Geotechnical Completion Report

Stages 1 to 6, Falcons View Subdivision, 153 Lincoln Rolleston Road, Rolleston

Issue Date: **28 November 2023**

Miyamoto Ref: **2003576-RP-001[A]**

Prepared for: **Yoursection FV Ltd**

miyamoto.
236 Hereford Street, Christchurch Central, Christchurch 8011
Christchurch • Wellington • Kapiti • Auckland • California • Haiti • Italy • Turkey • India • Bangladesh • Thailand • Japan

Report Tracking – Stages 1 to 6, Falcons View Subdivision, 153 Lincoln Rolleston Road, Rolleston

Revision	Status	Date	Prepared by	Reviewed by
A	Final	28 November 2023	Joseph Byron-Joyce	Charles McDermott

Authorisation

Author's Signature		**Reviewer's Signature**	
Name	Joseph Byron-Joyce	**Name**	Charles McDermott
Title	Senior Engineering Geologist BSc (Geology) MEngNZ	**Title**	Technical Director (Geotechnics) BEng(Hons) CMEngNZ CPEng IntPE(NZ)

Miyamoto International New Zealand Ltd
236 Hereford Street | Christchurch 8011

www.miyamoto.nz

Table of Contents

1. Introduction and Scope

Miyamoto International NZ Ltd (Miyamoto) has been engaged by Yoursection FV Ltd (the Client) to provide geotechnical engineering services related to the earthworks and building platform preparation for 75 residential lots as part of Stages 1 to 6 of the Falcons View Subdivision at 153 Lincoln Rolleston Road, Rolleston.

Miyamoto have previously provided a 'Geotechnical Report for Proposed Plan Change' (200357-RP-002[A], dated 25 November 2020) for the site.

The purpose of this Geotechnical Completion Report (GCR) is to confirm the suitability of the earthworks and building platforms for building construction. The GCR is also required in order to comply with the Selwyn District Council (SDC) resource consent conditions (refer to Section 3.1 of this Report) and may be used in support of subsequent building consent applications for the individual lots at the SDC.

The following works have been conducted as per the agreed scope of works:

- Construction monitoring during the earthworks:
  - Fill suitability assessment including review of the laboratory testing undertaken for the fill material.
  - Visual inspections and advising the contractor regarding specification compliance.
  - Review of fill compaction verification testing.
- Assessment and reporting included in this Geotechnical Completion Report (GCR).
- Provision of certification documentation including:
  - NZS4404:2010 'Schedule 2A: Statement of professional opinion on suitability of land for building construction'.
  - NZS4431:2022 'Appendix D: Statement of suitability of engineered fill for lightweight structures'.

The subdivision civil design, supervision, and overall management has been completed by Capture Land Development Consultants (Capture), with Ongrade Drainage & Excavation Limited (Ongrade) acting as the main civil contractor completing the civil works.

2. Site Description

The site, legally described as Lot 1 DP 568976 as contained in Record of Title 1024686, is approximately 10 ha in area and is located to the west of Lincoln Rolleston Road, ~3 km south of State Highway 1.

The site is generally flat and prior to development comprised grassed paddocks with shelter belt plantings.

The typical soil profile at the site is shown in Table 1.

Table 1: Typical soil profile

Layer	Typical thickness (m)	Soil Description
Tp	0.3	Topsoil, SILT, brown, with rootlets.
ML	0.3 to 0.8	SILT and Sandy SILT, low plasticity, pale brown, very stiff to hard.
GW	>10.0	Sandy GRAVEL, fine to coarse grained, grey, sub-rounded to rounded.

The site location including the subdivision layout is presented in Figure 1.

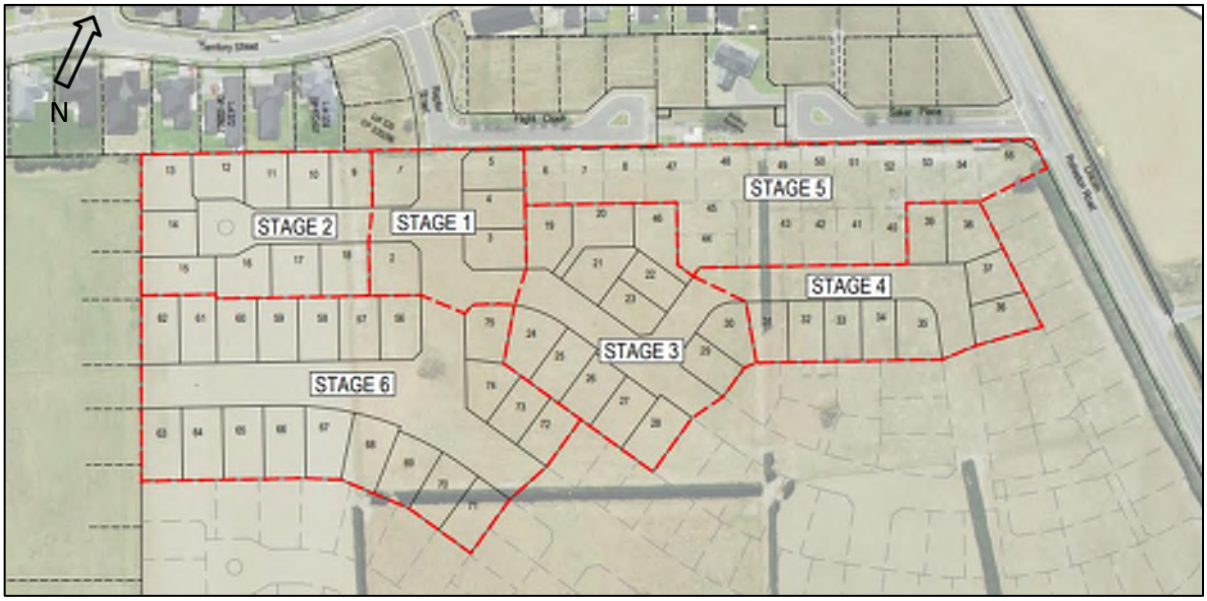


Figure 1: Site location and layout (BASE co, 15/04/23)

3. Earthworks

3.1 SDC Resource Consent Conditions

The resource consent conditions provided by the SDC (approval date 16 February 2023) are detailed within RC225866 and RC225867. This GCR is provided to satisfy conditions 33 and 34 of RC225866 and conditions 3 and 4 of RC225867, as detailed below.

RC225866

Site stability and site works

33. The Consent Holder shall confirm whether any earth fill has been placed on site. All earthworks completed on site are to be carried out in accordance with New Zealand Standard (NZS) 4431:2022 – Engineered fill construction for lightweight structures.

34. At the completion of all earthworks Certificates satisfying the conditions of New Zealand Standard (NZS) 4431:2022 – Engineered fill construction for lightweight structures, are to be provided to the Selwyn District Council. These certificates will detail the extent and nature of all earthworks undertaken.

RC225867

Construction Standards

3. That all earthworks shall be conducted in accordance with the approved engineering plans for subdivision consent 225866 and the Selwyn District Council Engineering Code of Practice.

The Consent Holder shall confirm whether any earth fill has been placed on site. All earthworks completed on site are to be carried out in accordance with New Zealand Standard (NZS) 4431:2022 – Engineered fill construction for lightweight structures.

4. At the completion of all earthworks Certificates satisfying the conditions of New Zealand Standard (NZS) 4431:2022 – Engineered fill construction for lightweight structures, are to be provided to the Selwyn District Council. These certificates will detail the extent and nature of all earthworks undertaken.

3.2 General

The earthworks design for the subdivision was completed by Capture Land Development Consultants (Capture) and was designed to raise / lower the grade to appropriate levels for the residential lots and create appropriate fall for drainage. The earthworks plan and as-built levels are included in Appendix A.

The earthworks were caried out between June and September 2023 by Ongrade Drainage & Excavation Limited (Ongrade), with Miyamoto, Capture, the SDC, and Yoursection FV Ltd completing regular site visits to observe earthworks and civil works at the site.

The initial design completed by Capture included for a total of 3,800 m^3 of soil to be cut and placed as engineered fill across the site, with a net balance between cutting and filling resulting in no requirement for importation of fill or removal of soil for the residential lots. Importation of material was required for construction of roading, service trenches, and soakage pits.

Due to thicker topsoil than anticipated in some areas and encountering unsuitable foundation soils in a former 'borrow pit', a relatively small volume of imported fill was required to complete the earthworks for the residential lots.

Earthworks were carried in general accordance with the following New Zealand Standards:

- NZS4431:2022 - Engineered fill construction for lightweight structures.
- NZS4404:2010 - Land Development and Subdivision Infrastructure.

3.3 Cutting and Topsoil Stripping

All residential lots required cutting and / or filling to achieve the desired grade, this necessitated topsoil to be stripped and stockpiled for future spreading. Miyamoto completed visual inspection of topsoil removal during regular site visits and through examination of contractor provided photographs.

Following excavation of topsoil, the majority of the excavated material comprised natural silt and sandy silt which was stockpiled to be used as site won engineered fill in the works (refer to Section 3.4 of this Report).

Cutting to waste (off-site disposal) of soils was completed in one discrete area of a former 'borrow pit' beneath lots 41, 42, 43, 49, 50, and 51, where unsuitable foundation soils (landfill and general refuse) were identified. The unsuitable material was excavated / removed exposing natural sandy

gravel deposits at a depth of greater than 3.5 m below ground level. Miyamoto completed several inspections during and after completion of unsuitable soil removal.

3.4 Filling

The bulk of the engineered fill for the residential lots compromised site won silt and sandy silt sourced from spoil created from the 'cut' lots, services and roading alignments. The site won fill material was sampled and tested at a laboratory for Particle Size Distribution (PSD), and determination of the dry density / water content relationship and assessed to be suitable for use as engineered fill (refer to Appendix B for laboratory test certificates).

The site won material had a suitable in-situ moisture content without the requirement for moisture conditioning and was stockpiled and shaped / battered into bunds along road alignments prior to placement as engineered fill. The shaping of the bunds allowed for water shedding to maintain suitable moisture condition of the soil during rainfall events.

Inspection of the stockpiled site won material was completed during regular site visits to confirm it was representative of the material tested in the laboratory. In general, there was very little variability of the material across the site.

The site won fill was placed and tracked in place / compacted with a 60-ton bulldozer, a methodology similar to that of a sheep's foot roller where the heavy plant imparts a large load directly to the freshly placed material and mechanically penetrates the surface of the fill material with the tracks.

Nuclear Densometer (NDM) testing of the placed and compacted fill material was completed by SGNT limited to verify adequate compaction was achieved. Typically, a minimum of two NDM tests were completed per lot per 250 mm of filling with additional testing completed where fill thickness exceeded 250 mm. The results of the NDM testing are included in Appendix C.

Imported 'pit run' material comprising well graded sandy gravel with cobles (sourced from Wheatsheaf Quarry) was utilised to fill the 'borrow pit' at lots 41, 42, 43, 49, 50, and 51. Where used, this material was capped with a minimum of 0.3 m of silt and sandy silt material. The imported material was placed in layers of approximately 250 mm thickness and compacted with a vibratory drum roller. NDM testing was completed at approximately 1 m vertical intervals and to the final lift (refer to Appendix C).

3.5 Earthworks Summary

A summary of the cut / fill earthworks and distribution across the site are shown in Table 2 and the as-built levels are provided in Appendix A.

Table 2: Earthworks summary

Stage	Lots within Stage	Fill Lots	Fill Type	Cut Lots
1	1,2,3,4,5	1,2,3	Site won - Silt	4, 5
2	9, 10, 11, 12, 13, 14, 15, 16, 17, 18	9, 10, 11, 12, 13, 14, 15, 16, 17, 18	Site won - Silt	-
3	19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30	21, 22, 23, 24, 25, 26, 27, 28, 29, 30	Site won - Silt	19, 20
4	31, 32, 33, 34, 35, 36, 37, 38, 39	31, 32, 33, 34, 35, 36, 37, 38, 39	Site won – Silt	-

Stage	Lots within Stage	Fill Lots	Fill Type	Cut Lots
5	6, 7, 8, 40, 41, 42, 43, 44, 45, 47, 48, 49, 50, 51, 52, 53, 54, 54, 55	40, 41, 42, 47, 48, 49, 50, 51, 52	Site won – Silt (all fill lots within stage) Imported – Pit run (lots 41, 42, 43, 49, 50, and 51)	6, 7, 8, 44, 45, 53, 54, 55
6	56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75	60, 61, 62, 72, 73, 74, 75	Site won – Silt	56, 57, 58, 59, 63, 64, 65, 66, 67, 68, 69, 70, 71

3.6 Certification

Based on site observations, laboratory testing and in-situ testing of placed and compacted material, in combination with earthworks planning, design, and construction being completed by experienced developers, engineers and contactors, it is our professional opinion that the earthworks for the residential lots have been completed to a suitable standard for residential development.

The following two documents are appended to this GCR (refer Appendix D and E):

- NZS4404:2010 - 'Schedule 2A: Statement of professional opinion on suitability of land for building construction'.
- NZS4431:2022 - 'Appendix D: Statement of suitability of engineered fill for lightweight structures'.

4. Building Development Design Considerations

4.1 Foundation Suitability

All residential lots within Stages 1 to 6 of the subdivision are considered to have a low liquefaction vulnerability with future seismic performance expected to be equivalent to MBIE Technical Category (TC) 1 as per the MBIE Guidance (2012).

As such, and with consideration of the assessment herein, foundations in accordance with MBIE (2012) TC1 are considered suitable for NZS3604:2011 compliant buildings, notably this includes NZS3604:2011 foundations and 'waffle slab' foundations.

4.2 Bearing Capacity and Other Considerations

The ground conditions across the site within the residential lots will typically comprise topsoil of varying thickness (0.3 to 0.4 m typically) overlying engineered and natural silt and sandy silt soils. In some locations sandy gravel may be encountered beneath topsoil.

Site specific testing should be completed to verify the available Geotechnical Ultimate Bearing Capacity (GUBC) of the soils underlying topsoil.

Preliminarily, assuming conventional residential foundations comprising 'NZS 3604 type' slab on grade with thickened edge beams, shallow timber piles of 0.45 m diameter, or waffle slab foundations with 0.3 m wide footings, foundation designers may assume 200 kPa GUBC beneath topsoil within the SILT and Sandy SILT soils at a minimum of 0.4 mbgl, however, this will need to be verified prior to construction.

Foundation designers should consider the effects of the interface between filled and non-filled ground on the performance of the structure.

4.3 Additional Considerations

A geotechnical plan review of proposed residential developments and the foundation design is recommended and considered best practice to ensure the recommendations of this report have been taken into consideration.

Construction monitoring of foundation excavations is recommended to ensure ground conditions encountered are as expected.

5. Limitations

This report is subject to the following limitations:

- This report has been prepared by Miyamoto for the Client for the purpose/s agreed with the Client (Purpose). Miyamoto accepts no responsibility for the validity, appropriateness, sufficiency or consequences of the Client using the report for purposes other than for the Purpose.
- This report is not intended for general publication or circulation. This report is not to be reproduced by the Client except in relation to the Purpose, without Miyamoto's prior written permission. Miyamoto disclaims all risk and all responsibility to any third party.
- This report is provided based on the various assumptions contained in the report.
- Miyamoto's professional services are performed using a degree of care and skill reasonably exercised by reputable consultants providing the same or similar services as at the date of this report.
- The Client is responsible for ensuring that the design of any foundations ensures the functionality of the building under SLS level loads.
- The sub surface information has been obtained from investigation carried out at discrete locations, which by their nature only provide information about a relatively small volume of subsoils. While Miyamoto has taken reasonable skill and care in carrying out the investigation to determine the subsoil condition, the subsoil condition could differ substantially from the results of any sampling investigation. Miyamoto is not responsible for and does not accept any liability in respect of any difference between the actual subsoil conditions and the results of our investigation.
- Where the Client provides information to Miyamoto, including design calculations and drawings of the as-built structure, or where the report indicates that we have obtained and/or relied upon information provided from a third party, Miyamoto has not made any independent verification of this information except as expressly stated in the report. Miyamoto assumes no responsibility for any inaccuracies in, or omissions to, that information.
- A change in circumstances, facts, information after the report has been provided may affect the adequacy or accuracy of the report. Miyamoto is not responsible for the adequacy or accuracy of the report as a result of any such changes.

References

Ministry of Business, Innovation, and Employment, 2012. *Repairing and rebuilding houses affected by the Canterbury earthquakes.*

New Zealand Standard NZS3604:2011. Timber-framed buildings.

New Zealand Standard NZS4404:2010. Land Development and Subdivision Infrastructure.

New Zealand Standard NZS4431:2022. Engineered fill construction for lightweight structures.

Appendix A: Earthworks Plan and As-built Levels

LEGEND:

—40.47— MAJOR CONTOUR (0.5m)

- - - - - MINOR CONTOUR (0.1m)

40.47 FINISHED LEVEL

NOTES:

1. CONTOURS SHOWN ON THIS PLAN DEPICT THE FINISHED TOPSOIL LEVELS OVER THE SITE.

2. ASBUILT INFORMATION WAS COLLECTED AND SUPPLIED BY ONGRADE DRAINAGE & EXCAVATION LTD AND CENTA SURVEY LTD.

ORIGIN OF LEVELS:	BURNHAM NO 2 (1127)
REDUCED LEVEL:	69.5942m
DATUM:	LVD 1937 (DEC 13)

REV	DATE	REVISION DETAILS	ISSUED
A	27/11/23	FOR INFORMATION	DG

CAPTURE
Land Development Consultants

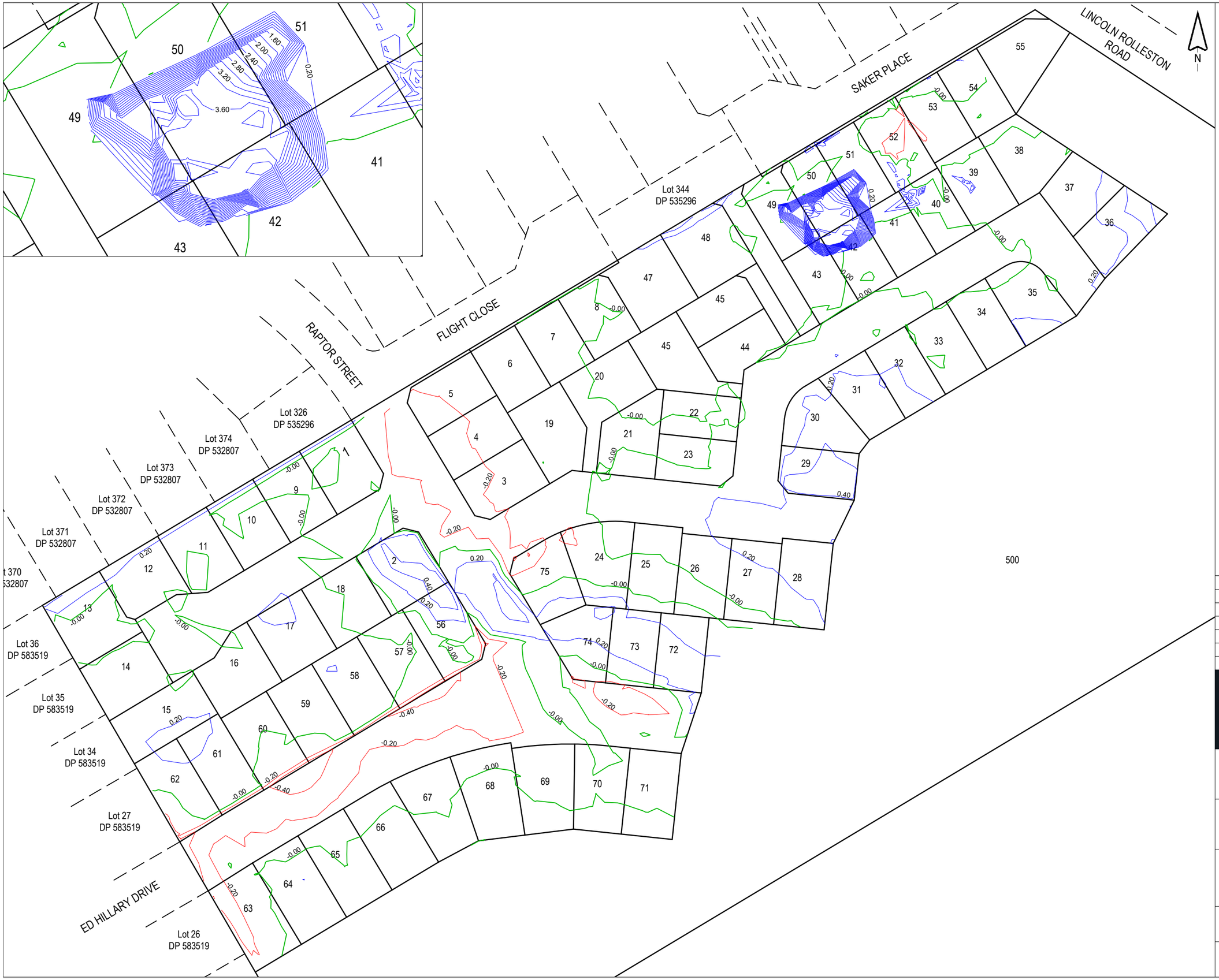
CLIENT
YOURSECTION FV LTD

PROJECT
FALCONS VIEW - STAGE 1-6

DRAWING TITLE
ASBUILT PLAN
EARTHWORKS FINISHED LEVELS AND CONTOURS

STATUS	*SCALE*	*SIZE*
FOR INFORMATION	1:1250	A3

PROJECT	*DRAWING NO*	*REVISION*
1041-1	AB-01	A



LEGEND:

-0.20 CUT CONTOUR (0.2m)

ZERO CONTOUR

0.20 FILL CONTOUR (0.2m)

NOTES:

1. CONTOURS SHOWN ON THIS PLAN DEPICT THE DEPTH OF CUT OR FILL BETWEEN THE ORIGINAL SURFACE STRIPPED OF TOPSOIL AND ANY UNDERCUT AREAS, VERSUS THE FINAL SURFACE PRIOR TO TOPSOIL BEING RESPREAD.

2. ASBUILT INFORMATION WAS COLLECTED AND SUPPLIED BY ONGRADE DRAINAGE & EXCAVATION LTD AND CENTA SURVEY LTD.

ORIGIN OF LEVELS:	BURNHAM NO 2 (1127)
REDUCED LEVEL:	69.5942m
DATUM:	LVD 1937 (DEC 13)

REV	DATE	REVISION DETAILS	ISSUED
A	27/11/23	FOR INFORMATION	DG

CAPTURE Land Development Consultants

CLIENT

YOURSECTION FV LTD

PROJECT

FALCONS VIEW - STAGE 1-6

DRAWING TITLE

ASBUILT PLAN
EARTHWORKS CUT/FILL CONTOURS

STATUS	*SCALE*	*SIZE*
FOR INFORMATION	1:1250	A3

PROJECT	*DRAWING NO*	*REVISION*
1041-1	AB-02	A

Appendix B: Laboratory Test Certificates

ROAD TECH LABORATORY LTD
205 Springs Road, Christchurch
lab@roadtech.co.nz
03-9417616

Dry Density / Water Content Relationship

New Zealand Standard Compaction Test

Lab Reference: *0862 / 23*

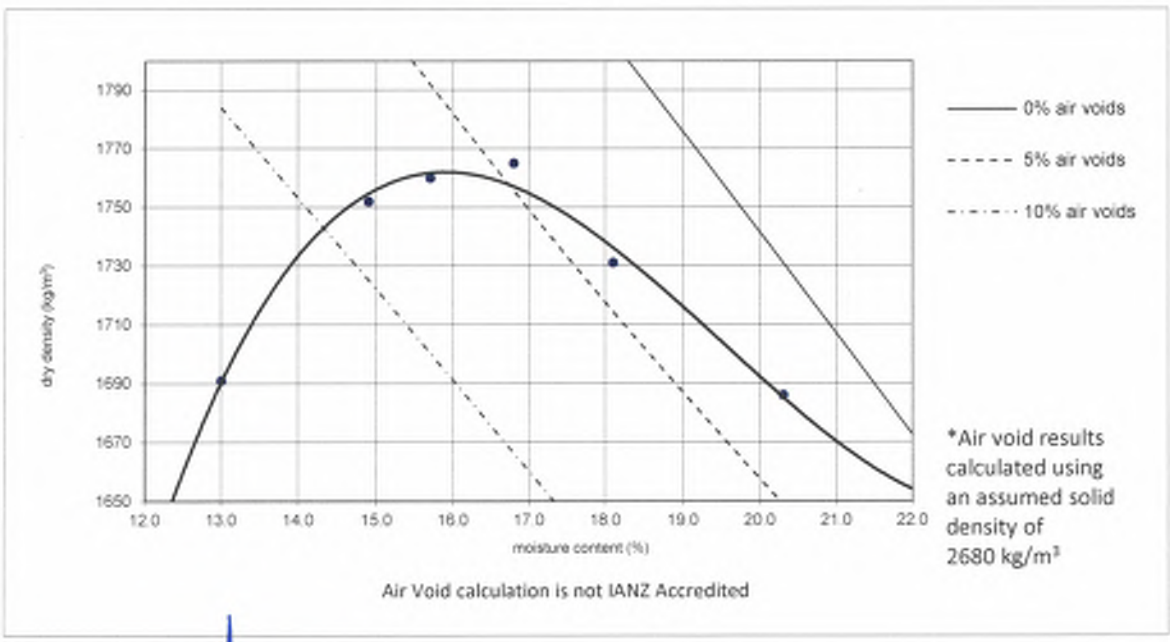
Client: SGNT Limited
Contact Name: Mr S. Gardner

Sample Type: Silt with aggregate
Sample Source: Falcons View, Rolleston (Stage 1 to 6)

Date of Reciept: 8 June 2023 **Sampled By:** S. Gardner
Date of Test: 13 June 2023 **Tested By:** J. Tieman

Sample Method: Unknown (Sampling method is not IANZ Accredited)
Test Method: NZS 4402:1986 Test 4.1.1 (Standard Compaction)
Results:

Moisture Content (% by dry mass)	Wet Density (kg/m^3)	Dry Density (kg/m^3)
13.0	1910	1690
14.9	2010	1750
15.7	2040	1760
16.8	2060	1770
18.1	2040	1730
20.3	2030	1690
Maximum Dry Density = 1760 kg/m^3 Optimum Water Content = 16.0 %		
Sample History: Natural. Test performed on sample passing 19.0mm (1.2% of sample removed)		



Date of Issue: 15 June 2023

Approved Signatory: _____
(T. O'Regan, Laboratory Manager)

Checked By: _____

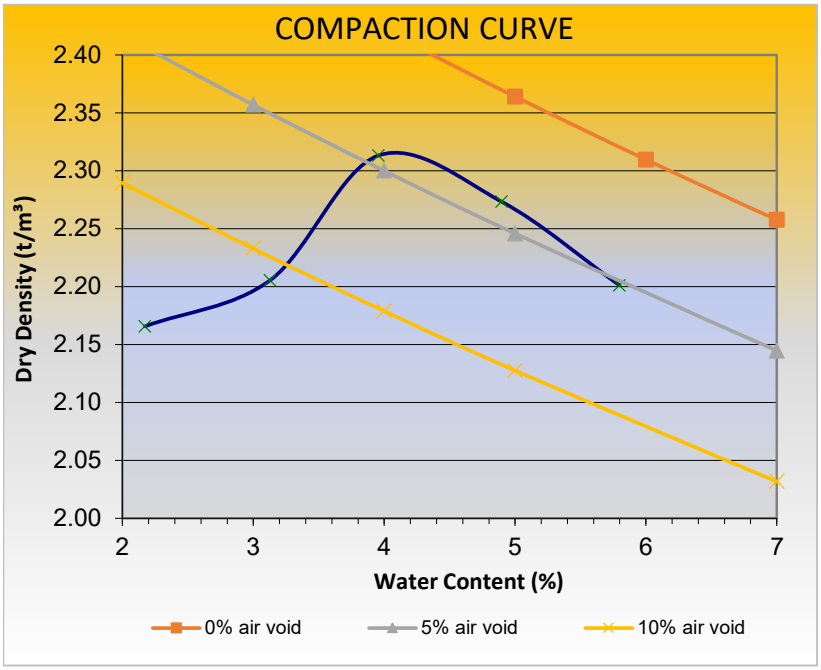
Pavetech Laboratory
1/1222 Courtenay Road, Kirwee, 7571.
PO Box 52394 Kirwee, 7543.
T 021 730 210
E gordon.hayward@pavetechlab.com
W www.pavetechlab.com

PITRUN TEST ANALYSIS REPORT

CLIENT:	Winstone Aggregates, PO Box 17 195, Greenlane, Auckland		
CLIENT SAMPLE REF:	Source Property	**LABORATORY NO:**	**P23-0254 - FINAL**
SAMPLE REFERENCE:	Wheatsheaf Quarry	**DATE SAMPLED:**	19 June 2023
MATERIAL SOURCE:	Wheatsheaf Quarry	**DATE RECEIVED:**	19 June 2023
MATERIAL:	Pitrun	**DATE REPORTED:**	20 June 2023

Determination of the Dry Density/Water Content Relationship: NZ Vibrating Hammer Compaction Test - NZS 4402: 1986 Test 4.1.3 — **Date of Test: 19/06/2023**

Test Number:	1	2	3	4	5
Bulk Density (t/m³)	2.21	2.27	2.40	2.38	2.33
Water Content (%)	2.2	3.1	4.0	4.9	5.8
Dry Density (t/m³)	2.17	2.21	2.31	2.27	2.20



Maximum Dry Density (t/m³): **2.32**

Optimum Water Content (%): **4.0**

Test performed on fraction passing (mm): **37.5**

Percent retained on the 37.5mm sieve: **28**

NOTES:

1 Compaction performed on air dried sample
2 Solid density of 2.68 t/m³ obtained from this test report P23-0063 to calculate airvoids
3 Sampled by G Hayward
4 Sample received in damp condition
5 Sampling is endorsed by this report

GORDON HAYWARD BSc PGDipSci
LABORATORY MANAGER - KEY TECHNCIAL PERSONNEL

ACCREDITED IANZ TESTING LABORATORY

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

Appendix C: Nuclear Densometer Test Results

Christchurch Laboratory
SGNT Limited
1/19 Repton Street, Merivale,
Christchurch 8014
Phone 021898295

Approved Signatory: Stephen Gardner
(Senior Technician)
IANZ Accredited Laboratory Number:1270
Date signed 31/8/23

Nuclear Density Report

Principal: Mike Niven
Client : Ongrade Drainage & Excavation Ltd

Project No: SGNT02158
Report No: CHRIW04543
Project Name: Falcons View

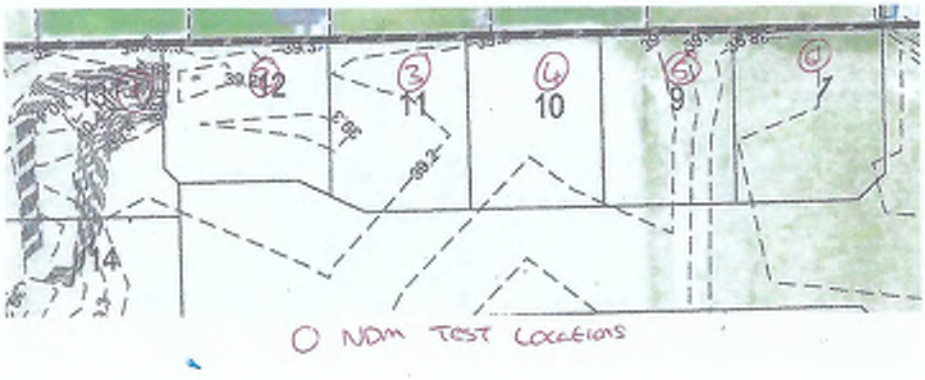
Testing Details				Compaction Target Details	
Site Tested:	Fill Lot 1 , 9 to 13 Final layer			Material Sample ID:	External
Date:	30/08/2023	Time:	12.15	Max.Dry Density :	1.76 (t/m^3) @ 16.0 %
Material :	Silt			Min. Dry Density (t/m^3)	1.67
Field methods : NZS 4407:2015 Test 4.2				Solid density:	Assumed

Moisture Content Determined by Ndm

Test Results

Site No	Depth (mm)	Moisture (%)	Wet Density (t/m^3)	Dry Density (t/m^3)	Relative Compaction (%)
1	200	15.5	2.17	1.88	107
2	200	15.5	2.03	1.74	100
3	200	16.1	2.12	1.82	104
4	200	19.2	2.10	1.76	100
5	200	12.4	2.16	1.92	109
6	200	11.7	2.15	1.92	109

Ndm test Locations
not to scale



Comments
MDD Method : Test was conducted externally and is not accredited by this laboratory.

