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	AA	Approver's Signature	Alt
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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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.

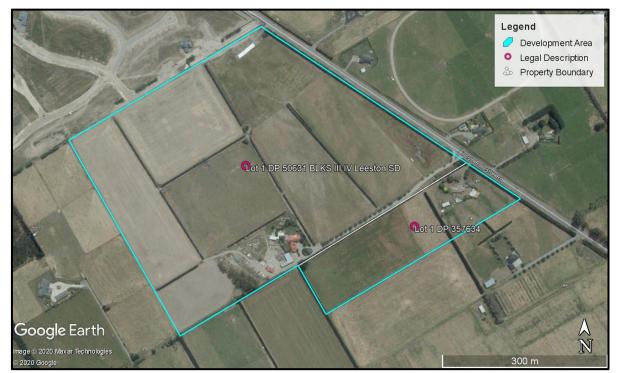


Figure 1: Site Location / Layout Plan

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	Bores ECan		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.
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- 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.
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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 Geotechnical Society (NZGS) and Ministry of Business, Innovation and Employment (MBIE) (2016). Earthquake geotechnical engineering practice Module 3: Identification, assessment and mitigation of liquefaction hazards, May 2016.
- New Zealand Standard NZS1170.5 (2004). Structural Design Actions, Part 5: Earthquake Actions New Zealand Standard, NZS 2004.
- Selwyn District Council District Plan Online Maps, https://eplan.selwyn.govt.nz/eplan/#/Property/7941662.

Appendices



A. Ground Investigation Data

MINZ site-specific investigation logs ECan well bore logs Aurecon 2017 investigation logs (nearby only) LandTech 2018 investigation logs (nearby only) Davis Ogilvie 2019 investigation logs (nearby only)

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											L	ab Te	estin	g			
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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, 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	

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SHALLOW GROUND INVESTIGATION LOG

PROJECT:	151 & 153 Lincoln	Rolleston Road, Rollesto	on	
LOGGED BY:	CG	TOTAL TESTING DEPTH:	0.7 mbgl	HOLE DIAMETER: 50 m
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

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SHALLOW GROUND INVESTIGATION LOG

PROJECT:	151 & 153 Lincoln	Rolleston Road, Rollest	ton	
LOGGED BY:	CG	TOTAL TESTING DEPTH:	1.2 mbgl	HOLE DIAMETER: 50 mr
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SHALLOW GROUND INVESTIGATION LOG

PROJECT:	151 & 153 Lincoln	51 & 153 Lincoln Rolleston Road, Rolleston												
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PROCESSED BY:	CG	TESTING METHOD:	TP + DC	CP	SHEAR VANE NUMBER:	-								
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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	

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SHALLOW GROUND INVESTIGATION LOG

PROJECT:	151 & 153 Lincoln	51 & 153 Lincoln Rolleston Road, Rolleston											
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- 2.0 - -		2																
2.5 -																		
-						LEG	END											
	ABBREVIATIONS															NOT	E <u>S</u>	
DCP	DYNAMIC CON	E PENETI	ROMETE	R N/E	NOT ENCOUNT	ERED	LL LI	QUID 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				Y INDEX		FC							
TP	TEST PIT			UW	UNIT WEIGHT			ATER CO	ONTENT			STAN	IDING	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 n
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			Sample	Atter	berg Li	imits	Gr	ain S	ize	wc		Shear Vane Reading (kPa)
(m)	(Blows per 100mm)		USC		Soil Characteristics		Graphic Log	Taken	ш	PL	PI	GR	SA	FC	(%)	υw	peak/remoulded
-	5				ic, dark brown, dry (
_	8			Sandy SILT; low sand is fine to	v plasticity, yellow-b medium	rown, dry,	× × × × × × × × × × ×										
0.5 -	Weight Bouncing				o coarse SAND / Sano , dry, gravel is subro												
-				EOH (T	ARGET STRATA RE	ACHED)	J										
- 1.0 - -		Q															
- 1.5 - -		NOT ENCOUNTERED															
- 2.0 - -																	
2.5 -																	
-																	
	ABBREVIATIONS					LEGEND									NOT	ES	
DCP	DYNAMIC CON		ROMETE	R N/E	NOT ENCOUNTERE	D LL	LIQUID LI	MIT		GR	GRA	VEL					
HA	HAND AUGER			UTP	UNABLE TO PENET	RATE PL	PLASTIC L				SAN						
SV	SHEAR VANE			EOH	END OF HOLE	PI				FC							
TP	TEST PIT			UW	UNIT WEIGHT (WATER C	ONTENT		. <u></u> .	STAN	IDING	6 GW	L	1		
GWL	GROUNDWATE	R LEVEL		mbgl	METERS BELOW G	ROUND LEVEL									<u> </u>		

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 + D	CP	SHEAR VANE NUMBER:	-
LOCATION:	REFER TO SITE PLAN	GROUNDWATER LEVEL:	N/E		This report may only be reproduced in full	

DCP Test Depth Results					6 H B						L	ab Te	estin	g			
		GWL			Soil Descripti	on		Sample	Atter	berg L	imits	Gı	rain S	ize	wc		Shear Vane Reading (kPa)
(m)	(Blows per 100mm)		USC		Soil Characteris	tics	Grap Lo		ш	PL	PI	GR	SA	FC	(%)	UW	peak/remoulded
-	5 4 5			SILT; non-plast	ic, dark brown, d	ry (TOPSOIL)											
0.5 -	6 7 8			Sandy SILT; low sand is fine to	/ plasticity, yellov medium	v-brown, dry	× × × × × ×	× × × × × ×									
-	7			to coarse, grey subangular	o coarse SAND / S , dry, gravel is su	brounded to	10 1/10 1/10 1/10 _01 1/10 1/10 1/10 _01 1/10 1/10 1/10										
_ 1.0 _ _	Weight Bouncing	9		EOH (T	ARGET STRATA	REACHED)											
- 1.5 - -		NOT ENCOUNTERED															
2.0 -																	
-																	
						LEGE	END										
DCP	ABBREVIATIONS			R N/E	NOT ENCOUNT	FRED	LL LIQU			GR	GPA				NOT	ES	
HA	HAND AUGER			K N/E UTP	UNABLE TO PE		PL PLAS				SAN						
SV	SHEAR VANE			EOH	END OF HOLE			FICITY INDEX		FC			NTEN	т			
TP	TEST PIT			UW	UNIT WEIGHT	(kN/m³)		ER CONTENT		.							
	GROUNDWATE	R LEVEL		mbgl	METERS BELOW												

miyamoto. Engineers+ construction 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:	0.7 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	

