Appendix C –ENGEO, Geotechnical Assessr	ment	





Geotechnical Investigation

174 - 250 Hamptons Road and 735 Shands Road

Prebbleton

Christchurch

Submitted to:

Urban Estates Ltd 181 High Street City Centre Christchurch 8144

22.10.2020

17637.000.000_01

ENGEO Limited

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ENGEO Document Control:

Report Title Geotechnical Investigation - 174 - 250 Hamptons Road and 735 Shands Road, Prebbleton										
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1 Introduction

ENGEO Ltd was requested by Urban Estates Ltd to undertake a geotechnical investigation of the property at 174 - 250 Hamptons Road and 735 Shands Road, Prebbleton, Christchurch (herein referred to as 'the site'). This work has been carried out in accordance with our signed agreement dated 18 August 2020.

We understand that you propose to apply for a plan change for this site to allow proposed zone change from general rural zone to general residential zone with an approximate density of 12 lots per hectare. Our scope of works at this stage will support your Resource Consent application for the plan change only. We can complete additional testing to support a subdivision consent application at a later date.

Our scope of works included the following:

- Review of published geotechnical and geological information relevant to the site;
- Site assessment by an experienced ground engineering professional;
- Coordinate local buried services location contractor;
- Shallow subsurface testing, consisting of approximately 0.3 tests (test pits) per hectare*, with a total of approximately 15-20 test pits; Observe the excavation of test pits including geotechnical logging of the exposed soils. These pits will be up to approximately 2 m deep, 3 m long and 1 m wide. We will loosely backfill the test pits upon completion with the excavated soil. Re-compaction will be accomplished by tamping with the excavator bucket.
- Assess the liquefaction potential for the site based on our site investigations and published literature;
- Prepare a report outlining our findings on the ground conditions and the suitability of the site for proposed zone change from general rural zone to general residential zone. This will include:
 - Likely Foundation types for typical low-rise timber framed residential dwellings.
 - Seismic Subsoil category;
 - Address likely geohazards that may affect the site; and
 - General geotechnical recommendations related to the proposed development.

Our scope of works does not include geotechnical recommendations to a level suitable for subdivision consent, foundation design or Building Consent.

2 Site Description

The site at 174 - 250 Hamptons Road and 735 Shands Road is located on a relatively flat area in Christchurch (Figure 1 and Appendix 1). The site covers an area of approximately 70 hectares.

The site is currently agricultural land mostly used for light grazing. There are various existing dwellings and sheds on-site.



A roadside water-race (approx. 1.0 m to 1.5 m wide by 0.5 m 1.0 m deep) is located on Hamptons Road at the southern end of the site. Water was flowing to the southeast and appeared to be approximately 100 mm to 200 mm deep at the time of our visit.

Figure 1: Site Location Plan

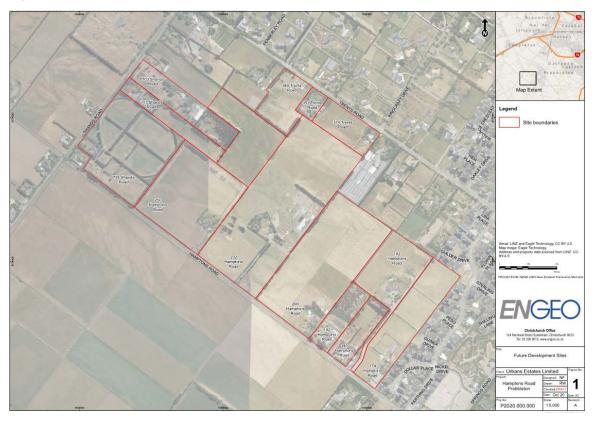


Image by ENGEO and presented in Appendix 1. Not to scale

3 Background Review

3.1 Regional Geology

The site has been regionally mapped by GNS (Forsyth et al., 2008) as being underlain by grey to brown alluvium, comprising silty subangular gravel and sand (Q1a).

3.2 Geohazards

3.2.1 Seismicity

There are no known or mapped faults in the immediate area of the site, however, the site may be at risk of ground shaking induced by movement of other faults.

The site is located between two recently discovered fault systems, the Greendale Fault and the Port Hills Fault, the ruptures of which initiated the ongoing Canterbury Earthquake Sequence (CES). The Greendale Fault has been mapped approximately 11 km west of the site and trends roughly east-west with a surface rupture of approximately 28 km (GNS, 2015), while the Port Hills Fault remains unmapped as the fault did not rupture the surface. Movement on the Port Hills Fault is believed to have occurred at a depth of 1 km to 2 km below the ground surface.



Large regional areas of faulting (GNS, 2015) namely the Ashley Fault, Porters Pass-Amberley Fault Zone, and the Hope and Alpine Faults, are further afield but present a high seismic hazard to the Christchurch area due to the anticipated size of earthquakes generated. The largest of these faults is the Alpine Fault, which has a return period of 250-300 years and is expected to produce a M8 earthquake. The last rupture on the Alpine Fault is believed to have occurred in 1717 (Pettinga et al., 2001).

3.2.2 Liquefaction during the Canterbury Earthquakes

We have reviewed the mapping undertaken by Geotech Consulting in their 2010 Canterbury Earthquake Liquefaction Report, dated 8 February 2011. The mapping shows areas of observed liquefaction following the 2010 Darfield Earthquake and areas assessed as likely to be underlain by potentially liquefiable ground (Figure 2). The mapping shows the site is located approximately 600 m north of an area of observed liquefaction, and approximately 500 m north of the Potentially Liquefiable Ground Zone.

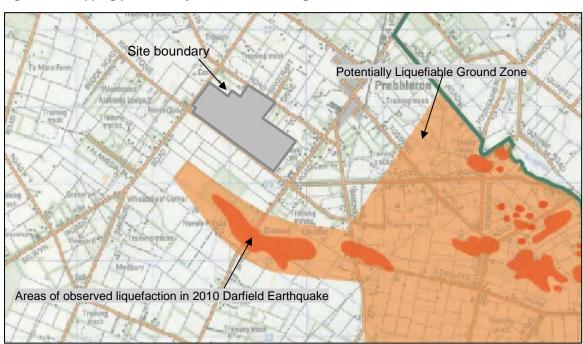


Figure 2: Mapping produced by Geotech Consulting 2010

Image from Geotech Consulting (2011). Not to scale.

We have also reviewed the mapping undertaken by GNS Science in their report titled "Review of liquefaction hazard information in eastern Canterbury, including Christchurch City and parts of Selwyn, Waimakariri and Hurunui Districts", dated 2012. The site is mapped on the boundary between two zones delineating relative liquefaction risk. The northwest side of the site is mapped within an area where "liquefaction damage unlikely" and the southeast side of the site is mapped as "liquefaction assessment needed".



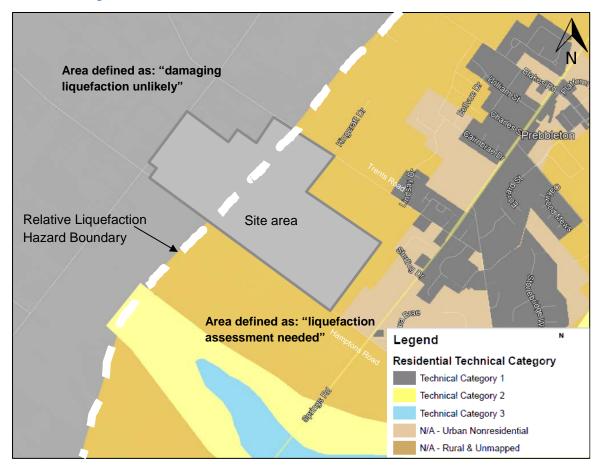


Figure 3: Canterbury Liquefaction Susceptibility Mapping by GNS Science/ECan and MBIE Residential Technical Categories

From Google Earth with Canterbury Maps layers. Not to scale.

3.3 Flooding

The site is outside of any defined flood zones in the Selwyn District Council (SDC) Operative District Plan (SDC, 2015). The closest flood zone is the Lower Plains Flood Area which is approximately 4 km southeast of the site towards the Port Hills.

The Selwyn District Council have carried out computer-based flood modelling to predict the extent and depth of flooding that could happen during a one-in-200-year and a one-in-500-year flood. Based on this modelling, the water depth through the site may be up to 1 m deep in the existing channel feature (Figure 4) during the 500 year flood.



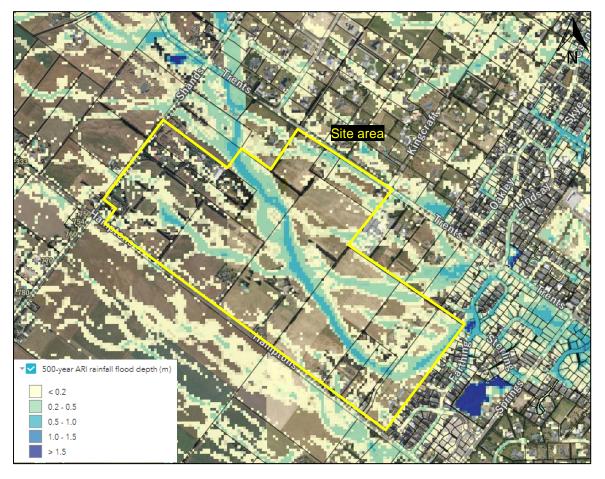


Figure 4: SDC Flooding map

From Google Earth with Canterbury Maps layers. Not to scale.

3.4 ECan Boreholes

We have reviewed deep ECan borehole logs located on the site (or close to the site boundary, as shown in Figure 1), and have reviewed the monitoring well data from the three nearest monitoring wells to the site (part of the ECan Water Level Monitoring Network).

The logs for the wells located on the site, or close to the site boundary (Wells M36/2842, M36/4805, M36/2882 and M36/1517) indicate the underlying soil comprises up to 2 m of surficial sands and silts further underlain by gravels which extend to the bottom of the drill holes. The groundwater levels recorded in these wells are between approximately 7 m and 9 m below ground level. The details for the wells are provided in Appendix 2 (including available drill logs).

The groundwater levels recorded in the nearest monitoring wells to the site are variable and show a range of recorded water levels. The range of recorded water levels is shown in Table 1. The recorded well monitoring data shows the groundwater is typically well in excess of 5 m depth, but in isolated wells it is as shallow as 4 m depth



Table 1: Summary of ECan Borehole Data

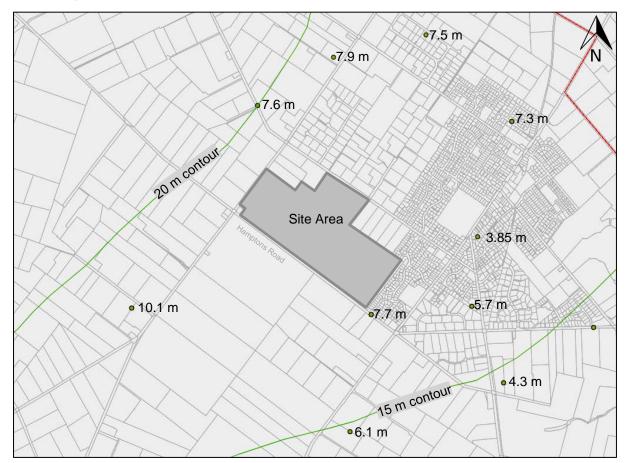
Туре	Well ID	Location	Material Description	Groundwater Level
	M36/2842	Located near to the west boundary of the site	Shingle and gravel to 7 m depth.	N/A
Wells	M36/4805	Located near to the south boundary of the site	Topsoil underlain by sand to 2 m depth, further underlain by gravels to 30 m depth.	Water level recorded at 7.67 m bgl
On site Wells	M36/2882	Located near to the southeast boundary of the site	Log not available [total well depth: 21 m)	Water level recorded at 8.5 m bgl
	M36/1517	Located near to the north boundary of the site	Topsoil underlain by silt to 1.2 m depth, further underlain by gravels to 15.1 m depth.	Water level recorded at 8.84 m bgl
yrk 1	M36/0142	3 km west of the site	Silt to 2.09 m depth underlain by gravels to 24.4 m depth.	Highest recorded water level: 9.40 m bgl Lowest recorded water level: 16.60 m bgl Typical recorded water level appears to be approx. 15 m bgl
er Level Monitoring Network	M36/5716	1.8 km northeast of the site	N/A	Highest recorded water level: 3.37 m bgl Lowest recorded water level: 5.88 m bgl Typical recorded water level appears to be approx. 5 m bgl
Water	M36/0250	2.2 km south of the site	N/A	Highest recorded water level: 4.17 m bgl Lowest recorded water level:10.36 m bgl Typical recorded water level appears to be approx. 9 m



3.5 Mapped Groundwater

We have reviewed the well information from ECan used in various published groundwater models and groundwater contour maps available on Canterbury Maps. Published regional mapping of groundwater shows the site is located approximately halfway between the 15 m and 20 m groundwater elevation contours. The site itself is located at an elevation of approximately 22 m (south-eastern end) to 27 m (north-western end), which suggests the depth of the groundwater surface below the site is approximately 4 m to 9 m depth (Figure 5). Various other published groundwater studies available on Canterbury Maps show the site located between contour lines ranging from 5 m to 10 m (Figure 6), indicating the groundwater beneath the site is at least 5 m deep and may be up to 10 m deep. Nearby piezometric wells summarised on Canterbury Maps (shown in Figure 5) generally corroborate with mapped groundwater contours and with the groundwater information from wells described in Section 3.4.