Christchurch Laboratory
SGNT Limited
1/19 Repton Street, Merivale,
Christchurch 8014
Phone 021898295

Approved Signatory: Stephen Gardner
(Senior Technician)
IANZ Accredited Laboratory Number:1270
Date signed 31/8/23

Nuclear Density Report

Principal: Mike Niven
Client : Ongrade Drainage & Excavation Ltd

Project No: SGNT02158
Report No: CHRIW04489
Project Name: Falcons View

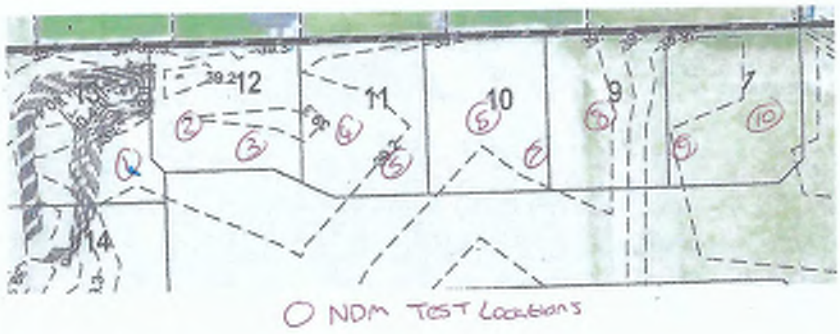
Testing Details				Compaction Target Details	
Site Tested:	Fill Lot 1, 9 to 13 Final layer			Material Sample ID:	External
Date:	23/08/2023	Time:	16.00	Max.Dry Density :	1.76 (t/m^3) @ 16.0 %
Material :	Silt			Min. Dry Density (t/m^3)	1.67
Field methods :	NZS 4407:2015 Test 4.2			Solid density:	Assumed

Moisture Content Determined by Ndm

Test Results

Site No	Depth (mm)	Moisture (%)	Wet Density (t/m^3)	Dry Density (t/m^3)	Relative Compaction (%)
1	200	12.2	2.04	1.81	102
2	200	13.9	2.22	1.95	110
3	200	10.3	2.07	1.88	105
4	200	20.8	2.11	1.75	98
5	200	20.1	2.11	1.76	99
6	200	17.4	2.11	1.80	101
7	200	11.6	2.08	1.82	102
8	200	18.0	2.11	1.79	100
9	200	14.4	2.05	1.79	101
10	200	13.5	2.18	1.92	108

Ndm test Locations
not to scale



Comments
MDD Method : Test was conducted externally and is not accredited by this laboratory.

Christchurch Laboratory
SGNT Limited
1/19 Repton Street, Merivale,
Christchurch 8014
Phone 021898295

Approved Signatory: Stephen Gardner
(Senior Technician)
IANZ Accredited Laboratory Number:1270
Date signed 16/9/23

Nuclear Density Report

Principal: Mike Niven
Client : Ongrade Drainage & Excavation Ltd

Project No: SGNT02158
Report No: CHRIW04559
Project Name: Flacons View

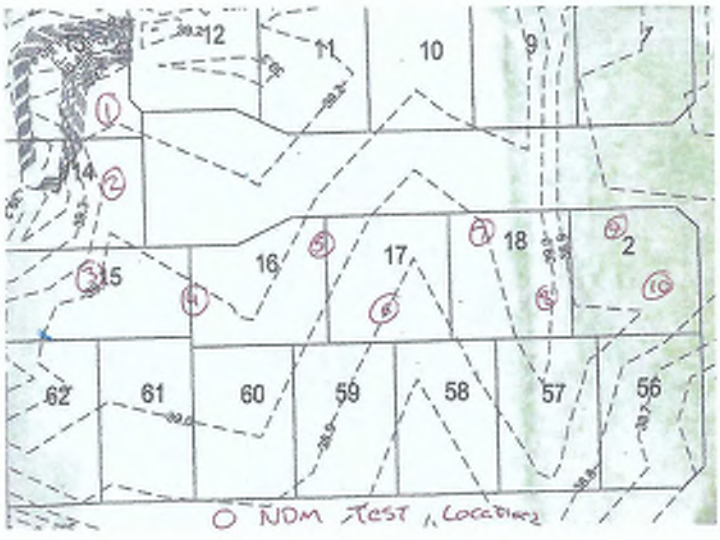
Testing Details				Compaction Target Details	
Site Tested:	Fill Lot 2 & 13 to 18 Final layer			Material Sample ID:	External
Date:	31/08/2023	Time:	16.00	Max.Dry Density :	1.76 (t/m^3) @ 16.0 %
Material :	Silt			Min. Dry Density (t/m^3)	1.67
Field methods : NZS 4407:2015 Test 4.2				Solid density:	Assumed

Moisture Content Determined by Ndm

Test Results

Site No	Depth (mm)	Moisture (%)	Wet Density (t/m^3)	Dry Density (t/m^3)	Relative Compaction (%)
1	200	11.8	2.15	1.92	109
2	200	10.3	2.15	1.95	110
3	200	11.9	2.13	1.91	108
4	200	12.6	1.93	1.72	98
5	200	14.8	1.97	1.94	109
6	200	15.6	2.03	1.75	100
7	200	11.6	2.11	1.94	110
8	200	11.9	2.11	1.89	107
9	200	12.6	2.12	1.88	107
10	200	11.8	2.11	1.89	107

Ndm test Locations
not to scale



Comments
MDD Method : Test was conducted externally and is not accredited by this laboratory.

Christchurch Laboratory
SGNT Limited
1/19 Repton Street, Merivale,
Christchurch 8014
Phone 021898295

Stephen Gardner
Approved Signatory: Stephen Gardner
(Senior Technician)
IANZ Accredited Laboratory Number:1270
Date signed 17/6/23

Nuclear Density Report

Principal: Mike Niven
Client : Ongrade Drainage & Excavation Ltd

Project No: SGNT02158
Report No: CHRIW04035
Project Name: Flacons View

Testing Details				Compaction Target Details	
Site Tested:	Fill Lot 2 , 14 to 18 , 56 to 62 Final layer			Material Sample ID:	External
Date:	12/06/2023	Time:	9.30	Max.Dry Density :	1.76 (t/m^3) @ 16.0 %
Material :	Silt			Min. Dry Density (t/m^3)	1.67
Field methods : NZS 4407:2015 Test 4.2				Solid density:	Assumed

Moisture Content Determined by Ndm

Test Results

Site No	Depth (mm)	Moisture (%)	Wet Density (t/m^3)	Dry Density (t/m^3)	Relative Compaction (%)
1	200	20.2	2.05	1.71	97
2	200	20.0	2.03	1.69	96
3	200	18.4	2.01	1.69	96
4	200	19.0	2.10	1.76	100
5	200	19.9	2.10	1.74	99
6	200	18.0	2.97	1.78	101
7	200	18.1	2.09	1.77	101
8	200	16.1	2.06	1.77	101
9	200	17.2	2.07	1.77	100
10	200	18.0	2.06	1.75	99
11	200	19.3	2.07	1.73	98
12	200	18.5	2.08	1.75	99
13	200	15.8	2.12	1.83	104
14	200	18.5	2.13	1.80	102
15	200	19.6	2.07	1.73	98
16	200	19.3	2.07	1.74	97
17	200	18.6	2.08	1.75	100
18	200	16.0	2.05	1.77	101
19	200	14.9	2.12	1.84	105
20	200	17.4	2.08	1.77	101
21	200	19.5	2.13	1.78	101
22	200	19.3	2.12	1.77	101
23	200	19.5	2.10	1.76	100
24	200	19.6	2.08	1.74	99
25	200	17.3	2.06	1.75	100
26	200	15.9	2.07	1.79	102

Comments
MDD Method : Test was conducted externally and is not accredited by this laboratory.

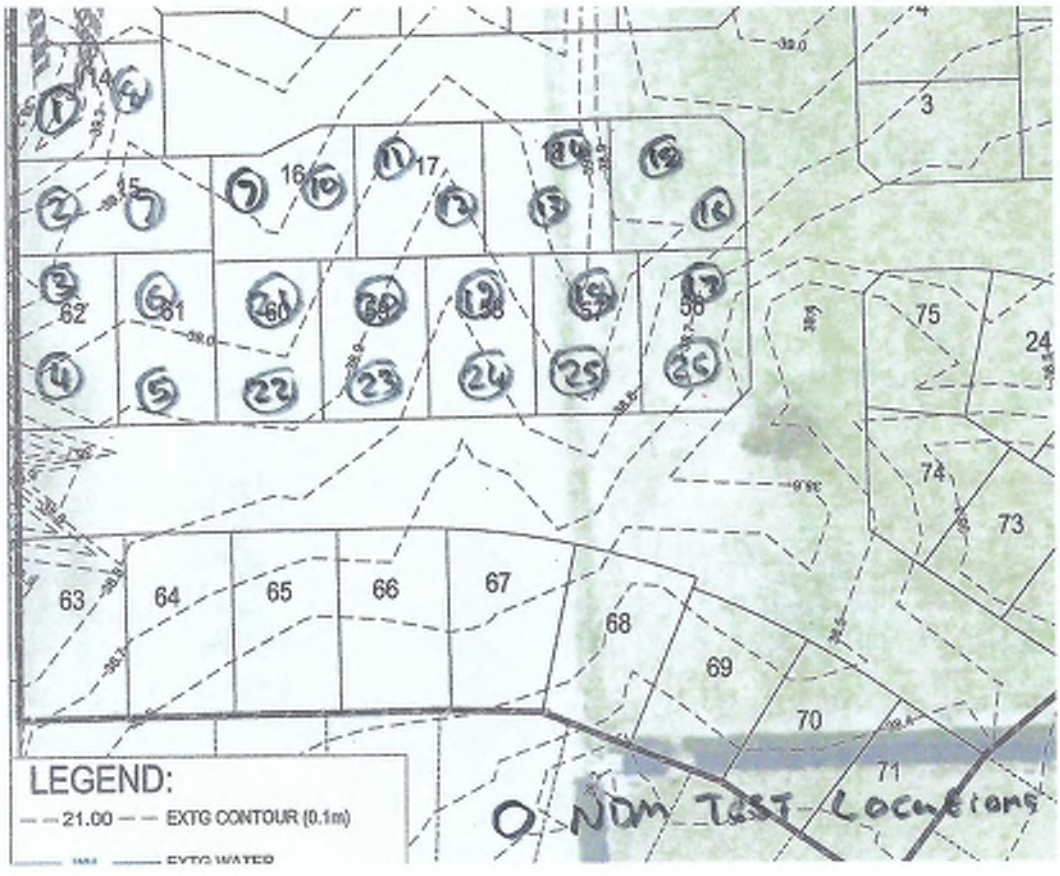
Christchurch Laboratory
SGNT Limited
1/19 Repton Street, Merivale,
Christchurch 8014
Phone 021898295

Nuclear Density Report

Principal: Mike Niven
Client : Ongrade Drainage & Excavation Ltd

Project No: SGNT02158
Report No: CHRIW04035
Project Name: Flacons View

Testing Details				Compaction Target Details	
Site Tested:	Fill Lot 2 , 14 to 18 , 56 to 62 Final layer			Material Sample ID:	External
Date:	12/06/2023	Time:	9.30	Max.Dry Density :	1.76 (t/m^3) @ 16.0 %
Material :	Silt			Min. Dry Density (t/m^3)	1.67
Field methods :	NZS 4407:2015 Test 4.2			Solid density:	Assumed



Ndm test Locations
not to scale

Comments
MDD Method : Test was conducted externally and is not accredited by this laboratory.

Christchurch Laboratory
SGNT Limited
1/19 Repton Street, Merivale,
Christchurch 8014
Phone 021898295

Approved Signatory: Stephen Gardner
(Senior Technician)
IANZ Accredited Laboratory Number: 1270
Date signed 8/7/23

Nuclear Density Report

Principal: Mike Niven
Client : Ongrade Drainage & Excavation Ltd

Project No: SGNT02158
Report No: CHRIW04191
Project Name: Flacons View

Testing Details				Compaction Target Details	
Site Tested:	Fill Lot 21 to 23 Final layer			Material Sample ID:	External
Date:	30/06/2023	Time:	10.00	Max.Dry Density :	1.76 (t/m^3) @ 16.0 %
Material :	Silt			Min. Dry Density (t/m^3)	1.67
Field methods :	NZS 4407:2015 Test 4.2			Solid density:	Assumed
Moisture Content Determined by Ndm					

Test Results

Site No	Depth (mm)	Moisture (%)	Wet Density (t/m^3)	Dry Density (t/m^3)	Relative Compaction (%)
1	200	13.8	2.10	1.85	105
2	200	14.2	2.00	1.75	100
3	200	12.8	1.99	1.76	100
4	200	12.7	1.98	1.75	100
5	200	13.1	1.97	1.74	99
6	200	14.1	2.01	1.76	100

Ndm test Locations
not to scale

Comments
MDD Method : Test was conducted externally and is not accredited by this laboratory.

Christchurch Laboratory
SGNT Limited
1/19 Repton Street, Merivale,
Christchurch 8014
Phone 021898295

Approved Signatory: Stephen Gardner
(Senior Technician)
IANZ Accredited Laboratory Number:1270
Date signed 27/7/23

Nuclear Density Report

Principal: Mike Niven
Client : Ongrade Drainage & Excavation Ltd

Project No: SGNT02158
Report No: CHRIW04246
Project Name: Flacons View

Testing Details				Compaction Target Details	
Site Tested:	Fill Lot 24 to 28 & 75 Final layer			Material Sample ID:	External
Date:	18/07/2023	Time:	17.00	Max.Dry Density :	1.76 (t/m^3) @ 16.0 %
Material :	Silt			Min. Dry Density (t/m^3)	1.67
Field methods : NZS 4407:2015 Test 4.2				Solid density:	Assumed

Moisture Content Determined by Ndm

Test Results

Site No	Depth (mm)	Moisture (%)	Wet Density (t/m^3)	Dry Density (t/m^3)	Relative Compaction (%)
1	200	17.3	2.03	1.73	98
2	200	18.7	2.04	1.72	98
3	200	15.6	2.02	1.75	99
4	200	17.3	1.98	1.69	96
5	200	16.6	1.99	1.70	97
6	200	17.4	2.02	1.72	98
7	200	17.7	2.03	1.73	98
8	200	16.6	2.20	1.68	95
9	200	12.8	2.13	1.89	107
10	200	18.4	1.99	1.68	95
11	200	15.2	2.05	1.78	101
12	200	15.4	2.01	1.74	99

Ndm test Locations
not to scale

○ NDM Test Locations

Comments
MDD Method : Test was conducted externally and is not accredited by this laboratory.

Christchurch Laboratory
SGNT Limited
1/19 Repton Street, Merivale,
Christchurch 8014
Phone 021898295

Stephen Gardner

Approved Signatory: Stephen Gardner
(Senior Technician)
IANZ Accredited Laboratory Number:1270
Date signed 17/6/23

Nuclear Density Report

Principal: Mike Niven
Client : Ongrade Drainage & Excavation Ltd

Project No: SGNT02158
Report No: CHRIW04060
Project Name: Flacons View

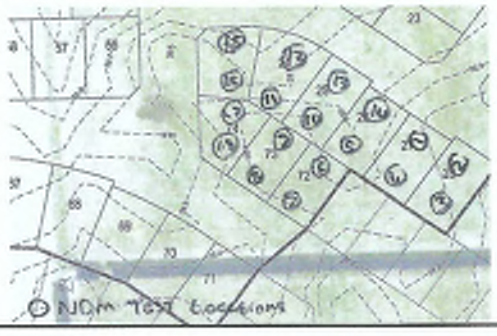
Testing Details				Compaction Target Details	
Site Tested:	Fill Lot 24 to 28 , 72 to 75 Final layer			Material Sample ID:	External
Date:	14/06/2023	Time:	16.20	Max.Dry Density :	1.76 (t/m^3) @ 16.0 %
Material :	Silt			Min. Dry Density (t/m^3)	1.67
Field methods : NZS 4407:2015 Test 4.2				Solid density:	Assumed

Moisture Content Determined by Ndm

Test Results

Site No	Depth (mm)	Moisture (%)	Wet Density (t/m^3)	Dry Density (t/m^3)	Relative Compaction (%)
1	200	19.0	2.14	1.80	102
2	200	17.4	2.02	1.72	98
3	200	17.9	2.06	1.75	100
4	200	14.8	2.06	1.79	102
5	200	14.5	2.11	1.84	105
6	200	15.9	2.07	1.79	102
7	200	17.3	2.06	1.75	100
8	200	15.5	2.06	1.79	101
9	200	14.8	2.12	1.85	105
10	200	13.9	2.05	1.80	102
11	200	20.5	2.06	1.71	97
12	200	18.9	2.10	1.76	100
13	200	19.4	2.05	1.72	98
14	200	19.5	2.13	1.78	101
15	200	19.1	2.08	1.75	99
16	200	18.7	2.09	1.76	100
17	200	18.2	2.09	1.77	101
18	200	18.6	2.09	1.76	100

Ndm test Locations
not to scale



Comments
MDD Method : Test was conducted externally and is not accredited by this laboratory.

Christchurch Laboratory
SGNT Limited
1/19 Repton Street, Merivale,
Christchurch 8014
Phone 021898295

Approved Signatory: Stephen Gardner
(Senior Technician)
IANZ Accredited Laboratory Number:1270
Date signed 31/8/23

Nuclear Density Report

Principal: Mike Niven
Client : Ongrade Drainage & Excavation Ltd

Project No: SGNT02158
Report No: CHRIW04342
Project Name: Falcons View

Testing Details				Compaction Target Details	
Site Tested:	Fill Lot 29 to 35 Final layer			Material Sample ID:	External
Date:	2/08/2023	Time:	7.30	Max.Dry Density :	1.76 (t/m^3) @ 16.0 %
Material :	Silt			Min. Dry Density (t/m^3)	1.67
Field methods :	NZS 4407:2015 Test 4.2			Solid density:	Assumed

Moisture Content Determined by Ndm

Test Results

Site No	Depth (mm)	Moisture (%)	Wet Density (t/m^3)	Dry Density (t/m^3)	Relative Compaction (%)
1	200	17.5	2.09	1.78	101
2	200	15.9	2.10	1.81	103
3	200	14.1	2.18	1.91	109
4	200	14.9	2.14	1.86	106
5	200	18.5	2.10	1.77	101
6	200	16.3	1.99	1.71	97
7	200	11.0	2.13	1.87	106
8	200	13.1	2.15	1.70	108
9	200	14.8	2.08	1.81	103
10	200	18.3	2.07	1.75	100
11	200	16.0	2.08	1.78	101
12	200	16.6	2.09	1.79	102
13	200	14.1	2.15	1.88	106
14	200	15.2	2.13	1.85	105

Ndm test Locations
not to scale

○ NDM Test Locations

Comments
MDD Method : Test was conducted externally and is not accredited by this laboratory.

Christchurch Laboratory
SGNT Limited
1/19 Repton Street, Merivale,
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Approved Signatory: Stephen Gardner
(Senior Technician)
IANZ Accredited Laboratory Number:1270
Date signed 31/8/23

Nuclear Density Report

Principal: Mike Niven
Client : Ongrade Drainage & Excavation Ltd

Project No: SGNT02158
Report No: CHRIW04382
Project Name: Falcons View

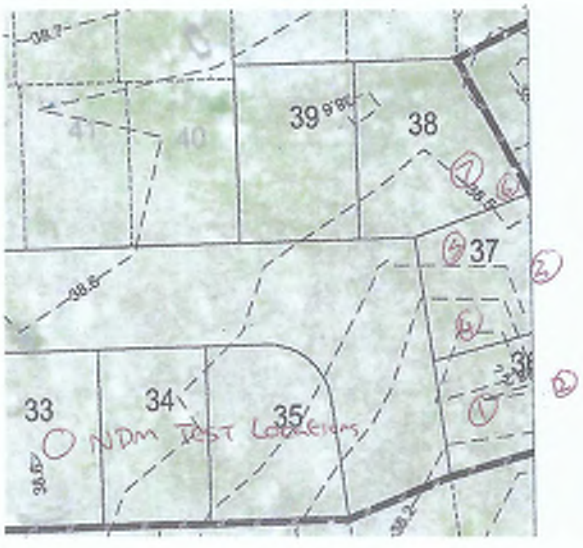
Testing Details				Compaction Target Details	
Site Tested:	Fill Lot 36 to 38 test 2 First Layer 1,3 to 7 Final layer			Material Sample ID:	External
Date:	8/08/2023	Time:	16.20	Max.Dry Density :	1.76 (t/m^3) @ 16.0 %
Material :	Silt			Min. Dry Density (t/m^3)	1.67
Field methods : NZS 4407:2015 Test 4.2				Solid density:	Assumed

Moisture Content Determined by Ndm

Test Results

Site No	Depth (mm)	Moisture (%)	Wet Density (t/m^3)	Dry Density (t/m^3)	Relative Compaction (%)
1	200	11.4	2.11	1.89	108
2	200	13.3	2.20	1.94	110
3	200	21.4	2.05	1.69	96
4	200	11.7	2.15	1.93	109
5	200	12.5	2.15	1.91	108
6	200	12.7	2.04	1.81	103
7	200	11.4	2.09	1.88	107

Ndm test Locations
not to scale



Comments
MDD Method : Test was conducted externally and is not accredited by this laboratory.

Christchurch Laboratory
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1/19 Repton Street, Merivale,
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Approved Signatory: Stephen Gardner
(Senior Technician)
IANZ Accredited Laboratory Number:1270
Date signed 31/8/23

Nuclear Density Report

Principal: Mike Niven
Client : Ongrade Drainage & Excavation Ltd

Project No: SGNT02158
Report No: CHRIW04378
Project Name: Falcons View

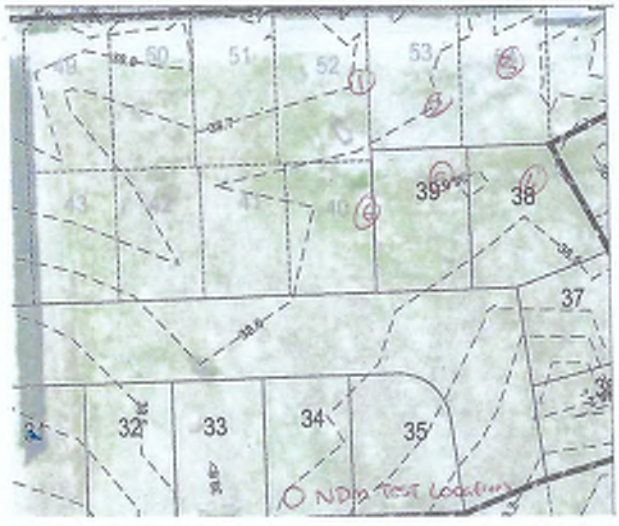
Testing Details				Compaction Target Details	
Site Tested:	Fill Lot 38 to 40 & 52 to 54 Final layer			Material Sample ID:	External
Date:	8/08/2023	Time:	10.00	Max.Dry Density :	1.76 (t/m^3) @ 16.0 %
Material :	Silt			Min. Dry Density (t/m^3)	1.67
Field methods :	NZS 4407:2015 Test 4.2			Solid density:	Assumed

Moisture Content Determined by Ndm

Test Results

Site No	Depth (mm)	Moisture (%)	Wet Density (t/m^3)	Dry Density (t/m^3)	Relative Compaction (%)
1	200	16.3	1.97	1.70	96
2	200	13.6	1.97	1.73	98
3	200	12.1	1.99	1.78	101
4	200	14.0	1.99	1.75	99
5	200	12.7	2.00	1.78	101
6	200	12.8	1.99	1.76	100

Ndm test Locations
not to scale



Comments
MDD Method : Test was conducted externally and is not accredited by this laboratory.

