



Revised Geotechnical Investigation

92 Dunns Crossing Road

Rolleston

Christchurch

Submitted to:

Hughes Developments Ltd

Christchurch

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13.12.2019

12903.001.000_02



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ENGEO Document Control:

Report Title	Revised Geotechnical Investigation - 92 Dunns Crossing Road, Rolleston			
Project No.	12903.001.000	Doc ID	02	
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2019/12/06	Issued to Client	JT	KF	GM
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1 Introduction

ENGEO Ltd was requested by Hughes Developments Ltd to undertake a geotechnical investigation of the property at 92 Dunns Crossing Road, Rolleston, Christchurch, and a neighbouring section off Goulds Road, as outlined in our variation proposal (ref: P2019.002.259_01).

The purpose of this assessment was to conceptualise a geological model of the site, assess the likely future land performance, comment on the suitability of the site for residential subdivision, address the requirements of Section 106 of the Resource Management Act (RMA) and provide recommendations for subdivision works and foundations for typical timber framed residential dwellings.

Our scope of works included the following:

- Complete a desktop study of relevant available geotechnical and geological publications, including the NZ Geotechnical and Environment Canterbury Databases;
- Undertake a geotechnical site walkover;
- Undertake forty hand auger boreholes with associated Scala penetrometer tests to assess the near surface material types and strength characteristics;
- Organise and technically supervise the excavation of forty-five test pits, including geotechnical logging of the exposed soils; and
- Preparation of this report outlining our findings on the ground conditions and the suitability of the site for residential subdivision, including geotechnical advice on the likely foundation Technical Category, conceptual foundation recommendations for typical timber framed residential dwellings, and address likely geohazards as required by Section 106 of the RMA.

ENGEO previously issued a Geotechnical Investigation report dated 6 December 2019 (ref: 12903.001.000_01), which included thirty-three hand augers and thirty-two test pit investigations. Our testing scope was reduced, due to three paddocks being unavailable for testing at that time. Subsurface testing has now been completed in the three remaining paddocks, finalising the testing for this site. This version of our report supersedes our original report for the site dated 6 December 2019.

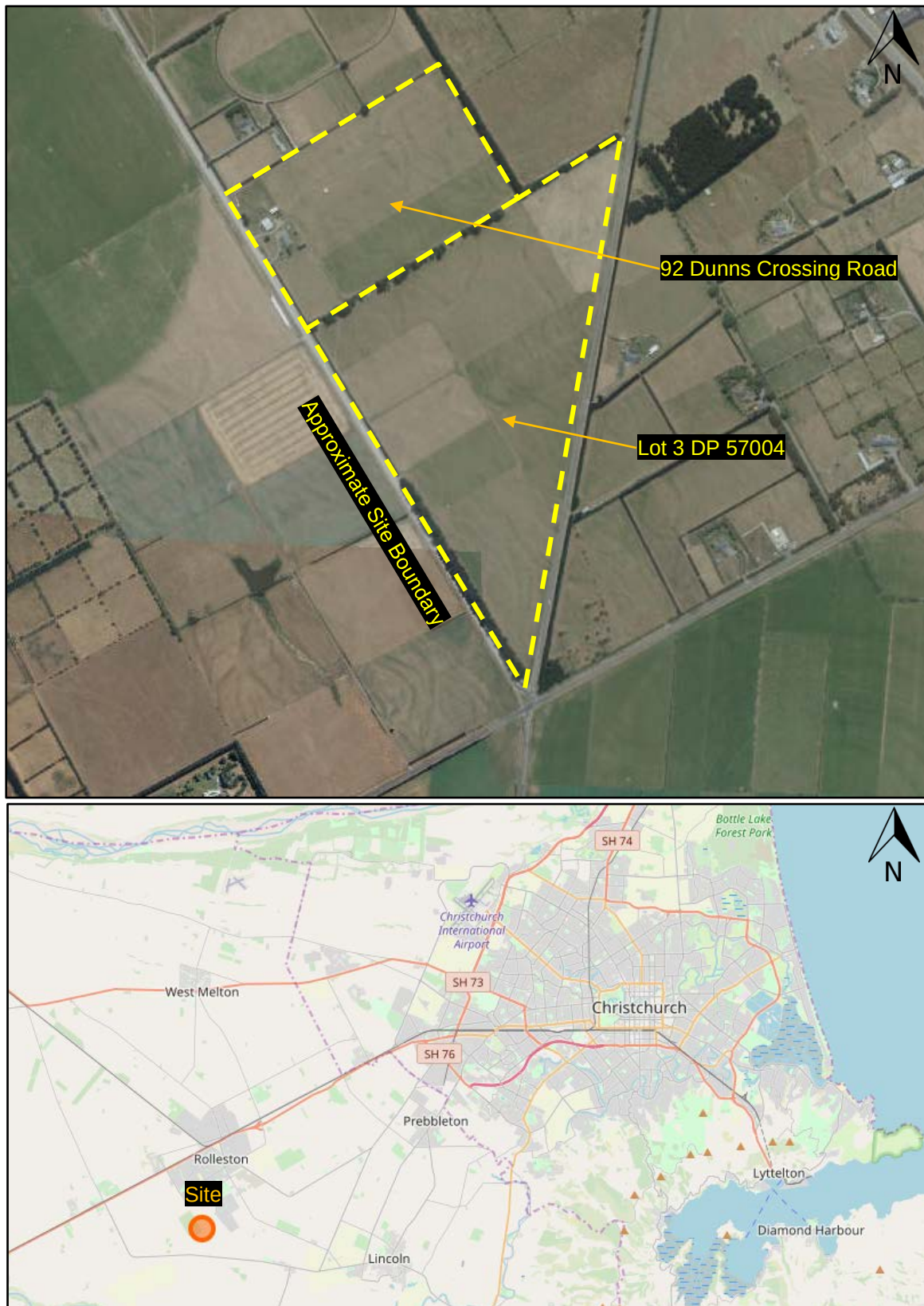
2 Site Description

The site comprises of two properties with a total area of 30.8 ha and have the following legal descriptions (Canterbury Maps):

- 92 Dunns Crossing Road - Lot 1 DP 61278 – 10.1 ha
- Lot 3 DP 57004 – 20.7 ha

They are located approximately 3 km southwest of Rolleston town centre. They are both bound to the southwest by Dunns Crossing Road. 92 Dunns Crossing Road is bound to all other sides by rural properties, whereas the neighbouring property is bound to the east by Goulds Road (Figure 1).

Figure 1: Site Location Plan



Images sourced from Canterbury Maps and "© OpenStreetMap contributors". Not to scale.

3 Geological Model

3.1 Regional Geology

The site has been regionally mapped by GNS (Forsyth et al., 2008) as being underlain by brownish grey river alluvium (Q2a).

3.2 Geomorphology

The site comprises relatively flat ground, with gentle undulations and depressions in some areas. As evident on aerial imagery (Canterbury Maps, 2019) and observed during our site walkover conducted on 21 November 2019, undulating and depressed ground can be attributed to paleo-channels, which traverse the site in a general northwest to southeast direction (Figure 2). Based on observations, sandy silt deposits with variable thickness (up to 0.6 m) are expected to have in-filled the paleo-channels where they have not remained as channel features. Inferred paleo-channels have been mapped to give an indication of areas with potential channel in-fill (Appendix 1).

Figure 2: Historical Aerial Photo – 1940 to 1944

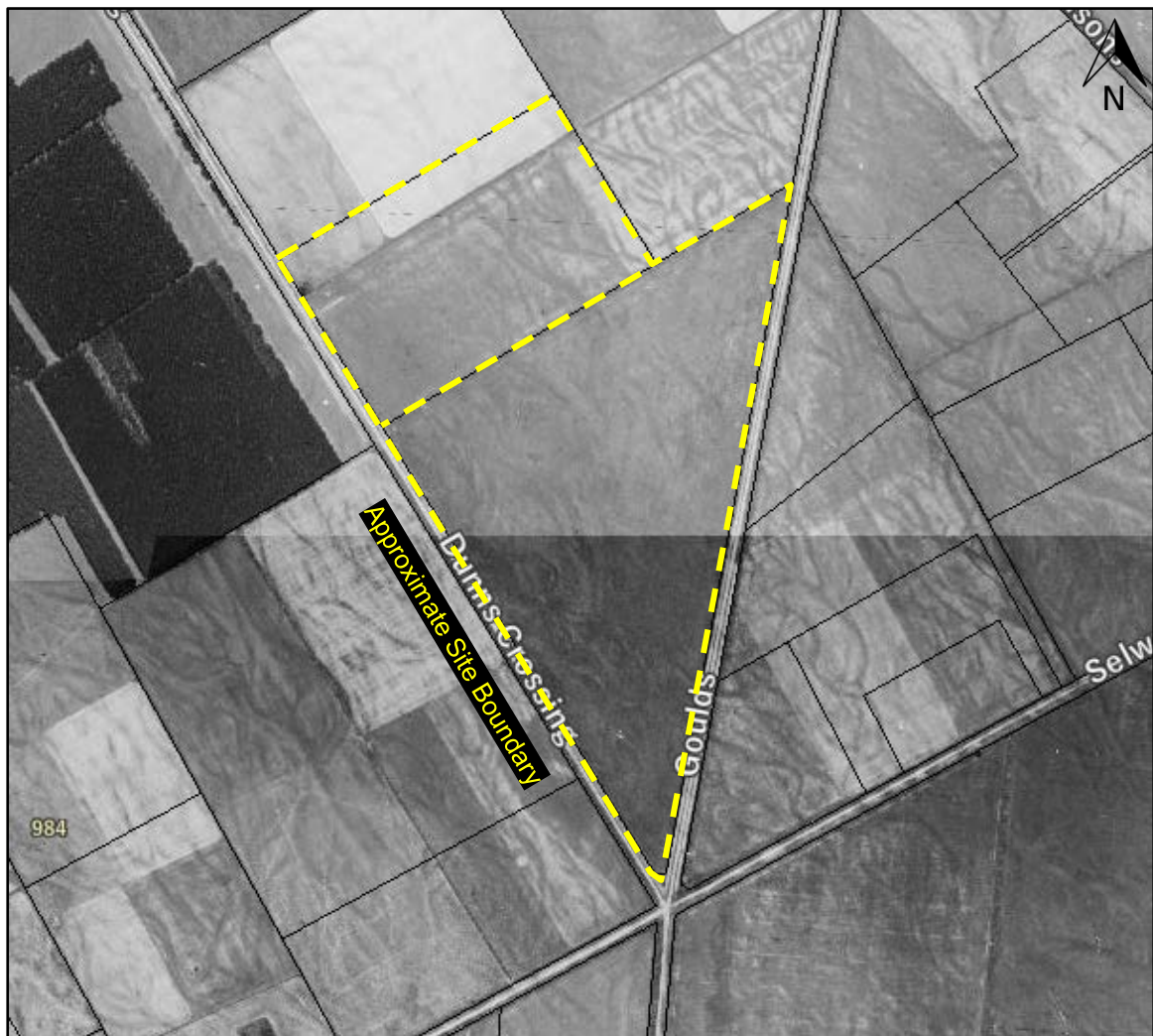


Image sourced from Canterbury Maps. Not to scale.

3.3 Geohazards

3.3.1 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 proximal or distal 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 6 km north / northwest of the site and trends roughly east-west with a surface rupture length of approximately 28 km (GNS, 2015), while the Port Hills Fault remains unmapped as the fault did not rupture at the surface. Movement on the Port Hills Fault is believed to have extended to within 1 km to 2 km below 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).

3.3.2 Liquefaction and Lateral Spreading

The site is located in an area mapped where “damaging liquefaction is unlikely” (NZGD Map CGD5140, 2012), and a “zone of very low liquefaction potential” (GNS, 2006).

3.4 Site Investigation

Site investigations to assess the shallow subsurface material types and strength characteristics were undertaken by ENGEO from 22 November to 6 December 2019. Forty-five test pits and forty-one hand auger investigations with associated Scala Penetrometer tests were completed to a maximum depth of 2.1 m below ground level. An extra hand auger investigation was required due to the shape of the site, and the grid pattern adopted to accurately plan the testing locations.

The investigations revealed subsurface conditions across the site are consistent with the published geological mapping, as summarised in Table 2. Hand auger and test pit logs are attached as Appendix 2 of this report.