Figure 5: ECan Regional Piezometric Elevation Contours and Piezometric Wells used in various published groundwater studies.



Source: Canterbury Maps. Not to scale.





Figure 6: ECan Depth to Groundwater from various published studies

Source: Canterbury Maps. Not to scale.

3.6 Subsurface Data

We have reviewed the New Zealand Geotechnical Database subsurface data and have summarised the closest geotechnical data to this site in Table 2. Investigation locations are shown in Figure 6.

The ground conditions in nearby testing locations are generally consistent and comprise shallow sand and silt overlying gravel.

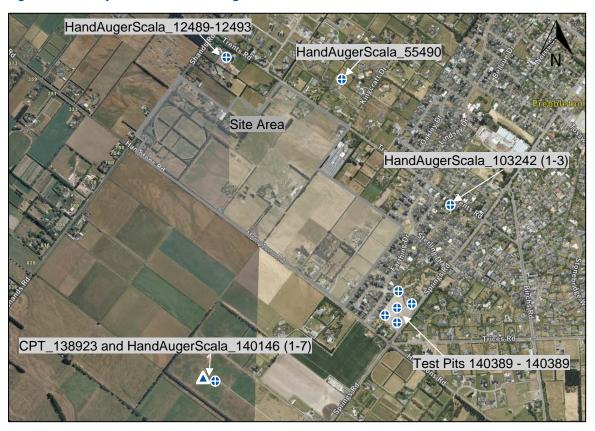
Testing within an area located 800 m south of the site shows a deeper profile of sand and silt overlying gravel – liquefaction was observed in this area following the 2010 Darfield Earthquake and the land has been categorized as TC3 (see Figures 2 and 3). The area of observed liquefaction appears to be constrained to a linear area that is likely related to a deeper channel of silts and sands. We do not consider this area represents the ground conditions beneath the site.



Table 2: Summary of Subsurface Data from NZGD

Investigation Identifier	Position Relative to Site	Depth of Exploration (m)	Material Summary
HandAugerScala_12489- 12493	Approximately 300 m to the northwest	0.7 – 1.0	Silt to between 0.7 m and 1 m underlain by gravel
HandAugerScala_103242 (BH1-3)	Approximately 500 m to the east	0.7-1.2	Silt to between 0.7 m and 1.2 m underlain by (inferred) gravel.
HandAugerScala_55490	Approximately 500 m to the northeast	2.2	Silt and sand to 2.2 m underlain by gravel.
Test Pits_140389-140393	Approximately 800 m to the east	3.2 - 3.6	Silt to between 0.6 m and 1.0 m, underlain by gravels.
CPT_138923 and HandAugerScala_140146 (1-7)	Approximately 800 m to the south	CPT: 7.77 Hand Augers: 3.0	Silt and sand to 7.7 m underlain by gravel (inferred based on tip refusal)

Figure 7: Nearby Geotechnical Investigations



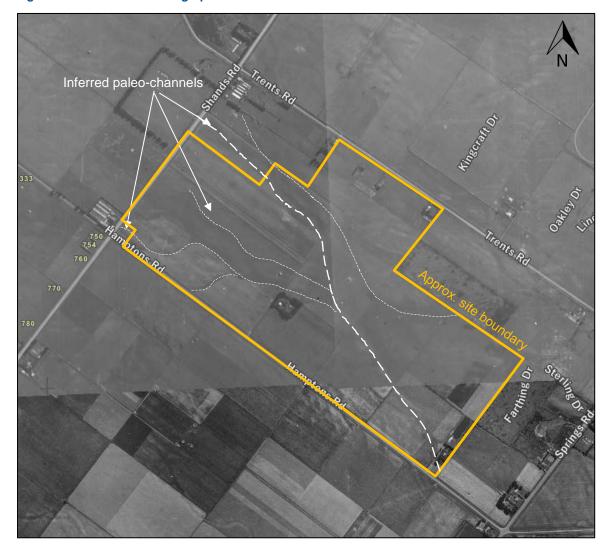
Source: Canterbury Maps. Not to scale.



3.7 Historic Aerial Photography

We have reviewed historic aerial photographs dating back to 1940. It appears that land use at the site has included general rural farming activities with no significant ground modifications identified in the available photographs. Linear features trending northwest-southeast were identified in several historic and recent aerial photographs and are interpreted to be related to paleo-channels (presumably from large flood events), these features are shown in Figure 8 below.

Figure 8: 1940 Aerial Photograph



Source: Canterbury Maps. Not to scale.

4 Site Investigation

Site investigations to assess the shallow subsurface material types and strength characteristics were undertaken by ENGEO on October 2020. The investigations comprised of ten hand auger boreholes and twenty-one test pits with associated Scala penetrometer and shear vane tests. Appendix 1 includes a site plan showing investigation locations.

The investigations revealed subsurface conditions across the site are consistent with the published geological mapping, as summarised in Table 3 below.



Table 3: Generalised Summary of Subsurface Conditions

Soil Type	Depth to top of layer (m)	Layer Thickness (m)	Density / Consistency
TOPSOIL	0.0	0.3 to 0.4	N/A
SILT / SAND	0.3 to 0.4	0.1 to 1.1	Firm to Hard / Medium Dense to Dense
GRAVEL*	Typically <1 m [↔]	>10	Medium Dense to Very Dense (inferred)

^{*}From NZGD test pit data and onsite wells.

Standing groundwater was not encountered in any of the hand auger investigations.

Hand auger logs, showing soil descriptions, as well as raw Scala data are presented in Appendix 2.

4.1 Geomorphology

The site comprises relatively flat ground, with gentle undulations and shallow depressions in some areas. A low area in the central part of the site is interpreted to be a paleo-channel and is visible in historical aerial photography.

4.2 Site Seismic Class

For the purpose of seismic design, we consider the soil classification in line with NZS 1170.5:2004 to be 'Class D – Deep or soft soil sites'.

5 Liquefaction Assessment

We have considered the liquefaction potential for the site based on our geotechnical testing and published geotechnical information.

Our ground model for the site is based on the shallow testing at the site which indicates shallow sand and silt overlying gravel, nearby geotechnical information which indicates similar soil profiles to the shallow on-site tests, and drill logs from wells drilled on-site. The well logs also indicate the gravel layers extend to at least the base of the drill holes (up to 30 m depth). While liquefaction can occur in gravel layers in the right conditions, it is generally not expected to be extensive and is unlikely to contribute to significant liquefaction induced settlements at the site.

Bowen and Jacka (2013) found that a crust of 3 m to 3.5 m thickness was sufficient to reduce liquefaction damage to lightweight buildings supported on shallow foundations even if the underlying soils were to liquefy. All nearby drillholes in the ECan database show groundwater is located at depths in excess of 5 m, and thus a dry, non-liquefiable crust of at least 5 m is present across the site.

We have therefore assessed the likelihood of liquefaction triggering and post-liquefaction induced vertical settlement occurring at the site to be low.



^{**}Silt and sand overlying gravel extends up to 1.7 m depth in localised channel deposits.

We therefore consider the site of the proposed subdivision to have Technical Category 1 (TC1) future land performance where by future land damage from liquefaction is unlikely, and ground settlements are expected to be within normally accepted tolerances.

6 RMA Section 106 Requirements

Section 106 of the Resource Management Act 1991 states a consent authority may refuse to grant subdivision consent, or may grant a consent subject to specific consent conditions if the land is likely to be subject to the following:

- Erosion, including surface and subsurface erosion, associated with water and wind;
- Falling debris, including rockfall that could impact the site from upslope sources;
- Subsidence, which involves the removal of underlying support by natural or artificial means;
- Slippage, which is defined as the downslope transfer of materials by sliding and / or flowage;
 and
- Inundation, which may be sourced from streams, coastal processes or excess precipitation.

Based on our observations and the nature of the site, and the site's distance from the nearest significant watercourse, we consider it unlikely for the site to be subject to any of the above hazards and, as such, the site is considered suitable for a plan change from a geotechnical perspective. As discussed in Section 3.3 of this report, we recommend that flooding hazard is considered during subdivision design.

7 Geotechnical Recommendations

7.1 Foundations

Foundations for future proposed residential dwellings within the subdivision may comprise pad, strip or slab foundations designed in accordance with the provisions of NZS 3604 Timber Framed Buildings. In areas where native gravel is < 400 mm of the surface, it is likely that standard 3604 foundations will be suitable. In areas where foundations are native on alluvial silt or sand, standard foundations will likely be suitable however engineering judgement may be required to design the foundations to accommodate for a reduced bearing capacity. This should be confirmed by lot specific reporting completed during the building consent process.



8 References

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Selwyn District Council (2015), Property Search. Retrieved August 2020, from https://www.selwyn.govt.nz/my-property/rates/search-properties.

The Ministry of Business, Innovation, and Employment. (2012). Guidance-Repairing and rebuilding houses affected by the Canterbury earthquakes. Christchurch: The Ministry of Business, Innovation, and Employment.

We also acknowledge the New Zealand GeoNet project and its sponsors EQC, GNS Science and LINZ, for providing data used in this report.



9 Limitations

- i. We have prepared this report in accordance with the brief as provided. This report has been prepared for the use of our client, Urban Estates Ltd, their professional advisers and the relevant Territorial Authorities in relation to the specified project brief described in this report. No liability is accepted for the use of any part of the report for any other purpose or by any other person or entity.
- ii. The recommendations in this report are based on the ground conditions indicated from published sources, site assessments and subsurface investigations described in this report based on accepted normal methods of site investigations. Only a limited amount of information has been collected to meet the specific financial and technical requirements of the client's brief and this report does not purport to completely describe all the site characteristics and properties. The nature and continuity of the ground between test locations has been inferred using experience and judgement and it should be appreciated that actual conditions could vary from the assumed model.
- iii. Subsurface conditions relevant to construction works should be assessed by contractors who can make their own interpretation of the factual data provided. They should perform any additional tests as necessary for their own purposes.
- iv. This Limitation should be read in conjunction with the Engineering NZ/ACENZ Standard Terms of Engagement.
- v. This report is not to be reproduced either wholly or in part without our prior written permission.

We trust that this information meets your current requirements. Please do not hesitate to contact the undersigned on (03) 328 9012 if you require any further information.

