Geotechnical Completion Report

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

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

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Miyamoto Ref: 2003576-RP-001[A]

Prepared for: Yoursection FV Ltd

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

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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.
 - \circ $\;$ 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
Тр	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.

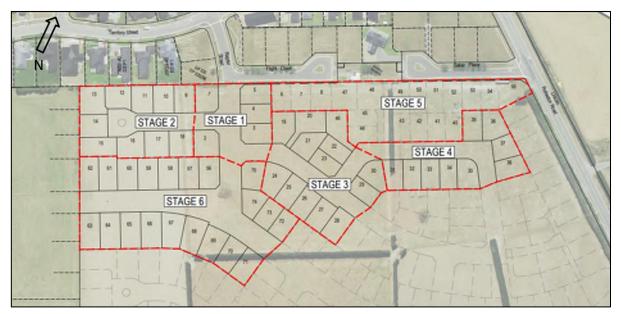


Figure 1: Site location and layout (BASE co, 15/04/23)

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 m³ 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.

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	-

Table 2: Earthworks summary

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





FOLN ROLLESTON	This drawing remains the property of Capture Land Limited and may not be reproduced or amended without written permission. No liability shall be accepted for unauthorised use of this drawing.
	LEGEND:
\sim	—-0.20 — CUT CONTOUR (0.2m)
\rightarrow	ZERO CONTOUR
36	— 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)REVDATEREVISION DETAILSISSUEDA27/11/23FOR INFORMATIONDG
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Appendix B: Laboratory Test Certificates



ROAD TECH LABORATORY LTD 205 Springs Road, Christehurch lab@roadlisch.co.nz 33:9417616

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 (Samplng method is not IANZ Accredited) NZS 4402:1986 Test 4.1.1 (Standard Compaction) Results: Moisture Content Wet Density Dry Density (% by dry mass) (kg/m ³) (kg/m ³) 14.9 2010 1750 15.7 2040 1760 16.8 2060 1770 18.1 2040 1730 0ptimum Water Content = 16.0 % Sample History: Natural. Test performed on sample passing 19.0mm (1.2% of sample removed) 12%	
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 (Samping method is not IANZ Accredited) NZS 4402:1986 Test 4.1.1 (Standard Compaction) Results: Moisture Content Wet Density Dry Density (% by dry mass) (kg/m ³) (kg/m ³) 13.0 1910 1690 14.9 2010 1750 15.7 2040 1760 16.8 2060 17770 18.1 2040 1730 20.3 Optimum Water Content = 16.0 % Sample History: Natural. Test performed on sample passing 19.0mm (1.2% of sample removed) 19.0mm (1.2% of sample removed) 19.0mm (1.2% of sample removed)	
Date of Test: 13 June 2023 Tested By: J. Tieman Sample Method: Unknown (Samplng method is not IANZ Accredited) NZS 4402:1986 Test 4.1.1 (Standard Compaction) Results: Moisture Content Wet Density Dry Density (% by dry mass) (kg/m³) (kg/m³) 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/m³ Optimum Water Content = 16.0 % Sample History: Natural. Test performed on sample passing 19.0mm (1.2% of sample removed) 19.0mm (1.2% of sample removed)	
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density of	
2000 Kg/m*	
Air Void calculation is not IANZ Accredited	
Date of Issue: 15 June 2023	
	2
Approved Signatory: Checked By: C.C.	, //
(T. O'Regan, Laboratory Manager)	, ,
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All tests reported herein have been performed in accordance with the laboratory's scope of accreditation



T 021 730 210

E gordon.hayward@pavetechlab.com

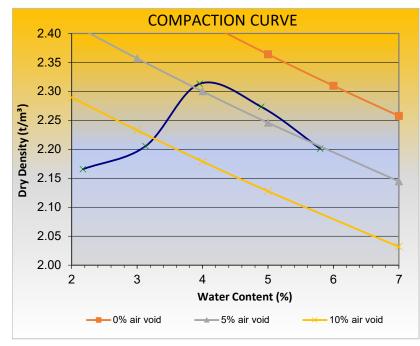
Page 1 of 1

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					
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

-M

GORDON HAYWARD BSc PGDipSci LABORATORY MANAGER - KEY TECHNCIAL PERSONNEL



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

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Appendix C: Nuclear Densometer Test Results



1/19 Repton Street, Merivale, Christchurch 8014 Phone 021898295



All tests reported herein have been performed in

Nuclear Density Report

Principal: Mike Niven

Client : Ongrade Drainage & Excavation Ltd

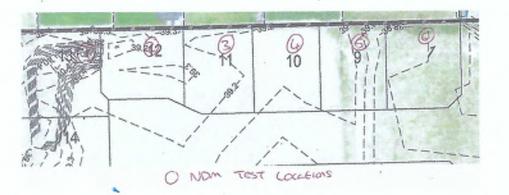
Project No: SGNT02158 Report No: CHRIW04543 Project Name: Falcons View

				Project Name: Facons view			
Testing Details			Compaction Target Details				
Site Tested:	Fill Lot 1, 9 to 13 Fi	inal 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/m3)	1.67		
Field method	s : NZS 4407:2015 Test 4.	2		Solid density:	Assumed		
Moisture Con	tent Determined by Ndm						
Test Re	sults						

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.



1/19 Repton Street, Merivale, Christchurch 8014 Phone 021898295



Nuclear Density Report

Principal: Mike Niven

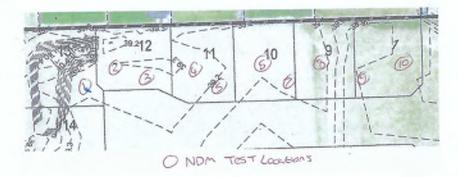
Client : Ongrade Drainage & Excavation Ltd

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

						FIDJOULIN	arrie. I arcoris v	10044	
Testing Details					Compacti	Compaction Target Details			
Site Tested: Date:	Fill Lot 1, 9 to 23/08/2023	13 Final laye	er Time:	16.00	Material Samp Max.Dry Dens	ity :	External 1.76 (t/m ³)	@ 16.0 %	
Material :	Silt				Min. Dry Dens	ity (t/m [~])	1.67		
Field methods	s: NZS 4407:2015	Test 4.2			Solid density:		Assumed		
Moisture Con	itent Determined by	Ndm							
Test Re	sults								
Si	te No	Depth (mm)	Moisture (%)	Wet D	ensity (t/m ³)	Dry De	ensity (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.



1/19 Repton Street, Merivale, Christchurch 8014 Phone 021898295



Nuclear Density Report

Principal: Mike Niven

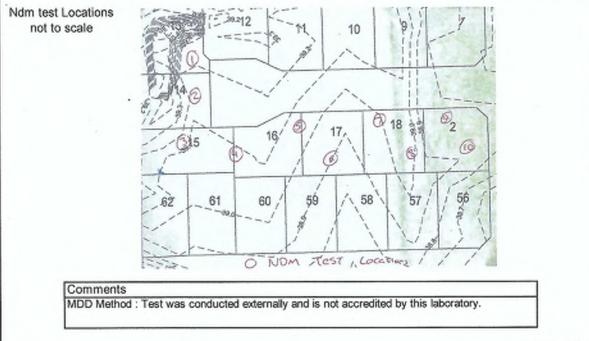
Client : Ongrade Drainage & Excavation Ltd

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

Testing D	Details			Compaction Targ	et 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/m3)	1.67	
Field methods	s : NZS 4407:2015 Test 4.	2		Solid density:	Assumed	
Moisture Con	tent 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





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All tests reported herein have been performed in accordance with the laboratory's accept of accreditation. (This document may not be altered or reproduced accept in Lift, This report relates only to the positions tested.) Approved Signatory: Stephen Gendher (Senior Technician) HNZ Accredited Laboratory Number: 1270 Date signed (7/6/23)

Nuclear Density Report

Principal: Mike Niven

Client : Ongrade Drainage & Excavation Ltd

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

Testing D	Details				Compacti	on Targe	t Details	
Site Tested:	Fill Lot 2 , 14	to 18, 56 to	62 Final laye	r	Material Samp	de ID:	External	
Date:	12/06/2023		Time:	9.30	Max.Dry Dens	ity :	1.76 (t/m ³)	@ 16.0 %
Material :	Silt				Min. Dry Dens	ity (t/m ³)	1.67	
Field methods	s: NZS 4407:2015	Test 4.2			Solid density:		Assumed	
Moisture Con	tent Determined by	y Ndm						
Test Re	sults							
Sit	te No	Depth (mm)	Moisture (%)	Wet [Density (t/m ³)	Dry Der	nsity (t/m ³)	Relative Compaction

Sile No	(mm)	(%)	wet Density (orn)	Dry Density (UM)	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

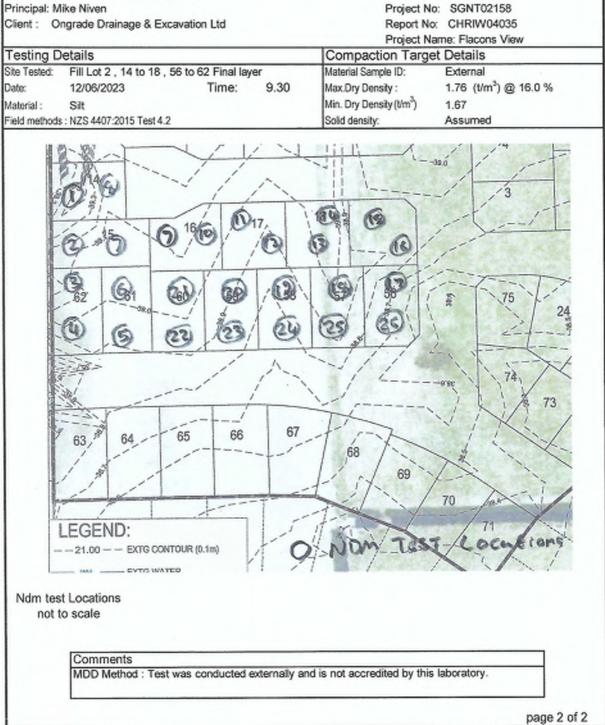
Comments

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



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Nuclear Density Report





1/19 Repton Street, Merivale, Christchurch 8014 Phone 021898295



All lists reported herein have been performed in

Nuclear Density Report

Principal: Mike Niven

Client : Ongrade Drainage & Excavation Ltd

Project No: SGNT02158 Report No: CHRIW04191 Project Name: Electors Your

	• •			Project N	lame: Flacons View	
Testing D)etails			Compaction Targ	et 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 (Vm3)	1.67	
Field methods	s : NZS 4407:2015 Test 4.2			Solid density:	Assumed	
Moisture Con	tent Determined by Ndm					
Test Re	sults					

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



O NOM TEST LOCATIONS

Ndm test Locations not to scale

Comments

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



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Nuclear Density Report

Principal: Mike Niven

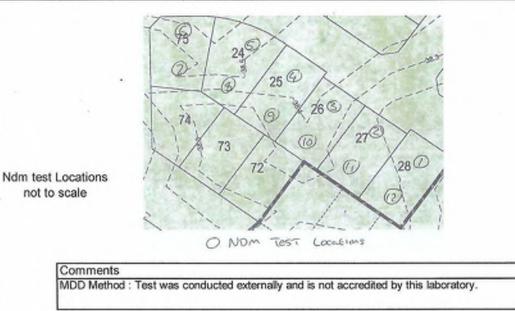
Client : Ongrade Drainage & Excavation Ltd

Project No: SGNT02158 Report No: CHRIW04246

				Project N	lame: Flacons View	
Testing D	Details			Compaction Targ	et 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/m3)	1.67	
Field methods	s : NZS 4407:2015 Test 4.2			Solid density:	Assumed	
Moisture Con	tent 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





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n Gesdr Glagher ATOF Approved Signatory: Stephen Gardner (Senior Technician) UNIZ Accredited Laboratory Number: 1270 Date signed 17/6/23

Date: 14/ Material : Silt	S Lot 24 to 28 , 72 to 75 06/2023 6 4407:2015 Test 4.2	Final layer Time:	Material Sam 16.20 Max.Dry Den Min. Dry Den Solid density:	sity: 1.76 (t/m ³) sity(1/m ³) 1.67	@ 16.0 %
Moisture Content D					
Test Result	S				
Site No	Depth (mm)	Moisture (%)	Wet Density (t/m ³)	Dry Density (Vm 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

Comments

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

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Nuclear Density Report

Principal: Mike Niven

Client : Ongrade Drainage & Excavation Ltd

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Approved Signatory: Stephen Genther (Senior Technican) WAZ Accredited Laboratory Number: 1270 Date signed 31/8/23

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

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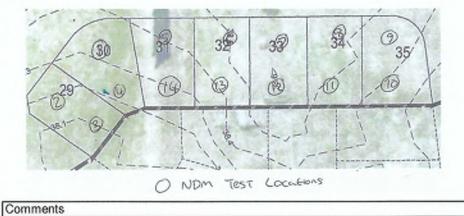
The state

Testing D	otaile			Compaction Target Details			
	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 (1/m3)	1.67		
Field methods	s : NZS 4407:2015 Test 4.2			Solid density:	Assumed		
Moisture Con	tent Determined by Ndm						
Test Re	sults						

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



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



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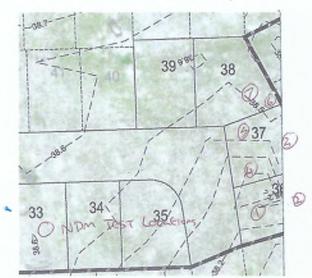
Nuclear Density Report

Principal: Mike Niven

Client : Ongrade Drainage & Excavation Ltd

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

Testing D	esting Details					Compaction Target Details			
	8/08/2023 Silt s : NZS 4407:2015 tent Determined b	5 Test 4.2	st Layer 1,3 to Time:		Material Samp Max.Dry Densi Min. Dry Densi Solid density:	ity: 1.76 (ity(t/m ³) 1.67	(t/m³) @ 16.0 %		
	e No	Depth (mm)	Moisture (%)	Wet Den	sity (t/m ³)	Dry Density (t/n	n 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.



