TETRA TECH COFFEY

North Sydney Public School

Geotechnical Investigation

NSW Department of Education

Reference: SYDGE290593-AE

8 October 2021

NORTH SYDNEY PUBLIC SCHOOL

Geotechnical Investigation

Report reference number: SYDGE290593-AE
8 October 2021

PREPARED FOR

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CONTENTS

LIST OF TABLES

LIST OF FIGURES

APPENDICES

1. INTRODUCTION

Tetra Tech Coffey Pty Ltd (Coffey) was engaged by NSW Department of Education (DoE) in response to RFT SINSW01975/21 for Geotechnical & Contamination investigations at North Sydney Public School. This report presents the results of the geotechnical investigation carried out for the proposed new structures at North Sydney Public School. The investigation was carried out in general accordance with Coffey proposal Ref: SYDGE29053AA_Rev 3, dated 23 June 2021.

A geotechnical desktop study was prepared by Coffey (Report Ref: SYDGE290593AB V02, dated 13 August 2021) to support DoE in their State Significant Development Application (SSDA) and respond to the Secretary's Environmental Assessment Requirements (SEARs) for SSD-11869481 dated 24 December 2020.

Coffey also previously conducted geotechnical and contamination investigations at the North Sydney Public School as documented in our geotechnical investigation report Ref: SYDGE232786AD, dated 20 November 2019. At the time of that investigation, the new building was to be located within the playground area to the north of the existing School Hall. Borehole investigation did not target the current development footprint.

The current geotechnical investigation reported herein was carried out to obtain information on subsurface conditions within the current development footprint.

In conjunction with the geotechnical investigation, a contamination investigation was also carried out by Coffey. The results of this contamination investigation will be provided in a separate report.

2. PROPOSED DEVELOPMENT

The new three storey building is to be located to the south side of the school along the Bay Road boundary.

Broadly the development proposal entails:

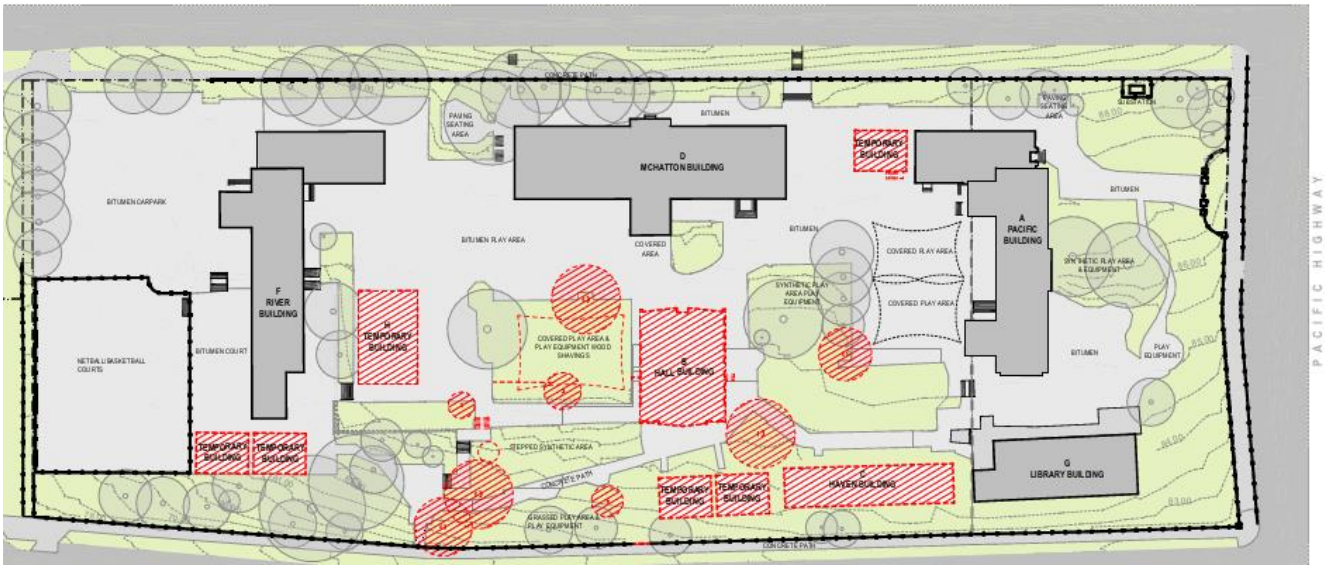
- Demolition of existing building B and C and existing temporary buildings (see Plan 1 overleaf);
- Construction of a three-storey building comprising a new library, new hall, rooms, facilities, amenities and covered outdoor learning area (see Plan 2 overleaf). The proposed base level of the new building is at RL 82.8 m AHD
- New entry gate and forecourt from Bay Road;
- Associated tree removal, landscaping and excavation.

The proposal maintains:

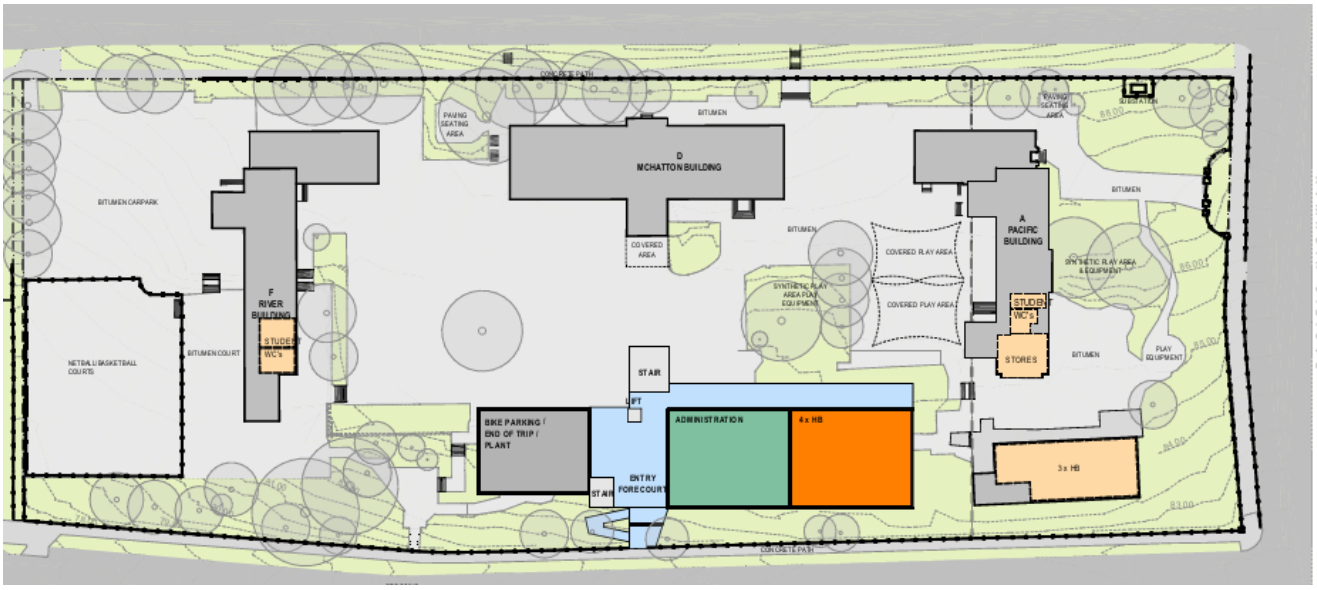
- Buildings A, D, F and G (with some internal refurbishment;
- The gates and fence of former Crows Nest House, entrances from Pacific Highway and Bay Road and existing gate along McHatton Street;
- The outdoor play area east of Building A and covered outdoor learning area adjacent to Building A;
- The basketball courts and staff carpark in the west of the site;

Figure 1 attached shows the proposed development 'site' within the school. Architectural drawings of the proposed development provided by the client are shown in Appendix D.

Plan 1: Demolition Plan



Plan 2: Development Proposal



3. SITE DESCRIPTION AND REGIONAL GEOLOGY

The project site is located within the existing North Sydney Public School, 182 Pacific Highway, North Sydney. The site includes an at-grade parking area, basketball courts, school buildings and demountables. The school is bounded by Pacific Highway to the east, McHatton Street to the north, a pedestrian and cycle path to the west, and Bay Road to the south.

The site slopes to the south with a series of benches, from an RL of approximately 89 m AHD on the McHatton Street boundary to 83 m AHD at the Bay Road boundary. A sandstone block retaining wall separates the site from Bay Road with an elevation difference of approximately 1 m to Bay Road.

Reference to the NSW Seamless Geology (March 2020) database indicates the site is underlain by Ashfield Shale of the Wianamatta Group, characterised by dark-grey to black claystone-siltstone and fine sandstone-siltstone laminite. Hawkesbury Sandstone (which underlies Ashfield Shale), is a medium to coarse-grained quartz sandstone with very minor shale and laminite lenses outcropping at lower elevation approximately 160 m south-west of the site.

4. PREVIOUS INVESTIGATIONS

Coffey previously completed five boreholes (BH01 to BH05 inclusive) outside the current development site in 2019 (Ref: SYDGE232786AD, dated 20 November 2019). These borehole locations are shown on Figure 1 and the borehole logs are presented in Appendix C. These boreholes encountered a thin layer of Fill, typically less than 300 mm, underlain by low to medium residual clay 0.75 to 1.8 m thick. The residual soil was underlain by very low to medium strength Ashfield Shale. The top of shale was encountered at about RL 83 m AHD to RL 85.8 m AHD. Groundwater was not encountered in any borehole location.

Coffey has also carried out an investigation at the nearby 225-235 Pacific Highway where two groundwater monitoring wells were installed. Groundwater levels were measured between RL 68.5 to RL 73.2 m AHD.

5. GEOTECHNICAL INVESTIGATION

5.1 FIELD INVESTIGATION

The geotechnical investigation for the current development site comprised the following field investigations;

- Four boreholes (BH101 to BH104) drilled using a track mounted Commachio GEO205 drilling rig. These boreholes extended to depths of about 2.7 m to 9.3 m below the ground surface. In soils, the drilling was advanced using solid flight augers. Standard Penetration Tests (SPT) were carried out at intervals to assess soil strengths and obtain samples for logging. Once bedrock was encountered, the boreholes were continued using diamond core drilling to obtain about 3 m to 6 m of rock core. Rock was not cored in BH101.
- Nine hand augered boreholes (HA1 to HA9) were drilled to 0.5 m to 1.2 m below the ground surface for comtamination assessment purposes. Dynamic cone penetration (DCP) tests were carried out at the hand auger borehole locations to maximum depth of 2.2 m below the ground surface.

Figure 1 attached presents the borehole location plan.

A Coffey geotechnical engineer was present on site for the duration of works to observe the drilling, record test results, box and photograph the rock core samples, and log the encountered ground conditions.

The engineering borehole logs and the DCP test results from the investigation are presented in Appendix A, together with Explanation Sheets defining the terms and symbols adopted in the borehole log preparation.

5.2 LABORATORY TESTING

Soil and rock core laboratory testing included:

- Three Natural Moisture Content tests.
- Four Soil Geotechnical Index/Classification (Particle Size Distribution or Atterberg Limit).
- One Soil aggression (pH, sulfate, chloride and EC)
- Point Load Strength Index tests on rock cores at about 1m intervals.

Laboratory testing certificates for the tests carried out on soils are presented in Appendix B. Rock strength tests results are noted on the borehole logs

6. ENCOUNTERED SUBSURFACE CONDITIONS

Based on the borehole logs, the site is interpreted to be underlain by the following generalised sequence of strata:

- **Fill** – encountered to depths of 0.2 m to 0.4 m below the ground surface in the geotechnical boreholes. Deeper fill (about 1.0 m thick) was encountered in the environmental boreholes. Variable but generally gravelly sand with concrete on the surface in some areas.
- **Residual Soil**– Clay, below the fill natural clays, generally stiff to very stiff, about 1.9 m to 2.4 m thick.
- **Shale** – encountered at the base of the Residual Soil at about 2.0 m to 2.7m below the ground surface. This stratum includes Shale, Siltstone and interlaminated Siltstone and Sandstone. The weathering and strength varied from extremely to slightly weathered and very low to low with some medium strength towards the bottom. BH101 and BH102 terminated within this layer at 2.7 m and 6.4 m below the ground surface.
- **Sandstone** – encountered in BH103 and BH104 at 7.1 m and 6.1 m below the ground surface and typically moderately to slightly weathered and medium to high strength. BH103 and BH104 were terminated within this layer at 9.3 m and 6.2 m below the ground surface respectively.

Groundwater was not encountered in the boreholes during augering. Water was introduced in the borehole during rock coring that precluded further measurement of natural groundwater (if it is present).

7. LABORATORY TESTING RESULTS

Water contents of clayey soils varied from about 16% to 22%.

Atterberg Limits tests indicated liquid limit ranging from 33% to 53%, plastic limit ranging from 21% to 25%, plasticity index ranging from 12% to 28%, and linear shrinkage ranging from 5.5% to 9.5% which shows that the tested soils range from low to high plasticity clays.

Particle size distribution test indicated the soils were 97% fines (silt and clay <0.075 mm grain size).

The results of the soil aggressivity (pH, sulphate, chloride and EC) testing are presented and discussed in Section 9.6 below.

The results of the point load strength index tests on sandstone are presented in the borehole logs in Appendix A. The results indicated $I_{s(50)}$ values ranging from 0.02 MPa (very low strength) to 1.75 MPa (high strength).

8. GEOTECHNICAL GROUND MODEL

Table 1 below presents the inferred geotechnical model for the site. Three geotechnical cross sections for the site are presented in Figures 2 and 3.

Table 1 Inferred Geotechnical Model

Unit	Origin	Description	Approximate Top of Unit (m AHD)	Range of Unit Thickness (m)	Rock Classification[1]
1	Fill	Concrete, asphalt, and gravelly sand	Surface	0.2 – 0.4	N/A
2	Residual Soil	CLAY, low to high plasticity, trace fine to coarse gravel, initially stiff becoming very stiff	84.2 – 84.5	2.0 – 2.7	N/A
3A	Shale[2]	Extremely to moderately weathered, very low to low strength with some interbeds in Unit 3B	82.0 – 82.8 Interbed at 80.0	1.1 – 2.8	Class V
3B		Moderately to slightly weathered, low with some medium strength	79.4 – 82.0	0.9 – 3.3	Class IV
4	Sandstone	Moderately to slightly weathered, medium to high strength	77.9 – 78.6	-	Class III

1. Classification based on Pells et al. (2019) Classification of Sandstone and Shales in the Sydney Region: A Forty Year Review.
2. It can be seen from Figure 2 that Unit 3A and 3B are sequentially layered strata across the development site. In some Unit 3B overlies Unit 3A

9. GEOTECHNICAL ASSESSMENT

9.1 SITE CLASSIFICATION

For residential scale structures (with respect to size and loadings), where there is less than 0.4 m depth of fill, the site is expected to be classed as Class M – moderately reactive with respect to AS 2870 – 2011 Residential Slabs and Footings site classification. Where fill is greater than 0.4 m depth, the site is classified as Class P.

9.2 FOUNDATIONS

For the design of the proposed new structures, it is anticipated that the base of the structure at RL 82.8 m AHD will expose Unit 2 clays and weathered rock Units 3A and 3B. It is expected that shallow pad or pile footings on weathered shale would be practicable.

9.2.1 Shallow Foundations

Considering the proposed development and ground conditions, Coffey consider shallow footings on Class V shale (Unit 3A) may be feasible for the main building structure but a deeper bored pile solution may be more suitable. An allowable bearing pressure of 700 kPa may be adopted for shallow footings in Class V Shale. Where ancillary structures are required, they should be founded on competent natural material and may be designed using a maximum allowable bearing pressure of 200 kPa for very stiff clays within the lower portion of Residual Soil (Unit 2).

To reduce the risk of excessive differential settlement, we recommended that all footing should be founded on similar material. If Unit 3A or 3B Shale is exposed at shallow footing level, this may weather quickly. Geotechnical advice should be sought before adopting a higher bearing pressure than recommended above.

9.2.2 Deep Foundations

Bored pile footings are considered suitable for the proposed development at this site. For preliminary assessment of piles, the parameters in Table 2 could be adopted.

Table 2 Preliminary Pile Foundation Design Parameters

Geotechnical Unit (1)	Ultimate End Bearing (MPa) (2)	Serviceability (allowable) End Bearing (MPa)	Ultimate Shaft Adhesion (kPa)	Elastic Modulus (MPa) (3)
Class V Shale	2	0.7	50	50
Class IV Shale	3(4)	1(4)	150	150
Class III Sandstone	20(5)	4(5)	800	700

Notes:

1. Rock classified using Pells et al. (2019) Classification of Sandstone and Shales in the Sydney Region: A Forty Year Review.
2. Assumes a minimum embedment depth of at least 5 x pile diameter and 0.5 m into the relevant bearing stratum.
3. For limit state design, serviceability should be assessed using the Young's modulus value to check that settlements are within tolerable limits.
4. The interpreted sections demonstrate that there is a risk that Class IV Shale could be underlain by lower strength Class V Shale interbed on the eastern portion of the site. This could affect pile performance (depending on pile depth and diameter).. The proposed pile base levels should be reviewed by a geotechnical engineer to assess this risk.
5. Only two boreholes penetrated into Class III sandstone. Higher parameters than recommended may be achievable in this unit but cannot be justified based on the scope of investigation. For the expected building loads, further investigation to achieve higher parameters may not be warranted.

If a design of bored piles is adopted, particular attention needs to be given to ensuring the socket is cleaned and roughened using a suitable scraper such as a tooth, oriented perpendicular to the auger shaft prior to pouring of concrete.

For limit state design a geotechnical reduction factor (ϕ_g) is to be applied to the ultimate geotechnical pile capacity assessed using the ultimate shaft resistance and end bearing values shown in Table 2 to derive the design ultimate geotechnical pile capacity. In accordance with AS2159-2009, ϕ_g is dependent on assignment of an Average Risk Rating (ARR) which takes into account various geotechnical uncertainties, redundancy of the foundation system, construction supervision, and the quantity and type of pile testing. The assessment of ϕ_g therefore depends on the structural design of the foundation system as well as the design and construction method, and testing (if any) to be employed by the designer and piling contractor. Where testing is undertaken, it may be possible to adopt a ϕ_g value that leads to a more economical design.

The use of limit state design also requires that serviceability performance of the foundation system be assessed, including pile group interaction effects. Such assessment should be carried out by an experienced geotechnical professional using well-established and soundly based methods. The modulus values given in Table 2 may be adopted for such assessment, but it should be recognised that the accuracy of settlement prediction is a function of construction methodology as well as the assessed values of material stiffness, both of which can involve considerable uncertainty. Therefore, the accuracy of settlement predictions may be no better than ± 50%. Where foundation settlement is critical to the performance of the structure, serviceability pile load testing should be carried out to confirm the design assumptions and/or assess prediction accuracy.

All footings should be inspected by a geotechnical engineer to confirm that a suitable founding stratum has been reached.

9.3 EXCAVATIONS

For the proposed ground floor levels, some excavations into sloping ground at the proposed new building site will be required.

9.3.1 Bench / Batter Slopes

Batter slopes or bench excavations may be possible where excavations are set back sufficiently from adjacent structures and the site boundary. The batter slopes or benches should be scaled following excavation to remove loose materials which could slide or topple from the face during construction and pose a risk to construction personnel. A summary of the recommended maximum batter slopes for the natural geotechnical units is presented in Table 3. Flatter batter slopes and/or erosion controls and surface drainage may be required depending on local conditions.

Table 3 Recommended Batter Slopes

Unit	Short-term Batter Slope (up to 2-month)	Long-term Batter Slope
Unit 2 – CLAY	1H:1V	2H:1V
Unit 3A – Shale	1H:1V	2H:1V
Unit 3B - Shale	0.5H:1V	1.5H:1V

9.3.2 Excavation Support

Where insufficient space is available for unsupported, open excavations, excavation support such as shoring or other temporary retaining structures can be employed in excavations in soils or highly weathered rock. However, given the expected site conditions, excavations up to 3m deep are not expected to encounter Unit 3B or better bedrock.

Table 4 presents recommended design parameters for the design of the temporary retaining structures where there is a level retained ground surface. The recommended K_0 values assume that some wall movement and relaxation of horizontal stress will occur due to excavation. Retaining wall analyses will need to consider surcharges, footing loads from adjacent structures and roads and hydrostatic pressure.

Table 4 Earth Pressure Coefficients for Retaining Wall Design

Unit	Bulk Density γ (kN/m3)	Effective Cohesion c' (kPa)	Effective Friction Angle φ' (degrees)	Coefficient of Active Earth pressure, K_a	Coefficient of Earth pressure at rest, Ko	Coefficient of Passive Earth pressure, K_p	Elastic Modulus (MPa) E_h
2	17	0	25	0.4	0.5	2.5	20
3A	20	5	25	0.4	0.5	2.5	40
3B	22	10	25	0.4	0.5	2.5	100

9.4 GROUNDWATER IMPACTS

Based on our understanding of the site development and given an approximate reduced level for groundwater of 68.5 to 73.2 m AHD, Coffey do not expect the proposed development would encounter or adversely impact the groundwater environment or groundwater quality. Some temporal seepage should be expected in temporary and permanent excavations due to rain infiltration and seepage along bedding and rock defects.

9.5 SOIL SALINITY

There is no information at present to suggest that soil salinity would pose a significant risk to the development or surrounds. Accordingly, a Salinity Management Plan is not required.

9.6 SOIL AGGRESSIVITY

Soil samples from boreholes have been tested for a durability suite in order to assess soil aggressivity to buried steel and concrete elements in accordance with AS2159-2009 Piling – Design and Installation. In accordance with AS2159-2009, the sub-surface soils beneath the site would be most appropriately classified under Soil Condition B (low permeability soils which are above groundwater, e.g. silts and clays).

Based on the test results, pH value of 4.6, sulphate concentration of 170 mg/kg, chloride concentration of 120 mg/kg and electrical conductivity of 190 μS/cm were recorded.

The relevant exposure classification outlined within Tables 6.4.2(C) and 6.5.2(C) of AS2159-2009 indicated that the soils are sample has been classified as “mild” exposure to concrete elements and “non-aggressive” to steel elements.

10. CLOSURE

The geotechnical model and recommendations in this report are based on a limited number of boreholes. The engineering logs describe subsurface conditions only at the specific borehole locations. Ground conditions can vary over relatively close distances and a geotechnical engineer should be engaged at the construction stage to assess whether site conditions are consistent with design assumptions.

The attached document entitled “Important Information about your Coffey Report” presents additional information about the uses and limitations of this report.

IMPORTANT INFORMATION ABOUT YOUR TETRA TECH COFFEY REPORT

As a client of Tetra Tech Coffey you should know that site subsurface conditions cause more construction problems than any other factor. These notes have been prepared by Tetra Tech Coffey to help you interpret and understand the limitations of your report.

Your report is based on project specific criteria

Your report has been developed on the basis of your unique project specific requirements as understood by Tetra Tech Coffey and applies only to the site investigated. Project criteria typically include the general nature of the project; its size and configuration; the location of any structures on the site; other site improvements; the presence of underground utilities; and the additional risk imposed by scope-of-service limitations imposed by the client. Your report should not be used if there are any changes to the project without first asking Tetra Tech Coffey to assess how factors that changed subsequent to the date of the report affect the report's recommendations. Tetra Tech Coffey cannot accept responsibility for problems that may occur due to changed factors if they are not consulted.

Subsurface conditions can change

Subsurface conditions are created by natural processes and the activity of man. For example, water levels can vary with time, fill may be placed on a site and pollutants may migrate with time. Because a report is based on conditions which existed at the time of subsurface exploration, decisions should not be based on a report whose adequacy may have been affected by time. Consult Tetra Tech Coffey to be advised how time may have impacted on the project.

Interpretation of factual data

Site assessment identifies actual subsurface conditions only at those points where samples are taken and when they are taken. Data derived from literature and external data source review, sampling and subsequent laboratory testing are interpreted by geologists, engineers or scientists to provide an opinion about overall site conditions, their likely impact on the proposed development and recommended actions. Actual conditions may differ from those inferred to exist, because no professional, no matter how qualified, can reveal what is hidden by earth, rock and time. The actual interface between materials may be far more gradual or abrupt than assumed based on the facts obtained. Nothing can be done to change the actual site conditions which exist, but steps can be taken to reduce the impact of unexpected conditions. For this reason, owners should retain the services of Tetra Tech Coffey through the development stage, to identify variances, conduct additional tests if required, and recommend solutions to problems encountered on site.

Your report will only give preliminary recommendations

Your report is based on the assumption that the site conditions as revealed through selective point sampling are indicative of actual conditions throughout an area. This assumption cannot be substantiated until project implementation has commenced and therefore your report recommendations can only be regarded as preliminary. Only Tetra Tech Coffey, who prepared the report, is fully familiar with the background information needed to assess whether or not the report's recommendations are valid and whether or not changes should be considered as the project develops. If another party undertakes the implementation of the recommendations of this report there is a risk that the report will be misinterpreted and Tetra Tech Coffey cannot be held responsible for such misinterpretation.

Your report is prepared for specific purposes and persons

To avoid misuse of the information contained in your report it is recommended that you confer with Tetra Tech Coffey before passing your report on to another party who may not be familiar with the background and the purpose of the report. Your report should not be applied to any project other than that originally specified at the time the report was issued.

Interpretation by other design professionals

Costly problems can occur when other design professionals develop their plans based on misinterpretations of a report. To help avoid misinterpretations, retain Tetra Tech Coffey to work with other project design professionals who are affected by the report. Have Tetra Tech Coffey explain the report implications to design professionals affected by them and then review plans and specifications produced to see how they incorporate the report findings.

Data should not be separated from the report

The report as a whole presents the findings of the site assessment and the report should not be copied in part or altered in any way. Logs, figures, drawings, etc. are customarily included in our reports and are developed by scientists, engineers or geologists based on their interpretation of field logs (assembled by field personnel) and laboratory evaluation of field samples. These logs etc. should not under any circumstances be redrawn for inclusion in other documents or separated from the report in any way.

Geoenvironmental concerns are not at issue

Your report is not likely to relate any findings, conclusions, or recommendations about the potential for hazardous materials existing at the site unless specifically required to do so by the client. Specialist equipment, techniques, and personnel are used to perform a geoenvironmental assessment. Contamination can create major health, safety and environmental risks. If you have no information about the potential for your site to be contaminated or create an environmental hazard, you are advised to contact Tetra Tech Coffey for information relating to geoenvironmental issues.

Rely on Tetra Tech Coffey for additional assistance

Tetra Tech Coffey is familiar with a variety of techniques and approaches that can be used to help reduce risks for all parties to a project, from design to construction. It is common that not all approaches will be necessarily dealt with in your site assessment report due to concepts proposed at that time. As the project progresses through design towards construction, speak with Tetra Tech Coffey to develop alternative approaches to problems that may be of genuine benefit both in time and cost.