Report prepared by

Jed Watts

Engineering Geologist

Report reviewed by

Neil Charters, CMEngNZ (CPEng)

al Charters

Principal Geotechnical Engineer

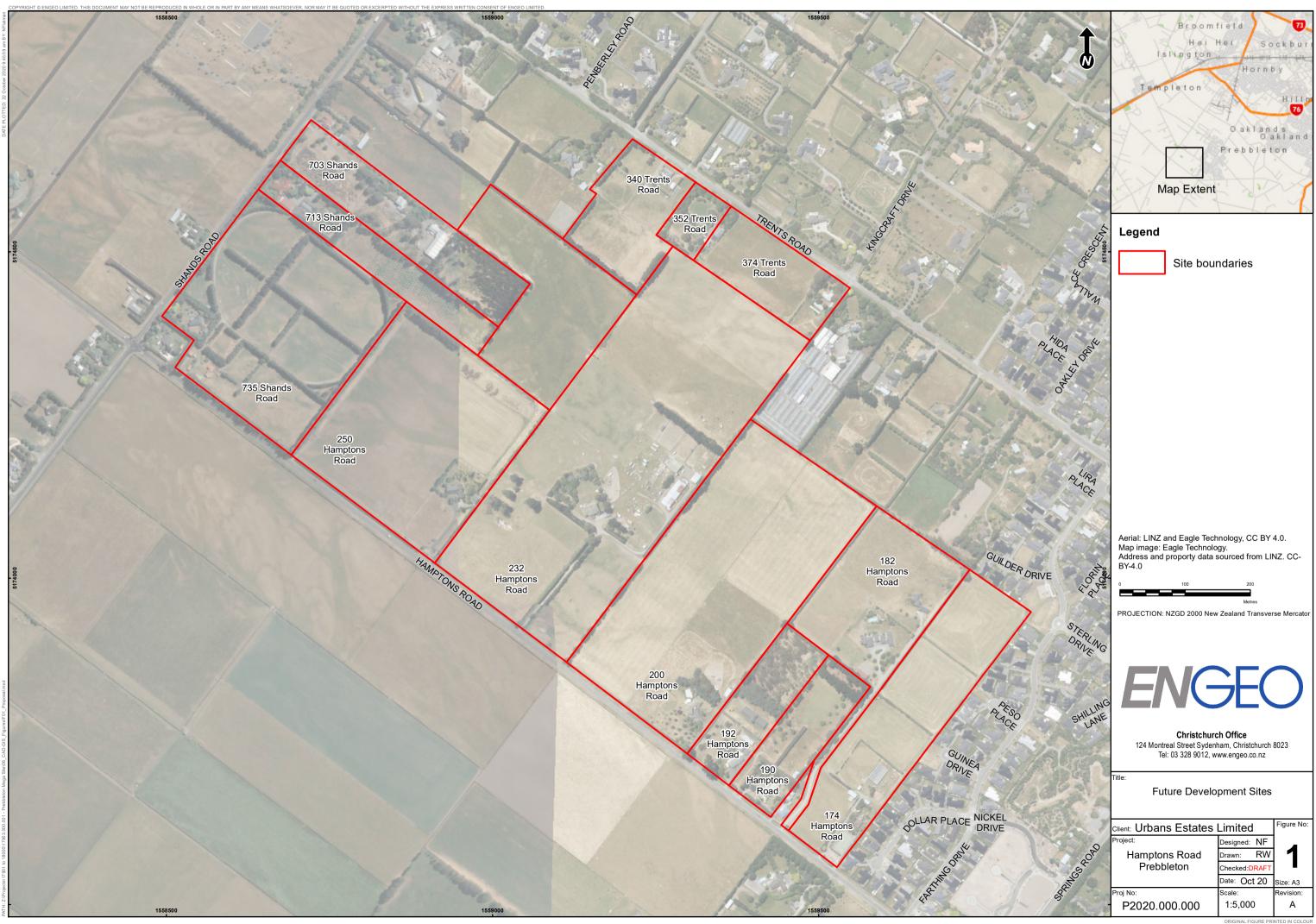




APPENDIX 1:

Site Plan







APPENDIX 2:

Hand Auger & Test Pit Logs





Geotechnical Investigation **Rhodes Land** Prebbleton

Client: Urban Estates Ltd Client Ref. : N/A Date : 24/08/2020 Hole Depth : 0.6 m

Shear Vane No : N/A Logged By : JC Reviewed By : ZP

Latitude: -43.586245

	17637				Hole Depth : 0.6 m Hole Diameter : 50 mm					Latitude : -43.586245 Longitude : 172.493885					
Depth (m BGL)	Material	USCS Symbol	DESCRIPTION		Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Undrained Shear Strength (kPa) Peak/Remolded	2		Pene s per	100m	_
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- 0.5 - _	ALLUVIUM	SP	Fine to medium SAND with trace s brown. Poorly graded.					M	L						
-			End of Hole Depth: 0.6 m Termination Condition: Practical re	efusal											
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-															
- - 1.5 -															
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- 2.0— -															
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- 2.5 - -															
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Geotechnical Investigation **Rhodes Land** Prebbleton 17637

Client: Urban Estates Ltd Client Ref. : N/A Date : 24/08/2020 Hole Depth : 1.5 m

Logged By : JC Reviewed By : ZP Latitude : -43.584684

Shear Vane No: 2022

		1/63/	Hole Diame	ter	: 50	mm					gitud	e : 17	2.494	955	
	loqu		•	lodmy		(mRL)	el	Sond.	cy/ dex	/ane I Shear (kPa) nolded		Scala	Pene	tromete	er
Material	JSCS Syr	DESCRIPTION	I	Graphic S		Elevation	Vater Lev	Aoisture (Consisten Density In	Shear \ Jndrainec Strength Peak/Rer	,				
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ALLUVIUM	ML								VSt-H / MD-D	223/40				•	
-	SW	grey. Well graded.	-		***										<i></i>
,		with orange mottles. End of Hole Depth: 1.5 m Termination Condition: Practical r	efusal												
: 0 0 1 0 1	TOPSOIL	ALLUVIUM TOPSOIL W	Silty fine to medium SAND with trace of server. Well graded. Silty fine to medium SAND with trace signey. Well graded. Silty fine to medium SAND with trace signey. Well graded. Sandy SILT, light greyish brown we mottles. Low Plasticity. Sand is fine signey. Well graded. Silty fine to coarse SAND with trace signey. Well graded. Sandy SILT with trace gravel, light with orange mottles.	SM Sandy SILT, light greyish brown with orange mottles. Low Plasticity. Sand is fine to medium. ML Fine to coarse SAND with trace silt and gravel, grey. Well graded.	Silty fine to medium SAND with trace rootlets, brown. Poorly graded. SM Sandy SILT, light greyish brown with orange mottles. Low Plasticity. Sand is fine to medium. ML ML Silty fine to coarse SAND with trace silt and gravel, grey. Well graded. ML Sandy SILT with trace gravel, light greyish brown with orange mottles.	Silty fine to medium SAND with trace rootlets, brown. Poorly graded. SM Sandy SILT, light greyish brown with orange mottles. Low Plasticity. Sand is fine to medium. ML WIL Sandy SILT, light greyish brown with orange mottles. Low Plasticity. Sand is fine to medium. ML Sandy SILT with trace gravel, light greyish brown with orange mottles.	Silty fine to medium SAND with trace rootlets, brown. Poorly graded. SM Sandy SILT, light greyish brown with orange mottles. Low Plasticity. Sand is fine to medium. ML WILD Fine to coarse SAND with trace silt and gravel, grey. Well graded. ML Sandy SILT with trace gravel, light greyish brown with orange mottles.	Silty fine to medium SAND with trace rootlets, brown. Poorly graded. SM Sandy SILT, light greyish brown with orange mottles. Low Plasticity. Sand is fine to medium. ML WILD Fine to coarse SAND with trace silt and gravel, grey. Well graded. ML Sandy SILT with trace gravel, light greyish brown with orange mottles.	Silty fine to medium SAND with trace rootlets, brown. Poorly graded. SM Sandy SILT, light greyish brown with orange mottles. Low Plasticity. Sand is fine to medium. ML Fine to coarse SAND with trace silt and gravel, grey. Well graded. ML Sandy SILT with trace gravel, light greyish brown with orange mottles.	Silty fine to medium SAND with trace rootlets, brown. Poorly graded. SM Sandy SILT, light greyish brown with orange mottles. Low Plasticity. Sand is fine to medium. ML WSt-H / MD-D Fine to coarse SAND with trace silt and gravel, grey. Well graded. ML Sandy SILT with trace gravel, light greyish brown with orange mottles.	SILT, light greyish brown with orange mottles. Low Plasticity. Sand is fine to medium. Sandy SILT, light greyish brown with orange mottles. Low Plasticity. Sand is fine to medium. 203/55	Silty fine to medium SAND with trace rootlets, brown. Poorly graded. SM Sandy SILT, light greyish brown with orange mottles. Low Plasticity. Sand is fine to medium. ML Sandy SILT, light greyish brown with orange mottles. Low Plasticity. Sand is fine to medium. 203/55 M VSt-H / MD-D SW Fine to coarse SAND with trace silt and gravel, grey. Well graded. ML Sandy SILT with trace gravel, light greyish brown with orange mottles.	Silty fine to medium SAND with trace rootlets, brown. Poorly graded. SM Sandy SILT, light greyish brown with orange mottles. Low Plasticity. Sand is fine to medium. ML WSt-H / MD-D Sandy SILT with trace silt and gravel, grey. Well graded. ML Sandy SILT with trace gravel, light greyish brown with orange mottles.	Silty fine to medium SAND with trace rootlets, brown. Poorly graded. SM Sandy SILT, light greyish brown with orange mottles. Low Plasticity. Sand is fine to medium. ML WSt-H1/MD-D WSt-H1/MD-D Sandy SILT with trace gravel, light greyish brown with orange mottles. Sandy SILT with trace gravel, light greyish brown with orange mottles.	Silty fine to medium SAND with trace rootlets, brown. Poorly graded. SM Sandy SILT, light greyish brown with orange mottles. Low Plasticity. Sand is fine to medium. ML WSt-H / MD-D With grey. Well graded. Sandy SILT with trace gravel, light greyish brown with orange mottles.



Geotechnical Investigation **Rhodes Land** Prebbleton 17637

Shear Vane No : N/A Client: Urban Estates Ltd Client Ref. : N/A Logged By : JC Date : 24/08/2020 Reviewed By : ZP Hole Depth : 0.5 m

Latitude: -43.583202

	17637		Hole Diameter : 50 mm					Longitude : 172.49557								
Depth (m BGL)	al	USCS Symbol	DESCRIPTIO	N	Graphic Symbol	Elevation (mRL)	Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Undrained Shear Strength (kPa) Peak/Remolded			a Pen			
Depth	Material	nscs			Graphi	Elevati	Water Level	Moistu	Consis Densit	She Undra Stren Peak/	2	Blov 4	ws per 6	r 10 8	0mm 10	
_	TOPSOIL	SM	Silty fine to medium SAND with brown. Poorly graded.	trace rootlets,	17. 4.7. 4.19. 4.1			М	N/A		•					
-	ALLUVIUM	SM	Silty fine to medium SAND with and gravel, light brown. Poorly g	trace rootlets raded.					L		•				-	
0.5 - -	₹ '		End of Hole Depth: 0.5 m Termination Condition: Practical	refusal												
-																
- 1.0 																
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	1										:		:	:		:
-																
- 1.5 -																
- 1.5 - -																
- 1.5 - - - -																
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-																
- - - 2.0— - - -																
- - 1.5 - - - - 2.0 - - - - - - -																