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(Senior Technician) WNZ Accredited Laboratory Number: 1270 Date signed 31 /% 23

Nuclear Density Report Principal: Mike Niven

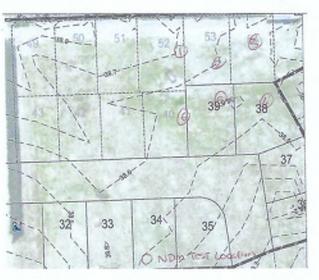
Client : Ongrade Drainage & Excavation Ltd

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

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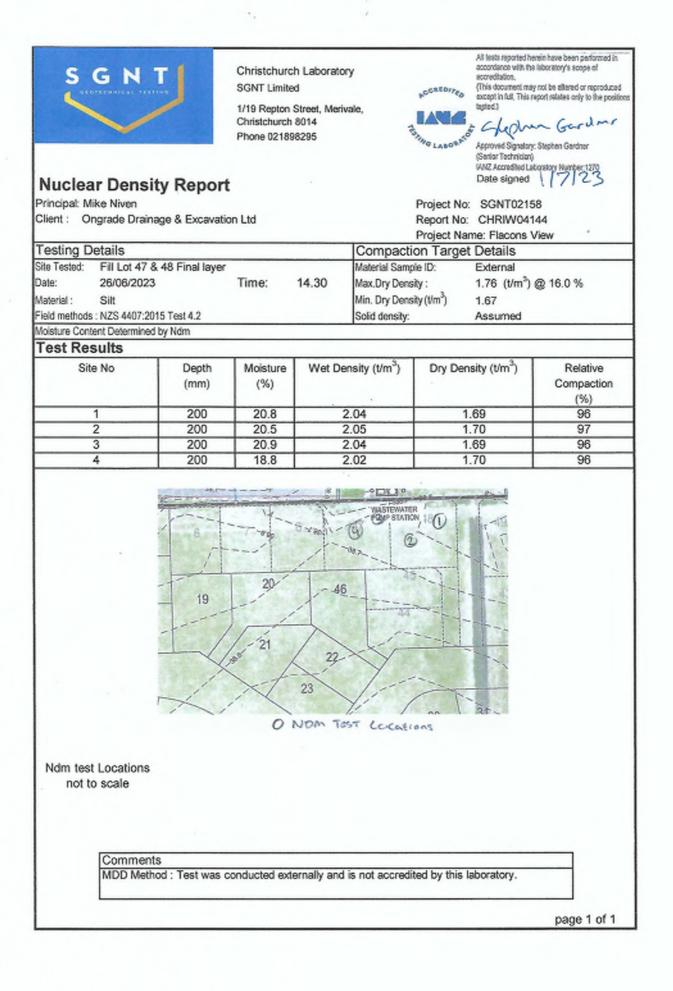
Testing D)etails				Compaction Target Details			
	Fill Lot 38 to	40 & 52 to 54			Material Sample ID: External			
Date:	8/08/2023		Time:	10.00	Max.Dry Dens	ity: 1.76 (t/m ³)	@ 16.0 %	
Material :	Silt				Min. Dry Dens	ity (t/m ³) 1.67		
Field methods	: NZS 4407:201	4407:2015 Test 4.2 Solid density: Assume			Assumed	ed		
Moisture Cont	tent Determined t	by Ndm						
Test Res	sults							
Sit	e No	Depth (mm)	Moisture (%)	Wet De	nsity (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	1 2	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.





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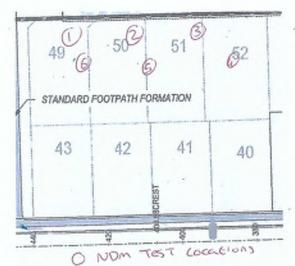
Nuclear Density Report

Principal: Mike Niven

Client : Ongrade Drainage & Excavation Ltd

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

Testing D	etails			Compacti	on Targe	et Details	
Site Tested: Date: Material : Field methods	Fill Lot 49 to 52 Fin 16/08/2023 Silt s : NZS 4407:2015 Test 4	Time:	12.34	Material Sample ID: Max.Dry Density : Min. Dry Density (t/m ³) Solid density:		External 1.76 (t/m ³), 1.67 Assumed	@ 16.0 %
Moisture Conf	tent Determined by Ndm			1			
Test Res	sults						
Sit		epth Moisture mm) (%)	Wet Der	nsity (t/m ³)	Dry De	msity (t/m ³)	Relative Compaction (%)
	1 2	200 17.5	2	2.09		1.78	101
	2 2	200 15.9	2	2.10		1.81	103
	3 2	200 14.1	2	2.18		1.91	109
	4 2	200 14.9	2	2.14		1.86	106
	4 4	14.0		2.10			
		200 18.5				1.77	101



Ndm test Locations not to scale

Comments

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



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Approved Signalory: Stephen Gardner (Seniar Technicisn) WN2 Accredited Laboratory Number: 1270 Date signed 1619123

1.83

1.85

Nuclear Density Report Principal: Mike Niven

7

8

200

200

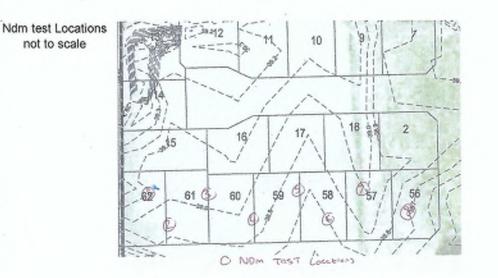
13.4

14.5

			- /			Project Name: Flac	ons View	
Testing D	Details				Compacti	on Target Detail:	S	
Site Tested: Date:	Fill Lot 56 to 5/09/2023	62 Final layer	Time:	8.10		ity: 1.76 (t	External 1.76 (t/m ³) @ 16.0 %	
Material : Silt Field methods : NZS 4407:2015 Test 4.2					Min. Dry Dens Solid density:		ed	
Moisture Cont	tent Determined by	y Ndm						
Teet D	a							
Test Res	suits							
	te No	Depth (mm)	Moisture (%)	Wet De	nsity (t/m ³)	Dry Density (t/m	Compaction	
					nsity (t/m ³)	Dry Density (t/m 1.83		
		(mm)	(%)	2			Compaction (%)	
	te No 1	(mm) 200	(%) 15.9	2	2.12	1.83	Compaction (%) 104	
Sit	1 2	(mm) 200 200	(%) 15.9 15.4	22	2.12	1.83 1.82	Compaction (%) 104 104	
Sit	1 2 3	(mm) 200 200 200	(%) 15.9 15.4 16.1	22	2.12	1.83 1.82 1.84	Compaction (%) 104 104 104	

2.07

2.12



Comments

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

page 1 of 1

104

105



1/19 Repton Street, Merivale, Christchurch 8014 Phone 021898295

Approved Signalory: Stephen Gardner (Senior Technickan) (ANZ Accordited Laboratory Number: 1270 Date signed 27/17/23

Nuclear Density Report Principal: Mike Niven

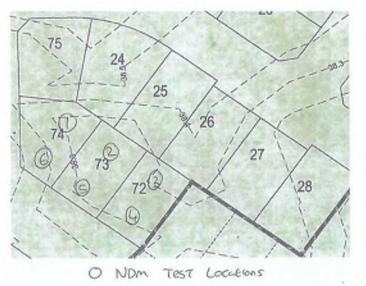
Client : Ongrade Drainage & Excavation Ltd

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

						ofeet menter i meetie ale		
Testing D	Details				Compaction Target Details			
Site Tested: Date:	Fill Lot 72 to 7 19/07/2023	74 Final layer	Time:	16.00	Material Sample Max.Dry Density		16.0 %	
Material :	Silt				Min. Dry Density	(b/m ³) 1.67		
Field methods	s: NZS 4407:2015	Test 4.2			Solid density:	Assumed		
Moisture Con	itent Determined by	y Ndm						
Test Re	sults							
Si	te No	Denth	Moisture	Wet D	ensity (t/m ³)	Dry Density (t/m ³)	Relative	

Site No	Depth (mm)	Moisture (%)	Wet Density (t/m [*])	Dry Density (t/m ²)	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



Comments

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



1/19 Repton Street, Merivale, Christchurch 8014 Phone 021898295



Nuclear Density Report

Principal: Mike Niven

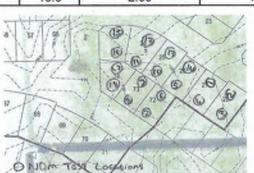
Client : Ongrade Drainage & Excavation Ltd

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

Testing D	Details		Compaction Target Details			
Site Tested: Date:	Fill Lot 24 to 28 , 72 t 14/06/2023	o 75 First layer Time:	16.20	Material Sample ID: Max.Dry Density :	External 1.76 (t/m ²) @ 16.0 %	
Material :	Silt	, and ,	10.20	Min. Dry Density (t/m3)	1.67	
Field methods	s : NZS 4407:2015 Test 4.2			Solid density:	Assumed	
Moisture Con	tent Determined by Ndm					
Test Re	sults					

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)



1/19 Repton Street, Merivale, Christchurch 8014 Phone 021898295

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(Serior Technolari) IANZ According 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

2.33

2.24

TUSIE

a.

						The rest of the rest	
Testing D	Details			Compaction Target Details			
Site Tested: Date: Material : Field method	Lot 41,42,50,51 28/08/2023 Pit run s : NZS 4407:2015 Te	Material Sample ID: Max.Dry Density : Min. Dry Density (t/m ³) Solid density:		External 2.32 (V/m ³),@ 4.0 % 2.20 Assumed			
	tent Determined by N			loons sound.			
Test Re							
Si	te No	Moisture (%)	Wet Der	nsity (t/m ³)	Dry Den	sity (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

2.45

2.36

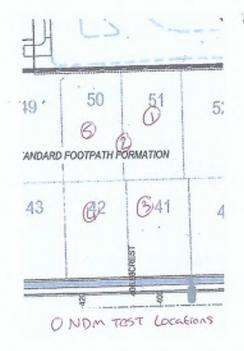
5.2

5.3

Ndm test locations not to scale

4

5



Comments

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

page 1 of 1

101

97



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All lists reported herein have been performed in accordance with the laboratory's acces of accreditation. (This document may not be altered or reproduced except in Rdl. This report relates only to the positions CORED/FED insted.] Gasdas Glag Approved Signatory: Stephen Gerdner

(Serier Technicka) INIZ Accordinal 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

Q LA

Testing Details				Compacti	on Target Deta	ils
Date: 30/08 Material : Silt Field methods : NZS 4 Moisture Content Dete			Final Layer 11.46	Material Samp Max.Dry Dens Min. Dry Dens Solid density:	ity: 1.76	(Vm³) @ 16.0 %
Test Results Site No	Depth (mm)	Moisture (%)	Wet Den	sity (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
			13			
Ndm test Locat	ions	491	Q50	51 ©	5:	

43

Ndm test Locations not to scale

Comments

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

TANDARD FOOTPATH FORMATION

42

0

O NOM TEST LOCATIONS

(6)

CREST

41

A



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Nuclear Density Report

Principal: Mike Niven Client : Ongrade Drainage & Excavation Ltd Project No: SGNT02158 Report No: CHRIW04477

2.25

2.29

2.39

					Project Na	ime: Falcons \	new
Testing Details				Compaction Target Details			
Site Tested:	Lot 41,42,50,51 Old rubbish Tip Back 22/08/2023 Time:		fill First Layer	Max.Dry Density :		External 2.32 (t/m ³) @ 4.0 %	
Date:			12.20				
Material :	Pit run			Min. Dry Density (t/m ³)		2.20	
Field methods : NZS 4407:2015 Test 4.3				Solid density:		Assumed	
Moisture Cont	tent Determined by No	ím					
Test Re:	sults						
Sit	te No	Moisture (%)	Wet Density (t/m ³)		Dry Density (t/m ³)		Relative Compaction (%)
1		6.0	2	2.38		2.24	
2		5.9	2	2.50		2.37	102

2.38

2.42

2.50

5.9

5.6

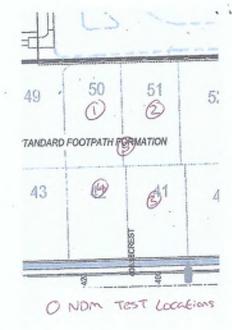
4.6

Ndm test locations not to scale

3

4

5



Comments

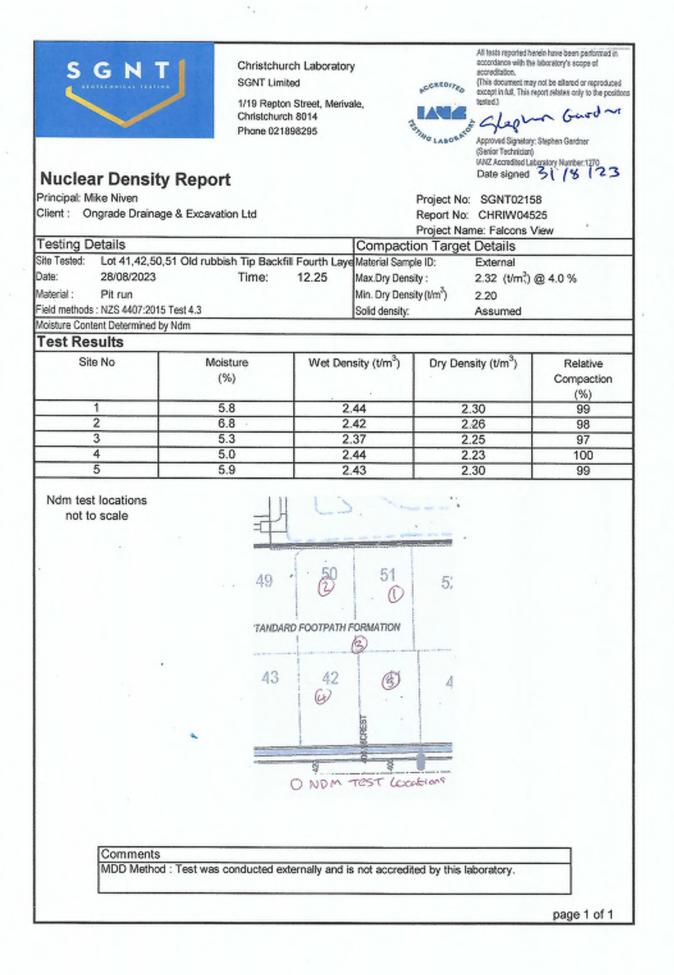
MDD Method : Test was conducted externally and is not accredited by this laboratory.

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97

99

103





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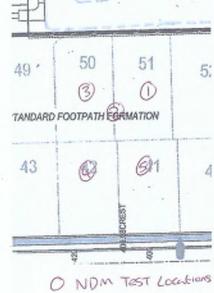
Nuclear Density Report

Principal: Mike Niven

Client : Ongrade Drainage & Excavation Ltd

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

Testing De	etails			Compacti	on Target Details	
the second s	the second s	Old rubbish Tip Backl Time:	II Second Lay 12.20		le ID: External ity: 2.32 (t/m)	č) @ 4.0 %
	NZS 4407:2015 Te	st 4.3		Solid density:	Assumed	
	nt Determined by No			our our any		
Test Res	ults					
Site	No	Moisture (%)	Wet Der	isity (t/m ³)	Dry Density (t/m ³)	Relative Compaction (%)
1	1	5.8	2	.38	2.25	97
2	2	6.3	2	.40	2.26	97
3	3	6.5	2	.37	2.22	96
4	1	5.7	2	.48	2.35	101
5	5	5.5	2	.39	2.26	97



Comments

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

page 1 of 1



Christchurch Laboratory SGNT Limited

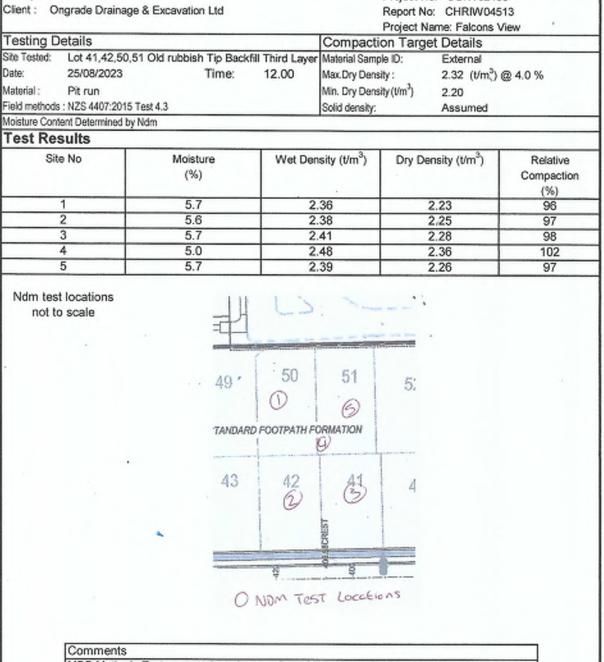
1/19 Repton Street, Merivale, Christchurch 8014 Phone 021898295



Nuclear Density Report

Principal: Mike Niven

Project No: SGNT02158 Report No: CHRIW04513



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

page 1 of 1

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 Mo	
(4	Full name) 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.
- 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 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):

 - (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 Charles McDe BEng(Hons) CMEngNZ CPEng IntPE(NZ)

Date 28 November 2023

(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):	2							
(1) Site layout plan(s) Appendix A of this G	CR (Miyamoto 2003576-RP-001[A]							
(2) Fill layout plan(s) Appendix A of this G	CR (Miyamoto 2003576-RP-001[A]							
(3) Fill section(s)								
(4) Design report Appendix F of this G	CR (Miyamoto 2003576-RP-001[A]							
(a) As-built survey:	 (5) Earthworks completion report, including the following appendices: Geotechnical (a) As-built survey; (b) Cut-fill plan (with contours); (c) Inspection and test plan; (d) Earthworks specification; 							
I confirm I am qualified as a certifier as defined	in NZS 4431:2022.							
testing as documented in the attached earthwo	I or my certifier's representative undertook inspections and rks completion report.							
tested in accordance with the attached earthworks have been documented in the earthworks com Geotechnical Based on the information available, I certify that	he attached as-built survey was placed, compacted, and orks specification and that all variations and non-compliances oletion report. t, to the best of my knowledge, the intent of the geotechnical s, and earthworks specification) has been achieved.							
The area shown on the as-built survey plan refe NZS 3604. (strike out if not relevant)	erenced above is considered suitable for development as per							
	y for normal inspection and design of foundations as would							
Certifier's signature:	Date: 28 November 2023							
Certifier's qualifications, protessional registratic BEng(Hons), CMEngNZ, CPEng (102484								

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

miyamoto.