Table 1: Summary of Hand Auger Investigations

Soil Type	Depth to Top of Layer (m)	General Layer Thickness (m)	Density / Consistency	Additional Comments
TOPSOIL	0.0	0.1 – 0.2	Firm to Stiff	-
Sandy SILT	0.1 – 0.2	0.1 – 0.5	Firm to Very Stiff	Consistent across the site

Table 2: Summary of Test Pit Investigations

Soil Type	Depth to Top of Layer (m)	General Layer Thickness (m)	Density / Consistency	Additional Comments
TOPSOIL	0.0	0.1 – 0.3	Firm to Stiff	-
SILT	0.1 – 0.3	0.2 – 0.3	Stiff to Very Stiff	Present in TP11, 22, 24 and 40
Silty SAND / SAND	0.3 – 0.6	0.2 – 0.5	Medium Dense to Dense	Silty sand present in TP09, 11 and sand present in TP36
Sandy GRAVEL	0.1 – 1.0	Unknown	Medium Dense to Very Dense	Consistent across the site Noticeable sand increase in TP03, 04, and 09

3.5 ECan Boreholes

A review of six deep ECan borehole logs was conducted. The first (M36/4449 & M36/4387), are located on-site, and appear to be water wells providing the properties irrigation and domestic supply. The other boreholes are located to the north (M36/4450), east (M36/20535), south (BX23/0895) and west (M36/7416) of the site.

Well logs from the six holes of interest are attached to this report as Appendix 3 and summarised in Table 3.

Table 3: Generalised Summary of ECan Boreholes

ECan Borehole	Total Depth (m)	Water Level Below Ground Level (m)	Generalised Borelog as Logged by Driller
BX23/0895	53	5.35	Varying sandy and silty gravel layers to 53 m.
M36/20535	30	7.1	Topsoil to 0.3 m with gravel from 0.3 to 30 m.
M36/4387	35	6.5	Grey / sandy gravel to 35 m, with a layer of clay-bound gravel from 6.6 to 20.7 m.
M36/4449	24	7.7	Gravel to 24 m with a layer of clay from 12 to 14 m and sandy gravel from 14 to 18 m.

ECan Borehole	Total Depth (m)	Water Level Below Ground Level (m)	Generalised Borelog as Logged by Driller
M36/4450	26	8.1	Gravel to 26 m with a layer of clayey gravel from 12 to 18 m, clay and sand from 22 to 24 m and 26 to 26.5 m.
M36/7416	47	5.18	Sandy gravel to 16.8 with a layer of clay-bound sandy gravel from 5.6 to 14.7 m, and predominant gravel to 23 m. Logs not available from 23 to 47 m.

Figure 3: Nearby ECan Borehole Locations



Aerial photograph sourced from Canterbury Maps. Not to scale.

3.6 Groundwater

Groundwater is recorded in the surrounding boreholes between approximately 5.18 m and 8.1 m depth.

3.7 Site Seismic Class

In accordance with NZS 1170.5:2004, Class D applies to this particular site, defining it as a 'deep soft soil site'.

4 Liquefaction Analysis

Owing to the nature of the subsurface materials and depth to groundwater at the site, we consider the potential for liquefaction and lateral spreading on the site to be very low.

We therefore consider future land performance to be in line with Technical Category 1 (TC1), whereby future land damage from liquefaction is unlikely, and ground settlements are expected to be within normally accepted tolerances.

5 RMA Section 106 Requirements and Suitability to Subdivide

Section 106 of the Resource Management Act 1991 states a consent authority may refuse to grant a subdivision consent, or may grant a consent subject to specific consent conditions if it considers that:

- There is a significant risk from natural hazards; or
- Sufficient provision has not been made for legal or physical access to each allotment to be created by the subdivision.

An assessment of the risk from natural hazards as required by the RMA includes the following:

- The likelihood of natural hazards occurring (whether individually or in combination);
- The material damage to land in respect of which the consent is sought, other land, or structures that would result from natural hazards; and
- Any likely subsequent use of the land in respect of which the consent is sought that would accelerate, worsen, or result in material damage of the kind referred to in paragraph (b).

We have assessed the risk of natural hazards at the site in accordance with Section 106 of the Resource Management Act (RMA) and considered the risk to the site from rockfall, inundation (debris), slope stability, subsidence, flooding and tsunami. Based on our observations and the nature of the site, its performance during the CES, and the site's distance from the nearest significant watercourse, we consider it is unlikely for the site to be subject to natural hazards such as rockfall, inundation (debris), slope stability, subsidence, flooding and tsunami. As such, the site is considered suitable for subdivision from a geotechnical perspective.

6 Geotechnical Recommendations

6.1 Earthworks

Earthworks carried out for the subdivision shall be in accordance with NZS 4404:2010, Land Development and Subdivision Infrastructure and NZS 4431:1989, Code of Practice for Earth filling for Residential Development. In particular, any areas to receive fill should be stripped of all vegetation, topsoil, non-engineered fill, soft or organic soils prior to fill placement.

Fill may comprise clean natural sandy gravel or silty soils, or clean imported soils and / or granular fill, compacted to achieve no less than 95% of maximum dry density. Fill faces steeper than 2V:1H and higher than 600 mm should be retained and referred back to ENGEO. Although unlikely, where any springs or groundwater seeps are encountered, they should be intercepted with suitable drainage and discharged to a Council approved outlet.

All unretained batters of pond and stormwater drains constructed with the native sandy gravel material should be at an inclination no steeper than 1V:3H, with protection schemes in place to control erosion of the formed batters within the waterways.

A comprehensive earthworks specification should be provided to the earthworks contractor prior to starting excavations and an inspection / testing regime agreed, along with a robust erosion and sediment control plan.

6.2 Subdivision Roding

Vegetation, any organic or deleterious material, topsoil and non-engineered fill should be removed from the site under pavement areas prior to aggregate placement. Based on our observations during testing, we consider the natural ground below the topsoil at the site should provide an adequate subgrade for the proposed pavement areas.

6.3 Stormwater Control

Concentrated stormwater flows from all impermeable areas must be collected and carried in sealed pipes to the Council system or an alternative disposal point subject to approval from Council.

Uncontrolled stormwater must not be allowed to saturate the ground as this will potentially affect future foundation performance both statically and during future seismic activity.

6.4 Foundations

Foundations for future proposed residential dwellings within the subdivision may comprise shallow pad, strip, or slab foundations designed in accordance with the provisions of NZS 3604 Timber Framed Buildings.

Site specific testing will be required for Building Consent, to confirm the bearing materials and capacity. For preliminary design, we anticipate that a geotechnical Ultimate Bearing Capacity of 300 kPa may be assumed for foundations bearing on sandy gravel or engineered fill, below any topsoil. All topsoil shall be stripped from within building footprints, we anticipate this to be typically below 0.1 to 0.3 m depth based on our subsurface investigations.

7 References

- Canterbury Maps, Groundwater. Retrieved November 2019, from <http://canterburymaps.govt.nz/Viewer>.
- Canterbury Maps, Historic Aerial Imagery. Retrieved November 2019, from <https://apps.canterburymaps.govt.nz/CanterburyHistoricAerialImagery>.
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- GNS Science (2015). New Zealand Active Faults Database. Retrieved November 2018, from <http://data.gns.cri.nz/af>.
- Pettinga J.R., Yetton M.D., Van Dissen R.J., & Downes G. (2001). Earthquake Source Identification and Characterisation for the Canterbury Region, South Island, New Zealand. Bulletin of the New Zealand Society for Earthquake Engineering, Vol 34, No. 4, pp 282-317.
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- Standards Association of New Zealand (2004). NZS 1170.5:2004. Structural Design Actions Part 5: Earthquake Actions – New Zealand.
- Standards Association of New Zealand (2010). NZS 3604:2010. Timber Framed Buildings.
- Standards Association of New Zealand (2010). NZS 4404:2010. Land Development and Subdivision Infrastructure.
- The Ministry of Business, Innovation, and Employment (2016). New Zealand Geotechnical Database. Retrieved November 2019, from <https://www.nzgd.org.nz>.

8 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, Hughes Developments 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



Kristian Fairley

Engineering Geologist

Report reviewed by



Greg Martin, CMEngNZ (PEngGeol)

Principal Engineering Geologist

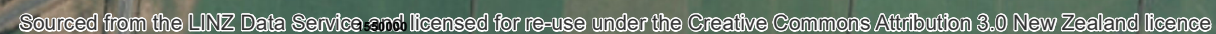


Jed Watts

Engineering Geologist

APPENDIX 1:

Site Plan and Inferred Paleo Channels

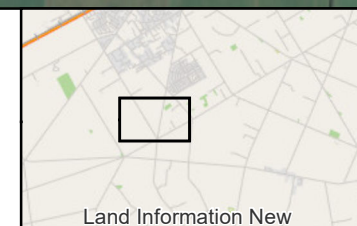


Title:

Site plan and inferred paleo channels

Aerial: LINZ and Eagle Technology, CC-BY-3.0-NZ.
Map image: LINZ NZTopo Series, CC-BY-3.0-NZ.

PROJECTION: NZGD 2000 New Zealand Transverse Mercator



Client: Hughes Developments Ltd

Project:
92 Dunns Crossing Road
Rolleston
Canterbury

Proj No: 12903.000.000

Designed:	NF
Drawn:	NF
Checked:	XX
Date:	Dec 19

Scale: 1:5,000

Figure No:

1

Size: A3

Revision: A

APPENDIX 2:

ENGEO Hand Auger and Test Pit Logs



LOG OF AUGER HA01

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd
Client Ref. : N/A
Date : 22/11/2019
Hole Depth : 0.3 m
Hole Diameter : 50 mm

Shear Vane No : 1379
Logged By : KF/CR
Reviewed By : JW
Latitude : -43.626634
Longitude : 172.372952

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	Scala Penetrometer					
										Blows per 100mm					
										2	4	6	8	10	12
	TS	ML	Sandy SILT with trace rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].					S-F							
	ALLUVIUM	ML	Sandy SILT with trace gravel; greyish brown. Low plasticity. Sand, fine.				D	St-H							
			End of Hole Depth: 0.3 m Termination Condition: Practical refusal												
0.5															
1.0															
1.5															
Hand auger met practical refusal at 0.3 m depth on inferred gravel. Scala Penetrometer met practical refusal at 0.3 m depth. Standing groundwater was not encountered. TS = TOPSOIL															



LOG OF AUGER HA02

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd
Client Ref. : N/A
Date : 22/11/2019
Hole Depth : 0.3 m
Hole Diameter : 50 mm

Shear Vane No : 1379
Logged By : KF/CR
Reviewed By : JW
Latitude : -43.627341
Longitude : 172.373596

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	Scala Penetrometer					
										Blows per 100mm					
										2	4	6	8	10	12
	TS	ML	Sandy SILT with trace rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].					F-St							
	ALLUVIUM	ML	Sandy SILT with minor gravel; greyish brown. Low plasticity. Sand, fine. Gravel, fine to medium, subangular to subrounded.				D	St-VSt							
			End of Hole Depth: 0.3 m Termination Condition: Practical refusal												
0.5															
1.0															
1.5															

Hand auger met practical refusal at 0.3 m depth on inferred gravel.
Scala Penetrometer met practical refusal at 0.7 m depth.
Standing groundwater was not encountered.
TS = TOPSOIL

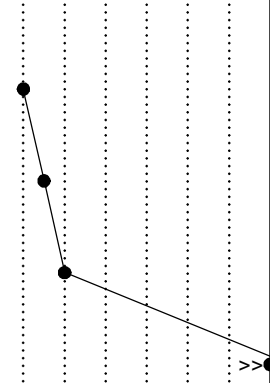


LOG OF AUGER HA03

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd
Client Ref. : N/A
Date : 22/11/2019
Hole Depth : 0.3 m
Hole Diameter : 50 mm

Shear Vane No : 1379
Logged By : KF/CR
Reviewed By : JW
Latitude : -43.626801
Longitude : 172.374937

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	Scala Penetrometer					
										Blows per 100mm					
										2	4	6	8	10	12
	TS	ML	SILT with some sand and trace rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].					S-F							
	ALLUVIUM	ML	Sandy SILT with minor gravel; greyish brown. Low plasticity. Sand, fine. Gravel, fine, subangular to subrounded.				D	F-St							
			End of Hole Depth: 0.3 m Termination Condition: Practical refusal												
0.5															
1.0															
1.5															
Hand auger met practical refusal at 0.3 m depth on inferred gravel. Scala Penetrometer met practical refusal at 0.4 m depth. Standing groundwater was not encountered. TS = TOPSOIL															

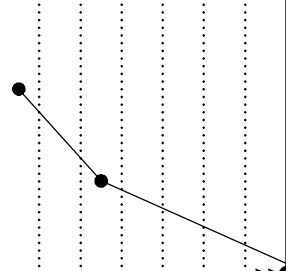


LOG OF AUGER HA04

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd
Client Ref. : N/A
Date : 22/11/2019
Hole Depth : 0.3 m
Hole Diameter : 50 mm

