
Report on Geotechnical Investigation

Newington Masterplan

**200-244 and 221-235 Stanmore Road,
Stanmore NSW**

**Prepared for Council of Newington
College**

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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

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The following general project overview is included in this report at the request of the project planner.

Introduction

Douglas Partners Pty Ltd has been commissioned by the Council of Newington College (the Applicant) to prepare this report in accordance with the technical requirements of the Secretary's Environmental Assessment Requirements (SEARs), and in support of the State Significant Development Application (SSD-78268465) for alterations and additions to the Newington College Senior Campus in Stanmore.

Description of the site and locality

The Newington College Senior Campus is located at 200-244 Stanmore Road, Stanmore and is bordered by Stanmore Road to the north, Newington Road to the south and College Lane to the west. The College boundary also includes the Concordia building to the north at 221-235 Stanmore Road. The main campus is legally described as Lot 8 in DP710369 and the Concordia site is legally described as Lot A in DP109269, Lot 1 in DP49, Lot B in DP330028, and Lot 1 in DP526319.

Key features of the site include:

- The main campus site is a regular shaped allotment with an area of 8.7ha. The Concordia site (and access handle to Cavendish Street), immediately north of the main campus is irregular in shape and is 2,903sqm in area.
- The topography of the main campus is a defining characteristic, particularly the grassed slope from the historic Founders Building down to Johnson Oval. The site has an overall fall of approximately 18m from the north-west corner to south-east corner.
- The at-grade car park adjacent to the Concordia building sits approximately 2.8m above the Stanmore Road street level, and is accessed via Cavendish Street (to the rear).
- The existing school buildings are largely located along the College Lane and Newington Road edges of the site. Existing buildings generally range from 2-4 storeys in scale. The balance of the site comprises at-grade car parking and sporting facilities, including sporting ovals and tennis courts.
- The Concordia building across Stanmore Road is a two-storey building with basement and car parking accessed from Stanmore Road. An at-grade car park is located within the eastern portion of this site, with vehicular access from a driveway to Cavendish Street (to the north).
- The site has a primary frontage to Stanmore Road (which accommodates both vehicular and pedestrian access to the site) and a secondary frontage to Newington Road, which is generally limited to pedestrian access and service vehicles.
- The area surrounding the site is predominantly zoned R2 Low Density Residential and includes a combination of single dwellings and residential flat building ranging from 1-3 storeys in height. Stanmore Train Station is located approximately 220m to the north. An existing pedestrian bridge and signalised traffic lights provide pedestrian access over Stanmore Road to Stanmore Train Station, further north.

The site is identified in the figure overleaf.



Source: Urbis 2024

Project Description

The SSDA seeks consent for staged alterations and additions to the Newington College Senior Campus comprising:

Concept Proposal for the provision of new and upgraded facilities, including:

- Building envelope for the redevelopment of Sevington Courts to accommodate recreational facilities and teaching spaces (refer to detailed Stage 1 Works below).
- Building envelope for alterations and additions to Centenary Hall and development of an adjoining, four storey teaching and learning facility (College Lane building). This development will accommodate a cafeteria and dining hall, lecture theatre, multi-purpose teaching spaces and additional pastoral spaces.
- Building envelope for the redevelopment of the Concordia building to accommodate a performance theatre, multi-purpose gallery and exam centre, new teaching spaces and basement car parking. The Concordia redevelopment includes a new pedestrian bridge across Stanmore Road to the main campus.
- Landscaping design strategy across the campus.
- Car parking provision and circulation arrangements.
- Increase of 368 students and 45 full-time equivalent (**FTE**) staff.

Detailed Stage 1 Works, including:

- Earthworks and the associated demolition of Sevington Courts.
- Construction, fit-out and operation of 3 storey building comprising multi-purpose indoor and rooftop courts, fitness centre, multi-purpose teaching spaces, amenities and basement car parking.
- Construction, fit-out and operation of 4 storey building comprising multi-purpose teaching spaces, administrative functions and amenities.
- Alterations to the existing driveway within the site to facilitate vehicle access to the new basement car park.
- Temporary car park during construction phase of Stage 1 Works.
- Tree removal and new landscaping adjacent to the Stage 1 development site.
- Increase of 368 students and 45 FTE staff.

Report on Geotechnical Investigation

Newington Masterplan

200-244 and 221-235 Stanmore Road, Stanmore NSW

1. Introduction

This report prepared by Douglas Partners Pty Ltd (Douglas) presents the results of a geotechnical investigation undertaken for the proposed alterations and additions to the Newington College Senior Campus at 200-244 and 221-235 Stanmore Road, Stanmore NSW. The investigation was commissioned by Ross Xenos of Council of Newington College and was undertaken in accordance with Douglas' proposal 234875.00.P.001.Rev0 dated 19/03/2025.

It is understood that the Concept Proposal and Detailed Stage 1 Development includes the proposed redevelopment of three sites (note the term 'site' in this report is used to describe each individual redevelopment area within the wider Newington College site) at Newington College, as follows:

- The "Concordia Redevelopment" site (Stage 6), north of the main Newington College campus, on the north side of Stanmore Road, which will generally involve demolition of the existing building and construction of a new four-storey school building with a theatre, over a single level basement carpark. This development is also understood to include a pedestrian bridge over Stanmore Road connecting the site with the wider campus;
- The "Sevington Courts" site (Stage 1) on the northeast edge of the main campus, on the south side of Stanmore Road, which will generally involve demolition of the existing tennis courts and surrounding pavements, and construction of two new three to four storey buildings, including a sports and fitness centre and multi-purpose teaching and administrative spaces, over a basement carpark; and,
- The "Centenary Hall" site (Stages 2 and 3) on the northwest edge of the main campus, on the southeast side of College Lane, which will generally involve demolition of an existing landscaped area, alterations to the existing Centenary Hall building, and construction of a new four-storey school building extension.

It is understood that the proposed redevelopments will also involve removal of demountable classrooms to the west of the Sevington Courts (Stage 5), and landscaping works along the Memorial Drive internal road running north-south through the main campus (Stage 4). These aspects of the redevelopment were not advised to Douglas prior to the time of the investigation field work and as such these areas were not targeted for investigation; however, the scope of proposed works at these project stages are understood to not involve any excavation or construction of new structures, so there is likely to be no requirement for detailed geotechnical advice to inform these stages of the redevelopment. One exception to this may be that if the Stage 4 landscaping works involve new pavements; in which case additional geotechnical advice may need to be sought in the future. Otherwise, Stages 4 and 5 of the proposed Masterplan are not discussed further in this report.

Note that the above comment regarding geotechnical advice not generally being expected to be required for the Stage 4 and 5 works does not apply to the south abutment/landing for the proposed pedestrian bridge forming part of the Stage 6 Concordia Redevelopment, which was

not investigated due to the location being inaccessible at the time – investigations will be required at a later date (as part of the detailed SSDA for Stage 6) to inform detailed design of foundations in this area as outlined in Section 8.16.

Reference should be made to the project architectural drawing *Masterplan – Staging Plan SSDA-00-1003 Revision 1* dated 1 August 2025 prepared by AJC Architects for an overview of the aforementioned project stages and their extents.

An overview of the three sites to which this report pertains is shown on Drawing 1 in Appendix B. The sites are individually shown in Drawings 2 to 4. It is noted the sites are referred to hereon in this report as the “Concordia”, “Sevington”, and “Centenary Hall” sites.

The aim of the investigation was to assess the subsurface soil and groundwater conditions across the sites to provide geotechnical inputs for the SSDA submission and further design development.

Specifically, of the required documentation under SEARs Item 12 (concept) and 17 (stage 1):

- This report addresses the requirement for a Geotechnical Assessment;
- Impacts to Groundwater and Surface water (where relevant) are discussed in this investigation report and this report may also satisfy the requirement for a Surface and Groundwater Impact Assessment as per the SEARs; however it is noted that further hydrogeological assessments and preparation of a dewatering management plan (DMP) is expected to be required for approval of the proposed basement excavations by the Department of Climate Change, Energy, the Environment and Water (DCCEE) and Water NSW. This is discussed further in Section 8.8. Note Douglas has prepared a report addressing this requirement (reference 234875.00.R.002.Rev1 dated 23 October 2025) with which this report should be read in conjunction.
- Salinity and Acid Sulfate Soils are assessed in this investigation report, but this report is not a Salinity Management Plan (SMP) or Acid Sulfate Soils Management Plan (ASSMP). Neither a SMP nor ASSMP are considered to be necessary for the proposed developments.

The investigation included the drilling of 16 boreholes across the three sites and laboratory testing of selected samples. The details of the field work are presented in this report, together with comments and recommendations on geotechnical issues considered pertinent to the proposed development.

Douglas completed a contamination preliminary site investigation (PSI) with limited sampling in parallel with the geotechnical investigation (reference: 234875.01.R.001.Rev1), which this report should be read in conjunction with.

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

2. Site description

The three sites are part of the wider Newington College Stanmore Campus, of which the sites are concentrated towards the northwest.

The sites are generally situated on the sides or crests of broad local hills and ridgelines, with surrounding site levels generally falling towards the south (and to the north of the Concordia Site). Site levelling and the construction of retaining walls have formed relatively flat areas on each site. Each site is described separately in detail below.

2.1 **Concordia Site**

The Concordia site is an irregular shaped area of approximately 2,900 m², bounded by Stanmore Road to the south, residential properties to the west and east, and residential properties then Cavendish Street to the north.

The site is currently occupied by a multi-storey office building with a single level carpark at approximately the same elevation as Stanmore Road at the west end of the site (approximately RL 37 m AHD), and an elevated on-grade carpark at the east end of the site at RL 38.3 m AHD, essentially splitting the site into two relatively flat areas.

The site is situated at the crest of a ridge, with surrounding surface levels falling away to the north and south of the site.

Stanmore Road generally falls gradually to the southeast, resulting in a maximum height difference of approximately 3 m between the raised on-grade carpark and the street, near the southeast corner of the site adjacent to Stanmore Road, supported by a tapered concrete and brick retaining wall along part of the southern and eastern site boundaries.

The lower carpark level is lower than the surrounding site levels to the north and west of the site, with retained heights of up to approximately 1.5 m.

It is noted that Stanmore Road is a classified NSW State Road and Transport for NSW asset.

2.2 **Sevington Site**

The Sevington site is a rectangular shaped area of approximately 3,600m², bounded by Stanmore Road to the north, and existing landscaped areas and on-grade pavements to the west, east, and south (on Newington College property).

The site is currently an outdoor tennis/basketball court and entry forecourt. The surface of the existing court is relatively flat at RL 31.8 m to 31.6 m; slightly above surrounding levels to the east and south, with a retaining wall up to a maximum height of approximately 1.5 m running along the south and east boundaries of the court. The forecourt area surface level in the west of the site is at approximately RL 34 m AHD and the surface level in the carpark area southeast of the court falls towards the southeast, to a minimum level of approximately RL 30 m AHD.

Along the north and west boundaries of the court, the surrounding surface levels are in the range of 1.2 m to 2 m higher than the court, with existing retaining walls of the same heights running along these boundaries.

At the northern edge of the site, there is a stairway and landing for an existing concrete pedestrian footbridge over Stanmore Road.

2.3 Centenary Hall Site

The Centenary Hall site is an L-shaped area of approximately 2,000 m², bounded by College Lane then residential properties to the west, other school buildings on Newington College property to the north and south, and an internal road and oval to the east.

The site is currently occupied by the existing Centenary Hall building, Chapel building, and outdoor landscaped areas.

Site levels fall towards the southeast, from between approximately RL 33 m and 34 m along the western site boundary adjacent to College Lane, to between approximately RL 29.5 m and RL 30 m along the eastern site boundary at the internal road. Most of the fall occurs in the western half of the site over a series of stairs and timber, brick and sandstone retaining walls in the landscaped area, or at the western external wall of the existing Centenary Hall building.

3. Published data

3.1 Geology

Reference to the Sydney 1:100 000 Series Geological Sheet indicates that the site broadly is underlain by Ashfield Shale of the Wianamatta Group, typically comprising black to light grey shale, siltstone and laminite.

3.2 Soil Landscape

Reference to Sydney 1:100 000 Soils Landscape Sheet indicates that the site is located within the Blacktown landscape area, typically characterised by moderately to highly plastic and relatively impermeable residual soils derived from Wianamatta Group shales, forming broad round crested hills and ridges with gently inclined slopes (usually <5% grade).

3.3 Acid Sulfate Soil

Reference to the published national mapping indicates that the site is located within an area mapped as having “extremely low probability of occurrence” of acid sulfate soil (ASS).

Reference to regional ASS Risk mapping indicates that the site is located within an area mapped as “no known occurrence of acid sulphate soils”.

Acid sulfate soils mostly occur in low-lying marine depositional environments, typically below RL 5 m AHD and rarely above RL 10 m AHD; and are not likely to be present at this site.

No signs of ASS were observed during the investigation.

3.4 Salinity

Reference to NSW DCCEE Hydrogeological Landscapes of NSW and the ACT mapping indicates that the site is in a region mapped as having a “Very High Overall Salinity Hazard”.

It is noted that the salinity mapping generally lumps Wiannamatta Group Shales (and soils derived from them) together as high risk, and while Bringelly Shale is typically associated with a high salinity hazard, this is usually not the case for soils derived from Ashfield Shale. This notwithstanding, salinity has been assessed as part of the investigation and is discussed further in Section 8.12.

3.5 Surface Water and Groundwater

Surface water runoff from the site is expected to follow the general regional topography and drain into the local stormwater system. As the sites are situated on local crests or hillsides, the surface water is likely to eventually drain either to Johnstons Creek (from the Concordia site), which is approximately 900 m north of the site, or to the Cooks River (all sites), which is approximately 3 km south of the site.

Likewise, groundwater is also anticipated to follow the regional topography, either to the north to Johnstons Creek or to the southeast towards the Cooks River.

A search of the publicly available registered groundwater bore database indicated that there are three registered groundwater bores within 1 km of the site. The three groundwater bores from within 1 km of the site are summarised in Table 1 below.

Table 1: Summary of available information from nearby registered groundwater bores

Bore ID	Authorised purpose	Completion year	Status	Location relative to site	Final depth (m)	Standing water level (m bgl)
GW111687	Monitoring	2012	Active	770 m southwest (downgradient)	4.25	2.5
GW111686	Monitoring	2012	Active	780 m southwest (downgradient)	3.50	1.55
GW111692	Monitoring	2012	Active	1 km southwest (downgradient)	1.30	0.5

Given the local geology (i.e., Ashfield Shale), the groundwater in the fractured rock beneath the site is anticipated to be saline and very low yield. Accordingly, there is not expected to be any significant potential beneficial uses of the shallow groundwater.

4. Historical Investigation Data

Douglas completed investigations on the Concordia site in 2005, including drilling of cored boreholes to depths of between 7.3 m and 9.8 m (generally to termination depths approximately between RL 28.5 m AHD and RL 30 m AHD). The results of these investigations have been considered in the preparation of this geotechnical investigation report, and are presented in Appendix E.

5. Field work

5.1 Field work methods

The field work for the current investigation included:

- Drilling of 13 boreholes (BH1 and BH5 to BH16) using a tracked or bobcat mounted drilling rig, or hand-portable drilling equipment (BH10 only);
 - o The boreholes were drilled through soil and weathered rock to depths of between 2.12 m and 8.11 m using a combination of diatube coring, hand auger, continuous solid flight augers and rotary wash bore methods;
 - o A dynamic cone penetrometer (DCP) test was completed to 1.35 m in the upper soil profile at BH1, and Standard Penetration Tests (SPTs) were completed at selected intervals through the soil and weathered rock profiles in the other boreholes to obtain samples and investigate the consistency of the encountered soils;
 - o The boreholes were then continued to depths of between 10.21 m and 13.3 m using NMLC diamond core drilling methods to obtain continuous core samples of the bedrock;
 - o It is noted that BH13 (at the Sevington site) was terminated at shallow depth and abandoned due to difficulties progressing the borehole through variable fill. BH13 is excluded from the depth ranges noted above;
- On completion of the borehole drilling, installation of four (4) groundwater monitoring wells in BH1, BH6, BH15 and BH16 to allow for the measurement of groundwater levels, which were developed (purged) following installation;
 - o The groundwater levels in the new monitoring wells were measured manually several weeks after development, rising or falling head permeability tests were completed in the wells, and data loggers were installed for long-term monitoring of groundwater level fluctuations;
- Supervision of the drilling by a geotechnical engineer, who logged the encountered subsurface conditions and collected samples for subsequent laboratory testing;
- Laboratory testing of selected samples for:
 - o Aggressivity to buried steel and concrete (pH, electrical conductivity, sulfate and chloride ion content);
 - o California Bearing Ratio (CBR);
 - o Atterberg Limits and Linear Shrinkage;
 - o Salinity (textural class, exchangeable sodium percentage, Emerson class).

Three shallow boreholes (BH2 to BH4) were also completed using hand-tools as part of the parallel contamination investigation.

Except for BH1, the borehole locations (in GDA2020 MGA Zone 56) and elevations (relative to Australian Height Datum, AHD), were recorded using a differential GPS with a stated accuracy of ± 0.1 m in the vertical and horizontal directions. As BH1 was drilled indoors and no satellite fix can be achieved, the location and elevation of this borehole were measured relative to site features and estimated from a survey plan respectively.

The borehole locations at the Concordia, Sevington and Centenary Hall sites are shown on Drawing 2, Drawing 3, and Drawing 4, respectively, in Appendix B.

5.2 Field work results

Details of the subsurface conditions encountered are presented in the borehole logs in Appendix C, with colour photographs of the recovered rock cores. Notes defining classification methods and descriptive terms used in preparation of the logs are included in Appendix A.

Generally, across all three sites, the subsurface profile comprised varying depths of fill overlying residual clay grading into weathered rock which generally becomes less weathered and higher strength with increasing depth. Generalised subsurface profiles from each site are provided below.

5.2.1 Concordia Site Subsurface Profile

The subsurface conditions encountered at the Concordia site, in BH1-BH4, can generally be described as follows:

FILL: Pavements, comprising a 130 mm thick concrete slab in the west (lower) part of the site, or a 50 mm thick surficial asphalt layer over gravelly sand road base material to 0.3 m depth in the east (upper) part of the site.

In the west of the site, the concrete slab overlies a thin layer of variable fill (gravelly sand in BH01 or sandy clay in BH02), encountered to depths of between 0.23 m and 0.25 m.

In the east of the site, the pavement overlies sand fill with traces of concrete, brick, tile and terracotta fragments (building rubble) to between 1.5 m and 1.7 m depth, then overlying sandy clay fill with traces similar building rubble materials to depths of between 1.7 m (BH4) and 2.8 m (BH3); overlying,

RESIDUAL CLAY: Medium to high plasticity, red-brown and grey, very stiff, residual clay. BH2-4 terminated in this material. In BH1, residual clay was encountered to approximately 5.6 m (noting that the drilling method makes the gradual transition from residual clay to extremely weathered shale difficult to accurately delineate); overlying,

SHALE: Encountered in BH1, initially extremely weathered Ashfield Shale (hard clay with very low to medium strength siltstone and iron indurated bands), generally grading into less weathered siltstone over the upper several metres, increasing to very low strength at approximately 7 m depth, to generally low and medium strength below 9.5 m depth.

It is noted that a piece of asbestos containing material (confirmed by laboratory testing) was encountered in BH01 below the lower-level carpark slab. Reference should be made to Douglas' PSI report for further information.

5.2.2 Sevington Site Subsurface Profile

The subsurface conditions encountered at the Sevington site, in BH11-BH16, can generally be described as follows:

FILL: Pavements generally comprising pavers, concrete slabs, asphalt and granular road base materials to total depths of up to 0.5 m, overlying variable fill materials including clay, sandy clay, silty sand and clayey sand, with varied proportions of minor components including igneous gravel, tile fragments and rootlets; to depths of between 0.7 m and 2.3 m (generally maximum in the west, at BH11 and BH12); overlying,

RESIDUAL CLAY: Medium to high plasticity, generally red-brown and grey, residual clay. The residual clay is generally firm or stiff, becoming very stiff to hard with increasing depth, encountered to depths of between approximately 4 m and 5.5 m; overlying,

SHALE: Initially extremely weathered Ashfield Shale (hard clay with very low to medium strength siltstone and iron indurated bands), generally grading into less weathered siltstone over the upper several metres, increasing to very low strength at approximate depths between 7 m and 8 m, to generally low to medium strength at approximate depths between 8.4 m and 9.8 m. Below between 9.4 m and 11 m, the rock is generally fresh and medium to high strength, with an increased proportion of sandstone laminations (in some cases grading into “laminite”, or interlaminated siltstone and sandstone in roughly equal proportions).

5.2.3 Centenary Hall Site Subsurface Profile

The subsurface conditions encountered at the Centenary Hall site, in BH5-BH10, can generally be described as follows (noting that BH5 and BH6 are outside the site):

FILL: Pavements, where present, generally comprising either (at BH7, BH8 and BH9) a thin surficial asphalt layer (50 mm to 80 mm) or (at BH10) concrete pavers, over gravel or sand to a maximum depth of 0.4 m, overlying clay or sandy clay fill with varying minor proportions of igneous, sandstone and ironstone gravel, rootlets, and brick or plastic fragments, to depths of between 0.3 m and 2.4 m.

In BH8 only, from 2.4 m to 3.5 m depth, very soft to soft dark grey medium to high plasticity clay was encountered, which may be localised alluvial material, or possibly fill.

The above generally overlies,

RESIDUAL CLAY: Medium to high plasticity, generally red-brown, orange and grey, residual clay. The residual clay is generally firm or stiff, becoming very stiff to hard with increasing depth, encountered to depths of between approximately 1.6 m and 5.5 m; overlying,

SHALE: Initially extremely weathered Ashfield Shale (hard clay with very low to medium strength siltstone and iron indurated bands), generally grading into less weathered siltstone over the upper 3 m to 6 m of the weathered shale profile, increasing to very low strength at approximate depths between 4.5 m and 7.6 m, to generally low to medium strength at approximate depths between 6.8 m and 11.6 m. Below between 8 m and 12.1 m, the rock is generally fresh and medium to high strength, with an increased proportion of sandstone laminations (in some cases grading into “laminite”, i.e., siltstone and sandstone interlaminated in roughly equal proportions).

5.2.4 Groundwater

Excluding seepage in fill observed in BH11, interpreted to be associated with flow through a subsoil drain behind a retaining wall, no free groundwater was observed during auger drilling of any of the boreholes.

Following installation of the monitoring wells, several discrete measurements of groundwater levels have been made in BH1, BH6, BH15 and BH16. Groundwater observations to-date are summarised in Table 2.

Table 2: Summary of Discrete Groundwater Observations

Location		Date	Observation Type	Groundwater Depth (m bgl)	Groundwater Elevation (m AHD)
Concordia Site	BH1	29 April 2025	Water level in well	1.47	35.53
	BH1	21 May 2025	Water level in well	1.33	35.67
	BH1	29 May 2025	Water level in well	1.23	35.77
	BH1	1 Sept 2025	Water level in well	1.30	35.70
Centenary Hall Site	BH6	29 April 2025	Water level in well	3.93	29.47
	BH6	21 May 2025	Water level in well	3.79	29.61
	BH6	29 May 2025	Water level in well	3.65	29.75
	BH6	1 Sept 2025	Water level in well	3.51	29.89
Sevington Site	BH11	9 April 2025	Seepage in borehole	1.8	31.2
	BH15	29 April 2025	Water level in well	3.07	25.83
	BH15	21 May 2025	Water level in well	3.04	25.86
	BH15	29 May 2025	Water level in well	2.94	25.96
	BH15	1 Sept 2025	Water level in well	2.98	25.92
	BH16	21 May 2025	Water level in well	1.79	27.81
	BH16	30 May 2025	Water level in well	1.67	27.93
	BH16	1 Sept 2025	Water level in well	1.78	27.82

Rising or falling head tests were completed in the monitoring wells in BH1, BH6, BH15 and BH16 to assess the hydraulic conductivity of the subsurface materials. The results of the tests are summarised in Table 3, and included in Appendix C.

Table 3: Summary of Hydraulic Conductivity Test Results

Location	Test Type	Screen Interval (m bgl)	Screen Material	Estimated Hydraulic Conductivity (m/s)
BH1	Falling Head	8.05-11.7	LAMINITE	1.4×10^{-6}
BH6	Falling Head	5.4-12.1	CLAY and LAMINITE	1.7×10^{-6}
BH15	Falling Head	6.3-12.8	CLAY and LAMINITE	4.1×10^{-6}
BH16	Rising Head	1.5-4.0	CLAY	3.9×10^{-8}

Following completion of hydraulic conductivity testing, data loggers were installed in the monitoring wells to regularly measure groundwater levels over a period of approximately three months between late May and early September 2025. The results of the groundwater monitoring are included in Appendix C and summarised in Table 4. The attached groundwater monitoring results show the recorded groundwater levels together with rainfall measured at weather station 066036 at Marrickville Golf Club (ref: www.bom.gov.au) over the monitoring period.

Table 4: Groundwater Monitoring Result Summary

Monitoring Well Location	Surface RL (m AHD)	Minimum Recorded Groundwater RL (m AHD)	Maximum Recorded Groundwater RL (m AHD)	Range (m)
BH 01	37.00	35.44 28/06/25	35.88 23/08/25	0.44
BH 06	33.40	29.39 28/06/25	30.01 28/08/25	0.62
BH 15	28.90	25.51 01/07/25	26.07 28/08/25	0.56
BH 16	29.60	27.61 27/06/2025	28.06 27/08/25	0.45

It is noted that groundwater levels are transient and may fluctuate over time in response to seasonal or climatic variations or be influenced by other works in the future.

6. Laboratory testing

Following completion of the investigation field work, laboratory testing was undertaken on selected samples for the following:

- Aggressivity to buried steel and concrete (pH, electrical conductivity, sulfate and chloride ion content);
- California Bearing Ratio (CBR);
- Atterberg Limits and Linear Shrinkage;
- Salinity (textural class, exchangeable sodium percentage, Emerson class).

The laboratory results are summarised in Table 5 to Table 9 below. The detailed laboratory result certificates of analysis are included in Appendix D. Note in all cases except where noted otherwise, CLAY in these tables refers to residual clay or clay derived from extremely weathered rock.

Table 5: Summary of Plasticity Laboratory Results

Location	Material	Depth (m)	LL (%)	PL (%)	PI (%)	LS (%)	FMC (%)
BH1	CLAY	0.25-0.35	53	19	34	15.0	22.0
BH6	CLAY	2.5-2.95	33	22	11	8.0	14.1
BH9	CLAY	1.0-1.45	55	25	30	13.5	25.4
BH12	CLAY	2.5-2.95	68	28	40	16.5	24.9
BH14	CLAY	0.8-1.0	59	25	34	14.5	26.4
BH15	CLAY	0.8-1.0	60	26	34	15.0	33.2

Notes: LL=Liquid Limit, PL=Plastic Limit, PI=Plasticity Index, LS=Linear Shrinkage, FMC=Field Moisture Content

Table 6: Summary of CBR Laboratory Results

Location	Material	Depth (m)	CBR (%)	SMDD (t/m ³)	Swell (%)
BH1	FILL / Gravelly SAND	0.15-0.25	50	2.02	0.0
BH8	FILL / CLAY	1.0-2.3	5.0	1.54	1.0
BH15	CLAY	0.7-1.5	3.5	1.68	2.5
BH16	CLAY	1.5-2.0	8.0	1.67	0.5

Notes: CBR=California Bearing Ratio, SMDD=Standard Maximum Dry Density

Table 7: Summary of Aggressivity Laboratory Results

Location	Material	Depth (m)	EC (μS/cm)	pH	Cl (ppm)	SO ₄ (ppm)
BH1	CLAY	2.4-2.5	100	4.8	<10	200
BH3	FILL / SAND	1.5-1.7	110	8.5	<10	59
BH5	CLAY	1.3-1.5	78	4.9	<10	130
BH7	CLAY	0.8-1.0	260	4.9	56	410
BH11	CLAY	4.0-4.45	77	5.6	34	57
BH15	FILL / Sandy CLAY	0.4-0.5	75	6.4	<10	48

Notes: EC=electrical conductivity, Cl=chloride content, SO₄=sulfate content, ppm=parts per million

Table 8: Summary of Salinity Laboratory Results

Location	Material	Depth (m)	ESP (%)	ECe (dS/m)	Salinity
BH1	CLAY	2.4-2.5	4	<2	Non-saline
BH7	CLAY	0.8-1.0	24	2.1	Slightly saline
BH8	CLAY*	2.5-2.95	14	<2	Non-saline
BH11	CLAY	4.0-4.45	26	<2	Non-saline
BH16	CLAY	2.5-2.95	14	2.5	Slightly saline

Notes: ESP=Exchangeable Sodium Percentage, ECe=saturated extract electrical conductivity

*Possibly alluvial, possibly fill

Table 9: Summary of Dispersion Laboratory Results

Location	Material	Depth (m)	Emerson Class No.	Dispersion
BH1	CLAY	2.4-2.5	6	Flocculation in suspension
BH7	CLAY	0.8-1.0	5	Dispersion in suspension
BH8	CLAY*	2.5-2.95	3b	Moderate to slight
BH11	CLAY	4-4.45	1	Complete
BH16	CLAY	2.5-2.95	5	Dispersion in suspension

Notes: *Possibly alluvial, possibly fill

7. Proposed development

It is understood that the Concept Proposal and Detailed Stage 1 development involves alterations and additions to the Newington College senior school campus.