Geotechnical Investigation Rhodes Land Prebbleton

LOG OF AUGER HA04

Client: Urban Estates Ltd Client Ref. : N/A Date : 24/08/2020 Hole Depth : 0.3 m

Shear Vane No : N/A Logged By : JC Reviewed By: ZP

			17637	Hole Depth : 0.3 m Hole Diameter : 50 mm					Latitude : -43.582792 Longitude : 172.497016						
Depth (m BGL)	Material	USCS Symbol	DESCRIPTION		Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Undrained Shear Strength (kPa) Peak/Remolded	So E	Blows		romete	
-	TOPSOIL	SM	Silty fine to medium SAND with so trace rootlets, brown. Poorly grade fine to coarse.	ome gravel and od. Gravel is	$\frac{1}{1} \cdot \frac{1}{2} \cdot \frac{1}$			М	N/A		•	•	<u> </u>		
-			End of Hole Depth: 0.3 m Termination Condition: Practical re	efusal	! a i · · · · i								•		···
0.5 -	-														
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_	_														
- 1.0 															
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2.0 -															
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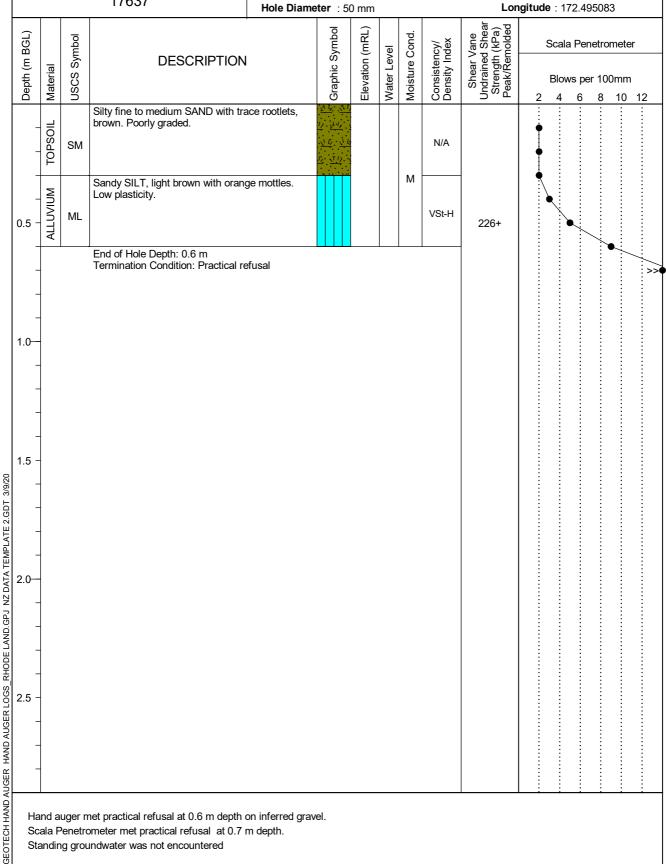


Geotechnical Investigation **Rhodes Land** Prebbleton 17637

Client: Urban Estates Ltd Client Ref. : N/A Date : 24/08/2020 Hole Depth: 0.6 m

Shear Vane No: 2022 Logged By : JC Reviewed By : ZP Latitude: -43.580846

Longitude: 172.495083



Hand auger met practical refusal at 0.6 m depth on inferred gravel.

Scala Penetrometer met practical refusal at 0.7 m depth.



Geotechnical Investigation **Rhodes Land** Prebbleton

Shear Vane No : N/A Client: Urban Estates Ltd Client Ref. : N/A Logged By : JC Date : 24/08/2020 Reviewed By : ZP

Latitude : -43.582212 Hole Depth: 0.4 m

	17637			Hole Depth : 0.4 m Hole Diameter : 50 mm						Latitude : -43.582212 Longitude : 172.494501				
Depth (m BGL)	Material	USCS Symbol	DESCRIPTION		Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Undrained Shear Strength (kPa) Peak/Remolded		ws per	tromete 100mm 8 10	า
	ALLUVIUMTOPSOIL	SM	Silty fine to medium SAND with trabrown. Poorly graded.		70 VD			М	N/A		•			
-).5 - - -	ALLUV	SM	Silty fine to medium SAND with tra and gravel, light brown. Poorly gra End of Hole Depth: 0.4 m Termination Condition: Practical re	ded.					MD					
- 1.0— - -														
- - 1.5 - -														
- - 2.0 -														
										ĺ	: :	:	. :	:



Geotechnical Investigation **Rhodes Land** Prebbleton 17637

Client: Urban Estates Ltd Client Ref. : N/A Date : 24/08/2020 Hole Depth: 1.1 m

Reviewed By : ZP Latitude: -43.581358

Shear Vane No: 2022

Logged By : JC

Longitude: 172.492381 Hole Diameter: 50 mm Undrained Shear Strength (kPa) Peak/Remolded Graphic Symbol Elevation (mRL) Depth (m BGL) **JSCS Symbol** Moisture Cond. Shear Vane Consistency/ Density Index Scala Penetrometer Water Level **DESCRIPTION** Material Blows per 100mm 8 10 12 Sandy SILT with trace rootlets, brown. Low plasticity. Sand is fine to medium. TOPSOIL N/A ML226+ Sandy SILT, light greyish brown with orange mottles. Low plasticity. Sand is fine to medium. 0.5 Μ VSt-H ML 226+ 1.0-End of Hole Depth: 1.1 m Termination Condition: Practical refusal 1.5 GEOTECH HAND AUGER HAND AUGER LOGS RHODE LAND.GPJ NZ DATA TEMPLATE 2.GDT 3/9/20 2.0 2.5

Hand auger met practical refusal at 1.1 m depth on inferred gravel.

Scala Penetrometer met practical refusal at 1.3 m depth.



Geotechnical Investigation Rhodes Land Prebbleton 17637 Client : Urban Estates Ltd
Client Ref. : N/A
Date : 24/08/2020
Hole Depth : 1.25 m

Shear Vane No: 2022 Logged By: JC Reviewed By: ZP

Latitude : -43.582975 Longitude : 172.493024

				17637	Hole Diame							gitude : 1			
	Depth (m BGL)	Material	USCS Symbol	DESCRIPTION		Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Undrained Shear Strength (kPa) Peak/Remolded		la Penet ws per		ı
-		TOPSOIL	ML	Sandy SILT with trace rootlets, broplasticity. Sand is fine to medium.	own. Low		ш.	7		N/A	_	•		3 10	
	- 0.5 - - -	M	ML	Sandy SILT, light greyish brown. L Sand is fine to medium.	ow plasticity.	12. n. 16. n.			M	VSt-H	226+				
	- 1.0—	ALLUVIUM	SM	Silty fine to medium SAND, light g with orange mottles. Poorly graded	reyish brown I.					MD-D	UTP			•	
9/20	- - 1.5 -			End of Hole Depth: 1.25 m Termination Condition: Practical re	fusal										>>•
DAIA IEMPLAIE 2.GDI 3/9/20	- - 2.0—														
	- - -														
ND AUGER HAND AUGER LOGS_RHODE LAND.GPJ NZ	2.5 - - - -														

OTECH HAND AUGER HAN

Hand auger met practical refusal at 1.25 m depth on inferred gravel.

Scala Penetrometer met practical refusal at 1.3 m depth.



Geotechnical Investigation **Rhodes Land** Prebbleton 17637

Client: Urban Estates Ltd Client Ref. : N/A Date : 24/08/2020 Hole Depth : 0.9 m

Logged By : JC Reviewed By : ZP Latitude: -43.584398

Shear Vane No : N/A

			17637	Hole Diame							ngitude: 172.493431					
Depth (m BGL)	Material	USCS Symbol	DESCRIPTIO	N	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Undrained Shear Strength (kPa) Peak/Remolded		Scala Blows	s per	100m	nm	
<u> </u>	TOPSOIL	SM	Silty fine to medium SAND with brown. Poorly graded.	trace rootlets,	9 11/2 3/1/2 12/3/1/2		>	M	N/A	2.4	2	4	6	8 1	0 1	
- 0.5 - - -	ALLUVIUM	SP	Fine to medium SAND with mind brown. -0.6 becomes light greyish brown with mottles.	n orange				М	L-MD							
_			End of Hole Depth: 0.9 m Termination Condition: Practical													
1.0 -			Termination Condition. Tractical	rerusai							:	i	:	i	:	
1.0 - - -			Termination Condition. Fractical	relusai												
1.0— - - - 1.5 -			Termination Condition. I ractical	relusai												
- - -			Termination Condition. I ractical	relusai												
- - - 11.5 - - -			Termination Condition. I ractical	relusai												
- - 11.5 - - - - 2.0— -			TOTIMINATION CONTINUES. I TACKER	relusai												
- - -			TOTIMINATION CONTINUES. I TACKE	relusai												



Geotechnical Investigation **Rhodes Land** Prebbleton

Shear Vane No : N/A Client: Urban Estates Ltd Client Ref. : N/A Logged By : JC Date : 24/08/2020 Reviewed By : ZP Hole Depth: 0.4 m

Latitude : -43.585845

			17637	Hole Diame	eter : 50) mm					ngitud	atitude : -43.585845 gitude : 172.49233					
Depth (m BGL)	Material	USCS Symbol	DESCRIPTION	N	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Undrained Shear Strength (kPa) Peak/Remolded	2			etrome r 100n 8 1			
-	ALLUVIUMTOPSOIL	SM	Silty fine to medium SAND with tr brown. Poorly graded.		17 3 17 3 18 18 18 18 18 18 18 18 18 18 18 18 18			М	N/A		•						
).5 -	ALLUV	SP	light brown. Poorly graded. End of Hole Depth: 0.4 m Termination Condition: Practical r						L				-				
1.0-																	
4											:		•				
- - 1.5 - -																	



Geotechnical Investigation Hamptons Road Prebbleton, Christchurch 17903.000.001
 Client
 : Urban Estates
 Shear Vane No : N/A

 Date
 : 09/10/2020
 Logged By : JC

 Max Test Pit Depth
 : 1.9 m
 Reviewed By : JRW

Digger Type/Size: Bucket Excavator / 5 tonneLatitude: -43.586045Bucket Type/Size: Toothed / 400 mmLongitude: 172.501276

				Bucket Type/Size . 10	Journeu /	4 00 i	11111				5 . 172.301270
Depth (m BGL)	Material	Excavatability (Relative Scale	Sym	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remolded (kPa)	Scala Penetrometer Blows per 100mm 2 4 6 8 10 12
-	TS		ML	Sandy SILT with trace gravel and rootlets; brown. Low plasticity. Sand, fine to medium. Poorly graded. [TOPSOIL]	\(\frac{1}{1}\)\(\frac{1}\)\(\frac{1}{1}\)\(\frac{1}{1}\)\(\frac{1}{1}\)\(\frac{1}{1}\)\(\frac{1}{1}\)\(\frac{1}{1}\)\(\frac{1}{1}\)\(\frac{1}{1}\)\(\frac{1}{1}\)\(\frac{1}{1}\)\(\frac{1}{1}\)\(\frac{1}{1}\)\(\frac{1}\)\(\frac{1}{1}\)\(\frac{1}\)\(\frac{1}\)\(\frac{1}\)\(\frac{1}{1}\)\(\frac{1}\)\(\	_ -		_	F-St		•
0.5			ML	Sandy SILT; light brown with orange mottles. Low plasticity. Sand, fine to medium. Poorly graded.		- - -			St-VSt		
1.0-	ALLUVIUM		GW	Sandy fine to coarse GRAVEL with trace cobbles; rounded to sub-angular. Sand, fine to coarse. Well graded.		- - - - - - - - -		М	Tightly Packed		
2.0-	-			Depth of Excavation: 1.9 m Termination Condition: Target depth							
2.5	-										

GEOTECH TEST PIT LOG TP01-07_20201009.GPJ NZ MASTER DATA TEMPLATE.GDT 22/10/20



Geotechnical Investigation Hamptons Road Prebbleton, Christchurch 17903.000.001
 Client
 : Urban Estates
 Shear Vane No : N/A

 Date
 : 09/10/2020
 Logged By : JC

 Max Test Pit Depth
 : 2.2 m
 Reviewed By : JRW

Digger Type/Size: Bucket Excavator / 5 tonne
Bucket Type/Size: Toothed / 400 mm

Latitude: -43.587022
Longitude: 172.501215

				Bucket Type/OIZE : 14	ounou ,	.00					7 : 172:00 12 10
Depth (m BGL)	Material	Easier (Relative Scale) Harder	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remolded (kPa)	Scala Penetrometer Blows per 100mm 2 4 6 8 10 12
-	TS		SM	Silty fine to medium SAND with trace gravel and rootlets; brown. Poorly graded. [TOPSOIL]	17 - 7-17 - 7 - 7 - 7 - 7 - 7 - 7 - 7 -	- - -			MD		>
0.5 -	-		SM	Silty fine to medium SAND; light brown with orange mottles. Poorly graded.		 - -			MD		
1.0	ALLUVIUM		GW	Sandy fine to coarse GRAVEL with trace cobbles; rounded to sub-angular. Sand, fine to coarse. Well graded.		- -21 - - - - - - - - -		M	Tightly Packed		
2.5				Depth of Excavation: 2.2 m Termination Condition: Target depth		- 20					