Christchurch Laboratory
SGNT Limited
1/19 Repton Street, Merivale,
Christchurch 8014
Phone 021898295

Stephen Gardner
Approved Signatory: Stephen Gardner
(Senior Technician)
IANZ Accredited Laboratory Number:1270
Date signed 1/7/23

Nuclear Density Report

Principal: Mike Niven
Client : Ongrade Drainage & Excavation Ltd

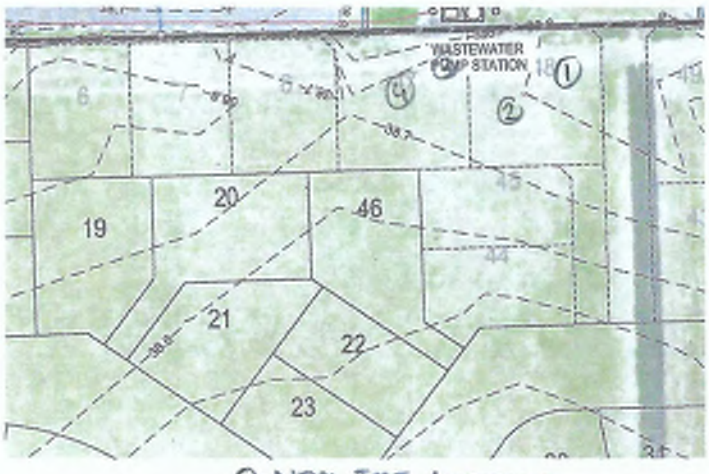
Project No: SGNT02158
Report No: CHRIW04144
Project Name: Flacons View

Testing Details				Compaction Target Details	
Site Tested:	Fill Lot 47 & 48 Final layer			Material Sample ID:	External
Date:	26/06/2023	Time:	14.30	Max.Dry Density :	1.76 (t/m^3) @ 16.0 %
Material :	Silt			Min. Dry Density (t/m^3)	1.67
Field methods : NZS 4407:2015 Test 4.2				Solid density:	Assumed

Moisture Content Determined by Ndm

Test Results

Site No	Depth (mm)	Moisture (%)	Wet Density (t/m^3)	Dry Density (t/m^3)	Relative Compaction (%)
1	200	20.8	2.04	1.69	96
2	200	20.5	2.05	1.70	97
3	200	20.9	2.04	1.69	96
4	200	18.8	2.02	1.70	96



O NDM Test Locations

Ndm test Locations
not to scale

Comments
MDD Method : Test was conducted externally and is not accredited by this laboratory.

Christchurch Laboratory
SGNT Limited
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Christchurch 8014
Phone 021898295

Approved Signatory: Stephen Gardner
(Senior Technician)
IANZ Accredited Laboratory Number:1270
Date signed 31/8/23

Nuclear Density Report

Principal: Mike Niven
Client : Ongrade Drainage & Excavation Ltd

Project No: SGNT02158
Report No: CHRIW04435
Project Name: Falcons View

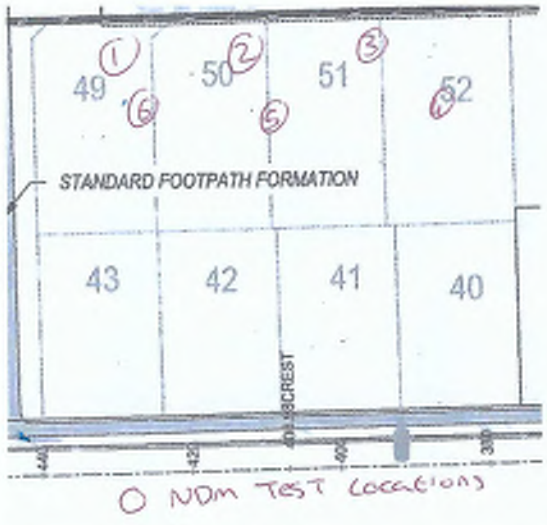
Testing Details				Compaction Target Details	
Site Tested:	Fill Lot 49 to 52 Final layer			Material Sample ID:	External
Date:	16/08/2023	Time:	12.34	Max.Dry Density :	1.76 (t/m^3),@ 16.0 %
Material :	Silt			Min. Dry Density (t/m^3)	1.67
Field methods :	NZS 4407:2015 Test 4.2			Solid density:	Assumed

Moisture Content Determined by Ndm

Test Results

Site No	Depth (mm)	Moisture (%)	Wet Density (t/m^3)	Dry Density (t/m^3)	Relative Compaction (%)
1	200	17.5	2.09	1.78	101
2	200	15.9	2.10	1.81	103
3	200	14.1	2.18	1.91	109
4	200	14.9	2.14	1.86	106
5	200	18.5	2.10	1.77	101
6	200	16.3	1.99	1.71	97

Ndm test Locations
not to scale



Comments
MDD Method : Test was conducted externally and is not accredited by this laboratory.

Christchurch Laboratory
SGNT Limited
1/19 Repton Street, Merivale,
Christchurch 8014
Phone 021898295

Approved Signatory: Stephan Gardner
(Senior Technician)
IANZ Accredited Laboratory Number:1270
Date signed 16/9/23

Nuclear Density Report

Principal: Mike Niven
Client : Ongrade Drainage & Excavation Ltd

Project No: SGNT02158
Report No: CHRIW04589
Project Name: Flacons View

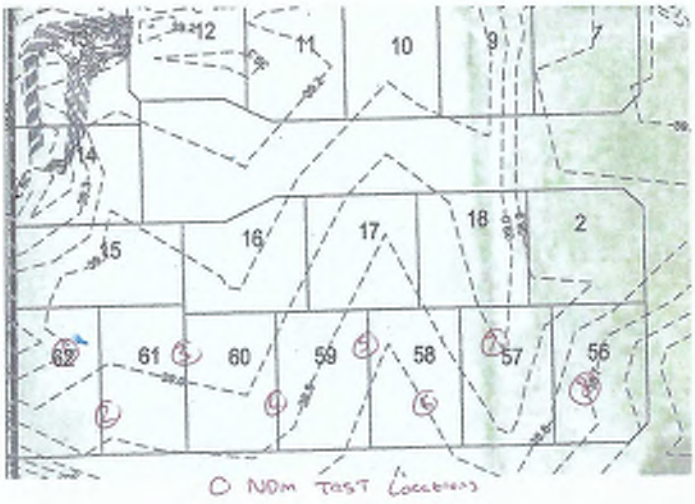
Testing Details				Compaction Target Details	
Site Tested:	Fill Lot 56 to 62 Final layer			Material Sample ID:	External
Date:	5/09/2023	Time:	8.10	Max.Dry Density :	1.76 (t/m^3) @ 16.0 %
Material :	Silt			Min. Dry Density (t/m^3)	1.67
Field methods :	NZS 4407:2015 Test 4.2			Solid density:	Assumed

Moisture Content Determined by Ndm

Test Results

Site No	Depth (mm)	Moisture (%)	Wet Density (t/m^3)	Dry Density (t/m^3)	Relative Compaction (%)
1	200	15.9	2.12	1.83	104
2	200	15.4	2.11	1.82	104
3	200	16.1	2.13	1.84	104
4	200	15.2	2.14	1.86	105
5	200	13.9	2.10	1.84	105
6	200	13.2	2.07	1.83	104
7	200	13.4	2.07	1.83	104
8	200	14.5	2.12	1.85	105

Ndm test Locations
not to scale



Comments
MDD Method : Test was conducted externally and is not accredited by this laboratory.

Christchurch Laboratory
SGNT Limited
1/19 Repton Street, Merivale,
Christchurch 8014
Phone 021898295

Stephen Gardner

Approved Signatory: Stephen Gardner
(Senior Technician)
IANZ Accredited Laboratory Number: 1270

Date signed 27/7/23

Nuclear Density Report

Principal: Mike Niven
Client : Ongrade Drainage & Excavation Ltd

Project No: SGNT02158
Report No: CHRIW04258
Project Name: Flacons View

Testing Details				Compaction Target Details	
Site Tested:	Fill Lot 72 to 74 Final layer			Material Sample ID:	External
Date:	19/07/2023	Time:	16.00	Max.Dry Density :	1.76 (t/m^3) @ 16.0 %
Material :	Silt			Min. Dry Density (t/m^3)	1.67
Field methods : NZS 4407:2015 Test 4.2				Solid density:	Assumed
Moisture Content Determined by Ndm					

Test Results

Site No	Depth (mm)	Moisture (%)	Wet Density (t/m^3)	Dry Density (t/m^3)	Relative Compaction (%)
1	200	13.5	2.09	1.84	105
2	200	11.5	1.97	1.72	98
3	200	13.5	1.94	1.71	97
4	200	11.5	2.19	1.92	108
5	200	15.9	2.14	1.85	105
6	200	14.7	1.95	1.70	97

Ndm test Locations
not to scale

○ NDM TEST Locations

Comments
MDD Method : Test was conducted externally and is not accredited by this laboratory.

Christchurch Laboratory
SGNT Limited
1/19 Repton Street, Merivale,
Christchurch 8014
Phone 021898295

Stephen Gardner

Approved Signatory: Stephen Gardner
(Senior Technician)
IANZ Accredited Laboratory Number:1270

Date signed 27/7/23

Nuclear Density Report

Principal: Mike Niven
Client : Ongrade Drainage & Excavation Ltd

Project No: SGNT02158
Report No: CHRIW04060B
Project Name: Flacons View

Testing Details				Compaction Target Details	
Site Tested:	Fill Lot 24 to 28 , 72 to 75 First layer			Material Sample ID:	External
Date:	14/06/2023	Time:	16.20	Max.Dry Density :	1.76 (t/m^3) @ 16.0 %
Material :	Silt			Min. Dry Density (t/m^3)	1.67
Field methods :	NZS 4407:2015 Test 4.2			Solid density:	Assumed

Moisture Content Determined by Ndm

Test Results

Site No	Depth (mm)	Moisture (%)	Wet Density (t/m^3)	Dry Density (t/m^3)	Relative Compaction (%)
1	200	19.0	2.14	1.80	102
2	200	17.4	2.02	1.72	98
3	200	17.9	2.06	1.75	100
4	200	14.8	2.06	1.79	102
5	200	14.5	2.11	1.84	105
6	200	15.9	2.07	1.79	102
7	200	17.3	2.06	1.75	100
8	200	15.5	2.06	1.79	101
9	200	14.8	2.12	1.85	105
10	200	13.9	2.05	1.80	102
11	200	20.5	2.06	1.71	97
12	200	18.9	2.10	1.76	100
13	200	19.4	2.05	1.72	98
14	200	19.5	2.13	1.78	101
15	200	19.1	2.08	1.75	99
16	200	18.7	2.09	1.76	100
17	200	18.2	2.09	1.77	101
18	200	18.6	2.09	1.76	100

Ndm test Locations
not to scale

Comments
MDD Method : Test was conducted externally and is not accredited by this laboratory.
(This report supersedes chriw4060)

Christchurch Laboratory
SGNT Limited
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Christchurch 8014
Phone 021898295

Approved Signatory: Stephen Gardner
(Senior Technician)
IANZ Accredited Laboratory Number:1270
Date signed 31/8/23

Nuclear Density Report

Principal: Mike Niven
Client : Ongrade Drainage & Excavation Ltd

Project No: SGNT02158
Report No: CHRIW04528
Project Name: Falcons View

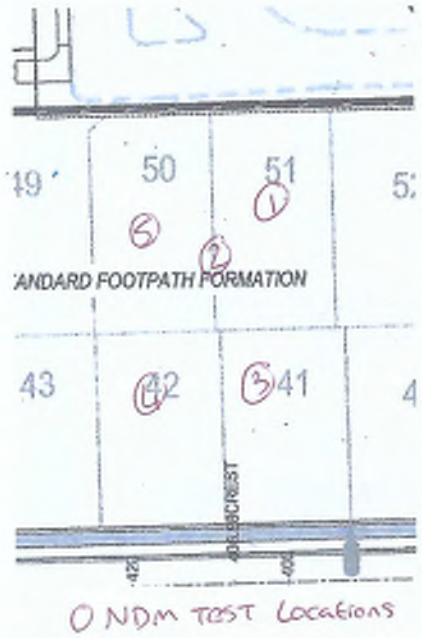
Testing Details				Compaction Target Details	
Site Tested:	Lot 41,42,50,51 Old rubbish Tip Backfill Fifth Layer			Material Sample ID:	External
Date:	28/08/2023	Time:	16.32	Max.Dry Density :	2.32 (t/m^3) @ 4.0 %
Material :	Pit run			Min. Dry Density (t/m^3)	2.20
Field methods :	NZS 4407:2015 Test 4.3			Solid density:	Assumed

Moisture Content Determined by Ndm

Test Results

Site No	Moisture (%)	Wet Density (t/m^3)	Dry Density (t/m^3)	Relative Compaction (%)
1	6.0	2.50	2.36	102
2	6.5	2.45	2.30	99
3	5.1	2.53	2.39	103
4	5.2	2.45	2.33	101
5	5.3	2.36	2.24	97

Ndm test locations
not to scale



Comments
MDD Method : Test was conducted externally and is not accredited by this laboratory.
+ 200mm on top of Fourth Layer

Christchurch Laboratory
SGNT Limited
1/19 Repton Street, Merivale,
Christchurch 8014
Phone 021898295

Approved Signatory: Stephen Gardner
(Senior Technician)
IANZ Accredited Laboratory Number:1270
Date signed 31/8/23

Nuclear Density Report

Principal: Mike Niven
Client : Ongrade Drainage & Excavation Ltd

Project No: SGNT02158
Report No: CHRIW04542
Project Name: Falcons View

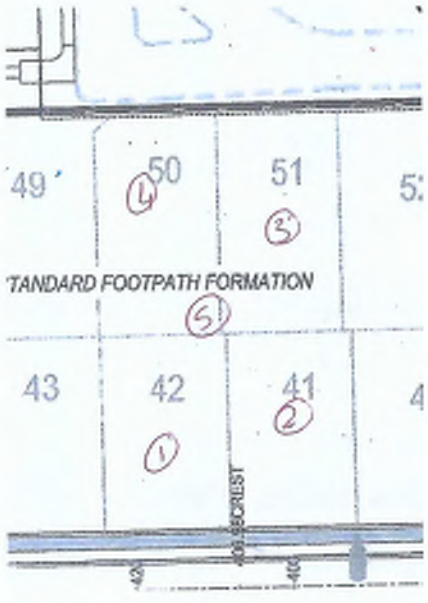
Testing Details				Compaction Target Details	
Site Tested:	Lot 41,42,50,51 Old rubbish Tip Backfill Final Layer			Material Sample ID:	External
Date:	30/08/2023	Time:	11.46	Max.Dry Density :	1.76 (t/m^3) @ 16.0 %
Material :	Silt			Min. Dry Density (t/m^3)	1.67
Field methods :	NZS 4407:2015 Test 4.2			Solid density:	Assumed

Moisture Content Determined by Ndm

Test Results

Site No	Depth (mm)	Moisture (%)	Wet Density (t/m^3)	Dry Density (t/m^3)	Relative Compaction (%)
1	200	17.3	2.09	1.78	101
2	200	18.9	2.09	1.76	100
3	200	13.5	2.18	1.92	109
4	200	15.3	2.04	1.76	101
5	200	13.0	2.05	1.81	103

Ndm test Locations
not to scale



0 NDM Test Locations

Comments
MDD Method : Test was conducted externally and is not accredited by this laboratory.

Christchurch Laboratory
SGNT Limited
1/19 Repton Street, Merivale,
Christchurch 8014
Phone 021898295

Stephen Gardner

Approved Signatory: Stephen Gardner
(Senior Technician)
IANZ Accredited Laboratory Number: 1270

Date signed 31/8/23

Nuclear Density Report

Principal: Mike Niven
Client : Ongrade Drainage & Excavation Ltd

Project No: SGNT02158
Report No: CHRIW04477
Project Name: Falcons View

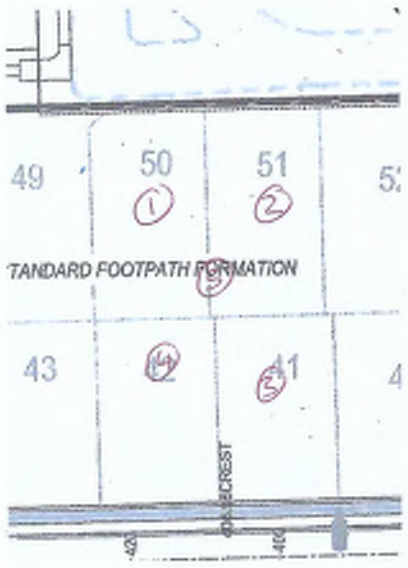
Testing Details				Compaction Target Details	
Site Tested:	Lot 41,42,50,51 Old rubbish Tip Backfill First Layer			Material Sample ID:	External
Date:	22/08/2023	Time:	12.20	Max.Dry Density :	2.32 (t/m^3) @ 4.0 %
Material :	Pit run			Min. Dry Density (t/m^3)	2.20
Field methods :	NZS 4407:2015 Test 4.3			Solid density:	Assumed

Moisture Content Determined by Ndm

Test Results

Site No	Moisture (%)	Wet Density (t/m^3)	Dry Density (t/m^3)	Relative Compaction (%)
1	6.0	2.38	2.24	97
2	5.9	2.50	2.37	102
3	5.9	2.38	2.25	97
4	5.6	2.42	2.29	99
5	4.6	2.50	2.39	103

Ndm test locations
not to scale



O NDM Test Locations

Comments
MDD Method : Test was conducted externally and is not accredited by this laboratory.

Christchurch Laboratory
SGNT Limited
1/19 Repton Street, Merivale,
Christchurch 8014
Phone 021898295

Approved Signatory: Stephen Gardner
(Senior Technician)
IANZ Accredited Laboratory Number:1270
Date signed 31/8/23

Nuclear Density Report

Principal: Mike Niven
Client : Ongrade Drainage & Excavation Ltd

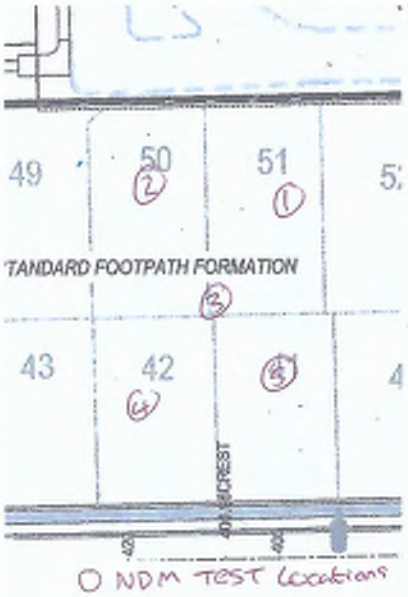
Project No: SGNT02158
Report No: CHRIW04525
Project Name: Falcons View

Testing Details				Compaction Target Details	
Site Tested:	Lot 41,42,50,51 Old rubbish Tip Backfill Fourth Laye			Material Sample ID:	External
Date:	28/08/2023	Time:	12.25	Max.Dry Density :	2.32 (t/m^3) @ 4.0 %
Material :	Pit run			Min. Dry Density (t/m^3)	2.20
Field methods :	NZS 4407:2015 Test 4.3			Solid density:	Assumed
Moisture Content Determined by Ndm					

Test Results

Site No	Moisture (%)	Wet Density (t/m^3)	Dry Density (t/m^3)	Relative Compaction (%)
1	5.8	2.44	2.30	99
2	6.8	2.42	2.26	98
3	5.3	2.37	2.25	97
4	5.0	2.44	2.23	100
5	5.9	2.43	2.30	99

Ndm test locations
not to scale



Comments
MDD Method : Test was conducted externally and is not accredited by this laboratory.

Christchurch Laboratory
SGNT Limited
1/19 Repton Street, Merivale,
Christchurch 8014
Phone 021898295

Stephen Gardner
Approved Signatory: Stephen Gardner
(Senior Technician)
IANZ Accredited Laboratory Number:1270
Date signed 31/8/23

Nuclear Density Report

Principal: Mike Niven
Client : Ongrade Drainage & Excavation Ltd

Project No: SGNT02158
Report No: CHRIW04483
Project Name: Falcons View

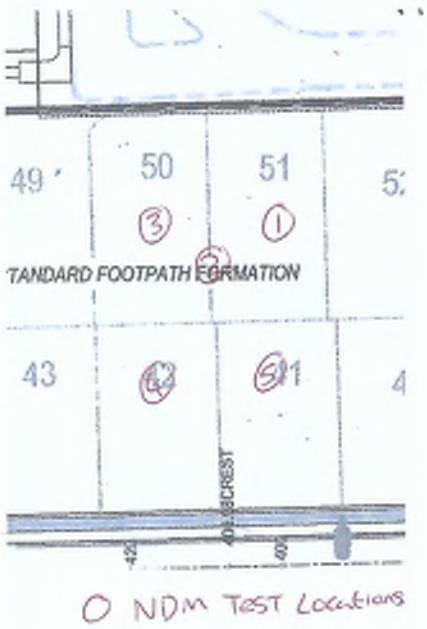
Testing Details				Compaction Target Details	
Site Tested:	Lot 41,42,50,51 Old rubbish Tip Backfill Second Lay			Material Sample ID:	External
Date:	23/08/2023	Time:	12.20	Max.Dry Density :	2.32 (t/m^3) @ 4.0 %
Material :	Pit run			Min. Dry Density (t/m^3)	2.20
Field methods :	NZS 4407:2015 Test 4.3			Solid density:	Assumed

Moisture Content Determined by Ndm

Test Results

Site No	Moisture (%)	Wet Density (t/m^3)	Dry Density (t/m^3)	Relative Compaction (%)
1	5.8	2.38	2.25	97
2	6.3	2.40	2.26	97
3	6.5	2.37	2.22	96
4	5.7	2.48	2.35	101
5	5.5	2.39	2.26	97

Ndm test locations
not to scale



O NDM Test Locations

Comments
MDD Method : Test was conducted externally and is not accredited by this laboratory.

Christchurch Laboratory
SGNT Limited
1/19 Repton Street, Merivale,
Christchurch 8014
Phone 021898295

Stephen Gardner

Approved Signatory: Stephen Gardner
(Senior Technician)
IANZ Accredited Laboratory Number:1270

Date signed 31/8/23

Nuclear Density Report

Principal: Mike Niven
Client : Ongrade Drainage & Excavation Ltd

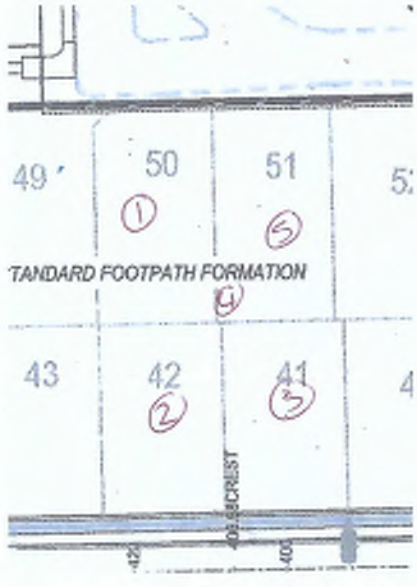
Project No: SGNT02158
Report No: CHRIW04513
Project Name: Falcons View

Testing Details				Compaction Target Details	
Site Tested:	Lot 41,42,50,51 Old rubbish Tip Backfill Third Layer			Material Sample ID:	External
Date:	25/08/2023	Time:	12.00	Max.Dry Density :	2.32 (t/m^3) @ 4.0 %
Material :	Pit run			Min. Dry Density (t/m^3)	2.20
Field methods :	NZS 4407:2015 Test 4.3			Solid density:	Assumed
Moisture Content Determined by Ndm					

Test Results

Site No	Moisture (%)	Wet Density (t/m^3)	Dry Density (t/m^3)	Relative Compaction (%)
1	5.7	2.36	2.23	96
2	5.6	2.38	2.25	97
3	5.7	2.41	2.28	98
4	5.0	2.48	2.36	102
5	5.7	2.39	2.26	97

Ndm test locations
not to scale



O NDM Test Locations

Comments
MDD Method : Test was conducted externally and is not accredited by this laboratory.

Appendix D: NZS4404:2010 – Schedule 2A

SCHEDULE 2A

STATEMENT OF PROFESSIONAL OPINION ON SUITABILITY OF LAND FOR BUILDING CONSTRUCTION

Development Falcons View Subdivision

Developer Yoursection FV Ltd

Location 153 Lincoln Rolleston road, Rolleston

I Charles McDermott (*Full name*) of Miyamoto International NZ Ltd (236 Hereford Street, Christchurch 8011) (*Name and address of firm*)

Hereby confirm that:

1. I am a geo-professional as defined in clause 1.2.2 of NZS 4404:2010 and was retained by the developer as the geo-professional on the above development.

2. The extent of my preliminary investigations are described in my Report(s) number 200357-RP-002[A], dated 25 November 2020 and the conclusions and recommendations of that/those document(s) have been re-evaluated in the preparation of this report. The extent of ~~my~~ Miyamotos inspections during construction, and the results of all tests and/or re-evaluations carried out are as described in my geotechnical completion report dated 28 November 2023

3. In my professional opinion, not to be construed as a guarantee, I consider that (delete as appropriate):

   (a) The earth fills shown on the ~~attached~~ Plan ~~No.~~ in Appendix A of this GCR (Miyamoto 2003576-RP-001[A]) have been placed in compliance with the requirements of the Selwyn District Council and ~~my specification.~~ NZS4431:2022

   (b) The completed works take into account land slope and foundation stability considerations, subject to the appended foundation recommendations and earthworks restrictions, (which should be read in conjunction with the appended final site contour plan).

   (c) Subject to 3(a) and 3(b) of this Schedule, the original ground not affected by filling is suitable for the erection of buildings designed according to NZS 3604 provided that:
   (i) the recommendations included in the Miyamoto GCR (2003576-RP-001[A], dated 28 November 2023) are followed.
   (ii) .....

   (d) Subject to 3(a) and 3(b) of this Schedule, the filled ground is suitable for the erection of buildings designed according to NZS 3604 provided that:
   (i) the recommendations included in the Miyamoto GCR (2003576-RP-001[A], dated 28 November 2023) are followed.
   (ii) .....

   (e) The original ground not affected by filling and the filled ground are not subject to erosion, subsidence, or slippage in accordance with the provisions of section 106 of the Resource Management Act 1991 provided that:
   (i) the recommendations included in the Miyamoto GCR (2003576-RP-001[A], dated 28 November 2023) are followed.
   (ii) .....

NOTE – These subclauses may be deleted or added to as appropriate, to include such considerations as expansive soils where excluded from NZS 3604, and site seismic characteristics as covered in clause 3.1.3 of NZS 1170.5.

4. This professional opinion is furnished to the TA and the developer for their purposes alone on the express condition that it will not be relied upon by any other person and does not remove the necessity for the normal inspection of foundation conditions at the time of erection of any building.

5. This certificate shall be read in conjunction with my geotechnical report referred to in clause 2 above and shall not be copied or reproduced except in conjunction with the full geotechnical completion report.

Signed ..... Date 28 November 2023

Charles McDermott
BEng(Hons) CMEngNZ CPEng IntPE(NZ)
.....
.....
(Name, title, and professional qualifications)

Copyright waived

Appendix E: NZS4431:2022 – Appendix A

APPENDIX D – STATEMENT OF SUITABILITY OF ENGINEERED FILL FOR LIGHTWEIGHT STRUCTURES

(Informative)

To: *(name and address of local authority)*	Selwyn District Council
Development name:	Falcons View Subdivision
Land title(s):	Lot 1 DP 568976 as contained in Record of Title 1024686
Development location/address:	153 Lincoln Rolleston road, Rolleston
Relevant resource consent number(s):	RC225866 and RC225867
Developer's name and company:	Yoursection FV Ltd
Geotechnical designer's name and company:	Charles McDermott of Miyamoto International NZ Ltd
Certifier's name and company:	Charles McDermott of Miyamoto International NZ Ltd

Attachments (give reference numbers):

(1) Site layout plan(s) Appendix A of this GCR (Miyamoto 2003576-RP-001[A]

(2) Fill layout plan(s) Appendix A of this GCR (Miyamoto 2003576-RP-001[A]

~~(3) Fill section(s)~~

(4) Design report Appendix F of this GCR (Miyamoto 2003576-RP-001[A]

(5) ~~Earthworks~~ Geotechnical completion report, including the following appendices:

- (a) As-built survey; This document comprises Appendix E of the GCR (Miyamoto 2003576-RP-001[A]
- (b) Cut-fill plan (with contours);
- (c) Inspection and test plan;
- (d) Earthworks specification;
- (e) All test results;
- (f) All inspection records.

I confirm I am qualified as a certifier as defined in NZS 4431:2022.

During this work, I was retained as certifier, and I or my certifier's representative undertook inspections and testing as documented in the attached ~~earthworks~~ Geotechnical completion report.

I am satisfied that the engineered fill shown in the attached as-built survey was placed, compacted, and tested in accordance with the ~~attached~~ earthworks specification and that all variations and non-compliances have been documented in the ~~earthworks~~ Geotechnical completion report.

Based on the information available, I certify that, to the best of my knowledge, the intent of the geotechnical designer (as presented in their design, drawings, and earthworks specification) has been achieved.