7.1 Concordia Site

It is understood that the “Concordia Redevelopment”, north of the main Newington College campus, on the north side of Stanmore Road, will generally involve demolition of the existing building on the site and construction of a new four-storey school building with a theatre, over a single level basement carpark. This development is also understood to include a pedestrian bridge over Stanmore Road connecting the site with the wider campus.

The structural engineer has advised preliminary column loads for the proposed building are in the order of 5,500 kN.

The proposed basement carpark finished floor level (FFL) is at approximately RL 35.4 m AHD. Assuming a bulk excavation/earthworks level (BEL) nominally 0.3 m below the FFL puts the BEL at RL 35.1 m AHD, approximately 1.9 m below the existing lower carpark slab level and approximately 3.2 m below the existing upper outdoor carpark pavement level. It is noted that the existing lower carpark level is already up to approximately 1.5 m below existing surface levels on adjacent sites to the west and north (with existing retaining walls), such that the proposed basement level is a maximum of 3 m to 3.5 m below surface levels on adjacent sites in the northwest of the site.

Construction of the proposed basement carpark will likely require bulk excavation to maximum depths of up to approximately 3.2 m below existing surface levels on the site, including excavation in proximity to residential properties to the north and east of the site forming maximum height differences of 3 m to 3.5 m between the sites, and to a maximum depth of approximately 1.9 m below Stanmore Road on the southwest of the site.

7.2 Sevington Site

It is understood that the “Sevington Courts” redevelopment on the northeast edge of the main campus, on the south side of Stanmore Road, will generally involve demolition of the existing tennis courts and surrounding pavements, and construction of two new three to four storey buildings, including a sports and fitness centre and multi-purpose teaching and administrative spaces, over a basement carpark.

The structural engineer has advised preliminary column loads for the proposed building are in the order of 2,500 kN to 3,500 kN.

The proposed basement carpark FFL is at approximately RL 26.3 m AHD. Again assuming a BEL nominally 0.3 m below the FFL puts the BEL at RL 26 m AHD, which is approximately 5.7 m below the existing court level and a maximum of approximately 7.5 m to 8 m below the existing paved area to the west of the courts and Stanmore Road to the north (decreasing to approximately 6.5 m to 7 m below Stanmore Road at the east end of the basement).

Construction of the proposed basement carpark will likely require bulk excavation to depths of up to a maximum of approximately 8 m below existing surface levels.

7.3 Centenary Hall Site

It is understood that the “Centenary Hall” site on the northwest edge of the main campus, on the southeast side of College Lane, will generally involve demolition of an existing landscaped area, alterations to the existing Centenary Hall building, and construction of a new four-storey school building extension.

The structural engineer has advised preliminary column loads for the proposed building are in the order of 3,000 kN.

The proposed ground floor FFL is at approximately RL 30.65 m, which is generally similar to existing surface levels across most of the site, except in the landscaped area in the north of the site, where a nominal BEL of RL 30.3 m AHD would be a maximum of approximately 3.5 m to 4 m below existing surface levels in the landscaped area and on College Lane.

Construction of the proposed development will likely require bulk excavation to depths of up to a maximum of approximately 4 m below existing surface levels, locally in the north of the Centenary Hall site, and adjacent to College Lane.

8. Comments

8.1 Geotechnical Model

The sites are all generally characterised by a relatively deep residual soil and extremely weathered rock profile, grading into less weathered higher strength Ashfield Shale with increasing depth. The subsurface profile approximately follows regional topography, with the top of rock elevation typically gradually falling in the downhill direction (generally south or southeast, except at the north edge of the Concordia site which is on the crest of a ridge).

The encountered subsurface materials across all three sites have been grouped into six geotechnical units (Unit 1 to Unit 6) as follows:

UNIT 1: FILL:	Including all existing pavements and variable fill materials encountered during the investigation. The fill is considered uncontrolled.
UNIT 2: RESIDUAL CLAY:	Firm, stiff or very stiff; grey mottled red and orange, residual clay.
UNIT 3: EXTREMELY WEATHERED SHALE:	Hard; typically red and grey, clay with very low to medium strength siltstone and ironstone bands, with Ashfield Shale rock fabric evident.
UNIT 4: VERY LOW TO LOW STRENGTH SHALE	Very low and low strength, highly weathered, highly to moderately fractured, dark grey and brown siltstone.
UNIT 5: LOW TO MEDIUM STRENGTH SHALE	Low and medium strength, moderately weathered, moderately to slightly fractured, dark grey siltstone with some sandstone laminations.
UNIT 6: MEDIUM TO HIGH STRENGTH SHALE	Medium and high strength, slightly weathered to fresh, slightly fractured, dark grey siltstone often interlaminated with pale grey fine-grained sandstone in roughly equal proportions (i.e., laminite).

The rock cores encountered numerous joints and fractures typically ranging from 20° to near vertical, with jointing distributed fairly uniformly with respect to depth and between boreholes, with the exception of BH10, in which a significantly greater degree of jointing was encountered than in other boreholes, together with rotated bedding and relative displacements on discontinuities; which together may be evidence of local shearing or faulting in the rock.

The distribution of the geotechnical units across the sites are summarised in six cross-sections (A-A', B-B', C-C', D-D', E-E' and F-F'), showing the interpreted subsurface profile between boreholes, as shown on Drawings 5 to 10 in Appendix B. The sections show the interpreted geotechnical divisions of the underlying soil and rock together with the approximate current ground surface level, and approximate proposed bulk excavation or earthworks levels on each site.

It should be noted that the boundaries shown on the section are accurate at the borehole locations only, and layers/levels shown diagrammatically on the drawings are based on inferred boundaries between strata with different engineering properties. Reference should be made to the borehole logs for more detailed information and descriptions of the soil and rock.

8.2 Dilapidation Surveys

Dilapidation surveys should be carried out on adjacent existing buildings, pavements and infrastructure that may be affected by the proposed excavation works. The dilapidation surveys should be undertaken before the commencement of any excavation works in order to document any existing defects so that claims for damage due to construction related activities can be accurately assessed.

8.3 Excavation Conditions

The proposed bulk excavation works on all three sites are expected to extend through fill, residual clay, and extremely weathered shale (Units 1-3). Some minor localised bulk excavation into very low to low strength shale may be required, and generally bulk excavation into low, medium and high strength shale is not expected to be required to reach the proposed bulk excavation levels.

Topsoil, fill, residual clay and extremely weathered shale should be readily excavated using conventional earthmoving equipment (e.g., hydraulic excavators), particularly if buckets are fitted with 'rock teeth'. Some allowance should however be made for the presence of very low to medium strength rock bands within the extremely weathered profile, practical excavation of which may require the assistance of ripping tyres or hydraulic rock hammers (fitted to excavators), or ripping using large bulldozers.

Detailed excavation for shallow footings at bulk level (if adopted) should generally be achievable using the same methods as above.

Although bulk excavation into less weathered slightly fractured medium and high strength rock is not expected to be required, it is noted that this material may prove effectively 'un-rippable' and would require hydraulic rock hammers and / or rock saws / grinders for effective excavation (particularly for the high strength, slightly fractured rock). Relatively slow production rates in such material would be expected.

The excavation rates that can be achieved will be dependent on the type of machinery being used and the skill of the operator. It is suggested that bulk excavation tenderers be required to make their own assessment of the equipment required to carry out the work. Contractors may inspect the rock core samples at the DP office in West Ryde prior to submitting final tenders (rock cores are generally kept for 6 months after drilling unless longer holding times are requested).

8.4 Vibrations

During demolition, excavation and earthworks, it will be necessary to use appropriate methods and equipment to keep ground vibrations at adjacent buildings and structures within acceptable limits; noting that the excavations through clay and extremely weathered rock are not expected to generate significant vibrations. The level of acceptable vibration is dependent on various factors including the type of structure (e.g. reinforced concrete or brick structures, etc.), its

structural condition, the frequency range of vibrations produced by the construction equipment, the natural frequency of the structure and the vibration transmitting medium.

Ground vibration can be strongly perceptible to humans at levels above 2.5 mm/s vector sum peak particle velocity (VSPPV). This is generally much lower than the vibration levels required to cause structural damage to buildings. The Australian Standard AS2670.2-1990 "Evaluation of human exposure to whole-body vibrations – continuous and shock induced vibrations in buildings (1-80 Hz)" indicates an acceptable day time limit of 8 mm/s VSPPV for human comfort.

Based on the experience of DP and with reference to AS2670, it is suggested that a maximum VSPPV of 8 mm/s (applicable at the foundation level of existing nearby buildings) be adopted for this site for both architectural and human comfort considerations.

As the magnitude of vibration transmission is site specific, it is recommended that a vibration trial be undertaken at the commencement of excavation. The trial may indicate that smaller or different types of excavation equipment should be used for bulk (or detailed) excavation purposes.

8.5 Disposal of Excavated Material

All excavated materials will need to be disposed of in accordance with the provisions of the current legislation and guidelines including the *Waste Classification Guidelines* (EPA, 2014). This includes filling and natural materials that may be removed from the site. Reference should be made to the preliminary in-situ waste classification provided in the PSI report for the site (reference: 234875.01.R.001.Rev0).

8.6 Excavation Support

The proposed excavations will require both temporary and permanent lateral support during and after excavation.

8.6.1 Batter Slopes

Suggested temporary and permanent batter slopes for unsupported excavations up to a maximum height of 4 m are shown in Table 10. If taller batters are required, or if surcharge loads are applied near the crest of the slope, then further specific geotechnical review and probably flatter batters, intermediate benches or stabilisation using rock bolts or soil nails may be required. Batters are not recommended near existing buildings or services.

Table 10: Recommended Batters for Exposed Material

Material	Maximum Temporary Batter Slope (H : V)	Maximum Permanent Batter Slope (H : V)
UNIT 1: FILL	1.5 : 1	2.5 : 1**
UNIT 2: RESIDUAL CLAY	1 : 1	2 : 1**
UNIT 3: EXTREMELY WEATHERED SHALES		
UNIT 4: VERY LOW TO LOW STRENGTH SHALES	0.75 : 1*	1 : 1*
UNIT 5: LOW TO MEDIUM STRENGTH SHALES		
UNIT 6: MEDIUM TO HIGH STRENGTH SHALES		

Note: * Subject to jointing assessment by experienced Geotechnical Engineer/Engineering Geologist

** Permanent batters in soil may need to be reduced to 3H:1V to facilitate maintenance of landscaped areas, if required

Any permanent batters will require face protection in the form of vegetation, geofabric or shotcrete; and careful detailing of drainage behind the crest, to reduce erosion due to surface runoff over the crest.

8.6.2 Retaining Walls

Where neither temporary nor permanent batter slopes can be used, shoring walls will be required to support the proposed excavations prior to commencing excavation. Anchored soldier pile walls are often used to provide temporary retaining support to soils and weathered rock.

Cantilevered pile walls should not be used where there are adjacent structures or infrastructure within a distance equal to the height of the excavation from the shoring wall. This is due to their (i.e., cantilevered shoring walls) greater propensity for outward rotation and the consequently higher risk of disturbing or damaging adjacent structures or infrastructure.

It is suggested that preliminary design of cantilevered shoring systems or shoring with one row of anchors/ propping be based on a triangular earth pressure distribution using the earth pressure coefficients provided in Table 11. 'Active' earth pressure coefficient (K_a) values may be used where some wall movement is acceptable, and 'at rest' earth pressure (K_0) values should be used where the wall movement needs to be reduced (i.e. adjacent to existing structures or utilities).

Table 11: Recommended Design Parameters for Shoring Systems

Material	Unit Weight (kN/m ³)	Earth Pressure Coefficient		Effective Cohesion c' (kPa)	Effective Friction Angle (Degrees)
		Active (K _a)	At Rest (K _o)		
UNIT 1: FILL	20	0.4	0.6	1	25
UNIT 2: RESIDUAL CLAY	20	0.35	0.5	3	26
UNIT 3: EXTREMELY WEATHERED SHALE	20	0.3	0.45	5	27
UNIT 4: VERY LOW TO LOW STRENGTH SHALE	22	0.25	0.4	10	28

The preliminary design for lateral earth pressures in Unit 1-4 material where multiple rows of anchors or propping are used (i.e. two or more rows) may be based on a trapezoidal earth pressure distribution with a maximum pressure of between 4H and 6H (where H is the excavation height in metres). The maximum pressure generally acts over the central 60% of the wall height, reducing to zero at the top and base of the retained soil. If wall movements are to be reduced (i.e., adjacent to existing structures or utilities), a maximum pressure of between 6H and 8H should be assumed for preliminary design instead.

The design of the shoring should allow for all surcharge loads, including building footings, inclined slopes behind the wall, traffic, site sheds, and construction related activities.

Shoring walls should also be designed for full hydrostatic pressures unless drainage of the ground behind impermeable walls can be provided. Drainage could comprise 150 mm wide strip drains pinned to the face at 1 m to 2 m centres behind shotcrete in-fill panels. The base of the strip drains should extend out from the shoring wall to allow any seepage to flow into a perimeter toe drain which is connected to the stormwater drainage system.

If a more accurate assessment of predicated ground movements at nearby buildings or infrastructure as a result of the proposed excavations is required then numerical modelling (using commercially available software such as Plaxis 2D or RS2) of the proposed excavation may be required.

8.6.3 Passive Restraint

Passive resistance for piles/shoring founded below the base of the bulk excavation (including allowance for services and/or footings) may be based on the ultimate passive restraint values provided in Table 12. This ultimate value represents the pressure mobilised at high displacements and therefore it will be necessary to incorporate a factor of safety of at least 3 to limit wall movement. The top 0.5 m of the socket should be ignored due to possible disturbance and over-excavation.

Table 12: Recommended Passive Resistance Values

Material	Maximum Ultimate Passive Pressure (kPa)
UNIT 2: RESIDUAL CLAY	$\sigma_v \times K_p$ with $K_p = 2.5$
UNIT 3: EXTREMELY WEATHERED SHALE	$\sigma_v \times K_p$ with $K_p = 3.0$
UNIT 4: VERY LOW TO LOW STRENGTH SHALE	400*

Note: * subject to geotechnical inspection, σ_v = vertical stress in kPa

8.6.4 Ground Anchors

The design of temporary and permanent ground anchors/rock bolts for the support of excavations and/or shoring systems may be carried out on the basis of the maximum bond stresses given in Table 13. Anchors should preferably be bonded into Unit 4 or better rock.

Table 13: Recommended Bond Stresses for Ground Anchor Design

Material	Maximum Allowable Bond Stress (kPa)	Maximum Ultimate Bond Stress (kPa)
UNIT 3: EXTREMELY WEATHERED SHALE	25	75
UNIT 4: VERY LOW TO LOW STRENGTH SHALE	50	150
UNIT 5: LOW TO MEDIUM STRENGTH SHALE	100	400
UNIT 6: MEDIUM TO HIGH STRENGTH SHALE	350	800

The parameters given in Table 13 assume that the drilled holes are clean and adequately flushed. The anchors should be bonded behind a line drawn up at 45 degrees from the base of the shoring, and "lift-off" tests should be carried out to confirm the anchor capacities. Trial anchors should be used to confirm bond stress values. It is suggested that ground anchors should be proof loaded to 125% of the design working load and locked-off at no higher than 80% of the working load.

It is anticipated that the building will support the basement excavation over the long-term and therefore the ground anchors (where utilised) are expected to be temporary only. The use of permanent anchors would require careful attention to corrosion protection. Further advice on design and specification should be sought if permanent anchors are to be employed at this site.

It will be necessary to obtain permission from neighbouring landowners prior to installing anchors that will extend beyond the site perimeter. In addition, care should be taken during anchor installation to avoid damaging buried services and pipes, and possibly neighbouring piled footings or basement walls. Anchoring should only be carried out by an experienced contractor with demonstrated experience in similar ground conditions.

8.7 Foundations

It is expected that bulk excavation for all basements will generally expose residual clay or extremely weathered shale at bulk level (Unit 2 and Unit 3), and possibly some very low to low strength shale (Unit 4).

Generally, all building footings (for each building) should be supported on a uniform stratum to reduce the risk of differential settlements, which will probably require a combination of pads (if suitable to support the proposed loads with tolerable settlements) and piles across the three sites. Footings should not be supported on the Unit 1 uncontrolled fill. The parameters given for Unit 2 are provided for isolated smaller structures if proposed.

If piles are proposed, bored piles could be used at this site, although allowances should be made for removal of water or more likely, tremie pouring of concrete, particularly for deeper piles. Temporary casing may be required if bored piles are to be drilled through variable fill (e.g., Centenary Hall Site) and even the deeper clay profile if significant water inflow occurs.

Driven piles are unlikely to be suitable for use at this site due to vibrations associated with installation.

Footings may be proportioned using the values given in Table 14. For bored piles, the top 0.5 m of the socket should be ignored due to possible disturbance and over-excavation and shaft adhesion values for uplift (tension) may be taken as being equal to 70% of the shaft adhesion values provided for compression in Table 14.

Footings should be supported outside the zone of influence of adjacent excavations, drawn upward at 45 degrees from the toe of the excavation (such as lift pit or in-ground tank excavations below bulk level). If any foundations are proposed to be supported within the zone of influence, this will need to be assessed by the geotechnical engineer on a case-by-case basis and it may be necessary to support these footings deeper (e.g., on piles, or locally deepened pads), below the zone of influence of nearby excavations.

Table 14: Recommended Parameters for Foundation Design

Material	Maximum Allowable Pressure (Serviceability)		Maximum Ultimate Pressure		Young's Modulus, E (MPa)
	End Bearing (kPa)	Shaft Adhesion (Compression) (kPa)	End Bearing (kPa)	Shaft Adhesion (Compression) (kPa)	
UNIT 2: RESIDUAL CLAY	100	10	250	30	20
UNIT 3: EXTREMELY WEATHERED SHALE	700	25	2,000	75	50

Material	Maximum Allowable Pressure (Serviceability)		Maximum Ultimate Pressure		Young's Modulus, E (MPa)
	End Bearing (kPa)	Shaft Adhesion (Compression) (kPa)	End Bearing (kPa)	Shaft Adhesion (Compression) (kPa)	
UNIT 4: VERY LOW TO LOW STRENGTH SHALE	1,000	50	3,000	150	100
UNIT 5: LOW TO MEDIUM STRENGTH SHALE	2,000	100	6,000	400	300
UNIT 6: MEDIUM TO HIGH STRENGTH SHALE	3,500	350	30,000	800	700

Higher end bearing pressures for the Unit 6 medium to high strength shale may be justifiable (up to 6 to 8 MPa) but given the limited extent of investigation into this unit currently completed, additional cored boreholes to greater depth would be recommended to properly assess whether such design values would be appropriate, if sought.

Foundations proportioned on the basis of the allowable bearing pressures in Table 14 would be expected to experience total settlements of less than 1% of the footing width under the applied working load, with differential settlements between adjacent columns expected to be less than half of this value.

Footings designed using ultimate values and Limit State Design will need to consider serviceability which usually governs the design in this case. For pile design, an average risk rating (ARR) of 3.3 and a basic geotechnical strength reduction factor, Φ_{gb} , of about 0.56 (for a high redundancy system) calculated from Table 4.3.2 (A, B, and C) of AS2159-2009: Piling Design and Installation, is considered feasible. However, the designer will need to make their own assessment with the final (Φ_{gb}) number being dependent on the risk ratings adopted and applicable redundancy of the system. It is noted that a maximum basic geotechnical strength reduction factor of 0.4 can be adopted when the average risk rating is above 2.5 if no pile serviceability load testing is undertaken; or if no pile testing is undertaken at all (including integrity testing).

During construction, all exposed shallow footing excavations should be inspected by a geotechnical engineer, and all bored piles should be inspected by a geotechnical engineer during drilling; to assess the actual foundation conditions and confirm they are suitable for the design assumptions.

8.8 Groundwater

Observed groundwater level ranges at each site, proposed bulk levels, and relative differences from proposed bulk levels are summarised in Table 15 (excluding the interpreted subsoil drainage level observed at the Sevington site). The observed levels are between approximately 1 m below and 2 m above BEL.

Table 15: Summary of Groundwater Observations Relative to Proposed Excavations

Site and Screen Material	Range of Groundwater Observations (m AHD)	Proposed BEL (m AHD)	Water Level Relative to BEL* (m)
Concordia (rock) – BH1	35.4 to 35.9	35.1	+0.3 to +0.8
Sevington (rock) – BH15	25.5 to 26.1	26.0	-0.5 to +0.1
Sevington (soil) – BH16	27.6 to 28.1		+1.6 to +2.1
Centenary Hall (rock) – BH6	29.4 to 30.1	30.3	-0.9 to -0.2

Note: *Positive values represent the measured water levels being above the proposed BEL

The results indicate a general trend of decreasing groundwater levels towards the south and southeast, following surface elevation falls and consistent with the expected flow path towards the Cooks River on the south side of the ridgeline that the Concordia site is situated on.

The monitoring results in all four monitoring wells follow a very similar trend in overall fluctuations and response to rainfall, suggesting that the water levels observed in all of the boreholes are likely related to the same aquifer. The response of the aquifer to rainfall appears relatively rapid but overall small, with groundwater level rises of only up to a few hundred millimetres following periods of heavy rainfall, and downward drainage trends recommencing within a week or so after heavy rain ceases.

It is expected that the proposed basements at the Concordia and Sevington sites are both likely to intercept the measured groundwater tables and require dewatering.

It is expected that, separate to the perennial groundwater table, perched groundwater seepage will occur along the top of the clay and weathered rock, and through joints and along bedding planes within the rock exposed in the basement floor and walls above the groundwater table, particularly following periods of extended rainfall.

Given the aquifer composition, measured hydraulic conductivities (being relatively low permeability), and relatively minor depth of proposed excavations below the observed groundwater levels (maximum 2 m); during construction and in the long term, it is anticipated that groundwater flows into the excavations could be controlled by perimeter and subfloor drainage connected to a sump-and-pump system. On this basis, a drained basement could be considered for this site. Generally, water collected should be suitable for disposal by pumping to stormwater drains, however this will be subject to confirmation testing of groundwater quality and approval from Council and relevant authorities.

It is possible that groundwater flows into the basement may give rise to precipitation of a red-brown iron oxide residue from the oxidation of soluble iron likely to be present in the groundwater. Therefore, perimeter and subfloor drains should be designed for easy access to allow for inspection, maintenance and periodic cleaning.

Higher than expected inflows may occur locally in the excavation (e.g., along fractured/fissured zones), in which case some form of grouting may be required to reduce inflow rates.

Management of the inflow rates and drawdowns associated with adopting a drained basement is considered to be feasible geotechnically. However, construction of a drained basement would be subject to approvals from the relevant authorities (DCCEEW). Such approvals will require analysis to estimate water take and groundwater level drawdown due to dewatering, and an assessment of impacts to nearby receptors. Ultimately, the decision of whether to approve a drained basement scheme will be with the relevant authorities.

If it is necessary or preferable to avoid issues with long term management of groundwater inflows then a water-tight 'tanked' basement could be adopted in the permanent condition. A tanked basement would need to be designed to resist uplift forces associated with hydrostatic groundwater pressures.

8.9 Site Preparation and Earthworks

The sites are generally underlain by a relatively shallow depths of uncontrolled fill, except in the southeast of the Centenary Hall site, where relatively deeper fill was observed (to 3.5 m depth, including some very soft to soft, possibly alluvial clay in BH08), and in the east of the Concordia site, where levels have been raised to form the upper pavement level. Long term settlement of uncontrolled fill is unpredictable and there are inherent risks associated with supporting slabs or any structural loads on uncontrolled fill (including raising site levels with engineered fill supported on such fill), and if additional load is applied to the fill (via slab loadings, increased fill heights, etc.) there will be associated consolidation and long-term creep settlements which can be significant and difficult to predict.

The proposed excavations will mostly involve removal of the uncontrolled fill, however, where this may not be the case, and especially if site levels are proposed to be raised above existing levels, consideration will need to be given to the treatment of the uncontrolled fill in design and construction.

Suitable site preparation methods will depend on the applied loads and settlement tolerances. The following general subgrade preparation measures are recommended for the placement of engineered fill for site levelling and raising of site levels:

- Strip existing fill to expose the natural subgrade material;
- Proof roll the exposed natural surface using a minimum 10 tonne smooth drum roller in non-vibration mode. The surface should be rolled a minimum of six times with the last two passes observed by an experienced geotechnical engineer to identify any 'soft spots';
- Any soft or heaving materials identified during proof rolling should be removed and replaced, or otherwise treated (e.g., with geosynthetics and/or rock fill bridging layers), as directed by the geotechnical engineer at the time;
- Fill should be placed in layers of 300 mm maximum loose thickness and compacted to a dry density ratio of between 98% and 102% Standard compaction, with moisture content maintained with 2% of Standard optimum moisture content (OMC).

For the construction of working platforms or pavements where some potential long-term settlements are acceptable, it may be practical to remove and replace existing uncontrolled fill to a maximum depth of between 0.6 m and 1.2 m (depending on the particular application) rather than removing and replacing all uncontrolled fill, noting that a residual risk of long-term settlements will exist in this case.

Excavated fill material from all of the sites may be suitable for re-use as engineered fill from a geotechnical point of view, provided it does not contain peaty clays or excessively silty material, organic material, or other deleterious materials (e.g., rubbish). Oversize material (> 100 mm diameter) will inhibit compaction and should also be removed. The suitability for re-use will also depend on the contamination status of the material.

Imported fill generally should be free of oversize, organic and deleterious materials, and be non-dispersive, have a plasticity index of less than 25%, and a CBR of greater than 5% (but subject to final design requirements and specifications).

Density testing of placed fill should be carried out in accordance with AS3798 “Guidelines for Earthworks for Commercial and Residential Developments”.

8.10 **Working Platforms**

Piling rigs and cranes will need a suitable working platform during construction to reduce the risk of bearing capacity failures or substantial differential settlement, either of which could lead to overturning or toppling or plant.

The design of working platforms will be dependent on the maximum applied track pressures and track dimensions of any piling rigs or cranes that will be used. It may be beneficial to keep existing slabs or pavements in place for piling works to help reduce the platform requirements, however slabs or pavements alone are often not sufficient to support heavy piling rig and crane loads.

Demolished concrete could be crushed down to use as working platform material, but should be well graded with no particles larger than 70 mm. Imported durable granular material could also be used, or a combination of imported and site-won material. Material used to construct working platforms should be placed in accordance with the previous advice provided in Section 8.9 for placement of engineered fill.

All platforms will require detailed design. Where relevant, specific assessment of the additional stresses caused by track or outrigger loadings on underground utilities should be undertaken in conjunction with the structural engineer. Methods of keeping the applied pressures to acceptable levels may include the placement of extra rock fill thicknesses to ‘bridge over’ the subject structures/services and/or the use of steel road plates to distribute the applied track pressure.