GEOTECH TEST PIT LOG TP01-07_20201009.GPJ NZ MASTER DATA TEMPLATE.GDT 22/10/20



Geotechnical Investigation Hamptons Road Prebbleton, Christchurch 17903.000.001

Client: Urban Estates Shear Vane No: N/A Date: 09/10/2020 Logged By : JC Max Test Pit Depth : 2.1 m Reviewed By: JRW

Digger Type/Size : Bucket Excavator / 5 tonne **Latitude**: -43.586985 **Longitude**: 172.5004 Bucket Type/Size: Toothed / 400 mm

		_				Bucket Type/Size :	lootned	400	mm			Longitude	: 1/2.500	4	
Depth (m BGL)	Material	Excavata (Relative	ability Scale) Harder	USCS Symbol	DESC	CRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remolded (kPa)		enetromo per 100n 3 8 10	nm
-	ST			SM	Silty fine to mediu gravel and rootlets [TOPSOIL]	m SAND with trace s; brown. Poorly graded	$\frac{1}{\sqrt{1 \cdot \frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2}}} \cdot \frac{\sqrt{1}}{\sqrt{1}} \cdot \frac{1}{\sqrt{1}} \cdot \frac{1}{\sqrt{1}$	- -			MD				
0.5 -				SM	Silty fine to mediu with orange mottle	m SAND; light brown es. Poorly graded.		- - - - -			MD		•		
1.0	ALLUVIUM			GW	Sandy fine to coar cobbles; rounded fine to coarse. We	se GRAVEL with trace to sub-angular. Sand, ell graded.		-21 - - - - - -		M	Tightly Packed				>>
2.0					Depth of Excavation Termination Cond	on: 2.1 m ition: Target depth		-20				-			
MPLATE.GDT 22/10	-														
GEOTECH TEST PIT LOG TP01-07_20201009.GPJ NZ MASTER DATA TEMPLATE.GDT 22/10/20 CS															
Tes Sca Stal	ıla Pe	met targe enetromet g groundw	er met	practi	l m. cal refusal at 0.9 m encountered	n depth. T	S = TOPS	SOIL							



Geotechnical Investigation Hamptons Road Prebbleton, Christchurch 17903.000.001

Client: Urban Estates Shear Vane No: N/A Date: 09/10/2020 Logged By : JC Max Test Pit Depth : 2.2 m Reviewed By: JRW

Digger Type/Size : Bucket Excavator / 5 tonne Latitude: -43.587944 Longitude: 172.500034 Bucket Type/Size: Toothed / 400 mm

					-	Bucket Type/Size :	lootned	/ 400 i	mm			Longitude	: 1/2.500)034	
Depth (m BGL)	Material	Excavat (Relative	ability Scale) Harder	USCS Symbol	DESC	CRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remolded (kPa)	Scala P Blows	per 100	
	TS			SM	Silty fine to mediu gravel and rootlets [TOPSOIL]	m SAND with trace s; brown. Poorly graded.	1/2 24 1/2 1/2 1/2 1/2 1/2 1/2 1/2 1/2 1/2 1/2	-			MD				
0.5 -	ALLUVIUM			SM	Silty fine to mediu with orange mottle	m SAND; light brown es. Poorly graded.		- - - - - -21		М	MD				×
1.5 -	ALLU			GW	cobbles; rounded fine to coarse. We			- - - - - - -20			Tightly Packed				
2.50T 22/10/20					Depth of Excavation Termination Cond	on: 2.2 m ition: Target depth									
GEOTECH TEST PIT LOG TP01-07_20201009.GPJ NZ MASTER DATA TEMPLATE.GDT 22/10/20 SQ															
Test Scal Stan	la Pe	met targe enetrome g ground	ter met	practi	2 m. ical refusal at 1.2 m encountered	n depth. T	S = TOPS	SOIL							



Geotechnical Investigation Hamptons Road Prebbleton, Christchurch 17903.000.001
 Client
 : Urban Estates
 Shear Vane No : N/A

 Date
 : 09/10/2020
 Logged By : JC

 Max Test Pit Depth
 : 2.2 m
 Reviewed By : JRW

Digger Type/Size: Bucket Excavator / 5 tonne
Bucket Type/Size: Toothed / 400 mm

Latitude: -43.588417
Longitude: 172.49976

	Excavatability		•	_	_				þ			
Material	(Relative Scale)	Sym	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remolded (kPa)	Scala Pe	er 100n	nm
TS	ш	SM	Silty fine to medium SAND with trace gravel and rootlets; brown. Poorly graded. [TOPSOIL]	17. 31.14.	<u>ш</u> - -	Λ	2	MD		2 4 6	8 10	112
ALLUVIUM		GW	Sandy fine to coarse GRAVEL with trace cobbles; rounded to sub-angular. Sand, fine to coarse. Well graded.				М	Tightly Packed				>>
			Depth of Excavation: 2.2 m Termination Condition: Target depth									
	ST	ST	TS Materia Easier	Silty fine to medium SAND with trace gravel and rootlets; brown. Poorly graded. [TOPSOIL] Sandy fine to coarse GRAVEL with trace cobbles; rounded to sub-angular. Sand, fine to coarse. Well graded. GW Depth of Excavation: 2.2 m	Silty fine to medium SAND with trace gravel and rootlets; brown. Poorly graded. [TOPSOIL] Sandy fine to coarse GRAVEL with trace cobbles; rounded to sub-angular. Sand, fine to coarse. Well graded. GW Depth of Excavation: 2.2 m	Silty fine to medium SAND with trace gravel and rootlets; brown. Poorly graded. [TOPSOIL] Sandy fine to coarse GRAVEL with trace cobbles; rounded to sub-angular. Sand, fine to coarse. Well graded. GW Depth of Excavation: 2.2 m	Silty fine to medium SAND with trace gravel and rootlets; brown. Poorly graded. [TOPSOIL] Sandy fine to coarse GRAVEL with trace cobbles; rounded to sub-angular. Sand, fine to coarse. Well graded. GW Depth of Excavation: 2.2 m	Silty fine to medium SAND with trace gravel and rootlets; brown. Poorly graded. [TOPSOIL] Sandy fine to coarse GRAVEL with trace cobbles; rounded to sub-angular. Sand, fine to coarse. Well graded. GW Depth of Excavation: 2.2 m	Silty fine to medium SAND with trace gravel and rootlets; brown. Poorly graded. [TOPSOIL] Sandy fine to coarse GRAVEL with trace cobbles; rounded to sub-angular. Sand, fine to coarse. Well graded. GW GW Depth of Excavation: 2.2 m	Silty fine to medium SAND with trace gravel and rootlets; brown. Poorly graded. [TOPSOIL] Sandy fine to coarse GRAVEL with trace cobbles; rounded to sub-angular. Sand, fine to coarse. Well graded. GW Tightty Packed Depth of Excavation: 2.2 m	Silty fine to medium SAND with trace gravel and rootlets; brown. Poorly graded. [TOPSOIL] Sandy fine to coarse GRAVEL with trace cobbles; rounded to sub-angular. Sand, fine to coarse. Well graded. GW Tightly Packed Depth of Excavation: 2.2 m	Silty fine to medium SAND with trace gravel and rootlets; brown. Poorly graded. [TOPSOIL] Sandy fine to coarse GRAVEL with trace cobbles; rounded to sub-angular. Sand, fine to coarse. Well graded. GW Tightly Packed Depth of Excavation: 2.2 m

GEOTECH TEST PIT LOG TP01-07_20201009.GPJ NZ MASTER DATA TEMPLATE.GDT 22/10/20



Geotechnical Investigation Hamptons Road Prebbleton, Christchurch 17903.000.001
 Client
 : Urban Estates
 Shear Vane No : N/A

 Date
 : 09/10/2020
 Logged By : JC

 t Depth
 : 2.1 m
 Reviewed By : JRW

Max Test Pit Depth: 2.1 mReviewed By : JRWDigger Type/Size: Bucket Excavator / 5 tonneLatitude : -43.588791Bucket Type/Size: Toothed / 400 mmLongitude : 172.498326

-		_	_								_	_						
	Depth (m BGL)	Material	(Rel	cavata lative S	tility Scale) Harder	USCS Symbol	DESC	CRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remolded (kPa)	Scala Blow		etron	
	Бе	ĭ	Еa		Ŧ	SN			Ü	⊟ Ele⊓	8	≥	රීමී	n A	2 4	6	8 1	0 12
	<u> </u>	TS				SM	Silty fine to mediu gravel and rootlets [TOPSOIL]	m SAND with trace s; brown. Poorly sorted.	\(\frac{1}{1}\)\(\frac{1}\)\(1	_			MD					
(- - 0.5 -					SP	brown with orange Low plasticity.	AND with some silt; light e mottles. Poorly graded.		_			MD			\		
	- -						Sandy fine to coar cobbles; rounded fine to coarse. We	rse GRAVEL with trace to sub-angular. Sand, ell graded.	X	- -		М					\	>>
1	1.0 - -	ALLUVIUM								-21 - -			Tightly					
1	- - 1.5 -					GW				- - - -			Packed					
2	- - 2.0-								X	- 20		W						
	-						Depth of Excavation Termination Cond	on: 2.1 m lition: Target depth										
210.171	- 2.5 - -																	
) ! !	_																	



Geotechnical Investigation Hamptons Road Prebbleton, Christchurch 17903.000.001
 Client
 : Urban Estates
 Shear Vane No : N/A

 Date
 : 09/10/2020
 Logged By : JC

 Max Test Pit Depth
 : 2.2 m
 Reviewed By : JRW

Digger Type/Size: Bucket Excavator / 5 tonneLatitude: -43.589363Bucket Type/Size: Toothed / 400 mmLongitude: 172.497972

				Bucket Type/Size . 10	Journa /	1 00 i					112.491912
Depth (m BGL)	Material	Excavatability (Relative Scale)) y	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remolded (kPa)	Scala Penetrometer Blows per 100mm 2 4 6 8 10 12
	ST		SM	Silty fine to medium SAND with trace gravel and rootlets; brown. Poorly graded. [TOPSOIL]	$\frac{\vec{\gamma}_1 \vec{i}_1 \cdot \vec{\gamma}_1}{\vec{i}_1 \cdot \vec{\gamma}_1 \cdot \vec{i}_2} \cdot \frac{\vec{\gamma}_1 \cdot \vec{i}_2}{\vec{\gamma}_1 \cdot \vec{i}_2} \cdot \frac{\vec{\gamma}_1 \cdot \vec{i}_2}{\vec{\gamma}_1 \cdot \vec{i}_2}$	_ -	1	_	MD		
1.0-	ALLUVIUM		GW	Sandy fine to coarse GRAVEL with trace cobbles; rounded to sub-angular. Sand, fine to coarse. Well graded.				M	Tightly Packed		
2.5				Depth of Excavation: 2.2 m Termination Condition: Target depth							



Geotechnical Investigation Hamptons Road Prebbleton, Christchurch 17903.000.001
 Client
 : Urban Estates
 Shear Vane No : N/A

 Date
 : 15/10/2020
 Logged By : JC/DO

 Max Test Pit Depth
 : 2.1 m
 Reviewed By : JRW

Digger Type/Size : Bucket Excavator / 5 tonne Latitude : -43.582282

Bucket Type/Size : Toothed / 400 mm Longitude : 172.486911

			4 - 1										D.	0	I - D			┪
Depth (m BGL)	Material	(Rel	cavatal ative S	Harder (algorithms)	USCS Symbol		CRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remolded (kPa)	Blo	la Per ws pe	er 100		
	TS				SM	Silty fine to mediu gravel and rootlets Sand, fine to medi	m SAND with trace s; brown. Low plasticity. ium. [TOPSOIL]	\(\frac{1}{2\ldots}\fra	-		D	MD			•			
					SP	Fine to medium Sabrown. Poorly grad	AND with some silt; light ded.					MD				•		
1.0	ALLUVIUM				GW	cobbles; greyish b	I graded. Sand, fine to		- - -26 - -		М	Tightly Packed					Â	>
2.0-						Depth of Excavation	on: 2.1 m	X	-25									
						Termination Cond	ition: l'arget depth											
2.5																		
																		_



