





Preliminary Geotechnical Investigation to Support Structure Plan and Plan Change

Coatesville Riverhead Highway, Riverhead

Rev C 19 September 2023



Auckland (09) 835 1740 Northland (09) 982 805 **Wellington** (04) 896 0675

Christchurch (03) 352 4519

Job No. 21640

www.soilandrock.co.nz



PRELIMINARY GEOTECHNICAL INVESTIGATION TO SUPPORT PLAN CHANGE Coatesville Riverhead Highway, Riverhead

| Job Number: | 21640 |
|--------------------------------|---|
| Name of Project: | Coatesville Riverhead Highway, Riverhead |
| Client: | Fletcher Residential Ltd on behalf of Riverhead Landowner Group |
| Author: | Byron Smith, Senior Engineering Geologist, MEngNZ |
| Reviewer/Authoriser: | Dave Ouwejan, Principal Geotechnical Engineer, CMEngNZ, CPEng |
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| Reviewer/Authoriser Signature: | J.N.J |

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Geotechnical

Environmental



Hydrogeology

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1.0 Introduction

Soil & Rock Consultants (S&RC) were engaged by Fletcher Residential Ltd on behalf of Riverhead Landowner Group¹ to carry out a preliminary geotechnical investigation at Coatesville Riverhead Highway, Riverhead to support a proposed Structure Plan and Plan Change request.

The extent of the subject site is described in Section 2.0 of this report. Parts of the site have been previously investigated by others, as outlined in Section 4.0 of this report. The scope of our engagement was to:

- Drill 22 hand augerholes to a target depth of 3.0m in areas not previously investigated.
- Review available geotechnical data including:
 - Existing site data provided by Fletcher Residential Ltd (FRL)
 - o Geotechnical investigation and completion reports for nearby subdivisions
 - Information from the New Zealand Geotechnical Database
- Prepare a Preliminary Geotechnical Investigation Report to support a Plan Change application for the entire subject site.

1.1 Limitations

This report has been prepared by S&RC for the sole benefit of Fletcher Residential Ltd on behalf of Riverhead Landowner Group (the client) with respect to the site described below and the scope described above. The data and/or opinions contained in this report may not be used in other contexts, for any other purpose or by any other party without our prior review and agreement. This report may only be read or transmitted in its entirety, including the appendices.

The recommendations given in this report are based on data obtained from discrete locations and soil conditions between locations are inferred only. A proportion of the data relied on has been prepared by other consultants, and S&RC take no responsibility for the accuracy of that data.

2.0 Site Description

The subject site comprises the properties listed in Table 1 and outlined (in purple) in Figure 1.

¹ The Riverhead Landowner Group includes Fletcher Residential Ltd, Matvin Group and The Neil Group.

| Address | Legal Description | Area (Ha) (Rounded to 1 DP) | Investigated by |
|------------------------------|-------------------|--------------------------------|-----------------|
| 22 Duke St | Lot 20 DP 499876 | 6.3 | S&RC |
| 30 Cambridge Rd | Lot 1 DP 499822 | 4.9 | S&RC |
| 307 Riverhead Rd | Lot 2 DP 109763 | 6.8 | CMW |
| 1092 CRH | Lot 2 DP 164590 | 4.2 | CMW |
| Lot 1 DP 164590, CRH | Lot 1 DP 164590 | 5.8 | CMW |
| 325 Riverhead Rd | Lot 1 DP 109763 | 6.2 | CMW |
| 306 Riverhead Rd | Lot 1 DP 109763 | 1.0 | CMW |
| Lot 2 DP 164978, Lathrope Rd | Lot 2 DP 164978 | 8.4 | CMW |
| 328 Riverhead Rd | Pt Lot 2 DP 37432 | 7.0 | CMW |
| 51 Lathrope Rd | Lot 1 DP 64605 | 4.0 | S&RC |
| 340 Riverhead Rd | Pt Lot 2 DP 4818 | 6.0 | S&RC |
| Lot 2 DP 64605, Lathrope Rd | Lot 2 DP 64605 | 4.0 | |
| 1140 CRH | Lot 1 DP 61985 | 2.4 | S&RC |
| 1156 CRH | Lot 1 DP 77992 | 0.8 | S&RC |
| 1158 CRH | Lot 2 DP 77992 | 0.8 | S&RC |
| 1170 CRH | Lot 3 DP 63577 | 1.6 | S&RC |
| 1186 CRH | Lot 2 DP 63577 | 4.3 | S&RC |
| 1194 CRH | Lot 1 DP 113506 | 5.4 | S&RC |
| 1200 CRH | Lot 1 DP 66488 | 0.4 | S&RC |

Table 1 – Summary of Subject Site

CRH = Coatesville Riverhead Highway

The site is generally near-level, with moderate slopes in some locations (generally on the edge of erosional gully features such as the southern side of 1194 CRH and the western side of 22 Duke St. Current land use generally comprises horticulture with some agriculture (grazing). Various residential and commercial (horticulture-related) buildings are present across the site. Large shelterbelts are present within the site.

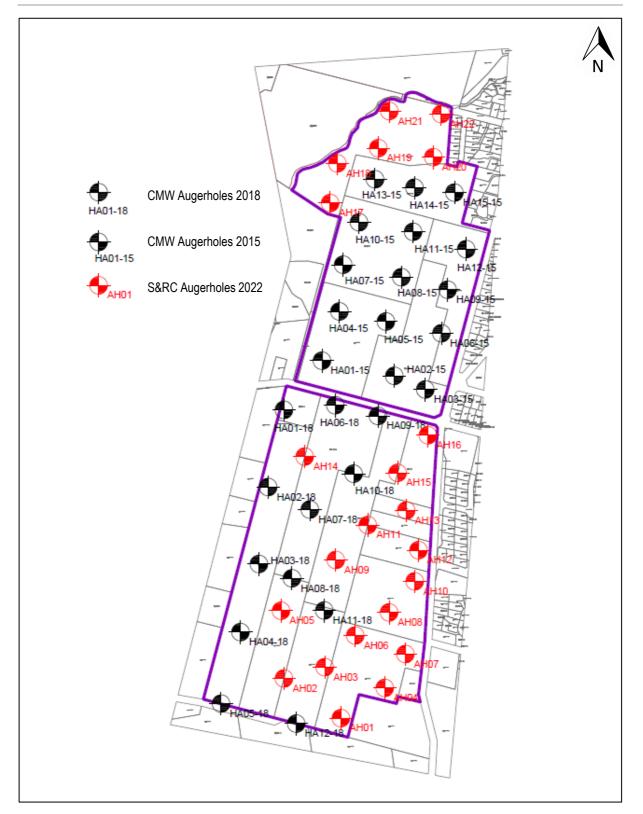


Figure 1: Site Extent and Augerhole Locations

2.1 Proposed Development

We understand that is it proposed to submit a plan change application to change the current site zoning (Future Urban) to a mixture of commercial and residential zones. The bulk of the 22 Duke Street property is proposed to be changed to Mixed Rural.

3.0 Geology

Reference to the GNS New Zealand Geological Web Map 1:250,000 Geology map, indicates the site is underlain by Puketoka Formation alluvial soils of the Tauranga Group (See Figure 2).

Alluvial soils are often susceptible to consolidation (resulting in settlement) when subjected to foundation or fill loads, particularly where organic soils are present. In addition, these soils shrink and swell with soil moisture content changes and can be sensitive, often rapidly losing strength in response to disturbance by construction plant and/or exposure to the elements.

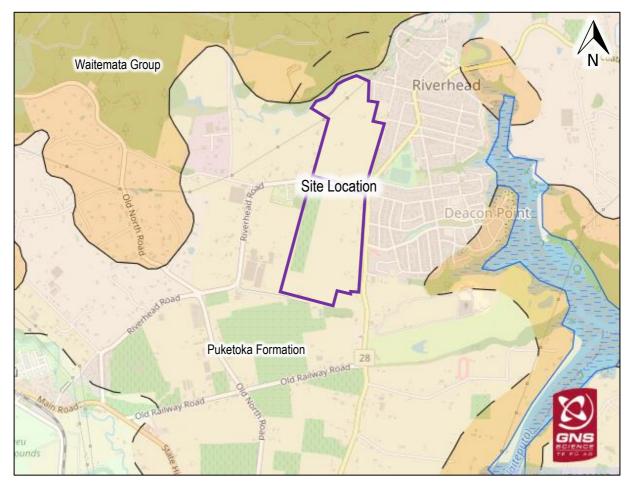


Figure 2: Geological Map (Source: GNS WebMaps Website)

4.0 Past Investigations

FRL has provided copies of the following past geotechnical reporting carried out within the subject site:

- CMW Geosciences 'Preliminary Geotechnical Assessment Report for 307 & 325 Riverhead Road, 1092 Coatesville Riverhead Highway and 28 & 30 Cambridge Road, Riverhead' dated 4 December 2015, Ref. AKL2016_0280AB Rev 0.
- 2. CMW Geosciences 'Preliminary Geotechnical Investigation for Pook Block Residential Development, Riverhead' dated 15 October 2018, Ref AKL2018-0160AB Rev 0.

The above investigations comprised the drilling of 27 hand augerholes as summarised in Tables 2 and 3 below. The augerhole logs and location plans are attached as Appendix C.

| Test ID | ID Termination Depth Depth to the base of Topsoil S | | Vane Shear Strength Range (kPa) | Groundwater Depth |
|---------|---|------------------------|---------------------------------------|----------------------|
| | All depths measured in (| (m) below present grou | nd level. (Rounded to 1 DI | ^{>}) |
| HA01-15 | 4.0 | 0.3 | 77 – 153 | 2.1 |
| HA02-15 | 4.0 | 1.9 | 30 – 164 | 1.0 |
| HA03-15 | 4.0 | 0.2 | <10 – 191+ | 1.0 |
| HA04-15 | 4.0 | 0.2 | 60 – UTP | 2.0 |
| HA05-15 | 4.0 | 0.2 | 77 – 191+ | 2.0 |
| HA06-15 | 4.0 | 0.9 | 55 – 150 | 2.2 |
| HA07-15 | 2.4 | 0.7 | 34 – UTP | 1.0 |
| HA08-15 | 4.0 | 0.2 | 44 – 123 | 2.0 |
| HA09-15 | 4.0 | 0.2 | 74 – 161 | 2.0 |
| HA10-15 | 2.6 | 0.2 | 52 – UTP | 1.6 |
| HA11-15 | 1.7 | 0.2 | 30 – UTP | 1.1 |
| HA12-15 | 4.0 | 0.8 | 68 – 98 | 1.0 |
| HA13-15 | 3.1 | 0.2 | 107 – UTP | 2.0 |
| HA14-15 | 4.0 | 0.2 | 85 – UTP | 3.3 |
| HA15-15 | 2.6 | 0.2 | 71 – UTP | 2.3 |

Table 2: CMW 2015 Investigation Data

UTP = Unable to Penetrate

| Test ID | Termination Depth | Depth to the base of Topsoil/Fill Vane Shear Strength Range (kPa) | | Groundwater Depth |
|---------|--------------------------|--|----------------------------|----------------------|
| A | All depths measured in (| m) below present grou | nd level. (Rounded to 1 DI | ^{>}) |
| HA01-18 | 5.0 | 0.3 | 58 – UTP | 2.5 |
| HA02-18 | 5.0 | 0.3 | 85 – 197+ | 2.0 |
| HA03-18 | 5.0 | 0.6 | 58 – UTP | 1.5 |
| HA04-18 | 5.0 | 0.3 | 44 – 160 | 2.0 |
| HA05-18 | 5.0 | 0.6 | 44 – 145 | 1.5 |
| HA06-18 | 5.0 | 0.4 | 73 – UTP | 0.8 |
| HA07-18 | 5.0 | 0.4 | 73 – 183 | 0.8 |
| HA08-18 | 5.0 | 0.3 | 78 – 186 | 1.9 |
| HA09-18 | 5.0 | 1.1 | 70 – UTP | 0.9 |
| HA10-18 | 3.3 | 0.3 | 99 – UTP | 1.8 |
| HA11-18 | 5.0 | 0.4 | 87 – UTP | 2.8 |
| HA12-18 | 5.0 | 1.0 | 73 – 116 | 1.9 |

UTP = Unable to Penetrate

Reference has also been made to geotechnical reporting for a subdivision to the east of the subject site as follows:

- Coffey Geotechnics (NZ) Ltd 'Geotechnical Investigation Report for a Residential Subdivision at 1135, 1147 and 1161 Coatesville Riverhead Highway, Riverhead' Ref. GENZAUCK15395, dated 22 May 2012.
- Coffey Geotechnics (NZ) Ltd 'Residential Subdivision Stage J3 at 1161 Coatesville-Riverhead Highway, Riverhead, Geotechnical Completion Report', Ref. GENZAUK15847AB, dated 10 November 2015.

Review of the New Zealand Geotechnical database provided a number of water-bore drillers logs from bores either within, or close to the subject site. Relevant information is discussed in Section 6.0 of this report.

5.0 Soil & Rock Consultants Investigation

Our field investigation carried out on 10 & 17 January, 28 February, 01 March and 04 April 2022, comprised the following components:

- Visual appraisal of the site
- Drilling of 19 hand augerholes (AH01 to AH22, excluding AH03, AH12 & AH14) Appendix B

Augerhole AH03, AH12 and AH14 were not drilled due to access issues or site constraints. Numerous attempts were made at drilling AH18 as detailed on the attached logs.

The test locations are shown on the attached Site Plans, Drawing Nos 21640/1 to 21640/4 inclusive (Appendix A). The locations were determined from hand-held GPS.

Measurements of undrained shear strength were undertaken in the augerholes at intervals of depth using a handheld shear vane in accordance with the New Zealand Geotechnical Society Guidelines for Handheld Shear Vane Tests, dated August 2001. Peak and remoulded vane shear strengths shown on the attached augerhole logs represent dial readings off the shear vane adjusted using the BS 1377 calibration correction factor.

A visual-tactile field classification of the soils encountered during drilling was carried out in accordance with "Guidelines for the Field Classification and Description of Soil and Rock for Engineering Purposes", issued by the New Zealand Geotechnical Society Inc. (2005).

The findings of our investigation are summarised in Table 4.

| Test ID | Termination Depth | Depth to the base of Topsoil/Fill | Vane Shear Strength Range (kPa) | Groundwater Depth | Weaker layers, Organic Clay and/or Peat |
|---------|----------------------|---|---------------------------------------|----------------------|---|
| | All depths meas | ured in (m) below p | resent ground level | . (Rounded to 1 DP) | |
| AH01 | 3.0 | 0.4 | 35 – 151 | NE | NE |
| AH02 | 3.0 | 1.7 | 0 – 61 | NE | 0.0 – 3.0+ |
| AH04 | 3.0 | 0.2 | 60 – 133 | 2.4 | 2.1 – 2.4 |
| AH05 | 3.0 | 0.4 | 51 – 121 | 2.9 | 2.0 – 3.0+ |
| AH06 | 3.0 | 0.3 | 23 – 112 | 2.8 | 1.8 – 3.0+ |
| AH07 | 3.0 | 0.3 | 74 – 88 | NE | 2.0 – 2.2 |

 Table 4 – Summary of Subsurface Conditions

| Test ID | Termination Depth | Depth to the base of Topsoil/Fill | Vane Shear Strength Range (kPa) | Groundwater Depth | Weaker layers, Organic Clay and/or Peat |
|---------|----------------------|---|---------------------------------------|----------------------|---|
| | All depths meas | ured in (m) below p | resent ground level | . (Rounded to 1 DP) | |
| AH08 | 3.0 | 0.4 | 37 – 123 | 2.4 | 1.9 – 3.0+ |
| AH09 | 3.0 | NE | 26 – 121 | 2.0 | 2.0 – 3.0+ |
| AH10 | 3.0 | 0.6 | 60 – 200+UTP | 2.8 | 2.1 – 3.0+ |
| AH11 | 4.0 | NE | 5 – 85 | 2.2 | 1.0 – 2.9 |
| AH13 | 3.0 | 0.4 | 37 – 159 | 2.8 | 1.5 – 2.0 |
| AH15 | 3.0 | NE | 85 – 156 | NE | NE |
| AH16 | 3.0 | 0.1 | 66 – 200+UTP | NE | NE |
| AH17* | 0.2 | 0.2+ | N/A | N/A | N/A |
| AH18A* | 0.6 | 0.6+ | 200+UTP* | N/A | N/A |
| AH18B* | 0.5 | 0.5+ | N/A | N/A | N/A |
| AH18C* | 0.1 | 0.1+ | N/A | N/A | N/A |
| AH18D* | 0.2 | 0.2+ | N/A | N/A | N/A |
| AH18E* | 0.2 | 0.2+ | N/A | N/A | N/A |
| AH19 | 1.7 | 0.3 | 52 – 200+UTP | 1.4 | NE |
| AH20 | 1.5 | 0.2 | 81 – 116 | NE | NE |
| AH21 | 3.0 | 0.2 | 41 – 188 | 2.6 | 2.3 – 3.0+ |
| AH22 | 2.3 | 0.3 | 87 – 200+UTP | 1.6 | NE |

N/A = Not Applicable, NE = Not Encountered, NT = Not Tested, * = Unable to reach target depth due to gravelly fill

6.0 Subsurface Conditions

The subsurface conditions described below are based on our review of geotechnical data both within and near the subject site.

Topsoil was encountered across the site from the ground surface and *generally* ranged in thickness between 0.2m and 0.4m. The maximum depth of topsoil encountered was 1.9m (CMW HA02-15).

Fill was present within parts of the site ranging in depth between 0.3m and 1.7m below present ground level (bpgl). At a number of locations within the property at 22 Duke St, the fill could not be penetrated using hand equipment and therefore the fill thickness was not ascertained. Review of historic aerial photographs in this area shows evidence of past tipping.

The topsoil and fill (where encountered) were underlain by alluvial deposits of the Puketoka Formation. The alluvial soils generally comprised firm to very stiff silt with varying clay and sand proportions. Layers of peat and organic soils were encountered, generally below a depth of 2.0m, but shallower in some places.

A number of augerholes undertaken by CMW during their 2015 investigation logged weathered soils of the Waitemata Group underlying the alluvial soils and from the ground surface at some locations. Based on comparison of the soil descriptions between those logs and other logs around the site (both CMW and S&RC) we consider it more likely that the surface soils are alluvial in origin and form part of the Puketoka Formation, however Waitemata Group soils are likely to underlie the alluvial soils at shallow depth at the northern end of the site.

Dense sand was encountered in parts of the northern end of the site at depths of approximately 1.0m to 1.5m bpgl. In some cases the sand was too dense to penetrate using handheld equipment. A drillers log from a water bore drilled in the northern part of the site in 1988 shows a layer of sand from 2.0m to 3.0m, underlain by sandstone (inferred to be Waitemata Group rock).

Other water bore logs in or near the site, but further to the south, show the depth to sandstone ranging between approximately 9m and 33m - generally becoming deeper to the south.

7.0 Geotechnical Discussion

The subsurface conditions across the site (logged by CMW and S&RC) appear consistent with those reported to the west where residential subdivisions have been successfully completed. The results of our research and investigation suggest that the site is generally suitable for future urban development, subject to detailed geotechnical investigation at Resource Consent stage to address the constraints identified below.

7.1 Topsoil

The topsoil thickness across the site is variable with isolated deep areas, but generally between 0.2m and 0.4m across the majority of the site. Topsoil is an unsuitable subgrade to support foundations and will require stripping during subdivision bulk earthworks.

7.2 Fill

Our site observations and testing (and past reporting for parts of the site we were not able to access) show that there are a number of locations where past filling has been carried out. Key areas include the

properties at Lot 1 DP 164590, Coatesville-Riverhead Highway, 30 Cambridge Rd and 22 Duke Street, however fill is likely to be present in isolated areas across the site. Any fill material will require removal during subdivision earthworks. Some may be suitable for re-use.

7.3 Organic Soils

Organic silts and peat layers were encountered across the southern portion of the site, generally below a depth of 2.0m, although as shallow as 0.6m at one location (CMW HA05-18). Less organic material was encountered in the northern half of the site and was generally described as organic stained silts as opposed to the peat that was often encountered further south.

Organic soils are a significant geotechnical constraint due to their low strength and high compressibility. Where a thickness of around 2.0m of non-organic soil is present above organic material it is likely that lightweight residential buildings on stiffened raft-type foundations will be feasible, however reduced design bearing capacities (when compared to the 'good ground' values provided in NZS3604) may be required.

Where lesser thicknesses of non-organic material are present, remedial works may be required during bulk earthworks to improve the subgrade. These may comprise use of geogrid and/or geotextile stiffened rafts of engineered fill to spread building platform and roading loads. Similarly, earthworks will require careful design to ensure the thickness of non-organic materials at the ground surface is not reduced.

7.4 Groundwater

Groundwater measurements taken during the various investigations ranged between 0.8m and 3.3m below ground level. The investigations were carried out across summer, winter and autumn months. High groundwater levels were measured in both summer and winter. It is likely that civil works (drainage etc) and possibly bulk earthworks will encounter groundwater which will require special consideration at the time of construction.

Detailed investigation of groundwater levels is recommended prior to development.

7.5 Sensitive Soils

Shear strengths measured in the augerholes show that the soils generally range between 'moderately sensitive' and 'extra sensitive'. These soils are potentially susceptible to mechanical disturbance and/or exposure to the elements and soils that test well in-situ can perform poorly when construction is underway. Care is therefore required during construction to ensure the soils are protected to ensure favourable short and long-term subgrade and foundation performance.

Practical means of protecting the soils include avoidance of vibration-based compaction equipment, protecting the subgrade following initial site clearance, minimising the passage of heavy or vibrating construction plant, and extra care during earthworks.

7.6 Expansivity

Previous testing in the area by S&RC and others, combined with our understanding of the expansivity characteristics of Puketoka Formation soils, suggest that the expansivity class across the majority of the site is likely to be H (highly expansive) to E (extremely expansive). Site specific testing should be undertaken following bulk earthworks.

7.7 Slope Stability

We consider the areas of the site that are generally near level to gently sloping to have a low risk of global slope instability. The areas of moderately sloping land will require specific assessment for global land stability during detailed geotechnical investigations. We consider that prudent engineering and construction to good practice will mitigate the effects of global instability in these areas, and they do not propose an impediment to the proposed land rezoning.