Results (Blows per 100mm) 5 4 4 2 7 7 16 Weight Bouncing	GWL - -		SILT; non-plasti Sandy SILT; low sand is fine to r	coarse SAND / S	ry (TOPSOIL) v-brown, dry,	Graphic Log	Sample Taken	Attern LL	berg Li PL	PI		ain Si SA	FC	WC (%)	UW	Shear Vane Reading (kPa) peak/remoulded
100mm) 5 4 4 2 7 7 16 Weight	-		SILT; non-plasti Sandy SILT; low sand is fine to r Gravelly fine to to coarse, grey,	c, dark brown, di plasticity, yellov nedium coarse SAND / S	ry (TOPSOIL) v-brown, dry,	Log		Ш	PL	PI	GR	SA	FC		UW	peak/remoulded
4 4 2 7 16 Weight	-		Sandy SILT; low sand is fine to r Gravelly fine to to coarse, grey,	plasticity, yellov nedium coarse SAND / S	v-brown, dry,											
16 Weight	-		to coarse, grey,		andy Gravel: fir	× × × × × × × × × × × × × × × × × × ×										
					,,	ne										
			EOH (T/	dry, gravel is sul		3333333333	-									
	Ð															
	NOT ENCOUNTERI															
					LEGEN	D										
BREVIATIONS														NOT	ES	
	PENETR	OMETER														
AND AUGER			UTP										_			
							UNTENT		. Y	STAN	IDING	GWL	-			
H E	(NAMIC CONE AND AUGER IEAR VANE IST PIT	(NAMIC CONE PENETR) AND AUGER IEAR VANE	BREVIATIONS //NAMIC CONE PENETROMETE AND AUGER HEAR VANE ST PIT	BREVIATIONS //NAMIC CONE PENETROMETER N/E AND AUGER UTP HEAR VANE EOH :ST PIT UW	BREVIATIONS INAMIC CONE PENETROMETER N/E NOT ENCOUNT AND AUGER UTP UNABLE TO PEN IEAR VANE EOH END OF HOLE IST PIT UW UNIT WEIGHT	EREVIATIONS VNAMIC CONE PENETROMETER N/E NOT ENCOUNTERED LL AND AUGER UTP UNABLE TO PENETRATE PI IEAR VANE EOH END OF HOLE PI IST PIT UW UNIT WEIGHT (kN/m³) W	Image: Second	END ELEGEND END END END ELIQUID LIMIT AND AUGER UTP UNABLE TO PENETRATE PL PLASTIC LIMIT REAL YANE EOH END OF HOLE PL PLASTIC LIMIT REAL YANE EOH END OF HOLE PL PLASTIC ITY INDEX ST PIT UW UNIT WEIGHT (kN/m³) WC WATER CONTENT	LEGEND EREVIATIONS NAMIC CONE PENETROMETER N/E NOT ENCOUNTERED LL LIQUID LIMIT AND AUGER UTP UNABLE TO PENETRATE PL PLASTIC LIMIT HEAR VANE EOH END OF HOLE PI PLASTIC LIMIT	LEGEND EREVIATIONS (NAMIC CONE PENETROMETER N/E NOT ENCOUNTERED LL LIQUID LIMIT GR AND AUGER UTP UNABLE TO PENETRATE PL PLASTIC LIMIT SA HEAR VANE EOH END OF HOLE PI PLASTICITY INDEX FC IST PIT UW UNIT WEIGHT (kN/m³) WC WATER CONTENT	BREVIATIONS VIAAMIC CONE PENETROMETER N/E NOT ENCOUNTERED LL LIQUID LIMIT GR GRAM NAMIC CONE PENETROMETER N/E NOT ENCOUNTERED LL LIQUID LIMIT GR GRAM TP UTP UNABLE TO PENETRATE PL PLASTIC LIMIT SA SAMI IEAR VANE EOH EOH END OF HOLE PI PLASTICITY INDEX FC FINE STAT UW UW UNIT WEIGHT KN/M*) WC WATER CONTENT	BREVIATIONS VIAAMIC CONE PENETROMETER N/E NAAMIC CONE PENETROMETER N/E NOT ENCOUNTERED LL LIQUID LIMIT GR GR GRAVEL STANDIAGER UTP LEGEND STEPIT UW UW UNIT WEIGHT (kN/m³) WC WC WATER CONTENT STANDING	BREVIATIONS IMAMIC CONE PENETROMETER N/E NAMIC CONE PENETROMETER N/E NAMIC CONE PENETROMETER N/E NOT ENCOUNTERED LL LIQUID LIMIT GR GR GRAVEL AND AUGER UTP UTP UNABLE TO PENETRATE PL PLASTICITY INDEX FC FINES CONTENT IST PIT UW UW UNIT WEIGHT KM/m³) WC WATER CONTENT	BREVIATIONS INAMIC CONE PENETROMETER N/E NOT ENCOUNTERED LL LIQUID LIMIT GR GRAVEL SBREVIATIONS INAMIC CONE PENETROMETER N/E NOT ENCOUNTERED LL LIQUID LIMIT GR GRAVEL AND AUGER UTP UNABLE TO PENETRATE PL PLASTIC LIMIT SA SAND IEAR VANE EOH END OF HOLE PI PLASTICITY INDEX FC FINES CONTENT STS PIT UW UNIT WEIGHT (KN/m³) WC WATER CONTENT	Image: Standard S	LEGEND LEGEND LEGEND LEGEND LEGEND LEGEND LEGEND LEGEND LL LIQUID LIMIT GR GRAVEL ST PIT UNABLE TO PENETRATE PL PLASTIC LIMIT SA SAND HEAR VANE EOH END OF HOLE PI PLASTIC LIMIT PLASTIC LIMIT PLASTIC P

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 mbg	gl	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	

					Soil Descripti	07					L	ab Te	estin	g			Shows Vers-
Depth		GWL			Soli 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	(%)	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	/ plasticity, yellov medium	w-brown, dry,	× × × × × × × × × × × × × × × × × × ×										
-	Weight Bouncing			to coarse, grey subangular	o coarse SAND / S , dry, gravel is su ARGET STRATA	brounded to	fine										
1.0 - -																	
- 1.5 - -		NOT ENCOUNTERED															
_ 2.0 _ _ _																	
- 2.5 - -																	
-						LEGE	ND										
						LEGE									NOT	EC	
-	ABBREVIATIONS DYNAMIC CON	-	ROMETE	R N/E	NOT ENCOUNT	FRED	LL LIQUID I	IMIT		GR	GRA	VFI			NOT	<u>E3</u>	
	HAND AUGER			UTP	UNABLE TO PE		PL PLASTIC				SAN						
	SHEAR VANE			EOH	END OF HOLE			ITY INDEX				s con	NTEN.	т			
	TEST PIT			UW	UNIT WEIGHT		WC WATER			.							
	GROUNDWATE			mbgl	METERS BELOV										1		

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:	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 Results (Blows per									L	ab Te	estin	g				
Depth		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	(%)	UW	peak/remoulded
_	5 4			SILT; non-plast	ic, dark brown, d	ry (TOPSOIL)											
-	9 13			Sandy SILT; low sand is fine to	v plasticity, yellov medium	v-brown, dry,	× × × × × × × × × × × × × × × × × × ×	÷.									
0.5 -	11 7						× × × × × × × × × × ×										
-	8			to coarse, grey subangular	o coarse SAND / S 9, dry, gravel is su	brounded to	ne ************************************										
- 1.0 - -	Weight Bouncing			EOH (T	ARGET STRATA	REACHED)											
- 1.5 - -		NOT ENCOUNTERED															
- 2.0 - -		NG															
2.5 -																	
-																	
						LEGEN	D										
	ABBREVIATIONS							INALT		CD	C D A1				NOT	<u>ES</u>	
DCP		E PENE IF	KUIVIETE	R N/E UTP						GR SA							
HA SV	HAND AUGER SHEAR VANE			EOH	UNABLE TO PEI END OF HOLE		L PLASTIC	LIMIT TY INDEX		SA FC				т			
TP	TEST PIT			UW	UNIT WEIGHT		C WATER			7							
	GROUNDWATE			mbgl	METERS BELOV						2.74			-			

PROJECT NUMBER: CLIENT:

TESTING COMPLETED:

200357 Yoursection Ltd 17 November 2020

SHALLOW GROUND INVESTIGATION LOG

PROJECT:	151 & 153 Lincoln	Rolleston Road, Rollest	1 & 153 Lincoln Rolleston Road, Rolleston											
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				Cail Deserinti							L	ab Te	estin	g			<i>a</i> , <i>u</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	S	oil Characteris	tics		iraphic Log	Taken	LL	PL	PI	GR	SA	FC	(%)	UW	peak/remoulded
-	6 5 8			SILT; non-plastic	, dark brown, d	ry (TOPSOIL)												
0.5 -	15 21			Sandy SILT; low p sand is fine to m		w-brown, dry	× ×	× × × × × × × × × × × ×										
-	Weight Bouncing			SAND; fine to me				<u> </u>										
- 1.0 -				Gravelly fine to o to coarse, grey, o subangular EOH (TA		brounded to	D 10											
- - 1.5 - -		NOT ENCOUNTERED																
- 2.0																		
2.5 -																		
						LEG	END									NOT		
DCP	ABBREVIATIONS DYNAMIC CON		ROMETE	R N/E	NOT ENCOUNT	ERED		QUID LII	MIT		GR	GRA	VEL			NOT	<u>55</u>	
HA	HAND AUGER	/12/1			UNABLE TO PE			LASTIC LI				SANE						
SV	SHEAR VANE				END OF HOLE				Y INDEX		FC			ITEN.	т			
TP	TEST PIT			UW	UNIT WEIGHT	(kN/m³)	WC W	ATER CO	ONTENT		. .	STAN	IDING	6 GW	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, 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 Descript								L	ab Te	estin	g			<i>ci v</i>	
Depth	Results (Blows per	GWL			Soli Descripti	on			Sample	Atter	berg L	imits	Gr	ain S	ize	wc		Shear Vane Reading (kPa)
(m)	(Blows per 100mm)		usc		Soil Characteris	ics		aphic Log	Taken	LL	PL	PI	GR	SA	FC	(%)	' I NAV . I	peak/remoulded
-	8 15 15			Sandy SILT; low	ic, dark brown, d / plasticity, yellov		×											
0.5 -	Weight Bouncing			to coarse, grey subangular	nedium o coarse SAND / S , dry, gravel is su ARGET STRATA	brounded to	×	X X X X X X X X X X X X X X X X										
- 1.0 - -																		
- 1.5 - -		NOT ENCOUNTERED																
- 2.0 -																		
2.5 -																		
-						LEGE	ND											
	ABBREVIATIONS															NOT	ES	
DCP	DYNAMIC CON	E PENETI	ROMETE	R N/E	NOT ENCOUNT	ERED	LL LIC	QUID LIN	1IT		GR	GRA	VEL					
HA	HAND AUGER			UTP	UNABLE TO PE	NETRATE	PL PL	ASTIC LII	MIT		SA	SANI	D					
SV	SHEAR VANE			EOH	END OF HOLE		PI PL	ASTICITY	' INDEX		FC							
TP	TEST PIT			UW	UNIT WEIGHT		WC W	ATER CO	NTENT		. .	STAN	DING	GW	L			
GWL	GROUNDWATE	R LEVEL		mbgl	METERS BELOV	V GROUND LE	VEL											

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:	1.0 mbgl	HOLE DIAMETER:	50 mm
PROCESSED BY:	CG	TESTING METHOD:	TP + DCP	SHEAR VANE NUMBER:	-
LOCATION:	REFER TO SITE PLAN	GROUNDWATER LEVEL:	N/E	This report may only be reproduced in full	