Geotechnical Investigation Hamptons Road Prebbleton, Christchurch 17903.000.001
 Client
 : Urban Estates
 Shear Vane No : N/A

 Date
 : 15/10/2020
 Logged By : JC/DO

 Max Test Pit Depth
 : 2.1 m
 Reviewed By : JRW

Digger Type/Size: Bucket Excavator / 5 tonneLatitude: -43.580741Bucket Type/Size: Toothed / 400 mmLongitude: 172.487801

					Bucket Type/Size . I	oonieu ,	400	111111				e . 172.467601
Depth (m BGL)	Material	(Re	cavatability lative Scale) De EH	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remolded (kPa)	Scala Penetrometer Blows per 100mm 2 4 6 8 10 12
	TS			SM	Silty SAND with trace gravel and rootlets; dark brown. Low plasticity. Sand, fine to medium. [TOPSOIL]	7.7.7. 7.7.7.	-		D-M	L		1
0.5	-			SP	Fine to medium SAND with some silt; light brown. Poorly graded.		-			MD		
1.0-	ALLUVIUM			GW	Sandy fine to coarse GRAVEL with trace cobbles; greyish brown. Rounded to sub-rounded. Well graded. Sand, fine to medium. Well graded.		26 - - - - - -		D	Tightly Packed		***
2.0-	- - - - - - - -				Depth of Excavation: 2.1 m Termination Condition: Target depth		- 25					
<u>:</u>												



Geotechnical Investigation Hamptons Road Prebbleton, Christchurch 17903.000.001
 Client
 : Urban Estates
 Shear Vane No : N/A

 Date
 : 15/10/2020
 Logged By : JC/DO

 Max Test Pit Depth
 : 2.1 m
 Reviewed By : JRW

Digger Type/Size: Bucket Excavator / 5 tonneLatitude: -43.581958Bucket Type/Size: Toothed / 400 mmLongitude: 172.489902

						Bucket Type/Size . 1	ooti ica i	+00 i				Longitud	. 172	00	JU2		
Depth (m BGL)	Material	Excava (Relativ	atability ve Scale) Harder Harder	USCS Symbol	DES	CRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remolded (kPa)		ala Peoows p	er 10		m
-	TS		+	SM	Silty SAND with tr dark brown. Low p medium. [TOPSO	race gravel and rootlets; blasticity. Sand, fine to IL]		- -		2	L		•	4 0		10	
-				SP	Fine to medium S brown. Poorly gra	AND with some silt; light ded.		-			MD			•			>>
0.5	ALLUVIUM			GW	cobbles; greyish be sub-rounded. Wel medium. Well gra					М	Tightly Packed						
2.5 -					Depth of Excavati Termination Cond	on: 2.1 m lition: Target depth											



Geotechnical Investigation Hamptons Road Prebbleton, Christchurch 17903.000.001

Client: Urban Estates Shear Vane No: N/A Date : 15/10/2020 Logged By : JC/DO Reviewed By : JRW

Max Test Pit Depth : 1.9 m Digger Type/Size : Bucket Excavator / 5 tonne

Bucket Type/Size : Toothed / 400 mm

Latitude: -43.583132 Longitude: 172.488671

						Bucket Type/Size . I	ooti ica .	/ 4 00 i	111111			Longitud	. 172.	400	071		
Depth (m BGL)	Material	Easier (Rela	avatal tive S	oility Scale) Harder	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remolded (kPa)		ws p	er 10	omete 00mm 10 1	1
-	TS				SM	Silty SAND with trace gravel and rootlets; dark brown. Low plasticity. Sand, fine to medium. [TOPSOIL]	\(\frac{1}{2}\)\(\fra	-			L		•				
					SP	Fine to medium SAND with some silt; light brown. Poorly graded.		-			MD		•		····	:: -:	
0.5 -						Sandy fine to coarse GRAVEL with trace cobbles; greyish brown. Rounded to sub-rounded. Well graded. Sand, fine to medium. Well graded.		-									>>
1.0-	ALLUVIUM				GW			25 - - -		M	Tightly Packed						
1.5 -								-									
2.0-		l i	:	•		Depth of Excavation: 1.9 m Termination Condition: Target depth											
2.5 -																	
Tesi Sca Star																	
Tes Sca Sta	la P	enetro	omete	r met	at 1.9 pract	ical refusal at 0.5 m depth	= TOPS	SOIL									_



Geotechnical Investigation Hamptons Road Prebbleton, Christchurch 17903.000.001

Client: Urban Estates Shear Vane No: N/A Date : 15/10/2020 Logged By : JC/DO Max Test Pit Depth : 1.9 m Reviewed By : JRW

Digger Type/Size : Bucket Excavator / 5 tonne Latitude : -43.58426 Bucket Type/Size : Toothed / 400 mm **Longitude**: 172.489126

Depth (m BGL)	Material	Excavatability (Relative Scale)	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remolded (kPa)	Scala Penetrometer Blows per 100mm
	TS	lii I	SM	Fine to medium SAND with some silt, trace gravel and rootlets; light brown. Poorly graded. [TOPSOIL]	5 	<u> </u>	>	Ž	MD	<u>а</u>	2 4 6 8 10 12
_			SP	Fine to medium SAND; light brown. Poorly		-			D		
- 0.5 - - -				graded. Sandy fine to coarse GRAVEL with trace cobbles; greyish brown. Rounded to sub-rounded. Well graded. Sand, fine to medium. Well graded.	CXXX	- - - -					>
1.0— - -	ALLUVIUM		GW			- 25 - - -		D	Tightly Packed		
1.5 = - -						- - - -					
2.0 				Depth of Excavation: 1.9 m Termination Condition: Target depth							
2.5 -											
2.5 - - - -											
	t nit	met target depth	ot 1 C								
Sca	la P	enetrometer met g groundwater w	t practi	ical refusal at 0.4 m depth.	= TOPS	SOIL					



Geotechnical Investigation Hamptons Road Prebbleton, Christchurch 17903.000.001
 Client
 : Urban Estates
 Shear Vane No : N/A

 Date
 : 15/10/2020
 Logged By : JC/DO

 Max Test Pit Depth
 : 1.9 m
 Reviewed By : JRW

Digger Type/Size: Bucket Excavator / 5 tonne

Bucket Type/Size: Toothed / 400 mm

Latitude: -43.582674

Longitude: 172.490608

					Buoket Typeroize : 14						. 5	
	Depth (m BGL)	Material	Excavatability (Relative Scale) Harder	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remolded (kPa)	Scala Penetrometer Blows per 100mm 2 4 6 8 10 12
	_	TS		SP	Fine to medium SAND with some silt, trace gravel and rootlets; dark brown. Poorly graded. [TOPSOIL]	$\frac{\vec{\gamma}_1 \vec{v}_1 \cdot \vec{\gamma}_1}{\vec{\gamma}_1 \cdot \vec{\gamma}_2 \cdot \vec{\gamma}_2} \cdot \frac{\vec{\gamma}_1 \vec{v}_2 \cdot \vec{\gamma}_2}{\vec{\gamma}_1 \cdot \vec{\gamma}_2 \cdot \vec{\gamma}_2} \cdot \frac{\vec{\gamma}_2 \cdot \vec{\gamma}_2 \cdot \vec{\gamma}_2}{\vec{\gamma}_1 \cdot \vec{\gamma}_2 \cdot \vec{\gamma}_2} \cdot \frac{\vec{\gamma}_1 \cdot \vec{\gamma}_2 \cdot \vec{\gamma}_2}{\vec{\gamma}_1 \cdot \vec{\gamma}_2 \cdot \vec{\gamma}_2} \cdot \frac{\vec{\gamma}_2 \cdot \vec{\gamma}_2 \cdot \vec{\gamma}_2}{\vec{\gamma}_1 \cdot \vec{\gamma}_2 \cdot \vec{\gamma}_2} \cdot \frac{\vec{\gamma}_1 \cdot \vec{\gamma}_2 \cdot \vec{\gamma}_2}{\vec{\gamma}_1 \cdot \vec{\gamma}_2 \cdot \vec{\gamma}_2} \cdot \frac{\vec{\gamma}_2 \cdot \vec{\gamma}_2 \cdot \vec{\gamma}_2}{\vec{\gamma}_1 \cdot \vec{\gamma}_2 \cdot \vec{\gamma}_2} \cdot \frac{\vec{\gamma}_1 \cdot \vec{\gamma}_2 \cdot \vec{\gamma}_2}{\vec{\gamma}_1 \cdot \vec{\gamma}_2 \cdot \vec{\gamma}_2} \cdot \frac{\vec{\gamma}_2 \cdot \vec{\gamma}_2 \cdot \vec{\gamma}_2}{\vec{\gamma}_1 \cdot \vec{\gamma}_2 \cdot \vec{\gamma}_2} \cdot \frac{\vec{\gamma}_2 \cdot \vec{\gamma}_2 \cdot \vec{\gamma}_2}{\vec{\gamma}_1 \cdot \vec{\gamma}_2 \cdot \vec{\gamma}_2} \cdot \frac{\vec{\gamma}_2 \cdot \vec{\gamma}_2 \cdot \vec{\gamma}_2}{\vec{\gamma}_1 \cdot \vec{\gamma}_2 \cdot \vec{\gamma}_2} \cdot \frac{\vec{\gamma}_2 \cdot \vec{\gamma}_2}{\vec{\gamma}_1 \cdot \vec{\gamma}_2} \cdot \frac{\vec{\gamma}_2 \cdot \vec{\gamma}_2}{\vec{\gamma}_2} \cdot \frac{\vec{\gamma}_2 \cdot \vec{\gamma}_2}{\vec{\gamma}_2} \cdot \frac{\vec{\gamma}$	-			MD		•
0	- - 0.5 - - -			SP	Fine to medium SAND; light brown. Poorly graded.		- - - -			MD-D		Ä
	.5 -	ALLUVIUM		GW	Sandy fine to coarse GRAVEL with trace cobbles; greyish brown. Rounded to sub-rounded. Well graded. Sand, fine to medium. Well graded.		- -25 - - - - -		D	Tightly Packed		
2	- -0.! - -				Depth of Excavation: 1.9 m Termination Condition: Target depth							
22/10/20	- 2.5 - - -											

Test pit met target depth at 1.9 m. Scala Penetrometer met practical refusal at 0.6 m depth. Standing groundwater was not encountered

GEOTECH TEST PIT LOG TP01-14_20201015.GPJ NZ MASTER DATA TEMPLATE.GDT 22/10/20

TS = TOPSOIL



Geotechnical Investigation Hamptons Road Prebbleton, Christchurch 17903.000.001
 Client
 : Urban Estates
 Shear Vane No : N/A

 Date
 : 15/10/2020
 Logged By : JC/DO

 Max Test Pit Depth
 : 1.8 m
 Reviewed By : JRW

Digger Type/Size: Bucket Excavator / 5 tonneLatitude: -43.583659Bucket Type/Size: Toothed / 400 mmLongitude: 172.492275

				Buoket Typeroize : 19						- J	 		
Depth (m BGL)	Material	Excavatability (Relative Scale) Harder H	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remolded (kPa)	vs per	etrome 100m 8 10	nm
	TS		SP	Fine to medium SAND with some silt, trace gravel and rootlets; dark brown. Poorly graded. [TOPSOIL]	17 · 37 · 17 · 17 · 17 · 17 · 17 · 17 ·	-			MD		1		
0.5			SP	Fine to medium SAND; light brown. Poorly graded.		-			MD-D			<i>*</i>	• />×
1.0	ALLUVIUM		GW	Sandy fine to coarse GRAVEL with trace cobbles; greyish brown. Rounded to sub-rounded. Well graded. Sand, fine to medium. Well graded.		25 24 		D	Tightly Packed				
2.0	- - - - - - -			Depth of Excavation: 1.8 m Termination Condition: Target depth									
	1_										-		

Test pit met target depth at 1.8 m. Scala Penetrometer met practical refusal at 0.4 m depth. Standing groundwater was not encountered

GEOTECH TEST PIT LOG TP01-14_20201015.GPJ NZ MASTER DATA TEMPLATE.GDT 22/10/20

TS = TOPSOIL



Geotechnical Investigation Hamptons Road Prebbleton, Christchurch 17903.000.001

Client: Urban Estates Shear Vane No: N/A Date : 15/10/2020 Logged By : JC/DO Max Test Pit Depth : 1.6 m Reviewed By: JRW

