Aitken Rowe
GEOTECHNICAL ENGINEERING

GEOTECHNICAL INVESTIGATION & PAVEMENT DESIGN

PROPOSED WENTWORTH HEALTH SERVICE REDEVELOPMENT
24 HOSPITAL ROAD, WENTWORTH, NSW

JBS&G
SYDNEY, NSW

S22-348 REV 1
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12 October 2022 Reg. No.: S22-348 REV 1

JBS&G
Level 1, 50 Margaret Street,
Sydney NSW 2000

Attention: Gina Pinget – Project Manager

Dear Gina,

GEOTECHNICAL INVESTIGATION & PAVEMENT DESIGN
PROPOSED WENTWORTH HEALTH SERVICE REDEVELOPMENT,
24 HOSPITAL ROAD, WENTWORTH, NSW

We have completed the above revised geotechnical investigation and pavement design report and forward to you for your perusal and use.

Should you have any queries, please contact us.

Yours Faithfully,

Peter Forbes-Taber
Geotechnical Engineer

TABLE OF CONTENTS

1.0 INTRODUCTION 1

2.0 SITE DESCRIPTION 1

3.0 SITE TOPOGRAPHY & GEOLOGY 2

4.0 INVESTIGATION PROCEDURE
4.1 Fieldwork 2
4.2 Laboratory Testing 3

5.0 SUBSURFACE CONDITIONS
5.1 Main Hospital Building 3
5.2 Existing Levee Bank 5
5.3 Staff Accommodation Building 5
5.4 Pavement Areas & Access Roads 6

6.0 SITE PREPARATION & EARTHWORKS 7

7.0 FOUNDATION FOR PROPOSED STRUCTURES
7.1 Site Classification 8
7.2 Foundation Design 9
7.2 Settlement 12

8.0 SOIL AGGRESSION & ACIDITY 12

8.0 EXCAVATION, SUPPORT & RETAINING WALL 13

10.0 SITE SUB-SOIL CLASS – EARTHQUAKE DESIGN 15

11.0 SUBGRADE FOR PAVEMENT AREAS 15

12.0 PAVEMENT DESIGN
12.1 Design Traffic 16
12.2 Pavement Design 16

13.0 GENERAL COMMENT 18

FIGURES

Figure 1 The Subject Site 1
Figure 2 Site Geology 2
Figure 3 Liquefaction Hazard Maps 15

ADDENDUM

APPENDIX A - BOREHOLE & DCP TEST LOCATION PLAN
APPENDIX B - BOREHOLE LOGS & MATERIALS SCHEDULE WITH EXPLANATORY NOTE
APPENDIX C - DYNAMIC CONE PENETROMETER TEST REPORTS
APPENDIX D - LABORATORY TEST REPORTS BY AITKEN ROWE TESTING LABORATORIES PTY LTD
APPENDIX E - LABORATORY TEST REPORTS BY SYDNEY ENVIRONMENTAL & SOIL LABORATORY PTY LTD
APPENDIX F - CIRCLY DESIGN PRINTOUTS

1.0 INTRODUCTION

Further to your request in response to our revised quotation, Q22-264R dated 28 July 2022, a geotechnical investigation was carried out at the location of the proposed Wentworth Health Service Redevelopment. It is understood that the proposed redevelopment includes the construction of a new main hospital building structure and a small staff accommodation building, with associated pavement areas and access roads throughout the subject site.

The purpose of the investigation was to determine the type and condition of the subsurface soils and groundwater conditions by drilling, testing and sampling across the subject site and make recommendations for the proposed redevelopment and provide pavement design options for the proposed pavement areas.

2.0 SITE DESCRIPTION

The site for the proposed development is located at DP 1136392, Lot 1, No. 24 Hospital Road, Wentworth, NSW approximately 0.45km south-east/east of the Wentworth town centre. The site consists of existing single-story buildings, concrete and bitumen sealed pavement areas and grassed lawn areas as part of the Wentworth hospital development which forms part of the Far West Local Health District (FWLHD). Small to large sized trees were also noted throughout the existing hospital grounds and surrounding the subject site as noted at the time of the investigation.

The subject site is surrounded by vacant land, Tucker Creek and the Silver City Highway to the north, vacant land to the east, vacant land including historic Wentworth Water Tower and Murray River to the south and the Darling River and Wentworth town centre to the west (refer to Figure 1 below). The subject site is generally flat and covered with buildings and lawn as noted at the time of the investigation. It should be noted an earthen levee bank approximately 1.5m in height above the natural ground level surrounds the exiting hospital site which was reportedly built pre the year 1956 protecting the subject site from the 1956 major flood which is reportedly the highest flood recorded in the local Wentworth area.

Figure 1 – The Subject Site (Google Earth Screen Image)

3.0 SITE TOPOGRAPHY & GEOLOGY

The general topography of the area is flat, gently undulating low tablelands. The 1:500,000 Geological Series Sheet for Wentworth (First Edition 1971) indicates the subject area is underlain by Quaternary aged floodplains and outwash areas (Qrs) with Pleistocene lacustrine deposits, limestones, clays, shales and well bedded sandstones (Ql) north-west of the Wentworth town centre (refer to Figure 2 below).

It should be noted that the borehole investigation revealed natural alluvial material comprising clay-based and sand-based material within the investigated depth of 7.5m (refer to borehole logs).

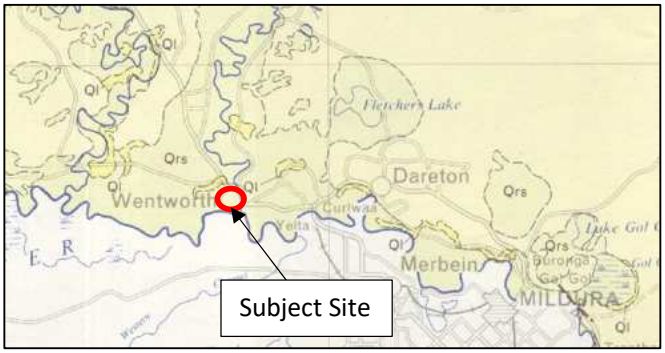


Figure 2 – Site Geology

4.0 INVESTIGATION PROCEDURE

4.1 Fieldwork

The fieldwork for the investigation consisted of drilling fifteen (15) boreholes (BH1 to BH15) at the locations selected by the client at the locations as shown in the attached borehole and DCP test location plans as follows;

- Five boreholes (BH1, BH2, BH3, BH4, BH6) to the depth of 7.5m at the location of the proposed new main hospital building (includes the construction of four (4) piezometers (P1 to P4) for future ground water monitoring)
- One borehole (BH5) to the depth of 8.0m at the location of the existing levee bank
- One borehole (BH7) to the depth of 7.5m at the location of the proposed new staff accommodation building
- Eight boreholes (BH8 to BH15) to the depth of 1.5m at the location of the proposed pavement areas and access roads

The boreholes were taken to the termination depths stated above and they were excavated using our trailer mounted drilling rig between 9 and 11 August 2022. Dynamic Cone Penetrometer (DCP) testing was carried out from the existing surface level at each borehole location (DCP1 to DCP15), and Standard Penetrometer Testing (SPT) was carried out at seven (7) borehole locations (BH1 to BH7) in order to assess the strength of the underlying subgrade material. The representative samples were recovered from the boreholes for relevant laboratory testing.

Piezometers were constructed at four (4) borehole locations (BH1 to BH4), which were backfilled with washed fine graded gravel then sealed with bentonite with an aluminium monument concreted/installed to allow future ground water monitoring at the subject site.

The fieldwork was supervised by our Geotechnical Engineer of Aitken Rowe Testing Laboratories Pty Ltd, who nominated the sampling and prepared continuous engineering logs of the augered boreholes.

The detailed Borehole Logs including SPT results and Piezometer construction details with explanatory note are presented in Appendix B and DCP test reports in Appendix C. The descriptions in the Borehole Logs are provided in accordance with "AS 1726–2017 Geotechnical site investigations".

4.2 Laboratory Testing

The relevant laboratory testing which included moisture content determination test, linear shrinkage test, particle size distribution test, Atterberg Limit test, Shrink/Swell analysis, Standard Maximum Dry Density (SMDD) test and California Bearing Ratio (CBR) tests on the recovered natural subgrade samples from the boreholes across the subject site, were undertaken at our NATA accredited testing laboratory in Wagga Wagga, NSW. The samples for CBR testing on natural subgrade material were compacted at 95% of SMDD and at nearest 100% of Standard Optimum Moisture Content (SOMC) and soaked for 10 Days.

The laboratory test reports for field moisture content determination (FMC), linear shrinkage (LS), particle size distribution, Atterberg Limit, Shrink/Swell (Iss), SMDD and CBR tests are presented in Appendix D. The FMC, LS, and Iss test results are also incorporated in the respective borehole logs and the FMC, SOMC, and CBR test results are incorporated in the respected materials schedule and logs as relevant and presented in Appendix B.

The pH, Electrical Conductivity (EC), chloride, sulphate and resistivity analysis tests were also carried out on disturbed samples recovered from the boreholes and they were carried out at Sydney Environmental and Soil Laboratory (SESL) in Sydney, NSW. The test reports as received from SESL are presented in Appendix E.

5.0 SUBSURFACE CONDITION

5.1 Main Hospital Building

BH1 to BH4 and BH6 represents the proposed new main hospital building (refer to attached borehole and DCP test location plan). The boreholes drilled revealed that the site at the location of BH1 to BH4 and BH6 is generally underlain by fill material comprising topsoil of 100 to 200mm thickness, low plasticity sandy silt (BH1 and BH4 only) and various medium and high plasticity clays, silty clays, and sandy clays extending to 0.5m in BH1 and BH2, 0.7m in BH3 and BH4 and 0.6m in BH6 overlying natural alluvial material.

The natural alluvial material encountered at the subject site comprises medium, medium to high, and high plasticity clays and silty clays extending to 4.8m in BH1, 6.5m in BH2, 5.6m in BH3, 4.5m in BH4 and 5.5m in BH6, which is underlain by fine to medium grained clayey sand extending to the borehole termination depth at 7.5m in BH2, BH3, BH4 & BH6 and to 6.4m in BH1, which is then underlain by high plasticity clay extending to the borehole termination depth at 7.5m in BH1. It should be noted that borehole wall collapse in the clayey sand layer occurred in all boreholes, preventing the borehole target depth of 8.0m from being achieved. The fill material encountered in BH1 to BH4 and BH6 appeared to have been placed "uncontrolled" and varying from "poorly compacted" to "moderately compacted".

The moisture condition of the underlying natural material was generally varied from less than plastic limit to greater than plastic limit throughout the clay-based profile in BH1 and BH2 however noted as generally greater than plastic limit throughout the entire clay-based profile in BH3, BH4 and BH6, with the underlying sand-based material noted as generally wet where encountered in BH1 to BH4 and BH6 at the time of the investigation.

Seepage was encountered at a depth of 4.8m below the existing surface level and noted to extend to 6.4m in BH1, from 6.0m to 7.5m (end of borehole) in BH2, from 5.6m to 7.5m (EOBH) in BH3, 4.5m to 7.5m (EOBH) in BH4 and from 5.0m to 7.5m (EOBH) in BH6 at the time of the investigation.

The post-drilling water depths were also recorded one day after the Piezometer installation with recordings presented in Table 1 below. It should be noted that variations to the water table level could fluctuate with changes to the season, temperature and rainfall.

Table 1 Piezometer Ground Water Levels

Piezometer Location	Initial Seepage Depth (m)	Post Drilling Water Depth (m)
P1	4.8	4.2
P2	6.0	4.4
P3	5.6	4.9
P4	4.5	3.2

As per the DCP and STP test results and visual observation of the resistance by auger TC bit, the underlying natural material (below fill material) is assessed to generally vary between stiff and very stiff consistency throughout the clay-based profile with the underlying clayey sand assessed to be generally medium dense where encountered in BH1 to BH4 and BH6 at the time of the investigation. **It should be noted however that the clay-based profile was noted to be firm consistency from 0.7m to 1.1m and from 1.5m to 2.4m in BH3, firm and firm to stiff consistency throughout the clay-based profile in BH4 and firm consistency from 0.6m to 1.1m and firm to stiff consistency from 3.7m to 5.5m in BH6, with the underlying clayey sand noted as loose density from 4.5 to 6.0m in BH4 at the time of the investigation.**

The boreholes were logged in accordance with "AS1726-2017 – Geotechnical site investigations". The details of the subsurface profile should be referred to the attached borehole logs with explanatory note presented in Appendix B.

5.2 Existing Levee Bank

BH5 represents the existing levee bank location (refer to attached borehole and DCP test location plan). The borehole drilled revealed that the site is generally underlain by fill material comprising medium plasticity sandy clay of 100mm thickness overlying high plasticity clay fill material to 2.0m, overlying natural alluvial material comprising medium plasticity silty clay and high plasticity clay extending to 6.7m, which is then underlain by fine to medium grained clayey sand extending to the borehole termination depth at 7.5m in BH5. The fill material encountered in BH5 appeared to have been placed "uncontrolled" and "moderately compacted".

The moisture condition of the underlying fill material was noted to be generally greater than plastic limit throughout the high plasticity clay fill profile with the underlying natural material generally less than plastic limit in the upper natural clay-based profile then increasing to equal to plastic limit and greater than plastic limit with depth, with the underlying sand-based material noted as generally wet where encountered in BH5 at the time of the investigation.

Seepage was encountered at a depth of 6.7m below the existing surface level and noted to extend to 8.0m (end of borehole) in BH5 at the time of the investigation. It should be noted that variations to the water table level could fluctuate with changes to the season, temperature and rainfall.

As per the DCP and STP test results and visual observation of the resistance by auger TC bit, the underlying natural material (below fill material) is assessed to be generally very stiff consistency in the upper clay-based natural profile to 4.5m, then stiff to very stiff consistency to 6.7m, with the underlying clayey sand assessed to be generally medium dense where encountered in BH5 at the time of the investigation.

The boreholes were logged in accordance with "AS1726-2017 – Geotechnical site investigations". The details of the subsurface profile should be referred to the attached borehole logs with explanatory note presented in Appendix B.

5.3 Staff Accommodation Building

BH7 represents the proposed new staff accommodation building (refer to attached borehole and DCP test location plan). The borehole drilled revealed that the site is generally underlain by fill material comprising topsoil of 100mm thickness and medium plasticity sandy clay fill material to 0.3m, overlying natural alluvial material comprising medium to high and high plasticity clays and silty clays extending to 5.8m, which is then underlain by fine to medium grained clayey sand extending to the borehole termination depth at 7.5m in BH7. It should be noted that borehole wall collapse in the clayey sand layer occurred in the borehole, preventing the borehole target depth of 8.0m from being achieved. The fill material encountered in BH7 appeared to have been placed "uncontrolled" and "poorly compacted".

The moisture condition of the underlying natural material was noted as generally greater than plastic limit throughout the clay-based profile with the underlying sand-based material noted as generally wet where encountered in BH7 at the time of the investigation.

Seepage was encountered at a depth of 5.8m below the existing surface level and noted to extend to 7.5m (end of borehole) in BH7 at the time of the investigation. It should be noted that variations to the water table level could fluctuate with changes to the season, temperature and rainfall.

As per the DCP and STP test results and visual observation of the resistance by auger TC bit, the underlying natural material (below fill material) is assessed to be generally soft consistency to 0.5m then firm consistency to 1.5m, then increasing to stiff consistency and stiff to very stiff consistency with depth throughout the clay-based profile, with the underlying clayey sand assessed to be generally medium dense where encountered in BH7 at the time of the investigation.

The boreholes were logged in accordance with "AS1726-2017 – Geotechnical site investigations". The details of the subsurface profile should be referred to the attached borehole logs with explanatory note presented in Appendix B.

5.4 Pavement Areas & Access Roads

BH8 to BH15 represents the proposed pavement areas and access roads throughout the subject site (refer to attached borehole and DCP test location plan). The boreholes drilled revealed that the site is generally underlain by various fill materials comprising topsoil of 100 to 200mm thickness (BH10, BH12 to BH15), low plasticity sandy silt (BH9, BH13, BH14), medium plasticity silty clay (BH8) and sandy clay (BH10, BH11, BH15), and high plasticity clay (BH9, BH13) and sandy clay (BH10), extending to 0.4m in BH8 to BH11, 0.2m in BH12, 0.7m in BH13, 0.5m in BH14, and 0.3m in BH15, overlying natural alluvial material comprising medium, medium to high and high plasticity clays and silty clays extending to the borehole termination depth at 1.5m in BH8 to BH15. The fill material encountered in BH8 to BH15 appeared to have been placed "uncontrolled" and varying from "poorly compacted" to "moderately compacted".

The moisture condition of the underlying fill and natural material was generally varied from less than plastic limit to greater than plastic limit throughout the silt and clay-based profile in BH8 to BH15 at the time of the investigation. No seepage was encountered during the drilling of BH8 to BH15, however it should be noted that variations to the water table level could fluctuate with changes to the season, temperature and rainfall.

As per the DCP test results and visual observation of the resistance by auger TC bit, the underlying natural material (below fill material) is assessed to be generally firm consistency to 1.0m then increasing to stiff consistency with depth in BH8, generally firm consistency to 0.8m then increasing to stiff consistency with depth in BH9, generally very stiff consistency throughout the tested profile in BH10, generally firm consistency throughout the tested profile in BH11, generally stiff consistency to 0.6m then increasing to stiff to very stiff consistency with depth in BH12, generally stiff to very stiff consistency to 1.2m then increasing to very stiff consistency with depth in BH13, generally firm to stiff consistency to 1.3m then increasing to very stiff consistency with depth in BH14, and generally stiff consistency to 0.9m then decreasing to firm to stiff consistency with depth in BH15 at the time of the investigation.

The boreholes were logged in accordance with "AS1726-2017 – Geotechnical site investigations". The details of the subsurface profile should be referred to the attached materials schedule and logs with explanatory note presented in Appendix B.

6.0 SITE PREPARATION & EARTHWORKS

The topsoil and fill material encountered across the proposed site is assessed to be "not suitable" for use as subgrade or foundation of any structure in its current state. We therefore recommend excavation of this material and replace and re-compact with approved fill material in such a way that it achieves a minimum of 98% of Standard Maximum Dry Density (SMDD) if to be used as subgrade and foundation for the proposed construction.

It should be noted that if a deep footing system, such as deep pad footing or pile footing system is to be adopted and the slab is to be fully suspended on the footing system, then the removal of the existing fill material may not be required. In general, **if the slab is not to be fully suspended**, the following site preparation is recommended as required once the fill and unsuitable materials, if any, are removed and cuts if required are undertaken.

- Remove topsoil, fill material, and unsuitable materials, if any, and stockpile for later use for landscaping and backfilling as appropriate. An average stripping depth of 0.1 to 0.2m is anticipated for the topsoil across the proposed site, with uncontrolled fill (excluding levee bank fill) noted to extend up to 0.7m (refer to borehole logs).
- Once the topsoil, fill, and unsuitable materials, if any, are removed as required, the exposed natural clay-based material should then be scarified to a depth of about 200mm; moisture conditioned to within +/-2% of Standard Optimum Moisture Content (SOMC) and compacted to a minimum of 98% of Standard Maximum Dry Density (SMDD).
- Proof roll the exposed subgrade using a minimum of 10 passes of 12 tonne dead weight roller to detect any soft, loose or heaving areas. **It should be noted that the clay-based subgrade was noted to be firm and firm to stiff consistency up to 2.4m below the existing surface level at the location of BH3, 4.5m in BH4, 1.1m in BH6, 1.5m in BH7, 1.0m in BH8, 0.8m in BH9, 1.5m in BH11, 1.3m in BH14, and 1.5m in BH15 at the time of the investigation (refer to borehole logs). It should be noted that surface movement on the firm and firm to stiff consistency natural subgrade encountered across the site may be experienced during the construction. This material may be required to be removed/treated as required prior to the placement of any controlled fill material.**
- Any soft, loose or heave areas, if detected, should be excavated down and backfilled with appropriate approved materials, compacted in 200mm thick layers to the equivalent density of minimum 98% of SMDD. **It should be noted that the depth and location of the affected material may be varied depending on the climatic condition at the time of the construction.**
- Any area of exposed subgrade, which exhibits shrinkage cracking and does not require re-compaction, should be watered and rolled until the shrinkage cracks do not reappear. During this undertaking, care should be exercised to ensure the surface does not become soft.

Subsequent to the above subgrade preparation, clean approved fill preferably granular materials can be placed as required and compacted to the compaction requirements as given above. The degree of compaction of any fill placement should be verified by a NATA accredited testing authority to ensure that it achieves the specified density. As the fill is to be placed on the clay-based formation, the compaction shall be carried out with minimum amount of water required to achieve the required density. The boundaries of the fill areas should be sloped to a maximum batter of 1.0 Vertical to 2.0 Horizontal as required or retained with a properly designed retaining wall.

The structural fill supporting any structural element of the structures shall be prepared in such a way that it achieves a minimum of 98% of SMDD in every 150mm thick compacted layers and certified by a relevant NATA accredited testing laboratory for which a safe allowable bearing pressure of 100kPa may be adopted, provided proper drainage measures are incorporated in the design, during and after the construction.

It is highly recommended to undertake the construction of fill pads under Level 1 supervision in accordance with "AS3798 – 2007 – Guidelines on earthworks for commercial and residential developments" if fill pads are to be used for the foundation of any structure.

If the subgrade is to be stabilised, then the exposed clay-based subgrade should be stabilised with lime-based additive as required. It is anticipated that mixing of 3% of appropriate additive to the soil material should provide required strength for the subgrade. However, this should be confirmed with trial testing in the laboratory prior to adoption for the construction.

It would be essential to maintain drainage of the site area during any earthworks to prevent rainfall from adversely affecting the materials such that they become unsuitable for direct re-use.

7.0 FOUNDATION FOR PROPOSED STRUCTURES

7.1 Site Classification

It is assessed that the "uncontrolled" fill material encountered across the site at the location of the proposed main hospital building and staff accommodation building is considered "unsuitable" for any structural element of the footing system in its current state. Therefore, based on the available data, the site shall be classified as **"Class P – Problem"** site in accordance with Australian Standard "AS 2870-2011 – Residential slabs and footings".

However, if the "uncontrolled" fill material is removed and replaced with approved structural fill (existing fill material may be re-used provided topsoil including organic material and silt-based, if any, is excluded) and re-compacted in such a way that it can be established as "controlled fill" as specified above or all the footings (i.e. edge beams internal beams and load support thickenings) are founded on the stiff natural ground, then **"Class "H1-D" - Highly reactive deep drying"** classification may be adopted (the calculated characteristic surface movement (y_s) values noted to be above 40 and below 60mm) in accordance with the Australian Standard AS 2870 - 2011 "Residential Slab and Footings", **provided the subgrade is prepared as specified in Section 6.0.**

It should also be noted that the proposed removal of some of the existing buildings and concrete path/slabs/pavers and trees across the subject site is likely to significantly modify the soil moisture conditions under the footprint of the proposed new buildings. Therefore, the site may have **"abnormal moisture conditions"** after the removal of the existing buildings, concrete paths/slabs/pavers and trees and shall therefore be classified as **"P - Problem site"** in accordance with the Australian Standard AS 2870 - 2011 "Residential Slab and Footings".

It is anticipated that equilibrium moisture conditions may be achieved within a minimum period of 6 to 12 months following the removal of the existing concrete paths/slabs/pavers and building/footing system and trees, provided abnormal moisture ingress does not affect the underlying foundation material during this period. It is highly recommended to undertake additional drilling and field moisture content determination tests at or after the minimum 6 to 12 month period.

If fill placement is required for the new construction, it is highly recommended to place granular fill comprising mainly sand and well graded gravel, but caution shall be exercised not to select a 'raw' or non-plastic material that may induce erosion. It should be noted that the clay soils are subject to saturation and shrink/swell problems. **The fill shall be placed in accordance with clause 6.4.1 & 6.4.2 of AS2870 and any site classification should be reviewed.**

As noted above, existing building and concrete paths/slabs and trees are to be demolished and removed across the subject site prior to the new constructions. It is therefore highly recommended to completely remove the concrete slabs and entire footing systems of the removed buildings and entire tree and tree root systems and allow the ground to achieve equilibrium moisture condition throughout the soil profile after the removal and then backfill in a controlled manner that it can be used as "structural fill" as required.

7.2 Foundation Design

The shallow footing system such as deep edge beam or pad and strip footings may be adopted and they may be proportioned for a maximum allowable bearing pressure of 100kPa and a subgrade reaction modulus (k) of 30kPa/mm founded on the underlying natural stiff consistency or better clay-based material or "controlled fill" subgrade, prepared as specified in Section 6.0 provided proper drainage measures are incorporated during and after the construction. It should be noted that the exposed natural subgrade should be prepared as specified in Section 6.0 prior to the construction of any footing slab as required.

Alternatively, the deep pad footing system, bored and cast-in-place pile footing system or driven pile footing system or screw pile footing system, if adopted, should be taken into the natural clay-based material and the design parameters given in Table 2 below may be adopted for the design of the footing system. It should be noted that the geotechnical design parameters given in Table 2 were estimated from the SPT test results and visual observation of the soil cuttings from the boreholes.

Table 2 Geotechnical Design Parameters

BH	Depth (m)	Material Description	UBP (kPa)	USF (C) (kPa)	USF (U) (kPa)	ABP (kPa)	ASF (C) (kPa)	ASF (U) (kPa)	USS (kPa) OR AOF(°)	Density (kN/m³)	Modulus subgrade reaction (kN/m³) **
BH1	0.5-4.8	Clay	500	50*	25*	200*	20*	10*	60	17.5	20,000
	4.8-6.4	Clayey Sand	375	38	19	150	15	7.5	29°	17.5	15,000
	6.4-7.5	Clay	250	25	13	100	10	5	30	16.5	10,000
BH2	0.5-4.5	Clay / Silty Clay	500	50*	25*	200*	20*	10*	60	17.5	20,000
	4.5-6.5	Clay / Silty Clay	250	25	12.5	100	10	5	30	16.5	10,000
	6.5-7.5	Clayey Sand	375	38	19	150	15	7.5	29°	17.5	15,000
BH3	0.7-2.4	Clay / Silty Clay	125	13*	6.5*	50*	5*	2.5*	15	15.5	5,000
	2.4-5.6	Silty Clay	250	25	12.5	100	10	5	30	16.5	10,000
	5.6-7.5	Clayey Sand	375	38	19	150	15	7.5	29°	17.5	15,000
BH4	0.5-4.5	Clay / Silty Clay	125	13*	6.5*	50*	5*	2.5*	15	15.5	5,000
	4.5-6.0	Clayey Sand	125	13	6.5	50	5	2.5	28°	16.5	5,000
	6.0-7.5	Clayey Sand	375	38	19	150	15	7.5	29°	17.5	15,000
BH6	0.6-1.1	Clay	125	10*	5*	50*	5*	2.5*	15	15.5	5,000
	1.1-3.7	Clay / Silty Clay	500	50*	25*	200*	20*	10*	60	17.5	20,000
	3.7-5.5	Clay	125	13	6.5	50	5	2.5	15	15.5	5,000
	5.5-7.5	Clayey Sand	375	38	19	150	15	7.5	29°	17.5	15,000
BH7	0.5-1.5	Clay / Silty Clay	125	13*	6.5*	50*	5*	2.5*	15	15.5	5,000
	1.5-2.5	Silty Clay	250	25	12.5	100	10	5	30	16.5	10,000
	2.5-4.5	Silty Clay	500	50	25	200	20	10	60	17.5	20,000
	4.5-5.8	Silty Clay	250	25	12.5	100	10	5	30	16.5	10,000
	5.8-7.5	Clayey Sand	375	38	19	150	15	7.5	29°	17.5	15,000

Note:

UBP - Ultimate Base Pressure
USF (C) - Ultimate Skin Friction (Compression)
USF (U) - Ultimate Skin Friction (Uplift)
ABP - Allowable Base Pressure
ASF (C) - Allowable Skin Friction (Compression)
ASF (U) - Allowable Skin Friction (Uplift)
USS - Undrained Shear Strength
AOF - Angle of Friction
Density - Density (at in-situ moisture)

* The side adhesion within fill material and the top 1.5m natural soil shall be ignored.

** **Factor of safety of 2.5 is adopted in estimating the Modulus of Subgrade Reaction.**

If uplift forces are to be assessed, the allowable side resistance on the footing system may be taken as equivalent to 50% of the allowable side adhesion values given above. It should be noted that a factor of safety (FOS) 2.5 was adopted for the bearing pressure and skin friction values given in Table 2 for the natural alluvial material.

If Pad/Column footing system is to be adopted, then footing size and depth shall be designed in such a way that it withstands lateral forces and overturning moments. Care shall be exercised in adopting the recommended design parameters given above in respect to the influenced zone of the adopted footing system.

The footing excavations in the clay-based material should not be left exposed for prolonged period as deterioration of footing bases may occur when subjected to wetting and drying processes. Care should be exercised during construction to ensure water ponding does not occur since this may lead to subsequent softening of the founding materials.

Groundwater seepage and side collapse should be expected during the footing excavation, particularly for pile footing system within the clayey sand material. Such seepage should be readily controllable by conventional sump and pump dewatering systems installed at the base of the excavation with the provision of temporary liners sealed into the impervious material or by installing a series of well points. In a situation of groundwater inflows during the foundation construction, correct underwater concrete placement technique should be adopted to ensure achievement of the specified concrete quality.

The footing excavations shall be cleared off the debris and ponding water prior to the placement of the concrete in order to adopt the recommended design parameters. The bases of the pile shafts and footings must be clean and free of soft and loose material and the sides of bored pile holes where side adhesion is adopted must be free of smear prior to concreting. To achieve this, bases of bored pile holes should be cleaned using a cleaning bucket and the sides of the pile holes should be roughed to remove the smear zone associated with drilling, or the side adhesion values given above Table 2 should be reduced by 50%.

If water ponds in the base of footings or the base founding materials are affected by moisture ingress, then this material should be excavated to expose the subgrade, which has not been exposed to moisture, and pour the concrete immediately. If a delay in pouring concrete is anticipated, then a blinding layer should be placed over the base of the footing to prevent softening of the footing base, particularly for silt-based and clay-based foundation.

It is highly recommended to have the footing excavations inspected by an experienced geotechnical engineer to ensure that the specified allowable bearing capacity is achieved for the footing system.