The proximity of the groundwater table to the working platform surface should be noted. Where the water table is within approximately 2.0 m of the working surface, the bearing capacity of the subgrade or platform material could be reduced and will need to be considered in the platform design. Where the water table is found to be within 2.0 m of the working platform (surface), further geotechnical advice should be sought.

Most of the incidents relating to the stability of piling rigs (or cranes) occur due to localised problems and variability such as poorly compacted filling, soft/spongy spots or working too close to batter slopes or excavations. Accordingly, it will be important that the site controller and earthworks contractor are vigilant in inspecting and maintaining the integrity of the piling platform throughout the construction programme.

In areas where plant will operate directly on existing ground slabs or pavements, there will always be a risk that subgrade conditions are different to those assumed for design. For example, if a weak or soft subgrade is present this could result in the sudden shear or 'punching' failure of the concrete slab, which may result in rig instability. Similar concerns would obviously prevail if there were voids beneath existing ground slabs. Where existing slabs or pavements are to support piling rigs, crane outriggers or other heavy plant, the subgrade conditions should be assessed on a case by case basis, most likely including testing of the subgrade conditions below the slabs in the subject areas.

It is noted that the materials expected to be exposed at bulk level in all excavations are likely to be sensitive to wet weather, and a working platform constructed at the base of the excavation (e.g., to facilitate construction of foundation piles below bulk level), may also assist with improving trafficability at the base of the excavation during periods of wet weather.

8.11 Soil Aggressivity

In accordance with AS2159-2009, the results of the chemical laboratory testing indicate that the tested soils from the sites are non-aggressive or mildly aggressive to buried concrete and non-aggressive to buried steel. It would be prudent to adopt an aggressivity exposure classification of at least mild for all structural elements in contact with the ground.

8.12 Salinity

Highly saline soils are not typically present in areas underlain by Ashfield Shale, which are characterised by lower salt content (compared to other parts of Sydney with high salinity hazards) and topography that facilitates drainage, resulting in a reduced accumulation of salts.

It is expected that the proposed development will not meaningfully alter the topography and surface or subsurface flow regimes on and around the sites. Further, the results of the laboratory testing generally indicate that the soils on-sites are non-saline to slightly saline.

On the basis of the above, it is considered that soil salinity is unlikely to be an issue for this development, and no further assessment or special management of salinity is required for the proposed development.

8.13 Site Classification

The clays across the sites are generally of medium to high plasticity and expected to be moderately to highly reactive.

Although not strictly applicable to non-residential developments, the principles outlined in AS2870-2011 for classification of reactive soil sites can provide an indication of potential free surface movements due to moisture variations. Excluding areas with clayey fill greater than 0.4 m which would be Class P, a preliminary classification for the sites of 'H1' is likely to be appropriate, with expected free surface movements in the order of 40 to 60 mm.

8.14 Seismic Design

In accordance with the Earthquake Loading Standard AS1170.4-2024, the site has a hazard factor (z) of 0.08 and a site sub-soil class of shallow soil (C_e). It may be feasible to improve the site sub-

soil class to rock (B_r) in accordance with the Standard by undertaking a more rigorous assessment of the low amplitude natural site period, supported by direct measurements of the seismic shear wave velocity using in-situ tests.

8.15 Pavements

Subject to earthworks and the final condition of the soils within the upper 1 m of the design subgrade level, natural and filled subgrades at this site could be assigned a preliminary design CBR value of 3% based on experience in similar projects and the expectation that some gravel content will result from mixing of soils during excavation. To maintain this design value, or any other amended / alternate design value, it will be necessary to prepare the subgrade soils into a well-compacted condition, free of significant adverse long-term or differential settlements under service loading.

The pavement designer should consider the following:

- Undertaking CBR tests on the prepared surface after earthworks completion to confirm the ongoing validity of the preliminary design CBR value;
- The loads applied to the various pavements over their design life, including normal road vehicle pavements, commercial in-service truck loads and possibly construction machinery loads;
- The magnitude and frequency of load repetitions of the various vehicles using each pavement;
- The need to provide edge constraints to the pavement, particularly along the crest of batters, immediately behind retaining walls and along the edge of landscaped areas;
- The position and grading of subsurface drainage lines, particularly with reference to pavement edges and internal landscaped openings;
- Pavement surface gradients and water flow to drainage lines. One-way cross fall pavements may be beneficial, otherwise regularly spaced and centralised drainage collection pits should be installed;
- The backfilling and compaction of service trenches, particularly below heavily loaded pavements; and
- The ability of any filled subgrade to carry the load of the pavement.

Surface and subsoil drainage should be incorporated into pavement and floor slab designs to prevent the ingress of moisture into the pavement and sub-floor working platform layers and any subsequent weakening of the pavement and subgrade layers.

In addition, a regular and long-term inspection and maintenance programme should be adopted by the operator of the pavement. The maintenance program should be primarily aimed at limiting the amount of moisture infiltrating to the subgrade (e.g., inspecting drainage lines and repairing as required, maintaining construction joints and sealing or repairing cracks as they develop).

8.16 Additional Geotechnical Input

Additional geotechnical input may be required to support future approval applications and facilitate detailed design for detailed SSDAs.

Hydrogeological assessment of inflows and impacts on nearby receptors associated with dewatering of basements has been completed and reported separately (reference 234875.00.R.002.Rev1 dated 23 October 2025).

Currently there is no on-site access to the area in the vicinity of the Concordia redevelopment proposed footbridge support on the south side of Stanmore Road. Once access is made available, it is recommended that additional intrusive investigation is undertaken in this area to facilitate design of foundations for the footbridge. A suitable scope of additional investigation is expected to be one rock cored borehole in proximity to the proposed footbridge foundation location. Douglas can provide a fee for this at a later date, and this could be undertaken as part of the detailed SSDA for Stage 6.

9. Limitations

Douglas Partners Pty Ltd (Douglas) has prepared this report for this project at 200-244 and 221-235 Stanmore Road, Stanmore NSW in line with Douglas' proposal dated 19/03/2025 and acceptance received from Ross Xenos of Council of Newington College. The work was carried out under Douglas' Engagement Terms. This report is provided for the exclusive use of Council of Newington College for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of Douglas, does so entirely at its own risk and without recourse to Douglas for any loss or damage. In preparing this report Douglas has necessarily relied upon information provided by the client and/or their agents.

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

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

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

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

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

The scope of work for this investigation/report did not include the assessment of surface or sub-surface materials or groundwater for contaminants, within or adjacent to the site. Should evidence of fill of unknown origin be noted in the report, and in particular the presence of building demolition materials, it should be recognised that there may be some risk that such fill may contain contaminants and hazardous building materials.

Appendix A

About this Report

Terminology, Symbols and Abbreviations

Soil Descriptions

Rock Descriptions

Sampling, Testing and Excavation Methodology

Introduction

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

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

Copyright

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

Borehole and Test Pit Logs

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

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

Groundwater

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

- In low permeability soils groundwater may enter the hole very slowly or perhaps not at all during the time the hole is left open;
- A localised, perched water table may lead to an erroneous indication of the true water table;
- Water table levels will vary from time to time with seasons or recent weather

changes. They may not be the same at the time of construction as are indicated in the report; and

- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water measurements are to be made.

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

Reports

The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, the information and interpretation may not be relevant if the design proposal is changed. If this happens, Douglas 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, Douglas 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, Douglas will be pleased to assist with investigations or advice to resolve the matter.

About this Report

Site Anomalies

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, Douglas 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. Douglas 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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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 augering 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

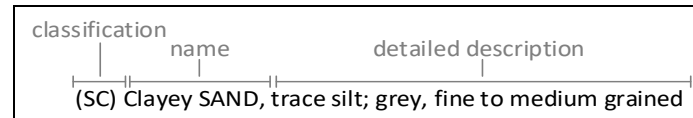
Graphic Symbols

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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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
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
Fluvial	Deposited by channel fill and overbank (natural levee, crevasse splay or flood basin)	FLV
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:

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

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

Stratification Spacing

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

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

Rock Descriptions

Terminology
Symbols
Abbreviations

Defect Descriptions

Defect Type

Term	Abbreviation Code
Bedding plane	B
Cleavage	CL
Crushed seam	CS
Crushed zone	CZ
Drilling break	DB
Decomposed seam	DS
Drill lift	DL
Extremely Weathered seam	EW
Fault	F
Fracture	FC
Fragmented	FG
Handling break	HB
Infilled seam	IS
Joint	JT
Lamination	LAM
Shear seam	SS
Shear zone	SZ
Vein	VN
Mechanical break	MB
Parting	P
Sheared Surface	S

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
Pyrite	Py
Secondary material	MS
Silt	M
Quartz	Qz
Unidentified material	MU

Rock Defect Shape/Planarity

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

Rock Defect Roughness

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

Defect Orientation

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

intentionally blank



Sampling and Testing

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

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

Sampling

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

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

¹ – numeric suffixes indicate tube diameter/width in mm

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

Field and Laboratory Testing

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

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

Unconfined compressive strength, (MPa)	UCS
--	-----

Field and laboratory testing (continued)

Test Type	Code
Point load test, (MPa), axial (A), diametric (D), irregular (I)	PLT(L)
Dynamic cone penetrometer, followed by blow count penetration increment in mm (cone tip, generally in accordance with AS1289.6.3.2)	DCP9/150
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
Direct Push	DP
Solid flight auger. Suffixes: /T = tungsten carbide tip, /V = v-shaped tip	AD ¹
Air Track	AT
Diatube	DT ¹
Hand auger	HA ¹
Hand tools (unspecified)	HAND
Existing exposure	X
Hollow flight auger	HSA ¹
HQ coring	HQ3
HMLC series coring	HMLC
NMLC series coring	NMLC
NQ coring	NQ3
PQ coring	PQ3
Predrilled	PD
Push tube	PT ¹
Ripping tyne/ripper	R
Rock roller	RR ¹
Rock breaker/hydraulic hammer	EH
Sonic drilling	SON ¹
Mud/blade bucket	MB ¹
Toothed bucket	TB ¹
Vibrocore	VC ¹
Vacuum excavation	VE
Wash bore (unspecified bit type)	WB ¹

¹ – numeric suffixes indicate tool diameter/width in mm

Appendix B

Drawings



LEGEND

Sevington Courts Redevelopment Site

Centenary Hall Redevelopment Site

Concordia Redevelopment Site

Proposed Footbridge for Concordia Redevelopment

REV	DESCRIPTION/COMMENT	DATE	DRAWN BY
0	INITIAL ISSUE	16.05.2025	EC
1	UPDATES	03.09.2025	EC

SCALE:
0 10 20 30 40 50 m
1:1000 @ A3

Douglas

PARTNERS

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

CLIENT:

Newington College

NOTE:
1: Basemap from Metromap (Dated 20.09.2024)

COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 56

PROJECT NAME:
Newington Masterplan

PROJECT ADDRESS:
244 Stanmore Road,
Stanmore

DRAWING TITLE:
Site Overview

PROJECT NO:	234875.00
DRAWING NO:	1
REVISION:	1



- LEGEND**
- Concordia Redevelopment Site
 - Proposed Footbridge for Concordia Redevelopment
 - Cored Borehole (2005)
 - Cored Borehole (2025)
 - Hand Auger Borehole (2025)
 - Interpreted Geotechnical Cross Section
 - Standpipe Piezometer

REV	DESCRIPTION/COMMENT	DATE	DRAWN BY
0	INITIAL ISSUE	16.05.2025	EC
1	UPDATES	03.09.2025	EC

SCALE: 0 5 10 15 20 25 m
1:500 @ A3

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

CLIENT:
Newington College

NOTE:
1: Basemap from Metromap (Dated 20.09.2024)

COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 56

PROJECT NAME:
Newington Masterplan

PROJECT ADDRESS:
**244 Stanmore Road,
Stanmore**

DRAWING TITLE:
**Test Location Plan –
Concordia Redevelopment
Site**

PROJECT NO:
234875.00

DRAWING NO:
2

REVISION:
1



LEGEND

- Sevington Courts Redevelopment Site
- Cored Borehole (2025)
- Interpreted Geotechnical Cross Section
- Standpipe Piezometer

REV	DESCRIPTION/COMMENT	DATE	DRAWN BY
0	INITIAL ISSUE	30.05.2025	EC
1	UPDATES	02.09.2025	EC

SCALE:

1:500 @ A3

Douglas
PARTNERS

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

CLIENT:

Newington College

NOTE:

1: Basemap from Metromap (Dated 14.07.2025)

COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 56

PROJECT NAME:

Newington Masterplan

PROJECT ADDRESS:

**244 Stanmore Road,
Stanmore**

DRAWING TITLE:

**Test Location Plan –
Sevington Courts
Redevelopment Site**

PROJECT NO:

234875.00

DRAWING NO:

3

REVISION:

1



REV	DESCRIPTION/COMMENT	DATE	DRAWN BY
0	INITIAL ISSUE	02.06.2025	EC
1	UPDATES	02.09.2025	EC

SCALE: 0 5 10 15 20 25 m
1:500 @ A3

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

CLIENT:
Newington College

NOTE:
1: Basemap from Metromap (Dated 14.07.2025)

COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 56

PROJECT NAME:
Newington Masterplan

PROJECT ADDRESS:
**244 Stanmore Road,
Stanmore**

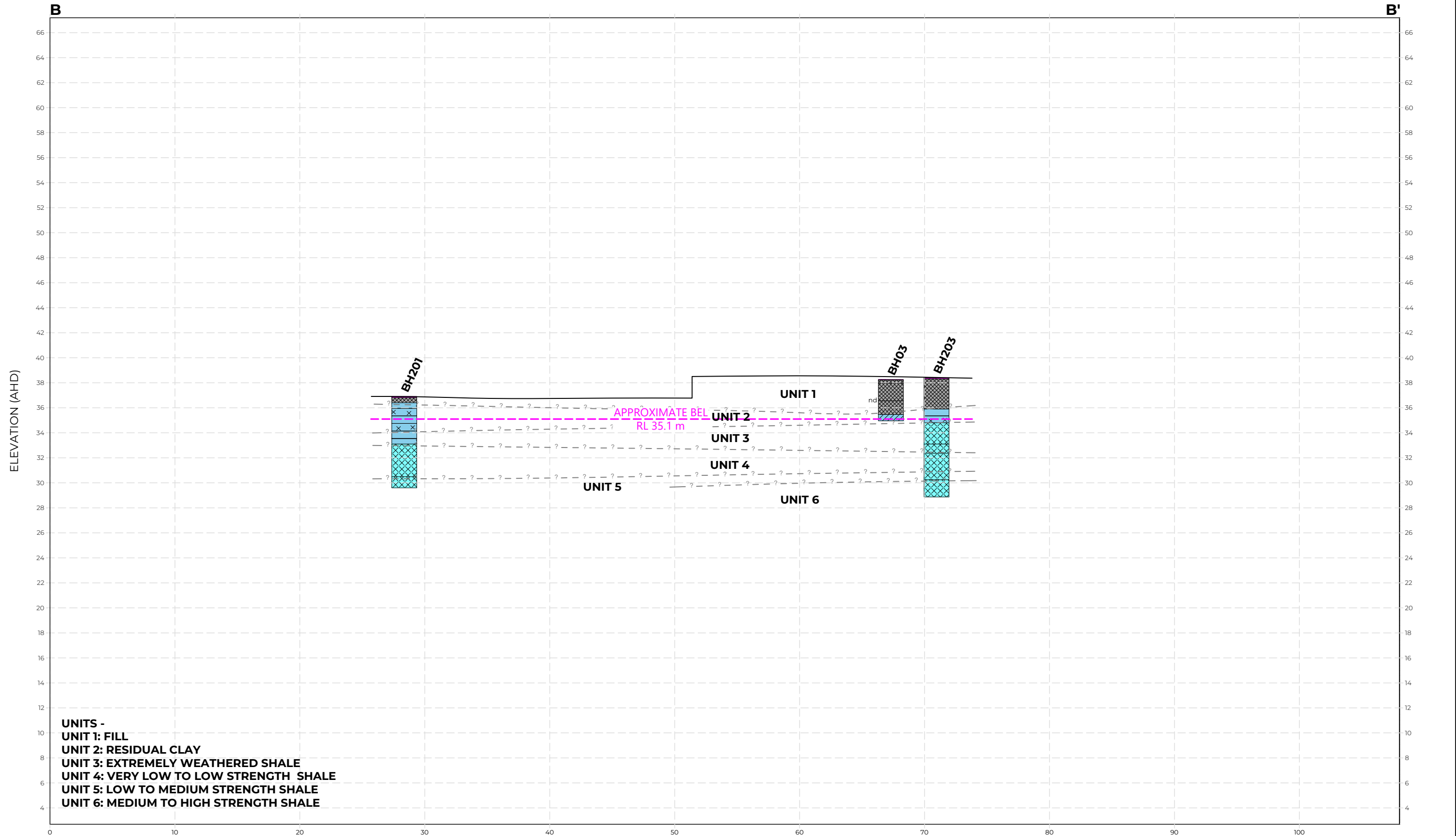
DRAWING TITLE:
**Test Location Plan –
Centenary Hall
Redevelopment Site**

PROJECT NO:
234875.00

DRAWING NO:
4

REVISION:
1

P:\234875.00 - STANMORE, 244 Stanmore Road, Geo\7.0 Drawings\7.2 Out\234875.00.D.005-010.Rev1_Cross Sections A-F.dwg



- LEGEND
- ASPHALTIC CONCRETE
 - CLAY
 - Silty CLAY
 - CONCRETE
 - FILL
 - SILTSTONE

TESTS / OTHER
- ? - - - Interpreted geotechnical boundary

REV	DESCRIPTION/COMMENT	DATE	DRAWN BY
0	INITIAL ISSUE	06.06.2025	EC
1	UPDATES	02.09.2025	EC

SCALE:

0124681015

1:300 @ A3

Vertical Exaggeration = 1.0



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

CLIENT:
Newington College

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.

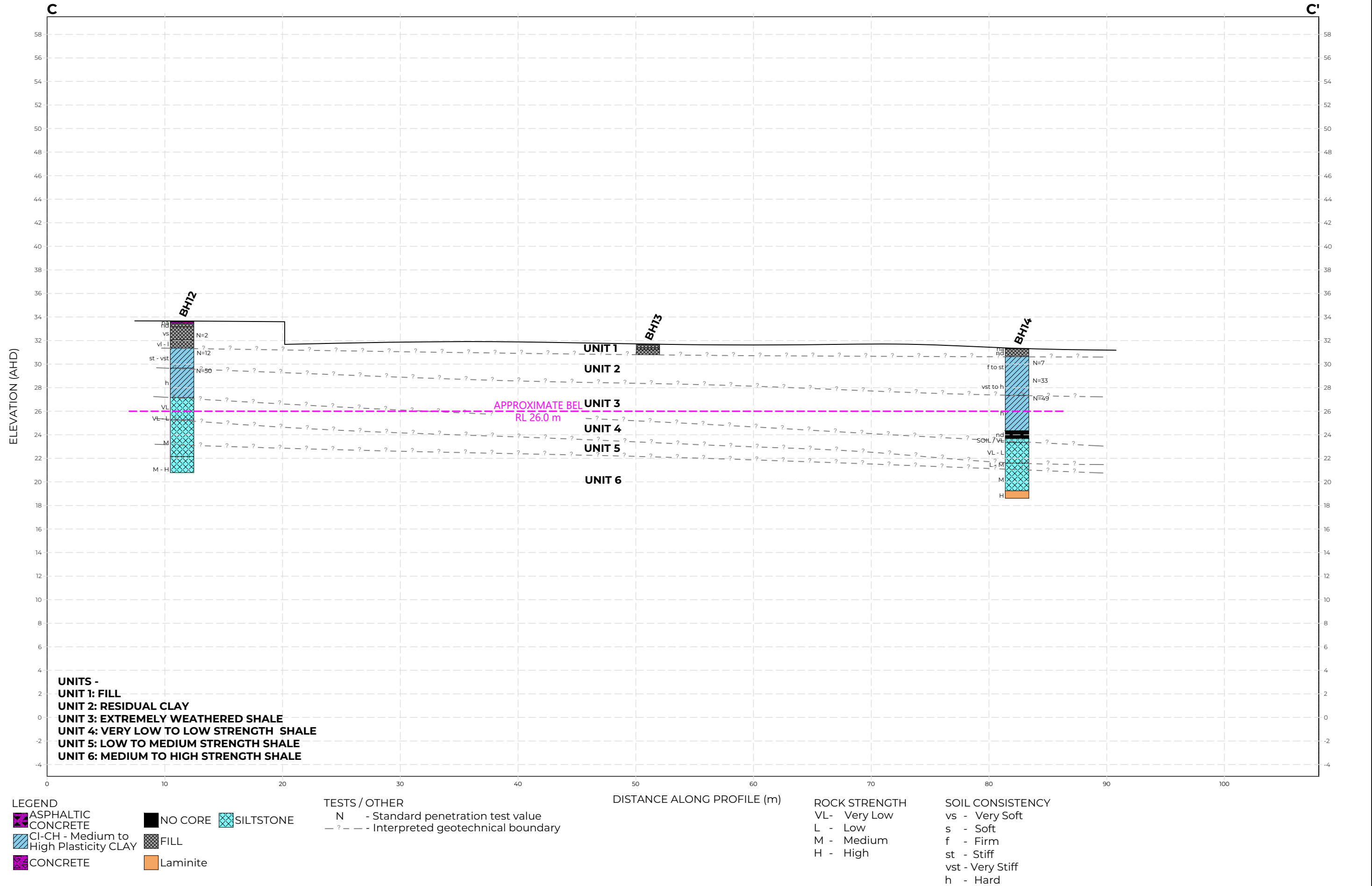
PROJECT NAME:
Newington Masterplan

PROJECT ADDRESS:
**244 Stanmore Road,
Stanmore**

DRAWING TITLE:
**INTERPRETED
GEOTECHNICAL
CROSS SECTION B-B'**

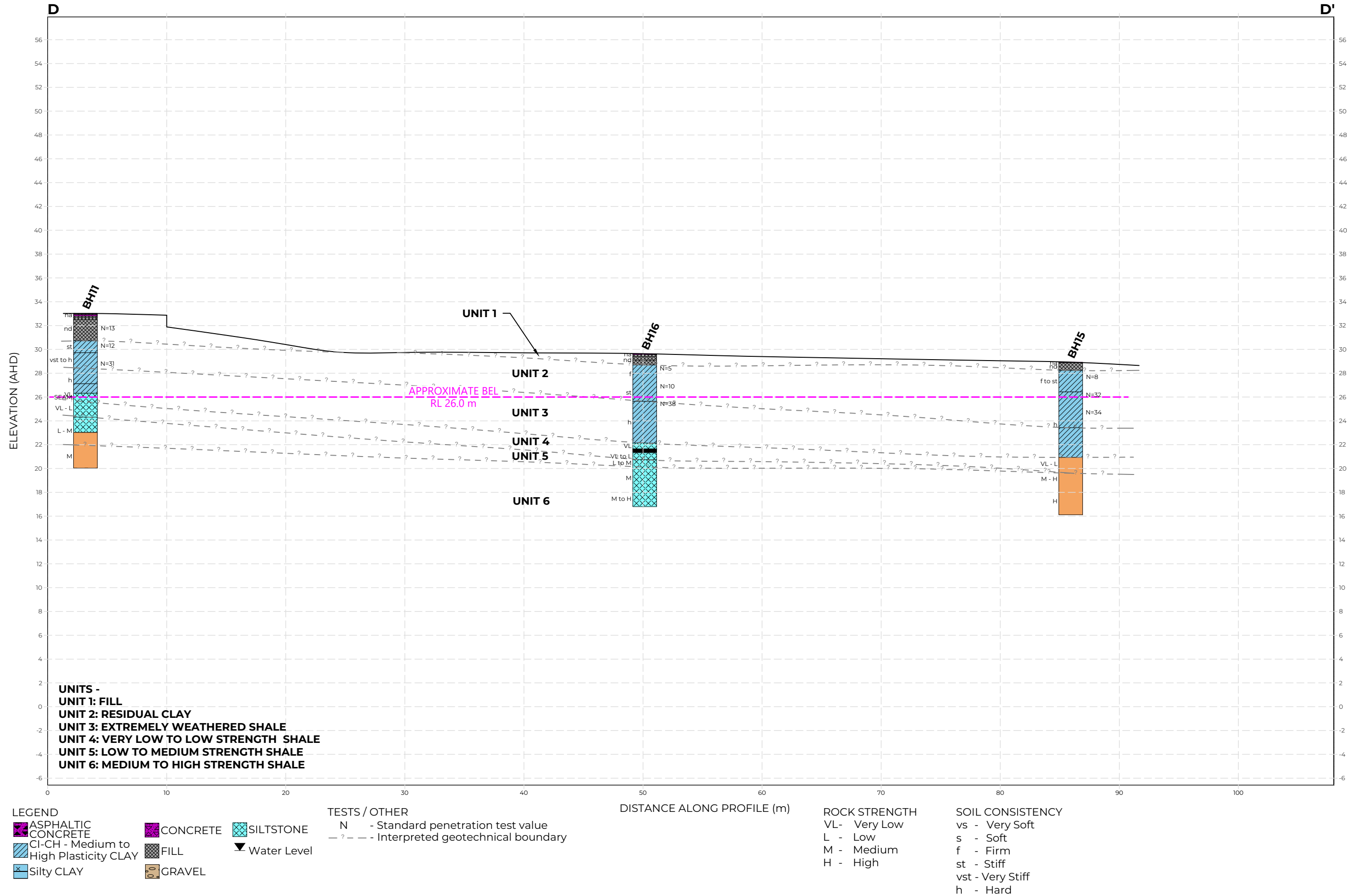
PROJECT No:	234875.00
DRAWING No:	6
REVISION:	1

P:\234875\00 - STANMORE, 244 Stanmore Road, Geo\7.0 Drawings\7.2 Out\234875\00.D\005-010.Rev1_Cross Sections A-F.dwg



REV		DESCRIPTION/COMMENT	DATE	DRAWN BY		CLIENT: Newington College	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.	PROJECT NAME: Newington Masterplan PROJECT ADDRESS: 244 Stanmore Road, Stanmore	DRAWING TITLE: INTERPRETED GEOTECHNICAL CROSS SECTION C-C'	PROJECT No: 234875.00
0		INITIAL ISSUE	06.06.2025	EC						DRAWING No: 7
1		UPDATES	02.09.2025	EC						REVISION: 1
SCALE: 					OFFICE: SYDNEY 96-98 Hermitage Rd, West Ryde NSW 2114 (02) 9809 0666					

P:\234875\00 - STANMORE, 244 Stanmore Road, Geo\7.0 Drawings\7.2 Out\234875\00.D\005-010.Rev1_Cross Sections A-F.dwg



REV	DESCRIPTION/COMMENT	DATE	DRAWN BY
0	INITIAL ISSUE	06.06.2025	EC
1	UPDATES	02.09.2025	EC

SCALE: 0 1 2 4 6 8 10 15
1:300 @ A3
Vertical Exaggeration = 1.0

Douglas
PARTNERS

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

CLIENT:
Newington College

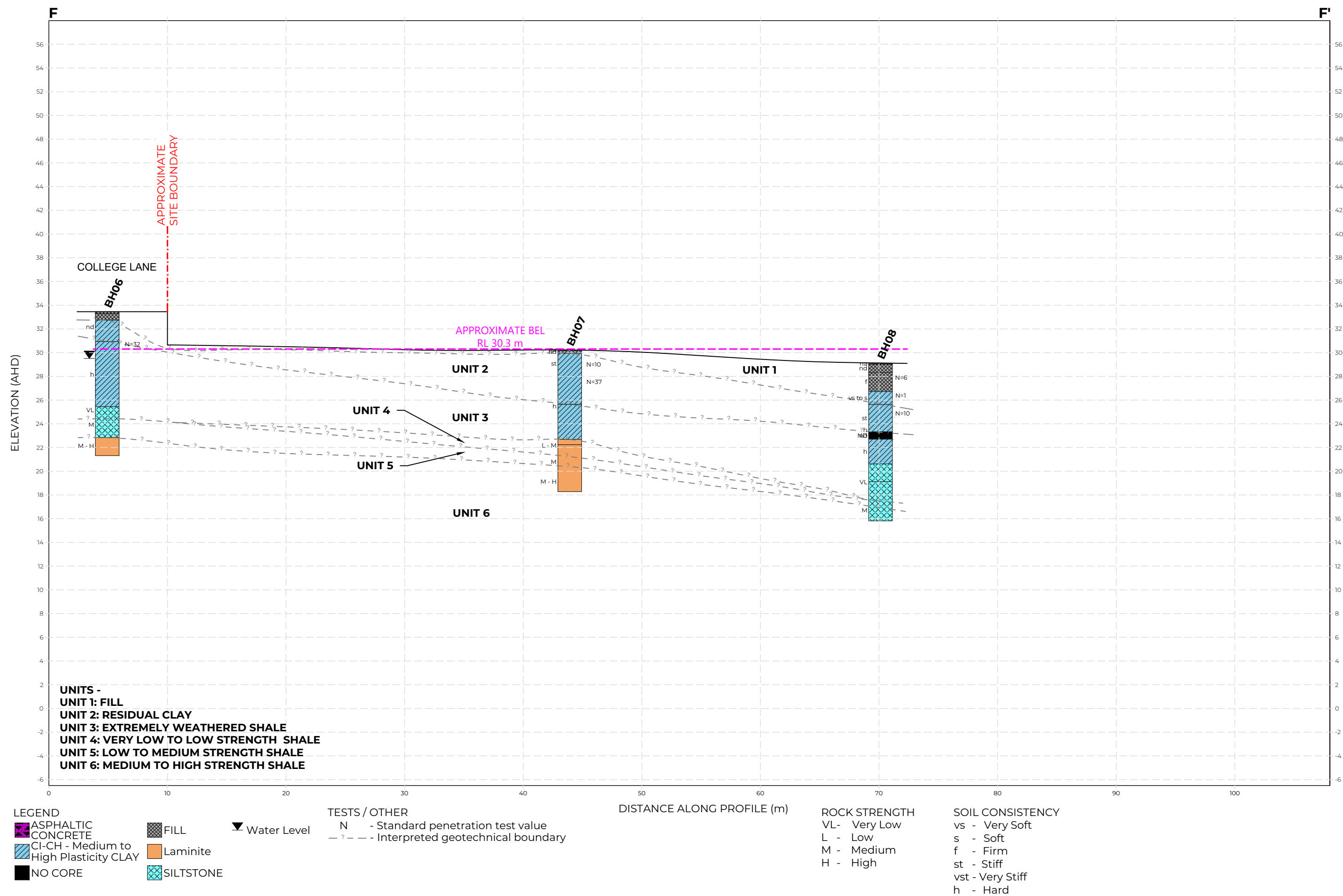
NOTES
1. Subsurface conditions are accurate at the borehole locations only.
Variations in subsurface conditions may occur between borehole locations.
Interpreted strata boundaries are approximate and should be used as a guide only.
2. Summary logs only and should be read in conjunction with detailed logs.

