FALCON'S RUN
Rolleston

Geotech Report

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Geotechnical Report for Proposed Plan Change

148, 156 & 178 Lincoln Rolleston Road & 487 Weedens Road

Issue Date: **7 September 2022**

Miyamoto Ref: **200357-01-RP-001[B]**

Prepared for: **Yoursection Ltd**

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Report Tracking

Revision	Status	Date	Prepared by
A	FINAL	22 June 2022	C. McDermott
B	FINAL	7 September 2022	C. McDermott

Authorisation

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1. Introduction

Miyamoto International NZ Limited (MINZ) has been engaged by Yoursection Ltd to undertake a geotechnical investigation, evaluation and land suitability assessment as part of the proposed land reclassification and plan change encompassing 148, 156 & 178 Lincoln Rolleston Road & 487 Weedens Road.

Miyamoto have previously undertaken a geotechnical assessment for a similar purpose for the adjacent land (encompassing 151 & 153 Lincoln Rolleston Road). The resulting report is referenced 200357-002-[A] and dated 25 November 2020.

As part of this phase of works our assessment comprised the following:

- 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' (2017), 'Repairing and rebuilding houses affected by the Canterbury earthquakes' (2012), and the MBIE-NZGS 'Earthquake geotechnical engineering practice' Modules (2021).

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 19 hectares in area) is located in a rural setting in Rolleston, Selwyn, and encompasses the following land parcels (as shown in Figure 1):

- LOT 1 to 3 DP 427521;
- LOT 9 DP 47839;
- LOT 1 DP 514579.

The site is predominantly flat with a global elevation difference of ~ 3.0 m (increasing to the north-west). The land is predominantly grass covered farmland with residential dwellings, and auxiliary structures currently occupying three 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);
- Selwyn District Council (SDC);
- Canterbury Maps.

4. Geotechnical Assessment

Geological Setting

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

Field Investigations

Miyamoto undertook a site-specific ground investigation on 10 June 2022, comprising:

- 20No. machine excavated trial pits (referenced 2022_TP001 to 2022_TP020);
- 20No. 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 our previous investigations and the NZGD, 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.

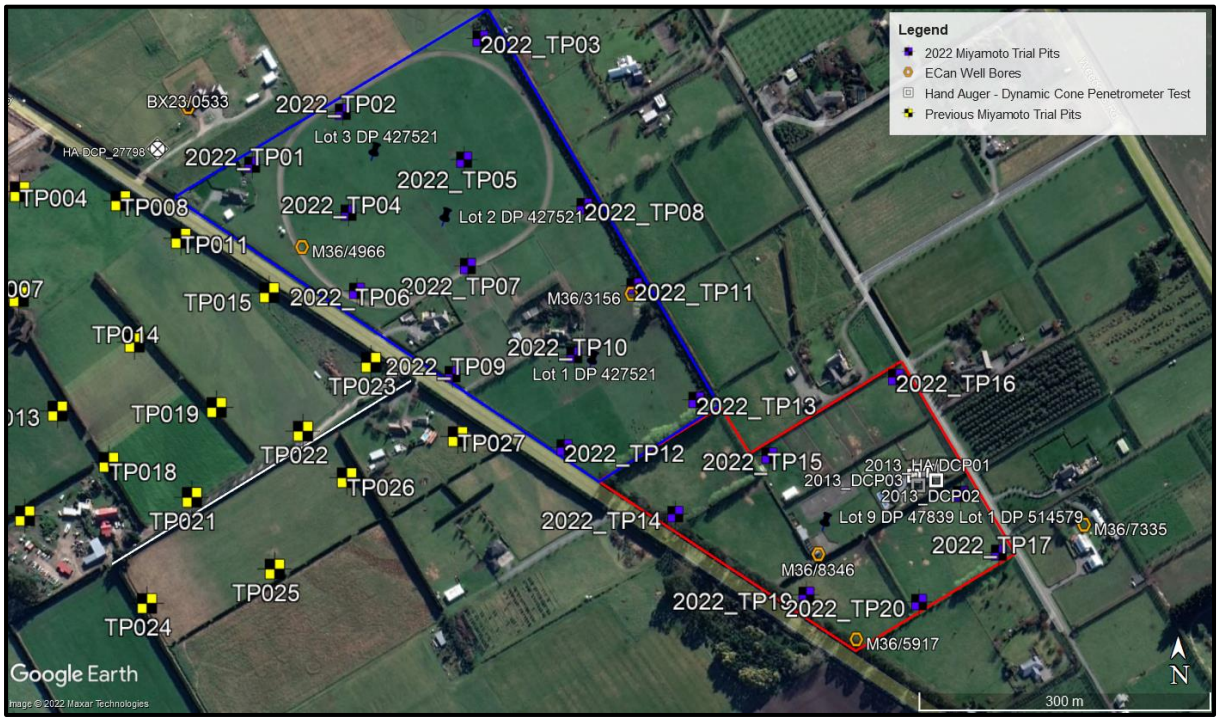

Figure 2: Ground Investigation Location Plan

Table 1: Summary of Ground Investigations

Test Ref.	Source	Source Ref.	Test Type	Depth (mbgl)
2022_TP01 to 2022_TP20	Miyamoto	200357-1	TP / DCP	0.4 to 1.3
TP001 to TP027	Miyamoto	200357	TP / DCP	0.7 to 1.8
HA-DCP_27798	NZGD / LDE	10774	TP / DCP	0.8 to 3.0
ECan Well Bores	ECan	Various	Rotary / Percussion / Cable Tool	26.0 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 (0.1 m to 0.3 m in thickness), overlying low plasticity, firm to very stiff Silt with trace Sand to between 0.3 m and 1.1 mbgl, below which dense to very dense Sandy / Silty Gravel and Cobbles are present to depth. It is noted that the thickness of the Silt layer differs locally including at the location of 2022_TP20 where the Silt layer was encountered to at least 1.3 mbgl, and at 2013_HA/DCP01 where the Silt layer was encountered to 1.8 mbgl with the inclusion of an interbedded Sand layer (not encountered elsewhere).

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

As per the Proposed Selwyn District Plan, areas of the site are mapped within the 'Plains Flood Management' area. Requirements around building floor levels must be checked at building consent stage.

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).

As per the Proposed Selwyn District Plan, areas of the site are mapped within the 'Plains Flood Management' area. Requirements 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 4431:2022. 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. Conclusion

Based on our investigations and assessment, and provided that the geotechnical recommendations given in this report are followed, and the appropriate engineering measures implemented, we consider that the site is suitable for residential land use with such development 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

Forsyth, P.J. ; Barrell, D.J.A. ; Jogens, R. (compilers) 2008. Geology of the Christchurch area. Institute of Geological and Nuclear Sciences 1: 250000 geological map 16. Lower Hutt, New Zealand.

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

Ian MacCahon, 2013. Selwyn District Council 'Area of low geotechnical risk' map.

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

New Zealand Geotechnical Database. Accessed via Google Earth from https://www.nzgd.org.nz/.

New Zealand Geotechnical Society and Ministry of Business, Innovation and Employment, 2021. Earthquake geotechnical engineering practice Module 1: Overview of the guidelines

New Zealand Geotechnical Society and Ministry of Business, Innovation and Employment, 2021. Earthquake geotechnical engineering practice Module 2: Geotechnical investigations for earthquake engineering

New Zealand Geotechnical Society and Ministry of Business, Innovation and Employment, 2021. Earthquake geotechnical engineering practice Module 3: Identification, assessment and mitigation of liquefaction hazards

New Zealand Geotechnical Society and Ministry of Business, Innovation and Employment, 2021. Earthquake geotechnical engineering practice Module 4: Earthquake resistant foundation design

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

New Zealand Standard NZS4431 (2022). Engineered fill construction for lightweight structures - New Zealand Standard.

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

Appendices

A. Ground Investigation Data

Miyamoto site-specific investigation logs

ECan well bore logs

TM Consultants investigation logs

Refer to previous Miyamoto Report (200357-002-[A], dated 25 November 2020) for engineering logs in adjacent land

miyamoto. ENGINEERS+ CONSTRUCTION CONSULTANTS	*PROJECT NUMBER:*	**200357-1**
	CLIENT:	**YourSection Ltd**
	TESTING COMPLETED:	**10 June 2022**

SHALLOW GROUND INVESTIGATION LOG

2022_TP01

PROJECT:	**148, 156 & 178 Lincoln Rolleston Road & 487 Weedens Road**				
LOGGED BY:	**CMD / CM**	*TOTAL TESTING DEPTH:*	**0.5 mbgl**	*HOLE DIAMETER:*	**50 mm**
PROCESSED BY:	**CM**	*TESTING METHOD:*	**HA + DCP**	*SHEAR VANE NUMBER:*	**-**
LOCATION:	**REFER TO SITE PLAN**	*GROUNDWATER LEVEL:*	**N/E mbgl**	This report may only be reproduced in full	

Depth (m)	*DCP Test Results (Blows per 100mm)*	*GWL*	*Soil Description*			*Sample Taken*	*Lab Testing*								*Shear Vane Reading (kPa) peak/remoulded*
							Atterberg Limits			*Grain Size*			*WC (%)*	*UW*	
			USC	*Soil Characteristics*	*Graphic Log*		*LL*	*PL*	*PI*	*GR*	*SA*	*FC*			
0	2 3 5 Refusal	NOT ENCOUNTERED		Silty TOPSOIL, dark brown to black with rootlets											
				SILT, light brown, dry, low plasticity with trace Sand											
0.5				Sandy / Silty GRAVEL & COBBLES, gravel is greywacke, medium to coarse, rounded to sub-rounded; sand is fine to course											
				EOH - Target Stratum											
1.0															
1.5															
2.0															
2.5															

