



Appendix B

Geotechnical Assessment

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**

Report Tracking

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

Authorisation

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

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

www.miyamoto.nz

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Table of Contents

1. Introduction	1
2. Site Description	1
3. Data Sources	2
4. Geotechnical Assessment	2
5. Development Considerations	4
6. Assessment Against RMA Section 106	5
7. Limitations.....	5
References	7
Appendices	
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.

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,
<http://canterburymaps.govt.nz/Viewer/#webmap>
- Environment Canterbury, Web app viewer - Flood Hazard,
<https://ecanmaps.ecan.govt.nz/portal/apps/webappviewer/index.html?id=57c74073c2f14a85ac0caf30073ae48a>
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- GNS Science (2012). Review of liquefaction hazard information in eastern Canterbury, including Christchurch City and parts of Selwyn, Waimakariri and Hurunui Districts, Report No. R12/83
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- New Zealand Geotechnical Database, 2017. Accessed via Google Earth from
<https://www.nzgd.org.nz/>.
- New Zealand Geotechnical Society (NZGS) and Ministry of Business, Innovation and Employment (MBIE) (2016). Earthquake geotechnical engineering practice Module 2: Geotechnical investigations for earthquake engineering, November 2016.
- 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)

TP001

No.	Name of the person	Age	Sex	Religion	Caste	Occupation	Education	Marital status	Family size	Income	Assets	Health	Housing	Transport	Communication	Social services	Other facilities	Remarks	
1	Mr. A. B. C.	45	M	Hindu	Sharma	Teacher	Graduate	Married	4	₹ 10,000	House, Car	Good	Own	Own	Own	Own	Own	Own	
2	Mr. D. E. F.	30	M	Muslim	Khan	Business	High School	Married	3	₹ 8,000	House, Motorcycle	Fair	Own	Own	Own	Own	Own	Own	
3	Mr. G. H. I.	55	M	Hindu	Verma	Retired	Post Graduate	Married	5	₹ 12,000	House, Car	Good	Own	Own	Own	Own	Own	Own	
4	Mr. J. K. L.	25	M	Sikh	Singh	Student	Graduate	Single	2	₹ 5,000	House	Fair	Own	Own	Own	Own	Own	Own	
5	Mr. M. N. O.	60	M	Hindu	Sharma	Farmer	Illiterate	Married	6	₹ 6,000	House, Land	Poor	Own	Own	Own	Own	Own	Own	
6	Mr. P. Q. R.	35	M	Muslim	Khan	Business	High School	Married	4	₹ 9,000	House, Car	Fair	Own	Own	Own	Own	Own	Own	
7	Mr. S. T. U.	40	M	Hindu	Verma	Teacher	Graduate	Married	3	₹ 11,000	House, Car	Good	Own	Own	Own	Own	Own	Own	
8	Mr. V. W. X.	50	M	Sikh	Singh	Business	High School	Married	5	₹ 7,000	House, Land	Fair	Own	Own	Own	Own	Own	Own	
9	Mr. Y. Z. A.	20	M	Hindu	Sharma	Student	Graduate	Single	2	₹ 4,000	House	Fair	Own	Own	Own	Own	Own	Own	
10	Mr. B. C. D.	65	M	Muslim	Khan	Retired	Post Graduate	Married	4	₹ 13,000	House, Car	Good	Own	Own	Own	Own	Own	Own	

TP002

TP003

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	
SV	SHEAR VANE	EOH	END OF HOLE	PI	PLASTICITY INDEX	FC	FINES CONTENT	
TP	TEST PIT	UW	UNIT WEIGHT (kN/m ³)	WC	WATER CONTENT		STANDING GWL	
GWL	GROUNDWATER LEVEL	mbgl	METERS BELOW GROUND LEVEL					

TP004

TP005

TP006

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	
SV	SHEAR VANE	EOH	END OF HOLE	PI	PLASTICITY INDEX	FC	FINES CONTENT	
TP	TEST PIT	UW	UNIT WEIGHT (kN/m³)	WC	WATER CONTENT		STANDING GWL	
GWL	GROUNDWATER LEVEL	mbgl	METERS BELOW GROUND LEVEL					

TP007[illegible]

NOTES

TP008

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	
SV	SHEAR VANE	EOH	END OF HOLE	PI	PLASTICITY INDEX	FC	FINES CONTENT	
TP	TEST PIT	UW	UNIT WEIGHT (kN/m ³)	WC	WATER CONTENT		STANDING GWL	
GWL	GROUNDWATER LEVEL	mbgl	METERS BELOW GROUND LEVEL					

TP009

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	
SV	SHEAR VANE	EOH	END OF HOLE	PI	PLASTICITY INDEX	FC	FINES CONTENT	
TP	TEST PIT	UW	UNIT WEIGHT (kN/m ³)	WC	WATER CONTENT		STANDING GWL	
GWL	GROUNDWATER LEVEL	mbgl	METERS BELOW GROUND LEVEL					

SHALLOW GROUND INVESTIGATION LOG

TP010

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

Depth (m)	DCP Test Results (Blows per 100mm)	GWL	Soil Description			Sample Taken	Lab Testing								Shear Vane Reading (kPa) peak/remoulded
			USC	Soil Characteristics	Graphic Log		Atterberg Limits			Grain Size			WC (%)	UW	
							LL	PL	PI	GR	SA	FC			
	5 4 4 2 7 16 Weight Bouncing	NOT ENCOUNTERED		SILT; non-plastic, dark brown, dry (TOPSOIL)											
				Sandy SILT; low plasticity, yellow-brown, dry, sand is fine to medium											
				Gravelly fine to coarse SAND / Sandy Gravel; fine to coarse, grey, dry, gravel is subrounded to subangular											
				EOH (TARGET STRATA REACHED)											
											</				

LEGEND

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								
SV	SHEAR VANE	EOH	END OF HOLE	PI	PLASTICITY INDEX	FC	FINES CONTENT								
TP	TEST PIT	UW	UNIT WEIGHT (kN/m³)	WC	WATER CONTENT	▽	STANDING GWL								
GWL	GROUNDWATER LEVEL	mbgl	METERS BELOW GROUND LEVEL												

TP011[illegible]

NOTES

TP012

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
SV	SHEAR VANE	EOH	END OF HOLE	PI	PLASTICITY INDEX	FC	FINES CONTENT
TP	TEST PIT	UW	UNIT WEIGHT (kN/m ³)	WC	WATER CONTENT		STANDING GWL
GWL	GROUNDWATER LEVEL	mbgl	METERS BELOW GROUND LEVEL				

TP013

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	
SV	SHEAR VANE	EOH	END OF HOLE	PI	PLASTICITY INDEX	FC	FINES CONTENT	
TP	TEST PIT	UW	UNIT WEIGHT (kN/m³)	WC	WATER CONTENT		STANDING GWL	
GWL	GROUNDWATER LEVEL	mbgl	METERS BELOW GROUND LEVEL					

