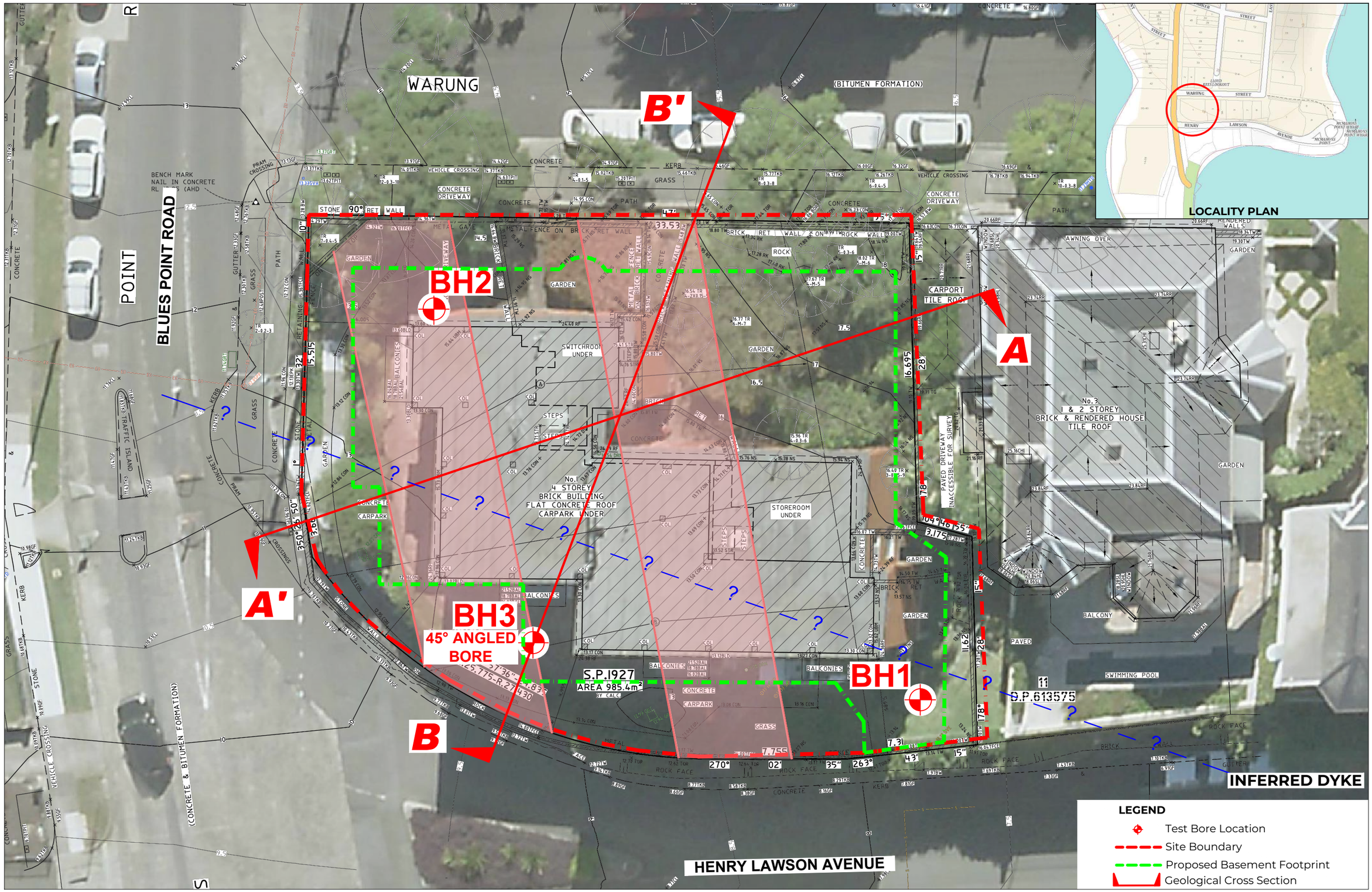
7.00 – 12.00m

BORE: 03 PROJECT: MCMAHONS POINT MAY 2021

12.00 – 14.40m

Appendix D

Site Plan and Geotechnical Cross-Sections including TfNSW Information



REV	DESCRIPTION/COMMENT	DATE	DRAWN BY
0		30.01.2024	CJ/MN

SCALE: 0 5 10m
1:200 @ A3

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

CLIENT: **Highbury Warung Pty Ltd**

NOTE:
1: Base image from Metromap (Dated 15.04.2021)
2: Survey plan from C.M.S. Surveyors Pty Limited (dated 28.01.2021).
3: Proposed basement footprint from Squillace, Job No. HIG2009, Drawing No. DA-099, Issue P2 (Dated 11.01.2024)