Shear Vane No : 1379
Logged By : KF/CR
Reviewed By : JW
Latitude : -43.626238
Longitude : 172.376311

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	Scala Penetrometer					
										Blows per 100mm					
										2	4	6	8	10	12
	TS	ML	SILT with some sand and trace rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].					S-F							
	ALLUVIUM	ML	Sandy SILT with trace gravel; greyish brown. Low plasticity. Sand, fine. Gravel, fine, subangular to subrounded.				D	St-VSt							
			End of Hole Depth: 0.3 m Termination Condition: Practical refusal												
0.5															
1.0															
1.5															
Hand auger met practical refusal at 0.3 m depth on inferred gravel. Scala Penetrometer met practical refusal at 0.3 m depth. Standing groundwater was not encountered. TS = TOPSOIL															

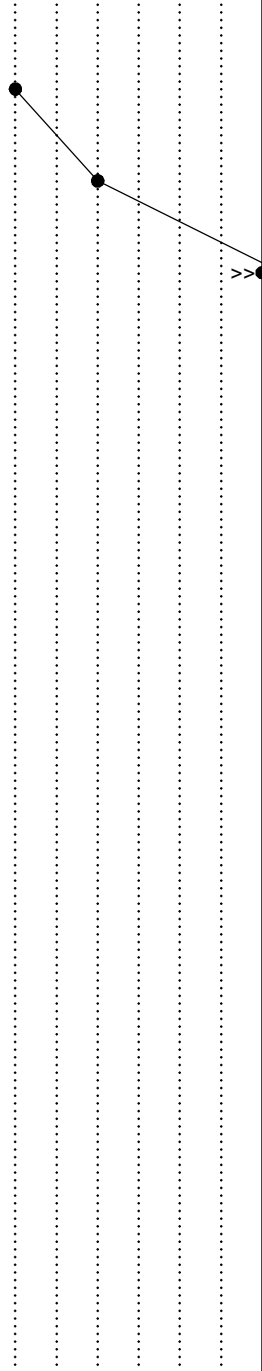


LOG OF AUGER HA05

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd
Client Ref. : N/A
Date : 22/11/2019
Hole Depth : 0.2 m
Hole Diameter : 50 mm

Shear Vane No : 1379
Logged By : KF/CR
Reviewed By : JW
Latitude : -43.625776
Longitude : 172.377469

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	Scala Penetrometer					
										Blows per 100mm					
										2	4	6	8	10	12
	TS	ML	SILT with some sand and trace rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].					S-F							
	A	ML	Sandy SILT with trace gravel; greyish brown. Low plasticity. Sand, fine. Gravel, fine, subangular to subrounded.				D	St-VSt							
End of Hole Depth: 0.2 m Termination Condition: Practical refusal															

Hand auger met practical refusal at 0.2 m depth on inferred gravel.
Scala Penetrometer met practical refusal at 0.3 m depth.
Standing groundwater was not encountered.
TS = TOPSOIL, A = ALLUVIUM



LOG OF AUGER HA06

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd
Client Ref. : N/A
Date : 22/11/2019
Hole Depth : 0.2 m
Hole Diameter : 50 mm

Shear Vane No : 1379
Logged By : KF/CR
Reviewed By : JW
Latitude : -43.625827
Longitude : 172.378467

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	Scala Penetrometer					
										Blows per 100mm					
										2	4	6	8	10	12
	TS	ML	SILT with some sand and trace rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].					F-St							
	A	ML	SILT with some sand; brown. Low plasticity. Sand, fine.				D	St-VSt							
End of Hole Depth: 0.2 m Termination Condition: Practical refusal															
0.5															
1.0															
1.5															
Hand auger met practical refusal at 0.2 m depth on inferred gravel. Scala Penetrometer met practical refusal at 0.4 m depth. Standing groundwater was not encountered. TS = TOPSOIL, A = ALLUVIUM															



LOG OF AUGER HA07

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd
Client Ref. : N/A
Date : 22/11/2019
Hole Depth : 0.2 m
Hole Diameter : 50 mm

Shear Vane No : 1379
Logged By : KF/CR
Reviewed By : JW
Latitude : -43.626312
Longitude : 172.378918

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	Scala Penetrometer					
										Blows per 100mm					
	TS	ML	SILT with some sand and trace rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].					F-St							
	A	ML	SILT with some sand; brown. Low plasticity. Sand, fine.				D	St-VSt							
End of Hole Depth: 0.2 m Termination Condition: Practical refusal															
0.5															
1.0															
1.5															

Hand auger met practical refusal at 0.2 m depth on inferred gravel.
Scala Penetrometer met practical refusal at 0.3 m depth.
Standing groundwater was not encountered.
TS = TOPSOIL, A = ALLUVIUM



LOG OF AUGER HA08

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd
Client Ref. : N/A
Date : 22/11/2019
Hole Depth : 0.4 m
Hole Diameter : 50 mm

Shear Vane No : 1379
Logged By : KF/CR
Reviewed By : JW
Latitude : -43.626009
Longitude : 172.379583

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	Scala Penetrometer					
										Blows per 100mm					
										2	4	6	8	10	12
	TS	ML	SILT with some sand and trace rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].					F-St							
	ALLUVIUM	ML	SILT with some sand; greyish brown. Low plasticity. Sand, fine. Becomes brownish grey and trace gravel encountered from 0.3 m depth.				D	VSt-H							
0.5			End of Hole Depth: 0.4 m Termination Condition: Practical refusal												
1.0															
1.5															

Hand auger met practical refusal at 0.4 m depth on inferred gravel.
Scala Penetrometer met practical refusal at 0.6 m depth.
Standing groundwater was not encountered.
TS = TOPSOIL

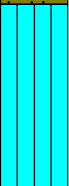


LOG OF AUGER HA09

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd
Client Ref. : N/A
Date : 22/11/2019
Hole Depth : 0.3 m
Hole Diameter : 50 mm

Shear Vane No : 1379
Logged By : KF/CR
Reviewed By : JW
Latitude : -43.62663
Longitude : 172.378167

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	Scala Penetrometer					
										Blows per 100mm					
										2	4	6	8	10	12
	TS	ML	SILT with some sand and trace rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].					St							
	ALLUVIUM	ML	SILT with some sand; greyish brown. Low plasticity. Sand, fine.				D	St-VSt							
			End of Hole Depth: 0.3 m Termination Condition: Practical refusal												
0.5															
1.0															
1.5															

Hand auger met practical refusal at 0.3 m depth on inferred gravel.
Scala Penetrometer met practical refusal at 0.3 m depth.
Standing groundwater was not encountered.
TS = TOPSOIL



LOG OF AUGER HA10

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd
Client Ref. : N/A
Date : 22/11/2019
Hole Depth : 0.5 m
Hole Diameter : 50 mm

Shear Vane No : 1379
Logged By : KF/CR
Reviewed By : JW
Latitude : -43.626452
Longitude : 172.377126

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	Scala Penetrometer					
										Blows per 100mm					
										2	4	6	8	10	12
	TS	ML	SILT with some sand and trace rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].					F-St							
	ALLUVIUM		SILT with some sand; greyish brown. Low plasticity. Sand, fine.				D	St-VSt							
ML		Trace gravel and sand observed from 0.3 m depth.													
0.5	End of Hole Depth: 0.5 m Termination Condition: Practical refusal														
1.0															
1.5															

Hand auger met practical refusal at 0.5 m depth on inferred gravel.

Scala Penetrometer met practical refusal at 0.7 m depth.

Standing groundwater was not encountered.

TS = TOPSOIL

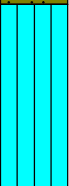
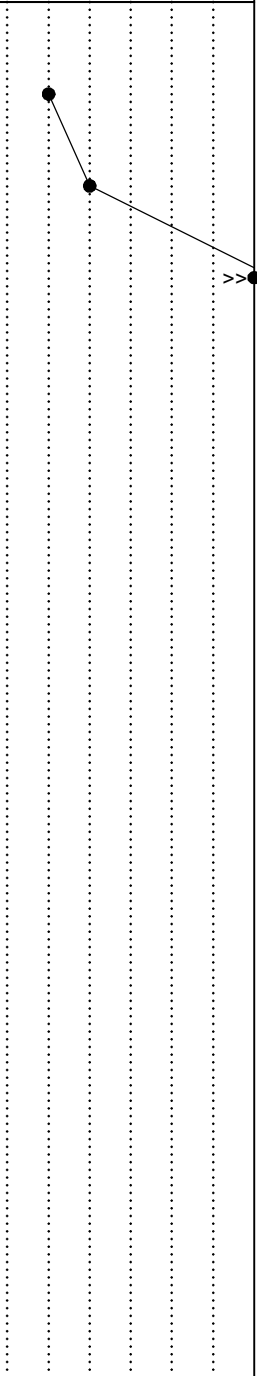


LOG OF AUGER HA11

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd
Client Ref. : N/A
Date : 22/11/2019
Hole Depth : 0.3 m
Hole Diameter : 50 mm

Shear Vane No : 1379
Logged By : KF/CR
Reviewed By : JW
Latitude : -43.627174
Longitude : 172.37697

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	Scala Penetrometer					
										Blows per 100mm					
										2	4	6	8	10	12
	TS	ML	SILT with some sand and trace rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].					F-St							
	ALLUVIUM	ML	SILT with some sand and trace gravel; greyish brown. Low plasticity. Sand, fine.				D	St-VSt							
			End of Hole Depth: 0.3 m Termination Condition: Practical refusal												
0.5															
1.0															
1.5															
Hand auger met practical refusal at 0.3 m depth on inferred gravel. Scala Penetrometer met practical refusal at 0.3 m depth. Standing groundwater was not encountered. TS = TOPSOIL															

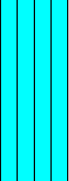
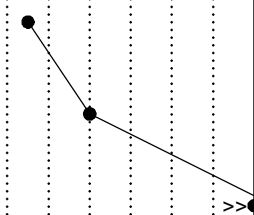


LOG OF AUGER HA12

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd
Client Ref. : N/A
Date : 22/11/2019
Hole Depth : 0.3 m
Hole Diameter : 50 mm

Shear Vane No : 1379
Logged By : KF/CR
Reviewed By : JW
Latitude : -43.626972
Longitude : 172.375908

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	Scala Penetrometer					
										Blows per 100mm					
										2	4	6	8	10	12
	TS	ML	SILT with some sand and trace rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].					F-St							
	ALLUVIUM	ML	SILT with some sand and trace gravel; greyish brown. Low plasticity. Sand, fine.				D	St-VSt							
			End of Hole Depth: 0.3 m Termination Condition: Practical refusal												
0.5															
1.0															
1.5															
Hand auger met practical refusal at 0.3 m depth on inferred gravel. Scala Penetrometer met practical refusal at 0.3 m depth. Standing groundwater was not encountered. TS = TOPSOIL															

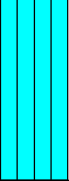
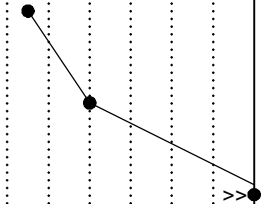


LOG OF AUGER HA13

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd
Client Ref. : N/A
Date : 22/11/2019
Hole Depth : 0.3 m
Hole Diameter : 50 mm

Shear Vane No : 1379
Logged By : KF/CR
Reviewed By : JW
Latitude : -43.627741
Longitude : 172.375608

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	Scala Penetrometer					
										Blows per 100mm					
										2	4	6	8	10	12
	TS	ML	SILT with some sand and trace rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].					F-St							
	ALLUVIUM	ML	Sandy SILT with minor gravel; greyish brown. Low plasticity. Sand, fine. Gravel, fine, subangular to subrounded.				D	St-VSt							
			End of Hole Depth: 0.3 m Termination Condition: Practical refusal												
0.5															
1.0															
1.5															
Hand auger met practical refusal at 0.3 m depth on inferred gravel. Scala Penetrometer met practical refusal at 0.3 m depth. Standing groundwater was not encountered. TS = TOPSOIL															



LOG OF AUGER HA14

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd
Client Ref. : N/A
Date : 22/11/2019
Hole Depth : 0.4 m
Hole Diameter : 50 mm

Shear Vane No : 1379
Logged By : KF/CR
Reviewed By : JW
Latitude : -43.62757
Longitude : 172.374573

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	Scala Penetrometer					
										Blows per 100mm					
										2	4	6	8	10	12
	TS	ML	SILT with some sand and trace rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].					S-F							
	ALLUVIUM	ML	Sandy SILT with trace gravel; greyish brown. Low plasticity. Sand, fine.				D	St-VSt							
0.5			End of Hole Depth: 0.4 m Termination Condition: Practical refusal												
1.0															
1.5															