Based on the subsurface materials encountered and the known seepage issues with side collapse in the sand-based layer, it appears that screw pile footing design is the most appropriate footing system for the proposed development at the subject site. If adopted, the screw piles should be installed into the natural clay or sand-based material with careful monitoring of the installation torque to ensure the required end bearing capacity is achieved. It is recommended to provide this report to the contractor to enable them to choose the right type and size of piling rig for the construction.

7.3 Settlement

We envisage that the total settlements should be minimal provided the design is made within the allowable design parameters recommended and the maintenance of the structures and proper drainage measures are adopted around the structures.

Shallow footings proportioned in accordance with design parameters recommended above are estimated to have load induced settlements of no greater than 0.75% of the width of the footing.

Pile foundation designed in accordance with design parameters recommended above are estimated to have load induced settlements of no greater than 0.75% of the diameter of the piles. It is anticipated that differential settlement is likely to be less than 50% of the total settlement provided the footings are designed in accordance with the design parameters given above.

It should be noted that although the aforementioned design parameters given above are in terms of allowable limit, their use should be checked against settlement, using deformation characteristics values of the underlying clayey silt material given in Table 3. It should be noted that differential settlement should not exceed 50% of the total settlement.

Table 3 Deformation Characteristics Values[1]

Parameters	Stiff Clay	Very Stiff Clay
Bulk Density (kN/m^3)	16.5	17.5
Elastic Modulus (Undrained) (MPa) -E_u	7.0	15.0
Coefficient of Volume Compressibility - (m^2/MN) - m_v	0.07	0.07

Note: 1 - These values are estimated from the field SPT test results and visual assessment of the recovered soil samples.

8.0 SOIL AGGRESSION & ACIDITY

Two (2) samples of the clay-based subgrade from BH1 and BH3 were externally tested by SESL in Sydney, NSW. The pH values ranging from 9.0 to 9.3 were recorded on the underlying natural clay-based material and the soils are therefore considered to be “strong alkalinity”. EC Values of 0.27 to 0.61mS/cm were recorded on the same samples tested, which are assessed to be “slight to moderate salinity”. The “strong alkaline” nature of the clay-based natural material is considered “mild to non-aggressive” towards concrete due to the nature of the impermeable material and “non-corrosive” towards steel.

The sulphate content ranging from 210 to 630mg/kg and chloride content ranging from 340 to 1410mg/kg were also noted on the samples tested and they are considered generally low. The low chloride and sulphate levels are considered “non to mildly aggressive” towards concrete due to the nature of the impermeable material and “non-corrosive” towards steel.

The resistivity values ranging from 8.2 to 140Ω.m were recorded on the same samples tested, which are assessed to be “high resistivity” on sample 1F and “low resistivity” on sample 3E. The “high resistivity” is considered to provide a “non-aggressive” environment towards unprotected steel due to the nature of the impermeable material.

It should be noted however that the "low resistivity” is considered to provide a “moderately to severely aggressive” environment and “moderately to severely aggressive” environment respectively towards unprotected steel.

The designer is therefore referred to Section 4 of AS3600-2018 (Tables 4.3, 4.4, 4.8.1, 4.8.2, 4.8.3) and Section 6 of AS2159-2009 (Tables 6.4.2C, 6.4.3, 6.5.2C, 6.5.3) for any special precautionary measures required for buried concrete and steel elements into these materials.

9.0 EXCAVATION, SUPPORT & RETAINING WALL

It is noted that excavations and cuts will be involved for the construction of the new main hospital building at the subject site. Based upon the subsurface conditions encountered in the boreholes, it is expected that the materials to be excavated will comprise layers of fill and natural silt/clay-based material depending on the extent of the proposed cut. It is assessed that the excavation within the fill and natural silt/clay material could be undertaken by conventional earthmoving plant such as standard boring equipment, scrapers, dozers, rollers, standard trenching machine, backhoes or excavator with boring attachment.

It is therefore recommended to provide the borehole logs and the assessment to the contractor to enable them to choose the right equipment for the boring and excavations.

It should be noted that trafficability in the silt and clay-based material for wheeled vehicles can be expected to be slightly difficult during and following rainfall when it is exposed.

The temporary batter slopes of 1(V): 1(H) is recommended for unsupported cuts of up to 3.0m depth within natural soil material.

The following is recommended for permanent batter slopes for unsupported cuts of up to 3.0m depth in the natural clayey sandy silt and sandy silty clay material encountered across the site:

- Natural SILT/CLAY material 1(V): 2(H)

The permanent batter slope of the unsupported structural fill of up to 3.0m height should not exceed 1(V): 2(H).

If vertical cut with equivalent retaining wall design option is to be adopted, the following characteristic earth pressure coefficients and subsoil parameters given in Table 1 may be adopted for the design of the wall.

Table 4 Design Parameters – Retaining Wall

Design Parameters	Natural Soil material
Bulk Unit Weight	17.0 kN/m^3
Active Earth Pressure Coefficient, K_a	0.4
At rest Earth Pressure Coefficient, K_o	0.6
Passive Earth Pressure Coefficient, K_p	2.4
Effective cohesion, c'	0.5
Effective Friction Angle, ϕ'	24•

Appropriate factor of safety should be applied in the design of the walls. The walls should be designed to withstand full hydrostatic pressure unless special measures are taken to introduce complete and permanent drainage of the ground behind the wall. It should be noted that similar design parameters may be used for the fill embankment provided similar quality material is used for the fill and the fill placement is placed under Level 1 supervision as specified above.

It should be noted that surcharge loadings should not be placed within a distance equivalent to the excavation depth form the crest of a batter cut or fill.

Care would be required to ensure excavation bases are cleaned of loosened and remoulded debris. If feasible, the exposed subgrade base should be proof rolled to detect any soft or heaving areas. Any soft or heave areas should be removed. The excavation base should not be left exposed for prolonged periods as deterioration of bases may occur when subjected to wetting and drying processes. Care should be exercised during construction to ensure water ponding does not occur in the excavations since this may lead to subsequent softening of the founding materials.

It would be prudent to expect some seepage, even at shallower depth of the excavation during the construction. Any seepage should be readily controllable by conventional sump and pump dewatering systems installed at the base of the excavation with the provision of temporary liners sealed into the impervious material or by installing a series of well points.

It should be noted that side collapse within the uncontrolled fill, particularly natural comprising gravel/sand-based and silt-based material may be experienced during the excavation and therefore care and caution shall be exercised throughout the construction. The use of temporary liners may be required during the excavation within these materials. Care and caution should also be exercised by personnel entering into any excavation greater than 1.5m. Any excavation greater than 1.5m in depth should have benches as required.

It should be noted that, no matter what method of excavation support is used, some ground displacement will occur within and immediately surrounding the excavation. We recommend that the risk of structural damage to nearby structures and buried services as a result of such excavation-induced movements, be carefully evaluated. We believe it is unlikely that excavation induced movements will significantly affect structures situated back from the excavation perimeter a distance greater than the excavation depth.

10.0 SITE SUB-SOIL CLASS – EARTHQUAKE DESIGN

The site sub-soil class in accordance with Section 4.2 of AS1170.4-2007 "Part 4: Earthquake actions in Australia", is assessed to be "Class C_e- Shallow soil site". As per Figure 3.2(A) of AS1170.4-2007, a Hazard Design Factor (Z) of 0.09 should be adopted for the subject site. Based on Tables 3.2 and 3.3 of AS1170.0-2002, the proposed development is considered 'Importance Level 4', and the 'Annual Probability of Exceedance' should be determined in conjunction with the design working life.

Liquefaction hazard for the subject site is considered to be generally low as per the 'Liquefaction Hazard Maps for Australia' developed by T.I. Mote and J.N. Dismuke for the 15th World Conference on Earthquake Engineering (WCEE) 2012, which are presented in Figure 3 below. It should be noted that map (a) represents an annual probability of exceedance equal to 10% in 50 years and map (b) represents 2% in 50 years (corresponding to 1/500 and 1/2500 respectively).

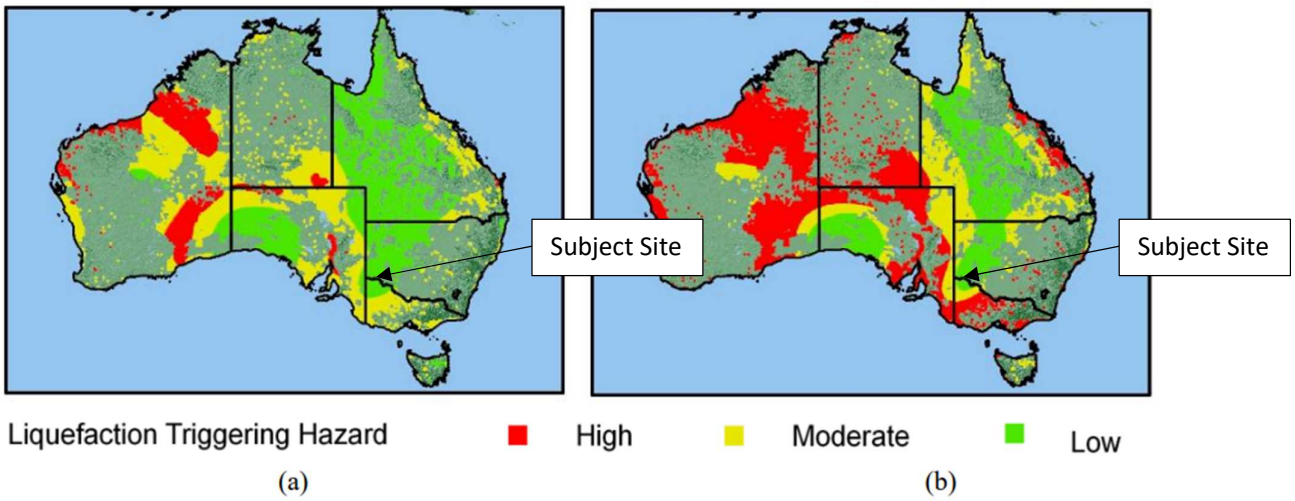


Figure 3 – Liquefaction Hazard Maps for Australia, T.I. Mote & J.N. Dismuke

11.0 SUBGRADE FOR PAVEMENT AREAS

The boreholes drilled revealed that the site is generally underlain by various fill materials comprising topsoil, low plasticity sandy silt, medium plasticity silty clay and sandy clay, and high plasticity clay and sandy clay, overlying natural alluvial material comprising medium, medium to high and high plasticity clays and silty clays within the investigated depth of 1.5m in BH8 to BH15 (refer to attached materials schedule and logs).

The laboratory 10 day soaked CBR tests indicated CBR values of 3.0 to 3.5% on natural high plasticity clay material and 4.0% on natural medium plasticity silty clay material, which were compacted at 95% of SMDD and at nearest 100% SOMC. The in-situ CBR values correlated from DCP tests indicate CBR values ranging from 3 to 23% on the above natural subgrade materials.

It should be noted that in-situ CBR values correlated from the field tests (DCP test) are generally higher than laboratory 10 day-soaked CBR values. It should be appreciated that the CBR test results is directly related to the dry density and the water content of the material. It is noted that the

Optimum Moisture Content (OMC) at which the sample was compacted in the laboratory and the moisture content after soaking at which the sample was tested are generally higher than Field Moisture Content (FMC), which could be contributing factor in resulting generally high CBR values in some areas of the field.

It is noted that the Wentworth area has an annual average rainfall of <1000mm and it is assumed that the subgrade would be prepared as specified in Section 6.0 and the moisture content of the subgrade materials would be generally less than Optimum Moisture Content with provision of drainage measures across the site.

Based on these evaluations and assumptions, the design subgrade CBR value of 3.0% and a subgrade reaction modulus (k) of 30kPa/mm may be adopted for the design of the proposed pavement areas and access roads at the subject site provided drainage measures are provided and maintained around the pavement throughout the pavement life.

12.0 PAVEMENT DESIGN

12.1 Design Traffic

Based on the anticipated traffic data supplied by the client representative, Mr. Matthew Chow of SCT Consulting, in the emails dated 14 September 2022, the following pavement design parameters as given in Table 4 are used for the calculation of the design traffic for the proposed pavement areas and access roads. It should be noted that the traffic volumes are estimates only, and the subsequent pavement designs should be revised if the actual traffic volumes are found to be higher than the below values.

Table 5 Design Parameters

Design Parameters	**Proposed Pavement Areas**
AADT 2022	43
Heavy Vehicle %	25.0%
Directional Factor	0.5
Annual growth	0.0%
Design Life	30 years
ESA/HVAG (Refer Table 12.2 of Austroads Pavement Design Manual)	0.443
Cumulative number of heavy vehicle axle groups in the design lane during design period (Ndt)	1.47×10^5 HVAGs
Calculated Design Traffic (DESA)	**6.52×10^4**

12.2 Pavement Design – Proposed Pavement Areas & Access Roads

In adopting the design subgrade CBR of 3.0% and the design traffic of 6.52×10^4 ESA for 30 years design life as discussed above, one of the following pavement designs, as a minimum, may be adopted for the proposed pavement areas and access roads at the subject site.

Design Option 1 – Pavement with Granular Material (TfNSW DGS20 & DGS40 quality material)

40mm Asphalt (AC14) – 2200MPa OR 7mm Primerseal followed by 14mm Seal OR 14/7mm Double Seal
200mm TfNSW DGS20 quality or equivalent (Ev= 250MPa)
225mm TfNSW DGS40 quality or equivalent (Ev= 250MPa)
Subgrade CBR 3.0%

The above pavement will give a design life of 31 years, according to Circly 7.0 (1 February 2022), using the given design parameters, provided proper drainage measures are incorporated at the site. It should be noted that this does not allow any tolerance on pavement layers. **It should also be noted that the surface asphalt layer or bitumen layer is not part of the structural design of the pavement.**

Design Option 2 – Pavement with Granular Material (TfNSW DGB20 & DGS40 quality material) & Stabilised Subgrade

40mm Asphalt (AC14) – 2200MPa OR 7mm Primerseal followed by 14mm Seal OR 14/7mm Double Seal
200mm TfNSW DGS20 quality or equivalent (Ev= 250MPa)
250mm Stabilised subgrade layer (* stabilised with 3% based additive as appropriate) (Ev= 100Mpa)
Subgrade CBR 3.0%

Note: * - The clay-based subgrade should be stabilised with appropriate additive as required as discussed above. However, this should be confirmed with laboratory trial testing prior to adoption for the construction.

The above pavement will give a design life of 30 years, according to Circly 7.0 (1 February 2022), using the given design parameters, provided proper drainage measures are incorporated at the site. It should be noted that this does not allow any tolerance on pavement layers. **It should also be noted that the surface asphalt layer and bitumen layer is not part of the structural design of the pavement.**

Design Option 3 – Pavement with Granular Material (TfNSW DGB20 & Select fill quality material)

40mm Asphalt (AC14) – 2200MPa OR 7mm Primerseal followed by 14mm Seal OR 14/7mm Double Seal
170mm TfNSW DGB20 quality or equivalent (Ev= 350MPa)
250mm Select Fill Material* (Ev=150MPa)
Subgrade CBR 3.0%

Note*: (i) Select fill material should have a CBR>15% and plasticity index (PI) <12%.
(ii) Select fill material should be modified with 2% hydrated lime if CBR <15% and/or PI>12%.

The above pavement will give a design life of 33 years, according to Circly 7.0 (1 February 2022), using the given design parameters, provided proper drainage measures are incorporated at the site. It should be noted that this does not allow any tolerance on pavement layers. **It should also be noted that the surface asphalt layer or bitumen layer is not part of the structural design of the pavement.**

13.0 GENERAL COMMENT

- Occasionally, the subsurface soil conditions between the completed boreholes may be found different (or may be interpreted to be different) from those expected. This can also occur with groundwater conditions, especially after climatic changes. If such differences appear to exist, we recommend that you immediately contact us.
- The material specified as base and sub-base material as per above designs may be used provided the material meets all criteria as shown in Table 242.3 and 242.4 of AusSpec for NGB20, NGS20/NGS40 or TfNSW DGB20/DGS20 specification. It is therefore highly recommended to use those similar quality materials and to undertake on-going quality control test to ensure that the material quality is maintained throughout the construction.
- The pavement materials shall be compacted to a minimum of 102% SMDD for base and 100% SMDD for sub-base and select fill or as per Council Specification.
- It is highly recommended that an adequate drainage system should be formed to maintain constant moisture conditions in the pavement and subgrade below the pavement. It is also highly recommended to place interface trench drain at the joints between existing and new pavement if the existing materials are found different from new materials, particularly if the existing or new pavement has a stabilised layer. The trench drain of 300x300mm shall be placed below the stabilised layer and be extended to about 300mm.
- It should be noted that site preparation may expose wet subgrade material if excavation is carried out after prolonged period of rainfall. Trafficability in the silt/clay materials for wheeled vehicles can be expected to be slightly difficult during and following rainfall, if it is exposed. Caution shall therefore be exercised during the construction.

Should you have any queries, please do contact us.

Yours Faithfully,

Peter Forbes-Taber
Geotechnical Engineer

Tin Maung
Principal Geotechnical Engineer (Director)

ADDENDUM

LIMITS OF INVESTIGATION

The recommendations made in this report are based on the assumption that the test results are representative of the overall subsurface conditions. However, it should be noted that even under optimum circumstances, actual conditions in some parts of the building site may differ from those said to exist, because no geotechnical engineer, no matter how qualified, and no subsurface exploration program, no matter how comprehensive, can reveal all that is hidden by earth, rock and time.

The client should also be aware that our recommendations refer only to our test site locations and the ground level at the time of testing.

The recommendations in this report are based on the following: -

a) The information gained from our investigation.
b) The present "state of the art" in testing and design.
c) The building type and site treatment conveyed to us by the client.
d) Historical Information

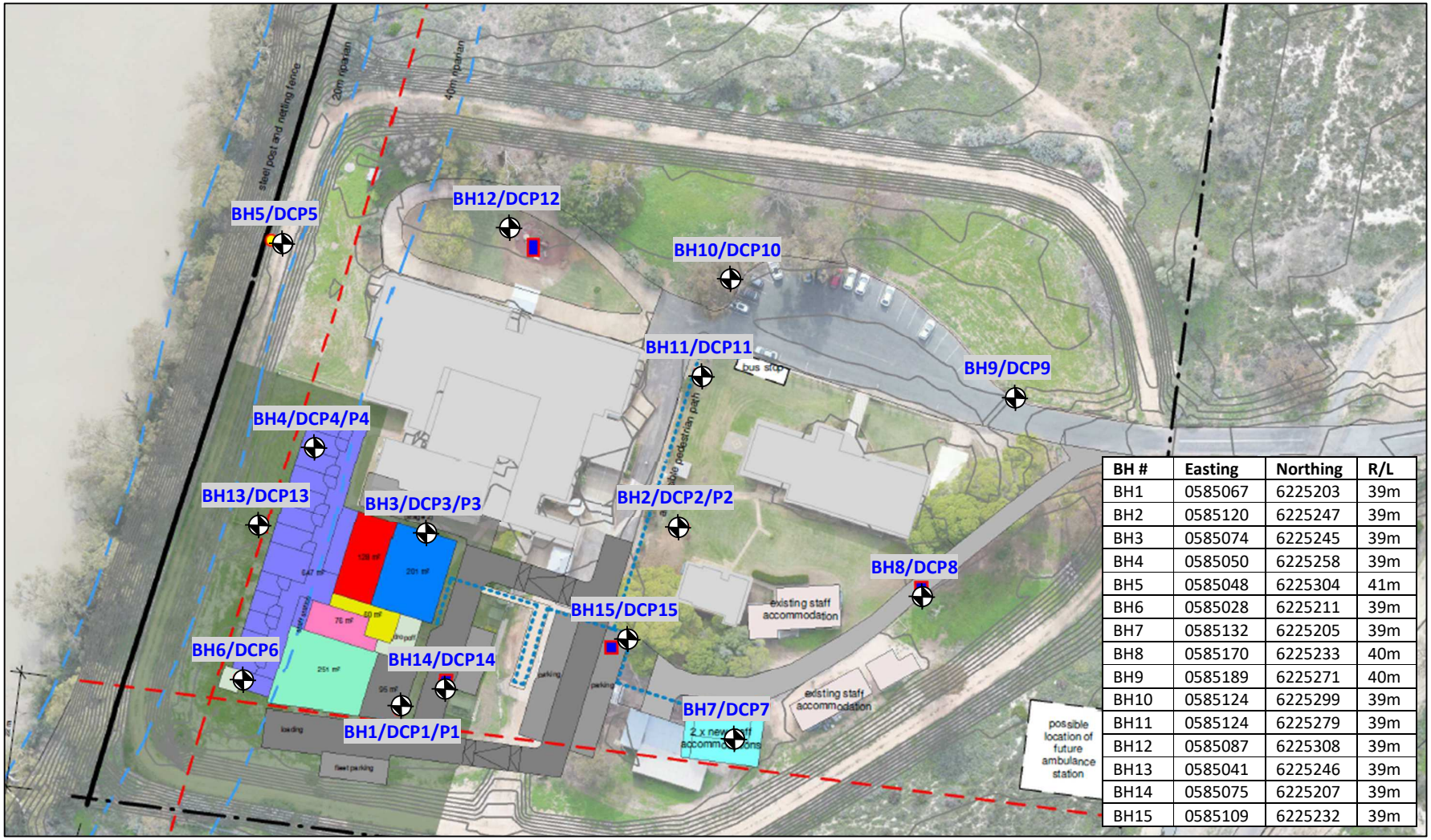
Should the client or their agent have omitted to supply us with the correct relevant information, or make significant changes to the building type and/or building envelope, our report may not take responsibility for any consequences and we reserve the right to make an additional charge if more testing is necessary.

Not withstanding the recommendations made in this report, we also recommend that whenever footings are close to any excavations or easements, that consideration should be given to deepening the footings.

Unless otherwise stated in our commission, any dimensions or slope direction and magnitude should not be used for any building costing calculations and/or positioning. Any sketch supplied should be considered as only an approximate pictorial evidence of our work.

APPENDIX A

BOREHOLE & DCP TEST LOCATION PLAN



BH #	Easting	Northing	R/L
BH1	0585067	6225203	39m
BH2	0585120	6225247	39m
BH3	0585074	6225245	39m
BH4	0585050	6225258	39m
BH5	0585048	6225304	41m
BH6	0585028	6225211	39m
BH7	0585132	6225205	39m
BH8	0585170	6225233	40m
BH9	0585189	6225271	40m
BH10	0585124	6225299	39m
BH11	0585124	6225279	39m
BH12	0585087	6225308	39m
BH13	0585041	6225246	39m
BH14	0585075	6225207	39m
BH15	0585109	6225232	39m

Aitken Rowe Testing Laboratories Pty Ltd

Registration Number: S22-348

Client: JBS&G – SYDNEY, NSW

Project: GEOTECHNICAL INVESTIGATION
PROPOSED WENTWORTH HEALTH SERVICE REDEVELOPMENT,
24 HOSPITAL ROAD, WENWORTH, NSW
BOREHOLE & DCP TEST LOCATION PLAN

APPENDIX B

BOREHOLE LOGS & MATERIALS SCHEDULE WITH EXPLANATORY NOTE

AITKEN ROWE TESTING LABORATORIES PTY LTD

Borehole No.: **1**
Sheet No.: 1 of 2

Ground Level: Existing
Method: Auger Drilling with TC Bit

Date: ***9/08/2022***
GPS N: ***6225203 (R/L: 39m)***
E: ***0585067***

USCS Symbol	Description	Depth (m)	Moisture Condition	Consistency/ Rel. Density	Sample Type	Sample No.	Field Test SPT	Remarks & Field Records	Piezometer
ML	FILL/TOPSOIL: Sandy SILT; low plasticity, fine to coarse sand, grey		MC<PL	St.				FILL: Appears moderately compacted 'Uncontrolled'	
ML	FILL: Sandy SILT; low plasticity, fine to coarse sand, trace gravel, grey	0.5		VSt.	D	1A			
CH	CLAY; high plasticity, with fine to medium sand, grey	1.0			U50	1B		NATURAL LS = 14.0% FMC = 13.4% Iss = 3.88	
CI-CH	CLAY; medium to high plasticity, trace sand, yellow	1.5			D	1C	1.5		
		2.0			D	1D	SPT 7,12, 17 N = 29 1.95		
		2.5							
CH	CLAY; high plasticity, trace sand, grey	3.0	MC>PL	St.-VSt.			3.0		
		3.5			D	1E	SPT 6, 9, 10 N = 19 3.45	LS = 14.0% FMC = 23.6%	
		4.0		St.	D	1F		Post drilling Seepage @ 4.2m	
		4.5					4.5	Piezo installed	
					D	1G	SPT 6, 9, 10 N = 19		
SC	Clayey SAND; fine to medium grained, fines of medium plasticity, yellow grey	5.0	W	MD		1H	4.95	Seepage @ 4.8m to 6.4m	
		5.5							
		6.0							

Registration No.: S22-348

Location: Geotechnical Investigation & Pavement Design - Proposed Wentworth Health Service Redevelopment, 24 Hospital Road, Wentworth, NSW

Client: JBS&G - Sydney, NSW

Logged By: PFT

Scale: As shown

Seepage @ 4.8m to 6.4m

AITKEN ROWE TESTING LABORATORIES PTY LTD

Borehole No.: **1**
Sheet No.: 2 of 2

Ground Level: Existing
Method: Auger Drilling with TC Bit

Date: ***9/08/2022***
GPS N: ***6225203 (R/L: 39m)***
E: ***0585067***

USCS Symbol	Description	Depth (m)	Moisture Condition	Consistency/ Rel. Density	Sample Type	Sample No.	Field Test SPT	Remarks & Field Records
SC	Clayey SAND; fine to medium grained, fines of medium plasticity, yellow grey		W	MD	D	1I	SPT 4, 5, 5 N = 10	LS = 7.0% FMC = 26.3%
CH	CLAY; high plasticity, with fine to medium sand, grey	6.5	MC>PL	St.			6.45	End of Seepage
	End of Borehole (BH1) @ 7.5m	7.0 7.5 8.0 8.5 9.0 9.5 10.0 10.5 11.0 11.5 12.0						

Registration No.: S22-348

Location: Geotechnical Investigation & Pavement Design - Proposed Wentworth Health Service Redevelopment, 24 Hospital Road, Wentworth, NSW

Client: JBS&G - Sydney, NSW

Logged By: PFT

Scale: As shown

Seepage @ 4.8m to 6.4m

AITKEN ROWE TESTING LABORATORIES PTY LTD

Borehole No.: **2**
Sheet No.: 1 of 2

Ground Level: Existing
Method: Auger Drilling with TC Bit

Date: ***9/08/2022***
GPS N: ***6225247 (R/L: 39m)***
E: ***0585120***

USCS Symbol	Description	Depth (m)	Moisture Condition	Consistency/ Rel. Density	Sample Type	Sample No.	Field Test	Remarks & Field Records	Piezometer
ML	FILL/TOPSOIL: Sandy SILT; low plasticity, fine to coarse sand, grey		MC<PL	F				FILL: Appears moderately compacted 'Uncontrolled'	
CH	FILL: Silty CLAY; high plasticity, with fine to coarse sand, grey yellow	**0.5**	MC>PL	St.	D	2A			
CH	CLAY; high plasticity, with fine to medium sand, grey		MC>PL		U50	2B		NATURAL LS = 13.5% FMC = 18.0% Iss = 3.87	
CI-CH	Silty CLAY; medium to high plasticity, with fine to medium sand, yellow	**1.0**	MC<PL		D	2C			
		1.5					1.5		
CH	CLAY; high plasticity, with fine to medium sand, yellow grey		MC>PL		D	2D	SPT 6, 7, 9 N = 16		
		2.0					1.95		
		2.5							
		3.0					3.0		
CH	CLAY; high plasticity, trace sand, grey			VSt.	D	2E	SPT 6, 9, 11 N = 20		
		3.5					3.45		
		4.0							
		4.5					4.5	Post drilling Seepage @ 4.4m	
				St.	D	2F	SPT 4, 5, 6 N = 11	Piezo installed LS = 11.0% FMC = 25.3%	
		5.0					4.95		
		5.5							
CI	Silty CLAY; medium plasticity, with fine to medium sand, grey yellow	**6.0**							

Registration No.: S22-348

Location: Geotechnical Investigation & Pavement Design - Proposed Wentworth Health Service Redevelopment, 24 Hospital Road, Wentworth, NSW

Client: JBS&G - Sydney, NSW

Logged By: PFT

Scale: As shown

Seepage @ 6.0m to 7.5m (EOBH)

AITKEN ROWE TESTING LABORATORIES PTY LTD

Borehole No.: **2**
Sheet No.: 2 of 2

Ground Level: Existing
Method: Auger Drilling with TC Bit

Date: ***9/08/2022***
GPS N: ***6225247 (R/L: 39m)***
E: ***0585120***

USCS Symbol	Description	Depth (m)	Moisture Condition	Consistency/ Rel. Density	Sample Type	Sample No.	Field Test SPT	Remarks & Field Records
					Type	No.	SPT	
CI	Silty CLAY; medium plasticity, with fine to medium sand, grey yellow	6.5	MC>PL	St.	D	2G	SPT 5, 6, 9 N = 15	Seepage @ 6.0m to 7.5m (EOBH)
SC	Clayey SAND; fine to medium grained, fines of medium plasticity, yellow	7.0	W	MD	D	2H	6.45	
	End of Borehole (BH2) @ 7.5m	7.5						
		8.0						
		8.5						
		9.0						
		9.5						
		10.0						
		10.5						
		11.0						
		11.5						
		12.0						

Registration No.: S22-348

Location: Geotechnical Investigation & Pavement Design - Proposed Wentworth Health Service Redevelopment, 24 Hospital Road, Wentworth, NSW

Client: JBS&G - Sydney, NSW

Logged By: PFT

Scale: As shown

Seepage @ 6.0m to 7.5m (EOBH)