LEGEND

ABBREVIATIONS

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

NOTES

As per MINZ policy, the DCP was transferred to the base of the hand auger borehole at 1.9m depth

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	TESTING COMPLETED:	**10 June 2022**

SHALLOW GROUND INVESTIGATION LOG

2022_TP02

PROJECT:	**148, 156 & 178 Lincoln Rolleston Road & 487 Weedens Road**				
LOGGED BY:	**CMD / CM**	*TOTAL TESTING DEPTH:*	**0.4 mbgl**	*HOLE DIAMETER:*	**50 mm**
PROCESSED BY:	**CM**	*TESTING METHOD:*	**HA + DCP**	*SHEAR VANE NUMBER:*	**-**
LOCATION:	**REFER TO SITE PLAN**	*GROUNDWATER LEVEL:*	**N/E**	This report may only be reproduced in full	

Depth (m)	*DCP Test Results (Blows per 100mm)*	*GWL*	*Soil Description*			*Sample Taken*	*Lab Testing*								*Shear Vane Reading (kPa) peak/remoulded*
							Atterberg Limits			*Grain Size*			*WC (%)*	*UW*	
			USC	*Soil Characteristics*	*Graphic Log*		*LL*	*PL*	*PI*	*GR*	*SA*	*FC*			
0	1 3 4 Refusal	NOT ENCOUNTERED		Silty TOPSOIL, dark brown to black with rootlets											
				SILT, light brown, dry, low plasticity with trace Sand											
0.5				Sandy / Silty GRAVEL & COBBLES, gravel is greywacke, medium to coarse, rounded to sub-rounded; sand is fine to course											
				EOH - Target Stratum											
1.0															
1.5															
2.0															
2.5															

LEGEND

ABBREVIATIONS

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

NOTES

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	CLIENT:	**YourSection Ltd**
	TESTING COMPLETED:	**10 June 2022**

SHALLOW GROUND INVESTIGATION LOG

2022_TP03

PROJECT:	**148, 156 & 178 Lincoln Rolleston Road & 487 Weedens Road**				
LOGGED BY:	**CMD / CM**	*TOTAL TESTING DEPTH:*	**0.8 mbgl**	*HOLE DIAMETER:*	**50 mm**
PROCESSED BY:	**CM**	*TESTING METHOD:*	**HA + DCP**	*SHEAR VANE NUMBER:*	**-**
LOCATION:	**REFER TO SITE PLAN**	*GROUNDWATER LEVEL:*	**N/E**	This report may only be reproduced in full	

Depth (m)	*DCP Test Results (Blows per 100mm)*	*GWL*	*Soil Description*			*Sample Taken*	*Lab Testing*								*Shear Vane Reading (kPa) peak/remoulded*
							Atterberg Limits			*Grain Size*			*WC (%)*	*UW*	
			USC	*Soil Characteristics*	*Graphic Log*		*LL*	*PL*	*PI*	*GR*	*SA*	*FC*			
0.0	2	NOT ENCOUNTERED		Silty TOPSOIL, dark brown to black with rootlets											
	3														
	2														
	3			SILT, light brown, dry, low plasticity with trace Sand											
0.5	2														
	3														
	Refusal			Sandy / Silty GRAVEL & COBBLES, gravel is greywacke, medium to coarse, rounded to sub-rounded; sand is fine to course											
1.0				**EOH - Target Stratum**											
1.5															
2.0															
2.5															

LEGEND

ABBREVIATIONS

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

NOTES

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	CLIENT:	**YourSection Ltd**
	TESTING COMPLETED:	**10 June 2022**

SHALLOW GROUND INVESTIGATION LOG

2022_TP04

PROJECT:	**148, 156 & 178 Lincoln Rolleston Road & 487 Weedens Road**				
LOGGED BY:	**CMD / CM**	*TOTAL TESTING DEPTH:*	**0.6 mbgl**	*HOLE DIAMETER:*	**50 mm**
PROCESSED BY:	**CM**	*TESTING METHOD:*	**HA + DCP**	*SHEAR VANE NUMBER:*	**-**
LOCATION:	**REFER TO SITE PLAN**	*GROUNDWATER LEVEL:*	**N/E**	This report may only be reproduced in full	

Depth (m)	*DCP Test Results (Blows per 100mm)*	*GWL*	*Soil Description*			*Sample Taken*	*Lab Testing*								*Shear Vane Reading (kPa) peak/remoulded*
							Atterberg Limits			*Grain Size*			*WC (%)*	*UW*	
			USC	*Soil Characteristics*	*Graphic Log*		*LL*	*PL*	*PI*	*GR*	*SA*	*FC*			
0.0	1	NOT ENCOUNTERED		Silty TOPSOIL, dark brown to black with rootlets											
	2			SILT, light brown, dry, low plasticity with trace Sand											
	3														
	4														
0.5	3			Sandy / Silty GRAVEL & COBBLES, gravel is greywacke, medium to coarse, rounded to sub-rounded; sand is fine to course											
	Refusal			**EOH - Target Stratum**											
1.0															
1.5															
2.0															
2.5															

LEGEND

ABBREVIATIONS

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

NOTES

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	TESTING COMPLETED:	**10 June 2022**

SHALLOW GROUND INVESTIGATION LOG

2022_TP05

PROJECT:	**148, 156 & 178 Lincoln Rolleston Road & 487 Weedens Road**				
LOGGED BY:	**CMD / CM**	*TOTAL TESTING DEPTH:*	**0.6 mbgl**	*HOLE DIAMETER:*	**50 mm**
PROCESSED BY:	**CM**	*TESTING METHOD:*	**HA + DCP**	*SHEAR VANE NUMBER:*	**-**
LOCATION:	**REFER TO SITE PLAN**	*GROUNDWATER LEVEL:*	**N/E**	This report may only be reproduced in full	

Depth (m)	*DCP Test Results (Blows per 100mm)*	*GWL*	*Soil Description*			*Sample Taken*	*Lab Testing*								*Shear Vane Reading (kPa) peak/remoulded*
							Atterberg Limits			*Grain Size*			*WC (%)*	*UW*	
			USC	*Soil Characteristics*	*Graphic Log*		*LL*	*PL*	*PI*	*GR*	*SA*	*FC*			
0.0	1	NOT ENCOUNTERED		Silty TOPSOIL, dark brown to black with rootlets											
	2			SILT, light brown, dry, low plasticity with trace Sand											
	2														
	2														
0.5	3			Sandy / Silty GRAVEL & COBBLES, gravel is greywacke, medium to coarse, rounded to sub-rounded; sand is fine to course											
	Refusal			**EOH - Target Stratum**											
1.0															
1.5															
2.0															
2.5															

LEGEND

ABBREVIATIONS

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

NOTES

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	TESTING COMPLETED:	**10 June 2022**

SHALLOW GROUND INVESTIGATION LOG

2022_TP06

PROJECT:	**148, 156 & 178 Lincoln Rolleston Road & 487 Weedens Road**				
LOGGED BY:	**CMD / CM**	*TOTAL TESTING DEPTH:*	**0.5 mbgl**	*HOLE DIAMETER:*	**50 mm**
PROCESSED BY:	**CM**	*TESTING METHOD:*	**HA + DCP**	*SHEAR VANE NUMBER:*	**-**
LOCATION:	**REFER TO SITE PLAN**	*GROUNDWATER LEVEL:*	**N/E**	This report may only be reproduced in full	

Depth (m)	*DCP Test Results (Blows per 100mm)*	*GWL*	*Soil Description*			*Sample Taken*	*Lab Testing*								*Shear Vane Reading (kPa) peak/remoulded*
							Atterberg Limits			*Grain Size*			*WC (%)*	*UW*	
			USC	*Soil Characteristics*	*Graphic Log*		*LL*	*PL*	*PI*	*GR*	*SA*	*FC*			
0	2	NOT ENCOUNTERED		Silty TOPSOIL, dark brown to black with rootlets											
	2														
	2														
	Refusal			Sandy / Silty GRAVEL & COBBLES, gravel is greywacke, medium to coarse, rounded to sub-rounded; sand is fine to course											
0.5				**EOH - Target Stratum**											
1.0															
1.5															
2.0															
2.5															

LEGEND

ABBREVIATIONS

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

NOTES

miyamoto. ENGINEERS+ CONSTRUCTION CONSULTANTS	*PROJECT NUMBER:*	**200357-1**
	CLIENT:	**YourSection Ltd**
	TESTING COMPLETED:	**10 June 2022**

SHALLOW GROUND INVESTIGATION LOG

2022_TP07

PROJECT:	**148, 156 & 178 Lincoln Rolleston Road & 487 Weedens Road**				
LOGGED BY:	**CMD / CM**	*TOTAL TESTING DEPTH:*	**0.6 mbgl**	*HOLE DIAMETER:*	**50 mm**
PROCESSED BY:	**CM**	*TESTING METHOD:*	**HA + DCP**	*SHEAR VANE NUMBER:*	**-**
LOCATION:	**REFER TO SITE PLAN**	*GROUNDWATER LEVEL:*	**N/E**	This report may only be reproduced in full	