Responsibility

Reporting relies on interpretation of factual information based on judgement and opinion and has a level of uncertainty attached to it, which is far less exact than the design disciplines. This has often resulted in claims being lodged against consultants, which are unfounded. To help prevent this problem, a number of clauses have been developed for use in contracts, reports and other documents. Responsibility clauses do not transfer appropriate liabilities from Tetra Tech Coffey to other parties but are included to identify where Tetra Tech Coffey's responsibilities begin and end. Their use is intended to help all parties involved to recognise their individual responsibilities. Read all documents from Tetra Tech Coffey closely and do not hesitate to ask any questions you may have.

revision	no.	description	drawn	approved	date
	A	ORIGINAL ISSUE			

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drawn	AM / AW
approved	-
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TETRA TECH COFFEY

client: SCHOOL INFRASTRUCTURE NSW

project: NORTH SYDNEY PUBLIC SCHOOL
DETAILED SITE INVESTIGATION
PACIFIC HIGHWAY, NORTH SYDNEY, NSW

title: BOREHOLE LOCATION PLAN

project no: 754-SYDGE290593-AE | figure no: FIGURE 1 | rev: A

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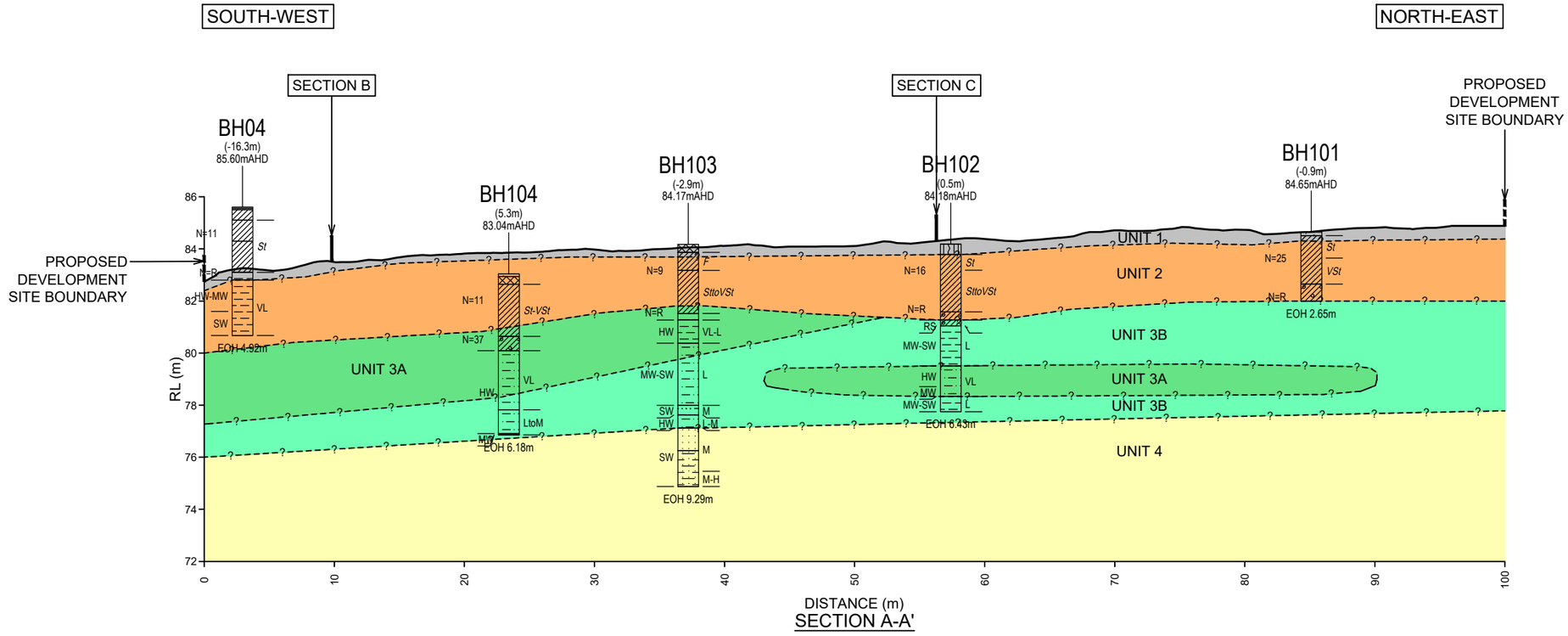

SECTION A-A'

LEGEND

- CONCRETE
- CLAY
- SHALE
- TOPSOIL
- SANDY CLAY
- GRAVELLY CLAY
- ASPHALT
- SILTSTONE
- FILL
- INTERLAMINATED SILTSTONE & SANDSTONE
- SANDSTONE
- INTERBEDDED SILTSTONE & SANDSTONE

SECTION LEGEND

- EXISTING GROUND SURFACE
- INFERRED GEOLOGICAL BOUNDARY

UNIT LEGEND

- UNIT 1 - FILL / TOPSOIL
- UNIT 2 - RESIDUAL SOIL
- UNIT 3A - CLASS V SHALE
- UNIT 3B - CLASS IV SHALE
- UNIT 4 - CLASS III SANDSTONE

DRAFT

revision no.	description	drawn	approved	date
A	ORIGINAL ISSUE			

Horizontal Scale (metres) 1:400

Vertical Scale (metres) 1:200

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date	06/10/2021
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original size	A3

TETRA TECH COFFEY

client: SCHOOL INFRASTRUCTURE NSW

project: NORTH SYDNEY PUBLIC SCHOOL
DETAILED SITE INVESTIGATION
PACIFIC HIGHWAY, NORTH SYDNEY, NSW

title: SECTION A-A'

project no: 754-SYDGE290593-AE | figure no: FIGURE 2 | rev: A

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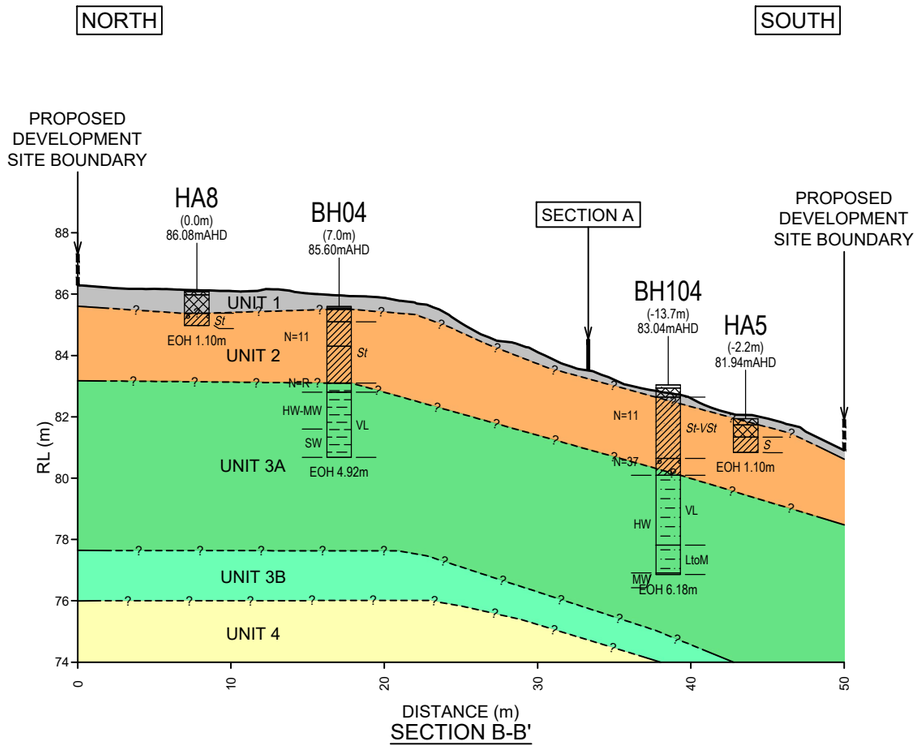

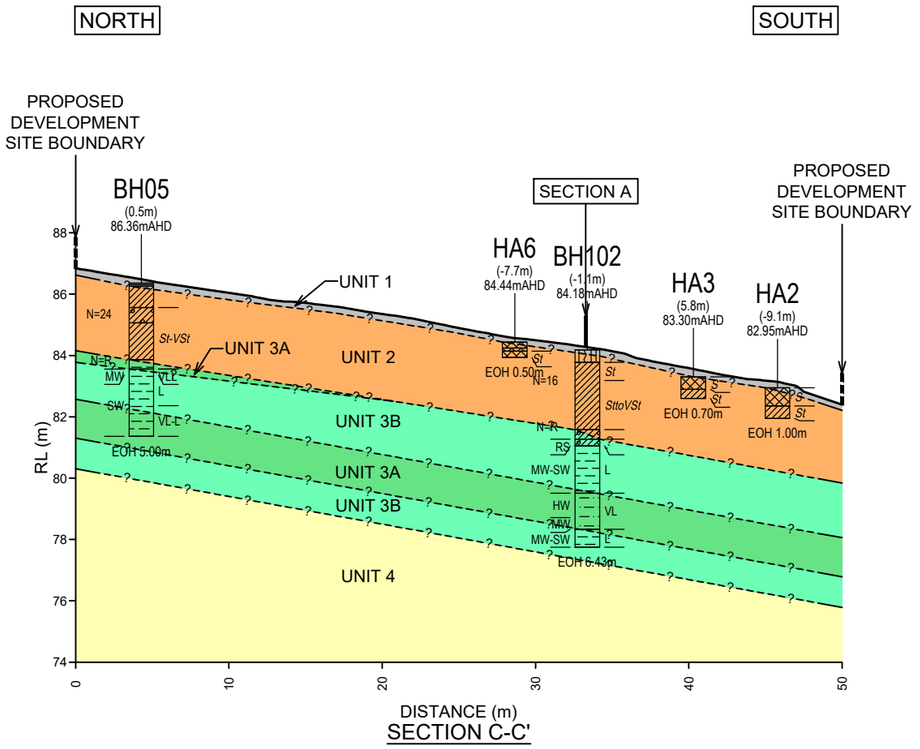

LEGEND

- CONCRETE
- CLAY
- SHALE
- TOPSOIL
- SANDY CLAY
- GRAVELLY CLAY
- ASPHALT
- SILTSTONE
- FILL
- INTERLAMINATED SILTSTONE & SANDSTONE
- SANDSTONE
- INTERBEDDED SILTSTONE & SANDSTONE

SECTION LEGEND

- EXISTING GROUND SURFACE
- INFERRED GEOLOGICAL BOUNDARY

UNIT LEGEND

- UNIT 1 - FILL / TOPSOIL
- UNIT 2 - RESIDUAL SOIL
- UNIT 3A - CLASS V SHALE
- UNIT 3B - CLASS IV SHALE
- UNIT 4 - CLASS III SANDSTONE

DRAFT

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TETRA TECH COFFEY

client: SCHOOL INFRASTRUCTURE NSW

project: NORTH SYDNEY PUBLIC SCHOOL
DETAILED SITE INVESTIGATION
PACIFIC HIGHWAY, NORTH SYDNEY, NSW

title: SECTION B-B' AND C-C'

project no: 754-SYDGE290593-AE | figure no: FIGURE 3 | rev: A

APPENDIX A: ENGINEERING BOREHOLE LOGS AND DCP RESULTS

SOIL DESCRIPTION EXPLANATION SHEET

DEFINITION:

In engineering terms soil includes every type of uncemented or partially cemented inorganic or organic material found in the ground. In practice, if the material can be remoulded or disaggregated by hand in its field condition or in water it is described as a soil. Other materials are described using rock description terms.

CLASSIFICATION SYMBOL & SOIL NAME

Soils are described in accordance with AS 1726:2017 as shown in the table on Sheet 2.

PARTICLE SIZE DEFINITIONS

Components	Subdivision	Size (mm)
Boulders Cobbles		>200 63 - 200
Gravel	Coarse Medium Fine	19 - 63 6.7 - 19 2.36 - 6.7
Sand	Coarse Medium Fine	0.6 - 2.36 0.210 - 0.6 0.075 - 0.21
Silt Clay		0.002 – 0.075 < 0.002

MOISTURE CONDITION

Coarse Grained Soil

Dry (D)	Non-cohesive and free-running
Moist (M)	Soil feels cool, darked in colour. Soil tends to stick together.
Wet (W)	As for moist, with free water forming when handled.

Fine Grained Soil

Moist, dry of plastic limit ($w<W_P$)	Hard and friable or powdery
Moist, near plastic limit ($w\approx W_P$)	Can be moulded at a moisture content approximately equal to the plastic limit.
Moist, wet of plastic limit ($w>W_P$)	Soils usually weakened and free water forms on hands when handling.
Wet, near liquid limit ($w\approx W_L$)	Near liquid limit.
Wet, wet of liquid limit ($w>W_L$)	Wet of liquid limit.

CONSISTENCY OF COHESIVE SOILS

Term (Abbreviation)	Indicative undrained shear strength s_u (kPa)	Field guide
Very Soft (VS)	<12	Soil exudes between fingers when squeezed in hand.
Soft (S)	12 – 25	Soil can be moulded by light finger pressure.
Firm (F)	25 – 50	Soil can be moulded by strong finger pressure.
Stiff (St)	50 – 100	Soil cannot be moulded by fingers.
Very Stiff (VSt)	100 – 200	Soil can be indented by thumb nail.
Hard (H)	>200	Soil can be indented with difficulty by thumb nail.
Friable (Fb)	–	Soil can be easily crumbled or broken into small pieces by hand.

RELATIVE DENSITY OF NON-COHESIVE SOILS

Term (Abbreviation)	Density index (%)
Very Loose (VL)	Less than 15
Loose (L)	15 – 35
Medium Dense (MD)	35 – 65
Dense (D)	65 – 85
Very Dense (VD)	Greater than 85

MINOR COMPONENTS

Term	Assessment Guide	Proportion of minor component in:
Trace	Presence just detectable by feel or eye, but soil properties little or no different to general properties of primary component.	Coarse grained soils: Fines - <5%, Accessory coarse fraction - <15% Fine grained soils: sand/gravel <15%
With	Presence easily detected by feel or eye, soil properties little different to general properties of primary component.	Coarse grained soils: Fines - 5 to 12%, Accessory coarse fraction – 15 to 30% Fine grained soils: sand/gravel 15 to 30%

SOIL STRUCTURE AND CEMENTATION

Zoning		Cementation	
Layer	Zone is continuous across exposure or sample.	Weakly cemented	Easily disaggregated by hand in air or water.
Lense	Discontinuous layer of different material, with lenticular shape.	Moderately cemented	Effort is required to disaggregate the soil by hand in air or water.
Pocket	Irregular inclusion of different material.		

GEOLOGICAL ORIGIN

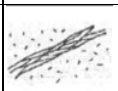
Residual soil	Structure and fabric of parent rock not visible.
Extremely weathered material	Structure and/or fabric of parent rock is visible.
Alluvial soil	Deposited by streams and rivers.
Estuarine soil	Deposited in coastal estuaries, including sediments carried by inflowing rivers and streams, or tidal currents.
Marine soil	Deposited in a marine environment
Lacustrine soil	Deposited in freshwater lakes
Aeolian soil	Carried and deposited by wind
Colluvial soil	Deposited on slopes (transported downslope by gravity, with or without assistance of water).
Topsoil	Mantle of surface or near surface material, often defined by high levels of organic material.
Fill	Any material which has been placed by anthropogenic processes. Fill may be significantly more variable between tested locations than naturally occurring soils.

SOIL CLASSIFICATION INCLUDING IDENTIFICATION AND DESCRIPTION

FIELD IDENTIFICATION PROCEDURES (Excluding particles larger than 63 mm and basing fractions on estimated mass)							GROUP SYMBOL	SOIL NAME
COARSE GRAINED SOIL More than 65% of materials less than 63 mm is larger than 0.075 mm	(A 0.075 mm particle is about the smallest particle visible to the naked eye)	GRAVEL More than half of coarse fraction is larger than 2.36 mm	CLEAN GRAVEL (Fines less than 5%)	Wide range in grain size and substantial amounts of all intermediate particle sizes, not enough fines to bind coarse grains, no dry strength.			GW	GRAVEL
				Predominantly one size or a range of sizes with some intermediate sizes missing, not enough fines to bind coarse grains, no dry strength.			GP	GRAVEL
			GRAVEL with FINES (Fines greater than 12%)	'Dirty' materials with excess of non-plastic fines (for identification procedures see ML below).			GM	Silty GRAVEL
				'Dirty' materials with excess of plastic fines (for identification procedures see CL below).			GC	Clayey GRAVEL
		SAND More than half of coarse fraction is smaller than 2.36	CLEAN SAND (Fines less than 5%)	Wide range in grain sizes and substantial amounts of all intermediate sizes, not enough fines to bind coarse grains, no dry strength.			SW	SAND
				Predominantly one size or a range of sizes with some intermediate sizes missing, not enough fines to bind coarse grains, no dry strength.			SP	SAND
			SAND with FINES (Fines greater than 12%)	'Dirty' materials with excess of non-plastic fines (for identification procedures see ML below).			SM	Silty SAND
				'Dirty' materials with excess of plastic fines (for identification procedures see CL below).			SC	Clayey SAND
FINE GRAINED SOIL More than 35% of material less than 63 mm is smaller than 0.075 mm			IDENTIFICATION PROCEDURES ON FRACTIONS <0.2 mm					
		SILT & CLAY Liquid limit less	DRY STRENGTH	DILATANCY	TOUGHNESS			
			None to low	Slow to rapid	Low		ML	SILT
			Medium to high	None to slow	Medium		CL, CI	CLAY
			Low to medium	Slow	Low		OL	Organic SILT
		SILT & CLAY Liquid limit	Low to medium	None to slow	Low to medium		MH	SILT
			High to very high	None	High		CH	CLAY
			Medium to high	None to very slow	Low to medium		OH	Organic CLAY
HIGHLY ORGANIC SOILS			Readily identified by colour, odour, spongy feel and frequently by fibrous texture.				PT	Peat

● Low plasticity – Liquid Limit W_L less than 35%. ● Medium plasticity –W_L between 35% and 50%. ● High plasticity – W_L greater than 50%.

COMMON DEFECTS IN SOIL

TERM	DEFINITION	DIAGRAM
Parting	A surface or crack across which the soil has little or no tensile strength. Parallel or sub parallel to layering (e g. bedding). May be open or closed.	
Fissure	A surface or crack across which the soil has little or no tensile strength but which is not parallel or sub parallel to layering. May be open or closed. May include desiccation cracks.	
Sheared Seam	Zone in clayey soil with roughly parallel near planar, curved or undulating boundaries containing closely spaced, smooth or slickensided, curved intersecting joints which divide the mass into lenticular or wedge shaped blocks.	
Sheared Surface	A near planar curved or undulating, smooth, polished or slickensided surface in clayey soil. The polished or slickensided surface indicates that movement (in many cases very little) has occurred along the defect	

TERM	DEFINITION	DIAGRAM
Softened Zone	A zone in clayey soil, usually adjacent to a defect in which the soil has a higher moisture content than elsewhere	
Tube	Tubular cavity. May occur singly or as one of a large number of separate or interconnected tubes. Walls often coated with clay or strengthened by denser packing of grains. May contain organic matter. Origins include root holes, animal burrows, tunnel erosion.	
Tube cast	An infilled tube. The infill may be uncemented or weakly cemented soil or have rock properties.	
Infilled Seam	Sheet or wall like body of soil substance or mass with roughly planar to irregular near parallel boundaries which cuts through a soil mass. Formed by infilling of open defects.	

ROCK DESCRIPTION EXPLANATION SHEET

The descriptive terms used by Tetra Tech Coffey are given below. They are broadly consistent with Australian Standard AS1726:2017.

DEFINITIONS: Rock material, defect, structure and rock mass are defined as follows:

Rock material	In engineering terms rock material is any naturally occurring aggregate of minerals and/or organic materials that cannot be disaggregated by hand in air or water without prior soaking. Rock material is intact rock that is bounded by defects. Material which can be disaggregated or remoulded should be described as a soil.
Defect	Discontinuity, fracture, break or void in the material or materials across which there is little or no tensile strength.
Structure	Nature and configuration of the different defects within the rock mass and their relationship with each other.
Rock mass	It is the entirety of the system formed by all of the rock material and all of the defects. That is, it is a body of material which is not effectively homogeneous.

MATERIAL DESCRIPTIVE TERMS:

Rock name	Simple rock names are used rather than precise geological classification.
Particle size	Grain size terms for sandstone are:
Coarse grained	Mainly 0.6mm to 2mm
Medium grained	Mainly 0.2mm to 0.6mm
Fine grained	Mainly 0.06mm (just visible) to 0.2mm
Fabric	When grains show an alignment, a preferred orientation or a layering (e.g. bedding or lamination for sedimentary rocks, and foliation or cleavage for metamorphic rocks) the terms used are:
Massive	No layering or penetrative fabric.
Indistinct	Layering or fabric just visible. Little effect on strength properties.
Distinct	Layering or fabric is easily visible. Rock may break more easily parallel to the fabric.

CLASSIFICATION OF MATERIAL WEATHERING

Term	Abbreviation	Definition
Residual Soil	**RS**	Material is weathered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are no longer visible. Soil has not been significantly transported.
Extremely Weathered	**XW**	Material is weathered to such an extent that it has soil properties, i.e. it either disaggregates or can be remoulded in water. Mass structure and material texture and fabric of original rock are still visible.
Highly Weathered[1]	**HW**	The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognisable. Rock strength is significantly changed by weathering. Some primary minerals have weathered to clay minerals. Porosity may be increased by leaching or may be decreased due to the deposition of weathering products in pores.
Moderately Weathered[1]	**MW**	The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is no longer recognisable. Little or no change of strength from fresh rock.
Slightly Weathered	**SW**	Rock is partially discoloured with staining or bleaching adjacent to defects, but shows little or no change of strength from fresh rock.
Fresh	**FR**	Rock shows no sign of decomposition of individual minerals or colour changes.

Notes on Weathering:

1. The term 'Distinctly Weathered' (DW) may be used where it is not practicable (or it is judged that there is no advantage in making such a distinction) to distinguish between 'Highly Weathered' and 'Moderately Weathered'. 'Distinctly Weathered' is defined as follows: '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 weathering products in pores'.
2. Where physical and chemical changes of the rock material are caused by hot gases or liquids at depth (process called alteration) the term 'altered' may be substituted for 'weathering' to give the abbreviations XA, HA, MA, SA and DA.

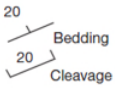
ROCK MATERIAL STRENGTH TERMS

Term (Abbreviation)	Guide to Strength: Point Load Strength Index, $I_{s(50)}$ (MPa)	Guide to Strength: Field Assessment
Very Low (VL)	0.03 - 0.1	Material crumbles under firm blows with sharp end of pick; can be peeled with a knife; too hard to cut a triaxial sample by hand; pieces up to 30mm thick can be broken by finger pressure.
Low (L)	0.1 - 0.3	Easily scored with a knife; indentations 1mm to 3mm show with firm bows of a pick point; has a dull sound under hammer. A piece of core 150mm long by 50mm diameter may be broken by hand. Sharp edges of core may be friable and break during handling.
Medium (M)	0.3 to 1.0	Readily scored with a knife; a piece of core 150mm long by 50mm diameter can be broken by hand with difficulty.
High (H)	1 to 3	A piece of core 150mm long by 50mm diameter cannot be broken by hand but can be broken by a pick with a single firm blow; rock rings under hammer.
Very High (VH)	3 to 10	Hand specimen breaks after more than one blow; rock rings under hammer.
Extremely High (EH)	More than 10	Specimen requires many blows with geological pick to break through intact material; rock rings under hammer.

Notes on Rock Material Strength:

1. Material with strength less than 'Very Low' should be described using soil characteristics.
2. The method of measuring the $I_{s(50)}$ should be in accordance with AS 4133.4.2.
3. The rock strength should be determined perpendicular to any anisotropy in the rock. High strength anisotropic rocks may readily break parallel to the planar anisotropy.
4. Although AS1726:2017 provides a basis for rock strength terms based on Unconfined Compressive Strength (UCS), the ratio between UCS and $I_{s(50)}$ may vary from less than 10 to over 30 depending on the rock type and overall strength. The UCS/$I_{s(50)}$ strength ratio should be determined for each rock material.
5. The rock strength classification using $I_{s(50)}$ above should be considered indicative only. The rock strength classified in accordance with AS1726:2017 may be higher or lower if UCS results are available.

COMMON ROCK DEFECT TYPES

Term	Definition	Diagram	Map Symbol	Graphic Log (Note 1)
Parting	A surface or crack across which the rock has little or no tensile strength. Parallel or sub-parallel to layering (e.g. bedding) or a planar anisotropy in the rock material (e.g. cleavage). May be open or closed.			
Joint	A surface or crack with no apparent shear displacement and across which the rock has little or no tensile strength, but which is not parallel or sub-parallel to layering or to planar anisotropy in the rock material. May be open or closed.			
Sheared Zone/Seam (Note 3)	Zone of rock material with roughly parallel near planar, curved or undulating boundaries cut by closely spaced joints, sheared surfaces or other defects. Some of the defects are usually curved and intersect to divide the mass into lenticular or wedge shaped blocks.			
Sheared Surface (Note 3)	A near planar, curved or undulating surface which is usually smooth, polished or slickensided and which shows evidence of shear displacement.			
Crushed Seam (Note 3)	Seam of soil material with roughly parallel almost planar boundaries, composed of disoriented, usually angular fragments of the host rock material which may be more weathered than the host rock. The seam has soil properties.			
Infilled Seam	Seam of soil material usually with distinct roughly parallel boundaries formed by the migration of soil into an open cavity or joint, infilled seams up to 1mm thick may be described as veneer or coating on a joint surface.			
Extremely Weathered Seam	Seam of soil material, often with gradational boundaries. Formed by weathering of the rock material in place.			

Notes on Defects:

1. Usually borehole logs show the true dip of defects, and face sketches and sections show the apparent dip.
2. Partings and joints are not usually shown on the graphic log unless considered significant.
3. Sheared zones/seams, sheared surfaces and crushed seams are generally faults in geological terms.

DEFECT SHAPE TERMS

Planar	The defect does not vary in orientation
Curved	The defect has a gradual change in orientation
Undulating	The defect has a wavy surface
Stepped	The defect has one or more well defined steps
Irregular	The defect has many sharp changes of orientation

Note: The assessment of defect shape is partly influenced by the scale of the observation.

DEFECT ROUGHNESS TERMS

Very Rough	Many large surface irregularities (amplitude generally more than 1mm). Feels like, or coarser than very coarse sand paper.
Rough	Many small surface irregularities (amplitude generally less than 1mm). Feels like fine to coarse sand paper.
Smooth	Smooth to touch. Few or no surface irregularities.
Polished	Shiny smooth surface.
Slickensided	Grooved or striated surface, usually polished.

DEFECT COATING TERMS

Clean	No visible coating.
Stained	No visible coating but surfaces are discoloured.
Veneer	A visible coating of soil or mineral, too thin to measure; may be patchy.
Coating	A visible coating up to 1mm thick. Thicker soil material should be described using appropriate defect terms (e g. infilled seam). Thicker rock strength material should be described as a vein.

DIMENSION OF DEFECTS

Spacing, length, openness and thickness

The spacing, length, aperture (openness), and seam thickness should generally be described directly in millimetres or metres.

Block Shape

Where it is considered significant, block shape (e.g. tabular, prismatic, columnar) should be described using the terms in Table 23 of AS 1726:2017.