AITKEN ROWE TESTING LABORATORIES PTY LTD

Borehole No.: **3**
Sheet No.: 1 of 2

Ground Level: Existing
Method: Auger Drilling with TC Bit

Date: ***10/08/2022***
GPS N: ***6225245 (R/L: 39m)***
E: ***0585074***

USCS Symbol	Description	Depth (m)	Moisture Condition	Consistency/ Rel. Density	Sample Type	Sample No.	Field Test SPT	Remarks & Field Records	Piezometer
ML	FILL/TOPSOIL: Sandy SILT; low plasticity, fine to coarse sand, grey		MC>PL	S				FILL: Appears poorly compacted 'Uncontrolled'	
Cl	FILL: Sandy CLAY; medium plasticity, fine to coarse sand, trace gravel, trace concrete, trace bricks, grey brown	0.5		S-F	D	3A			
CH	CLAY; high plasticity, trace sand, grey	1.0		F	D	3B		NATURAL	
CH	Silty CLAY; high plasticity, trace sand, yellow	1.5		St.	D	3C	1.5		
		2.0		F	D	3D	SPT 2, 2, 3 N = 5		
							1.95		
CH	Silty CLAY; high plasticity, trace sand, grey	2.5		St.	D	3E			
		3.0					3.0		
					D	3F	SPT 3, 4, 5 N = 9	LS = 18.0% FMC = 27.3%	
		3.5					3.45		
		4.0							
		4.5					4.5		
					D	3G	SPT 3, 5, 5 N = 10		
		5.0					4.95	Post drilling Seepage @ 4.9m	
		5.5							
SC	Clayey SAND; fine to medium grained, fines of medium plasticity, grey yellow	6.0	W	MD				Seepage @ 5.6m to 7.5m (EOBH)	
								Piezo installed	

Registration No.: S22-348

Location: Geotechnical Investigation & Pavement Design - Proposed Wentworth Health Service Redevelopment, 24 Hospital Road, Wentworth, NSW

Client: JBS&G - Sydney, NSW

Logged By: PFT

Scale: As shown

Seepage @ 5.6m to 7.5m (EOBH)

AITKEN ROWE TESTING LABORATORIES PTY LTD

Borehole No.: **3**
Sheet No.: 2 of 2

Ground Level: Existing
Method: Auger Drilling with TC Bit

Date: ***10/08/2022***
GPS N: ***6225245 (R/L: 39m)***
E: ***0585074***

USCS Symbol	Description	Depth (m)	Moisture Condition	Consistency/ Rel. Density	Sample Type	Sample No.	Field Test SPT	Remarks & Field Records
SC	Clayey SAND; fine to medium grained, fines of medium plasticity, grey yellow	6.5 7.0 7.5	W	MD	D	3H	SPT 4, 4, 7 N = 11 6.45	
	End of Borehole (BH3) @ 7.5m	8.0 8.5 9.0 9.5 10.0 10.5 11.0 11.5 12.0						

Registration No.: S22-348

Location: Geotechnical Investigation & Pavement Design - Proposed Wentworth Health Service Redevelopment, 24 Hospital Road, Wentworth, NSW

Client: JBS&G - Sydney, NSW

Logged By: PFT

Scale: As shown

Seepage @ 5.6m to 7.5m (EOBH)

AITKEN ROWE TESTING LABORATORIES PTY LTD

Borehole No.: **4**
Sheet No.: 1 of 2

Ground Level: Existing
Method: Auger Drilling with TC Bit

Date: ***10/08/2022***
GPS N: ***6225258 (R/L: 39m)***
E: ***0585050***

USCS Symbol	Description	Depth (m)	Moisture Condition	Consistency/ Rel. Density	Sample Type	Sample No.	Field Test SPT	Remarks & Field Records	Piezometer
ML	FILL/TOPSOIL: Sandy SILT; low plasticity, fine to coarse sand, grey		MC>PL	S				FILL: Appears poorly compacted 'Uncontrolled'	
ML	FILL: Sandy SILT; low plasticity, fine to coarse sand, trace gravel, orange brown	0.5		S-F					
CH	FILL: CLAY; high plasticity, with fine to coarse sand, trace gravel, grey brown			St.	D	4A		FILL: Appears moderately compacted 'Uncontrolled'	
CH	CLAY; high plasticity, trace sand, grey	1.0			U50	4B		NATURAL LS = 15.5% FMC = 20.1% Iss = 3.63	
CI	Silty CLAY; medium plasticity, trace sand, yellow	1.5		F-St.			1.5		
					D	4C	SPT 3, 3, 5 N = 8	LS = 10.0% FMC = 26.8%	
		2.0					1.95		
		2.5							
		3.0					3.0		
CI-CH	CLAY; medium to high plasticity, trace sand, grey yellow				D	4D	SPT 3, 3, 4 N = 7	LS = 12.5% FMC = 27.6% Post drilling Seepage @ 3.2m	
		3.5					3.45		
CH	CLAY; high plasticity, trace sand, grey orange	4.0		F					
		4.5					4.5		
SC	Clayey SAND; fine to medium grained, fines of medium plasticity, grey orange		W	L	D	4E	SPT 2, 2, 4 N = 6	Seepage @ 4.5m to 7.5m (EOBH)	
		5.0					4.95		
		5.5							
		6.0						Piezo installed	

Registration No.: S22-348

Location: Geotechnical Investigation & Pavement Design - Proposed Wentworth Health Service Redevelopment, 24 Hospital Road, Wentworth, NSW

Client: JBS&G - Sydney, NSW

Logged By: PFT

Scale: As shown

Seepage @ 4.5m to 7.5m (EOBH)

AITKEN ROWE TESTING LABORATORIES PTY LTD

Borehole No.: **4**
Sheet No.: 2 of 2

Ground Level: Existing
Method: Auger Drilling with TC Bit

Date: ***10/08/2022***
GPS N: ***6225258 (R/L: 39m)***
E: ***0585050***

USCS Symbol	Description	Depth (m)	Moisture Condition	Consistency/ Rel. Density	Sample Type	Sample No.	Field Test SPT	Remarks & Field Records
SC	Clayey SAND; fine to medium grained, fines of medium plasticity, grey orange	6.5	W	MD	D	4F	SPT 5, 5, 6 N = 11	
		7.0					6.45	
	End of Borehole (BH4) @ 7.5m	7.5						
		8.0						
		8.5						
		9.0						
		9.5						
		10.0						
		10.5						
		11.0						
		11.5						
		12.0						

Registration No.: S22-348

Location: Geotechnical Investigation & Pavement Design - Proposed Wentworth Health Service Redevelopment, 24 Hospital Road, Wentworth, NSW

Client: JBS&G - Sydney, NSW

Logged By: PFT

Scale: As shown

Seepage @ 4.5m to 7.5m (EOBH)

AITKEN ROWE TESTING LABORATORIES PTY LTD

Borehole No.: **5**
Sheet No.: 1 of 2

Ground Level: Existing
Method: Auger Drilling with TC Bit

Date: ***10/08/2022***
GPS N: ***6225304 (R/L: 41m)***
E: ***0585048***

USCS Symbol	Description	Depth (m)	Moisture Condition	Consistency/ Rel. Density	Sample Type	Sample No.	Field Test	Remarks & Field Records
CI	FILL: Sandy CLAY; medium plasticity, fine to coarse sand, trace gravel, orange		MC<PL	St.				FILL: Appears moderately compacted 'Uncontrolled'
CH	FILL: CLAY; high plasticity, with fine to coarse sand, trace gravel, grey brown	0.5	MC>PL		D	5A		
CH	FILL: CLAY; high plasticity, trace sand, grey	1.0		St.-VSt.	D	5B		
		1.5					1.5	
		2.0			D	5C	SPT 5, 7, 9 N = 16	
CI	Silty CLAY; medium plasticity, trace sand, grey yellow	2.5	MC<PL	VSt.			1.95	NATURAL
		3.0					3.0	
		3.5			D	5D	SPT 7, 11, 15 N = 26	
		4.0					3.45	
		4.5					4.5	
CH	CLAY; high plasticity, trace sand, grey	5.0	MC=PL	St.-VSt.	D	5E	SPT 6, 9, 9 N = 18	
		5.5					4.95	
		6.0						

Registration No.: S22-348

Location: Geotechnical Investigation & Pavement Design - Proposed Wentworth Health Service Redevelopment, 24 Hospital Road, Wentworth, NSW

Client: JBS&G - Sydney, NSW

Logged By: PFT

Scale: As shown

Seepage @ 6.7m to 8.0m

AITKEN ROWE TESTING LABORATORIES PTY LTD

Borehole No.: **5**
Sheet No.: 2 of 2

Ground Level: Existing
Method: Auger Drilling with TC Bit

Date: ***10/08/2022***
GPS N: ***6225304 (R/L: 41m)***
E: ***0585048***

USCS Symbol	Description	Depth (m)	Moisture Condition	Consistency/ Rel. Density	Sample Type	Sample No.	Field Test SPT	Remarks & Field Records
CH	CLAY; high plasticity, with fine to medium sand, grey	6.5	MC>PL	St.-VSt.	D	5F	SPT 4, 6, 9 N = 15	
							6.45	← Seepage @ 6.7m to 8.0m (EOBH)
SC	Clayey SAND; fine to medium grained, fines of medium plasticity, grey orange	7.0	W	MD				
		7.5						
		8.0			D	5G	SPT 6, 5, 5 N = 10	
	End of Borehole (BH5) @ 8.0m	8.5						
		9.0						
		9.5						
		10.0						
		10.5						
		11.0						
		11.5						
		12.0						

Registration No.: S22-348

Location: Geotechnical Investigation & Pavement Design - Proposed Wentworth Health Service Redevelopment, 24 Hospital Road, Wentworth, NSW

Client: JBS&G - Sydney, NSW

Logged By: PFT

Scale: As shown

Seepage @ 6.7m to 8.0m (EOBH)

AITKEN ROWE TESTING LABORATORIES PTY LTD

Borehole No.: **6**
Sheet No.: 1 of 2

Ground Level: Existing
Method: Auger Drilling with TC Bit

Date: ***10/08/2022***
GPS N: ***6225211 (R/L: 39m)***
E: ***0585028***

USCS Symbol	Description	Depth (m)	Moisture Condition	Consistency/ Rel. Density	Sample Type	Sample No.	Field Test	Remarks & Field Records
ML	FILL/TOPSOIL: Sandy SILT; low plasticity, fine to coarse sand, grey		MC<PL	St.				FILL: Appears moderately compacted 'Uncontrolled'
CI	FILL: Silty CLAY; medium plasticity, with fine to coarse sand, trace gravel, grey	0.5						
CH	CLAY; high plasticity, with fine to medium sand, grey	1.0	MC>PL	F	D	6A		NATURAL LS = 13.5% FMC = 23.3%
CI-CH	Silty CLAY; medium to high plasticity, trace sand, yellow	1.5		St.-VSt.	D	6B	1.5	
		2.0		VSt.	D	6C	SPT 6, 9, 11 N = 20	LS = 13.0% FMC = 18.8%
		2.5					1.95	
CH	CLAY; high plasticity, trace sand, grey	3.0			D	6D	3.0 SPT 6, 8, 11 N = 19	
		3.5					3.45	
CH	CLAY; high plasticity, with fine to medium sand, yellow grey	4.0		F-St.				
		4.5			D	6E	4.5 SPT 3, 3, 4 N = 7	LS = 13.5% FMC =25.5%
		5.0					4.95	Seepage @ 5.0m to 7.5m (EOBH)
		5.5						
SC	Clayey SAND; fine to medium grained, fines of medium plasticity, grey orange	6.0	W	MD				

Registration No.: S22-348

Location: Geotechnical Investigation & Pavement Design - Proposed Wentworth Health Service Redevelopment, 24 Hospital Road, Wentworth, NSW

Client: JBS&G - Sydney, NSW

Logged By: PFT

Scale: As shown

Seepage @ 5.0m to 7.5m (EOBH)

AITKEN ROWE TESTING LABORATORIES PTY LTD

Borehole No.: **6**
Sheet No.: 2 of 2

Ground Level: Existing
Method: Auger Drilling with TC Bit

Date: ***10/08/2022***
GPS N: ***6225211 (R/L: 39m)***
E: ***0585028***

USCS Symbol	Description	Depth (m)	Moisture Condition	Consistency/ Rel. Density	Sample Type	Sample No.	Field Test SPT	Remarks & Field Records
SC	Clayey SAND; fine to medium grained, fines of medium plasticity, grey orange	6.5	W	MD	D	6F	SPT 5, 5, 5 N = 10	
		7.0					6.45	
	End of Borehole (BH6) @ 7.5m	7.5						
		8.0						
		8.5						
		9.0						
		9.5						
		10.0						
		10.5						
		11.0						
		11.5						
		12.0						

Registration No.: S22-348

Location: Geotechnical Investigation & Pavement Design - Proposed Wentworth Health Service Redevelopment, 24 Hospital Road, Wentworth, NSW

Client: JBS&G - Sydney, NSW

Logged By: PFT

Scale: As shown

Seepage @ 5.0m to 7.5m (EOBH)

AITKEN ROWE TESTING LABORATORIES PTY LTD

Borehole No.: **7**
Sheet No.: 1 of 2

Ground Level: Existing
Method: Auger Drilling with TC Bit

Date: ***9/08/2022***
GPS N: ***6225205 (R/L: 39m)***
E: ***0585132***

USCS Symbol	Description	Depth (m)	Moisture Condition	Consistency/ Rel. Density	Sample Type	Sample No.	Field Test	Remarks & Field Records
ML	FILL/TOPSOIL: Sandy SILT; low plasticity, fine to coarse sand, grey		MC>PL	F				FILL: Appears poorly compacted
CI	FILL: Sandy CLAY; medium plasticity, fine to coarse sand, trace gravel, brown				D	7A		'Uncontrolled'
CH	CLAY; high plasticity, trace sand, grey			S				NATURAL
		0.5		F				
					U50	7B		LS =15.5% FMC = 25.3% Iss = 3.84
		1.0						
CI-CH	Silty CLAY; medium to high plasticity, trace sand, yellow				D	7C		
		1.5					1.5	
				St.	D	7D	SPT 4, 7, 7 N = 14	LS = 11.5% FMC = 24.2%
		2.0					1.95	
		2.5						
CH	Silty CLAY; high plasticity, trace sand, grey			St.-VSt.				
		3.0					3.0	
					D	7E	SPT 5, 8, 10 N = 18	LS = 17.0% FMC = 23.0%
		3.5					3.45	
		4.0						
		4.5					4.5	
				St.	D	7F	SPT 4, 6, 7 N = 13	
		5.0					4.95	
		5.5						
SC	Clayey SAND; fine to medium grained, fines of medium plasticity, yellow	6.0	W	MD				Seepage @ 5.8m to 7.5m (EOBH)

Registration No.: S22-348

Location: Geotechnical Investigation & Pavement Design - Proposed Wentworth Health Service Redevelopment, 24 Hospital Road, Wentworth, NSW

Client: JBS&G - Sydney, NSW

Logged By: PFT

Scale: As shown

Seepage @ 5.8m to 7.5m (EOBH)

AITKEN ROWE TESTING LABORATORIES PTY LTD

Borehole No.: **7**
Sheet No.: 2 of 2

Ground Level: Existing
Method: Auger Drilling with TC Bit

Date: ***9/08/2022***
GPS N: ***6225205 (R/L: 39m)***
E: ***0585132***

USCS Symbol	Description	Depth (m)	Moisture Condition	Consistency/ Rel. Density	Sample Type	Sample No.	Field Test SPT	Remarks & Field Records
SC	Clayey SAND; fine to medium grained, fines of medium plasticity, yellow	6.5	W	MD	D	6G	SPT 4, 5, 8 N = 13	
		7.0					6.45	
	End of Borehole (BH7) @ 7.5m	7.5						
		8.0						
		8.5						
		9.0						
		9.5						
		10.0						
		10.5						
		11.0						
		11.5						
		12.0						

Registration No.: S22-348

Location: Geotechnical Investigation & Pavement Design - Proposed Wentworth Health Service Redevelopment, 24 Hospital Road, Wentworth, NSW

Client: JBS&G - Sydney, NSW

Logged By: PFT

Scale: As shown

Seepage @ 5.8m to 7.5m (EOBH)

Aitken Rowe Testing Laboratories Pty Ltd

4/2 Riedell Street, Wagga Wagga NSW 2650

Pavement & Subgrade Investigation - Materials Schedule and Log

CLIENT: JBS&G - SYDNEY, NSW

PROJECT: GEOTECHNICAL INVESTIGATION & PAVEMENT DESIGN

PROPOSED WENTWORTH HEALTH SERVICE REDEVELOPMENT, No. 24 HOSPITAL ROAD, WENTWORTH, NSW

STAFF: PFT **SAMPLING METHOD :** AS1289.1.2.1 **CLAUSE :** 6.5.3

DATE: 11/08/2022

REGO. NO.: S22-348

Borehole No. and Location	Layer Sample No.	Depth (mm)	Group Symbol	Field Description (layer, type, plasticity / particle size, colour, secondary components)	Moisture Conditions	Strength Comments	Moistures (FMC=Field MC) (OMC=Optimum MC) (FMC/OMC=Moisture Ratio)			Dynamic Cone Penetrometer (NB not equiv. to lab soaked CBR)		(CBR%)	Other Comments
							OMC	FMC	FMC/ OMC	Depth In Subgrade (mm)	Equiv. CBR %	10 day (95% Rel. Comp.)	
BH8	F8	0-400	CI	FILL: Silty CLAY; medium plasticity, with fine to coarse sand, trace gravel, orange	MC<PL	VSt.							FILL: Appears moderately compacted
N: 6225233				brown									'Uncontrolled'
E: 0585170	SG8	400-1000	CH	CLAY; high plasticity, with fine to medium sand, grey	MC>PL	F	21.2	17.0	0.80	400-1000	5	3.5	NATURAL
R/L: 40m		1000-1500	CI-CH	Silty CLAY; medium to high plasticity, trace sand, yellow	MC>PL	St.				1000-1500	8		
				End of Borehole (BH8) @ 1.5m									
BH9		0-200	ML	FILL: Sandy SILT; low plasticity, fine to coarse sand, orange brown	MC<PL	S							FILL: Appears poorly compacted 'Uncontrolled'
N: 6225271	F9	200-400	CH	FILL: CLAY; high plasticity, with fine to coarse sand, trace gravel, grey brown	MC>PL	S-F							FILL: Appears poorly compacted 'Uncontrolled'
E: 0585189	SG9	400-800	CH	CLAY; high plasticity, with fine to medium sand, grey	MC>PL	F	21.7	17.1	0.79	400-800	5	3	NATURAL
R/L: 40m		800-1500	CH	CLAY; high plasticity, with fine to medium sand, grey	MC>PL	St.				800-1500	11		
				End of Borehole (BH9) @ 1.5m									
BH10		0-100	ML	FILL/TOPSOIL: Sandy SILT; low plasticity, fine to coarse sand, grey	MC>PL	F							FILL: Appears poorly compacted 'Uncontrolled'
N: 6225299	F10	100-400	CH	FILL: Sandy CLAY; high plasticity, fine to coarse sand, trace gravel, grey brown	MC<PL	St.-VSt.							FILL: Appears moderately compacted 'Uncontrolled'
E: 0585124	SG10	400-1200	CH	CLAY; high plasticity, trace sand, grey	MC<PL	VSt.	20.9	13.8	0.66	400-1200	20	3	NATURAL
R/L: 39m		1200-1500	CI	Silty CLAY; medium plasticity, trace sand, yellow	MC<PL	VSt.				1200-1500	22		
				End of Borehole (BH10) @ 1.5m									
BH11		0-400	CI	FILL: Sandy CLAY; medium plasticity, fine to coarse sand, trace gravel, grey	MC<PL	F-St.							FILL: Appears poorly compacted 'Uncontrolled'
N: 6225279		400-800	CH	CLAY; high plasticity, with fine to medium sand, grey	MC>PL	F				400-800	3		NATURAL
E: 0585124	SG11	800-1500	CI	Silty CLAY; medium plasticity, trace sand, yellow	MC>PL	F	17.7	19.2	1.08	800-1500	3	4	
R/L: 39m				End of Borehole (BH11) @ 1.5m									
BH12		0-200	ML	FILL/TOPSOIL: Sandy SILT; low plasticity, fine to coarse sand, grey	MC>PL	S							FILL: Appears poorly compacted 'Uncontrolled'
N: 6225308	SG12	200-600	CH	CLAY; high plasticity, with fine to medium sand, grey	MC>PL	St.	22.0	15.9	0.72	200-600	9	3	NATURAL
E: 0585087		600-1500	CI	Silty CLAY; medium plasticity, trace sand, yellow	MC<PL	St.-VSt.				600-1500	17		
R/L: 39m				End of Borehole (BH12) @ 1.5m									

Aitken Rowe Testing Laboratories Pty Ltd

4/2 Riedell Street, Wagga Wagga NSW 2650

Pavement & Subgrade Investigation - Materials Schedule and Log

CLIENT: JBS&G - SYDNEY, NSW

PROJECT: GEOTECHNICAL INVESTIGATION & PAVEMENT DESIGN

PROPOSED WENTWORTH HEALTH SERVICE REDEVELOPMENT, No. 24 HOSPITAL ROAD, WENTWORTH, NSW

STAFF: PFT **SAMPLING METHOD :** AS1289.1.2.1 **CLAUSE :** 6.5.3

PAGE: 2 OF 2

DATE: 11/08/2022

REGO. NO.: S22-348

Borehole No. and Location	Layer Sample No.	Depth (mm)	Group Symbol	Field Description (layer, type, plasticity / particle size, colour, secondary components)	Moisture Conditions	Strength Comments	Moistures (FMC=Field MC) (OMC=Optimum MC) (FMC/OMC=Moisture Ratio)			Dynamic Cone Penetrometer (NB not equiv. to lab soaked CBR)		(CBR%)	Other Comments
							OMC	FMC	FMC/ OMC	Depth In Subgrade (mm)	Equiv. CBR %	10 day (95% Rel. Comp.)	
BH13		0-200	ML	FILL/TOPSOIL: Sandy SILT; low plasticity, fine to coarse sand, grey	MC>PL	S							FILL: Appears poorly compacted 'Uncontrolled'
N: 6225246		200-400	ML	FILL: Sandy SILT; low plasticity, fine to coarse sand, trace gravel, orange brown	MC>PL	F-St.							FILL: Appears poorly compacted 'Uncontrolled'
E: 0585041		400-700	CH	FILL: CLAY; high plasticity, with fine to coarse sand, trace gravel, grey brown	MC>PL	St.							FILL: Appears poorly compacted 'Uncontrolled'
R/L: 39m	SG13	700-1200	CH	CLAY; high plasticity, with fine to medium sand, grey	MC>PL	St.-VSt.	21.3	15.9	0.75	700-1200	18	3	NATURAL
		1200-1500	CI-CH	Silty CLAY; medium to high plasticity, trace sand, yellow	MC>PL	VSt.				1200-1500	19		
				End of Borehole (BH13) @ 1.5m									
BH14		0-100	ML	FILL/TOPSOIL: Sandy SILT; low plasticity, fine to coarse sand, grey	MC<PL	F							FILL: Appears poorly compacted 'Uncontrolled'
N: 6225207		100-500	ML	FILL: Sandy SILT; low plasticity, fine to coarse sand, trace gravel, grey	MC<PL	F							FILL: Appears poorly compacted 'Uncontrolled'
E: 0585075	SG14	500-1300	CH	CLAY; high plasticity, with fine to medium sand, grey	MC>PL	F-St.	19.4	18.3	0.94	500-1300	8	3	NATURAL
R/L: 39m		1300-1500	CI-CH	Silty CLAY; medium to high plasticity, trace sand, yellow	MC<PL	VSt.				1300-1500	18		
				End of Borehole (BH14) @ 1.5m									
BH15		0-100	ML	FILL/TOPSOIL: Sandy SILT; low plasticity, fine to coarse sand, grey	MC<PL	St.							FILL: Appears moderately compacted 'Uncontrolled'
N: 6225232		100-300	CI	FILL: Sandy CLAY; medium plasticity, fine to coarse sand, orange brown	MC<PL	St.							FILL: Appears moderately compacted 'Uncontrolled'
E: 0585109	SG15	300-900	CH	CLAY; high plasticity, with fine to medium sand, grey	MC>PL	St.	21.4	14.8	0.69	300-900	8	3.5	NATURAL
R/L: 39m		900-1500	CI-CH	Silty CLAY; medium to high plasticity, trace sand, yellow	MC>PL	F-St.				900-1500	8		
				End of Borehole (BH15) @ 1.5m									

AITKEN ROWE TESTING LABORATORIES PTY LTD
LOG SYMBOLS

LOG COLUMN	SYMBOLS	DEFINITION
Groundwater Record	▼	Standing water level. Time delay following completion of drilling may be shown.
	▶—	Groundwater seepage into borehole or excavation noted during drilling or excavation.
Samples	**D**	Small disturbed bag sample taken between the depths indicated by lines.
	B	Bulk disturbed sample taken between the depths indicated by lines.
	U	Undisturbed 50mm diameter tube sample taken between the depths indicated by lines
Field Tests	**N=17 4, 7, 10**	Standard Penetration Test (S.P.T.) performed between depths indicated by lines. Individual figures show blows per 150mm penetration driven by SPT hammer.
	N_c 5 7 3	Dynamic Cone Penetration Test performed between depths indicated by lines. Individual figures show blows per 100mm penetration for 60 degree solid cone driven by 9 kg hammer.
Moisture Condition (Clay or Silt based)	**MC>PL**	Moisture content estimated to be greater than plastic limit.
	MC=PL	Moisture content estimated to be approx. equal to plastic limit.
	MC<PL	Moisture content estimated to be less than plastic limit.
Moisture Condition (Gravel or Sand based)	**D**	DRY – runs freely through fingers.
	M	MOIST – does not run freely but no free water visible on soil surface.
	W	WET – free water visible on soil surface.
Consistency (Clay or Silt based)	**VS**	VERY SOFT – unconfined compressive strength less than 25kPa.
	S	SOFT – unconfined compressive strength 25-50 kPa.
	F	FIRM – unconfined compressive strength 50-100kPa.
	St.	STIFF – unconfined compressive strength 100-200kPa.
	VSt.	VERY STIFF – unconfined compressive strength 200-400kPa.
	H	HARD – unconfined compressive strength greater than 400kPa.

Relative Density (Gravel or Sand based)		**Description**	**Density Index Range % S.P.T.**	**'N' Value Range Blows/300mm**
	VL	VERY LOOSE	<15	0-5
	L	LOOSE	15-35	6-10
	MD	MEDIUM DENSE	35-65	11-30
	D	DENSE	65-85	31-60
	VD	VERY DENSE	>85	>60

Hand Penetrometer Readings	**300 250 280**	Numbers indicate individual test results in kPa on representative undisturbed material unless noted otherwise.
Laboratory Test	**L.S. %**	Linear Shrinkage (As per TfNSW Method T113)
	M.C. %	Field Moisture Content (As per Australian Standard AS1289.2.1.1 or TfNSW Method T120)
	I_{ss}	Shrink-Swell Index (As per Australian Standard AS1289.7.1.1)
Remarks	**'V' bit**	Hardened steel 'V' shaped bit.
	'TC' bit	Tungsten Carbide wing bit.
	T^{60}	Penetration of auger string in mm under static load of rig rear axle without rotation of augers.

Piezometer Construction	**Fill**		**Piezometer**	
		Bentonite		Solid Pipe
		Washed Fine Graded Gravel		Slotted Screen

APPENDIX C

DYNAMIC CONE PENETROMETER TEST REPORTS

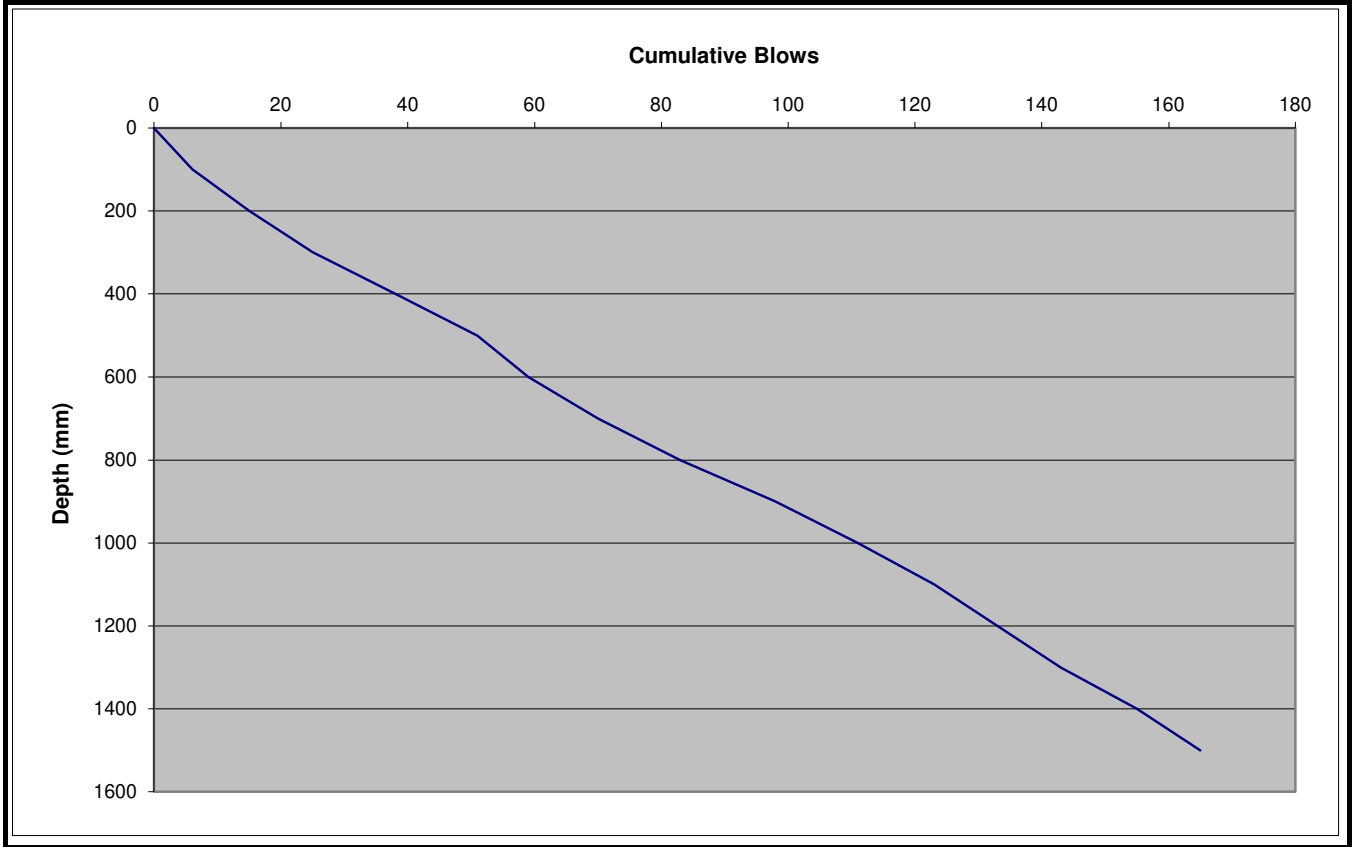
Aitken Rowe Testing Laboratories Pty Ltd

ARTL Wagga: 4/2 Riedell Street, Wagga Wagga NSW 2650

DYNAMIC CONE PENETROMETER REPORT

CLIENT: JBS&G - SYDNEY, NSW	PAGE: 1 OF: 15 ***DCP: 1 (BH1)***
PROJECT: GEOTECHNICAL INVESTIGATION & PAVEMENT DESIGN	REGISTRATION NO: **S22-348**
PROPOSED WENTWORTH HEALTH SERVICE REDEVELOPMENT	DATE OF TEST: 9/08/2022
LOCATION: No. 24 HOSPITAL ROAD, WENTWORTH, NSW	DEPTH BELOW FSL (mm): NIL
SOIL DESCRIPTION: REFER TO BOREHOLE LOGS & MATERIALS SCHEDULE & LOG	MOISTURE CONDITION: REFER TO LOGS
DEPTH OF GROUND WATER TABLE IF INTERSECTED: N/A	TEST METHOD: AS 1289.6.3.2

Depth(m)	Blows	Est. CBR	Depth(m)	Blows	Est. CBR	Depth(m)	Blows	Est. CBR	Depth(m)	Blows	Est. CBR
0.0 - 0.1	6	12	1.5 - 1.6	END	*	3.0 - 3.1	*	*	4.5 - 4.6	*	*
0.1 - 0.2	9	20	1.6 - 1.7	*	*	3.1 - 3.2	*	*	4.6 - 4.7	*	*
0.2 - 0.3	10	23	1.7 - 1.8	*	*	3.2 - 3.3	*	*	4.7 - 4.8	*	*
0.3 - 0.4	13	32	1.8 - 1.9	*	*	3.3 - 3.4	*	*	4.8 - 4.9	*	*
0.4 - 0.5	13	32	1.9 - 2.0	*	*	3.4 - 3.5	*	*	4.9 - 5.0	*	*
0.5 - 0.6	8	17	2.0 - 2.1	*	*	3.5 - 3.6	*	*	5.0 - 5.1	*	*
0.6 - 0.7	11	25	2.1 - 2.2	*	*	3.6 - 3.7	*	*	5.1 - 5.2	*	*
0.7 - 0.8	13	32	2.2 - 2.3	*	*	3.7 - 3.8	*	*	5.2 - 5.3	*	*
0.8 - 0.9	15	38	2.3 - 2.4	*	*	3.8 - 3.9	*	*	5.3 - 5.4	*	*
0.9 - 1.0	13	32	2.4 - 2.5	*	*	3.9 - 4.0	*	*	5.4 - 5.5	*	*
1.0 - 1.1	12	28	2.5 - 2.6	*	*	4.0 - 4.1	*	*	5.5 - 5.6	*	*
1.1 - 1.2	10	23	2.6 - 2.7	*	*	4.1 - 4.2	*	*	5.6 - 5.7	*	*
1.2 - 1.3	10	23	2.7 - 2.8	*	*	4.2 - 4.3	*	*	5.7 - 5.8	*	*
1.3 - 1.4	12	28	2.8 - 2.9	*	*	4.3 - 4.4	*	*	5.8 - 5.9	*	*
1.4 - 1.5	10	23	2.9 - 3.0	*	*	4.4 - 4.5	*	*	5.9 - 6.0	*	*



NATA
WORLD RECOGNISED ACCREDITATION

Accredited for compliance with ISO/IEC 17025 - Testing.