Depth (m)	*DCP Test Results (Blows per 100mm)*	*GWL*	*Soil Description*			*Sample Taken*	*Lab Testing*								*Shear Vane Reading (kPa) peak/remoulded*
							Atterberg Limits			*Grain Size*			*WC (%)*	*UW*	
			USC	*Soil Characteristics*	*Graphic Log*		*LL*	*PL*	*PI*	*GR*	*SA*	*FC*			
0.0	1 2 4 5 5	NOT ENCOUNTERED		Silty TOPSOIL, dark brown to black with rootlets											
				SILT, light brown, dry, low plasticity with trace Sand											
0.5	Refusal			Sandy / Silty GRAVEL & COBBLES, gravel is greywacke, medium to coarse, rounded to sub-rounded; sand is fine to course											
				EOH - Target Stratum											
1.0															
1.5															
2.0															
2.5															

LEGEND

ABBREVIATIONS

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

NOTES

miyamoto. ENGINEERS+ CONSTRUCTION CONSULTANTS	*PROJECT NUMBER:*	**200357-1**
	CLIENT:	**YourSection Ltd**
	TESTING COMPLETED:	**10 June 2022**

SHALLOW GROUND INVESTIGATION LOG

2022_TP08

PROJECT:	**148, 156 & 178 Lincoln Rolleston Road & 487 Weedens Road**				
LOGGED BY:	**CMD / CM**	*TOTAL TESTING DEPTH:*	**0.5 mbgl**	*HOLE DIAMETER:*	**50 mm**
PROCESSED BY:	**CM**	*TESTING METHOD:*	**HA + DCP**	*SHEAR VANE NUMBER:*	**-**
LOCATION:	**REFER TO SITE PLAN**	*GROUNDWATER LEVEL:*	**N/E**	This report may only be reproduced in full	

Depth (m)	*DCP Test Results (Blows per 100mm)*	*GWL*	*Soil Description*			*Sample Taken*	*Lab Testing*								*Shear Vane Reading (kPa) peak/remoulded*
							Atterberg Limits			*Grain Size*			*WC (%)*	*UW*	
			USC	*Soil Characteristics*	*Graphic Log*		*LL*	*PL*	*PI*	*GR*	*SA*	*FC*			
0.0	2	NOT ENCOUNTERED		Silty TOPSOIL, dark brown to black with rootlets											
	2			SILT, light brown, dry, low plasticity with trace Sand											
	2														
	15			Sandy / Silty GRAVEL & COBBLES, gravel is greywacke, medium to coarse, rounded to sub-rounded; sand is fine to course											
0.5	Refusal			**EOH - Target Stratum**											
1.0															
1.5															
2.0															
2.5															

LEGEND

ABBREVIATIONS

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

NOTES

miyamoto. ENGINEERS+ CONSTRUCTION CONSULTANTS	*PROJECT NUMBER:*	**200357-1**
	CLIENT:	**YourSection Ltd**
	TESTING COMPLETED:	**10 June 2022**

SHALLOW GROUND INVESTIGATION LOG

2022_TP09

PROJECT:	**148, 156 & 178 Lincoln Rolleston Road & 487 Weedens Road**				
LOGGED BY:	**CMD / CM**	*TOTAL TESTING DEPTH:*	**0.4 mbgl**	*HOLE DIAMETER:*	**50 mm**
PROCESSED BY:	**CM**	*TESTING METHOD:*	**HA + DCP**	*SHEAR VANE NUMBER:*	**-**
LOCATION:	**REFER TO SITE PLAN**	*GROUNDWATER LEVEL:*	**N/E**	This report may only be reproduced in full	

Depth (m)	*DCP Test Results (Blows per 100mm)*	*GWL*	*Soil Description*			*Sample Taken*	*Lab Testing*								*Shear Vane Reading (kPa) peak/remoulded*
							Atterberg Limits			*Grain Size*			*WC (%)*	*UW*	
			USC	*Soil Characteristics*	*Graphic Log*		*LL*	*PL*	*PI*	*GR*	*SA*	*FC*			
	1 3 4 Refusal	NOT ENCOUNTERED		Silty TOPSOIL, dark brown to black with rootlets											
0.5				Sandy / Silty GRAVEL & COBBLES, gravel is greywacke, medium to coarse, rounded to sub-rounded; sand is fine to course											
				EOH - Target Stratum											
1.0															
1.5															
2.0															
2.5															

LEGEND

ABBREVIATIONS

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

NOTES

miyamoto. ENGINEERS+ CONSTRUCTION CONSULTANTS	*PROJECT NUMBER:*	**200357-1**
	CLIENT:	**YourSection Ltd**
	TESTING COMPLETED:	**10 June 2022**

SHALLOW GROUND INVESTIGATION LOG

2022_TP10

PROJECT:	**148, 156 & 178 Lincoln Rolleston Road & 487 Weedens Road**				
LOGGED BY:	**CMD / CM**	*TOTAL TESTING DEPTH:*	**0.9 mbgl**	*HOLE DIAMETER:*	**50 mm**
PROCESSED BY:	**CM**	*TESTING METHOD:*	**HA + DCP**	*SHEAR VANE NUMBER:*	**-**
LOCATION:	**REFER TO SITE PLAN**	*GROUNDWATER LEVEL:*	**N/E**	This report may only be reproduced in full	

Depth (m)	*DCP Test Results (Blows per 100mm)*	*GWL*	*Soil Description*			*Sample Taken*	*Lab Testing*								*Shear Vane Reading (kPa) peak/remoulded*
							Atterberg Limits			*Grain Size*			*WC (%)*	*UW*	
			USC	*Soil Characteristics*	*Graphic Log*		*LL*	*PL*	*PI*	*GR*	*SA*	*FC*			
0.0	2	NOT ENCOUNTERED		Silty TOPSOIL, dark brown to black with rootlets											
	1														
	1			SILT, light brown, dry, low plasticity with trace Sand											
	2														
0.5	2														
	1														
	2														
	3														
	5														
1.0	Refusal			Sandy / Silty GRAVEL & COBBLES, gravel is greywacke, medium to coarse, rounded to sub-rounded; sand is fine to course											
				EOH - Target Stratum											
1.5															
2.0															
2.5															

LEGEND

ABBREVIATIONS

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

NOTES

miyamoto. ENGINEERS+ CONSTRUCTION CONSULTANTS	*PROJECT NUMBER:*	**200357-1**
	CLIENT:	**YourSection Ltd**
	TESTING COMPLETED:	**10 June 2022**

SHALLOW GROUND INVESTIGATION LOG

2022_TP11

PROJECT:	**148, 156 & 178 Lincoln Rolleston Road & 487 Weedens Road**				
LOGGED BY:	**CMD / CM**	*TOTAL TESTING DEPTH:*	**0.3 mbgl**	*HOLE DIAMETER:*	**50 mm**
PROCESSED BY:	**CM**	*TESTING METHOD:*	**HA + DCP**	*SHEAR VANE NUMBER:*	**-**
LOCATION:	**REFER TO SITE PLAN**	*GROUNDWATER LEVEL:*	**N/E**	This report may only be reproduced in full	

Depth (m)	*DCP Test Results (Blows per 100mm)*	*GWL*	*Soil Description*			*Sample Taken*	*Lab Testing*								*Shear Vane Reading (kPa) peak/remoulded*
							Atterberg Limits			*Grain Size*			*WC (%)*	*UW*	
			USC	*Soil Characteristics*	*Graphic Log*		*LL*	*PL*	*PI*	*GR*	*SA*	*FC*			
	2	NOT ENCOUNTERED		Silty TOPSOIL, dark brown to black with rootlets											
	1														
	2														
	15			Sandy / Silty GRAVEL & COBBLES, gravel is greywacke, medium to coarse, rounded to sub-rounded; sand is fine to course											
0.5	Refusal			**EOH - Target Stratum**											
1.0															
1.5															
2.0															
2.5															

LEGEND

ABBREVIATIONS

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

NOTES

miyamoto. ENGINEERS+ CONSTRUCTION CONSULTANTS	*PROJECT NUMBER:*	**200357-1**
	CLIENT:	**YourSection Ltd**
	TESTING COMPLETED:	**10 June 2022**

SHALLOW GROUND INVESTIGATION LOG

2022_TP12

PROJECT:	**148, 156 & 178 Lincoln Rolleston Road & 487 Weedens Road**				
LOGGED BY:	**CMD / CM**	*TOTAL TESTING DEPTH:*	**0.6 mbgl**	*HOLE DIAMETER:*	**50 mm**
PROCESSED BY:	**CM**	*TESTING METHOD:*	**HA + DCP**	*SHEAR VANE NUMBER:*	**-**
LOCATION:	**REFER TO SITE PLAN**	*GROUNDWATER LEVEL:*	**N/E**	This report may only be reproduced in full	

Depth (m)	*DCP Test Results (Blows per 100mm)*	*GWL*	*Soil Description*			*Sample Taken*	*Lab Testing*								*Shear Vane Reading (kPa) peak/remoulded*
							Atterberg Limits			*Grain Size*			*WC (%)*	*UW*	
			USC	*Soil Characteristics*	*Graphic Log*		*LL*	*PL*	*PI*	*GR*	*SA*	*FC*			
0.0	3	NOT ENCOUNTERED		Silty TOPSOIL, dark brown to black with rootlets											
	3														
	5			SILT, light brown, dry, low plasticity with trace Sand											
	5														
0.5	10														
	15														
	Refusal			Sandy / Silty GRAVEL & COBBLES, gravel is greywacke, medium to coarse, rounded to sub-rounded; sand is fine to course											
1.0				**EOH - Target Stratum**											
1.5															
2.0															
2.5															