Hand auger met practical refusal at 0.4 m depth on inferred gravel.
Scala Penetrometer met practical refusal at 0.4 m depth.
Standing groundwater was not encountered.
TS = TOPSOIL



LOG OF AUGER HA15

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd
Client Ref. : N/A
Date : 22/11/2019
Hole Depth : 0.5 m
Hole Diameter : 50 mm

Shear Vane No : 1379
Logged By : KF/CR
Reviewed By : JW
Latitude : -43.628288
Longitude : 172.374337

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	Scala Penetrometer					
										Blows per 100mm					
										2	4	6	8	10	12
	TS	ML	SILT with some sand and trace rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].					S-F							
	ALLUVIUM		Sandy SILT with trace gravel; greyish brown. Low plasticity. Sand, fine.												
		ML	Trace gravel and becomes brownish grey from 0.3 m depth.				D	F-VSt							
0.5			End of Hole Depth: 0.5 m Termination Condition: Practical refusal												
1.0															
1.5															
Hand auger met practical refusal at 0.5 m depth on inferred gravel. Scala Penetrometer met practical refusal at 0.6 m depth. Standing groundwater was not encountered. TS = TOPSOIL															



Shear Vane No : 1379
 Logged By : KF/CR
 Reviewed By : JW
 Latitude : -43.629139
 Longitude : 172.375002

[illegible]

GEOTECH HAND AUGER 2019.11.27 - HAND AUGER LOGS.GPJ NZ DATA TEMPLATE 2.GDT 4/12/19

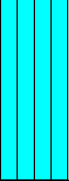
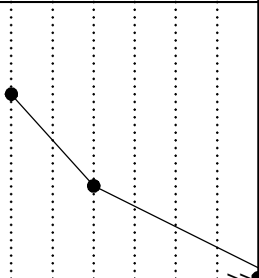


LOG OF AUGER HA17

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd
Client Ref. : N/A
Date : 22/11/2019
Hole Depth : 0.3 m
Hole Diameter : 50 mm

Shear Vane No : 1379
Logged By : KF/CR
Reviewed By : JW
Latitude : -43.628389
Longitude : 172.375254

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	Scala Penetrometer					
										Blows per 100mm					
										2	4	6	8	10	12
	TS	ML	SILT with some sand and trace rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].					S-F							
	ALLUVIUM	ML	Sandy SILT; greyish brown. Low plasticity. Sand, fine.				D	St-VSt							
			End of Hole Depth: 0.3 m Termination Condition: Practical refusal												
0.5															
1.0															
1.5															
Hand auger met practical refusal at 0.3 m depth on inferred gravel. Scala Penetrometer met practical refusal at 0.3 m depth. Standing groundwater was not encountered. TS = TOPSOIL															



LOG OF AUGER HA18

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd
Client Ref. : N/A
Date : 22/11/2019
Hole Depth : 0.1 m
Hole Diameter : 50 mm

Shear Vane No : 1379
Logged By : KF/CR
Reviewed By : JW
Latitude : -43.628587
Longitude : 172.376257

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	Scala Penetrometer					
										Blows per 100mm					
										2	4	6	8	10	12
	TS	ML	SILT with some sand and trace rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].				D	F-St							
			End of Hole Depth: 0.1 m Termination Condition: Practical refusal												
0.5															
1.0															
1.5															
Hand auger met practical refusal at 0.1 m depth on inferred gravel. Scala Penetrometer met practical refusal at 0.3 m depth. Standing groundwater was not encountered. TS = TOPSOIL															



LOG OF AUGER HA19

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd
Client Ref. : N/A
Date : 22/11/2019
Hole Depth : 0.6 m
Hole Diameter : 50 mm

Shear Vane No : 1379
Logged By : KF/CR
Reviewed By : JW
Latitude : -43.627815
Longitude : 172.376568

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	Scala Penetrometer						
										Blows per 100mm						
										2	4	6	8	10	12	
0.5	TS	ML	SILT with some sand and trace rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].				D	S-F								
	ALLUVIUM	ML	SILT with some sand; greyish brown. Low plasticity. Sand, fine.					F-St								
		ML	Sandy SILT with trace gravel; greyish brown. Low plasticity. Sand, fine.					St-VSt								
End of Hole Depth: 0.6 m Termination Condition: Practical refusal										>>						
1.0																
1.5																
Hand auger met practical refusal at 0.6 m depth on inferred gravel. Scala Penetrometer met practical refusal at 0.6 m depth. Standing groundwater was not encountered. TS = TOPSOIL																

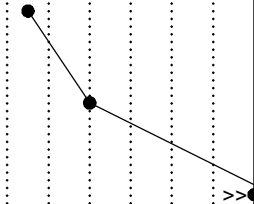


LOG OF AUGER HA20

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd
Client Ref. : N/A
Date : 22/11/2019
Hole Depth : 0.3 m
Hole Diameter : 50 mm

Shear Vane No : 1379
Logged By : KF/CR
Reviewed By : JW
Latitude : -43.627993
Longitude : 172.377662

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	Scala Penetrometer					
										Blows per 100mm					
										2	4	6	8	10	12
	TS	ML	SILT with some sand and trace rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].					S-F							
	ALLUVIUM	ML	SILT with some sand and trace gravel; greyish brown. Low plasticity. Sand, fine.				D	St-VSt							
			End of Hole Depth: 0.3 m Termination Condition: Practical refusal												
0.5															
1.0															
1.5															
Hand auger met practical refusal at 0.3 m depth on inferred gravel. Scala Penetrometer met practical refusal at 0.3 m depth. Standing groundwater was not encountered. TS = TOPSOIL															



LOG OF AUGER HA21

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd
Client Ref. : N/A
Date : 22/11/2019
Hole Depth : 0.2 m
Hole Diameter : 50 mm

Shear Vane No : 1379
Logged By : KF/CR
Reviewed By : JW
Latitude : -43.627255
Longitude : 172.377872

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	Scala Penetrometer					
										Blows per 100mm					
										2	4	6	8	10	12
	TOPSOIL	ML	SILT with some sand and trace rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].				D	F-St							
			End of Hole Depth: 0.2 m Termination Condition: Practical refusal												
0.5															
1.0															
1.5															

Hand auger met practical refusal at 0.2 m depth on inferred gravel.
Scala Penetrometer met practical refusal at 0.3 m depth.
Standing groundwater was not encountered.

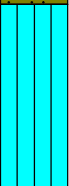


LOG OF AUGER HA22

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd
Client Ref. : N/A
Date : 22/11/2019
Hole Depth : 0.3 m
Hole Diameter : 50 mm

Shear Vane No : 1379
Logged By : KF/CR
Reviewed By : JW
Latitude : -43.627454
Longitude : 172.378955

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	Scala Penetrometer					
										Blows per 100mm					
										2	4	6	8	10	12
	TS	ML	SILT with some sand and trace rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].					F-St							
	ALLUVIUM	ML	SILT with some sand and trace gravel; greyish brown. Low plasticity. Sand, fine.				D	St-VSt							
			End of Hole Depth: 0.3 m Termination Condition: Practical refusal												
0.5															
1.0															
1.5															

Hand auger met practical refusal at 0.3 m depth on inferred gravel.
Scala Penetrometer met practical refusal at 0.3 m depth.
Standing groundwater was not encountered.
TS = TOPSOIL

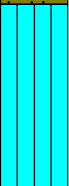


LOG OF AUGER HA23

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd
Client Ref. : N/A
Date : 22/11/2019
Hole Depth : 0.3 m
Hole Diameter : 50 mm

Shear Vane No : 1379
Logged By : KF/CR
Reviewed By : JW
Latitude : -43.629267
Longitude : 172.37593

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	Scala Penetrometer					
										Blows per 100mm					
										2	4	6	8	10	12
	TS	ML	SILT with some sand and trace rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].					S-F							
	ALLUVIUM	ML	Sandy SILT with trace gravel; brown. Low plasticity. Sand, fine.				D	St-VSt							
			End of Hole Depth: 0.3 m Termination Condition: Practical refusal												
0.5															
1.0															
1.5															

Hand auger met practical refusal at 0.3 m depth on inferred gravel.
Scala Penetrometer met practical refusal at 0.3 m depth.
Standing groundwater was not encountered.
TS = TOPSOIL

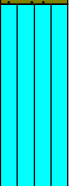
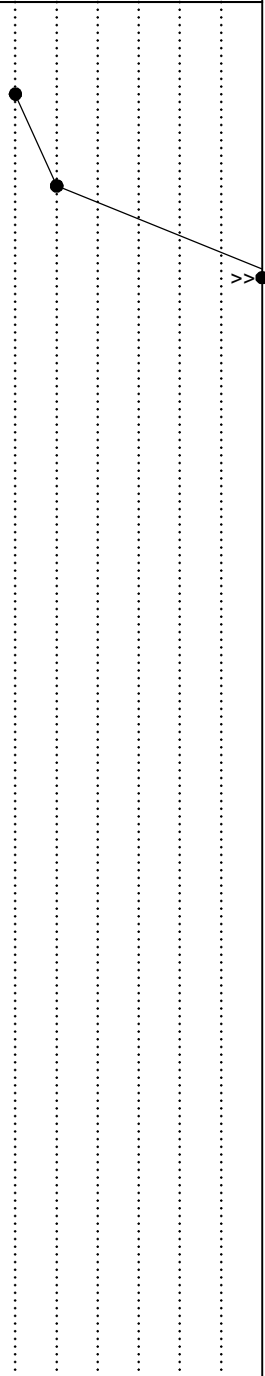


LOG OF AUGER HA24

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd
Client Ref. : N/A
Date : 22/11/2019
Hole Depth : 0.3 m
Hole Diameter : 50 mm

Shear Vane No : 1379
Logged By : KF/CR
Reviewed By : JW
Latitude : -43.629275
Longitude : 172.377732

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	Scala Penetrometer					
										Blows per 100mm					
										2	4	6	8	10	12
	TS	ML	SILT with some sand and trace rootlets; brown. Low plasticity [TOPSOIL].					S-F							
	ALLUVIUM	ML	Sandy SILT with minor gravel; brown. Low plasticity. Sand, fine. Gravel, fine, subangular to subrounded.				D	St-VSt							
			End of Hole Depth: 0.3 m Termination Condition: Practical refusal												
0.5															
1.0															
1.5															
Hand auger met practical refusal at 0.3 m depth on inferred gravel. Scala Penetrometer met practical refusal at 0.3 m depth. Standing groundwater was not encountered. TS = TOPSOIL															



LOG OF AUGER HA25

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd
Client Ref. : N/A
Date : 22/11/2019
Hole Depth : 0.1 m
Hole Diameter : 50 mm

Shear Vane No : 1379
Logged By : KF/CR
Reviewed By : JW
Latitude : -43.628692
Longitude : 172.379095

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/Remoulded	Scala Penetrometer					
										Blows per 100mm					
										2	4	6	8	10	12
	TS	ML	SILT with some sand and trace rootlets; brown. Low plasticity [TOPSOIL].				D	F-St							
			End of Hole Depth: 0.1 m Termination Condition: Practical refusal												
0.5															
1.0															
1.5															
Hand auger met practical refusal at 0.1 m depth on inferred gravel. Scala Penetrometer met practical refusal at 0.5 m depth. Standing groundwater was not encountered. TS = TOPSOIL															



LOG OF AUGER HA26

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd
Client Ref. : N/A
Date : 22/11/2019
Hole Depth : 0.2 m
Hole Diameter : 50 mm

Shear Vane No : 1379
Logged By : KF/CR
Reviewed By : JW
Latitude : -43.629562
Longitude : 172.378456

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/Remoulded	Scala Penetrometer					
										Blows per 100mm					
										2	4	6	8	10	12
	TOPSOIL	ML	SILT with some sand and trace gravel; brown. Low plasticity. Sand, fine [TOPSOIL].				D	F-St							
			End of Hole Depth: 0.2 m Termination Condition: Practical refusal												
0.5															
1.0															
1.5															

Hand auger met practical refusal at 0.2 m depth on inferred gravel.
Scala Penetrometer met practical refusal at 0.3 m depth.
Standing groundwater was not encountered.