ACCREDITATION NUMBER: 4679

REMARKS:

APPROVED SIGNATORY: Peter Forbes-Taber

DATE: 9/09/2022

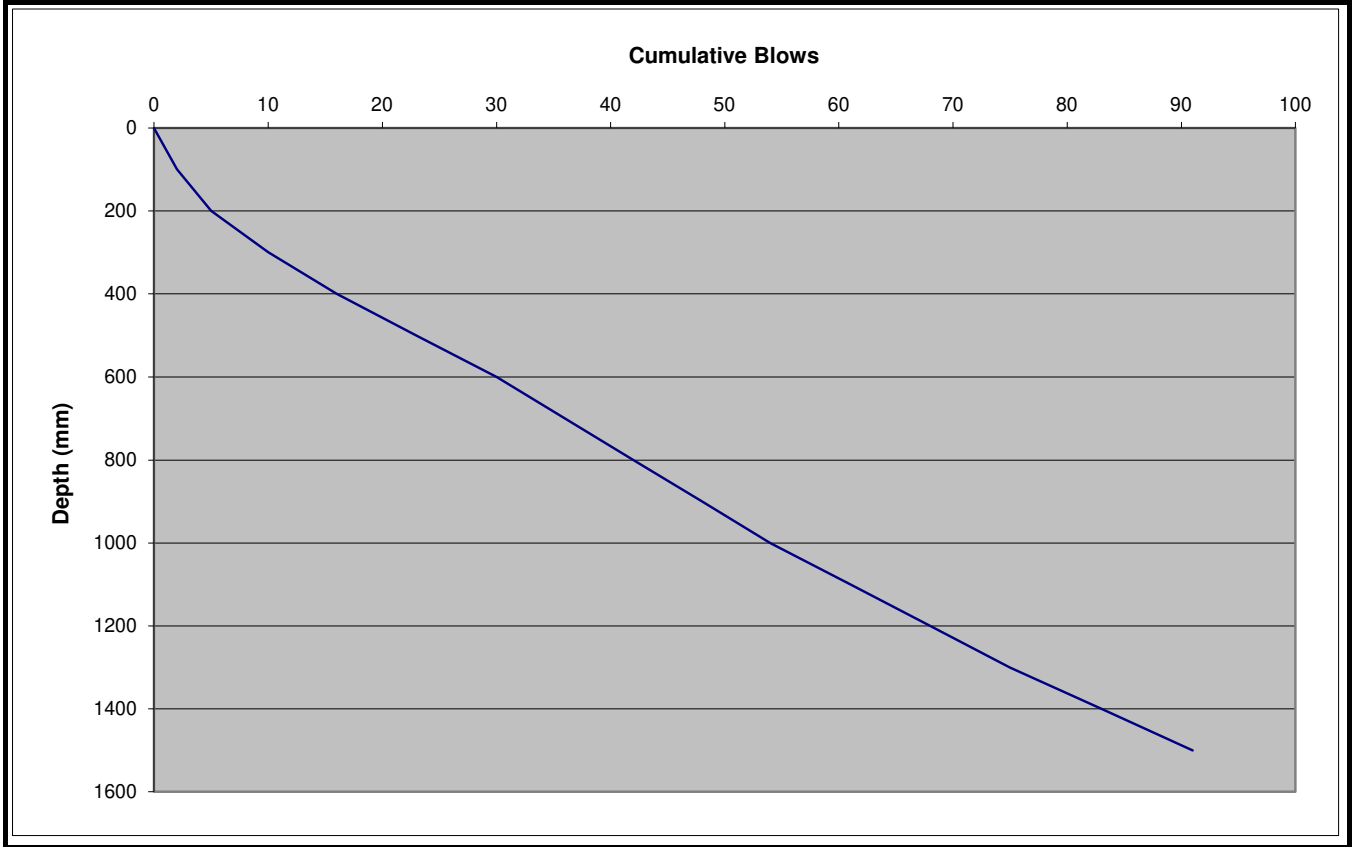
Aitken Rowe Testing Laboratories Pty Ltd

ARTL Wagga: 4/2 Riedell Street, Wagga Wagga NSW 2650

DYNAMIC CONE PENETROMETER REPORT

CLIENT: JBS&G - SYDNEY, NSW	PAGE: 2 OF: 15 ***DCP: 2 (BH2)***
PROJECT: GEOTECHNICAL INVESTIGATION & PAVEMENT DESIGN	REGISTRATION NO: **S22-348**
PROPOSED WENTWORTH HEALTH SERVICE REDEVELOPMENT	DATE OF TEST: 9/08/2022
LOCATION: No. 24 HOSPITAL ROAD, WENTWORTH, NSW	DEPTH BELOW FSL (mm): NIL
SOIL DESCRIPTION: REFER TO BOREHOLE LOGS & MATERIALS SCHEDULE & LOG	MOISTURE CONDITION: REFER TO LOGS
DEPTH OF GROUND WATER TABLE IF INTERSECTED: N/A	TEST METHOD: AS 1289.6.3.2

Depth(m)	Blows	Est. CBR	Depth(m)	Blows	Est. CBR	Depth(m)	Blows	Est. CBR	Depth(m)	Blows	Est. CBR
0.0 - 0.1	2	3	1.5 - 1.6	END	*	3.0 - 3.1	*	*	4.5 - 4.6	*	*
0.1 - 0.2	3	5	1.6 - 1.7	*	*	3.1 - 3.2	*	*	4.6 - 4.7	*	*
0.2 - 0.3	5	9	1.7 - 1.8	*	*	3.2 - 3.3	*	*	4.7 - 4.8	*	*
0.3 - 0.4	6	12	1.8 - 1.9	*	*	3.3 - 3.4	*	*	4.8 - 4.9	*	*
0.4 - 0.5	7	14	1.9 - 2.0	*	*	3.4 - 3.5	*	*	4.9 - 5.0	*	*
0.5 - 0.6	7	14	2.0 - 2.1	*	*	3.5 - 3.6	*	*	5.0 - 5.1	*	*
0.6 - 0.7	6	12	2.1 - 2.2	*	*	3.6 - 3.7	*	*	5.1 - 5.2	*	*
0.7 - 0.8	6	12	2.2 - 2.3	*	*	3.7 - 3.8	*	*	5.2 - 5.3	*	*
0.8 - 0.9	6	12	2.3 - 2.4	*	*	3.8 - 3.9	*	*	5.3 - 5.4	*	*
0.9 - 1.0	6	12	2.4 - 2.5	*	*	3.9 - 4.0	*	*	5.4 - 5.5	*	*
1.0 - 1.1	7	14	2.5 - 2.6	*	*	4.0 - 4.1	*	*	5.5 - 5.6	*	*
1.1 - 1.2	7	14	2.6 - 2.7	*	*	4.1 - 4.2	*	*	5.6 - 5.7	*	*
1.2 - 1.3	7	14	2.7 - 2.8	*	*	4.2 - 4.3	*	*	5.7 - 5.8	*	*
1.3 - 1.4	8	17	2.8 - 2.9	*	*	4.3 - 4.4	*	*	5.8 - 5.9	*	*
1.4 - 1.5	8	17	2.9 - 3.0	*	*	4.4 - 4.5	*	*	5.9 - 6.0	*	*



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ACCREDITATION NUMBER: 4679

REMARKS:

APPROVED SIGNATORY: Peter Forbes-Taber

DATE: 9/09/2022

Aitken Rowe Testing Laboratories Pty Ltd

ARTL Wagga: 4/2 Riedell Street, Wagga Wagga NSW 2650

DYNAMIC CONE PENETROMETER REPORT

CLIENT: JBS&G - SYDNEY, NSW

PROJECT: GEOTECHNICAL INVESTIGATION & PAVEMENT DESIGN
PROPOSED WENTWORTH HEALTH SERVICE REDEVELOPMENT

LOCATION: No. 24 HOSPITAL ROAD, WENTWORTH, NSW

SOIL DESCRIPTION: REFER TO BOREHOLE LOGS & MATERIALS SCHEDULE & LOG

DEPTH OF GROUND WATER TABLE IF INTERSECTED: N/A

PAGE: 3 OF: 15 ***DCP: 3 (BH3)***

REGISTRATION NO: **S22-348**

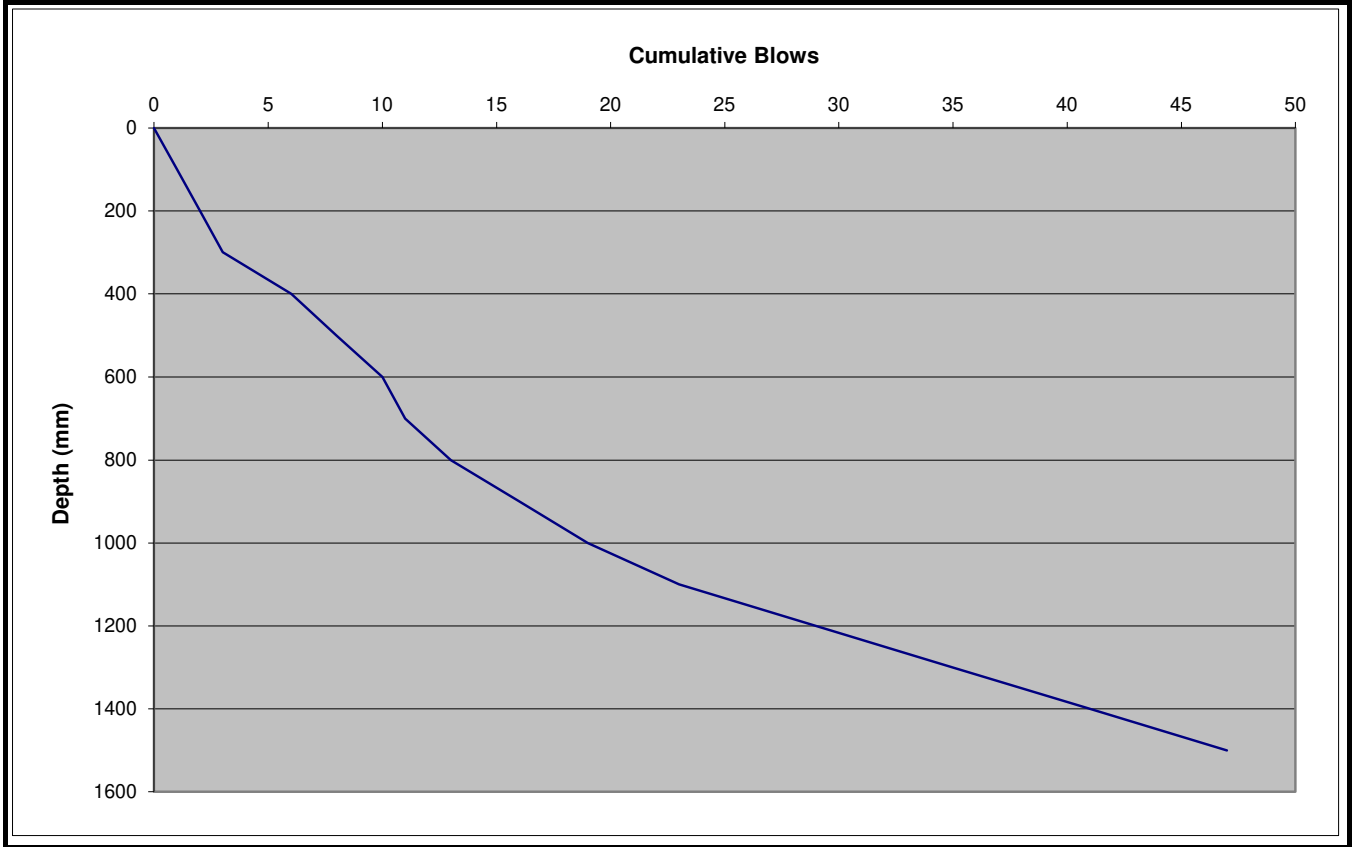
DATE OF TEST: 10/08/2022

DEPTH BELOW FSL (mm): NIL

MOISTURE CONDITION: REFER TO LOGS

TEST METHOD: AS 1289.6.3.2

Depth(m)	Blows	Est. CBR	Depth(m)	Blows	Est. CBR	Depth(m)	Blows	Est. CBR	Depth(m)	Blows	Est. CBR
0.0 - 0.1	1	1	1.5 - 1.6	END	*	3.0 - 3.1	*	*	4.5 - 4.6	*	*
0.1 - 0.2	1	1	1.6 - 1.7	*	*	3.1 - 3.2	*	*	4.6 - 4.7	*	*
0.2 - 0.3	1	1	1.7 - 1.8	*	*	3.2 - 3.3	*	*	4.7 - 4.8	*	*
0.3 - 0.4	3	5	1.8 - 1.9	*	*	3.3 - 3.4	*	*	4.8 - 4.9	*	*
0.4 - 0.5	2	3	1.9 - 2.0	*	*	3.4 - 3.5	*	*	4.9 - 5.0	*	*
0.5 - 0.6	2	3	2.0 - 2.1	*	*	3.5 - 3.6	*	*	5.0 - 5.1	*	*
0.6 - 0.7	1	1	2.1 - 2.2	*	*	3.6 - 3.7	*	*	5.1 - 5.2	*	*
0.7 - 0.8	2	3	2.2 - 2.3	*	*	3.7 - 3.8	*	*	5.2 - 5.3	*	*
0.8 - 0.9	3	5	2.3 - 2.4	*	*	3.8 - 3.9	*	*	5.3 - 5.4	*	*
0.9 - 1.0	3	5	2.4 - 2.5	*	*	3.9 - 4.0	*	*	5.4 - 5.5	*	*
1.0 - 1.1	4	7	2.5 - 2.6	*	*	4.0 - 4.1	*	*	5.5 - 5.6	*	*
1.1 - 1.2	6	12	2.6 - 2.7	*	*	4.1 - 4.2	*	*	5.6 - 5.7	*	*
1.2 - 1.3	6	12	2.7 - 2.8	*	*	4.2 - 4.3	*	*	5.7 - 5.8	*	*
1.3 - 1.4	6	12	2.8 - 2.9	*	*	4.3 - 4.4	*	*	5.8 - 5.9	*	*
1.4 - 1.5	6	12	2.9 - 3.0	*	*	4.4 - 4.5	*	*	5.9 - 6.0	*	*



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ACCREDITATION NUMBER: 4679

REMARKS:

APPROVED SIGNATORY: Peter Forbes-Taber

DATE: 9/09/2022

Aitken Rowe Testing Laboratories Pty Ltd

ARTL Wagga: 4/2 Riedell Street, Wagga Wagga NSW 2650

DYNAMIC CONE PENETROMETER REPORT

CLIENT: JBS&G - SYDNEY, NSW

PROJECT: GEOTECHNICAL INVESTIGATION & PAVEMENT DESIGN
PROPOSED WENTWORTH HEALTH SERVICE REDEVELOPMENT

LOCATION: No. 24 HOSPITAL ROAD, WENTWORTH, NSW

SOIL DESCRIPTION: REFER TO BOREHOLE LOGS & MATERIALS SCHEDULE & LOG

DEPTH OF GROUND WATER TABLE IF INTERSECTED: N/A

PAGE: 4 OF: 15 ***DCP: 4 (BH4)***

REGISTRATION NO: **S22-348**

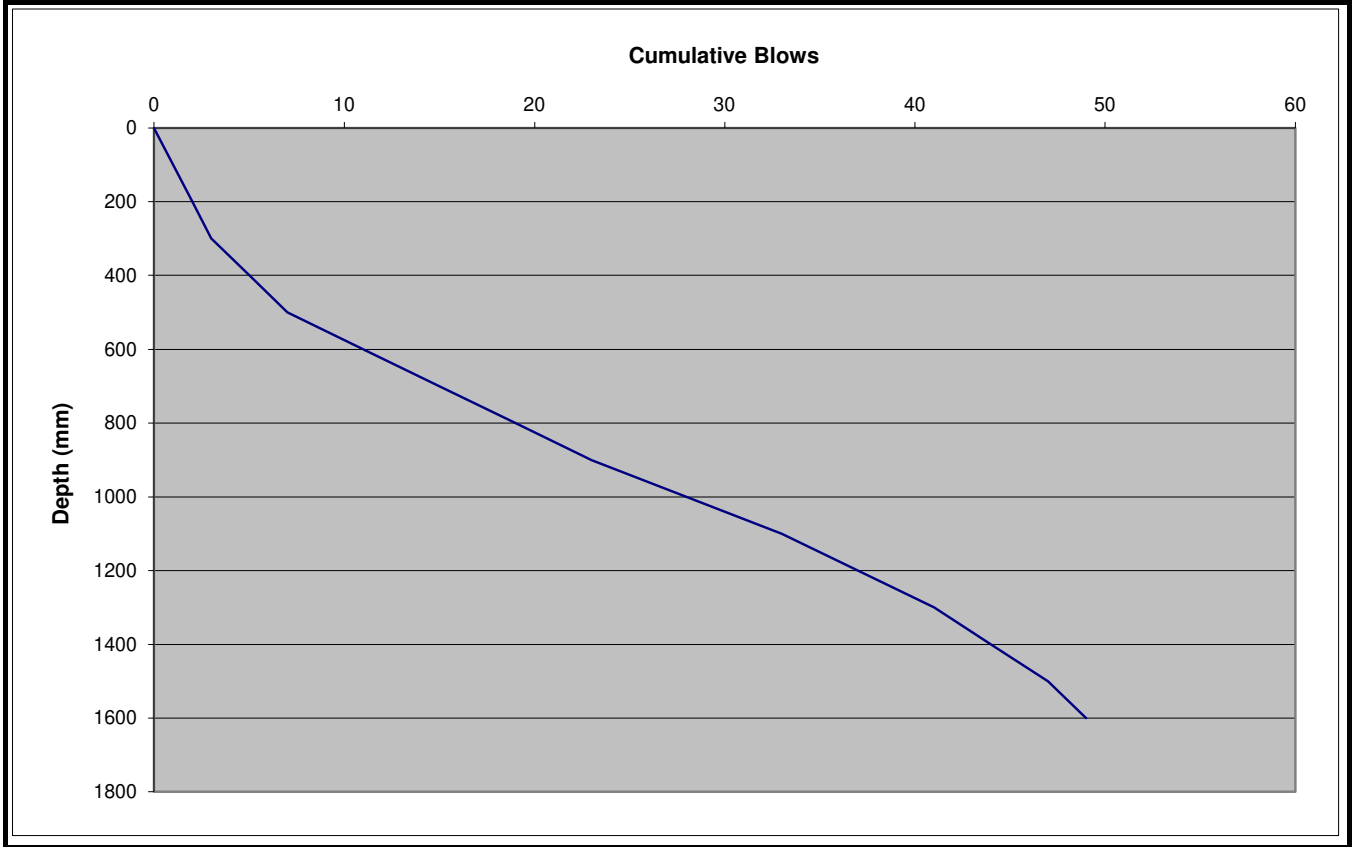
DATE OF TEST: 10/08/2022

DEPTH BELOW FSL (mm): NIL

MOISTURE CONDITION: REFER TO LOGS

TEST METHOD: AS 1289.6.3.2

Depth(m)	Blows	Est. CBR	Depth(m)	Blows	Est. CBR	Depth(m)	Blows	Est. CBR	Depth(m)	Blows	Est. CBR
0.0 - 0.1	1	1	1.5 - 1.6	2	3	3.0 - 3.1	*	*	4.5 - 4.6	*	*
0.1 - 0.2	1	1	1.6 - 1.7	ENND	*	3.1 - 3.2	*	*	4.6 - 4.7	*	*
0.2 - 0.3	1	1	1.7 - 1.8	*	*	3.2 - 3.3	*	*	4.7 - 4.8	*	*
0.3 - 0.4	2	3	1.8 - 1.9	*	*	3.3 - 3.4	*	*	4.8 - 4.9	*	*
0.4 - 0.5	2	3	1.9 - 2.0	*	*	3.4 - 3.5	*	*	4.9 - 5.0	*	*
0.5 - 0.6	4	7	2.0 - 2.1	*	*	3.5 - 3.6	*	*	5.0 - 5.1	*	*
0.6 - 0.7	4	7	2.1 - 2.2	*	*	3.6 - 3.7	*	*	5.1 - 5.2	*	*
0.7 - 0.8	4	7	2.2 - 2.3	*	*	3.7 - 3.8	*	*	5.2 - 5.3	*	*
0.8 - 0.9	4	7	2.3 - 2.4	*	*	3.8 - 3.9	*	*	5.3 - 5.4	*	*
0.9 - 1.0	5	9	2.4 - 2.5	*	*	3.9 - 4.0	*	*	5.4 - 5.5	*	*
1.0 - 1.1	5	9	2.5 - 2.6	*	*	4.0 - 4.1	*	*	5.5 - 5.6	*	*
1.1 - 1.2	4	7	2.6 - 2.7	*	*	4.1 - 4.2	*	*	5.6 - 5.7	*	*
1.2 - 1.3	4	7	2.7 - 2.8	*	*	4.2 - 4.3	*	*	5.7 - 5.8	*	*
1.3 - 1.4	3	5	2.8 - 2.9	*	*	4.3 - 4.4	*	*	5.8 - 5.9	*	*
1.4 - 1.5	3	5	2.9 - 3.0	*	*	4.4 - 4.5	*	*	5.9 - 6.0	*	*



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ACCREDITATION NUMBER: 4679

REMARKS:

APPROVED SIGNATORY: Peter Forbes-Taber

DATE: 9/09/2022

Aitken Rowe Testing Laboratories Pty Ltd

ARTL Wagga: 4/2 Riedell Street, Wagga Wagga NSW 2650

DYNAMIC CONE PENETROMETER REPORT

CLIENT: JBS&G - SYDNEY, NSW

PROJECT: GEOTECHNICAL INVESTIGATION & PAVEMENT DESIGN
PROPOSED WENTWORTH HEALTH SERVICE REDEVELOPMENT

LOCATION: No. 24 HOSPITAL ROAD, WENTWORTH, NSW

SOIL DESCRIPTION: REFER TO BOREHOLE LOGS & MATERIALS SCHEDULE & LOG

DEPTH OF GROUND WATER TABLE IF INTERSECTED: N/A

PAGE: 5 OF: 15 ***DCP: 5 (BH5)***

REGISTRATION NO: **S22-348**

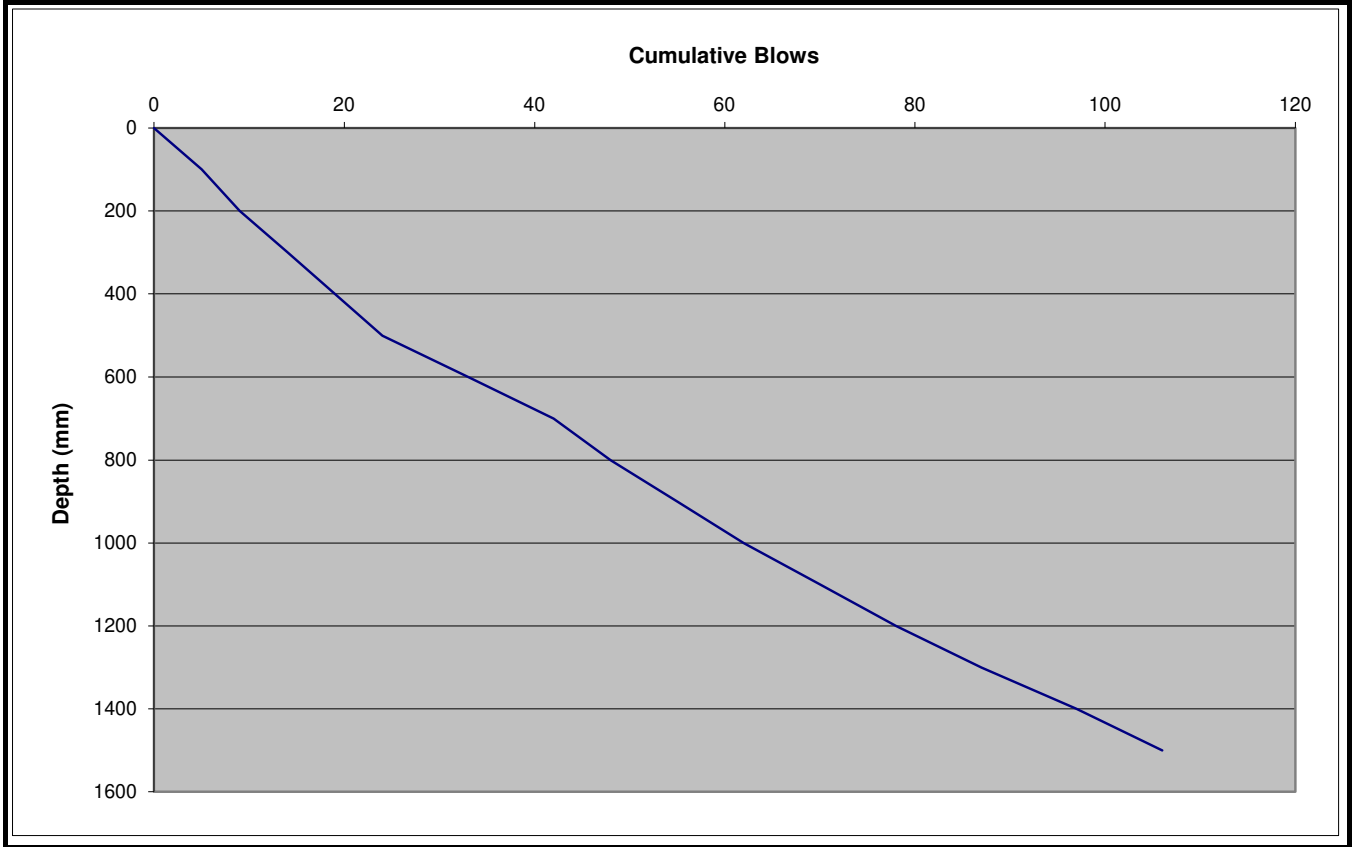
DATE OF TEST: 10/08/2022

DEPTH BELOW FSL (mm): NIL

MOISTURE CONDITION: REFER TO LOGS

TEST METHOD: AS 1289.6.3.2

Depth(m)	Blows	Est. CBR	Depth(m)	Blows	Est. CBR	Depth(m)	Blows	Est. CBR	Depth(m)	Blows	Est. CBR
0.0 - 0.1	5	9	1.5 - 1.6	END	*	3.0 - 3.1	*	*	4.5 - 4.6	*	*
0.1 - 0.2	4	7	1.6 - 1.7	*	*	3.1 - 3.2	*	*	4.6 - 4.7	*	*
0.2 - 0.3	5	9	1.7 - 1.8	*	*	3.2 - 3.3	*	*	4.7 - 4.8	*	*
0.3 - 0.4	5	9	1.8 - 1.9	*	*	3.3 - 3.4	*	*	4.8 - 4.9	*	*
0.4 - 0.5	5	9	1.9 - 2.0	*	*	3.4 - 3.5	*	*	4.9 - 5.0	*	*
0.5 - 0.6	9	20	2.0 - 2.1	*	*	3.5 - 3.6	*	*	5.0 - 5.1	*	*
0.6 - 0.7	9	20	2.1 - 2.2	*	*	3.6 - 3.7	*	*	5.1 - 5.2	*	*
0.7 - 0.8	6	12	2.2 - 2.3	*	*	3.7 - 3.8	*	*	5.2 - 5.3	*	*
0.8 - 0.9	7	14	2.3 - 2.4	*	*	3.8 - 3.9	*	*	5.3 - 5.4	*	*
0.9 - 1.0	7	14	2.4 - 2.5	*	*	3.9 - 4.0	*	*	5.4 - 5.5	*	*
1.0 - 1.1	8	17	2.5 - 2.6	*	*	4.0 - 4.1	*	*	5.5 - 5.6	*	*
1.1 - 1.2	8	17	2.6 - 2.7	*	*	4.1 - 4.2	*	*	5.6 - 5.7	*	*
1.2 - 1.3	9	20	2.7 - 2.8	*	*	4.2 - 4.3	*	*	5.7 - 5.8	*	*
1.3 - 1.4	10	23	2.8 - 2.9	*	*	4.3 - 4.4	*	*	5.8 - 5.9	*	*
1.4 - 1.5	9	20	2.9 - 3.0	*	*	4.4 - 4.5	*	*	5.9 - 6.0	*	*



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Accredited for compliance with ISO/IEC 17025 - Testing.