The area shown on the as-built survey plan referenced above is considered suitable for development as per NZS 3604. (*strike out if not relevant*)

This certification does not remove the necessity for normal inspection and design of foundations as would be made in natural ground.

Certifier's signature:	Date: 28 November 2023

Certifier's qualifications, professional registration type, and number:

BEng(Hons), CMEngNZ, CPEng (1024840)

Figure 12 – Statement of suitability of engineered fill for lightweight structures

Appendix F: Geotechnical Report for Proposed Plan Change

Geotechnical Report for Proposed Plan Change

Falcons Subdivision Proposed Extension

Issue Date: **25 November 2020**

Miyamoto Ref: **200357-RP-002[A]**

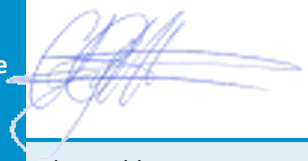
Prepared for: **Yoursection Ltd**

236 Hereford Street, Christchurch 8011 • PO Box 137, Christchurch 8140 • P +64 03 377 4095
Christchurch • Wellington • Auckland • Kapiti Coast • California • Nevada • Washington, D.C
Costa Rica • Colombia • Haiti • Liberia • Italy • Turkey • India • Nepal • Japan

Report Tracking

Revision	Status	Date	Prepared by	Reviewed by
A	FINAL	25 November 2020	C. Gibbens	C. McDermott

Authorisation

Author's Signature		**Approver's Signature**	
Name	Clem Gibbens	**Name**	Charles McDermott
Title	Engineering Geologist BSc MSc (Hons) MEngNZ	**Title**	Associate Geotechnical Engineer BEng (Hons) CMEngNZ CPEng

Miyamoto International New Zealand Ltd
Level 1, 236 Hereford Street | Christchurch 8011

www.miyamoto.nz

Table of Contents

1. Introduction

Miyamoto International NZ Limited (MINZ) has been engaged by Yoursection Limited to undertake a geotechnical investigation, evaluation and land suitability assessment as part of the proposed land reclassification and plan change required for the proposed extension of the Falcons residential subdivision (encompassing 151 and 153 Lincoln Rolleston Road).

Our assessment comprised the following scope of works:

- Research of available information; including historic reports, the New Zealand Geotechnical Database (NZGD), Selwyn District Council (SDC) and Environment Canterbury (ECan);
- Site walkover inspection of the land;
- Shallow field investigation comprising:
    - Machine excavated trial pits (TP);
    - Dynamic cone penetrometer (DCP) testing.
- Geotechnical Assessment including high-level assessment of the site with regard to the Resource Management Act (RMA) Section 106.

This report presents the findings of our investigation and assessment which were carried out considering the Ministry of Business, Innovation & Employment (MBIE) Guidance documents “Planning and engineering guidance for potentially liquefaction-prone land” - Version 1, dated September 2017, “Repairing and rebuilding houses affected by the Canterbury earthquakes” - Version 3, dated December 2012, and “Earthquake geotechnical engineering practice - Modules 2 & 3”.

It is noted that this report is limited to geotechnical assessment. Advice related to other development requirements (such as roading infrastructure, pavements, services, stormwater management and contaminated land) should be sought from appropriately qualified personnel.

2. Site Description

The site (approximately 25 hectares in area) is located in a rural setting in Rolleston, Selwyn, south of the existing Falcons / Branthwaite residential subdivision, and encompasses the following land parcels (as shown in Figure 1):

- Lot 1 DP 357634;
- Lot 1 DP 50631 BLKS III IV Leeston SD.

The site is predominantly flat with a global elevation difference of 2.0 m to 3.0 m (increasing to the north-west). The land is predominantly grass covered farmland with residential dwellings, workshops and sheep farming buildings currently occupying two relatively small areas of the proposed development area.

Figure 1: Site Location / Layout Plan

3. Data Sources

The following sources of third-party information were considered and are referenced in this report:

- GNS Science - Geological Maps;
- New Zealand Geotechnical Database (NZGD);
- Environment Canterbury (ECan);
- Aurecon (2017). Falcons Landing Geotechnical Subdivision Report;
- Selwyn District Council (SDC);
- Canterbury Maps.

4. Geotechnical Assessment

Geological Setting

The geological map of the area (GNS 1:250,000 QMap) indicates that the site geology is described as 'modern (Quaternary) river floodplain/low-level degradation terraces of unweathered, variably sorted gravel/sand/silt/clay'.

Field Investigations

Miyamoto undertook a site-specific ground investigation on 17 November 2020, comprising:

- 27No. machine excavated trial pits (referenced TP001 to TP027);
- 27No. Dynamic Cone Penetrometer (DCP) tests associated with the above exploratory holes.

In addition to our site-specific investigation we have also utilised available geotechnical information from the surrounding subdivisions and a number of ECan well bores as part of our assessment.

The test locations are shown in Figure 2, the general details of the ground investigations are summarised in Table 1, and the engineering and well bore logs are presented in Appendix A.

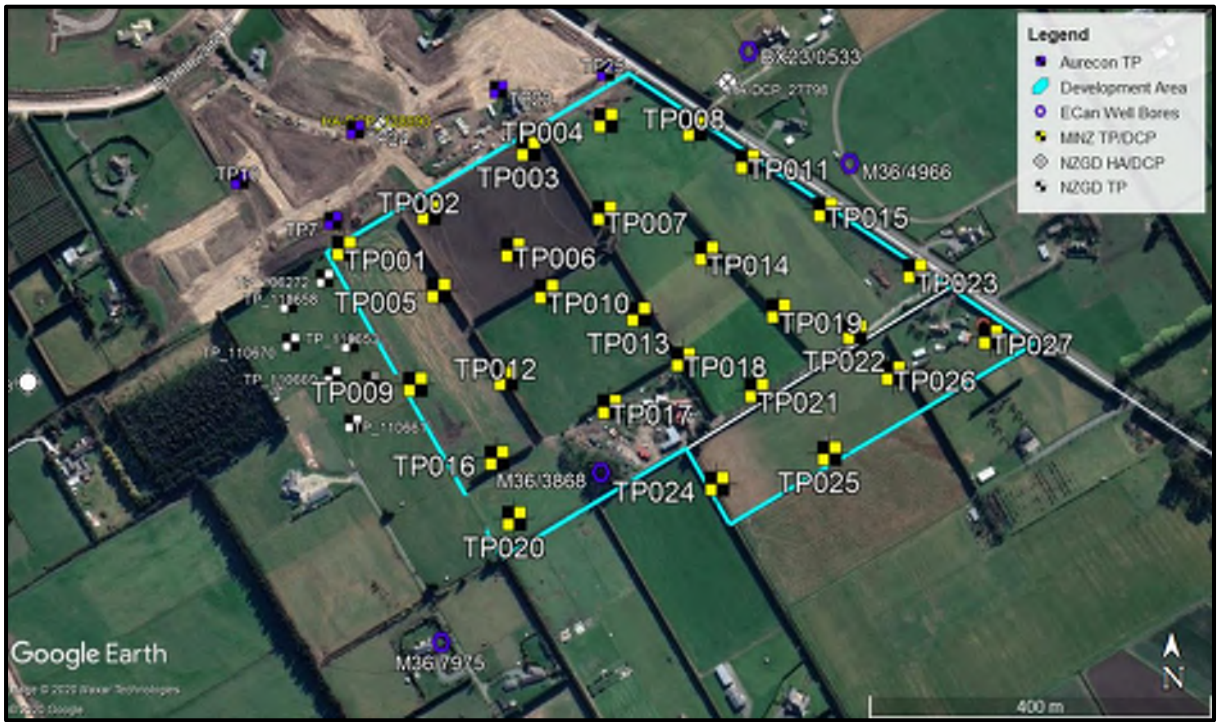


Figure 2: Ground Investigation Location Plan

Table 1: Summary of Ground Investigations

Test Ref.	Source	Source Ref.	Test Type	Depth (mbgl)
TP001 to TP027	MINZ	200357	TP / DCP	0.7 to 1.8
Various	Aurecon	254246	TP	1.6 to 1.7
Various	NZGD / Landtech	LTCL18051	TP / DCP	2.1 to 2.6
HA-DCP_128990	NZGD / Davis Ogilvie	39353	HA / DCP	1.2 to 1.7
HA-DCP_27798	NZGD / LDE	10774	TP / DCP	0.8 to 3.0
ECan Well Bores	ECan	Various	Rotary / Percussion / Cable Tool	37.0 to 48.0

Ground Conditions

The ground profile interpreted from the on-site shallow ground investigation, correlated with the available existing data, generally comprises a layer of topsoil (0.2 m to 0.4 m in thickness), overlying low plasticity, firm to stiff Sandy SILT to between 0.4 m and 1.1 mbgl, below which dense to very dense Sandy fine to coarse GRAVEL is present to depth. It is

noted that the upper 0.1 m to 0.2 of the gravel layer is more of a gravelly Sand and a relatively thin layer (0.2 m to 0.4 m) of sand was encountered at isolated locations.

Groundwater

Standing groundwater was not encountered during our site-specific investigation and the soils encountered were dry. Long-term groundwater level monitoring information available from ECan well bores from the surrounding area indicate the groundwater table to average around 10 to 13 mbgl with seasonal fluctuations reaching a shallowest level of ~6 mbgl.

Liquefaction Assessment

The site is located within an area of 'low geotechnical risk' as defined by Selwyn District Council (McCahon, 2013). The site is also located within an area identified as 'Liquefaction damage is unlikely' (2012), and a 'Zone of low liquefaction potential' (2006) as presented on the Canterbury Maps Viewer.

Based on our assessment (including the site-specific ground conditions and groundwater regime) we concur that the risk of damaging effects from liquefaction at the site is low with the seismic performance expected to be equivalent to MBIE Technical Category (TC) 1 as per the MBIE Guidance (2012).

NZS1170.5 Site Sub-soil Class

Based on our geotechnical assessment, geological maps and other available information, NZS1170.5 Site Sub-soil Class D (deep or soft soil site) is considered appropriate for the site.

Flood Hazard

The site is not currently located within one of the Flood Zones identified by Selwyn District Council, however, restrictions around building floor levels must be checked at building consent stage.

5. Development Considerations

At this stage in the project, the future development plans are not defined. However, considering likely residential subdivision similar to that in the local area, the following preliminary guidance is provided:

- Earthworks should be undertaken in general accordance with the requirements of NZS 4431:1989. All unsuitable materials should be stripped from the work areas and stockpiled clear of the operations or removed from site;
- Preliminarily, NZS3604 foundations are considered geotechnically feasible for NZS3604 compliant structures, subject to building-specific geotechnical investigations to assess the available bearing capacity.

It is noted that this report is limited to geotechnical assessment. Advice related to other development requirements (such as roading infrastructure, pavements, services,

stormwater management and contaminated land) should be sought from appropriately qualified personal.

6. Assessment Against RMA Section 106

As per the requirements of Section 106 of the Resource Management Act (RMA) (2017), we have undertaken a high-level assessment of the significant geotechnical hazards that may affect the site. These hazards include, but are not limited to:

- Erosion;
- Falling debris;
- Slippage;
- Subsidence
- Inundation.

At the time of our site visit, there was no evidence of erosion or erosional features on site. The shallow soils could be vulnerable to erosion if the topsoil layer is removed and left unprotected for prolonged periods of time. This can be easily mitigated with appropriate design measures during construction.

Given the proximity of the site to any source, rockfall (falling debris) is not considered a risk to the site and given the site is generally flat with only a minor gradual change in elevation across the site, slope instability (slippage) is not considered to be a risk.

On the basis of our geotechnical assessment herein, we do not consider subsidence (under either static or seismic loading) to be a significant hazard for normal construction (i.e. NZS3604 compliant buildings).

The site is not currently located within one of the Flood Zones identified by Selwyn District Council, however, restrictions around building floor levels must be checked at building consent stage.

Based on our assessment, we consider that the geotechnical hazards may be mitigated to an acceptable standard, provided that the geotechnical recommendations given in this report are followed, and the appropriate engineering measures implemented, we consider that the development is unlikely to be affected nor worsen, accelerate or result in material damage.

7. Limitations

This report is subject to the following limitations:

- This report has been prepared by Miyamoto for the Client for the purpose/s agreed with the Client (Purpose). Miyamoto accepts no responsibility for the validity, appropriateness, sufficiency or consequences of the Client using the report for purposes other than for the Purpose.
- This report is not intended for general publication or circulation. This report is not to be reproduced by the Client except in relation to the Purpose, without Miyamoto's prior written permission. Miyamoto disclaims all risk and all responsibility to any third party.
- This report is provided based on the various assumptions contained in the report.

- Miyamoto's professional services are performed using a degree of care and skill reasonably exercised by reputable consultants providing the same or similar services as at the date of this report.
- The sub surface information has been obtained from investigation carried out at discrete locations, which by their nature only provide information about a relatively small volume of subsoils. While Miyamoto has taken reasonable skill and care in carrying out the investigation to determine the subsoil condition, the subsoil condition could differ substantially from the results of any sampling investigation. Miyamoto is not responsible for and does not accept any liability in respect of any difference between the actual subsoil conditions and the results of our investigation.
- A change in circumstances, facts, information after the report has been provided may affect the adequacy or accuracy of the report. Miyamoto is not responsible for the adequacy or accuracy of the report as a result of any such changes.
- This report is not to be reproduced, either wholly or in part, without our prior written permission.

If you have any queries or you require any further clarification on any aspects of this report, please do not hesitate to contact Miyamoto International (NZ) Ltd.

References

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Environment Canterbury, Web app viewer - Flood Hazard, https://ecanmaps.ecan.govt.nz/portal/apps/webappviewer/index.html?id=57c74073c2f14a85ac0caf30073ae48a

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New Zealand Geotechnical Society (NZGS) and Ministry of Business, Innovation and Employment (MBIE) (2016). Earthquake geotechnical engineering practice Module 3: Identification, assessment and mitigation of liquefaction hazards, May 2016.

New Zealand Standard NZS1170.5 (2004). Structural Design Actions, Part 5: Earthquake Actions - New Zealand Standard, NZS 2004.

Selwyn District Council - District Plan Online Maps, https://eplan.selwyn.govt.nz/eplan/#/Property/7941662.

Appendices

A. Ground Investigation Data

MINZ site-specific investigation logs

ECan well bore logs

Aurecon 2017 investigation logs (nearby only)

LandTech 2018 investigation logs (nearby only)

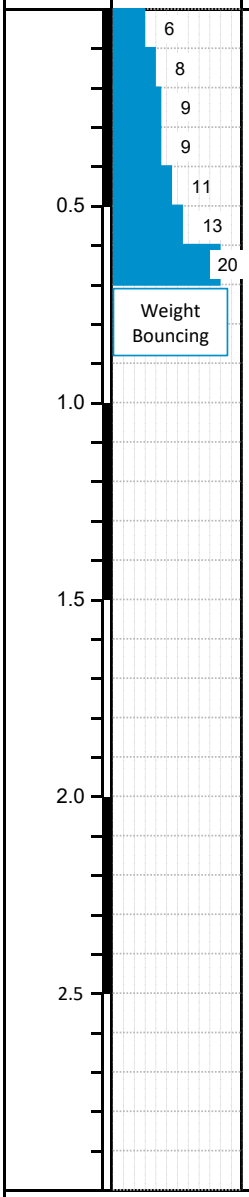
Davis Ogilvie 2019 investigation logs (nearby only)

miyamoto. ENGINEERS + CONSTRUCTION CONSULTANTS	*PROJECT NUMBER:*	**200357**
	CLIENT:	**Yoursection Ltd**
	TESTING COMPLETED:	**17 November 2020**

SHALLOW GROUND INVESTIGATION LOG

TP001

PROJECT:	**151 & 153 Lincoln Rolleston Road, Rolleston**				
LOGGED BY:	**CG**	*TOTAL TESTING DEPTH:*	**0.8 mbgl**	*HOLE DIAMETER:*	**50 mm**
PROCESSED BY:	**CG**	*TESTING METHOD:*	**TP + DCP**	*SHEAR VANE NUMBER:*	**-**
LOCATION:	**REFER TO SITE PLAN**	*GROUNDWATER LEVEL:*	**N/E**	This report may only be reproduced in full	



Depth (m)	*DCP Test Results (Blows per 100mm)*	*GWL*	*Soil Description*			*Sample Taken*	*Lab Testing*								*Shear Vane Reading (kPa) peak/remoulded*
							Atterberg Limits			*Grain Size*			*WC (%)*	*UW*	
			USC	*Soil Characteristics*	*Graphic Log*		*LL*	*PL*	*PI*	*GR*	*SA*	*FC*			
				SILT; non-plastic, dark brown, dry (TOPSOIL)											
				Sandy SILT; low plasticity, yellow-brown, dry, sand is fine to medium											
				Gravelly fine to coarse SAND / Sandy Gravel; fine to coarse, grey, dry, gravel is subrounded to subangular											
				EOH (TARGET STRATA REACHED)											

LEGEND

ABBREVIATIONS

DCP	DYNAMIC CONE PENETROMETER	N/E	NOT ENCOUNTERED	LL	LIQUID LIMIT	GR	GRAVEL
HA	HAND AUGER	UTP	UNABLE TO PENETRATE	PL	PLASTIC LIMIT	SA	SAND
SV	SHEAR VANE	EOH	END OF HOLE	PI	PLASTICITY INDEX	FC	FINES CONTENT
TP	TEST PIT	UW	UNIT WEIGHT (kN/m^3)	WC	WATER CONTENT	▽	STANDING GWL
GWL	GROUNDWATER LEVEL	mbgl	METERS BELOW GROUND LEVEL				

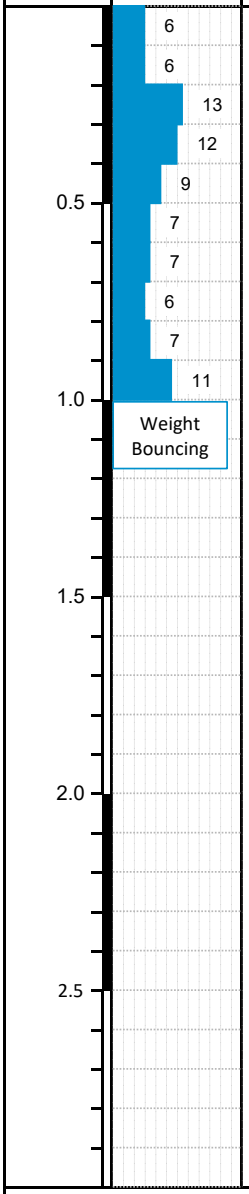
NOTES

miyamoto. ENGINEERS + CONSTRUCTION CONSULTANTS	*PROJECT NUMBER:*	**200357**
	CLIENT:	**Yoursection Ltd**
	TESTING COMPLETED:	**17 November 2020**

SHALLOW GROUND INVESTIGATION LOG

TP002

PROJECT:	**151 & 153 Lincoln Rolleston Road, Rolleston**				
LOGGED BY:	**CG**	*TOTAL TESTING DEPTH:*	**1.0 mbgl**	*HOLE DIAMETER:*	**50 mm**
PROCESSED BY:	**CG**	*TESTING METHOD:*	**TP + DCP**	*SHEAR VANE NUMBER:*	**-**
LOCATION:	**REFER TO SITE PLAN**	*GROUNDWATER LEVEL:*	**N/E**	This report may only be reproduced in full	



Depth (m)	DCP Test Results (Blows per 100mm)	GWL	Soil Description: USC	Soil Description: Soil Characteristics	Soil Description: Graphic Log	Sample Taken	Lab Testing: Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI	Grain Size GR	Grain Size SA	Grain Size FC	WC (%)	UW	Shear Vane Reading (kPa) peak/remoulded
0.0	6	NOT ENCOUNTERED		SILT; non-plastic, dark brown, dry (TOPSOIL)											
	6														
	13			Sandy SILT; low plasticity, yellow-brown, dry, sand is fine to medium											
	12														
0.5	9														
	7														
	7														
	6														
	7														
	11			Gravelly fine to coarse SAND / Sandy Gravel; fine to coarse, grey, dry, gravel is subrounded to subangular											
1.0	Weight Bouncing			**EOH (TARGET STRATA REACHED)**											
1.5															
2.0															
2.5															

LEGEND

ABBREVIATIONS

DCP	DYNAMIC CONE PENETROMETER	N/E	NOT ENCOUNTERED	LL	LIQUID LIMIT	GR	GRAVEL
HA	HAND AUGER	UTP	UNABLE TO PENETRATE	PL	PLASTIC LIMIT	SA	SAND
SV	SHEAR VANE	EOH	END OF HOLE	PI	PLASTICITY INDEX	FC	FINES CONTENT
TP	TEST PIT	UW	UNIT WEIGHT (kN/m^3)	WC	WATER CONTENT	▽	STANDING GWL
GWL	GROUNDWATER LEVEL	mbgl	METERS BELOW GROUND LEVEL				

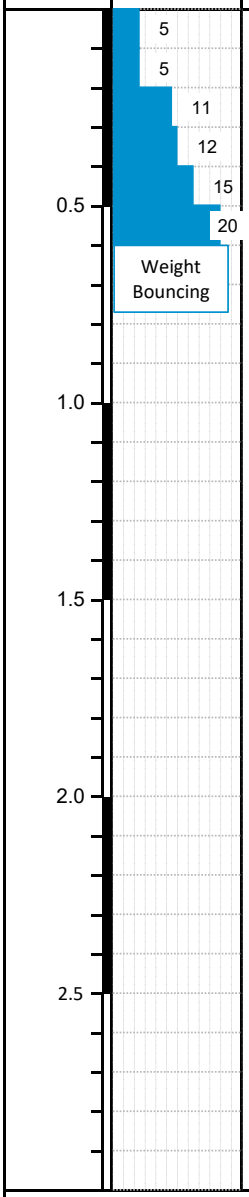
NOTES

miyamoto. ENGINEERS + CONSTRUCTION CONSULTANTS	*PROJECT NUMBER:*	**200357**
	CLIENT:	**Yoursection Ltd**
	TESTING COMPLETED:	**17 November 2020**

SHALLOW GROUND INVESTIGATION LOG

TP003

PROJECT:	**151 & 153 Lincoln Rolleston Road, Rolleston**				
LOGGED BY:	**CG**	*TOTAL TESTING DEPTH:*	**0.7 mbgl**	*HOLE DIAMETER:*	**50 mm**
PROCESSED BY:	**CG**	*TESTING METHOD:*	**TP + DCP**	*SHEAR VANE NUMBER:*	**-**
LOCATION:	**REFER TO SITE PLAN**	*GROUNDWATER LEVEL:*	**N/E**	This report may only be reproduced in full	



Depth (m)	*DCP Test Results (Blows per 100mm)*	*GWL*	*Soil Description*			*Sample Taken*	*Lab Testing*								*Shear Vane Reading (kPa) peak/remoulded*
							Atterberg Limits			*Grain Size*			*WC (%)*	*UW*	
			USC	*Soil Characteristics*	*Graphic Log*		*LL*	*PL*	*PI*	*GR*	*SA*	*FC*			
				SILT; non-plastic, dark brown, dry (TOPSOIL)											
				Sandy SILT; low plasticity, yellow-brown, dry, sand is fine to medium											
				Gravelly fine to coarse SAND / Sandy Gravel; fine to coarse, grey, dry, gravel is subrounded to subangular											
				EOH (TARGET STRATA REACHED)											

LEGEND

ABBREVIATIONS

DCP	DYNAMIC CONE PENETROMETER	N/E	NOT ENCOUNTERED	LL	LIQUID LIMIT	GR	GRAVEL
HA	HAND AUGER	UTP	UNABLE TO PENETRATE	PL	PLASTIC LIMIT	SA	SAND
SV	SHEAR VANE	EOH	END OF HOLE	PI	PLASTICITY INDEX	FC	FINES CONTENT
TP	TEST PIT	UW	UNIT WEIGHT (kN/m^3)	WC	WATER CONTENT	▽	STANDING GWL
GWL	GROUNDWATER LEVEL	mbgl	METERS BELOW GROUND LEVEL				

NOTES

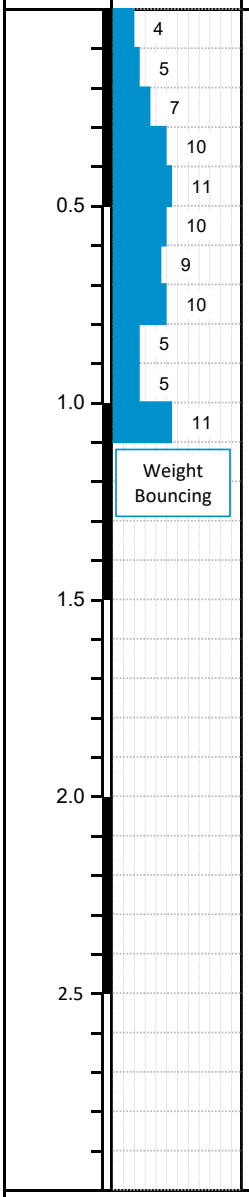
miyamoto. ENGINEERS + CONSTRUCTION CONSULTANTS

PROJECT NUMBER:	**200357**
CLIENT:	**Yoursection Ltd**
TESTING COMPLETED:	**17 November 2020**

SHALLOW GROUND INVESTIGATION LOG

TP004

PROJECT:	**151 & 153 Lincoln Rolleston Road, Rolleston**				
LOGGED BY:	**CG**	*TOTAL TESTING DEPTH:*	**1.2 mbgl**	*HOLE DIAMETER:*	**50 mm**
PROCESSED BY:	**CG**	*TESTING METHOD:*	**TP + DCP**	*SHEAR VANE NUMBER:*	**-**
LOCATION:	**REFER TO SITE PLAN**	*GROUNDWATER LEVEL:*	**N/E**	This report may only be reproduced in full	



Depth (m)	*DCP Test Results (Blows per 100mm)*	*GWL*	*Soil Description*			*Sample Taken*	*Lab Testing*								*Shear Vane Reading (kPa) peak/remoulded*
							Atterberg Limits			*Grain Size*			*WC (%)*	*UW*	
			USC	*Soil Characteristics*	*Graphic Log*		*LL*	*PL*	*PI*	*GR*	*SA*	*FC*			
		NOT ENCOUNTERED		SILT; non-plastic, dark brown, dry (TOPSOIL)											
				Sandy SILT; low plasticity, yellow-brown, dry, sand is fine to medium											
				SAND; fine to medium, yellow-brown, dry											
				Gravelly fine to coarse SAND / Sandy Gravel; fine to coarse, grey, dry, gravel is subrounded to subangular											
				EOH (TARGET STRATA REACHED)											

LEGEND

ABBREVIATIONS

DCP	DYNAMIC CONE PENETROMETER	N/E	NOT ENCOUNTERED	LL	LIQUID LIMIT	GR	GRAVEL
HA	HAND AUGER	UTP	UNABLE TO PENETRATE	PL	PLASTIC LIMIT	SA	SAND
SV	SHEAR VANE	EOH	END OF HOLE	PI	PLASTICITY INDEX	FC	FINES CONTENT
TP	TEST PIT	UW	UNIT WEIGHT (kN/m^3)	WC	WATER CONTENT	▽	STANDING GWL
GWL	GROUNDWATER LEVEL	mbgl	METERS BELOW GROUND LEVEL				

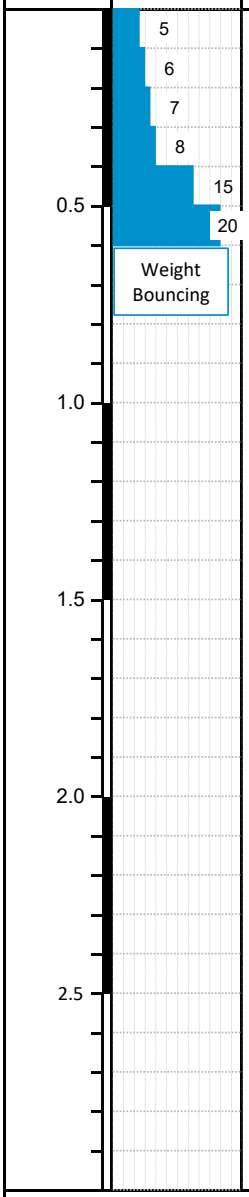
NOTES

miyamoto. ENGINEERS + CONSTRUCTION CONSULTANTS	*PROJECT NUMBER:*	**200357**
	CLIENT:	**Yoursection Ltd**
	TESTING COMPLETED:	**17 November 2020**