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
А	FINAL	25 November 2020	C. Gibbens	C. McDermott

Authorisation

Author's Signature	AM	Approver's Signature	All
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

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3.	Data Sources	2
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5.	Development Considerations	4
6.	Assessment Against RMA Section 106	5
7.	Limitations	5
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A	opendices	

A. Ground Investigation Data

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.

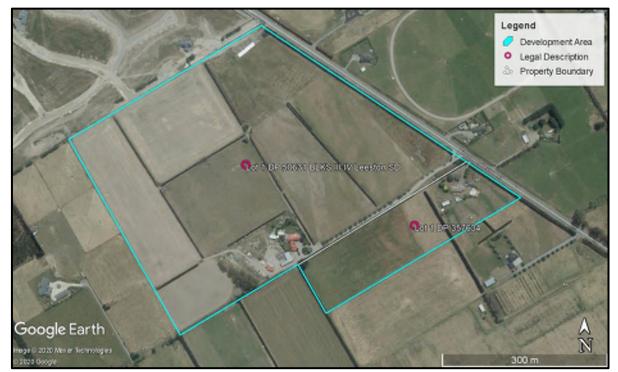


Figure 1: Site Location / Layout Plan

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	ТР	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.

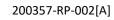
- Miyamoto's professional services are performed using a degree of care and skill reasonably exercised by reputable consultants providing the same or similar services as at the date of this report.
- The sub surface information has been obtained from investigation carried out at discrete locations, which 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

- Environment Canterbury, 2014. Canterbury Maps Viewer, <u>http://canterburymaps.govt.nz/Viewer/#webmap</u>
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- 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)

PROJECT NUMBER: CLIENT:

TESTING COMPLETED:

200357 Yoursection Ltd 17 November 2020

SHALLOW GROUND INVESTIGATION LOG

PROJECT:	151 & 153 Lincoln	Rolleston Road, Rollest	on		
LOGGED BY:	CG	TOTAL TESTING DEPTH:	0.8 mbgl	HOLE DIAMETER: 50	0 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	

	DCP Test				Soil Description					Lab Testing								Shear Vane
Depth	Results	GWL	Son Description					Sample	Atterberg Lin			imits Grain Size			e wc		Reading (kPa)	
(m)	(Blows per 100mm)		USC		Soil Characterist	ics		raphic Log	Taken	LL	PL	PI	GR	SA	FC	UW neg	peak/remoulded	
_	6			SILT; non-plast	ic, dark brown, d	ry (TOPSOIL)												
-	9 9			Sandy SILT; low sand is fine to	v plasticity, yellov medium	v-brown, dry,	/ × ×	2 X X X X 2 X X X #										
0.5 -	11 13 20						× × ×	× × × × × × × × × ×										
-	Weight Bouncing				o coarse SAND / S , dry, gravel is su			X A										
1.0 -					ARGET STRATA	REACHED)												
-		UNTERED																
1.5 – –		NOT ENCOUNTERED																
2.0 -																		
- 2.5																		
-																		
_																		
						LEGE	IND									N	50	
DCP						FRED	11 17	איי ו טוו ור	іт		GP	CD ^'	151			NOT	<u>ES</u>	
DCP HA	DYNAMIC CONI HAND AUGER	E PENEII	ONETE	R N/E UTP	NOT ENCOUNT			QUID LIM ASTIC LIN			GR SA	SANE						
па SV	SHEAR VANE			EOH	END OF HOLE			ASTIC LIN					s con	ITFN.	т			
TP	TEST PIT			UW	UNIT WEIGHT			ATER CO			V							
GWL	GROUNDWATE	R LEVEI		mbgl	METERS BELOV													

PROJECT NUMBER: CLIENT:

TESTING COMPLETED:

200357 Yoursection Ltd 17 November 2020

SHALLOW GROUND INVESTIGATION LOG

PROJECT:	151 & 153 Lincoln	Rolleston Road, Rollest	ton		
LOGGED BY:	CG	TOTAL TESTING DEPTH:	1.0 mbgl	HOLE DIAMETER: 50	0 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	

	DCP Test			Soil Description						L	ab Te	esting	g			Chann Vana	
Depth	Results	GWL			Soli Descriptio	'n			Atter	berg Li	imits	Gr	Grain Siz		wc		Shear Vane Reading (kPa)
(m)	(Blows per 100mm)		usc		Soil Characteristi	cs	Graphic Log	Taken	ш	PL	PI	GR	SA	FC	(%)	UW	peak/remoulded
_	6			SILT; non-plasti	c, dark brown, dr	y (TOPSOIL)											
	13 12			Sandy SILT; low sand is fine to r	y plasticity, yellow medium	-brown, dry,	× × × × × × × × × × × × × × × × × × ×										
0.5 -	9 7 7						× × × × × × × × × × × × × × × × ×										
	6 7						* * * * * * * * * * * * *										
1.0 -	11 Weight Bouncing			to coarse, grey subangular	coarse SAND / Sa , dry, gravel is sub ARGET STRATA	rounded to	fine										
		TERED		2011 (1													
1.5 -		NOT ENCOUNTERED															
- 2.0 -		Ň															
_ 2.5 _																	
						LEGE	ND								NO7	50	
DCP	ABBREVIATIONS		ROMFTF	R N/E	NOT ENCOUNTE	RED	LL LIQUID L	IMIT		GR	GRA	VEI			NOT	<u>ES</u>	
НА	HAND AUGER			UTP	UNABLE TO PEN		PL PLASTIC				SANE						
SV	SHEAR VANE			EOH	END OF HOLE		PI PLASTICI			FC	FINE	s cor					
ТР	TEST PIT			UW	UNIT WEIGHT	(kN/m³)	WC WATER C	ONTENT		. .	STAN	DING	G G W	L			
GWL	GROUNDWATE	R LEVEL		mbgl	METERS BELOW	GROUND LE	VEL										

PROJECT NUMBER: CLIENT:

TESTING COMPLETED:

200357 Yoursection Ltd 17 November 2020

SHALLOW GROUND INVESTIGATION LOG

PROJECT:	151 & 153 Lincoln	Rolleston Road, Rollesto	on		
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	

	DCP Test				6 H B							La	ıb Te	esting	g			
Depth	Results	GWL			Soil Descripti	on		San		Atterb	erg Liı	nits	Gr	ain Si	ize	wc		Shear Vane Reading (kPa)
(m)	(Blows per 100mm)		USC		Soil Characterist	tics		aphic Log	ken	ш	PL	PI	GR	SA	FC	(%)	UW	peak/remoulded
-	5 5 11			SILT; non-plast	ic, dark brown, d	ry (TOPSOIL)												
0.5 -	12 15 20			Sandy SILT; low sand is fine to	v plasticity, yellov medium	v-brown, dry,	, × × × × × ×	x x										
-	Weight Bouncing			to coarse, grey subangular	o coarse SAND / S , dry, gravel is su ARGET STRATA	brounded to	fine											
1.0 _		ED																
- 1.5 - - -		NOT ENCOUNTERED																
_ 2.0 _ _																		
2.5 -																		
-						LEGE	ND											
						LEGE	ND									NOT	EC	
DCP	ABBREVIATIONS DYNAMIC CON		ROMETF	R N/E	NOT ENCOUNT	ERED		UID LIMIT			GR (GRAV	'EL			NOT	<u>L3</u>	
HA	HAND AUGER	/12/1		UTP	UNABLE TO PE			ASTIC LIMIT				SAND						
SV	SHEAR VANE			EOH	END OF HOLE			ASTICITY IND	DEX		FC I			ITEN	г			
ТР	TEST PIT			UW	UNIT WEIGHT	(kN/m³)	WC WA	ATER CONTE	NT		X. 9							
GWL	GROUNDWATE	R LEVEL		mbgl	METERS BELOV	V GROUND LE	EVEL											

PROJECT NUMBER: CLIENT:

TESTING COMPLETED:

200357 Yoursection Ltd 17 November 2020

SHALLOW GROUND INVESTIGATION LOG

PROJECT:	151 & 153 Lincoln	Rolleston Road, Rollesto	on		
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	

	DCP Test										L	ab Te	esting	g			
Depth	Results	GWL			Soil Description	п		Sample	Atter	berg Li	imits	Gr	ain Si	ize	wc		Shear Vane Reading (kPa)
(m)	(Blows per 100mm)		USC		Soil Characteristi	cs	Graphic Log	Taken	LL	PL	PI	GR	SA	FC	(%)	υw	peak/remoulded
-	4 5			SILT; non-plast	ic, dark brown, dry	(TOPSOIL)											
-	7 10			Sandy SILT; low sand is fine to	v plasticity, yellow medium	·brown, dry,	× × × × × × × × × × × × × × × × × × ×										
0.5 -	11 10						× × × × × × × × × × × × × ×										
-	9 10 5			SAND; fine to r	nedium, yellow-br	own, dry											
- 1.0 -	5																
-	Weight Bouncing	<u>n</u>			o coarse SAND / Sa , dry, gravel is sub												
-		UNTERE		EOH (T	ARGET STRATA I	REACHED)											
1.5 - - -		NOT ENCOUNTERED															
2.0 -																	
- 2.5 -																	
-																	
-																	
						LEGEND											
_	ABBREVIATIONS			n •• /=						~~	67 ·				NOT	<u>ES</u>	
		E PENETI	ROMETE		NOT ENCOUNTE					GR							
	HAND AUGER SHEAR VANE			UTP EOH	UNABLE TO PEN END OF HOLE	EIRAIE PL PI	PLASTIC L			SA FC				г			
	TEST PIT			UW	UNIT WEIGHT		WATER C			N							
	GROUNDWATE			0.00		····· / V/C		CITICITY			2170	-Dive		-	L		

PROJECT NUMBER: CLIENT:

TESTING COMPLETED:

200357 Yoursection Ltd 17 November 2020

SHALLOW GROUND INVESTIGATION LOG

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

	DCP Test				Soil Descripti	on		Ι				L	ab Te	estin	9			Chone 1/mar
Depth	Results	GWL			Soli Descripti	UN			Sample	Atter	berg L	imits	Gr	ain S	ize	wc		Shear Vane Reading (kPa)
(m)	(Blows per 100mm)		USC		Soil Characteris	tics		iraphic Log	Taken	LL	PL	PI	GR	SA	FC	(%)	UW	peak/remoulde
_	5			SILT; non-plast	ic, dark brown, d	ry (TOPSOIL)												
_	7 8			Sandy SILT; low sand is fine to	v plasticity, yellov medium	v-brown, dry	', × ×	× × × × × ×										
0.5 -	15 20				o coarse SAND / S , dry, gravel is su			× × × × ×										
-	Weight Bouncing			subangular	ARGET STRATA													
- 1.0 - -																		
1.5 –		NOT ENCOUNTERED																
-		NOT ENC																
- 2.0 - -																		
-																		
2.5																		
-																		
						LEGE	END											
1	ABBREVIATIONS															NOT	<u>ES</u>	
DCP	DYNAMIC CON	E PENET	ROMETE	R N/E	NOT ENCOUNT	ERED	LL LI		TIN		GR	GRA	VEL					
HA	HAND AUGER			UTP	UNABLE TO PE	NETRATE	PL PL	ASTIC LI	IMIT		SA	SANI	D					
SV	SHEAR VANE			EOH	END OF HOLE				Y INDEX				S CON					
ТР	TEST PIT			UW	UNIT WEIGHT	(kN/m³)	WC W	ATER CO	ONTENT			STAN	NDING	GW	L			
GWL	GROUNDWATE	R LEVEL		mbgl	METERS BELOW	V GROUND LI	EVEL											

PROJECT NUMBER: CLIENT:

TESTING COMPLETED:

200357 Yoursection Ltd 17 November 2020

SHALLOW GROUND INVESTIGATION LOG

PROJECT:	151 & 153 Lincoln	Rolleston Road, Rollesto	on		
LOGGED BY:	CG	TOTAL TESTING DEPTH:	1.3 mbgl	HOLE DIAMETER: 5	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	

	DCP Test				Soil Descriptio						L	ab Te	esting	g			
Depth	Results	GWL			Soli Descriptio	'n		Sample	Atter	berg L	imits	Gr	ain S	ize	wc		Shear Vane Reading (kPa)
(m)	(Blows per 100mm)		USC		Soil Characteristi	cs	Graphic Log	Taken	LL	PL	PI	GR	SA	FC	(%)	υw	peak/remoulded
_	5 5			SILT; non-plast	ic, dark brown, dr	y (TOPSOIL)											
- - 0.5 -	4 4 6 6			Sandy SILT; low sand is fine to i	v plasticity, yellow nedium	-brown, dry,	× × × × × × ×										
	5 5 4			CAND: fine to r	nedium, yellow-b	rown dry	× × × × × × × × × × × × × × × × × ×										
1.0 -	4 5																
-	6 15	RED		to coarse, grey subangular	o coarse SAND / Sa , dry, gravel is sub ARGET STRATA	rounded to	e										
- 1.5 - - - -	Weight Bouncing	NOT ENCOUNTERED		Lon (i													
_ 2.0 _ _ _ _																	
2.5 -																	
U						LEGENI	D								I		
_	ABBREVIATIONS DYNAMIC CONE		ROMETE	R N/E	NOT ENCOUNTE			MIT		GR	GRA	VEL			NOT	<u>ES</u>	
НА	HAND AUGER			UTP	UNABLE TO PEN		PLASTIC L				SANI						
SV	SHEAR VANE			EOH	END OF HOLE	PI						S CON					
	TEST PIT			UW	UNIT WEIGHT		C WATER C	ONTENT			STAN	DING	6 GW	L			
GWL	GROUNDWATE	R LEVEL		mbgl	METERS BELOW	GROUND LEVE	EL										

PROJECT NUMBER: CLIENT:

TESTING COMPLETED:

200357 Yoursection Ltd 17 November 2020

SHALLOW GROUND INVESTIGATION LOG

PROJECT:	151 & 153 Lincoln	Rolleston Road, Rollest	on		
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	