SHALLOW GROUND INVESTIGATION LOG

TP014

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

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

LEGEND

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								
SV	SHEAR VANE	EOH	END OF HOLE	PI	PLASTICITY INDEX	FC	FINES CONTENT								
TP	TEST PIT	UW	UNIT WEIGHT (kN/m³)	WC	WATER CONTENT		STANDING GWL								
GWL	GROUNDWATER LEVEL	mbgl	METERS BELOW GROUND LEVEL												

SHALLOW GROUND INVESTIGATION LOG

TP015

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

Depth (m)	DCP Test Results (Blows per 100mm)	GWL	Soil Description			Sample Taken	Lab Testing								Shear Vane Reading (kPa) peak/remoulded
			USC	Soil Characteristics	Graphic Log		Atterberg Limits			Grain Size			WC (%)	UW	
							LL	PL	PI	GR	SA	FC			
	7	NOT ENCOUNTERED		SILT; non-plastic, dark brown, dry (TOPSOIL)											
	6														
	4														
	4														
0.5	5				Sandy SILT; low plasticity, yellow-brown, dry, sand is fine to medium										
	6														
	4														
	6														
	9				Gravelly fine to coarse SAND / Sandy Gravel; fine to coarse, grey, dry, gravel is subrounded to subangular										
1.0	20				EOH (TARGET STRATA REACHED)										
	Weight Bouncing														

LEGEND											NOTES
ABBREVIATIONS											
DCP	DYNAMIC CONE PENETROMETER	N/E	NOT ENCOUNTERED	LL	LIQUID LIMIT	GR	GRAVEL				
HA	HAND AUGER	UTP	UNABLE TO PENETRATE	PL	PLASTIC LIMIT	SA	SAND				
SV	SHEAR VANE	EOH	END OF HOLE	PI	PLASTICITY INDEX	FC	FINES CONTENT				
TP	TEST PIT	UW	UNIT WEIGHT (kN/m³)	WC	WATER CONTENT		STANDING GWL				
GWL	GROUNDWATER LEVEL	mbgl	METERS BELOW GROUND LEVEL								

miyamoto. ENGINEERS + CONSTRUCTION CONSULTANTS	PROJECT NUMBER: 200357	
	CLIENT: Yoursection Ltd	
	TESTING COMPLETED: 17 November 2020	
SHALLOW GROUND INVESTIGATION LOG		TP016

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

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

LEGEND												
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					
SV	SHEAR VANE	EOH	END OF HOLE	PI	PLASTICITY INDEX	FC	FINES CONTENT					
TP	TEST PIT	UW	UNIT WEIGHT (kN/m³)	WC	WATER CONTENT		STANDING GWL					
GWL	GROUNDWATER LEVEL	mbgl	METERS BELOW GROUND LEVEL									

TP017

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	
SV	SHEAR VANE	EOH	END OF HOLE	PI	PLASTICITY INDEX	FC	FINES CONTENT	
TP	TEST PIT	UW	UNIT WEIGHT (kN/m ³)	WC	WATER CONTENT		STANDING GWL	
GWL	GROUNDWATER LEVEL	mbgl	METERS BELOW GROUND LEVEL					

TP018

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	
SV	SHEAR VANE	EOH	END OF HOLE	PI	PLASTICITY INDEX	FC	FINES CONTENT	
TP	TEST PIT	UW	UNIT WEIGHT (kN/m³)	WC	WATER CONTENT		STANDING GWL	
GWL	GROUNDWATER LEVEL	mbgl	METERS BELOW GROUND LEVEL					

TP019

TP020

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	
SV	SHEAR VANE	EOH	END OF HOLE	PI	PLASTICITY INDEX	FC	FINES CONTENT	
TP	TEST PIT	UW	UNIT WEIGHT (kN/m ³)	WC	WATER CONTENT		STANDING GWL	
GWL	GROUNDWATER LEVEL	mbgl	METERS BELOW GROUND LEVEL					

miyamoto. ENGINEERS + CONSTRUCTION CONSULTANTS	PROJECT NUMBER: CLIENT: TESTING COMPLETED: 200357 Yoursection Ltd 17 November 2020
SHALLOW GROUND INVESTIGATION LOG	TP021

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

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

LEGEND											NOTES
ABBREVIATIONS											
DCP	DYNAMIC CONE PENETROMETER	N/E	NOT ENCOUNTERED	LL	LIQUID LIMIT	GR	GRAVEL				
HA	HAND AUGER	UTP	UNABLE TO PENETRATE	PL	PLASTIC LIMIT	SA	SAND				
SV	SHEAR VANE	EOH	END OF HOLE	PI	PLASTICITY INDEX	FC	FINES CONTENT				
TP	TEST PIT	UW	UNIT WEIGHT (kN/m³)	WC	WATER CONTENT		STANDING GWL				
GWL	GROUNDWATER LEVEL	mbgl	METERS BELOW GROUND LEVEL								

SHALLOW GROUND INVESTIGATION LOG

TP022

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

Depth (m)	DCP Test Results (Blows per 100mm)	GWL	Soil Description			Sample Taken	Lab Testing								Shear Vane Reading (kPa) peak/remoulded
			USC	Soil Characteristics	Graphic Log		Atterberg Limits			Grain Size			WC (%)	UW	
							LL	PL	PI	GR	SA	FC			
	5	NOT ENCOUNTERED		SILT; non-plastic, dark brown, dry (TOPSOIL)											
	4														
	5														
	5														
	7														
0.5	20			Gravelly fine to coarse SAND / Sandy Gravel; fine to coarse, grey, dry, gravel is subrounded to subangular											
	Weight Bouncing			EOH (TARGET STRATA REACHED)											
1.0															
1.5															
2.0															
2.5															

LEGEND

ABBREVIATIONS														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								
SV	SHEAR VANE	EOH	END OF HOLE	PI	PLASTICITY INDEX	FC	FINES CONTENT								
TP	TEST PIT	UW	UNIT WEIGHT (kN/m³)	WC	WATER CONTENT		STANDING GWL								
GWL	GROUNDWATER LEVEL	mbgl	METERS BELOW GROUND LEVEL												

TP023

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	
SV	SHEAR VANE	EOH	END OF HOLE	PI	PLASTICITY INDEX	FC	FINES CONTENT	
TP	TEST PIT	UW	UNIT WEIGHT (kN/m ³)	WC	WATER CONTENT		STANDING GWL	
GWL	GROUNDWATER LEVEL	mbgl	METERS BELOW GROUND LEVEL					

TP024

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	
SV	SHEAR VANE	EOH	END OF HOLE	PI	PLASTICITY INDEX	FC	FINES CONTENT	
TP	TEST PIT	UW	UNIT WEIGHT (kN/m ³)	WC	WATER CONTENT		STANDING GWL	
GWL	GROUNDWATER LEVEL	mbgl	METERS BELOW GROUND LEVEL					