ACCREDITATION NUMBER: 4679

REMARKS:

APPROVED SIGNATORY: Peter Forbes-Taber

DATE: 9/09/2022

Aitken Rowe Testing Laboratories Pty Ltd

ARTL Wagga: 4/2 Riedell Street, Wagga Wagga NSW 2650

DYNAMIC CONE PENETROMETER REPORT

CLIENT: JBS&G - SYDNEY, NSW

PROJECT: GEOTECHNICAL INVESTIGATION & PAVEMENT DESIGN
PROPOSED WENTWORTH HEALTH SERVICE REDEVELOPMENT

LOCATION: No. 24 HOSPITAL ROAD, WENTWORTH, NSW

SOIL DESCRIPTION: REFER TO BOREHOLE LOGS & MATERIALS SCHEDULE & LOG

DEPTH OF GROUND WATER TABLE IF INTERSECTED: N/A

PAGE: 6 OF: 15 ***DCP: 6 (BH6)***

REGISTRATION NO: **S22-348**

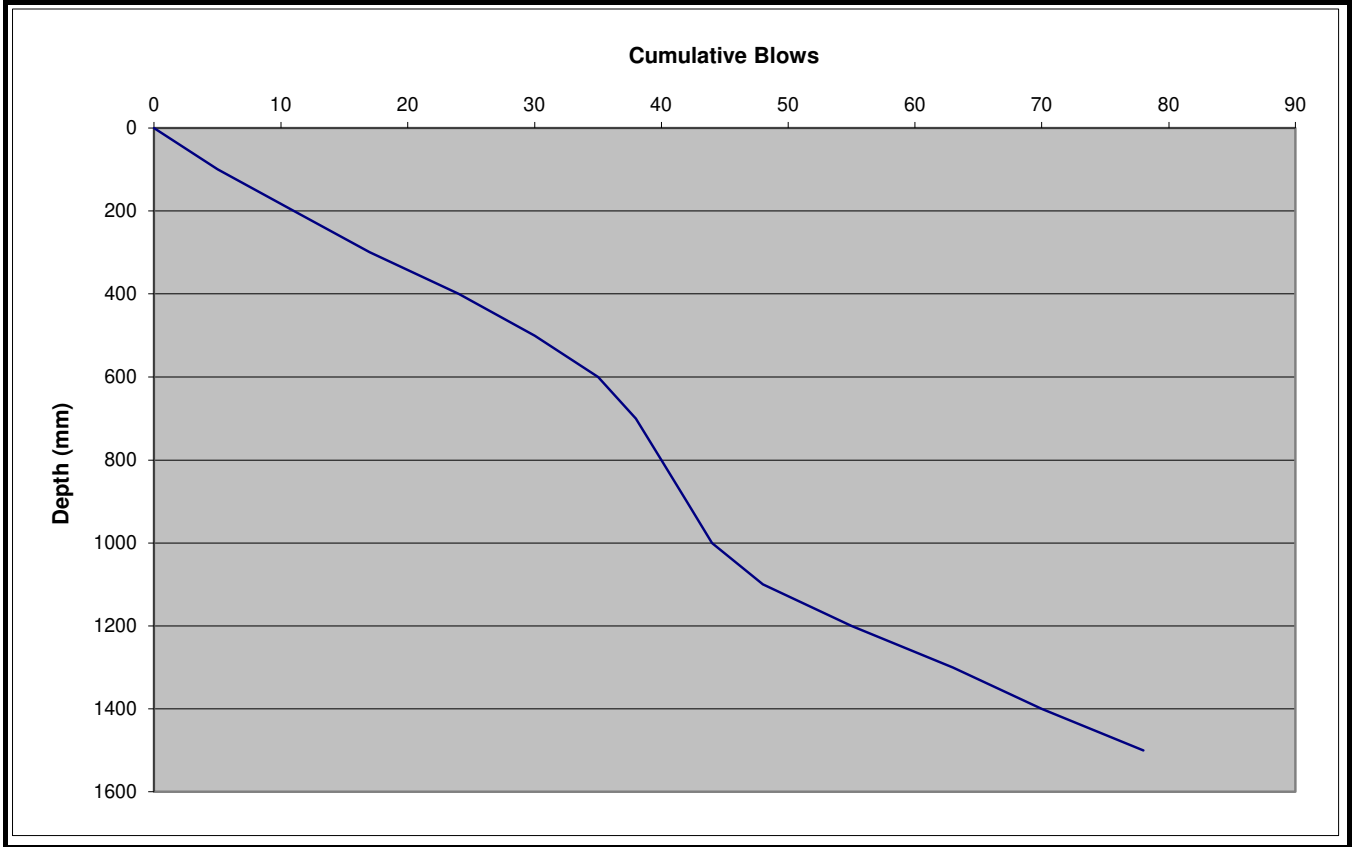
DATE OF TEST: 10/08/2022

DEPTH BELOW FSL (mm): NIL

MOISTURE CONDITION: REFER TO LOGS

TEST METHOD: AS 1289.6.3.2

Depth(m)	Blows	Est. CBR	Depth(m)	Blows	Est. CBR	Depth(m)	Blows	Est. CBR	Depth(m)	Blows	Est. CBR
0.0 - 0.1	5	9	1.5 - 1.6	END	*	3.0 - 3.1	*	*	4.5 - 4.6	*	*
0.1 - 0.2	6	12	1.6 - 1.7	*	*	3.1 - 3.2	*	*	4.6 - 4.7	*	*
0.2 - 0.3	6	12	1.7 - 1.8	*	*	3.2 - 3.3	*	*	4.7 - 4.8	*	*
0.3 - 0.4	7	14	1.8 - 1.9	*	*	3.3 - 3.4	*	*	4.8 - 4.9	*	*
0.4 - 0.5	6	12	1.9 - 2.0	*	*	3.4 - 3.5	*	*	4.9 - 5.0	*	*
0.5 - 0.6	5	9	2.0 - 2.1	*	*	3.5 - 3.6	*	*	5.0 - 5.1	*	*
0.6 - 0.7	3	5	2.1 - 2.2	*	*	3.6 - 3.7	*	*	5.1 - 5.2	*	*
0.7 - 0.8	2	3	2.2 - 2.3	*	*	3.7 - 3.8	*	*	5.2 - 5.3	*	*
0.8 - 0.9	2	3	2.3 - 2.4	*	*	3.8 - 3.9	*	*	5.3 - 5.4	*	*
0.9 - 1.0	2	3	2.4 - 2.5	*	*	3.9 - 4.0	*	*	5.4 - 5.5	*	*
1.0 - 1.1	4	7	2.5 - 2.6	*	*	4.0 - 4.1	*	*	5.5 - 5.6	*	*
1.1 - 1.2	7	14	2.6 - 2.7	*	*	4.1 - 4.2	*	*	5.6 - 5.7	*	*
1.2 - 1.3	8	17	2.7 - 2.8	*	*	4.2 - 4.3	*	*	5.7 - 5.8	*	*
1.3 - 1.4	7	14	2.8 - 2.9	*	*	4.3 - 4.4	*	*	5.8 - 5.9	*	*
1.4 - 1.5	8	17	2.9 - 3.0	*	*	4.4 - 4.5	*	*	5.9 - 6.0	*	*



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WORLD RECOGNISED ACCREDITATION

Accredited for compliance with ISO/IEC 17025 - Testing.

ACCREDITATION NUMBER: 4679

REMARKS:

APPROVED SIGNATORY: Peter Forbes-Taber

DATE: 9/09/2022

Aitken Rowe Testing Laboratories Pty Ltd

ARTL Wagga: 4/2 Riedell Street, Wagga Wagga NSW 2650

DYNAMIC CONE PENETROMETER REPORT

CLIENT: JBS&G - SYDNEY, NSW

PROJECT: GEOTECHNICAL INVESTIGATION & PAVEMENT DESIGN
PROPOSED WENTWORTH HEALTH SERVICE REDEVELOPMENT

LOCATION: No. 24 HOSPITAL ROAD, WENTWORTH, NSW

SOIL DESCRIPTION: REFER TO BOREHOLE LOGS & MATERIALS SCHEDULE & LOG

DEPTH OF GROUND WATER TABLE IF INTERSECTED: N/A

PAGE: 7 OF: 15 ***DCP: 7 (BH7)***

REGISTRATION NO: **S22-348**

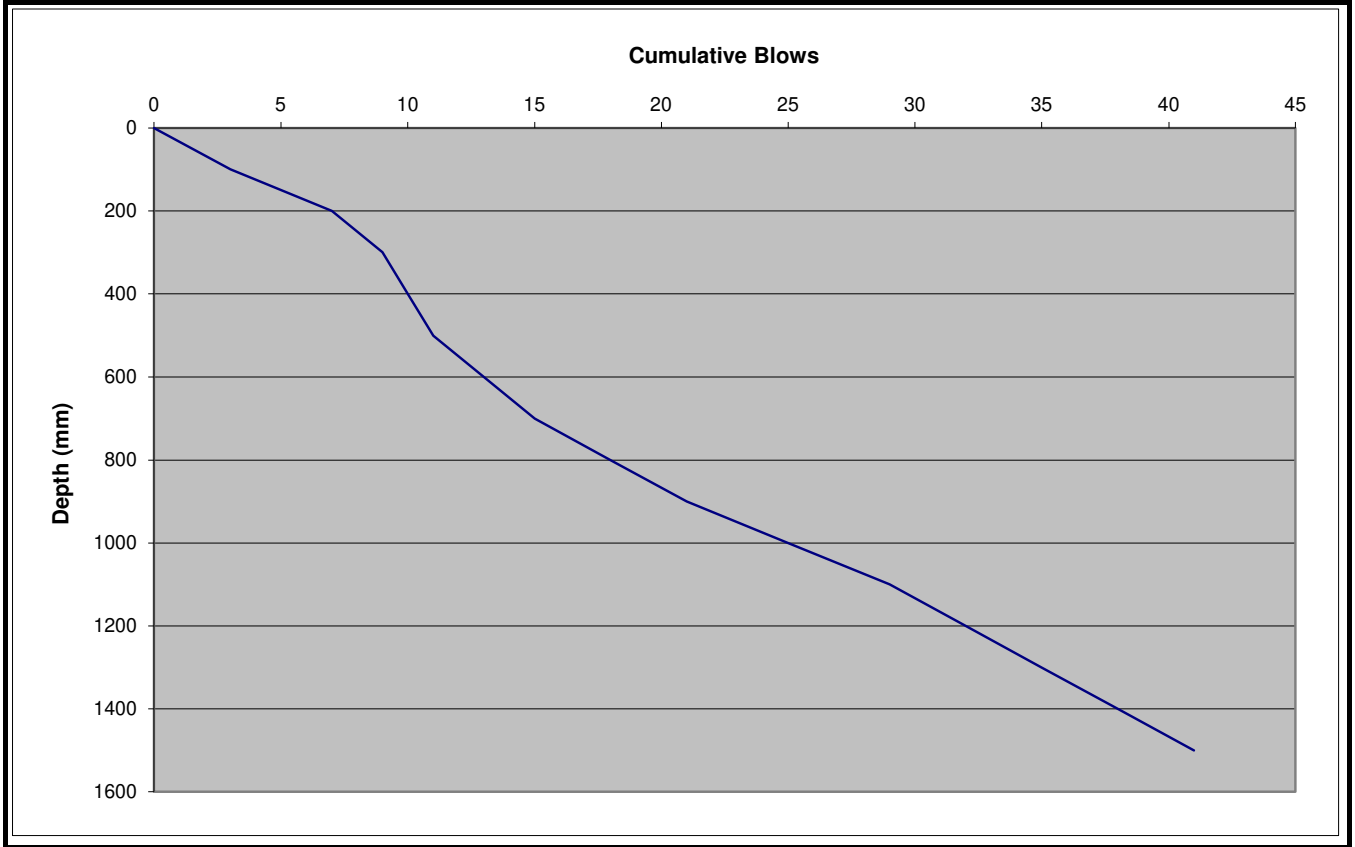
DATE OF TEST: 9/08/2022

DEPTH BELOW FSL (mm): NIL

MOISTURE CONDITION: REFER TO LOGS

TEST METHOD: AS 1289.6.3.2

Depth(m)	Blows	Est. CBR	Depth(m)	Blows	Est. CBR	Depth(m)	Blows	Est. CBR	Depth(m)	Blows	Est. CBR
0.0 - 0.1	3	5	1.5 - 1.6	END	*	3.0 - 3.1	*	*	4.5 - 4.6	*	*
0.1 - 0.2	4	7	1.6 - 1.7	*	*	3.1 - 3.2	*	*	4.6 - 4.7	*	*
0.2 - 0.3	2	3	1.7 - 1.8	*	*	3.2 - 3.3	*	*	4.7 - 4.8	*	*
0.3 - 0.4	1	1	1.8 - 1.9	*	*	3.3 - 3.4	*	*	4.8 - 4.9	*	*
0.4 - 0.5	1	1	1.9 - 2.0	*	*	3.4 - 3.5	*	*	4.9 - 5.0	*	*
0.5 - 0.6	2	3	2.0 - 2.1	*	*	3.5 - 3.6	*	*	5.0 - 5.1	*	*
0.6 - 0.7	2	3	2.1 - 2.2	*	*	3.6 - 3.7	*	*	5.1 - 5.2	*	*
0.7 - 0.8	3	5	2.2 - 2.3	*	*	3.7 - 3.8	*	*	5.2 - 5.3	*	*
0.8 - 0.9	3	5	2.3 - 2.4	*	*	3.8 - 3.9	*	*	5.3 - 5.4	*	*
0.9 - 1.0	4	7	2.4 - 2.5	*	*	3.9 - 4.0	*	*	5.4 - 5.5	*	*
1.0 - 1.1	4	7	2.5 - 2.6	*	*	4.0 - 4.1	*	*	5.5 - 5.6	*	*
1.1 - 1.2	3	5	2.6 - 2.7	*	*	4.1 - 4.2	*	*	5.6 - 5.7	*	*
1.2 - 1.3	3	5	2.7 - 2.8	*	*	4.2 - 4.3	*	*	5.7 - 5.8	*	*
1.3 - 1.4	3	5	2.8 - 2.9	*	*	4.3 - 4.4	*	*	5.8 - 5.9	*	*
1.4 - 1.5	3	5	2.9 - 3.0	*	*	4.4 - 4.5	*	*	5.9 - 6.0	*	*



NATA
WORLD RECOGNISED ACCREDITATION

Accredited for compliance with ISO/IEC 17025 - Testing.

ACCREDITATION NUMBER: 4679

REMARKS:

APPROVED SIGNATORY: Peter Forbes-Taber

DATE: 9/09/2022

Aitken Rowe Testing Laboratories Pty Ltd

ARTL Wagga: 4/2 Riedell Street, Wagga Wagga NSW 2650

DYNAMIC CONE PENETROMETER REPORT

CLIENT: JBS&G - SYDNEY, NSW

PROJECT: GEOTECHNICAL INVESTIGATION & PAVEMENT DESIGN
PROPOSED WENTWORTH HEALTH SERVICE REDEVELOPMENT

LOCATION: No. 24 HOSPITAL ROAD, WENTWORTH, NSW

SOIL DESCRIPTION: REFER TO BOREHOLE LOGS & MATERIALS SCHEDULE & LOG

DEPTH OF GROUND WATER TABLE IF INTERSECTED: N/A

PAGE: 8 OF: 15 ***DCP: 8 (BH8)***

REGISTRATION NO: **S22-348**

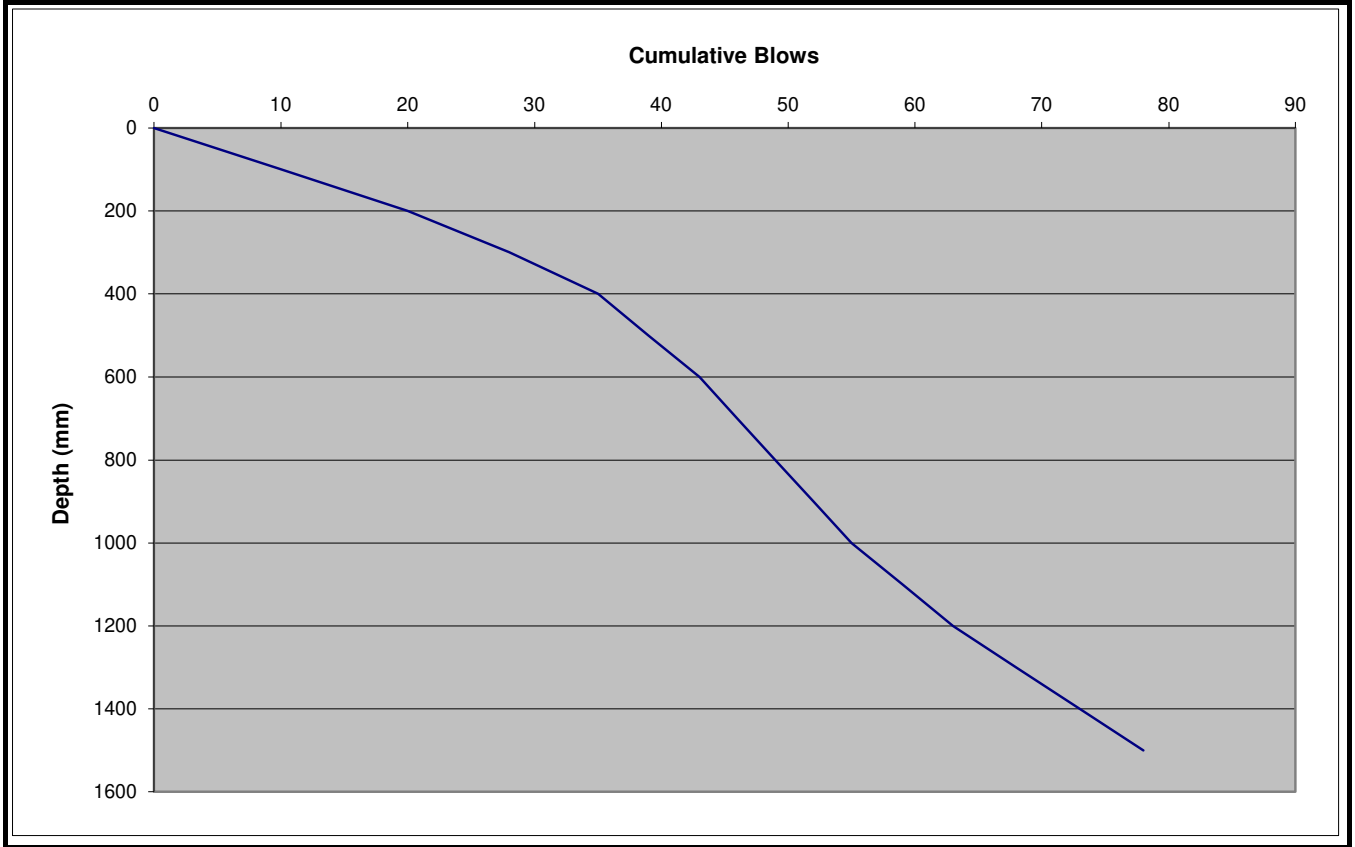
DATE OF TEST: 11/08/2022

DEPTH BELOW FSL (mm): NIL

MOISTURE CONDITION: REFER TO LOGS

TEST METHOD: AS 1289.6.3.2

Depth(m)	Blows	Est. CBR	Depth(m)	Blows	Est. CBR	Depth(m)	Blows	Est. CBR	Depth(m)	Blows	Est. CBR
0.0 - 0.1	10	23	1.5 - 1.6	END	*	3.0 - 3.1	*	*	4.5 - 4.6	*	*
0.1 - 0.2	10	23	1.6 - 1.7	*	*	3.1 - 3.2	*	*	4.6 - 4.7	*	*
0.2 - 0.3	8	17	1.7 - 1.8	*	*	3.2 - 3.3	*	*	4.7 - 4.8	*	*
0.3 - 0.4	7	14	1.8 - 1.9	*	*	3.3 - 3.4	*	*	4.8 - 4.9	*	*
0.4 - 0.5	4	7	1.9 - 2.0	*	*	3.4 - 3.5	*	*	4.9 - 5.0	*	*
0.5 - 0.6	4	7	2.0 - 2.1	*	*	3.5 - 3.6	*	*	5.0 - 5.1	*	*
0.6 - 0.7	3	5	2.1 - 2.2	*	*	3.6 - 3.7	*	*	5.1 - 5.2	*	*
0.7 - 0.8	3	5	2.2 - 2.3	*	*	3.7 - 3.8	*	*	5.2 - 5.3	*	*
0.8 - 0.9	3	5	2.3 - 2.4	*	*	3.8 - 3.9	*	*	5.3 - 5.4	*	*
0.9 - 1.0	3	5	2.4 - 2.5	*	*	3.9 - 4.0	*	*	5.4 - 5.5	*	*
1.0 - 1.1	4	7	2.5 - 2.6	*	*	4.0 - 4.1	*	*	5.5 - 5.6	*	*
1.1 - 1.2	4	7	2.6 - 2.7	*	*	4.1 - 4.2	*	*	5.6 - 5.7	*	*
1.2 - 1.3	5	9	2.7 - 2.8	*	*	4.2 - 4.3	*	*	5.7 - 5.8	*	*
1.3 - 1.4	5	9	2.8 - 2.9	*	*	4.3 - 4.4	*	*	5.8 - 5.9	*	*
1.4 - 1.5	5	9	2.9 - 3.0	*	*	4.4 - 4.5	*	*	5.9 - 6.0	*	*



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WORLD RECOGNISED ACCREDITATION

Accredited for compliance with ISO/IEC 17025 - Testing.

ACCREDITATION NUMBER: 4679

REMARKS:

APPROVED SIGNATORY: Peter Forbes-Taber

DATE: 9/09/2022

Aitken Rowe Testing Laboratories Pty Ltd

ARTL Wagga: 4/2 Riedell Street, Wagga Wagga NSW 2650

DYNAMIC CONE PENETROMETER REPORT

CLIENT: JBS&G - SYDNEY, NSW

PROJECT: GEOTECHNICAL INVESTIGATION & PAVEMENT DESIGN
PROPOSED WENTWORTH HEALTH SERVICE REDEVELOPMENT

LOCATION: No. 24 HOSPITAL ROAD, WENTWORTH, NSW

SOIL DESCRIPTION: REFER TO BOREHOLE LOGS & MATERIALS SCHEDULE & LOG

DEPTH OF GROUND WATER TABLE IF INTERSECTED: N/A

PAGE: 9 OF: 15 ***DCP: 9 (BH9)***

REGISTRATION NO: **S22-348**

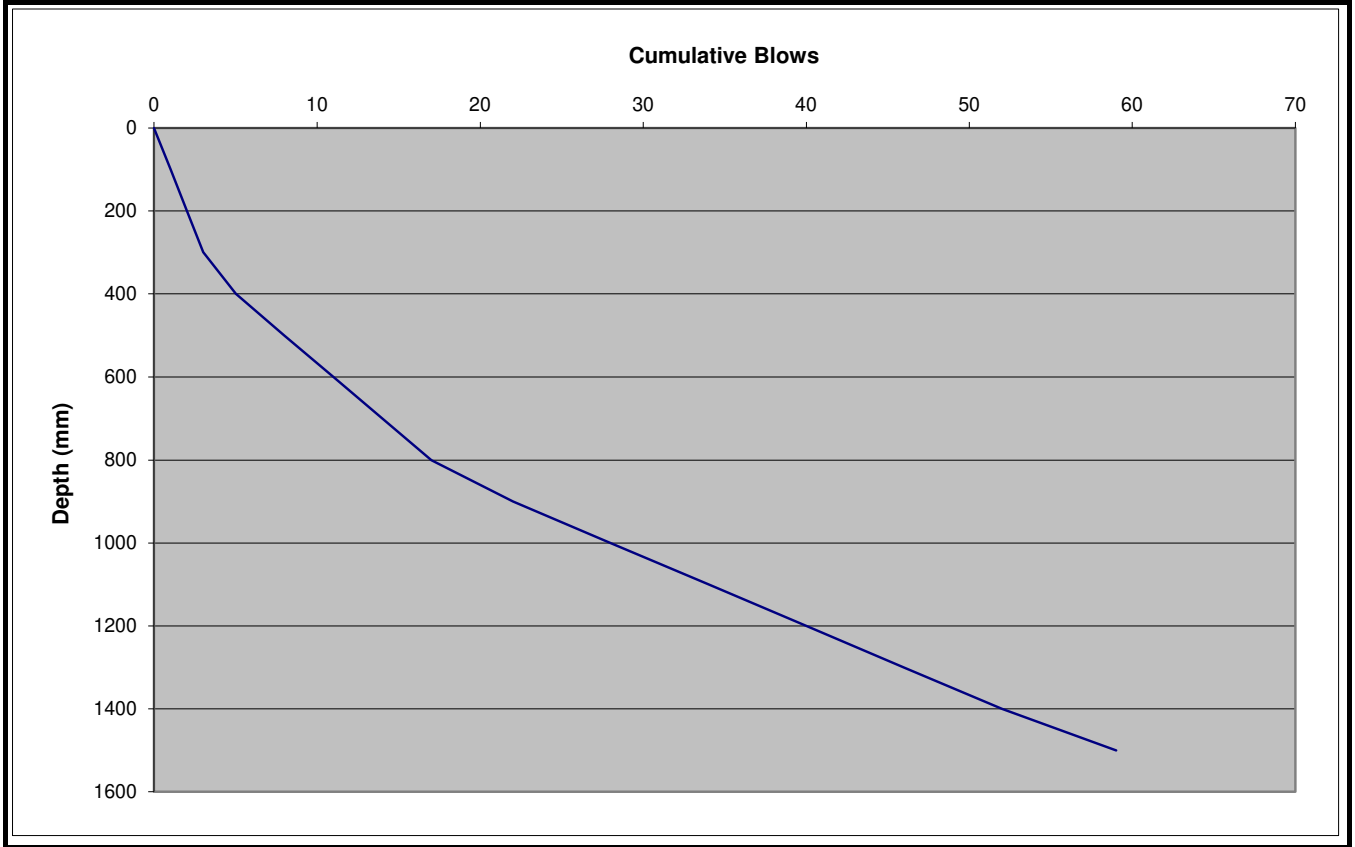
DATE OF TEST: 11/08/2022

DEPTH BELOW FSL (mm): NIL

MOISTURE CONDITION: REFER TO LOGS

TEST METHOD: AS 1289.6.3.2

Depth(m)	Blows	Est. CBR	Depth(m)	Blows	Est. CBR	Depth(m)	Blows	Est. CBR	Depth(m)	Blows	Est. CBR
0.0 - 0.1	1	1	1.5 - 1.6	END	*	3.0 - 3.1	*	*	4.5 - 4.6	*	*
0.1 - 0.2	1	1	1.6 - 1.7	*	*	3.1 - 3.2	*	*	4.6 - 4.7	*	*
0.2 - 0.3	1	1	1.7 - 1.8	*	*	3.2 - 3.3	*	*	4.7 - 4.8	*	*
0.3 - 0.4	2	3	1.8 - 1.9	*	*	3.3 - 3.4	*	*	4.8 - 4.9	*	*
0.4 - 0.5	3	5	1.9 - 2.0	*	*	3.4 - 3.5	*	*	4.9 - 5.0	*	*
0.5 - 0.6	3	5	2.0 - 2.1	*	*	3.5 - 3.6	*	*	5.0 - 5.1	*	*
0.6 - 0.7	3	5	2.1 - 2.2	*	*	3.6 - 3.7	*	*	5.1 - 5.2	*	*
0.7 - 0.8	3	5	2.2 - 2.3	*	*	3.7 - 3.8	*	*	5.2 - 5.3	*	*
0.8 - 0.9	5	9	2.3 - 2.4	*	*	3.8 - 3.9	*	*	5.3 - 5.4	*	*
0.9 - 1.0	6	12	2.4 - 2.5	*	*	3.9 - 4.0	*	*	5.4 - 5.5	*	*
1.0 - 1.1	6	12	2.5 - 2.6	*	*	4.0 - 4.1	*	*	5.5 - 5.6	*	*
1.1 - 1.2	6	12	2.6 - 2.7	*	*	4.1 - 4.2	*	*	5.6 - 5.7	*	*
1.2 - 1.3	6	12	2.7 - 2.8	*	*	4.2 - 4.3	*	*	5.7 - 5.8	*	*
1.3 - 1.4	6	12	2.8 - 2.9	*	*	4.3 - 4.4	*	*	5.8 - 5.9	*	*
1.4 - 1.5	7	14	2.9 - 3.0	*	*	4.4 - 4.5	*	*	5.9 - 6.0	*	*



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WORLD RECOGNISED ACCREDITATION

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ACCREDITATION NUMBER: 4679

REMARKS:

APPROVED SIGNATORY: Peter Forbes-Taber

DATE: 9/09/2022

Aitken Rowe Testing Laboratories Pty Ltd

ARTL Wagga: 4/2 Riedell Street, Wagga Wagga NSW 2650

DYNAMIC CONE PENETROMETER REPORT

CLIENT: JBS&G - SYDNEY, NSW

PROJECT: GEOTECHNICAL INVESTIGATION & PAVEMENT DESIGN
PROPOSED WENTWORTH HEALTH SERVICE REDEVELOPMENT

LOCATION: No. 24 HOSPITAL ROAD, WENTWORTH, NSW

SOIL DESCRIPTION: REFER TO BOREHOLE LOGS & MATERIALS SCHEDULE & LOG

DEPTH OF GROUND WATER TABLE IF INTERSECTED: N/A

PAGE: 10 OF: 15 ***DCP: 10 (BH10)***

REGISTRATION NO: **S22-348**

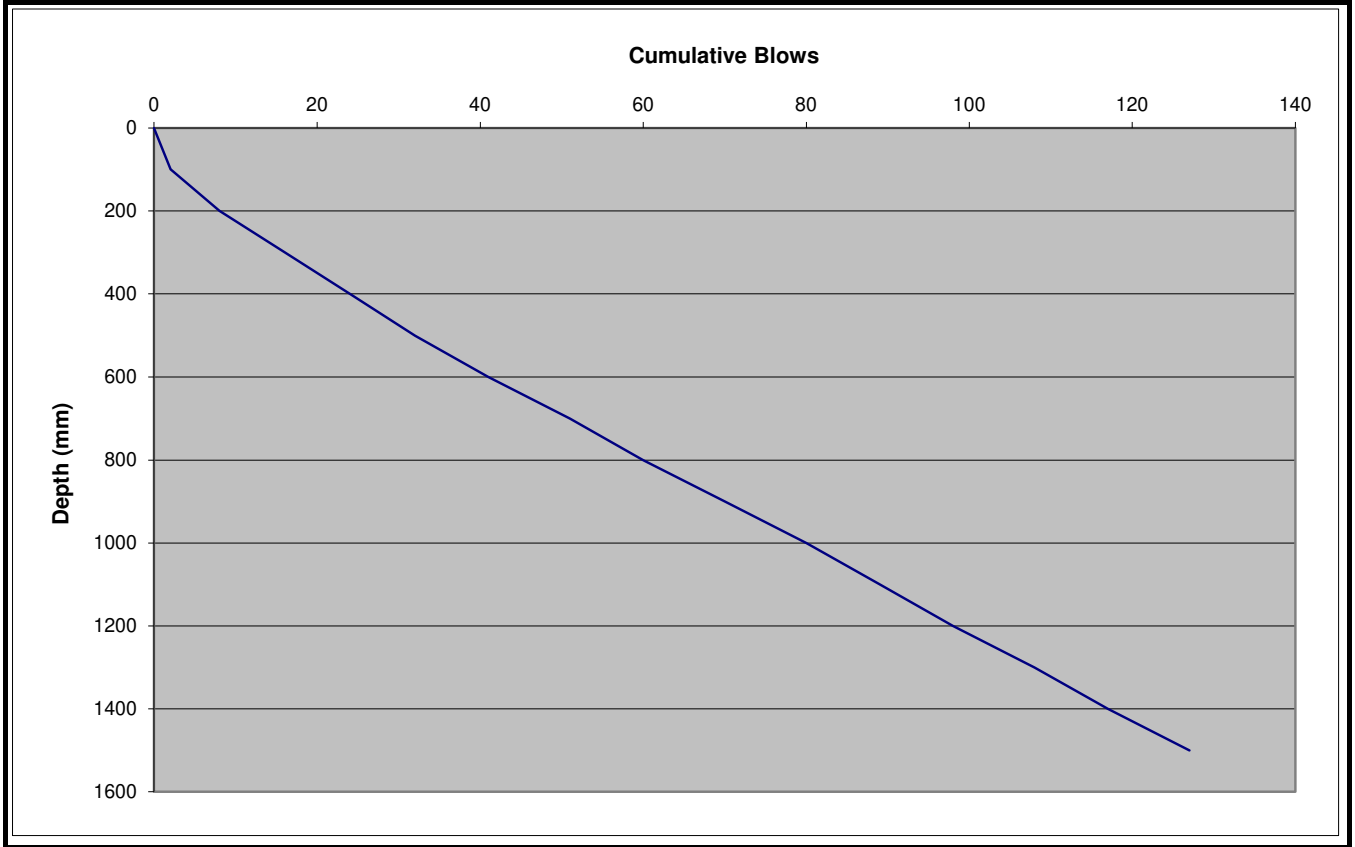
DATE OF TEST: 11/08/2022

DEPTH BELOW FSL (mm): NIL

MOISTURE CONDITION: REFER TO LOGS

TEST METHOD: AS 1289.6.3.2

Depth(m)	Blows	Est. CBR	Depth(m)	Blows	Est. CBR	Depth(m)	Blows	Est. CBR	Depth(m)	Blows	Est. CBR
0.0 - 0.1	2	3	1.5 - 1.6	END	*	3.0 - 3.1	*	*	4.5 - 4.6	*	*
0.1 - 0.2	6	12	1.6 - 1.7	*	*	3.1 - 3.2	*	*	4.6 - 4.7	*	*
0.2 - 0.3	8	17	1.7 - 1.8	*	*	3.2 - 3.3	*	*	4.7 - 4.8	*	*
0.3 - 0.4	8	17	1.8 - 1.9	*	*	3.3 - 3.4	*	*	4.8 - 4.9	*	*
0.4 - 0.5	8	17	1.9 - 2.0	*	*	3.4 - 3.5	*	*	4.9 - 5.0	*	*
0.5 - 0.6	9	20	2.0 - 2.1	*	*	3.5 - 3.6	*	*	5.0 - 5.1	*	*
0.6 - 0.7	10	23	2.1 - 2.2	*	*	3.6 - 3.7	*	*	5.1 - 5.2	*	*
0.7 - 0.8	9	20	2.2 - 2.3	*	*	3.7 - 3.8	*	*	5.2 - 5.3	*	*
0.8 - 0.9	10	23	2.3 - 2.4	*	*	3.8 - 3.9	*	*	5.3 - 5.4	*	*
0.9 - 1.0	10	23	2.4 - 2.5	*	*	3.9 - 4.0	*	*	5.4 - 5.5	*	*
1.0 - 1.1	9	20	2.5 - 2.6	*	*	4.0 - 4.1	*	*	5.5 - 5.6	*	*
1.1 - 1.2	9	20	2.6 - 2.7	*	*	4.1 - 4.2	*	*	5.6 - 5.7	*	*
1.2 - 1.3	10	23	2.7 - 2.8	*	*	4.2 - 4.3	*	*	5.7 - 5.8	*	*
1.3 - 1.4	9	20	2.8 - 2.9	*	*	4.3 - 4.4	*	*	5.8 - 5.9	*	*
1.4 - 1.5	10	23	2.9 - 3.0	*	*	4.4 - 4.5	*	*	5.9 - 6.0	*	*



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WORLD RECOGNISED ACCREDITATION

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ACCREDITATION NUMBER: 4679

REMARKS:

APPROVED SIGNATORY: Peter Forbes-Taber

DATE: 9/09/2022

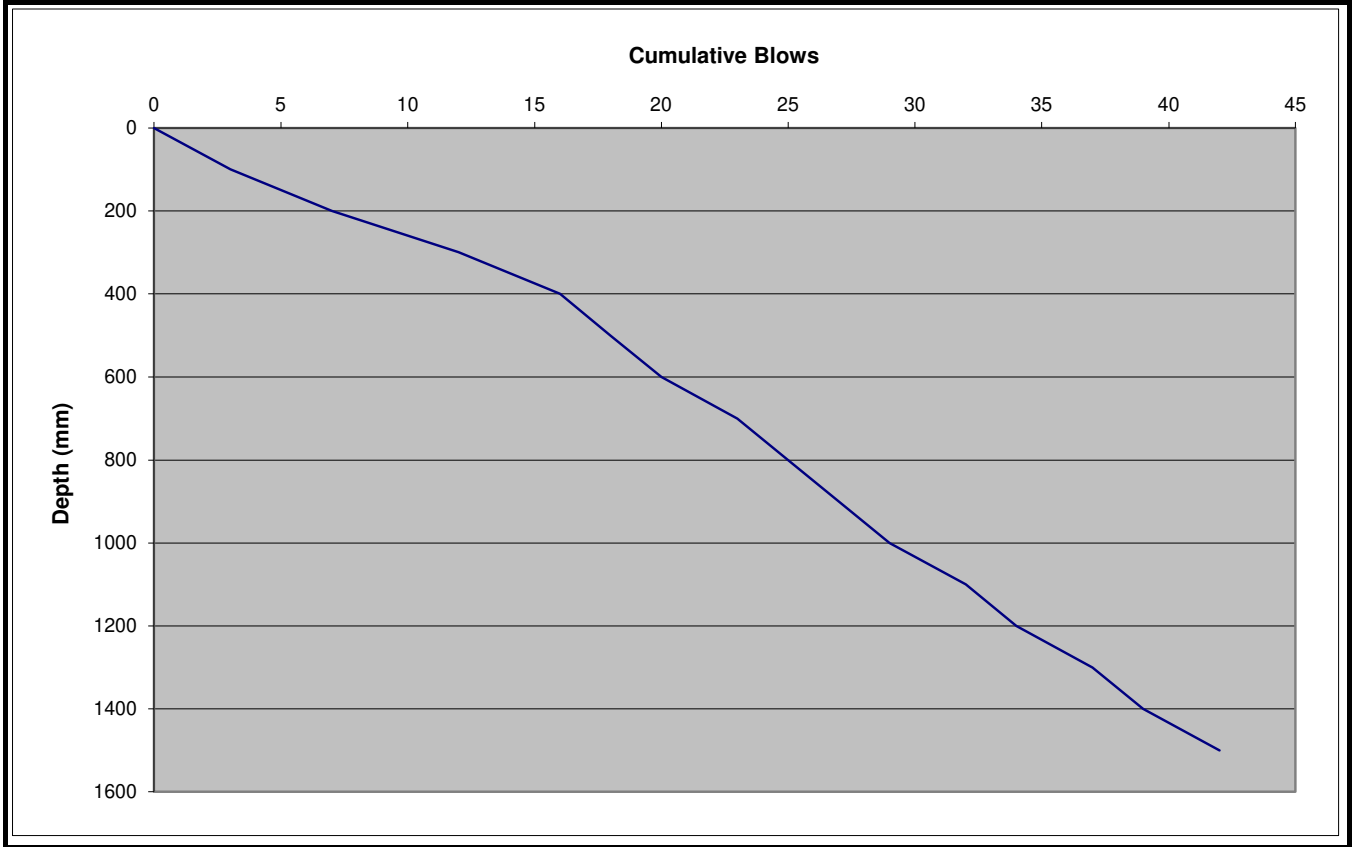
Aitken Rowe Testing Laboratories Pty Ltd

ARTL Wagga: 4/2 Riedell Street, Wagga Wagga NSW 2650

DYNAMIC CONE PENETROMETER REPORT

CLIENT: JBS&G - SYDNEY, NSW	PAGE: 11 OF: 15 ***DCP: 11 (BH11)***
PROJECT: GEOTECHNICAL INVESTIGATION & PAVEMENT DESIGN	REGISTRATION NO: **S22-348**
PROPOSED WENTWORTH HEALTH SERVICE REDEVELOPMENT	DATE OF TEST: 11/08/2022
LOCATION: No. 24 HOSPITAL ROAD, WENTWORTH, NSW	DEPTH BELOW FSL (mm): NIL
SOIL DESCRIPTION: REFER TO BOREHOLE LOGS & MATERIALS SCHEDULE & LOG	MOISTURE CONDITION: REFER TO LOGS
DEPTH OF GROUND WATER TABLE IF INTERSECTED: N/A	TEST METHOD: AS 1289.6.3.2

Depth(m)	Blows	Est. CBR	Depth(m)	Blows	Est. CBR	Depth(m)	Blows	Est. CBR	Depth(m)	Blows	Est. CBR
0.0 - 0.1	3	5	1.5 - 1.6	END	*	3.0 - 3.1	*	*	4.5 - 4.6	*	*
0.1 - 0.2	4	7	1.6 - 1.7	*	*	3.1 - 3.2	*	*	4.6 - 4.7	*	*
0.2 - 0.3	5	9	1.7 - 1.8	*	*	3.2 - 3.3	*	*	4.7 - 4.8	*	*
0.3 - 0.4	4	7	1.8 - 1.9	*	*	3.3 - 3.4	*	*	4.8 - 4.9	*	*
0.4 - 0.5	2	3	1.9 - 2.0	*	*	3.4 - 3.5	*	*	4.9 - 5.0	*	*
0.5 - 0.6	2	3	2.0 - 2.1	*	*	3.5 - 3.6	*	*	5.0 - 5.1	*	*
0.6 - 0.7	3	5	2.1 - 2.2	*	*	3.6 - 3.7	*	*	5.1 - 5.2	*	*
0.7 - 0.8	2	3	2.2 - 2.3	*	*	3.7 - 3.8	*	*	5.2 - 5.3	*	*
0.8 - 0.9	2	3	2.3 - 2.4	*	*	3.8 - 3.9	*	*	5.3 - 5.4	*	*
0.9 - 1.0	2	3	2.4 - 2.5	*	*	3.9 - 4.0	*	*	5.4 - 5.5	*	*
1.0 - 1.1	3	5	2.5 - 2.6	*	*	4.0 - 4.1	*	*	5.5 - 5.6	*	*
1.1 - 1.2	2	3	2.6 - 2.7	*	*	4.1 - 4.2	*	*	5.6 - 5.7	*	*
1.2 - 1.3	3	5	2.7 - 2.8	*	*	4.2 - 4.3	*	*	5.7 - 5.8	*	*
1.3 - 1.4	2	3	2.8 - 2.9	*	*	4.3 - 4.4	*	*	5.8 - 5.9	*	*
1.4 - 1.5	3	5	2.9 - 3.0	*	*	4.4 - 4.5	*	*	5.9 - 6.0	*	*



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WORLD RECOGNISED ACCREDITATION

Accredited for compliance with ISO/IEC 17025 - Testing.

ACCREDITATION NUMBER: 4679

REMARKS:

APPROVED SIGNATORY: Peter Forbes-Taber

DATE: 9/09/2022

Aitken Rowe Testing Laboratories Pty Ltd

ARTL Wagga: 4/2 Riedell Street, Wagga Wagga NSW 2650

DYNAMIC CONE PENETROMETER REPORT

CLIENT: JBS&G - SYDNEY, NSW

PROJECT: GEOTECHNICAL INVESTIGATION & PAVEMENT DESIGN
PROPOSED WENTWORTH HEALTH SERVICE REDEVELOPMENT

LOCATION: No. 24 HOSPITAL ROAD, WENTWORTH, NSW

SOIL DESCRIPTION: REFER TO BOREHOLE LOGS & MATERIALS SCHEDULE & LOG

DEPTH OF GROUND WATER TABLE IF INTERSECTED: N/A

PAGE: 12 OF: 15 ***DCP: 12 (BH12)***

REGISTRATION NO: **S22-348**

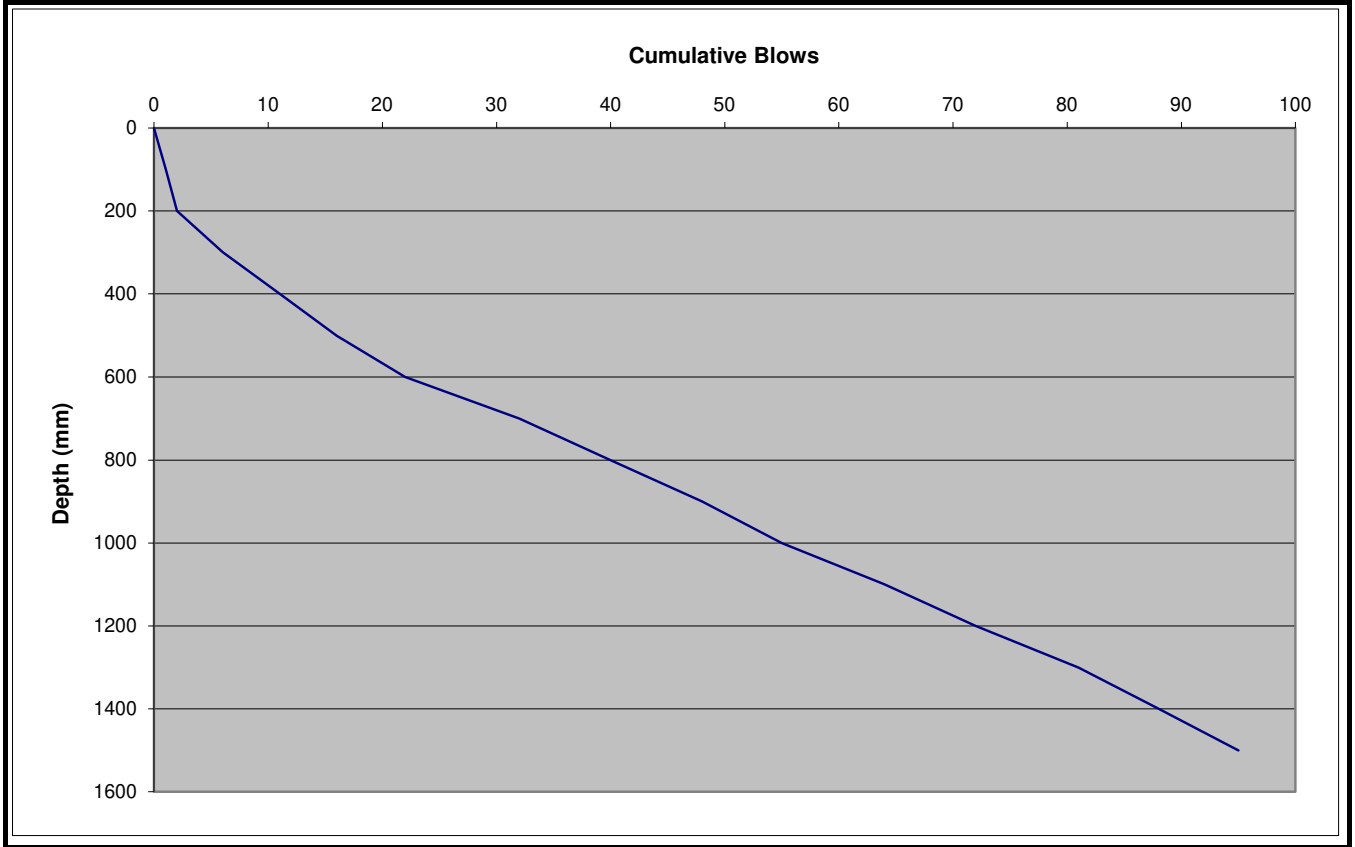
DATE OF TEST: 11/08/2022

DEPTH BELOW FSL (mm): NIL

MOISTURE CONDITION: REFER TO LOGS

TEST METHOD: AS 1289.6.3.2

Depth(m)	Blows	Est. CBR	Depth(m)	Blows	Est. CBR	Depth(m)	Blows	Est. CBR	Depth(m)	Blows	Est. CBR
0.0 - 0.1	1	1	1.5 - 1.6	END	*	3.0 - 3.1	*	*	4.5 - 4.6	*	*
0.1 - 0.2	1	1	1.6 - 1.7	*	*	3.1 - 3.2	*	*	4.6 - 4.7	*	*
0.2 - 0.3	4	7	1.7 - 1.8	*	*	3.2 - 3.3	*	*	4.7 - 4.8	*	*
0.3 - 0.4	5	9	1.8 - 1.9	*	*	3.3 - 3.4	*	*	4.8 - 4.9	*	*
0.4 - 0.5	5	9	1.9 - 2.0	*	*	3.4 - 3.5	*	*	4.9 - 5.0	*	*
0.5 - 0.6	6	12	2.0 - 2.1	*	*	3.5 - 3.6	*	*	5.0 - 5.1	*	*
0.6 - 0.7	10	23	2.1 - 2.2	*	*	3.6 - 3.7	*	*	5.1 - 5.2	*	*
0.7 - 0.8	8	17	2.2 - 2.3	*	*	3.7 - 3.8	*	*	5.2 - 5.3	*	*
0.8 - 0.9	8	17	2.3 - 2.4	*	*	3.8 - 3.9	*	*	5.3 - 5.4	*	*
0.9 - 1.0	7	14	2.4 - 2.5	*	*	3.9 - 4.0	*	*	5.4 - 5.5	*	*
1.0 - 1.1	9	20	2.5 - 2.6	*	*	4.0 - 4.1	*	*	5.5 - 5.6	*	*
1.1 - 1.2	8	17	2.6 - 2.7	*	*	4.1 - 4.2	*	*	5.6 - 5.7	*	*
1.2 - 1.3	9	20	2.7 - 2.8	*	*	4.2 - 4.3	*	*	5.7 - 5.8	*	*
1.3 - 1.4	7	14	2.8 - 2.9	*	*	4.3 - 4.4	*	*	5.8 - 5.9	*	*
1.4 - 1.5	7	14	2.9 - 3.0	*	*	4.4 - 4.5	*	*	5.9 - 6.0	*	*



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WORLD RECOGNISED ACCREDITATION

Accredited for compliance with ISO/IEC 17025 - Testing.

ACCREDITATION NUMBER: 4679

REMARKS:

APPROVED SIGNATORY: Peter Forbes-Taber

DATE: 9/09/2022

Aitken Rowe Testing Laboratories Pty Ltd

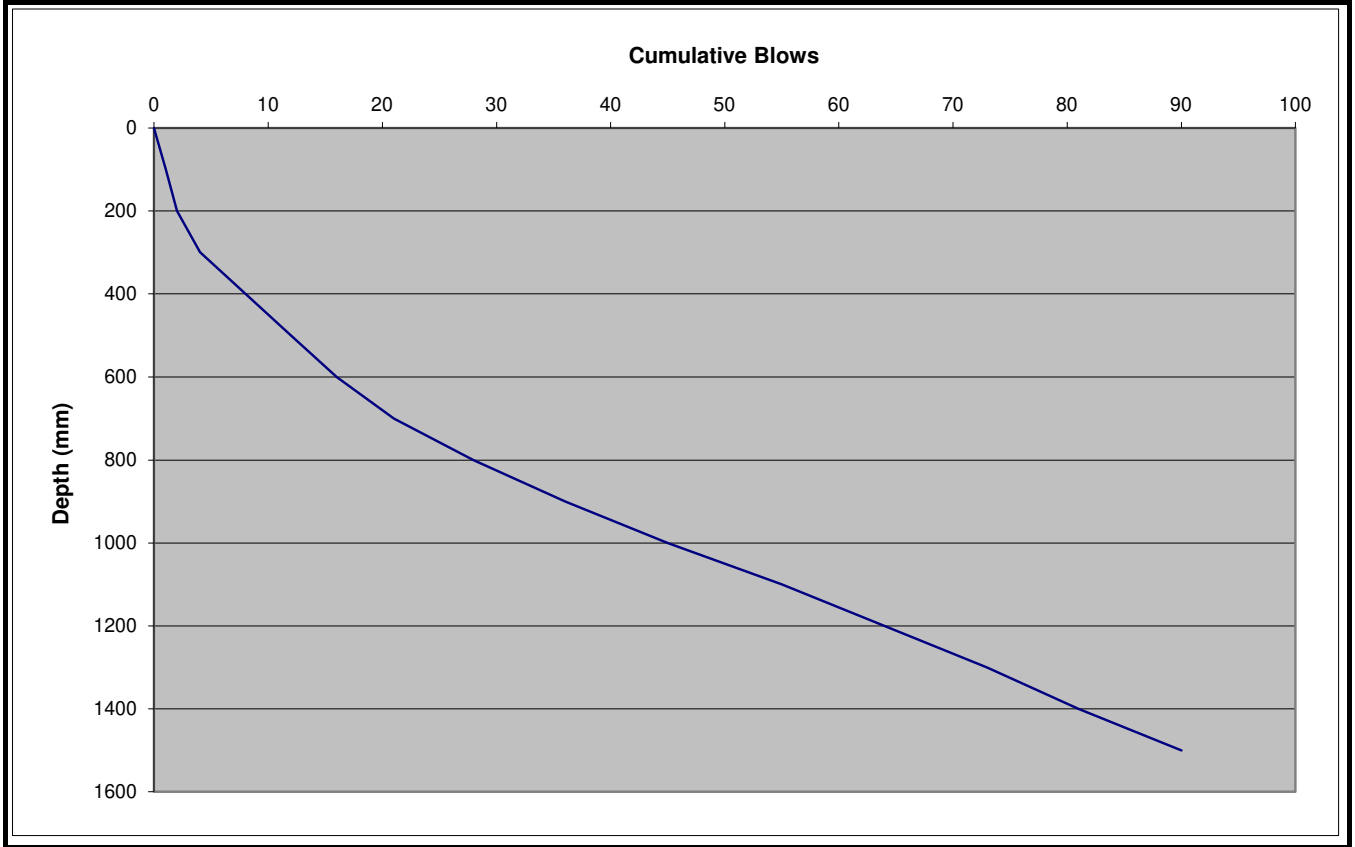
ARTL Wagga: 4/2 Riedell Street, Wagga Wagga NSW 2650

DYNAMIC CONE PENETROMETER REPORT

CLIENT: JBS&G - SYDNEY, NSW
PROJECT: GEOTECHNICAL INVESTIGATION & PAVEMENT DESIGN
PROPOSED WENTWORTH HEALTH SERVICE REDEVELOPMENT
LOCATION: No. 24 HOSPITAL ROAD, WENTWORTH, NSW
SOIL DESCRIPTION: REFER TO BOREHOLE LOGS & MATERIALS SCHEDULE & LOG
DEPTH OF GROUND WATER TABLE IF INTERSECTED: N/A

PAGE: 13 OF: 15 ***DCP: 13 (BH13)***
REGISTRATION NO: **S22-348**
DATE OF TEST: 11/08/2022
DEPTH BELOW FSL (mm): NIL
MOISTURE CONDITION: REFER TO LOGS
TEST METHOD: AS 1289.6.3.2

Depth(m)	Blows	Est. CBR	Depth(m)	Blows	Est. CBR	Depth(m)	Blows	Est. CBR	Depth(m)	Blows	Est. CBR
0.0 - 0.1	1	1	1.5 - 1.6	END	*	3.0 - 3.1	*	*	4.5 - 4.6	*	*
0.1 - 0.2	1	1	1.6 - 1.7	*	*	3.1 - 3.2	*	*	4.6 - 4.7	*	*
0.2 - 0.3	2	3	1.7 - 1.8	*	*	3.2 - 3.3	*	*	4.7 - 4.8	*	*
0.3 - 0.4	4	7	1.8 - 1.9	*	*	3.3 - 3.4	*	*	4.8 - 4.9	*	*
0.4 - 0.5	4	7	1.9 - 2.0	*	*	3.4 - 3.5	*	*	4.9 - 5.0	*	*
0.5 - 0.6	4	7	2.0 - 2.1	*	*	3.5 - 3.6	*	*	5.0 - 5.1	*	*
0.6 - 0.7	5	9	2.1 - 2.2	*	*	3.6 - 3.7	*	*	5.1 - 5.2	*	*
0.7 - 0.8	7	14	2.2 - 2.3	*	*	3.7 - 3.8	*	*	5.2 - 5.3	*	*
0.8 - 0.9	8	17	2.3 - 2.4	*	*	3.8 - 3.9	*	*	5.3 - 5.4	*	*
0.9 - 1.0	9	20	2.4 - 2.5	*	*	3.9 - 4.0	*	*	5.4 - 5.5	*	*
1.0 - 1.1	10	23	2.5 - 2.6	*	*	4.0 - 4.1	*	*	5.5 - 5.6	*	*
1.1 - 1.2	9	20	2.6 - 2.7	*	*	4.1 - 4.2	*	*	5.6 - 5.7	*	*
1.2 - 1.3	9	20	2.7 - 2.8	*	*	4.2 - 4.3	*	*	5.7 - 5.8	*	*
1.3 - 1.4	8	17	2.8 - 2.9	*	*	4.3 - 4.4	*	*	5.8 - 5.9	*	*
1.4 - 1.5	9	20	2.9 - 3.0	*	*	4.4 - 4.5	*	*	5.9 - 6.0	*	*



NATA
WORLD RECOGNISED ACCREDITATION

Accredited for compliance with ISO/IEC 17025 - Testing.