PROJECT NAME:
Newington Masterplan

PROJECT ADDRESS:
**244 Stanmore Road,
Stanmore**

DRAWING TITLE:
**INTERPRETED
GEOTECHNICAL
CROSS SECTION D-D'**

PROJECT No: 234875.00
DRAWING No: 8
REVISION: 1



REV	DESCRIPTION/COMMENT	DATE	DRAWN BY
0	INITIAL ISSUE	04.06.2025	EC
1	UPDATES	02.09.2025	EC
SCALE:			

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

CUSTOMER:

Newington College

NOTES

- 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.
- Summary logs only and should be read in conjunction with detailed logs.

PROJECT NAME:

Newington Masterplan

PROJECT ADDRESS:

**244 Stanmore Road,
Stanmore**

DRAWING TITLE:

**INTERPRETED
GEOTECHNICAL
CROSS SECTION F-F'**

PROJECT No:

234875.00

DRAWING No:

10

REVISION:

1

Appendix C

Field Work Results

BOREHOLE LOG

CLIENT: Newington College
PROJECT: Newington Masterplan
LOCATION: 244 Stanmore Road, Stanmore, Sydney, NSW 2048

SURFACE LEVEL: 37.0 AHD
COORDINATE: E:330108.2, N:6247863.8
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH01
PROJECT No: 234875.00
DATE: 02/04/25 - 04/04/25
SHEET: 1 of 2

CONDITIONS ENCOUNTERED														SAMPLE			TESTING				
GROUNDWATER	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	SOIL			ROCK							SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS	BACKFILL	WELL PIPE
				ORIGIN(##)	CONSIS.(%) DENSITY.(%)	MOISTURE	WEATH.	DEPTH (m)	STRENGTH	RECOVERY (%)	RQD	FRACTURE SPACING (m)	DEFECTS & REMARKS								
04/04/25 NFGCOWWA	0.13 0.15 0.25	CONCRETE SLAB; plastic sheet at 0.13m depth.		FILL	NA ND	NA D								B/ES B/ES		0.15 0.25 0.30	PID PID	5 10 15 23	Concrete soil		
▼ 29/04/25	0.36 1 3.6 3.5 3.4 3.3 3.2 5.60 5.1	FILL / GRAVEL; fine to coarse, igneous; trace asbestos containing material. FILL / Gravelly SAND trace clay; pale grey; fine to coarse; fine to coarse, sandstone gravel; trace asbestos containing material. CLAY (CI-CH); red-brown mottled grey; medium to high plasticity. CLAY (CI-CH) trace gravel; red-brown mottled grey; medium to high plasticity; fine to medium, ironstone gravel; extremely weathered Ashfield Shale.		VSt to H RS XWM	(VSt) to (H) w<PL w<PL																
	7.00 7.30 7.30 7.81	SILTSTONE: dark grey and brown. Ashfield Shale.					MW HW	VL VL L						C		7.30 7.90	PLT PLT	PL(A)=0.10MPa PL(A)=0.06GPa	tonite		
NOTES: ## Soil origin is "probable" unless otherwise stated. % Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.																					

PLANT: Comacchio 205	OPERATOR: Groundtest (J.Jeffcoat)	LOGGED: E. Miler
METHOD: HA to 0.35m, then WB to 7.3m, then NMLC to 11.73m		CASING: HW to 1.5m
REMARKS: Surface Level estimated from survey. * BD3/20250402 taken from 0.25-0.3m		

Refer to explanatory notes for symbol and abbreviation definitions



BOREHOLE LOG

CLIENT: Newington College
PROJECT: Newington Masterplan
LOCATION: 244 Stanmore Road, Stanmore, Sydney, NSW 2048

SURFACE LEVEL: 37.0 AHD
COORDINATE: E:330108.2, N:6247863.8
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH01
PROJECT No: 234875.00
DATE: 02/04/25 - 04/04/25
SHEET: 2 of 2

[illegible]

PLANT: Comacchio 205

OPERATOR: Groundtest (J.Jeffcoat)

LOGGED: E. Miler

METHOD: HA to 0.35m, then WB to 7.3m, then NMLC to 11.73m

CASING: HW to 1.5m

REMARKS: Surface Level estimated from survey. * BD3/20250402 taken from 0.25-0.3m

Refer to explanatory notes for symbol and abbreviation definitions



CORE PHOTO LOG

CLIENT: Newington College

PROJECT: Newington Masterplan

LOCATION: 244 Stanmore Road, Stanmore, Sydney, NSW 2048

SURFACE LEVEL: 37.0 AHD

COORDINATE: E:330108.2, N:6247863.8

DATUM/GRID: MGA2020 Zone 56

DIP/AZIMUTH: 90°/---°

LOCATION ID: BH01

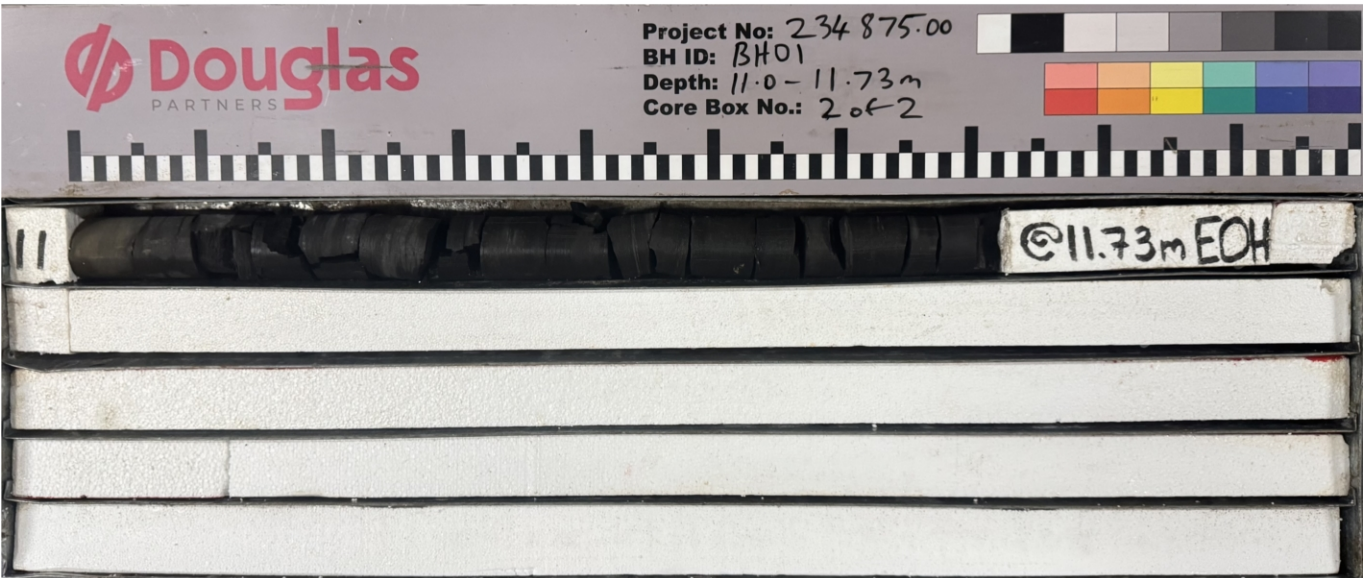
PROJECT No: 234875.00

DATE: 02/04/25 - 04/04/25

SHEET: 1 of 1



7.30-11.00 m depth



11.00-11.73 m depth

BOREHOLE LOG

CLIENT: Newington College
PROJECT: Newington Masterplan
LOCATION: 244 Stanmore Road, Stanmore, Sydney, NSW 2048

SURFACE LEVEL: 35.3 AHD
COORDINATE: E:330017.0, N:6247739.5
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH05
PROJECT No: 234875.00
DATE: 07/04/23
SHEET: 1 of 2

CONDITIONS ENCOUNTERED														SAMPLE		TESTING						
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	SOIL			ROCK							SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS		
					ORIGIN(%)	CONSIS.(%)	DENSITY.(%)	MOISTURE	WEATH.	DEPTH (m)	STRENGTH	RECOVERY (%)	RQD	FRACTURE SPACING (m)							DEFECTS & REMARKS	
07/04/25 NFGWOWWA	35		FILL / CLAY: dark brown and dark grey; low to medium plasticity; trace brick fragments and plastic.		FILL	ND											ES	0.10				
		0.65															ES	0.40				
		1	CLAY (CI-CH): pale grey mottled orange-brown; medium to high plasticity.		RS	F											ES	0.80				
		1.80															SPT	1.00	SPT	2,3,4 N=7		
		2	CLAY (CI-CH): grey mottled red-orange-brown; medium to high plasticity; with low and very low strength iron indurated and siltstone bands, extremely weathered Ashfield Shale.					w<PL				100	0				SPT	1.45				
		2															ES	1.50				
		3															SPT	1.90	SPT	20,25/120		
		3															C	2.17				
		3.2			XWM	H						100	0				C	2.50				
		4																		PLT	PL(A)=0.26MPa	
		4																		PLT	PL(A)=0.03MPa	
		5																		PLT	PL(A)=0.15MPa	
		5.20	SILTSTONE: dark grey and orange-brown. Ashfield Shale.							5.20										PLT	PL(A)=0.15MPa	
		6							HW - MW													
		6										100	15								PLT	PL(A)=0.22MPa
		7																			PLT	PL(A)=0.25MPa
		7.30	SILTSTONE: dark grey and grey; with fine grained sandstone laminations (<5%). Ashfield Shale.						MW - SW	7.30											PLT	PL(A)=0.21MPa
																				PLT	PL(A)=0.08MPa	
																				PLT	PL(A)=0.42MPa	
																				PLT	PL(A)=0.29MPa	
																				PLT	PL(A)=0.28MPa	
																				PLT	PL(A)=0.43MPa	
																				PLT	PL(A)=0.59MPa	

Generated with CORE-GS by Geroc - Combined Log

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

NOTES: ¹Soil origin is "probable" unless otherwise stated. ²Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Bobcat
METHOD: AD/T to 2.18m, then NMLC to 10.21m
REMARKS:

OPERATOR: Groundtest (J.Jeffcoat)

LOGGED: E. Miler
CASING: HW to 1.9m

Refer to explanatory notes for symbol and abbreviation definitions

BOREHOLE LOG

CLIENT: Newington College
PROJECT: Newington Masterplan
LOCATION: 244 Stanmore Road, Stanmore, Sydney, NSW 2048

SURFACE LEVEL: 35.3 AHD
COORDINATE: E:330017.0, N:6247739.5
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH05
PROJECT No: 234875.00
DATE: 07/04/25
SHEET: 2 of 2

CONDITIONS ENCOUNTERED														SAMPLE				TESTING		
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	SOIL			ROCK							SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
					ORIGIN (#)	CONSIS. ^(*)	DENSITY. ^(*)	MOISTURE	WEATH.	DEPTH (m)	STRENGTH	RECOVERY (%)	RQD	FRACTURE SPACING (m)						
	27		[CONT] SILTSTONE: dark grey and grey; with fine grained sandstone laminations (<5%). Ashfield Shale.																	
	26	9							MW - SW									PLT	PL(A)=0.54MPa	
																		PLT	PL(A)=0.40MPa	
		10																PLT	PL(A)=0.46MPa	
		10.21	Borehole discontinued at 10.21m depth. Target Depth Reached.															PLT	PL(A)=0.40MPa	
		11																		
		12																		
		13																		
		14																		
		15																		

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

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

PLANT: Bobcat
METHOD: AD/T to 2.18m, then NMLC to 10.21m
REMARKS:

OPERATOR: Groundtest (J.Jeffcoat)

LOGGED: E. Miler
CASING: HW to 1.9m

Refer to explanatory notes for symbol and abbreviation definitions

CORE PHOTO LOG

CLIENT: Newington College

PROJECT: Newington Masterplan

LOCATION: 244 Stanmore Road, Stanmore, Sydney, NSW 2048

SURFACE LEVEL: 35.3 AHD

COORDINATE: E:330017.0, N:6247739.5

DATUM/GRID: MGA2020 Zone 56

DIP/AZIMUTH: 90°/---°

LOCATION ID: BH05

PROJECT No: 234875.00

DATE: 07/04/25

SHEET: 1 of 1



2.18-6.00 m depth



6.00-10.21 m depth

BOREHOLE LOG

CLIENT: Newington College
PROJECT: Newington Masterplan
LOCATION: 244 Stanmore Road, Stanmore, Sydney, NSW 2048

SURFACE LEVEL: 33.4 AHD
COORDINATE: E:330003.9, N:6247685.1
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH06
PROJECT No: 234875.00
DATE: 04/04/25 - 11/04/25
SHEET: 1 of 2

CONDITIONS ENCOUNTERED														SAMPLE		TESTING					
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	SOIL			ROCK						SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS	BACKFILL	WELL PIPE
					ORIGIN ^(#)	CONSIS. ^(*) DENSITY. ^(*)	MOISTURE	WEATH.	DEPTH (m)	STRENGTH	RECOVERY (%)	RQD	FRACTURE SPACING (m)								
11/04/25 NFGWOWA	33	0.15	FILL / Silty SAND: brown; fine to medium; with rootlets, topsoil.		FILL AND TOP		M								ES	0.10	PID	<1ppm			
													ES	0.25	PID	<1ppm					
													ES	0.40	PID	<1ppm					
													ES	0.50	PID	<1ppm					
													ES	0.70	PID	<1ppm					
													ES	0.80	PID	<1ppm					
													ES	0.90	PID	<1ppm					
													ES	1.00	PID	<1ppm					
													ES	1.40	PID	<1ppm					
													ES	1.50	PID	<1ppm					
29/04/25	31	0.70	FILL / CLAY trace gravel: pale grey and orange-brown; fine to coarse, ironstone and igneous gravel.		FILL		w<PL								ES	1.70	PID	<1ppm			
													ES	2.00	PID	<1ppm					
													ES	2.30	PID	<1ppm					
													ES	2.50	PID	<1ppm					
													SPT	2.95	SPT	7,12,20 N=32					
29/04/25	29	2.50	CLAY (CI-CH): grey mottled red-orange-brown; medium to high plasticity; with very low strength siltstone and iron indurated bands, extremely weathered Ashfield Shale.												ES	4.00	PID	<1ppm			
													ES	4.25	PID	<1ppm					
													SPT	4.00	SPT	18,25/100					
29/04/25	27	4.00													SPT	4.00	SPT	18,25/100			
29/04/25	26	5.36													C	5.36	C				
29/04/25	26	7.35													C	7.35	C				

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

BOREHOLE LOG

CLIENT: Newington College
PROJECT: Newington Masterplan
LOCATION: 244 Stanmore Road, Stanmore, Sydney, NSW 2048

SURFACE LEVEL: 33.4 AHD
COORDINATE: E:330003.9, N:6247685.1
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH06
PROJECT No: 234875.00
DATE: 04/04/25 - 11/04/25
SHEET: 2 of 2

GROUNDWATER		CONDITIONS ENCOUNTERED												SAMPLE			TESTING				
RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	SOIL			ROCK							SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS	BACKFILL	WELL PIPE
				ORIGIN (#)	CONSIS. (%)	DENSITY (%)	MOISTURE	WEATH.	DEPTH (m)	STRENGTH	RECOVERY (%)	RQD	FRACTURE SPACING (m)								
	8.00	SILTSTONE: dark grey and grey; interlaminated with pale grey fine grained sandstone (<5%). Ashfield Shale.					HW - MW	VL									PLT	PL(A)=0.03MPa			
25														8.52m: CS, PR, SM, gravel				PLT	PL(A)=0.46MPa		
9								SW - FR			100	57		8.83m: P, 0-5°, PR, CN, RF	C			PLT	PL(A)=0.46MPa		
24										M				9.52m JT, 40-60°, ST, CN, SM				PLT	PL(A)=0.35MPa		
10		LAMINITE: pale grey, black, fine grained; sandstone, interlaminated with shreds (50/50).																			
23														10.34m: P 0-5°, PR, VNR Clay, RF							
10.60														10.50m: P, 0-5°, PR, VNR Clay, SM				PLT	PL(A)=0.38MPa		
11								FR			100	73		10.56m: P, 0-5°, PR, VNR Clay, SM							
22								M				10.70m: P, 0-5°, PR, VNR Clay, SM									
								H				10.81m: P, 0-5°, PR, CN, SM	C			PLT	PL(A)=0.91MPa				
												10.89m: P, 0-5°, PR, VNR Clay, RF									
												11.17-11.58m: P x13, 0-5°, PR, RF, Clay 0-3 mm									
												12.00m: JT, 75°, PR, CN, SM				PLT	PL(A)=0.79MPa				
																PLT	PL(A)=0.74MPa				
		Borehole discontinued at 12.12m depth. Target Depth Reached.																			
	13																				
	14																				
	15																				

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

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

PLANT: Bobcat
METHOD: HA to 1.68m, then AD/T to 2.5m, then WB to 4m, then NMLC to 12.12m
REMARKS:

OPERATOR: Groundtest (J.Jeffcoat)
LOGGED: R.Muller/E.Miller
CASING: HW to 2.5m

Refer to explanatory notes for symbol and abbreviation definitions



CORE PHOTO LOG

CLIENT: Newington College

PROJECT: Newington Masterplan

LOCATION: 244 Stanmore Road, Stanmore, Sydney, NSW 2048

SURFACE LEVEL: 33.4 AHD

COORDINATE: E:330003.9, N:6247685.1

DATUM/GRID: MGA2020 Zone 56

DIP/AZIMUTH: 90°/---°

LOCATION ID: BH06

PROJECT No: 234875.00

DATE: 04/04/25 - 11/04/25

SHEET: 1 of 1



4.00-8.00 m depth



8.00-12.12 m depth

BOREHOLE LOG

CLIENT: Newington College
PROJECT: Newington Masterplan
LOCATION: 244 Stanmore Road, Stanmore, Sydney, NSW 2048

SURFACE LEVEL: 30.2 AHD
COORDINATE: E:330035.2, N:6247658.8
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH07
PROJECT No: 234875.00
DATE: 14/04/25
SHEET: 1 of 2

CONDITIONS ENCOUNTERED														SAMPLE		TESTING					
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	SOIL				ROCK						SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS	
					ORIGIN(1)	CONSIS.(1)	DENSITY.(1)	MOISTURE	WEATH.	DEPTH (m)	STRENGTH	RECOVERY (%)	RQD	FRACTURE SPACING (m)							DEFECTS & REMARKS
14/04/25 NFGWOWA	30	0.05	ASPHALTIC CONCRETE.		FILL	ND										D/ES	0.10	PID	<1ppm		
	30	0.30	FILL / CLAY trace sand trace gravel: dark grey-brown; fine sand; fine to medium, sandstone gravel.													D/ES	0.20				
																	0.40	PID	<1ppm		
																	0.50				
		1	CLAY (CI-CH): grey mottled red-orange-brown; medium to high plasticity.			St										D/ES	0.80	PID	<1ppm		
																SPT	1.00	SPT	3,5,5 N=10		
																	1.45				
		2			RS													2.50	SPT	13,12,25 N=37	
																		2.95			
		3																			
																		4.00	SPT	8,18,25/130	
		4																4.43			
			4.60	CLAY (CI-CH): grey mottled red-orange-brown; medium to high plasticity; with iron indurated bands, extremely weathered Ashfield Shale.			H												5		
		5																	6		
		6																			
		7																7.00	SPT	11,17,25/50 (HB)	
																		7.22			
																		7.35			
		7.55	LAMINITE: [description over].					HW	7.55	100	16									PLT	PL(A)=0.24MPa
								MW												PLT	PL(A)=0.25MPa
																				PLI	PL(A)=0.55MPa
NOTES: (1) Soil origin is "probable" unless otherwise stated. (2) Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.																					

PLANT: Bobcat
METHOD: AD/T to 2.5m, then WB to 7m, then NMLC to 11.96m
REMARKS:

OPERATOR: Groundtest (J.Jeffcoat)
LOGGED: E. Miler
CASING: HW to 2.5m

Refer to explanatory notes for symbol and abbreviation definitions



BOREHOLE LOG

CLIENT: Newington College
PROJECT: Newington Masterplan
LOCATION: 244 Stanmore Road, Stanmore, Sydney, NSW 2048

SURFACE LEVEL: 30.2 AHD
COORDINATE: E:330035.2, N:6247658.8
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH07
PROJECT No: 234875.00
DATE: 14/04/25
SHEET: 2 of 2

[illegible]

PLANT: Bobcat	OPERATOR: Groundtest (J.Jeffcoat)	LOGGED: E. Miller
METHOD: AD/T to 2.5m, then WB to 7m, then NMLC to 11.96m		CASING: HW to 2.5m
REMARKS:		



Refer to explanatory notes for symbol and abbreviation definitions

CORE PHOTO LOG

CLIENT:

Newington College

PROJECT:

Newington Masterplan

LOCATION:

244 Stanmore Road, Stanmore, Sydney, NSW 2048

SURFACE LEVEL:

30.2 AHD

COORDINATE:

E:330035.2, N:6247658.8

DATUM/GRID:

MGA2020 Zone 56

DIP/AZIMUTH:

90°/---°

LOCATION ID:

BH07

PROJECT No:

234875.00

DATE:

14/04/25

SHEET:

1 of 1



7.22-11.96 m depth

BOREHOLE LOG

CLIENT: Newington College
PROJECT: Newington Masterplan
LOCATION: 244 Stanmore Road, Stanmore, Sydney, NSW 2048

SURFACE LEVEL: 29.1 AHD
COORDINATE: E:330070.5, N:6247675.4
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH08
PROJECT No: 234875.00
DATE: 09/04/25
SHEET: 1 of 2

CONDITIONS ENCOUNTERED														SAMPLE		TESTING			
GROUNDWATER	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	SOIL			ROCK							SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
				ORIGIN(1)	CONSISTENCY(1) DENSITY(1)	MOISTURE	WEATH.	DEPTH (m)	STRENGTH	RECOVERY (%)	RQD	FRACTURE SPACING (m)	DEFECTS & REMARKS						
09/04/25 NFGWOWA	0.07	ASPHALTIC CONCRETE.			NA	NA													
	0.10	FILL / GRAVEL; medium to coarse, igneous; 30mm thick.		FILL	ND										ES	0.20	PID	<1ppm	
															ES	0.30			
																0.50	PID	<1ppm	
	0.80	FILL / Sandy CLAY trace gravel: red-brown mottled grey; fine sand; fine to medium, sandstone gravel; trace rootlets.													ES	0.80	PID	<1ppm	
	1	FILL / CLAY trace sand: grey mottled red-orange-brown; medium to high plasticity; fine sand.		FILL	(F)	w<PL									B	1.00	SPT	2,3,3 N=6	
															SPT	1.30			
																1.45			
	2																		
	2																		
	2.40	CLAY (CI-CH): dark grey; medium to high plasticity; possibly alluvial, possibly fill.		possibly ALV	VS to S										SPT	2.50	SPT	0,0,1 N=1	
	3																		
	3.50	CLAY (CI-CH): grey; medium to high plasticity.																	
	4	3.50m: becoming grey		RS	St	w=PL									SPT	4.00	SPT	2,4,6 N=10	
																	4.45		
	5																		
	5																		
	5.79	CORE LOSS (630mm).				H			5.79						SPT	5.50	SPT	12,25/135	
	6				ND	ND													
6.42	CLAY (CI-CH): grey and red-brown; medium to high plasticity; with bands of ironstone and very low strength siltstone.							6.42											
7			XWM	H	NDF				77	0				C					

NOTES: (1) Soil origin is "probable" unless otherwise stated. (1) Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

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

PLANT: Bobcat
METHOD: AD/T to 2.5m, then WB to 5.8m, then NMLC to 13.3m
REMARKS: * BD5/20250409 taken from 0.8-1.0m

OPERATOR: Groundtest (J.Jeffcoat)

LOGGED: E. Miler
CASING: HW to 2.5m

Refer to explanatory notes for symbol and abbreviation definitions

BOREHOLE LOG

CLIENT: Newington College
PROJECT: Newington Masterplan
LOCATION: 244 Stanmore Road, Stanmore, Sydney, NSW 2048

SURFACE LEVEL: 29.1 AHD
COORDINATE: E:330070.5, N:6247675.4
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH08
PROJECT No: 234875.00
DATE: 09/04/25
SHEET: 2 of 2

CONDITIONS ENCOUNTERED														SAMPLE				TESTING	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	SOIL			ROCK						SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
					ORIGIN (#)	CONSIS. ⁽¹⁾	DENSITY. ⁽¹⁾	MOISTURE	WEATH.	DEPTH (m)	STRENGTH	RECOVERY (%)	RQD						
	21		[CONT] CLAY (CI-CH): grey and red-brown; medium to high plasticity; with bands of ironstone and very low strength siltstone.		XWM	H	NDF					77	0						
	8.50									8.50					8.53-9.10m: P x9 0-5°, PR, Clay, SM, 0-10mm			8.53	
	20	9	SILTSTONE: dark grey; 5% pale grey, fine grained sandstone laminations. Ashfield Shale.												9.40m: JT, 30°, PR, CN, SM			9	
															9.42-9.85m: P x7, 0-5°, PR, Clay, 0-5mm				PLT — PL(A)=0.01MPa
	10.00		SILTSTONE: dark grey; 5-15% pale grey, fine grained sandstone laminations. Ashfield Shale.						XW to HW		VL	100	0		10.00m: EW, Clay, 20mm		C	10	
															10.10m: EW, Clay, 20mm				PLT — PL(A)=0.01MPa
															10.26-10.70m: P x5, 0-5°, PR, CN, SM				
	11														10.75-10.85m: JT x2, 50°, UN, Clay, SM, 0-5mm			11	
	18														10.88m: EW, Clay, 40mm				PLT — PL(A)=0.05MPa
															11.00m: EW, Clay, 10mm				
															11.15-11.52m: P x5, 0-5°, PR, CN, SM				PLT — PL(A)=0.03MPa
										11.55					11.53-11.66m: FG			11.66	
	12														11.75-12.00m: P x9 0-5°, PR, CN, SM				
	17								SW to FR		M	100	45		11.76-12.00m: JT x7, 50-80°, IR-CU, SM, CN		C	12	
															12.06-13.25m: P x13 0-5°, PR, SM, Clay 0-10mm				PLT — PL(A)=0.30MPa
	13														12.16-13.28m: JT x4, 40-80°, PR, CN, SM			13	
	16																	13.30	
			Borehole discontinued at 13.30m depth. Target Depth Reached.																
	14																		
	15																		

NOTES: ⁽¹⁾Soil origin is "probable" unless otherwise stated. ⁽²⁾Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

NOTES: ¹Soil origin is "probable" unless otherwise stated. ²Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Bobcat
METHOD: AD/T to 2.5m, then WB to 5.8m, then NMLC to 13.3m
REMARKS: * BD5/20250409 taken from 0.8-1.0m

OPERATOR: Groundtest (J.Jeffcoat)

LOGGED: E. Miler
CASING: HW to 2.5m

Refer to explanatory notes for symbol and abbreviation definitions



CORE PHOTO LOG

CLIENT: Newington College

PROJECT: Newington Masterplan

LOCATION: 244 Stanmore Road, Stanmore, Sydney, NSW 2048

SURFACE LEVEL: 29.1 AHD

COORDINATE: E:330070.5, N:6247675.4

DATUM/GRID: MGA2020 Zone 56

DIP/AZIMUTH: 90°/---°

LOCATION ID: BH08

PROJECT No: 234875.00

DATE: 09/04/25

SHEET: 1 of 1



5.79-10.00 m depth



10.00-13.30 m depth

BOREHOLE LOG

CLIENT: Newington College
PROJECT: Newington Masterplan
LOCATION: 244 Stanmore Road, Stanmore, Sydney, NSW 2048

SURFACE LEVEL: 30.4 AHD
COORDINATE: E:330087.8, N:6247716.6
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH09
PROJECT No: 234875.00
DATE: 08/04/25
SHEET: 1 of 2

CONDITIONS ENCOUNTERED														SAMPLE		TESTING				
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	SOIL			ROCK							SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
					ORIGIN(%)	CONSIS.(%)	DENSITY(%)	MOISTURE	WEATH.	DEPTH (m)	STRENGTH	RECOVERY (%)	RQD	FRACTURE SPACING (m)						
08/04/25 NFGWOWA		0.08	ASPHALTIC CONCRETE.			NA	NA													
	30	0.40	FILL / Silty SAND trace clay trace gravel: dark brown; fine to medium gravel.		FILL	ND									ES	0.20-0.30	PID	<1ppm		
		0.70	FILL / CLAY trace silt: dark brown; medium to high plasticity.		FILL										ES	0.50-0.65	PID	<1ppm		
	1	1.00	CLAY (CI-CH): grey mottled red-orange-brown; medium to high plasticity.												ES	0.80-1.00	PID	<1ppm		
	29	1.45			RS	F									SPT		SPT	2,2,4 N=6		
		2.00	CLAY (CI-CH): red-orange-brown mottled pale grey; medium to high plasticity; with very low strength siltstone and iron indurated bands, extremely weathered Ashfield Shale.			VSt - H	w<PL													
	28	2.50													SPT		SPT	7,17,15 N=32		
	3	2.95																		
	27	3.00																		
	4	4.00				XWM	H								C					
26	5.00																			
5	5.45																			
5.45	6.05		SILTSTONE: dark grey and orange-brown; interlaminated with 20-30% pale grey fine grained sandstone, Ashfield Shale. Ashfield Shale.																	
6	6.80																			
24	7.45		LAMINITE: [description over].																	
23	7.80																			
NOTES: #Soil origin is "probable" unless otherwise stated. %Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.																				