	DCP Test				Soil Descripti	<u></u>						L	ab Te	estin	g			Charme Manage
Depth	Results	GWL			Soli Descripti	on			Sample	Atter	berg L	imits	Gr	rain S	ize	wc		Shear Vane Reading (kPa)
(m)	(Blows per 100mm)		USC		Soil Characteris	tics	C	Graphic Log	Taken	ш	PL	PI	GR	SA	FC	(%)	υw	peak/remoulded
-	5 6 8				ic, dark brown, d													
0.5 -	20 Weight Bouncing			sand is fine to i Gravelly fine to to coarse, grey subangular	o coarse SAND / S , dry, gravel is su	andy Gravel brounded to	l; fine											
- - 1.0 -				EOH (T	ARGET STRATA	REACHED))											
- - 1.5 - -		NOT ENCOUNTERED																
- 2.0 - -		2																
- 2.5 - -																		
-						LEG	END											
	ABBREVIATIONS															NOT	ES	
DCP	DYNAMIC CON	E PENETI	ROMETE	R N/E	NOT ENCOUNT	ERED	LL L	IQUID LII	МІТ		GR	GRA	VEL					
HA	HAND AUGER			UTP	UNABLE TO PE	NETRATE	PL P	LASTIC L	IMIT		SA	SAN	D					
SV	SHEAR VANE			EOH	END OF HOLE		PI P	LASTICIT	Y INDEX		FC							
TP	TEST PIT			UW	UNIT WEIGHT	(kN/m³)	WC V	VATER CO	ONTENT		. <u></u> .	STAN	DING	G G W	L			
GWL	GROUNDWATE	R LEVEL		mbgl	METERS BELOV	V GROUND L	LEVEL											

PROJECT NUMBER: CLIENT:

TESTING COMPLETED:

200357 Yoursection Ltd 17 November 2020

SHALLOW GROUND INVESTIGATION LOG

PROJECT:	151 & 153 Lincoln	Rolleston Road, Rollesto	on		
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	

	DCP Test										L	ab Te	estin	g			<i>a</i>
Depth	Results	GWL			Soil Descriptio	n		Sample	Atter	berg L	imits	Gr	ain S	ize	wc		Shear Vane Reading (kPa)
(m)	(Blows per 100mm)		USC		Soil Characteristi	cs	Graphic Log	Taken	LL	PL	PI	GR	SA	FC	(%)	υw	peak/remoulded
-	5				ic, dark brown, dry												
-	8			Sandy SILT; low sand is fine to r	<pre>/ plasticity, yellow medium</pre>	·brown, dry,	× × × × × × × × × × ×										
0.5	Weight Bouncing				o coarse SAND / Sa , dry, gravel is sub		ne """"""""""""""""""""""""""""""""""""										
-				EOH (T	ARGET STRATA	REACHED)											
- 1.0 -																	
- 1.5 - -		NOT ENCOUNTERED															
- - 2.0 -		NOT															
- 2.5 -																	
-																	
		<u>. </u>		l		LEGEN	D	I		1			I	I	I	I	I
-	ABBREVIATIONS									_	_				NOT	ES	
		E PENETI	ROMETE	R N/E UTP			LIQUID L PLASTIC			GR	GRAV SANI						
HA SV	HAND AUGER SHEAR VANE			EOH	UNABLE TO PEN END OF HOLE			TY INDEX				S S CON	NTEN	т			
TP	TEST PIT			UW	UNIT WEIGHT		C WATER (.							
	GROUNDWATE	R LEVEL		mbgl	METERS BELOW												

PROJECT NUMBER: CLIENT:

TESTING COMPLETED:

200357 Yoursection Ltd 17 November 2020

SHALLOW GROUND INVESTIGATION LOG

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

	DCP Test				Soil Descripti	0.0						L	ab Te	estin	g			Shear Vane
Depth	Results (Blows per	GWL			Son Descripti	011			Sample	Atter	berg L	imits	Gr	ain S	ize	wc		Reading (kPa)
(m)	(Blows per 100mm)		usc		Soil Characteris	tics		iraphic Log	Taken	ш	PL	PI	GR	SA	FC	(%)	υw	peak/remoulded
-	5 4 5			SILT; non-plasti	ic, dark brown, d	ry (TOPSOIL)												
0.5 -	6 7 8			sand is fine to r			× × ×	× × × × × × × × × × × ×										
-	7 16			to coarse, grey, subangular	o coarse SAND / S , dry, gravel is su ARGET STRATA	brounded to	30											
- 1.0 - -	Weight Bouncing					REACHED												
_ _ 1.5 _ _ _		NOT ENCOUNTERED																
_ 2.0 _ _																		
2.5																		
-																		
						LEGE	IND									NOT	EC	
-	ABBREVIATIONS DYNAMIC CONI		ROMFTF	R N/E	NOT ENCOUNT	ERED	LL LI	יי ו מועס	MIT		GR	GRA	VEL			<u>NOT</u>	<u>E3</u>	
НА	HAND AUGER	• 1		UTP	UNABLE TO PE		PL PL				SA							
SV	SHEAR VANE			EOH	END OF HOLE				Y INDEX		FC			ITEN	т			
ТР	TEST PIT			UW	UNIT WEIGHT	(kN/m³)	WC W	ATER CO	ONTENT			STAN	IDING	6 GW	L			
GWL	GROUNDWATE	R LEVEL		mbgl	METERS BELOW	V GROUND L	EVEL											

PROJECT NUMBER: CLIENT:

TESTING COMPLETED:

200357 Yoursection Ltd 17 November 2020

SHALLOW GROUND INVESTIGATION LOG

PROJECT:	151 & 153 Lincoln	Rolleston Road, Rollest	on		
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	

	DCP Test				Soil Descripti							L	ab Te	estin	g			Charm Maria
Depth	Results (Blows per	GWL			Soil Descripti	UN			Sample	Atter	berg L	imits	Gr	ain S	ize	wc		Shear Vane Reading (kPa)
(m)	(Blows per 100mm)		usc		Soil Characteris	tics		Graphic Log	Taken	ш	PL	PI	GR	SA	FC	(%)	υw	peak/remoulded
-	5 4 4			SILT; non-plast	ic, dark brown, d	ry (TOPSOIL)												
0.5 -	2 7 16			Sandy SILT; low sand is fine to i	v plasticity, yellov medium	v-brown, dry	Ι,	* * * * * * * * * * * * * * * * *										
-	Weight Bouncing			to coarse, grey subangular	o coarse SAND / S , dry, gravel is su ARGET STRATA	brounded to												
1.0 -		RED																
- 1.5 - - -		NOT ENCOUNTERED																
2.0 -																		
2.5 -																		
						LEGE	END									1		
	ABBREVIATIONS															NOT	<u>ES</u>	
DCP	DYNAMIC CON	E PENET	ROMETE		NOT ENCOUNT			LIQUID LI			GR							
HA	HAND AUGER			UTP	UNABLE TO PE	NETRATE		PLASTIC L				SAN			_			
SV	SHEAR VANE			EOH	END OF HOLE	/LAL/31		PLASTICIT			FC		S CON					
TP	TEST PIT			UW	UNIT WEIGHT			WATER C	UNIENT		.	STAN	DING	5 GW	L			
GWL	GROUNDWATE	N LEVEL		mbgl	METERS BELOW		LVEL									<u> </u>		

PROJECT NUMBER: CLIENT:

TESTING COMPLETED:

200357 Yoursection Ltd 17 November 2020

SHALLOW GROUND INVESTIGATION LOG

PROJECT:	151 & 153 Lincoln	Rolleston Road, Rollest	on		
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	

	DCP Test				Soil Descripti						L	ab Te	estin	g			Shear Vane
Depth	Results (Blows per	GWL			Soli Descripti	on		Sample	Atter	berg L	imits	Gr	ain S	ize	wc		Reading (kPa)
(m)	(Blows per 100mm)		usc		Soil Characteris	tics	Graphic Log	Taken	ш	PL	PI	GR	SA	FC	(%)	UW	peak/remoulde
-	8 9 7			SILT; non-plast	ic, dark brown, d	ry (TOPSOIL)											
- 0.5 -	7 11 20			Sandy SILT; low sand is fine to i	v plasticity, yellov medium	w-brown, dry,	× × × × × × × × × × × × × × × × × × ×	22 (2									
-	Weight Bouncing			to coarse, grey subangular	o coarse SAND / S , dry, gravel is su ARGET STRATA	brounded to	ne <u>statata</u>										
1.0 - -		0															
- 1.5 - -		NOT ENCOUNTERED															
- 2.0 - -																	
2.5 -																	
-						LEGEN	ID										
	ABBREVIATIONS														NOT	ES	
DCP	DYNAMIC CON		ROMETE	R N/E	NOT ENCOUNT	ERED L	L LIQUID L	IMIT		GR	GRA	VEL					
HA	HAND AUGER			UTP	UNABLE TO PE		L PLASTIC				SANI						
SV	SHEAR VANE			EOH	END OF HOLE			ITY INDEX		FC			ITEN	т			
TP	TEST PIT			UW	UNIT WEIGHT	(kN/m³) V	VC WATER	CONTENT			STAN	DING	G G W	L			
	GROUNDWATE			mbgl	METERS BELOV												

miyamoto. Engineerst Client:

PROJECT NUMBER: CLIENT:

TESTING COMPLETED:

200357 Yoursection Ltd 17 November 2020

SHALLOW GROUND INVESTIGATION LOG

PROJECT:	151 & 153 Lincoln	Rolleston Road, Rollest	on		
LOGGED BY:	CG	TOTAL TESTING DEPTH:	0.8 mbgl	HOLE DIAMETER: 50	i0 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	

	DCP Test				Coil Deceminti						L	ab Te	estin	g			<i>ci v</i>
Depth	Results	GWL			Soil Description	on		Sample	Atter	berg L	imits	Gr	rain S	ize	wc		Shear Vane Reading (kPa)
(m)	(Blows per 100mm)		USC		Soil Characterist	ics	Graphic Log	Taken	LL	PL	PI	GR	SA	FC	(%)	υw	peak/remoulded
-	5			SILT; non-plast	ic, dark brown, d	ry (TOPSOIL)											
-	9 13			Sandy SILT; low sand is fine to i	v plasticity, yellov medium	v-brown, dry,	× × × × × × × × × × × × × × × × × × ×										
0.5 -	11 7						* * * * *										
-	8			to coarse, grey subangular	o coarse SAND / S , dry, gravel is su	brounded to											
- 1.0 -	Weight Bouncing			EOH (T	ARGET STRATA	REACHED)											
-		0															
- - 1.5 -		NOT ENCOUNTERED															
1.5 -		DT ENCO															
-		Ň															
2.0 -																	
-																	
- 2.5 -																	
-																	
_																	
						LEGEND)										
/	ABBREVIATIONS														NOT	ES	
	DYNAMIC CON	E PENETI	ROMETE		NOT ENCOUNT					GR							
	HAND AUGER			UTP	UNABLE TO PE		PLASTIC				SANI			-			
	SHEAR VANE			EOH	END OF HOLE	PI (kN1/m ³) A/(FC							
TP	TEST PIT			UW	UNIT WEIGHT	(KN/m²) WC	C WATER C	ONTENT.			SIAN	NDING	5 GW	L	I		

PROJECT NUMBER: CLIENT:

TESTING COMPLETED:

200357 Yoursection Ltd 17 November 2020

SHALLOW GROUND INVESTIGATION LOG

PROJECT:	151 & 153 Lincoln	Rolleston Road, Rollest	on		
LOGGED BY:	CG	TOTAL TESTING DEPTH:	0.9 mbgl	HOLE DIAMETER: 5	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	

	DCP Test				Soil Descripti	o.n.						L	ab Te	esting	g			Charme Maria
Depth	Results	GWL			Soil Descripti	UN			Sample	Atter	berg L	imits	Gr	ain S	ize	wc		Shear Vane Reading (kPa)
(m)	(Blows per 100mm)		usc		Soil Characteris	tics	(Graphic Log	Taken	LL	PL	PI	GR	SA	FC	(%)	UW	peak/remoulded
-	6 5 8			SILT; non-plast	ic, dark brown, d	ry (TOPSOIL))											
0.5 -	15 21			Sandy SILT; low sand is fine to i	v plasticity, yellov medium	w-brown, dr	y, ×	× × × × × × × × × × × × × × ×										
-	Weight Bouncing				nedium, yellow-b			X X X										
1.0 -				to coarse, grey subangular	o coarse SAND / S , dry, gravel is su ARGET STRATA	brounded to)											
- 1.5 - -		NOT ENCOUNTERED																
- 2.0 - -																		
2.5 -																		
-																		
						LEG	END									1		
			DONALTE			ERED		יי י סוו וסו			CP	CDAY				NOT	<u>ES</u>	
DCP HA	DYNAMIC CON HAND AUGER	E PENEII	KUIVIETE	R N/E UTP	NOT ENCOUNT			IQUID LIN			GR SA							
на SV	SHEAR VANE			EOH	END OF HOLE	INCIRALE					SA FC				г			
TP	TEST PIT			UW	UNIT WEIGHT	(kN/m³)		VATER CO			7							
GWL	GROUNDWATE			mbgl	METERS BELOV													

PROJECT NUMBER: CLIENT:

TESTING COMPLETED:

200357 Yoursection Ltd 17 November 2020

SHALLOW GROUND INVESTIGATION LOG

PROJECT:	151 & 153 Lincoln	Rolleston Road, Rollest	on		
LOGGED BY:	CG	TOTAL TESTING DEPTH:	0.5 mbgl	HOLE DIAMETER: 50	0 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	

	DCP Test				Soil Descripti							L	ab Te	estin	g			Shear Vane
Depth	Results (Plaus par	GWL			Son Description)n			Sample	Atter	berg L	imits	Gr	ain S	ize	wc		Reading (kPa)
(m)	(Blows per 100mm)		usc		Soil Characterist	ics	0	Graphic Log	Taken	ш	PL	PI	GR	SA	FC	(%)	UW	peak/remoulded
-	8 15 15 Weight				ic, dark brown, d / plasticity, yellov medium		, ×	* * *										
0.5 -	Bouncing			to coarse, grey subangular	o coarse SAND / S , dry, gravel is su ARGET STRATA	brounded to	<u></u>	× ×										
- 1.0 - -		0																
- 1.5 - -		NOT ENCOUNTERED																
- 2.0 -																		
2.5 -																		
	ABBREVIATIONS					LEGE	UND.									NOT	FS	
DCP	DYNAMIC CONE		ROMETE	R N/E	NOT ENCOUNT	ERED	LL LI	IQUID LI	МІТ		GR	GRA	VEL			101	<u>LJ</u>	
HA	HAND AUGER			UTP	UNABLE TO PEI			LASTICL				SANI						
SV	SHEAR VANE			EOH	END OF HOLE				Y INDEX		FC			ITEN.	г			
ТР	TEST PIT			UW	UNIT WEIGHT	(kN/m³)			ONTENT		. 	STAN		GW	L			
GWL	GROUNDWATE	R LEVEL		mbgl	METERS BELOV		EVEL											

PROJECT NUMBER: CLIENT:

TESTING COMPLETED:

200357 Yoursection Ltd 17 November 2020

SHALLOW GROUND INVESTIGATION LOG

PROJECT:	ROJECT: 151 & 153 Lincoln Rolleston Road, Rolleston								
LOGGED BY:	CG	TOTAL TESTING DEPTH:	1.0 mbgl	HOLE DIAMETER: 5	i0 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	Lab Testing							Channe Marra	
			Soil Description			Atterberg Limits			Gr	Grain Size		wc		Shear Vane Reading (kPa)			
			USC		Soil Characterist	tics	Graphic Log	Taken	ш	LL PL PI	PI	GR	SA	FC	(%)	UW	peak/remoulded
0.5 -	7 6 4 4 5 6 4 6				c, dark brown, d plasticity, yellov nedium												
- - 1.0 - - -	9 20 Weight Bouncing	NOT ENCOUNTERED		to coarse, grey, subangular	coarse SAND / S dry, gravel is su ARGET STRATA	brounded to	ne										
- 1.5 - - -																	
_ 2.0 _ _ _																	
2.5																	
I						LEGEN	D	1	1				8	8			
DCP HA SV TP	ABBREVIATIONS DYNAMIC CONE PENETROMETER HAND AUGER SHEAR VANE TEST PIT			R N/E UTP EOH UW	NOT ENCOUNT UNABLE TO PEI END OF HOLE UNIT WEIGHT	ERED L NETRATE P P	L LIQUID L L PLASTIC I I PLASTICI VC WATER C	LIMIT TY INDEX	T						NOT	<u>ES</u>	