LOG OF AUGER HA27

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd
Client Ref. : N/A
Date : 22/11/2019
Hole Depth : 0.1 m
Hole Diameter : 50 mm

Shear Vane No : 1379
Logged By : KF/CR
Reviewed By : JW
Latitude : -43.62955
Longitude : 172.377029

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/Remoulded	Scala Penetrometer					
										Blows per 100mm					
										2	4	6	8	10	12
	TS	ML	SILT with some sand, trace gravel and rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].				D	S-F							
			End of Hole Depth: 0.1 m Termination Condition: Practical refusal												
0.5															
1.0															
1.5															
Hand auger met practical refusal at 0.1 m depth on inferred gravel. Scala Penetrometer met practical refusal at 0.3 m depth. Standing groundwater was not encountered. TS = TOPSOIL															



LOG OF AUGER HA28

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd
Client Ref. : N/A
Date : 22/11/2019
Hole Depth : 0.2 m
Hole Diameter : 50 mm

Shear Vane No : 1379
Logged By : KF/CR
Reviewed By : JW
Latitude : -43.630284
Longitude : 172.376702

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	Scala Penetrometer					
										Blows per 100mm					
										2	4	6	8	10	12
	TS	ML	SILT with some sand and trace rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].					S-F							
	A	ML	Sandy SILT with trace gravel; brownish grey. Low plasticity. Sand, fine.				D	VSt-H							
End of Hole Depth: 0.2 m Termination Condition: Practical refusal															
0.5															
1.0															
1.5															
Hand auger met practical refusal at 0.2 m depth on inferred gravel. Scala Penetrometer met practical refusal at 0.2 m depth. Standing groundwater was not encountered. TS = TOPSOIL, A = ALLUVIUM															



LOG OF AUGER HA29

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd
Client Ref. : N/A
Date : 22/11/2019
Hole Depth : 0.2 m
Hole Diameter : 50 mm

Shear Vane No : 1379
Logged By : KF/CR
Reviewed By : JW
Latitude : -43.630074
Longitude : 172.375758

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	Scala Penetrometer					
										Blows per 100mm					
										2	4	6	8	10	12
	TS	ML	SILT with some sand and trace rootlets; brown. Low plasticity. Sand fine [TOPSOIL].												
	A	ML	Sandy SILT with trace gravel; brown. Low plasticity. Sand, fine.												
End of Hole Depth: 0.2 m Termination Condition: Practical refusal															
0.5															
1.0															
1.5															
Hand auger met practical refusal at 0.2 m depth on inferred gravel. Scala Penetrometer met practical refusal at 0.3 m depth. Standing groundwater was not encountered. TS = TOPSOIL, A = ALLUVIUM															



LOG OF AUGER HA30

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd
Client Ref. : N/A
Date : 22/11/2019
Hole Depth : 0.4 m
Hole Diameter : 50 mm

Shear Vane No : 1379
Logged By : KF/CR
Reviewed By : JW
Latitude : -43.63101
Longitude : 172.376531

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	Scala Penetrometer					
										Blows per 100mm					
										2	4	6	8	10	12
	TS	ML	SILT with some sand and trace rootlets; brown. Low plasticity. Sand fine [TOPSOIL].					S-F							
	ALLUVIUM	ML	Sandy SILT with minor gravel; greyish brown. Low plasticity. Sand, fine. Gravel, fine to medium, subangular to subrounded.				D	St-VSt							
			End of Hole Depth: 0.4 m Termination Condition: Practical refusal												
0.5															
1.0															
1.5															

Hand auger met practical refusal at 0.4 m depth on inferred gravel.
Scala Penetrometer met practical refusal at 0.3 m depth.
Standing groundwater was not encountered.
TS = TOPSOIL

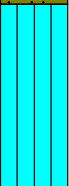


LOG OF AUGER HA31

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd
Client Ref. : N/A
Date : 22/11/2019
Hole Depth : 0.3 m
Hole Diameter : 50 mm

Shear Vane No : 1379
Logged By : KF/CR
Reviewed By : JW
Latitude : -43.630521
Longitude : 172.37778

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	Scala Penetrometer					
										Blows per 100mm					
										2	4	6	8	10	12
	TS	ML	SILT with some sand and trace rootlets; brown. Low plasticity. Sand fine [TOPSOIL].					F-St							
	ALLUVIUM	ML	Sandy SILT with trace gravel; greyish brown. Low plasticity. Sand, fine.				D	St-H							
			End of Hole Depth: 0.3 m Termination Condition: Practical refusal												
0.5															
1.0															
1.5															
Hand auger met practical refusal at 0.3 m depth on inferred gravel. Scala Penetrometer met practical refusal at 0.3 m depth. Standing groundwater was not encountered. TS = TOPSOIL															

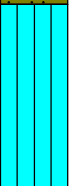


LOG OF AUGER HA32

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd
Client Ref. : N/A
Date : 22/11/2019
Hole Depth : 0.3 m
Hole Diameter : 50 mm

Shear Vane No : 1379
Logged By : KF/CR
Reviewed By : JW
Latitude : -43.631356
Longitude : 172.377566

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	Scala Penetrometer					
										Blows per 100mm					
										2	4	6	8	10	12
	TS	ML	SILT with some sand and trace rootlets; brown. Low plasticity. Sand fine [TOPSOIL].					S-F							
	ALLUVIUM	ML	Sandy SILT with trace gravel; greyish brown. Low plasticity. Sand, fine.				D	St-VSt							
			End of Hole Depth: 0.3 m Termination Condition: Practical refusal												
0.5															
1.0															
1.5															

Hand auger met practical refusal at 0.3 m depth on inferred gravel.
Scala Penetrometer met practical refusal at 0.3 m depth.
Standing groundwater was not encountered.
TS = TOPSOIL



LOG OF AUGER HA33

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd
Client Ref. : N/A
Date : 22/11/2019
Hole Depth : 0.6 m
Hole Diameter : 50 mm

Shear Vane No : 1379
Logged By : KF/CR
Reviewed By : JW
Latitude : -43.632691
Longitude : 172.377909

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	Scala Penetrometer					
										Blows per 100mm					
										2	4	6	8	10	12
	TOPSOIL	ML	SILT with some sand and trace rootlets; brown. Low plasticity. Sand fine [TOPSOIL].					F-St							
	ALLUVIUM	ML	Sandy SILT with trace gravel; greyish brown. Low plasticity. Sand, fine.				D								
0.5		ML	Gravel becomes minor from 0.5 m depth. Gravel, fine to medium, subangular to subrounded.					VSt-H							
			End of Hole Depth: 0.6 m Termination Condition: Practical refusal												>>
1.0															
1.5															

GEOTECH HAND AUGER 2019.11.27 - HAND AUGER LOGS.GPJ NZ DATA TEMPLATE 2.GDT 4/12/19

Hand auger met practical refusal at 0.6 m depth on inferred gravel.
Scala Penetrometer met practical refusal at 0.6 m depth.
Standing groundwater was not encountered.

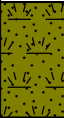


LOG OF AUGER HA34

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd
Client Ref. : N/A
Date : 06/12/2019
Hole Depth : 0.3 m
Hole Diameter : 50 mm

Shear Vane No : 1379
Logged By : KF/MK
Reviewed By : JW
Latitude : -43.625477
Longitude : 172.376421

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	Scala Penetrometer					
										Blows per 100mm					
										2	4	6	8	10	12
	TOPSOIL	ML	SILT with some sand and trace rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].					F-St							
	ALLUVIUM	ML	Sandy SILT with trace gravel; greyish brown. Low plasticity. Sand, fine.				D	St-H							
			End of Hole Depth: 0.3 m Termination Condition: Practical refusal												
0.5															
1.0															
Hand auger met practical refusal at 0.3 m depth on inferred gravel. Scala Penetrometer met practical refusal at 0.3 m depth. Standing groundwater was not encountered.															



LOG OF AUGER HA35

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd
Client Ref. : N/A
Date : 06/12/2019
Hole Depth : 0.1 m
Hole Diameter : 50 mm

Shear Vane No : 1379
Logged By : KF/MK
Reviewed By : JW
Latitude : -43.625997
Longitude : 172.375209

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	Scala Penetrometer					
										Blows per 100mm					
										2	4	6	8	10	12
	TOPSOIL	ML	SILT with some sand and trace rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].				D	F-St							
			End of Hole Depth: 0.1 m Termination Condition: Practical refusal												
0.5															
1.0															
Hand auger met practical refusal at 0.1 m depth on inferred gravel. Scala Penetrometer met practical refusal at 0.3 m depth. Standing groundwater was not encountered.															



LOG OF AUGER HA36

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd
Client Ref. : N/A
Date : 06/12/2019
Hole Depth : 0.3 m
Hole Diameter : 50 mm

Shear Vane No : 1379
Logged By : KF/MK
Reviewed By : JW
Latitude : -43.626541
Longitude : 172.373835

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	Scala Penetrometer					
										Blows per 100mm					
										2	4	6	8	10	12
	TOPSOIL	ML	SILT with some sand and trace rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].					F-St							
	ALLUVIUM	ML	Sandy SILT with minor gravel; greyish brown. Low plasticity. Sand, fine. Gravel, fine, subangular to subrounded.				D	VSt-H							
			End of Hole Depth: 0.3 m Termination Condition: Practical refusal												
0.5															
1.0															
Hand auger met practical refusal at 0.3 m depth on inferred gravel. Scala Penetrometer met practical refusal at 0.3 m depth. Standing groundwater was not encountered.															



LOG OF AUGER HA37

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd
Client Ref. : N/A
Date : 06/12/2019
Hole Depth : 0.4 m
Hole Diameter : 50 mm

Shear Vane No : 1379
Logged By : KF/MK
Reviewed By : JW
Latitude : -43.625788
Longitude : 172.374136

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	Scala Penetrometer																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
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	TOPSOIL	ML	SILT with some sand and trace rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].					F-St																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																



LOG OF AUGER HA38

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd
Client Ref. : N/A
Date : 06/12/2019
Hole Depth : 0.4 m
Hole Diameter : 50 mm

Shear Vane No : 1379
Logged By : KF/MK
Reviewed By : JW
Latitude : -43.625065
Longitude : 172.374372

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	Scala Penetrometer																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
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	TOPSOIL	ML	SILT with some sand and trace rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].					F-St																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																</



LOG OF AUGER HA39

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd
Client Ref. : N/A
Date : 06/12/2019
Hole Depth : 0.2 m
Hole Diameter : 50 mm

Shear Vane No : 1379
Logged By : KF/MK
Reviewed By : JW
Latitude : -43.625291
Longitude : 172.375434

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	Scala Penetrometer					
										Blows per 100mm					
										2	4	6	8	10	12
	TOPSOIL	ML	SILT with some sand and trace rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].					F-St							
	A	ML	Sandy SILT with trace gravel; greyish brown. Low plasticity. Sand, fine.				D	VSt-H							
End of Hole Depth: 0.2 m Termination Condition: Practical refusal															
0.5															
1.0															
Hand auger met practical refusal at 0.2 m depth on inferred gravel. Scala Penetrometer met practical refusal at 0.2 m depth. Standing groundwater was not encountered. A = ALLUVIUM															

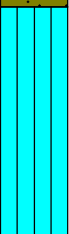


LOG OF AUGER HA40

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd
Client Ref. : N/A
Date : 06/12/2019
Hole Depth : 0.4 m
Hole Diameter : 50 mm

Shear Vane No : 1379
Logged By : KF/MK
Reviewed By : JW
Latitude : -43.624561
Longitude : 172.375659

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	Scala Penetrometer					
										Blows per 100mm					
										2	4	6	8	10	12
	TOPSOIL	ML	SILT with some sand and trace rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].					F-St							
	ALLUVIUM	ML	Sandy SILT with trace gravel and rootlets; greyish brown. Low plasticity. Sand, fine. No rootlets encountered from 0.3 m depth.				D	VSt-H							
0.5			End of Hole Depth: 0.4 m Termination Condition: Practical refusal												
1.0															
Hand auger met practical refusal at 0.4 m depth on inferred gravel. Scala Penetrometer met practical refusal at 0.4 m depth. Standing groundwater was not encountered.															