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

PLANT: Bobcat
METHOD: AD/T to 2.95m, then NMLC to 11.64m
REMARKS: * BD4/20250409 taken from 0.8-1.0m

OPERATOR: Groundtest (J.Jeffcoat)

LOGGED: E. Miler
CASING: HW to 2.75m

Refer to explanatory notes for symbol and abbreviation definitions



BOREHOLE LOG

CLIENT: Newington College
PROJECT: Newington Masterplan
LOCATION: 244 Stanmore Road, Stanmore, Sydney, NSW 2048

SURFACE LEVEL: 30.4 AHD
COORDINATE: E:330087.8, N:6247716.6
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH09
PROJECT No: 234875.00
DATE: 08/04/25
SHEET: 2 of 2

GROUNDWATER		CONDITIONS ENCOUNTERED											SAMPLE		TESTING				
RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	SOIL			ROCK							SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
				ORIGIN (#)	CONSIS. ^(*) DENSITY. ^(*)	MOISTURE	WEATH.	DEPTH (m)	STRENGTH	RECOVERY (%)	RQD	FRACTURE SPACING (m)	DEFECTS & REMARKS						
	8.00	LAMINITE: dark grey shale; interlaminated with pale grey, fine grained sandstone (<30%). Ashfield Shale.																	
22																			
9																			
21																			
10																			
20																			
	8.50																		
	9																		
	9.50																		
	10																		
	10.50																		
	11																		
	11.10																		
	11.64																		
	11.64																		
	12																		
	13																		
	14																		
	15																		

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

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

PLANT: Bobcat
METHOD: AD/T to 2.95m, then NMLC to 11.64m
REMARKS: * BD4/20250409 taken from 0.8-1.0m

OPERATOR: Groundtest (J.Jeffcoat)

LOGGED: E. Miler
CASING: HW to 2.75m

Refer to explanatory notes for symbol and abbreviation definitions



CORE PHOTO LOG

CLIENT: Newington College

PROJECT: Newington Masterplan

LOCATION: 244 Stanmore Road, Stanmore, Sydney, NSW 2048

SURFACE LEVEL: 30.4 AHD

COORDINATE: E:330087.8, N:6247716.6

DATUM/GRID: MGA2020 Zone 56

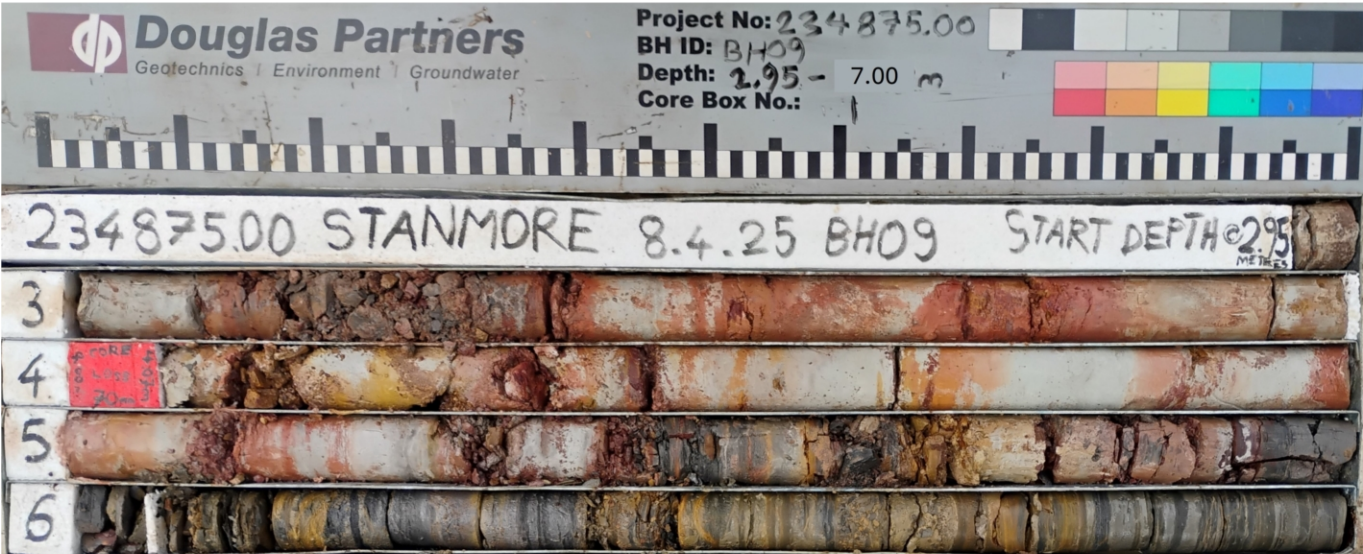
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH09

PROJECT No: 234875.00

DATE: 08/04/25

SHEET: 1 of 1



2.95-7.00 m depth



7.00-11.64 m depth

BOREHOLE LOG

CLIENT: Newington College
PROJECT: Newington Masterplan
LOCATION: 244 Stanmore Road, Stanmore, Sydney, NSW 2048

SURFACE LEVEL: 30.7 AHD
COORDINATE: E:330037.0, N:6247707.1
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH10
PROJECT No: 234875.00
DATE: 28/04/25 - 29/04/25
SHEET: 1 of 2

CONDITIONS ENCOUNTERED													SAMPLE		TESTING				
GROUNDWATER	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	SOIL			ROCK							SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
				ORIGIN(%)	CONSIS.(%)	DENSITY.(%)	MOISTURE	WEATH.	DEPTH (m)	STRENGTH	RECOVERY (%)	RQD	FRACTURE SPACING						
28/04/25 NFGWOWA	0.04	CONCRETE PAVERS.		FILL			w<PL								D		0.05	PID	<1ppm
	0.30	FILL / SAND trace clay trace gravel: pale brown and brown; fine to coarse; fine to coarse, sandstone gravel; brick fragments.		FILL											ES		0.25	PID	<1ppm
	0.90	FILL / Sandy CLAY trace organics trace gravel: dark brown; fine to coarse sand; decomposed organics; fine to medium, sandstone gravel.		RS	ND		w=PL								D/ES		0.50	PID	<1ppm
	1.60	CLAY (CI-CH) trace gravel: grey mottled red-orange-brown; medium to high plasticity; fine, ironstone gravel.															1.00	PID	<1ppm
	2.12	CLAY (CI-CH): grey and red-brown; medium to high plasticity; with very low strength siltstone bands and medium strength iron indurated bands, extremely weathered Ashfield Shale.		XWM	H	NDF											1.10		
	3.70	CORE LOSS (530mm).															1.20		
	4.23																1.30		
	4.50	SILTSTONE: dark grey and orange-brown; with medium strength ironstone bands up to 50mm thick. Ashfield Shale.		XWM	H	NDF											1.70	PID	<1ppm
	5.83	SILTSTONE: dark grey and brown. Ashfield Shale.															2.00		
	6.86	CORE LOSS (50mm).															2.12		
	6.91																2.12		
	7.04																2.12		
	7.65																2.12		
	7.90																2.12		
	8.00																2.12		
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	18.80																2.12		
	18.90																2.12		
	19.00																2.12		

PLANT: Proline

OPERATOR: Tightsite (Ben B)

LOGGED: E. Miler

METHOD: HA to 2.12m, then NMLC to 11.64m

CASING: HQ to 2.1m

REMARKS:

Refer to explanatory notes for symbol and abbreviation definitions



BOREHOLE LOG

CLIENT: Newington College
PROJECT: Newington Masterplan
LOCATION: 244 Stanmore Road, Stanmore, Sydney, NSW 2048

SURFACE LEVEL: 30.7 AHD
COORDINATE: E:330037.0, N:6247707.1
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH10
PROJECT No: 234875.00
DATE: 28/04/25 - 29/04/25
SHEET: 2 of 2

CONDITIONS ENCOUNTERED														SAMPLE		TESTING			
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	SOIL			ROCK						SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
					ORIGIN ^(#)	CONSIS. ^(*)	DENSITY ^(*)	MOISTURE	WEATH.	DEPTH (m)	STRENGTH	RECOVERY (%)	RQD						
		8.00	SILTSTONE: dark grey and brown. Ashfield Shale [continued].																
		8.40	LAMINITE: dark grey shale (60%); interlaminated with pale grey (40%), fine grained sandstone laminations. Ashfield Shale.																
		9	9.20m: (Inferred fault zone) Bedding displaced and rotated from 9.2m-9.7m.																
		10.00	SILTSTONE: dark grey; with 15% pale grey, fine grained sandstone laminations.																
		11																	
		12	Borehole discontinued at 11.64m depth. Target Depth Reached.																
		13																	
		14																	
		15																	

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

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

PLANT: Proline
METHOD: HA to 2.12m, then NMLC to 11.64m
REMARKS:

OPERATOR: Tightsite (Ben B)

LOGGED: E. Miler
CASING: HQ to 2.1m

Refer to explanatory notes for symbol and abbreviation definitions



CORE PHOTO LOG

CLIENT: Newington College

PROJECT: Newington Masterplan

LOCATION: 244 Stanmore Road, Stanmore, Sydney, NSW 2048

SURFACE LEVEL: 30.7 AHD

COORDINATE: E:330037.0, N:6247707.1

DATUM/GRID: MGA2020 Zone 56

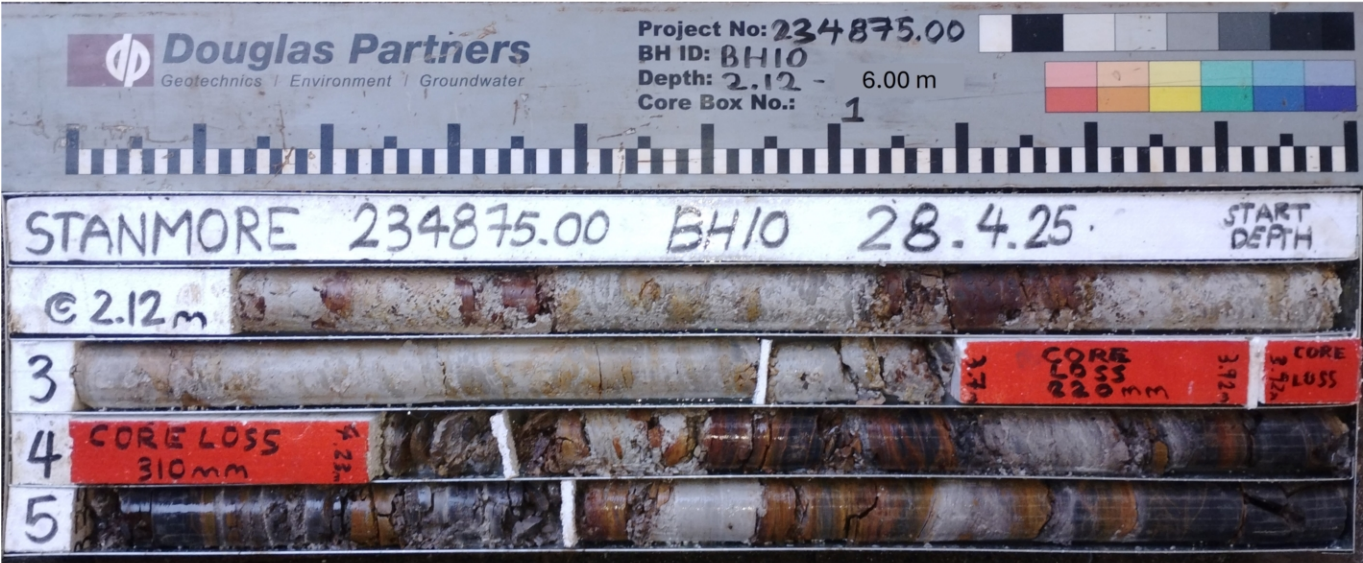
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH10

PROJECT No: 234875.00

DATE: 28/04/25 - 29/04/25

SHEET: 1 of 2



2.12-6.00 m depth



6.00-10.00 m depth

CORE PHOTO LOG

CLIENT: Newington College

PROJECT: Newington Masterplan

LOCATION: 244 Stanmore Road, Stanmore, Sydney, NSW 2048

SURFACE LEVEL: 30.7 AHD

COORDINATE: E:330037.0, N:6247707.1

DATUM/GRID: MGA2020 Zone 56

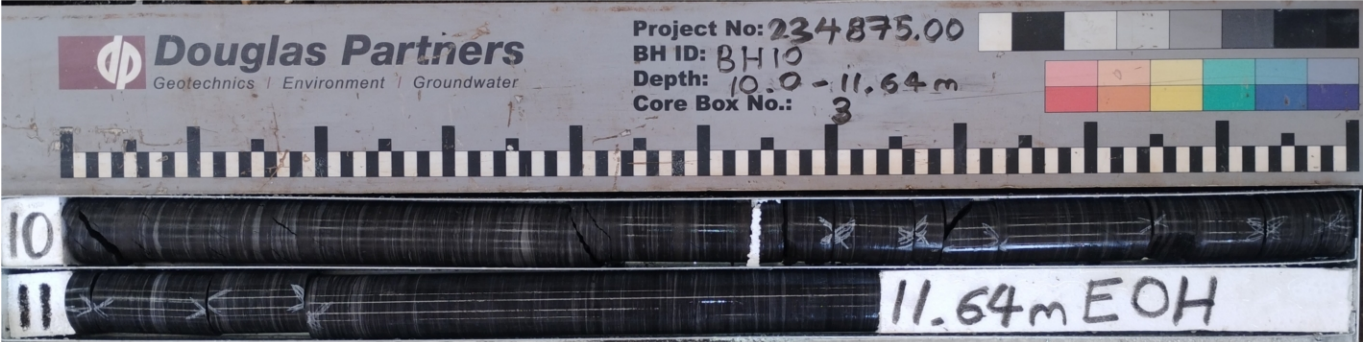
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH10

PROJECT No: 234875.00

DATE: 28/04/25 - 29/04/25

SHEET: 2 of 2



10.00-11.64 m depth

BOREHOLE LOG

CLIENT: Newington College
PROJECT: Newington Masterplan
LOCATION: 244 Stanmore Road, Stanmore, Sydney, NSW 2048

SURFACE LEVEL: 33.0 AHD
COORDINATE: E:330134.1, N:6247760.5
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH11
PROJECT No: 234875.00
DATE: 09/04/25 - 10/04/25
SHEET: 1 of 2

CONDITIONS ENCOUNTERED														SAMPLE				TESTING	
GROUNDWATER DEPTH (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	SOIL			ROCK							SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
				ORIGIN(%)	CONSIS.(%) DENSITY(%)	MOISTURE	WEATH.	DEPTH (m)	STRENGTH	RECOVERY (%)	RQD	FRACTURE SPACING (m)	DEFECTS & REMARKS						
09/04/25 NFGWOWA	0.06	CONCRETE PAVER.			NA	NA													
	0.12	PAVER BASE SAND.																	
	0.24	CONCRETE.																	
	0.34	FILL / GRAVEL: grey; igneous, road base.																	
	0.50	FILL / Silty CLAY trace sand trace gravel: dark brown; fine sand; fine gravel.																	
	1	FILL / Silty SAND: pale brown and grey; fine to medium.																	
	2	CLAY (CI-CH): grey mottled red-brown; medium to high plasticity.																	
	3	CLAY (CI-CH): grey mottled red-orange-brown; medium to high plasticity; with ironstone gravel and bands.																	
	4																		
	5																		
6	CLAY (CI-CH): grey and brown; medium to high plasticity; with bands of ironstone and very low strength siltstone.																		
7	SILTSTONE: dark grey and orange-brown; 20-30% extremely weathered material. Ashfield Shale.																		
NOTES: #Soil origin is "probable" unless otherwise stated. %Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.																			

PLANT: Bobcat
METHOD: DT to 0.34m, then AD/T to 2m, then WB to 5.9m, then NMLC to 12.98m
REMARKS:

OPERATOR: Groundtest (J.Jeffcoat)

LOGGED: E. Miler
CASING: HW to 2m

Refer to explanatory notes for symbol and abbreviation definitions



BOREHOLE LOG

CLIENT: Newington College
PROJECT: Newington Masterplan
LOCATION: 244 Stanmore Road, Stanmore, Sydney, NSW 2048

SURFACE LEVEL: 33.0 AHD
COORDINATE: E:330134.1, N:6247760.5
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH11
PROJECT No: 234875.00
DATE: 09/04/25 - 10/04/25
SHEET: 2 of 2

CONDITIONS ENCOUNTERED														SAMPLE					
GROUNDWATER	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	SOIL			ROCK						DEFECTS & REMARKS	SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
				ORIGIN (#)	CONSIS. ^(*)	DENSITY. ^(*)	MOISTURE	WEATH.	DEPTH (m)	STRENGTH	RECOVERY (%)	RQD							
	8.70	[CONT] SILTSTONE: dark grey and orange-brown; 20-30% extremely weathered material. Ashfield Shale.					XW HW			VL			8.05m: JT, 30°, PR, SN Fe, SM						
	9	SILTSTONE: dark grey. Ashfield Shale.							8.70		100	21	8.15-8.50m DS, 350mm				9	PLT	PL(A)=0.55MPa
	10.00	LAMINITE: dark grey shale (50%); interlaminated with fine grained pale grey sandstone (50%).											8.62-8.70m: DS, 80mm					PLT	PL(A)=0.23MPa
	11						FR						8.80m JT, 60°, PR, CT Clay, SM					PLT	PL(A)=0.42MPa
	12												9.00m: JT, 85°, PR, TI, (8.88-9.05)					PLT	PL(A)=0.38MPa
	13	Borehole discontinued at 12.98m depth. Target Depth Reached.											9.10m: JT, 50°, PR, CN, SM						
	14												9.43-9.50m: JT x2, 30-60°, PR, CN, SM, fragmented						
	15												9.75-9.90m: JT x2, 60-70°, PR, CN, SM						
	16												10.78-10.95m: B x4, 0-10°, PR, CT Clay, SM						
	17												11.05m: EW, Clay 10mm					PLT	PL(A)=0.97MPa
	18												11.10m: B, 0°, PR, VNR Clay, SM						
	19												11.25m: JT, 30-50°, ST, CN, SM						
	20												12.32m: B, 5°, PR, VNR Clay, SM					PLT	PL(A)=0.92MPa
	21												12.36m: B, 0°, PR, VNR Clay, SM						
	22												12.69m: B 0°, PR, CN, SM						
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NOTES: ¹Soil origin is "probable" unless otherwise stated. ²Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Bobcat
METHOD: DT to 0.34m, then AD/T to 2m, then WB to 5.9m, then NMLC to 12.98m
REMARKS:

OPERATOR: Groundtest (J.Jeffcoat)

LOGGED: E. Miler
CASING: HW to 2m

Refer to explanatory notes for symbol and abbreviation definitions



CORE PHOTO LOG

CLIENT: Newington College

PROJECT: Newington Masterplan

LOCATION: 244 Stanmore Road, Stanmore, Sydney, NSW 2048

SURFACE LEVEL: 33.0 AHD

COORDINATE: E:330134.1, N:6247760.5

DATUM/GRID: MGA2020 Zone 56

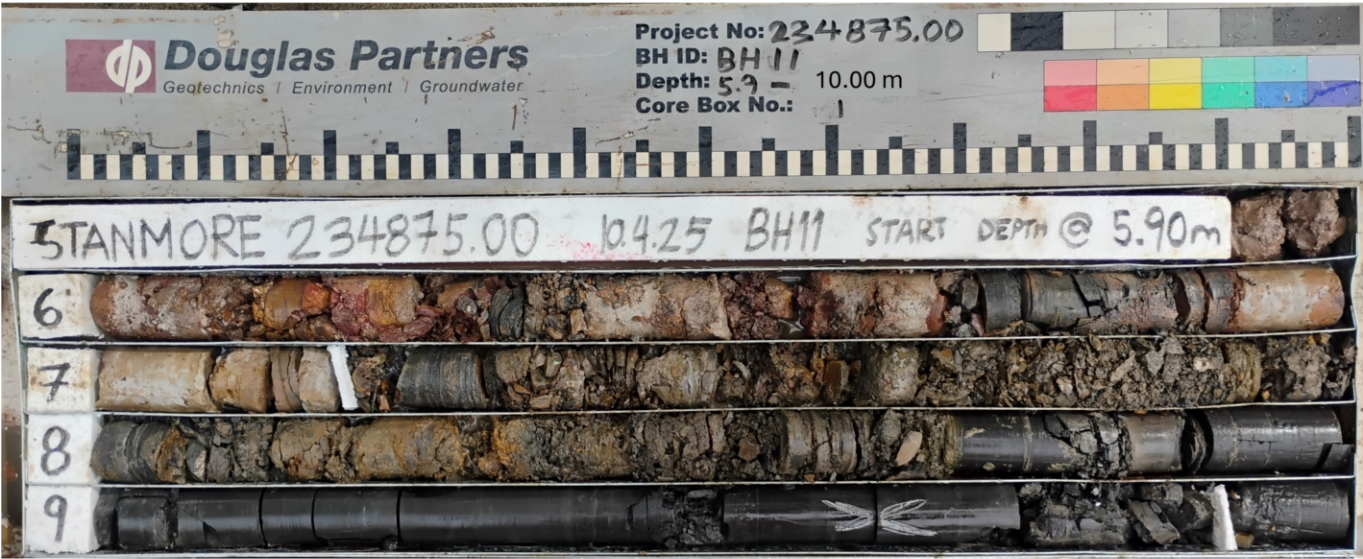
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH11

PROJECT No: 234875.00

DATE: 09/04/25 - 10/04/25

SHEET: 1 of 1



5.90-10.00 m depth



10.00-12.98 m depth

BOREHOLE LOG

CLIENT: Newington College
PROJECT: Newington Masterplan
LOCATION: 244 Stanmore Road, Stanmore, Sydney, NSW 2048

SURFACE LEVEL: 33.7 AHD
COORDINATE: E:330153.3, N:6247775.0
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH12
PROJECT No: 234875.00
DATE: 10/04/25
SHEET: 1 of 2

CONDITIONS ENCOUNTERED													SAMPLE		TESTING				
GROUNDWATER	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	SOIL			ROCK							SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
				ORIGIN ^(#)	CONSIS. ^(*)	DENSITY ^(*)	MOISTURE	WEATH.	DEPTH (m)	STRENGTH	RECOVERY (%)	RQD	FRACTURE SPACING (m)						
10/04/25 NFGWOWA	0.06	CONCRETE PAVERS.				NA	NA												
	0.10	PAVERS.																	
	0.24	CONCRETE SLAB.																	
	0.50	FILL / GRAVEL; fine to coarse, igneous.		FILL	ND	NDF								ES	0.40 - 0.50	PID	<1ppm		
	1	FILL / Silty CLAY: dark brown; tile fragment.		FILL	VS	w<PL								ES	0.80 - 1.00	PID	<1ppm		
	1.60	FILL / Silty SAND: pale brown and grey; fine to medium.		FILL	(VL) (L)	D								ES	1.30 - 1.50	SPT	0,1,1 N=2		
	2	CLAY (CI-CH): grey mottled red-brown; medium to high plasticity.		RS	St - VSt	w<PL								ES	1.80 - 2.30	PID	<1ppm		
	2.30	CLAY (CI-CH): grey mottled red-brown; medium to high plasticity.		RS	St - VSt	w<PL								ES	2.30 - 2.60	SPT	3,6,6 N=12		
	3	CLAY (CI-CH): grey mottled red-brown; medium to high plasticity.		RS	St - VSt	w<PL								ES	2.60 - 3.00	PID	<1ppm		
	4.00	CLAY (CI-CH): grey mottled red-brown; medium to high plasticity; with beds of ironstone and very low strength siltstone.		RS	St - VSt	w<PL								SPT	4.00 - 4.45	SPT	8,25,25 N=50		
5			XWM	H	w=PL														
6.50	SILTSTONE: dark grey and orange-brown. Ashfield Shale.																		
7																			

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

PLANT: Bobcat

OPERATOR: Groundtest (J.Jeffcoat)