COORDINATE REFERENCE SYSTEM: GDA1994/ MGA ZONE 56

PROJECT NAME: **Proposed Residential Development**

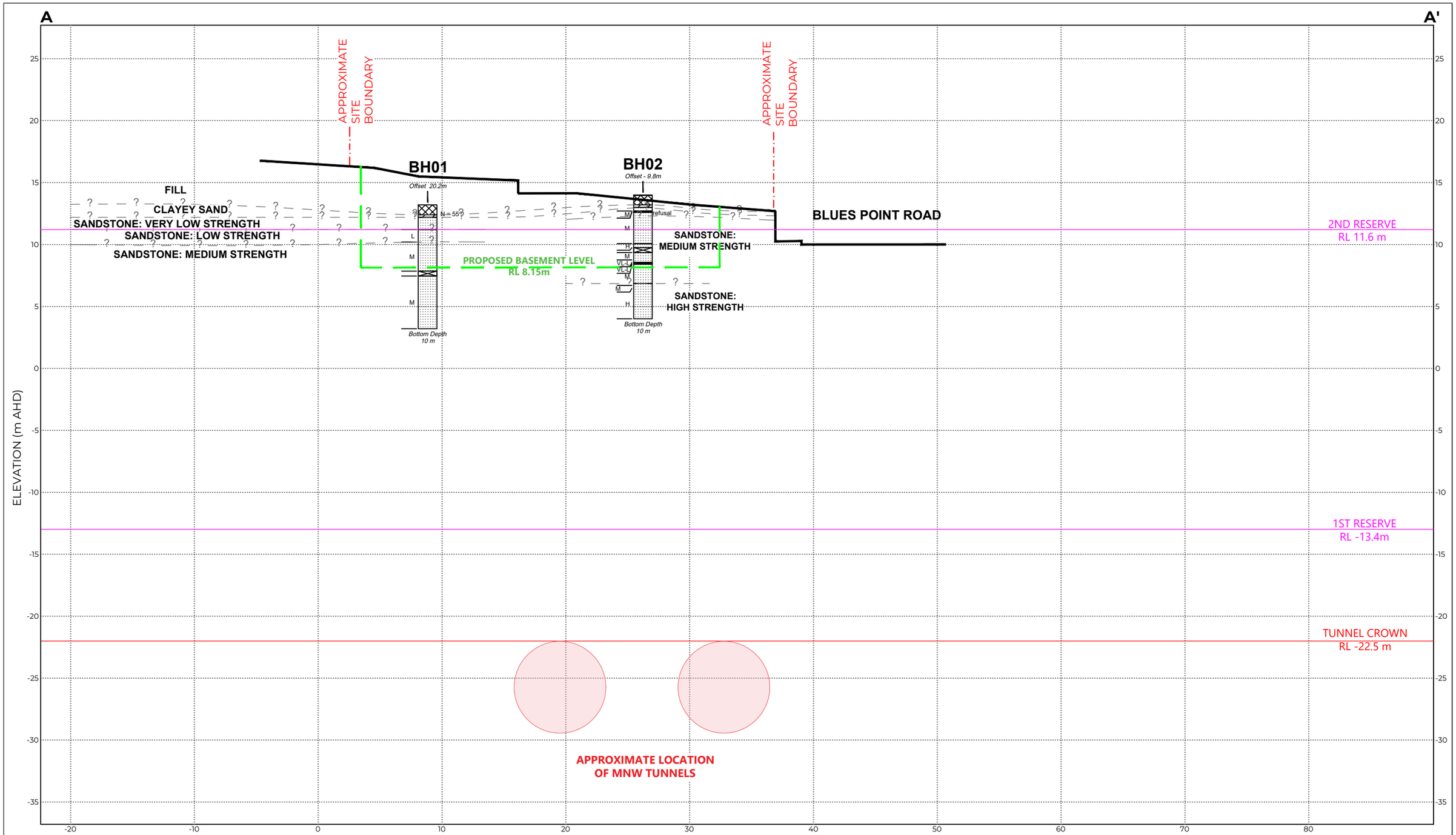
PROJECT ADDRESS: **1 Warung Street, McMahons Point**