LOG OF AUGER HA41

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd
Client Ref. : N/A
Date : 06/12/2019
Hole Depth : 0.2 m
Hole Diameter : 50 mm

Shear Vane No : 1379
Logged By : KF/MK
Reviewed By : JW
Latitude : -43.624739
Longitude : 172.376636

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	Scala Penetrometer					
										Blows per 100mm					
										2	4	6	8	10	12
	TOPSOIL	ML	SILT with some sand, trace gravel and rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].					St-VSt							
	A	ML	Sandy SILT with trace gravel and rootlets; greyish brown. Low plasticity. Sand, fine.				D	VSt-H							
End of Hole Depth: 0.2 m Termination Condition: Practical refusal															
0.5															
1.0															
Hand auger met practical refusal at 0.2 m depth on inferred gravel. Scala Penetrometer met practical refusal at 0.4 m depth. Standing groundwater was not encountered. A = ALLUVIUM															



LOG OF TEST PIT TP01

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd Shear Vane No : N/A
Date : 25/11/2019 Logged By : KF
Max Test Pit Depth : 2 m Reviewed By : JW
Digger Type/Size : 24 Tonne Latitude : -43.626724
Bucket Type/Size : Bucket Excavator Longitude : 172.37925

Depth (m BGL)	Material	Excavatability (Relative Scale)	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remoulded (kPa)	Scala Penetrometer Blows per 100mm
		Easier Harder									2 4 6 8 10 12
	T		ML	Sandy SILT with trace gravel and rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].				M	F-St		
0.5				Sandy fine to medium GRAVEL with some silt and trace rootlets; greyish brown with orange mottles. Well graded, subangular to subrounded. Sand, fine.							
1.0	ALLUVIUM		GW	Silt becomes trace and no rootlets from 0.5 m depth.				M	MD-D		
1.5				Trace cobbles encountered from 0.9 m depth.							
2.0				Cobbles become minor from 1.3 m depth.							
				Depth of Excavation: 2 m Termination Condition: Target depth							

GEOTECH TEST PIT LOG 2019.11.27 - TEST PIT LOGS.GPJ NZ MASTER DATA TEMPLATE.GDT 4/12/19

Test pit met target depth
Scala Penetrometer met practical refusal.
Standing groundwater was not encountered.

T = TOPSOIL



LOG OF TEST PIT TP02

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd Shear Vane No : N/A
Date : 25/11/2019 Logged By : KF
Max Test Pit Depth : 2 m Reviewed By : JW
Digger Type/Size : 24 Tonne Latitude : -43.625528
Bucket Type/Size : Bucket Excavator Longitude : 172.379116

Depth (m BGL)	Material	Excavatability (Relative Scale)	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remoulded (kPa)	Scala Penetrometer Blows per 100mm
		Easier	Harder								2 4 6 8 10 12
	TS		ML	SILT with some sand and tree roots; light brownish grey. Low plasticity. Sand, fine [TOPSOIL].					F-St		
0.5				Sandy fine to coarse GRAVEL with some silt and trace rootlets; brownish grey. Well graded, subangular to subrounded. Sand, fine to medium.				D			
1.0	ALLUVIUM		GW	Trace cobbles and silt encountered from 0.6 m depth.							
1.5				No rootlets observed from 1.0 m depth.					MD-D		
2.0				Cobbles become minor from 1.6 m depth.				M			
				Depth of Excavation: 2 m Termination Condition: Target depth							

GEOTECH TEST PIT LOG 2019.11.27 - TEST PIT LOGS.GPJ NZ MASTER DATA TEMPLATE.GDT 4/12/19

Test pit met target depth
Scala Penetrometer met practical refusal.
Standing groundwater was not encountered.

TS = TOPSOIL



LOG OF TEST PIT TP03

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd Shear Vane No : N/A
Date : 25/11/2019 Logged By : KF
Max Test Pit Depth : 1.9 m Reviewed By : JW
Digger Type/Size : 24 Tonne Latitude : -43.625939
Bucket Type/Size : Bucket Excavator Longitude : 172.372464

Depth (m BGL)	Material	Excavatability (Relative Scale)	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remoulded (kPa)	Scala Penetrometer Blows per 100mm
		Easier	Harder								2 4 6 8 10 12
	TOPSOIL		ML	Sandy SILT with trace gravel and rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].				D	St-Vst		
0.5			SM	Silty fine to medium SAND with some gravel and trace rootlets; greyish brown. Well graded. Gravel, fine to medium, subangular to subrounded.					MD-D		
1.0	ALLUVIUM		GW	Sandy fine to coarse GRAVEL with trace silt; grey. Well graded, subangular to subrounded. Sand, fine to coarse.				M	MD-D		
1.5				Trace cobbles encountered from 1.7 m depth.							
2.0				Depth of Excavation: 1.9 m Termination Condition: Target depth							

GEOTECH TEST PIT LOG 2019.11.27 - TEST PIT LOGS.GPJ NZ MASTER DATA TEMPLATE.GDT 4/12/19

Test pit met target depth
Scala Penetrometer met practical refusal.
Standing groundwater was not encountered.

Noticeable sand increase from 0.8 m depth.



LOG OF TEST PIT TP04

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd Shear Vane No : N/A
Date : 25/11/2019 Logged By : KF
Max Test Pit Depth : 2 m Reviewed By : JW
Digger Type/Size : 24 Tonne Latitude : -43.6271
Bucket Type/Size : Bucket Excavator Longitude : 172.374267

Depth (m BGL)	Material	Excavatability (Relative Scale)	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remoulded (kPa)	Scala Penetrometer Blows per 100mm
		Easier	Harder								2 4 6 8 10 12
	TS		ML	SILT with some sand, trace gravel and rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].				D	F-St		
0.5			GW	Sandy fine to medium GRAVEL with some silt and trace rootlets; greyish brown. Well graded, subangular to subrounded.					MD-D		
			SM	Silty fine to medium SAND with minor gravel; greyish brown. Well graded. Gravel, fine to medium, subangular to subrounded.					MD-D		
1.0	ALLUVIUM		GW	Sandy fine to coarse GRAVEL with trace cobbles; grey. Well graded, subangular to subrounded. Sand, fine to coarse.				M	MD-D		
1.5											
2.0											
Depth of Excavation: 2 m Termination Condition: Target depth											

GEOTECH TEST PIT LOG 2019.11.27 - TEST PIT LOGS.GPJ NZ MASTER DATA TEMPLATE.GDT 4/12/19

Test pit met target depth
Scala Penetrometer met practical refusal.
Standing groundwater was not encountered.

TS = TOPSOIL
Noticeable sand increase from 0.9 m depth.



LOG OF TEST PIT TP05

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd Shear Vane No : N/A
Date : 25/11/2019 Logged By : KF
Max Test Pit Depth : 1.8 m Reviewed By : JW
Digger Type/Size : 24 Tonne Latitude : -43.626522
Bucket Type/Size : Bucket Excavator Longitude : 172.375592

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/Remoulded (kPa)	Scala Penetrometer Blows per 100mm
	TS			ML	SILT with some sand, trace gravel and rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].				D	F-St		2 4 6 8 10 12
0.5	ALLUVIUM			GW	Sandy fine to coarse GRAVEL with some silt and trace rootlets; greyish brown. Well graded, subangular to subrounded. Sand, fine to medium.				M	MD-D		
1.0					Trace cobbles and silt encountered from 0.6 m depth.							
1.5					No rootlets observed from 0.9 m depth.							
					Becomes grey from 1.4 m depth.							
					Cobbles become minor from 1.7 m depth.							
2.0					Depth of Excavation: 1.8 m Termination Condition: Target depth							

GEOTECH TEST PIT LOG 2019.11.27 - TEST PIT LOGS.GPJ NZ MASTER DATA TEMPLATE.GDT 4/12/19

Test pit met target depth
Scala Penetrometer met practical refusal.
Standing groundwater was not encountered.

TS = TOPSOIL



LOG OF TEST PIT TP06

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd Shear Vane No : N/A
Date : 25/11/2019 Logged By : KF
Max Test Pit Depth : 1.9 m Reviewed By : JW
Digger Type/Size : 24 Tonne Latitude : -43.626028
Bucket Type/Size : Bucket Excavator Longitude : 172.376879

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
		Easier	Harder								2 4 6 8 10 12
	TS		ML	SILT with some sand, trace gravel and rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].				D	F-St		
0.5				Sandy fine to coarse GRAVEL with some silt and trace rootlets; greyish brown. Well graded, subangular to subrounded. Sand, fine to medium. No silt encountered from 0.4 m depth.							
1.0	ALLUVIUM		GW	Cobbles become minor from 0.9 m depth. Sand becomes some from 1.2 m depth. No rootlets observed from 1.6 m depth.			M	MD-D			
2.0				Depth of Excavation: 1.9 m Termination Condition: Target depth							

GEOTECH TEST PIT LOG 2019.11.27 - TEST PIT LOGS.GPJ NZ MASTER DATA TEMPLATE.GDT 4/12/19

Test pit met target depth
Scala Penetrometer met practical refusal.
Standing groundwater was not encountered.

TS = TOPSOIL



LOG OF TEST PIT TP07

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd Shear Vane No : N/A
Date : 25/11/2019 Logged By : KF
Max Test Pit Depth : 1.8 m Reviewed By : JW
Digger Type/Size : 24 Tonne Latitude : -43.626164
Bucket Type/Size : Bucket Excavator Longitude : 172.377786

Depth (m BGL)	Material	Excavatability (Relative Scale)	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remoulded (kPa)	Scala Penetrometer Blows per 100mm
		Easier	Harder								2 4 6 8 10 12
	TS		ML	SILT with some sand, trace gravel and rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].				D	F-St		
0.5			GW	Sandy fine to coarse GRAVEL with some silt and trace cobbles; greyish brown. Well graded, subangular to subrounded. Sand, fine to medium.							
				Cobbles become minor from 0.6 m depth.							
				Sand becomes some from 0.8 m depth.							
1.0	ALLUVIUM						M		MD-D		
1.5											
2.0				Depth of Excavation: 1.8 m Termination Condition: Target depth							

Test pit met target depth
Scala Penetrometer met practical refusal.
Standing groundwater was not encountered.

TS = TOPSOIL



LOG OF TEST PIT TP08

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd Shear Vane No : N/A
Date : 25/11/2019 Logged By : KF
Max Test Pit Depth : 1.8 m Reviewed By : JW
Digger Type/Size : 24 Tonne Latitude : -43.626906
Bucket Type/Size : Bucket Excavator Longitude : 172.377587

Depth (m BGL)	Material	Excavatability (Relative Scale)	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remoulded (kPa)	Scala Penetrometer Blows per 100mm
		Easier	Harder								2 4 6 8 10 12
	TS		ML	SILT with some sand, trace gravel and rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].				D	F-St		
0.5											
1.0	ALLUVIUM		GW	Sandy fine to coarse GRAVEL with some silt, trace cobbles and rootlets; greyish brown. Well graded, subangular to subrounded. Sand, fine to coarse. No rootlets observed from 0.4 m depth.			M	MD-D			
1.5											
2.0				Becomes grey and some sand from 1.2 m depth.							
				Depth of Excavation: 1.8 m Termination Condition: Target depth							

Test pit met target depth
Scala Penetrometer met practical refusal.
Standing groundwater was not encountered.

TS = TOPSOIL



LOG OF TEST PIT TP09

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd Shear Vane No : N/A
Date : 25/11/2019 Logged By : KF
Max Test Pit Depth : 2 m Reviewed By : JW
Digger Type/Size : 24 Tonne Latitude : -43.626677
Bucket Type/Size : Bucket Excavator Longitude : 172.376622

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/Remoulded (kPa)	Scala Penetrometer Blows per 100mm
		Easier										2 4 6 8 10 12
	TS			ML	Sandy SILT with trace gravel and rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].				D	F-St		
0.5				GW	Sandy fine to medium GRAVEL with some silt and trace rootlets; greyish brown. Well graded, subangular to subrounded. Sand, fine to medium. No silt encountered from 0.6 m depth. Trace cobbles encountered from 0.8 m depth.				M	MD-D		
1.0	ALLUVIUM			GW	Sandy fine to coarse GRAVEL with trace cobbles; grey. Well graded, subangular to subrounded. Sand, fine to coarse.					MD-D		
1.5												
2.0					Depth of Excavation: 2 m Termination Condition: Target depth							

GEOTECH TEST PIT LOG 2019.11.27 - TEST PIT LOGS.GPJ NZ MASTER DATA TEMPLATE.GDT 4/12/19

Test pit met target depth
Scala Penetrometer met practical refusal.
Standing groundwater was not encountered.

TS = TOPSOIL
Noticeable sand increase from 1.7 m depth.



LOG OF TEST PIT TP10

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd Shear Vane No : N/A
Date : 25/11/2019 Logged By : KF
Max Test Pit Depth : 1.9 m Reviewed By : JW
Digger Type/Size : 24 Tonne Latitude : -43.627457
Bucket Type/Size : Bucket Excavator Longitude : 172.376289

Depth (m BGL)	Material	Excavatability (Relative Scale)	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remoulded (kPa)	Scala Penetrometer Blows per 100mm
		Easier	Harder								2 4 6 8 10 12
	TOPSOIL		ML	Sandy SILT with trace gravel and rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].				D	St-Vst		
0.5	ALLUVIUM		GW	Sandy fine to coarse GRAVEL with trace silt; greyish brown. Well graded, subangular to subrounded. Sand, fine to coarse. No silt and trace cobbles encountered from 0.6 m depth. Sand becomes some from 1.0 m depth.				M	MD-D		
2.0				Depth of Excavation: 1.9 m Termination Condition: Target depth							

GEOTECH TEST PIT LOG 2019.11.27 - TEST PIT LOGS.GPJ NZ MASTER DATA TEMPLATE.GDT 4/12/19

Test pit met target depth
Scala Penetrometer met practical refusal.
Standing groundwater was not encountered.