8.0 Further Investigation

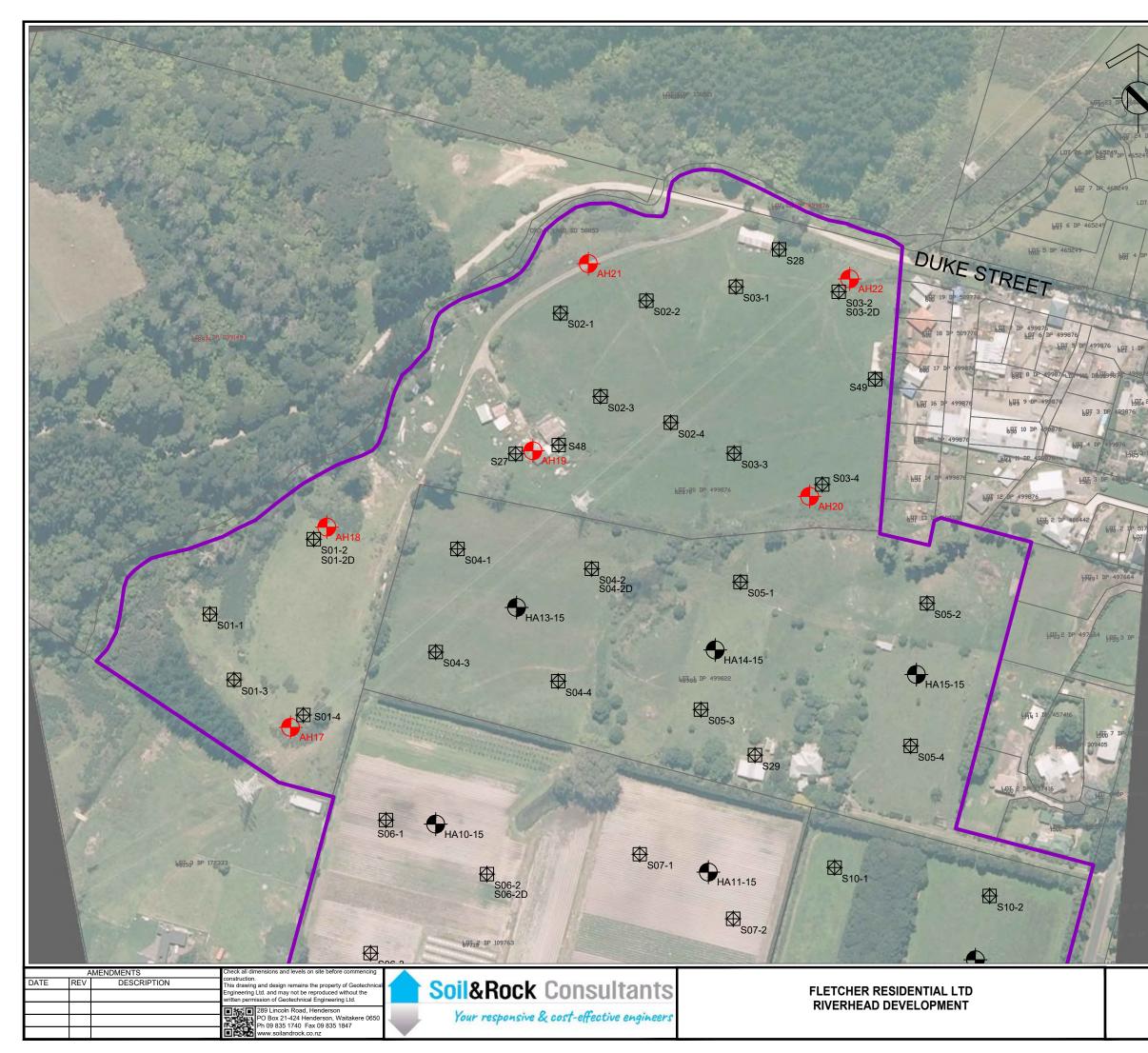
Detailed geotechnical investigation must be carried out to inform the design of any future urban development and address the constraints discussed above. Such investigation will require machine drilling and CPT testing to provide sufficient data for analysis of settlement risk, combined with additional hand augerholes to improve data resolution.

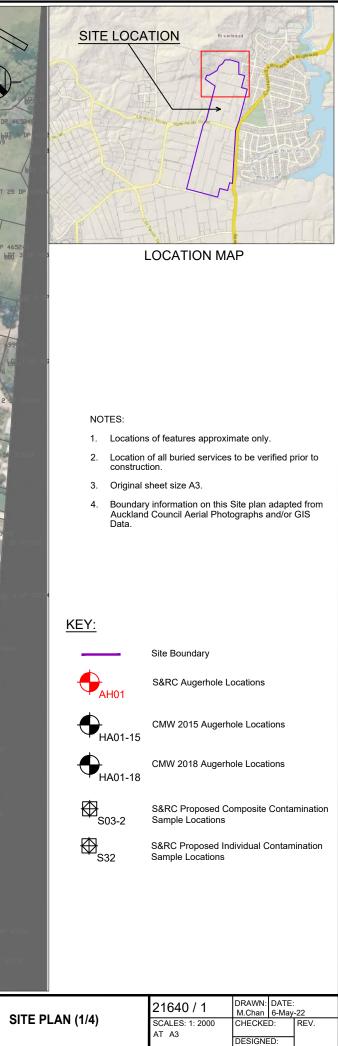
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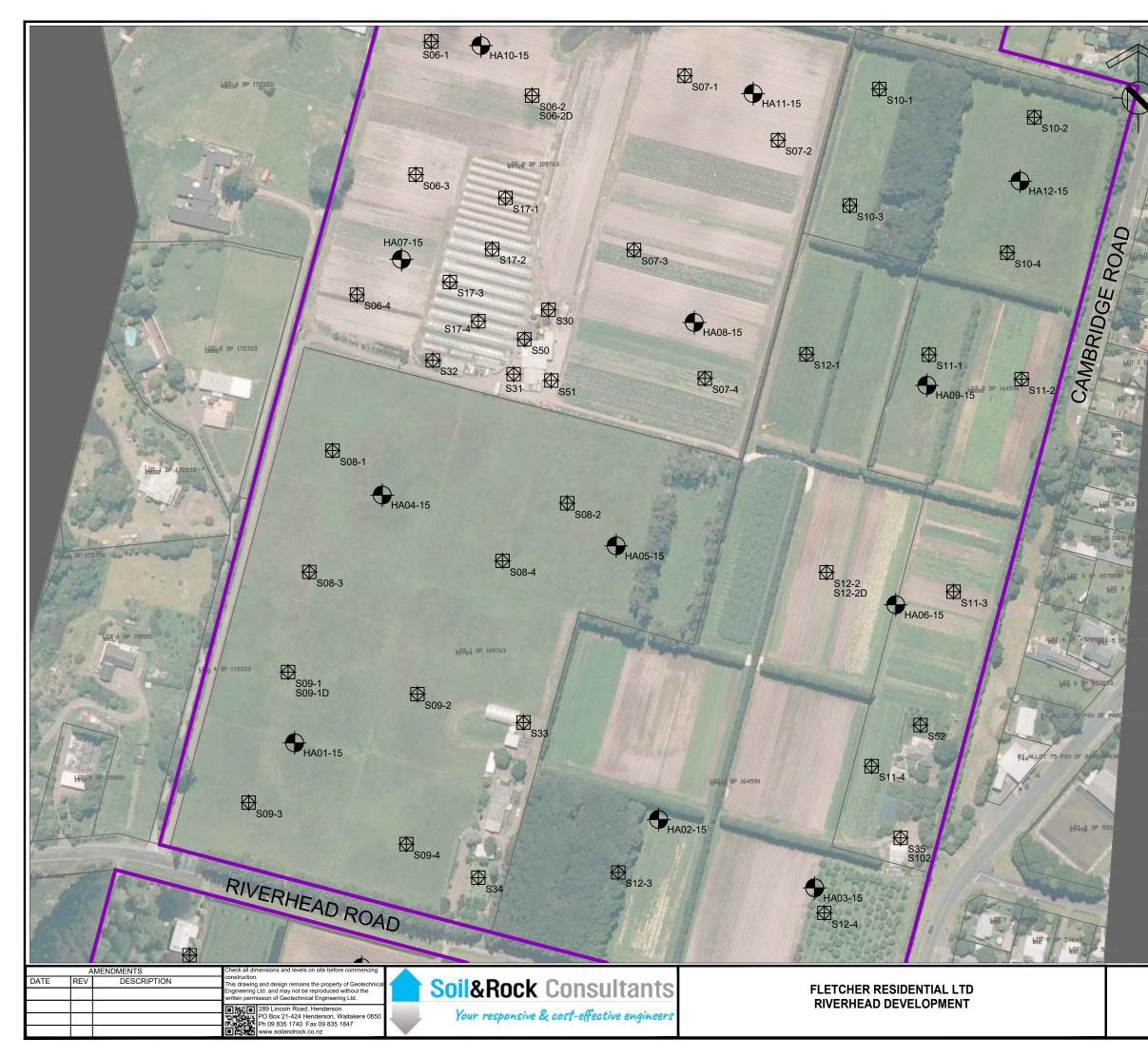
Appendix A

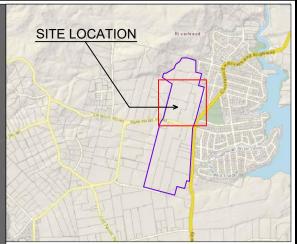
Test Location Plans





Filename: 21640 - master plan gir rev a.dwg





LOCATION MAP

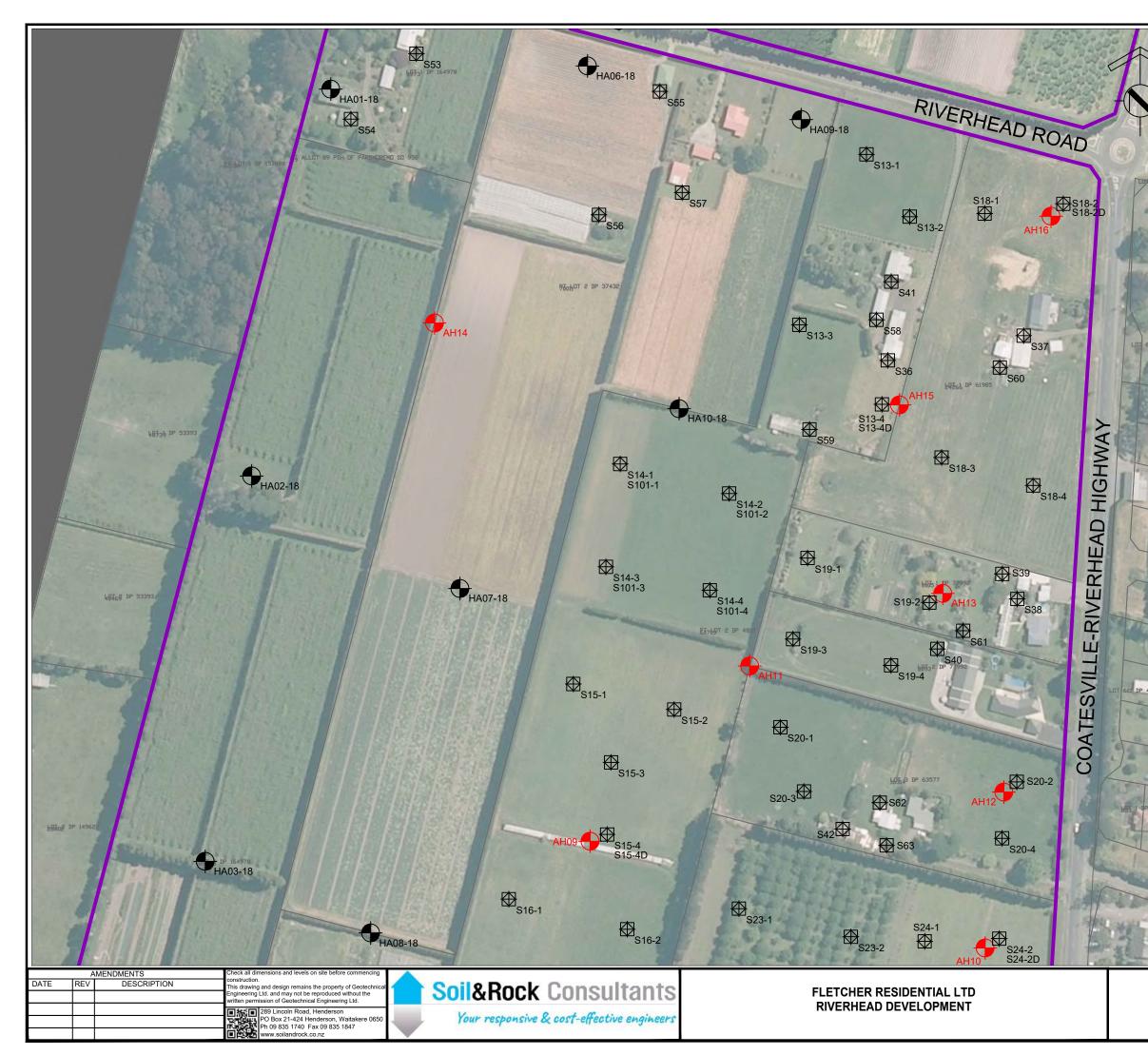
NOTES:

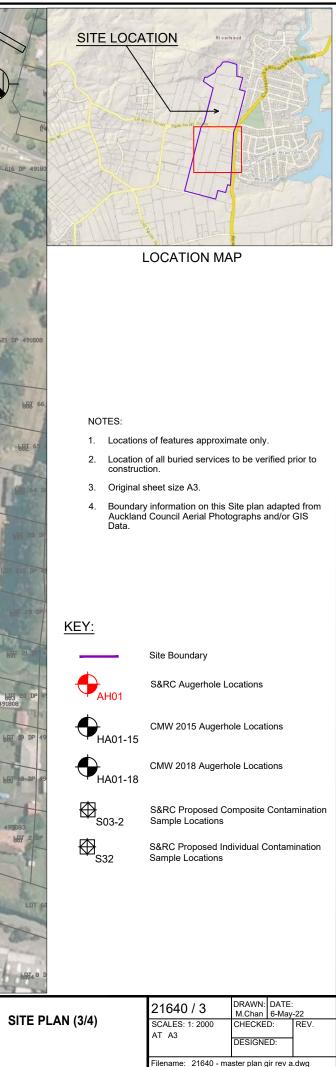
- 1. Locations of features approximate only.
- 2. Location of all buried services to be verified prior to construction.
- 3. Original sheet size A3.
- Boundary information on this Site plan adapted from Auckland Council Aerial Photographs and/or GIS Data.

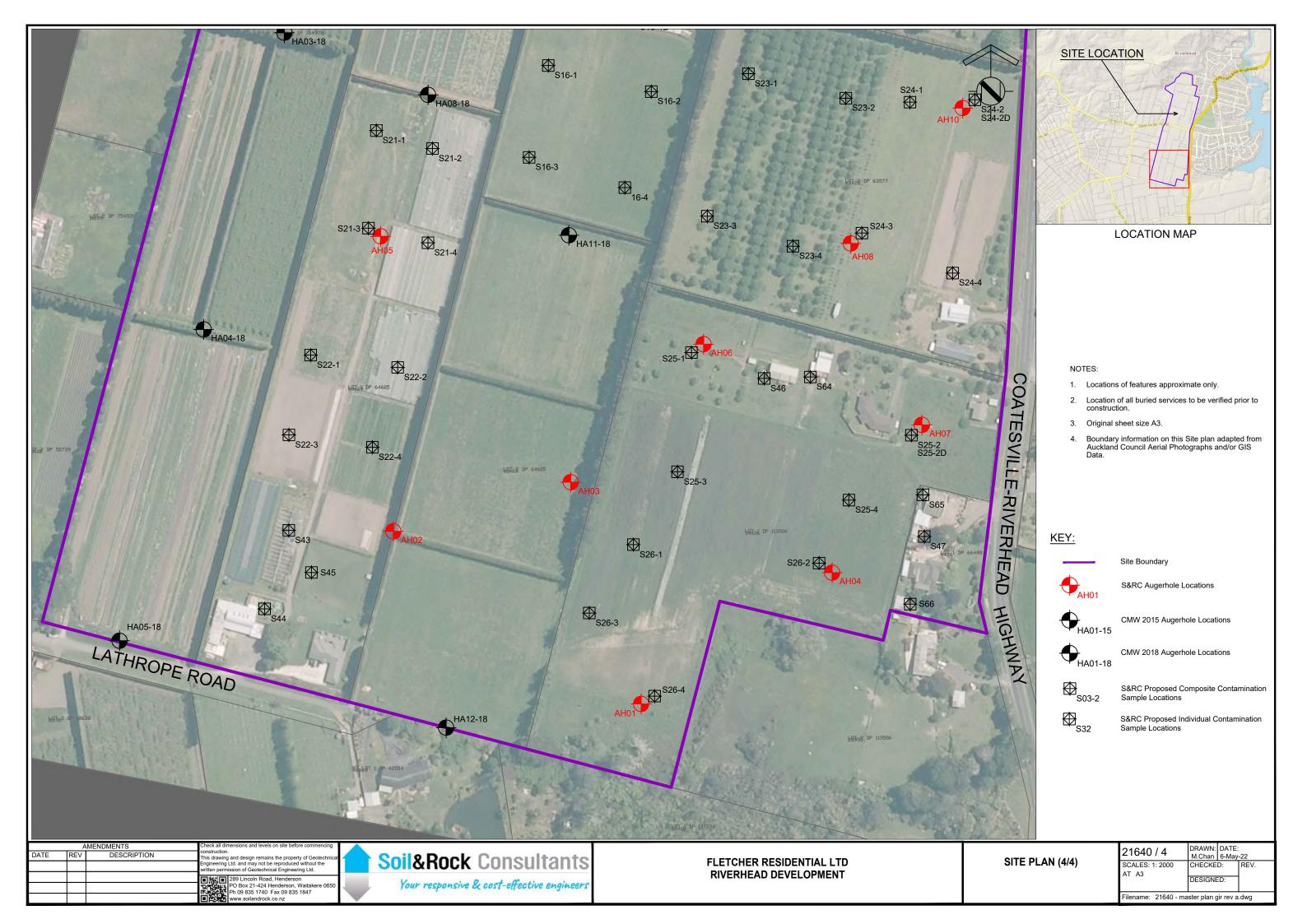
<u>KEY:</u>

| | Site Boundary |
|--------------|--|
| | S&RC Augerhole Locations |
| € HA01-15 | CMW 2015 Augerhole Locations |
| €на01-18 | CMW 2018 Augerhole Locations |
| ₿ 803-2 | S&RC Proposed Composite Contamination Sample Locations |
| ₿ 832 | S&RC Proposed Individual Contamination Sample Locations |
| | |

| | 21640 / 2 | DRAWN: | DATE: | : | | |
|-----------------|---|--------|----------------------------------|---|--|--|
| SITE PLAN (2/4) | | | M.Chan 6-May-22 CHECKED: REV. | | | |
| | AT A3 | | DESIGNED: | | | |
| | Filename: 21640 - master plan gir rev a.dwg | | | | | |



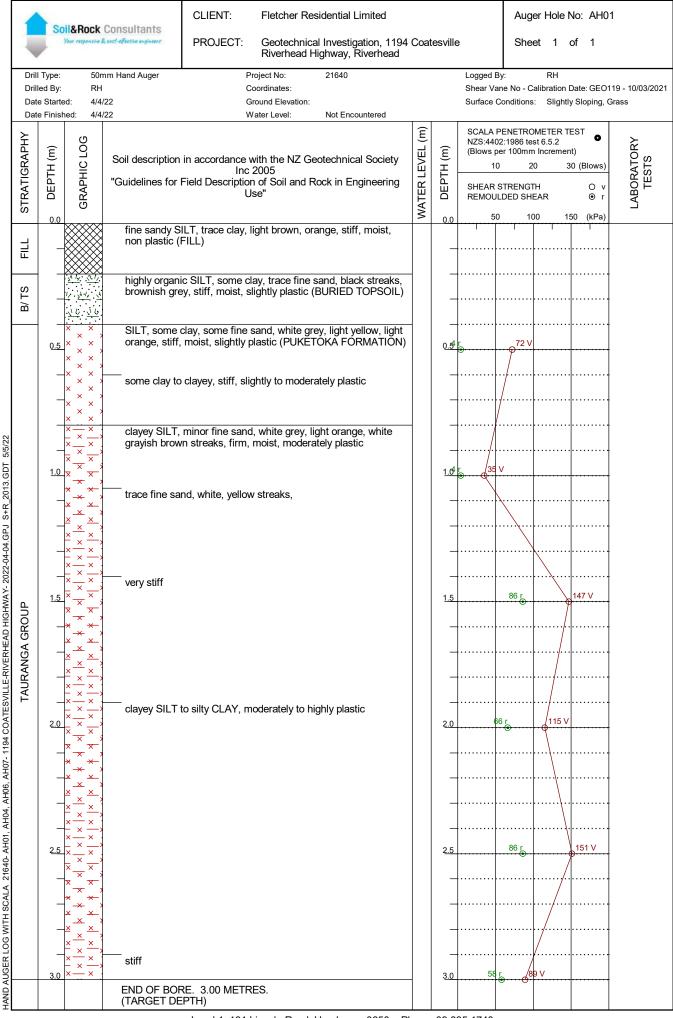


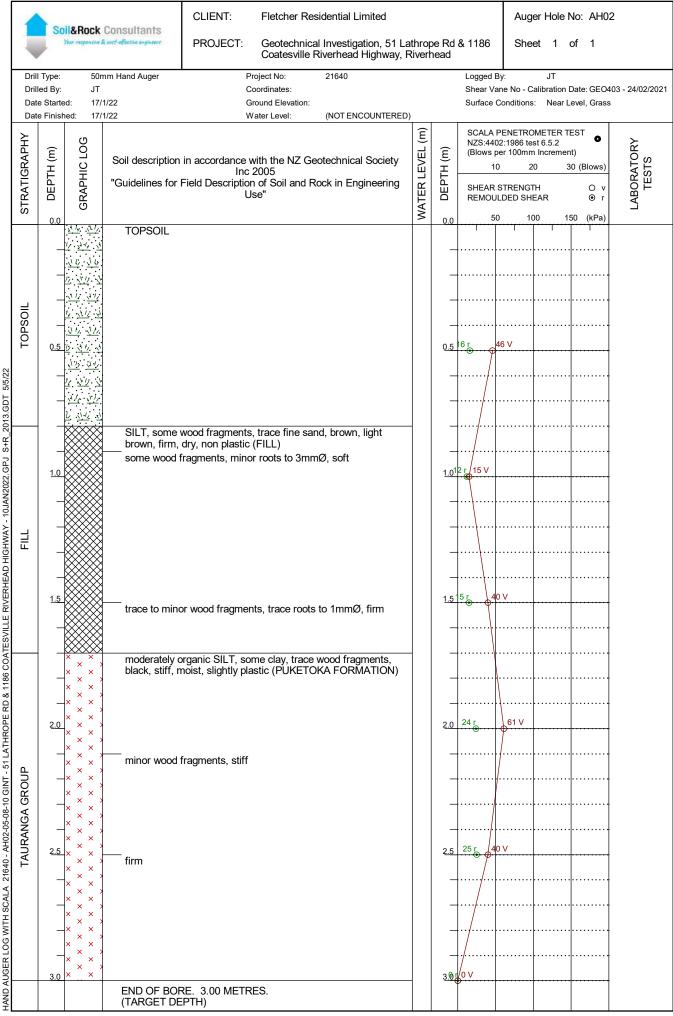




Appendix B

S&RC Investigation Logs





| 1 | So | il&Rock | Consultants | CLIENT: Fletcher Residential Limited | | | | Auge | er Hole I | No: AH04 | Ļ |
|---|--|-------------------|--------------------------|---|-----------------|-----------|------------------------------------|---|--------------------------------|----------|---------------------|
| | | Your responsive 8 | cost-effective engineers | PROJECT: Geotechnical Investigation, 1194 Riverhead Highway, Riverhead | 4 Coa | tesville | e | Shee | et 1 | of 1 | |
| Dri Da | II Type: Iled By: te Starte te Finist | TDS ed: 4/4/ | 22 | Project No: 21640 Coordinates: Ground Elevation: Water Level: 2.4m 4/04/2022 | | T | Logged B Shear Var Surface C | ne No - C | | | 22 - 20/12/2021 |
| STRATIGRAPHY | 00 DEPTH (m) | GRAPHIC LOG | | in accordance with the NZ Geotechnical Society Inc 2005 Field Description of Soil and Rock in Engineering Use" | WATER LEVEL (m) | OEPTH (m) | NZS:4402 | 2:1986 tes er 100mm 2 STRENGT DED SHE | i Incremer 0 3 ïH EAR | 0 | LABORATORY TESTS |
| HAND AUGER LOG WITH SCALA 21640- AH01, AH04, AH06, AH07- 1194 COATESVILLE-RIVERHEAD HIGHWAY- 2022-04-04.GPJ S+R_2013.GDT 5/5/22 TAURANGA GROUP TOPSOIL | | | orange strea | | | | | 85 85 74 V | V | 3 V | |
| UGER LOG WITH SCALA 21640 | | | | | | | | | | | |
| HAND A | | | END OF BOF (TARGET DE | RE. 3.00 METRES. PTH) | | | | | | | |