Digger Type/Size : Bucket Excavator / 5 tonne Latitude : -43.585019 Bucket Type/Size : Toothed / 400 mm Longitude: 172.491031

				Bucket Type/Size	Tootifica	4001	111111			Longitude	<i>.</i> 172.491031	
Depth (m BGL)	Material	Excavatability (Relative Scale)	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remolded (kPa)	Scala Peneti Blows per 1 2 4 6 8	
-			SP	Fine to medium SAND with trace gravel and rootlets; light brown. Poorly graded.	\(\frac{1}{2}\cdot \frac{1}{2}\cdot \fra	-			MD		•	
0.5 -	ALLUVIUM		GW	Sandy fine to coarse GRAVEL with trace cobbles; greyish brown. Rounded to sub-rounded. Well graded. Sand, fine to medium.		- -25 - - - - - - - -		D	Tightly Packed			
1.5				Depth of Excavation: 1.6 m Termination Condition: Target depth	7 5	24						
2.0—2.05												
GEOTECH TEST PIT LOG TP01-14_20201015.GPJ NZ MASTER DATA TEMPLATE.GDT 22/10/20 SP												; ;
Test Sca Star	la Pe	met target deptl enetrometer me g groundwater w	t pract	ical refusal at 0.3 m depth.	S = TOPS	SOIL						



Geotechnical Investigation Hamptons Road Prebbleton, Christchurch 17903.000.001
 Client
 : Urban Estates
 Shear Vane No : N/A

 Date
 : 15/10/2020
 Logged By : JC/DO

 Max Test Pit Depth
 : 1.8 m
 Reviewed By : JRW

Digger Type/Size: Bucket Excavator / 5 tonneLatitude: -43.586983Bucket Type/Size: Toothed / 400 mmLongitude: 172.49432

				Buoket Typeroize : 10						. J	
Depth (m BGL)	Material	Excavatability (Relative Scale) and education and educatio	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remolded (kPa)	netrometer er 100mm 8 10 12
-	Z		SP SP	Fine to medium SAND with trace gravel and rootlets; light brown. Poorly graded. [TOPSOIL] Fine to medium SAND; light brown with	() : 73 · 15 (7 · 77 · 15 - 74 · 18 · 74	-			MD MD		•
0.5 -				minor orange mottles. Poorly graded. Sandy fine to coarse GRAVEL with trace cobbles; greyish brown. Rounded to sub-rounded. Well graded. Sand, fine to medium.	X	- - - -					***
1.0	ALLUVIUM		GW			- -23 -		D	Tightly Packed		
1.5 -				Cobbles became minor from 1.7 m depth.		- - -					
2.0-				Depth of Excavation: 1.8 m Termination Condition: Target depth							
2.5 - - -											



Geotechnical Investigation Hamptons Road Prebbleton, Christchurch 17903.000.001

Shear Vane No: N/A Client: Urban Estates Date: 15/10/2020 Logged By : JC/DO Max Test Pit Depth: 1.6 m Reviewed By: JRW

Digger Type/Size : Bucket Excavator / 5 tonne Latitude: -43.584991 Bucket Type/Size : Toothed / 400 mm Longitude: 172.496482

Shear Vane Peak/Remolded (kPa) Excavatability Graphic Symbol Scala Penetrometer Depth (m BGL) Symbol Elevation (mRL) Moisture Cond. Consistency/ Density Index (Relative Scale) Water Level **DESCRIPTION** Material Blows per 100mm Harder uscs : Easier 6 8 10 12 Fine to medium SAND with trace gravel ള SP MD and rootlets; light brown. Poorly graded. [TOPSOIL] Fine to medium SAND; light brown with minor orange mottles. Poorly graded. 0.5 MD SP D 1.0-Sandy fine to coarse GRAVEL with trace cobbles; greyish brown. Rounded to sub-rounded. Well graded. Sand, fine to medium. Tightly GW 1.5 Depth of Excavation: 1.6 m Termination Condition: Target depth 2.0 GEOTECH TEST PIT LOG TP01-14 20201015.GPJ NZ MASTER DATA TEMPLATE.GDT 22/10/20 2.5



Geotechnical Investigation Hamptons Road Prebbleton, Christchurch 17903.000.001
 Client
 : Urban Estates
 Shear Vane No : N/A

 Date
 : 15/10/2020
 Logged By : JC/DO

 Max Test Pit Depth
 : 1.8 m
 Reviewed By : JRW

Digger Type/Size: Bucket Excavator / 5 tonneLatitude: -43.585741Bucket Type/Size: Toothed / 400 mmLongitude: 172.497842

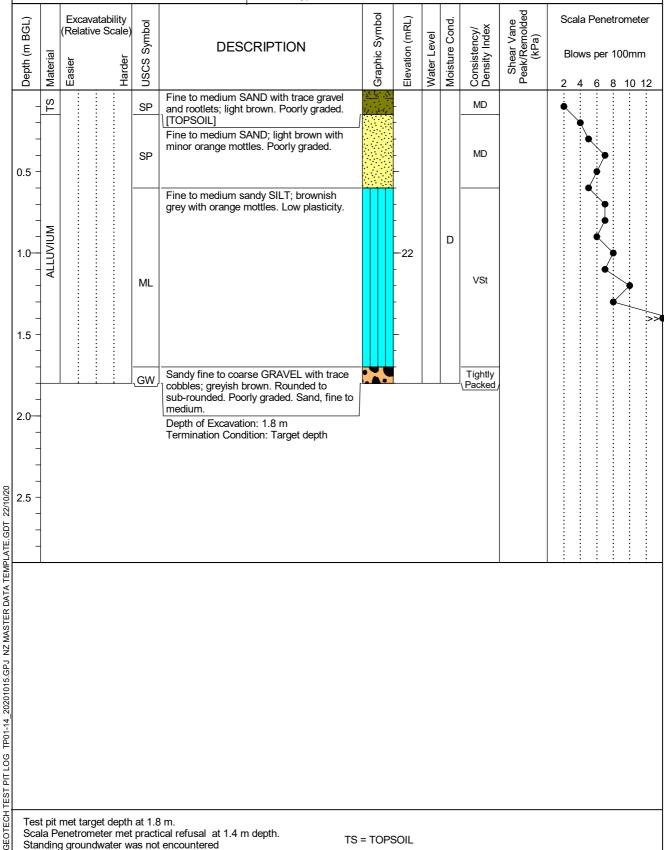
				Bucket Type/OIZe : 1							
Depth (m BGL)	Material	Excavatability (Relative Scale) Harder Harder	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remolded (kPa)	Scala Penetrometer Blows per 100mm 2 4 6 8 10 12
-	TS		SP	Fine to medium SAND with trace gravel and rootlets; light brown. Poorly graded.	$\frac{1}{2}, \frac{7}{4}, \frac{1}{4}$	-			MD		•
-			SP	[TOPSOIL] Fine to medium SAND; light brown with minor orange mottles. Poorly graded.		-			MD		
0.5 1.0—	ALLUVIUM		GW	Sandy fine to coarse GRAVEL with trace cobbles; greyish brown. Rounded to sub-rounded. Well graded. Sand, fine to medium.		-23		D	Tightly Packed		/A
2.0		 		Depth of Excavation: 1.8 m Termination Condition: Target depth							
2.5	-										



Geotechnical Investigation Hamptons Road Prebbleton, Christchurch 17903.000.001

Shear Vane No: N/A Client: Urban Estates Logged By : JC/DO Date: 15/10/2020 Max Test Pit Depth: 1.8 m Reviewed By: JRW

Digger Type/Size : Bucket Excavator / 5 tonne Latitude: -43.586898 Bucket Type/Size : Toothed / 400 mm Longitude: 172.49668





Geotechnical Investigation Hamptons Road Prebbleton, Christchurch 17903.000.001
 Client
 : Urban Estates
 Shear Vane No : N/A

 Date
 : 15/10/2020
 Logged By : JC/DO

 Max Test Pit Depth
 : 1.8 m
 Reviewed By : JRW

Digger Type/Size : Bucket Excavator / 5 tonne Latitude : -43.586659

Bucket Type/Size : Toothed / 400 mm Longitude : 172.49837

				Buoket Type/Gize : 1	oou loa /	.00.					1112:10001
Depth (m BGL)	Material	Excavatability (Relative Scale) Harder	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remolded (kPa)	Scala Penetrometer Blows per 100mm 2 4 6 8 10 12
	-		SP	Fine to medium SAND with trace gravel and rootlets; light brown. Poorly graded.	1/2 1/2 1/2 1/2 1/2 1/2 1/2 1/2 1/2 1/2	-			MD		
1.0-	ALLUVIUM		GW	Fine to coarse GRAVEL with trace cobbles; light brown. Rounded to sub-rounded. Well graded. Sand, fine to coarse.				D	Tightly Packed		A
2.0-	-			Depth of Excavation: 1.8 m Termination Condition: Target depth		-					



Geotechnical Investigation Hamptons Road Prebbleton, Christchurch 17903.000.001
 Client
 : Urban Estates
 Shear Vane No : N/A

 Date
 : 15/10/2020
 Logged By : JC/DO

 Max Test Pit Depth
 : 1.9 m
 Reviewed By : JRW

Digger Type/Size: Bucket Excavator / 5 tonne
Bucket Type/Size: Toothed / 400 mm
Latitude: -43.58601
Longitude: 172.499498

					Bucket Type/Size	. 10001160	7 400				Longitude	. 172	433	430	<u>'</u>	
Depth (m BGL)	Material	Easier (b) x	cavatability ative Scale) Jepue Hauder	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remolded (kPa)	Blo	ows p	per 1	100m	nm
_	TS	_		SP	Fine to medium SAND with trace grave and rootlets; dark brown. Poorly graded [TOPSOIL]	s				MD		•				
0.5	-			SP	Fine to medium SAND with trace grave light brown. Poorly graded.	el;	- - -23		D	MD			•	`•	•	
1.5 -	ALLUVIUM			GW	Fine to coarse GRAVEL with trace cobbles; light brown. Rounded to sub-rounded. Well graded. Sand, fine t coarse.		- - - - - - - - -22		М	Tightly Packed						>>
2.0-			· ·		Depth of Excavation: 1.9 m Termination Condition: Target depth	·			•							
2.5	-															



APPENDIX 3:

Ecan Well Summary Sheets



Bore or Well No	M36/1517
Well Name	404 TRENTS ROAD
Owner	BOULTON W.R.