DRAWING TITLE: **TEST LOCATION PLAN**

PROJECT No: **203182.01**

DRAWING No: **1**

REVISION: **0**



LEGEND

- Core Loss
- Asphaltic Concrete
- Clayey Sand
- Dolerite
- Filling
- Sandstone

TESTS / OTHER

N - Standard penetration test value
— ? — — - Interpreted geotechnical boundary

ROCK STRENGTH

VL - Very Low
L - Low
M - Medium
H - High
VH - Very High

REV	DESCRIPTION/COMMENT	DATE	DRAWN BY
0		30.01.2024	CJ/MN

SCALE: 0 6
Horizontal Scale 1:300 @A3
Vertical Exaggeration = 1.0

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

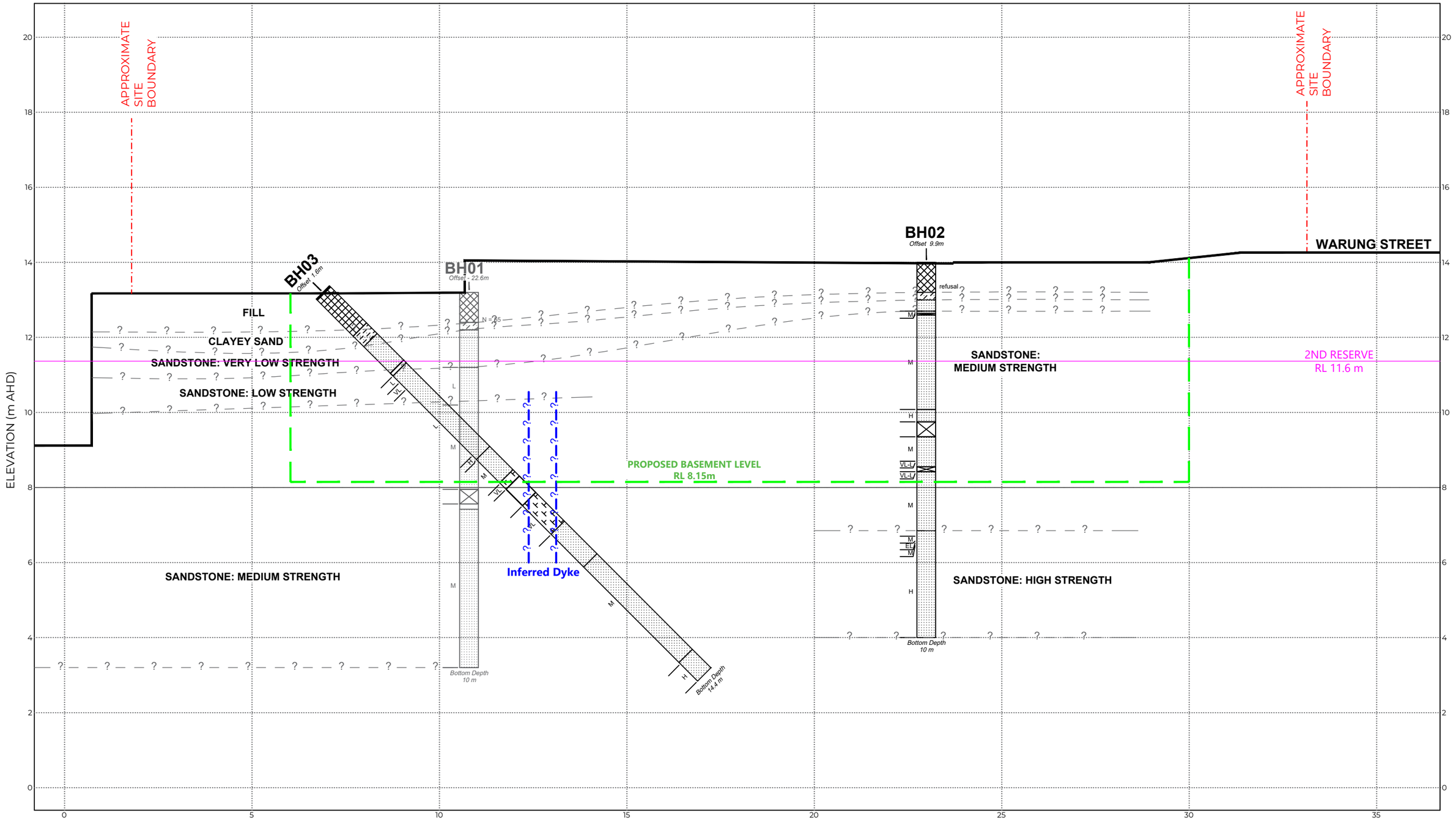
CLIENT: **Highbury Warung Pty Ltd**

NOTES
1. Subsurface conditions are accurate at the borehole locations only. Variations in subsurface conditions may occur between borehole locations. Interpreted strata boundaries are approximate and should be used as a guide only.
2. Summary logs only and should be read in conjunction with detailed logs.
3. Horizontal and vertical scales are not equal.

PROJECT NAME: **Proposed Residential Redevelopment**
PROJECT ADDRESS: **1 Warung Street, McMahon's Point**

DRAWING TITLE: **Cross-section A-A'**

PROJECT No: **203182.01**
DRAWING No: **2**
REVISION: **0**



LEGEND

- Core Loss
- Asphaltic Concrete
- Clayey Sand
- Dolerite
- Filling
- Sandstone

TESTS / OTHER

- N - Standard penetration test value
- — ? — — - Interpreted geotechnical boundary

ROCK STRENGTH

- VL - Very Low
- L - Low
- M - Medium
- H - High
- VH - Very High

REV	DESCRIPTION/COMMENT	DATE	DRAWN BY
0		30.01.2024	CJ/MN

SCALE: 0 2
Horizontal Scale 1:100 @A3
Vertical Exaggeration = 1.0

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

CLIENT: **Highbury Warung Pty Ltd**

NOTES
1. Subsurface conditions are accurate at the borehole locations only. Variations in subsurface conditions may occur between borehole locations. Interpreted strata boundaries are approximate and should be used as a guide only.
2. Summary logs only and should be read in conjunction with detailed logs.
3. Horizontal and vertical scales are not equal.