ACCREDITATION NUMBER: 4679

REMARKS:

APPROVED SIGNATORY: Peter Forbes-Taber

DATE: 9/09/2022

Aitken Rowe Testing Laboratories Pty Ltd

ARTL Wagga: 4/2 Riedell Street, Wagga Wagga NSW 2650

DYNAMIC CONE PENETROMETER REPORT

CLIENT: JBS&G - SYDNEY, NSW

PROJECT: GEOTECHNICAL INVESTIGATION & PAVEMENT DESIGN
PROPOSED WENTWORTH HEALTH SERVICE REDEVELOPMENT

LOCATION: No. 24 HOSPITAL ROAD, WENTWORTH, NSW

SOIL DESCRIPTION: REFER TO BOREHOLE LOGS & MATERIALS SCHEDULE & LOG

DEPTH OF GROUND WATER TABLE IF INTERSECTED: N/A

PAGE: 14 OF: 15 ***DCP: 14 (BH14)***

REGISTRATION NO: **S22-348**

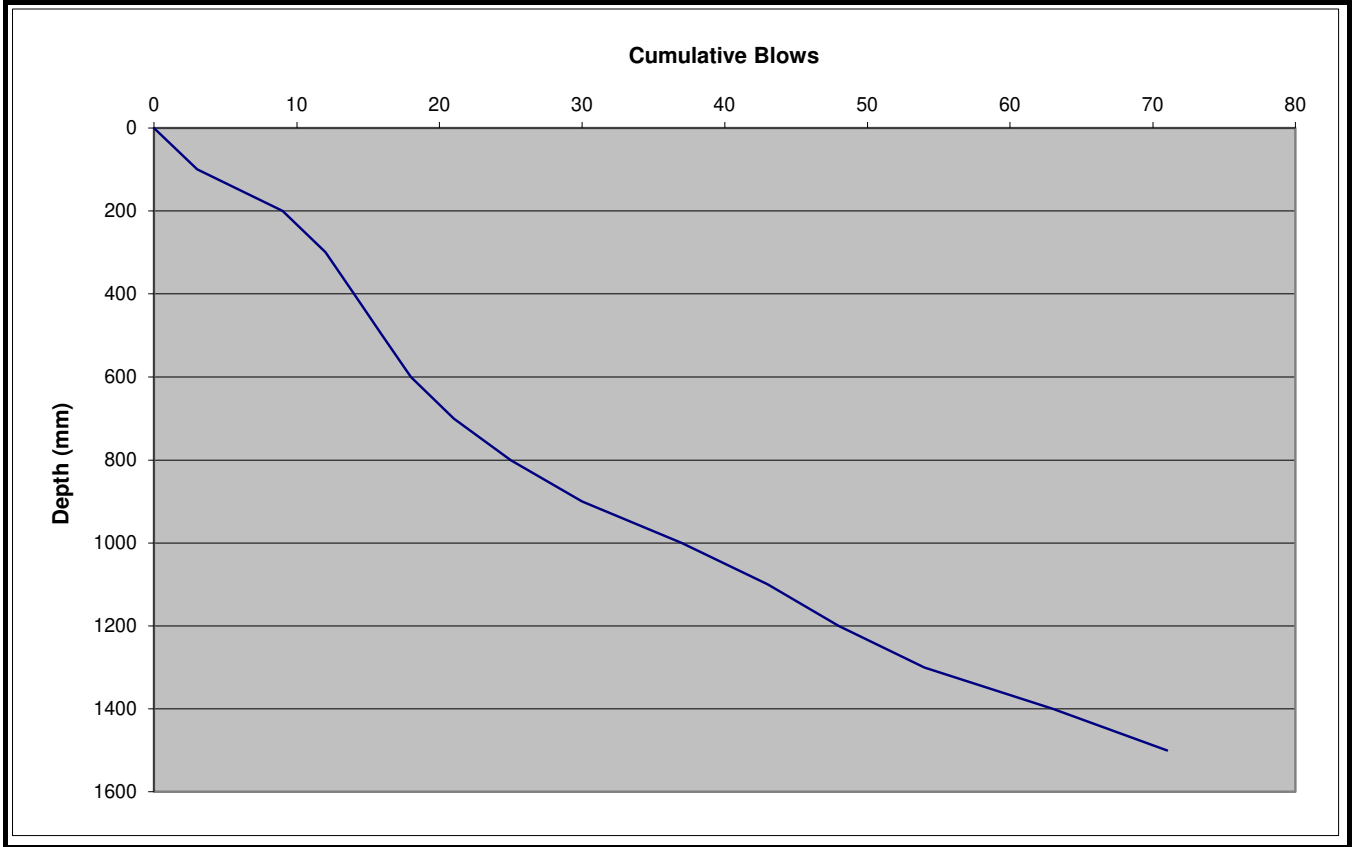
DATE OF TEST: 11/08/2022

DEPTH BELOW FSL (mm): NIL

MOISTURE CONDITION: REFER TO LOGS

TEST METHOD: AS 1289.6.3.2

Depth(m)	Blows	Est. CBR	Depth(m)	Blows	Est. CBR	Depth(m)	Blows	Est. CBR	Depth(m)	Blows	Est. CBR
0.0 - 0.1	3	5	1.5 - 1.6	END	*	3.0 - 3.1	*	*	4.5 - 4.6	*	*
0.1 - 0.2	6	12	1.6 - 1.7	*	*	3.1 - 3.2	*	*	4.6 - 4.7	*	*
0.2 - 0.3	3	5	1.7 - 1.8	*	*	3.2 - 3.3	*	*	4.7 - 4.8	*	*
0.3 - 0.4	2	3	1.8 - 1.9	*	*	3.3 - 3.4	*	*	4.8 - 4.9	*	*
0.4 - 0.5	2	3	1.9 - 2.0	*	*	3.4 - 3.5	*	*	4.9 - 5.0	*	*
0.5 - 0.6	2	3	2.0 - 2.1	*	*	3.5 - 3.6	*	*	5.0 - 5.1	*	*
0.6 - 0.7	3	5	2.1 - 2.2	*	*	3.6 - 3.7	*	*	5.1 - 5.2	*	*
0.7 - 0.8	4	7	2.2 - 2.3	*	*	3.7 - 3.8	*	*	5.2 - 5.3	*	*
0.8 - 0.9	5	9	2.3 - 2.4	*	*	3.8 - 3.9	*	*	5.3 - 5.4	*	*
0.9 - 1.0	7	14	2.4 - 2.5	*	*	3.9 - 4.0	*	*	5.4 - 5.5	*	*
1.0 - 1.1	6	12	2.5 - 2.6	*	*	4.0 - 4.1	*	*	5.5 - 5.6	*	*
1.1 - 1.2	5	9	2.6 - 2.7	*	*	4.1 - 4.2	*	*	5.6 - 5.7	*	*
1.2 - 1.3	6	12	2.7 - 2.8	*	*	4.2 - 4.3	*	*	5.7 - 5.8	*	*
1.3 - 1.4	9	20	2.8 - 2.9	*	*	4.3 - 4.4	*	*	5.8 - 5.9	*	*
1.4 - 1.5	8	17	2.9 - 3.0	*	*	4.4 - 4.5	*	*	5.9 - 6.0	*	*



NATA
WORLD RECOGNISED ACCREDITATION

Accredited for compliance with ISO/IEC 17025 - Testing.

ACCREDITATION NUMBER: 4679

REMARKS:

APPROVED SIGNATORY: Peter Forbes-Taber

DATE: 9/09/2022

Aitken Rowe Testing Laboratories Pty Ltd

ARTL Wagga: 4/2 Riedell Street, Wagga Wagga NSW 2650

DYNAMIC CONE PENETROMETER REPORT

CLIENT: JBS&G - SYDNEY, NSW

PROJECT: GEOTECHNICAL INVESTIGATION & PAVEMENT DESIGN
PROPOSED WENTWORTH HEALTH SERVICE REDEVELOPMENT

LOCATION: No. 24 HOSPITAL ROAD, WENTWORTH, NSW

SOIL DESCRIPTION: REFER TO BOREHOLE LOGS & MATERIALS SCHEDULE & LOG

DEPTH OF GROUND WATER TABLE IF INTERSECTED: N/A

PAGE: 15 OF: 15 ***DCP: 15 (BH15)***

REGISTRATION NO: **S22-348**

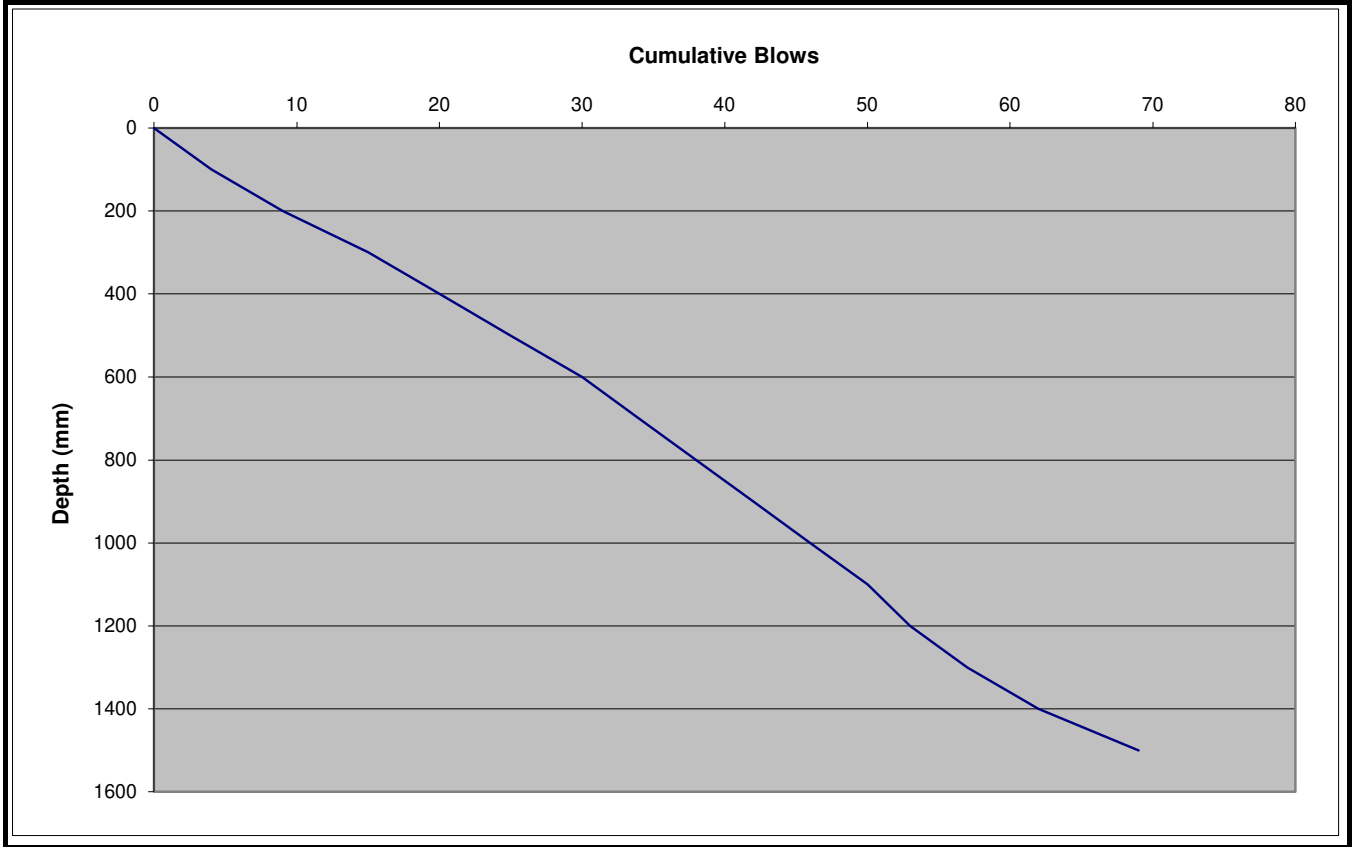
DATE OF TEST: 11/08/2022

DEPTH BELOW FSL (mm): NIL

MOISTURE CONDITION: REFER TO LOGS

TEST METHOD: AS 1289.6.3.2

Depth(m)	Blows	Est. CBR	Depth(m)	Blows	Est. CBR	Depth(m)	Blows	Est. CBR	Depth(m)	Blows	Est. CBR
0.0 - 0.1	4	7	1.5 - 1.6	END	*	3.0 - 3.1	*	*	4.5 - 4.6	*	*
0.1 - 0.2	5	9	1.6 - 1.7	*	*	3.1 - 3.2	*	*	4.6 - 4.7	*	*
0.2 - 0.3	6	12	1.7 - 1.8	*	*	3.2 - 3.3	*	*	4.7 - 4.8	*	*
0.3 - 0.4	5	9	1.8 - 1.9	*	*	3.3 - 3.4	*	*	4.8 - 4.9	*	*
0.4 - 0.5	5	9	1.9 - 2.0	*	*	3.4 - 3.5	*	*	4.9 - 5.0	*	*
0.5 - 0.6	5	9	2.0 - 2.1	*	*	3.5 - 3.6	*	*	5.0 - 5.1	*	*
0.6 - 0.7	4	7	2.1 - 2.2	*	*	3.6 - 3.7	*	*	5.1 - 5.2	*	*
0.7 - 0.8	4	7	2.2 - 2.3	*	*	3.7 - 3.8	*	*	5.2 - 5.3	*	*
0.8 - 0.9	4	7	2.3 - 2.4	*	*	3.8 - 3.9	*	*	5.3 - 5.4	*	*
0.9 - 1.0	4	7	2.4 - 2.5	*	*	3.9 - 4.0	*	*	5.4 - 5.5	*	*
1.0 - 1.1	4	7	2.5 - 2.6	*	*	4.0 - 4.1	*	*	5.5 - 5.6	*	*
1.1 - 1.2	3	5	2.6 - 2.7	*	*	4.1 - 4.2	*	*	5.6 - 5.7	*	*
1.2 - 1.3	4	7	2.7 - 2.8	*	*	4.2 - 4.3	*	*	5.7 - 5.8	*	*
1.3 - 1.4	5	9	2.8 - 2.9	*	*	4.3 - 4.4	*	*	5.8 - 5.9	*	*
1.4 - 1.5	7	14	2.9 - 3.0	*	*	4.4 - 4.5	*	*	5.9 - 6.0	*	*



NATA
WORLD RECOGNISED ACCREDITATION

Accredited for compliance with ISO/IEC 17025 - Testing.

ACCREDITATION NUMBER: 4679

REMARKS:

APPROVED SIGNATORY: Peter Forbes-Taber

DATE: 9/09/2022

APPENDIX D

LABORATORY TEST REPORTS

AITKEN ROWE TESTING LABORATORIES PTY LTD

AITKEN ROWE Testing Laboratories Pty Ltd

ARTL Wagga: 4/2 Riedell Street, Wagga Wagga NSW 2650

*

SAMPLED BY: ARTL

DATE SAMPLED: 9-11/08/2022

DATE SUBMITTED: 15/08/2022

SAMPLING METHOD: AS1289.1.2.1

SAMPLING CLAUSE: 6.5.3

DATES TESTED: 15/08-9/09/2022

ORDER No.: *

TEST REPORT: GEOTECHNICAL INVESTIGATION - SOIL ANALYSIS

CLIENT : JBS&G - SYDNEY, NSW

JOB DESCRIPTION : GEOTECHNICAL INVESTIGATION & PAVEMENT DESIGN
PROPOSED WENTWORTH HEALTH SERVICE REDEVELOPMENT
No. 24 HOSPITAL ROAD, WENTWORTH, NSW

MATERIAL SOURCE : IN-SITU BOREHOLES | PROPOSED USE : DESIGN

MATERIAL TYPE : REFER TO BOREHOLE LOGS & MATERIALS SCHEDULE & LOG

REGISTRATION No : R28 **S22-348**

		SAMPLE NUMBER :	1B	1E	1I	2B	2F	3D
		SAMPLING LOCATION :	BH1	BH1	BH1	BH2	BH2	BH3
		DEPTHS BETWEEN WHICH SAMPLES TAKEN (mm) :	500-800	3000-3450	6000-6450	600-900	4500-4950	1500-1950
TESTS	TEST ELEMENT		*	*	*	*	*	*
AS1289.3.6.1		PASS 100.0mm SIEVE %	*	*	*	*	*	*
		PASS 75.0mm SIEVE %	*	*	*	*	*	*
		PASS 53.0mm SIEVE %	*	*	*	*	*	*
		PASS 37.5mm SIEVE %	*	*	*	*	*	*
		PASS 26.5mm SIEVE %	*	*	*	*	*	*
		PASS 19.0mm SIEVE %	*	*	*	*	*	*
		PASS 13.2mm SIEVE %	*	*	*	*	*	*
		PASS 9.50mm SIEVE %	*	*	*	*	*	*
		PASS 6.70mm SIEVE %	*	*	*	*	*	*
		PASS 4.75mm SIEVE %	*	*	*	*	*	*
		PASS 2.36mm SIEVE %	*	*	*	*	*	100
AS1141.19	WHOLE SAMPLE	PASS 425 µm SIEVE %	*	*	*	*	*	100
		PASS 75 µm SIEVE %	*	*	*	*	*	92
		LESS THAN 13.5 µm %	*	*	*	*	*	67
AS1141.19	-2.36mm	PASS 425 µm SIEVE %	*	*	*	*	*	100
		PASS 75 µm SIEVE %	*	*	*	*	*	92
		LESS THAN 13.5 µm %	*	*	*	*	*	67
		OBSERVATIONS	*	*	*	*	*	*
AS1289.3.1.2		LIQUID LIMIT %	*	*	*	*	*	57
AS1289.3.2.1		PLASTIC LIMIT %	*	*	*	*	*	14
AS1289.3.3.1		PLASTICITY INDEX	*	*	*	*	*	43
		PREPARATION METHOD	*	*	*	*	*	AS1289.1.1-5.3
AS1289.5.1.1		STANDARD MAX. DRY DENSITY t/m^3	*	*	*	*	*	*
(NOT DRY PREPPED)		OPTIMUM MOISTURE CONTENT %	*	*	*	*	*	*
		OVERSIZE MATERIAL % RETAINED ON 19.0mm	*	*	*	*	*	*
		LL METHOD OF CURING TIME DETERMINATION	*	*	*	*	*	*
		CURING DURATION HOURS	*	*	*	*	*	*
AS1289.3.4.1		LINEAR SHRINKAGE %	14.0	14.0	7.0	13.5	11.0	*
		LENGTH OF MOULD mm	250	250	250	250	250	*
		CRACKING (CA), CRUMBLING (CR) OR CURLING (CU) OCCURRED	CA	CA	CA	CA	CA	*
AS1289.2.1.1		FIELD MOISTURE CONTENT %	13.4	23.6	26.3	18.0	25.3	*

NATA
WORLD RECOGNISED ACCREDITATION

Accredited for compliance with ISO/IEC 17025 - Testing.

ACCREDITATION NUMBER: 4679

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All samples are oven dried and dry sieved during prep. unless otherwise stated

APPROVED SIGNATORY : ..... DATE: 9/09/2022

Peter Forbes-Taber

AITKEN ROWE Testing Laboratories Pty Ltd

ARTL Wagga: 4/2 Riedell Street, Wagga Wagga NSW 2650

*

SAMPLED BY: ARTL

DATE SAMPLED: 9-11/08/2022

DATE SUBMITTED: 15/08/2022

SAMPLING METHOD: AS1289.1.2.1

SAMPLING CLAUSE: 6.5.3

DATES TESTED: 15/08-9/09/2022

ORDER No.: *

TEST REPORT: GEOTECHNICAL INVESTIGATION - SOIL ANALYSIS

CLIENT : JBS&G - SYDNEY, NSW

JOB DESCRIPTION : GEOTECHNICAL INVESTIGATION & PAVEMENT DESIGN
PROPOSED WENTWORTH HEALTH SERVICE REDEVELOPMENT
No. 24 HOSPITAL ROAD, WENTWORTH, NSW

MATERIAL SOURCE : IN-SITU BOREHOLES | PROPOSED USE : DESIGN

MATERIAL TYPE : REFER TO BOREHOLE LOGS & MATERIALS SCHEDULE & LOG

REGISTRATION No : R28 **S22-348**

		SAMPLE NUMBER :	3F	3H	4B	4C	4D	6A
		SAMPLING LOCATION :	BH3	BH3	BH4	BH4	BH4	BH6
		DEPTHS BETWEEN WHICH SAMPLES TAKEN (mm) :	3000-3450	6000-6450	800-1100	1500-1950	3000-3450	600-900
TESTS	TEST ELEMENT		*	*	*	*	*	*
AS1289.3.6.1		PASS 100.0mm SIEVE %	*	*	*	*	*	*
		PASS 75.0mm SIEVE %	*	*	*	*	*	*
		PASS 53.0mm SIEVE %	*	*	*	*	*	*
		PASS 37.5mm SIEVE %	*	*	*	*	*	*
		PASS 26.5mm SIEVE %	*	*	*	*	*	*
		PASS 19.0mm SIEVE %	*	*	*	*	*	*
		PASS 13.2mm SIEVE %	*	*	*	*	*	*
		PASS 9.50mm SIEVE %	*	*	*	*	*	*
		PASS 6.70mm SIEVE %	*	*	*	*	*	*
		PASS 4.75mm SIEVE %	*	*	*	*	*	*
		PASS 2.36mm SIEVE %	*	100	*	*	*	*
AS1141.19	WHOLE SAMPLE	PASS 425 µm SIEVE %	*	100	*	*	*	*
		PASS 75 µm SIEVE %	*	33	*	*	*	*
		LESS THAN 13.5 µm %	*	21	*	*	*	*
AS1141.19	-2.36mm	PASS 425 µm SIEVE %	*	100	*	*	*	*
		PASS 75 µm SIEVE %	*	33	*	*	*	*
		LESS THAN 13.5 µm %	*	21	*	*	*	*
		OBSERVATIONS	*	*	*	*	*	*
AS1289.3.1.2		LIQUID LIMIT %	*	38	*	*	*	*
AS1289.3.2.1		PLASTIC LIMIT %	*	16	*	*	*	*
AS1289.3.3.1		PLASTICITY INDEX	*	22	*	*	*	*
		PREPARATION METHOD	*	AS1289.1.1-5.3	*	*	*	*
AS1289.5.1.1		STANDARD MAX. DRY DENSITY t/m^3	*	*	*	*	*	*
(NOT DRY PREPPED)		OPTIMUM MOISTURE CONTENT %	*	*	*	*	*	*
		OVERSIZE MATERIAL % RETAINED ON 19.0mm	*	*	*	*	*	*
		LL METHOD OF CURING TIME DETERMINATION	*	*	*	*	*	*
		CURING DURATION HOURS	*	*	*	*	*	*
AS1289.3.4.1		LINEAR SHRINKAGE %	18.0	*	15.5	10.0	12.5	13.5
		LENGTH OF MOULD mm	250	*	250	254	250	250
		CRACKING (CA), CRUMBLING (CR) OR CURLING (CU) OCCURRED	CA	*	CA	CA	CA	CA
AS1289.2.1.1		FIELD MOISTURE CONTENT %	27.3	*	20.1	26.8	27.6	23.3

NATA
WORLD RECOGNISED ACCREDITATION

Accredited for compliance with ISO/IEC 17025 - Testing.

ACCREDITATION NUMBER: 4679

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All samples are oven dried and dry sieved during prep. unless otherwise stated

APPROVED SIGNATORY : .....

Peter Forbes-Taber

DATE: 9/09/2022

AITKEN ROWE Testing Laboratories Pty Ltd

ARTL Wagga: 4/2 Riedell Street, Wagga Wagga NSW 2650

*

SAMPLED BY: ARTL

DATE SAMPLED: 9-11/08/2022

DATE SUBMITTED: 15/08/2022

SAMPLING METHOD: AS1289.1.2.1

SAMPLING CLAUSE: 6.5.3

DATES TESTED: 15/08-9/09/2022

ORDER No.: *

TEST REPORT: GEOTECHNICAL INVESTIGATION - SOIL ANALYSIS

CLIENT : JBS&G - SYDNEY, NSW

JOB DESCRIPTION : GEOTECHNICAL INVESTIGATION & PAVEMENT DESIGN
PROPOSED WENTWORTH HEALTH SERVICE REDEVELOPMENT
No. 24 HOSPITAL ROAD, WENTWORTH, NSW

MATERIAL SOURCE : IN-SITU BOREHOLES | PROPOSED USE : DESIGN

MATERIAL TYPE : REFER TO BOREHOLE LOGS & MATERIALS SCHEDULE & LOG

REGISTRATION No : R28 **S22-348**

		SAMPLE NUMBER :	6C	6E	7B	7D	7E	SG8
		SAMPLING LOCATION :	BH6	BH6	BH7	BH7	BH7	BH8
		DEPTHS BETWEEN WHICH SAMPLES TAKEN (mm) :	1500-1950	4500-4950	500-900	1500-1950	3000-3450	400-1000
TESTS	TEST ELEMENT		*	*	*	*	*	*
AS1289.3.6.1		PASS 100.0mm SIEVE %	*	*	*	*	*	*
		PASS 75.0mm SIEVE %	*	*	*	*	*	*
		PASS 53.0mm SIEVE %	*	*	*	*	*	*
		PASS 37.5mm SIEVE %	*	*	*	*	*	*
		PASS 26.5mm SIEVE %	*	*	*	*	*	*
		PASS 19.0mm SIEVE %	*	*	*	*	*	*
		PASS 13.2mm SIEVE %	*	*	*	*	*	*
		PASS 9.50mm SIEVE %	*	*	*	*	*	*
		PASS 6.70mm SIEVE %	*	*	*	*	*	*
		PASS 4.75mm SIEVE %	*	*	*	*	*	*
		PASS 2.36mm SIEVE %	*	*	*	*	*	100
AS1141.19	WHOLE SAMPLE	PASS 425 µm SIEVE %	*	*	*	*	*	99
		PASS 75 µm SIEVE %	*	*	*	*	*	80
		LESS THAN 13.5 µm %	*	*	*	*	*	53
AS1141.19	-2.36mm	PASS 425 µm SIEVE %	*	*	*	*	*	99
		PASS 75 µm SIEVE %	*	*	*	*	*	80
		LESS THAN 13.5 µm %	*	*	*	*	*	53
		OBSERVATIONS	*	*	*	*	*	*
AS1289.3.1.2		LIQUID LIMIT %	*	*	*	*	*	53
AS1289.3.2.1		PLASTIC LIMIT %	*	*	*	*	*	14
AS1289.3.3.1		PLASTICITY INDEX	*	*	*	*	*	39
		PREPARATION METHOD	*	*	*	*	*	AS1289.1.1-5.3
AS1289.5.1.1		STANDARD MAX. DRY DENSITY t/m^3	*	*	*	*	*	1.64
(NOT DRY PREPPED)		OPTIMUM MOISTURE CONTENT %	*	*	*	*	*	21.2
		OVERSIZE MATERIAL % RETAINED ON 19.0mm	*	*	*	*	*	0.0
		LL METHOD OF CURING TIME DETERMINATION	*	*	*	*	*	VISUAL
		CURING DURATION HOURS	*	*	*	*	*	>168
AS1289.3.4.1		LINEAR SHRINKAGE %	13.0	13.5	15.5	11.5	17.0	*
		LENGTH OF MOULD mm	250	250	250	250	250	*
		CRACKING (CA), CRUMBLING (CR) OR CURLING (CU) OCCURRED	CA	CA	CA	CA	CA	*
AS1289.2.1.1		FIELD MOISTURE CONTENT %	18.8	25.5	25.3	24.2	23.0	17.0

NATA
WORLD RECOGNISED ACCREDITATION

Accredited for compliance with ISO/IEC 17025 - Testing.

ACCREDITATION NUMBER: 4679

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All samples are oven dried and dry sieved during prep. unless otherwise stated

APPROVED SIGNATORY : ..... DATE: 9/09/2022

Peter Forbes-Taber

AITKEN ROWE Testing Laboratories Pty Ltd

ARTL Wagga: 4/2 Riedell Street, Wagga Wagga NSW 2650

*

SAMPLED BY: ARTL

DATE SAMPLED: 9-11/08/2022

DATE SUBMITTED: 15/08/2022

SAMPLING METHOD: AS1289.1.2.1

SAMPLING CLAUSE: 6.5.3

DATES TESTED: 15/08-9/09/2022

ORDER No.: *

TEST REPORT: GEOTECHNICAL INVESTIGATION - SOIL ANALYSIS

CLIENT : JBS&G - SYDNEY, NSW

JOB DESCRIPTION : GEOTECHNICAL INVESTIGATION & PAVEMENT DESIGN
PROPOSED WENTWORTH HEALTH SERVICE REDEVELOPMENT
No. 24 HOSPITAL ROAD, WENTWORTH, NSW

MATERIAL SOURCE : IN-SITU BOREHOLES | PROPOSED USE : DESIGN

MATERIAL TYPE : REFER TO BOREHOLE LOGS & MATERIALS SCHEDULE & LOG

REGISTRATION No : R28 **S22-348**

		SAMPLE NUMBER :	SG9	SG10	SG11	SG12	SG13	SG14
		SAMPLING LOCATION :	BH9	BH10	BH11	BH12	BH13	BH14
		DEPTHS BETWEEN WHICH SAMPLES TAKEN (mm) :	400-1500	400-1200	800-1500	200-600	700-1200	500-1300
TESTS	TEST ELEMENT		*	*	*	*	*	*
AS1289.3.6.1		PASS 100.0mm SIEVE %	*	*	*	*	*	*
		PASS 75.0mm SIEVE %	*	*	*	*	*	*
		PASS 53.0mm SIEVE %	*	*	*	*	*	*
		PASS 37.5mm SIEVE %	*	*	*	*	*	*
		PASS 26.5mm SIEVE %	*	*	*	*	*	*
		PASS 19.0mm SIEVE %	*	*	*	*	*	*
		PASS 13.2mm SIEVE %	*	*	*	*	*	*
		PASS 9.50mm SIEVE %	*	*	*	*	*	*
		PASS 6.70mm SIEVE %	*	*	100	*	*	*
		PASS 4.75mm SIEVE %	*	*	100	*	*	*
		PASS 2.36mm SIEVE %	100	100	99	100	100	100
AS1141.19	WHOLE SAMPLE	PASS 425 µm SIEVE %	99	99	99	99	98	99
		PASS 75 µm SIEVE %	82	86	89	83	80	82
		LESS THAN 13.5 µm %	65	64	49	65	65	59
AS1141.19	-2.36mm	PASS 425 µm SIEVE %	99	99	100	99	98	99
		PASS 75 µm SIEVE %	82	86	89	83	80	82
		LESS THAN 13.5 µm %	65	64	49	65	65	59
		OBSERVATIONS	*	*	*	*	*	*
AS1289.3.1.2		LIQUID LIMIT %	57	56	44	56	57	54
AS1289.3.2.1		PLASTIC LIMIT %	13	13	15	13	13	14
AS1289.3.3.1		PLASTICITY INDEX	44	43	29	43	44	40
		PREPARATION METHOD	AS1289.1.1-5.3	AS1289.1.1-5.3	AS1289.1.1-5.3	AS1289.1.1-5.3	AS1289.1.1-5.3	AS1289.1.1-5.3
AS1289.5.1.1		STANDARD MAX. DRY DENSITY t/m^3	1.63	1.61	1.76	1.60	1.60	1.69
(NOT DRY PREPPED)		OPTIMUM MOISTURE CONTENT %	21.7	20.9	17.7	22.0	21.3	19.4
		OVERSIZE MATERIAL % RETAINED ON 19.0mm	0.0	0.0	0.0	0.0	0.0	0.0
		LL METHOD OF CURING TIME DETERMINATION	VISUAL	VISUAL	VISUAL	VISUAL	VISUAL	VISUAL
		CURING DURATION HOURS	>168	>168	>168	>168	>168	>168
AS1289.3.4.1		LINEAR SHRINKAGE %	*	*	*	*	*	*
		LENGTH OF MOULD mm	*	*	*	*	*	*
		CRACKING (CA), CRUMBLING (CR) OR CURLING (CU) OCCURRED	*	*	*	*	*	*
AS1289.2.1.1		FIELD MOISTURE CONTENT %	17.1	13.8	19.2	15.9	15.9	18.3

NATA
WORLD RECOGNISED ACCREDITATION

Accredited for compliance with ISO/IEC 17025 - Testing.