	DCP Test				Soil Descripti	0 m					L	ab Te	estin	g			Characteria a
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	tics	Graphic Log	Taken	ш	PL	PI	GR	SA	FC	(%)	υw	peak/remoulded
-	7 6 4			SILT; non-plasti	c, dark brown, d	ry (TOPSOIL)											
0.5 -	4 5 6 4			Sandy SILT; low sand is fine to r	plasticity, yellov nedium	v-brown, dry,	× × × × × × × × × × × × × × × × × × ×										
- - 1.0 -	6 9 20			to coarse, grey, subangular	coarse SAND / S dry, gravel is su ARGET STRATA	brounded to	ne										
- - 1.5 - -	Weight Bouncing	NOT ENCOUNTERED		2011 (17													
2.0 -		Z															
2.5																	
	ABBREVIATIONS					LEGEN	טו								NOT	ES	
DCP	DYNAMIC CON		ROMETE	R N/E	NOT ENCOUNT	ERED LI	L LIQUID L	IMIT		GR	GRA	VEL					
HA	HAND AUGER			UTP	UNABLE TO PE	NETRATE P	L PLASTIC	LIMIT		SA	SAN	D					
SV	SHEAR VANE			EOH	END OF HOLE		PLASTICI	TY INDEX		FC							
TP	TEST PIT	EST PIT UW UNIT WEIGHT (kN/m³) WC WA					VC WATER	CONTENT		. ∇	STAN	DING	G GW	L			
GWL	GROUNDWATE	R LEVEL		mbgl	METERS BELOV	V GROUND LEV	/EL										

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		nm
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		L	ab Te	estin	g			Shear Vane
Depth	Results	GWL			Son Descripti	ווכ			Sample	Atter	berg L	imits	Gı	ain S	ize	wc		Snear Vane Reading (kPa)
(m)	(Blows per 100mm)		USC		Soil Characteris	tics		Graphic Log	Taken	ш	PL	PI	GR	SA	FC	(%)	υw	peak/remoulde
_	5			SILT; non-plasti	ic, dark brown, d	ry (TOPSOIL)) :											
_	11 20			Sandy SILT; low sand is fine to r	/ plasticity, yellov medium	v-brown, dry	у <i>,</i>	× × × × × × × × × × ×										
0.5 -	Weight Bouncing							× × × × × × × × × × ×										
-					o coarse SAND / S , dry, gravel is su													
- 1.0 -				subangular	TARGET STRATA													
-	·····	ERED																
- 1.5 -		NOT ENCOUNTERED																
-		.ON																
2.0 -																		
2.5																		
-																		
						LEGI	END											
-	ABBREVIATIONS															NOT	ES	
DCP	DYNAMIC CON	E PENETI	ROMETE	R N/E	NOT ENCOUNT	ERED	LL	LIQUID LI	MIT		GR							
HA	HAND AUGER			UTP	UNABLE TO PE	NETRATE		PLASTIC L			SA							
SV	SHEAR VANE			EOH	END OF HOLE			PLASTICIT			FC							
TP	TEST PIT			UW	UNIT WEIGHT			WATER C	ONTENT			STAN	NDING	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, Rollest	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	estin	g			
Depth	Results	GWL			Soil Descripti	on		Sample	Atter	berg L	imits	Gr	rain S	ize	wc		Shear Vane Reading (kPa)
(m)	(Blows per 100mm)		USC		Soil Characteris	tics	Grap Lo		LL	PL	PI	GR	SA	FC	(%)	υw	peak/remoulded
	4 3 3 4 4 4				c, dark brown, d y plasticity, yellov nedium		/, × × × × × × × × × × ×	× × × × × × × ×									
-	5 20 Weight Bouncing			to coarse, grey, subangular	coarse SAND / S dry, gravel is su	brounded to	; fine	× ×									
1.0 – – –		rered		EOH (1	FARGET STRATA	REACHED)											
1.5 - - -		NOT ENCOUNTERED															
2.0																	
2.5 -																	
I						LEGE	END										
-	ABBREVIATIONS DYNAMIC CONE HAND AUGER		ROMETE	R N/E UTP	NOT ENCOUNT		LL LIQU PL PLAS			GR SA	GRA SANI				NOT	<u>ES</u>	
SV TP	SHEAR VANE TEST PIT			EOH UW	END OF HOLE UNIT WEIGHT	(kN/m³)	PI PLAS WC WAT	TICITY INDEX ER CONTENT		FC	FINE	S CON					
GWL	GROUNDWATE	k 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, Rollesto	n			
LOGGED BY:	CG	TOTAL TESTING DEPTH:	0.4 mb	bgl	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			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	Grap. Log		ш	PL	PI	GR	SA	FC	(%)	υw	peak/remoulded
_	5 8 20			SILT; non-plasti	c, dark brown, d	ry (TOPSOIL)											
- 0.5 - -	Weight Bouncing			to coarse, grey, subangular	coarse SAND / S , dry, gravel is su ARGET STRATA	brounded to)	××									
- - 1.0 - -		0															
- 1.5 - -		NOT ENCOUNTERED															
2.0 -																	
- 2.5 - -																	
-						LEG	END										
	ABBREVIATIONS														NOT	ES	
DCP	DYNAMIC CONE		OMETE	R N/E	NOT ENCOUNT	ERED	LL LIQUI	D LIMIT		GR	GRA	VEL					
HA	HAND AUGER			UTP	UNABLE TO PE	NETRATE	PL PLAS	FIC LIMIT		SA	SAN	D					
SV	SHEAR VANE			EOH	END OF HOLE			FICITY INDEX		FC							
TP	TEST PIT			UW	UNIT WEIGHT			ER CONTENT			STAN	NDING	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, 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											L	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	C	Graphic Log	Taken	ш	PL	PI	GR	SA	FC	(%)	UW	peak/remoulded
-	5 5 20			SILT; non-plasti	ic, dark brown, d	ry (TOPSOIL)												
- 0.5 - -				to coarse, grey subangular	o coarse SAND / S , dry, gravel is su ARGET STRATA	brounded to	fine											
- 1.0 -	Weight Bouncing																	
- - 1.5 - -		NOT ENCOUNTERED																
- 2.0 - -																		
2.5 -																		
						LEGE	ND											
:	ABBREVIATIONS															NOT	ES	
DCP	DYNAMIC CON	E PENETI	ROMETE	R N/E	NOT ENCOUNT	ERED	LL L	IQUID LI	MIT		GR	GRA	VEL					
HA	HAND AUGER			UTP	UNABLE TO PE	NETRATE	PL P	LASTIC L	IMIT			SAN						
SV	SHEAR VANE			EOH	END OF HOLE				TY INDEX		FC							
TP	TEST PIT			UW	UNIT WEIGHT			VATER C	ONTENT			STAN	IDING	G G W	L			
GWL	GROUNDWATE	R LEVEL		mbgl	METERS BELOW	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		nm
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		Sample	Atter	berg L	imits	Gı	ain S	ize	wc		Shear Vane Reading (kPa)
(m)	(Blows per 100mm)		usc	Soil Characteristics	Graphic Log	Taken	ш	PL	PI	GR	SA	FC	(%)	UW	peak/remoulded
-	4 3 4			SILT; non-plastic, dark brown, dry (TOPSOIL)											
- 0.5 - -	4 7 16			Sandy SILT; low plasticity, yellow-brown, dry, sand is fine to medium	× × × × × × × × × × × × × × × ×										
-	17 13 20 Weight				× × × × × × × × × × × × × × × × × × ×										
1.0 -	Bouncing			Gravelly fine to coarse SAND / Sandy Gravel; fi	× × × × × × × ne ^{#+*++++++++++}										
-		TERED		to coarse, grey, dry, gravel is subrounded to subangular EOH (TARGET STRATA REACHED)											
1.5 -		NOT ENCOUNTERED													
2.0															
2.5 -															
_															
			1	LEGEN	D										
4	ABBREVIATIONS												NOT	ES	
	DYNAMIC CON	E PENETI	ROMETE	•	L LIQUID L			GR							
	HAND AUGER				L PLASTIC				SANI		1TE	т			
	SHEAR VANE TEST PIT				I PLASTIC	TY INDEX		FC							
	GROUNDWATE			mbgl METERS BELOW GROUND LEV					JIAN			-			

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 m
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	esting	g			Ch - m Maria
Depth	Results	GWL			Soli 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	Graphic 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 6			Sandy SILT; low sand is fine to r	v plasticity, yellov nedium	v-brown, dry	y, ×	× × × × × ×										
- 1.0 -	17 Weight Bouncing			to coarse, grey, subangular	coarse SAND / S . dry, gravel is su ARGET STRATA	brounded to)	x										
- 1.5 - -		NOT ENCOUNTERED																
- 2.0 - -		Z																
2.5 -																		
-						LEGI	END											
	ABBREVIATIONS															NOT	<u>ES</u>	
DCP	DYNAMIC CONI	E PENETF	ROMETE	R N/E	NOT ENCOUNT			IQUID LII			GR							
HA	HAND AUGER			UTP	UNABLE TO PE	NETRATE		LASTIC L				SAN				1		
SV	SHEAR VANE			EOH	END OF HOLE	/I-N1/ 21			Y INDEX		FC							
TP	TEST PIT	חובערי		UW	UNIT WEIGHT			VATER CO	ONTENT	1	. <u></u>	STAN	IDING	GW	L			
GWL	GROUNDWATE	R LEVEL		mbgl	METERS BELOW	V GROUND L	LEVEL									<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:	0.6 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		Soil Description									L	ab Te						
Depth (m)	Results (Blows per 100mm)	GWL			Soll Description	on			Sample	Atter	berg L	imits	Gr	ain S	ize	wc		Shear Vane Reading (kPa)
			USC		Soil Characterist	ics	G	Graphic Log	Taken	ш	LL PL	PI	GR	SA	FC	(%)	υw	peak/remoulded
_	5			SILT; non-plast	ic, dark brown, d	ry (TOPSOIL)												
-	5			Sandy SILT; low sand is fine to i	v plasticity, yellov medium	v-brown, dry,	×	× × × × × × × × ×										
0.5 -	7 20			to coarse, grey	o coarse SAND / S , dry, gravel is su		fine											
-	Weight Bouncing			subangular EOH (T	ARGET STRATA	REACHED)												
- 1.0 -																		
-		ITERED																
1.5 -		NOT ENCOUNTERED																
-		ON																
2.0 -																		
-																		
2.5 -																		
-																		
						LEGE	ND											
	ABBREVIATIONS					2202										NOT	ES	
DCP	DYNAMIC CON		ROMETE	R N/E	NOT ENCOUNT	ERED		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			VATER CO	ONTENT			STAN	NDING	6 GW	L			
GWL	GROUNDWATE	R LEVEL		mbgl	METERS BELOV	V GROUND LE	EVEL											

miyamoto. Engineers+ construction consultants

PROJECT NUMBER: CLIENT:

TESTING COMPLETED:

200357 Yoursection Ltd 17 November 2020

SHALLOW GROUND INVESTIGATION LOG

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

	DCP Test		Soil Description					Lab Testing								Shaar Vana	
Depth	Results (Blows per 100mm)	GWL					Sample	711101		tterberg Limits		Grain Size		ize wC		Shear Vane Reading (kPa)	
(m)			USC		Soil Characteris	tics	Graphic Log	Taken	LL	LL PL	PL PI	GR	SA	FC	(%)	υw	peak/remoulded
- - - 0.5 -	7 7 8 15 13				c, dark brown, d y plasticity, yellov nedium												
-	8 13 Weight Bouncing				o coarse SAND / S , dry, gravel is su		* * * * * * * * * * * * * * * * * fine										
1.0 – – –		INTERED		EOH (T	ARGET STRATA	A REACHED)											
1.5 - - -		NOT ENCOUNTERED															
2.0 -																	
2.5 -																	
						LEGE	ND										
DCP		YNAMIC CONE PENETROMETER		R N/E UTP	NOT ENCOUNT					GR					<u>NOT</u>	<u>ES</u>	
HA SV TP	HAND AUGER SHEAR VANE TEST PIT			EOH UW	UNABLE TO PE END OF HOLE UNIT WEIGHT		PL PLASTIC PI PLASTICI WC WATER (TY INDEX		SA FC V		s cor					
	GROUNDWATE	R LEVEL		mbgl	METERS BELOV							-					

PROJECT NUMBER: CLIENT:

TESTING COMPLETED:

200357 Yoursection Ltd 17 November 2020

SHALLOW GROUND INVESTIGATION LOG

PROJECT: 151 & 153 Lincoln Rolleston Road, Rolleston										
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			Sail Description					Shoar Vano					
Depth	Results (Blows per 100mm)	GWL	Soil Description			Sample	Atterb	erberg Limits		s Grain Si		wc		Shear Vane Reading (kPa)
(m)			USC	Soil Characteristics	Graphic Log	Taken	LL	PL PI	GR	SA	FC	(%)	UW	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; fir to coarse, grey, dry, gravel is subrounded to										
1.0 – – –		TERED		subangular EOH (TARGET STRATA REACHED)]									
1.5 - - -		NOT ENCOUNTERED												
2.0 -														
2.5 -														
				LEGEN	<u>п</u>							1		
	ABBREVIATIONS			LEGEN								NOT	ËS	
DCP	DYNAMIC CON		ROMETE	R N/E NOT ENCOUNTERED LI	LIQUID L	IMIT	G	GR GR	AVEL					
HA	HAND AUGER			UTP UNABLE TO PENETRATE PI	PLASTIC		S	SA SAI	١D			1		
SV	SHEAR VANE				PLASTICI				ES CO			1		
	TEST PIT				C WATER C	ONTENT		Х. . ST/	NDIN	G GW	L			
GWL	GROUNDWATE	R LEVEL		mbgl METERS BELOW GROUND LEV	EL									

miyamoto. Engineerst Client: Consultants

PROJECT NUMBER: CLIENT:

TESTING COMPLETED:

200357 Yoursection Ltd 17 November 2020

SHALLOW GROUND INVESTIGATION LOG

TP025

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

	DCP Test				Coll Decerimeti					Lab Testing						Shear Vane		
Depth	Results	GWL			Soil Descripti	on			imple	Atter	berg L	imits	Gr	ain S	ize	wc		Reading (kPa)
(m)	(Blows per 100mm)		USC		Soil Characteris	tics		aphic .og	aken	Ш	PL	PI	GR	SA	FC	(%)	UW	
-	4				ic, dark brown, d													
-	6 15			sand is fine to i			× × > ×	× × × × × ×										
0.5 -	Weight Bouncing				o coarse SAND / S , dry, gravel is su													
-				EOH (T	ARGET STRATA	REACHED)	1											
- 1.0 -																		
-		NTERED																
1.5 - - -		NOT ENCOUNTERED																
- - 2.0 -		Z																
-																		
2.5 -																		
-																		
-																		
						LEG	END			· · · · ·			•		•	•		
-	ABBREVIATIONS															NOT	ES	
DCP	DYNAMIC CON	E PENET	ROMETE		NOT ENCOUNT			UID LIMIT			GR							
HA	HAND AUGER			UTP	UNABLE TO PE	NETRATE						SAN			Ŧ			
SV TP	SHEAR VANE TEST PIT			EOH UW	END OF HOLE	(kN/m ³)		ASTICITY IN			FC							
	GROUNDWATE			mbgl	METERS BELOV							JIAN	N DINC		-			

miyamoto. Engineerst Client: Consultants

PROJECT NUMBER: CLIENT:

TESTING COMPLETED:

200357 Yoursection Ltd 17 November 2020

SHALLOW GROUND INVESTIGATION LOG

TP026

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

	DCP Test				Soil Descripti	<u></u>						L	ab Te	estin	g			Shear Vane
Depth	Results	GWL			son Descripti	UN			Sample	Atter	berg L	imits	Gr	rain S	ize	wc		Snear 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				ic, dark brown, d													
- 0.5 - - -	20 Weight Bouncing			to coarse, grey, subangular	o coarse SAND / S , dry, gravel is su ARGET STRATA	brounded to	о 											
- - 1.0 -																		
- 1.5 - -		NOT ENCOUNTERED																
_ 		2																
_ 2.5 _ _																		
-						LEG	END											
4	ABBREVIATIONS															NOT	ES	
DCP	DYNAMIC CONI	E PENETI	ROMETE	R N/E	NOT ENCOUNT	ERED	LL L	IQUID LII	MIT		GR	GRA	VEL					
	HAND AUGER			UTP	UNABLE TO PE	NETRATE		PLASTIC L				SAN						
	SHEAR VANE			EOH	END OF HOLE	11			Y INDEX		FC							
	TEST PIT			UW	UNIT WEIGHT			VATER C	ONTENT			STAN	IDING	5 GW	L			
GWL	GROUNDWATE	R LEVEL		mbgl	METERS BELOV	V GROUND	LEVEL											

miyamoto. Engineerst Client: Consultants

PROJECT NUMBER: CLIENT:

TESTING COMPLETED:

200357 Yoursection Ltd 17 November 2020

SHALLOW GROUND INVESTIGATION LOG

TP027

PROJECT:	151 & 153 Lincoln	Rolleston Road, Rollest	on		
LOGGED BY:	CG	TOTAL TESTING DEPTH:	0.3 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 Bosulte Soil Description				Coil Decerinti						L	ab Te	estin	g			Shear Vane
Depth (m)	Results (Blows per	GWL			Son Description			Sample Taken	Atter	berg L	imits	Gr	ain S	ize	wc		Reading (kPa)
(111)	(Diows per 100mm)		usc		Soil Characterist	ics	Graphi Log	c Tuken	ш	PL	PI	GR	SA	FC	(%)	υw	peak/remoulded
-	5 5 15 Weight			Gravelly fine to	ic, dark brown, di o coarse SAND / S r, dry, gravel is sul	Sandy Gravel; fi											
0.5 -	Bouncing				ARGET STRATA	REACHED)											
1.0 - - -		ERED															
- 1.5 - - -		NOT ENCOUNTERED															
2.0 -																	
2.5 - - - -																	
			-			LEGEN	ID	<u> </u>					-				
1	ABBREVIATIONS														NOT	ES	
DCP	DYNAMIC CONI	E PENETI	ROMETE		NOT ENCOUNT					GR							
HA	HAND AUGER			UTP	UNABLE TO PER		PL PLASTI				SANI			Ŧ	1		
SV TP	SHEAR VANE TEST PIT			EOH UW	END OF HOLE UNIT WEIGHT		PLASTI	CITY INDEX		FC					1		
١P	GROUNDWATE			UW	METERS BELOV		VC VVAIE	CONTENT			JIAN	NUNC	000	L	1		