SHALLOW GROUND INVESTIGATION LOG

TP005

PROJECT:	**151 & 153 Lincoln Rolleston Road, Rolleston**				
LOGGED BY:	**CG**	*TOTAL TESTING DEPTH:*	**0.6 mbgl**	*HOLE DIAMETER:*	**50 mm**
PROCESSED BY:	**CG**	*TESTING METHOD:*	**TP + DCP**	*SHEAR VANE NUMBER:*	**-**
LOCATION:	**REFER TO SITE PLAN**	*GROUNDWATER LEVEL:*	**N/E**	This report may only be reproduced in full	



Depth (m)	*DCP Test Results (Blows per 100mm)*	*GWL*	*Soil Description*			*Sample Taken*	*Lab Testing*								*Shear Vane Reading (kPa) peak/remoulded*
							Atterberg Limits			*Grain Size*			*WC (%)*	*UW*	
			USC	*Soil Characteristics*	*Graphic Log*		*LL*	*PL*	*PI*	*GR*	*SA*	*FC*			
				SILT; non-plastic, dark brown, dry (TOPSOIL)											
				Sandy SILT; low plasticity, yellow-brown, dry, sand is fine to medium											
				Gravelly fine to coarse SAND / Sandy Gravel; fine to coarse, grey, dry, gravel is subrounded to subangular											
				EOH (TARGET STRATA REACHED)											

LEGEND

ABBREVIATIONS

DCP	DYNAMIC CONE PENETROMETER	N/E	NOT ENCOUNTERED	LL	LIQUID LIMIT	GR	GRAVEL
HA	HAND AUGER	UTP	UNABLE TO PENETRATE	PL	PLASTIC LIMIT	SA	SAND
SV	SHEAR VANE	EOH	END OF HOLE	PI	PLASTICITY INDEX	FC	FINES CONTENT
TP	TEST PIT	UW	UNIT WEIGHT (kN/m^3)	WC	WATER CONTENT	▽	STANDING GWL
GWL	GROUNDWATER LEVEL	mbgl	METERS BELOW GROUND LEVEL				

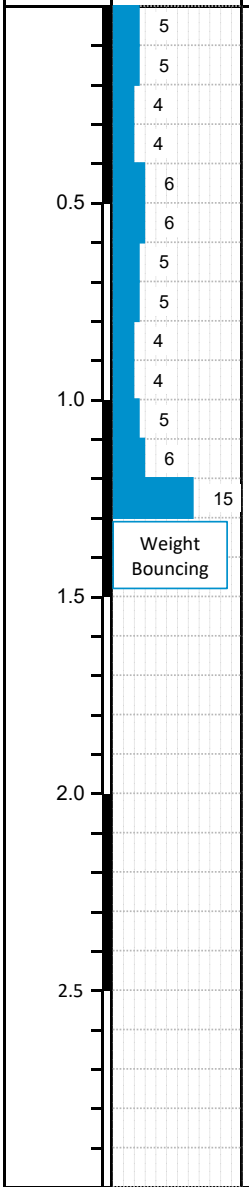
NOTES

miyamoto. ENGINEERS + CONSTRUCTION CONSULTANTS	*PROJECT NUMBER:*	**200357**
	CLIENT:	**Yoursection Ltd**
	TESTING COMPLETED:	**17 November 2020**

SHALLOW GROUND INVESTIGATION LOG

TP006

PROJECT:	**151 & 153 Lincoln Rolleston Road, Rolleston**				
LOGGED BY:	**CG**	*TOTAL TESTING DEPTH:*	**1.3 mbgl**	*HOLE DIAMETER:*	**50 mm**
PROCESSED BY:	**CG**	*TESTING METHOD:*	**TP + DCP**	*SHEAR VANE NUMBER:*	**-**
LOCATION:	**REFER TO SITE PLAN**	*GROUNDWATER LEVEL:*	**N/E**	This report may only be reproduced in full	



Depth (m)	*DCP Test Results (Blows per 100mm)*	*GWL*	*Soil Description*			*Sample Taken*	*Lab Testing*								*Shear Vane Reading (kPa) peak/remoulded*
							Atterberg Limits			*Grain Size*			*WC (%)*	*UW*	
			USC	*Soil Characteristics*	*Graphic Log*		*LL*	*PL*	*PI*	*GR*	*SA*	*FC*			
		NOT ENCOUNTERED		SILT; non-plastic, dark brown, dry (TOPSOIL)											
				Sandy SILT; low plasticity, yellow-brown, dry, sand is fine to medium											
				SAND; fine to medium, yellow-brown, dry											
				Gravelly fine to coarse SAND / Sandy Gravel; fine to coarse, grey, dry, gravel is subrounded to subangular											
				EOH (TARGET STRATA REACHED)											

LEGEND

ABBREVIATIONS

DCP	DYNAMIC CONE PENETROMETER	N/E	NOT ENCOUNTERED	LL	LIQUID LIMIT	GR	GRAVEL
HA	HAND AUGER	UTP	UNABLE TO PENETRATE	PL	PLASTIC LIMIT	SA	SAND
SV	SHEAR VANE	EOH	END OF HOLE	PI	PLASTICITY INDEX	FC	FINES CONTENT
TP	TEST PIT	UW	UNIT WEIGHT (kN/m^3)	WC	WATER CONTENT	▽	STANDING GWL
GWL	GROUNDWATER LEVEL	mbgl	METERS BELOW GROUND LEVEL				

NOTES

miyamoto. ENGINEERS + CONSTRUCTION CONSULTANTS	*PROJECT NUMBER:*	**200357**
	CLIENT:	**Yoursection Ltd**
	TESTING COMPLETED:	**17 November 2020**

SHALLOW GROUND INVESTIGATION LOG

TP007

PROJECT:	**151 & 153 Lincoln Rolleston Road, Rolleston**				
LOGGED BY:	**CG**	*TOTAL TESTING DEPTH:*	**0.6 mbgl**	*HOLE DIAMETER:*	**50 mm**
PROCESSED BY:	**CG**	*TESTING METHOD:*	**TP + DCP**	*SHEAR VANE NUMBER:*	**-**
LOCATION:	**REFER TO SITE PLAN**	*GROUNDWATER LEVEL:*	**N/E**	This report may only be reproduced in full	

Depth (m)	*DCP Test Results (Blows per 100mm)*	*GWL*	*Soil Description*			*Sample Taken*	*Lab Testing*								*Shear Vane Reading (kPa) peak/remoulded*
							Atterberg Limits			*Grain Size*			*WC (%)*	*UW*	
			USC	*Soil Characteristics*	*Graphic Log*		*LL*	*PL*	*PI*	*GR*	*SA*	*FC*			
0.5	5 6 8 20 Weight Bouncing	NOT ENCOUNTERED		SILT; non-plastic, dark brown, dry (TOPSOIL)											
				Sandy SILT; low plasticity, yellow-brown, dry, sand is fine to medium											
				Gravelly fine to coarse SAND / Sandy Gravel; fine to coarse, grey, dry, gravel is subrounded to subangular											
1.0				**EOH (TARGET STRATA REACHED)**											
1.5															
2.0															
2.5															

LEGEND

ABBREVIATIONS

DCP	DYNAMIC CONE PENETROMETER	N/E	NOT ENCOUNTERED	LL	LIQUID LIMIT	GR	GRAVEL
HA	HAND AUGER	UTP	UNABLE TO PENETRATE	PL	PLASTIC LIMIT	SA	SAND
SV	SHEAR VANE	EOH	END OF HOLE	PI	PLASTICITY INDEX	FC	FINES CONTENT
TP	TEST PIT	UW	UNIT WEIGHT (kN/m^3)	WC	WATER CONTENT	▽	STANDING GWL
GWL	GROUNDWATER LEVEL	mbgl	METERS BELOW GROUND LEVEL				

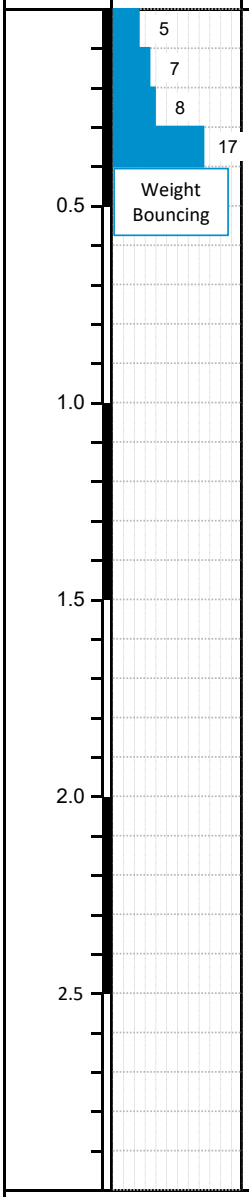
NOTES

miyamoto. ENGINEERS + CONSTRUCTION CONSULTANTS	*PROJECT NUMBER:*	**200357**
	CLIENT:	**Yoursection Ltd**
	TESTING COMPLETED:	**17 November 2020**

SHALLOW GROUND INVESTIGATION LOG

TP008

PROJECT:	**151 & 153 Lincoln Rolleston Road, Rolleston**				
LOGGED BY:	**CG**	*TOTAL TESTING DEPTH:*	**0.5 mbgl**	*HOLE DIAMETER:*	**50 mm**
PROCESSED BY:	**CG**	*TESTING METHOD:*	**TP + DCP**	*SHEAR VANE NUMBER:*	**-**
LOCATION:	**REFER TO SITE PLAN**	*GROUNDWATER LEVEL:*	**N/E**	This report may only be reproduced in full	



Depth (m)	DCP Test Results (Blows per 100mm)	GWL	Soil Description: USC	Soil Description: Soil Characteristics	Soil Description: Graphic Log	Sample Taken	Lab Testing: Atterberg Limits LL	PL	PI	Grain Size GR	SA	FC	WC (%)	UW	Shear Vane Reading (kPa) peak/remoulded
				SILT; non-plastic, dark brown, dry (TOPSOIL)											
				Sandy SILT; low plasticity, yellow-brown, dry, sand is fine to medium											
				Gravelly fine to coarse SAND / Sandy Gravel; fine to coarse, grey, dry, gravel is subrounded to subangular											
				EOH (TARGET STRATA REACHED)											

LEGEND

ABBREVIATIONS

DCP	DYNAMIC CONE PENETROMETER	N/E	NOT ENCOUNTERED	LL	LIQUID LIMIT	GR	GRAVEL
HA	HAND AUGER	UTP	UNABLE TO PENETRATE	PL	PLASTIC LIMIT	SA	SAND
SV	SHEAR VANE	EOH	END OF HOLE	PI	PLASTICITY INDEX	FC	FINES CONTENT
TP	TEST PIT	UW	UNIT WEIGHT (kN/m^3)	WC	WATER CONTENT	▽	STANDING GWL
GWL	GROUNDWATER LEVEL	mbgl	METERS BELOW GROUND LEVEL				

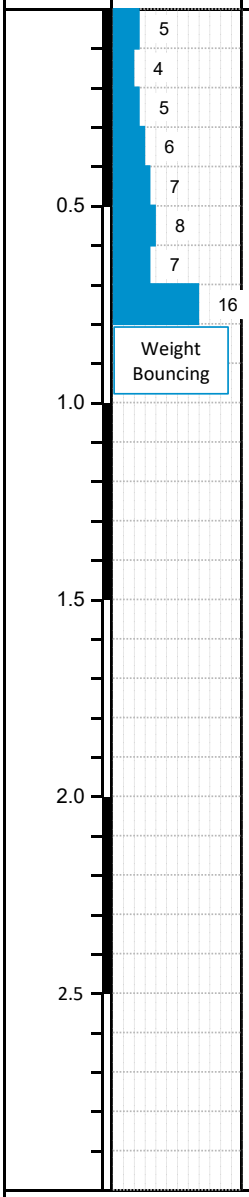
NOTES

miyamoto. ENGINEERS + CONSTRUCTION CONSULTANTS	*PROJECT NUMBER:*	**200357**
	CLIENT:	**Yoursection Ltd**
	TESTING COMPLETED:	**17 November 2020**

SHALLOW GROUND INVESTIGATION LOG

TP009

PROJECT:	**151 & 153 Lincoln Rolleston Road, Rolleston**				
LOGGED BY:	**CG**	*TOTAL TESTING DEPTH:*	**0.7 mbgl**	*HOLE DIAMETER:*	**50 mm**
PROCESSED BY:	**CG**	*TESTING METHOD:*	**TP + DCP**	*SHEAR VANE NUMBER:*	**-**
LOCATION:	**REFER TO SITE PLAN**	*GROUNDWATER LEVEL:*	**N/E**	This report may only be reproduced in full	



Depth (m)	*DCP Test Results (Blows per 100mm)*	*GWL*	*Soil Description*			*Sample Taken*	*Lab Testing*								*Shear Vane Reading (kPa) peak/remoulded*
							Atterberg Limits			*Grain Size*			*WC (%)*	*UW*	
			USC	*Soil Characteristics*	*Graphic Log*		*LL*	*PL*	*PI*	*GR*	*SA*	*FC*			
				SILT; non-plastic, dark brown, dry (TOPSOIL)											
				Sandy SILT; low plasticity, yellow-brown, dry, sand is fine to medium											
				Gravelly fine to coarse SAND / Sandy Gravel; fine to coarse, grey, dry, gravel is subrounded to subangular											
				EOH (TARGET STRATA REACHED)											

LEGEND

ABBREVIATIONS

DCP	DYNAMIC CONE PENETROMETER	N/E	NOT ENCOUNTERED	LL	LIQUID LIMIT	GR	GRAVEL
HA	HAND AUGER	UTP	UNABLE TO PENETRATE	PL	PLASTIC LIMIT	SA	SAND
SV	SHEAR VANE	EOH	END OF HOLE	PI	PLASTICITY INDEX	FC	FINES CONTENT
TP	TEST PIT	UW	UNIT WEIGHT (kN/m^3)	WC	WATER CONTENT	▽	STANDING GWL
GWL	GROUNDWATER LEVEL	mbgl	METERS BELOW GROUND LEVEL				

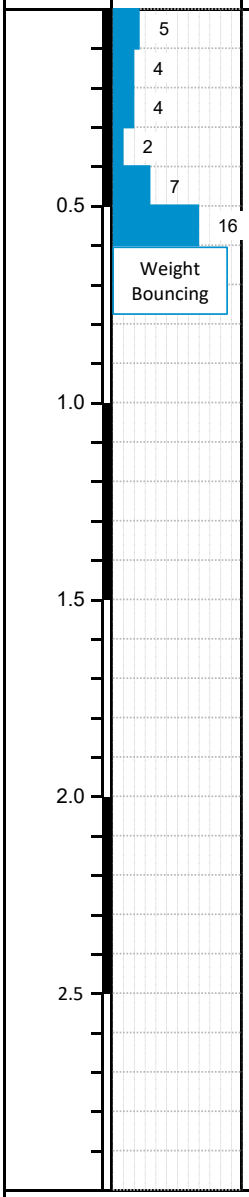
NOTES

miyamoto. ENGINEERS + CONSTRUCTION CONSULTANTS	*PROJECT NUMBER:*	**200357**
	CLIENT:	**Yoursection Ltd**
	TESTING COMPLETED:	**17 November 2020**

SHALLOW GROUND INVESTIGATION LOG

TP010

PROJECT:	**151 & 153 Lincoln Rolleston Road, Rolleston**				
LOGGED BY:	**CG**	*TOTAL TESTING DEPTH:*	**0.7 mbgl**	*HOLE DIAMETER:*	**50 mm**
PROCESSED BY:	**CG**	*TESTING METHOD:*	**TP + DCP**	*SHEAR VANE NUMBER:*	**-**
LOCATION:	**REFER TO SITE PLAN**	*GROUNDWATER LEVEL:*	**N/E**	This report may only be reproduced in full	



Depth (m)	*DCP Test Results (Blows per 100mm)*	*GWL*	*Soil Description*			*Sample Taken*	*Lab Testing*								*Shear Vane Reading (kPa) peak/remoulded*
							Atterberg Limits			*Grain Size*			*WC (%)*	*UW*	
			USC	*Soil Characteristics*	*Graphic Log*		*LL*	*PL*	*PI*	*GR*	*SA*	*FC*			
				SILT; non-plastic, dark brown, dry (TOPSOIL)											
				Sandy SILT; low plasticity, yellow-brown, dry, sand is fine to medium											
				Gravelly fine to coarse SAND / Sandy Gravel; fine to coarse, grey, dry, gravel is subrounded to subangular											
				EOH (TARGET STRATA REACHED)											

LEGEND

ABBREVIATIONS

DCP	DYNAMIC CONE PENETROMETER	N/E	NOT ENCOUNTERED	LL	LIQUID LIMIT	GR	GRAVEL
HA	HAND AUGER	UTP	UNABLE TO PENETRATE	PL	PLASTIC LIMIT	SA	SAND
SV	SHEAR VANE	EOH	END OF HOLE	PI	PLASTICITY INDEX	FC	FINES CONTENT
TP	TEST PIT	UW	UNIT WEIGHT (kN/m^3)	WC	WATER CONTENT	▽	STANDING GWL
GWL	GROUNDWATER LEVEL	mbgl	METERS BELOW GROUND LEVEL				

NOTES

miyamoto. ENGINEERS + CONSTRUCTION CONSULTANTS	*PROJECT NUMBER:*	**200357**
	CLIENT:	**Yoursection Ltd**
	TESTING COMPLETED:	**17 November 2020**

SHALLOW GROUND INVESTIGATION LOG

TP011

PROJECT:	**151 & 153 Lincoln Rolleston Road, Rolleston**				
LOGGED BY:	**CG**	*TOTAL TESTING DEPTH:*	**0.7 mbgl**	*HOLE DIAMETER:*	**50 mm**
PROCESSED BY:	**CG**	*TESTING METHOD:*	**TP + DCP**	*SHEAR VANE NUMBER:*	**-**
LOCATION:	**REFER TO SITE PLAN**	*GROUNDWATER LEVEL:*	**N/E**	This report may only be reproduced in full	

Depth (m)	*DCP Test Results (Blows per 100mm)*	*GWL*	*Soil Description*			*Sample Taken*	*Lab Testing*								*Shear Vane Reading (kPa) peak/remoulded*
							Atterberg Limits			*Grain Size*			*WC (%)*	*UW*	
			USC	*Soil Characteristics*	*Graphic Log*		*LL*	*PL*	*PI*	*GR*	*SA*	*FC*			
0.5	8 9 7 7 11 20 Weight Bouncing	NOT ENCOUNTERED		SILT; non-plastic, dark brown, dry (TOPSOIL)											
				Sandy SILT; low plasticity, yellow-brown, dry, sand is fine to medium											
				Gravelly fine to coarse SAND / Sandy Gravel; fine to coarse, grey, dry, gravel is subrounded to subangular											
1.0				**EOH (TARGET STRATA REACHED)**											
1.5															
2.0															
2.5															

LEGEND

ABBREVIATIONS

DCP	DYNAMIC CONE PENETROMETER	N/E	NOT ENCOUNTERED	LL	LIQUID LIMIT	GR	GRAVEL
HA	HAND AUGER	UTP	UNABLE TO PENETRATE	PL	PLASTIC LIMIT	SA	SAND
SV	SHEAR VANE	EOH	END OF HOLE	PI	PLASTICITY INDEX	FC	FINES CONTENT
TP	TEST PIT	UW	UNIT WEIGHT (kN/m^3)	WC	WATER CONTENT	▽	STANDING GWL
GWL	GROUNDWATER LEVEL	mbgl	METERS BELOW GROUND LEVEL				

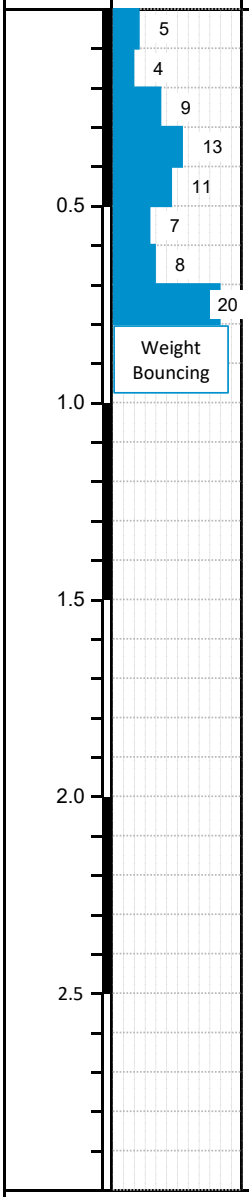
NOTES

miyamoto. ENGINEERS + CONSTRUCTION CONSULTANTS	*PROJECT NUMBER:*	**200357**
	CLIENT:	**Yoursection Ltd**
	TESTING COMPLETED:	**17 November 2020**

SHALLOW GROUND INVESTIGATION LOG

TP012

PROJECT:	**151 & 153 Lincoln Rolleston Road, Rolleston**				
LOGGED BY:	**CG**	*TOTAL TESTING DEPTH:*	**0.8 mbgl**	*HOLE DIAMETER:*	**50 mm**
PROCESSED BY:	**CG**	*TESTING METHOD:*	**TP + DCP**	*SHEAR VANE NUMBER:*	**-**
LOCATION:	**REFER TO SITE PLAN**	*GROUNDWATER LEVEL:*	**N/E**	This report may only be reproduced in full	



Depth (m)	*DCP Test Results (Blows per 100mm)*	*GWL*	*Soil Description*			*Sample Taken*	*Lab Testing*								*Shear Vane Reading (kPa) peak/remoulded*
							Atterberg Limits			*Grain Size*			*WC (%)*	*UW*	
			USC	*Soil Characteristics*	*Graphic Log*		*LL*	*PL*	*PI*	*GR*	*SA*	*FC*			
				SILT; non-plastic, dark brown, dry (TOPSOIL)											
				Sandy SILT; low plasticity, yellow-brown, dry, sand is fine to medium											
				Gravelly fine to coarse SAND / Sandy Gravel; fine to coarse, grey, dry, gravel is subrounded to subangular											
				EOH (TARGET STRATA REACHED)											

LEGEND

ABBREVIATIONS

DCP	DYNAMIC CONE PENETROMETER	N/E	NOT ENCOUNTERED	LL	LIQUID LIMIT	GR	GRAVEL
HA	HAND AUGER	UTP	UNABLE TO PENETRATE	PL	PLASTIC LIMIT	SA	SAND
SV	SHEAR VANE	EOH	END OF HOLE	PI	PLASTICITY INDEX	FC	FINES CONTENT
TP	TEST PIT	UW	UNIT WEIGHT (kN/m^3)	WC	WATER CONTENT	▽	STANDING GWL
GWL	GROUNDWATER LEVEL	mbgl	METERS BELOW GROUND LEVEL				

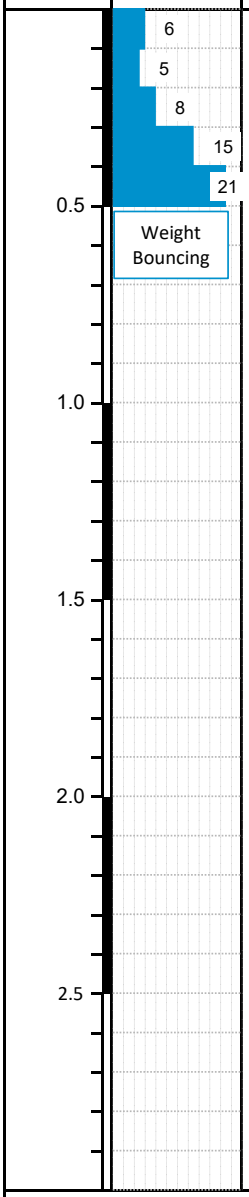
NOTES

miyamoto. ENGINEERS + CONSTRUCTION CONSULTANTS	*PROJECT NUMBER:*	**200357**
	CLIENT:	**Yoursection Ltd**
	TESTING COMPLETED:	**17 November 2020**

SHALLOW GROUND INVESTIGATION LOG

TP013

PROJECT:	**151 & 153 Lincoln Rolleston Road, Rolleston**				
LOGGED BY:	**CG**	*TOTAL TESTING DEPTH:*	**0.9 mbgl**	*HOLE DIAMETER:*	**50 mm**
PROCESSED BY:	**CG**	*TESTING METHOD:*	**TP + DCP**	*SHEAR VANE NUMBER:*	**-**
LOCATION:	**REFER TO SITE PLAN**	*GROUNDWATER LEVEL:*	**N/E**	This report may only be reproduced in full	



Depth (m)	*DCP Test Results (Blows per 100mm)*	*GWL*	*Soil Description*			*Sample Taken*	*Lab Testing*								*Shear Vane Reading (kPa) peak/remoulded*
							Atterberg Limits			*Grain Size*			*WC (%)*	*UW*	
			USC	*Soil Characteristics*	*Graphic Log*		*LL*	*PL*	*PI*	*GR*	*SA*	*FC*			
				SILT; non-plastic, dark brown, dry (TOPSOIL)											
				Sandy SILT; low plasticity, yellow-brown, dry, sand is fine to medium											
				SAND; fine to medium, yellow-brown, dry											
				Gravelly fine to coarse SAND / Sandy Gravel; fine to coarse, grey, dry, gravel is subrounded to subangular											
				EOH (TARGET STRATA REACHED)											

LEGEND

ABBREVIATIONS

DCP	DYNAMIC CONE PENETROMETER	N/E	NOT ENCOUNTERED	LL	LIQUID LIMIT	GR	GRAVEL
HA	HAND AUGER	UTP	UNABLE TO PENETRATE	PL	PLASTIC LIMIT	SA	SAND
SV	SHEAR VANE	EOH	END OF HOLE	PI	PLASTICITY INDEX	FC	FINES CONTENT
TP	TEST PIT	UW	UNIT WEIGHT (kN/m^3)	WC	WATER CONTENT	▽	STANDING GWL
GWL	GROUNDWATER LEVEL	mbgl	METERS BELOW GROUND LEVEL				

NOTES

miyamoto. ENGINEERS + CONSTRUCTION CONSULTANTS	*PROJECT NUMBER:*	**200357**
	CLIENT:	**Yoursection Ltd**
	TESTING COMPLETED:	**17 November 2020**

SHALLOW GROUND INVESTIGATION LOG

TP014

PROJECT:	**151 & 153 Lincoln Rolleston Road, Rolleston**				
LOGGED BY:	**CG**	*TOTAL TESTING DEPTH:*	**0.5 mbgl**	*HOLE DIAMETER:*	**50 mm**
PROCESSED BY:	**CG**	*TESTING METHOD:*	**TP + DCP**	*SHEAR VANE NUMBER:*	**-**
LOCATION:	**REFER TO SITE PLAN**	*GROUNDWATER LEVEL:*	**N/E**	This report may only be reproduced in full	

Depth (m)	*DCP Test Results (Blows per 100mm)*	*GWL*	*Soil Description*			*Sample Taken*	*Lab Testing*								*Shear Vane Reading (kPa) peak/remoulded*
							Atterberg Limits			*Grain Size*			*WC (%)*	*UW*	
			USC	*Soil Characteristics*	*Graphic Log*		*LL*	*PL*	*PI*	*GR*	*SA*	*FC*			
0.0	8 15 15 Weight Bouncing	NOT ENCOUNTERED		SILT; non-plastic, dark brown, dry (TOPSOIL)											
				Sandy SILT; low plasticity, yellow-brown, dry, sand is fine to medium											
0.5				Gravelly fine to coarse SAND / Sandy Gravel; fine to coarse, grey, dry, gravel is subrounded to subangular											
				EOH (TARGET STRATA REACHED)											
1.0															
1.5															
2.0															
2.5															

LEGEND

ABBREVIATIONS

DCP	DYNAMIC CONE PENETROMETER	N/E	NOT ENCOUNTERED	LL	LIQUID LIMIT	GR	GRAVEL
HA	HAND AUGER	UTP	UNABLE TO PENETRATE	PL	PLASTIC LIMIT	SA	SAND
SV	SHEAR VANE	EOH	END OF HOLE	PI	PLASTICITY INDEX	FC	FINES CONTENT
TP	TEST PIT	UW	UNIT WEIGHT (kN/m^3)	WC	WATER CONTENT	▽	STANDING GWL
GWL	GROUNDWATER LEVEL	mbgl	METERS BELOW GROUND LEVEL				