LEGEND

ABBREVIATIONS

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

NOTES

miyamoto. ENGINEERS+ CONSTRUCTION CONSULTANTS	*PROJECT NUMBER:*	**200357-1**
	CLIENT:	**YourSection Ltd**
	TESTING COMPLETED:	**10 June 2022**

SHALLOW GROUND INVESTIGATION LOG

2022_TP13

PROJECT:	**148, 156 & 178 Lincoln Rolleston Road & 487 Weedens Road**				
LOGGED BY:	**CMD / CM**	*TOTAL TESTING DEPTH:*	**0.6 mbgl**	*HOLE DIAMETER:*	**50 mm**
PROCESSED BY:	**CM**	*TESTING METHOD:*	**HA + DCP**	*SHEAR VANE NUMBER:*	**-**
LOCATION:	**REFER TO SITE PLAN**	*GROUNDWATER LEVEL:*	**N/E**	This report may only be reproduced in full	

Depth (m)	*DCP Test Results (Blows per 100mm)*	*GWL*	*Soil Description*			*Sample Taken*	*Lab Testing*								*Shear Vane Reading (kPa) peak/remoulded*
			USC	*Soil Characteristics*	*Graphic Log*		*Atterberg Limits*			*Grain Size*			*WC (%)*	*UW*	
							LL	*PL*	*PI*	*GR*	*SA*	*FC*			
0.0	2	NOT ENCOUNTERED		Silty TOPSOIL, dark brown to black with rootlets											
	2														
	3			SILT, light brown, dry, low plasticity with trace Sand											
	5														
0.5	10														
	15														
	Refusal			Sandy / Silty GRAVEL & COBBLES, gravel is greywacke, medium to coarse, rounded to sub-rounded; sand is fine to course											
1.0				**EOH - Target Stratum**											
1.5															
2.0															
2.5															

LEGEND

ABBREVIATIONS

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

NOTES

miyamoto. ENGINEERS+ CONSTRUCTION CONSULTANTS	*PROJECT NUMBER:*	**200357-1**
	CLIENT:	**YourSection Ltd**
	TESTING COMPLETED:	**10 June 2022**

SHALLOW GROUND INVESTIGATION LOG

2022_TP14

PROJECT:	**148, 156 & 178 Lincoln Rolleston Road & 487 Weedens Road**				
LOGGED BY:	**CMD / CM**	*TOTAL TESTING DEPTH:*	**0.9 mbgl**	*HOLE DIAMETER:*	**50 mm**
PROCESSED BY:	**CM**	*TESTING METHOD:*	**HA + DCP**	*SHEAR VANE NUMBER:*	**-**
LOCATION:	**REFER TO SITE PLAN**	*GROUNDWATER LEVEL:*	**N/E**	This report may only be reproduced in full	

Depth (m)	*DCP Test Results (Blows per 100mm)*	*GWL*	*Soil Description*			*Sample Taken*	*Lab Testing*								*Shear Vane Reading (kPa) peak/remoulded*
			USC	*Soil Characteristics*	*Graphic Log*		*Atterberg Limits*			*Grain Size*			*WC (%)*	*UW*	
							LL	*PL*	*PI*	*GR*	*SA*	*FC*			
0.0	2	NOT ENCOUNTERED		Silty TOPSOIL, dark brown to black with rootlets											
0.5	2 5 7 8 8 15 Refusal			SILT, light brown, dry, low plasticity with trace Sand											
1.0				Sandy / Silty GRAVEL & COBBLES, gravel is greywacke, medium to coarse, rounded to sub-rounded; sand is fine to course											
1.5				**EOH - Target Stratum**											
2.0															
2.5															

LEGEND

ABBREVIATIONS

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

NOTES

miyamoto. ENGINEERS+ CONSTRUCTION CONSULTANTS	*PROJECT NUMBER:*	**200357-1**
	CLIENT:	**YourSection Ltd**
	TESTING COMPLETED:	**10 June 2022**

SHALLOW GROUND INVESTIGATION LOG

2022_TP15

PROJECT:	**148, 156 & 178 Lincoln Rolleston Road & 487 Weedens Road**				
LOGGED BY:	**CMD / CM**	*TOTAL TESTING DEPTH:*	**0.6 mbgl**	*HOLE DIAMETER:*	**50 mm**
PROCESSED BY:	**CM**	*TESTING METHOD:*	**HA + DCP**	*SHEAR VANE NUMBER:*	**-**
LOCATION:	**REFER TO SITE PLAN**	*GROUNDWATER LEVEL:*	**N/E**	This report may only be reproduced in full	

Depth (m)	*DCP Test Results (Blows per 100mm)*	*GWL*	*Soil Description*			*Sample Taken*	*Lab Testing*								*Shear Vane Reading (kPa) peak/remoulded*
							Atterberg Limits			*Grain Size*			*WC (%)*	*UW*	
			USC	*Soil Characteristics*	*Graphic Log*		*LL*	*PL*	*PI*	*GR*	*SA*	*FC*			
0.0	3	NOT ENCOUNTERED		Silty TOPSOIL, dark brown to black with rootlets											
	3														
	5			SILT, light brown, dry, low plasticity with trace Sand											
	5														
0.5	15			Sandy / Silty GRAVEL & COBBLES, gravel is greywacke, medium to coarse, rounded to sub-rounded; sand is fine to course											
	Refusal			**EOH - Target Stratum**											
1.0															
1.5															
2.0															
2.5															

LEGEND

ABBREVIATIONS

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

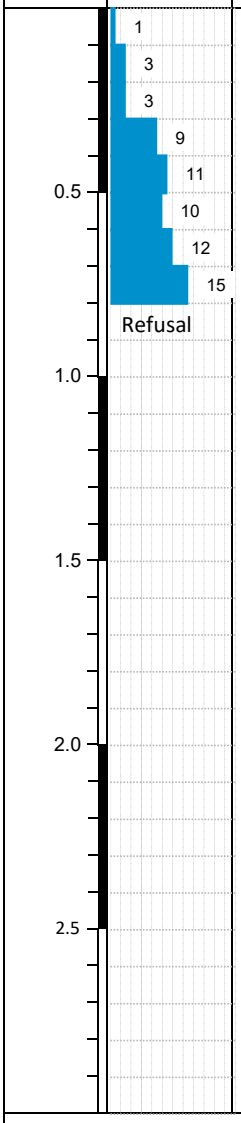
NOTES

miyamoto. ENGINEERS+ CONSTRUCTION CONSULTANTS	*PROJECT NUMBER:*	**200357-1**
	CLIENT:	**YourSection Ltd**
	TESTING COMPLETED:	**10 June 2022**

SHALLOW GROUND INVESTIGATION LOG

2022_TP16

PROJECT:	**148, 156 & 178 Lincoln Rolleston Road & 487 Weedens Road**				
LOGGED BY:	**CMD / CM**	*TOTAL TESTING DEPTH:*	**1.2 mbgl**	*HOLE DIAMETER:*	**50 mm**
PROCESSED BY:	**CM**	*TESTING METHOD:*	**HA + DCP**	*SHEAR VANE NUMBER:*	**-**
LOCATION:	**REFER TO SITE PLAN**	*GROUNDWATER LEVEL:*	**N/E**	This report may only be reproduced in full	



Depth (m)	*DCP Test Results (Blows per 100mm)*	*GWL*	*Soil Description*			*Sample Taken*	*Lab Testing*								*Shear Vane Reading (kPa) peak/remoulded*
							Atterberg Limits			*Grain Size*			*WC (%)*	*UW*	
			USC	*Soil Characteristics*	*Graphic Log*		*LL*	*PL*	*PI*	*GR*	*SA*	*FC*			
				Silty TOPSOIL, dark brown to black with rootlets											
				SILT, light brown, dry, low plasticity with trace Sand											
				Sandy / Silty GRAVEL & COBBLES, gravel is greywacke, medium to coarse, rounded to sub-rounded; sand is fine to course											
				EOH - Target Stratum											

LEGEND

ABBREVIATIONS

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

NOTES

miyamoto. ENGINEERS + CONSTRUCTION CONSULTANTS	*PROJECT NUMBER:*	**200357-1**
	CLIENT:	**YourSection Ltd**
	TESTING COMPLETED:	**10 June 2022**

SHALLOW GROUND INVESTIGATION LOG

2022_TP17

PROJECT:	**148, 156 & 178 Lincoln Rolleston Road & 487 Weedens Road**				
LOGGED BY:	**CMD / CM**	*TOTAL TESTING DEPTH:*	**1.2 mbgl**	*HOLE DIAMETER:*	**50 mm**
PROCESSED BY:	**CM**	*TESTING METHOD:*	**HA + DCP**	*SHEAR VANE NUMBER:*	**-**
LOCATION:	**REFER TO SITE PLAN**	*GROUNDWATER LEVEL:*	**N/E**	This report may only be reproduced in full	