Borelog for well M36/3868

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



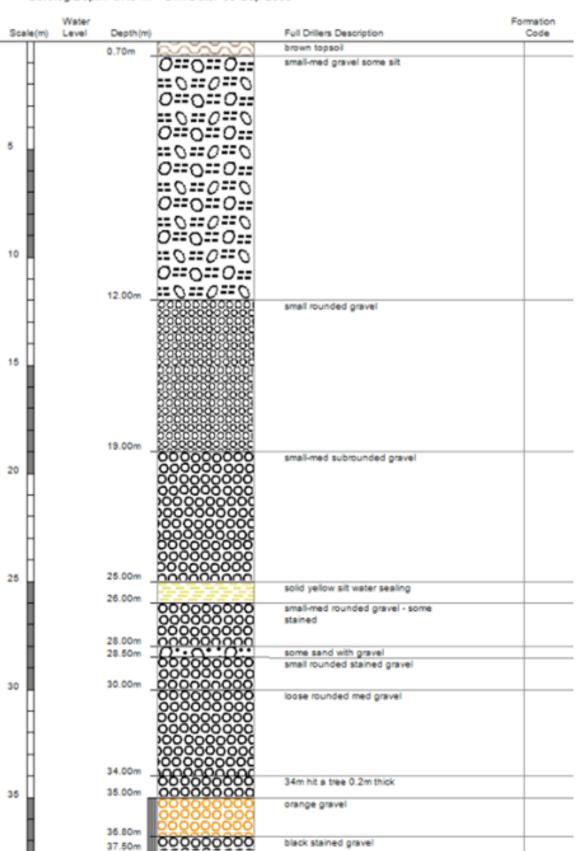
Scale(m)	Water Level	Depth(m)		Full Drillers Description	Formation Code
		0.30m		Earth	SP
н			000000000000000000000000000000000000000	Grey gravels	SP
- 11		1.80m	000000000		
н			000	Sand and gravels with some clay	SP-RI
U			00		
п			::0::0::0		
н			- · · · · · · · · · · · · · · · · · · ·		
5			0:0:0::		
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15			1.0.0.0		
			<u> </u>		
			0:.0::0::		
		18.50m			
			0::0::0::	Free gravels and sand	RI-LI
20			.0.0.0		
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п			0:0:0:0:		
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- 11					
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- 11			1.0.0.0		
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			0.000		
30					
П			0.0.0.		
Н			0.00.000		
			0		
Н			0.0.0.		
			0::0::0		
П			0.000		
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			D: 0: 0: (
		36.79m	T + + + + +		1

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Borelog for well M36/7975

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



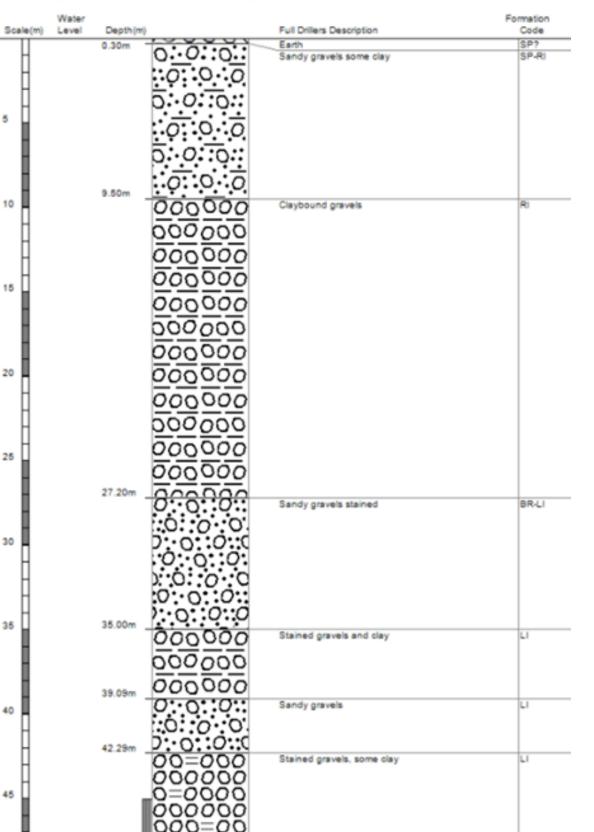




Borelog for well M36/4966

Grid Reference (NZTM): 1552787 mE, 5171550 mN Location Accuracy: 50 - 300m Ground Level Altitude: 38.6 m +MSD Accuracy: < 2.5 m Driller: McMillan Drilling Ltd Drill Method: Rotary/Percussion Borelog Depth: 48.0 m Drill Date: 18-Aug-1995





r

48.00r



Borelog for well BX23/0533

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



Water Formation Scale(m) Level Depth(m) Full Drillers Description Code Brown TOPSOIL. Unsaturated (dry or 0.50m moist). Grey GRAVEL (2 - 60 MM). 0000 Unsaturated (dry or moist). 3.00m Grey sandy GRAVEL (2 - 60 MM). Unsaturated (dry or moist). 5 10 13.79 13.70 15 19.00m Brown clayey GRAVEL (2 - 60 MM). 20 Unsaturated (dry or moist). 23.00m Brown clayey GRAVEL (2 - 60 MM) with some sand. Saturated (water-bearing). 25 30 ٤ 31.00m Light brown GRAVEL (2 - 60 MM). Saturated (water-bearing). 35 40 45

48.00m





TEST PIT NO.

TP7

PROJECT NO. 254246

PROJEC	⊤ Bra r	nthwaite Drive							
METHOD) TP		CO-ORDINATES	(NZTM)	LOGGED		CHEC	KED	
			E 1552186	T. MITCHELL		A. HILLS			
MACHINI	E & NO.	Wheeled Excavator	N 5171475	DATE					
CONTRA	CTOR	Maugers	GROUND LEVEL	GROUND LEVEL +37.00 m RL			DATE		
					22/11/2016		016		
		STE	RATA		SAM	S & TESTS			
Depth (m)	Legend		Description			Depth	No	Remarks/Tests	
	$= \frac{\frac{\sqrt{1}}{\sqrt{1}}}{\frac{1}{\sqrt{1}}} \frac{\sqrt{1}}{\sqrt{1}}$ $= \frac{1}{\sqrt{1}} \frac{\sqrt{1}}{\sqrt{1}}$	SILT with minor sand and trace of (TOPSOIL)	rootlets; dark brown	. Moist, low plasticity	/; sand, fine.				
0.50	- 1 <u>/ N1/</u>								
		SILT; light brown with orange-grey	r mottles. Moist, low	plasticity.					
1.40		1.20 - 1.40 Becomes with minor sa	and.						
1.40	1.40 \times $$ Fine to coarse GRAVEL with minor sand, silt and cobbles; brownish grey. Moist, $\begin{array}{c} \circ & \circ \\ \circ & \circ \\ \circ & \circ \end{array}$ subrounded to rounded; sand, fine to medium.								

End of Trial pit/trench at 1.70m, on 22/11/2016 *Termination Reason:* Target depth acheived.

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

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.

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



TEST PIT NO.

TP10

254246

	PROJECT NO.								
PROJECT B	anthwaite Drive								
METHOD T	P	CO-ORDINATES (NZTM)	LOGGED		CHEC	CKED			
		E 1552053	T. MITCHELL		A. HILLS				
	IO. Wheeled Excavator	N 5171529	DATE		DATE	:			
CONTRACTO	R Maugers	GROUND LEVEL +43.00 m RI			2/12/2				
		STRATA		SAM	1PLE	S & TESTS			
Depth (m)		Description		Depth	No	Remarks/Tests			
0.25	(TOPSOIL)	sand, fine.							
	· · · · · · · · · · · · · · · · · · ·	SILT with minor sand; light brown. Moist, low plasticity; sand, fine.							
	sand, fine to coarse.	ome sand; greyish brown. Moist, subrounde ial pit/trench at 1.60m, on 22/11/2016 <i>tion Reason:</i> Target depth acheived.	ed to rounded;	-					
		, , , , , , , , , , , , , , , , , , ,							

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. port Re

All dimensions in metres CLIENT GW Rolleston Ltd.	▷▷ Pocket Penetrometer Test ↓ Insitu Vane Shear Test
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TEST PIT NO.

TP23

PROJECT NO. 254246

PROJECT Branthwaite Drive

METHOD TP		CO-ORDINATES (NZTM)	LOGGED		CHEC	KED			
		E 1552359	T. MITCHELL		A. HILLS				
MACHINE & NO.	Wheeled Excavator	N 5171660		- · · · ·					
CONTRACTOR	Maugers	GROUND LEVEL +43.00	DATE 23/11/2016		DATE 5/12/2016				
	STRATA SAMPLES & TESTS								
Depth (m) Legend		Description			Depth	No	Remarks/Tests		

	(m)	Legend		Description		Depth	No	Remarks/Tests
		<u>1/ 1/ 1</u>	SILT with (TOPSO	h minor sand and rootlets; dark brown. Moist, low pla NL)	sticity; sand, fine.			
F	0.25	-× .		SAND with trace of rootlets; brown. Dry.		-		
	0.50	· × · ·				_		
		-00		coarse GRAVEL with some sand, minor cobbles, trac s; brown. Dry, subrounded to rounded; sand, fine to c				
		-000						
		100	1.00 Bec	comes with no rootlets; greyish brown.				
		-00						
		00						
	1.60	00						
		-		End of Trial pit/trench at 1.60m, on 23/1 <i>Termination Reason:</i> Target depth ach				
2016		_						
ember		-						
: 5 Dec		-						
Date		_						
0.GLB		-						
3S 4_(_						
ary: A0		-						
Libra								
GPJ		-						
LOGS		-						
RIVE		-						
THWA		-						
BRAN								
oject: I		_						
) Pr		-						
O MAP								
KETCH N	GENEF	RAL RI	EMARK	S		1		
RD (NO SI			IPPORT: Generally					
Report ID AGS4 TEST PIT RECORD (NO SKETCH NO MAP) Project: BRANTHWAITE DRIVE LOGS. GPJ Library: AGS 4_0.GLB Date: 5 December 2016	Coordina	tes four	t encounte nd using h ınd using	ered. handheld GPS, likely accurate to +/- 5 m. handheld GPS, likely accurate to +/- 10 m.				
Report ID:	All dimer	nsions ir	n metres	CLIENT GW Rolleston Ltd.	▷▷ Pocket Penetrometer Test ↓ Insitu Vane Shear Test	¥ Water Leve	1	



°00

TEST PIT RECORD

TEST PIT NO.