TP025

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	
SV	SHEAR VANE	EOH	END OF HOLE	PI	PLASTICITY INDEX	FC	FINES CONTENT	
TP	TEST PIT	UW	UNIT WEIGHT (kN/m ³)	WC	WATER CONTENT		STANDING GWL	
GWL	GROUNDWATER LEVEL	mbgl	METERS BELOW GROUND LEVEL					

TP026

FC



SHALLOW GROUND INVESTIGATION LOG

TP027

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

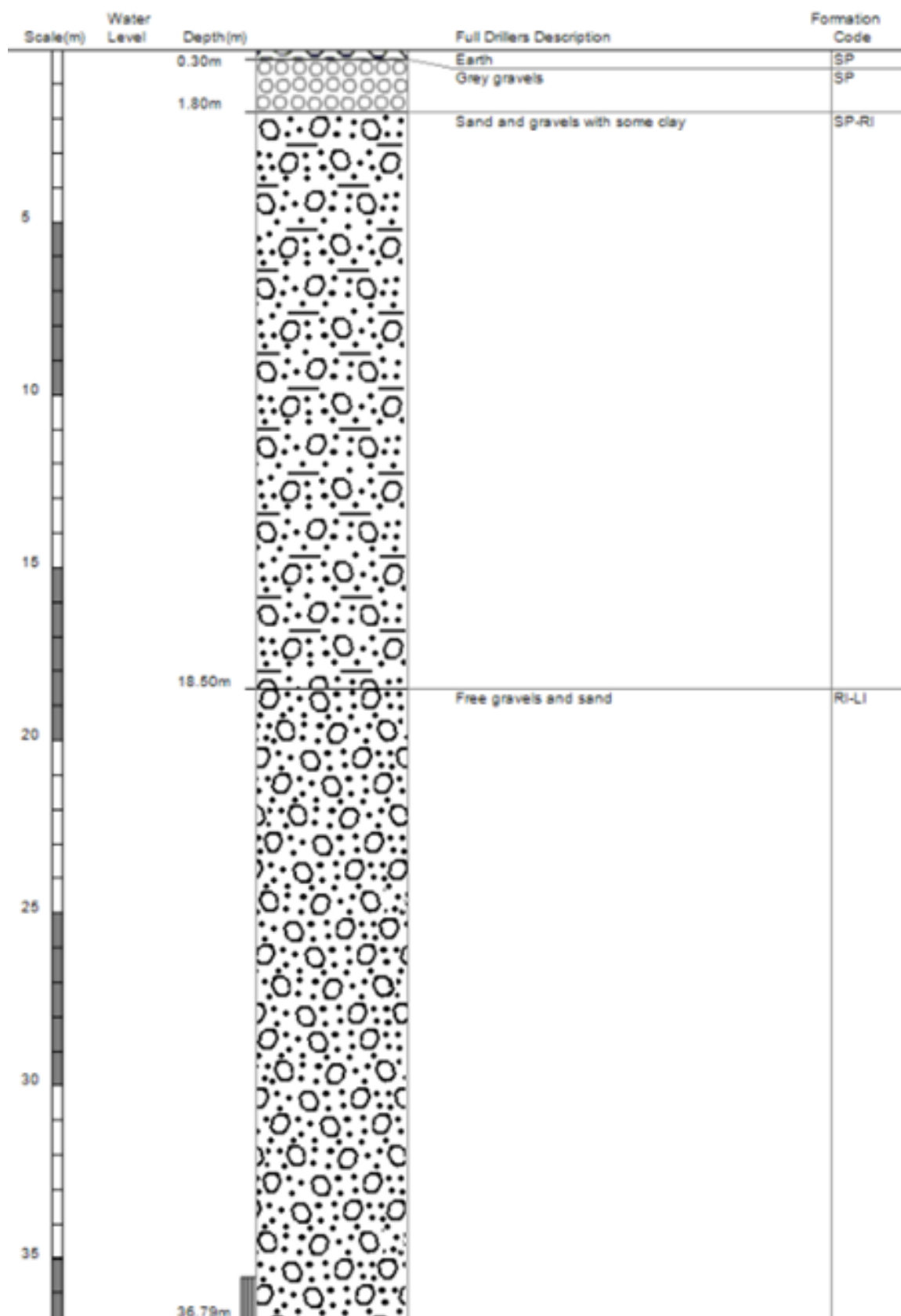
Depth (m)	DCP Test Results (Blows per 100mm)	GWL	Soil Description			Sample Taken	Lab Testing								Shear Vane Reading (kPa) peak/remoulded
							Atterberg Limits			Grain Size			WC (%)	UW	
			USC		Graphic Log		LL	PL	PI	GR	SA	FC			
	5	NOT ENCOUNTERED		SILT; non-plastic, dark brown, dry (TOPSOIL)				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

LEGEND

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								
SV	SHEAR VANE	EOH	END OF HOLE	PI	PLASTICITY INDEX	FC	FINES CONTENT								
TP	TEST PIT	UW	UNIT WEIGHT (kN/m³)	WC	WATER CONTENT		STANDING GWL								
GWL	GROUNDWATER LEVEL	mbgl	METERS BELOW GROUND LEVEL												