TETRA TECH COFFEY

Engineering Log - Borehole

Borehole ID.	**BH101**
sheet:	1 of 1
project no.	**754-SYDGE290593**
client:	**NSW Department of Education**
date started:	**21 Sep 2021**
principal:	
date completed:	**21 Sep 2021**
project:	**North Sydney Public School**
logged by:	**MR**
location:	**182 Pacific Highway, North Sydney 2060**
checked by:	**AM**

position: E: 333835; N: 6254693 (MGA94 Zone 56) | surface elevation: 84.65 m (AHD) | angle from horizontal: 90°

drill model: Comacchio GEO 205, Track mounted | drilling fluid: Water | hole diameter : 110 mm

drilling information | **material substance**

method & support	penetration	water	samples & field tests	RL (m)	depth (m)	graphic log	soil group symbol	material description (SOIL NAME: plasticity or particle characteristics, colour, secondary and minor components)	moisture condition	consistency / relative density	hand penetrometer (kPa)	soil origin, structure and additional observations
DT HA AD/T N	1 2 3	Not Encountered	D SPT 6, 9, 16 N*=25 D SPT 15 HB N*=R	84 83 82 81 80 79 78 77	1.0 2.0 3.0 4.0 5.0 6.0 7.0		CL CI	**CONCRETE**. **CLAY**: low plasticity, grey-brown, trace roots. **Gravelly CLAY**: medium plasticity, dark grey, relic rock fabric, fine to medium grained, subangular gravel. Borehole BH101 terminated at 2.65 m Target depth	<Wp	St VSt	100 200 300 400	**CONCRETE** **RESIDUAL SOIL** **EXTREMELY WEATHERED SHALE**

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method
- DT diatube
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore
- RR rock roller

* bit shown by suffix e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nil

penetration
1 2 3 — no resistance ranging to refusal

water
10-Oct-12 water level on date shown
water inflow
water outflow

samples & field tests
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shear; peak/remouded (kPa)
- R refusal
- HB hammer bouncing

soil group symbol & material description based on AS 1726:2017

moisture condition
- D dry
- M moist
- W wet
- Wp plastic limit
- Wl liquid limit

consistency / relative density

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

TETRA TECH COFFEY

Engineering Log - Borehole

Borehole ID.	**BH102**
sheet:	1 of 2
project no.	**754-SYDGE290593**
client:	**NSW Department of Education**
date started:	**20 Sep 2021**
principal:	
date completed:	**20 Sep 2021**
project:	**North Sydney Public School**
logged by:	**MR**
location:	**182 Pacific Highway, North Sydney 2060**
checked by:	**AM**

position: E: 333809; N: 6254683 (MGA94 Zone 56) | surface elevation: 84.18 m (AHD) | angle from horizontal: 90°

drill model: Comacchio GEO 205, Track mounted | drilling fluid: Water | casing diameter : HW

drilling information | **material substance**

method & support	penetration	water	samples & field tests	RL (m)	depth (m)	graphic log	soil group symbol	material description (SOIL NAME: plasticity or particle characteristics, colour, secondary and minor components)	moisture condition	consistency / relative density	hand penetrometer (kPa)	soil origin, structure and additional observations
HA; AD/T; HW casing		Not Observable		84				**TOPSOIL: SAND**: fine to medium grained, brown, with silt, trace roots.	D			**TOPSOIL**
							Cl	**CLAY**: medium plasticity, brown grey.	<Wp	St		**RESIDUAL SOIL**
			SPT 3, 6, 10 N*=16	83	1.0			1.0 m: becoming grey		St to VSt	>>X	HP >600 kPa
			D									
				82	2.0							
			SPT 1, 7, 12/70mm HB N*=R				CH	**Gravelly CLAY**: high plasticity, dark grey, relic rock fabric, fine to medium grained gravel.				**EXTREMELY WEATHERED SHALE**
				81	3.0			Borehole BH102 continued as cored hole				
				80	4.0							
				79	5.0							
				78	6.0							
				77	7.0							

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method
- DT diatube
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore
- RR rock roller

* bit shown by suffix e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nil

penetration
1 2 3 — no resistance ranging to refusal

water
10-Oct-12 water level on date shown
water inflow
water outflow

samples & field tests
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shear; peak/remouded (kPa)
- R refusal
- HB hammer bouncing

soil group symbol & material description based on AS 1726:2017

moisture condition
- D dry
- M moist
- W wet
- Wp plastic limit
- Wl liquid limit

consistency / relative density

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

TETRA TECH COFFEY

Engineering Log - Cored Borehole

Borehole ID.	**BH102**
sheet:	2 of 2
project no.	**754-SYDGE290593**
client:	**NSW Department of Education**
date started:	**20 Sep 2021**
principal:	
date completed:	**20 Sep 2021**
project:	**North Sydney Public School**
logged by:	**MR**
location:	**182 Pacific Highway, North Sydney 2060**
checked by:	**AM**

position: E: 333809; N: 6254683 (MGA94 Zone 56) | surface elevation: 84.18 m (AHD) | angle from horizontal: 90°

drill model: Comacchio GEO 205, Track mounted | drilling fluid: Water | casing diameter : HW

drilling information | **material substance** | **rock mass defects**

method & support	water	RL (m)	depth (m)	graphic log	material description **ROCK TYPE**: grain characterisics, colour, structure, minor components	weathering & alteration	estimated strength & Is50 (X = axial; O = diametral) VL L M H VH EH	samples, field tests & Is(50) (MPa) a = axial; d = diametral	core run & RQD	defect spacing (mm) 30 100 300 1000 3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other) particular / general
		84									
			1.0								
		83									
			2.0								
		82			started coring at 2.91m						
NMLC	Not Observable	81	3.0		**Gravelly CLAY (CI-CH)**: medium to high plasticity, grey-brown, fine to medium grained gravel.	RS					
					SHALE: dark grey, distinctly laminated at 0-5°.	MW - SW		a=0.15 d=0.10	41%		JT, 40°, PL, RO, Fe SN, Healed JT, 45°, PL, RO, Fe SN
		80	4.0								JT, 40°, CU, RO, Fe SN JT, 30°, PL, RO, Clay VN JT, 45°, PL, RO, Fe SN
								a=0.12 d=0.19			JT, 20°, PL, RO, Fe SN CS, 0°, Clay, 30 mm JT, 85°, PL, RO, Fe SN
		79	5.0		**SILTSTONE**: dark grey to orange-brown, indistinctly cross-bedded at 5-15°, fractured appearance.	HW			77%		CS, 0°, Clay, 80 mm SM, 0°, Clay, 10 mm
						MW		a=0.02			JT, 55°, PL, RO, Fe SN JT, 60°, PL, RO, Fe SN
		78	6.0		**SHALE**: dark grey, distinctly laminated at 0-5°.	MW - SW			70%		JT, 70°, PL, RO, Fe SN SM, 0°, Clay, 10 mm PT, 5°, PL, RO, CN
					Borehole BH102 terminated at 6.43 m Target depth			a=0.18 d=0.18			Defects are: PT, 0 - 10°, PL, RO, Fe CN - SN, unless otherwise described
		77	7.0								

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method
DT diatube
NMLC NMLC core (51.9 mm)
NQ wireline core (47.6mm)
HQ wireline core (63.5mm)
PQ wireline core (85.0mm)
RR rock roller

support
C casing M mud N none

water
10/10/12, water level on date shown
water inflow
complete drilling fluid loss
partial drilling fluid loss
25uL water pressure test result (lugeons) for depth interval shown

graphic log / core recovery
core recovered (graphic symbols indicate material)
no core recovered

core run & RQD
barrel withdrawn
RQD = Rock Quality Designation (%)

weathering & alteration*
RS residual soil
XW extremely weathered
HW highly weathered
MW moderately weathered
SW slightly weathered
FR fresh
*W replaced with A for alteration

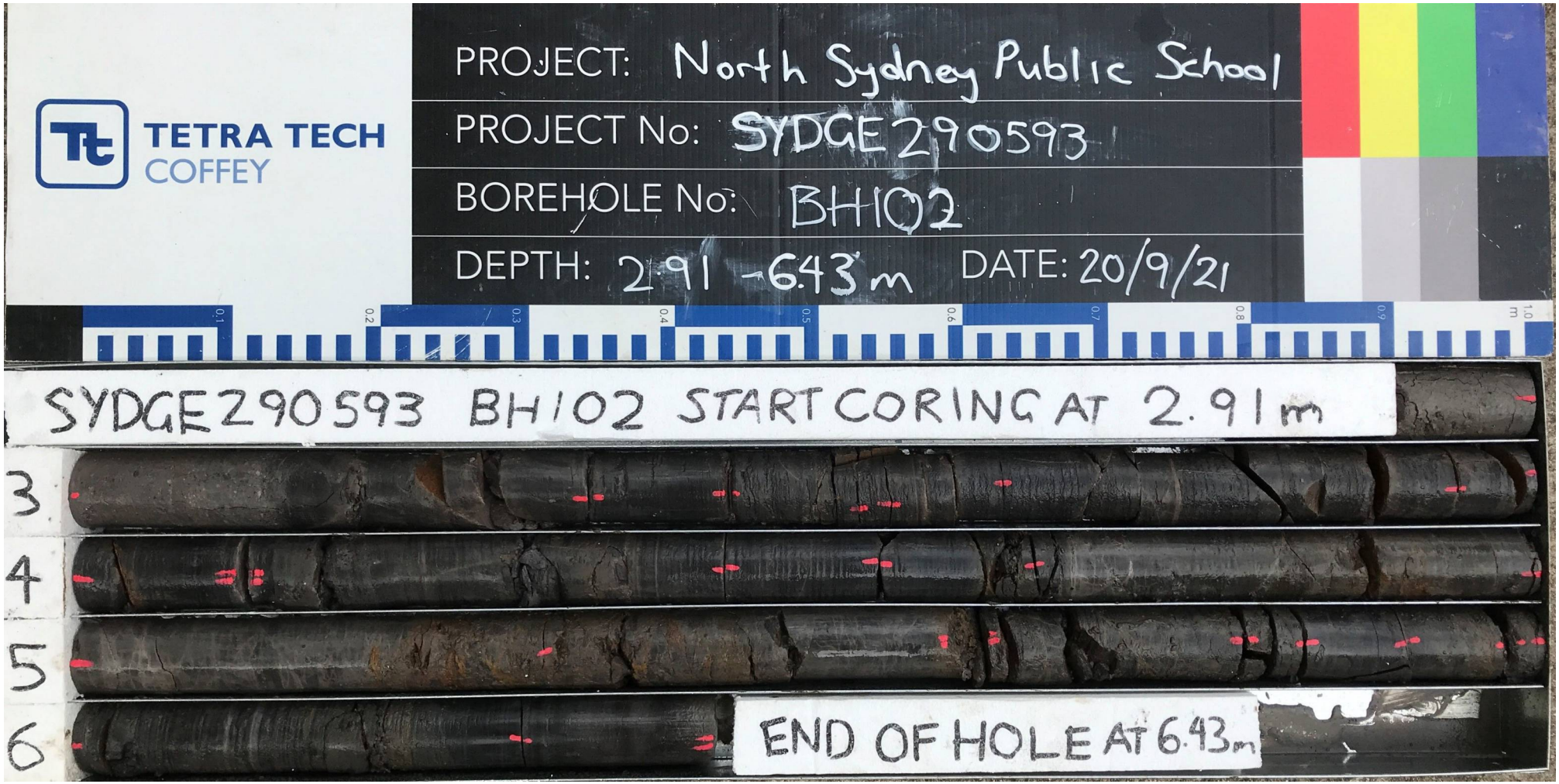
strength
VL very low
L low
M medium
H high
VH very high
EH extremely high

defect type
PT parting
JT joint
SS sheared surface
SZ sheared zone
CO contact
CS crushed seam
SM seam

roughness
VR very rough
RO rough
SO smooth
POL polished
SL slickensided

planarity
PL planar
CU curved
UN undulating
ST stepped
IR Irregular

coating
CN clean
SN stained
VN veneer
CO coating



drawn	**AM**
approved	**AM**
date	**1/10/2021**
scale	**N.T.S.**
original size	**A4**

TETRA TECH COFFEY

client: NSW Department of Education

project: North Sydney Public School
182 Pacific Highway, North Sydney 2060

title: **CORE PHOTOGRAPH**
BH102

project no: 754-SYDGE290593 | fig no: **FIGURE 1** | rev:

TETRA TECH COFFEY

Engineering Log - Borehole

Borehole ID.	***BH103***
sheet:	1 of 2
project no.	***754-SYDGE290593***
client:	***NSW Department of Education***
date started:	***21 Sep 2021***
principal:	
date completed:	***21 Sep 2021***
project:	***North Sydney Public School***
logged by:	***MR***
location:	***182 Pacific Highway, North Sydney 2060***
checked by:	***AM***

position: E: 333789; N: 6254681 (MGA94 Zone 56) | surface elevation: 84.17 m (AHD) | angle from horizontal: 90°

drill model: Comacchio GEO 205, Track mounted | drilling fluid: Water | casing diameter : HW

drilling information | **material substance**

method & support	penetration 1 2 3	water	samples & field tests	RL (m)	depth (m)	graphic log	soil group symbol	material description (SOIL NAME: plasticity or particle characteristics, colour, secondary and minor components)	moisture condition	consistency / relative density	hand penetrometer (kPa) 100 200 300 400	soil origin, structure and additional observations
HA		Not Observable	D	84				**FILL: Gravelly SAND**: fine to medium grained, brown, with silt.	D			**FILL**
							Cl	**CLAY**: medium plasticity, grey-brown.	<Wp	F		**RESIDUAL SOIL**
			SPT 4, 3, 6 N*=9	83	1.0		Cl	**CLAY**: medium plasticity, grey, with fine sand.		St to VSt		HP 410 - 550 kPa
AD/T — HW casing			D	82	2.0							
			SPT 7, 14 HB N*=R					**SHALE**: dark grey, recovered as Gravelly CLAY, medium plasticity, gravels are fine grained and sub-angular to angular.				**SHALE**
				81	3.0			Borehole BH103 continued as cored hole				
				80	4.0							
				79	5.0							
				78	6.0							
				77	7.0							

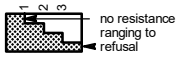
CDF_0_10_00.3_LIBRARY.GLB rev:CDF_0_10_00.3 2020-08-25 Log COF BOREHOLE: NON CORED NTH SYD DSI LOGS.GPJ <<DrawingFile>> 08/10/2021 18:22

method
- DT diatube
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore
- RR rock roller

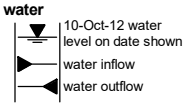
* bit shown by suffix, e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nil

penetration



water



samples & field tests
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shear; peak/remouded (kPa)
- R refusal
- HB hammer bouncing

soil group symbol & material description based on AS 1726:2017

moisture condition
- D dry
- M moist
- W wet
- Wp plastic limit
- Wl liquid limit

consistency / relative density

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

TETRA TECH COFFEY

Engineering Log - Cored Borehole

Borehole ID.	**BH103**
sheet:	2 of 3
project no.	**754-SYDGE290593**
client:	**NSW Department of Education**
date started:	**21 Sep 2021**
principal:	
date completed:	**21 Sep 2021**
project:	**North Sydney Public School**
logged by:	**MR**
location:	**182 Pacific Highway, North Sydney 2060**
checked by:	**AM**

position: E: 333789; N: 6254681 (MGA94 Zone 56) surface elevation: 84.17 m (AHD) angle from horizontal: 90°

drill model: Comacchio GEO 205, Track mounted drilling fluid: Water casing diameter : HW

drilling information				material substance						rock mass defects		
method & support	water	RL (m)	depth (m)	graphic log	material description **ROCK TYPE**: grain characterisics, colour, structure, minor components	weathering & alteration	estimated strength & Is50 X = axial; O = diametral VL L M H VH EH	samples, field tests & Is(50) (MPa) a = axial; d = diametral	core run & RQD	defect spacing (mm) 30 100 300 1000 3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other) particular / general
		84									
		83	1.0								
		82	2.0		started coring at 2.90m						
NMLC	Not Observable	81	3.0		**SHALE**: dark grey to pale grey, distinctly laminated at 0-10°.	HW		a=0.30 d=0.00	22%		CS, 0°, Clay, 10 mm SM, 0°, Clay, 20 mm SM, 0°, Clay, 10 mm JT, 80°, PL, RO, Clay VN SM, 0°, Clay, 25 mm SM, 0°, Clay, 10 mm JT, 30°, PL, RO, Fe SN CS, 0°, Clay, 30 mm
		80	4.0		**SILTSTONE**: dark grey, distinctly laminated at 0-15°, with brown weathering.	MW - SW		a=0.38 d=0.30	47%		CS, 5°, Clay, 25 mm JT, 60°, PL, RO, Fe SN, Healed CS, 0°, Clay, 20 mm JT, 30°, PL, RO, Fe SN CS, Clay, 20 mm SM, Clay, 20 mm
		79	5.0								
		78	6.0		**INTERLAMINATED SILTSTONE (60%) WITH SANDSTONE (60%)**: dark grey, indistinctly bedded at 5-10°, sandstone is fine grained.	SW		a=0.47 d=0.74	84%		JT, 50°, PL, RO, Fe SN JT, 50°, CU, RO, Fe SN, Healed
					SILTSTONE: dark grey, indistinctly bedded at 0-5°.	HW		d=0.07 a=0.21			JT, 30°, PL, RO, Fe SN
		77	7.0		**SANDSTONE**: medium grained, grey brown, indistinctly bedded at 0-10°.	SW		a=0.54 d=0.63	96%		JT, 35°, PL, RO, Fe SN

Defects are: PT, 0 - 10°, PL, RO, Fe CN - SN, unless otherwise described

method
DT diatube
NMLC NMLC core (51.9 mm)
NQ wireline core (47.6mm)
HQ wireline core (63.5mm)
PQ wireline core (85.0mm)
RR rock roller

support
C casing M mud N none

water
10/10/12, water level on date shown
water inflow
complete drilling fluid loss
partial drilling fluid loss
25uL water pressure test result (lugeons) for depth interval shown

graphic log / core recovery
core recovered (graphic symbols indicate material)
no core recovered

core run & RQD
barrel withdrawn
RQD = Rock Quality Designation (%)

weathering & alteration*
RS residual soil
XW extremely weathered
HW highly weathered
MW moderately weathered
SW slightly weathered
FR fresh
*W replaced with A for alteration

strength
VL very low
L low
M medium
H high
VH very high
EH extremely high

defect type
PT parting
JT joint
SS sheared surface
SZ sheared zone
CO contact
CS crushed seam
SM seam

planarity
PL planar
CU curved
UN undulating
ST stepped
IR Irregular

roughness
VR very rough
RO rough
SO smooth
POL polished
SL slickensided

coating
CN clean
SN stained
VN veneer
CO coating

TETRA TECH COFFEY

Engineering Log - Cored Borehole

Borehole ID.	**BH103**
sheet:	3 of 3
project no.	**754-SYDGE290593**
client:	***NSW Department of Education***
date started:	***21 Sep 2021***
principal:	
date completed:	***21 Sep 2021***
project:	***North Sydney Public School***
logged by:	***MR***
location:	***182 Pacific Highway, North Sydney 2060***
checked by:	***AM***

position: E: 333789; N: 6254681 (MGA94 Zone 56) surface elevation: 84.17 m (AHD) angle from horizontal: 90°

drill model: Comacchio GEO 205, Track mounted drilling fluid: Water casing diameter : HW

drilling information				material substance				rock mass defects			
method & support	water	RL (m)	depth (m)	graphic log	material description **ROCK TYPE**: grain characterisics, colour, structure, minor components	weathering & alteration	estimated strength & Is50 (X = axial; O = diametral) VL L M H VH EH	samples, field tests & Is(50) (MPa) a = axial; d = diametral	core run & RQD	defect spacing (mm) 30 100 300 1000 3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other) particular / general
NMLC	Not Observable	76			**INTERBEDDED SANDSTONE (80%) WITH SILTSTONE (20%)**: fine grained, dark grey, distinctly bedded at 0-10°. *(continued)*	SW		a=1.27 d=1.02			
			9.0		8.65 m: becoming sandstone (40%), siltstone (60%)			a=1.75 d=0.88	100%		
		75			Borehole BH103 terminated at 9.29 m Target depth						
		74	10.0								
		73	11.0								
		72	12.0								
		71	13.0								
		70	14.0								
		69	15.0								

method
DT diatube
NMLC NMLC core (51.9 mm)
NQ wireline core (47.6mm)
HQ wireline core (63.5mm)
PQ wireline core (85.0mm)
RR rock roller

support
C casing M mud N none

water
10/10/12, water level on date shown
water inflow
complete drilling fluid loss
partial drilling fluid loss
25uL water pressure test result (lugeons) for depth interval shown

graphic log / core recovery
core recovered (graphic symbols indicate material)
no core recovered

core run & RQD
barrel withdrawn
RQD = Rock Quality Designation (%)

weathering & alteration*
RS residual soil
XW extremely weathered
HW highly weathered
MW moderately weathered
SW slightly weathered
FR fresh
*W replaced with A for alteration

strength
VL very low
L low
M medium
H high
VH very high
EH extremely high

defect type
PT parting
JT joint
SS sheared surface
SZ sheared zone
CO contact
CS crushed seam
SM seam

roughness
VR very rough
RO rough
SO smooth
POL polished
SL slickensided

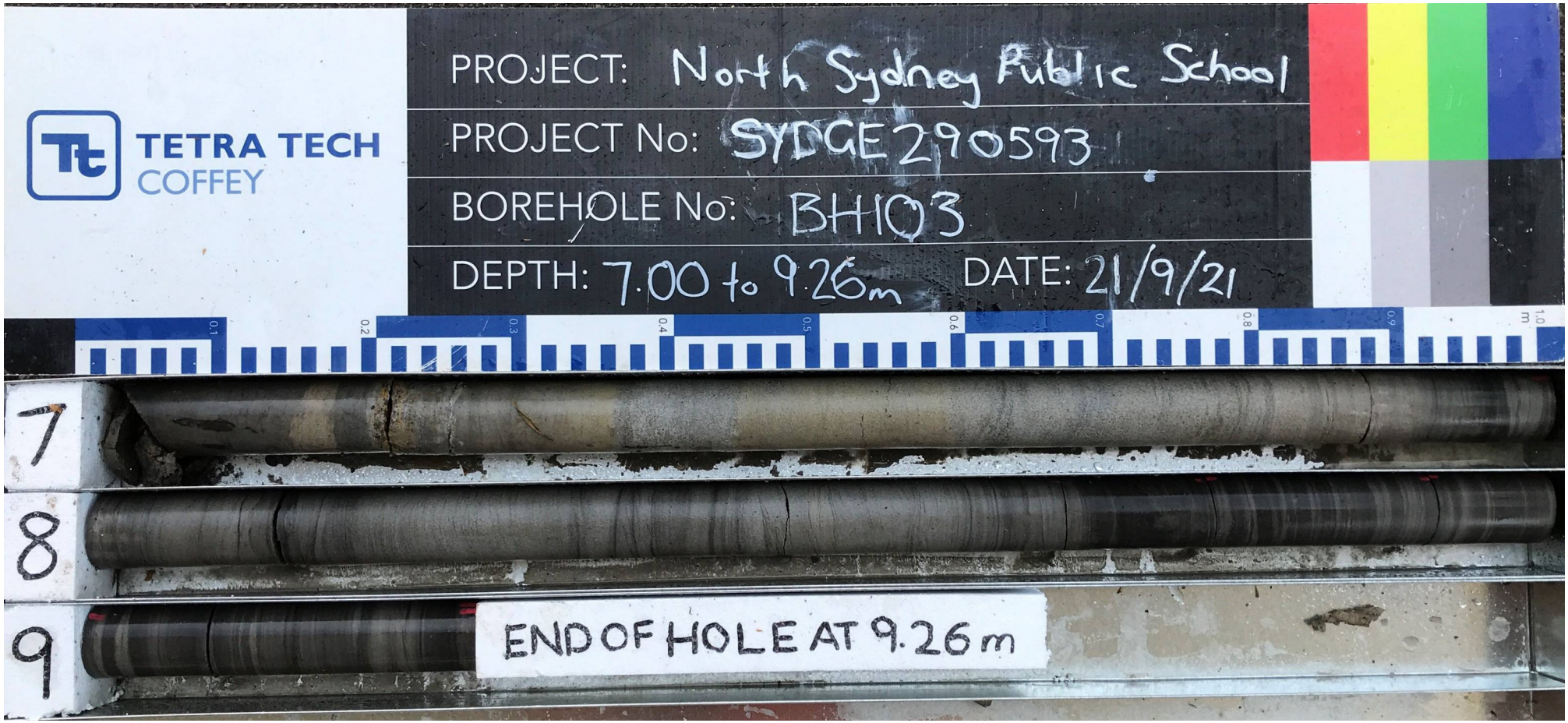
planarity
PL planar
CU curved
UN undulating
ST stepped
IR Irregular

coating
CN clean
SN stained
VN veneer
CO coating

drawn	AM
approved	AM
date	1/10/2021
scale	N.T.S.
original size	A4

TETRA TECH COFFEY

client:	NSW Department of Education
project:	North Sydney Public School 182 Pacific Highway, North Sydney 2060
title:	**CORE PHOTOGRAPH** **BH103**
project no:	754-SYDGE290593
fig no:	**FIGURE 2**
rev:	



drawn	AM
approved	AM
date	1/10/2021
scale	N.T.S.
original size	A4

TETRA TECH COFFEY

client:	NSW Department of Education
project:	North Sydney Public School 182 Pacific Highway, North Sydney 2060
title:	**CORE PHOTOGRAPH** **BH103**
project no:	754-SYDGE290593
fig no:	**FIGURE 3**
rev:	

TETRA TECH COFFEY

Engineering Log - Borehole

Borehole ID.	***BH104***
sheet:	1 of 2
project no.	***754-SYDGE290593***
client:	***NSW Department of Education***
date started:	***20 Sep 2021***
principal:	
date completed:	***20 Sep 2021***
project:	***North Sydney Public School***
logged by:	***MR***
location:	***182 Pacific Highway, North Sydney 2060***
checked by:	***AM***

position: E: 333778; N: 6254669 (MGA94 Zone 56) | surface elevation: 83.04 m (AHD) | angle from horizontal: 90°

drill model: Comacchio GEO 205, Track mounted | drilling fluid: Water | casing diameter : HW

drilling information | **material substance**

method & support	penetration	water	samples & field tests	RL (m)	depth (m)	graphic log	soil group symbol	material description (SOIL NAME: plasticity or particle characteristics, colour, secondary and minor components)	moisture condition	consistency / relative density	hand penetrometer (kPa)	soil origin, structure and additional observations
DT				83				**CONCRETE**.	D			**CONCRETE**
HA			D					**FILL: Gravelly SAND**: fine to medium grained, to 20 mm, sub-rounded to sub-angular, grey, trace silt.				**FILL**
							CH	**CLAY**: high plasticity, grey.	<Wp	St - VSt		**POSSIBLE RESIDUAL SOIL**
		Not Observable	SPT 3, 3, 8 N*=11	82	1.0						HP 240 - 480 kPa	
AD/T HW casing			D					1.7 m: becoming red brown - grey				
			SPT 1, 7, 30 N*=37	81	2.0		CH	**Gravelly CLAY**: fine grained, high plasticity, red brown - dark grey, relic rock fabric, fine grained subrounded to subangular gravel.				**EXTREMELY WEATHERED SHALE**
				80	3.0			Borehole BH104 continued as cored hole				
				79	4.0							
				78	5.0							
				77	6.0							
				76	7.0							