LOG OF TEST PIT TP11

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd Shear Vane No : N/A
Date : 26/11/2019 Logged By : KF
Max Test Pit Depth : 1.9 m Reviewed By : JW
Digger Type/Size : 24 Tonne Latitude : -43.627275
Bucket Type/Size : Bucket Excavator Longitude : 172.375259

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/Remoulded (kPa)	Scala Penetrometer Blows per 100mm
	TS			ML	SILT with some sand, trace gravel and rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].					F-St		
				GW	Sandy fine to medium GRAVEL with some silt and trace rootlets; greyish brown. Well graded, subangular to subrounded. Sand, fine to medium.				D	MD-D		
0.5				ML	SILT with some sand and trace gravel; brownish grey. Low plasticity. Sand, fine.					St-VSt		
1.0	ALLUVIUM			GW	Sandy fine to coarse GRAVEL with some silt; greyish brown with orange mottles. Well graded, subangular to subrounded. Sand, fine to medium. No silt encountered from 0.8 m depth.							
1.5					Sand becomes fine to coarse from 1.0 m depth.				M	MD-D		
					Trace cobbles encountered from 1.2 m depth.							
					Sand becomes some from 1.8 m depth.							
2.0					Depth of Excavation: 1.9 m Termination Condition: Target depth							

GEOTECH TEST PIT LOG 2019.11.27 - TEST PIT LOGS.GPJ NZ MASTER DATA TEMPLATE.GDT 4/12/19

Test pit met target depth
Scala Penetrometer met practical refusal.
Standing groundwater was not encountered.

TS = TOPSOIL



LOG OF TEST PIT TP12

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd Shear Vane No : N/A
Date : 26/11/2019 Logged By : KF
Max Test Pit Depth : 2 m Reviewed By : JW
Digger Type/Size : 24 Tonne Latitude : -43.628017
Bucket Type/Size : Bucket Excavator Longitude : 172.374975

Depth (m BGL)	Material	Excavatability (Relative Scale)	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remoulded (kPa)	Scala Penetrometer Blows per 100mm
		Easier	Harder								2 4 6 8 10 12
	TS		ML	SILT with some sand, trace gravel and rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].					F-St		
			GW	Fine to medium GRAVEL with some sand, silt and trace rootlets; greyish brown. Well graded, subangular to subrounded. Sand, fine.				D	MD-D		
0.5				Sandy fine to coarse GRAVEL with trace rootlets; grey. Well graded, subangular to subrounded. Sand, fine to coarse.							
1.0	ALLUVIUM		GW	No rootlets observed from 0.8 m depth. Trace cobbles encountered from 1.0 m depth.				M	MD-D		
1.5				Cobbles become minor from 1.5 m depth.				W			
2.0				Depth of Excavation: 2 m Termination Condition: Target depth							

GEOTECH TEST PIT LOG 2019.11.27 - TEST PIT LOGS.GPJ NZ MASTER DATA TEMPLATE.GDT 4/12/19

Test pit met target depth
Scala Penetrometer met practical refusal.
Standing groundwater was not encountered.

TS = TOPSOIL



LOG OF TEST PIT TP13

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd Shear Vane No : N/A
Date : 26/11/2019 Logged By : KF
Max Test Pit Depth : 2 m Reviewed By : JW
Digger Type/Size : 24 Tonne Latitude : -43.627819
Bucket Type/Size : Bucket Excavator Longitude : 172.373988

Depth (m BGL)	Material	Excavatability (Relative Scale)	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remoulded (kPa)	Scala Penetrometer Blows per 100mm
		Easier	Harder								2 4 6 8 10 12
	TS		ML	SILT with some sand, trace gravel and rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].					F-St		
0.5			GW	Sandy fine to medium GRAVEL with some silt and trace rootlets; greyish brown with orange mottles. Well graded, subangular to subrounded. Sand, fine. Sand becomes some from 0.4 m depth.				D	MD-D		
1.0	ALLUVIUM		GW	Sandy fine to coarse GRAVEL; greyish brown. Well graded, subangular to subrounded. Sand, fine to coarse.				M	MD-D		
1.5				Trace cobbles encountered from 1.6 m depth.							
2.0				Depth of Excavation: 2 m Termination Condition: Target depth							

GEOTECH TEST PIT LOG 2019.11.27 - TEST PIT LOGS.GPJ NZ MASTER DATA TEMPLATE.GDT 4/12/19

Test pit met target depth
Scala Penetrometer met practical refusal.
Standing groundwater was not encountered.

TS = TOPSOIL
Noticeable sand increase from 0.7 m depth.



LOG OF TEST PIT TP14

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd Shear Vane No : N/A
Date : 26/11/2019 Logged By : KF
Max Test Pit Depth : 2 m Reviewed By : JW
Digger Type/Size : 24 Tonne Latitude : -43.628684
Bucket Type/Size : Bucket Excavator Longitude : 172.374642

Depth (m BGL)	Material	Excavatability (Relative Scale)	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remoulded (kPa)	Scala Penetrometer Blows per 100mm
		Easier	Harder								2 4 6 8 10 12
	TS		ML	SILT with some sand, trace gravel and rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].					F-St		
0.5			GW	Fine to medium GRAVEL with some sand and silt; brownish grey. Well graded, subangular to subrounded. Sand, fine to medium.				D	MD-D		
1.0	ALLUVIUM		GW	Sandy fine to coarse GRAVEL with trace cobbles; grey. Well graded, subangular to subrounded. Sand, fine to coarse.							
1.5			GW	Cobbles become minor from 1.1 m depth.				M	MD-D		
2.0				Depth of Excavation: 2 m Termination Condition: Target depth							

GEOTECH TEST PIT LOG 2019.11.27 - TEST PIT LOGS.GPJ NZ MASTER DATA TEMPLATE.GDT 4/12/19

Test pit met target depth
Scala Penetrometer met practical refusal.
Standing groundwater was not encountered.

TS = TOPSOIL



LOG OF TEST PIT TP15

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd Shear Vane No : N/A
Date : 26/11/2019 Logged By : KF
Max Test Pit Depth : 2 m Reviewed By : JW
Digger Type/Size : 24 Tonne Latitude : -43.628875
Bucket Type/Size : Bucket Excavator Longitude : 172.375619

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/Remoulded (kPa)	Scala Penetrometer Blows per 100mm
	TS			ML	SILT with some sand, trace gravel and rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].				D	F-St		
0.5				GW	Sandy fine to medium GRAVEL with some silt and trace rootlets; brownish grey. Well graded, subangular to subrounded. Sand, fine to medium. Trace silt and sand becomes some from 0.4 m depth. Trace rootlets observed from 0.6 m depth.			M	MD-D			
1.0	ALLUVIUM			GW	Fine to coarse GRAVEL with some sand and trace cobbles; grey. Well graded, subangular to subrounded.			W	MD-D			
1.5				GW								
2.0					Depth of Excavation: 2 m Termination Condition: Target depth							

GEOTECH TEST PIT LOG 2019.11.27 - TEST PIT LOGS.GPJ NZ MASTER DATA TEMPLATE.GDT 4/12/19

Test pit met target depth
Scala Penetrometer met practical refusal.
Standing groundwater was not encountered.

TS = TOPSOIL
Loosely packed gravel encountered from 1.4 to 2.0 m depth.



LOG OF TEST PIT TP16

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd Shear Vane No : N/A
Date : 26/11/2019 Logged By : KF
Max Test Pit Depth : 2 m Reviewed By : JW
Digger Type/Size : 24 Tonne Latitude : -43.628098
Bucket Type/Size : Bucket Excavator Longitude : 172.375881

Depth (m BGL)	Material	Excavatability (Relative Scale)	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remoulded (kPa)	Scala Penetrometer Blows per 100mm
		Easier Harder									2 4 6 8 10 12
	TS		ML	SILT with some sand, trace gravel and rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].				D	F-St		
0.5				Sandy fine to medium GRAVEL with some silt and trace rootlets; greyish brown. Well graded, subangular to subrounded. Sand, fine.							
1.0	ALLUVIUM		GW	Silt becomes trace from 0.6 m depth. Gravel becomes fine to coarse from 0.8 m depth. Trace cobbles encountered from 1.0 m depth.			M	MD-D			
1.5				Cobbles become minor from 1.4 m depth.							
2.0				Depth of Excavation: 2 m Termination Condition: Target depth							

Test pit met target depth
Scala Penetrometer met practical refusal.
Standing groundwater was not encountered.

TS = TOPSOIL



LOG OF TEST PIT TP17

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd Shear Vane No : N/A
Date : 26/11/2019 Logged By : KF
Max Test Pit Depth : 2 m Reviewed By : JW
Digger Type/Size : 24 Tonne Latitude : -43.628312
Bucket Type/Size : Bucket Excavator Longitude : 172.376954

Depth (m BGL)	Material	Excavatability (Relative Scale)	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remoulded (kPa)	Scala Penetrometer Blows per 100mm
		Easier	Harder								2 4 6 8 10 12
	TS		ML	SILT with some sand, trace gravel and rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].					F-St		
			GW	Fine to medium GRAVEL with some sand, silt and trace rootlets; brownish grey. Well graded, subangular to subrounded. Sand, fine.				D	MD-D		
0.5											
	ALLUVIUM		GW	Sandy fine to coarse GRAVEL with trace rootlets; grey. Well graded, subangular to subrounded. Sand, fine to coarse. Sand becomes some from 0.8 m depth. No rootlets observed from 0.9 m depth. Trace cobbles encountered from 1.1 m depth. Cobbles become minor from 1.6 m depth.				M	MD-D		
1.0											
1.5											
2.0											
				Depth of Excavation: 2 m Termination Condition: Target depth							

GEOTECH TEST PIT LOG 2019.11.27 - TEST PIT LOGS.GPJ NZ MASTER DATA TEMPLATE.GDT 4/12/19

Test pit met target depth
Scala Penetrometer met practical refusal.
Standing groundwater was not encountered.

TS = TOPSOIL



LOG OF TEST PIT TP18

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd Shear Vane No : N/A
Date : 26/11/2019 Logged By : KF
Max Test Pit Depth : 2 m Reviewed By : JW
Digger Type/Size : 24 Tonne Latitude : -43.627512
Bucket Type/Size : Bucket Excavator Longitude : 172.377228

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
		Easier	Harder									Blows per 100mm
	TS			ML	SILT with some sand, trace gravel and rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].					F-St		2 4 6 8 10 12
				GW	Fine to medium GRAVEL with some sand, silt and trace rootlets; brownish grey. Well graded, subangular to subrounded. Sand, fine.				D	MD-D		
0.5					Sandy fine to coarse GRAVEL with trace rootlets; grey. Well graded, subangular to subrounded. Sand, fine to coarse. Sand becomes trace from 0.6 to 0.7 m depth.							
1.0				GW	Trace cobbles encountered from 0.8 m depth.					MD-D		
1.5									M			
2.0					Sand becomes trace from 1.8 m depth.							
					Depth of Excavation: 2 m Termination Condition: Target depth							

GEOTECH TEST PIT LOG 2019.11.27 - TEST PIT LOGS.GPJ NZ MASTER DATA TEMPLATE.GDT 4/12/19

Test pit met target depth
Scala Penetrometer met practical refusal.
Standing groundwater was not encountered.

TS = TOPSOIL



LOG OF TEST PIT TP19

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd Shear Vane No : N/A
Date : 26/11/2019 Logged By : KF
Max Test Pit Depth : 2 m Reviewed By : JW
Digger Type/Size : 24 Tonne Latitude : -43.627741
Bucket Type/Size : Bucket Excavator Longitude : 172.378285

Depth (m BGL)	Material	Excavatability (Relative Scale)	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remoulded (kPa)	Scala Penetrometer Blows per 100mm
		Easier Harder									2 4 6 8 10 12
	TS		ML	SILT with some sand, trace gravel and rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].					F-St		
0.5				Sandy fine to medium GRAVEL with some silt and trace rootlets; greyish brown. Well graded, subangular to subrounded. Sand, fine to medium.				D			
				No rootlets or silt observed from 0.6 m depth.							
1.0			GW	Gravel and sand become fine to coarse from 0.8 m depth.					MD-D		
				Sand becomes some and trace cobbles encountered from 1.0 m depth.				M			
1.5											
2.0				Sand becomes trace from 1.7 m depth.							
				Depth of Excavation: 2 m Termination Condition: Target depth							

GEOTECH TEST PIT LOG 2019.11.27 - TEST PIT LOGS.GPJ NZ MASTER DATA TEMPLATE.GDT 4/12/19

Test pit met target depth
Scala Penetrometer met practical refusal.
Standing groundwater was not encountered.