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PROJECT NUMBER: CLIENT:

TESTING COMPLETED:

200357 Yoursection Ltd 17 November 2020

SHALLOW GROUND INVESTIGATION LOG

PROJECT:	151 & 153 Lincoln	Rolleston Road, Rollesto	on		
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	

	DCP Test											L	ab Te	esting	g			<i>a</i>
Depth	Results	GWL			Soil Descripti	on			Sample	Atter	berg L	imits	Gr	ain S	ize	wc		Shear Vane Reading (kPa)
(m)	(Blows per 100mm)		USC		Soil Characteris	tics		Graphic Log	Taken	ш	PL	PI	GR	SA	FC	(%)	υw	peak/remoulded
_	5			SILT; non-plast	ic, dark brown, d	ry (TOPSOIL)	-) >											
	11 20			Sandy SILT; low sand is fine to i	<pre>/ plasticity, yellow medium</pre>	v-brown, dr	т у,	× × × × ×										
0.5 -	Weight Bouncing						:	* * * * * * * * * * * * * * *										
-				to coarse, grey	o coarse SAND / S , dry, gravel is su			× × × ×										
- 1.0 -				subangular EOH (TARGET STRATA	REACHED)												
-		TERED																
1.5 -		NOT ENCOUNTERED																
-		N																
2.0 -																		
-																		
2.5 -																		
-																		
						LEG	END			1								
	ABBREVIATIONS															NOT	<u>ES</u>	
DCP	DYNAMIC CON		ROMETE	R N/E	NOT ENCOUNT	ERED	LL	LIQUID LI	MIT		GR	GRA	VEL					
HA	HAND AUGER			UTP	UNABLE TO PE	NETRATE	PL	PLASTIC L	IMIT		SA	SANI	D					
SV	SHEAR VANE			EOH	END OF HOLE			PLASTICIT			FC							
TP	TEST PIT			UW	UNIT WEIGHT			WATER C	ONTENT	1		STAN	DING	GW	L			
GWL	GROUNDWATE	R LEVEL		mbgl	METERS BELOV	V GROUND I	LEVEL											

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PROJECT NUMBER: CLIENT:

TESTING COMPLETED:

200357 Yoursection Ltd 17 November 2020

SHALLOW GROUND INVESTIGATION LOG

PROJECT:	151 & 153 Lincoln	Rolleston Road, Rollesto	on		
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	

	DCP Test epth Results				Soil Descripti	0.12						Lo	ab Te	esting	g			Charm Mara a
Depth	Results	GWL			Soli Descripti	on			Sample	Atter	berg Li	imits	Gr	ain S	ize	wc		Shear Vane Reading (kPa)
(m)	(Blows per 100mm)		USC		Soil Characteris	tics		raphic Log	Taken	LL	PL	PI	GR	SA	FC	(%)	UW	peak/remoulded
0.5	4 3 3 4 4 4 4				ic, dark brown, d v plasticity, yellov medium													
-	5 20 Weight Bouncing			to coarse, grey subangular) coarse SAND / S , dry, gravel is su TARGET STRATA	brounded to												
1.0 — — — —		ITERED				·												
1.5		NOT ENCOUNTERED																
2.0																		
2.5 -																		
						LEGE	ND											
-	ABBREVIATIONS			- /-												NOT	<u>ES</u>	
	DYNAMIC CONE	E PENETI	ROMETE		NOT ENCOUNT		LL LIC				GR							
	HAND AUGER			UTP	UNABLE TO PE		PL PL					SANE		ITC	-			
	SHEAR VANE			EOH	END OF HOLE UNIT WEIGHT				Y INDEX		FC							
	TEST PIT GROUNDWATE			UW mbgl	METERS BELOV		WC W	MIERU			···¥····	JIAN	UING		L			

miyamoto. Engineerst Client: Testing

PROJECT NUMBER: CLIENT:

TESTING COMPLETED:

200357 Yoursection Ltd 17 November 2020

SHALLOW GROUND INVESTIGATION LOG

PROJECT:	151 & 153 Lincoln	Rolleston Road, Rollest	on		
LOGGED BY:	CG	TOTAL TESTING DEPTH:	0.4 mbgl	HOLE DIAMETER: 50	0 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	

	DCP Test	loculto			Soil Descripti							L	ab Te	estin	g			Charme Marrie
Depth	Results	GWL			Soli Descriptio	UN			Sample	Atter	berg L	imits	Gr	rain S	ize	wc		Shear Vane Reading (kPa)
(m)	(Blows per 100mm)		USC		Soil Characterist	tics		aphic Log	Taken	ш	PL	PI	GR	SA	FC	(%)	UW	peak/remoulded
-	5 8 20			SILT; non-plast	ic, dark brown, d	ry (TOPSOIL)												
- 0.5 - - -	Weight Bouncing			to coarse, grey subangular	o coarse SAND / S , dry, gravel is su ARGET STRATA	brounded to	<u> </u>											
- - 1.0 -																		
- - 1.5 - -		NOT ENCOUNTERED																
- 2.0 - -																		
- 2.5 - - -																		
-																		
						LEGE	END											
-	ABBREVIATIONS															NOT	ES	
	DYNAMIC CON	E PENET	ROMETE		NOT ENCOUNT			UID LIN			GR							
HA	HAND AUGER			UTP	UNABLE TO PE	NETRATE	PL PL				SA				-			
SV TP	SHEAR VANE			EOH	END OF HOLE UNIT WEIGHT	(kN/m ³)	PI PL/ WC W/				FC							
112	TEST PIT			UW	UNIT WEIGHT	(KIN/11°)	VVC VVA	ALEK CO				SIAN	NING	9 G VV	L	I .		

miyamoto. Engineerst Client: Consultants

PROJECT NUMBER: CLIENT:

TESTING COMPLETED:

200357 Yoursection Ltd 17 November 2020

SHALLOW GROUND INVESTIGATION LOG

PROJECT:	151 & 153 Lincoln	Rolleston Road, Rollest	on		
LOGGED BY:	CG	TOTAL TESTING DEPTH:	0.4 mbgl	HOLE DIAMETER: 50	0 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	

	DCP Test				Soil Description Sample Lab Testing				g									
Depth	Results	GWL			Soll Description	on			Sample	Atter	berg L	imits	Gr	ain S	ize	wc		Shear Vane Reading (kPa)
(m)	(Blows per 100mm)		USC		Soil Characterist	tics		Graphic Log	Taken	ш	PL	PI	GR	SA	FC	(%)	uw	peak/remoulded
-	5 5 20			SILT; non-plast	ic, dark brown, d	ry (TOPSOIL))											
0.5 -				to coarse, grey subangular	o coarse SAND / S , dry, gravel is su ARGET STRATA	brounded to)											
- - 1.0 -	Weight Bouncing																	
- 1.5 - -		NOT ENCOUNTERED																
- 2.0 - -																		
2.5 -																		
-						LEG	END											
	ABBREVIATIONS															NOT	<u>ES</u>	
DCP	DYNAMIC CON	E PENETI	ROMETE	R N/E	NOT ENCOUNT	ERED	LL	LIQUID LI	MIT		GR	GRA	VEL					
HA	HAND AUGER			UTP	UNABLE TO PE	NETRATE	PL	PLASTIC L	IMIT		SA	SAN	D					
SV	SHEAR VANE			EOH	END OF HOLE			PLASTICIT			FC							
TP	TEST PIT			UW	UNIT WEIGHT			WATER C	ONTENT	•	. .	STAN	IDING	6 GW	L			
GWL	GROUNDWATE	R LEVEL		mbgl	METERS BELOV	V GROUND L	LEVEL											

miyamoto. Engineerst Client: Consultants

PROJECT NUMBER: CLIENT:

TESTING COMPLETED:

200357 Yoursection Ltd 17 November 2020

SHALLOW GROUND INVESTIGATION LOG

PROJECT:	151 & 153 Lincoln	Rolleston Road, Rollesto	on		
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	

	DCP Test				Coil Deceminti						L	ab Te	esting	g			<i>a</i>
Depth	Results	GWL			Soil Description	on		Sample	Atter	berg L	imits	Gr	ain S	ize	wc		Shear Vane Reading (kPa)
(m)	(Blows per 100mm)		USC		Soil Characterist	ics	Graphic Log	Taken	ш	PL	PI	GR	SA	FC	(%)	υw	peak/remoulded
-	4 3 4				ic, dark brown, d												
0.5 -	4 7 16 17 13			sand is fine to	v plasticity, yellov medium	v-brown, ary,	× ×										
_ 1.0 _ _	20 Weight Bouncing	ED		to coarse, grey subangular) coarse SAND / S , dry, gravel is su	brounded to	* * * * * * * * * * * * * ine										
 1.5 		NOT ENCOUNTERED		ЕОН (Т	ARGET STRATA	REACHED)											
2.0 -																	
2.5 -																	
						LEGEN	ND	I	I						I	I	l
-	ABBREVIATIONS														NOT	<u>ES</u>	
		E PENETF	ROMETE				L LIQUID L			GR							
	HAND AUGER SHEAR VANE			UTP EOH	UNABLE TO PEI END OF HOLE		PL PLASTIC	LIMIT TY INDEX		SA FC	SANI FINE		ITEN	т			
	TEST PIT			UW	UNIT WEIGHT		VC WATER (.							
	GROUNDWATE	R LEVEL		mbgl	METERS BELOV												

miyamoto. Engineerst Client: Testing

PROJECT NUMBER: CLIENT:

TESTING COMPLETED:

200357 Yoursection Ltd 17 November 2020

SHALLOW GROUND INVESTIGATION LOG

PROJECT:	151 & 153 Lincoln	Rolleston Road, Rollesto	on	
LOGGED BY:	CG	TOTAL TESTING DEPTH:	0.9 mbgl	HOLE DIAMETER: 50 mr
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

	DCP Test				Soil Descripti	o.n.						Lo	ab Te	esting	g			Channe Maria
Depth	Results (Plows per	GWL			Soil Descripti	on			Sample Takan	Atter	berg Li	imits	Gr	ain S	ize	wc		Shear Vane Reading (kPa)
(m)	(Blows per 100mm)		usc		Soil Characteris	tics		aphic Log	Taken	ш	PL	PI	GR	SA	FC	(%)	υw	peak/remoulded
-	5 4 5			SILT; non-plasti	c, dark brown, d	ry (TOPSOIL)												
0.5 -	5 6 5 6			Sandy SILT; low sand is fine to r	plasticity, yellow	w-brown, dry	/, × × × × × × × ×	× × × × × × × × × ×										
- - 1.0 -	6 17 Weight Bouncing			to coarse, grey, subangular	coarse SAND / S , dry, gravel is su ARGET STRATA	brounded to	1949	< x x <u>x x</u> (2000-000 (000-000) (000-000)										
- - 1.5 -		NOT ENCOUNTERED																
		LON																
2.5 -																		
_																		
						LEGE	END									.		
DCP HA SV	ABBREVIATIONS DYNAMIC CONI HAND AUGER SHEAR VANE		ROMETE	R N/E UTP EOH	NOT ENCOUNT UNABLE TO PE END OF HOLE		PL PLA	UID LIMI ASTIC LIM	1IT			SAND		NTEN	т	<u>NOT</u>	<u>ES</u>	
ТР	TEST PIT GROUNDWATE	R LEVEL		UW mbgl	UNIT WEIGHT METERS BELOV		WC WA											

miyamoto. Engineerst Client: Consultants

PROJECT NUMBER: CLIENT:

TESTING COMPLETED:

200357 Yoursection Ltd 17 November 2020

SHALLOW GROUND INVESTIGATION LOG

PROJECT:	151 & 153 Lincoln	Rolleston Road, Rollest	on		
LOGGED BY:	CG	TOTAL TESTING DEPTH:	0.6 mbgl	HOLE DIAMETER: 50	0 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	

	DCP Test											L	ab Te	estin	g			
Depth	Results	GWL			Soil Description	on			Sample	Atter	berg L	imits	Gr	rain S	ize	wc		Shear Vane Reading (kPa)
(m)	(Blows per 100mm)		USC		Soil Characterist	ics		Graphic Log	Taken	Ш	PL	PI	GR	SA	FC	(%)	υw	peak/remoulded
_	5			SILT; non-plast	ic, dark brown, d	γ (TOPSOIL))											
-	5			Sandy SILT; low sand is fine to i	/ plasticity, yellov medium	v-brown, dry	<i> </i> ,	× × × × × × × × × × × × × ×										
0.5 -	7 20 Weight			to coarse, grey	o coarse SAND / S , dry, gravel is su													
-	Bouncing			subangular EOH (T	ARGET STRATA	REACHED))	J										
1.0 -																		
-		TERED																
1.5 -		NOT ENCOUNTERED																
-		.ON																
2.0																		
-																		
2.5 -																		
-																		
						-												
						LEGI	END									NO-		
DCP	ABBREVIATIONS DYNAMIC CONE		OMFTF	R N/E	NOT ENCOUNT	ERED	LL	LIQUID LI	МІТ		GR	GRA	VEI			NOT	<u>E5</u>	
HA	HAND AUGER			UTP	UNABLE TO PE			PLASTIC L				SANI						
SV	SHEAR VANE			EOH	END OF HOLE		PI	PLASTICIT			FC			NTEN	т			
ТР	TEST PIT			UW	UNIT WEIGHT	(kN/m³)	WC	WATER C	ONTENT		.	STAN	DING	G GW	L			
GWL	GROUNDWATE	R LEVEL		mbgl	METERS BELOV	GROUND L	EVEL											

miyamoto. Engineerst Client: Consultants

PROJECT NUMBER: CLIENT:

TESTING COMPLETED:

200357 Yoursection Ltd 17 November 2020

SHALLOW GROUND INVESTIGATION LOG

PROJECT:	151 & 153 Lincoln	Rolleston Road, Rollest	on		
LOGGED BY:	CG	TOTAL TESTING DEPTH:	0.9 mbgl	HOLE DIAMETER: 50	0 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	

	DCP Test				Coil Doccrinti	o.n.					L	ab Te	estin	g			Channel Vana
Depth	Results (Plaus par	GWL			Soil Descripti	on		Sample	Atter	rberg L	imits	Gr	ain S	ize	wc		Shear Vane Reading (kPa)
(m)	(Blows per 100mm)		usc		Soil Characteris	tics	Gra _l Lo	phic Taken	ш	PL	PI	GR	SA	FC	(%)	υw	peak/remoulded
-	7 7 8			SILT; non-plastic	c, dark brown, d	ry (TOPSOIL)											
- 0.5 - -	15 13 8 13			Sandy SILT; low sand is fine to n		w-brown, dry,	, × × , × × , × × , × × , × × , × × , × ×	* * * * * * * * * * *									
- - 1.0 -	Weight Bouncing			Gravelly fine to to coarse, grey, subangular	dry, gravel is su	brounded to	0,0,00	< x × × •									
-		JNTERED		EOH (TA	ARGET STRATA	KEACHED)											
1.5 -		NOT ENCOUNTERED															
2.0 -																	
2.5 -																	
l						LEGE]		
	ABBREVIATIONS					LEGE									NOT	ES	
DCP	DYNAMIC CON		ROMETE	R N/E	NOT ENCOUNT	ERED	LL LIQU	JID LIMIT		GR	GRA	VEL					
НА	HAND AUGER			UTP	UNABLE TO PE	NETRATE	PL PLAS	STIC LIMIT		SA	SAND	D					
SV	SHEAR VANE			EOH	END OF HOLE		PI PLAS	STICITY INDEX				S CON					
TP	TEST PIT			UW	UNIT WEIGHT			FER CONTENT		. ∇	STAN	DING	G G W	L			
GWL	GROUNDWATE	R LEVEL		mbgl	METERS BELOW	V GROUND LI	EVEL										

miyamoto. Engineerst Client: Testing

PROJECT NUMBER: CLIENT:

TESTING COMPLETED:

200357 Yoursection Ltd 17 November 2020

SHALLOW GROUND INVESTIGATION LOG

PROJECT:	151 & 153 Lincoln	Rolleston Road, Rollest	on		
LOGGED BY:	CG	TOTAL TESTING DEPTH:	0.9 mbgl	HOLE DIAMETER: 50	0 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	

	DCP Test			Soil Description					Lab T	estin	g			Charam Manag
Depth	Results	GWL		Soil Description		Sample	Atterb	erg Limit	s G	rain S	ize	wc		Shear Vane Reading (kPa)
(m)	(Blows per 100mm)		USC	Soil Characteristics	Graphic Log	Taken	LL	PL PI	GR	SA	FC	(%)	υw	peak/remoulded
-	3 4 3			SILT; non-plastic, dark brown, dry (TOPSOIL)										
- 0.5 -	5 7 15			Sandy SILT; low plasticity, yellow-brown, dry, sand is fine to medium	× × × × × × × × × × × × × × × × ×									
	Weight Bouncing			Gravelly fine to coarse SAND / Sandy Gravel; fin to coarse, grey, dry, gravel is subrounded to	e									
1.0 – – –		TERED		subangular EOH (TARGET STRATA REACHED)										
1.5 - - -		NOT ENCOUNTERED												
2.0 -														
2.5 -														
				LEGEN	ר ר							1		
	ABBREVIATIONS			LEGENI								NOT	ES	
DCP	DYNAMIC CON		ROMETE	R N/E NOT ENCOUNTERED LL	LIQUID L	IMIT	(GR GR	AVEL					
HA	HAND AUGER			UTP UNABLE TO PENETRATE PL	PLASTIC		9	SA SA	١D					
SV	SHEAR VANE			EOH END OF HOLE PI					ES CO					
	TEST PIT				C WATER C	ONTENT		У. . ST/	NDIN	G GW	L			
GWL	GROUNDWATE	R LEVEL		mbgl METERS BELOW GROUND LEVE	EL							1		

miyamoto. Engineerst Client: Consultants

PROJECT NUMBER: CLIENT:

TESTING COMPLETED:

200357 Yoursection Ltd 17 November 2020

SHALLOW GROUND INVESTIGATION LOG

PROJECT:	151 & 153 Lincoln	Rolleston Road, Rollest	on		
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	

100mml USC Sol Characteristics Log Lu P P GR SA FC P ^I 4 SlLT; non-plastic, dark brown, dry (TOPSOL) Sult; non-plastic, dark brown, dry (TOPSOL) 0.5 Sol Characteristics Sult; Non-plastic, dark brown, dry (TOPSOL) 0.5 Sol Characteristics Sult; Non-plastic, dark brown, dry (TOPSOL) Sult; Non-plastic, dark brown, dry (TOPSOL) Sult; Non-plastic, dark brown, dry (TOPSOL) 1.5 Sol Characteristics Sol Characteristics Sol Characteristics Sol Characteristics 1.0 Sol Characteristics Sol Characteristics Sol Characteristics Sol Characteristics Sol Characteristics 2.0 Sol Characteristics Sol Characteristics Sol Characteristics Sol Characteristics Sol Characteristics 2.0 Sol Characteristics Sol Characteristics Sol Characteristics Sol Characteristics Sol Characteristics Sol Characteristics 2.0 Sol Characteristics Sol Characteristics Sol Characteristics Sol Charac		DCP Test				Coll Deceminati	- 12					L	ab Te	estin	g			<i>a</i> , ,,,
Image: Description of the product o			GWL			Soli Descripti	UN		-	Atter	rberg l	imits.	Gr	rain S	ize	wc		Shear Vane Reading (kPa)
4 4 5ILT; non-plasticit, dark brown, dry (TOPSOIL) Image: Construction of the constructing of the construction of the construction	(<i>m</i>)			usc		Soil Characteris	tics		nic	Ш	PL	PI	GR	SA	FC		UW	peak/remoulded
Gravely fine to coarse SAND / Sandy Gravel, fine to coarse, grey, dry, gravel is subrounded to subbangular ECH (TARGET STRATA REACHED)		4			Sandy SILT; low	v plasticity, yellow			×									
LEGEND ABBREVIATIONS DCP DYNAMIC CONE PENETROMETER N/E NOT ENCOUNTERED LL LIQUID LIMIT GR GRAVEL HA HAND AUGER VIT WABLE TO PENETRATE PL PLASTIC LIMIT GR GRAVEL ABBREVIATIONS	0.5 -	Weight			Gravelly fine to to coarse, grey subangular	o coarse SAND / S , dry, gravel is su	brounded to	x x										
2.0 2.0 4 4 5 5 6 7 7 7 7 7 7 7 7 7 7 7 7 7	 1.0																	
2.0 2.0 2.0 4 4 5 5 6 6 7 7 7 7 7 7 7 7 7 7 7 7 7			OT ENCOUNTERED															
Image: Second state of the second s	2.0 -		Z															
ABBREVIATIONS NOTES 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	2.5 -																	
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							LEGEI	ND										
HA HAND AUGER UTP UNABLE TO PENETRATE PL PLASTIC LIMIT SA SAND																NOT	ES	
			E PENET	ROMETE														
SV SHEAR VANE FOH END OF HOLE DI DI ASTICITY INDEY EC EINES CONTENT															_			
		SHEAR VANE			EOH	END OF HOLE												
TP TEST PIT UW UNIT WEIGHT (kN/m³) WC WATER CONTENT									K CONTENT			SIAN	NDING	3 GW	L			

miyamoto. Engineerst Client: Testing

PROJECT NUMBER: CLIENT:

TESTING COMPLETED:

200357 Yoursection Ltd 17 November 2020

SHALLOW GROUND INVESTIGATION LOG

PROJECT:	151 & 153 Lincoln	Rolleston Road, Rollest	on			
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	

	DCP Test				Coil Deceminti							L	ab Te	estin	g			<i>a</i> , ,,,
Depth	Results	GWL			Soil Descripti	on			Sample	Atter	berg L	imits	Gr	ain S	ize	wc		Shear Vane Reading (kPa)
(m)	(Blows per 100mm)		USC		Soil Characteris	tics		Graphic Log	Taken	Ш	PL	PI	GR	SA	FC	(%)	υw	peak/remoulded
-	3 7 15			SILT; non-plast	ic, dark brown, d	ry (TOPSOIL)	× × × × × ×											
0.5 -	20 Weight Bouncing			to coarse, grey subangular	o coarse SAND / S , dry, gravel is su ARGET STRATA	brounded to	2											
- - 1.0 -																		
- - 1.5 - -		NOT ENCOUNTERED																
- 2.0 - -		2																
- 2.5 - - -																		
						LEGE	IND									-		
	ABBREVIATIONS			.												<u>NOT</u>	<u>ES</u>	
DCP		E PENETI	ROMETE								GR							
HA SV	HAND AUGER SHEAR VANE			UTP	UNABLE TO PE	NETRATE		PLASTIC L			SA FC				г			
SV TP	TEST PIT			EOH UW	UNIT WEIGHT	(kN/m ³)			TY INDEX									
	.231111	R LEVEL		0 **	METERS BELOV	(,)	***					JIAN			-	1		

miyamoto. Engineerst Client: Testing

PROJECT NUMBER: CLIENT:

TESTING COMPLETED:

200357 Yoursection Ltd 17 November 2020

SHALLOW GROUND INVESTIGATION LOG

PROJECT:	151 & 153 Lincoln	Rolleston Road, Rollest	on		
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	

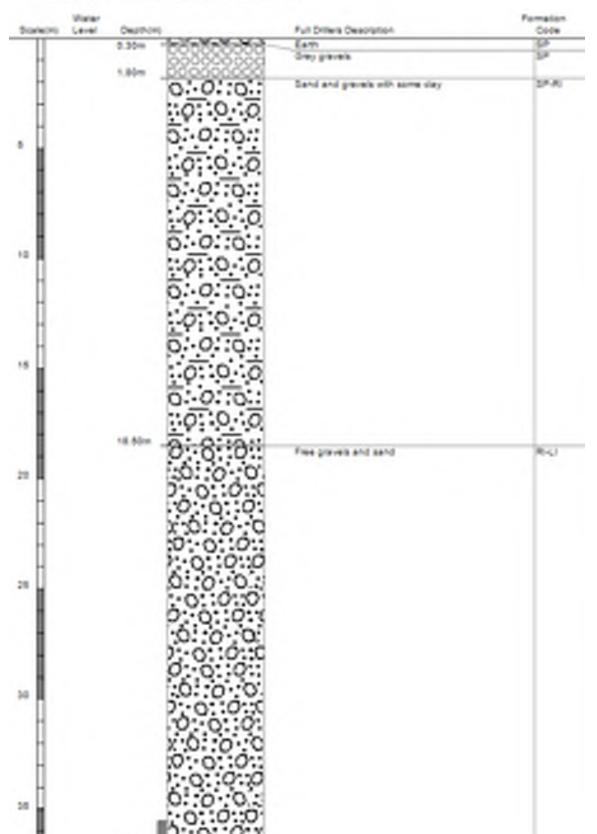
	DCP Test											Le	ab Te	esting	g			
Depth	Results	GWL			Soil Descripti	on			Sample	Atter	berg L	imits	Gr	ain S	ize	wc		Shear Vane Reading (kPa)
(m)	(Blows per 100mm)		USC		Soil Characteris	tics	G	iraphic Log	Taken	Ш	PL	PI	GR	SA	FC	(%)	UW	peak/remoulded
-	5 5 15			Gravelly fine to	ic, dark brown, d o coarse SAND / S	andy Gravel	; fine											
- 0.5 - - -	Weight Bouncing			subangular	, dry, gravel is su													
- 1.0 - -		ED																
- 1.5 - - -		NOT ENCOUNTERED																
_ 2.0 - _ _																		
- 2.5 - - - -																		
						LEGI												
	ABBREVIATIONS					LEG	LND									NOT	FS	
DCP	DYNAMIC CON		ROMETE	R N/E	NOT ENCOUNT	ERED	LL LI	QUID LII	MIT		GR	GRA	VEL					
HA	HAND AUGER			UTP	UNABLE TO PE			LASTIC L				SANE						
SV	SHEAR VANE			EOH	END OF HOLE		PI P	LASTICIT	Y INDEX		FC	FINES	S CON					
ТР	TEST PIT			UW	UNIT WEIGHT	(kN/m³)	WC W	ATER C	ONTENT		. .	STAN	IDING	GW	L			
GWL	GROUNDWATE	R LEVEL		mbgl	METERS BELOW	V GROUND L	EVEL											

Borelog for well M36/3868

Grid Reference (NZTM): 1552464 mE, 5171200 mN Lecation Accuracy: 10 - 50m Ground Level Attude: 38.4 m =MSD Accuracy: < 2.5 m Driller: McMillan Drilling Ltd Drill Method: Rolary/Peroussion Borelog Depth: 36.8 m Drill Date: 18-Jan-1988



iyamoto.



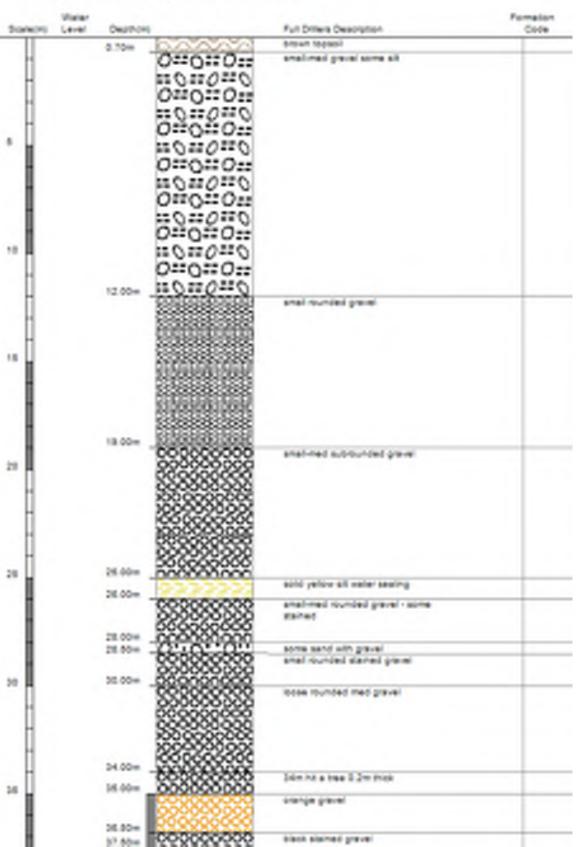


Borelog for well M36/7975

Grid Reference (N2TM): 1552217 mE, 5571001 mN Lecation Accuracy: 50 - 300m Ground Level Attrude: 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



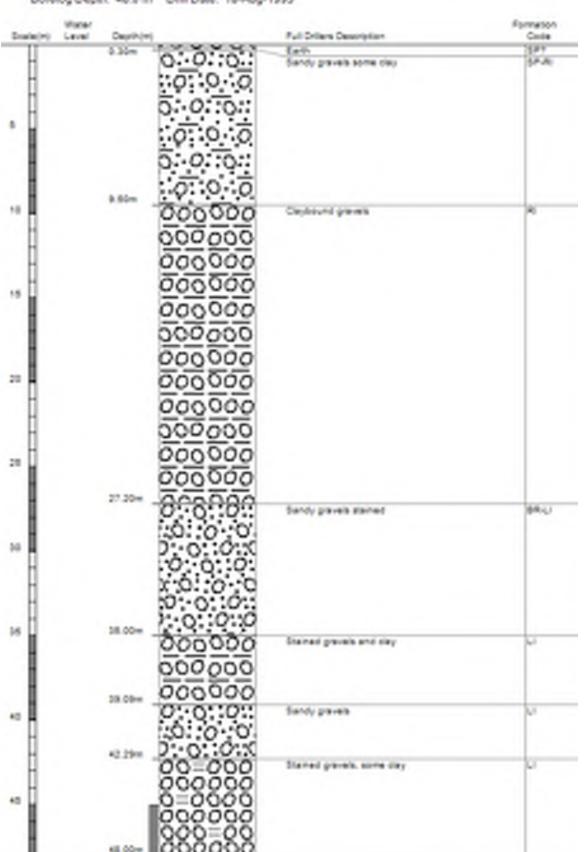
miyamoto.