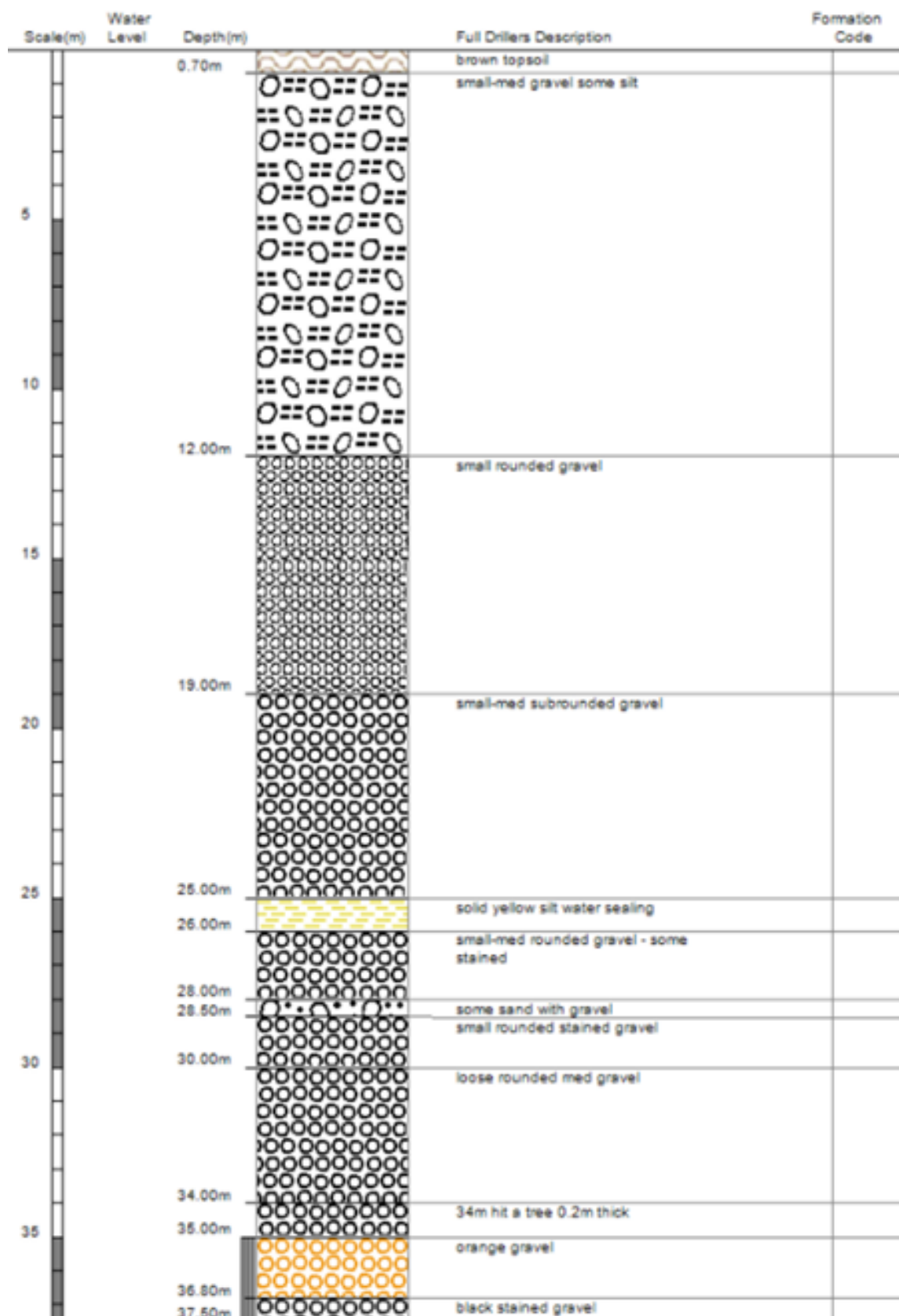
Borelog for well M36/3868

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



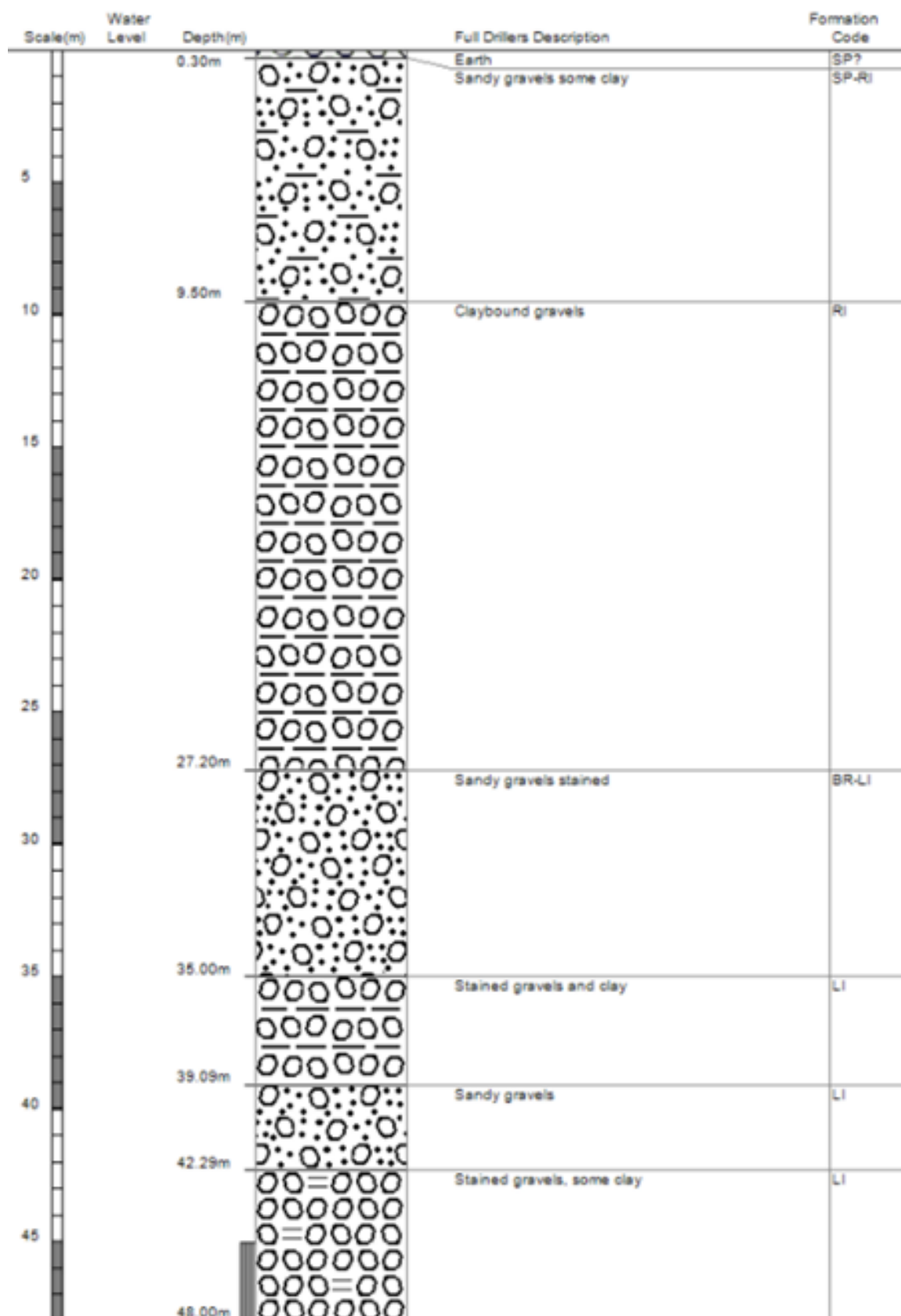
Borelog for well M36/7975

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



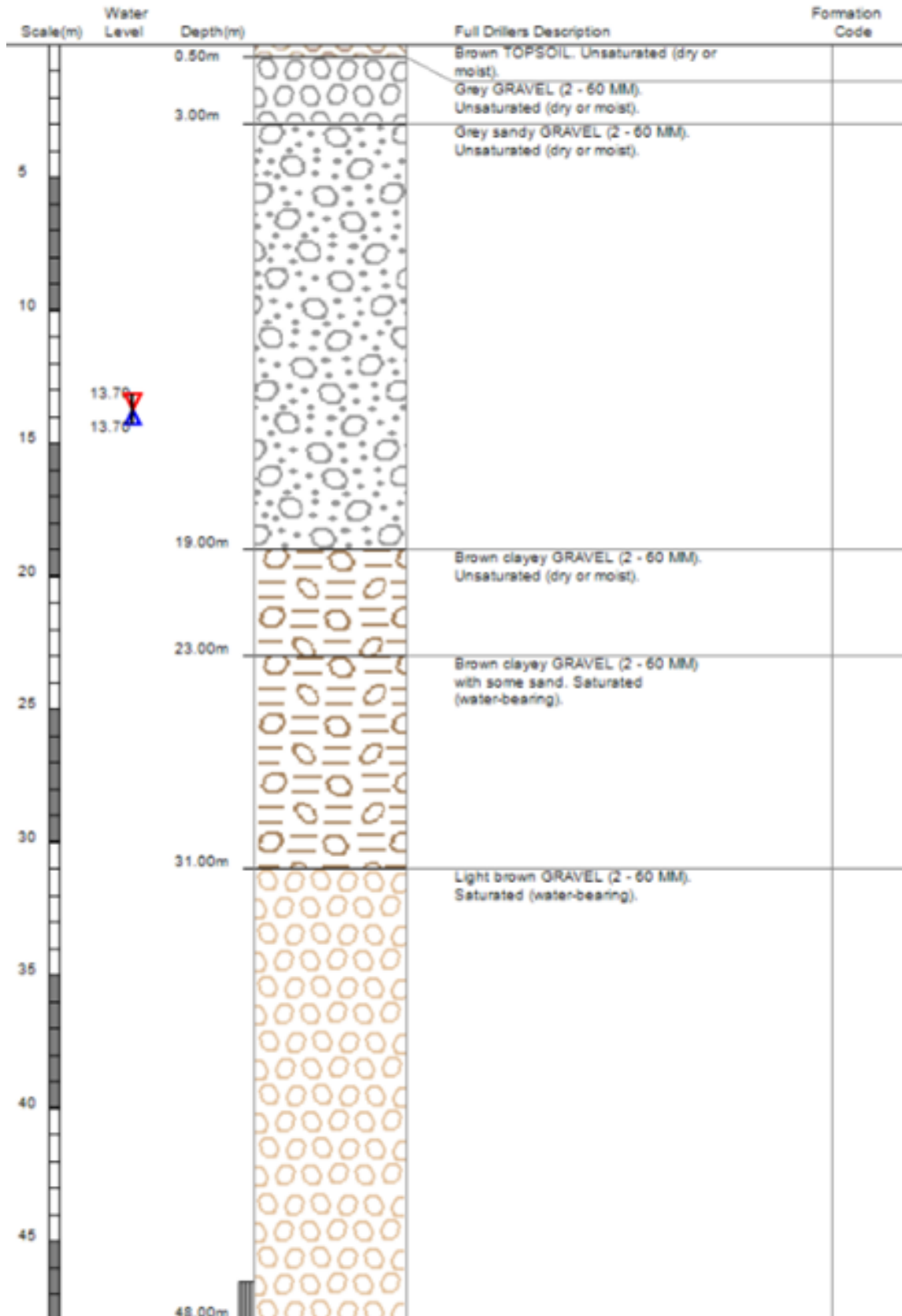
Borelog for well M36/4966

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



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



TEST PIT RECORD

 TEST PIT NO. **TP7**

 PROJECT NO. **254246**

 PROJECT **Branthwaite Drive**

 METHOD **TP**

CO-ORDINATES (NZTM)

E 1552186
N 5171475

LOGGED

T. MITCHELL

CHECKED

A. HILLS

 MACHINE & NO. **Wheeled Excavator**

 CONTRACTOR **Maugers**

 GROUND LEVEL **+37.00** m RL

DATE

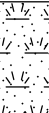
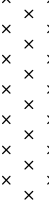
22/11/2016

DATE

2/12/2016

STRATA

SAMPLES & TESTS

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

GENERAL REMARKS

 SHORING/SUPPORT: **None**
 STABILITY: **Generally Stable**
Groundwater not encountered.
Coordinates found using handheld GPS, likely accurate to +/- 5 m.
Ground level found using handheld GPS, likely accurate to +/- 10 m.

All dimensions in metres

 CLIENT **GW Rolleston Ltd.**
 **Pocket Penetrometer Test**
 **Insitu Vane Shear Test**
 **Water Level**

TEST PIT RECORD

TEST PIT NO. **TP10**

PROJECT NO. **254246**

PROJECT **Branthwaite Drive**

METHOD **TP**

CO-ORDINATES (NZTM)

LOGGED

CHECKED

MACHINE & NO. **Wheeled Excavator**

E 1552053

T. MITCHELL

A. HILLS

N 5171529

CONTRACTOR **Maugers**

GROUND LEVEL **+43.00** m RL

DATE

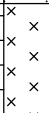
DATE

22/11/2016

2/12/2016

STRATA

SAMPLES & TESTS

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

GENERAL REMARKS

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

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

All dimensions in metres

CLIENT **GW Rolleston Ltd.**

 **Pocket Penetrometer Test**
 Insitu Vane Shear Test