PROJECT NAME: **Proposed Residential Redevelopment**

PROJECT ADDRESS: **1 Warung Street, McMahon's Point**

DRAWING TITLE: **Cross-section B-B'**

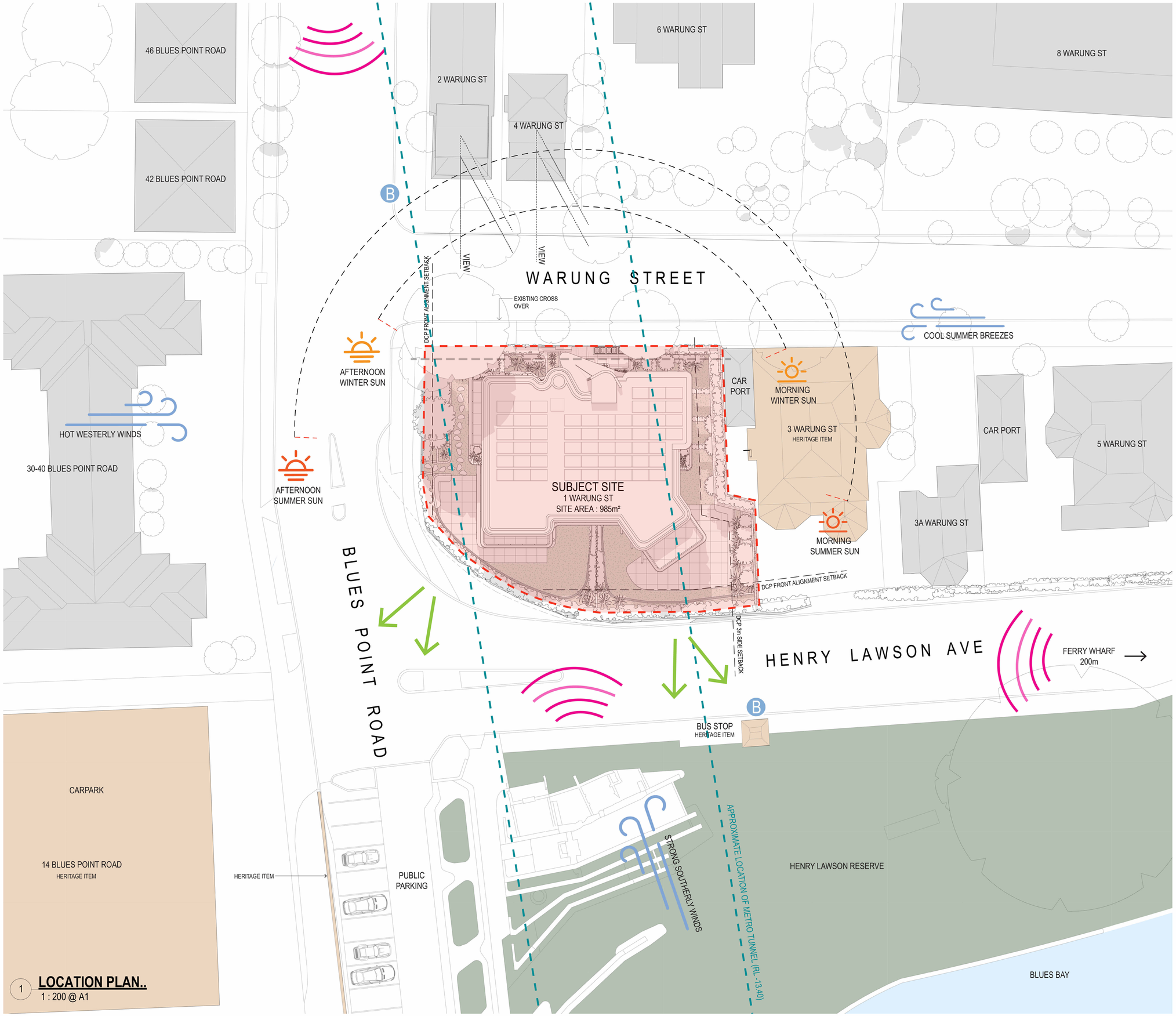
PROJECT No: **203182.01**

DRAWING No: **3**

REVISION: **0**

Appendix E

Architectural Drawings



1 **LOCATION PLAN..**
1 : 200 @ A1

Member Australian Institute of Architects

STATUS

PRELIMINARY

Do not scale drawings. Verify all dimensions on site.
This drawing is NOT SUITABLE for construction.

GRAPHIC SCALE

1:400 @ A3
1:200 @ A1
0 5m 10m

DRAWING NOTES

LEGEND

- HERITAGE ITEM
- SUBJECT SITE
- DOMINANT WIND SOURCES
- NOISE
- BUS STOPS
- SIGNIFICANT VIEWS FROM SITE

ISS	DATE	PURPOSE OF ISSUE
A	29.02.2024	ISSUE FOR DA
P3	15.02.2024	ISSUE TO CONSULTANTS
P2	11.01.2024	ISSUE TO ST CONSULTANT
P1	22.12.2023	ISSUE TO CONSULTANTS

CLIENT
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squillace

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ABN: 24 132 554 753

NOMINATED ARCHITECT
Vince Squillace Reg No. 6468 (NSW), 17219 (VIC), 3677 (QLD), AR1173 (NT)

PROJECT
Warung Street Apartments

1 Warung Street, McMahons Point NSW

DRAWING NO. DA-012
ISSUE A

JOB NO. HIG2307
SCALE @ A1
DATE 29.02.2024

DRAWING TITLE
SITE ANALYSIS PLAN

DRAWN BY MS
CHECKED BY VS

Member Australian Institute of Architects

STATUS

PRELIMINARY

Do not scale drawings. Verify all dimensions on site.
This drawing is NOT SUITABLE for construction.

GRAPHIC SCALE

1:200 @ A3 / 1:100 @ A1 — 0 — 2000 — 5000

DRAWING NOTES

WARUNG STREET

1m EXCAVATION SETBACK

BOUNDARY LINE

1 DA-301

VISITOR

5.4 m TYPICAL

CAR SPACE 1

CAR SPACE 2

STAIRS

LIFT

BASEMENT LOBBY

METERS

CAR SPACE 3

BIKE / STORAGE

CAR SPACE 4

1.0 m

3.4 m TYPICAL

0.3 m

BASEMENT 1

10 RESIDENTIAL CAR SPACES
1 VISITOR SPACE

RL 8.150

5.8 m

6.1 m

2.5 m TYPICAL

3 WARUNG ST

OUTLINE OF PREVIOUSLY APPROVED BASEMENT SHOWN IN PINK (DA379/21)

OUTLINE OF BUILDING ABOVE

4.2 m

RL 12.00

RL 11.50

1 DA-302

PROPOSED KERB & ISLAND AS PER CIVIL ENGINEERS DRAWINGS

RL 11.00

BLUES POINT ROAD

BIKE / STORAGE

CAR SPACE 5

CAR SPACE 6

CAR SPACE 7

5.4 m TYPICAL

CAR SPACE 9 ADAPTABLE

CAR SPACE 10 ADAPTABLE

VISITOR BIKE

SERVICES

CAR SPACE 8

BULK STORE

OSD TANK
REFER TO CIVIL DRAWINGS FOR DETAILS

1:20

3A WARUNG ST

RL 10.50

RL 10.00

RL 9.50

RL 9.00

RL 8.77

RL 8.50

RL 8.16

RL 8.00

RL 7.98

RL 7.81

RL 7.55

RL 7.50

RL 7.00

RL 6.50

RL 6.36

EXISTING ROCK

NEW ENTRY TO BASEMENT AS PER PREVIOUS APPROVAL (DA379/21)

EXISTING ROCK

EXISTING BRICK WALL

CURVED MIRROR

HENRY LAWSON AVE

ISS	DATE	PURPOSE OF ISSUE
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PROJECT
Warung Street Apartments

1 Warung Street, McMahons Point NSW

DRAWING NO. DA-099
ISSUE A

JOB NO. HIG2307
SCALE 1 : 100@ A1
DATE 29.02.2024

DRAWING TITLE
BASEMENT LEVEL PLAN

DRAWN BY MS
CHECKED BY VS

1 **BASEMENT FLOOR PLAN**
1 : 100 @ A1

Document Set ID: 10156381
Version: 1, Version Date: 17/09/2024

1 **GROUND LEVEL FLOOR PLAN**
1 : 100 @ A1

Member Australian Institute of Architects

STATUS

PRELIMINARY

Do not scale drawings. Verify all dimensions on site.
This drawing is NOT SUITABLE for construction.