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method
- DT diatube
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore
- RR rock roller

* bit shown by suffix e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nil

penetration
1 2 3 — no resistance ranging to refusal

water
10-Oct-12 water level on date shown
water inflow
water outflow

samples & field tests
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shear; peak/remouded (kPa)
- R refusal
- HB hammer bouncing

soil group symbol & material description based on AS 1726:2017

moisture condition
- D dry
- M moist
- W wet
- Wp plastic limit
- Wl liquid limit

consistency / relative density

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

TETRA TECH COFFEY

Engineering Log - Cored Borehole

Borehole ID.	**BH104**
sheet:	2 of 2
project no.	**754-SYDGE290593**
client:	**NSW Department of Education**
date started:	**20 Sep 2021**
principal:	
date completed:	**20 Sep 2021**
project:	**North Sydney Public School**
logged by:	**MR**
location:	**182 Pacific Highway, North Sydney 2060**
checked by:	**AM**

position: E: 333778; N: 6254669 (MGA94 Zone 56) surface elevation: 83.04 m (AHD) angle from horizontal: 90°

drill model: Comacchio GEO 205, Track mounted drilling fluid: Water casing diameter : HW

drilling information | **material substance** | **rock mass defects**

method & support	water	RL (m)	depth (m)	graphic log	material description **ROCK TYPE**: grain characterisics, colour, structure, minor components	weathering & alteration	estimated strength & Is50 (X = axial; O = diametral) VL L M H VH EH	samples, field tests & Is(50) (MPa) a = axial; d = diametral	core run & RQD	defect spacing (mm) 30 100 300 1000 3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other) particular / general
		83									
		82	1.0								
		81	2.0		started coring at 2.95m						
NMLC	Not Observable	80	3.0		**SILTSTONE**: grey-red brown, indistinctly laminated at 5-15°.	HW			0% 60%		SM, 0°, Clay, 10 mm PT, 5°, PL, RO, Clay VN
		79	4.0					a=0.08 d=0.05	39%		PT, 10°, IR, RO, Clay CO JT, 20°, PL, RO, Clay VN CS, 5°, Clay, 20 mm PT, 5°, PL, RO, Clay CO SM, 0°, Clay, 10 mm CS, 0°, Clay, 15 mm SM, 0°, Clay, 25 mm SM, 0°, Clay, 20 mm JT, 20°, PL, RO, Fe SN SM, 0°, Clay, 20 mm SM, 0°, Clay, 15 mm
		78	5.0		**SILTSTONE**: grey to orange-brown, indistinctly laminated at 0°-10°.			a=0.27 d=0.31	84%		CS, 0°, Clay, 30 mm SM, 0°, Clay, 20 mm JT, 15°, PL, RO, Fe SN JT, 30°, PL, RO, Fe SN JT, 30°, PL, RO, Fe SN JT, 75°, PL, RO, Fe SN, Healed
		77	6.0		**SANDSTONE**: fine to medium grained, brown.	MW		a=0.27 d=0.32			
		76	7.0		Borehole BH104 terminated at 6.18 m Target depth			a=0.25			

CDF_0_10_00.3_LIBRARY.GLB rev:CDF_0_10_00.3 2020-08-25 Log COF BOREHOLE: CORED NTH SYD DSI LOGS.GPJ <<DrawingFile>> 08/10/2021 18:25

method
DT diatube
NMLC NMLC core (51.9 mm)
NQ wireline core (47.6mm)
HQ wireline core (63.5mm)
PQ wireline core (85.0mm)
RR rock roller

support
C casing M mud N none

water
10/10/12, water level on date shown
water inflow
complete drilling fluid loss
partial drilling fluid loss
25uL water pressure test result (lugeons) for depth interval shown

graphic log / core recovery
core recovered (graphic symbols indicate material)
no core recovered

core run & RQD
barrel withdrawn
RQD = Rock Quality Designation (%)

weathering & alteration*
RS residual soil
XW extremely weathered
HW highly weathered
MW moderately weathered
SW slightly weathered
FR fresh
*W replaced with A for alteration

strength
VL very low
L low
M medium
H high
VH very high
EH extremely high

defect type
PT parting
JT joint
SS sheared surface
SZ sheared zone
CO contact
CS crushed seam
SM seam

planarity
PL planar
CU curved
UN undulating
ST stepped
IR Irregular

roughness
VR very rough
RO rough
SO smooth
POL polished
SL slickensided

coating
CN clean
SN stained
VN veneer
CO coating

drawn	AM
approved	AM
date	1/10/2021
scale	N.T.S.
original size	A4

TETRA TECH COFFEY

client: NSW Department of Education

project: North Sydney Public School
182 Pacific Highway, North Sydney 2060

title: **CORE PHOTOGRAPH**
BH104

project no: 754-SYDGE290593 | fig no: **FIGURE 4** | rev:

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Environmental Log - Hand Auger

Hole ID.	***HA1***
sheet:	1 of 1
project no.	***754-SYDGE290953***
client:	***School Infrastructure New South Wales***
date started:	***28 Aug 2021***
principal:	
date completed:	***28 Aug 2021***
project:	***North Sydney Public School DSI***
logged by:	***J.Y***
location:	***Bay Road, Waverton NSW 2060***
checked by:	

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90°

equipment type: Hand Auger | drilling fluid: | hole diameter :

drilling information | **material substance**

method & support	water	samples & field tests	photoionization detector (ppmv)	RL (m)	depth (m)	graphic log	soil group symbol	material description **SOIL NAME**: plasticity or particle characteristic, colour, secondary and minor components	moisture condition	consistency / relative density	structure and additional observations
HA	Not Encountered	E: HA1_0.1-0.2	1.3					**FILL: Sandy CLAY**: fine - medium grained, low plasticity, dark brown.	D	S	No staining, odour or acm
					0.5			**CLAY**: low plasticity, pale grey, orange mottling.		F	
		E: HA1_0.7-0.8	0.6								
					1.0			Hand Auger HA1 terminated at 1.00 m Target depth			
					1.5						

CDF_0_9_07_LIBRARY.GLB rev:AU Log COF BOREHOLE: ENVIRONMENTAL NTH SYD DSI LOGS.GPJ <<DrawingFile>> 14/09/2021 14:11

method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- MR mud rotary
- W washbore

* bit shown by suffix, e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nill

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- ALT air lift test
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- WS water sample
- HB hammer bouncing
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- PID photoionization detector
- R refusal

soil group symbol & soil description
based on AS 1726:2017

moisture condition
- D dry
- M moist
- W wet
- Wp plastic limit
- Wl liquid limit

consistency / relative density
- VS very soft
- S soft
- F firm
- St stiff
- VSt very stiff
- H hard
- Fb friable
- VL very loose
- L loose
- MD medium dense
- D dense
- VD very dense

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Environmental Log - Hand Auger

Hole ID.	***HA2***
sheet:	1 of 1
project no.	***754-SYDGE290953***
client:	***School Infrastructure New South Wales***
date started:	***28 Aug 2021***
principal:	
date completed:	***28 Aug 2021***
project:	***North Sydney Public School DSI***
logged by:	***J.Y***
location:	***Bay Road, Waverton NSW 2060***
checked by:	

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90°

equipment type: Hand Auger | drilling fluid: | hole diameter :

drilling information						material substance					
method & support	water	samples & field tests	photoionization detector (ppmv)	RL (m)	depth (m)	graphic log	soil group symbol	material description **SOIL NAME**: plasticity or particle characteristic, colour, secondary and minor components	moisture condition	consistency / relative density	structure and additional observations
HA	Not Encountered	E: HA2_0.1-0.2	1.9					**FILL: Gravelly Sandy CLAY**: fine - medium grained, to 30 mm, sub-angular to angular, high plasticity, dark brown.	D	S	No staining, odour or acm Ash Ash
					0.5				W		Treet root encountered, surrounding soil was wet
		E: HA2_0.7-0.8	0.5					**CLAY**: low plasticity, pale brown.	D	St	
					1.0			Hand Auger HA2 terminated at 1.00 m Target depth			
					1.5						

CDF_0_9_07_LIBRARY.GLB rev:AU Log COF BOREHOLE: ENVIRONMENTAL NTH SYD DSI LOGS.GPJ <<DrawingFile>> 14/09/2021 14:11

method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- MR mud rotary
- W washbore

* bit shown by suffix e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nill

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- ALT air lift test
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- WS water sample
- HB hammer bouncing
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- PID photoionization detector
- R refusal

soil group symbol & soil description
based on AS 1726:2017

moisture condition
- D dry
- M moist
- W wet
- Wp plastic limit
- Wl liquid limit

consistency / relative density
- VS very soft
- S soft
- F firm
- St stiff
- VSt very stiff
- H hard
- Fb friable
- VL very loose
- L loose
- MD medium dense
- D dense
- VD very dense

coffey
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Environmental Log - Hand Auger

Hole ID.	***HA3***
sheet:	1 of 1
project no.	***754-SYDGE290953***
client:	***School Infrastructure New South Wales***
date started:	***28 Aug 2021***
principal:	
date completed:	***28 Aug 2021***
project:	***North Sydney Public School DSI***
logged by:	***J.Y***
location:	***Bay Road, Waverton NSW 2060***
checked by:	

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90°

equipment type: Hand Auger | drilling fluid: | hole diameter :

drilling information						material substance					
method & support	water	samples & field tests	photoionization detector (ppmv)	RL (m)	depth (m)	graphic log	soil group symbol	material description **SOIL NAME**: plasticity or particle characteristic, colour, secondary and minor components	moisture condition	consistency / relative density	structure and additional observations
HA	Not Encountered	E: HA3_0.1-0.2	1.5					**FILL: Gravelly Sandy CLAY**: fine - medium grained, high plasticity, dark brown.	D	S	No odour, staining or acm
		E: HA3_0.5-0.6	0.6		0.5			**CLAY**: low plasticity, pale grey, orange mottling.		St	
					1.0			Hand Auger HA3 terminated at 0.70 m Target depth			
					1.5						

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method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- MR mud rotary
- W washbore

* bit shown by suffix e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nill

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- ALT air lift test
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- WS water sample
- HB hammer bouncing
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- PID photoionization detector
- R refusal

soil group symbol & soil description
based on AS 1726:2017

moisture condition
- D dry
- M moist
- W wet
- Wp plastic limit
- Wl liquid limit

consistency / relative density
- VS very soft
- S soft
- F firm
- St stiff
- VSt very stiff
- H hard
- Fb friable
- VL very loose
- L loose
- MD medium dense
- D dense
- VD very dense

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Environmental Log - Hand Auger

Hole ID.	***HA4***
sheet:	1 of 1
project no.	***754-SYDGE290953***
client:	***School Infrastructure New South Wales***
date started:	***28 Aug 2021***
principal:	
date completed:	***28 Aug 2021***
project:	***North Sydney Public School DSI***
logged by:	***J.Y***
location:	***Bay Road, Waverton NSW 2060***
checked by:	

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90°

equipment type: Hand Auger | drilling fluid: | hole diameter :

drilling information						material substance					
method & support	water	samples & field tests	photoionization detector (ppmv)	RL (m)	depth (m)	graphic log	soil group symbol	material description **SOIL NAME**: plasticity or particle characteristic, colour, secondary and minor components	moisture condition	consistency / relative density	structure and additional observations
HA	Not Encountered	E: HA4_0.1-0.2	0.9		0.5			**FILL: Gravelly SAND**: fine - medium grained, to 50 mm, sub-angular to angular, dark brown, dark grey.	D		No staining, odour or acm Ash Ash
		E: HA4_0.7-0.8	0.8					**CLAY**: low plasticity, pale grey, orange mottling.		St	
					1.0			Hand Auger HA4 terminated at 0.90 m Target depth			
					1.5						

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method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- MR mud rotary
- W washbore

* bit shown by suffix
e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nill

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- ALT air lift test
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- WS water sample
- HB hammer bouncing
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- PID photoionization detector
- R refusal

soil group symbol & soil description
based on AS 1726:2017

moisture condition
- D dry
- M moist
- W wet
- Wp plastic limit
- Wl liquid limit

consistency / relative density
- VS very soft
- S soft
- F firm
- St stiff
- VSt very stiff
- H hard
- Fb friable
- VL very loose
- L loose
- MD medium dense
- D dense
- VD very dense

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Environmental Log - Hand Auger

Hole ID.	***HA5***
sheet:	1 of 1
project no.	***754-SYDGE290953***
date started:	***28 Aug 2021***
date completed:	***28 Aug 2021***
logged by:	***J.Y***
checked by:	

client: ***School Infrastructure New South Wales***

principal:

project: ***North Sydney Public School DSI***

location: ***Bay Road, Waverton NSW 2060***

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90°

equipment type: Hand Auger | drilling fluid: | hole diameter :

drilling information | **material substance**

method & support	water	samples & field tests	photoionization detector (ppmv)	RL (m)	depth (m)	graphic log	soil group symbol	material description (SOIL NAME: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	structure and additional observations
HA	Not Encountered	E: HA5_0.1-0.2	0.6					**FILL: Gravelly SAND**: fine - medium grained, to 30 mm, pale brown, dark brown.	D		No staining, odour or acm
		E: HA5_0.3-0.4	0.9					**FILL: Gravelly SAND**: fine - medium grained, to 60 mm, pale grey. Increasing clay			
					0.5						
		E: HA5_0.8-0.9	0.6					**CLAY**: low plasticity, orange, red mottling.		S	
					1.0						
					1.5			Hand Auger HA5 terminated at 1.10 m Target depth			

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method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- MR mud rotary
- W washbore

* bit shown by suffix
e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nill

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- ALT air lift test
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- WS water sample
- HB hammer bouncing
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- PID photoionization detector
- R refusal

soil group symbol & soil description
based on AS 1726:2017

moisture condition
- D dry
- M moist
- W wet
- Wp plastic limit
- Wl liquid limit

consistency / relative density
- VS very soft
- S soft
- F firm
- St stiff
- VSt very stiff
- H hard
- Fb friable
- VL very loose
- L loose
- MD medium dense
- D dense
- VD very dense

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Environmental Log - Hand Auger

Hole ID.	**HA6**
sheet:	1 of 1
project no.	**754-SYDGE290953**
client:	**School Infrastructure New South Wales**
date started:	**28 Aug 2021**
principal:	
date completed:	**28 Aug 2021**
project:	**North Sydney Public School DSI**
logged by:	**J.Y**
location:	**Bay Road, Waverton NSW 2060**
checked by:	

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90°

equipment type: Hand Auger | drilling fluid: | hole diameter :

drilling information | **material substance**

method & support	water	samples & field tests	photoionization detector (ppmv)	RL (m)	depth (m)	graphic log	soil group symbol	material description **SOIL NAME**: plasticity or particle characteristic, colour, secondary and minor components	moisture condition	consistency / relative density	structure and additional observations
HA	Not Encountered	E: HA6_0.1-0.2	0.5					**FILL: Gravelly SAND**: fine - medium grained, to 30 mm, sub-angular to angular, dark brown, dark grey.	D		No staining, odour or acm
		E: HA6_0.2-0.3	0.8					**FILL: Sandy GRAVEL**: fine - medium grained, to 50 mm, sub-angular to angular, dark brown, dark grey.			Asphalt gravel and crushed brick
		E: HA6_0.4-0.5	0.5		0.5			**FILL: Gravelly Sandy CLAY**: fine - medium grained, sub-angular to angular, low plasticity, dark brown, pale grey.		St	
					1.0			Hand Auger HA6 terminated at 0.50 m Refusal			
					1.5						

method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- MR mud rotary
- W washbore

* bit shown by suffix
e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nill

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- ALT air lift test
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- WS water sample
- HB hammer bouncing
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- PID photoionization detector
- R refusal

soil group symbol & soil description
based on AS 1726:2017

moisture condition
- D dry
- M moist
- W wet
- Wp plastic limit
- Wl liquid limit

consistency / relative density
- VS very soft
- S soft
- F firm
- St stiff
- VSt very stiff
- H hard
- Fb friable
- VL very loose
- L loose
- MD medium dense
- D dense
- VD very dense

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Environmental Log - Hand Auger

Hole ID.	***HA7***
sheet:	1 of 1
project no.	***754-SYDGE290953***
date started:	***28 Aug 2021***
date completed:	***28 Aug 2021***
logged by:	***J.Y***
checked by:	

client: ***School Infrastructure New South Wales***

principal:

project: ***North Sydney Public School DSI***

location: ***Bay Road, Waverton NSW 2060***

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90°

equipment type: Hand Auger | drilling fluid: | hole diameter :

drilling information | **material substance**

method & support	water	samples & field tests	photoionization detector (ppmv)	RL (m)	depth (m)	graphic log	soil group symbol	material description (SOIL NAME: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	structure and additional observations
HA	Not Encountered	E: HA7_0.1-0.2	0.5					**FILL: Gravelly SAND**: fine - medium grained, to 30 mm, sub-angular to angular, dark brown.	D		No staining, odour or acm
					0.5			**FILL: Gravelly CLAYEY SAND**: fine - medium grained, to 30 mm, sub-angular to angular, low plasticity, dark brown.			
		E: HA7_0.6-0.7	0.6					**FILL: SAND**: medium - coarse grained, yellow, pale brown.			
								FILL: Gravelly SAND: fine - medium grained, to 40 mm, sub-angular to angular, dark grey.			
		E: HA7_0.9-1.0	1								
					1.0			Hand Auger HA7 terminated at 1.00 m Target depth			
					1.5						

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method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- MR mud rotary
- W washbore

* bit shown by suffix e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nill

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- ALT air lift test
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- WS water sample
- HB hammer bouncing
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- PID photoionization detector
- R refusal

soil group symbol & soil description
based on AS 1726:2017

moisture condition
- D dry
- M moist
- W wet
- Wp plastic limit
- Wl liquid limit

consistency / relative density
- VS very soft
- S soft
- F firm
- St stiff
- VSt very stiff
- H hard
- Fb friable
- VL very loose
- L loose
- MD medium dense
- D dense
- VD very dense

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Environmental Log - Hand Auger

Hole ID.	***HA8***
sheet:	1 of 1
project no.	***754-SYDGE290953***
client:	***School Infrastructure New South Wales***
date started:	***28 Aug 2021***
principal:	
date completed:	***28 Aug 2021***
project:	***North Sydney Public School DSI***
logged by:	***J.Y***
location:	***Bay Road, Waverton NSW 2060***
checked by:	

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90°

equipment type: Hand Auger | drilling fluid: | hole diameter :

drilling information | **material substance**

method & support	water	samples & field tests	photoionization detector (ppmv)	RL (m)	depth (m)	graphic log	soil group symbol	material description (SOIL NAME: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	structure and additional observations
HA	Not Encountered							**FILL: MULCH**.	D		No staining, odour or acm
		E: HA8_0.1-0.2	0.7					**FILL: Gravelly SAND**: fine - medium grained, to 30 mm, sub-angular to angular, dark brown, dark grey.			Crushed brick
					0.5			Increasing clay content			
		E: HA8_0.7-0.8	0.5					**Gravelly CLAY**: sub-angular to angular, low plasticity, pale grey.		St	
					1.0						
								Hand Auger HA8 terminated at 1.10 m Target depth			
					1.5						

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method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- MR mud rotary
- W washbore

* bit shown by suffix e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nill

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- ALT air lift test
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- WS water sample
- HB hammer bouncing
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- PID photoionization detector
- R refusal

soil group symbol & soil description based on AS 1726:2017

moisture condition
- D dry
- M moist
- W wet
- Wp plastic limit
- Wl liquid limit

consistency / relative density
- VS very soft
- S soft
- F firm
- St stiff
- VSt very stiff
- H hard
- Fb friable
- VL very loose
- L loose
- MD medium dense
- D dense
- VD very dense

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Environmental Log - Hand Auger

Hole ID.	***HA9***
sheet:	1 of 1
project no.	***754-SYDGE290953***
client:	***School Infrastructure New South Wales***
date started:	***28 Aug 2021***
principal:	
date completed:	***28 Aug 2021***
project:	***North Sydney Public School DSI***
logged by:	***J.Y***
location:	***Bay Road, Waverton NSW 2060***
checked by:	

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90°

equipment type: Hand Auger | drilling fluid: | hole diameter :

drilling information | **material substance**

method & support	water	samples & field tests	photoionization detector (ppmv)	RL (m)	depth (m)	graphic log	soil group symbol	material description (SOIL NAME: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	structure and additional observations
HA	Not Encountered							**FILL: MULCH**.	D		No staining, odour or acm
		E: HA9_0.2-0.3	0.4					**FILL: Gravelly SAND**: fine - medium grained, to 40 mm, sub-angular to angular, dark brown.			
					0.5			**Gravelly CLAY**: to 20 mm, sub-angular to angular, low plasticity, pale grey.		St	
		E: HA9_0.9-1.0	0.5		1.0						
								Hand Auger HA9 terminated at 1.20 m Target depth			
					1.5						

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method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- MR mud rotary
- W washbore

* bit shown by suffix e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nill

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- ALT air lift test
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- WS water sample
- HB hammer bouncing
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- PID photoionization detector
- R refusal

soil group symbol & soil description
based on AS 1726:2017

moisture condition
- D dry
- M moist
- W wet
- Wp plastic limit
- Wl liquid limit

consistency / relative density
- VS very soft
- S soft
- F firm
- St stiff
- VSt very stiff
- H hard
- Fb friable
- VL very loose
- L loose
- MD medium dense
- D dense
- VD very dense

TETRA TECH COFFEY

Penetrometer Test Results

date issued:
sheet: 1 of 2
project no. ***754-SYDGE290953***

client: ***NSW Department of Education***
principal:
project: ***North Sydney Public School***
location: ***182 Pacific Highway, North Sydney 2060***

date started: ***28 Aug 2021***
date completed: ***28 Aug 2021***
logged by: ***JY***
checked by:

location datum: MGA94 Zone 56 | penetrometer id(s).: DCP3 | drop height: mm
elevation datum: m AHD | test procedure(s): AS 1289.6.3.2-1997 | cone tip:

point ID.:	HA1	HA2	HA3	HA4	HA5	HA6	HA7	HA8
date of test:	28/08/2021	28/08/2021	28/08/2021	28/08/2021	28/08/2021	28/08/2021	28/08/2021	28/08/2021
easting:	333833.63	333820.26	333804.45	333788.3	333768.3	333814.11	333778.86	333756.25
northing:	6254677.75	6254673.73	6254674.88	6254669.95	6254661.1	6254689.8	6254685.48	6254694.89
RL:	83.26	82.95	83.30	83.06	81.94	84.44	85.62	86.08
test depth (m)								
0.0	1	2	1	3	5	2	2	1
0.1	1	2	2	4	7	5	3	1
0.2	2	2	2	3	7	5	3	2
0.3	1	1	1	3	6	5	5	2
0.4	2	2	2	6	7	5	5	3
0.5	3	1	4	5	9	4	Refused 30	10
0.6	5	2	2	4	9	4		8
0.7	4	3	3	5	10	4		11
0.8	6	2	4	9	15	2		7
0.9	6	2	6	9	15	3		7
1.0	7	5	8	10	15	4		7
1.1	9	6	10	10		3		7
1.2	10	6	12	11		4		8
1.3	12	3	22	15		6		6
1.4	14	4	21	15		7		Refused (HB) 20
1.5	Refused 15	16	10			7		
1.6		Refused (HB) 14/75 mm	11			4		
1.7			10			6		
1.8			10			7		
1.9								
2.0								
2.1								
2.2								

NOTES/REMARKS:

TETRA TECH COFFEY

Penetrometer Test Results

		date issued:	
		sheet:	2 of 2
		project no.	***754-SYDGE290953***
client:	***NSW Department of Education***	date started:	***28 Aug 2021***
principal:		date completed:	***28 Aug 2021***
project:	***North Sydney Public School***	logged by:	***JY***
location:	***182 Pacific Highway, North Sydney 2060***	checked by:	

location datum:	MGA94 Zone 56	penetrometer id(s).: DCP3	drop height: mm
elevation datum:	m AHD	test procedure(s): AS 1289.6.3.2-1997	cone tip:

point ID.:	HA9
date of test:	28/08/2021
easting:	333772.85
northing:	6254705.59
RL:	86.28

test depth (m)	
	1
	4
0.2	15
	11
0.4	6
	5
0.6	6
	5
0.8	6
	6
1.0	6
	8
1.2	10
	10
1.4	10
	11
1.6	8
	8
1.8	7
	7
2.0	9
	9
2.2	

NOTES/REMARKS:

APPENDIX B: LABORATORY TEST RESULTS

MOISTURE CONTENT TEST REPORT

Client	Tetra Tech Coffey	**Job #**	S21364-1
Address	Citadel Tower, Level 19, Tower B/799 Pacific Hwy, Chatswood NSW 2067	**Report #**	S71003-MC
Project	North Sydney Public School (SYDGE290593)		

Test Procedure

- ☑ AS 1289 2.1.1 Determination of the moisture content of a soil - Oven drying method (Standard method).
- ☐ AS4133 1.1.1 Determination of the moisture content of rock - Oven drying method (standard method)
- ☐ RMS T120 Moisture content of road construction materials (Standard method)
- ☐ RMS T262 Determination of moisture content of aggregates (Standard method)

Sampling Sampled by Client - results apply to the sample as received **Date Sampled** 21/09/2021

Preparation Prepared in accordance with the test method **Date Tested** 29/09/2021

Sample #	Source	Sample Description	Moisture Content %
S71003	BH101 1.0-1.45m	Sandy CLAY	**16.9**
S71005	BH103 2.60-2.90m	Sandy CLAY	**15.9**
S71006	BH104 1.0-1.45m	Silty CLAY, trace of Sand and Gravel	**21.7**

Notes

Accredited for compliance with ISO/IEC 17025 - Testing.

The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards. This document shall not be reproduced, except in full. Results relate only to the samples tested.