| | So | &Rock | Consultants | CLIENT: Fletcher Residential Limited | | | | Auger Ho | ble No: AH05 | 5 |
|---|--|---|-------------------------------|---|-----------------|---------------|----------|---|-------------------------|---------------------|
| | | | k oost-offective engineers | PROJECT: Geotechnical Investigation, 51 L Coatesville Riverhead Highway, | _athro River | pe Rd head | & 1186 | Sheet ⁷ | 1 of 1 | |
| Dri Da | II Type: Iled By: te Starte te Finish | JT ed: 17/ ⁻ | nm Hand Auger 1/22 1/22 | Project No: 21640 Coordinates: Ground Elevation: Water Level: 2.9m 17/01/2022 | | I | | | tion Date: GEO4 | 03 - 24/02/2021 |
| STRATIGRAPHY | DEPTH (m) | GRAPHIC LOG | | in accordance with the NZ Geotechnical Society Inc 2005 | WATER LEVEL (m) | DEPTH (m) | NZS:4402 | PENETROMETE 2:1986 test 6.5. er 100mm Incre 20 | 2 0 | LABORATORY TESTS |
| STRAI | | GRAF | Guidelines for r | Guidelines for Field Description of Soil and Rock in Engineering Use" | | | | STRENGTH DED SHEAR 100 | O v ⊚ r 150 (kPa) | LABO TI |
| TOPSOIL | | <u>x 1, x 1, x</u> 1/ <u>x 1, x 1, x</u> 1/ <u>x 1, x 1, x</u> | TOPSOIL | | | 0.0 | 50 | | ····· | |
| | | $\frac{\sqrt{l_2}}{\sqrt{l_2}} \cdot \frac{\sqrt{l_2}}{\sqrt{l_2}} \cdot \frac{\sqrt{l_2}}{\sqrt{l_2}}$ | SILT, some o | clay, trace organic wood fibers, brown, dark red | _ | - | | | | |
| T 5/5/22 | <u>0.5</u> | | brown, very s FORMATION | stiff, moist, slightly plastic (PUKETOKA N) | | <u>0.5</u> | 40 r | ····· | 121 Υ | |
| J S+R_2013.GDT | - | × × × × × × × × × × × × × × × × × × × | no wood fibe | rs | | _ | | | | |
| 10JAN2022.GP | <u>1.0</u> | × × × × × × × × × × × × | stiff | | | <u>1.0</u> | 30 r | 98 V | | |
| EAD HIGHWAY - | - | × × × × × × × × × × | | | | - | | | | |
| VILLE RIVERHE | <u>1.5</u> | × × × × × × | | | | <u>1.5</u> | 33 r | 91 V | | |
| 2 & 1186 COATESVILLE RIV TAURANGA GROUP | - | | | | | - | | | | |
| ATHROPE RD { | | $ \begin{array}{c} \times \\ \times \\ \times \\ \times \\ \times \\ \end{array} $ | amorphous v | y SILT, trace fine sand, trace wood fibers), black, vith residual fibers, stiff, wet to saturated, | | | 15 r | 51 V | | |
| 8-10 GINT - 51 L | - | | moderately p | lastic | | | | | | |
| 640 - AH02-05-0 | | | very stiff | | | | 37 r | 101 | v | |
| HAND AUGER LOG WITH SCALA 21640 - AH02-05-08-10 GINT - 51 LATHROPE RD & 1186 COATESVILLE RIVERHEAD HIGHWAY - 10JAN2022.GPJ S+R_ TAURANGA GROUP | - | <u>1/ 1/ 1/ 1/</u> 1/ 1// 1// | | | 17/01/2022 | | | | | |
| JGER LOG M | 3.0 | | saturated | | | 3.0 | 51 г | 11 | 2 V | |
| HAND AL | 3.0 | | END OF BOR (TARGET DE | RE. 3.00 METRES. PTH) | | | • | | | |

| | So | il&Bock | Consultants | CLIENT: Fletcher Residential Limited | | | | Auge | er Hole N | lo: AH06 | ; |
|---|--|--|---------------------------------|---|-----------------|-------------------------|-----------------------------------|--|----------------------------------|------------------------------|---------------------|
| | | | cost-effective engineers | PROJECT: Geotechnical Investigation, 119 Riverhead Highway, Riverhead | 4 Coa | tesvill | 9 | Shee | et 1 o | of 1 | |
| Dr Da | ill Type: illed By: ate Starte ate Finish | RH ed: 4/4/ | | Project No: 21640 Coordinates: Ground Elevation: Water Level: 2.8m 4/04/2022 | | I | | ane No - Ca | RH alibration D : Undulat | | 19 - 10/03/2021 |
| STRATIGRAPHY | DEPTH (m) | GRAPHIC LOG | | in accordance with the NZ Geotechnical Society Inc 2005 Field Description of Soil and Rock in Engineering Use" | WATER LEVEL (m) | DEPTH (m) | NZS:440 (Blows p 1 SHEAR | 02:1986 tes ber 100mm 0 20 STRENGT JLDED SHE | n Increment 0 30 TH EAR | ●) (Blows) ○ v ● r | LABORATORY TESTS |
| TOPSOIL | 0.0 | | TOPSOIL | | | 0.0 | | ····· | ······ | ····· | |
| | <u>0.5</u> | | fine sandy Sl non plastic (f | ILT, trace clay, light grayish orange, firm, moist, PUKETOKA FORMATION) | | | 29 • • • • • • • | / | | | |
| S+R_2013.GDT 5/5/22 | | | minor clay, y | ellowish orange, stiff, non to slightly plastic | | _ <u>1.0</u> | 16 r | | 99 V | ····· | |
| GROUP | | | | ellowish white, very stiff and to sandy, some clay, grayish brown, slightly | | | 2 r | | | ······ | |
| JATESVILLE-KIVERHEAU TAURANGA | 2.0 | $\begin{array}{c} \times & \cdot & \times \\ \cdot & \times & \cdot & \times \\ \times & \cdot & \times & \cdot \\ \times & \cdot & \times & \cdot \\ \cdot & \times & \cdot & \times \\ \cdot & \times & \cdot & \cdot & \times \\ \cdot & \times & \cdot & \cdot & \times \\ \cdot & \times & \cdot & \cdot & \cdot \\ \cdot & \times & \cdot & \cdot & \cdot \\ \cdot & \times & \cdot & \cdot & \cdot \\ \cdot & \times & \cdot & \cdot & \cdot \\ \cdot & \times & \cdot & \cdot & \cdot \\ \cdot & \times & \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot & \cdot & \cdot \\ \cdot & \cdot &$ | organic SILT stiff, moist, s | , some clay, trace fine sand, minor fibrous, black lightly plastic (PEAT) | ' | | 2 r_ | | 99 V | | |
| H04, AH06, AHU/- 1194 U | - | | wet | | | | | | | | |
| HAND AUGER LOG WITH SCALA 21640- AH01, AH04, AH06, AH07- 1194 COATESVILLE-RIVERHEAD HIGHWAY- 2022-04-04.GPJ | - | | very stiff, we | t to saturated | 4/04/2022 | | 26 r | | 112 V | | |
| AND AUGER LOG WITI | 3.0 | | Soft, saturate | RE. 3.00 METRES. | <u>\</u> | | 23 V | | | | |

| | 1 | | 10 Deek | Consultanta | idential Limited | | | | A | uger Hole | No: AH0 | 7 | | |
|--|----------------|----------------------|---|---|---|--------------------------------|---|-----------------|--------------|-------------------|---------------------------------------|---------------------------|---|---------------------|
| | | | | Consultants sost-offective engineers | PROJECT: | Geotechnica Riverhead Hi | Investigation, 1194 ghway, Riverhead | Coat | esville | 9 | SI | heet 1 | of 1 | |
| ſ | | Type: ed By: | 50m MS | nm Hand Auger | | oject No: oordinates: | 21640 | | | Logged Shear V | • | MS - Calibration | Date: GEO3 | 354 - 2/07/2021 |
| | | e Starte e Finish | | | | ound Elevation: ater Level: | Not Encountered | | | Surface | Conditio | ons: Near | Level, Grass | 3 |
| | STRATIGRAPHY | DEPTH (m) | GRAPHIC LOG | Soil description | in accordance w Inc 2 Field Description | rith the NZ Geo 2005 | otechnical Society | WATER LEVEL (m) | DEPTH (m) | NZS:44 | 02:1986 per 100r 0 STREN | IGTH | 0 | LABORATORY TESTS |
| ╞ | 0 | 0.0 | <u>x, 1</u> %. <u>x, 1</u> %. | TOPSOIL | | | | Ň | 0.0 | 5 | 0 | 100 | 150 (kPa) | |
| - | TOPSOIL | | <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> <u>11</u> | SILT, some | clay, minor fine s y plastic (PUKET eaks, moist | and, light orar IOKA FORMA | ige, stiff, dry to TION) | _ | | | | | | |
| | | <u>0.5</u> | × × × × × | | | | | | <u>0.5</u> | 32 r | | 88 V | | |
| DT 5/5/22 | | | × × × × × × × × × × × × × × × × × × × | some clay to | clayey, slightly t lightly plastic | o moderately p | lastic | | - | | | 70 1/ | | |
| 2013.GDT | | <u>1.0</u> | × × × × × × | | | | | | <u>1.0</u> | 18 r ••●•••• | ++ | 79 V | | , |
| S+R_20 | | _ | × × × × × × | | | | | | | | ••••• | •••• | | |
| | | _ | × × × × × × | some fine to | medium sand | | | | _ | | | | | |
| 2022-04-04.GPJ | | _ | × × × | | | | | | | | | | | , |
| | TAURANGA GROUP | | × × × × × × × × × × × × × × × × × × × | clayey SILT, mottles, stiff | minor fine sand, moist, moderate | light brownish aly plastic | i grey, orange | _ | | 21 r | · · · · · · · · · · · · · · · · · · · | 85 V | | |
| /ERH | JRAN | _ | × × × | black speckle | es | | | | | | | •••• | | |
| LE-R/ | TAI | _ | × × × | | | | | | _ | | | •••• | | |
| TESVIL | | _ | $\times - \times - \times$ | light grey stre | eaks | | | | | | | •••• | | |
| 21640- AH01, AH04, AH06, AH07- 1194 COATESVILLE-RIVERHEAD HIGHWAY- | | <u>2.0</u> | <u>x x x</u> <u>x x x</u> <u>x y y y</u> <u>y y y y</u> <u>x y y y</u> | | , minor clay, mir fragments, blac | | | _ | <u>2.0</u> 1 | 2 r -⊛ | | 4 V | | |
| <u> 104, AH06, A</u> | | | | clayey SILT, wet, modera | minor fine sand, ely plastic | purplish grey, | black mottles, stiff, | | _ | | •••••• | • • • • • • • • • • • • • | | |
| 101, Ai | | _ | × × × | light grey, no | black mottles | | | | _ | | | | ••••••••••••••••••••••••••••••••••••••• | |
| 340- AF | | <u>2.5</u> | × × × | | | | | | 2 <u>.5</u> | 25 r | ¢ | 84 V | | |
| | | - | × × × | | | | | | _ | | | ••• | | |
| H SCAI | | _ | $\times \frac{\times}{\times} \frac{\times}{\times}$ | | | | | | _ | | | | | |
| 1 M D | | _ | $\frac{1}{x} \frac{1}{x} \frac{1}{x}$ | trace fine sa | nd | | | | _ | | | ••• | | |
| UGER LOG WITH SCALA | | _ | ×_×_×_ | | | | | | _ | | | | | |
| ∢٢ | | 3.0 | ° × ^> | | | | | | <u>3.0</u> | 32 r | 74 | 4 V | | |
| HAND | | | | END OF BOF (TARGET DE | RE. 3.00 METRE PTH) | <u>=</u> ð. | | | | | | | | |

| dark reddish brown, orange streaks | 8 |
|---|---------------------|
| Drilled By: RH Coordinates: Shear Vane No - Calibration Date: GEO7 Date Started: 10/1/22 Ground Elevation: Surface Conditions: Near Level, Long of Date Started: Date Started: 10/1/22 Water Level: 2.4m 10/01/2022 Surface Conditions: Near Level, Long of Date: GEO7 Date Finished: 10/1/22 Water Level: 2.4m 10/01/2022 Surface Conditions: Near Level, Long of Dom Incorrent) Hdvard 00 Soil description in accordance with the NZ Geotechnical Society Inc 2005 Image: Condition of Soil and Rock in Engineering Use" Image: Condition of Soil and Rock in Engineering Use" Sufface Conditions: Sufface Conditions: Near Level, Long of Dom Incorrent) NEMOULDED SHEAR 0.0 Soil description of Soil and Rock in Engineering Use" Image: Condition of Soil and Rock in Engineering Use" Image: Condition of Soil and Rock in Engineering Use" Image: Condition of Soil and Rock in Engineering Condition of Soil and Rock in Engine and the condition of Soil and Rock in Engine | |
| 00 10 | |
| Image: State stat | LABORATORY TESTS |
| 0.5 x x | |
| Image: Stress of the stand | |
| x x x x x x x x x x x x x x x x x x x x x x x x x x x x x x x | |
| Image: Second state | |
| Image: Sector of the sector | |
| $\begin{array}{c c c c c c c c c c c c c c c c c c c $ | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | |
| $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ | |

| | | 1 Pook | Consultants | CLIENT: Fletcher Residential Ltd | | | | Auger H | ole No: AH0 |) |
|----------------|--|----------------|---|---|-----------------|-------------------|--|----------------------|--|---------------------|
| | | | CONSULTAINS & cost-effective engineers | PROJECT: Geotechnical Investigation, 1140 riverhead Highway & 340 Riverh Riverhead |) Coa ead F | tesville Road, | - | Sheet | 1 of 1 | |
| Dri Da | II Type: Iled By: te Starte te Finist | DE ed: 28/2 | nmØ Hand Auger G 2/22 2/22 | Project No: 21640 Coordinates: Ground Elevation: Water Level: 2.0m 28/02/2022 | | | | , | EG tion Date: GEO3 ear Level, Soil | 61 - 12/08/2021 |
| STRATIGRAPHY | DEPTH (m) | GRAPHIC LOG | | in accordance with the NZ Geotechnical Society Inc 2005 Field Description of Soil and Rock in Engineering Use" | WATER LEVEL (m) | DEPTH (m) | NZS:4402 (Blows pe 10 SHEAR S | TRENGTH DED SHEAR | .2 ● ement) 30 (Blows) ○ v ⊙ r | LABORATORY TESTS |
| TAURANGA GROUP | | | plastic (PUK minor clay, c slightly plast SILT, some orange, oran | ILT, trace clay, grey brown, very stiff, dry, non ETOKA FORMATION) dark orange brown, orange brown, moist, non to ic clay to clayey, trace fine to medium sand, dark ige brown, stiff, moist, slightly to moderately plastic grey brown, moist to wet, moderately plastic | | | 2 r | | 150 (kPa) | |
| | - | | saturated, no | ic SILT, some plant fibrous, trace clay, black, firm, on plastic (PEAT) | | 2,d | | 56 V | | |
| | | | END OF BOF (TARGET DE | | | | | | | |

| | | | Consultants cost-effective engineers | CLIENT: PROJECT: | Geotechnica | sidential Limited al Investigation, 51 Riverhead Highwa | Lathro | ope | e Rd a | & 1186 | | iger Hole leet 1 | No: AH1 of 1 | 0 |
|----------------------------------|--|--|---|--------------------------------------|--|---|------------|-----|------------|---------------------------------------|---------------------------------------|---------------------|--|---------------------------|
| Drill Dat | Type: led By: e Starte e Finish | RH ed: 10/* | | (| Project No: Coordinates: Ground Elevation: Water Level: | 21640 2.8m 10/01/2022 | - | | | | ane No - | | Date: GEO Level, Long | 765 - 10/03/2021 Grass |
| STRATIGRAPHY | DEPTH (m) | GRAPHIC LOG | | Inc Field Descriptic | ; 2005 | otechnical Societ ock in Engineerin | <u>ц</u> ш | | DEPTH (m) | NZS:44 (Blows 1 SHEAR | 02:1986 | GTH | 0 | LABORATORY TESTS |
| STF | 0.0 | <u>Aria Aria</u> A | TOPSOIL | | | | WAT | | 0.0 | | | | ● r 150 (kPa) | ΓΡ |
| TOPSOIL | _ | | | | | | | | | | | ••• | | |
| | 0.5 | <u>10 1/2 - 10 1/2</u> <u>12 - 10 1/2 - 10 1/2</u> <u>10 - 10 1/2 - 10 1/2</u> | | | | | | | <u>0.5</u> | | | ••• | | 200+ UTP V |
| K_2013.GD1 5/5/22 | | × × × × × × × × × × × × × × × | SILT, some f stiff, moist, n | ine sand, mino ion to slightly p | r clay, dark ora lastic (PUKETC | nge brown, very DKA FORMATION | I) | | _ | | | | | |
| HEAD HIGHWAY - 10JAN2022.GPJ S+K | | | stiff some clay, tr fibers to 4mr | ace fine sand, n diam, dark re | some partially c ddish brown, sl | lecomposed wood ightly plastic | I | | | | 71 | | | |
| кнеар нібниат | _ | × × × × × × × × × × × × × × × × × × × | | | | | | | _ | | · · · · · · · · · · · · · · · · · · · | | | |
| A GROUP | <u>1.5</u> | × × × × × × × × × × × × × × × × × × × | SILT, some o mottles, stiff, | clay to clayey, c moist to wet, s | orange, whitish slightly to mode | grey, purplish bla rately plastic | ck | | <u>1.5</u> | 18 r. | | 93 ∨ 9 | | |
| | 2.0 | × ` > | light orange : | | | | | | 2.01 | 5 r •● | 60 V | ••• | ······································ | |
| 10 GINI - 51 LAII | - | | wet, highly p | lastic | - | ained, stiff, moist | to | | _ | | | | | |
| 640 - AHUZ-US-U8- | 2.5 | <u> </u> | fibrous PEAT | Γ, some clay, bl | lack stiff, wet, s | lightly plastic | | | 2.5 | 18 r | 7 | 9 V | | |
| | - | ッ () () () () () () () () () (| saturated | | | | | | - | · · · · · · · · · · · · · · · · · · · | · · · · · · · · · · · · · · · · · · · | | | |
| | 3.0 | × · · · · | END OF BOF (TARGET DE | , | | Henderson 0650. | | | <u>3.0</u> | | 66 \ | / | | |

| | | D | 0 | CLIENT: | Fletcher Res | idential Ltd | | | | Auge | r Hole I | No: AH11 | |
|-----------------------|--|---|--|---|--|---|--|----------------------|--|--|-------------------------------------|---------------------------------------|------------------------------------|
| | | | Consultants cost-offective engineers | PROJECT: | Geotechnical riverhead Hig Riverhead | Investigation, 1140 hway & 340 Riverhe | Coat ad R | esville oad, | - | Sheet | t 1 | of 1 | |
| Drill Dat | l Type: led By: e Starte e Finish | DE0 d: 28/2 | 2/22 | Co | ject No: ordinates: ound Elevation: iter Level: | 21640 2.2m 28/02/2022 | | | | ane No - Cal | | | 61 - 12/08/2021 e Gravel Access |
| STRATIGRAPHY | o DEPTH (m) | GRAPHIC LOG | | Inc 2 | 005 of Soil and Ro | otechnical Society ock in Engineering | WATER LEVEL (m) | o DEPTH (m) | NZS:44 (Blows) 1 SHEAR REMOL | PENETROM 02:1986 test per 100mm I 0 20 STRENGTH JLDED SHE/ 0 100 | : 6.5.2 Incremer 3 1 AR | 0 | LABORATORY TESTS |
| | | | fine sandy S FORMATIOI trace roots to grey brown, | N) o 1mmØ | stiff, dry, non | plastic (PUKETOKA | | 0.5 | 33 [| 82 V | , , | | |
| | | | slightly plasti | clay, minor fine s ic felt while drilling, ar vane affected some decompos c brown stained, | very soft by voids ed wood fragn | nents, trace fine | | | 5 V 16 j. | 52 V | | | |
| 0UP | 1.5 | | stiff trace decom | posed wood fragr coarse sand, wet | | | | | | 79 V | | | |
| TAURANGA GROUF | | - × _ × × _ × × × _ × × × _ × × * * * * | some organi | | | | - 28/02/2022</td <td> 2.0⁸</td> <td>6</td> <td>v </td> <td></td> <td>· · · · · · · · · · · · · · · · · · ·</td> <td></td> | 2.0 ⁸ | 6 | v | | · · · · · · · · · · · · · · · · · · · | |
| | 2.5 | <u> </u> | | ic SILT, minor cla Iack dark brown, | | | 11 | 2 <u>.5</u> 1 | 3r | 85 \ | / | | |
| 16- 1140 CKH& 340 KIV | | $\begin{array}{c c} \times & \times & \times \\ \hline & \times & \times & \times \\ \hline & & & & & \\ \hline & & & & & \\ \hline & & & &$ | brown, dark highly organi saturated, no SILT, some saturated, sl | on plastic clay, minor organ | saturated, mc nts fibre to fib ic silt, dark bro | oderately plastic rous , black, firm,/ own, black, firm,/ | | 3.0 ⁵ | r | × | | ····· | |
| ALA 21640- AH09- AH | | × × × × × × × × × × × × × × × × × × × | mottles, firm | , saturated, mode | erately plastic | ghtly to moderately | | | | 49 V | | · · · · · · · · · · · · · · · · · · · | |
| נידע געו הא או הא או | | $\begin{array}{c} \times & \times \\ \times & \times \end{array}$ | SILT, some | n grey, stiff, mod fine to medium sa on to slightly plas | and, minor cla | y, yellow grey, stiff, | - | | 20 - | | | ····· | |
| | 4.0 | × × | END OF BOF (TARGET DE | RE. 4.00 METRE PTH) | S. | | | <u>4.0</u> | 30 r ••••• | 74 V | | | |

| | 1 | So | il&Rock | Consultants | CLIENT: | Fletcher Res | sidential Ltd | | | | Aug | er Hole I | No: AH13 | 3 |
|------------------------------|----------------|---|--|---|--|--|---|-----------------|-----------------|---------------------------------------|--|--------------------------------------|---|---------------------|
| | - | | | k oost-offective engineers | PROJECT: | riverhead Hi Riverhead | ll Investigation, 1140 ghway & 340 Riverhe | Coat ead R | esville oad, | | | et 1 | of 1 | |
| | Drill Date | Type: ed By: e Starte e Finish | TDS d: 1/3/ | 22 | Co Gr | oject No: oordinates: ound Elevation: ater Level: | 21640 2.8m 1/03/2022 | | | | • | | | 22 - 20/12/2021 |
| | STRATIGRAPHY | DEPTH (m) | GRAPHIC LOG | | Inc 2 | 2005 of Soil and R | otechnical Society ock in Engineering | WATER LEVEL (m) | DEPTH (m) | NZS:44 (Blows 1 SHEAR | PENETRO 02:1986 te per 100mn 10 2 8 STRENG JLDED SH | st 6.5.2 n Incremer 20 3 TH | 0 | LABORATORY TESTS |
| ╞ | | 0.0 | <u>, 1, . , 1, .</u> | TOPSOIL | | | | 3 | 0.0 | 5 | 50 1) | 00 1 | 50 (kPa) | |
| | TOPSOIL | | <u>17 · 21 · 17</u> · 21 · 21 · 17 · 21 · 14 · 21 · 17 · 21 · 14 | | | | | | _ | | · · · · · · · · · · · · · · · · · · · | ••••• | · · · · · · · · · · · · · · · · · · · | |
| | | 0.5 | × × × × × × × × | SILT, some o moist, very st FORMATION | iff, moderately p | and, light brow blastic (PUKE1 | νn, white speckles, ΓΟΚΑ | | 0.5 | 26 r | | | 159 V | |
| | | | × × × × × × × × × × × × × × × × × × × | | | | | | | 17 r | | | · · · · · · · · · · · · · · · · · · · | |
| | | <u>1.0</u> | $\begin{array}{c} \times \\ \end{array}$ | clavev SILT. | light grey to grey | /. stiff. moist. ı | moderately to highly | _ | <u>1.0</u> | ···· | | | · · · · · · · · · · · · · · · · · · · | |
| | ROUP | <u>1.5</u> | | plastic | | ., , , | , , , | | <u> </u> | 1.r¢ ⁸ | · · / · · · · · · · · · · · · · · · · · | ••••• | • | |
| | TAURANGA GROUP | | × × × × × × × × × × × × × × × × × × × | firm, slightly | some clay to cla to moderately pla fibrous material, | astic | n, brown, moist, | - | - | · · · · · · · · · · · · · · · · · · · | · · · · · · · · · · · · · · · · · · · | ••••• | · · · · · · · · · · · · · · · · · · · | |
| 5/5/22 | TAUR | 2.0 | × × × × × × × × × × × × × × × × × × × | streaks, mois | to wet, firm, m | oderately plas | tic | | | 4 r ••••• | 54 V | ••••• | · · · · · · · · · · · · · · · · · · · | |
| 2013.GDT 5 | | | * * * * * * * * * * * * | fibrous tree in | nclusions | | | | _ | | . | • • • • • • • • • • • • | · · · · · · · · · · · · · · · · · · · | |
| S+R | | <u>2.5</u> | | | | | | 1/03/2022 | 2 <u>.5</u> | 26 r | 71 V | | | |
| 2022-03-01.GPJ | | 3.0 | × _ × _ × × _ × _ × × _ × _ × | clayey SILT, moderately to | trace fine sand, highly plastic | dark brown, s | tiff, saturated, | <u> </u> | | 28 r | 57 V | • • • • • • • • • • • • | | |
| 340 RIVERHEAD RD- | | _ | | END OF BOR (TARGET DE | E. 3.00 METRI PTH) | ES. | | | _ | | - | | | |
| ł& 340 RIVE | | | | | | | | | | | | ••••• | | |
| 21640- AH09- AH16- 1140 CRH8 | | - | | | | | | | _ | | | | | |
| AH09- AH1(| | <u>4.0</u> | | | | | | | <u>4.0</u> | | | • • • • • • • • • • • • • | •••••• | |
| ALA 21640- | | - | | | | | | | | | | ••••• | •••••• | |
| G WITH SC/ | | <u>4.5</u> | | | | | | | <u>4.5</u> | | | | ····· | |
| HAND AUGER LOG WITH SCALA | | | | | | | | | | | | ••••• | · · · · · · · · · · · · · · · · · · · | |
| HAND | | | | | | | Henderson 0650 P | <u> </u> | | | | | | |