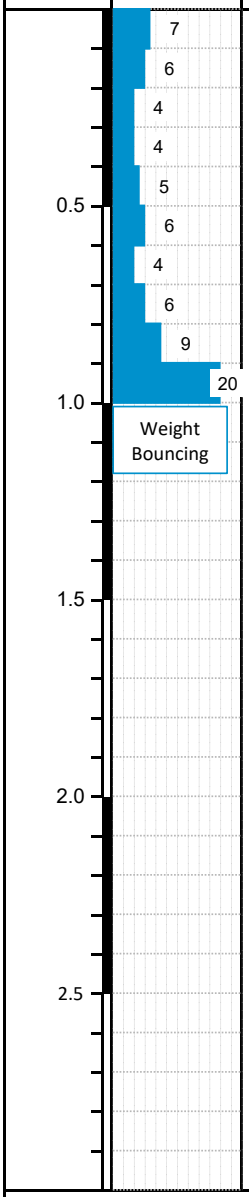
NOTES

miyamoto. ENGINEERS + CONSTRUCTION CONSULTANTS	*PROJECT NUMBER:*	**200357**
	CLIENT:	**Yoursection Ltd**
	TESTING COMPLETED:	**17 November 2020**

SHALLOW GROUND INVESTIGATION LOG

TP015

PROJECT:	**151 & 153 Lincoln Rolleston Road, Rolleston**				
LOGGED BY:	**CG**	*TOTAL TESTING DEPTH:*	**1.0 mbgl**	*HOLE DIAMETER:*	**50 mm**
PROCESSED BY:	**CG**	*TESTING METHOD:*	**TP + DCP**	*SHEAR VANE NUMBER:*	**-**
LOCATION:	**REFER TO SITE PLAN**	*GROUNDWATER LEVEL:*	**N/E**	This report may only be reproduced in full	



Depth (m)	*DCP Test Results (Blows per 100mm)*	*GWL*	*Soil Description*			*Sample Taken*	*Lab Testing*								*Shear Vane Reading (kPa) peak/remoulded*
							Atterberg Limits			*Grain Size*			*WC (%)*	*UW*	
			USC	*Soil Characteristics*	*Graphic Log*		*LL*	*PL*	*PI*	*GR*	*SA*	*FC*			
		NOT ENCOUNTERED		SILT; non-plastic, dark brown, dry (TOPSOIL)											
				Sandy SILT; low plasticity, yellow-brown, dry, sand is fine to medium											
				Gravelly fine to coarse SAND / Sandy Gravel; fine to coarse, grey, dry, gravel is subrounded to subangular											
				EOH (TARGET STRATA REACHED)											

LEGEND

ABBREVIATIONS

DCP	DYNAMIC CONE PENETROMETER	N/E	NOT ENCOUNTERED	LL	LIQUID LIMIT	GR	GRAVEL
HA	HAND AUGER	UTP	UNABLE TO PENETRATE	PL	PLASTIC LIMIT	SA	SAND
SV	SHEAR VANE	EOH	END OF HOLE	PI	PLASTICITY INDEX	FC	FINES CONTENT
TP	TEST PIT	UW	UNIT WEIGHT (kN/m^3)	WC	WATER CONTENT	▽	STANDING GWL
GWL	GROUNDWATER LEVEL	mbgl	METERS BELOW GROUND LEVEL				

NOTES

miyamoto. ENGINEERS + CONSTRUCTION CONSULTANTS

PROJECT NUMBER:	**200357**
CLIENT:	**Yoursection Ltd**
TESTING COMPLETED:	**17 November 2020**

SHALLOW GROUND INVESTIGATION LOG

TP016

PROJECT:	**151 & 153 Lincoln Rolleston Road, Rolleston**				
LOGGED BY:	**CG**	*TOTAL TESTING DEPTH:*	**0.8 mbgl**	*HOLE DIAMETER:*	**50 mm**
PROCESSED BY:	**CG**	*TESTING METHOD:*	**TP + DCP**	*SHEAR VANE NUMBER:*	**-**
LOCATION:	**REFER TO SITE PLAN**	*GROUNDWATER LEVEL:*	**N/E**	This report may only be reproduced in full	

Depth (m)	DCP Test Results (Blows per 100mm)	GWL	Soil Description: USC	Soil Description: Soil Characteristics	Soil Description: Graphic Log	Sample Taken	Lab Testing: Atterberg Limits LL	PL	PI	Grain Size GR	SA	FC	WC (%)	UW	Shear Vane Reading (kPa) peak/remoulded
0.0	5	NOT ENCOUNTERED		SILT; non-plastic, dark brown, dry (TOPSOIL)											
	7			Sandy SILT; low plasticity, yellow-brown, dry, sand is fine to medium											
	11														
0.5	20														
	Weight Bouncing														
1.0				Gravelly fine to coarse SAND / Sandy Gravel; fine to coarse, grey, dry, gravel is subrounded to subangular											
				EOH (TARGET STRATA REACHED)											
1.5															
2.0															
2.5															

LEGEND

ABBREVIATIONS

DCP	DYNAMIC CONE PENETROMETER	N/E	NOT ENCOUNTERED	LL	LIQUID LIMIT	GR	GRAVEL
HA	HAND AUGER	UTP	UNABLE TO PENETRATE	PL	PLASTIC LIMIT	SA	SAND
SV	SHEAR VANE	EOH	END OF HOLE	PI	PLASTICITY INDEX	FC	FINES CONTENT
TP	TEST PIT	UW	UNIT WEIGHT (kN/m^3)	WC	WATER CONTENT	▽	STANDING GWL
GWL	GROUNDWATER LEVEL	mbgl	METERS BELOW GROUND LEVEL				

NOTES

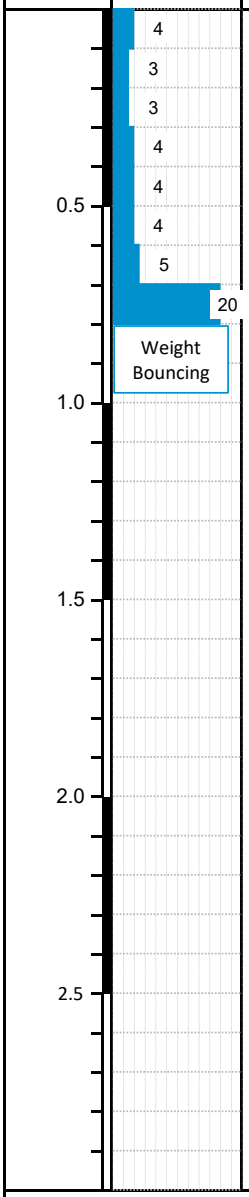
miyamoto. ENGINEERS + CONSTRUCTION CONSULTANTS

PROJECT NUMBER:	**200357**
CLIENT:	**Yoursection Ltd**
TESTING COMPLETED:	**17 November 2020**

SHALLOW GROUND INVESTIGATION LOG

TP017

PROJECT:	**151 & 153 Lincoln Rolleston Road, Rolleston**				
LOGGED BY:	**CG**	*TOTAL TESTING DEPTH:*	**0.8 mbgl**	*HOLE DIAMETER:*	**50 mm**
PROCESSED BY:	**CG**	*TESTING METHOD:*	**TP + DCP**	*SHEAR VANE NUMBER:*	**-**
LOCATION:	**REFER TO SITE PLAN**	*GROUNDWATER LEVEL:*	**N/E**	This report may only be reproduced in full	



Depth (m)	DCP Test Results (Blows per 100mm)	GWL	Soil Description: USC	Soil Description: Soil Characteristics	Soil Description: Graphic Log	Sample Taken	Lab Testing: Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI	Grain Size GR	Grain Size SA	Grain Size FC	WC (%)	UW	Shear Vane Reading (kPa) peak/remoulded
0.0	4	NOT ENCOUNTERED		SILT; non-plastic, dark brown, dry (TOPSOIL)											
	3														
	3														
	4			Sandy SILT; low plasticity, yellow-brown, dry, sand is fine to medium											
	4														
0.5	4														
	5														
	20			Gravelly fine to coarse SAND / Sandy Gravel; fine to coarse, grey, dry, gravel is subrounded to subangular											
	Weight Bouncing			EOH (TARGET STRATA REACHED)											
1.0															
1.5															
2.0															
2.5															

LEGEND

ABBREVIATIONS

DCP	DYNAMIC CONE PENETROMETER	N/E	NOT ENCOUNTERED	LL	LIQUID LIMIT	GR	GRAVEL
HA	HAND AUGER	UTP	UNABLE TO PENETRATE	PL	PLASTIC LIMIT	SA	SAND
SV	SHEAR VANE	EOH	END OF HOLE	PI	PLASTICITY INDEX	FC	FINES CONTENT
TP	TEST PIT	UW	UNIT WEIGHT (kN/m^3)	WC	WATER CONTENT	▽	STANDING GWL
GWL	GROUNDWATER LEVEL	mbgl	METERS BELOW GROUND LEVEL				

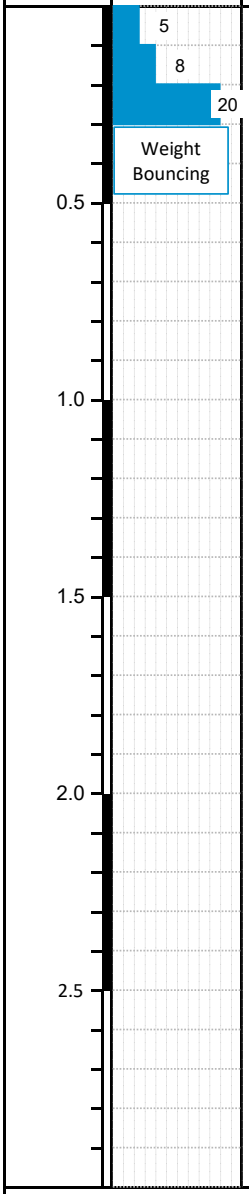
NOTES

miyamoto. ENGINEERS + CONSTRUCTION CONSULTANTS	*PROJECT NUMBER:*	**200357**
	CLIENT:	**Yoursection Ltd**
	TESTING COMPLETED:	**17 November 2020**

SHALLOW GROUND INVESTIGATION LOG

TP018

PROJECT:	**151 & 153 Lincoln Rolleston Road, Rolleston**				
LOGGED BY:	**CG**	*TOTAL TESTING DEPTH:*	**0.4 mbgl**	*HOLE DIAMETER:*	**50 mm**
PROCESSED BY:	**CG**	*TESTING METHOD:*	**TP + DCP**	*SHEAR VANE NUMBER:*	**-**
LOCATION:	**REFER TO SITE PLAN**	*GROUNDWATER LEVEL:*	**N/E**	This report may only be reproduced in full	



Depth (m)	*DCP Test Results (Blows per 100mm)*	*GWL*	*Soil Description*			*Sample Taken*	*Lab Testing*								*Shear Vane Reading (kPa) peak/remoulded*
			USC	*Soil Characteristics*	*Graphic Log*		*Atterberg Limits*			*Grain Size*			*WC (%)*	*UW*	
							LL	*PL*	*PI*	*GR*	*SA*	*FC*			
				SILT; non-plastic, dark brown, dry (TOPSOIL)											
				Gravelly fine to coarse SAND / Sandy Gravel; fine to coarse, grey, dry, gravel is subrounded to subangular											
				EOH (TARGET STRATA REACHED)											

LEGEND

ABBREVIATIONS

DCP	DYNAMIC CONE PENETROMETER	N/E	NOT ENCOUNTERED	LL	LIQUID LIMIT	GR	GRAVEL
HA	HAND AUGER	UTP	UNABLE TO PENETRATE	PL	PLASTIC LIMIT	SA	SAND
SV	SHEAR VANE	EOH	END OF HOLE	PI	PLASTICITY INDEX	FC	FINES CONTENT
TP	TEST PIT	UW	UNIT WEIGHT (kN/m^3)	WC	WATER CONTENT	▽	STANDING GWL
GWL	GROUNDWATER LEVEL	mbgl	METERS BELOW GROUND LEVEL				

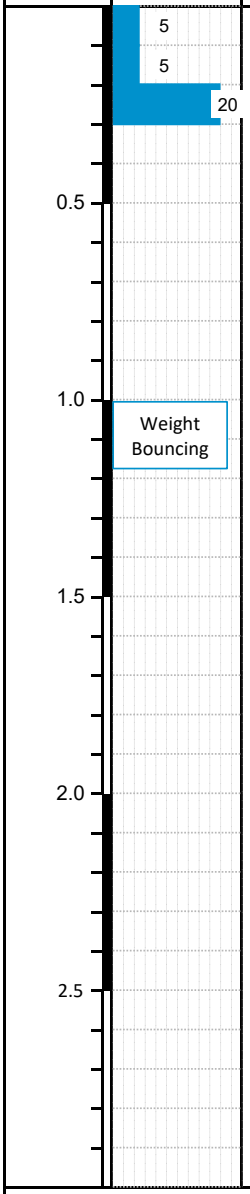
NOTES

miyamoto. ENGINEERS + CONSTRUCTION CONSULTANTS	*PROJECT NUMBER:*	**200357**
	CLIENT:	**Yoursection Ltd**
	TESTING COMPLETED:	**17 November 2020**

SHALLOW GROUND INVESTIGATION LOG

TP019

PROJECT:	**151 & 153 Lincoln Rolleston Road, Rolleston**				
LOGGED BY:	**CG**	*TOTAL TESTING DEPTH:*	**0.4 mbgl**	*HOLE DIAMETER:*	**50 mm**
PROCESSED BY:	**CG**	*TESTING METHOD:*	**TP + DCP**	*SHEAR VANE NUMBER:*	**-**
LOCATION:	**REFER TO SITE PLAN**	*GROUNDWATER LEVEL:*	**N/E**	This report may only be reproduced in full	



Depth (m)	*DCP Test Results (Blows per 100mm)*	*GWL*	*Soil Description*			*Sample Taken*	*Lab Testing*								*Shear Vane Reading (kPa) peak/remoulded*
							Atterberg Limits			*Grain Size*			*WC (%)*	*UW*	
			USC	*Soil Characteristics*	*Graphic Log*		*LL*	*PL*	*PI*	*GR*	*SA*	*FC*			
	5			SILT; non-plastic, dark brown, dry (TOPSOIL)											
	5														
	20														
0.5				Gravelly fine to coarse SAND / Sandy Gravel; fine to coarse, grey, dry, gravel is subrounded to subangular											
				EOH (TARGET STRATA REACHED)											
1.0	Weight Bouncing														
1.5															
2.0															
2.5															

LEGEND

ABBREVIATIONS

DCP	DYNAMIC CONE PENETROMETER	N/E	NOT ENCOUNTERED	LL	LIQUID LIMIT	GR	GRAVEL
HA	HAND AUGER	UTP	UNABLE TO PENETRATE	PL	PLASTIC LIMIT	SA	SAND
SV	SHEAR VANE	EOH	END OF HOLE	PI	PLASTICITY INDEX	FC	FINES CONTENT
TP	TEST PIT	UW	UNIT WEIGHT (kN/m^3)	WC	WATER CONTENT	▽	STANDING GWL
GWL	GROUNDWATER LEVEL	mbgl	METERS BELOW GROUND LEVEL				

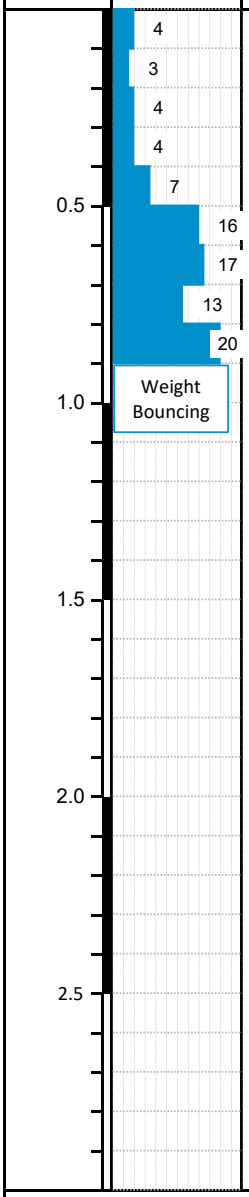
NOTES

miyamoto. ENGINEERS + CONSTRUCTION CONSULTANTS	*PROJECT NUMBER:*	**200357**
	CLIENT:	**Yoursection Ltd**
	TESTING COMPLETED:	**17 November 2020**

SHALLOW GROUND INVESTIGATION LOG

TP020

PROJECT:	**151 & 153 Lincoln Rolleston Road, Rolleston**				
LOGGED BY:	**CG**	*TOTAL TESTING DEPTH:*	**1.2 mbgl**	*HOLE DIAMETER:*	**50 mm**
PROCESSED BY:	**CG**	*TESTING METHOD:*	**TP + DCP**	*SHEAR VANE NUMBER:*	**-**
LOCATION:	**REFER TO SITE PLAN**	*GROUNDWATER LEVEL:*	**N/E**	This report may only be reproduced in full	



Depth (m)	DCP Test Results (Blows per 100mm)	GWL	Soil Description: USC	Soil Description: Soil Characteristics	Soil Description: Graphic Log	Sample Taken	Lab Testing: Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI	Grain Size GR	Grain Size SA	Grain Size FC	WC (%)	UW	Shear Vane Reading (kPa) peak/remoulded
0.0	4	NOT ENCOUNTERED		SILT; non-plastic, dark brown, dry (TOPSOIL)											
0.5	3, 4, 4, 7, 16, 17, 13, 20			Sandy SILT; low plasticity, yellow-brown, dry, sand is fine to medium											
1.0	Weight Bouncing			Gravelly fine to coarse SAND / Sandy Gravel; fine to coarse, grey, dry, gravel is subrounded to subangular											
1.2				**EOH (TARGET STRATA REACHED)**											

LEGEND

ABBREVIATIONS

DCP	DYNAMIC CONE PENETROMETER	N/E	NOT ENCOUNTERED	LL	LIQUID LIMIT	GR	GRAVEL
HA	HAND AUGER	UTP	UNABLE TO PENETRATE	PL	PLASTIC LIMIT	SA	SAND
SV	SHEAR VANE	EOH	END OF HOLE	PI	PLASTICITY INDEX	FC	FINES CONTENT
TP	TEST PIT	UW	UNIT WEIGHT (kN/m^3)	WC	WATER CONTENT	▽	STANDING GWL
GWL	GROUNDWATER LEVEL	mbgl	METERS BELOW GROUND LEVEL				

NOTES

miyamoto. ENGINEERS + CONSTRUCTION CONSULTANTS	*PROJECT NUMBER:*	**200357**
	CLIENT:	**Yoursection Ltd**
	TESTING COMPLETED:	**17 November 2020**

SHALLOW GROUND INVESTIGATION LOG

TP021

PROJECT:	**151 & 153 Lincoln Rolleston Road, Rolleston**				
LOGGED BY:	**CG**	*TOTAL TESTING DEPTH:*	**0.9 mbgl**	*HOLE DIAMETER:*	**50 mm**
PROCESSED BY:	**CG**	*TESTING METHOD:*	**TP + DCP**	*SHEAR VANE NUMBER:*	**-**
LOCATION:	**REFER TO SITE PLAN**	*GROUNDWATER LEVEL:*	**N/E**	This report may only be reproduced in full	

Depth (m)	*DCP Test Results (Blows per 100mm)*	*GWL*	*Soil Description*			*Sample Taken*	*Lab Testing*								*Shear Vane Reading (kPa) peak/remoulded*
			USC	*Soil Characteristics*	*Graphic Log*		*Atterberg Limits*			*Grain Size*			*WC (%)*	*UW*	
							LL	*PL*	*PI*	*GR*	*SA*	*FC*			
0.5	5 4 5 5 6 5 6 6	NOT ENCOUNTERED		SILT; non-plastic, dark brown, dry (TOPSOIL)											
				Sandy SILT; low plasticity, yellow-brown, dry, sand is fine to medium											
1.0	17 Weight Bouncing			Gravelly fine to coarse SAND / Sandy Gravel; fine to coarse, grey, dry, gravel is subrounded to subangular											
1.5				**EOH (TARGET STRATA REACHED)**											
2.0															
2.5															

LEGEND

ABBREVIATIONS

DCP	DYNAMIC CONE PENETROMETER	N/E	NOT ENCOUNTERED	LL	LIQUID LIMIT	GR	GRAVEL
HA	HAND AUGER	UTP	UNABLE TO PENETRATE	PL	PLASTIC LIMIT	SA	SAND
SV	SHEAR VANE	EOH	END OF HOLE	PI	PLASTICITY INDEX	FC	FINES CONTENT
TP	TEST PIT	UW	UNIT WEIGHT (kN/m^3)	WC	WATER CONTENT	▽	STANDING GWL
GWL	GROUNDWATER LEVEL	mbgl	METERS BELOW GROUND LEVEL				

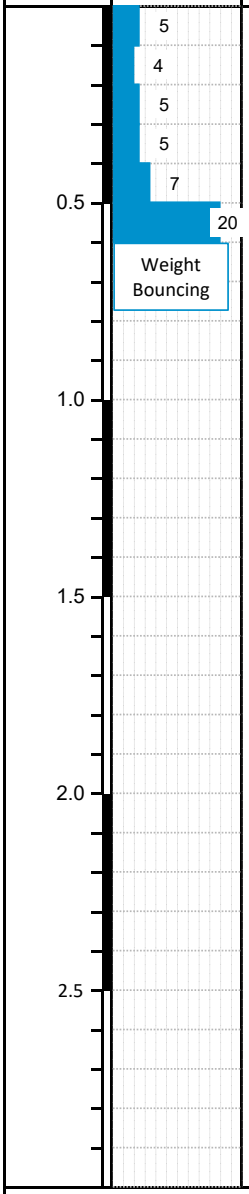
NOTES

miyamoto. ENGINEERS+ CONSTRUCTION CONSULTANTS	*PROJECT NUMBER:*	**200357**
	CLIENT:	**Yoursection Ltd**
	TESTING COMPLETED:	**17 November 2020**

SHALLOW GROUND INVESTIGATION LOG

TP022

PROJECT:	**151 & 153 Lincoln Rolleston Road, Rolleston**				
LOGGED BY:	**CG**	*TOTAL TESTING DEPTH:*	**0.6 mbgl**	*HOLE DIAMETER:*	**50 mm**
PROCESSED BY:	**CG**	*TESTING METHOD:*	**TP + DCP**	*SHEAR VANE NUMBER:*	**-**
LOCATION:	**REFER TO SITE PLAN**	*GROUNDWATER LEVEL:*	**N/E**	This report may only be reproduced in full	



Depth (m)	*DCP Test Results (Blows per 100mm)*	*GWL*	*Soil Description*			*Sample Taken*	*Lab Testing*								*Shear Vane Reading (kPa) peak/remoulded*
							Atterberg Limits			*Grain Size*			*WC (%)*	*UW*	
			USC	*Soil Characteristics*	*Graphic Log*		*LL*	*PL*	*PI*	*GR*	*SA*	*FC*			
		NOT ENCOUNTERED		SILT; non-plastic, dark brown, dry (TOPSOIL)											
				Sandy SILT; low plasticity, yellow-brown, dry, sand is fine to medium											
				Gravelly fine to coarse SAND / Sandy Gravel; fine to coarse, grey, dry, gravel is subrounded to subangular											
				EOH (TARGET STRATA REACHED)											

LEGEND

ABBREVIATIONS

DCP	DYNAMIC CONE PENETROMETER	N/E	NOT ENCOUNTERED	LL	LIQUID LIMIT	GR	GRAVEL
HA	HAND AUGER	UTP	UNABLE TO PENETRATE	PL	PLASTIC LIMIT	SA	SAND
SV	SHEAR VANE	EOH	END OF HOLE	PI	PLASTICITY INDEX	FC	FINES CONTENT
TP	TEST PIT	UW	UNIT WEIGHT (kN/m^3)	WC	WATER CONTENT	▽	STANDING GWL
GWL	GROUNDWATER LEVEL	mbgl	METERS BELOW GROUND LEVEL				

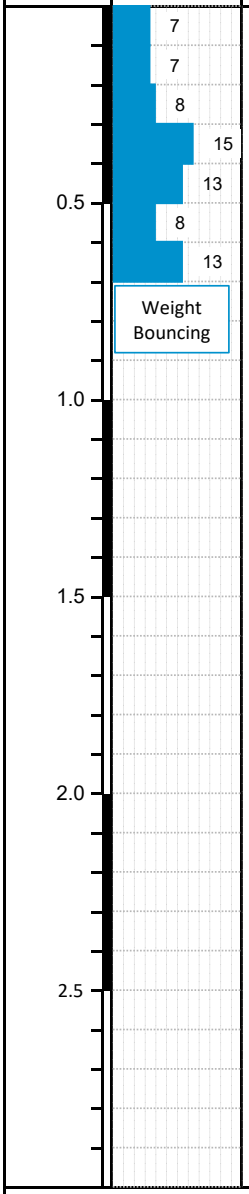
NOTES

miyamoto. ENGINEERS + CONSTRUCTION CONSULTANTS	*PROJECT NUMBER:*	**200357**
	CLIENT:	**Yoursection Ltd**
	TESTING COMPLETED:	**17 November 2020**

SHALLOW GROUND INVESTIGATION LOG

TP023

PROJECT:	**151 & 153 Lincoln Rolleston Road, Rolleston**				
LOGGED BY:	**CG**	*TOTAL TESTING DEPTH:*	**0.9 mbgl**	*HOLE DIAMETER:*	**50 mm**
PROCESSED BY:	**CG**	*TESTING METHOD:*	**TP + DCP**	*SHEAR VANE NUMBER:*	**-**
LOCATION:	**REFER TO SITE PLAN**	*GROUNDWATER LEVEL:*	**N/E**	This report may only be reproduced in full	



Depth (m)	DCP Test Results (Blows per 100mm)	GWL	Soil Description: USC	Soil Description: Soil Characteristics	Soil Description: Graphic Log	Sample Taken	Lab Testing: Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI	Grain Size GR	Grain Size SA	Grain Size FC	WC (%)	UW	Shear Vane Reading (kPa) peak/remoulded
0.0	7, 7, 8	NOT ENCOUNTERED		SILT; non-plastic, dark brown, dry (TOPSOIL)											
0.5	15, 13, 8, 13			Sandy SILT; low plasticity, yellow-brown, dry, sand is fine to medium											
1.0	Weight Bouncing			Gravelly fine to coarse SAND / Sandy Gravel; fine to coarse, grey, dry, gravel is subrounded to subangular											
				EOH (TARGET STRATA REACHED)											

LEGEND

ABBREVIATIONS

DCP	DYNAMIC CONE PENETROMETER	N/E	NOT ENCOUNTERED	LL	LIQUID LIMIT	GR	GRAVEL
HA	HAND AUGER	UTP	UNABLE TO PENETRATE	PL	PLASTIC LIMIT	SA	SAND
SV	SHEAR VANE	EOH	END OF HOLE	PI	PLASTICITY INDEX	FC	FINES CONTENT
TP	TEST PIT	UW	UNIT WEIGHT (kN/m^3)	WC	WATER CONTENT	▽	STANDING GWL
GWL	GROUNDWATER LEVEL	mbgl	METERS BELOW GROUND LEVEL				

NOTES

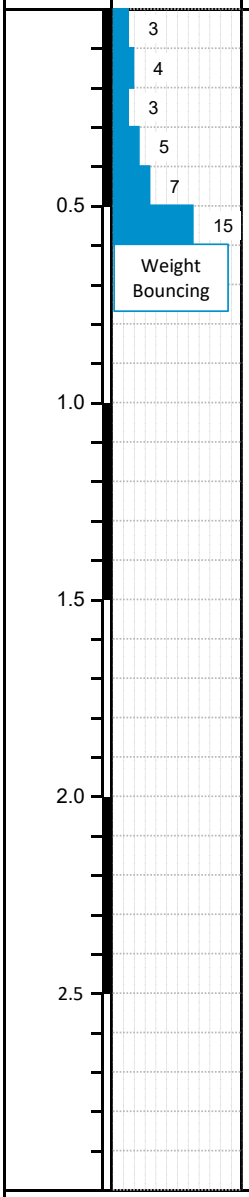
miyamoto. ENGINEERS + CONSTRUCTION CONSULTANTS

PROJECT NUMBER:	**200357**
CLIENT:	**Yoursection Ltd**
TESTING COMPLETED:	**17 November 2020**

SHALLOW GROUND INVESTIGATION LOG

TP024

PROJECT:	**151 & 153 Lincoln Rolleston Road, Rolleston**				
LOGGED BY:	**CG**	*TOTAL TESTING DEPTH:*	**0.9 mbgl**	*HOLE DIAMETER:*	**50 mm**
PROCESSED BY:	**CG**	*TESTING METHOD:*	**TP + DCP**	*SHEAR VANE NUMBER:*	**-**
LOCATION:	**REFER TO SITE PLAN**	*GROUNDWATER LEVEL:*	**N/E**	This report may only be reproduced in full	