TP24

254246 PROJECT NO.

PROJECT	Brar	nthwaite Drive						
METHOD	TP		CO-ORDINATES (NZTM)	LOGGED		CHEC	CKED	
MACHINE	& NO.	Wheeled Excavator	E 1552208 N 5171608	T. MITCHELL		A. HILLS		
CONTRAC	TOR	Maugers	GROUND LEVEL +44.00 m R	DATE 23/11/2016		5/12/2		
		STI	RATA		SAM	IPLE	S & TESTS	
Depth (m)	Legend		Description		Depth	No	Remarks/Tests	
0.20	<u>x¹ 1/</u> .x 1/ .x 1/	SILT with minor sand and tree root sand, fine. (TOPSOIL)	ts (up to 10 mm); dark brown. Moist, lov	v plasticity;				
- - - - - - - - - - - - - -		SILT with minor sand; brown. Mois	t, low plasticity; sand, fine.					
-	000	Fine to coarse GRAVEL with some brown. Moist, subrounded to round	e sand, minor cobbles and trace of root ded; sand, medium.	lets; light				
-	000	1.20 Becomes with no rootlets.						

E	End of Trial pit/trend	ch at 1.70m, or	1 23/11/2016
	Termination Reaso	n: Target dept	h acheived.

All dimensions in metres CLIENT GW Rolleston Ltd. PP Pocket Penetrometer Test V Water Level Aurecon New Zealand Limited, Tel: Fax:	SHORII STABIL Groundw	RAL REMAI NG/SUPPO ITY: Gener	RT: None ally Stable untered. ng handheld GPS, likely accurate to + ing handheld GPS, likely accurate to -			
	All dime				¥ Water Level	

All dimensions in metres CLIENT GW Rolleston Ltd.	▷▷ Pocket Penetrometer Test ▼ Water Level ✓ Insitu Vane Shear Test ▼ Water Level
--	--



TEST PIT NO.

TP25

wv	ww.aure	econgroup.com					PROJEC	T NO.	25	4246
PROJECT	Brai	nthwaite Drive								
METHOD	TP		CO-ORDINATE:	S (NZTM)		LOG				KED
MACHINE	& NO.	Wheeled Excavator	E 1552490 N 5171658			T. MI	TCHELL		a. Hil	LS
CONTRAC	TOR	Maugers	GROUND LEVEL	+44.00	m RL	DATE	∃ /2016		DATE 5/12/2	
						23/11	/2010			
Depth	Legend		STRATA Description					SAM Depth	PLE No	S & TESTS Remarks/Tests
(m)		SILT with minor sand and roo			ty; sand, f	fine.		Dopui		
-	1/ <u>1/</u>	(TOPSOIL)								
0.35 -	× ×	SILT with some sand; brown.	Moist, low plasticity; sar	nd, fine.						
0.70	× × × ×									
	000	Fine to coarse GRAVEL with subrounded to rounded; sand	some sand and trace of	rootlets; bro	wnish gro	ey. Mo	ist,			
	00	0.70 - 0.80 Sand becomes me		own.						
-	00									
-	00	1.30 Becomes with no rootlets	5.							
1.60	00									
-		End of T <i>Termin</i>	rial pit/trench at 1.60m, ation Reason: Target de	on 23/11/20 oth acheived	16 1					
-			allow request. ranget as							
-										
-										
-										
-										
-										
-										
-										
-										
-										
-										
-										
GENER	AL RI	EMARKS								
		PPORT: None								
		Generally Stable								
		t encountered. nd using handheld GPS, likely	accurate to +/- 5 m.							

Ground level found using handheld GPS, likely accurate to +/- 10 m.

Report ID: AGS4 TEST PI ▷▷ Pocket Penetrometer Test ↓ Insitu Vane Shear Test CLIENT GW Rolleston Ltd. Water Level All dimensions in metres

		ndlooh	Client: Hank Developments Limited					Augerhole No.	HA01	
	6 0	N S U L T I N G	Project: Proposed Subdivision Address: 7/572 Selwyn Road, Rolleston					Sheet No.	1 of 1	
rill Type: rilled By: ate Starte		8 Ton Excavator BE 6-Apr-18	Project No: LTCL1805 Coordinates: NZTM: 15 Ground Conditions: Grassed, I	52177		171418 mN	Logged By: Shear Vane Calibration			BI N// N//
ate Finisl		6-Apr-18	Groundwater Level (m): Not Encou			r-18)	Calibration	Date:		N//
hu μ	-og	Soil description in a	ccordance with Guideline for the Field Classification and	Groundwater Level (m)	ц)		In-situ Fi	eld Testing		
Stratigraphy Depth (m)	Graphic Log	Description of Soil and R	Rock for Engineering Purposes, NZ Geotechnical Society Inc 2005	vater L	Depth (m)	Shear Strength (kP		Dynamic Cone ਦ	Scala Blow Cou	unt /
in L	Ū			Ground		Peak: Remoulded:	Depth (m)	0 Count	100mm 5 10 15	5 20
- 0	$\langle \rangle \rangle$	SILT, minor fine sand, plastic [TOPSOIL]	minor organics, dark brown, medium dense, moist, no	n	_		-0.1	3	•	
	\times				_		-0.2 -0.3	4 5	\	
	* * * * *	SILT, minor fine sand, DEPOSITS]	yellowish brown, dense, moist, non-plastic [RIVER				-0.4	7		
0.5	* * * * * * * *				0.5		-0.5	8		
-	* × × × × * × × × ×				-		-0.6 -0.7	10 12	ł	
			nded greywacke gravelly fine to coarse SAND, trace e cobbles, greyish brown, tightly packed, moist	1	_]	-0.8	25 +		\neg
_		sabroanaea greywacki	o oobalea, greyian brown, lighily packed, moist				-0.9			
1.0					1.0		-1.0			
-					-		-1.2			
2	A.		nded greywacke GRAVEL, some to minor fine to prown, tightly packed, moist		_		-1.3			
1.5	04					-	-1.4			
1.5	~~~~~		nded greywacke gravelly fine to coarse SAND, trace	-	1.5		-1.5			
		subrounded greywack	e cobbles, greyish brown, tightly packed, moist				-1.7			
_					_		-1.8			
_						-	-1.9 -2.0			
2.0					2.0		-2.1			
							-2.2			
					_		-2.3 -2.4			
2.5					2.5		-2.5			
					_		-2.6			
_			End of Test Pit (2.6m)				-2.7			
-					-		-2.8 -2.9			
3.0					3.0		-3.0			
_						-	-3.1			
-					-		-3.2 -3.3			
-	1				-		-3.4			
3.5					3.5		-3.5			
-					-		-3.6 -3.7			
-	1				-		-3.8			
	1						-3.9			
4.0	4				4.0		-4.0			
-	1				-		-4.1 -4.2			
-					_	1	-4.3			
							-4.4			
4.5	-				4.5		-4.5			
-	1				-		-4.6			
	1]	-4.8			
-					-		-4.9			
5.0				+	5.0	In-situ field testing in accordan	-5.0	ndards:		
					1	Scala Penetrometer Testing: N	IZS 4402:1988, Test 6.5	2, Dynamic Cone Pe	netrometer	