GRAPHIC SCALE

1:200 @ A3 0 2000 5000
1:100 @ A1

DRAWING NOTES

ISS	DATE	PURPOSE OF ISSUE
A	29.02.2024	ISSUE FOR DA
P3	15.02.2024	ISSUE TO CONSULTANTS
P2	11.01.2024	ISSUE TO ST CONSULTANT
P1	22.12.2023	ISSUE TO CONSULTANTS

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PROJECT
Warung Street Apartments

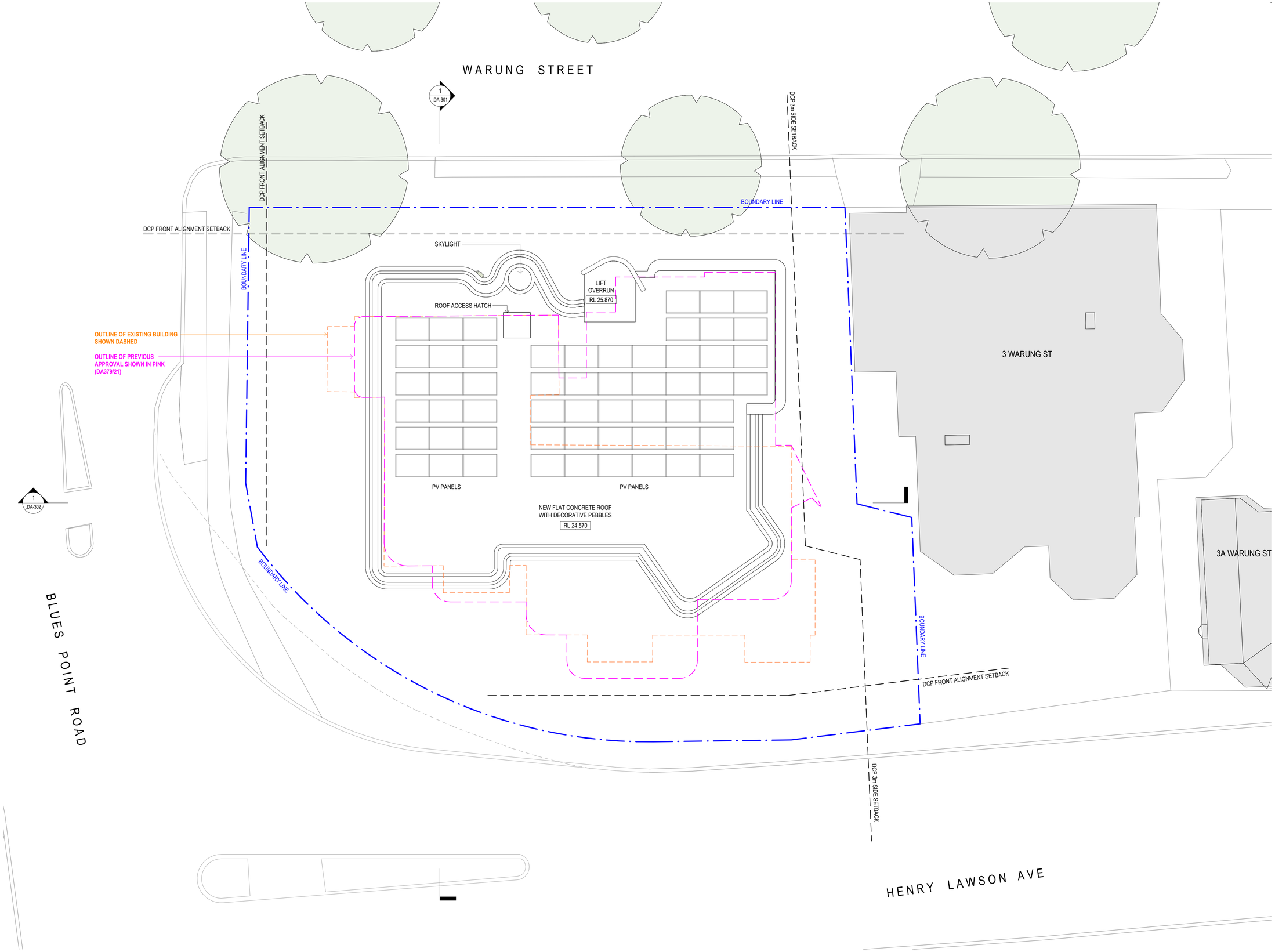
1 Warung Street, McMahons Point NSW

DRAWING NO. DA-100
ISSUE A

JOB NO. HIG2307
SCALE 1 : 100@ A1
DATE 29.02.2024

DRAWING TITLE
GROUND LEVEL PLAN

DRAWN BY MS
CHECKED BY VS



1 **ROOF FLOOR PLAN**
1 : 100 @ A1

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STATUS

PRELIMINARY

Do not scale drawings. Verify all dimensions on site.
This drawing is NOT SUITABLE for construction.