Borelog for well M36/4966

Grid Reference (N2TM): 1552787 mE, 5171558 mN Location Accuracy: 50 - 300m Oround Level Althode: 38.6 m +MSD Accuracy: < 2.5 m Driller: McMittan Drilling Ltd Drill Method: Rotary/Percussion Dorelog Depth: 48.9 m Drill Date: 18-Aug-1995





Falcons Subdivision Proposed Extension

Borelog for well BX23/0533

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



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TEAT BIT NO

TD**-**

au	irecon	TEST PIT RECO	ORD	TEST PI	I NO.	IP	1
	congroup.com			PROJEC	T NO.	25	4246
PROJECT Brar	nthwaite Drive						
METHOD TP		CO-ORDINATES (NZTM)		OGGED		CHEC	
MACHINE & NO. Wheeled Excavator		E 1552186	Т.	MITCHELL		A. HIL	LS
		N 5171475	D/	ATE		DATE	
CONTRACTOR	Maugers	GROUND LEVEL +37.00	^{m RL} 22	/11/2016		2/12/2	2016
		STRATA			SAM	IPLE	S & TESTS
Depth (m) Legend		Description			Depth	No	Remarks/Tests
$\begin{array}{c} \underbrace{\underline{x}} \underline{h} \underline{x} \\ -\underbrace{\underline{y}} \underline{h} \underline{y} \\ -\underline{y} \\ -\underbrace{\underline{y}} \underline{h} \underline{y} \\ -\underline{y} \\ -\underline{y} \\ -\underline{y} \underline{h} \underline{y} \\ -\underline{y} \\ -y$	SILT with minor sand and trace (TOPSOIL)	e of rootlets; dark brown. Moist, low	plasticity; s	and, fine.			
	SILT; light brown with orange-	grey mottles. Moist, low plasticity.					
- × × - × × - × × - × × - × ×	1.20 - 1.40 Becomes with mine Fine to coarse GRAVEL with n	ninor sand, silt and cobbles; brownis	sh grey. Mo	st,			
1.70	subrounded to rounded; sand,	fine to medium.					
	End of Tr <i>Termina</i>	ial pit/trench at 1.70m, on 22/11/201 <i>tion Reason:</i> Target depth acheived	6				

SHORING/SUPPORT: None STABILITY: Generally Stable

GENERAL REMARKS SHORING/SUPPORT: No STABILITY: Generally Sta Groundwater not encountered Coordinates found using hand Ground level found using hand All dimensions in metres 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 NO.

TP10

PROJECT NO. 254246

PROJECT Branthwaite Drive

METHOD TP		OD TP CO-ORDINATES (NZTM) LOGGE		LOGGED		CHECKED		
			E 1552053 T. MITCHELL		T. MITCHELL	ELL 🛛 🗛. HILI		LS
MACHINE & NO. Wheeled Excavator		Wheeled Excavator	N 5171529					
CONTRAC	CONTRACTOR Maugers		GROUND LEVEL +43.00	m RL	DATE		DATE	:
					22/11/2016	6		2016
	STRATA SAMPLES & TESTS						S & TESTS	
Depth (m)	Legend		Description			Depth	No	Remarks/Tests
0.25	0.25 SILT with minor sand and some rootlets; dark brown. Moist, low plasticity; sand, fine.							
	-× SILT with minor sand: light brown. Moist, low plasticity: sand, fine.							

	0.25	<u> </u>	(TOPSO	IL)		
		-× `>	SILT with	h minor sand; light brown. Moist, low plasticity; sand, fine.		
		* *				
		_×				
	0.70	× ×	Fine to c	coarse GRAVEL with some sand; greyish brown. Moist, subrounded to rounded;		
		00	sand, fin	le to coarse.		
		1001				
		100				
		1001				
		-00				
		-000				
	1.60			End of Tricl nit/tranch at 1 com an 22/11/2016		
		-		End of Trial pit/trench at 1.60m, on 22/11/2016 <i>Termination Reason:</i> Target depth acheived.		
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Date:]				
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g S			PPORT			
s S	IABIL	IIY: C	Generally	y Stable		
	round	ator not	t encounte	orad		
r C	oordina	tes foui	nd usina h	handheld GPS. likely accurate to +/- 5 m.		
	round le	evel fou	ind using	handheld GPS, likely accurate to +/- 10 m.		
TES						
Report ID: AGS4 TEST PIT RECORD (NO SKETCH NO MAP) Project: BRANTHWAITE DRIVE LOGS.GPJ LIbrary: AGS 4_0.GLB Date: 5 December 2016						
ă L						
۲ ۲	II dimon	ciono in	n metres		Vater Level	
A g	un unner	เอเบเาร ไไ	menes	↓ Insitu Vane Shear Test		

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TEST PIT NO.

TP23

PROJECT NO. 254246

PROJECT Branthwaite Drive

METHOD TP	CO-ORDINATES (NZTM)	LOGGED	CHECKED				
	E 1552359	T. MITCHELL	A. HILLS				
MACHINE & NO. Wheeled Excavator	N 5171660						
			DATE				
CONTRACTOR Maugers	GROUND LEVEL +43.00 m F	23/11/2016	5/12/2016				
STRATA SAMPLES & T							
Depth		D	with Nie Develop/Teete				

			STRATA	0/1W		SAIESIS
	Depth (m)	Legend	Description	Depth	No	Remarks/Tests
ł	1/	<u>x¹ 1₁, x</u>	SILT with minor sand and rootlets; dark brown. Moist, low plasticity; sand, fine.			
	0.25	1/ 1/	(TOPSOIL)			
ł	0.25	- × .	Silty fine SAND with trace of rootlets; brown. Dry.	1		
	0.50		,,			
ł	0.50		Fine to coarse GRAVEL with some sand, minor cobbles, trace of rootlets and occasional	-		
		100	boulders; brown. Dry, subrounded to rounded; sand, fine to coarse.			
		1001				
		-00				
		1001	1.00 Becomes with no rootlets; greyish brown.			
		-00	1.00 Decomes with no rootlets, greyish brown.			
		700				
		-00				
		-00				
ł	1.60	$-\sim$	End of Trial pit/trench at 1.60m, on 23/11/2016	-		
		-	<i>Termination Reason:</i> Target depth acheived.			
]				
16		4				
r 20		-				
roject: BRANTHWAITE DRIVE LOGS.GPJ Library: AGS 4_0.GLB Date: 5 December 2016						
ecel		-				
2 2						
Date		-				
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MA.		-				
SI						
SKETCH NO MAP) P	GENE		EMARKS			
SKE						
Q			PPORT: None			
RECORD (NO	STABIL	.IIY: (Generally Stable			
Ö	Croundu	ator no				
TRE			t encountered. nd using handheld GPS, likely accurate to +/- 5 m.			
T PIT	Ground I	evel fou	ind using handheld GPS, likely accurate to +/- 10 m.			
TES						
AGS4 TEST						
9G						
Report ID:	A.U:		CLIENT GW Rolleston Ltd.	Vater Leve	1	
epo	All dime	nsions i	n metres			
	Aurecon New	Zeeland Lir	nited, , . Tel: Fax:			

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TEST PIT NO.

TP24

PROJECT NO. 254246

PROJECT Branthwaite Drive

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

		STRATA	SAM	PLE	S & TESTS
Depth (m)	Legend	Description	Depth	No	Remarks/Tests
	<u></u> . <u>x</u>	SILT with minor sand and tree roots (up to 10 mm); dark brown. Moist, low plasticity;			
0.20	- × ×	sand, fine. (TOPSOIL) SILT with minor sand; brown. Moist, low plasticity; sand, fine.			
		, , , , ,,			
	-× × 1				
0.80		Fine to coarse GRAVEL with some sand, minor cobbles and trace of rootlets; light			
	-00	brown. Moist, subrounded to rounded; sand, medium.			
	-00				
	-00	1.20 Becomes with no rootlets.			
	-00				
	100				
1.70	-00	End of Trial pit/trench at 1.70m, on 23/11/2016			
		<i>Termination Reason:</i> Target depth acheived.			
	-				
	-				
	-				
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	-				
	-				
	-				
GENEF SHORI STABIL Groundw Ground I	RAL R	EMARKS			
SHORI	NG/SU	IPPORT: None			
STABIL		Generally Stable			
Ground	uator no	t open uptared			
Coordina	ates fou	t encountered. nd using handheld GPS, likely accurate to +/- 5 m.			
Ground I	evel fou	ind using handheld GPS, likely accurate to +/- 10 m.			
All dime	nsione i	CLIENT GW Rolleston Ltd.	¥ Water Leve	əl	
Aurecon New	/opland Lin	nited Tel: Fax:			

Aurecon New Zealand Limited, , . Tel: Fax:



TEST PIT NO.

TP25

	www.aure	congroup.com			PROJEC	T NO.	25	4246
PROJEC	CT Brai	nthwaite Drive						
METHO	D TP		CO-ORDINATES (NZTM)	LOGO	GED		CHEC	CKED
		Wheeled Evenueter	E 1552490	Т. МІТ	CHELL		a. Hil	LS
		Wheeled Excavator	N 5171658	DATE			DATE	<u>.</u>
CONTR	ACTOR	Maugers	GROUND LEVEL +44.00 m RL	23/11/			5/12/2	
		S	TRATA			SAM	IPLE	S & TESTS
Depth (m)	Legend		Description			Depth	No	Remarks/Tests
	$-\frac{\frac{x^{1}l_{2}}{l_{1}}\cdot\frac{x^{1}l_{2}}{x^{1}}}{\frac{1}{l_{2}}\cdot\frac{x^{1}l_{2}}{x^{1}}}$	SILT with minor sand and rootle (TOPSOIL)	ets; dark brown. Moist, low plasticity; sand, t	fine.				
0.35	-: <u>\\</u> ;.\ × × -	SILT with some sand; brown. M	oist low plasticity sand fine					
	-× × ×							
0.70		Fine to ecore (CDA)/FL with as	me sand and trace of rootlets; brownish gr	ov Moi	at			
	-000	subrounded to rounded; sand, f		ey. Moi	51,			
	-00	0.70 - 0.80 Sand becomes med	ium to coarse, light brown.					
	-00							
	-00	1.30 Becomes with no rootlets.						
	00							
1.60			al pit/trench at 1.60m, on 23/11/2016					
	-	Terminati	on Reason: Target depth acheived.					
	_							
	-							
	-							
	-							
1	-							

ID: AGS4 TEST PIT RECORD (NO SKETCH NO MAP) || Project: BRANTHWAITE DRIVE LOGS.GPJ || LIbrary: AGS 4_0.GLB || Date: 5 December 2016 **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.

Report ID	All dimensions in metres	CLIENT GW Rolleston Ltd.	₽P ~	Pocket Penetrometer Test Insitu Vane Shear Test	Vater Level
	Aurecon New Zealand Limited, , . Tel:	Fax:			

0		TLa	ndTech	Client: Hank Developments Limited Project: Proposed Subdivision					Augerhole No.	HA01	
1		C 0	NSULTING	Address: 7/572 Selwyn Road, Rolleston					Sheet No.	1 of 1	
Drill Typ Drilled B			8 Ton Excavator BE	Project No: LTCL180 Coordinates: NZTM: 1			171418 mN	Logged By: Shear Vane			BE
ate St			6-Apr-18	Ground Conditions: Grassed			17 14 IO IIIN	Calibration			N/#
ate Fir	nishe	ed:	6-Apr-18	Groundwater Level (m): Not Enco	untered	i (6 - Ap	r-18)	Calibration	Date:		N/#
bhy .	(i	6o-	Coll description in a	and the Cuideline for the Cield Obertification and	ې Groundwater Level (m)	(u		In-situ Fi	e l d Testing		
Stratigraphy	Uepth (m)	Graphic Log	Description of Soil and F	ccordance with <i>Guideline for the Field Classification and</i> tock for Engineering Purposes, NZ Geotechnical Society Ir 2005	'.' /ater L	Depth (m)	Shear Strength (kF	-7	Dynamic Cone F	Penetrometer Scala Blow Cou	int /
ŝ	ă	Gra		2003	wpund	ă	Peak: —	Depth (m)	0 Count	100mm	
					Ğ		Remoulded:	Dep	0 Blow	5 10 15	20
OIL			SILT, minor fine sand, plastic [TOPSOIL]	minor organics, dark brown, medium dense, moist, r	on	_		-0.1	3	•	
IDFSOIL		\sim				_	4	-0.2	4		
_		$\sim \sim$	SILT, minor fine sand,	yellowish brown, dense, moist, non-plastic [RIVER	_	-	1	-0.3 -0.4	5 7	₹ I I	
0	.5	ч ж ж ж ж ж ж ж	DEPOSITS]			0.5		-0.5	8	\	
-		* X X 3 * * * * 3						-0.6	10		
		* * * *				_		-0.7	12		
	_			nded greywacke gravelly fine to coarse SAND, trace e cobbles, greyish brown, tightly packed, moist		_		-0.8	25 +		-
	4		_			-	-	-0.9			
	.0					1.0		-1.0	-		_
	\neg					-	1	-1.2			
n				nded greywacke GRAVEL, some to minor fine to			1	-1.3			
		CXA.	coarse sand, greyish t	prown, tightly packed, moist				-1.4			
1	.5	244A				1.5		-1.5	-		
				nded greywacke gravely fine to coarse SAND, trace e cobbles, greyish brown, tightly packed, moist		_		-1.6			
						-		-1.7			
						-		-1.9			
2	2.0	····,				2.0		-2.0			
	_							-2.1			
						_		-2.2			
						_		-2.3			
	2.5					2.5		-2.4 -2.5			
2						2.5		-2.6	-		_
	-			End of Test Pit (2.6m)				-2.7			
								-2.8			
						_		-2.9			
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5	5.0				_	5.0	In situ field testing in and it	-5.0	ndarde:		
	ļ					1	In-situ field testing in accorda Scala Penetrometer Testing: I			netrometer	
							Shear Vane Testing: Guidelin	ne for Hand Held Shear V	ane Test, NZGS, Augu	ıst 2001	

		Client:	Hank Developments Limited							Augerhole No	р. Н.	A 02
L		NSULTING Project: Address: Address:	Proposed Subdivision 7/572 Selwyn Road, Rolleston							Sheet No.	1	of 1
I Type:		8 Ton Excavator	Project No:	LTCL18051					Logged By:			E
lled By: te Starte		BE 6-Apr-18	Coordinates:	NZTM: 1552 Grassed, Ne			71344 mN		Shear Vane			N
te Starte te Finish		6-Apr-18 6-Apr-18	Ground Conditions: Groundwater Level (m):	Not Encount			-18)		Calibration F Calibration E			N
	DC.				Groundwater Level (m)				In-situ Fie	d Testing		
Depth (m)	Graphic Log	Soil description in accordance with Description of Soil and Rock for Engine	ering Purposes, NZ Geotechnica		ater Le	Depth (m)	Shear Streng	gth (kPa)			Penetrometer Scala Blow	
De	Gra		2005		mpun	De	Peak:		Depth (m)	Count	100m	
					Gro		Remoulded:	•	Dept		0 5 10	15 2
	$\langle \rangle \langle \rangle$	SILT, minor fine sand, minor organi plastic [TOPSOIL]	cs, dark brown, medium dense	e, moist, non		_			-0.1	3	•	
_	ČČ								-0.2	3	Ļ	
	$\times \times$	SILT, minor fine sand, trace subrou	nded grouwacke gravel, vellow	vish brown					-0.3	4		
-	- * * * *	dense, moist, non-plastic [RIVER D		NST Drown,					-0.4 -0.5	7 10		
0.5	 					0.5			-0.5	11		_
-	* * * * *								-0.7	12		
	* * * * *								-0.8	10		'
_	* * * *					_			-0.9	19		
1.0	A.A	Fine to coarse sandy fine to coarse	subrounded grewwacks GPA	VFL traco		1.0			-1.0	25 +		_
-	and the second s	to minor subrounded greywacke co							-1.1 -1.2			
						-			1.2			
	44 L					-			1.4			
1.5	NX.					1.5			-1.5			
	n de la companya de l								-1.6			
	936-y-								-1.7			
_	1 Ag								-1.8			
_	AX)								-1.9			
2.0						2.0			-2.0 -2.1			_
	1819								2.2			
		End of	Test Pit (2.2m)						-2.3			
_	1								-2.4			
2.5]					2.5			-2.5			
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3.0						3.0			-3.1			
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3.5						3.5			-3.5			_
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1 -	1					5.0			-5.0			
5.0								-	th the following Star			