| ſ | 1 | | I a D l | | CLIENT: | Fletcher Res | sidential Ltd | | | | Aug | er Hole I | No: AH1 | 5 |
|-----------------------|----------------|--------------------|--|---|----------------------|--|---|-----------------|------------------|------------------|------------------------------------|---|-----------------------------|---------------------|
| | | | | Consultants & cost-offective engineers | PROJECT: | Geotechnica riverhead Hi Riverhead | al Investigation, 1140 ghway & 340 Riverhe | Coat ead R | esville load, |) - | She | et 1 | of 1 | |
| ſ | | Type: ed By: | 50n DE | nmØ Hand Auger | | Project No: Coordinates: | 21640 | | | Logged | | DEG | | 361 - 12/08/2021 |
| | | ео by: e Starte | | 2/22 | | Ground Elevation: | | | | | | | y Sloping, | |
| | Date | e Finisł | ned: 28/2 | 2/22 | | Water Level: | GROUND WATER NOT | 1 | OUNTE | RED | | | | |
| | STRATIGRAPHY | DEPTH (m) | GRAPHIC LOG | Soil description | in accordance | with the NZ Ge | otechnical Society | WATER LEVEL (m) | DEPTH (m) | NZS:44 (Blows | PENETRO 02:1986 te per 100mr | st 6.5.2 n Incremer | 0 | LABORATORY TESTS |
| | ATIG | Ш | H | "Guidelines for I | Field Description | c 2005 on of Soil and R | ock in Engineering | R LI | EPTI | SHEAR | STRENG | | 0 v | OR/ TES |
| | TRA | B | GRA | | | Use" | | ATE | DE | | JLDED SH | | ⊙r | LAB |
| | <i>w</i> | 0.0 | | | | | | Ň | 0.0 | 5 | 50 1 | 00 1 | 50 (kPa) | |
| | | _ | × ·× · ·× ·> × ·× · | (PUKETOKA | ILI, light grey | brown, stiff, dry, I) | non plastic | | _ | | ····'···· | | | |
| | | - | · · × · · × × · × · × | orange brow | n organic streaks | | | | _ | | | • • • • • • • • • • | | |
| | | _ | × × · · · · · · · · · · · · · · · · · · | | ngame su care | , | | | _ | | | • • • • • • • • • • | • • • • • • • • • • • • | |
| | | 0.5 | ^ × ^ > | SILT, some f | fine to medium | sand,minor cla | y, light orange, to slighty plastic | | 0.5 | 5 | ¶r ⊜ | 0115 V | | |
| | | _ | \times \times \times \times \times | yenow, yenov | | | to slightly plastic | | _ | | | •••• | | |
| | | - | × × × | | | | | | - | | | •••• | | |
| | | - | $\begin{array}{c} \times \\ \times \\ \times \\ \times \end{array}$ | some clay, o | range with yell | ow speckles, sti | ff, slighty plastic | | _ | | | ••• | • • • • • • • • • • • • • • | |
| | | 1.0 | × × × | | | | | | 1.0 ¹ | 3 r | | 112 V | | |
| | | _ | $\begin{array}{ccc} \times & \times \\ & \times & \times \\ \times & \times \end{array}$ | orange brow | n, yellow brow | n, grey brown | | | _ | | | | | |
| | ЧD | _ | ^ × ^ > ×— × | clavev SII T | trace fine san | d liaht purple ar | ev arev vellow | | _ | | | <i></i> | | |
| | RO | _ | - × ` × × ` | grey, stiff, m | oist, moderate | d, light purple gr ly plastic | ey, grey, yenen | | _ | | ·····/ | ••••• | | |
| | A A A | 1.5 | ×_××, | | | | | | 1.5 | 36 r | 8 | V | | |
| | ANG | _ | ×××, | 1 | | | | | _ | | X | | | |
| | TAURANGA GROUP | _ | Ŷ × × × | 1 | | | | | _ | | | | | |
| | TA | - | × × × | light grey, pu | Irple grey, very | stiff | | | - | | | | | |
| | | 2.0 | $\times \frac{1}{x} \times \frac{1}{x}$ | | | | | | <u>2.0</u> | ••••• | 66 r | | 156 V | |
| 5/5/22 | | _ | $\frac{\times}{\times} \frac{\times}{\times} \frac{\times}{\times}$ | stiff | | | | | _ | | ļ | | ļ | |
| GDT 5 | | _ | _ ×> × × | Sun | | | | | _ | | | | | |
| 2013.G | | _ | ×_×_× | | | | | | _ | | | | • • • • • • • • • • • • • | |
| œ' | | <u>2.5</u> | × × × | | | | | | <u>2.5</u> | 36 r | | 102 V | | |
| ъ Г | | _ | ^*^) × | | | | | | _ | | | ••••••• | | |
| 01.GPJ | | _ | × × × | | | | | | _ | | | • | | |
| 2-03-01 | | _ | $\times \frac{1}{\times} \times \frac{1}{\times}$ | light brown, I | orown, very sti | ff | | | | | | | | |
| - 2022 | | 3.0 | ×—× - × —> | | | | | | <u>3.0</u> | 54 | r | 115 V | • | |
| D RD- | | _ | | END OF BOF (TARGET DE | RE. 3.00 MET PTH) | RES. | | | _ | | | • • • • • • • • • • | | |
| 340 RIVERHEAD | | _ | - | , | , | | | | _ | | | • • • • • • • • • • • | | |
| RIVE | | _ | | | | | | | | | | | | |
| 340 F | | <u>3.5</u> | - | | | | | | <u>3.5</u> | | ····· | | | |
| | | _ | | | | | | | _ | | ····· | | | |
| 40 C | | _ | | | | | | | _ | | | • • • • • • • • • • | • • • • • • • • • • • • • | |
| 16- 1 | | _ | | | | | | | | | | | | |
| AH09- AH16- 1140 CRH& | | <u>4.0</u> | | | | | | | <u>4.0</u> | | | | | |
| AH09 | | _ | | | | | | | _ | | | • • • • • • • • • • | | |
| 21640- | | - | | | | | | | | | ····· | ••••• | • • • • • • • • • • • | L |
| | | _ | | | | | | | | | [| | | |
| SCAL | | <u>4.5</u> | 5 | | | | | | <u>4.5</u> | | | | | |
| ΗĘ | | - | | | | | | | _ | | ····· | | | |
| ≶ 00 | | _ | | | | | | | - | | ····· | • • • • • • • • • • • | | |
| ER L | | _ | | | | | | | | | | | | |
| AUGER LOG WITH SCALA | | 5.0 | | | | | | | <u>5.0</u> | | ļ | | | |
| HAND / | | | | | | | | | | | | | | |
| ΞL | | | | | | | | 1 | | | | | 1 | |

| | | US Daala | Omenitante | CLIENT: | Fletcher Re | esidential Ltd | | | | Aug | er Hole I | No: AH1 | 6 |
|----------------------|-------------------------|--|--|------------------------------------|--|---|-----------------|-------------------|---|--|--------------------------|----------|-----------------------|
| | | | Consultants koost-effective engineers | PROJECT: | Geotechnic riverhead H Riverhead | al Investigation, 1140 lighway & 340 Riverhe | Coat ead R | tesville Road, |) - | She | et 1 | of 1 | |
| | ill Type: | | nmØ Hand Auger | | Project No: | 21640 | | | Logged | | DEG | | |
| | illed By: ate Starte | DE0 | 3 2/22 | | Coordinates: Ground Elevation: | | | | | | alibration : Near L | | 361 - 12/08/2021 s |
| | ate Finish | | 2/22 | | Water Level: | GROUND WATER NO | TENC | OUNTE | | | | | |
| STRATIGRAPHY | DEPTH (m) | GRAPHIC LOG | | Ine ield Descriptie | c 2005 on of Soil and I | eotechnical Society Rock in Engineering | WATER LEVEL (m) | DEPTH (m) | NZS:44 (Blows 1 SHEAR | 02:1986 te per 100mn 0 2 STRENG | n Incremer 20 3 TH | 0 | _ABORATORY TESTS |
| STR. | | GR/ | | | Use" | | ATE | | REMOL | JLDED SH | EAR | ⊙r | LAE |
| | 0.0 | · · · · · · · · · · · · · · · · · · · | TODOOU | | | | 3 | 0.0 | 5 | 0 1 | 00 1 | 50 (kPa) | |
| TS | 1 - | | TOPSOIL | ome silt arev | brown, loose to | o medium drv | | _ | | | | | |
| | - | •••• | (PUKETOKA | FORMATION | l) | o mediam, ary | | _ | | | | | |
| | - | •••• | | | | | | _ | | | | | |
| | 0.5 | | light brown g | rey | | | | 0.5 | | | • • • • • • • • • • • | | 200+ UTP V |
| | | ••• | | | | | | _ | | | | | |
| | _ | $\begin{pmatrix} x & x \\ x & x \end{pmatrix}$ | fine sandy S brown grev. | LT, fine gum f /ery stiff, mois | fragments to 10 t. non plastic | 0mm, grey, light | | _ | 36∙r ⊚ | | | | V |
| | - | × . ×. × . × . | 5 ,, | , | , , | | | _ | ••••••••••••••••••••••••••••••••••••••• | | | | |
| | 1.0 | × . × . * . | some fine sa | nd to sandy, n | ninor clay, non | to slightly plastic | | | 21 r | | • • • • • • • • • • • • | | |
| | <u></u> | | | | | | | | | | | 9 | |
| | _ | some clay, light grey, light brown grey, slightly plastic | | | | | | | | | / | | |
| no | _ | ×— × - × —> | clayey SILT, | 1 | _ | | | / | | | | | |
| GR | 1.5 | ×× | moderately p inclusion of b | | | | 21 r_ | | / 0 V | | | | |
| NGA | 1.5 | $\hat{\mathbf{x}} = \hat{\mathbf{x}}$ | | | | | | 1.5 | •••• | <u> </u> | | | |
| TAURANGA GROUP | | * | | | | | | | | | | | |
| TAU | - | ׯ× | very stiff, ligh | nt brown grey medium sand | | | | _ | | | | | |
| 1 · | 20 | × × × | | mediam sana | | | | | 6 | 2 r | | | |
| 77/9/9 | | $\hat{x} \times \hat{x} \times \hat{x}$ | some clay to | clayey, slighty | to moderately | plastic | | <u>2.0</u> | | -⊚ | | | |
| 2013.GDI | - | $\begin{array}{c} \overline{} \times \\ \overline{} \end{array}$ | light brown, I | ight grey brow | n, stiff | | | _ | | · · · · · · · · · · · · · · · · · · · | | | |
| 2+K_20 | 2.5 | × × × | clayey, light (| grey white, ligh | nt brown mottle | s, moderately plastic | | 2 <u>.5</u> | 36 r ⊙ | 69 V | | | |
| GPJ | | ×∵́×∖ | a 6mm root | | | | | | | | | | |
| 10-50 | _ | ×_×_, | moist to wet, | light grey | | | | _ | | | | | |
| 2022-03-01 | 3.0 | $\frac{\times}{\times} \frac{\times}{\times}$ | wet | | | | | | 30 r | 66 V | | | |
| | 0.0 | | END OF BOF | | RES. | | 1 | <u>0.0</u> | | •••• | | | |
| 340 KIVERHEAD RD- | _ | | (TARGET DE | PTH) | | | | _ | | | | | |
| | - | | | | | | | _ | | | | | |
| 2 2 | 3.5 | | | | | | | | | | • • • • • • • • • • • | | |
| | | | | | | | | _ | | | | | |
| 1140 CKH& | _ | | | | | | | _ | | | | | |
| - 114(| - | | | | | | | - | | | | | |
| -9LH | 4.0 | | | | | | | <u> </u> | | | • • • • • • • • • • • • | | |
| | <u>4.0</u> | | | | | | | <u>4.0</u> | | | | | |
| Z1640- AH09- AH16- | | | | | | | | _ | | | | | |
| 2164 | | | | | | | | _ | | | | | l |
| | 4.5 | | | | | | | | | | | | |
| AUGER LOG WITH SCALA | <u></u> | | | | | | | <u></u> | | | | | 1 |
| M | | | | | | | | _ | | | | | |
| 4 LOC | | | | | | | | - | | | | | |
| 19E | 5.0 | | | | | | | | +••••• | | ••••• | | 1 |
| | 3.0 | | | | | | | <u>J.J</u> | | | + | | 1 |
| HAND | | | | | | | | | | | | | |

| | 1 | | | | CLIENT: | Fletcher Res | sidential Ltd | | | | Aug | er Hole I | No: AH1 | 7 |
|----------------------------|--------------|------------|-------------|---|---------------------------------------|---------------------------------|---|-----------------|-------------|---------|-------------------------|-----------------------|-----------------------------|---------------------|
| | | | | Consultants & cost-effective engineers | PROJECT: | Geotechnica | al Investigation, 22 Du | uke S | St, Riv | erhead | She | et 1 | of 1 | |
| | Drill | Type: | 50n | nmØ Hand Auger | P | roject No: | 21640 | | | Logged | Bv: | RH | | |
| | | ed By: | RH | • | | oordinates: | 21040 | | | | | | Date: GEO | 765 - 10/03/2021 |
| | | e Starte | | 2/22 | | round Elevation: | Not England | | | Surface | Conditions | s: Near L | evel, Grass | 6 |
| | Date | e Finish | ied: 28/. | 2/22 | vv | ater Level: | Not Encountered | $\widehat{}$ | | SCALA | | OMETER T | TOT | |
| | ₹ | | g | | | | | <u></u> | | NZS:44 | 02:1986 te | st 6.5.2 | 0 | ž |
| | RAF | H (m | CLO | Soil description | | | otechnical Society | N. | L (m | | | n Incremer | nt) 30 (Blows) | TOI |
| | STRATIGRAPHY | DEPTH (m) | GRAPHIC LOG | "Guidelines for | Field Description | 2005 1 of Soil and R | ock in Engineering | WATER LEVEL (m) | DEPTH (m) | | STRENG | | 0 v | LABORATORY TESTS |
| | TRA | B | BRA | | U | se" | | TEI | В | | ILDED SH | | ⊙r | AB |
| | Ś | 0.0 | Ŭ | | | | | Ň | 0.0 | 5 | 0 1 | 00 1 | 50 (kPa) | 1 |
| | _ | | | fine sandy S | ILT, some fine to parse sand light | o medium sub t bluish arev h | angular gravel, trace hard, dry, non plastic | | | | I | | | |
| | | _ | | (FILL) | ouroe ourie, iigin | r braioir groy, n | iara, ary, non piaoto | | _ | ••••• | | • • • • • • • • • • • | • • • • • • • • • • • • • | |
| | | | | | | | | - | _ | | | | | |
| | | _ | | (GRAVEL OE | RE. 0.20 METR SSTRUCTION) | ES. | | | _ | | | | | |
| | | | | - | | | | | | | | | | |
| | | _ | | | | | | | _ | ••••• | • • • • • • • • • • • • | ••••• | | , |
| | | <u>0.5</u> | | | | | | | <u>0.5</u> | ••••• | | | | |
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| | | <u>1.0</u> | | | | | | | 1.0 | | | | | |
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| 5/5/22 | | <u>1.5</u> | | | | | | | <u>1.5</u> | | | | | |
| | | _ | | | | | | | _ | | | | | |
| 2013.GDT | | | | | | | | | | | | | | |
| 201 | | | | | | | | | | | | | | |
| S+R | | - | | | | | | | - | ••••• | | ••••• | • • • • • • • • • • • • • • | |
| - 28FEB2022.GPJ | | _ | | | | | | | _ | | | | | |
| B202 | | <u>2.0</u> | | | | | | | <u>2.0</u> | | | | | , |
| 28FEI | | | | | | | | | | | | | | |
| ST | | _ | | | | | | | _ | ••••• | | ••••• | • • • • • • • • • • • • • | |
| ЫK | | _ | | | | | | | - | | | •••••• | | , |
| - 22 D | | _ | | | | | | | _ | | | | | |
| AH22- | | | | | | | | | | | | | | |
| H17-/ | | _ | | | | | | | _ | | | | | |
| 21640 - AH17-AH22- 22 DUKE | | <u>2.5</u> | | | | | | | 2 <u>.5</u> | | | | | |
| | | _ | | | | | | | _ | | | | | , |
| CALA | | _ | | | | | | | _ | | | | | , |
| TH S | | | | | | | | | | | | | | |
| N DC | | _ | | | | | | | - | | ••••• | ••••• | | |
| ER LC | | _ | | | | | | | - | | | | | |
| HAND AUGER LOG WITH SCALA | | <u>3.0</u> | | | | | | | <u>3.0</u> | | | | | |
| AND | | | | | | | | | | | | | | |
| τl | | | | | | | | 1 | | | | 1 | 1 | |

| | | | D - I | 0 | CLIENT: Flet | tcher Resid | lential Ltd | | | | Aug | er Hole I | No: AH1 | 8(A) |
|---------------------------|---------|-----------------|-------------|---|---|---------------------|---------------------|-----------------|------------|--------|-------------------------|-------------------------|---------------------------|---------------------|
| 8 | V | | | Consultants & cost-effective engineers | PROJECT: Geo | otechnical I | nvestigation, 22 Du | ıke S | it, Riv | erhead | She | et 1 | of 1 | |
| | Drill 1 | Туре: | 50m | nmØ Hand Auger | Project N | lo: | 21640 | | | Logged | By: | RH | | |
| | | d By: Starte | RH | 2/22 | Coordina | ates: Elevation: | | | | | | | Date: GEO y Sloping, (| 765 - 10/03/2021 |
| | | Finish | | 2/22 | Water Le | | Not Encountered | | | Sunace | Conditions | s. Silyriu | y Sloping, v | 31855 |
| | | DEPTH (m) | GRAPHIC LOG | | in accordance with th Inc 2005 | | | WATER LEVEL (m) | DEPTH (m) | NZS:44 | 02:1986 te per 100mn | n Incremen | 0 | LABORATORY TESTS |
| Ī | 5 | E E | SAPI | "Guidelines for I | Field Description of S Use" | oil and Roc | k in Engineering | ER | ЕЪ | | STRENG | | Ov ⊙r | TE BOF |
| | 5 | | ъ | | | | | VAT | | | ILDED SH | | | LA |
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| | | _ | | ocassionally moderately p | clay to clayey, trace fi orange streaks, hard, lastic | dry to moi | st, slightly to | | _ | | | | | |
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| | Ţ | | | Consultants & cost-effective engineers | PROJECT: | Geotechnica | al Investigation, 22 Du | uke S | st, Riv | erhead | She | et 1 | of 1 | |
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| | SIKALIGKAPHY | DEPTH (m) | GRAPHIC LOG | | In Field Descripti | c 2005 | otechnical Society ock in Engineering | WATER LEVEL (m) | DEPTH (m) | NZS:440 (Blows p 10 SHEAR | 02:1986 te per 100mn | n Incremer 10 3 TH | 0 | LABORATORY TESTS |
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| | | | | fine sandy S hard, dry, no | ILT, trace clay n plastic (FILL | , trace rootlets, l .) | ight grayish, brown, | | 0.0 | | T | | ····· | |
| i | | | | SILT, some of white specklo moderately p | clay to clayey, es, very stiff to | light grey, orang hard, moist to c | je blue streaks, dry, slightly to | _ | _ | | | | | |
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| STRATIGRAPHY | DEPTH (m) | | GRAPHIC LOG | Soil description | in accordance In | e with the NZ c 2005 | Geotechnical So | ciety | EVE | DEPTH (m) | ` | | | 30 (Blows) | LABORATORY TESTS |
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| | | <u>0.0</u> | | fine to mediu | m gravelly SIL | T, some fine | to coarse sand, , stiff, dry, non pla | minor | | 0.0 | | [| | T | |
| | | \rightarrow | | (FILL) | ar gravei, ligni | t grey, brown, | , sun, ary, non pia | astic | | _ | | | ••••• | | |
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| | _ | | | | | minor fino og | nd, organic stain | od | | _ | | | ••••• | | |
| | | _> | < | dark grey, br | own grey, stiff | , moist, slight | tly to moderately | eu, plastic | | _ | | | | | |
| | |).5 | × × × × | clayey, trace | fine to mediur | m sand, yello | w grey with orang | ge | | 0.5 | 36 r | 8 | 7 V | | |
| | | > | < | mottles, mod | erately plastic | | | | | | Ű | | | | |
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| | | -> | < | some clay to | clayey, some | fine to mediu | ım sand, light gre | ey, | | _ | | <i> </i> | ••••• | | |
| GR | | -, | × × × | orange grey, | firm, slightly t | o moderately | plastic | | | _ | | . / | ••••• | | |
| TAURANGA GROUP | 1 | 1.0 | < ^ × > < × × > | | | | | | | 1.0 | 20 r •••••••••••••••••••••••••••••••••••• | 52 V | | | |
| URA | | |) × | fine to mediu | m candy SILT | some clav | intermixed with s | ome | | _ | | | ••••• | | |
| TA | | _> | ·× · · > · · × · · > ·× · · > | fine to mediu | m sand, mino | r fine to coars | se subrounded gr | ravel, | 022 | _ | | ļ | | | |
| | | _> | * × . * | grey, orange | , blue grey, su | 11, 110/31, 110/1 | to signify plastic | , | 28/02/2022 | _ | | | | | |
| | | > | < ` × ` > · ×· > | | | | | | | | | | | | |
| | 1 | 1.5 | < · 、 ×· · 、 、 、 、 、 < . 、 、、 | saturated | | | | | | 1.5 | | | | | 200+ UTP V |
| 5/5/22 | | > | < | | clay, minor fine I, saturated, sl | | grey with red brow | wn | | | | | | | |
| 2013.GD1 | _ | > | < | | | | | | - | _ | | | ••••• | • • • • • • • • • • • • • | |
| | | - | | END OF BOF (TOO HARD | | RES. | | | | - | | | ••••• | | |
| ¥+2 5 | | - | | | | | | | | _ | | | ••••• | • • • • • • • • • • • • • • | |
| 22.GPJ | | - | | | | | | | | _ | | | ••••• | | |
| 28FEB2022 | 2 | 2.0 | | | | | | | | <u>2.0</u> | | | | | |
| 1 | | _ | | | | | | | | _ | | | ••••• | | |
| JKE SI | | _ | | | | | | | | _ | | | ••••• | | |
| 22 DI | | | | | | | | | | _ | | | | | |
| AHZ2- | | | | | | | | | | | | | | | |
| AH17-AH22- 22 DUKE | | 2.5 | | | | | | | | 2.5 | | [| | | |
| 21640 - / | | | | | | | | | | <u>2.0</u> | | | <u> </u> | +++++++++++++++++++++++++++++++++++++++ | 1 |
| | | | | | | | | | | | | | ••••• | • • • • • • • • • • • • • | |
| HAND AUGEK LOG WITH SCALA | | + | | | | | | | | _ | | ····· | ••••• | | |
| E MI | | \neg | | | | | | | | _ | | | | | |
| LA LO | | \neg | | | | | | | | _ | | | | | 1 |
| AUG | 3 | 3.0 | | | | | | | | <u>3.0</u> | | | | | |
| HAND | | | | | | | | | | | | | | | |