GRAPHIC SCALE

1:200 @ A3 / 1:100 @ A1 — 0 — 2000 — 5000

DRAWING NOTES

ISS	DATE	PURPOSE OF ISSUE
A	29.02.2024	ISSUE FOR DA
P3	15.02.2024	ISSUE TO CONSULTANTS
P2	11.01.2024	ISSUE TO ST CONSULTANT
P1	22.12.2023	ISSUE TO CONSULTANTS

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17219 (VIC), 3677 (QLD), AR1173 (NT)

PROJECT
Warung Street Apartments

1 Warung Street, McMahons Point NSW

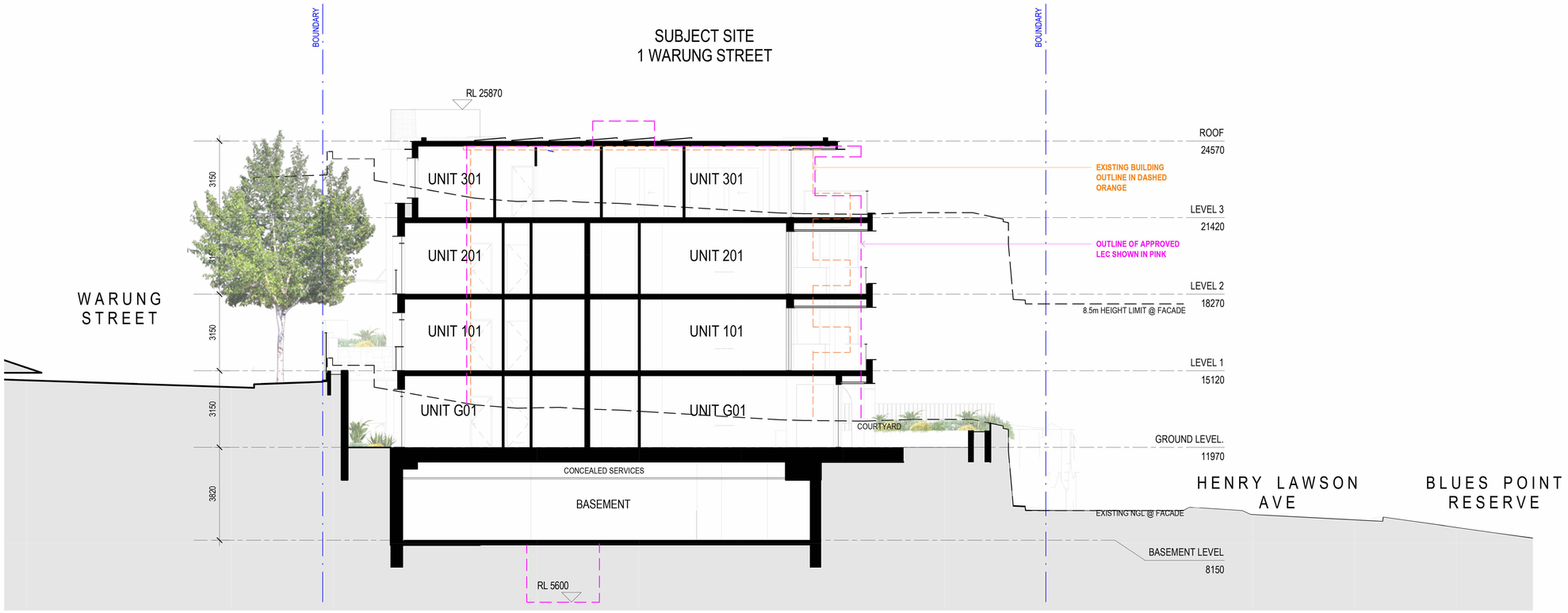
DRAWING NO. DA-104
ISSUE A

JOB NO. HIG2307
SCALE 1 : 100@ A1
DATE 29.02.2024

DRAWING TITLE
ROOF PLAN

DRAWN BY MS
CHECKED BY VS

Document Set ID: 10156381
Version: 1, Version Date: 17/09/2024



1 **DA SECTION 01**
1 : 100 @ A1

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STATUS

PRELIMINARY

Do not scale drawings. Verify all dimensions on site.
This drawing is NOT SUITABLE for construction.

GRAPHIC SCALE

1:200 @ A3 / 1:100 @ A1 — 0 2000 5000

DRAWING NOTES

ISS	DATE	PURPOSE OF ISSUE
A	29.02.2024	ISSUE FOR DA
P3	15.02.2024	ISSUE TO CONSULTANTS
P2	11.01.2024	ISSUE TO ST CONSULTANT
P1	22.12.2023	ISSUE TO CONSULTANTS

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NOMINATED ARCHITECT
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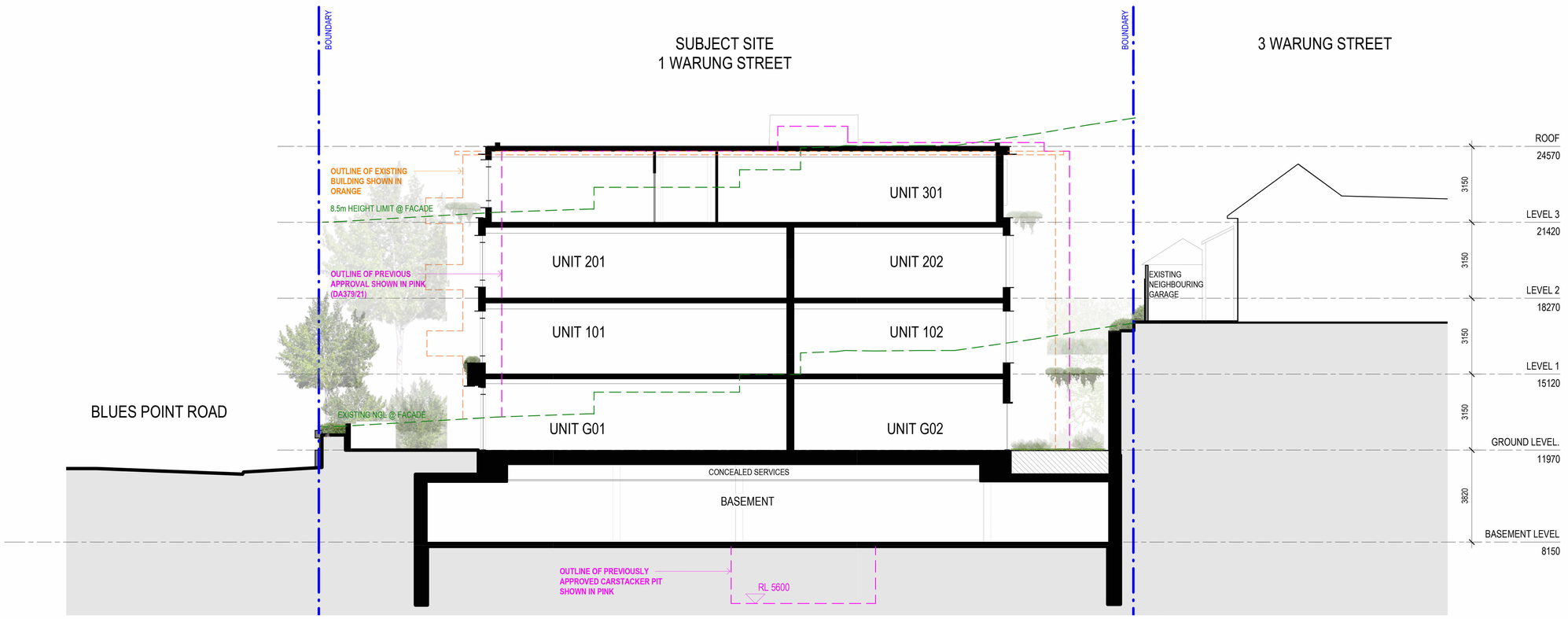
PROJECT
Warung Street Apartments