NATA Accredited Laboratory Number: 14874

Authorised Signatory:

Chris Lloyd

7/10/2021

Date:

MACQUARIE GEOTECH

Macquarie Geotechnical
U7/8 10 Bradford Street
Alexandria NSW 2015

SOIL CLASSIFICATION REPORT

Client	Tetra Tech Coffey	**Source**	BH101 1.0-1.45m
Address	Citadel Tower, Level 19, Tower B/799 Pacific Hwy, Chatswood NSW 2067	**Sample Description**	Sandy CLAY
Project	North Sydney Public School (SYDGE290593)	**Report No.**	S71003-PI
Job No.	S21364-1	**Lab No.**	S71003

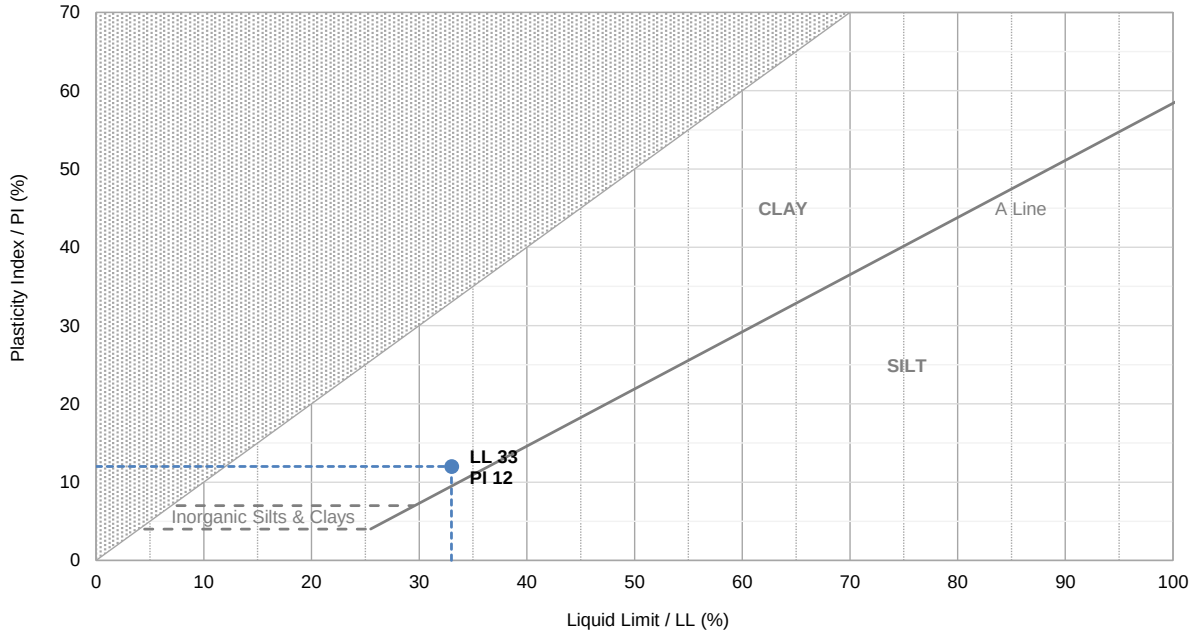
Test Procedure

- ☑ AS1289 3.1.1 Liquid Limit - Four point Casagrande method
- ☐ AS1289 3.1.2 Liquid Limit - One point Casagrande method
- ☑ AS1289 3.2.1 Plastic Limit - Standard method
- ☑ AS1289 3.3.1 Calculation of the Plasticity Index
- ☑ AS1289 3.4.1 Linear Shrinkage - Standard method

Sampling	Sampled by Client - results apply to the sample as received	**Date Sampled**	21/09/2021
Preparation	Prepared in accordance with the test method	**Date Tested**	6/10/2021

Plasticity Chart for Classification of Fine-Grained Soils

AS 1726:2017 Clause 6.1.6 (Figure 5)



Preparation	
Method of Preparation	**Dry Sieved**
History of the Sample	**Air Dried**

Results	
Liquid Limit / LL (%)	**33**
Plastic Limit (%)	**21**
Plasticity Index / PI (%)	**12**
Linear Shrinkage (%)	**5.5**
Condition upon Drying	**Linear**

Notes

Accredited for compliance with ISO/IEC 17025 - Testing.

The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards. This document shall not be reproduced, except in full. Results relate only to the samples tested.

NATA Accredited Laboratory Number: 14874

Authorised Signatory:

Chris Lloyd

7/10/2021

Date:

MACQUARIE GEOTECH

Macquarie Geotechnical
U7/8 10 Bradford Street
Alexandria NSW 2015

SOIL CLASSIFICATION REPORT

Client	Tetra Tech Coffey	**Source**	BH103 2.60-2.90m
Address	Citadel Tower, Level 19, Tower B/799 Pacific Hwy, Chatswood NSW 2067	**Sample Description**	Sandy CLAY
Project	North Sydney Public School (SYDGE290593)	**Report No.**	S71005-PI
Job No.	S21364-1	**Lab No.**	S71005

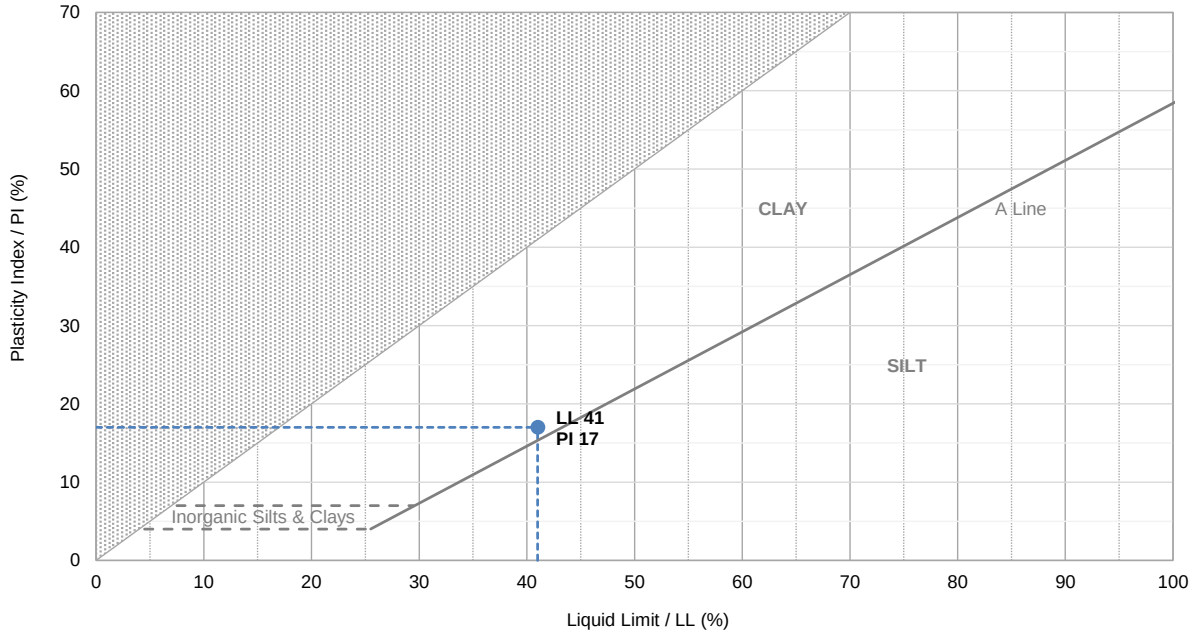
Test Procedure

- ☑ AS1289 3.1.1 Liquid Limit - Four point Casagrande method
- ☐ AS1289 3.1.2 Liquid Limit - One point Casagrande method
- ☑ AS1289 3.2.1 Plastic Limit - Standard method
- ☑ AS1289 3.3.1 Calculation of the Plasticity Index
- ☑ AS1289 3.4.1 Linear Shrinkage - Standard method

Sampling	Sampled by Client - results apply to the sample as received	**Date Sampled**	21/09/2021
Preparation	Prepared in accordance with the test method	**Date Tested**	6/10/2021

Plasticity Chart for Classification of Fine-Grained Soils

AS 1726:2017 Clause 6.1.6 (Figure 5)



Preparation	
Method of Preparation	**Dry Sieved**
History of the Sample	**Air Dried**

Results	
Liquid Limit / LL (%)	**41**
Plastic Limit (%)	**24**
Plasticity Index / PI (%)	**17**
Linear Shrinkage (%)	**8.0**
Condition upon Drying	**Linear**

Notes

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NATA Accredited Laboratory Number: 14874

Authorised Signatory:

Chris Lloyd

7/10/2021

Date:

MACQUARIE GEOTECH

Macquarie Geotechnical
U7/8 10 Bradford Street
Alexandria NSW 2015

SOIL CLASSIFICATION REPORT

Client	Tetra Tech Coffey	**Source**	BH104 1.0-1.45m
Address	Citadel Tower, Level 19, Tower B/799 Pacific Hwy, Chatswood NSW 2067	**Sample Description**	Silty CLAY, trace of Sand and Gravel
Project	North Sydney Public School (SYDGE290593)	**Report No.**	S71006-PI
Job No.	S21364-1	**Lab No.**	S71006

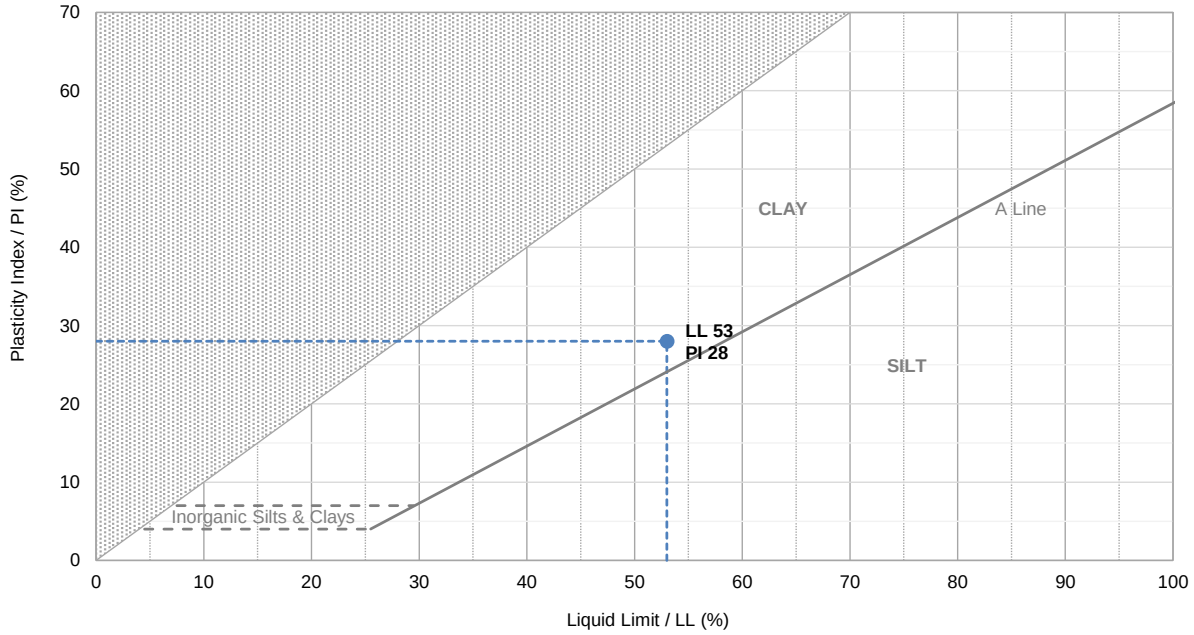
Test Procedure

☑	AS1289 3.1.1	Liquid Limit - Four point Casagrande method
☐	AS1289 3.1.2	Liquid Limit - One point Casagrande method
☑	AS1289 3.2.1	Plastic Limit - Standard method
☑	AS1289 3.3.1	Calculation of the Plasticity Index
☑	AS1289 3.4.1	Linear Shrinkage - Standard method

Sampling	Sampled by Client - results apply to the sample as received	**Date Sampled**	20/09/2021
Preparation	Prepared in accordance with the test method	**Date Tested**	6/10/2021

Plasticity Chart for Classification of Fine-Grained Soils

AS 1726:2017 Clause 6.1.6 (Figure 5)



Preparation	
Method of Preparation	**Dry Sieved**
History of the Sample	**Air Dried**

Results	
Liquid Limit / LL (%)	**53**
Plastic Limit (%)	**25**
Plasticity Index / PI (%)	**28**
Linear Shrinkage (%)	**9.5**
Condition upon Drying	**Linear**

Notes

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NATA Accredited Laboratory Number: 14874

Authorised Signatory:

Chris Lloyd

7/10/2021

Date:

MACQUARIE GEOTECH

Macquarie Geotechnical
U7/8 10 Bradford Street
Alexandria NSW 2015

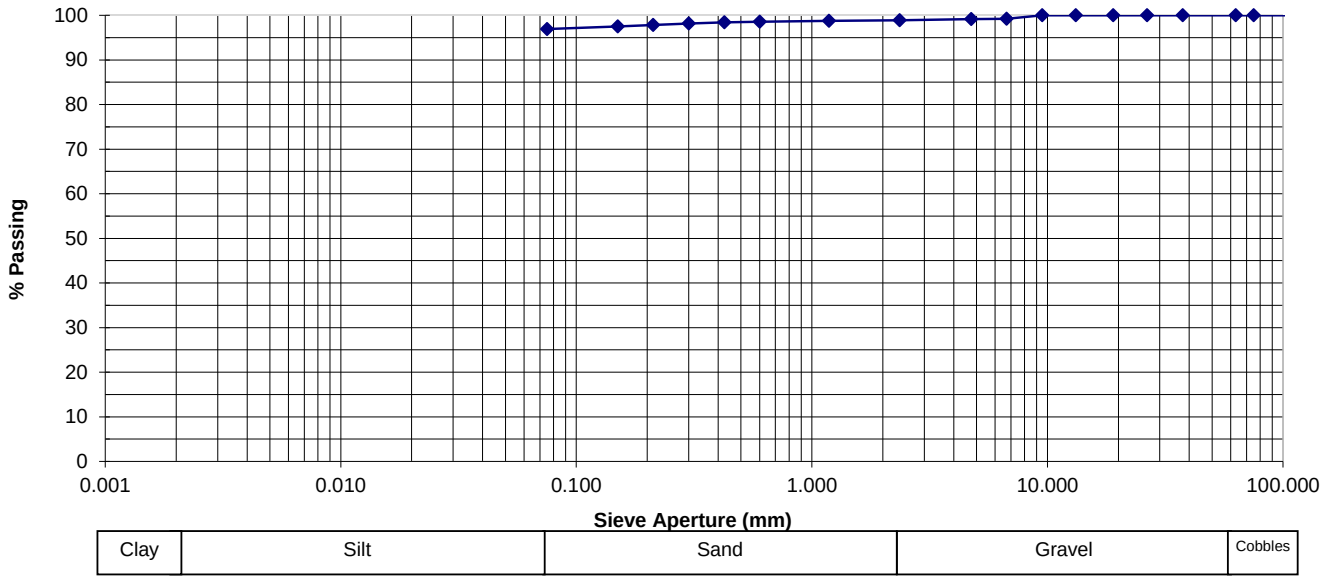
Particle Size Distribution Report

Client	Tetra Tech Coffey	**Source**	BH104 1.0-1.45m
Address	Citadel Tower, Level 19, Tower B/799 Pacific Hwy, Chatswood NSW 2067	**Sample Description**	Silty CLAY, trace of Sand and Gravel
Project	North Sydney Public School (SYDGE290593)	**Report No**	S71006-PSD
Job No	S21364-1	**Lab No**	S71006

Test Procedure AS 1289.3.6.1 Determination of the particle size distribution of a soil - Standard method of analysis by sieving

Sampling Sampled by Client - results apply to the sample as received **Date Sampled** 20/09/2021

Preparation Prepared in accordance with the test method **Date Tested** 6/10/2021



Sieve Aperture: (mm)	% Passing	Specification (..) Envelope	Sieve Aperture: (mm)	% Passing	Specification (..) Envelope
200			4.75	99	
75			2.36	99	
63			1.18	99	
37.5			0.600	99	
26.5			0.425	98	
19			0.300	98	
13.2	100		0.212	98	
9.5	100		0.150	97	
6.7	99		0.075	97	

Notes

Accredited for compliance with ISO/IEC 17025 - Testing.

The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards. This document shall not be reproduced, except in full. Results relate only to the samples tested.

NATA Accredited Laboratory Number: 14874

Authorised Signatory: Date:

6/10/2021

Chris Lloyd

MACQUARIE GEOTECH

Macquarie Geotechnical
U7/8 10 Bradford Street
Alexandria NSW 2015

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 279189

Client Details

Client	Macquarie Geotech
Attention	Chris Lloyd
Address	3 Watt Dr, Bathurst, NSW, 2795

Sample Details

Your Reference	**S21364, North Sydney Public School (SYDGE290593)**
Number of Samples	1 Soil
Date samples received	28/09/2021
Date completed instructions received	28/09/2021

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

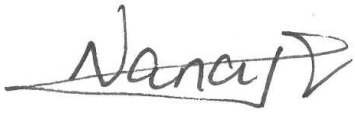
Date results requested by	06/10/2021
Date of Issue	06/10/2021

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
Jenny He, Chemist

Authorised By



Nancy Zhang, Laboratory Manager

Misc Inorg - Soil		
Our Reference		279189-1
Your Reference	UNITS	S71003
Sample ID		BH102 1.0-1.45m
Date Sampled		20/09/2021
Type of sample		Soil
Date prepared	-	05/10/2021
Date analysed	-	05/10/2021
pH 1:5 soil:water	pH Units	4.6
Electrical Conductivity 1:5 soil:water	µS/cm	190
Chloride, Cl 1:5 soil:water	mg/kg	120
Sulphate, SO4 1:5 soil:water	mg/kg	170

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

QUALITY CONTROL: Misc Inorg - Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			05/10/2021	[NT]	[NT]	[NT]	[NT]	05/10/2021	[NT]
Date analysed	-			05/10/2021	[NT]	[NT]	[NT]	[NT]	05/10/2021	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	[NT]	[NT]	[NT]	[NT]	101	[NT]
Electrical Conductivity 1:5 soil:water	µS/cm	1	Inorg-002	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Chloride, Cl 1:5 soil:water	mg/kg	10	Inorg-081	<10	[NT]	[NT]	[NT]	[NT]	95	[NT]
Sulphate, SO4 1:5 soil:water	mg/kg	10	Inorg-081	<10	[NT]	[NT]	[NT]	[NT]	102	[NT]

Result Definitions

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

Quality Control Definitions

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

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

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

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

Spikes for Physical and Aggregate Tests are not applicable.

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

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

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

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

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

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

Measurement Uncertainty estimates are available for most tests upon request.

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

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

Report Comments

pH/EC Samples were out of the recommended holding time for this analysis.

APPENDIX C: PREVIOUS INVESTIGATION (2019) BOREHOLE LOGS

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Engineering Log - Borehole

Borehole ID.	**BH01**
sheet:	1 of 2
project no.	**SYDGE232786**
client:	**NSW Department of Education**
date started:	**02 Oct 2019**
principal:	**Coffey Services Australia Pty Ltd**
date completed:	**02 Oct 2019**
project:	**North Sydney Public School**
logged by:	**RN**
location:	**North Sydney**
checked by:	**RR**

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90°

drill model: Delta Base, Track mounted | drilling fluid: | hole diameter : 100 mm

drilling information | **material substance**

method & support	penetration (1 2 3)	water	samples & field tests	RL (m)	depth (m)	graphic log	soil group symbol	material description (SOIL NAME: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	hand penetrometer (kPa)	structure and additional observations
AD/T, CASING		Not Encountered	E E E SPT 5, 13, 10/70mm HB N=R		0.0			**CONCRETE**.				**CONCRETE**
							CI	**FILL: ROAD BASE**.	~Wp	S		**FILL**
								CLAY: medium plasticity, brown, dark brown, with fine to coarse grained sand, trace fine grained, sub-rounded gravel. 0.7 m: becoming medium to high plasticity, pale brown.		F		**RESIDUAL SOIL**
					1.0		CL-CH	**CLAY**: medium - high plasticity, pale brown, grey, trace fine to coarse grained sand.		St - VSt		
					2.0			**SHALE**: pale brown, pale grey, recovered as sandy clay, estimated very low to low strength.				**INFERRED WEATHERED BEDROCK**
								Borehole BH01 continued as cored hole				
					3.0							
					4.0							
					5.0							
					6.0							
					7.0							

CDF_0_9_07_LIBRARY.GLB rev:AU Log COF BOREHOLE: NON CORED SYDGE232786 (NORTH SYDNEY).GPJ <<DrawingFile>> 19/11/2019 17:03

method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore

* bit shown by suffix, e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nil

penetration (1 2 3) — no resistance ranging to refusal

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shear; peak/remouded (kPa)
- R refusal
- HB hammer bouncing

soil group symbol & soil description based on AS 1726:2017

moisture condition
- D dry
- M moist
- W wet
- Wp plastic limit
- Wl liquid limit

consistency / relative density
- VS very soft
- S soft
- F firm
- St stiff
- VSt very stiff
- H hard
- Fb friable
- VL very loose
- L loose
- MD medium dense
- D dense
- VD very dense

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Engineering Log - Cored Borehole

Borehole ID.	**BH01**
sheet:	2 of 2
project no.	**SYDGE232786**
client:	**NSW Department of Education**
date started:	**02 Oct 2019**
principal:	**Coffey Services Australia Pty Ltd**
date completed:	**02 Oct 2019**
project:	**North Sydney Public School**
logged by:	**RN**
location:	**North Sydney**
checked by:	**RR**

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90°

drill model: Delta Base, Track mounted | drilling fluid: | hole diameter : 100 mm

drilling information | **material substance** | **rock mass defects**

method & support	water	RL (m)	depth (m)	graphic log	material description **ROCK TYPE**: grain characterisics, colour, structure, minor components	weathering & alteration	estimated strength & Is50 (X = axial; O = diametral) VL L M H VH EH	samples, field tests & Is(50) (MPa) a = axial; d = diametral	core run & RQD	defect spacing (mm) 30 100 300 1000 3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other) particular / general
			1.0								
			2.0		started coring at 2.50m						
NMLC	Not Encountered		3.0		**SHALE**: pale brown, pale grey, distinctly laminated at 0° - 10°, with iron staining.	HW - MW		a=0.11 d=0.06			CS, 0°, IR, RO, CN CS, 0°, IR, RO, CN CS, 0°, IR, RO, CN CS, 0°, IR, RO, CN CS, 0°, IR, RO, CN SZ, IR, RO, CN CS, 0°, IR, RO, CN CS, 0°, IR, RO, CN CS, 0°, IR, RO, CN CS, 0°, IR, RO, CN CS, 0°, IR, RO, CN Defects are: PT, 0 - 20°, PL, SO, CN, unless otherwise described
			4.0		4.0 m: becoming dark grey, pale grey.	MW - SW		a=0.10 d=0.12			
			5.0					a=0.35 d=0.44			
			6.0		Borehole BH01 terminated at 5.89 m Target depth						
			7.0								

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method & support
AS auger screwing
AD auger drilling
CB claw or blade bit
W washbore
RR rock roller
NMLC NMLC core (51.9 mm)
NQ wireline core (47.6mm)
HQ wireline core (63.5mm)
PQ wireline core (85.0mm)

support
C casing M mud N none

water
10/10/12, water level on date shown
water inflow
complete drilling fluid loss
partial drilling fluid loss
25uL water pressure test result (lugeons) for depth interval shown

graphic log / core recovery
core recovered (graphic symbols indicate material)
no core recovered

core run & RQD
barrel withdrawn
RQD = Rock Quality Designation (%)

weathering & alteration*
RS residual soil
XW extremely weathered
HW highly weathered
MW moderately weathered
SW slightly weathered
FR fresh
*W replaced with A for alteration

strength
VL very low
L low
M medium
H high
VH very high
EH extremely high

defect type
PT parting
JT joint
SS shear surface
SZ shear zone
CO contact
CS crushed seam
SM seam

planarity
PL planar
CU curved
UN undulating
ST stepped
IR Irregular

roughness
VR very rough
RO rough
SO smooth
POL polished
SL slickensided

coating
CN clean
SN stained
VN veneer
CO coating

BH01 2.50 - 5.89 m

drawn	
approved	
date	17-10-2019
scale	N.T.S.
original size	A4

coffey
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client:	NSW Department of Education
project:	North Sydney Public School North Sydney
title:	**CORE PHOTOGRAPH** **BH01**
project no: SYDGE232786	fig no: **FIGURE 1** rev:

coffey
A TETRA TECH COMPANY

Engineering Log - Borehole

Borehole ID.	**BH02**
sheet:	1 of 2
project no.	**SYDGE232786**
client:	**NSW Department of Education**
date started:	**02 Oct 2019**
principal:	**Coffey Services Australia Pty Ltd**
date completed:	**02 Oct 2019**
project:	**North Sydney Public School**
logged by:	**RN**
location:	**North Sydney**
checked by:	**RR**

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90°

drill model: Delta Base, Track mounted | drilling fluid: | hole diameter : 100 mm

drilling information | **material substance**

method & support	penetration (1 2 3)	water	samples & field tests	RL (m)	depth (m)	graphic log	soil group symbol	material description (SOIL NAME: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	hand penetrometer (kPa)	structure and additional observations
AD/T, CASING		Not Encountered	E				CL-Cl	**ASPHALT**.				**ASPHALT**
								FILL: ROAD BASE.	<Wp	S		**FILL**
			D + E				Cl	**CLAY**: low - medium plasticity, brown, grey, with fine to coarse grained sand, trace fine to medium sub-angular to sub-rounded gravel.				**RESIDUAL SOIL**
			SPT 19, HB N=R		1.0			**CLAY**: medium plasticity, brown, pale brown, with fine to coarse grained sand, trace fine to medium sub-rounded gravel.		F		
							Cl	**CLAY**: medium plasticity, brown, pale brown, grey, trace fine to coarse grained sand.	~Wp			
					2.0					St - VSt		
			SPT 11, 18/110mm, HB N=R					**SHALE**: grey to dark grey, recovered as sandy clay, estimated very low to low strength.				**INFERRED WEATHERED BEDROCK**
								Borehole BH02 continued as cored hole				
					3.0							
					4.0							
					5.0							
					6.0							
					7.0							

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method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore

* bit shown by suffix, e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nil

penetration
1 2 3 — no resistance ranging to refusal

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shear; peak/remouded (kPa)
- R refusal
- HB hammer bouncing

soil group symbol & soil description
based on AS 1726:2017

moisture condition
- D dry
- M moist
- W wet
- Wp plastic limit
- Wl liquid limit

consistency / relative density
- VS very soft
- S soft
- F firm
- St stiff
- VSt very stiff
- H hard
- Fb friable
- VL very loose
- L loose
- MD medium dense
- D dense
- VD very dense

coffey
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Engineering Log - Cored Borehole

Borehole ID.	**BH02**
sheet:	2 of 2
project no.	**SYDGE232786**
client:	**NSW Department of Education**
date started:	**02 Oct 2019**
principal:	**Coffey Services Australia Pty Ltd**
date completed:	**02 Oct 2019**
project:	**North Sydney Public School**
logged by:	**RN**
location:	**North Sydney**
checked by:	**RR**

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90°

drill model: Delta Base, Track mounted | drilling fluid: | hole diameter : 100 mm

drilling information | **material substance** | **rock mass defects**

method & support	water	RL (m)	depth (m)	graphic log	material description **ROCK TYPE**: grain characterisics, colour, structure, minor components	weathering & alteration	estimated strength & Is50 (X = axial; O = diametral) VL L M H VH EH	samples, field tests & Is(50) (MPa) a = axial; d = diametral	core run & RQD	defect spacing (mm) 30 100 300 1000 3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other) particular / general
			1.0								
			2.0		started coring at 2.80m						
NMLC	Not Encountered		3.0		**SHALE**: grey to dark grey, distinctly laminated at 0º - 10º, with some iron staining.	MW - SW		a=0.03 d=0.01			
			4.0			SW		a=0.34 d=0.07			CS, 0°, IR, RO, CN CS, 0°, IR, RO, CN CS, 0°, IR, RO, CN
			5.0			FR		a=0.59 d=1.02			JT, 45°, PL, SO, CN JT, 30 - 40°, PL, SO, CN JT, 20 - 25°, PL, SO, CN Defects are: PT, 0 - 20°, PL, SO, CN, unless otherwise described
			6.0		Borehole BH02 terminated at 5.65 m Target depth						
			7.0								