LOGGED: E. Miler

METHOD: DT to 0.24m, then AD/T to 3m, then WB to 8.11m, then NMLC to 12.88m

CASING: HW to 3m

REMARKS:

Refer to explanatory notes for symbol and abbreviation definitions



BOREHOLE LOG

CLIENT: Newington College
PROJECT: Newington Masterplan
LOCATION: 244 Stanmore Road, Stanmore, Sydney, NSW 2048

SURFACE LEVEL: 33.7 AHD
COORDINATE: E:330153.3, N:6247775.0
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH12
PROJECT No: 234875.00
DATE: 10/04/25
SHEET: 2 of 2

CONDITIONS ENCOUNTERED														SAMPLE				TESTING	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	SOIL			ROCK						SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
					ORIGIN(#)	CONSIS. (V)	DENSITY (V)	MOISTURE	WEATH.	DEPTH (m)	STRENGTH	RECOVERY (%)	RQD						
		8.40	[CONT] SILTSTONE: dark grey and orange-brown. Ashfield Shale.					HW	8.11	(VL)						8.11			
		9	SILTSTONE: dark grey; 1% pale grey, fine grained sandstone laminations. Ashfield Shale.					SW	8.40	(L)							PLT	PL(A)=0.40MPa	
		9.25																	
		10															PLT	PL(A)=0.39MPa	
		11																	
		11.50															PLT	PL(A)=0.32MPa	
		12	SILTSTONE: dark grey; 1-5% pale grey, fine grained sandstone laminations. Ashfield Shale.																
		12.30	From 12.30m: 30-40% pale grey, fine grained sandstone laminations																
		12.88															PLT	PL(A)=0.51MPa	
		13	Borehole discontinued at 12.88m depth. Target Depth Reached.																
		14																	
		15																	

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

NOTES: ¹ Soil origin is "probable" unless otherwise stated. ² Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Bobcat
METHOD: DT to 0.24m, then AD/T to 3m, then WB to 8.11m, then NMLC to 12.88m
REMARKS:

OPERATOR: Groundtest (J.Jeffcoat)

LOGGED: E. Miler
CASING: HW to 3m

Refer to explanatory notes for symbol and abbreviation definitions



CORE PHOTO LOG

CLIENT: Newington College
PROJECT: Newington Masterplan
LOCATION: 244 Stanmore Road, Stanmore, Sydney, NSW 2048

SURFACE LEVEL: 33.7 AHD
COORDINATE: E:330153.3, N:6247775.0
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH12
PROJECT No: 234875.00
DATE: 10/04/25
SHEET: 1 of 1



8.11-12.88 m depth

BOREHOLE LOG

CLIENT: Newington College
PROJECT: Newington Masterplan
LOCATION: 244 Stanmore Road, Stanmore, Sydney, NSW 2048

SURFACE LEVEL: 31.7 AHD
COORDINATE: E:330193.8, N:6247769.0
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH13
PROJECT No: 234875.00
DATE: 17/04/25
SHEET: 1 of 1

CONDITIONS ENCOUNTERED															SAMPLE			TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN (#)	CONSIS. ^(*)	DENSITY. ^(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS					
17/04/25 NFGWOWA	0.02		FILL / SYNTHETIC GRASS; 15mm thick.																
	0.07		FILL / CONCRETE SLAB; 50mm thick.		FILL					ES		0.10							
	0.33		FILL / GRAVEL; medium to coarse, igneous.		FILL							0.20							
	0.48		FILL / CONCRETE; inferred retaining wall footing.		FILL														
			FILL / Silty Gravelly CLAY trace roots; apparent void present.		FILL														
	1	Borehole discontinued at 0.90m depth. Practical refusal on concrete rubble in fill.																	
	2																		
	3																		
	4																		
	5																		
	6																		
	7																		

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

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

PLANT: Bobcat
METHOD: DT to 0.07m, then AD/T to 0.33m, then DT to 0.48m
REMARKS:

OPERATOR: Groundtest (J.Jeffcoat)

LOGGED: E. Miler
CASING: Uncased

Refer to explanatory notes for symbol and abbreviation definitions

BOREHOLE LOG

CLIENT: Newington College
PROJECT: Newington Masterplan
LOCATION: 244 Stanmore Road, Stanmore, Sydney, NSW 2048

SURFACE LEVEL: 31.3 AHD
COORDINATE: E:330220.6, N:6247752.0
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH14
PROJECT No: 234875.00
DATE: 14/04/25 - 15/04/25
SHEET: 1 of 2

CONDITIONS ENCOUNTERED														SAMPLE				TESTING	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	SOIL			ROCK						SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
					ORIGIN(%)	CONSIS. (%)	DENSITY (%)	MOISTURE	WEATH.	DEPTH (m)	STRENGTH	RECOVERY (%)	RQD						
14/04/25 NFGWOWA		0.06	ASPHALTIC CONCRETE.			NA	NA												
		31	FILL / Silty CLAY with sand trace gravel: pale grey-brown; fine sand; fine, igneous gravel; rootlets.		FILL	ND									ES	0.10 0.20	PID	<1ppm	
															ES	0.40 0.50	PID	<1ppm	
		0.70	CLAY trace silt: red-orange-brown mottled grey; medium to high plasticity.												ES	0.80 1.00	PID	<1ppm	
		1				F to St								SPT	1.30	SPT	2,3,4 N=7		
		30													ES	1.50	PID	<1ppm	
		2					w<PL												
		29				RS													
		3					VSt to H								SPT	2.50 2.95	SPT	8,9,24 N=33	
		28																	
		4.00		CLAY (CI-CH): grey mottled red-brown; medium to high plasticity; with bands of ironstone and very low strength siltstone.											SPT	4.00 4.45	SPT	20,24,25 N=49	
		27																	
		5																	
		26				XWM	H	w=PL							SPT	5.50 5.77	SPT	10,25/120	
	6																		
	25																		
	7.00		CORE LOSS (680mm).			NA	ND	ND			7.00			SPT	7.00 7.11	SPT	25/110		
	24																		
	7.68		SILTSTONE: [description over].					HW			7.68	SOIL/VL							
											7.95								
NOTES: [#] Soil origin is "probable" unless otherwise stated. [†] Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.																			

BOREHOLE LOG

CLIENT: Newington College
PROJECT: Newington Masterplan
LOCATION: 244 Stanmore Road, Stanmore, Sydney, NSW 2048

SURFACE LEVEL: 31.3 AHD
COORDINATE: E:330220.6, N:6247752.0
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH14
PROJECT No: 234875.00
DATE: 14/04/25 - 15/04/25
SHEET: 2 of 2

CONDITIONS ENCOUNTERED														SAMPLE			TESTING		
GROUNDWATER	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	SOIL			ROCK							SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
				ORIGIN(#)	CONSIS.(%)	DENSITY.(%)	MOISTURE	WEATH.	DEPTH (m)	STRENGTH	RECOVERY (%)	RQD	FRACTURE SPACING (m)						
	8.00	SILTSTONE: dark grey and orange-brown; 5-20% extremely weathered seams. Ashfield Shale.																PLT	PL(A)=0.05MPa
	9																	PLT	PL(A)=0.16MPa
	9.75	SILTSTONE: dark grey. Ashfield Shale.																PLT	PL(A)=0.29MPa
	10																	PLT	PL(A)=0.48MPa
	11	From 11.24m: 1-5% pale grey, fine grained sandstone laminations																PLT	PL(A)=0.55MPa
	12																	PLT	PL(A)=0.48MPa
	12.10	LAMINITE: dark grey shale (60%); interlaminated with pale grey, fine grained, sandstone (40%).																PLT	PL(A)=0.80MPa
																		PLT	PL(A)=0.78MPa
																		PLT	PL(A)=1.5MPa
																		PLT	PL(A)=1.4MPa
	13	Borehole discontinued at 12.73m depth. Target Depth Reached.																	
	14																		
	15																		

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

PLANT: Bobcat
METHOD: AD/T to 2.5m, then WB to 7m, then NMLC to 12.73m
REMARKS:

OPERATOR: Groundtest (J.Jeffcoat)

LOGGED: E. Miler
CASING: HW to 2.5m

Refer to explanatory notes for symbol and abbreviation definitions



CORE PHOTO LOG

CLIENT: Newington College

PROJECT: Newington Masterplan

LOCATION: 244 Stanmore Road, Stanmore, Sydney, NSW 2048

SURFACE LEVEL: 31.3 AHD

COORDINATE: E:330220.6, N:6247752.0

DATUM/GRID: MGA2020 Zone 56

DIP/AZIMUTH: 90°/---

LOCATION ID: BH14

PROJECT No: 234875.00

DATE: 14/04/25 - 15/04/25

SHEET: 1 of 1



7.00-12.73 m depth

BOREHOLE LOG

CLIENT: Newington College
PROJECT: Newington Masterplan
LOCATION: 244 Stanmore Road, Stanmore, Sydney, NSW 2048

SURFACE LEVEL: 28.9 AHD
COORDINATE: E:330206.3, N:6247718.9
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH15
PROJECT No: 234875.00
DATE: 15/04/25 - 16/04/25
SHEET: 1 of 2

CONDITIONS ENCOUNTERED														SAMPLE			TESTING				
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	SOIL			ROCK						SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS	BACKFILL	WELL PIPE
					ORIGIN (#)	CONSIS. (%) DENSITY (%)	MOISTURE	WEATH.	DEPTH (m)	STRENGTH	RECOVERY (%)	RQD	FRACTURE SPACING (m)								
15/04/25 NFGWOWA		0.06	ASPHALTIC CONCRETE.			NA	NA														
			FILL / Sandy CLAY trace silt trace gravel: dark grey-brown; fine sand; fine, igneous gravel.		FILL	ND								ES	0.10 0.20	PID	<1ppm				
														ES	0.40 0.50	PID	<1ppm				
		0.70	CLAY (CI-CH) trace silt: grey mottled red-brown; medium to high plasticity.											ES	0.70 0.80	PID	<1ppm				
		1			RS	F to St								B	1.00			2,3,5 N=8			
														SPT	1.45 1.50	SPT					
		2																			
		2.50	CLAY (CI-CH): grey mottled red-brown; medium to high plasticity; with ironstone gravels.												SPT	2.50 2.95	SPT	7,11,21 N=32			
		3																			
	2.5	4			RS	w<PL								SPT	4.00 4.45	SPT	8,13,21 N=34				
	2.4	5				H															
	2.3	5.50	CLAY (CI-CH): dark grey and orange-brown; medium to high plasticity; with very low strength siltstone beds, some ironstaining.											SPT	5.50 5.93	SPT	18,23,25/130				
	2.2	6			XWM																
	2.1	7												SPT	7.00 7.29	SPT	11,25/140				

BOREHOLE LOG

CLIENT: Newington College
PROJECT: Newington Masterplan
LOCATION: 244 Stanmore Road, Stanmore, Sydney, NSW 2048

SURFACE LEVEL: 28.9 AHD
COORDINATE: E:330206.3, N:6247718.9
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH15
PROJECT No: 234875.00
DATE: 15/04/25 - 16/04/25
SHEET: 2 of 2

CONDITIONS ENCOUNTERED										SAMPLE		TESTING									
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	SOIL			ROCK						SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS	BACKFILL	WELL PIPE
					ORIGIN ^(#)	CONSIS. ^(*)	DENSITY. ^(*)	MOISTURE	WEATH.	DEPTH (m)	STRENGTH	RECOVERY (%)	RQD								
		8.00	LAMINITE: dark grey shale (45%); interlaminited with fine grained, pale grey sandstone (55%). Ashfield Shale.										8.02m: JT, 30°, PR, SN Fe			8.00					
		9											8.05-815m: DS, 80mm			9	PLT	PL(A)=0.04MPa			
													8.23-8.40m: B x5 0°, PR, CT Clay				PLT	PL(A)=0.02MPa			
													8.45-853m: DS, 80mm				PLT	PL(A)=0.15MPa			
													8.56-875m: B x9 0-10°, PR, CT Clay				PLT	PL(A)=0.46MPa			
													8.75-885m: DS, 100mm				PLT	PL(A)=0.72MPa			
													8.88-8.95m: DS, 70mm				PLT	PL(A)=0.87MPa			
													9.02m: EW, Clay 30mm				PLT	PL(A)=1.9MPa			
													9.06-9.42m: B x7, 0-10°, PR, CT Clay 1mm, SM				PLT	PL(A)=0.72MPa			
													9.92m: B, 5°, PR, VNR Clay, SM				PLT	PL(A)=1.0MPa			
													10.48-10.56m DS, 60mm				PLT	PL(A)=0.23MPa			
																	PLT	PL(A)=1.4MPa			
																	PLT	PL(A)=1.2MPa			
																	PLT	PL(A)=2.8MPa			
																	PLT	PL(A)=2.4MPa			
																	PLT	PL(A)=3.0MPa			
																	PLT	PL(A)=2.0MPa			
		12.81											12.64m: JT, 40-90°, CU, CN, SM, (12.59-12.75m)								
		13	Borehole discontinued at 12.81m depth. Target Depth Reached.																		
		14																			
		15																			

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

PLANT: Bobcat	OPERATOR: Groundtest (J.Jeffcoat)	LOGGED: E. Miler
METHOD: AD/T to 2.5m, then WB to 8m, then NMLC to 12.81m		CASING: HW to 2.6m
REMARKS: * BD6/20250415 taken from 0.4-0.5m		



CORE PHOTO LOG

CLIENT: Newington College

PROJECT: Newington Masterplan

LOCATION: 244 Stanmore Road, Stanmore, Sydney, NSW 2048

SURFACE LEVEL: 28.9 AHD

COORDINATE: E:330206.3, N:6247718.9

DATUM/GRID: MGA2020 Zone 56

DIP/AZIMUTH: 90°/---°

LOCATION ID: BH15

PROJECT No: 234875.00

DATE: 15/04/25 - 16/04/25

SHEET: 1 of 1



8.00-12.81 m depth

BOREHOLE LOG

CLIENT: Newington College
PROJECT: Newington Masterplan
LOCATION: 244 Stanmore Road, Stanmore, Sydney, NSW 2048

SURFACE LEVEL: 29.6 AHD
COORDINATE: E:330175.3, N:6247737.4
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH16
PROJECT No: 234875.00
DATE: 16/04/25
SHEET: 1 of 2

CONDITIONS ENCOUNTERED													SAMPLE		TESTING					
GROUNDWATER	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	SOIL		ROCK							SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS	BACKFILL	WELL PIPE
				ORIGIN(%)	CONSIS.(%) DENSITY.(%)	MOISTURE	WEATH.	DEPTH (m)	STRENGTH	RECOVERY (%)	RQD	FRACTURE SPACING (m)								
16/04/25 NFGWOWA	0.08	ASPHALTIC PAVERS.		FILL	NA	NA								ES	0.10	PID	<1ppm			
	0.25	FILL / Gravelly SAND with clay; fine; fine to coarse gravel.		FILL		M														
	0.55	FILL / SAND with clay trace gravel: pale brown; fine to medium; fine gravel.		FILL	ND									ES	0.60	PID	<1ppm			
	0.95	FILL / Sandy CLAY trace gravel: brown; fine - medium sand; fine - coarse gravel.		FILL										ES	0.80	PID	<1ppm			
		CLAY (CI-CH) trace silt: red-brown mottled grey; medium to high plasticity.												SPT	0.95	PID	<1ppm			
														ES	1.30	SPT	3,3,2 N=5			
														B	1.50	PID	<1ppm			
										</										

PLANT: Bobcat	OPERATOR: Groundtest (J.Jeffcoat)	LOGGED: E. Miller
METHOD: DT to 0.08m, then AD/T to 2.5m, then WB to 8m, then NMLC to 12.84m		CASING: HW to 2.5m
REMARKS:		



Refer to explanatory notes for symbol and abbreviation definitions

BOREHOLE LOG

CLIENT: Newington College
PROJECT: Newington Masterplan
LOCATION: 244 Stanmore Road, Stanmore, Sydney, NSW 2048

SURFACE LEVEL: 29.6 AHD
COORDINATE: E:330175.3, N:6247737.4
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH16
PROJECT No: 234875.00
DATE: 16/04/25
SHEET: 2 of 2

CONDITIONS ENCOUNTERED													SAMPLE		TESTING					
GROUNDWATER	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	SOIL			ROCK						SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS	BACKFILL	WELL PIPE
				ORIGIN ^(#)	CONSIS. ^(*)	DENSITY. ^(*)	MOISTURE	WEATH.	DEPTH (m)	STRENGTH	RECOVERY (%)	RQD								
	8.00	CORE LOSS (320mm).														8.00				
	8.32	SILTSTONE: dark grey and brown; ironstained. Ashfield Shale.																		
	8.90	SILTSTONE: dark grey; 20-30% pale grey, fine grained sandstone laminations. Ashfield Shale.																		
	9.00																			
	9.20																			
	9.40																			
	9.60																			
	9.80																			
	10.00																			
	10.20																			
	10.40																			
	10.60																			
	10.80																			
	11.00																			
	11.20																			
	11.40																			
	11.60																			
	11.80																			
	12.00																			
	12.20																			
	12.40																			
	12.60																			
	12.80																			
	12.84	Borehole discontinued at 12.84m depth. Target Depth Reached.																		
	13.00																			
	13.20																			
	13.40																			
	13.60																			
	13.80																			
	14.00																			
	14.20																			
	14.40																			
	14.60																			
	14.80																			
	15.00																			

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

PLANT: Bobcat	OPERATOR: Groundtest (J.Jeffcoat)	LOGGED: E. Miller
METHOD: DT to 0.08m, then AD/T to 2.5m, then WB to 8m, then NMLC to 12.84m		CASING: HW to 2.5m
REMARKS:		



CORE PHOTO LOG

CLIENT: Newington College

PROJECT: Newington Masterplan

LOCATION: 244 Stanmore Road, Stanmore, Sydney, NSW 2048

SURFACE LEVEL: 29.6 AHD

COORDINATE: E:330175.3, N:6247737.4

DATUM/GRID: MGA2020 Zone 56

DIP/AZIMUTH: 90°/---°

LOCATION ID: BH16

PROJECT No: 234875.00

DATE: 16/04/25

SHEET: 1 of 1



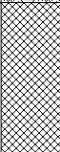
8.00-12.84 m depth

BOREHOLE LOG

CLIENT: Newington College
PROJECT: Masterplan and Concept Stage 1 SSDA
LOCATION: 244 Stanmore Road, Stanmore NSW

SURFACE LEVEL: 36.9 AHD
COORDINATE: E:330109.4, N:6247836.1
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH02
PROJECT No: 234875.01
DATE: 02/04/25
SHEET: 1 of 1

CONDITIONS ENCOUNTERED														SAMPLE			TESTING AND REMARKS				
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN (#)	CONSIS. ⁽¹⁾	DENSITY. ⁽²⁾	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS							
02/04/25 No free groundwater observed			CONCRETE; 130mm thick.					NA													
		0.13	FILL / Sandy CLAY trace cobbles: light brown; concrete cobbles.		FILL	ND				ES		0.13	PID	<1ppm							
		0.23	CLAY (CL): light brown; light grey; low to medium plasticity.		RS		w<PL			ES		0.23	PID	<1ppm							
Borehole discontinued at 0.35m depth. Hand auger refusal on very stiff clay.																0.25					
																0.35					

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

PLANT: Concrete coring machine and hand tools
METHOD: DT to 0.13m, HA to 0.35m
REMARKS:

OPERATOR: D. Kumar

LOGGED: D. Kumar
CASING: Uncased

Refer to explanatory notes for symbol and abbreviation definitions



BOREHOLE LOG

CLIENT: Newington College
PROJECT: Masterplan and Concept Stage 1 SSDA
LOCATION: 244 Stanmore Road, Stanmore NSW

SURFACE LEVEL: 38.3 AHD
COORDINATE: E:330147.6, N:6247824.1
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH03
PROJECT No: 234875.01
DATE: 02/04/25
SHEET: 1 of 1

CONDITIONS ENCOUNTERED										SAMPLE		TESTING AND REMARKS	
GROUNDWATER	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN (#)	CONSIS. ⁽¹⁾	DENSITY. ⁽²⁾	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
RL (m)													
02/04/25 No free groundwater observed	0.05	ASPHALT.											
	0.30	Roadbase: Gravelly SAND; fine to medium, roadbase; fine to medium, igneous gravel with bitumen gravel.		FILL			D		ES	0.20 - 0.30	PID	<1ppm	
		FILL / SAND with gravel trace concrete fragments, terracota, tiles and bricks: light brown; fine to medium; igneous and sandstone gravel.							ES	0.40 - 0.50	PID	<1ppm	
	1			FILL			M		ES	1.00 - 1.10	PID	<1ppm	
									ES	1.50 - 1.70	PID	<1ppm	
	1.70	FILL / Sandy CLAY with gravel trace terracota, tiles and bricks: brown to reddish brown; low plasticity; fine to coarse, sandstone and concrete gravel.							ES	1.80 - 1.90	PID	<1ppm	
	2			FILL			w<PL		ES	2.40 - 2.60	PID	<1ppm	
	2.80	CLAY (CL) trace gravel: reddish brown with light orange and light grey; low to medium plasticity; ironstone gravel.		RS					ES	3.00 - 3.20	PID	<1ppm	
	3												
		Borehole discontinued at 3.30m depth. Target depth reached.											
	4												

NOTES: ⁽¹⁾Soil origin is "probable" unless otherwise stated. ⁽²⁾Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

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

PLANT: Drillman GT-10
METHOD: Auger to 3.3m
REMARKS: BDI/20250402 collected from 1-1.1m

OPERATOR: Ground Test

LOGGED: D. Kumar
CASING: Uncased

Refer to explanatory notes for symbol and abbreviation definitions

BOREHOLE LOG

CLIENT: Newington College
PROJECT: Masterplan and Concept Stage 1 SSDA
LOCATION: 244 Stanmore Road, Stanmore NSW

SURFACE LEVEL: 38.3 AHD
COORDINATE: E:330154.1, N:6247836.2
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH04
PROJECT No: 234875.01
DATE: 02/04/25
SHEET: 1 of 1

CONDITIONS ENCOUNTERED														SAMPLE			TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN (#)	CONSIS. ^(*)	DENSITY. ^(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS				
02/04/25 No free groundwater observed	38	0.05	ASPHALT.					D										
			Roadbase: Gravelly SAND; fine to medium, roadbase; igneous gravel with bitumen gravel.		FILL													
		0.30	FILL / SAND with gravel trace concrete fragments, terracota, tiles and bricks: light brown; fine to medium; igneous and sandstone gravel.								ES		0.40	PID	<1ppm			
													0.60					
		1			FILL		ND		M		ES		1.10	PID	<1ppm			
													1.20					
		1.50	FILL / Sandy CLAY with gravel trace terracota, tiles and bricks: brown to dark grey-brown; low plasticity; fine to coarse, sandstone and concrete gravel.		FILL						ES		1.50	PID	<1ppm			
		1.70	CLAY (CL) trace gravel: reddish brown with hint of orange and light grey; low to medium plasticity; ironstone gravel.		RS				w<PL		ES		1.70					
													1.80	PID	<1ppm			
		2											2.00					
	36		Borehole discontinued at 2.00m depth. Target depth reached.															
	34																	

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

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

PLANT: Drillman GT-10
METHOD: Auger to 2m
REMARKS: BDI/20250402 collected from 0.40 to 0.60m

OPERATOR: Ground test

LOGGED: D. Kumar
CASING: Uncased

Permeability Testing - Falling Head Test Report

[illegible]

Permeability Testing - Falling Head Test Report

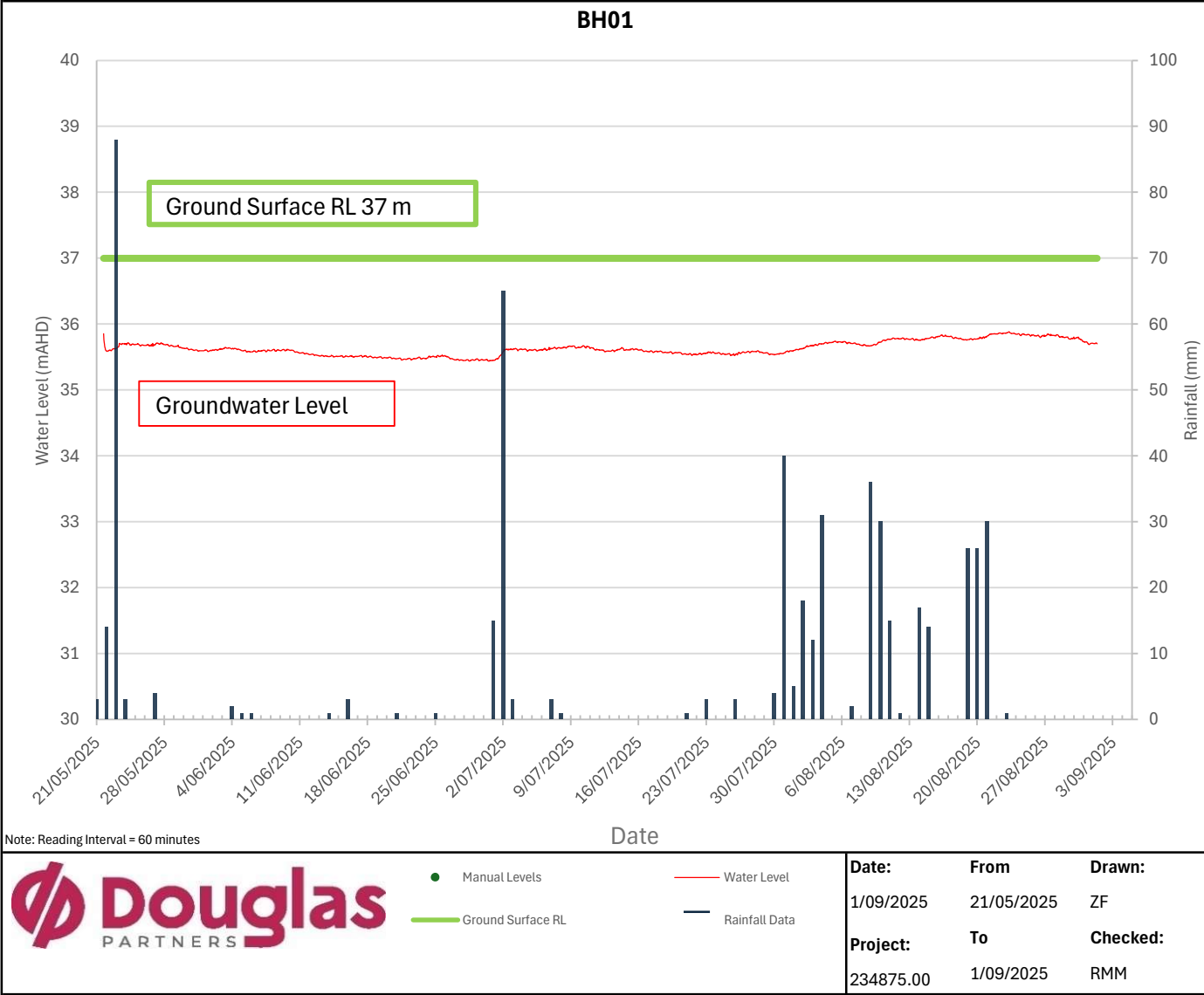
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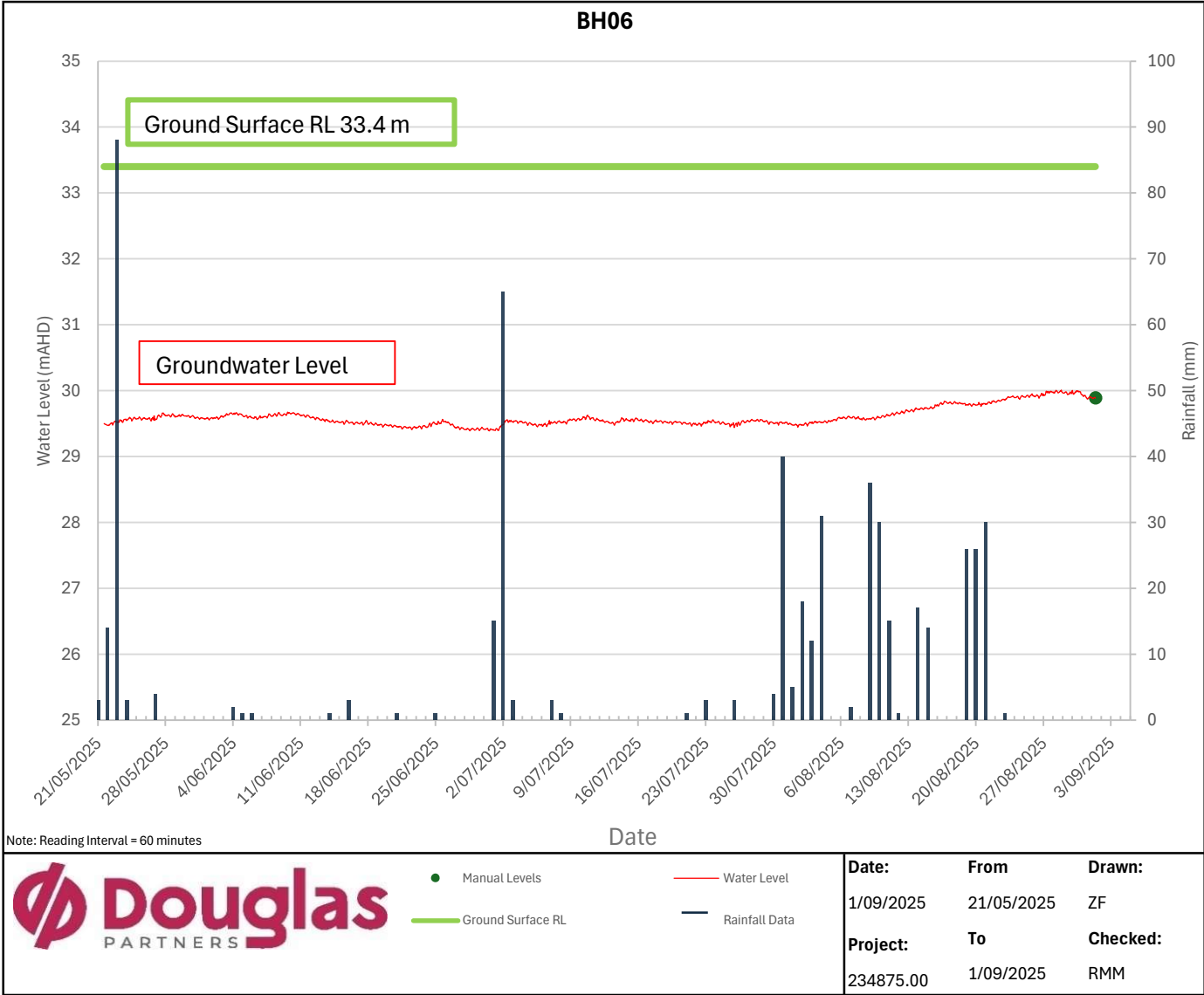
Permeability Testing - Falling Head Test Report