1 Warung Street, McMahons Point NSW

DRAWING NO. DA-301
ISSUE A
JOB NO. HIG2307
SCALE @ A1
DATE 29.02.2024

DRAWING TITLE
SECTIONS SHEET 1

DRAWN BY MS
CHECKED BY VS



1 **DA SECTION 02**
1 : 100 @ A1

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STATUS

PRELIMINARY

Do not scale drawings. Verify all dimensions on site.
This drawing is NOT SUITABLE for construction.

GRAPHIC SCALE

1:200 @ A3 / 1:100 @ A1 — 0 — 2000 — 5000

DRAWING NOTES

ISS	DATE	PURPOSE OF ISSUE
A	29.02.2024	ISSUE FOR DA
P3	15.02.2024	ISSUE TO CONSULTANTS
P2	11.01.2024	ISSUE TO ST CONSULTANT
P1	22.12.2023	ISSUE TO CONSULTANTS

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PROJECT
Warung Street Apartments

1 Warung Street, McMahons Point NSW

DRAWING NO.
DA-302

ISSUE
A

JOB NO.
HIG2307

SCALE
@ A1

DATE
29.02.2024

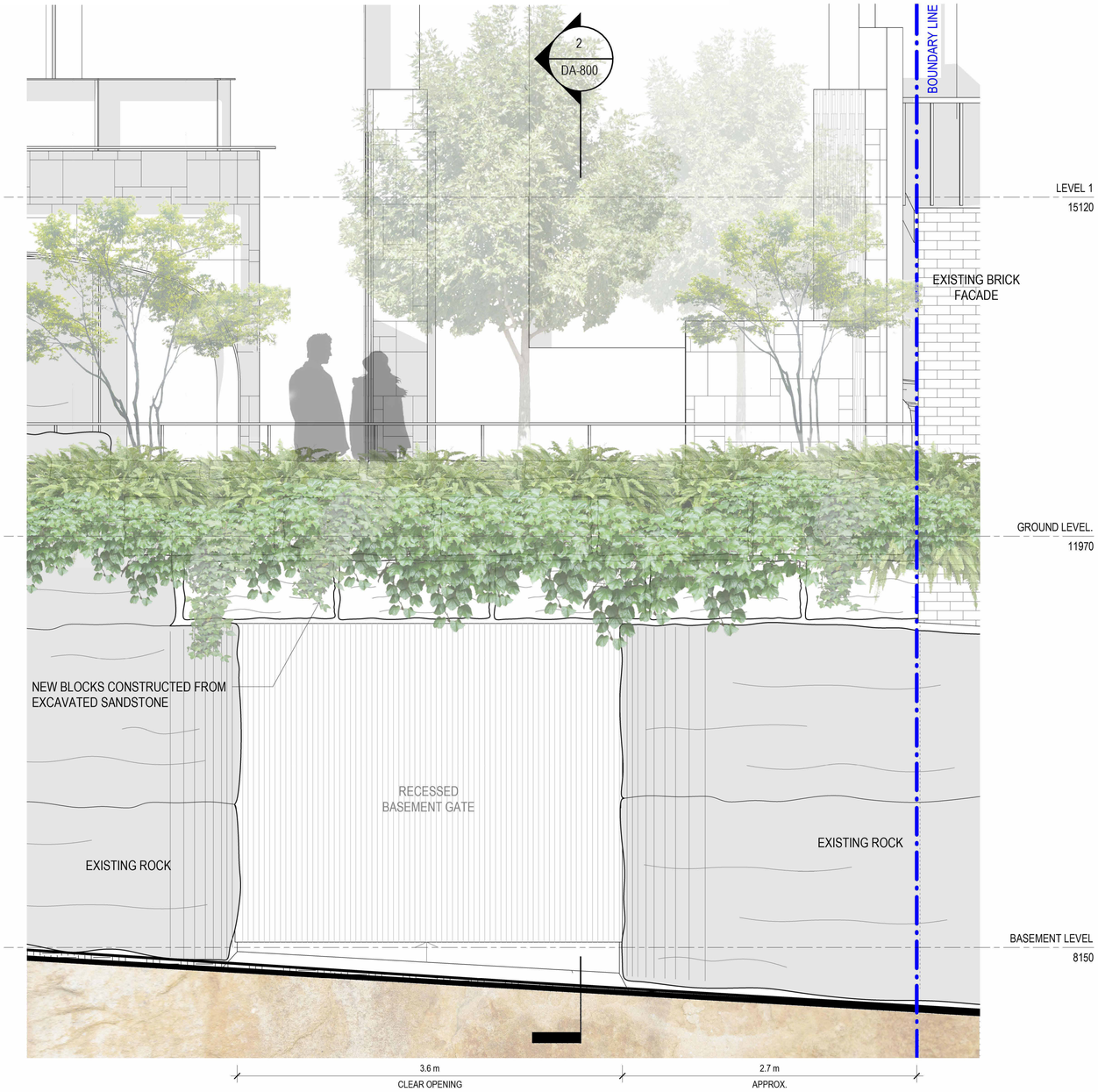
DRAWING TITLE
SECTIONS SHEET 2

DRAWN BY
MS

CHECKED BY
VS

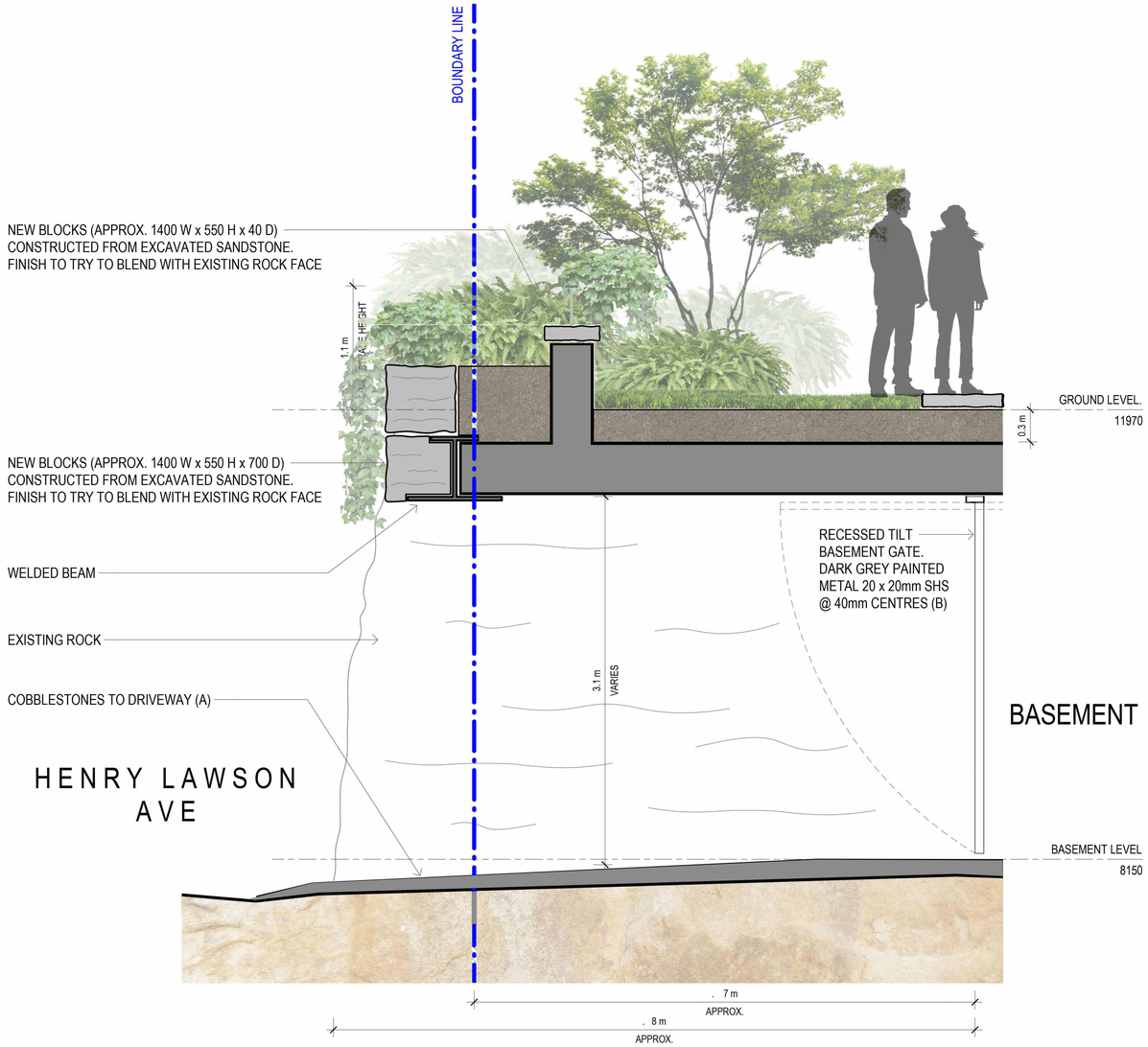