Depth (m)	DCP Test Results (Blows per 100mm)	GWL	Soil Description: USC	Soil Description: Soil Characteristics	Soil Description: Graphic Log	Sample Taken	Lab Testing: Atterberg Limits LL	PL	PI	Grain Size GR	SA	FC	WC (%)	UW	Shear Vane Reading (kPa) peak/remoulded
		NOT ENCOUNTERED		SILT; non-plastic, dark brown, dry (TOPSOIL)											
				Sandy SILT; low plasticity, yellow-brown, dry, sand is fine to medium											
				Gravelly fine to coarse SAND / Sandy Gravel; fine to coarse, grey, dry, gravel is subrounded to subangular											
				EOH (TARGET STRATA REACHED)											

LEGEND

ABBREVIATIONS

DCP	DYNAMIC CONE PENETROMETER	N/E	NOT ENCOUNTERED	LL	LIQUID LIMIT	GR	GRAVEL
HA	HAND AUGER	UTP	UNABLE TO PENETRATE	PL	PLASTIC LIMIT	SA	SAND
SV	SHEAR VANE	EOH	END OF HOLE	PI	PLASTICITY INDEX	FC	FINES CONTENT
TP	TEST PIT	UW	UNIT WEIGHT (kN/m^3)	WC	WATER CONTENT	▽	STANDING GWL
GWL	GROUNDWATER LEVEL	mbgl	METERS BELOW GROUND LEVEL				

NOTES

miyamoto. ENGINEERS + CONSTRUCTION CONSULTANTS	*PROJECT NUMBER:*	**200357**
	CLIENT:	**Yoursection Ltd**
	TESTING COMPLETED:	**17 November 2020**

SHALLOW GROUND INVESTIGATION LOG

TP025

PROJECT:	**151 & 153 Lincoln Rolleston Road, Rolleston**				
LOGGED BY:	**CG**	*TOTAL TESTING DEPTH:*	**0.5 mbgl**	*HOLE DIAMETER:*	**50 mm**
PROCESSED BY:	**CG**	*TESTING METHOD:*	**TP + DCP**	*SHEAR VANE NUMBER:*	**-**
LOCATION:	**REFER TO SITE PLAN**	*GROUNDWATER LEVEL:*	**N/E**	This report may only be reproduced in full	

Depth (m)	*DCP Test Results (Blows per 100mm)*	*GWL*	*Soil Description*			*Sample Taken*	*Lab Testing*								*Shear Vane Reading (kPa) peak/remoulded*
							Atterberg Limits			*Grain Size*			*WC (%)*	*UW*	
			USC	*Soil Characteristics*	*Graphic Log*		*LL*	*PL*	*PI*	*GR*	*SA*	*FC*			
0.5	4 4 6 15 Weight Bouncing	NOT ENCOUNTERED		SILT; non-plastic, dark brown, dry (TOPSOIL)											
				Sandy SILT; low plasticity, yellow-brown, dry, sand is fine to medium											
				Gravelly fine to coarse SAND / Sandy Gravel; fine to coarse, grey, dry, gravel is subrounded to subangular											
1.0				**EOH (TARGET STRATA REACHED)**											
1.5															
2.0															
2.5															

LEGEND

ABBREVIATIONS

DCP	DYNAMIC CONE PENETROMETER	N/E	NOT ENCOUNTERED	LL	LIQUID LIMIT	GR	GRAVEL
HA	HAND AUGER	UTP	UNABLE TO PENETRATE	PL	PLASTIC LIMIT	SA	SAND
SV	SHEAR VANE	EOH	END OF HOLE	PI	PLASTICITY INDEX	FC	FINES CONTENT
TP	TEST PIT	UW	UNIT WEIGHT (kN/m^3)	WC	WATER CONTENT	▽	STANDING GWL
GWL	GROUNDWATER LEVEL	mbgl	METERS BELOW GROUND LEVEL				

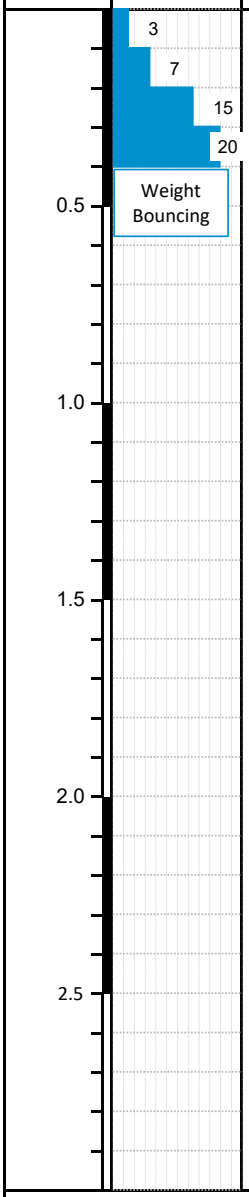
NOTES

miyamoto. ENGINEERS + CONSTRUCTION CONSULTANTS	*PROJECT NUMBER:*	**200357**
	CLIENT:	**Yoursection Ltd**
	TESTING COMPLETED:	**17 November 2020**

SHALLOW GROUND INVESTIGATION LOG

TP026

PROJECT:	**151 & 153 Lincoln Rolleston Road, Rolleston**				
LOGGED BY:	**CG**	*TOTAL TESTING DEPTH:*	**0.4 mbgl**	*HOLE DIAMETER:*	**50 mm**
PROCESSED BY:	**CG**	*TESTING METHOD:*	**TP + DCP**	*SHEAR VANE NUMBER:*	**-**
LOCATION:	**REFER TO SITE PLAN**	*GROUNDWATER LEVEL:*	**N/E**	This report may only be reproduced in full	



Depth (m)	*DCP Test Results (Blows per 100mm)*	*GWL*	*Soil Description*			*Sample Taken*	*Lab Testing*								*Shear Vane Reading (kPa) peak/remoulded*
			USC	*Soil Characteristics*	*Graphic Log*		*Atterberg Limits*			*Grain Size*			*WC (%)*	*UW*	
							LL	*PL*	*PI*	*GR*	*SA*	*FC*			
				SILT; non-plastic, dark brown, dry (TOPSOIL)											
				Gravelly fine to coarse SAND / Sandy Gravel; fine to coarse, grey, dry, gravel is subrounded to subangular											
				EOH (TARGET STRATA REACHED)											

LEGEND

ABBREVIATIONS

DCP	DYNAMIC CONE PENETROMETER	N/E	NOT ENCOUNTERED	LL	LIQUID LIMIT	GR	GRAVEL
HA	HAND AUGER	UTP	UNABLE TO PENETRATE	PL	PLASTIC LIMIT	SA	SAND
SV	SHEAR VANE	EOH	END OF HOLE	PI	PLASTICITY INDEX	FC	FINES CONTENT
TP	TEST PIT	UW	UNIT WEIGHT (kN/m^3)	WC	WATER CONTENT	▽	STANDING GWL
GWL	GROUNDWATER LEVEL	mbgl	METERS BELOW GROUND LEVEL				

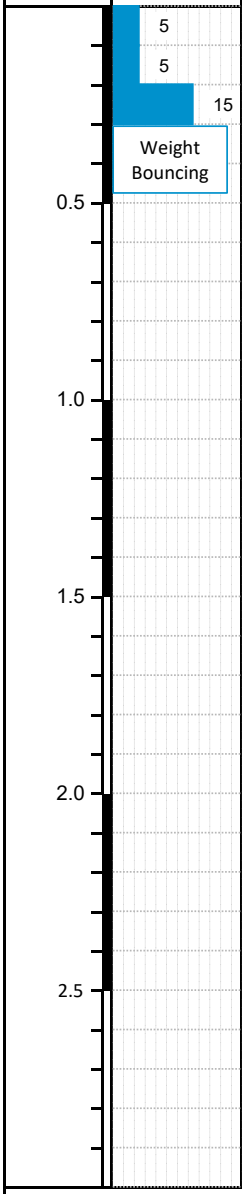
NOTES

miyamoto. ENGINEERS + CONSTRUCTION CONSULTANTS	*PROJECT NUMBER:*	**200357**
	CLIENT:	**Yoursection Ltd**
	TESTING COMPLETED:	**17 November 2020**

SHALLOW GROUND INVESTIGATION LOG

TP027

PROJECT:	**151 & 153 Lincoln Rolleston Road, Rolleston**				
LOGGED BY:	**CG**	*TOTAL TESTING DEPTH:*	**0.3 mbgl**	*HOLE DIAMETER:*	**50 mm**
PROCESSED BY:	**CG**	*TESTING METHOD:*	**TP + DCP**	*SHEAR VANE NUMBER:*	**-**
LOCATION:	**REFER TO SITE PLAN**	*GROUNDWATER LEVEL:*	**N/E**	This report may only be reproduced in full	



Depth (m)	*DCP Test Results (Blows per 100mm)*	*GWL*	*Soil Description*			*Sample Taken*	*Lab Testing*								*Shear Vane Reading (kPa) peak/remoulded*
							Atterberg Limits			*Grain Size*			*WC (%)*	*UW*	
			USC	*Soil Characteristics*	*Graphic Log*		*LL*	*PL*	*PI*	*GR*	*SA*	*FC*			
		NOT ENCOUNTERED		SILT; non-plastic, dark brown, dry (TOPSOIL)											
				Gravelly fine to coarse SAND / Sandy Gravel; fine to coarse, grey, dry, gravel is subrounded to subangular											
				EOH (TARGET STRATA REACHED)											

LEGEND

ABBREVIATIONS

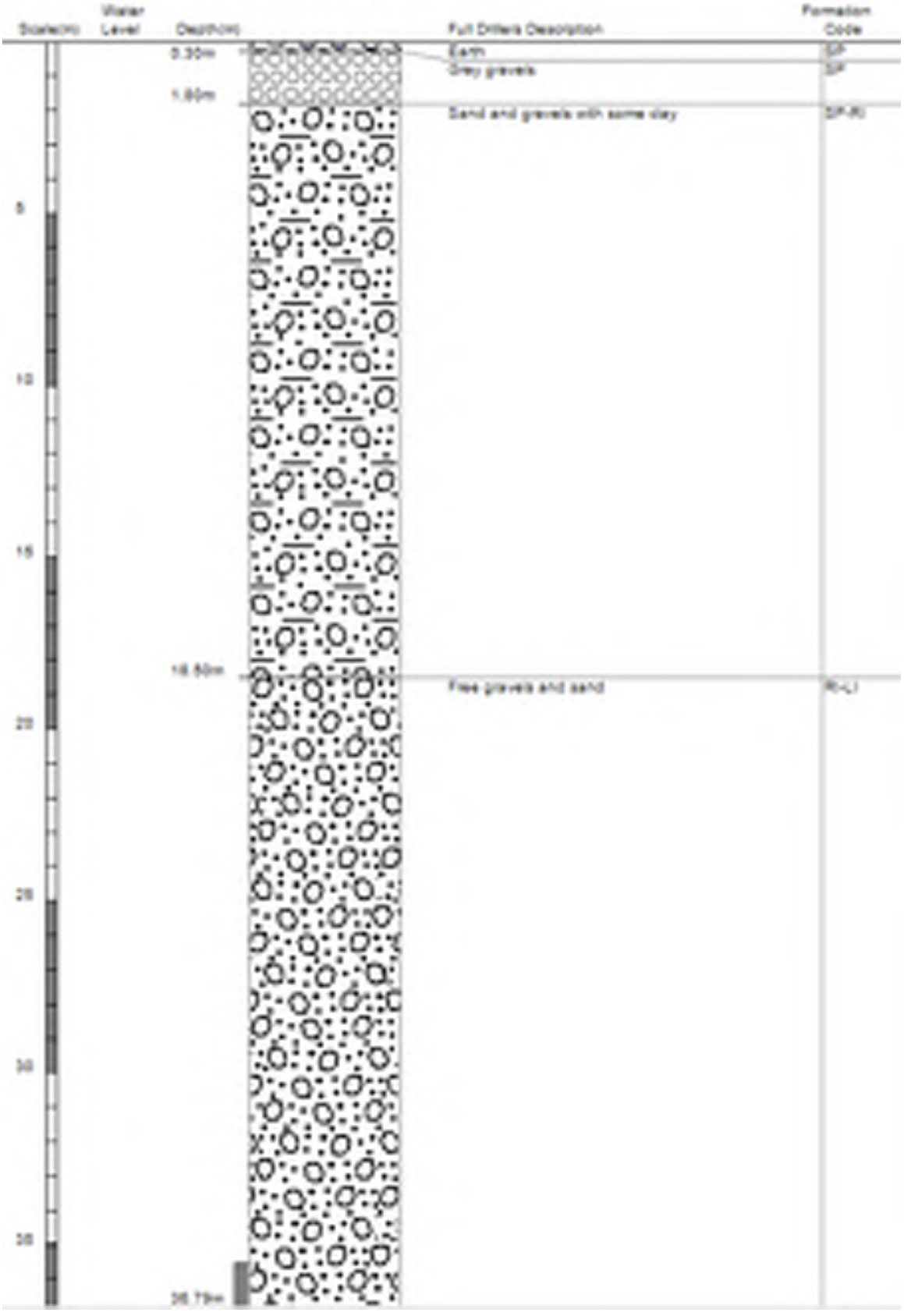
DCP	DYNAMIC CONE PENETROMETER	N/E	NOT ENCOUNTERED	LL	LIQUID LIMIT	GR	GRAVEL
HA	HAND AUGER	UTP	UNABLE TO PENETRATE	PL	PLASTIC LIMIT	SA	SAND
SV	SHEAR VANE	EOH	END OF HOLE	PI	PLASTICITY INDEX	FC	FINES CONTENT
TP	TEST PIT	UW	UNIT WEIGHT (kN/m^3)	WC	WATER CONTENT	▽	STANDING GWL
GWL	GROUNDWATER LEVEL	mbgl	METERS BELOW GROUND LEVEL				

NOTES

Borelog for well M36/3868

Grid Reference (NZTM): 1552494 mE, 5171203 mN
Location Accuracy: 10 - 50m
Ground Level Altitude: 38.4 m +MSD Accuracy: < 2.5 m
Driller: McMillan Drilling Ltd
Drill Method: Rotary/Percussion
Borelog Depth: 36.8 m Drill Date: 18-Jan-1988

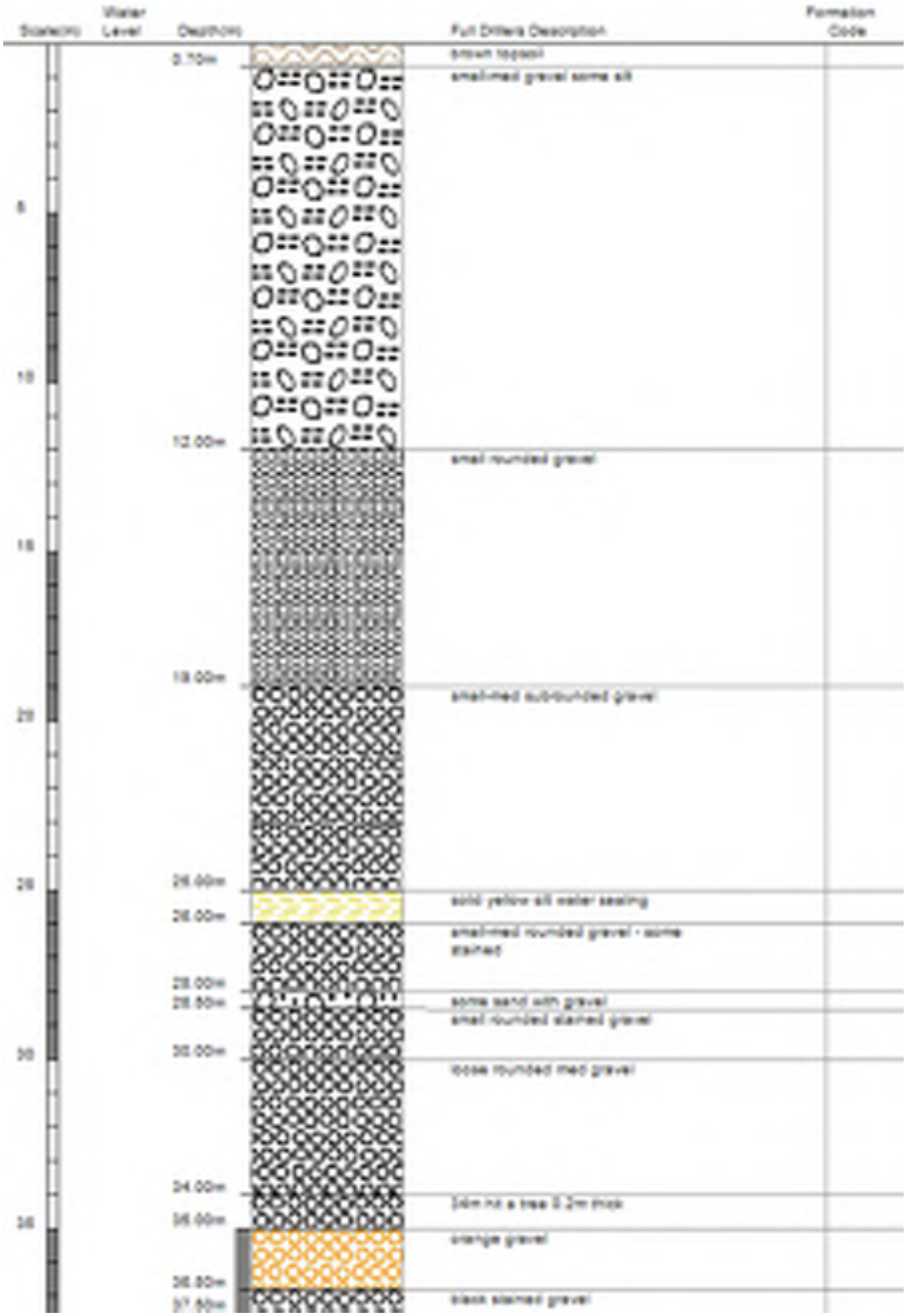
Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha



Borelog for well M36/7975

Grid Reference (NZTM): 1552317 mE, 5171001 mN
Location Accuracy: 50 - 300m
Ground Level Altitude: 37.7 m +MSD Accuracy: < 2.5 m
Driller: Dynes Road Drilling
Drill Method: Cable Tool
Borelog Depth: 37.5 m Drill Date: 05-Sep-2005

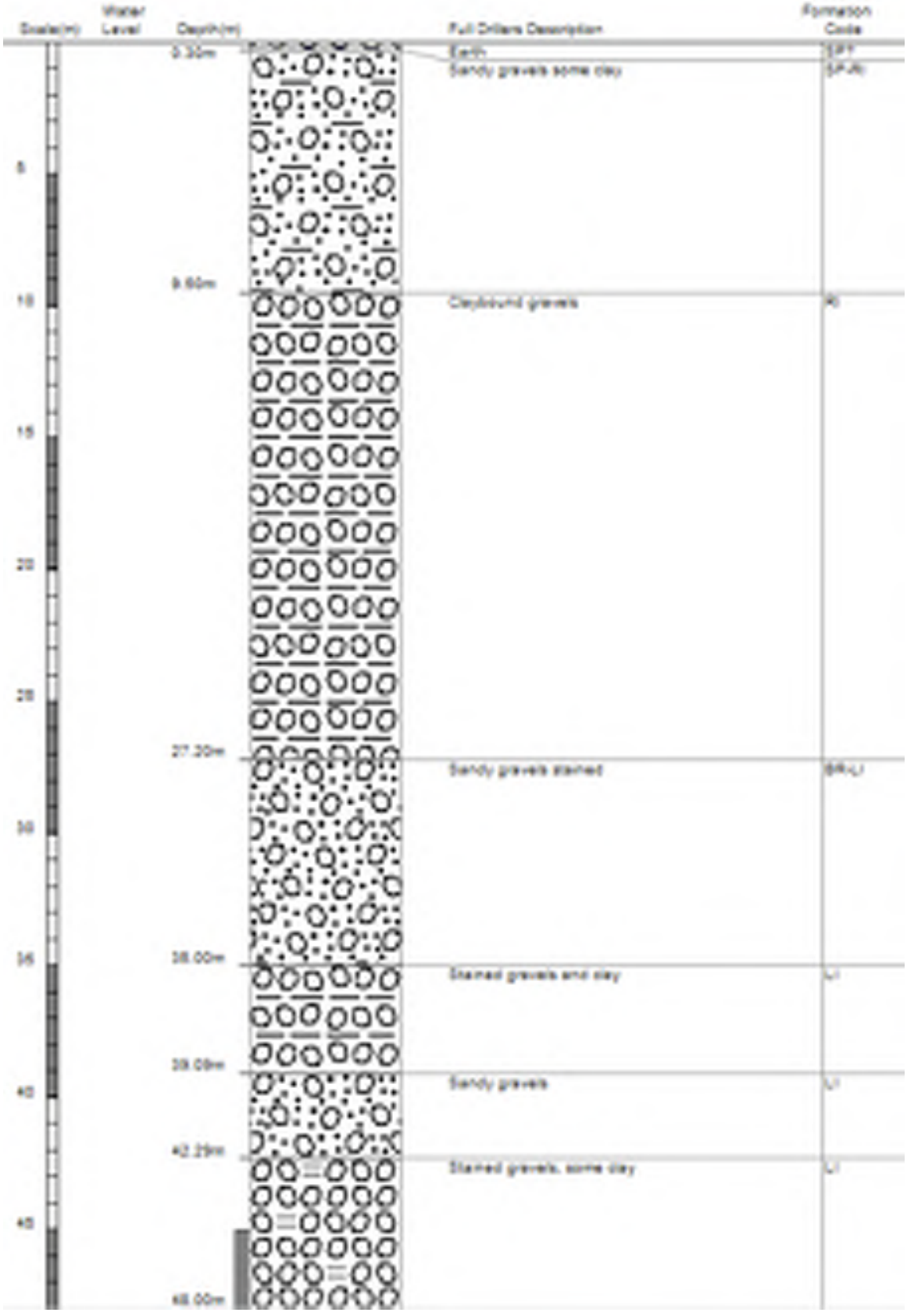
Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha



Borelog for well M36/4966

Grid Reference (NZTM): 1552787 mE, 5171558 mN
Location Accuracy: 50 - 200m
Ground Level Altitude: 38.6 m +MSD Accuracy: < 2.5 m
Driller: McMillan Drilling Ltd
Drill Method: Rotary/Percussion
Borelog Depth: 48.0 m Drill Date: 18-Aug-1995

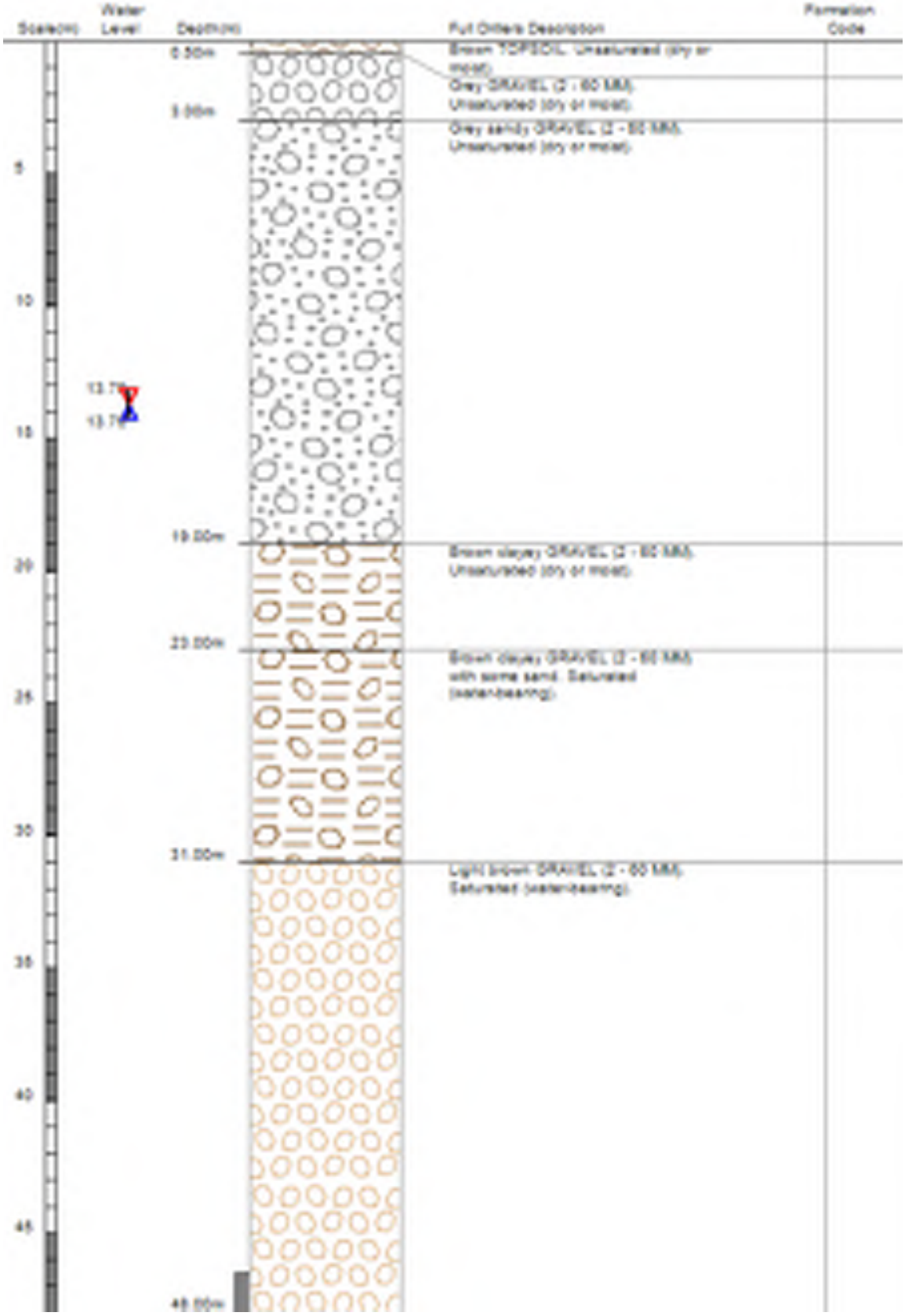
Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha



Borelog for well BX23/0533

Grid Reference (NZTM): 1552674 mE, 5171682 mN
Location Accuracy: 10 - 50m
Ground Level Altitude: m +MSD Accuracy:
Driller: East Coast Drilling
Drill Method: Air Rotary
Borelog Depth: 48.0 m Drill Date: 20-Nov-2015

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha



TEST PIT RECORD

TEST PIT NO. **TP7**

PROJECT NO. **254246**

PROJECT **Branthwaite Drive**

METHOD **TP**	CO-ORDINATES (NZTM) **E 1552186** **N 5171475**	LOGGED **T. MITCHELL**	CHECKED **A. HILLS**
MACHINE & NO. **Wheeled Excavator**		DATE **22/11/2016**	DATE **2/12/2016**
CONTRACTOR **Maugers**	GROUND LEVEL **+37.00** m RL		

STRATA			SAMPLES & TESTS		
Depth (m)	Legend	Description	Depth	No	Remarks/Tests
0.50		SILT with minor sand and trace of rootlets; dark brown. Moist, low plasticity; sand, fine. (TOPSOIL)			
1.40		SILT; light brown with orange-grey mottles. Moist, low plasticity. 1.20 - 1.40 Becomes with minor sand.			
1.70		Fine to coarse GRAVEL with minor sand, silt and cobbles; brownish grey. Moist, subrounded to rounded; sand, fine to medium.			
		End of Trial pit/trench at 1.70m, on 22/11/2016 *Termination Reason:* Target depth acheived.			

GENERAL REMARKS

SHORING/SUPPORT: **None**
STABILITY: **Generally Stable**

Groundwater not encountered.
Coordinates found using handheld GPS, likely accurate to +/- 5 m.
Ground level found using handheld GPS, likely accurate to +/- 10 m.

All dimensions in metres | CLIENT **GW Rolleston Ltd.** | Pocket Penetrometer Test | Insitu Vane Shear Test | Water Level

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TEST PIT RECORD

TEST PIT NO. **TP10**

PROJECT NO. **254246**

PROJECT **Branthwaite Drive**

METHOD **TP**	CO-ORDINATES (NZTM) **E 1552053** **N 5171529**	LOGGED **T. MITCHELL**	CHECKED **A. HILLS**
MACHINE & NO. **Wheeled Excavator**		DATE **22/11/2016**	DATE **2/12/2016**
CONTRACTOR **Maugers**	GROUND LEVEL **+43.00** m RL		

STRATA			SAMPLES & TESTS		
Depth (m)	Legend	Description	Depth	No	Remarks/Tests
0.25		SILT with minor sand and some rootlets; dark brown. Moist, low plasticity; sand, fine. (TOPSOIL)			
0.70		SILT with minor sand; light brown. Moist, low plasticity; sand, fine.			
1.60		Fine to coarse GRAVEL with some sand; greyish brown. Moist, subrounded to rounded; sand, fine to coarse.			
		End of Trial pit/trench at 1.60m, on 22/11/2016 *Termination Reason:* Target depth acheived.			