 **Water Level**

TEST PIT RECORD

TEST PIT NO. **TP23**

PROJECT NO. **254246**

PROJECT **Branthwaite Drive**

METHOD **TP**

CO-ORDINATES (NZTM)

LOGGED

CHECKED

MACHINE & NO. **Wheeled Excavator**

E 1552359

T. MITCHELL

A. HILLS

N 5171660

CONTRACTOR **Maugers**

GROUND LEVEL **+43.00** m RL

DATE

DATE

23/11/2016

5/12/2016

STRATA

SAMPLES & TESTS

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

GENERAL REMARKS

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

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

All dimensions in metres

CLIENT **GW Rolleston Ltd.**

 Pocket Penetrometer Test
 Insitu Vane Shear Test

 Water Level

TEST PIT RECORD

TEST PIT NO. **TP24**

PROJECT NO. **254246**

PROJECT **Branthwaite Drive**

METHOD **TP**

CO-ORDINATES (NZTM)

LOGGED

CHECKED

MACHINE & NO. **Wheeled Excavator**

E 1552208

T. MITCHELL

A. HILLS

N 5171608

CONTRACTOR **Maugers**

GROUND LEVEL **+44.00** m RL

DATE

DATE

23/11/2016

5/12/2016

STRATA

SAMPLES & TESTS

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

GENERAL REMARKS

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

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

All dimensions in metres

CLIENT **GW Rolleston Ltd.**

 **Pocket Penetrometer Test**
 **Insitu Vane Shear Test**

 **Water Level**

TEST PIT RECORD

TEST PIT NO. **TP25**

PROJECT NO. **254246**

PROJECT **Branthwaite Drive**

METHOD **TP**

CO-ORDINATES (NZTM)

LOGGED
T. MITCHELL

CHECKED
A. HILLS

MACHINE & NO. **Wheeled Excavator**

E 1552490
N 5171658

DATE
23/11/2016

DATE
5/12/2016

CONTRACTOR **Maugers**

GROUND LEVEL **+44.00** m RL

STRATA

SAMPLES & TESTS

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

GENERAL REMARKS

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

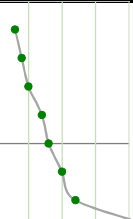
Groundwater not encountered.
Coordinates found using handheld GPS, likely accurate to +/- 5 m.
Ground level found using handheld GPS, likely accurate to +/- 10 m.