CDF_0_9_07_LIBRARY.GLB rev:AU Log COF BOREHOLE: CORED SYDGE232786 (NORTH SYDNEY).GPJ <<DrawingFile>> 19/11/2019 17:04

method & support
AS auger screwing
AD auger drilling
CB claw or blade bit
W washbore
RR rock roller
NMLC NMLC core (51.9 mm)
NQ wireline core (47.6mm)
HQ wireline core (63.5mm)
PQ wireline core (85.0mm)

support
C casing M mud N none

water
10/10/12, water level on date shown
water inflow
complete drilling fluid loss
partial drilling fluid loss
25uL water pressure test result (lugeons) for depth interval shown

graphic log / core recovery
core recovered (graphic symbols indicate material)
no core recovered

core run & RQD
barrel withdrawn
RQD = Rock Quality Designation (%)

weathering & alteration*
RS residual soil
XW extremely weathered
HW highly weathered
MW moderately weathered
SW slightly weathered
FR fresh
*W replaced with A for alteration

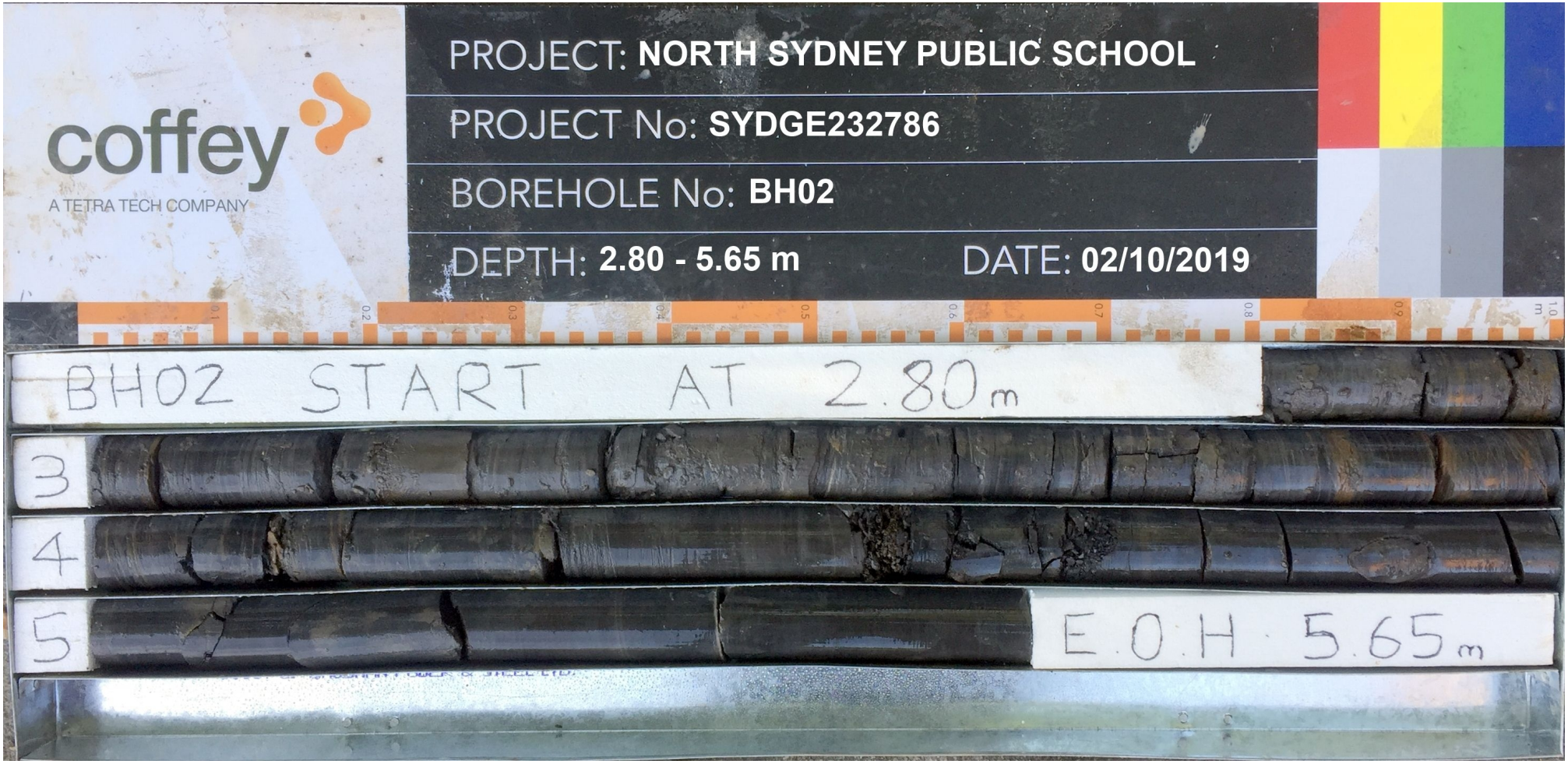
strength
VL very low
L low
M medium
H high
VH very high
EH extremely high

defect type
PT parting
JT joint
SS shear surface
SZ shear zone
CO contact
CS crushed seam
SM seam

planarity
PL planar
CU curved
UN undulating
ST stepped
IR Irregular

roughness
VR very rough
RO rough
SO smooth
POL polished
SL slickensided

coating
CN clean
SN stained
VN veneer
CO coating



BH02 2.80 - 5.65 m

drawn	
approved	
date	17-10-2019
scale	N.T.S.
original size	A4

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client:	NSW Department of Education
project:	North Sydney Public School North Sydney
title:	**CORE PHOTOGRAPH** **BH02**
project no: SYDGE232786	fig no: **FIGURE 1** rev:

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Engineering Log - Borehole

Borehole ID.	**BH03**
sheet:	1 of 2
project no.	**SYDGE232786**
client:	**NSW Department of Education**
date started:	**04 Oct 2019**
principal:	**Coffey Services Australia Pty Ltd**
date completed:	**04 Oct 2019**
project:	**North Sydney Public School**
logged by:	**RN**
location:	**North Sydney**
checked by:	**RR**

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90°

drill model: Delta Base, Track mounted | drilling fluid: | hole diameter : 100 mm

drilling information | **material substance**

method & support	penetration (1 2 3)	water	samples & field tests	RL (m)	depth (m)	graphic log	soil group symbol	material description (SOIL NAME: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	hand penetrometer (kPa)	structure and additional observations
AD/T, CASING		Not Encountered	E				CL	**ASPHALT**.				**ASPHALT**
								FILL: ROAD BASE.	<Wl	S		**FILL**
			D + E				CL-Cl	**CLAY**: low plasticity, brown, with fine to coarse grained sand, trace fine to medium, sub-angular to sub-rounded gravel.	~Wl	S - F		**RESIDUAL SOIL**
			E		1.0		Cl	**Sandy CLAY**: low - medium plasticity, brown, red, grey, with fine to medium grained gravel; sand is fine to medium grained.		F		
			SPT 4, 5, 15 N=20					**CLAY**: medium plasticity, brown, grey, trace fine to coarse sand.		St		
					2.0							
			SPT 14, 5/120mm, HB N=R					**SHALE**: grey, dark grey, recovered as sandy clay, estimated very low to low strength.				**INFERRED WEATHERED BEDROCK**
					3.0			Borehole BH03 continued as cored hole				
					4.0							
					5.0							
					6.0							
					7.0							

CDF_0_9_07_LIBRARY.GLB rev:AU Log COF BOREHOLE: NON CORED SYDGE232786 (NORTH SYDNEY).GPJ <<DrawingFile>> 19/11/2019 17:03

method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore

* bit shown by suffix, e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nil

penetration (1 2 3) — no resistance ranging to refusal

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shear; peak/remouded (kPa)
- R refusal
- HB hammer bouncing

soil group symbol & soil description based on AS 1726:2017

moisture condition
- D dry
- M moist
- W wet
- Wp plastic limit
- Wl liquid limit

consistency / relative density
- VS very soft
- S soft
- F firm
- St stiff
- VSt very stiff
- H hard
- Fb friable
- VL very loose
- L loose
- MD medium dense
- D dense
- VD very dense

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Engineering Log - Cored Borehole

Borehole ID.	**BH03**
sheet:	2 of 2
project no.	**SYDGE232786**
client:	**NSW Department of Education**
date started:	**04 Oct 2019**
principal:	**Coffey Services Australia Pty Ltd**
date completed:	**04 Oct 2019**
project:	**North Sydney Public School**
logged by:	**RN**
location:	**North Sydney**
checked by:	**RR**

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90°

drill model: Delta Base, Track mounted | drilling fluid: | hole diameter : 100 mm

drilling information | **material substance** | **rock mass defects**

method & support	water	RL (m)	depth (m)	graphic log	material description **ROCK TYPE**: grain characterisics, colour, structure, minor components	weathering & alteration	estimated strength & Is50 X = axial; O = diametral VL L M H VH EH	samples, field tests & Is(50) (MPa) a = axial; d = diametral	core run & RQD	defect spacing (mm) 30 100 300 1000 3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other) particular / general
			1.0								
			2.0		started coring at 2.80m						
NMLC	Not Encountered		3.0		**SHALE**: grey, dark grey, indistinctly laminated at 0º - 10º.	MW - SW					SM, 0°, 50 mm, clay
			4.0			SW		a=0.03 d=0.01 a=0.01 d=0.01			CS, 0°, IR, RO, CN CS, 0°, IR, RO, CN
			5.0					a=0.04 d=0.02			PT, 0 - 25°, IR, RO, CN CS, 0°, IR, RO, CN Defects are: PT, 0 - 20°, PL, SO, CN, unless otherwise described
			6.0		Borehole BH03 terminated at 5.78 m Target depth						
			7.0								

method & support
AS auger screwing
AD auger drilling
CB claw or blade bit
W washbore
RR rock roller
NMLC NMLC core (51.9 mm)
NQ wireline core (47.6mm)
HQ wireline core (63.5mm)
PQ wireline core (85.0mm)

support
C casing M mud N none

water
10/10/12, water level on date shown
water inflow
complete drilling fluid loss
partial drilling fluid loss
25uL water pressure test result (lugeons) for depth interval shown

graphic log / core recovery
core recovered (graphic symbols indicate material)
no core recovered

core run & RQD
barrel withdrawn
RQD = Rock Quality Designation (%)

weathering & alteration*
RS residual soil
XW extremely weathered
HW highly weathered
MW moderately weathered
SW slightly weathered
FR fresh
*W replaced with A for alteration

strength
VL very low
L low
M medium
H high
VH very high
EH extremely high

defect type
PT parting
JT joint
SS shear surface
SZ shear zone
CO contact
CS crushed seam
SM seam

planarity
PL planar
CU curved
UN undulating
ST stepped
IR Irregular

roughness
VR very rough
RO rough
SO smooth
POL polished
SL slickensided

coating
CN clean
SN stained
VN veneer
CO coating

BH03 2.80 - 5.78 m

drawn	
approved	
date	17-10-2019
scale	N.T.S.
original size	A4

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client:	NSW Department of Education
project:	North Sydney Public School North Sydney
title:	**CORE PHOTOGRAPH** **BH03**
project no: SYDGE232786	fig no: **FIGURE 1** rev:

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Engineering Log - Borehole

Borehole ID.	**BH04**
sheet:	1 of 2
project no.	**SYDGE232786**
client:	**NSW Department of Education**
date started:	**03 Oct 2019**
principal:	**Coffey Services Australia Pty Ltd**
date completed:	**03 Oct 2019**
project:	**North Sydney Public School**
logged by:	**RN**
location:	**North Sydney**
checked by:	**RR**

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90°

drill model: Delta Base, Track mounted | drilling fluid: | hole diameter : 100 mm

drilling information | **material substance**

method & support	penetration (1 2 3)	water	samples & field tests	RL (m)	depth (m)	graphic log	soil group symbol	material description (SOIL NAME: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	hand penetrometer (kPa)	structure and additional observations
AD/T, CASING		Not Encountered	E				CL	**ASPHALT**.	<Wp	S		**ASPHALT**
								FILL: ROAD BASE.				**FILL**
			D + E				CL-Cl	**CLAY**: low plasticity, brown, grey, with fine to coarse grained sand, trace fine to medium, sub-angular to sub-rounded gravel.		F		**RESIDUAL SOIL**
			E		1.0			**CLAY**: low - medium plasticity, brown, with fine to coarse grained sand, trace fine to medium sub-rounded gravel.				
			SPT 4, 4, 7 N=11				Cl	**CLAY**: medium plasticity, brown, grey, trace fine sand.		St		
					2.0				~Wp			
			SPT 6 HB N=R					**SHALE**: grey, pale grey, recovered as sandy clay, estimated very low to low strength.		St - VSt		**INFERRED WEATHERED BEDROCK**
								Borehole BH04 continued as cored hole				
					3.0							
					4.0							
					5.0							
					6.0							
					7.0							

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method
AD auger drilling*
AS auger screwing*
HA hand auger
W washbore

* bit shown by suffix
e.g. AD/T
B blank bit
T TC bit
V V bit

support
M mud
C casing
N nil

penetration
1 2 3 — no resistance ranging to refusal

water
10-Oct-12 water level on date shown
water inflow
water outflow

samples & field tests
B bulk disturbed sample
D disturbed sample
E environmental sample
SS split spoon sample
U## undisturbed sample ##mm diameter
HP hand penetrometer (kPa)
N standard penetration test (SPT)
N* SPT - sample recovered
Nc SPT with solid cone
VS vane shear; peak/remouded (kPa)
R refusal
HB hammer bouncing

soil group symbol & soil description
based on AS 1726:2017

moisture condition
D dry
M moist
W wet
Wp plastic limit
Wl liquid limit

consistency / relative density
VS very soft
S soft
F firm
St stiff
VSt very stiff
H hard
Fb friable
VL very loose
L loose
MD medium dense
D dense
VD very dense

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Engineering Log - Cored Borehole

Borehole ID.	**BH04**
sheet:	2 of 2
project no.	**SYDGE232786**
client:	**NSW Department of Education**
date started:	**03 Oct 2019**
principal:	**Coffey Services Australia Pty Ltd**
date completed:	**03 Oct 2019**
project:	**North Sydney Public School**
logged by:	**RN**
location:	**North Sydney**
checked by:	**RR**

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90°

drill model: Delta Base, Track mounted | drilling fluid: | hole diameter : 100 mm

drilling information | **material substance** | **rock mass defects**

method & support	water	RL (m)	depth (m)	graphic log	material description **ROCK TYPE**: grain characterisics, colour, structure, minor components	weathering & alteration	estimated strength & Is50 (X = axial; O = diametral) VL L M H VH EH	samples, field tests & Is(50) (MPa) a = axial; d = diametral	core run & RQD	defect spacing (mm) 30 100 300 1000 3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other) particular / general
			1.0								
			2.0		started coring at 2.80m						
NMLC	Not Encountered		3.0		**SHALE**: grey, pale grey, indistinctly laminated at 0º - 10º.	HW - MW					CS, 0°, IR, RO, CN CS, 0°, IR, RO, CN
			4.0			SW		a=0.01 d=0.00 a=0.02 d=0.03			Defects are: PT, 0 - 20°, PL, SO, CN, unless otherwise described
			5.0		Borehole BH04 terminated at 4.92 m Target depth						
			6.0								
			7.0								

CDF_0_9_07_LIBRARY.GLB rev:AU Log COF BOREHOLE: CORED SYDGE232786 (NORTH SYDNEY).GPJ <<DrawingFile>> 19/11/2019 17:04

method & support
AS auger screwing
AD auger drilling
CB claw or blade bit
W washbore
RR rock roller
NMLC NMLC core (51.9 mm)
NQ wireline core (47.6mm)
HQ wireline core (63.5mm)
PQ wireline core (85.0mm)

support
C casing M mud N none

water
10/10/12, water level on date shown
water inflow
complete drilling fluid loss
partial drilling fluid loss
25uL water pressure test result (lugeons) for depth interval shown

graphic log / core recovery
core recovered (graphic symbols indicate material)
no core recovered

core run & RQD
barrel withdrawn
RQD = Rock Quality Designation (%)

weathering & alteration*
RS residual soil
XW extremely weathered
HW highly weathered
MW moderately weathered
SW slightly weathered
FR fresh
*W replaced with A for alteration

strength
VL very low
L low
M medium
H high
VH very high
EH extremely high

defect type
PT parting
JT joint
SS shear surface
SZ shear zone
CO contact
CS crushed seam
SM seam

planarity
PL planar
CU curved
UN undulating
ST stepped
IR Irregular

roughness
VR very rough
RO rough
SO smooth
POL polished
SL slickensided

coating
CN clean
SN stained
VN veneer
CO coating

BH04 2.80 - 4.92 m

drawn	
approved	
date	**17-10-2019**
scale	**N.T.S.**
original size	**A4**

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client:	NSW Department of Education
project:	North Sydney Public School North Sydney
title:	**CORE PHOTOGRAPH** **BH04**
project no: SYDGE232786	fig no: **FIGURE 1** rev:

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Engineering Log - Borehole

Borehole ID.	**BH05**
sheet:	1 of 2
project no.	**SYDGE232786**
client:	**NSW Department of Education**
date started:	**03 Oct 2019**
principal:	**Coffey Services Australia Pty Ltd**
date completed:	**03 Oct 2019**
project:	**North Sydney Public School**
logged by:	**RN**
location:	**North Sydney**
checked by:	**RR**

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90°

drill model: Delta Base, Track mounted | drilling fluid: | hole diameter : 100 mm

drilling information | **material substance**

method & support	penetration (1 2 3)	water	samples & field tests	RL (m)	depth (m)	graphic log	soil group symbol	material description (SOIL NAME: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	hand penetrometer (kPa) 100 200 300 400	structure and additional observations
AD/T, CASING		Not Encountered	E				CL	**ASPHALT**.				**ASPHALT**
								FILL: ROAD BASE.	<Wp	S		**FILL**
			D + E					**CLAY**: low plasticity, brown, with fine to coarse grained sand, trace fine to coarse, sub-angular to sub-rounded gravel.				**RESIDUAL SOIL**
			E		1.0		CI	**CLAY**: medium plasticity, brown, pale brown, with fine to coarse grained sand, trace fine grained, sub-rounded gravel.	~Wp	F		
			SPT 5, 7, 17 N=24				CI	**CLAY**: medium plasticity, pale brown, grey.				
					2.0					St - VSt		
			SPT 12, 14/200mm HB N=R					**SHALE**: grey, dark grey, recovered as sandy clay, estimated very low to low strength.				**INFERRED WEATHERED BEDROCK**
								Borehole BH05 continued as cored hole				
					3.0							
					4.0							
					5.0							
					6.0							
					7.0							

CDF_0_9_07_LIBRARY.GLB rev:AU Log COF BOREHOLE: NON CORED SYDGE232786 (NORTH SYDNEY).GPJ <<DrawingFile>> 19/11/2019 17:03

method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore

* bit shown by suffix, e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nil

penetration (1 2 3) — no resistance ranging to refusal

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shear; peak/remouded (kPa)
- R refusal
- HB hammer bouncing

soil group symbol & soil description based on AS 1726:2017

moisture condition
- D dry
- M moist
- W wet
- Wp plastic limit
- Wl liquid limit

consistency / relative density
- VS very soft
- S soft
- F firm
- St stiff
- VSt very stiff
- H hard
- Fb friable
- VL very loose
- L loose
- MD medium dense
- D dense
- VD very dense

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Engineering Log - Cored Borehole

Borehole ID.	**BH05**
sheet:	2 of 2
project no.	**SYDGE232786**
client:	**NSW Department of Education**
date started:	**03 Oct 2019**
principal:	**Coffey Services Australia Pty Ltd**
date completed:	**03 Oct 2019**
project:	**North Sydney Public School**
logged by:	**RN**
location:	**North Sydney**
checked by:	**RR**

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90°

drill model: Delta Base, Track mounted | drilling fluid: | hole diameter : 100 mm

drilling information | **material substance** | **rock mass defects**

method & support	water	RL (m)	depth (m)	graphic log	material description **ROCK TYPE**: grain characterisics, colour, structure, minor components	weathering & alteration	estimated strength & Is50 (X = axial; O = diametral) VL L M H VH EH	samples, field tests & Is(50) (MPa) a = axial; d = diametral	core run & RQD	defect spacing (mm) 30 100 300 1000 3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other) particular	general
			1.0									
			2.0		started coring at 2.80m							
NMLC	Not Encountered		3.0		**SHALE**: grey, dark grey, indistinctly laminated at 0º - 10º.	MW / SW		a=0.21 d=0.31			CS, 0°, IR, RO, CN CS, 0°, IR, RO, CN CS, 0°, IR, RO, CN	Defects are: PT, 0 - 20°, PL, SO, CN, unless otherwise described
			4.0					a=0.03 d=0.05			PT, 25°, PL, SO, CN CS, 0°, IR, RO, CN	
			5.0		Borehole BH05 terminated at 5.00 m Target depth						JT, 35°, PL, SO, CN	
			6.0									
			7.0									

CDF_0_9_07_LIBRARY.GLB rev:AU Log COF BOREHOLE: CORED SYDGE232786 (NORTH SYDNEY).GPJ <<DrawingFile>> 19/11/2019 17:04

method & support
AS auger screwing
AD auger drilling
CB claw or blade bit
W washbore
RR rock roller
NMLC NMLC core (51.9 mm)
NQ wireline core (47.6mm)
HQ wireline core (63.5mm)
PQ wireline core (85.0mm)

support
C casing M mud N none

water
10/10/12, water level on date shown
water inflow
complete drilling fluid loss
partial drilling fluid loss
25uL water pressure test result (lugeons) for depth interval shown

graphic log / core recovery
core recovered (graphic symbols indicate material)
no core recovered

core run & RQD
barrel withdrawn
RQD = Rock Quality Designation (%)

weathering & alteration*
RS residual soil
XW extremely weathered
HW highly weathered
MW moderately weathered
SW slightly weathered
FR fresh
*W replaced with A for alteration

strength
VL very low
L low
M medium
H high
VH very high
EH extremely high

defect type
PT parting
JT joint
SS shear surface
SZ shear zone
CO contact
CS crushed seam
SM seam

planarity
PL planar
CU curved
UN undulating
ST stepped
IR Irregular

roughness
VR very rough
RO rough
SO smooth
POL polished
SL slickensided

coating
CN clean
SN stained
VN veneer
CO coating

BH05 2.80 - 5.00 m

drawn	
approved	
date	17-10-2019
scale	N.T.S.
original size	A4

coffey
A TETRA TECH COMPANY

client:	NSW Department of Education
project:	North Sydney Public School North Sydney
title:	**CORE PHOTOGRAPH** **BH05**
project no: SYDGE232786	fig no: **FIGURE 1** rev:

APPENDIX D: ARCHITECTURAL DRAWINGS

NORTH SYDNEY PUBLIC SCHOOL

FOR NSW DEPARTMENT OF EDUCATION

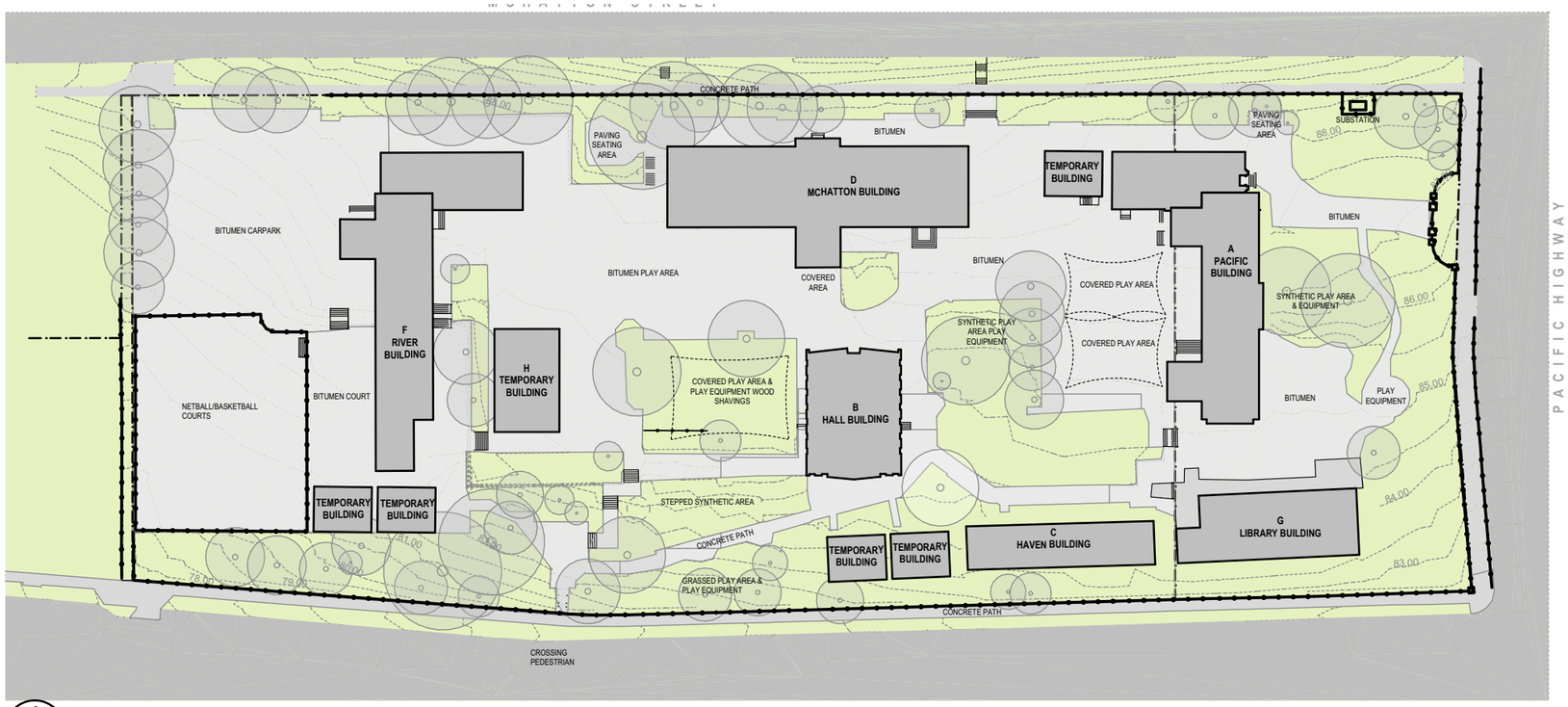
7068WA01

CD-000	Title Page	B
CD-001	Site Analysis 01	B
CD-002	Site Analysis 02	B
CD-003	Site Analysis 03	B
CD-004	Site Analysis 04	B
CD-005	Site Analysis 05	B
CD-006	Site Analysis 06	B
CD-101	Existing Site Plan	B
CD-102	Demolition Plan	C
CD-103	Proposed Site Plan - Level 1 / Street Level	B
CD-104	Proposed Site Plan - Level 2 / Courtyard Level	B
CD-105	Proposed Site Plan - Level 3	B
CD-106	Perspectives	C
CD-201	Level 1 / Street Level - Hall	C
CD-202	Level 1 / Street Level - Admin_Home Bases	C
CD-203	Level 2 / Courtyard Level - Hall	C
CD-204	Level 3 - Hall_Plant	C
CD-205	Level 3 - Home bases	C
CD-206	Proposed Plans - Building F	B
CD-207	Proposed Plans - Building F	B
CD-208	Proposed Plans - Building D	B
CD-209	Proposed Plans - Buildings A & G	B
CD-210	Roof Plan - Home Bases	B
CD-211	Roof Plan - Hall	B
CD-301	Elevations	B
CD-302	Elevations	B
CD-303	Elevations	B
CD-304	Elevations	B
CD-901	Level 1 - Administration FF+E Plan	B
CD-902	Home Base Cluster - FF+E Plan	B
CD-903	Library - FF+E Plan	C

fulton trotter
ARCHITECTS

plot date: Tuesday, 27 July 2021, 8:50 AM

file location: BIMcloud: SYDBIM23 - BIMcloud Basic for ARCHICAD 23/7068WA01 - North Sydney Public School Upgrade