GENERAL REMARKS

SHORING/SUPPORT: **None**
STABILITY: **Generally Stable**

Groundwater not encountered.
Coordinates found using handheld GPS, likely accurate to +/- 5 m.
Ground level found using handheld GPS, likely accurate to +/- 10 m.

All dimensions in metres | CLIENT **GW Rolleston Ltd.** | Pocket Penetrometer Test | Insitu Vane Shear Test | Water Level

TEST PIT RECORD

TEST PIT NO. **TP23**

PROJECT NO. **254246**

PROJECT **Branthwaite Drive**

METHOD **TP**	CO-ORDINATES (NZTM) **E 1552359 N 5171660**	LOGGED **T. MITCHELL**	CHECKED **A. HILLS**
MACHINE & NO. **Wheeled Excavator**		DATE **23/11/2016**	DATE **5/12/2016**
CONTRACTOR **Maugers**	GROUND LEVEL **+43.00** m RL		

STRATA			SAMPLES & TESTS		
Depth (m)	Legend	Description	Depth	No	Remarks/Tests
0.25		SILT with minor sand and rootlets; dark brown. Moist, low plasticity; sand, fine. (TOPSOIL)			
0.50		Silty fine SAND with trace of rootlets; brown. Dry.			
1.60		Fine to coarse GRAVEL with some sand, minor cobbles, trace of rootlets and occasional boulders; brown. Dry, subrounded to rounded; sand, fine to coarse. 1.00 Becomes with no rootlets; greyish brown.			
		End of Trial pit/trench at 1.60m, on 23/11/2016 *Termination Reason:* Target depth acheived.			

GENERAL REMARKS

SHORING/SUPPORT: **None**
STABILITY: **Generally Stable**

Groundwater not encountered.
Coordinates found using handheld GPS, likely accurate to +/- 5 m.
Ground level found using handheld GPS, likely accurate to +/- 10 m.

All dimensions in metres | CLIENT **GW Rolleston Ltd.** | ▷▷ Pocket Penetrometer Test ⌵ Insitu Vane Shear Test | ▼ Water Level

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TEST PIT RECORD

TEST PIT NO. **TP24**

PROJECT NO. **254246**

PROJECT **Branthwaite Drive**

METHOD **TP**	CO-ORDINATES (NZTM) **E 1552208** **N 5171608**	LOGGED **T. MITCHELL**	CHECKED **A. HILLS**
MACHINE & NO. **Wheeled Excavator**		DATE **23/11/2016**	DATE **5/12/2016**
CONTRACTOR **Maugers**	GROUND LEVEL **+44.00** m RL		

STRATA			SAMPLES & TESTS		
Depth (m)	Legend	Description	Depth	No	Remarks/Tests
0.20		SILT with minor sand and tree roots (up to 10 mm); dark brown. Moist, low plasticity; sand, fine. (TOPSOIL)			
0.80		SILT with minor sand; brown. Moist, low plasticity; sand, fine.			
1.70		Fine to coarse GRAVEL with some sand, minor cobbles and trace of rootlets; light brown. Moist, subrounded to rounded; sand, medium. 1.20 Becomes with no rootlets.			
		End of Trial pit/trench at 1.70m, on 23/11/2016 *Termination Reason:* Target depth acheived.			

GENERAL REMARKS

SHORING/SUPPORT: **None**
STABILITY: **Generally Stable**

Groundwater not encountered.
Coordinates found using handheld GPS, likely accurate to +/- 5 m.
Ground level found using handheld GPS, likely accurate to +/- 10 m.

All dimensions in metres | CLIENT **GW Rolleston Ltd.** | ▷▷ Pocket Penetrometer Test ⌵ Insitu Vane Shear Test | ▼ Water Level

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TEST PIT RECORD

TEST PIT NO. **TP25**

PROJECT NO. **254246**

PROJECT **Branthwaite Drive**

METHOD **TP**	CO-ORDINATES (NZTM) **E 1552490** **N 5171658**	LOGGED **T. MITCHELL**	CHECKED **A. HILLS**
MACHINE & NO. **Wheeled Excavator**		DATE **23/11/2016**	DATE **5/12/2016**
CONTRACTOR **Maugers**	GROUND LEVEL **+44.00** m RL		

STRATA			SAMPLES & TESTS		
Depth (m)	Legend	Description	Depth	No	Remarks/Tests
0.35		SILT with minor sand and rootlets; dark brown. Moist, low plasticity; sand, fine. (TOPSOIL)			
0.70		SILT with some sand; brown. Moist, low plasticity; sand, fine.			
1.60		Fine to coarse GRAVEL with some sand and trace of rootlets; brownish grey. Moist, subrounded to rounded; sand, fine to medium. 0.70 - 0.80 Sand becomes medium to coarse, light brown. 1.30 Becomes with no rootlets.			
		End of Trial pit/trench at 1.60m, on 23/11/2016 *Termination Reason:* Target depth acheived.			

GENERAL REMARKS

SHORING/SUPPORT: **None**
STABILITY: **Generally Stable**

Groundwater not encountered.
Coordinates found using handheld GPS, likely accurate to +/- 5 m.
Ground level found using handheld GPS, likely accurate to +/- 10 m.

All dimensions in metres | CLIENT **GW Rolleston Ltd.** | ▷▷ Pocket Penetrometer Test ⌵ Insitu Vane Shear Test | ▼ Water Level

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LandTech CONSULTING

Client: Hank Developments Limited
Project: Proposed Subdivision
Address: 7/572 Selwyn Road, Rolleston

Augerhole No. HA01
Sheet No. 1 of 1

Drill Type:	8 Ton Excavator	Project No:	LTCL18051	Logged By:	BE
Drilled By:	BE	Coordinates:	NZTM: 1552177 mE, 5171418 mN	Shear Vane No:	N/A
Date Started:	6-Apr-18	Ground Conditions:	Grassed, Near level	Calibration Factor:	N/A
Date Finished:	6-Apr-18	Groundwater Level (m):	Not Encountered (6-Apr-18)	Calibration Date:	N/A

Stratigraphy	Depth (m)	Graphic Log	Soil description in accordance with *Guideline for the Field Classification and Description of Soil and Rock for Engineering Purposes*, NZ Geotechnical Society Inc., 2005
TOPSOIL	0.0		SILT, minor fine sand, minor organics, dark brown, medium dense, moist, non-plastic [TOPSOIL]
RIVER DEPOSITS	0.5		SILT, minor fine sand, yellowish brown, dense, moist, non-plastic [RIVER DEPOSITS]
	1.0		Fine to coarse subrounded greywacke gravelly fine to coarse SAND, trace subrounded greywacke cobbles, greyish brown, tightly packed, moist
	1.5		Fine to coarse subrounded greywacke GRAVEL, some to minor fine to coarse sand, greyish brown, tightly packed, moist
	2.0		Fine to coarse subrounded greywacke gravelly fine to coarse SAND, trace subrounded greywacke cobbles, greyish brown, tightly packed, moist
	2.5		
	3.0		End of Test Pit (2.6m)
	3.5		
	4.0		
	4.5		
	5.0		

Groundwater Level (m): 0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0, 4.5, 5.0

In-situ Field Testing

Shear Strength (kPa): Peak: / Remoulded: 0

Dynamic Cone Penetrometer

Depth (m)	Blow Count
-0.1	3
-0.2	4
-0.3	5
-0.4	7
-0.5	8
-0.6	10
-0.7	12
-0.8	25 +
-0.9	
-1.0	
-1.1	
-1.2	
-1.3	
-1.4	
-1.5	
-1.6	
-1.7	
-1.8	
-1.9	
-2.0	
-2.1	
-2.2	
-2.3	
-2.4	
-2.5	
-2.6	
-2.7	
-2.8	
-2.9	
-3.0	
-3.1	
-3.2	
-3.3	
-3.4	
-3.5	
-3.6	
-3.7	
-3.8	
-3.9	
-4.0	
-4.1	
-4.2	
-4.3	
-4.4	
-4.5	
-4.6	
-4.7	
-4.8	
-4.9	
-5.0	

Scala Blow Count / 100mm: 0 5 10 15 20

In-situ field testing in accordance with the following Standards:

Scala Penetrometer Testing: NZS 4402:1988, Test 6.5.2, Dynamic Cone Penetrometer

Shear Vane Testing: Guideline for Hand Held Shear Vane Test, NZGS, August 2001

NZGD ID: TP_106272

LandTech CONSULTING

Client: Hank Developments Limited
Project: Proposed Subdivision
Address: 7/572 Selwyn Road, Rolleston

Augerhole No. HA02
Sheet No. 1 of 1

Drill Type:	8 Ton Excavator	Project No:	LTCL18051	Logged By:	BE
Drilled By:	BE	Coordinates:	NZTM: 1552207 mE, 5171344 mN	Shear Vane No:	N/A
Date Started:	6-Apr-18	Ground Conditions:	Grassed, Near level	Calibration Factor:	N/A
Date Finished:	6-Apr-18	Groundwater Level (m):	Not Encountered (6-Apr-18)	Calibration Date:	N/A

Stratigraphy	Depth (m)	Graphic Log	Soil description in accordance with *Guideline for the Field Classification and Description of Soil and Rock for Engineering Purposes*, NZ Geotechnical Society Inc., 2005
TOPSOIL	0.0		SILT, minor fine sand, minor organics, dark brown, medium dense, moist, non-plastic [TOPSOIL]
RIVER DEPOSITS	0.5		SILT, minor fine sand, trace subrounded greywacke gravel, yellowish brown, dense, moist, non-plastic [RIVER DEPOSITS]
	1.0		Fine to coarse sandy fine to coarse subrounded greywacke GRAVEL, trace to minor subrounded greywacke cobbles, greyish brown, tightly packed, moist
	1.5		
	2.0		
	2.5		End of Test Pit (2.2m)
	3.0		
	3.5		
	4.0		
	4.5		
	5.0		

Groundwater Level (m)

In-situ Field Testing

Shear Strength (kPa)
Peak:
Remoulded:
0

Dynamic Cone Penetrometer
Scala Blow Count / 100mm
0 5 10 15 20

Depth (m)	Blow Count
-0.1	3
-0.2	3
-0.3	4
-0.4	7
-0.5	10
-0.6	11
-0.7	12
-0.8	10
-0.9	19
-1.0	25 +
-1.1	
-1.2	
-1.3	
-1.4	
-1.5	
-1.6	
-1.7	
-1.8	
-1.9	
-2.0	
-2.1	
-2.2	
-2.3	
-2.4	
-2.5	
-2.6	
-2.7	
-2.8	
-2.9	
-3.0	
-3.1	
-3.2	
-3.3	
-3.4	
-3.5	
-3.6	
-3.7	
-3.8	
-3.9	
-4.0	
-4.1	
-4.2	
-4.3	
-4.4	
-4.5	
-4.6	
-4.7	
-4.8	
-4.9	
-5.0	

In-situ field testing in accordance with the following Standards:
Scala Penetrometer Testing: NZS 4402:1988, Test 6.5.2, Dynamic Cone Penetrometer
Shear Vane Testing: Guideline for Hand Held Shear Vane Test, NZGS, August 2001

NZGD ID: TP_110653

LandTech CONSULTING

Client: Hank Developments Limited
Project: Proposed Subdivision
Address: 7/572 Selwyn Road, Rolleston

Augerhole No. HA03
Sheet No. 1 of 1

Drill Type:	8 Ton Excavator	Project No:	LTCL18051	Logged By:	BE
Drilled By:	BE	Coordinates:	NZTM: 1552231 mE, 5171302 mN	Shear Vane No:	N/A
Date Started:	6-Apr-18	Ground Conditions:	Grassed, Near level	Calibration Factor:	N/A
Date Finished:	6-Apr-18	Groundwater Level (m):	Not Encountered (6-Apr-18)	Calibration Date:	N/A

Stratigraphy	Depth (m)	Graphic Log	Soil description in accordance with *Guideline for the Field Classification and Description of Soil and Rock for Engineering Purposes*, NZ Geotechnical Society Inc., 2005
TOPSOIL	0.0		SILT, minor fine sand, minor organics, dark brown, medium dense, moist, non-plastic [TOPSOIL]
RIVER DEPOSITS	0.5		SILT, minor fine sand, yellowish brown, dense, moist, non-plastic [RIVER DEPOSITS]
	1.0		Fine to coarse sandy, fine to coarse subrounded greywacke GRAVEL, trace subrounded cobbles, greyish brown, tightly packed, moist
	2.5		End of Test Pit (2.3m)
	5.0		

Groundwater Level (m)

In-situ Field Testing

Shear Strength (kPa)
Peak:
Remoulded:
0

Dynamic Cone Penetrometer
Scala Blow Count / 100mm
0 5 10 15 20

Depth (m)	Blow Count
-0.1	3
-0.2	2
-0.3	4
-0.4	6
-0.5	10
-0.6	12
-0.7	25 +
-0.8	
-0.9	
-1.0	
-1.1	
-1.2	
-1.3	
-1.4	
-1.5	
-1.6	
-1.7	
-1.8	
-1.9	
-2.0	
-2.1	
-2.2	
-2.3	
-2.4	
-2.5	
-2.6	
-2.7	
-2.8	
-2.9	
-3.0	
-3.1	
-3.2	
-3.3	
-3.4	
-3.5	
-3.6	
-3.7	
-3.8	
-3.9	
-4.0	
-4.1	
-4.2	
-4.3	
-4.4	
-4.5	
-4.6	
-4.7	
-4.8	
-4.9	
-5.0	

In-situ field testing in accordance with the following Standards:
Scala Penetrometer Testing: NZS 4402:1988, Test 6.5.2, Dynamic Cone Penetrometer
Shear Vane Testing: Guideline for Hand Held Shear Vane Test, NZGS, August 2001

NZGD ID: TP_110656

LandTech CONSULTING

Client: Hank Developments Limited
Project: Proposed Subdivision
Address: 7/572 Selwyn Road, Rolleston

Augerhole No. HA04
Sheet No. 1 of 1

Drill Type:	8 Ton Excavator	Project No:	LTCL18051	Logged By:	BE
Drilled By:	BE	Coordinates:	NZTM: 1552136 mE, 5171389 mN	Shear Vane No:	N/A
Date Started:	6-Apr-18	Ground Conditions:	Grassed, Near level	Calibration Factor:	N/A
Date Finished:	6-Apr-18	Groundwater Level (m):	Not Encountered (6-Apr-18)	Calibration Date:	N/A

Stratigraphy	Depth (m)	Graphic Log	Soil description in accordance with *Guideline for the Field Classification and Description of Soil and Rock for Engineering Purposes*, NZ Geotechnical Society Inc., 2005
TOPSOIL	0.0		SILT, minor fine sand, minor organics, dark brown, medium dense, moist, non-plastic [TOPSOIL]
RIVER DEPOSITS	0.5		SILT, minor fine sand, yellowish brown, dense, moist, non-plastic [RIVER DEPOSITS]
	1.0		Fine to coarse sandy fine to coarse subrounded greywacke GRAVEL, trace to minor subrounded greywacke cobbles, greyish brown, tightly packed, moist
	1.5		
	2.0		
	2.5		End of Test Pit (2.2m)
	3.0		
	3.5		
	4.0		
	4.5		
	5.0		

Groundwater Level (m)

In-situ Field Testing

Shear Strength (kPa)
Peak:
Remoulded:
0

Dynamic Cone Penetrometer
Scala Blow Count / 100mm
0 5 10 15 20

Depth (m)	Blow Count
-0.1	3
-0.2	4
-0.3	3
-0.4	8
-0.5	10
-0.6	12
-0.7	25 +
-0.8	
-0.9	
-1.0	
-1.1	
-1.2	
-1.3	
-1.4	
-1.5	
-1.6	
-1.7	
-1.8	
-1.9	
-2.0	
-2.1	
-2.2	
-2.3	
-2.4	
-2.5	
-2.6	
-2.7	
-2.8	
-2.9	
-3.0	
-3.1	
-3.2	
-3.3	
-3.4	
-3.5	
-3.6	
-3.7	
-3.8	
-3.9	
-4.0	
-4.1	
-4.2	
-4.3	
-4.4	
-4.5	
-4.6	
-4.7	
-4.8	
-4.9	
-5.0	

In-situ field testing in accordance with the following Standards:
Scala Penetrometer Testing: NZS 4402:1988, Test 6.5.2, Dynamic Cone Penetrometer
Shear Vane Testing: Guideline for Hand Held Shear Vane Test, NZGS, August 2001

NZGD ID: TP_110658

LandTech CONSULTING

Client: Hank Developments Limited
Project: Proposed Subdivision
Address: 7/572 Selwyn Road, Rolleston

Augerhole No. HA07
Sheet No. 1 of 1

Drill Type:	8 Ton Excavator	Project No:	LTCL18051	Logged By:	BE
Drilled By:	BE	Coordinates:	NZTM: 1552139 mE, 5171345 mN	Shear Vane No:	N/A
Date Started:	6-Apr-18	Ground Conditions:	Grassed, Near level	Calibration Factor:	N/A
Date Finished:	6-Apr-18	Groundwater Level (m):	Not Encountered (6-Apr-18)	Calibration Date:	N/A

Stratigraphy	Depth (m)	Graphic Log	Soil description in accordance with *Guideline for the Field Classification and Description of Soil and Rock for Engineering Purposes*, NZ Geotechnical Society Inc., 2005
TOPSOIL	0.0		SILT, minor fine sand, minor organics, dark brown, medium dense, moist, non-plastic [TOPSOIL]
RIVER DEPOSITS	0.5		SILT, minor fine sand, yellowish brown, dense, moist, non-plastic [RIVER DEPOSITS]
	1.0		Fine to coarse sandy fine to coarse subrounded greywacke gravel, greyish brown, tightly packed, moist [RIVER DEPOSITS]
	1.5		trace to minor subrounded greywacke cobbles
	2.0		
	2.5		
	3.0		End of Test Pit (2.6m)
	3.5		
	4.0		
	4.5		
	5.0		

Groundwater Level (m)

In-situ Field Testing

Shear Strength (kPa)
Peak:
Remoulded:
0

Dynamic Cone Penetrometer

Depth (m)	Blow Count
-0.1	3
-0.2	3
-0.3	4
-0.4	6
-0.5	8
-0.6	11
-0.7	25 +
-0.8	
-0.9	
-1.0	
-1.1	
-1.2	
-1.3	
-1.4	
-1.5	
-1.6	
-1.7	
-1.8	
-1.9	
-2.0	
-2.1	
-2.2	
-2.3	
-2.4	
-2.5	
-2.6	
-2.7	
-2.8	
-2.9	
-3.0	
-3.1	
-3.2	
-3.3	
-3.4	
-3.5	
-3.6	
-3.7	
-3.8	
-3.9	
-4.0	
-4.1	
-4.2	
-4.3	
-4.4	
-4.5	
-4.6	
-4.7	
-4.8	
-4.9	
-5.0	

Scala Blow Count / 100mm
0 5 10 15 20

In-situ field testing in accordance with the following Standards:
Scala Penetrometer Testing: NZS 4402:1988, Test 6.5.2, Dynamic Cone Penetrometer
Shear Vane Testing: Guideline for Hand Held Shear Vane Test, NZGS, August 2001

NZGD ID: TP_110670

LandTech CONSULTING

Client: Hank Developments Limited
Project: Proposed Subdivision
Address: 7/572 Selwyn Road, Rolleston

Augerhole No. HA05
Sheet No. 1 of 1

Drill Type:	8 Ton Excavator	Project No:	LTCL18051	Logged By:	BE
Drilled By:	BE	Coordinates:	NZTM: 1552187 mE, 5171307 mN	Shear Vane No:	N/A
Date Started:	6-Apr-18	Ground Conditions:	Grassed, Near level	Calibration Factor:	N/A
Date Finished:	6-Apr-18	Groundwater Level (m):	Not Encountered (6-Apr-18)	Calibration Date:	N/A

Stratigraphy	Depth (m)	Graphic Log	Soil description in accordance with *Guideline for the Field Classification and Description of Soil and Rock for Engineering Purposes*, NZ Geotechnical Society Inc., 2005
TOPSOIL	0.0		SILT, minor fine sand, minor organics, dark brown, loose, moist, non-plastic [TOPSOIL]
RIVER DEPOSITS	0.5		SILT, minor fine sand, yellowish brown, medium dense, moist, non-plastic [RIVER DEPOSITS]
	1.0		Fine to coarse sandy fine to coarse subrounded greywacke GRAVEL, trace subrounded greywacke cobbles, greyish brown, tightly packed, moist
	2.0		
	2.5		End of Test Pit (2.1m)
	3.0		
	3.5		
	4.0		
	4.5		
	5.0		

Groundwater Level (m): 0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0, 4.5, 5.0

In-situ Field Testing

Shear Strength (kPa): Peak: / Remoulded: (0)

Dynamic Cone Penetrometer

Depth (m)	Blow Count
-0.1	2
-0.2	2
-0.3	3
-0.4	4
-0.5	5
-0.6	8
-0.7	8
-0.8	8
-0.9	7
-1.0	8
-1.1	
-1.2	
-1.3	
-1.4	
-1.5	
-1.6	
-1.7	
-1.8	
-1.9	
-2.0	
-2.1	
-2.2	
-2.3	
-2.4	
-2.5	
-2.6	
-2.7	
-2.8	
-2.9	
-3.0	
-3.1	
-3.2	
-3.3	
-3.4	
-3.5	
-3.6	
-3.7	
-3.8	
-3.9	
-4.0	
-4.1	
-4.2	
-4.3	
-4.4	
-4.5	
-4.6	
-4.7	
-4.8	
-4.9	
-5.0	

Scala Blow Count / 100mm (0, 5, 10, 15, 20)

In-situ field testing in accordance with the following Standards:

Scala Penetrometer Testing: NZS 4402:1988, Test 6.5.2, Dynamic Cone Penetrometer

Shear Vane Testing: Guideline for Hand Held Shear Vane Test, NZGS, August 2001

NZGD ID: TP_110660

LandTech CONSULTING

Client: Hank Developments Limited
Project: Proposed Subdivision
Address: 7/572 Selwyn Road, Rolleston

Augerhole No. HA06
Sheet No. 1 of 1

Drill Type:	8 Ton Excavator	Project No:	LTCL18051	Logged By:	BE
Drilled By:	BE	Coordinates:	NZTM: 1552211 mE, 5171252 mN	Shear Vane No:	N/A
Date Started:	6-Apr-18	Ground Conditions:	Grassed, Near level	Calibration Factor:	N/A
Date Finished:	6-Apr-18	Groundwater Level (m):	Not Encountered (6-Apr-18)	Calibration Date:	N/A

Stratigraphy	Depth (m)	Graphic Log	Soil description in accordance with *Guideline for the Field Classification and Description of Soil and Rock for Engineering Purposes*, NZ Geotechnical Society Inc., 2005
TOPSOIL	0.0		SILT, minor fine sand, minor organics dark brown, loose, moist, non-plastic [TOPSOIL]
RIVER DEPOSITS	0.5		SILT, minor to some fine sand, yellowish brown, medium dense, moist, non-plastic [RIVER DEPOSITS]
	1.0		Fine to coarse sandy fine to coarse subrounded greywacke GRAVEL, trace subrounded greywacke cobbles, greyish brown, tightly packed, moist
	1.5		
	2.0		
	2.5		End of Test Pit (2.2m)
	3.0		
	3.5		
	4.0		
	4.5		
	5.0		

Groundwater Level (m): 0.5

In-situ Field Testing

Shear Strength (kPa): Peak: / Remoulded: (0)

Dynamic Cone Penetrometer

Depth (m)	Blow Count	Scala Blow Count / 100mm (0 5 10 15 20)
-0.1	2	
-0.2	3	
-0.3	3	
-0.4	4	
-0.5	5	
-0.6	5	
-0.7	25 +	
-0.8		
-0.9		
-1.0		
-1.1		
-1.2		
-1.3		
-1.4		
-1.5		
-1.6		
-1.7		
-1.8		
-1.9		
-2.0		
-2.1		
-2.2		
-2.3		
-2.4		
-2.5		
-2.6		
-2.7		
-2.8		
-2.9		
-3.0		
-3.1		
-3.2		
-3.3		
-3.4		
-3.5		
-3.6		
-3.7		
-3.8		
-3.9		
-4.0		
-4.1		
-4.2		
-4.3		
-4.4		
-4.5		
-4.6		
-4.7		
-4.8		
-4.9		
-5.0		

In-situ field testing in accordance with the following Standards:

Scala Penetrometer Testing: NZS 4402:1988, Test 6.5.2, Dynamic Cone Penetrometer

Shear Vane Testing: Guideline for Hand Held Shear Vane Test, NZGS, August 2001

NZGD ID: TP_110661

DAVIS OGILVIE
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SHALLOW INVESTIGATION RESULTS

Job Nº 39353
Test Nº DCP 1 + HA DCP 2

Project:	19 Raptor Street, Falcons Landing, Rolleston (Lot 298 DP 532807)	**Date:**	28/08/19
Client:	Compass Homes	**Time:**	10:00 a.m.
Test Location:	Refer to attached Geotechnical Site Plan (DWG G01A)	**Excavation Method:**	DCP+HA

DEPTH (m)	STRATA DESCRIPTION	USCS	Graphic Log	Water Table
	Auger at DCP 1			
0.0	SILT; dark brown. Moist, moderately organic with trace rootlets (TOPSOIL). [0.45m]	TS		
0.5	SILT with some fine sand; yellowish brown with minor orange mottling. Stiff to very stiff, moist. [0.65m]	ML		
1.0	SILT with trace fine sand and medium gravel; yellowish orangey brown, hard, moist, low plasticity. Gravel is subrounded greywacke. [0.10m]	ML		
1.2	Auger terminated at 1.20m - Refusal on gravel.			

Groundwater Not Encountered

BLOWS / 100 mm

DEPTH (m)	DCP 1	DCP 2
0.0		
0.5		
1.0		
1.5		
2.0		
2.5		
3.0		

DCP 1: 13, 30
DCP 2: 14, 12, 12, 27, 30

Logged By:	HC+GC	**Notes:**	Dynamic Penetrometer Test and logs give an indication of the ground condition at the location of the tests only. While they are representative of typical conditions across the site, they do not identify variations in the ground away from the test locations. This log does not cover slope stability or suitability of the site for building. Dynamic Cone Penetrometer Test performed in accordance with NZS 4402 Test 6.5.2 (Procedure 1 and 2)
Plotted By:	GC		
Checked By:	HC		

NZGD ID: HA-DCP_128990

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SHALLOW INVESTIGATION RESULTS

Job Nº 39353
Test Nº DCP 3 + HA DCP 4

Project:	19 Raptor Street, Falcons Landing, Rolleston (Lot 298 DP 532807)	**Date:**	28/08/19
Client:	Compass Homes	**Time:**	10:00 a.m.
Test Location:	Refer to attached Geotechnical Site Plan (DWG G01A)	**Excavation Method:**	DCP+HA

DEPTH (m)	STRATA DESCRIPTION Auger at DCP 3	USCS	Graphic Log	Water Table
0.0	SILT; dark brown. Moist, moderately organic with trace rootlets (TOPSOIL). [0.50m]	TS		Groundwater Not Encountered
0.5	SILT with some fine sand; yellowish brown with minor orange mottling. Stiff, moist. [0.90m]	ML		
1.4	SILT with trace fine sand, yellowish orangey brown. Hard, moist, low plasticity. [0.10m]	ML		
1.5	Fine and medium SAND with some silt; greyish brown. Dense, wet. [0.10m]	SM		
1.6	SILT with trace fine sand; mottled orange and grey. Hard, moist, low plasticity. [0.10m]	ML		
1.7	Auger terminated at 1.70m - Refusal on gravel. 1.7m: Sandy fine and medium gravel recovered			

BLOWS / 100 mm

DCP 3	DCP 4
15	28
16	30
30	

Logged By:	HC+GC
Plotted By:	GC
Checked By:	HC

Notes:

Dynamic Penetrometer Test and logs give an indication of the ground condition at the location of the tests only. While they are representative of typical conditions across the site, they do not identify variations in the ground away from the test locations. This log does not cover slope stability or suitability of the site for building.

Dynamic Cone Penetrometer Test performed in accordance with NZS 4402 Test 6.5.2 (Procedure 1 and 2)

NZGD ID: HA-DCP_128990