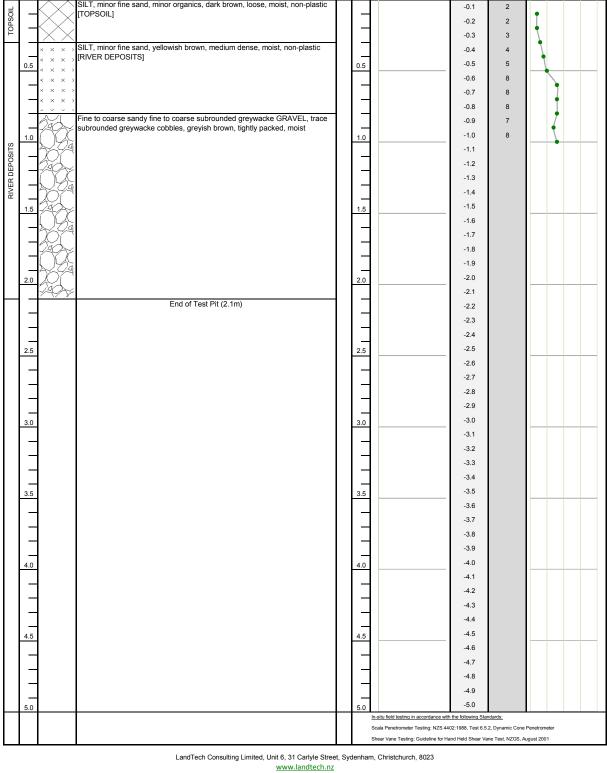
		ndloch	Client: Hank Developments Limited							Augerhole No	. HA0)2
		IN SULTING	Project: Proposed Subdivision Address: 7/572 Selwyn Road, Rolleston							Sheet No.	1 of	1
i ll Type:		8 Ton Excavator	Project No:	LTCL18051					Logged By:			E
illed By: ite Start	ed:	BE 6-Apr-18	Coordinates: Ground Conditions:	NZTM: 1552 Grassed, Ne			71344 mN		Shear Vane Calibration F			N. N
te Finis		6-Apr-18	Groundwater Level (m):	Not Encount			-18)		Calibration E			N
find find	Log	Soil description in a	accordance with Guideline for the Field Classifica	ion and	Groundwater Level (m)	(m			In-situ Fie			
Depth (m)	Graphic Log		Rock for Engineering Purposes, NZ Geotechnical 2005		vater I	Depth (m)	Shear Strengt	h (kPa)			Penetrometer Scala Blow C	
5 0	ğ				Groundv	Q	Peak: – Remoulded: 0	•	Depth (m)	Blow Count	100mm 5 10 :	15 2
-	$\langle \rangle \rangle$	SILT, minor fine sand, plastic [TOPSOIL]	, minor organics, dark brown, medium dense	, moist, non		-			-0.1	3	•	
	\otimes								-0.2 -0.3	3 4	+	
	× × × >		, trace subrounded greywacke gravel, yellow	ish brown,					-0.4	7		
0.5	× × × > × × × >	dense, moist, non-pla	stic [RIVER DEPOSITS]			0.5			-0.5	10		
_	< × × × > × × × >								-0.6	11	l l	
-	< × × >					-			-0.7 -0.8	12 10		
-	× × × × × × × ×								-0.9	19		
1.0	× × × >					1.0			-1.0	25 +		
_	bet and a second		fine to coarse subrounded greywacke GRAN greywacke cobbles, greyish brown, tightly pa			_			1.1			
-	Q Ga								-1.2 -1.3			
	LAC.								1.3			
1.5	í VÃ					1.5			-1.5			
_	$\mathcal{D}\mathcal{H}^{\mathbb{A}}$					_			-1.6			
_	2. Q. Y								-1.7			
-	XA								-1.8			
2.0						2.0			-1.9 -2.0			
2.0	() Á					2.0			-2.1			
	D^{γ}								-2.2			
			End of Test Pit (2.2m)						-2.3			
2.5	-								-2.4 -2.5			
2.5						2.5			-2.6			
-									-2.7			
						_			-2.8			
_	-					_			-2.9			
3.0	1					3.0			-3.0 -3.1			
-									-3.2			
]								-3.3			
_	1					_			-3.4			
3.5	-					3.5			-3.5			-
-	1								-3.6 -3.7			
-	1					-			-3.8			
]								-3.9			
4.0	4					4.0			-4.0			
-	-					-			-4.1 -4.2			
-	1					-			4.3			
-]					_			-4.4			
4.5]					4.5			-4.5			
-	-					_			-4.6			
-	-								-4.7 -4.8			
-	1					-			4.8			
5.0						5.0			5.0			
	I						In-situ field testing in ac					
1	1						Scala Penetrometer Tes Shear Vane Testing: Gu					

			ndiooh	Client: Hank Developments Limited						Augerhole No.	HA03	3
	L		IN SULTING	Project: Proposed Subdivision Address: 7/572 Selwyn Road, Rolleston						Sheet No.	1 of 1	
rille ate	Type: d By: Starte Finish		8 Ton Excavator BE 6-Apr-18 6-Apr-18	Coordinates: NZ Ground Conditions: Gr	CL18051 ZTM: 1552 rassed, Nei ot Encounte	ar lev	/e	171302 mN 18)	Logged By: Shear Vane Calibration I Calibration I	actor:		B N/ N/
۷۲	(Ď				evel (m)	(In-situ Fie	d Testing		
Straugraphy	Depth (m)	Graphic Log	Soil description in a Description of Soil and F	accordance with Guideline for the Field Classification Rock for Engineering Purposes, NZ Geotechnical Soc 2005	<i>and</i> ciety Inc.,	Groundwater Level (m)	Depth (m)	Shear Strength (kPa	· · · · · · · · · · · · · · · · · · ·	Dynamic Cone F	enetrometer Scala Blow Cou 100mm	unt /
						Grour		Remoulded:	Depth (m)	Blow Count		5 2(
IULAUL		\bigotimes	SILT, minor fine sand, plastic [TOPSOIL]	minor organics, dark brown, medium dense, m	oist, non		_		-0.1 -0.2	3 2	1	
-		$\times \times$		yellowish brown, dense, moist, non-plastic [RIV	/ER				-0.3 -0.4	4 6		
	0.5	* * * * * * * *	DEPOSITS]				0.5		-0.5	10 _		
	_	<							-0.6 -0.7	12 25 +	•	_
		<							-0.8			
	_	Þ.		fine to coarse subrounded greywacke GRAVEI greyish brown, tightly packed, moist	L, trace		_		-0.9			
	1.0	YA					1.0		-1.0			
2		H.					_		-1.2			
		QA							-1.3 -1.4			
	1.5	H.					1.5		-1.4			
		04							-1.6	-		
		R					_		-1.7			
		(A							-1.8 -1.9			
	2.0	XX4					2.0		-2.0			
		49X							-2.1			
	_	774					_		-2.2 -2.3			
	_	~_1		End of Test Pit (2.3m)					-2.4			
	2.5						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			
									-3.8			
	_								-3.9 -4.0			
	4.0						4.0		-4.1			
									-4.2			
	_						_		-4.3			
	4.5						4.5		-4.4 -4.5			
	+.3						+.5		-4.6			
							_		-4.7			
	_						_		-4.8 -4.9			
	5.0						5.0		-4.9			
								In-situ field testing in accordance				
								Scala Penetrometer Testing: NZ Shear Vane Testing: Guideline				

			Indiach	Client: Hank Developments Limited						Augerhole No	. HA04	4
á			N S U L T I N G	Project: Proposed Subdivision Address: 7/572 Selwyn Road, Rolleston						Sheet No.	1 of 1	1
rill T	/pe:		8 Ton Excavator	Project No: LTCI	_18051				Logged By:			В
rilled			BE	Coordinates: NZT	VI: 155213 sed, Near			71389 mN	Shear Vane Calibration			N/ N/
	inishe		6-Apr-18 6-Apr-18		Encountere			-18)	Calibration			N.
					ē	-						
hud	Ê	Log	Soil description in a	accordance with Guideline for the Field Classification an	d ty Inc.,	-040	Ê			d Testing		
stratigraphy	Depth (m)	Graphic Log		Rock for Engineering Purposes, NZ Geotechnical Socie 2005	ty Inc., ằ	Donth (m)	eptn (I	Shear Strength (kPa)		Dynamic Cone	Penetrometer Scala Blow Co	ount /
NI N	Ó	G		2000	- Apolino			Peak: Remoulded: •	Depth (m)	Blow Count	100mm	
		~ ~				5					5 10 1	5 2
IUPSUIL		$\langle \rangle \rangle$	SILT, minor fine sand, plastic [TOPSOIL]	minor organics, dark brown, medium dense, mois	st, non		_		-0.1 -0.2	3	•	
		XX					_		-0.2	4)	
	_			yellowish brown, dense, moist, non-plastic [RIVE	R		_		-0.4	8	•	
	0.5	< × × > < × × >	DEPOSITS]			0.	.5		-0.5	10		
	_	$\langle \times \times \rangle$	Fine to coarse sandy i	fine to coarse subrounded greywacke GRAVEL, to	(200		_		-0.6	12		
	\neg	7. X		greywacke cobbles, greyish brown, tightly packed,			_		-0.7 -0.8	25 +		
	\neg	4.JA					-		-0.9			
	1.0	XX.				1.	.0		-1.0			
		Ú Ha							-1.1			
	4	197ª					_		-1.2 -1.3			
2	_	ÃQ.					-		-1.3			
	1.5	XX4				1.	.5		-1.5			
	_	Ŵ							-1.6			
	_	XA					_		-1.7			
	_	H.					_		-1.8 -1.9			
	2.0	0 Åa				2	.0		-2.0			
	2.0	\widetilde{M}							-2.1			
		1444		5 - L (T - 1 B): (0.0 -)			_		-2.2			
	_			End of Test Pit (2.2m)			_		-2.3			
	2.5					2	.5		-2.4 -2.5			
F	2.5					2.	.5		-2.6			
									-2.7			
	_								-2.8			
	_						_		-2.9 -3.0			
ŀ	3.0					3.	.0		3.1			
									-3.2			
									-3.3			
	_						_		-3.4			
F	3.5					3.	.5		-3.5 -3.6			
	Η						٦		-3.7			
									-3.8			
	_						_		-3.9			
┢	4.0					4.	.0		-4.0 -4.1			
	\neg						-		-4.1			
									-4.3			
									-4.4			
┟	4.5					4	.5		-4.5			
	4						_		-4.6 -4.7			
	\neg						-		-4.8			
									-4.9			
	5.0					5	.0		-5.0			
1	ſ							In-situ field testing in accordance Scala Penetrometer Testing: NZS				_