1 **PLAN**
EXISTING SITE PLAN
SCALE: 1:1000

fulton trotter
ARCHITECTS

0 5 10 20 30 Scale 1:1000 @ A3 50m

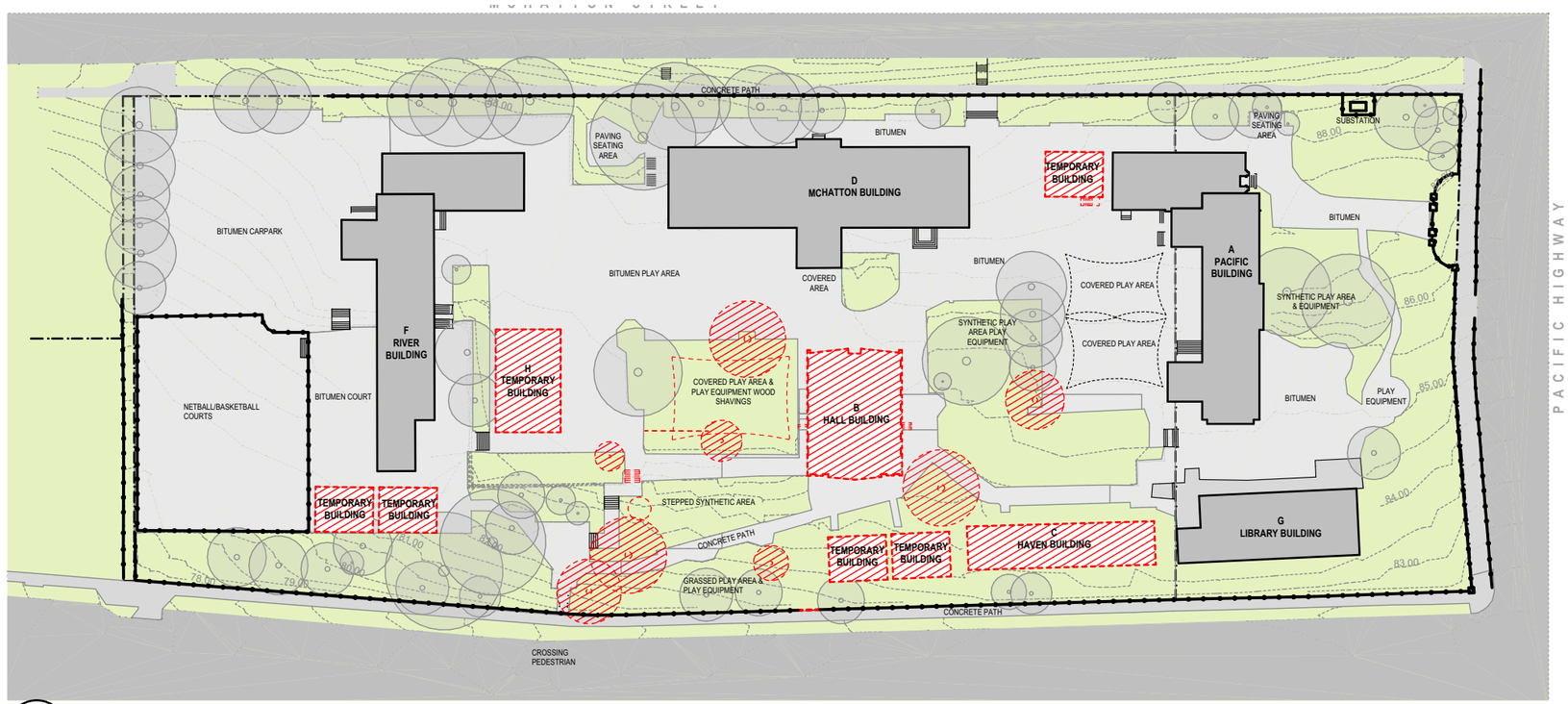
EXISTING SITE PLAN

NORTH SYDNEY PUBLIC SCHOOL FOR NSW DEPT OF EDUCATION (SCHOOLS INFRASTRUCTURE)

7068WA01 - CD-101 Rev: B

plot date: Tuesday, 27 July 2021, 8:50 AM

file location: BIMcloud: SYDBIM23 - BIMcloud Basic for ARCHICAD 23/7068WA01 - North Sydney Public School Upgrade



1 **PLAN**
DEMOLITION SITE PLAN
SCALE: 1:1000

SITE PLAN LEGEND

- EXISTING
- DEMOLISHED
- TREE TO BE REMOVED

fulton trotter
ARCHITECTS

0 5 10 20 30 Scale 1:1000 @ A3 50m

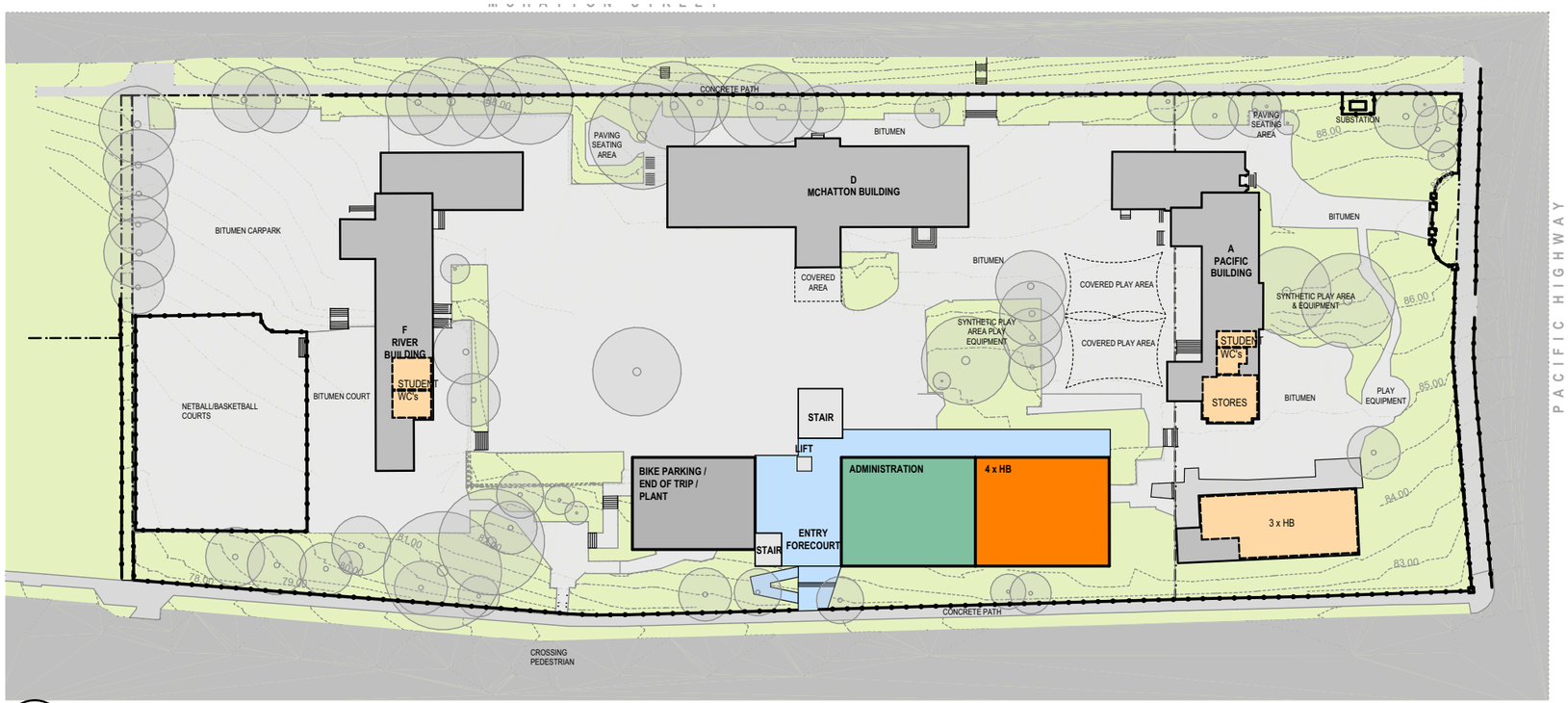
DEMOLITION PLAN

NORTH SYDNEY PUBLIC SCHOOL FOR NSW DEPT OF EDUCATION (SCHOOLS INFRASTRUCTURE)

7068WA01 - CD-102 Rev: C

plot date: Tuesday, 27 July 2021, 8:50 AM

file location: BIMcloud: SYDBIM23 - BIMcloud Basic for ARCHICAD 23/7068WA01 - North Sydney Public School Upgrade



1 **PLAN**

PROPOSED SITE PLAN - LEVEL 1/STREET LEVEL

SCALE: 1:1000

fulton trotter
ARCHITECTS

0 5 10 20 30 Scale 1:1000 @ A3 50m

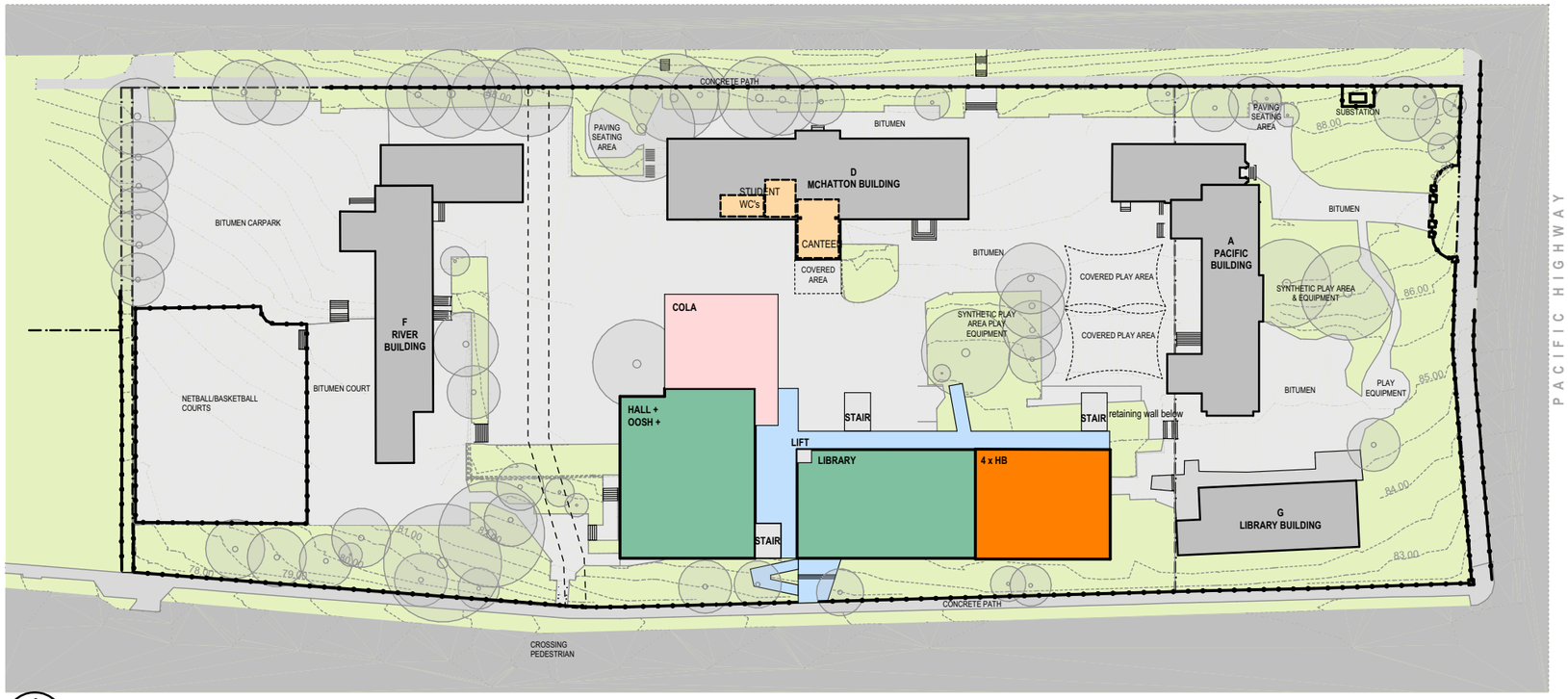
PROPOSED SITE PLAN - LEVEL 1 / STREET LEVEL

NORTH SYDNEY PUBLIC SCHOOL FOR NSW DEPT OF EDUCATION (SCHOOLS INFRASTRUCTURE)

7068WA01 - CD-103 Rev: B

plot date: Tuesday, 27 July 2021, 8:50 AM

file location: BIMcloud: SYDBIM23 - BIMcloud Basic for ARCHICAD 23/7068WA01 - North Sydney Public School Upgrade



1 **PLAN**

PROPOSED SITE PLAN - LEVEL 2/COURTYARD LEVEL

SCALE: 1:1000

fulton trotter
ARCHITECTS

0 5 10 20 30 Scale 1:1000 @ A3 50m

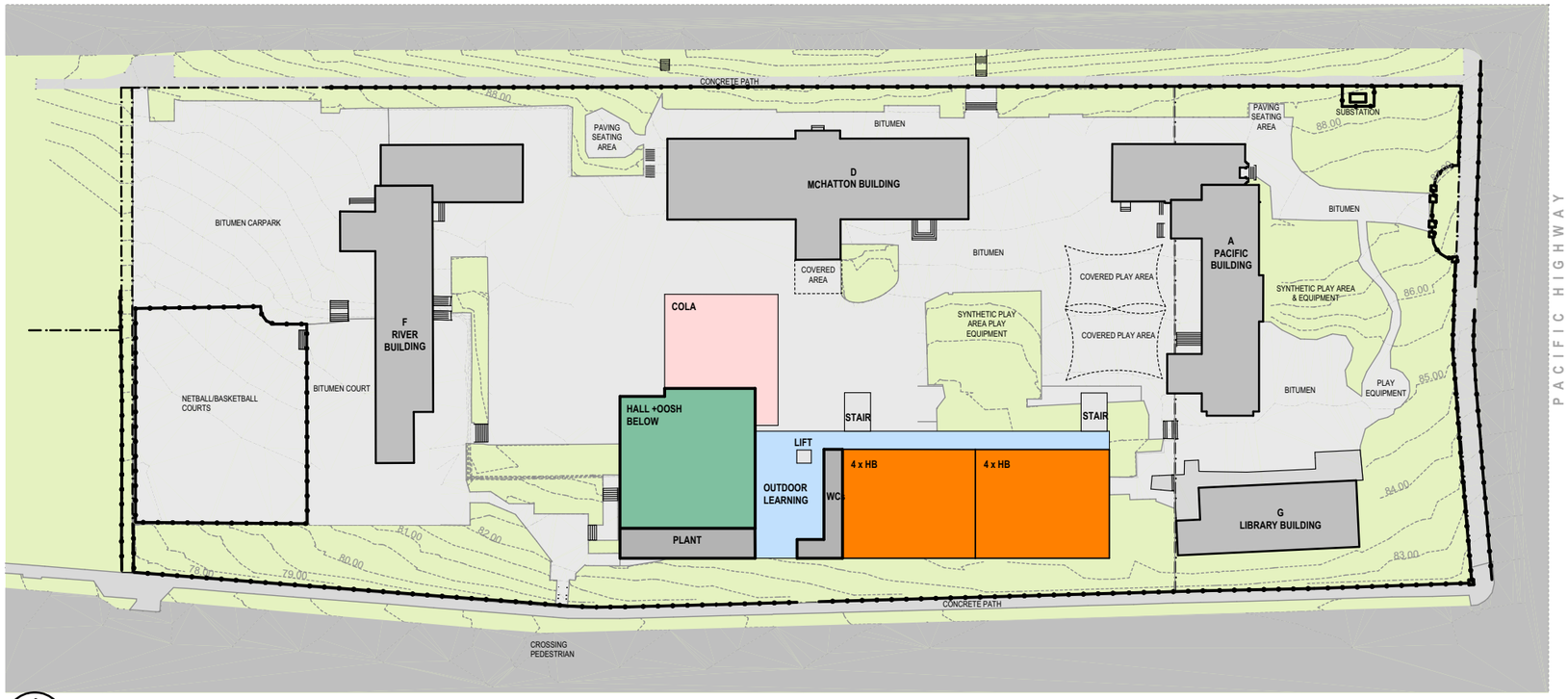
PROPOSED SITE PLAN - LEVEL 2 / COURTYARD LEVEL

NORTH SYDNEY PUBLIC SCHOOL FOR NSW DEPT OF EDUCATION (SCHOOLS INFRASTRUCTURE)

7068WA01 - CD-104 Rev: B

plot date: Tuesday, 27 July 2021, 8:51 AM

file location: BIMcloud: SYDBIM23 - BIMcloud Basic for ARCHICAD 23/7068WA01 - North Sydney Public School Upgrade



1 **PLAN**
PROPOSED SITE PLAN - LEVEL 3
SCALE: 1:1000

fulton trotter
ARCHITECTS

0 5 10 20 30 Scale 1:1000 @ A3 50m

PROPOSED SITE PLAN - LEVEL 3

NORTH SYDNEY PUBLIC SCHOOL FOR NSW DEPT OF EDUCATION (SCHOOLS INFRASTRUCTURE)

7068WA01 - CD-105 Rev: B

plot date: Tuesday, 27 July 2021, 8:51 AM

file location: BIMcloud: SYDBIM23 - BIMcloud Basic for ARCHICAD 23/7068WA01 - North Sydney Public School Upgrade

OVERVIEW

EDWARD STREET

BAY ROAD

PACIFIC HIGHWAY

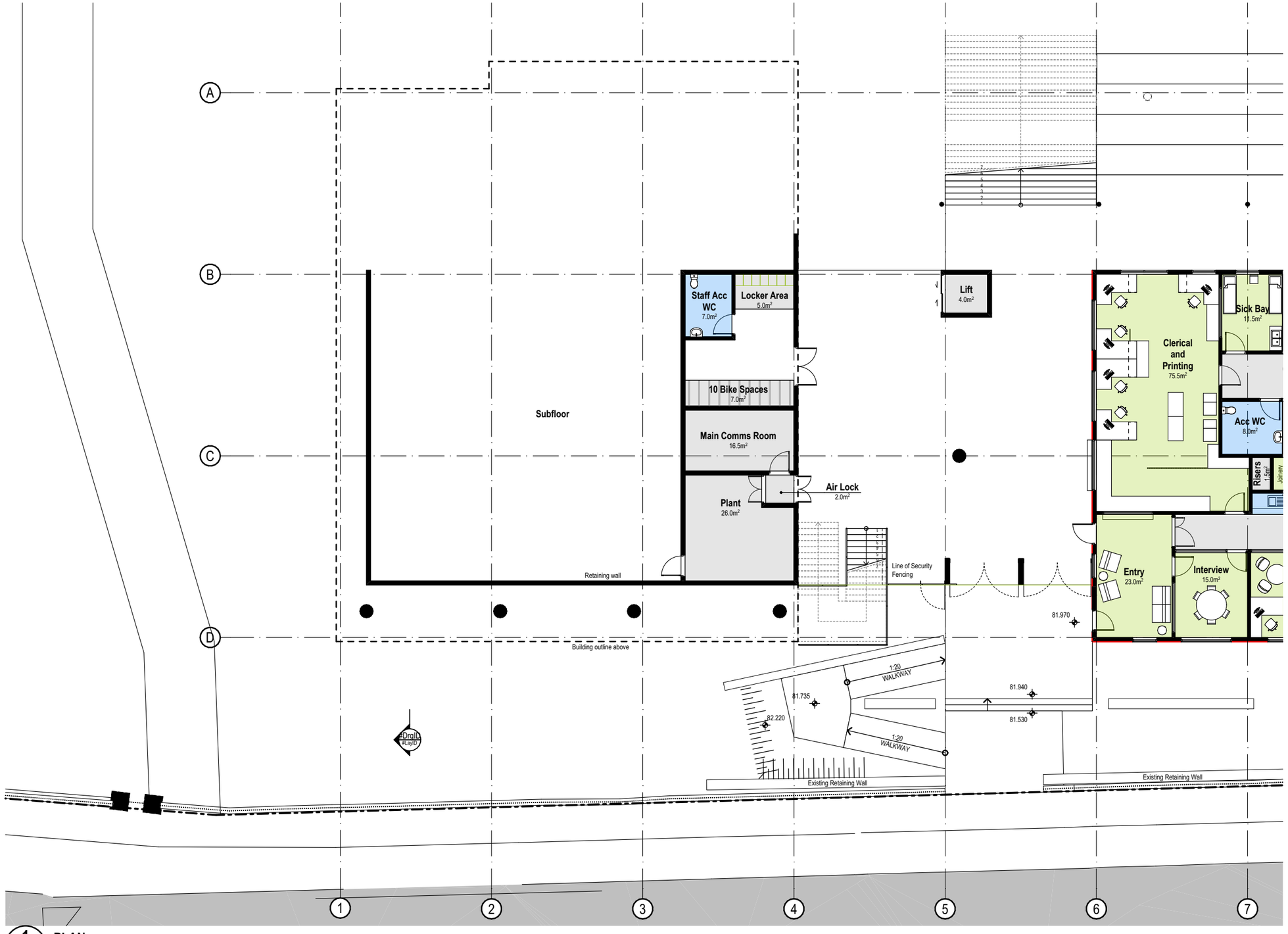
fulton trotter
ARCHITECTS

PERSPECTIVES

NORTH SYDNEY PUBLIC SCHOOL FOR NSW DEPT OF EDUCATION (SCHOOLS INFRASTRUCTURE)

7068WA01 - CD-106 Rev: C

plot date: Tuesday, 27 July 2021, 5:12 PM file location: BIMcloud: SYDBIM23 - BIMcloud Basic for ARCHICAD 23/7068WA01 - North Sydney Public School Upgrade



1 PLAN
LEVEL 1 - BIKE PARKING / END OF TRIP / PLANT
SCALE: 1:200

fulton trotter
ARCHITECTS

0 1 2 4 6 Scale 1:200 @ A3 10m

LEVEL 1 / STREET LEVEL - HALL

NORTH SYDNEY PUBLIC SCHOOL FOR NSW DEPT OF EDUCATION (SCHOOLS INFRASTRUCTURE)

7068WA01 - CD-201 Rev: C

plot date: Tuesday, 27 July 2021, 8:51 AM

file location: BIMcloud: SYDBIM23 - BIMcloud Basic for ARCHICAD 23/7068WA01 - North Sydney Public School Upgrade

1 PLAN

LEVEL 1 - ADMINISTRATION + HOME BASE

SCALE: 1:200

fulton trotter ARCHITECTS

0 2.5 5 10 15 Scale 1:500 @ A3 25m

LEVEL 1 / STREET LEVEL - ADMIN_HOME BASES

NORTH SYDNEY PUBLIC SCHOOL FOR NSW DEPT OF EDUCATION (SCHOOLS INFRASTRUCTURE)

7068WA01 - CD-202 Rev: C

plot date: Tuesday, 27 July 2021, 8:51 AM

file location: BIMcloud: SYDBIM23 - BIMcloud Basic for ARCHICAD 23/7068WA01 - North Sydney Public School Upgrade

1 **PLAN**
LEVEL 2 - HALL
SCALE: 1:200

fulton trotter
ARCHITECTS

0 2.5 5 10 15 Scale 1:500 @ A3 25m

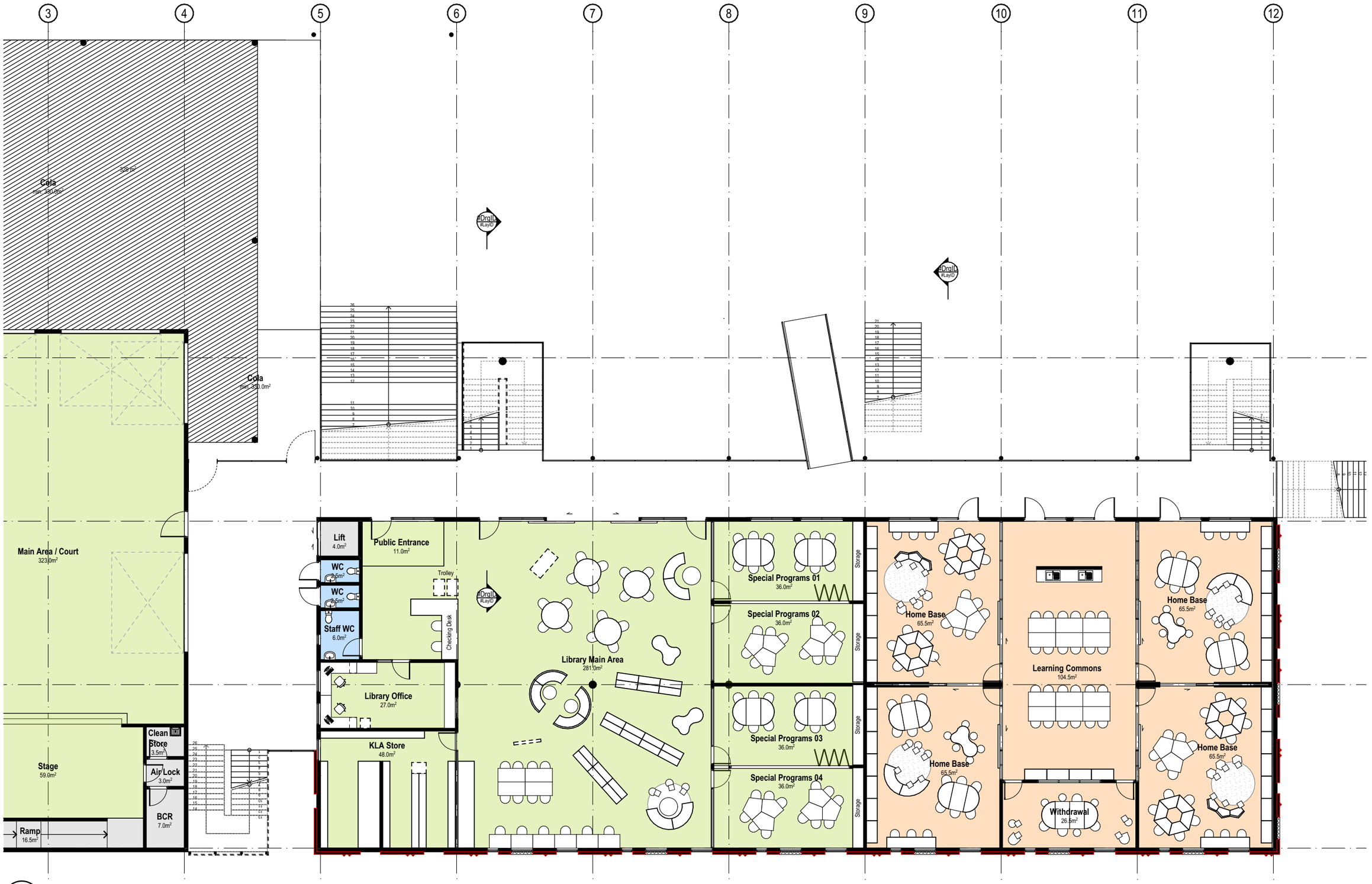
LEVEL 2 / COURTYARD LEVEL - HALL

NORTH SYDNEY PUBLIC SCHOOL FOR NSW DEPT OF EDUCATION (SCHOOLS INFRASTRUCTURE)