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| | 1 | | | | CLIENT: | Fletcher Res | sidential Ltd | | | | Auge | er Hole I | No: AH2 | 0 |
|--|------------------------|---|----------------|--|--|--|--|-----------------|---------------------|---------------------------------------|---|--------------------------------|---------------------------------|------------------------|
| | | | | Consultants k aust-effective engineers | PROJECT: | Geotechnica | al Investigation, 22 D | uke S | st, Riv | erhead | Shee | et 1 | of 1 | |
| | Drill Date | Type: ed By: e Starte e Finish | KM ed: 28/2 | nmØ Hand Auger 2/22 2/22 | (| Project No: Coordinates: Ground Elevation: Water Level: | 21640 Not Encountered | | | | ne No - C | | Date: GEO2 .evel, Grass | 2199 - 18/10/2021 s |
| | STRATIGRAPHY | DEPTH (m) | GRAPHIC LOG | | Inc | 2005 | otechnical Society ock in Engineering | WATER LEVEL (m) | DEPTH (m) | NZS:440 (Blows p 10 SHEAR \$ | 2:1986 tes er 100mm 0 20 STRENGT _DED SHE | n Incremen 0 3 TH EAR | nt) 30 (Blows) ○ v ⊙ r | LABORATORY TESTS |
| DUKE ST - 28FEB2022.GPJ S+R_2013.GDT 5/5/22 | TAURANGA GROUP TS STRA | | | TOPSOIL SILT, some of stiff, moist, s trace intermi some fine to very stiff fine to mediu wet very dense | Clay, minor fine lightly plastic (i xed wood fragn medium sand m SAND, som | e sand, orangey PUKETOKA FC nents to 1mmØ | brown, light brown, RMATION) | | <u>0.0</u> | 22 r | 81 | EAR 10 11 | © r 50 (kPa) 1 | |
| HAND AUGER LOG WITH SCALA 21640 - AH17-AH22- 22 DUKE | | 2.5 | | | | | | | 2 <u>.5</u> | | | | | |
| HAND AUGE | | <u>3.0</u> | | | | | | | <u>3.0</u> | | | | | |

| 1 | | | Consultants | CLIENT: PROJECT: | | sidential Ltd al Investigation, 22 [|)uko 9 | St Riv | erhead | | jer Hole eet 1 | No: AH2 | 1 |
|----------------|---|--|--|--|--|--|-----------------|----------------------|-----------------------------------|-------------|--|---------------|------------------------------|
| - | | | and all another a growth as | FROJECT. | Geolechnica | ai investigation, 22 L | Juke C | SL, KIV | emeau | She | | | |
| Drille Date | Type: ed By: e Starte e Finish | KM d: 28/2 | | Co Gr | oject No: oordinates: ound Elevation: ater Level: | 21640 2.6m 28/02/2022 | | | | /ane No - C | | | 2199 - 18/10/2 Long Grass |
| STRATIGRAPHY | DEPTH (m) | GRAPHIC LOG | | Inc 2 Field Description | 2005 | eotechnical Society Rock in Engineering | WATER LEVEL (m) | DEPTH (m) | NZS:44 (Blows SHEAF REMO | R STRENG | est 6.5.2 n Increme 20 : TH IEAR | 0 | LABORATORY TESTS |
| TS | 0.0 | <u>x 14</u> <u>x 1/</u> . | TOPSOIL | | | | | 0.0 | <u>`</u> | | | | |
| ⊢ | 0.5 | <u>1</u> <u>1</u> <u>1</u> <u>1</u> <u>1</u> <u>1</u> <u>1</u> <u>1</u> | orange staini | clay, minor fine t ng, orange strea FORMATION) | o medium sai aks, very stiff, | nd, light grey, dark moist, slightly plasti | c | | 26 r ● | | | • • • • | - - - |
| | | × | minor clay, s limonite band | ome fine to med ds | lium sand, mii | nor dark orange | | - | | | | | - - - |
| ٩. | <u>1.0</u> | ^ × ^ × × × × × × ·× ·× · × ·× ·× · | fine to mediu | medium sand to Im sandy SILT, s ks, very stiff, mo | some clay, lig | ht grey, dark orange astic | ' | <u>1.0</u> — — | 44 r | | | 1 | 88 ∨ |
| TAURANGA GROUP | <u>1.5</u> | | stiff clayey SILT, moist to wet, | some fine sand, moderately plas | grey, dark or tic | ange staining, stiff, | | | 29 r | 75 | / | | - - - |
| | 2.0 | ^ * * * * * * * * * * * * * * * * * * * | orange, wet | | | | | | 32 r_ | | ↓ V | | |
| | | × ·× ·× · × ·× ·× · × ·× ·× · × ·× ·× · × ·× ·× · | plastic | ILT, some clay, l por recovery - 40 | | rey, firm, wet, slightl | | | 4 r € | 46 V | | | - - - |
| | 3.0 | ^ × · ^ × × · × · × × · × · × × · × · × | END OF BOF (TARGET DE | RE. 3.00 METRI | ES. | | _ | | 2 r • ● | 41 V | | | - - - |
| | | | | , | | | | | | | | | - |
| | | | | | | | | - | | | | | |
| | <u>4.0</u> | | | | | | | <u>4.0</u> | | | | | |

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| 1 | | | Consultants | CLIENT: Fletcher Residential Ltd | | | | | e No: AH22 | 2 |
|----------------|---|--|--|---|-----------------|----------------|--|--|---------------------------------------|---------------------|
| | | Tour responsive & | cost-effective engineers | PROJECT: Geotechnical Investigation, 22 | Juke | St, Riv | erhead | Sheet 1 | of 1 | |
| Drill Date | Type: ed By: e Starte e Finish | KM ed: 28/2 | | Project No: 21640 Coordinates: Ground Elevation: Water Level: 1.6m 28/02/2022 | | | | y: KM ne No - Calibratio conditions: Nea | | 199 - 18/10/202 |
| STRATIGRAPHY | o DEPTH (m) | GRAPHIC LOG | | in accordance with the NZ Geotechnical Society Inc 2005 Field Description of Soil and Rock in Engineering Use" | WATER LEVEL (m) | DEPTH (m) | NZS:4402 (Blows pe 10 SHEAR S | STRENGTH DED SHEAR | • | LABORATORY TESTS |
| TS | | <u>12</u> <u>12</u> <u>11</u> <u>1</u> <u>12</u> <u>12</u> <u>14</u> <u>14</u> <u>14</u> <u>14</u> <u>12</u> <u>14</u> <u>14</u> <u>14</u> | TOPSOIL | | | | | | ············ | |
| | | × × × × × × × × × × × × × × × × × × × | SILT, some o very stiff, mo | clay, minor fine sand, grey, dark orange streaks, ist, slightly plastic (PUKETOKA FORMATION) | | | 41 r | | 145 ∨ | |
| ROUP | 1.0 | <pre></pre> | some clay to to wet | clayey, orangey grey, orange staining, stiff, mois | | | 32 r | | | |
| TAURANGA GROUP | <u>1.5</u> | | wet | ım SAND, some silt, bluish grey, medium dense, roundwater seepage | - | | ••• | | | 200+ UTP V |
| | <u>2.0</u> | | some silt to s dense | silty | | | , 3. 7. 9. | | · · · · · · · · · · · · · · · · · · · | |
| | | | very dense END OF BOF (TOO DENSE | RE. 2.25 METRES. E TO AUGER) | _ | - | | 20 | | |
| | <u>2.5</u> | | | | | <u>2.5</u> | | | | |
| | 3.0 | | | | | | | | | |

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Appendix C

Past Investigation Logs and Plans

| S F | ite A roje ate: | Addres ct No: 02/12 | s: R AKL 2/201 | verh 2016 5 | 5_0280 | | | | Chapman | Morton V | Geosciences |
|--------|-----------------------|---------------------------|----------------------|-------------------|--|------------|--------------|---|--|------------------------|----------------------------------|
| | | | | on: S | See site plan | E 1 | | | 1:2 | | Sheet 1 of 1 |
| | | ed by: ked by | | | Position: Survey Source: | Dat | vatio um: | n: | | | neter: 50mm n horizontal: 90° |
| OIII | Groundwater | RL (m) | Depth (m) | Graphic Log | Material Description Soil: USC; Soil type; colour; structure; strength; moisture; bedding; plasticity; sensitivity; additional comments Rock: Weathering; colour; fabric; rock name; strength; additional comments | | Sensitivity | Shear Strengths (kPa) Peak (Residual) | Dynamic Penetror (Blow/100 5 10 1 | Cone neter) mm) | Comments |
| | | | | | OL: Topsoil. CL: Silty CLAY: orange. Very stiff, moist, low plasticity. CH: CLAY, with minor silt: orange. Very stiff, moist, high plasticity. | - | | V-148(49) | | | |
| dho | | | 1- | | becoming light grey becoming sliff | м | | V-101(40) V-104(48) | | | |
| | • | | 2 - | | | | | V-99(57) V-97(45) | | | |
| | | | | | becoming with trace fine sand and peat, has texture of fine to medium sand becoming very stiff with minor coarse sand and fine gravel of completely weathered extremely weak SILTSTONE, very well rounded | - | MS | V-77(38) | | | |
| | | | 3 - | | | w | MS | V-112(31) | | | |
| | | | | | CH: CLAY, with some fine sand: light grey. Very stiff, moist, high plasticity. MH: Clayey SILT, with some fine sand: grey. Very stiff, wet , high plasticity. | | S | V-153(36) | | | |
| | | | | | ML: Fine sandy SILT, with some clay: grey. Very stiff, wet, low plasticity. | | MS | V-120(31) | | | |
| | | | 4 | <u>x</u> xò | Borehole terminated at 4.0m | | s | V-148(34) | | | |
| | | | 5 - | | | | | | | | |

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d)

| | | 01/12 nole L | | | See site plan | | | | Chapman Morton W 1:25 | oodward Sheet 1 of |
|-----------------|----------------|------------------|-----------|------------------------------|---|------|-------------|--------------------------|---|-----------------------------|
| L | ogge | ed by: | MB | | Position: | | vatio | n: | | eter: 50mm |
| Unit | Groundwater 30 | ked by (m) IX | Depth (m) | Graphic Log | Survey Source: Material Description Soil: USC; Soil type; colour; structure; strength; moisture; bedding; plasticity; sensitivity; additional comments | | Sensitivity | Shear Strengths (kPa) | Dynamic Cone Penetrometer (Blow/100 mm) | horizontal: 90° Comments |
| | Grou | R | Der | Grap | Rock: Weathering; colour; fabric; rock name; strength; additional comments OL: Organic SILT: black. Stiff, moist, low plasticity. | Ξΰ | Se | Peak (Residual) | 5 10 15 20 | |
| | | | | | OE. Organic OET. Black, Sun, molst, low plasticity. | | | | | |
| | | | | | becoming dark brown | м | ES | V-63(8) | | |
| Topsoil | | | - | | becoming with some wood inclusions | | ES | V-164(11) | | |
| <u>Р</u> | - | | 1 | | becoming saturated | | s | V-81(14) | | |
| - | | | | | becoming firm | S | S | V-30(5) | | |
| d. | | | 2 - | | CL: Silty CLAY, with some fine sand and organic inclusions: brown. Stiff, moist, low plasticity. | | MS | V-90(25) | | |
| Tauranga Group | | - | | × | | | MS | V-68(21) | | |
| | | | - | | ML: Fine to medium sandy SILT, with some clay: grey. Stiff, | м | MS | V-55(22) | | |
| dno. | 5 | | 3 - | × × × × × × × × × × | moist, low plasticity. | 2020 | Q | V-90(5) | | |
| Waitemata Group | | | | × × × × × × × × | becoming very stiff | | S | V-150(33) | | |
| | | | 4 | | | | s | V-150(27) | | |
| | | | | | Borehole terminated at 4.0m | | 3 | V-150(27) | | |
| | | | 5 | | | | | | | |

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| S P | ite A rojec | ddres | s: R AKL | verh 2016 | nd Cambridge Road Subdivision ead 5_0280 | | | | Cha | | Morton | Geoscience |
|--------|----------------|--------|-------------|--------------|---|-----------------------|-------------|---|------------|-------|--------------------------------|-------------------|
| В | oreh | ole Lo | ocati | | See site plan | | | | | 1:2 | | Sheet 1 of |
| | | ed by: | | | Position: | | vatio | n: | | | | meter: 50mm |
| | | ked by | | | Survey Source: Material Description | Dat | um: | | 1000 | | | m horizontal: 90° |
| OUIF | Groundwater | RL (m) | Depth (m) | Graphic Log | Soil: USC; Soil type; colour; structure; strength; moisture; bedding; plasticity; sensitivity; additional comments Rock: Weathering; colour; fabric; rock name; strength; additional comments | Moisture Condition | Sensitivity | Shear Strengths (kPa) Peak (Residual) | Pe (Blo | netro | Cone meter 0 mm) 5 20 | Comments |
| | • | | 1 | | OL: Topsoil. MH: Clayey SILT: brown (organic stained). Stiff, moist, high plasticity. CL: Silty CLAY: light brown. Very stiff, moist, low plasticity. becoming wet OL: Silty organic CLAY, with wood inclusions: dark brown. Saturated, firm, low plasticity. | м | - ES | V-68(7) V-191+ V-191+ V-101(7) V-71(25) | | | | |
| | | | 3 | | CL: Sandy CLAY, with minor silt: brownish grey. Very stiff, moist, low plasticity. ML: Pumiceous sandy SILT: light grey. Soft, wet, no plasticity. CH: CLAY: dark brown. Soft, saturated, high plasticity. | S M W | - | V-NA (SV sinking) V-191+ | | | | |
| | | | | | with trace organic inclusions | S | | V-25(14) V-16(8) | | | | |
| | | | 5 | | Borehole terminated at 4.0m | | MS | V-21(7) | | | | |

| E | Boreh | | ocat | ion: \$ | See site plan | | | | Chapman Morton ' 1:25 | Shee |
|-----------------|-------------|-----------------|--|-------------|---|-------------------------|--------------|---|---|---------------------------|
| | | ed by: ked b | | | Position: Survey Source: | Ele [.] Dat | vatio um: | n: | | neter: 50m n horizonta |
| Unit | Groundwater | RL (m) | Depth (m) | Graphic Log | Material Description Soil: USC; Soil type; colour; structure; strength; moisture; bedding plasticity; sensitivity; additional comments Rock: Weathering; colour; fabric; rock name; strength; additional comments | Moisture Condition | Sensitivity | Shear Strengths (kPa) Peak (Residual) | Dynamic Cone Penetrometer (Blow/100 mm) 5 10 15 20 | Comn |
| | | | 1 - | | OL: Topsoil. MH: Clayey SILT, with trace topsoil: brown, Very stiff, moist, high plasticity. CL: Silty CLAY: light grey, mottled orange. Stiff, moist, low plasticity. | | | V-134(49) V-90(38) | | |
| Tauranga Group | | | | | with some coarse sand, very stiff sand absent, stiff | | | V-175(68) V-89(30) | | |
| | • | | 2 - | | | м | S MS | V-60(10) V-77(25) | | |
| Waitemata Group | | | 3 - | | CL: Silty CLAY: grey. Very stiff, moist, low plasticity. | | MS | V-120(33) V-191+ V-191+ | | |
| | | | 4 - | | Borehole terminated at 4.0m | | | V-UTP | | |
| | | | and the second sec | | | | | | | |

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| F | roje | ddres ct No: 01/12 | AKL | 2016 | ead 5_0280 | | | | Chapman Morton | Geoscience Woodward |
|---------------------------|-------------|--------------------------|-----------|-------------------------|--|-----------------------|-------------|---|---|----------------------------------|
| | | | | on: S | See site plan Position: | Flor | vatio | 2. | 1:25 | Sheet 1 of meter: 50mm |
| | | ed by: ked by | | | Survey Source: | Dat | | n. | | meter: 50mm m horizontal: 90° |
| CIIII | Groundwater | RL (m) | Depth (m) | Graphic Log | Material Description Soil: USC; Soil type; colour; structure; strength; moisture; bedding; plasticity; sensitivity; additional comments Rock: Weathering; colour; fabric; rock name; strength; additional comments | Moisture Condition | Sensitivity | Shear Strengths (kPa) Peak (Residual) | Dynamic Cone Penetrometer (Blow/100 mm) 5 10 15 20 | Comments |
| | | | - | | OL: Topsoil. | | | | | |
| | | | | | MH: Clayey SILT, with some fine sand: orange. Very stiff, moist, high plasticity. | | s | V-161(33) | | |
| | | | 1- | | | м | MS | V-137(36) | | |
| | | | | | | | | V-191+ | | |
| | | | | | ML: SILT, with some fine sand and clay: orange. Very stiff, moist, low plasticity. | _ | | V-191+ | | |
| - | ▼ | | 2 - | | becoming wet | | - | V-191+ | | |
| Concernance of the second | | | | | Deconing sur | | MS | V-77(22) | | |
| | | | 3 | | ML: Fine sandy SILT, with some clay: light grey. Very stiff, wet, low plasticity. | w | MS | V-101(33) | | |
| | | | | | | | MS | V-109(36) | | |
| | | | | | | | MS | V-137(46) | | |
| | | | 4 - | × × : : × × × × : | Borehole terminated at 4.0m | | - MS | V-142(41) | | |
| | | | | | | | | | | |
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HAND AUGER BOREHOLE - HA06-15

Client: Neil Construction Limited

Project: Riverhead and Cambridge Road Subdivision Site Address: Riverhead Project No: AKL2016_0280



HAND AUGER BOREHOLE - HA07-15

Client: Neil Construction Limited

3

.

Project: Riverhead and Cambridge Road Subdivision Site Address: Riverhead Project No: AKL2016_0280 Date: 02/12/2015



| | | ole Lo | | | See site plan | | | | 1:25 | Sheet 1 of 1 |
|-----------------|-------------|--------|-----------|-------------|--|-----------------------|-------------|---|---|--------------------|
| | | ed by: | | | Position: | Elev | atio | n: | | meter: 50mm |
| C | | ked by | /: TL | | Survey Source: | Dat | um: | | Angle fro | om horizontal: 90° |
| Unit | Groundwater | RL (m) | Depth (m) | Graphic Log | Material Description Soil: USC; Soil type; colour; structure; strength; moisture; bedding; plasticity; sensitivity; additional comments Rock: Weathering; colour; fabric; rock name; strength; additional comments | Moisture Condition | Sensitivity | Shear Strengths (kPa) Peak (Residual) | Dynamic Cone Penetrometer (Blow/100 mm) 5 10 15 20 | Comments |
| Q | | | | | OL: Organic clayey SILT: dark brownish black. Stiff, moist, low plasticity. | | S | V-55(8) | | |
| Tauranga Group | • | 8 | 1 | | CL: Silty CLAY, with some fine sand: light greyish brown. Firm, moist, low plasticity. | | S | V-34(7) | | |
| | | 1 | | | CL: Sandy CLAY, with some organic inclusions: greyish orange. Very stiff, moist, low plasticity. | м | S | V-191(27) | | |
| | | | | | 100 mm thick: with subordinate wood inclusions ML: Sandy SILT, with some clay: grey. Very stiff, moist, low | - | S | V-130(23) | | |
| Waitemata Group | | | 2 | ***** | plasticity. SM: Silty fine to coarse SAND: grey. 'Dense', moist. | - | ES | V-164(14) | | |
| W | | | | | Borehole terminated at 2.4m | | | V-UTP | | |
| | | | 3 | | | | | | | |
| | | | 4 | | | | | | | |
| | | | | | | | | | | |
| Tor | min | ation | 5 - | n. 1 | Inable To Penetrate Further | | | | | |
| | | | | | | | | | | |
| Re | emar | KS: G | roune | | er encountered at 1.0 meter This report is based on the attached field description for soil and rock | k, New | / Zeal | land, Geotechnical | Society Inc 2005. | |
| L | | | | | i his report is based on the attached field description for soil and rock | (, New | Zea | land, Geotechnical | Society Inc 2005. | |

| Ľ | Date: | 02/12 | 2/201 | 5 | 6_0280 See site plan | | | | Chap | oman Mort 1:25 | ton Woodward Sheet 1 |
|----------------|-------------|---------|-----------|-------------|--|-----|-------------|---|-------------|---|-------------------------|
| L | ogge | d by: | MB | | Position: | | vatio | on: | | Hole D | Diameter: 50mm |
| Unit | Groundwater | ked bey | Depth (m) | Graphic Log | Survey Source: Material Description Soil: USC; Soil type; colour; structure; strength; moisture; bedding; plasticity; sensitivity; additional comments Rock: Weathering; colour; fabric; rock name; strength; additional comments | | Sensitivity | Shear Strengths (kPa) Peak (Residual) | Per (Blo | Angle namic Cond netrometer w/100 mm 10 15 20 | r 1) Comment |
| | 0 | | - | | OL: Topsoil. | | | | Ĭ | | |
| | | | | | ML: SILT, with some clay: brownish orange. Very stiff, moist, low plasticity. | | | V-101(14) | | | |
| | | | | | | | | V-120(16) | | | |
| | | | 1 | | CL: Silty CLAY: light orange brown. Very stiff, moist, low plasticity. | - M | | V-123(38) | | | _ |
| dn | | | | | | | | V-115(36) | | | |
| Tauranga Group | • | | 2 | | MH: Clayey SILT, with some fine sand and trace organic inclusions: brown. Stiff, wet, high plasticity. | | _ | V-74(19) | | | _ |
| μ. | | | | | | | | V-55(7) | | | |
| | | | 3- | | | w | | V-68(7) | | | |
| | | | | | | | | V-44(25) | | | |
| | | | | | | | | V-55(16) | | | |
| | | | 4- | | Borehole terminated at 4.0m | | - | V-88(30) | | | _ |
| | | | | | | | | | | | |
| | | | 5- | | | | | | | | |

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HAND AUGER BOREHOLE - HA09-15 Client: Neil Construction Limited Project: Riverhead and Cambridge Road Subdivision Site Address: Riverhead Project No: AKL2016 0280 Geosciences Date: 01/12/2015 Chapman Morton Woodward 1:25 Borehole Location: See site plan Sheet 1 of 1 Logged by: MB Position: Elevation: Hole Diameter: 50mm Checked by: TL Survey Source: Datum: Angle from horizontal: 90° Material Description Log Dynamic Cone Groundwate (m Soil: USC; Soil type; colour; structure; strength; moisture; bedding; plasticity; sensitivity; additional comments Rock: Weathering; colour; fabric; rock name; strength; additional Shear Strengths Moisture (m) Sensitivity Penetrometer (Blow/100 mm) Unit Graphic (kPa) Peak (Residual) Depth Comments RL 5 10 15 20 comments OL: Topsoil. CL: Silty CLAY: orange. Very stiff, moist, low plasticity. MS V-161(46) MS V-118(41) CH: CLAY: light grey mottled orange. Very stiff, moist, high 1 plasticity. М MS V-137(62) MS V-135(60) Tauranga Group ...with some silt trace fine sand. Almost white with orange mottles. 2 IS V-96(55) CL: Silty CLAY: orange/red/light grey. Stiff, moist, low plasticity. ∇ MS V-74(19) ...with fine to medium sized sand grains MS V-82(21) 3 W MS V-109(33) S V-98(14) MS V-93(25) 4 Borehole terminated at 4 0m 5 -Termination reason: Target Depth Reached Remarks: Groundwater seepage at 2.4metres, standing groundwater at 2.0 metres at end of borehole.