All dimensions in metres

CLIENT **GW Rolleston Ltd.**

 Pocket Penetrometer Test
 Insitu Vane Shear Test

 Water Level

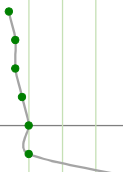
			Client: Hank Developments Limited Project: Proposed Subdivision Address: 7/572 Selwyn Road, Rolleston			Augerhole No. HA01 Sheet No. 1 of 1			
Drill Type: 8 Ton Excavator Drilled By: BE Date Started: 6-Apr-18 Date Finished: 6-Apr-18			Project No: LTCL18051 Coordinates: NZTM: 1552177 mE, 5171418 mN Ground Conditions: Grassed, Near level Groundwater Level (m): Not Encountered (6-Apr-18)			Logged By: BE Shear Vane No: N/A Calibration Factor: N/A Calibration Date: N/A			
Stratigraphy	Depth (m)	Graphic Log	Soil description in accordance with <i>Guideline for the Field Classification and Description of Soil and Rock for Engineering Purposes</i> , NZ Geotechnical Society Inc., 2005	Groundwater Level (m)	Depth (m)	In-situ Field Testing			
						Shear Strength (kPa)		Dynamic Cone Penetrometer	
				Peak:  Remoulded: 		Depth (m)	Blow Count	Scale Blow Count / 100mm	
								0 5 10 15 20	
TOPSOIL			SILT, minor fine sand, minor organics, dark brown, medium dense, moist, non-plastic [TOPSOIL]						
RIVER DEPOSITS	0.5		SILT, minor fine sand, yellowish brown, dense, moist, non-plastic [RIVER DEPOSITS]		0.5				
	1.0		Fine to coarse subrounded greywacke gravelly fine to coarse SAND, trace subrounded greywacke cobbles, greyish brown, tightly packed, moist		1.0				
	1.5		Fine to coarse subrounded greywacke GRAVEL, some to minor fine to coarse sand, greyish brown, tightly packed, moist		1.5				
	2.0		Fine to coarse subrounded greywacke gravelly fine to coarse SAND, trace subrounded greywacke cobbles, greyish brown, tightly packed, moist		2.0				
	2.5		End of Test Pit (2.6m)		2.5				
	3.0		End of Test Pit (2.6m)		3.0				
	3.5		End of Test Pit (2.6m)		3.5				
	4.0		End of Test Pit (2.6m)		4.0				
	4.5		End of Test Pit (2.6m)		4.5				
	5.0		End of Test Pit (2.6m)		5.0				
						In-situ field testing in accordance with the following Standards: Scale 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			

			Client: Hank Developments Limited Project: Proposed Subdivision Address: 7/572 Selwyn Road, Rolleston			Augerhole No. HA02 Sheet No. 1 of 1					
Drill Type: 8 Ton Excavator		Project No: LTCL18051		Logged By: BE		Drilled By: BE		Coordinates: NZTM: 1552207 mE, 5171344 mN		Shear Vane No: N/A	
Date Started: 6-Apr-18		Ground Conditions: Grassed, Near level		Calibration Factor: N/A		Date Finished: 6-Apr-18		Groundwater Level (m): Not Encountered (6-Apr-18)		Calibration Date: N/A	
Stratigraphy	Depth (m)	Graphic Log	Soil description in accordance with <i>Guideline for the Field Classification and Description of Soil and Rock for Engineering Purposes</i> , NZ Geotechnical Society Inc., 2005	Groundwater Level (m)	Depth (m)	In-situ Field Testing					
						Shear Strength (kPa)		Dynamic Cone Penetrometer			
						Peak: 					
						Remoulded: 					
TOPSOIL			SILT, minor fine sand, minor organics, dark brown, medium dense, moist, non-plastic [TOPSOIL]								
RIVER DEPOSITS	0.5		SILT, minor fine sand, trace subrounded greywacke gravel, yellowish brown, dense, moist, non-plastic [RIVER DEPOSITS]	0.5							
					</						

			Client: Hank Developments Limited Project: Proposed Subdivision Address: 7/572 Selwyn Road, Rolleston		Augerhole No. HA03 Sheet No. 1 of 1	
Drill Type: 8 Ton Excavator		Project No: LTCL18051		Logged By: BE		
Drilled By: BE		Coordinates: NZTM: 1552231 mE, 5171302 mN		Shear Vane No: N/A		
Date Started: 6-Apr-18		Ground Conditions: Grassed, Near level		Calibration Factor: N/A		
Date Finished: 6-Apr-18		Groundwater Level (m): Not Encountered (6-Apr-18)		Calibration Date: N/A		
Stratigraphy	Depth (m)	Graphic Log	Soil description in accordance with <i>Guideline for the Field Classification and Description of Soil and Rock for Engineering Purposes</i> , NZ Geotechnical Society Inc., 2005	Groundwater Level (m)	Depth (m)	In-situ Field Testing
						Shear Strength (kPa)
						Dynamic Cone Penetrometer
						Peak:  Remoulded: 
						Depth (m)
						Blow Count
						Scale Blow Count / 100mm
						0 5 10 15 20
TOPSOIL			SILT, minor fine sand, minor organics, dark brown, medium dense, moist, non-plastic [TOPSOIL]			-0.1 3
						-0.2 2
RIVER DEPOSITS	0.5		SILT, minor fine sand, yellowish brown, dense, moist, non-plastic [RIVER DEPOSITS]	0.5		-0.3 4
						-0.4 6
						-0.5 10
						-0.6 12
						-0.7 25 +
	1.0		Fine to coarse sandy, fine to coarse subrounded greywacke GRAVEL, trace subrounded cobbles, greyish brown, tightly packed, moist	1.0		-0.8
						-0.9
						-1.0
						-1.1
						-1.2
						-1.3
						-1.4
	1.5			1.5		-1.5
						-1.6
						-1.7
						-1.8
						-1.9
	2.0			2.0		-2.0
						-2.1
						-2.2
						-2.3
						-2.4
	2.5		End of Test Pit (2.3m)	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
						-4.4
	4.5			4.5		-4.5
						-4.6
						-4.7
						-4.8
						-4.9
	5.0			5.0		-5.0
						In-situ field testing in accordance with the following Standards: Scale 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