ACCREDITATION NUMBER: 4679

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All samples are oven dried and dry sieved during prep. unless otherwise stated

APPROVED SIGNATORY : ..... DATE: 9/09/2022

Peter Forbes-Taber

AITKEN ROWE Testing Laboratories Pty Ltd

ARTL Wagga: 4/2 Riedell Street, Wagga Wagga NSW 2650

*

SAMPLED BY: ARTL

DATE SAMPLED: 9-11/08/2022

DATE SUBMITTED: 15/08/2022

SAMPLING METHOD: AS1289.1.2.1

SAMPLING CLAUSE: 6.5.3

DATES TESTED: 15/08-9/09/2022

ORDER No.: *

TEST REPORT: GEOTECHNICAL INVESTIGATION - SOIL ANALYSIS

CLIENT : JBS&G - SYDNEY, NSW

JOB DESCRIPTION : GEOTECHNICAL INVESTIGATION & PAVEMENT DESIGN
PROPOSED WENTWORTH HEALTH SERVICE REDEVELOPMENT
No. 24 HOSPITAL ROAD, WENTWORTH, NSW

MATERIAL SOURCE : IN-SITU BOREHOLES | PROPOSED USE : DESIGN

MATERIAL TYPE : REFER TO BOREHOLE LOGS & MATERIALS SCHEDULE & LOG

REGISTRATION No : R28 S22-348

		SAMPLE NUMBER :	SG15	*	*	*	*	*
		SAMPLING LOCATION :	BH15	*	*	*	*	*
		DEPTHS BETWEEN WHICH SAMPLES TAKEN (mm) :	300-900	*	*	*	*	*
TESTS	TEST ELEMENT		*	*	*	*	*	*
AS1289.3.6.1		PASS 100.0mm SIEVE %	*	*	*	*	*	*
		PASS 75.0mm SIEVE %	*	*	*	*	*	*
		PASS 53.0mm SIEVE %	*	*	*	*	*	*
		PASS 37.5mm SIEVE %	*	*	*	*	*	*
		PASS 26.5mm SIEVE %	*	*	*	*	*	*
		PASS 19.0mm SIEVE %	*	*	*	*	*	*
		PASS 13.2mm SIEVE %	*	*	*	*	*	*
		PASS 9.50mm SIEVE %	*	*	*	*	*	*
		PASS 6.70mm SIEVE %	*	*	*	*	*	*
		PASS 4.75mm SIEVE %	*	*	*	*	*	*
		PASS 2.36mm SIEVE %	100	*	*	*	*	*
AS1141.19	WHOLE SAMPLE	PASS 425 µm SIEVE %	99	*	*	*	*	*
		PASS 75 µm SIEVE %	84	*	*	*	*	*
		LESS THAN 13.5 µm %	62	*	*	*	*	*
AS1141.19	-2.36mm	PASS 425 µm SIEVE %	99	*	*	*	*	*
		PASS 75 µm SIEVE %	84	*	*	*	*	*
		LESS THAN 13.5 µm %	62	*	*	*	*	*
		OBSERVATIONS	*	*	*	*	*	*
AS1289.3.1.2		LIQUID LIMIT %	53	*	*	*	*	*
AS1289.3.2.1		PLASTIC LIMIT %	14	*	*	*	*	*
AS1289.3.3.1		PLASTICITY INDEX	39	*	*	*	*	*
		PREPARATION METHOD	AS1289.1.1-5.3	*	*	*	*	*
AS1289.5.1.1		STANDARD MAX. DRY DENSITY t/m^3	1.62	*	*	*	*	*
(NOT DRY PREPPED)		OPTIMUM MOISTURE CONTENT %	21.4	*	*	*	*	*
		OVERSIZE MATERIAL % RETAINED ON 19.0mm	0.0	*	*	*	*	*
		LL METHOD OF CURING TIME DETERMINATION	VISUAL	*	*	*	*	*
		CURING DURATION HOURS	>168	*	*	*	*	*
AS1289.3.4.1		LINEAR SHRINKAGE %	*	*	*	*	*	*
		LENGTH OF MOULD mm	*	*	*	*	*	*
		CRACKING (CA), CRUMBLING (CR) OR CURLING (CU) OCCURRED	*	*	*	*	*	*
AS1289.2.1.1		FIELD MOISTURE CONTENT %	14.8	*	*	*	*	*

NATA
WORLD RECOGNISED ACCREDITATION

Accredited for compliance with ISO/IEC 17025 - Testing.

ACCREDITATION NUMBER: 4679

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All samples are oven dried and dry sieved during prep. unless otherwise stated

APPROVED SIGNATORY : ..... DATE: 9/09/2022

Peter Forbes-Taber

AITKEN ROWE Testing Laboratories Pty Ltd

ARTL Wagga Wagga: 4/2 Riedell Street, Wagga Wagga NSW 2650

TEST REPORT

CALIFORNIA BEARING RATIO OF SOILS AND GRAVELS

CLIENT: JBS&G - SYDNEY, NSW

JOB DESCRIPTION: GEOTECHNICAL INVESTIGATION & PAVEMENT DESIGN
PROPOSED WENTWORTH HEALTH SERVICE REDEVELOPMENT
No. 24 HOSPITAL ROAD, WENTWORTH, NSW

SOURCE OF MATERIAL: IN-SITU BOREHOLES

PROPOSED USE: FOUNDATION & PAVEMENT DESIGN

SAMPLED BY: ARTL
DATE SAMPLED: 9-11/08/2022
DATE RECEIVED: 15/08/2022
TESTING COMMENCED: 22/08/2022
TESTING COMPLETED: 6/09/2022
TEST METHODS: AS1289.2.1.1
AS1289.5.1.1 AS1289.6.1.1
SAMPLING PROCEDURE: AS1289.1.2.1
SAMPLING CLAUSE: 6.5.3

REGISTRATION NO : R6 **S22-348**

SAMPLE NO:	SG8	SG9	SG10	SG11	SG12
SITE OR LOCATION	BH8	BH9	BH10	BH11	BH12
DEPTHS BETWEEN WHICH SAMPLES TAKEN (mm)	400-1000	400-1500	400-1200	800-1500	200-600
ADDITIVE IF STABILISED	N/A	N/A	N/A	N/A	N/A
AMOUNT OF ADDITIVE (%)	NIL	NIL	NIL	NIL	NIL
TYPE OF COMPACTION (Standard/Modified)	STANDARD	STANDARD	STANDARD	STANDARD	STANDARD
MATERIAL RETAINED ON THE 19.0mm SIEVE (%)	0.0	0.0	0.0	0.0	0.0
OPTIMUM MOISTURE CONTENT (%)	21.2	21.7	20.9	17.7	22.0
MAXIMUM DRY DENSITY (t/m^3)	1.64	1.63	1.61	1.76	1.60
MOULDING MOISTURE CONTENT (%)	21.2	21.8	20.9	17.6	21.6
DRY DENSITY OF TEST SPECIMEN (t/m^3)	1.56	1.55	1.53	1.66	1.52
SPECIFIED LDR (%)	95	95	95	95	95
ACTUAL LDR (%)	95	95	95	95	95
MOISTURE CONTENTS : TOP 30 mm	27.3	34.0	30.3	23.9	34.8
WHOLE SAMPLE	25.0	27.1	27.0	23.0	27.2
ABSORPTION (%)	3.8	5.3	6.1	5.4	5.6
SPECIFIED LMR (%)	100	100	100	100	100
ACTUAL LMR (%)	100	101	100	99	98
NUMBER OF DAYS SOAKING	10	10	10	10	10
SWELL (%)	1.9	4.8	3.0	2.2	5.2
CBR OBTAINED FROM PENETRATION (mm)	2.5	2.5	2.5	2.5	2.5
CALIFORNIA BEARING RATIO (%)	**3.5**	**3**	**3**	**4**	**3**

NOTES: T117 specifications: LMR -3% to +2%, LDR ± 1%
*

COMMENTS: *

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WORLD RECOGNISED ACCREDITATION

Accredited for compliance with ISO/IEC 17025 - Testing.

ACCREDITATION NUMBER:

APPROVED SIGNATORY: Peter Forbes-Taber

DATE: 9/09/2022

AITKEN ROWE Testing Laboratories Pty Ltd

ARTL Wagga Wagga: 4/2 Riedell Street, Wagga Wagga NSW 2650

TEST REPORT

CALIFORNIA BEARING RATIO OF SOILS AND GRAVELS

CLIENT: JBS&G - SYDNEY, NSW

JOB DESCRIPTION: GEOTECHNICAL INVESTIGATION & PAVEMENT DESIGN
PROPOSED WENTWORTH HEALTH SERVICE REDEVELOPMENT
No. 24 HOSPITAL ROAD, WENTWORTH, NSW

SOURCE OF MATERIAL: IN-SITU BOREHOLES

PROPOSED USE: FOUNDATION & PAVEMENT DESIGN

SAMPLED BY: ARTL
DATE SAMPLED: 9-11/08/2022
DATE RECEIVED: 15/08/2022
TESTING COMMENCED: 22/08/2022
TESTING COMPLETED: 6/09/2022
TEST METHODS: AS1289.2.1.1
AS1289.5.1.1 AS1289.6.1.1
SAMPLING PROCEDURE: AS1289.1.2.1
SAMPLING CLAUSE: 6.5.3

REGISTRATION NO : R6 **S22-348**

SAMPLE NO:	SG13	SG14	SG15	*	*
SITE OR LOCATION	BH13	BH14	BH15	*	*
DEPTHS BETWEEN WHICH SAMPLES TAKEN (mm)	700-1200	500-1300	300-900	*	*
ADDITIVE IF STABILISED	N/A	N/A	N/A	*	*
AMOUNT OF ADDITIVE (%)	NIL	NIL	NIL	*	*
TYPE OF COMPACTION (Standard/Modified)	STANDARD	STANDARD	STANDARD	*	*
MATERIAL RETAINED ON THE 19.0mm SIEVE (%)	0.0	0.0	0.0	*	*
OPTIMUM MOISTURE CONTENT (%)	21.3	19.4	21.4	*	*
MAXIMUM DRY DENSITY (t/m^3)	1.60	1.69	1.62	*	*
MOULDING MOISTURE CONTENT (%)	21.5	19.4	20.9	*	*
DRY DENSITY OF TEST SPECIMEN (t/m^3)	1.52	1.41	1.54	*	*
SPECIFIED LDR (%)	95	95	95	*	*
ACTUAL LDR (%)	95	83	95	*	*
MOISTURE CONTENTS : TOP 30 mm	30.2	26.1	28.3	*	*
WHOLE SAMPLE	25.5	23.9	25.6	*	*
ABSORPTION (%)	3.9	4.5	4.7	*	*
SPECIFIED LMR (%)	100	100	100	*	*
ACTUAL LMR (%)	101	100	98	*	*
NUMBER OF DAYS SOAKING	10	10	10	*	*
SWELL (%)	3.1	2.5	2.9	*	*
CBR OBTAINED FROM PENETRATION (mm)	2.5	2.5	2.5	*	*
CALIFORNIA BEARING RATIO (%)	**3**	**3**	**3.5**	*	*

NOTES: T117 specifications: LMR -3% to +2%, LDR ± 1%
*

COMMENTS: *

NATA
WORLD RECOGNISED ACCREDITATION

Accredited for compliance with ISO/IEC 17025 - Testing.

ACCREDITATION NUMBER:

APPROVED SIGNATORY: Peter Forbes-Taber

DATE: 9/09/2022

AITKEN ROWE Testing Laboratories Pty Ltd

ARTL Wagga: 4/2 Riedell Street, Wagga Wagga NSW 2650

TEST REPORT

SOIL REACTIVITY- DETERMINATION OF THE SHRINKAGE INDEX OF A SOIL

SHRINK SWELL INDEX

CLIENT: JBS&G - SYDNEY, NSW

JOB DESCRIPTION GEOTECHNICAL INVESTIGATION & PAVEMENT DESIGN
PROPOSED WENTWORTH HEALTH SERVICE REDEVELOPMENT
No. 24 HOSPITAL ROAD, WENTWORTH, NSW

SAMPLED BY: ARTL
DATE SAMPLED: 9-11/8/2022
DATE SUBMITTED: 15/08/2022
DATE TESTED (from): 22/08/2022
DATE TESTED (to): 9/09/2022
No. OF SAMPLES: 4
TEST METHODS: AS1289.7.1.1
AS1289.2.1.1

REGISTRATION NO: R26 **S22-348**

SAMPLE No.:	1B	2B	4B
BOREHOLE No.:	BH1	BH2	BH4
DEPTH (mm):	500-800	600-900	800-1100
NATURE OF SPECIMEN (U50/REMOULDED):	U50	U50	U50
SHRINK SWELL INDEX (ISS):	3.88	3.87	3.63
INITIAL SWELL M.C. %:	20.5	21.8	18.0
FINAL SWELL M.C. %:	22.2	25.7	24.6
DESCRIPTION OF SOIL:	CH	CH	CH
ESTIMATED PERCENTAGE OF INERT INCLUSIONS:	<5%	<2%	<2%
EXTENT OF SOIL CRUMBLING DURING SHRINKAGE:	NIL	NIL	NIL
EXTENT OF CRACKING OF SHRINKAGE SPECIMEN:	NIL	NIL	NIL
(WHERE REMOULDED) SPECIMEN DENSITY (t/m^3):	N/A	N/A	N/A
MOISTURE ADDED TO ACHIEVE OMC (%):	N/A	N/A	N/A
COMPACTIVE EFFORT (BLOWS/ LAYER):	N/A	N/A	N/A
SAMPLE No.:	7B	*	*
BOREHOLE No.:	BH7	*	*
DEPTH:	500-900	*	*
NATURE OF SPECIMEN (U50/REMOULDED):	U50	*	*
SHRINK SWELL INDEX (ISS):	3.84	*	*
INITIAL SWELL M.C. %:	20.8	*	*
FINAL SWELL M.C. %:	26.5	*	*
DESCRIPTION OF SOIL:	CH	*	*
ESTIMATED PERCENTAGE OF INERT INCLUSIONS:	<5%	*	*
EXTENT OF SOIL CRUMBLING DURING SHRINKAGE:	NIL	*	*
EXTENT OF CRACKING OF SHRINKAGE SPECIMEN:	NIL	*	*
(WHERE REMOULDED) SPECIMEN DENSITY (t/m^3):	N/A	*	*
MOISTURE ADDED TO ACHIEVE OMC (%):	N/A	*	*
COMPACTIVE EFFORT (BLOWS/ LAYER):	N/A	*	*

NATA

Accredited for compliance with ISO/IEC 17025 - Testing.

ACCREDITATION NUMBER: 4679

APPROVED SIGNATORY: Peter Forbes-Taber

DATE: 9/9/2022

APPENDIX E

LABORATORY TEST REPORTS

SYDNEY ENVIRONMENTAL & SOIL LABORATORY PTY LTD

Corrosion & Scaling Assessment:

Soil Reporting Profile

Sample Drop Off: 16 Chilvers Road
Thornleigh NSW 2120
Mailing Address: PO Box 357
Pennant Hills NSW 1715
Tel: 1300 30 40 80
Fax: 1300 64 46 89
Em: info@sesl.com.au
Web: www.sesl.com.au

Batch N°: 63371	Sample N°: 1	Date Received: 17/8/22	Report Status: Final

Client Name: **Aitken Rowe Testing Laboratories (ARTL) Pty Ltd**
Client Contact: **Reports**
Client Order N°: **S22-348**
Address: **PO Box 5158**
WAGGA WAGGA NSW 2650

Project Name: **S22-348-In-Situ Borehole**
SESL Quote N°:
Sample Name: **1F**
Description: **Soil**
Test Type: **ARTL**

TEST		RESULT	COMMENTS
pH in water (1:5)		9	Strong alkalinity
EC mS/cm (1:5)		0.61	Moderate
Texture Class		-	Did not test
Soil Condition Class (Permeability)		-	Did not test
SOLUBLE ANION ANALYSIS			
Sulphate (1:5)	mgSO_4 / kg	630	Low (non to mildly aggressive)
Chloride (1:5)	mgCl / kg	1410	Low (non-aggressive)
* Resistivity Ω.	m	140	High (non-aggressive)

* Resistivity tested on a saturated sample/paste

(Note:- 10,000 mg/kg = 1%)

Recommendations

Analysed by SESL Australia Pty Ltd (NATA # 15633).

For the purposes of this corrosion and scaling assessment of soils towards concrete structures with steel reinforcement, concrete and steel piles, this soil shows strong alkalinity, moderate salinity, low sulphate, low chloride and high resistivity.

According to the *Australian Standard (AS) 2159-2009: Piling - Design and Installation*, the pH is considered mild to non-aggressive towards concrete (dependent on soil permeability) and non-aggressive towards steel. The sulfate levels are considered to be non- to mildly aggressive towards concrete. The chloride levels and resistivity are considered to be non-aggressive towards steel.

Factors affecting concrete scaling are: (a) elevated sulfate, becoming mildly aggressive at >2400 mgSO_4/kg; and (b) low pH, becoming moderately aggressive at pH of <5-6.

Factors affecting steel corrosivity are: (a) elevated chloride, becoming mildly aggressive at >5,000 mgCl/kg; and (b) low pH, becoming mildly aggressive at pH of <4-5 and (d) low resistivity, becoming mildly aggressive with resistivity values less than 50Ω.m.

Overall, according AS2159-2009, the likelihood of aggressive corrosion is low to mild.

pH, EC, Soluble SO_4: Bradley et al., (1983); **Cl,** (4500-Cl- E; APHA, 1998);
Resistivity, AS1289.4.4.1:1997, **Texture** - PM0003 (Texture- "Northcote" (1992))

Date Report Generated
25/08/2022

Consultant:
Jane Koo

Authorised Signatory:
Samantha Grant-Vest

SESL AUSTRALIA
Environment & Soil Sciences

Corrosion & Scaling Assessment:

Soil Reporting Profile

Sample Drop Off: 16 Chilvers Road
Thornleigh NSW 2120
Mailing Address: PO Box 357
Pennant Hills NSW 1715
Tel: 1300 30 40 80
Fax: 1300 64 46 89
Em: info@sesl.com.au
Web: www.sesl.com.au

Batch N°: 63371 **Sample N°: 2** **Date Received: 17/8/22** **Report Status: Final**

Client Name: **Aitken Rowe Testing Laboratories (ARTL) Pty Ltd**
Client Contact: **Reports**
Client Order N°: **S22-348**
Address: **PO Box 5158**
WAGGA WAGGA NSW 2650

Project Name: **S22-348-In-Situ Borehole**
SESL Quote N°:
Sample Name: **3E**
Description: **Soil**
Test Type: **ARTL**

TEST		RESULT	COMMENTS
pH in water (1:5)		9.3	Strong alkalinity
EC mS/cm (1:5)		0.27	Slight
Texture Class		-	Did not test
Soil Condition Class (Permeability)		-	Did not test
SOLUBLE ANION ANALYSIS			
Sulphate (1:5)	mgSO_4 / kg	210	Low (non to mildly aggressive)
Chloride (1:5)	mgCl / kg	340	Low (non-aggressive)
* Resistivity Ω.	m	8.2	Low (moderately to severely aggressive)

* Resistivity tested on a saturated sample/paste

(Note:- 10,000 mg/kg = 1%)

Recommendations

Analysed by SESL Australia Pty Ltd (NATA # 15633).

For the purposes of this corrosion and scaling assessment of soils towards concrete structures with steel reinforcement, concrete and steel piles, this soil shows strong alkalinity, slight salinity, low sulphate, low chloride and low resistivity.

According to the *Australian Standard (AS) 2159-2009: Piling - Design and Installation*, the pH is considered mild to non-aggressive towards concrete (dependent on soil permeability) and non-aggressive towards steel. The sulfate levels are considered to be non- to mildly aggressive towards concrete, and chloride levels are non-aggressive to steel. Resistivity is considered to be moderately to severely aggressive towards steel, due to lack of permeability class.

Factors affecting concrete scaling are: (a) elevated sulfate, becoming mildly aggressive at >2400 mgSO_4/kg; and (b) low pH, becoming moderately aggressive at pH of <5-6.

Factors affecting steel corrosivity are: (a) elevated chloride, becoming mildly aggressive at >5,000 mgCl/kg; and (b) low pH, becoming mildly aggressive at pH of <4-5 and (d) low resistivity, becoming mildly aggressive with resistivity values less than 50Ω.m.

Overall, according AS2159-2009, the likelihood of aggressive corrosion is moderate.

pH, EC, Soluble SO_4: Bradley et al., (1983); **Cl,** (4500-Cl- E; APHA, 1998);
Resistivity, AS1289.4.4.1:1997, **Texture** - PM0003 (Texture- "Northcote" (1992))

Date Report Generated
25/08/2022

Consultant:
Jane Koo

Authorised Signatory:
Samantha Grant-Vest

APPENDIX F

CIRCLY DESIGN PRINTOUTS

AITKEN ROWE TESTING LABORATORIES PTY LTD

DESIGN TRAFFIC CALCULATION

Reg. No.: **S22-348**
Project: **Proposed Wentworth Health Service Redevelopment, 24 Hospital Road, Wentworth, NSW**

1. AADT:	43
2. HV%:	25.00
3. Direction Factor (DF):	0.5
4. Lane Distribution Factor (LDF):	1.0
5. Design Life (Years)	30
6. Growth Rate:	0%
7. Cumulative Growth Factor (CGF)	30.00
8. Average number of axle groups per Heavy Vehicle (Nhvag):	2.5
9. ESA/HVAG:	0.443
10. Use of Design Lane %	100.0

Ni=AADTxDFx%HV/100xLDF

Ni=Initial Daily Heavy Vehicles trasversing the design lane

Ni= 5.375 HVs

Nhv=365xCGFxNi
Nhv= Cumulative number of Heavy Vehicles trasversing the design lane during design period

Nhv= 5.89E+04 HVs

Ndt=NhvxNhvag
Ndt=Cumulative number of heavy vehicle axle groups in the design lane during design period

Ndt= 1.47E+05 HVAGs

DESA=(ESA/HVAG)*Ndt
DESA=Design number of Equivalent Standard Axles of traffic loading

DESA= 6.52E+04

CIRCLY - Version 7.0 (1 February 2022)

Job Title: S22-348 Proposed Wentworth Health Services Redelopment, 24 Hospital Road, Wentworth, NSW

Design Method: Austroads 2017

NDT (cumulative heavy vehicle axle groups over design period): 1.47E+05

Traffic Load Distribution:

ID: LTR - O4
Name: Lightly-Trafficked Roads - O4 - local access with buses
ESA/HVAG: 0.443

Details of Load Groups:

Load No.	Load ID	Load Category	Load Type	Radius	Pressure/ Ref. stress	Exponent
1	ESA750-Full	ESA750-Full	Vertical Force	92.1	0.75	0.00
2	SAST53	SAST53	Vertical Force	102.4	0.80	0.00

Load Locations:

Location No.	Load ID	Gear No.	X	Y	Scaling Factor	Theta
1	ESA750-Full	1	-165.0	0.0	1.00E+00	0.00
2	ESA750-Full	1	165.0	0.0	1.00E+00	0.00
3	ESA750-Full	1	1635.0	0.0	1.00E+00	0.00
4	ESA750-Full	1	1965.0	0.0	1.00E+00	0.00
1	SAST53	1	0.0	0.0	1.00E+00	0.00
2	SAST53	1	2130.0	0.0	1.00E+00	0.00

Details of Layered System:

ID: S22-348 Title: Proposed Wentworth Health Services Revelopment, Hospital Road, Wentworth

Layer No.	Lower i/face	Material ID	Isotropy	Modulus (or Ev)	P.Ratio (or vvh)	F	Eh	vh
1	rough	Gran_250	Aniso.	2.50E+02	0.35	1.85E+02	1.25E+02	0.35
2	rough	Gran_250	Aniso.	2.50E+02	0.35	1.85E+02	1.25E+02	0.35
3	rough	Sub_CBR3	Aniso.	3.00E+01	0.45	2.07E+01	1.50E+01	0.45

Performance Relationships:

Layer No.	Location	Material ID	Component	Perform. Constant	Perform. Exponent	Shift Factor
3	top	Sub_CBR3	EZZ	0.009150	7.000	

Reliability Factors:
Project Reliability: Austroads 95%

Layer No.	Reliability Factor	Material Type
3	1.00	Subgrade (Austroads 2017)

Details of Layers to be sublayered:
Layer no. 1: Austroads (2004) sublayering
Layer no. 2: Austroads (2004) sublayering

Strains:

Layer No.	Thickness	Material ID	Axle	Unitless Strain
3	0.00	Sub_CBR3		
			SADT(80):	1.871E-03

Results:

Layer No.	Thickness	Material ID	Axle Group	CDF
1	200.00	Gran_250		n/a
2	225.00	Gran_250		n/a
3	0.00	Sub_CBR3	Total:	9.746E-01

CIRCLY - Version 7.0 (1 February 2022)

Job Title: S22-348 Proposed Wentworth Health Services Redelopment, 24 Hospital Road, Wentworth, NSW

Design Method: Austroads 2017

NDT (cumulative heavy vehicle axle groups over design period): 1.47E+05

Traffic Load Distribution:

ID: LTR - O4
Name: Lightly-Trafficked Roads - O4 - local access with buses
ESA/HVAG: 0.443

Details of Load Groups:

Load No.	Load ID	Load Category	Load Type	Radius	Pressure/ Ref. stress	Exponent
1	ESA750-Full	ESA750-Full	Vertical Force	92.1	0.75	0.00
2	SAST53	SAST53	Vertical Force	102.4	0.80	0.00

Load Locations:

Location No.	Load ID	Gear No.	X	Y	Scaling Factor	Theta
1	ESA750-Full	1	-165.0	0.0	1.00E+00	0.00
2	ESA750-Full	1	165.0	0.0	1.00E+00	0.00
3	ESA750-Full	1	1635.0	0.0	1.00E+00	0.00
4	ESA750-Full	1	1965.0	0.0	1.00E+00	0.00
1	SAST53	1	0.0	0.0	1.00E+00	0.00
2	SAST53	1	2130.0	0.0	1.00E+00	0.00

Details of Layered System:

ID: S22-348 Title: Proposed Wentworth Health Services Revelopment, Hospital Road, Wentworth

Layer No.	Lower i/face	Material ID	Isotropy	Modulus (or Ev)	P.Ratio (or vvh)	F	Eh	vh
1	rough	Gran_250	Aniso.	2.50E+02	0.35	1.85E+02	1.25E+02	0.35
2	rough	subsltCB10	Aniso.	1.00E+02	0.45	6.90E+01	5.00E+01	0.45
3	rough	Sub_CBR3	Aniso.	3.00E+01	0.45	2.07E+01	1.50E+01	0.45

Performance Relationships:

Layer No.	Location	Material ID	Component	Perform. Constant	Perform. Exponent	Shift Factor
2	top	subsltCB10	EZZ	0.009150	7.000	
3	top	Sub_CBR3	EZZ	0.009150	7.000	

Reliability Factors:
Project Reliability: Austroads 95%

Layer No.	Reliability Factor	Material Type
2	1.00	Subgrade (Selected Material) (Austroads 2017)
3	1.00	Subgrade (Austroads 2017)

Details of Layers to be sublayered:
Layer no. 1: Austroads (2004) sublayering
Layer no. 2: Austroads (2004) sublayering

Strains:

Layer No.	Thickness	Material ID	Axle	Unitless Strain
2	255.00	subsltCB10		
			SADT(80):	1.861E-03
3	0.00	Sub_CBR3		
			SADT(80):	1.737E-03

Results:

Layer No.	Thickness	Material ID	Axle Group	CDF
1	200.00	Gran_250		n/a
2	255.00	subsltCB10	Total:	9.390E-01
3	0.00	Sub_CBR3	Total:	5.781E-01

CIRCLY - Version 7.0 (1 February 2022)

Job Title: S22-348 Proposed Wentworth Health Services Redelopment, 24 Hospital Road, Wentworth, NSW

Design Method: Austroads 2017

NDT (cumulative heavy vehicle axle groups over design period): 1.47E+05

Traffic Load Distribution:

ID: LTR - O4
Name: Lightly-Trafficked Roads - O4 - local access with buses
ESA/HVAG: 0.443

Details of Load Groups:

Load No.	Load ID	Load Category	Load Type	Radius	Pressure/ Ref. stress	Exponent
1	ESA750-Full	ESA750-Full	Vertical Force	92.1	0.75	0.00
2	SAST53	SAST53	Vertical Force	102.4	0.80	0.00

Load Locations:

Location No.	Load ID	Gear No.	X	Y	Scaling Factor	Theta
1	ESA750-Full	1	-165.0	0.0	1.00E+00	0.00
2	ESA750-Full	1	165.0	0.0	1.00E+00	0.00
3	ESA750-Full	1	1635.0	0.0	1.00E+00	0.00
4	ESA750-Full	1	1965.0	0.0	1.00E+00	0.00
1	SAST53	1	0.0	0.0	1.00E+00	0.00
2	SAST53	1	2130.0	0.0	1.00E+00	0.00

Details of Layered System:

ID: S22-348 Title: Proposed Wentworth Health Services Revelopment, Hospital Road, Wentworth

Layer No.	Lower i/face	Material ID	Isotropy	Modulus (or Ev)	P.Ratio (or vvh)	F	Eh	vh
1	rough	Gran_350	Aniso.	3.50E+02	0.35	2.59E+02	1.75E+02	0.35
2	rough	Gran_150	Aniso.	1.50E+02	0.35	1.11E+02	7.50E+01	0.35
3	rough	Sub_CBR3	Aniso.	3.00E+01	0.45	2.07E+01	1.50E+01	0.45

Performance Relationships:

Layer No.	Location	Material ID	Component	Perform. Constant	Perform. Exponent	Shift Factor
3	top	Sub_CBR3	EZZ	0.009150	7.000	

Reliability Factors:
Project Reliability: Austroads 95%

Layer No.	Reliability Factor	Material Type
3	1.00	Subgrade (Austroads 2017)

Details of Layers to be sublayered:
Layer no. 1: Austroads (2004) sublayering
Layer no. 2: Austroads (2004) sublayering

Strains:

Layer No.	Thickness	Material ID	Axle	Unitless Strain
3	0.00	Sub_CBR3		
			SADT(80):	1.852E-03

Results:

Layer No.	Thickness	Material ID	Axle Group	CDF
1	170.00	Gran_350		n/a
2	250.00	Gran_150		n/a
3	0.00	Sub_CBR3	Total:	9.065E-01