	and Tech	Client: Hank Developments Limited Project: Proposed Subdivision Address: 7/572 Selwyn Road, Rolleston						Augerhole No Sheet No.	. HA07 1 of 1	
Drill Type: Drilled By: Date Started: Date Finished:	8 Ton Excavator BE 6-Apr-18 6-Apr-18	Project No: Coordinates: Ground Conditions: Groundwater Level (m):	LTCL18051 NZTM: 1552 Grassed, Ne Not Encount	ear le	vel		Logged By: Shear Vane Calibration Calibration	Factor:		BE N/A N/A N/A
б б				evel (m)	(In-situ Fi	eld Testing		
Stratigraphy Depth (m) Graphic Log		cordance with Guideline for the Field Classifical ock for Engineering Purposes , NZ Geotechnical 2005		Groundwater Level (m)	Depth (m)	Shear Strength (kPa Peak: Remoulded:	Depth (m)	Dynamic Cone	Scala Blow Count / 100mm	
Indext Image: state interview of the s	plastic [TOPSOIL] SILT, minor fine sand, y DEPOSITS] Fine to coarse sandy fi brown, tightly packed, r	minor organics, dark brown, medium dense vellowish brown, dense, moist, non-plastic ne to coarse subrounded greywacke grave noist [RIVER DEPOSITS] ded 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 -5.0	3 3 4 6 8 11 25 +		

		LandTech	Client: Project: Address:	Hank Developments Limit Proposed Subdivision 7/572 Selwyn Road, Rolle							Augerhole Sheet No.	No.	
Drill Ty Drilled Date S Date F	By:	8 Ton Excavator BE 6-Apr-18 6-Apr-18		Project No: Coordinates: Ground Conditions: Groundwater Level (LTCL18051 NZTM: 155 Grassed, N m): Not Encour	2187 ear le	vel			Logged By: Shear Vane Calibration I Calibration I	Factor:		
hy	(5 0				evel (m)	(۲			In-situ Fie	eld Testing		
Stratigraphy	Depth (m)			th Guideline for the Field Clas eering Purposes , NZ Geotect 2005		Groundwater Level (m)	Depth (m)	Shear Stre Peak: Remoulded:	ngth (kPa)	Depth (m)	Dynamic Co	ne Penetr Scal	ila I 1
TOPSOIL	-	SILT, minor fine s [TOPSOIL]	and, minor organ	iics, dark brown, loose, mo	st, non-plastic		-			-0.1 -0.2 -0.3	2 2 3	Į	
().5 × ×	SILT, minor fine s X > [RIVER DEPOSITION + Content of the second seco		own, medium dense, moist	, non-plastic		0.5			-0.4	4		_
		× > × > × >					-			-0.6 -0.7 -0.8	8 8 8		
	1.0			e subrounded greywacke (reyish brown, tightly packe			1.0			-0.9 -1.0	7 8		
RIVER DEPOSITS	-74						_			-1.1 -1.2 -1.3			
	<u>-</u> }	79) 77					1.5			-1.4			
							-			-1.6 -1.7 -1.8			
							2.0			-1.9 -2.0			
		14	End of	Test Pit (2.1m)						-2.1 -2.2			



BE N/A N/A

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,	N	V.	andTech	Client: Project: Address:	Propos	Developments Limite ed Subdivision Selwyn Road, Rolles						Augerhole N Sheet No.	lo.	
Drille Date	d By: Starte		8 Ton Excavator BE 6-Apr-18 6-Apr-18		C G	roject No: oordinates: iround Conditions: iroundwater Level (m	LTCL18051 NZTM: 155 Grassed, No): Not Encoun	2211 r ear lev	/el		Logged By: Shear Vane Calibration Calibration	e No: Factor:		
phy	m)	Log	Soil description i	n accordance wit	th Guideline	e for the Field Classi	fication and	-evel (m)	(u			ield Testing		
Stratigra	Depth (m)	Graphic Log	Description of Soil an	d Rock for Engine	eering Purp 2005	poses, NZ Geotechr	ical Society Inc.,	Groundwater Level (m)	Depth (m)	Shear Strength (kPa Peak: Remoulded:	Depth (m)	Dynamic Con tu OO MOI B	e Penetr Scal	
TOPSOIL		\bigotimes	SILT, minor fine sar	id, minor organ	ics dark b	prown, loose, moisi	, non-plastic				-0.1 -0.2 -0.3	2 3 3	1	
	0.5	× × × × × × × × × × × ×	 SILT, minor to some plastic [RIVER DEP 		owish bro	wn, medium dense	e, moist, non-		0.5		-0.4 -0.5 -0.6	4 5 5		
		× × × × × × × × ×	>								-0.8 -0.7 -0.8	25 +		_
S	1.0	× × × AA	Fine to coarse sand						1.0		-0.9 -1.0 -1.1			
RIVER DEPOSITS TOPSOIL S			ă F								-1.2 -1.3 -1.4			
RIVI	1.5		ā F						1.5		-1.5 -1.6			
		H	19 7						_		-1.7 -1.8 -1.9			
	2.0	H							2.0		-2.0 -2.1 -2.2			
		<u> </u>	<i>v</i>	End of	Test Pit (2.2m)					-2.3 -2.4			
	2.5								2.5		-2.5 -2.6 -2.7			
									_		-2.8			

	End of Test Pit (2.2m)			-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			
4.0		4.0					
				-4.1			
				-4.2			
				-4.3			
				-4.4			
4.5		4.5		-4.5			
				-4.6			
				-4.7			
				-4.8			
				-4.9			
5.0		5.0		-5.0			
0.0			In-situ field testing in accordance with				
			Scala Penetrometer Testing: NZS 44				
			Shear Vane Testing: Guideline for Ha	ing Held Shear Va	ne i est, NZGS, Au	igust 2001	
	LandTech Consulting Limited, Unit 6, 31 Carlyle Street www.landtech.nz	, Sydenhar	n, Christchurch, 8023				

BE N/A N/A N/A

NZGD ID: TP_110661

NZGD ID: HA-DCP_128990

	Davis Ogilvie & Partne Level 1, 24 Moorhouse Office 0800 999 333 f www.do.nz	Aveni	ue,	,Add	ding		:hri	ristchurcl	n 814	0	J	ob	Nº	393 /393/ /DC	53			ON R CP 2		ILTS
	Project: 19 Raptor Street, Falcons Landing, Rolles Client: Compass Homes Fest Location: Refer to attached Geotechnical Site Plan						28	807)								Da Tii	ate: me:	28/08 10:00 DCP+	3/19) a.m	
D E P T H (m)	STRATA DESCRIPTION Auger at DCP 1 SILT; dark brown. Moist, moderately organic with trace rootlets (TOPSOIL). [0.45m]	nscs	5 M	ST ST ST ST ST ST ST ST ST ST ST ST ST S	Log	Water Table		1 2 3		DCP	1			/ 100		D	CP 2			D E P T H (m)
-		TS	<u>व " व श व</u>	™ TS <u>∞∞</u> TS	dab	ater Not Encou													14 12 12	-
0.5	SILT with some fine sand; yellowish brown with minor orange mottling. Stiff to very stiff, moist. [0.65m]	ML				Grou														-0.5 - -
 1.0	SILT with trace fine sand and medium gravel; yellowish orangey brown, hard, moist, low plasticity. Gravel is	ML				-							13						27 30	- -1.0 -
- - 1. 5 -	subrounded greywacke. [0.10m] Auger terminated at 1.20m - Refusal on gravel.					-							30							- -1.5
_ 2.0- _																				- -2.0 -
- 2.5- -																				- 2.5
3.0-																				- - -3.0
Plot	ged By: HC+GC Notes: ted By: GC cked By: HC								con ty grou	dition pical on nd aw	at the lo conditic ay from	ocati ons a n the oi enetr	on of t cross test lo suita	the tests the site ocations bility of t	only. they d This the site	While lo not log do for bu ed in a	they a identify es not ilding.	tion of th re repre variatio cover s ance wit	esentat ons in lope st	tive of the tability

NZGD ID: HA-DCP_128990

т	Project: 19 Raptor Street, Falcons Landing, Rolles Client: Compass Homes Test Location: Refer to attached Geotechnical Site Plan (2807)		F		ate: 28/08/1 me: 10:00 a od: DCP+F	a.m.
D E P T	STRATA DESCRIPTION	nscs	1		Fog	Water Table		DCP	BLOW	S / 100 mm	CP 4	U (
H (m) -	Auger at DCP 3 SILT; dark brown. Moist, moderately organic with trace rootlets (TOPSOIL). [0.50m]	L IS		TS	<u>, an</u> <u>n</u> TS <u>n</u> S <u>n</u> S <u>n</u> TS <u>n</u>	Encountered		4 5 6 7	1		1	(n - -
- 0. 5 - -	SILT with some fine sand; yellowish brown with minor orange mottling. Stiff, moist. [0.90m]			<u>shi</u>	<u>~</u> TS	Groundw						0.
- 1.0- - -		ML										- -1. 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]	ML SM ML				-			15 5 16			- -1.
- - 2.0-	Auger terminated at 1.70m - Refusal on gravel. 1.7m: Sandy fine and medium gravel recovered								30			-
_												-
- 2.5- -												- -2. -
- 3.0-	ged By: HC+GC Notes:											- -3.