		Client: Hank Developments Limited Project: Proposed Subdivision Address: 7/572 Selwyn Road, Rolleston		Augerhole No. HA04 Sheet No. 1 of 1					
Drill Type: 8 Ton Excavator Drilled By: BE Date Started: 6-Apr-18 Date Finished: 6-Apr-18		Project No: LTCL18051 Coordinates: NZTM: 1552136 mE, 5171389 mN Ground Conditions: Grassed, Near level Groundwater Level (m): Not Encountered (6-Apr-18)		Logged By: BE Shear Vane No: N/A Calibration Factor: N/A Calibration Date: N/A					
Stratigraphy	Depth (m)	Graphic Log	Soil description in accordance with <i>Guideline for the Field Classification and Description of Soil and Rock for Engineering Purposes</i> , NZ Geotechnical Society Inc., 2005	Groundwater Level (m)	Depth (m)	In-situ Field Testing			
						Shear Strength (kPa)		Dynamic Cone Penetrometer	
						Peak: 			
						Remoulded: 			
							Depth (m)	Blow Count	Scale Blow Count / 100mm
								0 5 10 15 20	
TOPSOIL			SILT, minor fine sand, minor organics, dark brown, medium dense, moist, non-plastic [TOPSOIL]				-0.1	3	
							-0.2	4	
RIVER DEPOSITS			SILT, minor fine sand, yellowish brown, dense, moist, non-plastic [RIVER DEPOSITS]				-0.3	3	
	0.5						-0.4	8	
							-0.5	10	
			Fine to coarse sandy fine to coarse subrounded greywacke GRAVEL, trace to minor subrounded greywacke cobbles, greyish brown, tightly packed, moist				-0.6	12	
	1.0						-0.7	25 +	
							-0.8		
							-0.9		
							-1.0		
							-1.1		
							-1.2		
							-1.3		
							-1.4		
							-1.5		
							-1.6		
							-1.7		
							-1.8		
							-1.9		
							-2.0		
						-2.1			
						-2.2			
						-2.3			
						-2.4			
						-2.5			
						-2.6			
						-2.7			
						-2.8			
						-2.9			
						-3.0			
						-3.1			
						-3.2			
						-3.3			
						-3.4			
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						-3.6			
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In-situ field testing in accordance with the following Standards: Scale 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									

			Client: Hank Developments Limited Project: Proposed Subdivision Address: 7/572 Selwyn Road, Rolleston		Augerhole No. HA05 Sheet No. 1 of 1																																																																																																																															
Drill Type: 8 Ton Excavator		Project No: LTCL18051		Logged By: BE																																																																																																																																
Drilled By: BE		Coordinates: NZTM: 1552187 mE, 5171307 mN		Shear Vane No: N/A																																																																																																																																
Date Started: 6-Apr-18		Ground Conditions: Grassed, Near level		Calibration Factor: N/A																																																																																																																																
Date Finished: 6-Apr-18		Groundwater Level (m): Not Encountered (6-Apr-18)		Calibration Date: N/A																																																																																																																																
Stratigraphy	Depth (m)	Graphic Log	Soil description in accordance with <i>Guideline for the Field Classification and Description of Soil and Rock for Engineering Purposes</i> , NZ Geotechnical Society Inc., 2005	Groundwater Level (m)	Depth (m)	In-situ Field Testing																																																																																																																														
						Shear Strength (kPa)		Dynamic Cone Penetrometer																																																																																																																												
TOPSOIL	0.5		SILT, minor fine sand, minor organics, dark brown, loose, moist, non-plastic [TOPSOIL]		Peak:  Remoulded: 	Depth (m)	Blow Count	Scala Blow Count / 100mm																																																																																																																												
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RIVER DEPOSITS	1.0		SILT, minor fine sand, yellowish brown, medium dense, moist, non-plastic [RIVER DEPOSITS]					2																																																																																																																												
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		Client: Hank Developments Limited Project: Proposed Subdivision Address: 7/572 Selwyn Road, Rolleston		Augerhole No. HA06 Sheet No. 1 of 1						
Drill Type: 8 Ton Excavator Drilled By: BE Date Started: 6-Apr-18 Date Finished: 6-Apr-18		Project No: LTCL18051 Coordinates: NZTM: 1552211 mE, 5171252 mN Ground Conditions: Grassed, Near level Groundwater Level (m): Not Encountered (6-Apr-18)		Logged By: BE Shear Vane No: N/A Calibration Factor: N/A Calibration Date: N/A						
Stratigraphy	Depth (m)	Graphic Log	Soil description in accordance with <i>Guideline for the Field Classification and Description of Soil and Rock for Engineering Purposes</i> , NZ Geotechnical Society Inc., 2005	Groundwater Level (m)	Depth (m)	In-situ Field Testing				
						Shear Strength (kPa)		Dynamic Cone Penetrometer		
				Peak: 		Depth (m)	Blow Count	Scala Blow Count / 100mm		
				Remoulded: 				0 5 10 15 20		
TOPSOIL			SILT, minor fine sand, minor organics dark brown, loose, moist, non-plastic [TOPSOIL]					-0.1	2	
								-0.2	3	
RIVER DEPOSITS			SILT, minor to some fine sand, yellowish brown, medium dense, moist, non-plastic [RIVER DEPOSITS]					-0.3	3	
								-0.4	4	
	0.5							-0.5	5	
								-0.6	5	
								-0.7	25 +	
								-0.8		
								-0.9		
	1.0		Fine to coarse sandy fine to coarse subrounded greywacke GRAVEL, trace subrounded greywacke cobbles, greyish brown, tightly packed, moist					-1.0		
								-1.1		
								-1.2		
								-1.3		
								-1.4		
	1.5							-1.5		
								-1.6		
								-1.7		
								-1.8		
								-1.9		
2.0								-2.0		
								-2.1		
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								-2.3		
								-2.4		
2.5								-2.5		
								-2.6		
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								-4.6		
								-4.7		
								-4.8		
								-4.9		
5.0								-5.0		
End of Test Pit (2.2m)						In-situ field testing in accordance with the following Standards: Scala Penetrometer Testing: NZS 4402:1988, Test 6.5.2, Dynamic Cone Penetrometer Shear Vane Testing: Guideline for Hand Held Shear Vane Test, NZGS, August 2001				

Project: 19 Raptor Street, Falcons Landing, Rolleston (Lot 298 DP 532807)