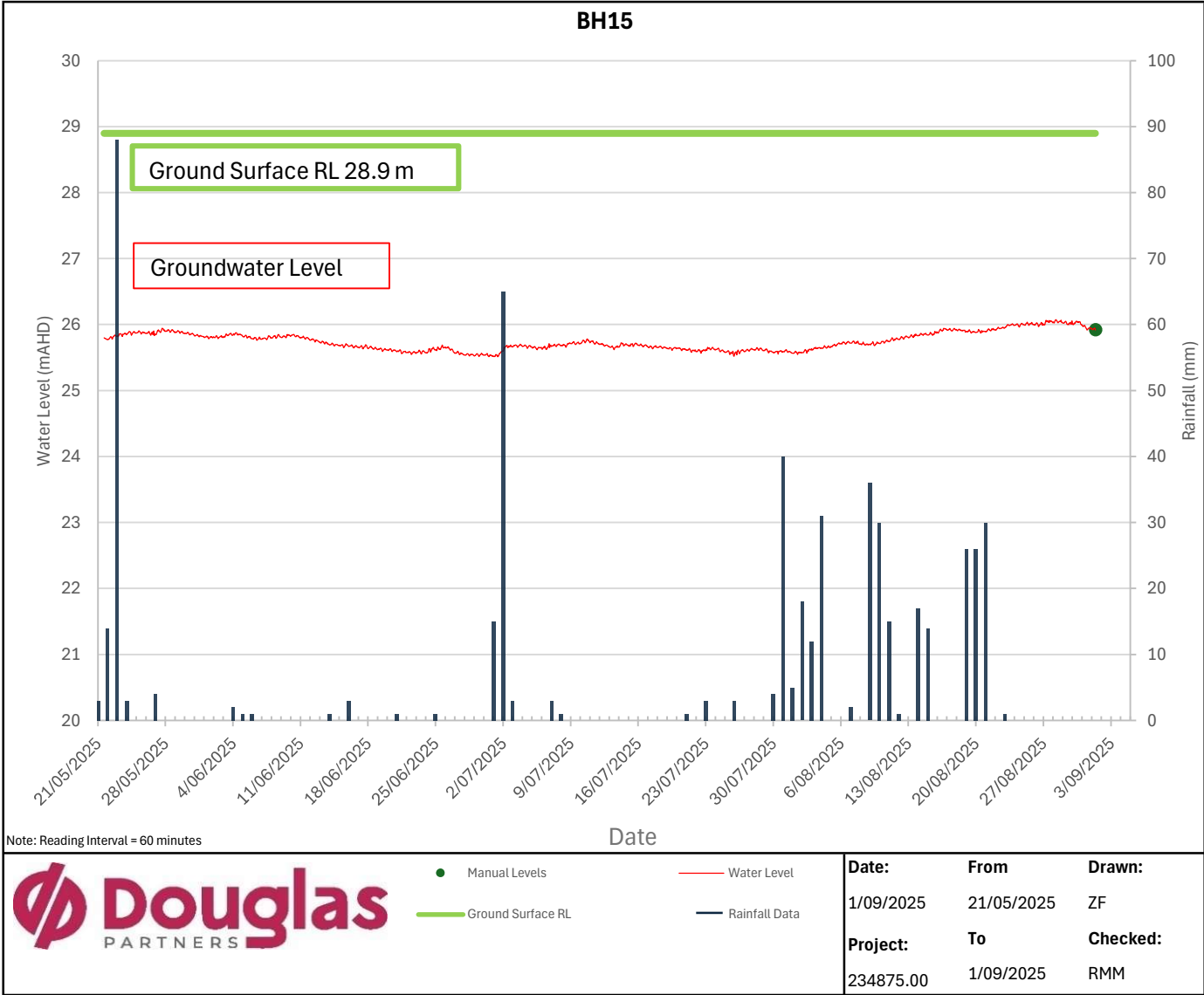
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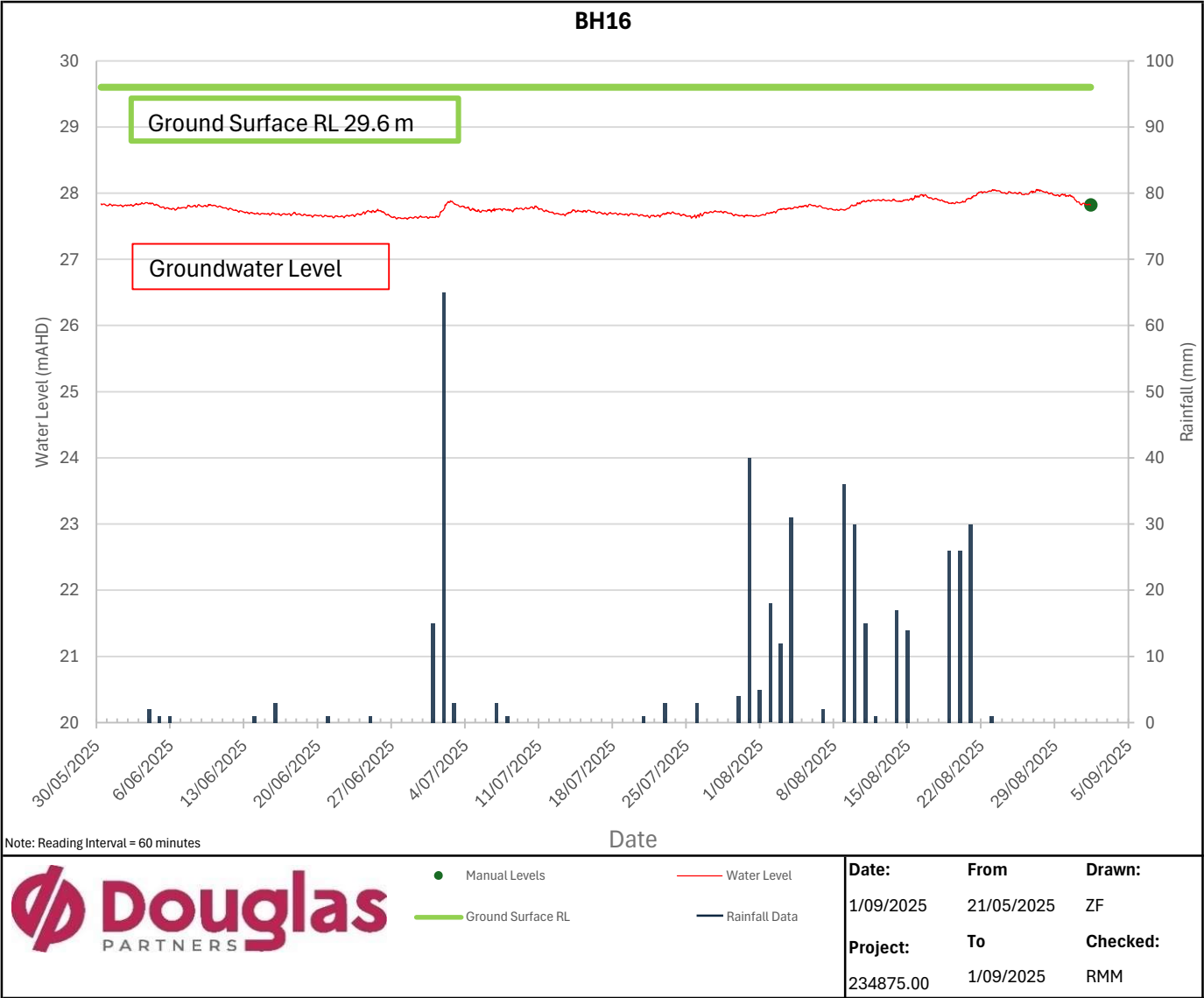
Permeability Testing - Rising Head Test Report

[illegible]









Appendix D

Laboratory Results

Material Test Report

Report Number: 234875.00-1
Issue Number: 1
Date Issued: 01/05/2025
Client: Newington College
244 Stanmore Road, Stanmore NSW
Contact: Ross Xenos
Project Number: 234875.00
Project Name: Newington Masterplan
Project Location: 244 Stanmore Road, Stanmore, sydney NSW
Work Request: 12295
Sample Number: SY-12295A
Date Sampled: 02/04/2025
Dates Tested: 23/04/2025 - 28/04/2025
Sampling Method: Sampled by Engineering Department
The results apply to the sample as received
Sample Location: BH1 , Depth: 0.25-0.35m
Material: CLAY (CH): red brown mottled grey



Douglas Partners Pty Ltd

Sydney Laboratory

96 Hermitage Road West Ryde NSW 2114

Phone: (02) 9809 0666

Email: lujia.wu@douglaspartners.com.au



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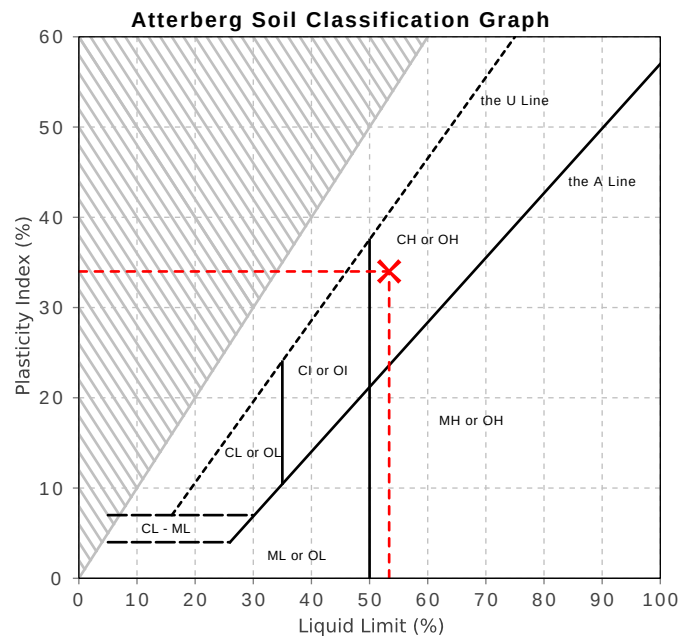
Lujia Wu

Approved Signatory: Lujia Wu

Soil Technician

Laboratory Accreditation Number: 828

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Oven Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	53		
Plastic Limit (%)	19		
Plasticity Index (%)	34		
Linear Shrinkage (AS1289 3.4.1)		Min	Max
Moisture Condition Determined By	AS 1289.3.1.2		
Linear Shrinkage (%)	15.0		
Cracking Crumbling Curling	None		
Moisture Content (AS 1289 2.1.1)		Min	Max
Moisture Content (%)	22.0		



Material Test Report

Report Number: 234875.00-1
Issue Number: 1
Date Issued: 01/05/2025
Client: Newington College
244 Stanmore Road, Stanmore NSW
Contact: Ross Xenos
Project Number: 234875.00
Project Name: Newington Masterplan
Project Location: 244 Stanmore Road, Stanmore, sydney NSW
Work Request: 12295
Sample Number: SY-12295B
Date Sampled: 02/04/2025
Dates Tested: 23/04/2025 - 28/04/2025
Sampling Method: Sampled by Engineering Department
The results apply to the sample as received
Sample Location: BH6 , Depth: 2.5-2.95m
Material: Silty CLAY (CI): grey mottled red-orange-brown, with ironstone gravel



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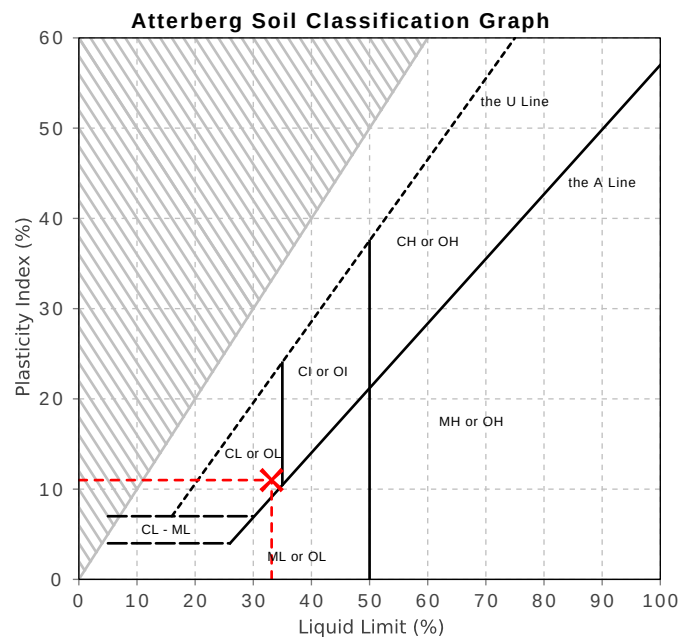
Lujia Wu

Approved Signatory: Lujia Wu

Soil Technician

Laboratory Accreditation Number: 828

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Oven Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	33		
Plastic Limit (%)	22		
Plasticity Index (%)	11		
Linear Shrinkage (AS1289 3.4.1)		Min	Max
Moisture Condition Determined By	AS 1289.3.1.2		
Linear Shrinkage (%)	8.0		
Cracking Crumbling Curling	None		
Moisture Content (AS 1289 2.1.1)		Min	Max
Moisture Content (%)	14.1		



Material Test Report

Report Number: 234875.00-1
Issue Number: 1
Date Issued: 01/05/2025
Client: Newington College
244 Stanmore Road, Stanmore NSW
Contact: Ross Xenos
Project Number: 234875.00
Project Name: Newington Masterplan
Project Location: 244 Stanmore Road, Stanmore, sydney NSW
Work Request: 12295
Sample Number: SY-12295C
Date Sampled: 02/04/2025
Dates Tested: 23/04/2025 - 28/04/2025
Sampling Method: Sampled by Engineering Department
The results apply to the sample as received
Sample Location: BH9 , Depth: 1.0-1.45m
Material: CLAY (CH): grey mottled red-orange-brown



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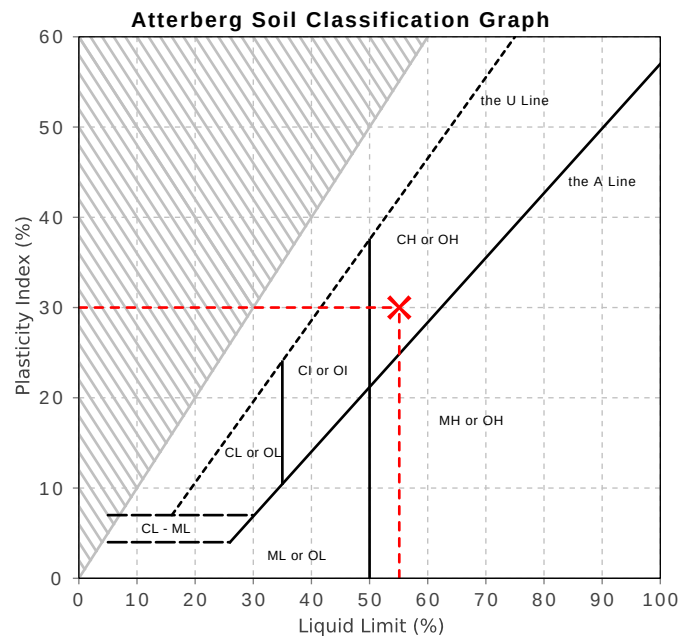
Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Lujia Wu

Soil Technician

Laboratory Accreditation Number: 828

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Oven Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	55		
Plastic Limit (%)	25		
Plasticity Index (%)	30		
Linear Shrinkage (AS1289 3.4.1)		Min	Max
Moisture Condition Determined By	AS 1289.3.1.2		
Linear Shrinkage (%)	13.5		
Cracking Crumbling Curling	None		
Moisture Content (AS 1289 2.1.1)		Min	Max
Moisture Content (%)	25.4		



Material Test Report

Report Number: 234875.00-1
Issue Number: 1
Date Issued: 01/05/2025
Client: Newington College
244 Stanmore Road, Stanmore NSW
Contact: Ross Xenos
Project Number: 234875.00
Project Name: Newington Masterplan
Project Location: 244 Stanmore Road, Stanmore, sydney NSW
Work Request: 12295
Sample Number: SY-12295D
Date Sampled: 02/04/2025
Dates Tested: 23/04/2025 - 28/04/2025
Sampling Method: Sampled by Engineering Department
The results apply to the sample as received
Sample Location: BH12 , Depth: 2.5-2.95m
Material: CLAY (CH): grey mottled red-orange-brown



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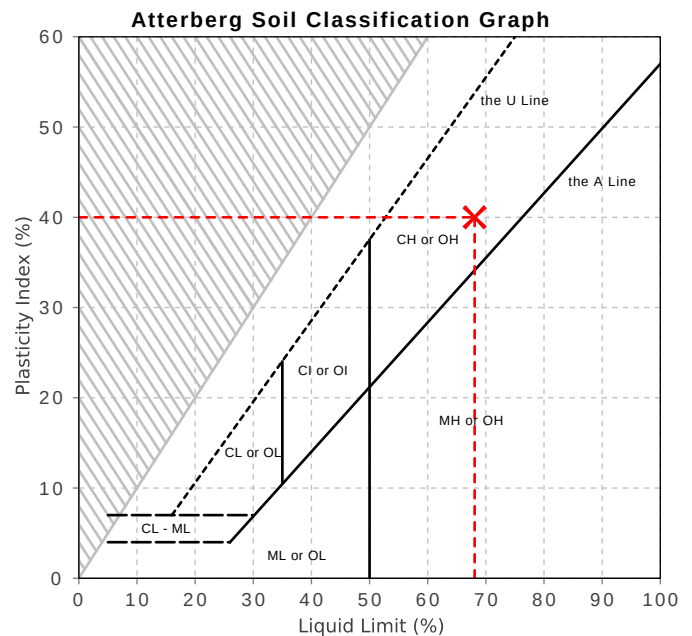
Lujia Wu

Approved Signatory: Lujia Wu

Soil Technician

Laboratory Accreditation Number: 828

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Oven Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	68		
Plastic Limit (%)	28		
Plasticity Index (%)	40		
Linear Shrinkage (AS1289 3.4.1)		Min	Max
Moisture Condition Determined By	AS 1289.3.1.2		
Linear Shrinkage (%)	16.5		
Cracking Crumbling Curling	None		
Moisture Content (AS 1289 2.1.1)		Min	Max
Moisture Content (%)	24.9		



Material Test Report

Report Number: 234875.00-1
Issue Number: 1
Date Issued: 01/05/2025
Client: Newington College
244 Stanmore Road, Stanmore NSW
Contact: Ross Xenos
Project Number: 234875.00
Project Name: Newington Masterplan
Project Location: 244 Stanmore Road, Stanmore, sydney NSW
Work Request: 12295
Sample Number: SY-12295E
Date Sampled: 02/04/2025
Dates Tested: 23/04/2025 - 28/04/2025
Sampling Method: Sampled by Engineering Department
The results apply to the sample as received
Sample Location: BH14 , Depth: 0.8-1.0m
Material: CLAY (CH): red brown mottled grey, with silt



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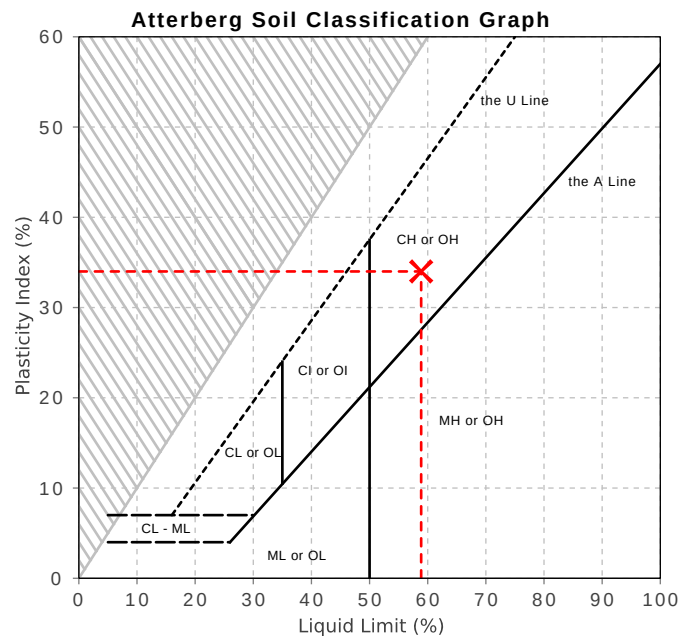
Lujia Wu

Approved Signatory: Lujia Wu

Soil Technician

Laboratory Accreditation Number: 828

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Oven Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	59		
Plastic Limit (%)	25		
Plasticity Index (%)	34		
Linear Shrinkage (AS1289 3.4.1)		Min	Max
Moisture Condition Determined By	AS 1289.3.1.2		
Linear Shrinkage (%)	14.5		
Cracking Crumbling Curling	None		
Moisture Content (AS 1289 2.1.1)		Min	Max
Moisture Content (%)	26.4		



Material Test Report

Report Number: 234875.00-1
Issue Number: 1
Date Issued: 01/05/2025
Client: Newington College
244 Stanmore Road, Stanmore NSW
Contact: Ross Xenos
Project Number: 234875.00
Project Name: Newington Masterplan
Project Location: 244 Stanmore Road, Stanmore, sydney NSW
Work Request: 12295
Sample Number: SY-12295F
Date Sampled: 02/04/2025
Dates Tested: 23/04/2025 - 28/04/2025
Sampling Method: Sampled by Engineering Department
The results apply to the sample as received
Sample Location: BH15 , Depth: 0.8-1.0m
Material: CLAY (CH), red-orange-brown mottled grey, with silt



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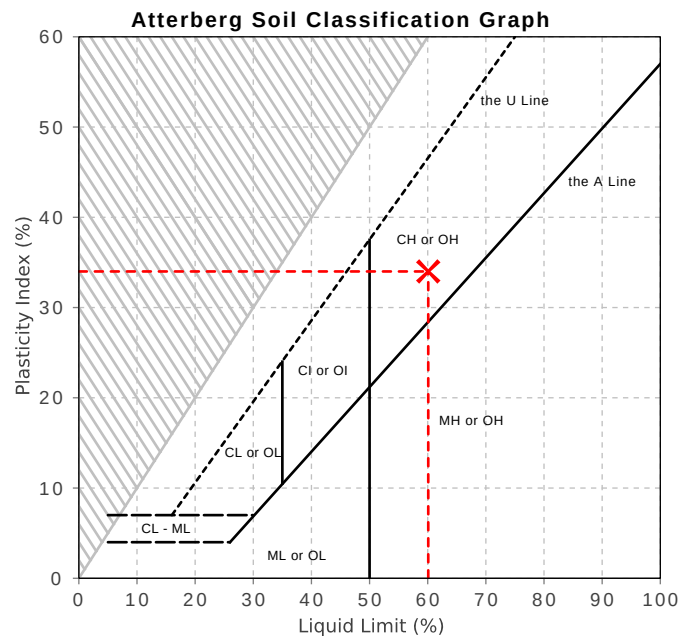
Lujia Wu

Approved Signatory: Lujia Wu

Soil Technician

Laboratory Accreditation Number: 828

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Oven Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	60		
Plastic Limit (%)	26		
Plasticity Index (%)	34		
Linear Shrinkage (AS1289 3.4.1)		Min	Max
Moisture Condition Determined By	AS 1289.3.1.2		
Linear Shrinkage (%)	15.0		
Cracking Crumbling Curling	None		
Moisture Content (AS 1289 2.1.1)		Min	Max
Moisture Content (%)	33.2		



Material Test Report

Report Number: 234875.00-2
Issue Number: 1
Date Issued: 13/05/2025
Client: Newington College
244 Stanmore Road, Stanmore NSW
Contact: Ross Xenos
Project Number: 234875.00
Project Name: Newington Masterplan
Project Location: 244 Stanmore Road, Stanmore, sydney NSW
Work Request: 12294
Sample Number: SY-12294A
Date Sampled: 02/04/2025
Dates Tested: 22/04/2025 - 13/05/2025
Sampling Method: Sampled by Engineering Department
The results apply to the sample as received
Preparation Method: AS 1289.1.1 - Sampling and Preparation of Soils
Sample Location: BH1 (0.15 - 0.25m)
Material: FILL / Gravelly SAND: pale grey, trace clay, fine to coarse sand, fine to coarse, sandstone gravel



Douglas Partners Pty Ltd

Sydney Laboratory

96 Hermitage Road West Ryde NSW 2114

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Email: mick.gref@douglaspartners.com.au



Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Mick Gref

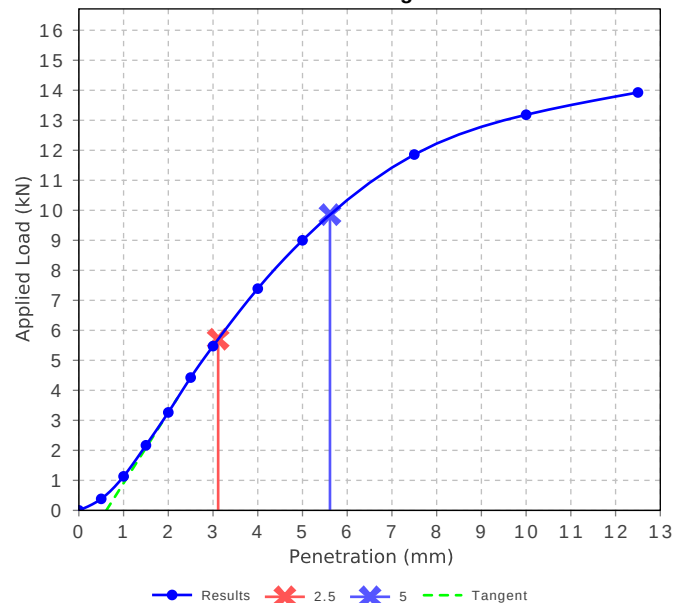
Assistant Laboratory Manager

Laboratory Accreditation Number: 828

California Bearing Ratio (AS 1289 6.1.1 & 2.1.1)		Min	Max
CBR taken at	5 mm		
CBR %	50		
Method of Compactive Effort	Standard		
Method used to Determine MDD	AS 1289 5.1.1 & 2.1.1		
Method used to Determine Plasticity	Visual Assessment		
Maximum Dry Density (t/m ³)	2.02		
Optimum Moisture Content (%)	10.0		
Laboratory Density Ratio (%)	100.0		
Laboratory Moisture Ratio (%)	98.5		
Dry Density after Soaking (t/m ³)	2.01		
Field Moisture Content (%)	15.9		
Moisture Content at Placement (%)	10.1		
Moisture Content Top 30mm (%)	11.8		
Moisture Content Rest of Sample (%)	10.9		
Mass Surcharge (kg)	4.5		
Soaking Period (days)	4		
Curing Hours (h)	187.2		
Swell (%)	0.0		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)	29.1		

Moisture Content (AS 1289 2.1.1)		Min	Max
Moisture Content (%)	15.9		

California Bearing Ratio



Material Test Report

Report Number: 234875.00-2
Issue Number: 1
Date Issued: 13/05/2025
Client: Newington College
244 Stanmore Road, Stanmore NSW
Contact: Ross Xenos
Project Number: 234875.00
Project Name: Newington Masterplan
Project Location: 244 Stanmore Road, Stanmore, sydney NSW
Work Request: 12294
Sample Number: SY-12294C
Date Sampled: 02/04/2025
Dates Tested: 22/04/2025 - 13/05/2025
Sampling Method: Sampled by Engineering Department
The results apply to the sample as received
Preparation Method: AS 1289.1.1 - Sampling and Preparation of Soils
Sample Location: BH8 (1.0 - 2.3m)
Material: CLAY: grey mottled red-orange-brown, trace fine sand



Douglas Partners Pty Ltd

Sydney Laboratory

96 Hermitage Road West Ryde NSW 2114

Phone: (02) 9809 0666

Email: mick.gref@douglaspartners.com.au



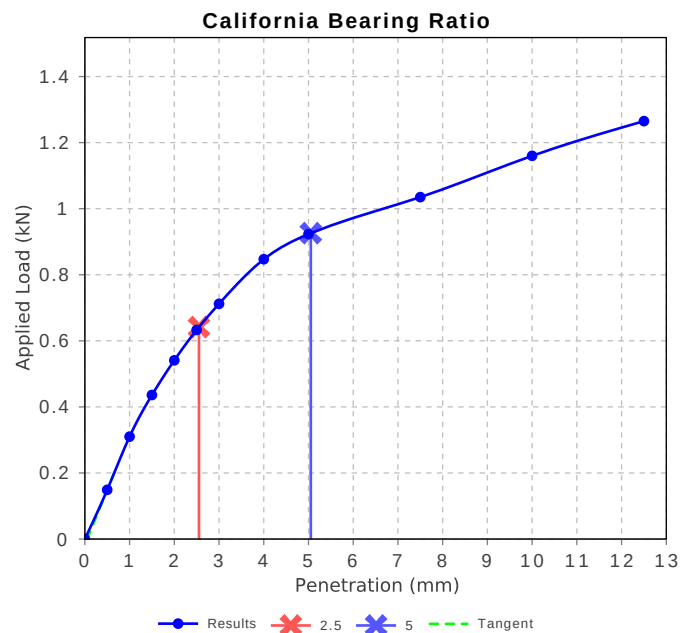
Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Mick Gref

Assistant Laboratory Manager

Laboratory Accreditation Number: 828

California Bearing Ratio (AS 1289 6.1.1 & 2.1.1)		Min	Max
CBR taken at	2.5 mm		
CBR %	5.0		
Method of Compactive Effort	Standard		
Method used to Determine MDD	AS 1289 5.1.1 & 2.1.1		
Method used to Determine Plasticity	Visual Assessment		
Maximum Dry Density (t/m ³)	1.54		
Optimum Moisture Content (%)	26.5		
Laboratory Density Ratio (%)	100.0		
Laboratory Moisture Ratio (%)	100.5		
Dry Density after Soaking (t/m ³)	1.52		
Field Moisture Content (%)	27.1		
Moisture Content at Placement (%)	26.6		
Moisture Content Top 30mm (%)	29.3		
Moisture Content Rest of Sample (%)	27.5		
Mass Surcharge (kg)	4.5		
Soaking Period (days)	4		
Curing Hours (h)	48		
Swell (%)	1.0		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)	0.2		
Moisture Content (AS 1289 2.1.1)		Min	Max
Moisture Content (%)	27.1		



Material Test Report

Report Number: 234875.00-2
Issue Number: 1
Date Issued: 13/05/2025
Client: Newington College
244 Stanmore Road, Stanmore NSW
Contact: Ross Xenos
Project Number: 234875.00
Project Name: Newington Masterplan
Project Location: 244 Stanmore Road, Stanmore, sydney NSW
Work Request: 12294
Sample Number: SY-12294D
Date Sampled: 02/04/2025
Dates Tested: 22/04/2025 - 13/05/2025
Sampling Method: Sampled by Engineering Department
The results apply to the sample as received
Preparation Method: AS 1289.1.1 - Sampling and Preparation of Soils
Sample Location: BH15 (0.7 - 1.5m)
Material: CLAY: grey mottled red-brown, trace silt



Douglas Partners Pty Ltd

Sydney Laboratory

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Phone: (02) 9809 0666

Email: mick.gref@douglaspartners.com.au



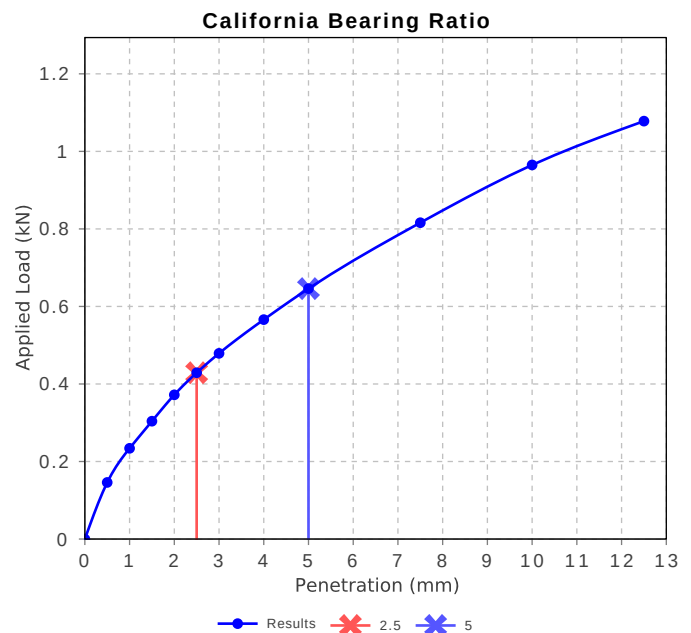
Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Mick Gref

Assistant Laboratory Manager

Laboratory Accreditation Number: 828

California Bearing Ratio (AS 1289 6.1.1 & 2.1.1)		Min	Max
CBR taken at	5 mm		
CBR %	3.5		
Method of Compactive Effort	Standard		
Method used to Determine MDD	AS 1289 5.1.1 & 2.1.1		
Method used to Determine Plasticity	Visual Assessment		
Maximum Dry Density (t/m ³)	1.68		
Optimum Moisture Content (%)	20.5		
Laboratory Density Ratio (%)	100.0		
Laboratory Moisture Ratio (%)	100.0		
Dry Density after Soaking (t/m ³)	1.64		
Field Moisture Content (%)	22.8		
Moisture Content at Placement (%)	20.7		
Moisture Content Top 30mm (%)	26.3		
Moisture Content Rest of Sample (%)	22.8		
Mass Surcharge (kg)	4.5		
Soaking Period (days)	4		
Curing Hours (h)	145.5		
Swell (%)	2.5		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)	0.1		
Moisture Content (AS 1289 2.1.1)		Min	Max
Moisture Content (%)	22.8		



Material Test Report

Report Number: 234875.00-2
Issue Number: 1
Date Issued: 13/05/2025
Client: Newington College
244 Stanmore Road, Stanmore NSW
Contact: Ross Xenos
Project Number: 234875.00
Project Name: Newington Masterplan
Project Location: 244 Stanmore Road, Stanmore, sydney NSW
Work Request: 12294
Sample Number: SY-12294E
Date Sampled: 02/04/2025
Dates Tested: 22/04/2025 - 13/05/2025
Sampling Method: Sampled by Engineering Department
The results apply to the sample as received
Sample Location: BH16 , Depth: 1.5 - 2.0m
Material: CLAY: red-brown mottled grey, trace silt



Douglas Partners Pty Ltd

Sydney Laboratory

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Phone: (02) 9809 0666

Email: mick.gref@douglaspartners.com.au



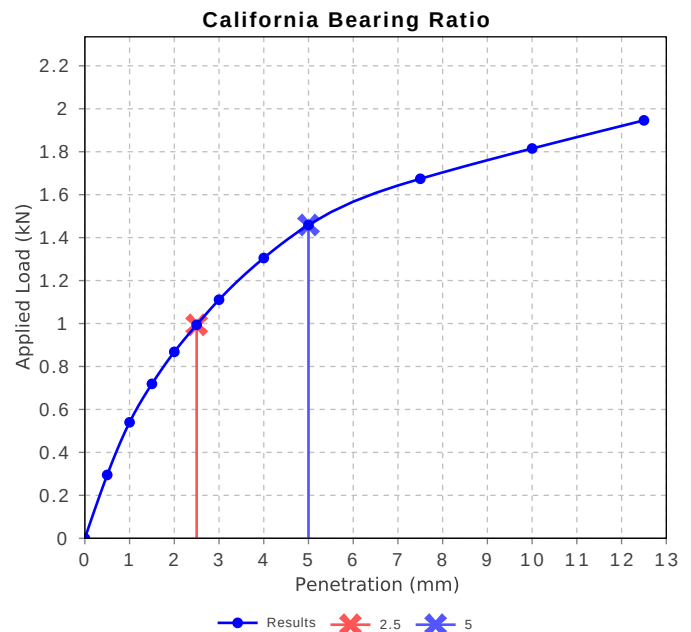
Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Mick Gref

Assistant Laboratory Manager

Laboratory Accreditation Number: 828

California Bearing Ratio (AS 1289 6.1.1 & 2.1.1)		Min	Max
CBR taken at	2.5 mm		
CBR %	8		
Method of Compactive Effort	Standard		
Method used to Determine MDD	AS 1289 5.1.1 & 2.1.1		
Method used to Determine Plasticity	Visual Assessment		
Maximum Dry Density (t/m ³)	1.67		
Optimum Moisture Content (%)	21.5		
Laboratory Density Ratio (%)	100.0		
Laboratory Moisture Ratio (%)	102.5		
Dry Density after Soaking (t/m ³)	1.66		
Field Moisture Content (%)	29.3		
Moisture Content at Placement (%)	21.9		
Moisture Content Top 30mm (%)	23.0		
Moisture Content Rest of Sample (%)	22.2		
Mass Surcharge (kg)	4.5		
Soaking Period (days)	4		
Curing Hours (h)	117.5		
Swell (%)	0.5		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)	0.0		
Moisture Content (AS 1289 2.1.1)		Min	Max
Moisture Content (%)	29.3		



CERTIFICATE OF ANALYSIS 378864

Client Details

Client	Douglas Partners Pty Ltd
Attention	Rhys McMillan
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	<u>234875.00 Stanmore</u>
Number of Samples	8 Soil
Date samples received	23/04/2025
Date completed instructions received	23/04/2025

Analysis Details

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

Report Details

Date results requested by	01/05/2025
Date of Issue	01/05/2025
NATA Accreditation Number 2901. This document shall not be reproduced except in full.	
Accredited for compliance with ISO/IEC 17025 - Testing. Tests not covered by NATA are denoted with *	

Results Approved By

Diego Bigolin, Inorganics Supervisor
Giovanni Agosti, Group Technical Manager
Stuart Chen, Asbestos Approved Identifier/Report coordinator

Authorised By

Nancy Zhang, Laboratory Manager

ESP/CEC						
Our Reference		378864-1	378864-4	378864-5	378864-6	378864-8
Your Reference	UNITS	BH1	BH7	BH8	BH11	BH16
Depth		2.4-2.5	0.8-1	2.5-2.95	4-4.45	2.5-2.95
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	30/04/2025	30/04/2025	30/04/2025	30/04/2025	30/04/2025
Date analysed	-	30/04/2025	30/04/2025	30/04/2025	30/04/2025	30/04/2025
Exchangeable Ca	meq/100g	2.4	1.7	1.6	0.3	1.5
Exchangeable K	meq/100g	0.1	0.2	0.4	0.2	0.1
Exchangeable Mg	meq/100g	1.3	3.6	3.7	2.1	1.7
Exchangeable Na	meq/100g	0.2	1.7	0.9	0.9	0.5
Cation Exchange Capacity	meq/100g	3.9	7.2	6.6	3.7	3.9
ESP	%	4	24	14	26	14

Misc Inorg - Soil						
Our Reference		378864-1	378864-2	378864-3	378864-4	378864-5
Your Reference	UNITS	BH1	BH3	BH5	BH7	BH8
Depth		2.4-2.5	1.5-1.7	1.3-1.5	0.8-1	2.5-2.95
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	28/04/2025	28/04/2025	28/04/2025	28/04/2025	28/04/2025
Date analysed	-	28/04/2025	28/04/2025	28/04/2025	28/04/2025	28/04/2025
pH 1:5 soil:water	pH Units	4.8	8.5	4.9	4.9	[NA]
Electrical Conductivity 1:5 soil:water	µS/cm	[NA]	110	78	[NA]	[NA]
Chloride, Cl 1:5 soil:water	mg/kg	<10	<10	<10	56	[NA]
Sulphate, SO4 1:5 soil:water	mg/kg	200	59	130	410	[NA]
Emerson Class No.	-	6.0	[NA]	[NA]	5.0	3b

Misc Inorg - Soil				
Our Reference		378864-6	378864-7	378864-8
Your Reference	UNITS	BH11	BH15	BH16
Depth		4-4.45	0.4-0.5	2.5-2.95
Type of sample		Soil	Soil	Soil
Date prepared	-	28/04/2025	28/04/2025	28/04/2025
Date analysed	-	28/04/2025	28/04/2025	28/04/2025
pH 1:5 soil:water	pH Units	5.6	6.4	[NA]
Electrical Conductivity 1:5 soil:water	µS/cm	[NA]	75	[NA]
Chloride, Cl 1:5 soil:water	mg/kg	34	<10	[NA]
Sulphate, SO4 1:5 soil:water	mg/kg	57	48	[NA]
Emerson Class No.	-	1.0	[NA]	5.0

Texture and Salinity*						
Our Reference		378864-1	378864-4	378864-5	378864-6	378864-8
Your Reference	UNITS	BH1	BH7	BH8	BH11	BH16
Depth		2.4-2.5	0.8-1	2.5-2.95	4-4.45	2.5-2.95
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	28/04/2025	28/04/2025	28/04/2025	28/04/2025	28/04/2025
Date analysed	-	28/04/2025	28/04/2025	28/04/2025	28/04/2025	28/04/2025
Electrical Conductivity 1:5 soil:water	µS/cm	100	260	73	77	350
Texture Value	-	7.0	8.0	8.0	8.0	7.0
Texture	-	MEDIUM CLAY	LIGHT MEDIUM CLAY	LIGHT MEDIUM CLAY	LIGHT MEDIUM CLAY	MEDIUM CLAY
ECe	dS/m	<2	2.1	<2	<2	2.5
Class	-	NON SALINE	SLIGHTLY SALINE	NON SALINE	NON SALINE	SLIGHTLY SALINE

Method ID	Methodology Summary
Ext-037	Analysed by Sydney Environmental & Soil Laboratory
Inorg-001	pH - Measured using pH meter and electrode. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-002	Conductivity and Salinity - measured using a conductivity cell.
Inorg-081	Anions - a range of Anions are determined by Ion Chromatography, in accordance with APHA latest edition, 4110-B. Waters samples are filtered on receipt prior to analysis. Alternatively determined by colourimetry/turbidity using Discrete Analyser.
INORG-123	Determined using a "Texture by Feel" method.
Metals-020	Determination of exchangeable cations and cation exchange capacity in soils using 1M Ammonium Chloride exchange and ICP-OES analytical finish.

QUALITY CONTROL: ESP/CEC					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	378864-6
Date prepared	-			30/04/2025	1	30/04/2025	30/04/2025		30/04/2025	30/04/2025
Date analysed	-			30/04/2025	1	30/04/2025	30/04/2025		30/04/2025	30/04/2025
Exchangeable Ca	meq/100g	0.1	Metals-020	<0.1	1	2.4	2.6	8	109	103
Exchangeable K	meq/100g	0.1	Metals-020	<0.1	1	0.1	0.1	0	103	94
Exchangeable Mg	meq/100g	0.1	Metals-020	<0.1	1	1.3	1.4	7	102	100
Exchangeable Na	meq/100g	0.1	Metals-020	<0.1	1	0.2	0.2	0	101	95
ESP	%	1	Metals-020	[NT]	1	4	5	22	[NT]	[NT]

QUALITY CONTROL: ESP/CEC					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	5	30/04/2025	30/04/2025		[NT]	[NT]
Date analysed	-			[NT]	5	30/04/2025	30/04/2025		[NT]	[NT]
Exchangeable Ca	meq/100g	0.1	Metals-020	[NT]	5	1.6	1.5	6	[NT]	[NT]
Exchangeable K	meq/100g	0.1	Metals-020	[NT]	5	0.4	0.3	29	[NT]	[NT]
Exchangeable Mg	meq/100g	0.1	Metals-020	[NT]	5	3.7	3.7	0	[NT]	[NT]
Exchangeable Na	meq/100g	0.1	Metals-020	[NT]	5	0.9	0.9	0	[NT]	[NT]
ESP	%	1	Metals-020	[NT]	5	14	14	0	[NT]	[NT]

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	378864-7
Date prepared	-			28/04/2025	2	28/04/2025	28/04/2025		28/04/2025	28/04/2025
Date analysed	-			28/04/2025	2	28/04/2025	28/04/2025		28/04/2025	28/04/2025
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	2	8.5	8.7	2	100	[NT]
Electrical Conductivity 1:5 soil:water	µS/cm	1	Inorg-002	<1	2	110	110	0	96	[NT]
Chloride, Cl 1:5 soil:water	mg/kg	10	Inorg-081	<10	2	<10	<10	0	112	89
Sulphate, SO4 1:5 soil:water	mg/kg	10	Inorg-081	<10	2	59	75	24	117	103

QUALITY CONTROL: Texture and Salinity*					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			28/04/2025	[NT]	[NT]	[NT]	[NT]	28/04/2025	[NT]
Date analysed	-			28/04/2025	[NT]	[NT]	[NT]	[NT]	28/04/2025	[NT]
Electrical Conductivity 1:5 soil:water	µS/cm	1	Inorg-002	<1	[NT]	[NT]	[NT]	[NT]	96	[NT]

Result Definitions

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

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

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

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

Spikes for Physical and Aggregate Tests are not applicable.

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

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

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

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

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

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

Measurement Uncertainty estimates are available for most tests upon request.

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

Air volumes are typically provided by customers (often as flow rate(s) and sampling time(s) and/or simply volumes) sampled or exposure times (determines 'volume' passive badges are exposed to)). Hence in such circumstances the volume measurement is inevitably not covered by Envirolab's NATA accreditation. An exception may occur where Envirolab Newcastle does the sampling where accreditation exists for certain types of sampling and hence volume determination(s). Note air volumes are often used to determine concentrations for dust and/or analyses on filters, sorbents and in impingers. For canister sampling, the air volume is covered by Envirolab's NATA accreditation.

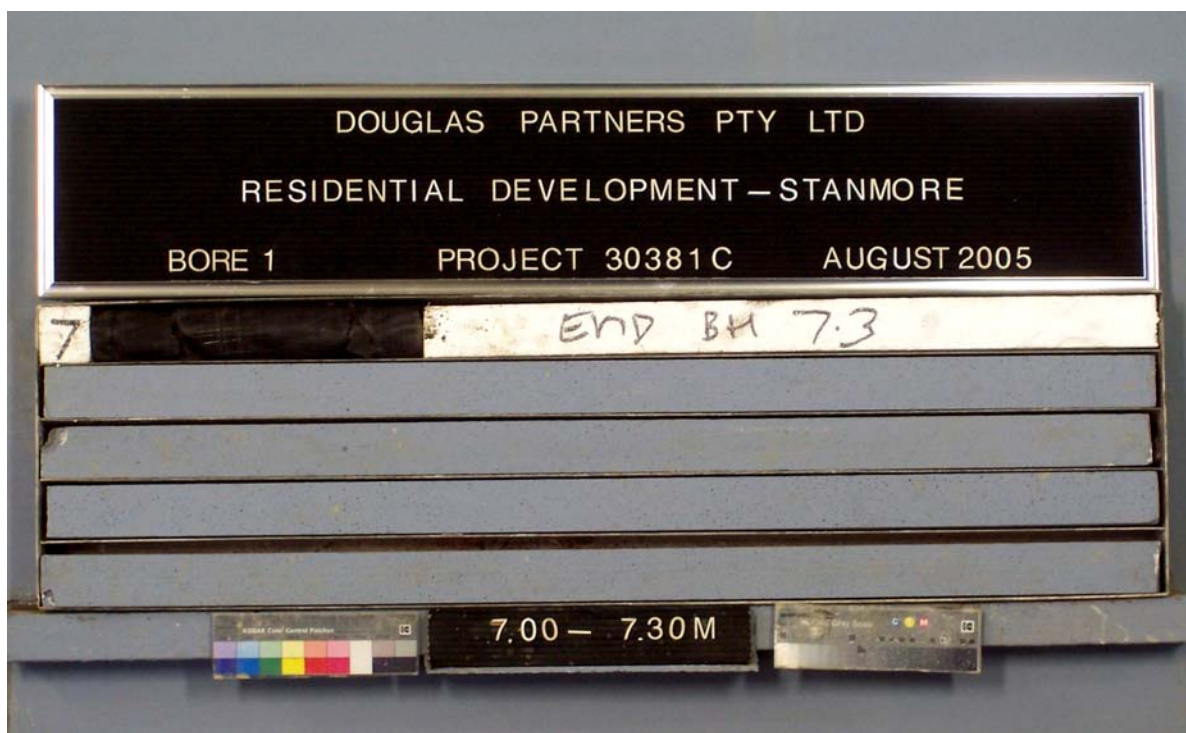
Urine Analysis - The BEI values listed are taken from the 2022 edition of "TLVs and BEIs Threshold Limits" by ACGIH.

Report Comments

Emerson Aggregate Test analysed by GSG Laboratories. Report no. EW250969.

Appendix E

Historical Investigation Results



BOREHOLE LOG

CLIENT:
PROJECT: Residential Development
LOCATION: 221 Stanmore Road, Stanmore

SURFACE LEVEL: 36.9 AHD
EASTING:
NORTHING:
DIP/AZIMUTH: 90°/--

BORE No: 201
PROJECT No: 30381C
DATE: 15 Aug 05
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Degree of Weathering					Graphic Log	Rock Strength					Water	Fracture Spacing (m)	Discontinuities		Sampling & In Situ Testing			
			EW	HW	MW	SW	FS		Ex Low	Low	Medium	High	Very High			B - Bedding S - Shear	J - Joint D - Drill Break	Type	Core Rec. %	RQD %	Test Results & Comments
	0.1	CONCRETE																A			11,25/120mm refusal
	0.5	FILLING - light brown medium grained sand filling, with some clay and gravel																A			
	1	SILTY CLAY - hard, light grey mottled red brown silty clay, with some medium strength ironstone bands (extremely weathered siltstone from 2.8m)																A			
	2																	S			
	3																				14,27,25/0mm refusal
	3.65																				PL(A) = 0.2MPa
	3.8	SILTSTONE - low strength, slightly weathered, fractured, grey siltstone with 10% fine grained sandstone laminae. Some extremely low and very low strength bands																C	85	0	
	4																				
	5																	C	93	34	
	5.65																				PL(A) = 0.3MPa
	6	SILTSTONE - low to medium strength, moderately to slightly weathered then slightly weathered, fractured to slightly fractured, dark grey siltstone with 10% fine grained sandstone laminae																			
	6.41																	C	100	85	
	7																				
	7.3	Bore discontinued at 7.3m																			

RIG: Bobcat

DRILLER: E Grimmer

LOGGED: Jardine

CASING: HW to 2.50m

TYPE OF BORING: Diatube to 0.10m; Solid flight auger (TC bit) to 2.50m; Rotary to 2.80m; NMLC-Coring to 7.30m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Surface level relative to SMM 103640 (RL 38.14)

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	PID	Photo ionisation detector
B	Bulk sample	S	Standard penetration test
U	Tube sample (x mm dia.)	PL	Point load strength Is(50) MPa
W	Water sample	V	Shear Vane (kPa)
C	Core drilling	Δ	Water seep
		¶	Water level

CHECKED	
Initials	GSY
Date:	9.05



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 Geotechnics • Environment • Groundwater



BOREHOLE LOG

CLIENT:
PROJECT: Residential Development
LOCATION: 221 Stanmore Road, Stanmore

SURFACE LEVEL: 38.4 AHD
EASTING:
NORTHING:
DIP/AZIMUTH: 90°/--

BORE No: 203
PROJECT No: 30381C
DATE: 17 Aug 05
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Degree of Weathering	Graphic Log	Rock Strength	Water	Fracture Spacing (m)	Discontinuities		Sampling & In Situ Testing			
								B - Bedding S - Shear	J - Joint D - Drill Break	Type	Core Rec. %	RQD %	Test Results & Comments
38.4	0.1	ASPHALTIC CONCRETE								A			
		FILLING - light brown medium grained sand filling, with some clay and a trace of gravel								A			
37.5	1									A			
37.0										S			4,3,3 N = 6
36.5	2												
36.0	2.5	SILTY CLAY - very stiff, mottled light grey, orange and red brown silty clay with some ironstone bands (extremely weathered siltstone)								S			4,7,15 N = 22
35.5	3												
35.0	3.6	SILTSTONE - extremely low strength, extremely weathered, light grey and orange brown siltstone. Some medium strength iron cemented bands											
34.5	4	- very low strength from 4.9m											
34.0	4.8												
33.5	5												
33.0	5.23	SILTSTONE - very low to low and low strength, highly and moderately weathered, fractured, grey, light grey and red brown siltstone											
32.5	5.3												
32.0	6	SILTSTONE - low strength, slightly weathered, fractured, dark grey siltstone with 10% fine grained sandstone laminae											
31.5	6.04	6.35-6.50m: extremely low to very low strength											
31.0	7												
30.5	8	Below 7.83m: low to medium strength											
30.0	8.16	SILTSTONE - medium strength, fresh, slightly fractured, dark grey siltstone with 10% fine grained sandstone laminae											
29.5	9												
29.0	9.53	Bore discontinued at 9.53m											

RIG: Bobcat

DRILLER: E Grimmer

LOGGED: Jardine

CASING: HW to 2.50m

TYPE OF BORING: Solid flight auger (TC bit) to 2.50m; Rotary to 3.60m; NMLC-Coring to 9.53m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Surface level relative to SMM 103640 (RL 38.14)

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	PID	Photo ionisation detector
B	Bulk sample	S	Standard penetration test
U	Tube sample (x mm dia.)	PL	Point load strength Is(50) MPa
W	Water sample	V	Shear Vane (kPa)
C	Core drilling	Δ	Water seep
		¶	Water level

CHECKED	
Initials:	GSY
Date:	9-05



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BORE No: 204
PROJECT No: 30381C
DATE: 17-18 August 05
SHEET 1 OF 1

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