| S | Site A Projec | ddres | s: Ri AKL | verho 2016 | nd Cambridge Road Subdivision ead _0280 | | | | Chapman Morto | Geosciences |
|--------------------------------|------------------|------------------|--------------|---------------|--|-----------------------|--------------|---|---|------------------------------------|
| E | Boreh | ole Lo | ocatio | | ee site plan | | | | 1:25 | Sheet 1 of 1 |
| | | ed by: ked by | | | Position: Survey Source: | Dat | vatio um: | n: | | ameter: 50mm om horizontal: 90° |
| Unit | Groundwater | RL (m) | Depth (m) | Graphic Log | Material Description Soil: USC; Soil type; colour; structure; strength; moisture; bedding; plasticity; sensitivity; additional comments Rock: Weathering; colour; fabric; rock name; strength; additional comments | Moisture Condition | Sensitivity | Shear Strengths (kPa) Peak (Residual) | Dynamic Cone Penetrometer (Blow/100 mm) 5 10 15 20 | Comments |
| Waitemata Group Tauranga Group | | | 2 2 3 | | OL: Topsoil. CL: Silty CLAY: brown. Stiff, moist, low plasticity. ML: Fine sandy SILT, with minor clay: brown, motified orange. Stiff, moist, low plasticity. MH: Clayey SILT: brown. Stiff, moist, high plasticity. | M | s | V-52(12) V-66(10) V-148(33) V-162(47) V-UTP | | |
| Te | | ation r | 5 – easo | n: U | Inable To Penetrate Further | | 1 | | | |

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| | | | | | SER BOREHOLE - HA11-15 | | | | | | | | |
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| | | | | | tion Limited nd Cambridge Road Subdivision | | | | | | | | |
| 5 | Site A | ddres | s: Riv | erh | ead | | | | C | | | M | Geosciences |
| | | ct No: 02/12 | | | 5_0280 | | | | Cha | apma | in Mo | orton | Woodward |
| E | Boreh | nole Lo | ocatio | | ee site plan | | | | | | 25 | | Sheet 1 of 1 |
| | | ed by: ked by | | | Position: Survey Source: | Elev Dat | vatio um [.] | n: | | | | | meter: 50mm om horizontal: 90° |
| | | | | Bo. | Material Description | | | | Dy | | ic Co | | |
| Unit | Groundwater | RL (m) | Depth (m) | Graphic Log | Soil: USC; Soil type; colour; structure; strength; moisture; bedding; plasticity; sensitivity; additional comments | Moisture Condition | Sensitivity | Shear Strengths (kPa) | | | omet 00 m | | Comments |
| | Grot | Ľ. | De | Gra | Rock: Weathering; colour; fabric; rock name; strength; additional comments | 20 | Š | Peak (Residual) | 5 | 10 | 15 | 20 | |
| Topsoil | | | | | OL: Topsoil. | | | | | | | | 2 |
| 4 | | | | <u>×</u> | CL: Silty CLAY: brown. Firm, moist, low plasticity. | | | | | | | | |
| | | | | × | | м | MS | V-30(10) | | | | | |
| đ | | | | | | | | | | | | | - |
| Grou | | | | | | | | 2 | | | | | 8 |
| Tauranga Group | | | | <u> </u> | ML: Fine Sandy SILT: brown. Stiff, wet, low plasticity. | | MS | V-56(25) | | | | | |
| Tauı | | | 1 | (×) × × (×) | | | | | | | | | - |
| | V | | . ↓ _× | ×× ×> | becoming dark brown | W | | | | | | | E |
| | | | | XX | | | S | V-75(16) | | | | | |
| ata o | | | | XXX | Interlayered CH:CLAY and ML:Fine Sandy SILT: grey, Hard, moist, low/high plasticity. | | | V-UTP | | | | | - |
| Waitemata Group | | | 1×1×1 | XX | | м | | | | | | | |
| × | | | | $\frac{\times}{\times}$ | | | | V-UTP | | | | | |
| | | | | | Borehole terminated at 1.7m | - | | | | | | | |
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| | <u> </u> | | 5 - | | | | | | | | | | - |
| | | | | | Inable To Penetrate Further | | | | | | | | |
| R | emar | rks: St | andin | g gr | roundwater at 1.1 metres at end of borehole | | | | | | | | |
| | | | | 7 | Fhis report is based on the attached field description for soil and rock | k, Nev | v Zea | land, Geotechnical | Soci | ety I | nc 20 | 005. | |

| P | rojec | | AKL | 2016 | ead 5_0280 | | | | Chapman Morto | Geosciences |
|------------------|-------------|------------------|-----------|-------------|--|-----------------------|--------------|---|---|------------------------------------|
| В | oreh | ole L | ocati | | See site plan | | | | 1:25 | Sheet 1 of |
| | | ed by: ked by | | 6 | Position: Survey Source: | Elev | vatio um: | n: | | ameter: 50mm om horizontal: 90° |
| | Groundwater | RL (m) | Depth (m) | Graphic Log | Material Description Soil: USC; Soil type; colour; structure; strength; moisture; bedding; plasticity; sensitivity; additional comments Rock: Weathering; colour; fabric; rock name; strength; additional comments | Moisture Condition | Sensitivity | Shear Strengths (kPa) Peak (Residual) | Dynamic Cone Penetrometer (Blow/100 mm) 5 10 15 20 | Comments |
| linedoi | | | 1 | | OL: Topsoil. MH: Clayey SILT: with some fine sand, brown to dark brown. Stiff, moist to wet, high plasticity. becoming wet | M to W | | V-88(14) V-68(14) | | - |
| | | | | | CL: Silty CLAY: with trace fine sand, brown with slight orange | | ES | V-68(8) | | |
| iauranga eroup | × | | 2 | | CL: Sandy CLAY: with some silty SAND, brown. Stiff, moist to wet, low plasticity. SAND is fine to coarse grained. | м | | V-82(30) V-93(22) | | |
| | | | | | | M to W | | V-98(19) V-96(19) | | |
| dn | | | 3 - | | ML: Sandy SILT: with some clay, grey. Hard, moist to wet, low plasticity. MH: Clayey SILT: with sand, grey. Hard, moist, low plasticity. | - | - | V-UTP | | |
| vvairemata Group | | | | | min, Grayey Oren, with Santa, grey, Frand, Indist, IOW prasticity. | м | | V-UTP | | |
| | | | 4 | | Borehole terminated at 4.0m | | | V-UTP | | |
| | | | 5 - | 1 | | | | | | |

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| Pro | ojec | | AKL | 2016 | ead 5_0280 | | | | C | \mathbf{M} | Geosciences |
|-----------------|------|---------------------|-----------|-------------|--|-----------------------|-------------|---|-----------------------|--|-----------------------------|
| | | 02/12 ole L | | | See site plan | | | | C==:>0.0803 | nan Morto 1:25 | on Woodward Sheet 1 of 1 |
| Log | gge | d by: | MB | | Position: | | vatio | n: | | Hole Di | ameter: 50mm |
| | | ked by (m) RF | Depth (m) | Graphic Log | Survey Source: Material Description Soil: USC; Soil type; colour; structure; strength; moisture; bedding; plasticity; sensitivity; additional comments Rock: Weathering; colour; fabric; rock name; strength; additional comments | Moisture Condition | Sensitivity | Shear Strengths (kPa) Peak (Residual) | Dyna Pene (Blow | Angle fi mic Cone etrometer /100 mm) 0 15 20 | |
| Waitemata Group | | | 1 2 3 4 5 | | Comments OL: Topsoil. CL: Silty CLAY: orange. Hard, moist, low plasticity. CH: CLAY: orange. Very stiff, moist, high plasticity. ML: Sandy SILT: with some clay, light grey with some orange mottles. Very stiff to hard, moist, low plasticitybecoming wet Borehole terminated at 3.1m Borehole terminated at 3.1m nable To Penetrate Further | w | MS | V-191+ V-123(55) V-107(36) V-191+ V-UTP V-UTP V-UTP V-UTP V-UTP | | | |

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| C F | Client Projec Site A | :: Neil ct: Riv ddres | Con verhe s: R | struc ead a iverh | GER BOREHOLE - HA14-15 tion Limited und Cambridge Road Subdivision uead 5_0280 | | | | CMV | Geosciences |
|-----------------|----------------------------|-----------------------------|----------------------|----------------------------------|--|-----------------------|-------------|---|---|-----------------------------|
| | | 02/12 | | | | | | | Chapman Mortor 1:25 | |
| | | ed by: | | | See site plan Position: | Elev | vatio | n: | | Sheet 1 of 1 meter: 50mm |
| | | ked by | | | Survey Source: | Dat | um: | | Angle fro | om horizontal: 90° |
| Unit | Groundwater | RL (m) | Depth (m) | Graphic Log | Material Description Soil: USC; Soil type; colour; structure; strength; moisture; bedding; plasticity; sensitivity; additional comments Rock: Weathering; colour; fabric; rock name; strength; additional comments | Moisture Condition | Sensitivity | Shear Strengths (kPa) Peak (Residual) | Dynamic Cone Penetrometer (Blow/100 mm) 5 10 15 20 | Comments |
| | | | - | | OL: Topsoil | | | | | |
| | | | | | CL: Silty CLAY: with topsoil in cracks, orange. Very stiff to hard, moist, low plasticity. Some limonite staining. | - | s | V-UTP V-142(26) | | |
| | | | | × | light grey streaked orange | | | | | - |
| | | | | | | М | S | V-85(21) | | |
| | | | - | | MH: Clayey SILT: orange. Stiff, moist, low plasticity. | | | V-UTP | | |
| dno | | | | (| ML: SILT: orange. Hard, moist, low to no plasticity. | | | | | |
| Waitemata Group | | | 2 - | : × × × × : (× × × × : | | | | V-UTP | | _ |
| Waite | | | - | | CH: CLAY: orange/grey. Hard, moist to wet, high plasticity. | | | | | |
| | | | | | Interlayered CH/CL:CLAY and MH: SILT: grey. Hard, high plasticity | | | V-UTP | | |
| | | | | | | | | V-UTP | | |
| | • | | 3 | | | M to W | | V-UTP | | |
| | × | | | | | | | V-UTP | | |
| | - | | 4 - | | Borehole terminated at 4.0m | | _ | V-UTP | | |
| | | | 5 | | | | | | | |
| T | | ation | | | Forget Depth Reached | | | | | |
| | | | | | Farget Depth Reached roundwater at 3.3 metres at end of borehole. | | | | | |
| | | | | | This report is based on the attached field description for soil and rocl | k. New | v Zea | land, Geotechnical | Society Inc 2005. | |

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| | HA | NC | AL | JC | SER BOREHOLE - HA15-15 | | | | | ÷, | |
|-----------------|-------------|------------------|-----------|---|--|-----------------------|-------------|---|---|---|------------------------------|
| | | | | | tion Limited nd Cambridge Road Subdivision | | | | | | |
| | Site A | Addres | s: Riv | erh | ead | | | | C | AV | (NZ) Ltd |
| 1 | Date: | 02/12 | 2/2015 | 5 | 3_0280 | | | | in the second | | Geosciences Woodward |
| | | hole L ed by: | | n: S | See site plan Position: | Ele | vatio | n. | | 1:25 Hole Dia | Sheet 1 of 1 ameter: 50mm |
| | Chec | ked by | y: TL | - | Survey Source: | Dat | | , | | | om horizontal: 90° |
| Unit | Groundwater | RL (m) | Depth (m) | Graphic Log | Material Description Soil: USC; Soil type; colour; structure; strength; moisture; bedding; plasticity; sensitivity; additional comments Rock: Weathering; colour; fabric; rock name; strength; additional comments | Moisture Condition | Sensitivity | Shear Strengths (kPa) Peak (Residual) | Pene (Blow | amic Cone etrometer v/100 mm) 10 15 20 | Comments |
| | | | | | OL: Topsoil. | | | | | | |
| | | | | ×× × > | ML: SILT: with some clay, brown. Very stiff, moist, high plasticity. | | | | | | |
| | | | | × × × × × × | | | Q | V-144(7) | | | |
| | | | | × × × × × × | | | | | | | |
| roup | | | | | CL: Silty CLAY: brown. Very stiff, moist, low plasticity. | | S | V-133(23) | | | |
| Tauranga Group | | | 1 1 | | CH: CLAY: orange mottled light grey. Stiff, moist, high plasticity. | 1 | | | | | - |
| Taura | | | | | | | MS | V-62(25) | | | |
| | | | | | becoming brown (organic stained) | м | | | | | |
| | | | | | | | S | V-71(14) | | | |
| | | | × | -× | CL: Silty CLAY: brown. Stiff, moist, low plasticity. | | | | | | |
| | | | | | | | | | | | - |
| | | | 2 | | | | | V-192+ | | | |
| Waitemata Group | | | | × × × × | Interlayered CH:CLAY and MH:Clayey SILT: grey. Hard, moist, high plasticity. | | | | | | |
| emata | | | | XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX | | | | V-UTP | | | |
| Waite | | 10 | | XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX | | | | V-UTP | | | |
| | | | | | Borehole terminated at 2.6m | | | V-UTP | | | |
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| | | | 5 | | | | | | | | |
| Те | rmina | ation r | - | : U | nable To Penetrate Further | | | | | | |
| R | emar | rks: St | anding | a ar | oundwater at 2.3 metres at end of borehole. | | | | | | |
| | | | | , <u>.</u> , | | | . 7 1 | | . | | |



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S: ROJECTSKL2016KL2016 0251 TO 0300KL2016 0280 RIVERHEAD & CAMBRIDGE ROADS. RIVERHEAD/08. DRAWINGSKL2016 0280REV A SITE AND GEOMORPHOLOGY PLAN DWG



SITE BOUNDARY

X:\01 PROJECTS\AKL\AKL2018\AKL2018-0151-0200\AKL2018-0160 POOK BLOCK, LATHROPE ROAD, RIVERHEAD\07 DRAWINGS\AKL2018-0160-FIG 01- SITE PLAN REV A.DWG

| FLETCHER LIVING | DRAWN: | FMS | PROJECT N AKL2 | o: 018-0160 |
|-------------------------|-----------|------------|-------------------|----------------|
| POOK BLOCK, | CHECKED: | JW | FIGURE: | 01 |
| RIVERHEAD | REVISION: | А | SCALE: | 1:4000 |
| SITE INVESTIGATION PLAN | DATE: | 01/10/2018 | SHEET: | A3 |

BOREHOLE LOG - HA01-18

Client: Fletcher Living



| _ | | | ocation: R | | | | 10.0 × N 5000010.0 × | | | | | | | :25 | D | Sheet 1 of 1 |
|---|-------------|----------------------|------------------------------|-----------------------|-----------|-------------|---|------------------------|--------|----------------------------------|----------|-----------------------------|-------|------------------|----------|--|
| | | l by: JW ed by: J | | Position: Survey S | | | 46.0m N.5930310.0m Auckland Council GIS | Elevation: Datum: A | | RL 21 СКНТ | | ım 16 (NZ | | | | eter: 50mm 1 horizontal: 90° |
| | | | oles & Insitu Tes | ts | | | Material Description Soil: Soil symbol; soil type; colour; structure; bedding | | - 1 | | - | · · | Dynar | nic Co tromet | ne er | Structure & Other Observation |
| | Groundwater | Depth | Type & Resi | ults | Depth (m) | Graphic Log | sensitivity; additional comments. (origin/geologica Rock: Colour; fabric; rock name; additional comments. (or unit) | al unit) เซี | Condit | Consistency/ Relative Density | Recovery | Drilling Method/ Support | • | 10 10 | | Number; Defect Type; Dip; De Shape; Roughness; Aperture; I Seepage; Spacing; Block Siz Block Shape; Remarks |
| | | 0.4 | Peak = 203+ | 27.3 27.0 kPa | - | | OL: TOPSOIL CH: Silty CLAY: grey streaked orange. High plat Trace limonite staining and trace rootlets. (Puketoka Formation) | sticity. | | | | | | | | |
| | | 0.8 | Peak = UT | P 26.4 | | | at 0.80m, becoming orange streaked grey CH: CLAY with minor silt and trace fine sand: gr | ey | | | | | | | | |
| | | 1.2 | Peak = 203+ | kPa | 1 - | | streaked orange. High plasticity. (Puketoka Formation) at 1.10m, with trace rootlets | N | 1 | | | | | | | |
| | | 1.6 | Peak = 203+ | kPa | - | | at 1.60m, with some fine sand | | | VSt | | | | | | |
| | | 2.0 | Peak = 203+ | kPa 25.3 | 2 - | | CH: Sandy CLAY with trace silt: grey. High plass is fine to medium grained with trace organic sta (Puketoka Formation) | | | | | | | | | |
| | ▼ | 2.4 | Peak = 119k Residual = 44 | | - | | at 2.50m, becoming saturated with trace fine o inclusions | organic | | | | HA | | | | |
| | | 2.8 | Peak = 125k Residual = 44 | | 3 - | | | | | | | | | | | |
| | | 3.2 | Peak = 58k Residual = 23 | | 5 | | at 3.00m, 100mm layer of organic stained CLJ high plasticity CH: CLAY with minor fine to medium sand and to grey. High plasticity. (Puketoka Formation) | | - | St | | | | | | |
| | | 3.6 | Peak = 116k Residual = 6 | | - | | at 3.40m, becoming greenish grey at 3.60m, 100mm layer of organic stained CL with organic inclusions | AY, black | 5 | | | | | | | |
| | | 4.0 | Peak = 139k Residual = 73 | | 4 - | | at 3.90m, 50mm seam of decomposed wood CH: Sandy CLAY with minor silt: grey. High plas Sand is fine to medium grained. (Puketoka Formation) | ticity. | | | | | | | | |
| | | 4.4 | Peak = 160k Residual = 11 | | - | | CL: Sandy CLAY: greenish grey. Low plasticity. medium to coarse grained, sub-rounded with tra | Sand is ace fine | | VSt | | | | | | |
| | | 4.8 | Peak = UT | P | E . | | sand grained pumiceous clasts. (Puketoka Formation) | | | | | | | | | |
| _ | | | | | 5 - | - | Borehole terminated at 5.0 m | | | | | | | T | | |

BOREHOLE LOG - HA02-18

Client: Fletcher Living

Project: Pook Block, Lathrope Road, Riverhead Site Location: Pook Block, Lathrope Road, Riverhead Project No.: AKL2018-0160 Date: 24/09/2018



| | d by: F | | osition: | | | 02.0m N.5930091.0m Elevat | | RL 3 | | | | | | | eter: 50mm |
|-------------|----------------|--|--------------------|-----------|-------------|---|-----------------------|----------------------------------|----------|-----------------------------|------|----------------------|-------|----|--|
| | sam | MJ S | Survey S | | | Auckland Council GIS Datum Material Description | | JCKH. | r | | Dyr | Ar namic netro | : Con | е | horizontal: 90° Structure & Other Observation |
| Groundwater | Depth | Type & Result | RL (m) | Depth (m) | Graphic Log | Soil: Soil symbol; soil type; colour; structure; bedding; plasticity; sensitivity; additional comments. (origin/geological unit) Rock: Colour; fabric; rock name; additional comments. (origin/geologi unit) | Moisture Condition | Consistency/ Relative Density | Recovery | Drilling Method/ Support | (Blo | ows/10 | 00mn | n) | Discontinuities: Depth; Def Number; Defect Type; Dip; D Shape; Roughness; Aperture; Seepage; Spacing; Block S Block Shape; Remarks |
| | 0.4 | Peak = 197+kF | 31.4 31.1 Pa | - | | OL: TOPSOIL ML: Clayey SILT: light brown, low plasticity. (Puketoka Formation) at 0.50m, with trace black organic deposits. | M | | | | | | | | |
| | 0.8 | Peak = 197+kF Peak = 197+kF | 30.3 | | | MH: SILT with some clay : brown, high plasticity. (Puketoka Formation) CH: CLAY: light brown with orange streaks, high plasticity. | M to W | VSt to H | | | | | | | |
| | 1.6 | Peak = 197+kF | 29.9 2a 29.8 | | | (Puketoka Formation) ML: SILT with minor clay: brownish grey with light orange streaks, low plasticity. (Puketoka Formation) CH: CLAY: light grey, high plasticity. (Puketoka Formation) | | _ | | | | | | | |
| ▼ | 2.0 | Peak = 197+kF | Pa | 2 - | | | M | _ | | | | | | | |
| | 2.4 2.5-3.0 | Peak = 99kPa Residual = 70k 1 D | | - | | at 2.40m, becoming with minor light orange streaks. | | St | - | HA | | | | | |
| | 2.8 | Peak = 110kP Residual = 82k Peak = 87kPa | Pa | 3 - | | | | VSt | - | | | | | | |
| | 3.6 | Residual = 56k Peak = 127kP Residual = 42k | Pa | - | | at 3.20m, becoming light brownish grey. | w | St | - | | | | | | |
| | 4.0 | Residual = 42k Peak = 85kPa Residual = 59k | 27.6 | 4 - | | CH: Silty CLAY with trace black organic deposits : dark brown with minor light orange streaks, high plasticity. (Puketoka Formation) | | VSt | - | | | | | | |
| | 4.4 | Peak = 104kP Residual = 56k | a 27.0 Pa | | | at 4.10m, becoming light grey with some fine sand CH: Pumiceous silty CLAY with minor white fine to | | St | | | | | | | |
| | 4.8 | Peak = 127kP Residual = 68k | a | - | | medium sub-angular pumiceous sand : light brownish grey, high plasticity. (Puketoka Formation) | | VSt | | | | | | | |
| 1 | L | | | 5 - | <u> </u> | Borehole terminated at 5.0 m | | 1 | 1 | | | | | | |

This report is based on the attached field description for soil and rock, CMW Geosciences - Field Logging Guide, Revision 3 - April 2018.

BOREHOLE LOG - HA03-18

Client: Fletcher Living

Project: Pook Block, Lathrope Road, Riverhead Site Location: Pook Block, Lathrope Road, Riverhead Project No.: AKL2018-0160 Date: 25/09/2018



| С | ogged hecke | l by: JV | / | Position: | – – <i>–</i> | 4 - 7 4 4 4 - | | | | | | | | | | |
|------|----------------|----------|-----------------------------|--|---------------------|---------------|--|----------|--------------|---------------|-----------------------------|------------|-------|---------------|----|---|
| | necke | | мт | Survey S | | | 76.0m N.5929870.0m Elevation Auckland Council GIS Datum: | | | 33.4(1710 |)m 46 (NZ | 711 | | | | eter: 50mm |
| | | - | | - | | | | | | - | r È | Dyi | namio | c Con | ne | horizontal: 90° Structure & Other Observations |
| Well | Groundwater | Samp | oles & Insitu Tes | sts בע צר | Depth (m) | Graphic Log | Material Description Soil: Soil symbol; soil type; colour; structure; bedding; plasticity; sensitivity; additional comments. (origin/geological unit) Rock: Colour; fabric; rock name; additional comments. (origin/geologica | Moisture | Consistency/ | Recovery | Drilling Method/ Support | (Blo | ows/1 | omete 00mr | n) | Discontinuities: Depth; Defect Number; Defect Type; Dip; Defe Shape; Roughness; Aperture; Inf |
| | Gro | Depth | Type & Res | ults 33.4 | ă | 5 | OL: TOPSOIL | " ≥ (| | Ϋ́α Ϋ́α | Drillir | 5 | 10 | 0 1 | 5 | Seepage; Spacing; Block Size; Block Shape; Remarks |
| | | | | 00.4 | | | | | | | | | | | | |
| | | 0.4 | Peak = 160 Residual = 2 | 9kPa | - | | | | | | | | | | | |
| | | 0.8 | Peak = 102 Residual = 2 | | | | CH: CLAY with trace silt and trace fine sand: dark brown. High plasticity. Organic staining with trace organics inclusions. (Alluvium) | м | VS | L . | | | | | | |
| | | 1.2 | Peak = 99k Residual = 2 | | 1 - | | at 1.00m, mottled black with minor organic inclusions | - | | | | | | | | |
| | ▾ | 1.6 | Peak = 58k | Pa 31.8 | - | | at 1.50m, becoming saturated | | | | | | | | | |
| | | | Residual = 2 | | | | OH: CLAY with some organics and trace silt: dark brown streaked black. High plasticity. With some organic inclusions and minor rootlets. (Alluvium) | | | | | | | | | |
| | | 2.0 | Peak = 64k Residual = 2 | | 2 - | | | | St | | | | | | | |
| | | 2.4 | Peak = 73k Residual = 2 | | - | | | | | | на | | | | | |
| | | 2.8 | Peak = 116i Residual = 3 | <pa< td=""><td>3 -</td><td></td><td>OH: Organic CLAY: black. High plasticity. (PEAT) (Alluvium)</td><td></td><td></td><td>_</td><td></td><td></td><td></td><td></td><td></td><td></td></pa<> | 3 - | | OH: Organic CLAY: black. High plasticity. (PEAT) (Alluvium) | | | _ | | | | | | |
| | | 3.2 | Peak = 116l Residual = 4 | | | | | s | vs | t | | | | | | |
| | | 3.6 | Peak = 87k Residual = 5 | | - | | CH: Organic stained CLAY with trace silt: dark brown/ black. High plasticity. Trace organic inclusions. (Alluvium) | _ | St | | | | | | | |
| | | 4.0 | Peak = 203+ | kPa | 4 - | | at 4.00m, with some organics and trace peat inclusions | - | | _ | | | | | | |
| | | 4.4 | Peak = 203+ | kPa 29.0 | - | | CH: CLAY with some fine to medium sand and trace silt: dark grey/organic stained. High plasticity. Trace organic inclusions. (Puketoka Formation) | _ | vs | t | | | | | | |
| | | 4.8 | Peak = U1 | P | | | | | | | | | | | | |
| | | | | | 5 - | - | Borehole terminated at 5.0 m | | | \vdash | | | | | | |

This report is based on the attached field description for soil and rock, CMW Geosciences - Field Logging Guide, Revision 3 - April 2018.