Well Number	M36/1517	File Number	
Owner	BOULTON W.R.	Well Status	Active (exist, present)
Street/Road	404 TRENTS ROAD	NZTM Grid Reference	BX23:59204-74589
Locality	PREBBLETON	NZTM X and Y	1559204 - 5174589
Location Description		Location Accuracy	50 - 300m
CWMS Zone	Selwyn - Waihora	Use	Domestic and Stockwater,
Groundwater Allocation Zone	Selwyn-Waimakariri	Water Level Monitoring	
Depth	15.10m	Water Level Count	0
Diameter	150mm	Initial Water Level	8.84m below MP
Measuring Point Description		Highest Water Level	
Measuring Point Elevation	27.28m above MSL (Lyttelton 1937)	Lowest Water Level	
Elevation Accuracy	< 5 m	First reading	
Ground Level	0.00m above MP	Last reading	
Strata Layers	4	Calc Min 80%	9.34m below MP (Estimated)
Aquifer Name	Riccarton Gravel	Aquifer Tests	0
Aquifer Type	Unknown	Yield Drawdown Tests	1
Drill Date	05 Feb 1982	Max Tested Yield	5 l/s
Driller	McMillan Drilling Ltd	Drawdown at Max Tested Yield	0 m
Drilling Method	Cable Tool	Specific Capacity	30.67 l/s/m
Casing Material	STEEL	Last Updated	08 Nov 2013
Pump Type	Unknown	Last Field Check	
Water Use Data	No		

Screens

Screen No.	Screen Type	Top (m)	Bottom (m)	Slot Size (mm)	Slot Length (mm)	Diameter (mm)	Leader Length (mm)
1	Galvanised (Nold)	13.4	15.1				

Step Tests

Step Test Date	Step	Yield	Yield GPM	DrawDown	Step Duration
05 Feb 1982	1	4.6	60.7116432	0.15	0

No comments for this well

Borelog for well M36/1517

Grid Reference (NZTM): 1559204 mE, 5174590 mN

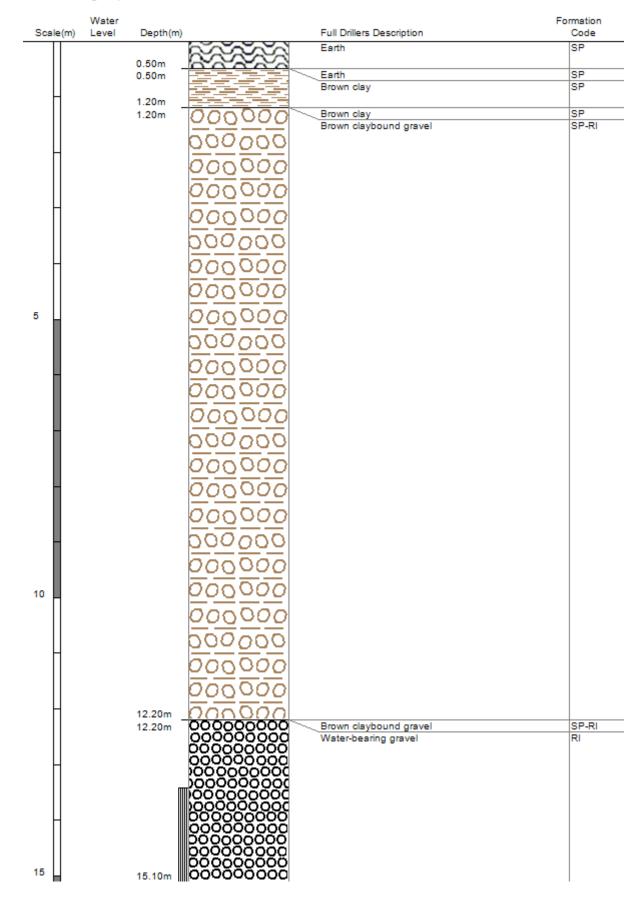
Location Accuracy: 50 - 300m

Ground Level Altitude: 27.3 m +MSD Accuracy: < 0.5 m

Driller: McMillan Drilling Ltd Drill Method: Cable Tool

Borelog Depth: 15.1 m Drill Date: 05-Feb-1982

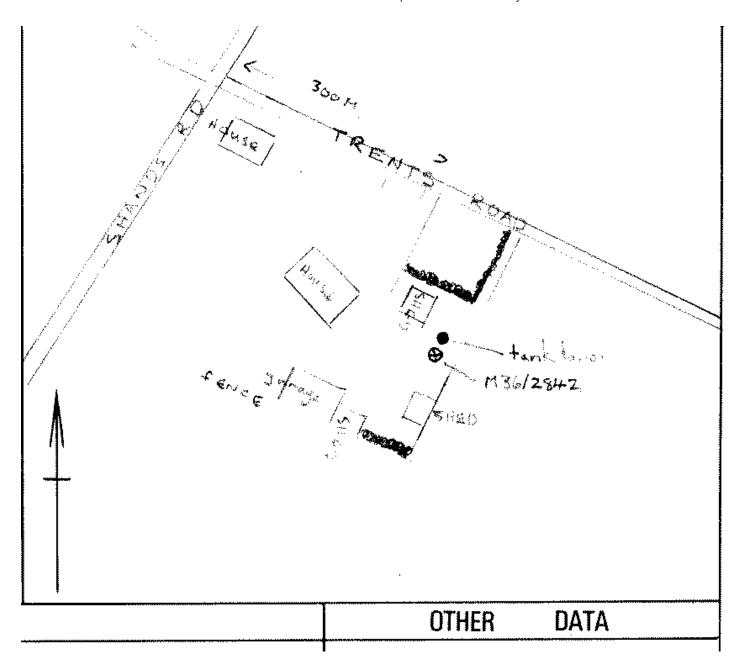




Bore or Well No	M36/2842
Well Name	TRENTS RD
Owner	HAY LAURIE



Well Number	M36/2842	File Number	
Owner	HAY LAURIE	Well Status	Active (exist, present)
Street/Road	TRENTS RD	NZTM Grid Reference	BX23:59004-74589
Locality	PREBBLETON	NZTM X and Y	1559004 - 5174589
Location Description		Location Accuracy	50 - 300m
CWMS Zone	Selwyn - Waihora	Use	Domestic Supply,
Groundwater Allocation Zone	Selwyn-Waimakariri	Water Level Monitoring	
Depth	24.40m	Water Level Count	0
Diameter	100mm	Initial Water Level	
Measuring Point Description		Highest Water Level	
Measuring Point Elevation	27.53m above MSL (Lyttelton 1937)	Lowest Water Level	
Elevation Accuracy	< 5 m	First reading	
Ground Level	0.00m above MP	Last reading	
Strata Layers	2	Calc Min 80%	11.28m below MP (Estimated)
Aquifer Name	Springston Formation	Aquifer Tests	0
Aquifer Type	Water Table	Yield Drawdown Tests	1
Drill Date	06 Mar 1980	Max Tested Yield	1 l/s
Driller	Smith, J R & I G	Drawdown at Max Tested Yield	19 m
Drilling Method	Cable Tool	Specific Capacity	0.06 l/s/m
Casing Material	STEEL	Last Updated	08 Nov 2013
Pump Type	Unknown	Last Field Check	
Water Use Data	No		



No screen data for this well

Step Tests

Step Test Date	Step	Yield	Yield GPM	DrawDown	Step Duration
06 Mar 1980	1	1.1	14.5180025	18.9	0

Borelog for well M36/2842

Grid Reference (NZTM): 1559004 mE, 5174590 mN

Location Accuracy: 50 - 300m

Ground Level Altitude: 27.5 m +MSD Accuracy: < 0.5 m

Driller: Smith, J R & I G Drill Method: Cable Tool

Borelog Depth: 7.5 m Drill Date: 06-Mar-1980

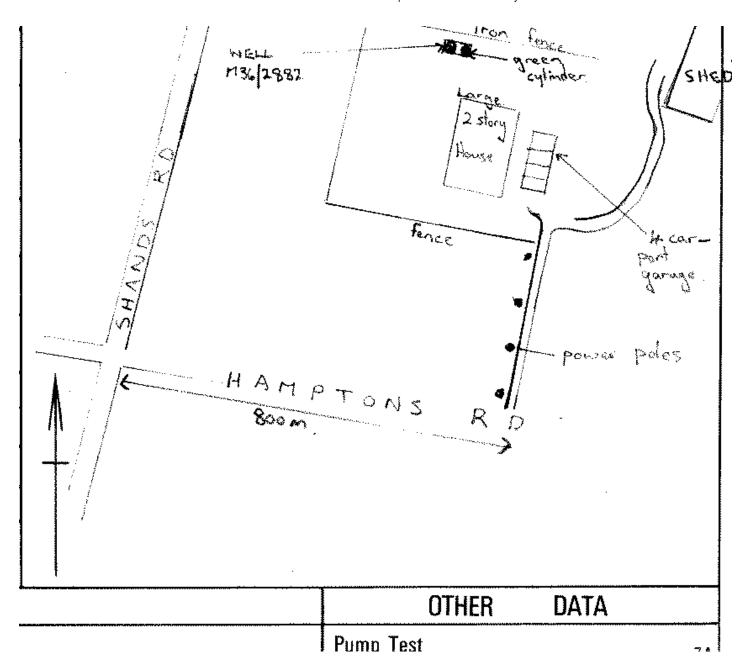


Scale(m)	Water Level	Depth(m)		Full Drillers Description	Formation Code
2 4		4.19m 4.19m	000000000 000000000 000000000 00000000	Shingle, slow drilling Shingle, slow drilling	SP
5		7.50m	00000 00000 00000 00000 00000 00000 0000	Big stones at 6.0m, hard drilling	SP

Bore or Well No	M36/2882
Well Name	HAMPTONS RD
Owner	RHODES, G.F.



Well Number	M36/2882	File Number	
Owner	RHODES, G.F.	Well Status	Active (exist, present)
Street/Road	HAMPTONS RD	NZTM Grid Reference	BX23:59304-74089
Locality	PREBBLETON	NZTM X and Y	1559304 - 5174089
Location Description		Location Accuracy	50 - 300m
CWMS Zone	Selwyn - Waihora	Use	Domestic Supply,
Groundwater Allocation Zone	Selwyn-Waimakariri	Water Level Monitoring	
Depth	21.00m	Water Level Count	0
Diameter	150mm	Initial Water Level	8.50m below MP
Measuring Point Description		Highest Water Level	
Measuring Point Elevation	25.94m above MSL (Lyttelton 1937)	Lowest Water Level	
Elevation Accuracy	< 5 m	First reading	
Ground Level	0.00m above MP	Last reading	
Strata Layers	0	Calc Min 80%	10.19m below MP (Estimated)
Aquifer Name		Aquifer Tests	0
Aquifer Type	Unknown	Yield Drawdown Tests	1
Drill Date	25 Mar 1977	Max Tested Yield	1 l/s
Driller	Smith, J R & I G	Drawdown at Max Tested Yield	3 m
Drilling Method	Cable Tool	Specific Capacity	0.52 l/s/m
Casing Material	STEEL	Last Updated	08 Nov 2013
Pump Type	Unknown	Last Field Check	
Water Use Data	No		



No screen data for this well

Step Tests

Step Test Date	Step	Yield	Yield GPM	DrawDown	Step Duration
25 Mar 1977	1	1.4	18.477457	2.7	0

No comments for this well

Bore or Well No	M36/4805
Well Name	HAMPTONS ROAD
Owner	SMITH, T.J.



Well Number	M36/4805	File Number	CO6C/04945
Owner	SMITH, T.J.	Well Status	Active (exist, present)
Street/Road	HAMPTONS ROAD	NZTM Grid Reference	BX23:58914-74039
Locality	PREBBLETON	NZTM X and Y	1558914 - 5174039
Location Description		Location Accuracy	50 - 300m
CWMS Zone	Selwyn - Waihora	Use	Irrigation, Domestic and Stockwater
Groundwater Allocation Zone	Selwyn-Waimakariri	Water Level Monitoring	
Depth	32.70m	Water Level Count	0
Diameter	150mm	Initial Water Level	7.67m below MP
Measuring Point Description		Highest Water Level	
Measuring Point Elevation	26.41m above MSL (Lyttelton 1937)	Lowest Water Level	
Elevation Accuracy	< 5 m	First reading	
Ground Level	0.00m above MP	Last reading	
Strata Layers	8	Calc Min 80%	10.46m below MP (Estimated)
Aquifer Name	Riccarton Gravel	Aquifer Tests	0
Aquifer Type	Unknown	Yield Drawdown Tests	1
Drill Date	20 Dec 1994	Max Tested Yield	14 l/s
Driller	McMillan Drilling Ltd	Drawdown at Max Tested Yield	21 m
Drilling Method	Rotary Rig	Specific Capacity	0.67 l/s/m
Casing Material	STEEL	Last Updated	08 Nov 2013
Pump Type	Unknown	Last Field Check	
Water Use Data	Yes		

Screens

Screen No.	Screen Type	Top (m)	Bottom (m)	Slot Size (mm)	Slot Length (mm)	Diameter (mm)	Leader Length (mm)
1	Stainless steel	30.7	32.7				

Step Tests

Step Test Date	Step	Yield	Yield GPM	DrawDown	Step Duration
20 Dec 1994	1	13.9	183.454742	20.8	0

No comments for this well

Borelog for well M36/4805 page 1 of 2

Grid Reference (NZTM): 1558914 mE, 5174040 mN

Location Accuracy: 50 - 300m

Ground Level Altitude: 26.4 m +MSD Accuracy: < 0.5 m

Driller: McMillan Drilling Ltd Drill Method: Rotary Rig

Borelog Depth: 32.7 m Drill Date: 20-Dec-1994