7068WA01 - CD-203 Rev: C

plot date: Tuesday, 27 July 2021, 8:51 AM

file location: BIMcloud: SYDBIM23 - BIMcloud Basic for ARCHICAD 23/7068WA01 - North Sydney Public School Upgrade



1 **PLAN**
LEVEL 2 - LIBRARY
SCALE: 1:200

fulton trotter
ARCHITECTS

0 2.5 5 10 15 Scale 1:500 @ A3 25m

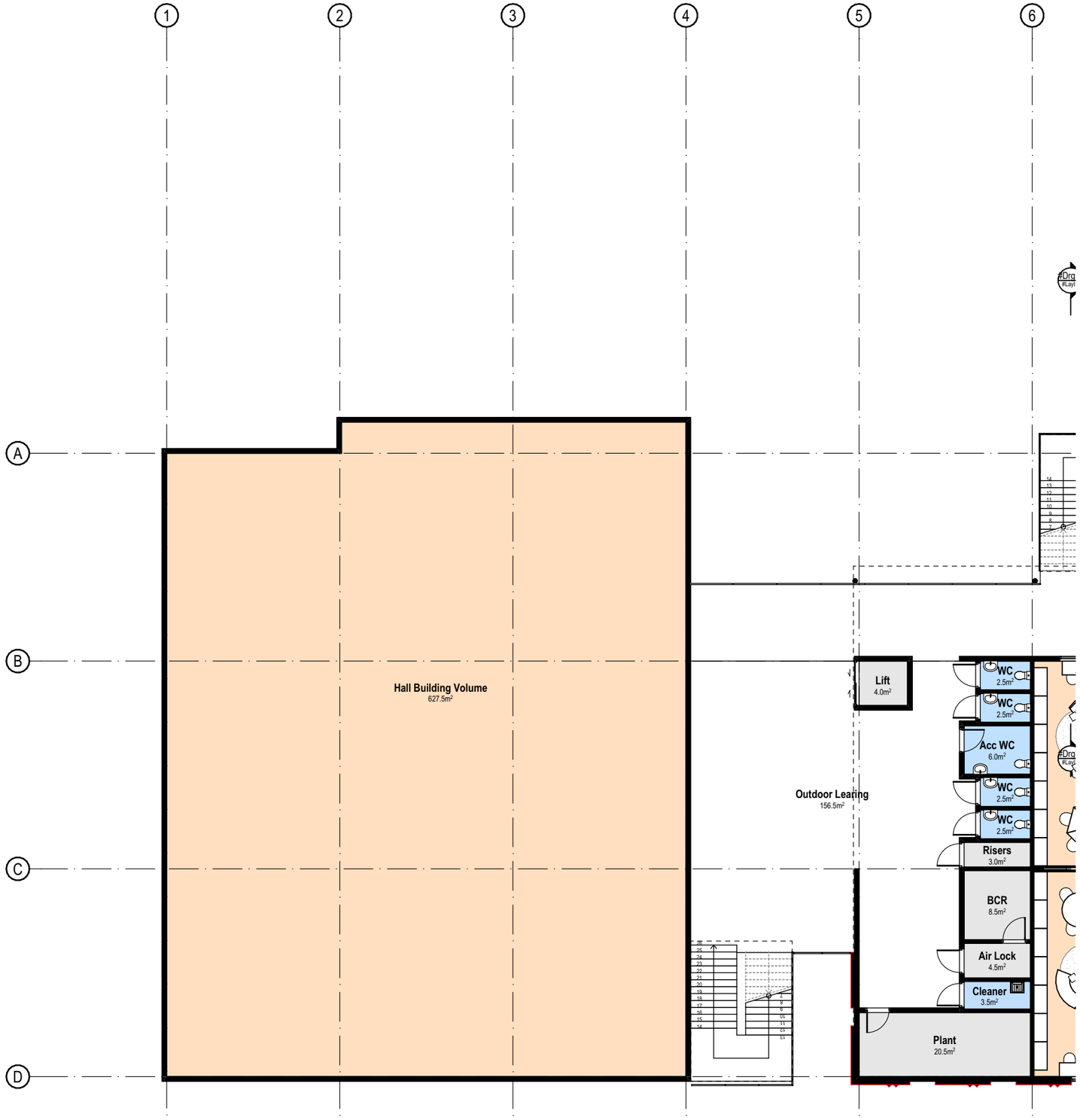
LEVEL 2 / COURTYARD LEVEL - LIBRARY

NORTH SYDNEY PUBLIC SCHOOL FOR NSW DEPT OF EDUCATION (SCHOOLS INFRASTRUCTURE)

7068WA01 - CD-204 Rev: A

plot date: Tuesday, 27 July 2021, 8:51 AM

file location: BIMcloud: SYDBIM23 - BIMcloud Basic for ARCHICAD 23/7068WA01 - North Sydney Public School Upgrade



1 PLAN
LEVEL 3 - HALL + PLANT
SCALE: 1:200

fulton trotter
ARCHITECTS

0 2.5 5 10 15 Scale 1:500 @ A3 25m

LEVEL 3 - HALL_PLANT

NORTH SYDNEY PUBLIC SCHOOL FOR NSW DEPT OF EDUCATION (SCHOOLS INFRASTRUCTURE)
7068WA01 - CD-205 Rev: C

plot date: Tuesday, 27 July 2021, 8:51 AM
file location: BIMcloud: SYDBIM23 - BIMcloud Basic for ARCHICAD 23/7068WA01 - North Sydney Public School Upgrade

1 PLAN
LEVEL 3 - HOME BASE
SCALE: 1:200

fulton trotter
ARCHITECTS

0 2.5 5 10 15 Scale 1:500 @ A3 25m

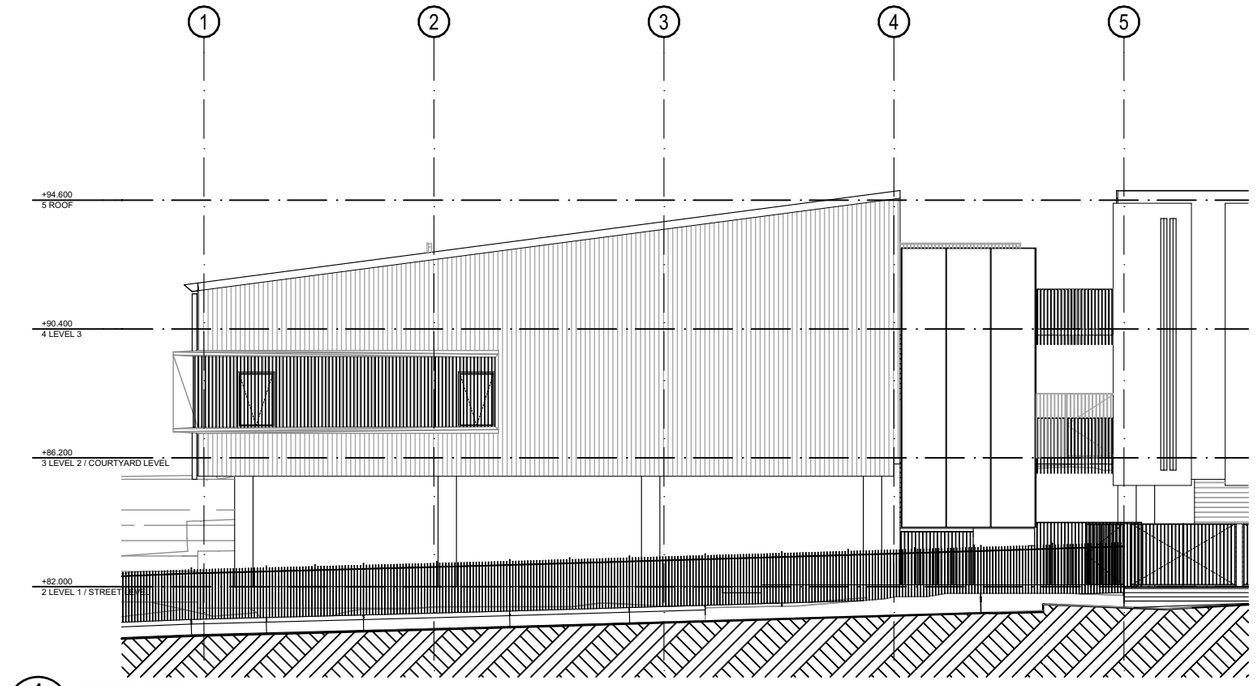
LEVEL 3 - HOME BASES

NORTH SYDNEY PUBLIC SCHOOL FOR NSW DEPT OF EDUCATION (SCHOOLS INFRASTRUCTURE)

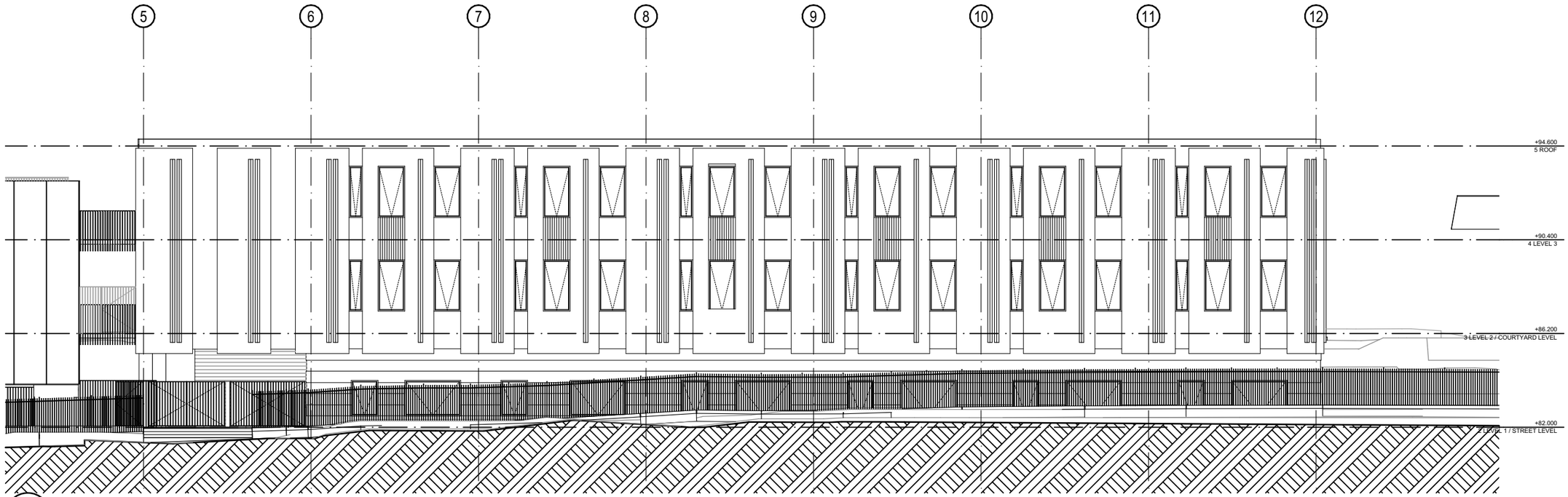
7068WA01 - CD-206 Rev: C

plot date: Tuesday, 27 July 2021, 8:51 AM

file location: BIMcloud: SYDBIM23 - BIMcloud Basic for ARCHICAD 23/7068WA01 - North Sydney Public School Upgrade



1 ELEVATION
SOUTH ELEVATION
SCALE: 1:200



2 ELEVATION
SOUTH ELEVATION
SCALE: 1:200

fulton trotter
ARCHITECTS

0 1 2 4 6 Scale 1:200 @ A3 10m

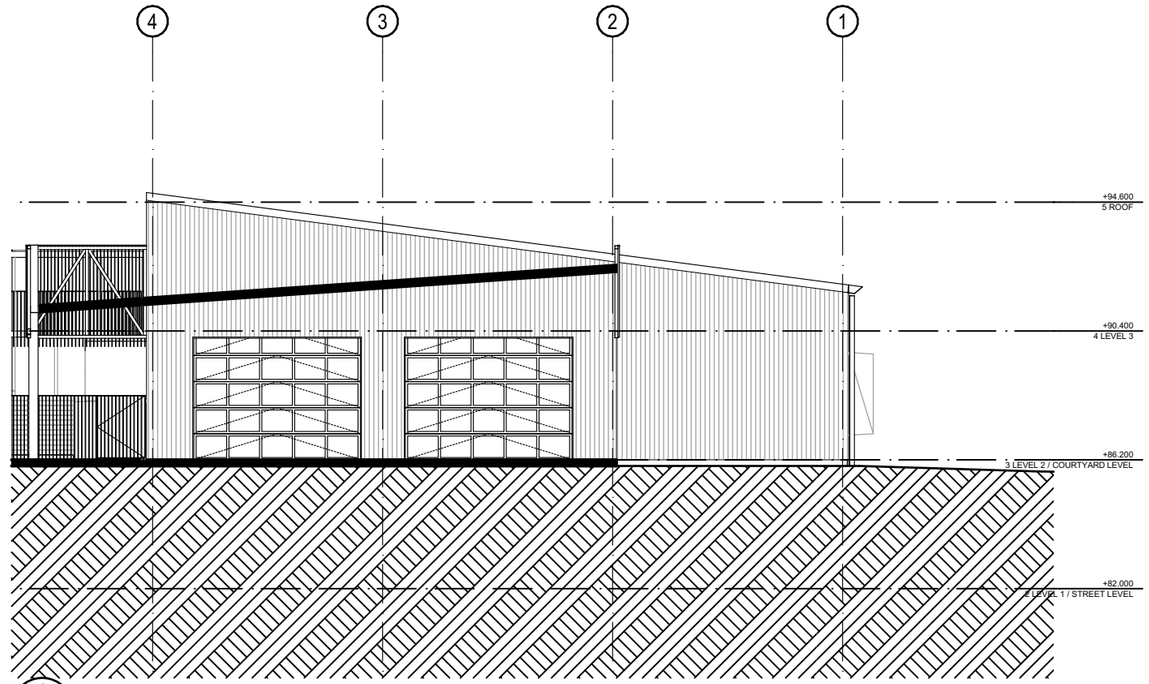
ELEVATIONS

NORTH SYDNEY PUBLIC SCHOOL FOR NSW DEPT OF EDUCATION (SCHOOLS INFRASTRUCTURE)

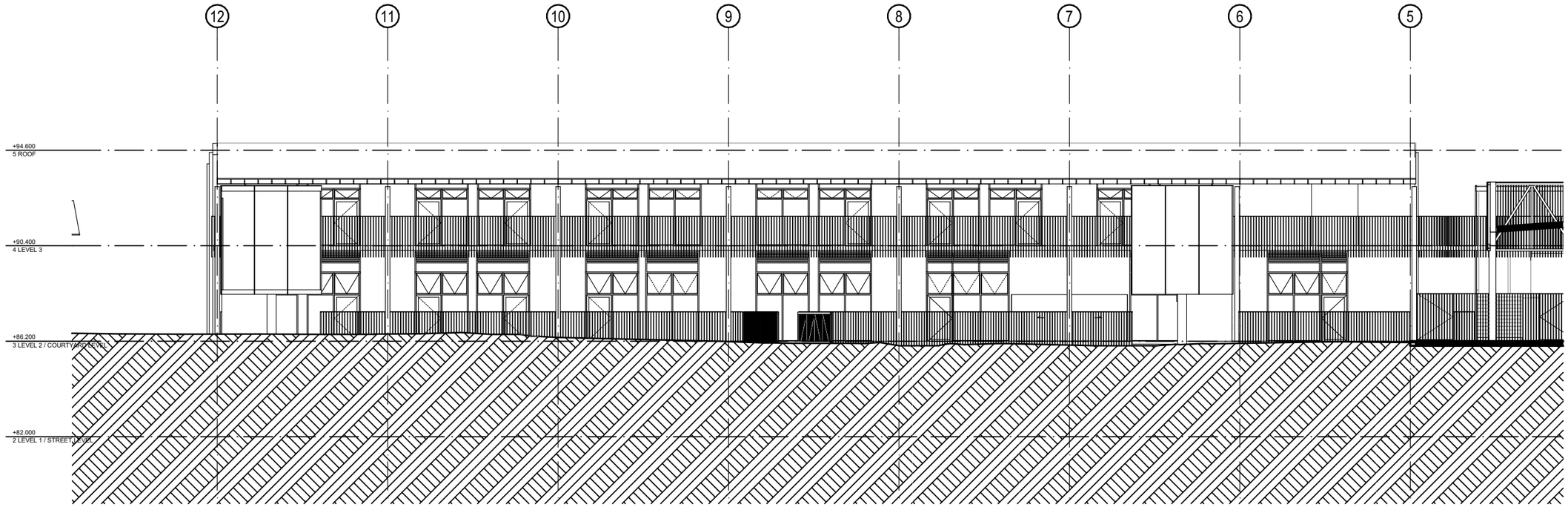
7068WA01 - CD-301 Rev: B

plot date: Tuesday, 27 July 2021, 8:51 AM

file location: BIMcloud: SYDBIM23 - BIMcloud Basic for ARCHICAD 23/7068WA01 - North Sydney Public School Upgrade



1 **ELEVATION**
NORTH ELEVATION
SCALE: 1:200



2 **ELEVATION**
NORTH ELEVATION
SCALE: 1:200

fulton trotter
ARCHITECTS

0 1 2 4 6 Scale 1:200 @ A3 10m

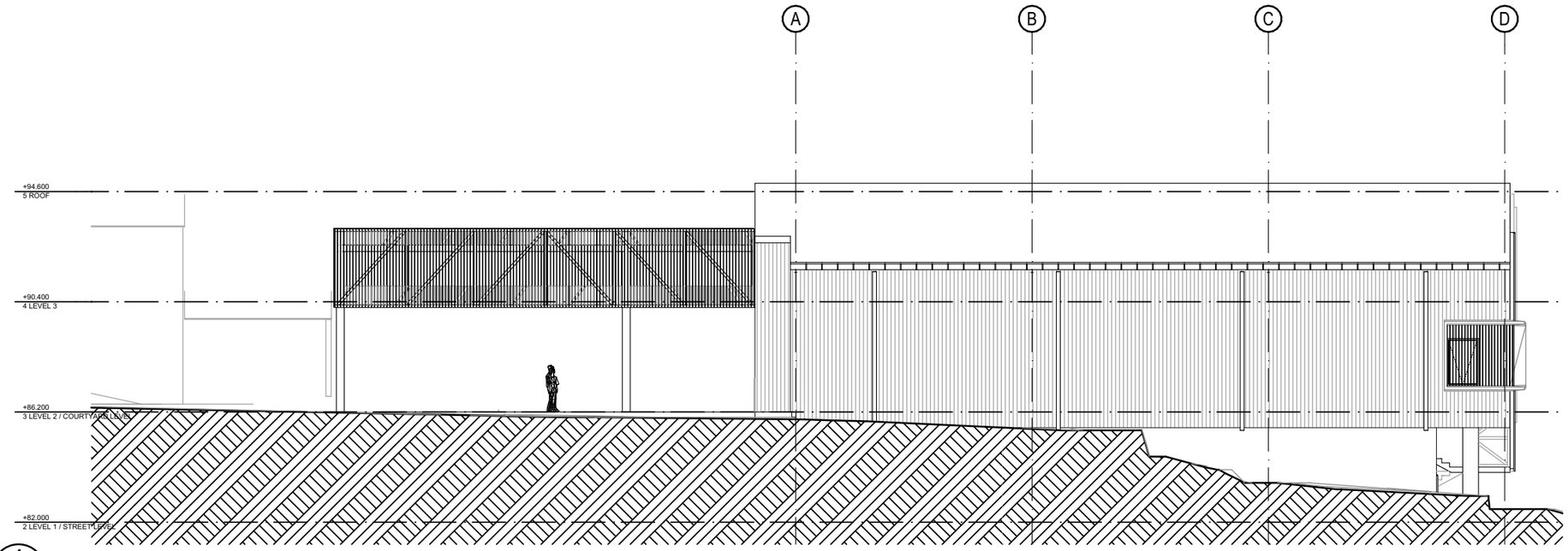
ELEVATIONS

NORTH SYDNEY PUBLIC SCHOOL FOR NSW DEPT OF EDUCATION (SCHOOLS INFRASTRUCTURE)

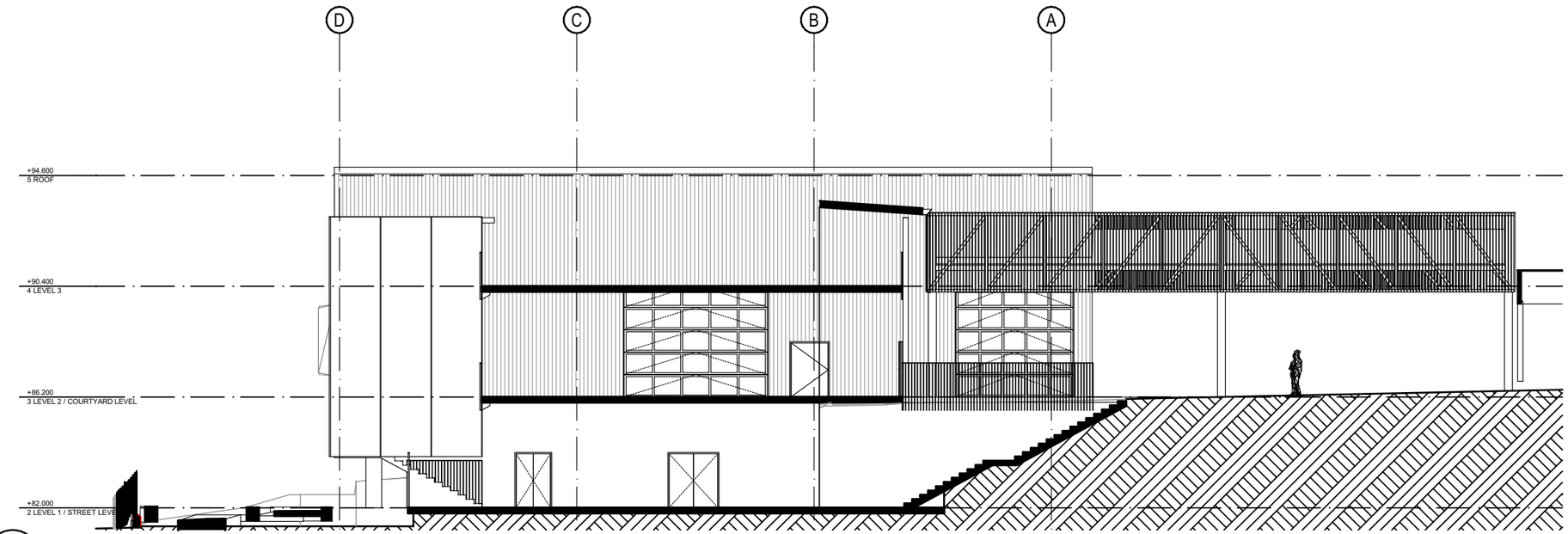
7068WA01 - CD-302 Rev: B

plot date: Tuesday, 27 July 2021, 8:51 AM

file location: BIMcloud: SYDBIM23 - BIMcloud Basic for ARCHICAD 23/7068WA01 - North Sydney Public School Upgrade



1 **SECTION**
WEST ELEVATION
SCALE: 1:200



2 **ELEVATION**
EAST ELEVATION - HALL
SCALE: 1:200

fulton trotter
ARCHITECTS

0 1 2 4 6 Scale 1:200 @ A3 10m

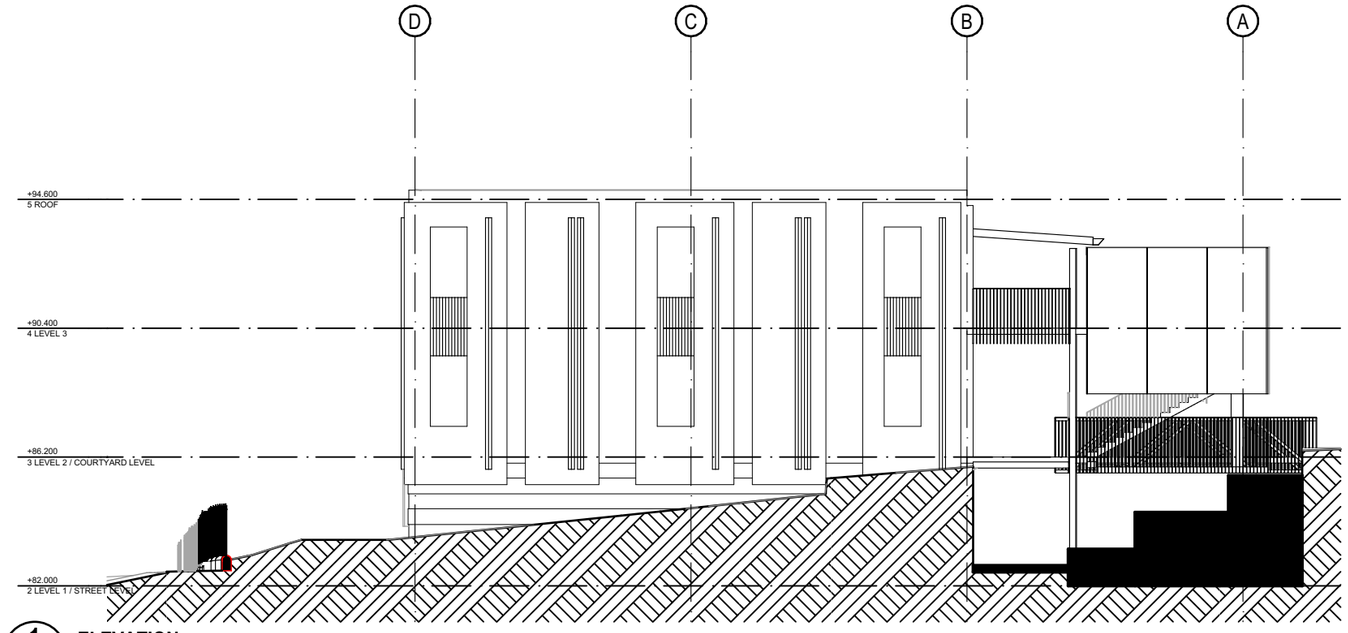
ELEVATIONS

NORTH SYDNEY PUBLIC SCHOOL FOR NSW DEPT OF EDUCATION (SCHOOLS INFRASTRUCTURE)

7068WA01 - CD-303 Rev: B

plot date: Tuesday, 27 July 2021, 8:51 AM

file location: BIMcloud: SYDBIM23 - BIMcloud Basic for ARCHICAD 23/7068WA01 - North Sydney Public School Upgrade



1 **ELEVATION**
EAST ELEVATION
SCALE: 1:200

fulton trotter
ARCHITECTS

0 1 2 4 6 Scale 1:200 @ A3 10m

ELEVATIONS

NORTH SYDNEY PUBLIC SCHOOL FOR NSW DEPT OF EDUCATION (SCHOOLS INFRASTRUCTURE)

7068WA01 - CD-304 Rev: B

plot date: Tuesday, 27 July 2021, 8:51 AM

file location: BIMcloud: SYDBIM23 - BIMcloud Basic for ARCHICAD 23/7068WA01 - North Sydney Public School Upgrade