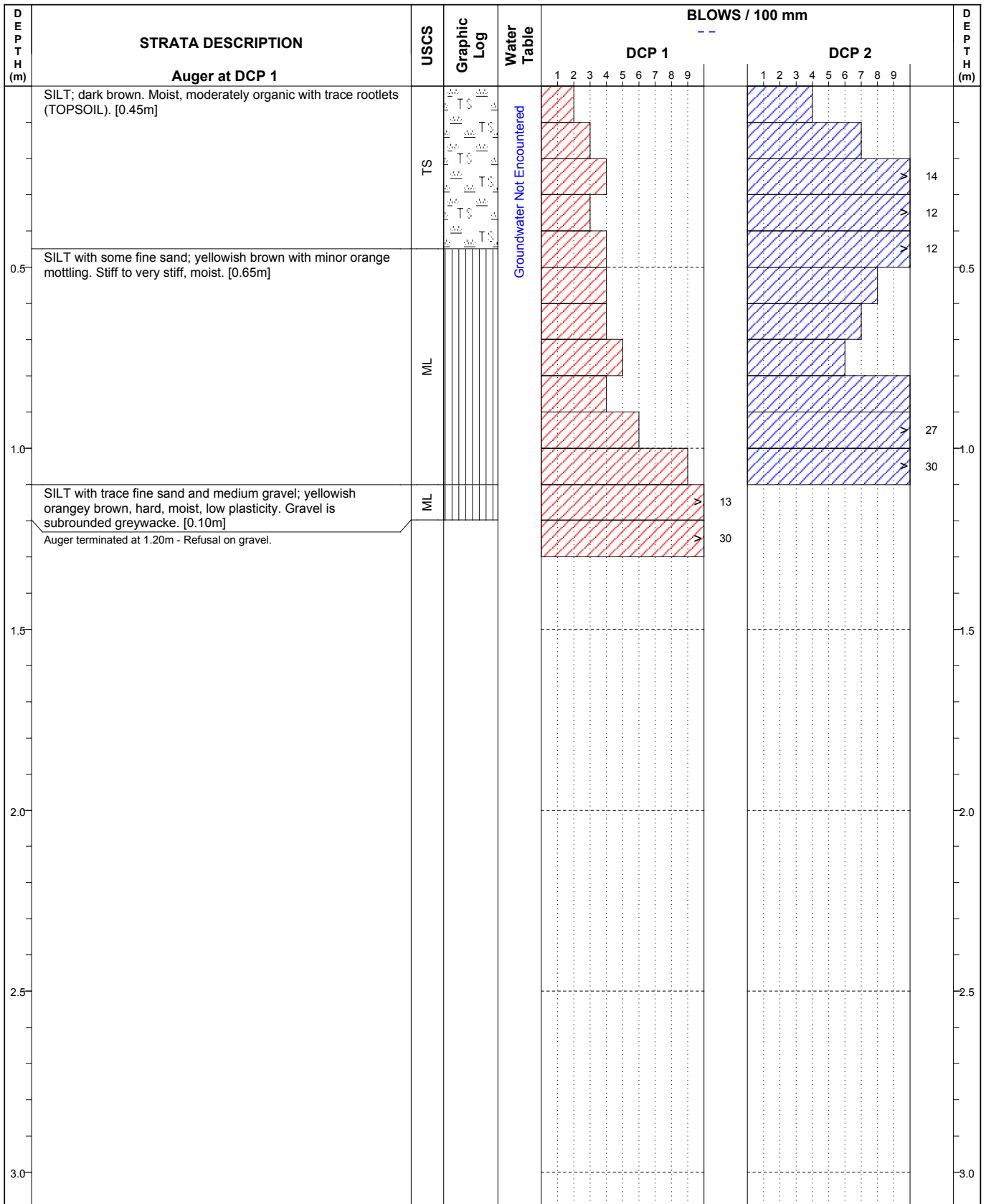
Client: Compass Homes

Test Location: Refer to attached Geotechnical Site Plan (DWG G01A)

Date: 28/08/19

Time: 10:00 a.m.

Excavation Method: DCP+HA



Logged By: HC+GC

Plotted By: GC

Checked By: HC

Notes:

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

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

Project: 19 Raptor Street, Falcons Landing, Rolleston (Lot 298 DP 532807)

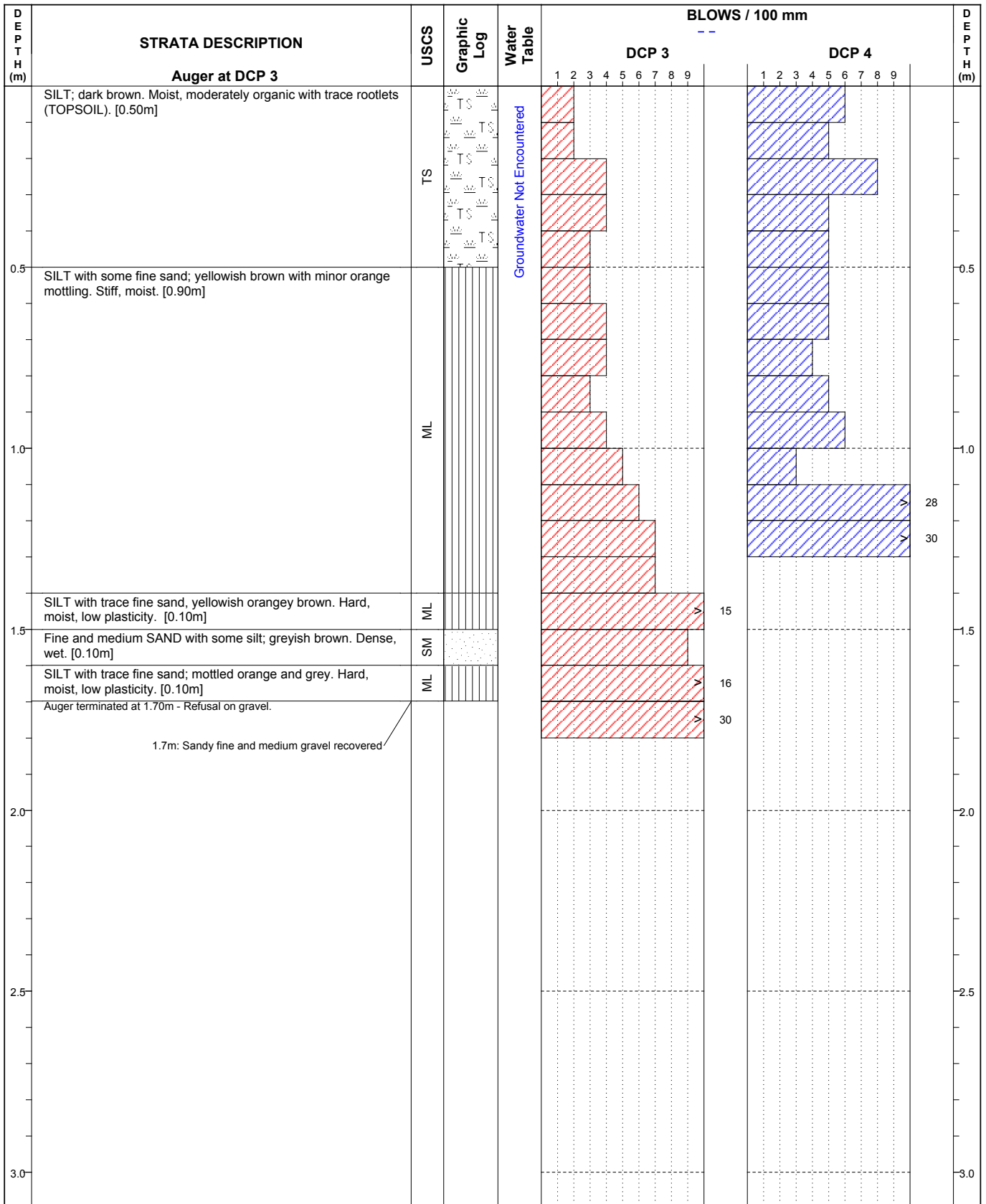
Client: Compass Homes

Test Location: Refer to attached Geotechnical Site Plan (DWG G01A)

Date: 28/08/19

Time: 10:00 a.m.

Excavation Method: DCP+HA



Logged By: HC+GC

Plotted By: GC

Checked By: HC

Notes:

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

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