			ndTooh	Client: Hank Developments Limited						Augerhole No.	HA03	
/			N S U L T I N G	Project: Proposed Subdivision Address: 7/572 Selwyn Road, Rolleston						Sheet No.	1 of 1	
i ll Typ			8 Ton Excavator	·	.18051				Logged By:			E
illed E ate Sta ate Fir	artec	d:	BE 6-Apr-18 6-Apr-18	Ground Conditions: Gras	M: 155223 sed, Near Encounter	leve	Э	71302 mN -18)	Shear Vane Calibration I Calibration I	actor:		N N N
(ind	(i	Log	Soil description in a	accordance with Guideline for the Field Classification ar	d -	Groundwater Level (m)	(E			eld Testing		
Denth (m)	nuda	Graphic Log		Rock for Engineering Purposes , NZ Geotechnical Socie 2005	ty Inc.,	vater I	Depth (m)	Shear Strength (kPa)		Dynamic Cone F	Scala Blow Cou	unt /
3	2	ŋ			-	Groundy	Δ	Peak: Remoulded: • 0	Depth (m)	Blow Count	100mm 5 10 15	5 2
			SILT, minor fine sand, plastic [TOPSOIL]	minor organics, dark brown, medium dense, mois	st, non-				-0.1	3	•	
-	-	ČČ							-0.2	2	•	
-	_		SILT, minor fine sand,	yellowish brown, dense, moist, non-plastic [RIVE	R		_		-0.3 -0.4	4 6	4	
0	.5		DEPOSITS]				0.5		-0.5	10		
		* * * *							-0.6	12		
		< * * > < * > >					_		-0.7	25 +		_
	-		Fine to coarse candy	fine to coarse subrounded greywacke GRAVEL,	race				-0.8			
		A Carr		greyish brown, tightly packed, moist					-0.9 -1.0			
+	.0					┢	1.0		-1.1	-		
1	Ļ	ML.					_		-1.2			
							_		-1.3			
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	_)	N KA							-1.6 -1.7			
	-	B							-1.8			
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2	.0	D.					2.0		-2.0	_		
		444					_		-2.1			
	_	47A							-2.2			
-		8-1 <u>3</u>		End of Test Pit (2.3m)			_		-2.3 -2.4			
2	5						2.5		-2.5			
	.0						2.0		-2.6	-		
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3.	.0					ŀ	3.0		-3.0 -3.1	-		
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3.	.5					┢	3.5		-3.5	-		
1.	\neg						_		-3.6 -3.7			
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4	.5						4.5		-4.5			
Ĺ									-4.6			
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5.	.0					╉	5.0	n-situ field testing in accordance		ndards:		
								Scala Penetrometer Testing: NZS			- Annual Annu	

			Client: Hank Developments Limited						Augerhole No.	HA04	
			Project: Proposed Subdivision Address: 7/572 Selwyn Road, Rolleston						Sheet No.	1 of 1	
rill Ty	/pe:		8 Ton Excavator Project No: LTCL	8051				Logged By:			E
ri ll ed						517	71389 mN	Shear Vane			N
	inish			ed, Near ncountere		Apr-	18)	Calibration Calibration			N N
Τ				Ĩ				In-situ Fid	d Testing		
orraligrapriy	(m) r	Graphic Log	Soil description in accordance with Guideline for the Field Classification an Description of Soil and Rock for Engineering Purposes, NZ Geotechnical Societ	Inc., the second	Denth (m)	(m) -	Shear Strength (kPa)		Dynamic Cone	Penetrometer	
วแลนใ	Depth (m)	Graph	2005	, inc., see	Dent	ndbri		Ê	nut	Scala Blow Cou 100mm	unt /
		0		ching.	000		Peak: Remoulded: •	Depth (m)	0 Count		5 2
		$\sim\sim$	SILT, minor fine sand, minor organics, dark brown, medium dense, mois	, non				-0.1	3		
-000		XX	plastic [TOPSOIL]					-0.2	4		
	_	XX						-0.3	3	4	
	_		SILT, minor fine sand, yellowish brown, dense, moist, non-plastic [RIVEI DEPOSITS]		-			-0.4	8		
ŀ	0.5				0.	.5		-0.5 -0.6	10 12		
	-	AA.	Fine to coarse sandy fine to coarse subrounded greywacke GRAVEL, tr		-	-		-0.8	25 +		_
		(Y)	to minor subrounded greywacke cobbles, greyish brown, tightly packed,	moist	-			-0.8			
		X-7-14						-0.9			
L	1.0	Þ.			1	0		-1.0			
) As			.			1.1			
	_	KA -			-			-1.2 -1.3			
	_				-			-1.4			
	1.5	r ya			1.	5		-1.5			
F		Þ.						-1.6			
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	_	1 X X						-1.9			
	2.0				2.	.0		-2.0			
	_	A			-			-2.1 -2.2			
-	-	(<u>V</u> 2	End of Test Pit (2.2m)		-	_		-2.3			
	_				-			-2.4			
	2.5				2.	.5		-2.5			
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-	3.0				3.	.0		-3.0 -3.1	-		
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	3.5				3.	.5		-3.5			
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	4.0				4.	.0		-4.0			
ŀ					F	, v		-4.1			
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ŀ	4.5				4.	5		-4.5			
	_				-	_		-4.6			
	_				-	_		-4.7 -4.8			
	_				-	┥		-4.8			
	5.0				5.	0		-5.0			
$^{+}$	J.U				5.	_	n-situ field testing in accordance v		ndards:		
					1		Scala Penetrometer Testing: NZS	4402:1988, Test 6.5	2. Dynamic Cone Pe	netrometer	

Γ			Client: Hank Developments Limited Project: Proposed Subdivision Address: 7/572 Selwyn Road, Rolleston						Augerhole No Sheet No.	9. HA07 1 of 1
orill Type: Orilled By: Oate Starte Oate Finish	ed:	8 Ton Excavator BE 6-Apr-18 6-Apr-18	Project No: Coordinates: Ground Conditions: Groundwater Level (m):	LTCL18051 NZTM: 1552 Grassed, No Not Encoun	2139 i ear le	vel		Logged By Shear Var Calibration Calibration	e No: n Factor:	B N/ N/
۸c (Бс				vel (m)	(In-situ F	ield Testing	
Stratigraphy Depth (m)	Graphic Log		accordance with Guideline for the Field Classifica Rock for Engineering Purposes , NZ Geotechnical 2005		Groundwater Level (m)	Depth (m)	Shear Strength (kP Peak: Remoulded:	(a)	Dynamic Cone	Penetrometer Scala Blow Count / 100mm 0 5 10 15 20
10050112 10050110 10050110000000000		plastic [TOPSOIL] SILT, minor fine sand, DEPOSITS] Fine to coarse sandy i brown, tightly packed,	, minor organics, dark brown, medium dense , yellowish brown, dense, moist, non-plastic fine to coarse subrounded greywacke grave moist [RIVER DEPOSITS] nded greywacke cobbles End of Test Pit (2.6m)	RIVER				-0.1 -0.2 -0.3 -0.4 -0.5 -0.6 -0.7 -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	3 3 4 6 8 11 25 +	

			and Tech	Client: Project: Address:	Proposed	velopments Limited d Subdivision elwyn Road, Rolleste						Augerhole N Sheet No.	No.	
			8 Ton Excavator BE 6-Apr-18 6-Apr-18		Coo Gro	oject No: ordinates: ound Conditions: oundwater Level (m)	LTCL18051 NZTM: 155 Grassed, N): Not Encour	2187 ı ear le	vel		Logged By: Shear Vane Calibration Calibration	No: Factor:		
hy	(бо						evel (m)	(In-situ Fi	eld Testing		
Stratigraphy	Depth (m)	Graphic Log	Soil description in a Description of Soil and i			for the Field Classif, oses , NZ Geotechni		Groundwater Level (m)	Depth (m)	Shear Strength (kPa) Peak: Remoulded:	Depth (m)	Dynamic Cor	Sc	etrom ala E 1
TOPSOIL	_<	X	SILT, minor fine sand [TOPSOIL]	, minor organi	cs, dark bro	own, loose, moist	, non-plastic		_		-0.1	2 2	ļ	
	0.5	<u>× × →</u> × × → × × →	SILT, minor fine sand [RIVER DEPOSITS]	, yellowish bro	wn, mediu	m dense, moist, r	non-plastic		0.5		-0.3 -0.4 -0.5	3 4 5		
ľ	×	× × > × × > × × >							_		-0.6 -0.7	8 8		
	تنو بن 1.0 !	÷ ÷	Fine to coarse sandy subrounded greywack						1.0		-0.8 -0.9 -1.0	8 7 8		
RIVER DEPOSITS		H.									-1.1 -1.2			
RIVER D	 								-		-1.3 -1.4 -1.5			
ľ	<u>1.5</u>) SP4							1.5		-1.6			
		Y.							_		-1.8 -1.9 -2.0			
	2.0	Ş÷		End of	Test Pit (2.	.1m)		_	2.0		-2.1			
	_								_		-2.3 -2.4 -2.5			
ľ	2.5								2.5		-2.6 -2.7			
											-2.8 -2.9			
·	3.0								3.0		-3.0 -3.1 -3.2			
	_										-3.3 -3.4			
-	3.5								3.5		-3.5 -3.6 -3.7			
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	4.5								4.5		-4.5 -4.6 -4.7			
									_		-4.8 -4.9			

LandTech Consulting Limited, Unit 6, 31 Carlyle Street, Sydenham, Christchurch, 8023 www.landtech.nz

5.0

-5.0

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

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

			ndiech	Client: Hank Developments Limited Project: Proposed Subdivision							Augerhole N	lo. HAC	06
			NSULTING	Address: 7/572 Selwyn Road, Rolleston							Sheet No.	1 of	f 1
rill T	ype:		8 Ton Excavator	Project No:	LTCL18051					Logged By:			E
	i By:		BE	Coordinates:	NZTM: 1552			71252 mN		Shear Vane			N
	Starte Finish		6-Apr-18 6-Apr-18	Ground Conditions: Groundwater Level (m):	Grassed, Ne Not Encount			-18)		Calibration I Calibration I			N N
							с. г.	-,					
						Ē				In-situ Fie	eld Testing		
ĥ	Ê	60-	Soil description in a	poordonoo with Cuideling for the Eield Classifier	tion and	Groundwater Level (m)	(u						
ouaugiapriy	Depth (m)	Graphic Log		ccordance with Guideline for the Field Classifica ock for Engineering Purposes, NZ Geotechnica		ater L	Depth (m)	Shear Streng	gth (kPa)	[-	e Penetrometer Scala Blow C	`ount /
olla	B	Gra		2005		:mpur	De	Peak:	-	E E	ount	100mm	
						Grot		Remoulded:	•	Depth (m)	Blow Count	0 5 10	15 2
	-		SILT, minor fine sand,	minor organics dark brown, loose, moist, n	on-plastic			_		-0.1	2		
Inradic	_	$\times \!$	[TOPSOIL]							-0.2	3	•	
2		XX								-0.3	3		
		× × × >		ne sand, yellowish brown, medium dense, r	noist, non-					-0.4	4	•	
	0.5	× × × > × × × >	plastic [RIVER DEPOS	sits]			0.5			-0.5	5		
ſ		<								-0.6	5		
		$\times \times \times \rightarrow \times \times$								-0.7	25 +		-
		× × × >								-0.8			
		$\times \times \times \rightarrow$								-0.9			
ŀ	1.0			ine to coarse subrounded greywacke GRA e cobbles, greyish brown, tightly packed, m			1.0			-1.0			
2			<u> </u>							-1.1			
	_	DM.								-1.2			
		207					_			-1.3			
	_									-1.4 -1.5			
-	1.5	AX)					1.5			-1.5			
		THE A					_			-1.7			
							_			-1.8			
		Alban.					_			-1.9			
	2.0	(XA)					2.0			-2.0			
	2.0	257					2.0			-2.1			
		2Q-4								-2.2			
	_			End of Test Pit (2.2m)			_			-2.3			
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	2.5						2.5			-2.5			
	_									-2.6			
	_						_			-2.7			
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	3.0						3.0			-3.0			
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ļ	5.0						5.0			-5.0			
l								In-situ field testing in a Scala Penetrometer T				Penetrometer	
1								Shear Vane Testing: (

NZGD ID: HA-DCP_128990

	Davis Ogilvie & Partne Level 1, 24 Moorhouse, Office 0800 999 333 0 www.do.nz	Avena	ue Adding		nistchurc	h 8140 Ja	b N ²	OW INVESTIGATION RESULTS 39353 DCP 1 + HA DCP 2
	Project: 19 Raptor Street, Falcons Landing, Rolles Client: Compass Homes Fest Location: Refer to attached Geotechnical Site Plan				807)		E	Date: 28/08/19 Time: 10:00 a.m. xcavation Method: DCP+HA
D E P T H (m)	STRATA DESCRIPTION Auger at DCP 1 SILT; dark brown. Moist, moderately organic with trace rootlets	nscs	Graphic Log	Water Table	1 2 3	E DCP 1 4 5 6 7 8 9		CP 2 T 2 3 4 5 6 7 8 9 CP 2 T H (m)
-	(TOPSOIL). [0.45m]	TS	د TS <u>من</u> مد من مد ک TS د من مد من مد	ater Not Encoul				14 12
0. 5 - - -	SILT with some fine sand; yellowish brown with minor orange mottling. Stiff to very stiff, moist. [0.65m]	ML		Groun				
1.0-	SILT with trace fine sand and medium gravel; yellowish orangey brown, hard, moist, low plasticity. Gravel is subrounded greywacke. [0.10m] Auger terminated at 1.20m - Refusal on gravel.	ML					13	30
1.5- - -								
2.0-								
- 2.5-								-2.5
3.0-								
Plot	ged By: HC+GC Notes: ted By: GC cked By: HC	<u>.</u>		·		condition at the lo typical condition ground away from	cation of ns across the test le or suita netromete	Test and logs give an indication of the ground the tests only. While they are representative of the site, they do not identify variations in the ocations. This log does not cover slope stability bility of the site for building. er Test performed in accordance with NZS 4402 6.5.2 (Procedure 1 and 2)

NZGD ID: HA-DCP_128990

	Project: 19 Raptor Street, Falcons Landing, Rollest Client: Compass Homes	ton (Lot 298	DP 532	807)				e: 28/08/19 e: 10:00 a.r	
٦	Test Location: Refer to attached Geotechnical Site Plan (DWO	G G01A)				Excavation Metho		
D E P T H (m)	STRATA DESCRIPTION Auger at DCP 3 SILT; dark brown. Moist, moderately organic with trace rootlets (TOPSOIL). [0.50m]	nscs	د المعالم المعا معالم معالم المعالم الم المعالم المعالم		1 2 3	DCP 3		/S / 100 mm DCI		D E P T H (m
- 0. 5 -	SILT with some fine sand; yellowish brown with minor orange mottling. Stiff, moist. [0.90m]	TS	<u>an</u>	indwater No					2	- 0.9
- - 1.0- - -		ML								- -1.0 28 - 30
- 1.5- -	SILT with trace fine sand, yellowish orangey brown. Hard, moist, low plasticity. [0.10m] Fine and medium SAND with some silt; greyish brown. Dense, wet. [0.10m] SILT with trace fine sand; mottled orange and grey. Hard, moist, low plasticity. [0.10m] Auger terminated at 1.70m - Refusal on gravel.	ML SM ML					1: > 1:	5		- -1. -
- 2.0- -	1.7m: Sandy fine and medium gravel recovered									- -2. -
- 2.5- -										- -2. -
- 3.0-	Iged By: HC+GC Notes:									- -3