A. COBBLESTONE TILES TO BASEMENT DRIVEWAY

B. BASEMENT GATE. DARK WEATHERED BRONZE FINISH METAL 20 x 20mm SHS @ 40mm CENTRES



1 DA BASEMENT ENTRY ELEVATION

1 : 25 @ A1



2 DA BASEMENT ENTRY SECTION

1 : 25 @ A1

Member Australian Institute of Architects

STATUS

DEVELOPMENT APPLICATION

Do not scale drawing. Verify all dimensions on site. Report any discrepancies in documentation to architect. This drawing is for the purpose of council approval and as such, is not suitable for construction.

ISS	DATE	PURPOSE OF ISSUE
A	29.02.2024	ISSUE FOR DA
P2	15.02.2024	ISSUE TO CONSULTANTS
P1	22.12.2023	ISSUE TO CONSULTANTS

GRAPHIC SCALE

1:50 @ A3
1:25 @ A1
0 500 1000

DRAWING NOTES

PROJECT
Warung Street Apartments

1 Warung Street, McMahons Point NSW

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DRAWING NO. DA-800
ISSUE A
JOB NO. HIG2307

DRAWN BY	CHECKED BY	SCALE	DATE
MS	VS	AS SHOWN	29.02.2024

DRAWING TITLE
BASEMENT ENTRY DRAWING