Depth (m)	*DCP Test Results (Blows per 100mm)*	*GWL*	*Soil Description*			*Sample Taken*	*Lab Testing*								*Shear Vane Reading (kPa) peak/remoulded*
			USC	*Soil Characteristics*	*Graphic Log*		*Atterberg Limits*			*Grain Size*			*WC (%)*	*UW*	
							LL	*PL*	*PI*	*GR*	*SA*	*FC*			
0	1, 2, 3	NOT ENCOUNTERED		Silty TOPSOIL, dark brown to black with rootlets											
0.5	3, 6, 6, 8, 15, 11			SILT, light brown, dry, low plasticity with trace Sand											
1.0				Sandy / Silty GRAVEL & COBBLES, gravel is greywacke, medium to coarse, rounded to sub-rounded; sand is fine to course											
1.5				**EOH - Target Stratum**											
2.0															
2.5															

LEGEND

ABBREVIATIONS

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

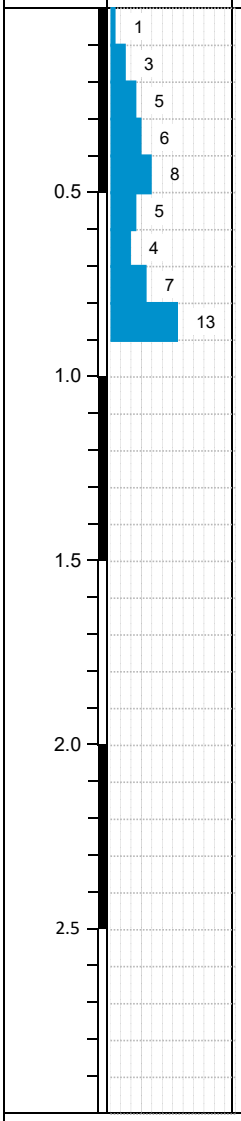
NOTES

miyamoto. ENGINEERS+ CONSTRUCTION CONSULTANTS	*PROJECT NUMBER:*	**200357-1**
	CLIENT:	**YourSection Ltd**
	TESTING COMPLETED:	**10 June 2022**

SHALLOW GROUND INVESTIGATION LOG

2022_TP18

PROJECT:	**148, 156 & 178 Lincoln Rolleston Road & 487 Weedens Road**				
LOGGED BY:	**CMD / CM**	*TOTAL TESTING DEPTH:*	**1.1 mbgl**	*HOLE DIAMETER:*	**50 mm**
PROCESSED BY:	**CM**	*TESTING METHOD:*	**HA + DCP**	*SHEAR VANE NUMBER:*	**-**
LOCATION:	**REFER TO SITE PLAN**	*GROUNDWATER LEVEL:*	**N/E**	This report may only be reproduced in full	



Depth (m)	*DCP Test Results (Blows per 100mm)*	*GWL*	*Soil Description*			*Sample Taken*	*Lab Testing*								*Shear Vane Reading (kPa) peak/remoulded*
			USC	*Soil Characteristics*	*Graphic Log*		*Atterberg Limits*			*Grain Size*			*WC (%)*	*UW*	
							LL	*PL*	*PI*	*GR*	*SA*	*FC*			
0	1, 3, 5, 6, 8, 5, 4, 7, 13	NOT ENCOUNTERED		Silty TOPSOIL, dark brown to black with rootlets											
0.5				SILT, light brown, dry, low plasticity with trace Sand											
1.0				Sandy / Silty GRAVEL & COBBLES, gravel is greywacke, medium to coarse, rounded to sub-rounded; sand is fine to course											
1.1				**EOH - Target Stratum**											

LEGEND

ABBREVIATIONS

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

NOTES

miyamoto. ENGINEERS+ CONSTRUCTION CONSULTANTS	*PROJECT NUMBER:*	**200357-1**
	CLIENT:	**YourSection Ltd**
	TESTING COMPLETED:	**10 June 2022**

SHALLOW GROUND INVESTIGATION LOG

2022_TP19

PROJECT:	**148, 156 & 178 Lincoln Rolleston Road & 487 Weedens Road**				
LOGGED BY:	**CMD / CM**	*TOTAL TESTING DEPTH:*	**1.0 mbgl**	*HOLE DIAMETER:*	**50 mm**
PROCESSED BY:	**CM**	*TESTING METHOD:*	**HA + DCP**	*SHEAR VANE NUMBER:*	**-**
LOCATION:	**REFER TO SITE PLAN**	*GROUNDWATER LEVEL:*	**N/E**	This report may only be reproduced in full	

Depth (m)	*DCP Test Results (Blows per 100mm)*	*GWL*	*Soil Description*			*Sample Taken*	*Lab Testing*								*Shear Vane Reading (kPa) peak/remoulded*
							Atterberg Limits			*Grain Size*			*WC (%)*	*UW*	
			USC	*Soil Characteristics*	*Graphic Log*		*LL*	*PL*	*PI*	*GR*	*SA*	*FC*			
0.5	2, 3, 5, 9, 12, 16, 16 Refusal	NOT ENCOUNTERED		Silty TOPSOIL, dark brown to black with rootlets											
				SILT, light brown, dry, low plasticity with trace Sand											
1.0				Sandy / Silty GRAVEL & COBBLES, gravel is greywacke, medium to coarse, rounded to sub-rounded; sand is fine to course											
				EOH - Target Stratum											
1.5															
2.0															
2.5															

LEGEND

ABBREVIATIONS

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

NOTES

miyamoto. ENGINEERS+ CONSTRUCTION CONSULTANTS	*PROJECT NUMBER:*	**200357-1**
	CLIENT:	**YourSection Ltd**
	TESTING COMPLETED:	**10 June 2022**

SHALLOW GROUND INVESTIGATION LOG

2022_TP20

PROJECT:	**148, 156 & 178 Lincoln Rolleston Road & 487 Weedens Road**				
LOGGED BY:	**CMD / CM**	*TOTAL TESTING DEPTH:*	**1.3 mbgl**	*HOLE DIAMETER:*	**50 mm**
PROCESSED BY:	**CM**	*TESTING METHOD:*	**HA + DCP**	*SHEAR VANE NUMBER:*	**-**
LOCATION:	**REFER TO SITE PLAN**	*GROUNDWATER LEVEL:*	**N/E**	This report may only be reproduced in full	

Depth (m)	*DCP Test Results (Blows per 100mm)*	*GWL*	*Soil Description*			*Sample Taken*	*Lab Testing*								*Shear Vane Reading (kPa) peak/remoulded*
			USC	*Soil Characteristics*	*Graphic Log*		*Atterberg Limits*			*Grain Size*			*WC (%)*	*UW*	
							LL	*PL*	*PI*	*GR*	*SA*	*FC*			
0.0	1	NOT ENCOUNTERED		Silty TOPSOIL, dark brown to black with rootlets											
0.5	2 3 3 6 6 8 15 11			SILT, light brown, dry, low plasticity with trace Sand											
1.0	Refusal														
1.5				**Excavator Refusal in Stiff Silt**											
2.0															
2.5															