BOREHOLE LOG - HA04-18

Client: Fletcher Living



| | | ocation: R | | | - | | | | | | | | | 25 | | Sheet 1 of 1 |
|---------------------|------------------|------------------------------|-----------------|-----------|----------|------------------|--|-------------|-----------------------|----------------------------------|----------|-----------------------------|----------------------------|-------------------|----------|---|
| | d by: JW | | Position | | | 112 | 5.0m N.5929678.0m | Elevation | | RL 3 | | | | | | eter: 50mm |
| | ed by: J Samp | NJ bles & Insitu Test | Survey S | | | : Log | Auckland Council GIS Material Description Soil: Soil symbol; soil type; colour; structure; beddi | Datum: | | | | ort ort | Dynam Peneti (Blows/ | nic Con romete | ne er | h horizontal: 90° Structure & Other Observations Discontinuities: Depth; Defect |
| Well Groundwater | Depth | Type & Resu | Ilts | Deoth (m) | | Graphic Log | sensitivity; additional comments. (origin/geolog Rock: Colour; fabric; rock name; additional comments. unit) | ical unit) | Moisture Condition | Consistency/ Relative Density | Recovery | Drilling Method/ Support | • |] 10 1 | | Number; Defect Type; Dip; Defec Shape; Roughness; Aperture; Infil Seepage; Spacing; Block Size; Block Shape; Remarks |
| | 0.4 | Peak = 134k Residual = 26 | | D | | | OL: TOPSOIL CL: Silty CLAY: dark brown. Low plasticity. Tr trace organic staining and trace organic inclus (Alluvium) CH: Silty CLAY: brown. High plasticity. Trace of (Alluvium) | sions. | | VSt | | | | | | |
| | 0.8 | Peak = 160k Residual = 35 | | 1 | | × × × × | at 0.80m, becoming brown mottled black | | м | | | | | | | |
| | 1.2 | Peak = 44kF Residual = 29 | | D | | | at 1.20m, with minor organic inclusions CH: CLAY with some organics: dark brown str black. High plasticity. Trace rootlets. (Alluvium) | reaked | | | | | | | | |
| | 1.6 | Peak = 44kF Residual = 32 | | | | | at 1.50m, 50mm layer of brown decompose | d wood | | F | | | | | | |
| ¥ | 2.0 | Peak = 49kF Residual = 17 | | 2 2 | | | at 1.90m, 100mm layer of decomposed woo OH: Organic CLAY: black. High plasticity. Trac peat inclusions and trace rootlets. (PEAT) (Alluvium) | | | | | | | | | |
| | 2.4 | Peak = 61kF Residual = 17 | | | | | | | | | | HA | | | | |
| | 2.8 | Peak = 73kF Residual = 23 | | 3 | | | | | | | | | | | | |
| | 3.2 | Peak = 87kF Residual = 73 | Pa 32.1 IkPa | D | | | OH: Organic stained CLAY with trace rootlets black. High plasticity. (Alluvium) | dark brown/ | | St | | | | | | |
| | 3.6 | Peak = 90kF Residual = 70 | | | | | | | S | | | | | | | |
| | 4.0 | Peak = 87kF Residual = 29 | | 4 | | | | | | | | | | | | |
| | 4.4 | Peak = 102k Residual = 73 | | | | | | | | VSt | | | | | | |
| | 4.8 | Peak = 73kF Residual = 46 | | 5 | | | Borehole terminated at 5.0 m | | | St | | | | | | |
| Terminati | on reac | on: To | rget Dep | th Pr |] arb | ed. | | | | | | | | | | <u> </u> |
| | Ground | dwater enco | untered | at 2.0 |)m. | | ed field description for soil and rock, CMV | | | | | _ | | | _ | |

BOREHOLE LOG - HA05-18

Client: Fletcher Living



| d by: J ed by: Sar Depth 0.4 | | ults | | ource | : | S9.0m N.5929476.0m Elevat Auckland Council GIS Datum | | RL 3 JCKH | |)m 46 (NZ | | | | eter: 50mm horizontal: 90° |
|--|--|--|--|---|--|--|--|--|--|---|---|---|-------------------------------|---|
| Sar | nples & Insitu Tes | ults | - | | | Auckialiu Coulicii GIS Datuli | . A | ЛОКП | 1194 | +0 (INZ | | ngie ii | 10111 | |
| Depth | | ults | sr (m) | Ê | | | | _ ≿ | | q | Dynam | nic Cone | | Structure & Other Observatio |
| | Type & Res | ults | Ţ, | Ĭ | ic Log | Material Description Soil: Soil symbol; soil type; colour; structure; bedding; plasticity; | Roisture Condition | Consistency/ Relative Density | very | Drilling Method/ Support | Penet | rometer (100mm) | | Discontinuities: Depth; Defe |
| | .,pc artes | | ш. | Depth (m) | Graphic Log | sensitivity; additional comments. (origin/geological unit) Rock: Colour; fabric; rock name; additional comments. (origin/geologi unit) | al Mois | onsis ative | Recovery | illing h Supp | 5 1 |] 10 15 | ; | Number; Defect Type; Dip; De Shape; Roughness; Aperture; I Seepage; Spacing; Block Siz |
| 0.4 | | | 37.0 | | | | _ | Re O | | D | | | | Block Shape; Remarks |
| 0.4 | | | 37.0 | | | OL: TOPSOIL | | | | | | | | |
| 0.4 | | | | | | | | | | | | | | |
| 0.4 | | | | | | | | | | | | | | |
| | Peak = 87k Residual = 2 | | | | | | | St | | | | | | |
| | | | | - | - | | | | | | | | | |
| | | | 36.4 | | - sta- | OH: Organic CLAY with trace silt: black. High plasticity. (PEAT) | | | | | | | | |
| 0.8 | | | | | | (Alluvium) | м | | | | | | | |
| | Residual = 1 | 7kPa | | | | | | | | | | | | |
| | | | | 1 - | | | | VSt | | | | | | |
| | | | | | | | | | | | | | | |
| 1.2 | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | _ | | | | | | | | | | |
| 1.6 | Peak = 44k | Ра | | | - <u>sha</u> | | | St | | | | | | |
| | Residual = 1 | 2kPa | | | | | | | | | | | | |
| | | | 35.2 | | <u>sha</u> | OH: Organic CLAY with some rootlets: black. High | | | | | | | | |
| | | | | | | plasticity. Minor inclusions of fibrous peat. (PEAT) | | | | | | | | |
| 2.0 | | | | 2 - | - 316- - 316- | (davian) | | | | | | | _ | |
| | | | | | - <u>sha</u> - | | | | | | | | | |
| | | | | | | | | vst | | | | | | |
| 2.4 | Peak = 70k | Ра | | | - 340- | | | | | | | | | |
| | Residual = 2 | 9kPa | | - | - <u>sk</u> - | | | | | НА | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| 2.8 | | | | | | | | | | | | | | |
| | | | | 2 | | | | | | | | | | |
| | | | | 3- | | | | | | | | | | |
| 3.2 | | | 33.8 | | | CH: Organic stained CLAX with minor silt and trace fine | | | | | | | | |
| | Residual = 5 | 8kPa | | | F | sand: dark brown/black. High plasticity. Trace rootlets. | s | | | | | | | |
| | | | | | 1 | (Alluvium) | | | | | | | | |
| | | | | - | 1 | | | | | | | | | |
| 3.6 | Peak = 73k Residual = 2 | Pa 9kPa | | | 1 | at 3.60m, with minor rootlets | | | | | | | | |
| | | | | | 1 | | | St | | | | | | |
| | | | | | <u>t-</u> | | | | | | | | | |
| 4.0 | | | | 4 - | <u>t-</u> | | | | | | | | | |
| | Residual = 2 | 9kPa | | | <u>1</u> | | | | | | | | | |
| | | | | | <u>t-</u> | | | | | | | | | |
| | | | | | <u>t-</u> | | | | | | | | | |
| 4.4 | | | | | <u>+_</u> | | | | | | | | | |
| | | | | | <u>+-</u> | | | | | | | | | |
| | | | | | £ | | | | | | | | | |
| 4.8 | | | | | F | | | | | | | | | |
| | Residual = 5 | ок⊬а | | | F | | | | | | | | | |
| <u> </u> | | | | 5 - | | Borehole terminated at 5.0 m | - | | 1 | | | | | |
| ion rea | son: Ta | arget D | Pepth | n Rea | ached | | | | 1 | | | | | |
| ~ | | | | | | | | | | | | | | |
| : Groui | ndwater enco | ountere | ed at | 1.5n | n. | | | | | | | | | |
| | 1.2 1.6 2.0 2.4 2.8 3.2 3.6 4.0 4.4 4.8 | Residual = 11.2Peak = 67k Residual = 11.6Peak = 44k Residual = 12.0Peak = 145l Residual = 22.4Peak = 70k Residual = 22.8Peak = 70k Residual = 22.8Peak = 70k Residual = 23.2Peak = 70k Residual = 23.6Peak = 73k Residual = 23.6Peak = 73k Residual = 24.0Peak = 78k Residual = 24.0Peak = 78k Residual = 24.4Peak = 78k Residual = 24.8Peak = 93k Residual = 5con reason:Ta Caracter encomponents | Residual = 17kPa1.2Peak = 67kPa Residual = 15kPa1.6Peak = 44kPa Residual = 12kPa2.0Peak = 145kPa Residual = 29kPa2.4Peak = 70kPa Residual = 29kPa2.8Peak = 73kPa Residual = 38kPa3.2Peak = 87kPa Residual = 58kPa3.6Peak = 73kPa Residual = 29kPa4.0Peak = 73kPa Residual = 29kPa4.0Peak = 87kPa Residual = 29kPa4.1Peak = 78kPa Residual = 29kPa4.2Peak = 87kPa Residual = 29kPa4.3Peak = 87kPa Residual = 61kPa Residual = 61kPa4.8Peak = 93kPa Residual = 58kPa4.8Peak = 93kPa Residual = 58kPa | Residual = 17kPa 1.2 Peak = 67kPa Residual = 15kPa 1.6 Peak = 44kPa Residual = 12kPa 2.0 Peak = 145kPa 2.0 Peak = 70kPa 2.4 Peak = 70kPa 2.8 Peak = 70kPa 3.2 Peak = 67kPa 3.2 Peak = 67kPa 3.3 Residual = 58kPa 3.6 Peak = 73kPa 4.0 Peak = 73kPa 4.1 Peak = 73kPa 4.2 Peak = 87kPa 4.3 Peak = 73kPa 4.4 Peak = 73kPa 4.5 Peak = 73kPa 4.6 Peak = 73kPa 4.7 Residual = 29kPa 4.8 Peak = 73kPa 4.4 Peak = 73kPa 4.5 Peak = 93kPa 4.6 Peak = 93kPa 4.7 Residual = 58kPa at k Peak = 93kPa corr reasor: Target Deptit | Residual = 17kPa 1 1.2 Peak = 67kPa Residual = 15kPa 35.2 1.6 Peak = 44kPa Residual = 12kPa 35.2 2.0 Peak = 145kPa 2.0 Peak = 145kPa 2.0 Peak = 70kPa 2.4 Peak = 70kPa Residual = 29kPa 33.8 3.2 Peak = 73kPa Residual = 58kPa 33.8 3.6 Peak = 73kPa 4.0 Peak = 78kPa 4.0 Peak = 78kPa 4.4 Peak = 87kPa 4.5 Peak = 87kPa 4.6 Peak = 87kPa 4.7 Residual = 29kPa 4.8 Peak = 87kPa 4.8 Peak = 87kPa 4.8 Peak = 87kPa 4.8 Peak = 93kPa 4.8 Peak = 93kPa 5 5 Corr reason: Target Depth Reat Groundwater encountered at 1.57 | Residual = 17kPa $4 - \frac{4k_{e}^{max}}{k_{e}^{max}}$ 1.2Peak = 67kPaResidual = 15kPa1.6Peak = 44kPaResidual = 12kPa2.0Peak = 145kPa2.0Peak = 145kPaResidual = 29kPa2.4Peak = 70kPaResidual = 29kPa3.2Peak = 87kPa3.6Peak = 73kPa4.0Peak = 78kPa4.1Peak = 87kPa4.2Peak = 87kPa3.6Peak = 78kPa4.1Peak = 87kPa4.2Peak = 78kPa3.6Peak = 78kPa4.1Peak = 87kPa4.2Peak = 78kPa4.3Peak = 58kPa4.4Peak = 87kPa4.5Peak = 78kPa4.6Peak = 58kPa4.7Peak = 58kPa4.8Peak = 93kPa4.8Peak = 93kPa4.8 | 0.8 Peak = 13kPa 1.2 Peak = 67kPa 1.8 Peak = 44kPa 1.8 Peak = 145kPa 2.0 Peak = 145kPa 2.0 Peak = 145kPa 2.1 Peak = 145kPa 2.2 Peak = 145kPa 2.3 Peak = 73kPa 3.4 Peak = 73kPa 2.4 Peak = 73kPa Residual = 29kPa 33.8 3 With | 0.8 Peak = 131kPa Resoul = 17kPa Resoul = 19kPa 1 <td< td=""><td>0.8 Peak = 131kPa Rescue = 17kPa Rescue = 17kPa Rescue = 18kPa 12 1 <t< td=""><td>0.8 Peet = 734 Page 1</td><td>0.8 Peak = 33 PBa 1</td><td>0.3 Peak = 73Ma 1 <</td><td>0.8 Peak 1510°B 1 </td><td>0.8 Peak = 1318° 12 Peak = 676° 12 Peak = 676° 13 Peak = 130° 14 Peak = 130° 15 Peak = 130° 16 Peak = 130° 17 Peak = 130° 18 Peak = 130° 20 Peak = 136° 20 Peak = 136° 21 Peak = 136° 22 Peak = 136° 23 Peak = 136° 24 Peak = 136° 25 Peak = 136° 26 Peak = 136° 27 Peak = 136° 28 Peak = 136° 29 Peak = 136° 32 Peak = 136° 33 Total 34 Total 35 Peak = 136° 40 Peak = 136° 41 Peak = 136° 42 Peak = 136° 43 Peak = 136° 44 Peak = 136° 45 Peak = 136° 46 Total 47 Total</td></t<></td></td<> | 0.8 Peak = 131kPa Rescue = 17kPa Rescue = 17kPa Rescue = 18kPa 12 1 <t< td=""><td>0.8 Peet = 734 Page 1</td><td>0.8 Peak = 33 PBa 1</td><td>0.3 Peak = 73Ma 1 <</td><td>0.8 Peak 1510°B 1 </td><td>0.8 Peak = 1318° 12 Peak = 676° 12 Peak = 676° 13 Peak = 130° 14 Peak = 130° 15 Peak = 130° 16 Peak = 130° 17 Peak = 130° 18 Peak = 130° 20 Peak = 136° 20 Peak = 136° 21 Peak = 136° 22 Peak = 136° 23 Peak = 136° 24 Peak = 136° 25 Peak = 136° 26 Peak = 136° 27 Peak = 136° 28 Peak = 136° 29 Peak = 136° 32 Peak = 136° 33 Total 34 Total 35 Peak = 136° 40 Peak = 136° 41 Peak = 136° 42 Peak = 136° 43 Peak = 136° 44 Peak = 136° 45 Peak = 136° 46 Total 47 Total</td></t<> | 0.8 Peet = 734 Page 1 | 0.8 Peak = 33 PBa 1 | 0.3 Peak = 73Ma 1 < | 0.8 Peak 1510°B 1 | 0.8 Peak = 1318° 12 Peak = 676° 12 Peak = 676° 13 Peak = 130° 14 Peak = 130° 15 Peak = 130° 16 Peak = 130° 17 Peak = 130° 18 Peak = 130° 20 Peak = 136° 20 Peak = 136° 21 Peak = 136° 22 Peak = 136° 23 Peak = 136° 24 Peak = 136° 25 Peak = 136° 26 Peak = 136° 27 Peak = 136° 28 Peak = 136° 29 Peak = 136° 32 Peak = 136° 33 Total 34 Total 35 Peak = 136° 40 Peak = 136° 41 Peak = 136° 42 Peak = 136° 43 Peak = 136° 44 Peak = 136° 45 Peak = 136° 46 Total 47 Total |

BOREHOLE LOG - HA06-18

Client: Fletcher Living



| 0 | Big Samples & Insitu Tests Image Samples & Insitu Tests Image Depth Type & Results Image | y Source (iii) Huerd 29.5 29.1 | e: | Auckland Council GIS Datum: Material Description Soil: Soil symbol; soil type; colour, structure; bedding; plasticity; sensitivity; additional comments. (origin/geological unit) Rock: Colour; fabric; rock name; additional comments. (origin/geological unit) OL: TOPSOIL OL: TOPSOIL CH: Silty CLAY: dark brown, high plasticity. (Puketoka Formation) at 0.70m, with trace white pumiceous sand. Sand. | AU Moisture Condition | | 194 | 6 (NZ | Dyi Pe (Blc | An namic enetror ows/10 | ngle 1 c Cone ometer 00mm | from e r n) | horizontal: 90° Structure & Other Observation: Discontinuities: Depth; Defect Number; Defect Type; Dip; Defe Shape; Roughness; Aperture; In Seepage; Spacing; Block Size |
|---|---|---|-------|---|-----------------------------|-------------------|-----|-----------------|-------------------|----------------------------------|------------------------------------|----------------------|---|
| B | Image: Solution of the second state of the second | (LL) Hored 29.5 29.1 | | Material Description Soil: Soil symbol; soil type; colour; structure; bedding; plasticity; sensitivity; additional comments. (origin/geological unit) Rock: Colour; fabric; rock name; additional comments. (origin/geologica unit) OL: TOPSOIL CH: Silty CLAY: dark brown, high plasticity. (Puketoka Formation) at 0.70m, with trace white pumiceous sand. | Moisture Condition | 1 | | | Dyi Pe (Blc | namic netroi ows/10 | c Cone ometer 00mm | e r n) | Structure & Other Observation: Discontinuities: Depth; Defect Number; Defect Type; Dip: Defe Shape; Roughness; Aperture; Im Seepage; Spacing; Block Size |
| 0.4 Point - 138/b Point - 178/b Point - 178/b | 0.4 Peak = 113kPa Residual = 17kPa ■ 0.8 Peak = 104kPa Residual = 14kPa | 29.5 | | Rock: Colour; fabric; rock name; additional comments. (origin/geologica unit) OL: TOPSOIL CH: Silty CLAY: dark brown, high plasticity. (Puketoka Formation) at 0.70m, with trace white pumiceous sand. | M to | Consi Relative | Rec | Drilling Sur | 5 | 10 | 0 15 | 5 | Shape; Roughness; Aperture; In Seepage; Spacing; Block Size |
| 9.4 Press = 1128-20 Rescue = 170-20 241 | 0.4 Peak = 113kPa Residual = 17kPa 0.8 Peak = 104kPa Residual = 14kPa 1.2 Peak = 130kPa | 29.1 | | CH: Silty CLAY: dark brown, high plasticity. (Puketoka Formation) at 0.70m, with trace white pumiceous sand. | | | | | | | | | |
| 0.8 Peak - 100Pa 28.0 Image: a start of the st | 1.2 Peak = 130kPa | 28.3 | | | | | | | | | | | |
| 12 Posk = 10348a 28.3 Image: Character State Provided | | 28.3 | | | | VSt | | | | | | | |
| 2.0 Peak - 73P-p. Peak - 24Pa - 73P-p. Peak - 36P-p. Peak - 36P-p. 2.4 Peak - 36P-p. Peak - 55P-P. Peak - 55P-P. Peak - 55P-P. 2.8 Peak - 157-P.P. Peak - 157-P.P. Peak - 157-P.P. Peak - 157-P.P. 3.6 Peak - 157-P.P. Peak - 157-P.P. Peak - 157-P.P. Peak - 157-P.P. 4.6 Peak - 107-P.P. Peak - 107-P.P. Peak - 107-P.P. Peak - 107-P.P. 4.6 Peak - 107-P.P. Peak - 107-P.P. Peak - 107-P.P. Peak - 107-P.P. 4.6 Peak - 107-P.P. Peak - 107-P.P. Peak - 107-P.P. Peak - 107-P.P. 4.6 Peak - 107-P.P. Peak - 107-P.P. Peak - 107-P.P. Peak - 107-P.P. 4.6 Peak - 107-P.P. Peak - 107-P.P. Peak - 107-P.P. Peak - 107-P.P. 4.6 Peak - 107-P.P. Peak - 107-P.P. Peak - 107-P.P. Peak - 107-P.P. | | | | organic deposits: light brownish grey, high plasticity. | | - | | | | | | | |
| 2.4 Peak = 686Ha Residual = 51kPa Residual = 51kPa Residual = 55kPa Residual = | | | | | | | | | | | | | |
| Residual = 51kPa | | 2 | | | | St | | | | | | | |
| 2.8 Peak = 155kPa Resource = 05kPa 26.7 | | | | at 2.50m, with trace black organic deposits. | W | | | HA | | | | | |
| 3.6 Peak = 197+kPa 4 | | 26.7 | | high plasticity. | | VSt | | | | | | | |
| $ \begin{array}{c c c c c c c c c c c c c c c c c c c $ | 3.2 Peak = 197+kPa | 26.3 | | plasticity. | _ | | | | | | | | |
| 4.4 Peak = UTP 25.4 5 SM: SAND with minor silt and organic wood deposits : dark brown, fine to medium grand. (Puketoka Formation) 5 MD to D 5 MD to D 4.8 Peak = UTP 5 Borehole terminated at 5.0 m 5 0 0 0 0 | 3.6 Peak = 197+kPa | | | | | VSt to H | | | | | | | |
| $\begin{array}{ c c c c c c c c c c c c c c c c c c c$ | | 4 | | SM: SAND with minor silt and organic wood deposits : dark brown, fine to medium grand. | | | | | | | | | |
| 5 Borehole terminated at 5.0 m | 4.4 Peak = UTP | | | (Puketoka Formation) | S | MD to D | | | | | | | |
| | 4.8 Peak = UTP | 5 | | Borehole terminated at 5.0 m | | | | | | | | | |
| Fermination reason: Target Depth Reached | Termination reason: Target D | enth Pr | ached | | | | | | | | | | |

BOREHOLE LOG - HA07-18

Client: Fletcher Living

Project: Pook Block, Lathrope Road, Riverhead Site Location: Pook Block, Lathrope Road, Riverhead Project No.: AKL2018-0160 Date: 24/09/2018



| Checked by: J | MJ Subles & Insitu Tests Type & Results | urvey So | | | Auckland Council GIS Datum: | AU | 1 | Г194 Г | 16 (NZ | | Ang | le fron | n horizontal: 90° |
|--------------------------------------|--|-----------|-----------|--|--|-----------|----------------------------------|-----------|-----------------------------|-----|------------------------------|---------|--|
| samı Samı O Depth | | (m). | (m | g | | | | | | | | | |
| Ö Depth | Type & Results | | Depth (m) | Graphic Log | Material Description Soil: Soil symbol; soil type; colour; structure; bedding; plasticity; sensitivity; additional comments. (origin/geological unit) | Moisture | Consistency/ Relative Density | Recovery | Drilling Method/ Support | Per | namic C netrome ws/100 | eter | Structure & Other Observation Discontinuities: Depth; Defe Number; Defect Type; Dip; Dip |
| | | 31.7 | De | Graf | Rock: Colour; fabric; rock name; additional comments. (origin/geologic: unit) | al ≚S | Con: Relativ | Re | Drillin | 5 | 10 | 15 | Shape; Roughness; Aperture; Seepage; Spacing; Block Si Block Shape; Remarks |
| 0.4 | Peak = 85kPa Residual = 23kP | 31.3 | | | OL: TOPSOIL ML: Clayey SILT: dark brown, low plasticity. (Puketoka Formation) | M to W | St | | | | | | |
| 0.8 1.2 | Peak = 110kPa Residual = 14kP Peak = 113kPa Residual = 48kP | | 1- | ×1×1×1×1×1×1×1×1×1×1×1×1×1×1×1×1×1×1×1 | at 1.00m, with trace black organic deposits. | W to S | VSt | | | | | | - |
| 1.6 | Peak = 73kPa Residual = 56kP | 30.4 | | | CH: Silty CLAY with minor white fine to medium grand sub-angular pumiceous sand: light brownish grey, high plasticity. (Puketoka Formation) at 1.40m, with trace rootlets. | - | | | | | | | |
| 2.0 | Peak = 76kPa Residual = 56kP | 29.7 a | 2 | 4 X X X X X | CH: Silty CLAY with trace fine sand and with some black organic deposits: light brownish grey, high plasticity. (Puketoka Formation) | w | St | | | | | | - |
| 2.4 | Peak = 116kPa Residual = 73kP | a | - | | at 2.50m, with trace white fine pumiceous sand. | - | | - | HA | | | | |
| 2.8 | Peak = 183kPa Residual = 56kP | | 3 - | | CH: Silty CLAY with minor white fine to coarse grand sub- | | - | | | | | | - |
| 3.2 | Peak = 118kPa Residual = 48kP | a | | | angular pumiceous sand and trace black organic deposits: light brownish grey, high plasticity. (Puketoka Formation) | W to S | VSt | | | | | | |
| 3.6 | Peak = 141kPa Residual = 39kP | 28.2 a | - | | CL: Sandy CLAY with minor white fine to medium grand sub-angular pumiceous sand: light grey, low plasticity. (Puketoka Formation) | | - | | | | | | |
| 4.0 | Peak = 132kPa Residual = 31kP | | 4 - | | | S | | | | | | | - |
| 4.4 | Peak = 85kPa Residual = 68kP | | | | CH: Silty CLAY with some fine sand: light grey, high plasticity. (Puketoka Formation) | W to S | St | - | | | | | |
| 4.8 | Peak = 127kPa Residual = 85kP | | 5 - | | Borehole terminated at 5.0 m | | VSt | - | | | | | |

This report is based on the attached field description for soil and rock, CMW Geosciences - Field Logging Guide, Revision 3 - April 2018.