LEGEND

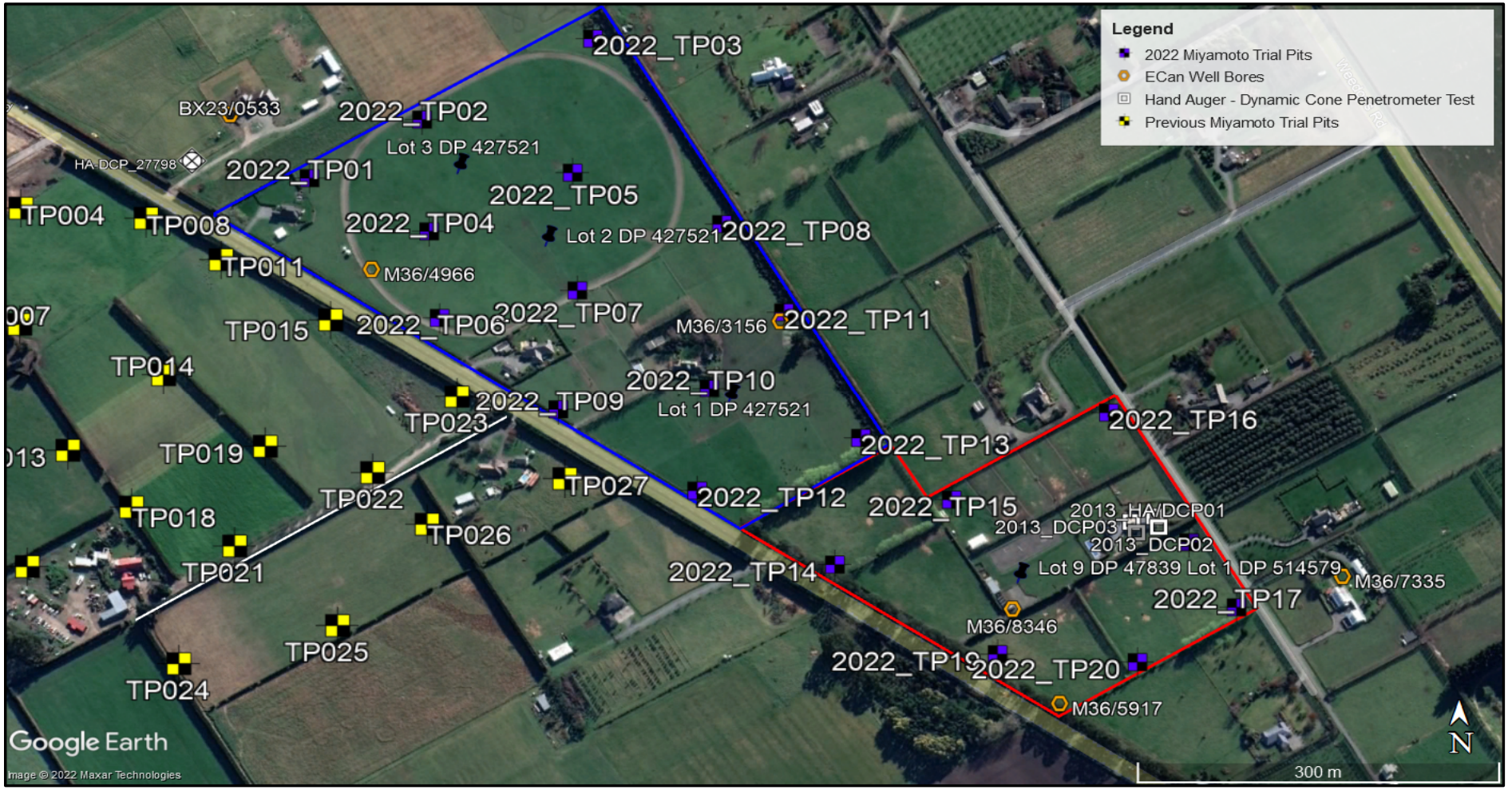
ABBREVIATIONS

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

NOTES

This report may only be reproduced in full

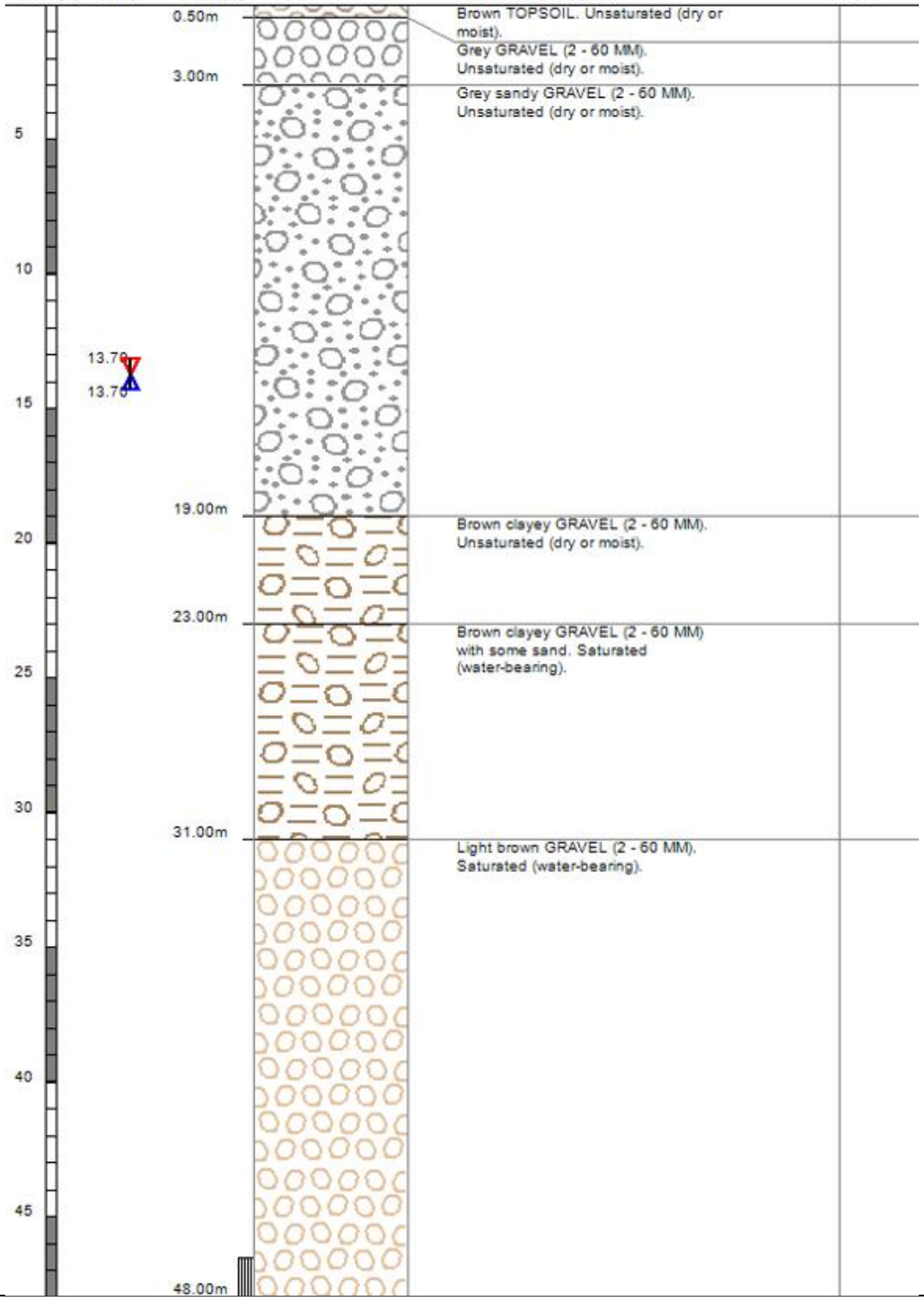
miyamoto. ENGINEERS + CONSTRUCTION CONSULTANTS	*PROJECT NUMBER:* **200357-1** *CLIENT:* **YourSection Ltd** *TESTING COMPLETED:* **10 June 2022**
SITE INVESTIGATION PLAN	**148, 156 & 178 Lincoln Rolleston Road & 487 Weedens Road**



Borelog for well BX23/0533

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

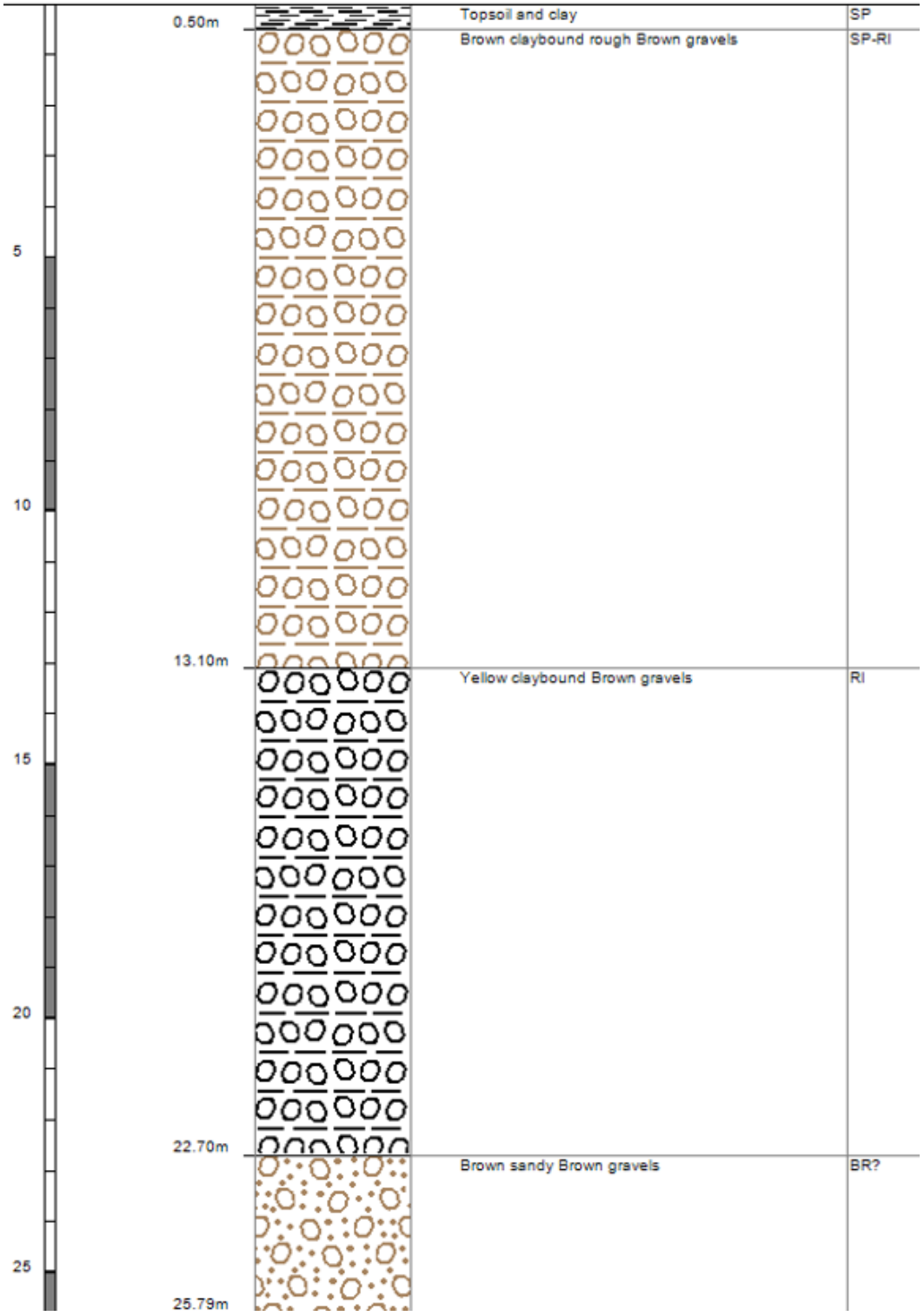
Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha



Borelog for well M36/3156

Grid Reference (NZTM): 1553107 mE, 5171541 mN
Location Accuracy: 50 - 300m
Ground Level Altitude: 37.5 m +MSD Accuracy: < 2.5 m
Driller: Harper A W
Drill Method: Cable Tool
Borelog Depth: 25.8 m Drill Date: 19-Nov-1984

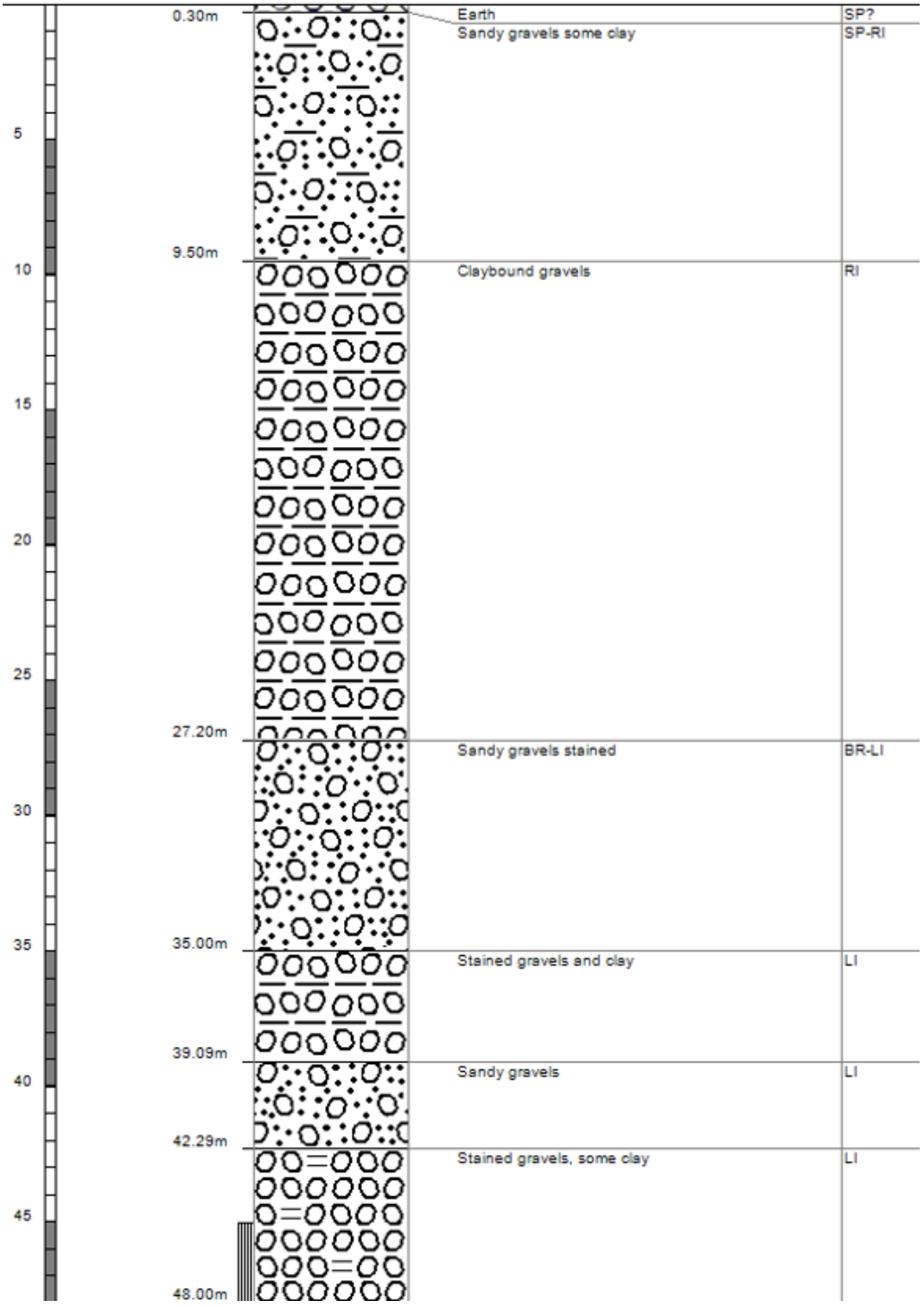
Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha

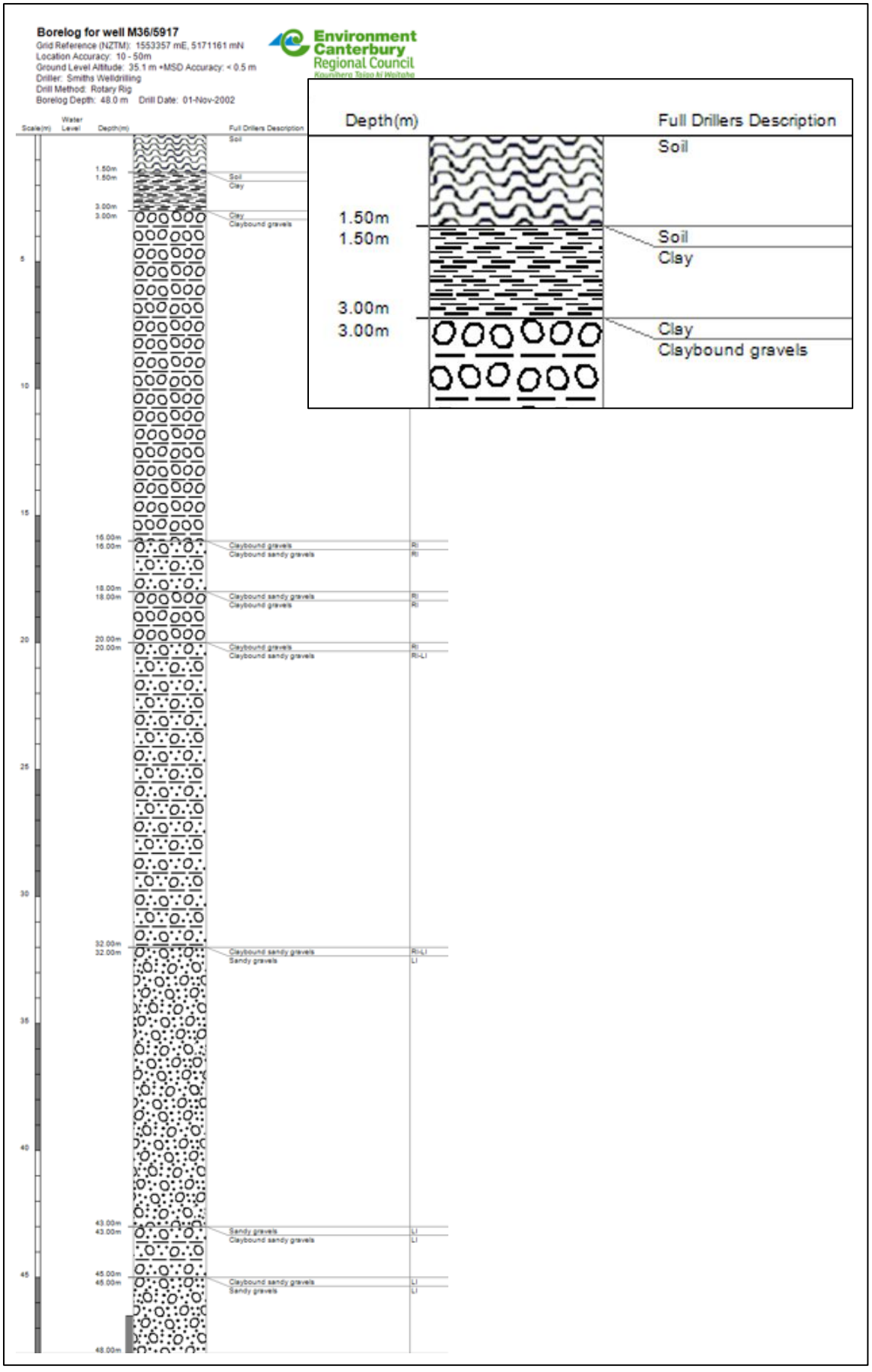


Borelog for well M36/4966

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

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha

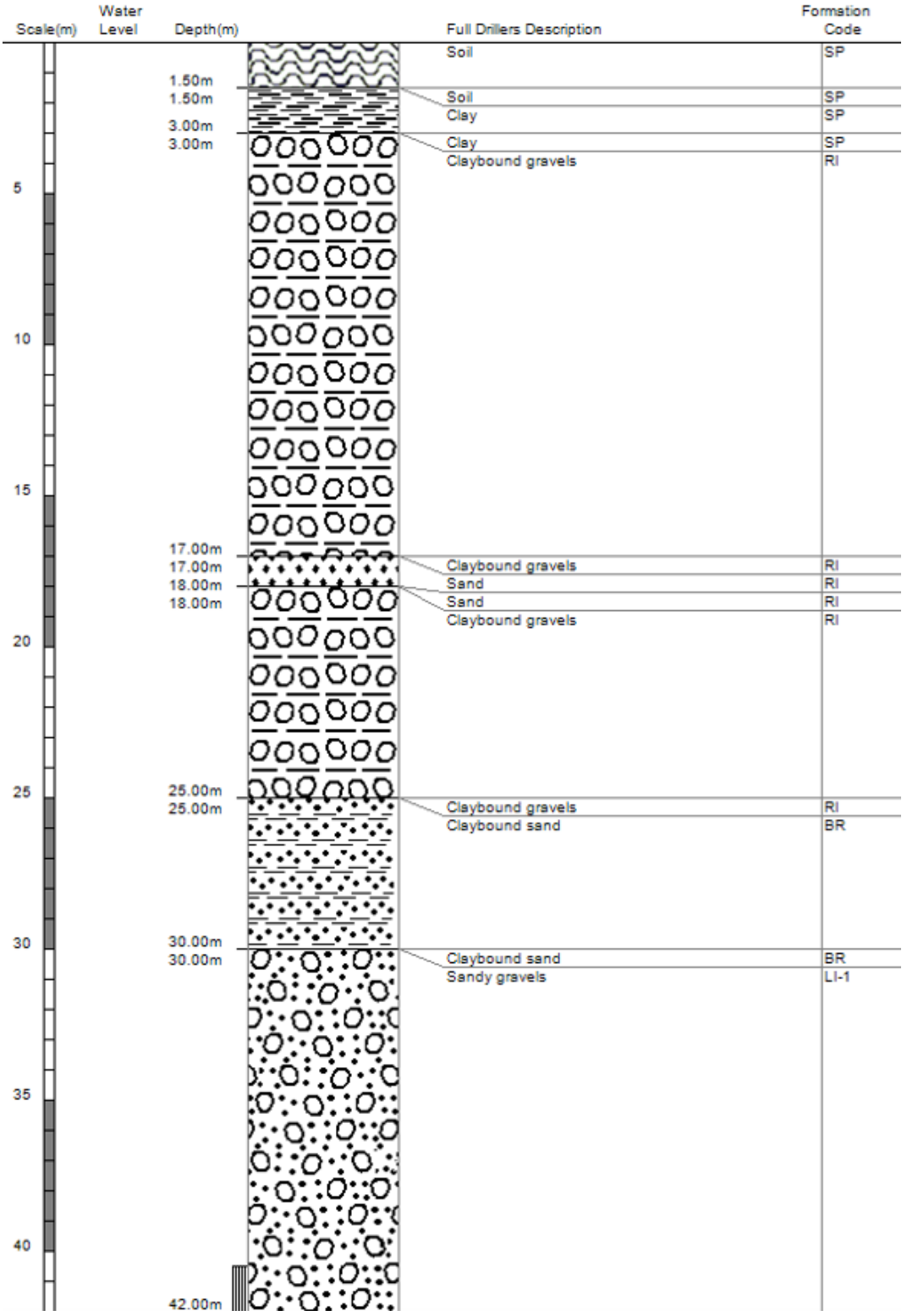


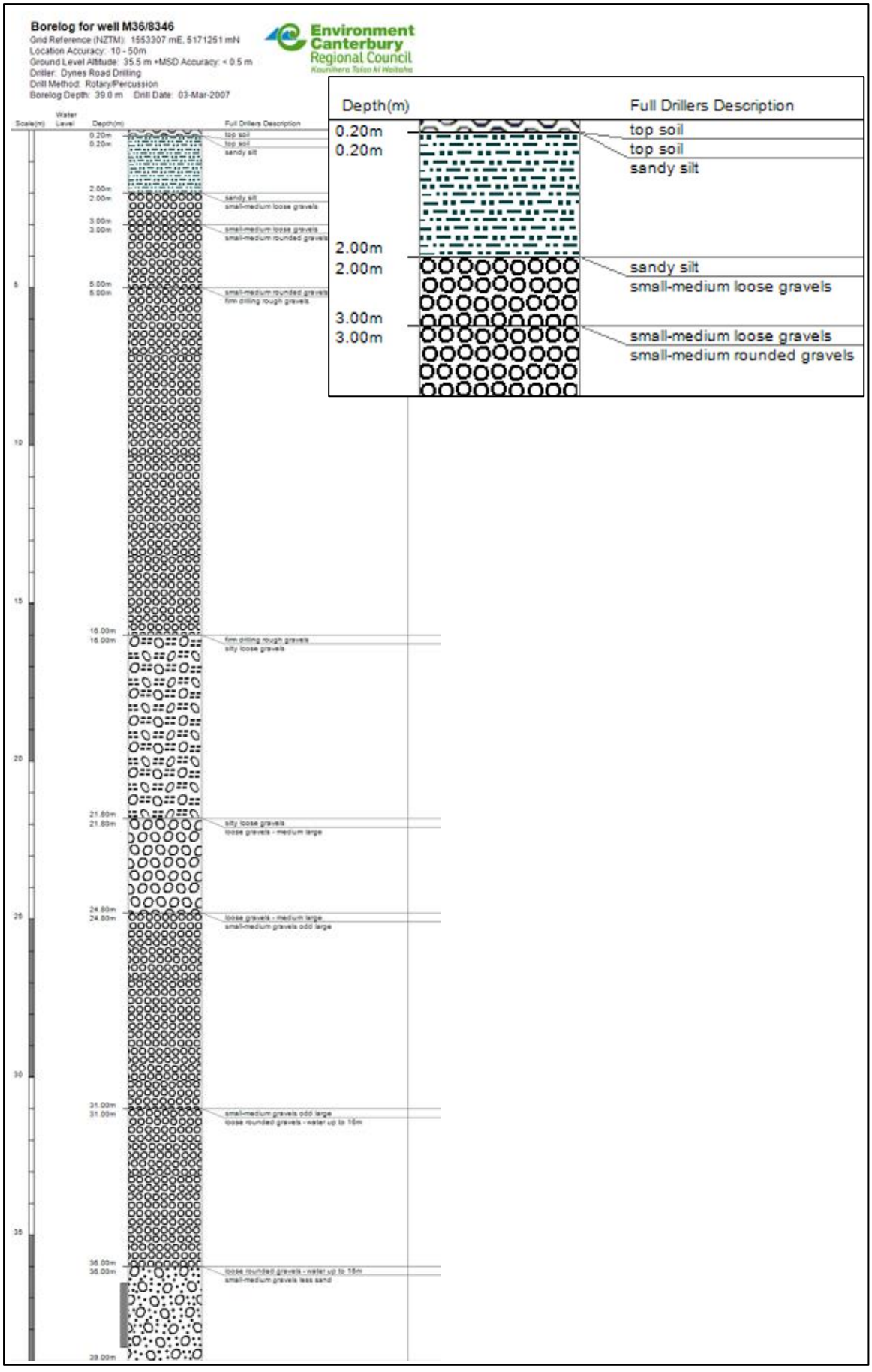

Borelog for well M36/5917
Grid Reference (NZTM): 1553357 mE, 5171161 mN
Location Accuracy: 10 - 50m
Ground Level Altitude: 35.1 m +MSD Accuracy: < 0.5 m
Driller: Smiths Welldrilling
Drill Method: Rotary Rig
Borelog Depth: 48.0 m Drill Date: 01-Nov-2002
Environment Canterbury Regional Council
Depth(m)
Full Drillers Description
Soil
1.50m
1.50m
Soil
Clay
3.00m
3.00m
Clay
Claybound gravels

Borelog for well M36/7335

Grid Reference (NZTM): 1553586 mE, 5171271 mN
Location Accuracy: 50 - 300m
Ground Level Altitude: 34.8 m +MSD Accuracy: < 0.5 m
Driller: Smiths Welldrilling
Drill Method: Rotary Rig
Borelog Depth: 42.0 m Drill Date: 13-Dec-2002

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha




Borelog for well M36/8346
Grid Reference (NZTM): 1553307 mE, 5171251 mN
Location Accuracy: 10 - 50m
Ground Level Altitude: 35.5 m +MSD Accuracy: < 0.5 m
Driller: Dynes Road Drilling
Drill Method: Rotary/Percussion
Borelog Depth: 39.0 m Drill Date: 03-Mar-2007
Environment Canterbury Regional Council
Depth(m)
Full Drillers Description
0.20m
top soil
0.20m
top soil
sandy silt
2.00m
sandy silt
small-medium loose gravels
3.00m
small-medium loose gravels
small-medium rounded gravels

FILE NAME: Murfitt House Alterations **DATE:** 07/10/2013

FILE NUMBER: 130564 **WEATHER:** Fine

SITE LOCATION: 8/487 Weedons Road, Rolleston **OPERATOR:** AO

TM CONSULTANTS
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Test Bore Results

Depth(m)	Bore Hole at Test 1	WT
0.10	TOPSOIL	
0.20		
0.30		
0.40	Brown SILT	
0.50		
0.60		
0.70	Light Brown SAND	
0.80		
0.90		
1.00		
1.10		
1.20	Light Brown SILT	
1.30		
1.40		
1.50		
1.60		
1.70	Light Brown SAND	
1.80	STONES	
1.90		
2.00		
2.10		
2.20		
2.30		
2.40		
2.50		
2.60		
2.70		
2.80		
2.90		
3.00		

Depth(m)	Bore Hole at Test 4	WT
0.10	TOPSOIL	
0.20		
0.30		
0.40	Light Brown SILT	
0.50		
0.60		
0.70		
0.80		
0.90		
1.00		
1.10		
1.20	STONES	
1.30		
1.40		
1.50		
1.60		
1.70		
1.80		
1.90		
2.00		
2.10		
2.20		
2.30		
2.40		
2.50		
2.60		
2.70		
2.80		
2.90		
3.00		