BOREHOLE LOG - HA08-18

Client: Fletcher Living

Project: Pook Block, Lathrope Road, Riverhead Site Location: Pook Block, Lathrope Road, Riverhead Project No.: AKL2018-0160 Date: 24/09/2018 · Dofer to site pla



| Logged Checker Gunndwater | d by: J | | sition: vey So | | | 70.0m N.5929831.0m Eleva | | | RL 33 | | | | Ho | le D | iam | eter: 50mm |
|---------------------------------|---------|--------------------------------------|-------------------|---|--|---|---------------|-----------|----------------------------------|----------|-----------------------------|------|-------------------------|----------------|------|---|
| | | VIJ Sur | vey So | ource: | | | | | | | | | | | | |
| Well bundwater | | | | | | Auckland Council GIS Datun | n: / | AU | СКНТ | 194 | 6 (NZ | (MTX | An | gle f | from | horizontal: 90° |
| , j | Depth | les & Insitu Tests Type & Results | RL (m) | Depth (m) | Graphic Log | Material Description Soil: Soil symbol; soil type; colour; structure; bedding; plasticity; sensitivity; additional comments. (origin/geological unit) Rock: Colour; fabric; rock name; additional comments. (origin/geologi unit) | B Moisture | Condition | Consistency/ Relative Density | Recovery | Drilling Method/ Support | Per | amic netron ws/10 | neter | 1) | Structure & Other Observation Discontinuities: Depth; Defec Number; Defect Type; Dip; Def Shape; Roughness; Aperture; Ir Seepage; Spacing; Block Size |
| 0 | Dopui | Type a recould | 33.2 | | | | | | 0 ag | | ŋ | | | $ \rightarrow$ | | Block Shape; Remarks |
| | 0.4 | Peak = 134kPa Residual = 20kPa | 32.9 | - | | OL: TOPSOIL CL: Silty CLAY: brown. Low plasticity. Trace organics. (Alluvium) at 0.60m, mottled black with trace rootlets | | | VSt | | | | | | | |
| | 0.8 | Peak = 186kPa Residual = 35kPa | | | | | P | И | | | | | | | | |
| | 1.2 | Peak = 99kPa Residual = 20kPa | | - | | | | | | | | | | | | |
| | 1.6 | Peak = 87kPa Residual = 17kPa | 31.7 | | | CH: CLAY with some organics: dark brown streaked black. High plasticity. (Alluvium) | | | St | | | | | | | |
| ▼ | 2.0 | Peak = 87kPa Residual = 15kPa | 31.2 | 2 | - sha | OH: Organic CLAY with trace rootlets: black. High plasticity. With some fibrous peat inclusions. (PEAT) (Alluvium) | | | | | | | | | | |
| | 2.4 | Peak = 119kPa Residual = 17kPa | | | 3162 | at 2.40m, becoming low plasticity | | | | | HA | | | | | |
| | 2.8 | Peak = 119kPa Residual = 23kPa | | - - - - - - - - - - - - - - - - - - - | - <u>ale</u> - <u>ale</u> - <u>ale</u> - <u>ale</u> - <u>ale</u> - <u>ale</u> | | | | VSt | | | | | | | |
| | 3.2 | Peak = 163kPa Residual = 58kPa | | - | - 340 - 340 - 340 - 340 340 | | | S | | | | | | | | |
| | 3.6 | Peak = 87kPa Residual = 29kPa | | - | - oka - oka - oka - oka - oka - oka - oka - oka | | | | | | | | | | | |
| | 4.0 | Peak = 78kPa Residual = 46kPa | 29.2 | 4 | | CH: CLAY with trace fine sand and trace silt: brown. High plasticity. Organic stained. (Alluvium) | | | St | | | | | | | |
| | 4.4 | Peak = 116kPa Residual = 78kPa | | | | at 4.40m, greyish brown with trace fine grained pumiceous clasts | | | | | | | | | | |
| | 4.8 | Peak = 160kPa Residual = 87kPa | | - | | at 4.80m, with minor medium gravel sized pumiceous clasts | | | VSt | | | | | | | |
| | | | _ | 5 — | | Borehole terminated at 5.0 m | | | | | | | | | | |

This report is based on the attached field description for soil and rock, CMW Geosciences - Field Logging Guide, Revision 3 - April 2018.

BOREHOLE LOG - HA09-18

Client: Fletcher Living



| В | oreh | nole Lo | ocation: F | | | | | | | | | | | | 25 | | Sheet 1 of 1 |
|-------|-------------|----------------------|----------------------------|-------------------|--------|-----------|-------------|---|----------------------------|----------------------------------|----------|-----------------------------|------|-----------------|----------|----|--|
| | | l by: JV ed by: J | | Positio Survey | | | | I4.0m N.5930292.0m Elevatic Auckland Council GIS Datum: | | RL 3 JCKH | |)m 16 (N2 | ZTM) | | | | eter: 50mm n horizontal: 90° |
| | | | ples & Insitu Te | | | | | Material Description | | | - | | C |)ynam Penetr | ic Cor | пе | Structure & Other Observations |
| Well | Groundwater | Sam | pies & insitu ie | SIS | L (II) | Depth (m) | Graphic Log | Soil: Soil symbol; soil type; colour; structure; bedding; plasticity; sensitivity; additional comments. (origin/geological unit) | - Moisture Condition | Consistency/ Relative Density | Recovery | Drilling Method/ Support | | Blows/ | | | Discontinuities: Depth; Defect Number; Defect Type; Dip; Defect |
| \$ | Groun | Depth | Type & Res | sults | ד | Dept | Graph | Rock: Colour; fabric; rock name; additional comments. (origin/geologica unit) | Con I | Consi | Rec | Sup | Ę | 5 1 |) 0 1 | 15 | Shape; Roughness; Aperture; Infi Seepage; Spacing; Block Size; |
| | - | | | 3 | 0.0 | | | OL: TOPSOIL | _ | - œ | - | | | | | | Block Shape; Remarks |
| | | | | | | - | | | | | | | | | | | |
| | | | | | | - | | | | | | | | | | | |
| | | | | | | - | | | | | | | | | | | |
| | | 0.4 | Peak = 84 Residual = 2 | 20kPa | 9.5 | - | | | м | | | | | | | | |
| | | | | 2 | | - | | OL: TOPSOIL: with trace silty mulch/garden material. Reddish brown. Low plasticity. | | St | | | | | | | |
| | | | | | | - | | | | | | | | | | | |
| | | | | | | - | | | | | | | | | | | |
| | | | | | | - | | | | 1 | | | | | | | |
| | | | | | | 1 — | | at 1.00m, 50mm seam of decomposed wood | | | | | | | | | |
| | | 1.2 | Peak = 160 | | 3.9 | - | × | CL: Silty CLAY with minor fine to medium sand: greyish brown. Low plasticity. Trace organics. | | | | | | | | | |
| | | | Residual = 5 | | | - | × | (Puketoka Formation) at 1.20m, trace pumiceous streaks | | | | | | | | | |
| | | | | | | - | × | | | | | | | | | | |
| | | | | | | - | × | | | | | | | | | | |
| | | 1.6 | Peak = U | TP 2 | 3.4 | - | × | CH: CLAY with some fine to medium gravel sized | | | | | | | | | |
| | | | | 2 | 3.2 | - | | pumiceous clasts, minor silt and minor fine to medium sand: whitish grey. High plasticity. | | | | | | | | | |
| | | | | 2 | 5.Z | - | | (Puketoka Formation) CH: Sandy CLAY with minor silt: greyish brown. High | 1 | | | | | | | | |
| | | 2.0 | Peak = U | TP 2 | 3.0 | 2 — | | plasticity. Sand is fine grained. (Puketoka Formation) | | VSt | | | | | | | |
| | | | | | | - | <u> </u> | CH: CLAY with trace silt and trace fine sand: brownish | / | | | | | | | | |
| | | | | 2 | 7.8 | - | <u> </u> | grey. High plasticity. Trace black organic staining. (Puketoka Formation) | | | | | | | | | |
| | | | Deals 440 | N-D- 0 | | - | <u> </u> | CH: Organic stained CLAY: black. High plasticity. Trace organic inclusions. | | | | | | | | | |
| | | 2.4 | Peak = 142 Residual = 8 | | 7.6 | _ | | CH: CLAY with trace silt and trace fine sand: brownish | 1 | | | НА | | | | | |
| | | | | | | - | | grey. High plasticity. Trace black organic staining. (Puketoka Formation) | | | | | | | | | |
| | | | | | | - | | (| | | | | | | | | |
| | | 2.8 | Peak = 87 Residual = 4 | | 7.2 | - | <u> </u> | CH: Organic stained CLAY with minor silt and trace fine to | - | | | | | | | | |
| | | | | | | - | <u> </u> | medium sand: black. High plasticity. Trace organic inclusions. | s | | | | | | | | |
| | | | | | | 3 — | <u> </u> | (Puketoka Formation) | | | | | | | | | |
| | | 3.2 | Peak = 73 | | | - | <u> </u> | | | | | | | | | | |
| | | | Residual = 4 | 16kPa | | - | <u> </u> | | | | | | | | | | |
| | | | | | | - | <u> </u> | at 3.40m, poor recovery | | St | | | | | | | |
| | | 2.6 | Deek 70 | | 6.5 | - | <u> </u> | CH: Silty CLAY with minor fine to medium sand: dark brown. High plasticity. Organic staining. | 1 | 1 | | | | | | | |
| | | 3.6 | Peak = 70 Residual = 4 | | | - | × | (Puketoka Formation) | | | | | | | | | |
| | | | | | | - | × | | | 1 | | | | | | | |
| | | | | | | - | × | | | | | | | | | | |
| | | 4.0 | Peak = 113 Residual = 8 | | 6.0 | 4 — | × | CH: Organic stained CLAY with minor silt and minor fine | - | | | | | | | | |
| | | | | | | - | | to coarse sand: dark brown. High plasticity. With trace organic inclusions. | | | | | | | | | |
| | | | | | | - | <u> </u> | (Puketoka Formation) | | | | | | | | | |
| | | 4.4 | Peak = 122 | | | - | E | | | | | | | | | | |
| | | | Residual = 7 | зкРа | | - | E | | | VSt | | | | | | | |
| | | | | | | - | E | | | | | | | | | | |
| | | 4.8 | Book - 101 | kDo | | - | E | | | 1 | | | | | | | |
| | | 4.0 | Peak = 131 Residual = 9 | | | - | E | | | 1 | | | | | | | |
| | | | | | | - 5 — | <u> </u> | Borehole terminated at 5.0 m | | <u> </u> | - | | | | | | |
| Term | inati | on reas | on T | arget De | nth | - Rea | ched | | | 1 | | | | • | • | | 1 |
| -GIII | andul | | . 10 | arget De | γu | . ed | oneu | | | | | | | | | | |
| Rem | arks: | Ground | dwater enco | ountered | lat | 0.9m | I | | | | | | | | | | |

BOREHOLE LOG - HA10-18

Client: Fletcher Living



| Logged b Checked | | | Positio Survey | | | | 46.0m N.5930126.0m Elevat Auckland Council GIS Datun | | RL 3 | | | 7764 | | | meter: 50mm om horizontal: 90° |
|---------------------|-------|-----------------------------|-------------------|--------|-----------|-------------|---|-----------------------|----------------------------------|----------|-----------------------------|----------|-------------------|-------|--|
| | | VIJ | | | | | Material Description | | - | | | <u> </u> | ynamic Penetro | Cone | Structure & Other Observatio |
| Groundwater | Depth | Type & Res | | RL (m) | Depth (m) | Graphic Log | Soil: Soil symbol; soil type; colour; structure; bedding; plasticity; sensitivity; additional comments. (origin/geological unit) Rock: Colour; fabric; rock name; additional comments. (origin/geologi unit) | Roisture Condition | Consistency/ Relative Density | Recovery | Drilling Method/ Support | (B | lows/10 | 00mm) | Discontinuities: Depth; Defe Number; Defect Type; Dip; De Shape; Roughness; Aperture; I Seepage; Spacing; Block Siz |
| | | | 3 | 1.7 | | | OL: TOPSOIL | | | | | | | | Block Shape; Remarks |
| | 0.4 | Peak = 147i Residual = 4 | kPa 8kPa | 1.4 | | | CH: Silty CLAY: dark brown, high plasticity. (Puketoka Formation) | — м | VSt | | | | | | |
| | 0.8 | Peak = 144 Residual = 1 | kPa 7kPa | 0.8 | | | ML: SILT with minor clay: dark brown, low plasticity. (Puketoka Formation) CH: Silty CLAY with trace black organic deposits : dark | | | | | | | | |
| | 1.2 | Peak = 99k Residual = 3 | | | 1 | | brown, high plasticity. (Puketoka Formation) | M to W | St | | | | | | |
| ¥ | 1.6 | Peak = 105i Residual = 4 | kPa 2kPa | | | | | | VSt | | НА | | | | |
| | 2.0 | Peak = 99k Residual = 2 | 8kPa 2 | 9.6 | 2 | | CH: CLAY: dark grey, high plasticity. (Puketoka Formation) | s | St | | | | | | _ |
| | 2.4 | Peak = 144 Residual = 3 | kPa | 9.4 | | | CH: Sandy CLAY with some fine grand sand and trace black organic deposits : light brownish grey, high plasticity (Puketoka Formation) | <i>.</i> | - | | | | | | |
| | 2.8 | Peak = 113i Residual = 5 | kPa 6kPa | | 3 | | | W to S | VSt | | | | | | _ |
| | 3.2 | Peak = UT | P | | - | | Borehole terminated at 3.3 m | | н | | | | | | |
| | | | | | 4 4 5 | | | | | | | | 200 | | |

BOREHOLE LOG - HA11-18

Client: Fletcher Living



| | necke | by: JW | | tion: /ey Sc | | | 62.0m N.5929740.0m EI | levation | : | RL 3 | 3.70 | m | l | Hole | Diam | eter: 50mm |
|------|-------------|----------------|---------------------------------------|-----------------|-----------------------|-------------------------------------|---|--------------------------|-----------------------|----------------------------------|----------|-----------------------------|----------------|------------------------------------|----------|--|
| | | ed by: Jl | MJ Surv | ey So | urce: | | | | | | | | | | | |
| Well | vater | | | | | | Auckland Council GIS Da | atum: | AU | | 194 | ·6 (NZ | TM) | Angle | e from | horizontal: 90° |
| | Groundwater | Samp Depth | oles & Insitu Tests Type & Results | RL (m) | Depth (m) | Graphic Log | Material Description Soil: Soil symbol: soil type; colour; structure; bedding; plasti sensitivity; additional comments. (origin/geological unit) Rock: Colour; fabric; rock name; additional comments. (origin/ge unit) | icity;) eological | Moisture Condition | Consistency/ Relative Density | Recovery | Drilling Method/ Support | Pene (Blows | nic Col tromete s/100m 10 | er m) | Structure & Other Observations Discontinuities: Depth; Defect Number; Defect Type; Dip; Defect Shape; Roughness; Aperture; Infill; Seepage; Spacing; Block Size; Block Shape; Remarks |
| | | 0.4-0.8 0.4 | 1 D Peak = UTP | 33.7 33.3 | | | OL: TOPSOIL CL: Silty CLAY: brown. Low plasticity. Trace organics. (Alluvium) | | | | | | | | | Expansive Sample |
| | | 0.8 | Peak = 142kPa Residual = 29kPa | | - - - 1 - | × × × × × | at 0.80m, becoming high plasticity at 1.00m, mottled black with minor organic inclusion | ns | | | | | | | | |
| | | 1.2 | Peak = 102kPa Residual = 35kPa | | | | | | м | | | | | | | |
| | | 1.6 | Peak = 113kPa Residual = 23kPa | 32.1 | | | CH: CLAY with minor silt: dark brown mottled black. I plasticity. Organic Stained with trace organic inclusion (Alluvium) | | | VSt | | | | | | - |
| | | 2.0 | Peak = 122kPa Residual = 41kPa | 31.6 | 2 | | CH: Organic CLAY: black. High plasticity. Fibrous/pla peat inclusions. (PEAT) (Alluvium) | astic | | | | | | | | |
| | | 2.4 | Peak = 145kPa Residual = 35kPa | | | 916 | at 2.40m, becoming low plasticity and with amorpho peat inclusions | ous | | | | HA | | | | |
| | ▼ | 2.8 | Peak = 142kPa Residual = 44kPa | | | | at 2.80m, becoming saturated | | | | | | | | | |
| | | 3.2 | Peak = 102kPa Residual = 73kPa | | | - <u>ak</u> ak ak ak ak | | | | | | | | | | |
| | | 3.6 | Peak = 87kPa Residual = 44kPa | | | | | | | | | | | | | |
| | | 4.0 | Peak = 87kPa Residual = 52kPa | 29.7 | 4 | | CH: Organic stained CLAY with minor silt: black. High plasticity. With a 2-5mm layer of peat every 100-150n (Alluvium) at 4.00m, poor recovery | | S | | | | | | | |
| | | 4.4 | Peak = 90kPa Residual = 44kPa | | | | at 4.30m, 100mm seam of decomposed wood | | | St | | | | | | |
| | | 4.8 | Peak = 87kPa Residual = 58kPa | | 5 | | Borehole terminated at 5.0 m | | | | | | | | | |
| Term | inatic | on reaso | on: Target | Donth | | ched | | | | | | | | | | |
| | | Ground | lwater encounte | red at | 2.8m | | ed field description for soil and rock, CMW Geos | sciences | s - Fi | ald I o | aair | na Gu | ide Rev | ision | 3 - 4 | .oril 2018 |

BOREHOLE LOG - HA12-18

Client: Fletcher Living



| | | iole Lo I by: JV | | Positio | | | | 30.0m N.5929421.0m | Elevation: | RL 3 | 5.00 |)m | ł | Hole D | iameter: 50mm | |
|-------|-------------|---------------------|---|-------------|-------------------------|---|--|--|-----------------|----------------------------------|----------|-----------------------------|----------------|--|--|--|
| Cł | necke | ed by: J | MJ | Surve | / Sc | ource: | | Auckland Council GIS | Datum: AU | 1 | 1 | 16 (NZ | , | - | from horizontal: 90° | |
| IIAAA | Groundwater | Sam Depth | oles & Insitu Tes | | RL (m) | Depth (m) | Graphic Log | Material Description Soil: Soil symbol; soil type; colour; structure; bedo sensitivity; additional comments. (origin/geolo Rock: Colour; fabric; rock name; additional comments unit) | gical unit) 🕺 💆 | Consistency/ Relative Density | Recovery | Drilling Method/ Support | Pene (Blows | nic Cone trometer /100mmj 10 15 |) Discontinuities: De Number; Defect Type Shape: Pourchness: A | oth; Defeo ; Dip; De perture; I Block Siz |
| | | 0.4 | Peak = 1021 Residual = 3 | kPa 3 | \$5.0 \$4.8 \$4.6 | | | OL: TOPSOIL CL: Silty CLAY with trace fine sand: orange a brown. Low plasticity. (Uncontrolled Fill) CH: CLAY with some silt and minor fine sand brown streaked orange. High plasticity. Trace staining and limonite streaks. (Uncontrolled Fill) | I: greyish | VSt | | | | | | |
| | | 0.8 | Peak = 110i Residual = 2 Peak = 87k Residual = 3 | 9kPa ; | 4.0 | 1 | | CH: Silty CLAY: light brown with orange streat plasticity. Trace limonite streaks. (Alluvium) | M aks. High | | _ | | | | | |
| | | 1.6 | Peak = 90k Residual = 3 | | | - | | at 1.60m, 50mm layer of CLAY with some brown mottled orange. High plasticity | silt. Yellowish | St | | | | | | |
| | ▼ | 2.0 | Peak = 110 Residual = 4 | kPa | 3.1 | 2 | | CL: Organic stained silty CLAY: dark brown r yellowish brown. Low plasticity. Trace rootlet topsoil and peat inclusions. (Alluvium) | | | - | | | | _ | |
| | | 2.4 | Peak = 116i Residual = 4 | | | | | | | | | HA | | | | |
| | | 2.8 | Peak = 119i Residual = 7 | | 2.2 | - - - - - - - - - - - - - - - - - - - | × - 346 - 346 - 346 - 346 | CH: Organic CLAY: black. High plasticity. Wi plastic peat inclusions. Trace seams of CLAY brown. High plasticity. With minor rootlets an organics. (PEAT) (Alluvium) | , yellowish | VSt | | | | | _ | |
| | | 3.2 | Peak = 102l Residual = 5 | | | - | 346 - 346 346 - 346 - 346 - 346 - 346 | | S | | | | | | | |
| | | 3.6 | Peak = 73k Residual = 5 | | | | - <u>alk</u> - alk <u>alk</u> <u>alk</u> <u>alk</u> <u>alk</u> | | | | | | | | | |
| | | 4.0 | Peak = 90k Residual = 7 | (Pa OkPa | | 4 | | | | St | | | | | | |
| | | 4.4 | Peak = 87k Residual = 5 | | | | - 346 - - 346 - - 346 - - 346 - - 346 - - 346 - | | | | | | | | | |
| | | 4.8 | Peak = 90k Residual = 6 | | | 5 — | - 346 - 346 346 346 346 | Borehole terminated at 5.0 m | 1 | | | | | | | |
| erm | inatio | on reas | on: Ta | arget D | epth | n Rea | ched | | | | | | | | | |