TS = TOPSOIL
Loosely packed gravel encountered from 1.7 to 2.0 m depth.



LOG OF TEST PIT TP20

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd Shear Vane No : N/A
Date : 26/11/2019 Logged By : KF
Max Test Pit Depth : 1.8 m Reviewed By : JW
Digger Type/Size : 24 Tonne Latitude : -43.627003
Bucket Type/Size : Bucket Excavator Longitude : 172.378526

Depth (m BGL)	Material	Excavatability (Relative Scale)	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remoulded (kPa)	Scala Penetrometer Blows per 100mm
	TS	Easier	ML	SILT with some sand, trace gravel and rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].				D	S-F		2 4 6 8 10 12
0.5			GW	Fine to medium GRAVEL with some sand, silt and trace rootlets; greyish brown. Well graded, subangular to subrounded. No silt encountered from 0.4 m depth.					MD-D		
1.0	ALLUVIUM		GW	Sandy fine to coarse GRAVEL with trace cobbles; grey. Well graded, subangular to subrounded. Sand, fine to coarse.			M		MD-D		
1.5											
2.0				Depth of Excavation: 1.8 m Termination Condition: Target depth							

Test pit met target depth
Scala Penetrometer met practical refusal.
Standing groundwater was not encountered.

TS = TOPSOIL



LOG OF TEST PIT TP21

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd Shear Vane No : N/A
Date : 26/11/2019 Logged By : KF
Max Test Pit Depth : 1.9 m Reviewed By : JW
Digger Type/Size : 24 Tonne Latitude : -43.629026
Bucket Type/Size : Bucket Excavator Longitude : 172.37652

Depth (m BGL)	Material	Excavatability (Relative Scale)	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remoulded (kPa)	Scala Penetrometer Blows per 100mm
		Easier	Harder								2 4 6 8 10 12
	TS		ML	SILT with some sand, trace gravel and rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].					F-St		
0.5			GW	Fine to medium GRAVEL with some sand, silt and trace rootlets; greyish brown. Well graded, subangular to subrounded. No silt encountered from 0.4 m depth.				D	MD-D		
1.0	ALLUVIUM		GW	Sandy fine to coarse GRAVEL; grey. Well graded, subangular to subrounded. Sand, fine to coarse. Trace cobbles encountered from 1.0 m depth.							
1.5			GW	Sand becomes some from 1.3 m depth.				M	MD-D		
2.0				Depth of Excavation: 1.9 m Termination Condition: Target depth							

GEOTECH TEST PIT LOG 2019.11.27 - TEST PIT LOGS.GPJ NZ MASTER DATA TEMPLATE.GDT 4/12/19

Test pit met target depth
Scala Penetrometer met practical refusal.
Standing groundwater was not encountered.

TS = TOPSOIL



LOG OF TEST PIT TP22

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd **Shear Vane No** : N/A
Date : 26/11/2019 **Logged By** : KF
Max Test Pit Depth : 1.9 m **Reviewed By** : JW
Digger Type/Size : 24 Tonne **Latitude** : -43.62955
Bucket Type/Size : Bucket Excavator **Longitude** : 172.375318

Depth (m BGL)	Material	Excavatability (Relative Scale)	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remoulded (kPa)	Scala Penetrometer Blows per 100mm
		Easier	Harder								2 4 6 8 10 12
	TS		ML	SILT with some sand, trace gravel and rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].					F-St		
			ML	Sandy SILT with trace rootlets; light greyish brown. Low plasticity. Sand, fine to medium.				D	F-St		
0.5				Fine to medium GRAVEL with some sand and silt; brownish grey. Well graded, subangular to subrounded. Sand, fine to medium. No silt encountered from 0.6 m depth.							
1.0	ALLUVIUM		GW	Gravel and sand become fine to coarse from 0.8 m depth.							
				Sand becomes trace from 1.1 to 1.3 m depth.					MD-D		
1.5				Trace cobbles encountered from 1.4 m depth.				M			
2.0				Depth of Excavation: 1.9 m Termination Condition: Target depth							

GEOTECH TEST PIT LOG 2019.11.27 - TEST PIT LOGS.GPJ NZ MASTER DATA TEMPLATE.GDT 4/12/19

Test pit met target depth
Scala Penetrometer met practical refusal.
Standing groundwater was not encountered.

TS = TOPSOIL



LOG OF TEST PIT TP23

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd Shear Vane No : N/A
Date : 26/11/2019 Logged By : KF
Max Test Pit Depth : 1.9 m Reviewed By : JW
Digger Type/Size : 24 Tonne Latitude : -43.630024
Bucket Type/Size : Bucket Excavator Longitude : 172.377367

Depth (m BGL)	Material	Excavatability (Relative Scale)	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remoulded (kPa)	Scala Penetrometer Blows per 100mm
	TS	Easier	ML	SILT with some sand, trace gravel and rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].					F-St		
0.5				Fine to coarse GRAVEL with some sand, silt and trace rootlets; greyish brown. Well graded, subangular to subrounded. Sand, fine to medium.				D			
1.0	ALLUVIUM		GW	No silt encountered from 0.5 m depth. Trace cobbles encountered from 0.6 m depth.					MD-D		
1.5				No rootlets observed from 1.0 m depth.				M			
2.0				Cobbles become minor from 1.3 m depth.							
				Depth of Excavation: 1.9 m Termination Condition: Target depth							

GEOTECH TEST PIT LOG 2019.11.27 - TEST PIT LOGS.GPJ NZ MASTER DATA TEMPLATE.GDT 4/12/19

Test pit met target depth
Scala Penetrometer met practical refusal.
Standing groundwater was not encountered.

TS = TOPSOIL



LOG OF TEST PIT TP24

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd Shear Vane No : N/A
Date : 26/11/2019 Logged By : KF
Max Test Pit Depth : 2 m Reviewed By : JW
Digger Type/Size : 24 Tonne Latitude : -43.629807
Bucket Type/Size : Bucket Excavator Longitude : 172.376332

Depth (m BGL)	Material	Excavatability (Relative Scale)	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remoulded (kPa)	Scala Penetrometer Blows per 100mm
		Easier	Harder								2 4 6 8 10 12
	TS		ML	SILT with some sand, trace gravel and rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].					F-St		
			ML	Sandy SILT with trace gravel and rootlets; greyish brown. Low plasticity. Sand, fine.					St-H		
0.5			GW	Fine to medium GRAVEL with some sand and silt; brownish grey. Well graded, subangular to subrounded. Sand, fine to medium.				D	MD-D		
1.0	ALLUVIUM		GW	Sandy fine to coarse GRAVEL with trace cobbles; grey. Well graded, subangular to subrounded. Sand, fine to coarse.							
1.5				Becomes moist from 1.0 m depth.							
				Sand becomes trace from 1.2 to 1.4 m depth.							
				Sand becomes trace from 1.8 to 2.0 m depth.			M		MD-D		
2.0				Depth of Excavation: 2 m Termination Condition: Target depth							

GEOTECH TEST PIT LOG 2019.11.27 - TEST PIT LOGS.GPJ NZ MASTER DATA TEMPLATE.GDT 4/12/19

Test pit met target depth
Scala Penetrometer met practical refusal.
Standing groundwater was not encountered.

TS = TOPSOIL



LOG OF TEST PIT TP25

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd Shear Vane No : N/A
Date : 26/11/2019 Logged By : KF
Max Test Pit Depth : 2 m Reviewed By : JW
Digger Type/Size : 24 Tonne Latitude : -43.630517
Bucket Type/Size : Bucket Excavator Longitude : 172.376123

Depth (m BGL)	Material	Excavatability (Relative Scale)	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remoulded (kPa)	Scala Penetrometer Blows per 100mm
		Easier	Harder								2 4 6 8 10 12
	TS		ML	SILT with some sand, trace gravel and rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].					F-St		
0.5			GW	Fine to medium GRAVEL with some sand, silt and trace rootlets; greyish brown. Well graded, subangular to subrounded. Sand, fine. No silt observed from 0.4 m depth.				D	MD-D		
1.0	ALLUVIUM		GW	Sandy fine to coarse GRAVEL with some sand, silt and trace rootlets; greyish brown. Well graded, subangular to subrounded. Sand, fine. Trace cobbles encountered from 0.9 m depth.				M	MD-D		
1.5				Cobbles become minor from 1.4 m depth.							
2.0				Depth of Excavation: 2 m Termination Condition: Target depth							

GEOTECH TEST PIT LOG 2019.11.27 - TEST PIT LOGS.GPJ NZ MASTER DATA TEMPLATE.GDT 4/12/19

Test pit met target depth
Scala Penetrometer met practical refusal.
Standing groundwater was not encountered.

TS = TOPSOIL



LOG OF TEST PIT TP26

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd Shear Vane No : N/A
Date : 27/11/2019 Logged By : KF
Max Test Pit Depth : 2 m Reviewed By : JW
Digger Type/Size : 24 Tonne Latitude : -43.630801
Bucket Type/Size : Bucket Excavator Longitude : 172.377121

Depth (m BGL)	Material	Excavatability (Relative Scale)	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remoulded (kPa)	Scala Penetrometer Blows per 100mm
		Easier	Harder								2 4 6 8 10 12
	TS		ML	SILT with some sand, trace gravel and rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].					St-Vst		
0.5			GW	Fine to medium GRAVEL with some sand, silt and trace rootlets; greyish brown. Well graded, subangular to subrounded. Sand, fine to medium. No rootlets observed from 0.4 m depth.				D	MD-D		
1.0	ALLUVIUM		GW	Fine to coarse GRAVEL with some sand and trace rootlets; grey. Well graded, subangular to subrounded. Sand, fine to coarse.							
1.5			GW	Trace cobbles encountered from 1.4 m depth.				M	MD-D		
2.0				Depth of Excavation: 2 m Termination Condition: Target depth							

GEOTECH TEST PIT LOG 2019.11.27 - TEST PIT LOGS.GPJ NZ MASTER DATA TEMPLATE.GDT 4/12/19

Test pit met target depth
Scala Penetrometer met practical refusal.
Standing groundwater was not encountered.

TS = TOPSOIL



LOG OF TEST PIT TP27

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd Shear Vane No : N/A
Date : 27/11/2019 Logged By : KF
Max Test Pit Depth : 2 m Reviewed By : JW
Digger Type/Size : 24 Tonne Latitude : -43.631612
Bucket Type/Size : Bucket Excavator Longitude : 172.376997

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/Remoulded (kPa)	Scala Penetrometer Blows per 100mm
		Easier										2 4 6 8 10 12
	TS			ML	SILT with some sand, trace gravel and rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].					F-St		
				GW	Fine to medium GRAVEL with some sand, silt and trace rootlets; greyish brown. Well graded, subangular to subrounded. Sand, fine to medium.				D	MD-D		
0.5					Fine to coarse GRAVEL with some sand, trace cobbles and rootlets; grey. Well graded, subangular to subrounded. Sand, fine to coarse.							
1.0	ALLUVIUM			GW					M	MD-D		
1.5					Cobbles become minor from 1.4 m depth.							
2.0					Depth of Excavation: 2 m Termination Condition: Target depth							

GEOTECH TEST PIT LOG 2019.11.27 - TEST PIT LOGS.GPJ NZ MASTER DATA TEMPLATE.GDT 4/12/19

Test pit met target depth
Scala Penetrometer met practical refusal.
Standing groundwater was not encountered.

TS = TOPSOIL



LOG OF TEST PIT TP28

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd Shear Vane No : N/A
Date : 27/11/2019 Logged By : KF
Max Test Pit Depth : 2 m Reviewed By : JW
Digger Type/Size : 24 Tonne Latitude : -43.632226
Bucket Type/Size : Bucket Excavator Longitude : 172.377512

Depth (m BGL)	Material	Excavatability (Relative Scale)	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remoulded (kPa)	Scala Penetrometer Blows per 100mm
		Easier	Harder								2 4 6 8 10 12
	TS		ML	SILT with some sand, trace gravel and rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].					St-VSt		
0.5			GW	Fine to medium GRAVEL with some sand, silt and trace rootlets; greyish brown. Well graded, subangular to subrounded. Sand, fine.					MD-D		
1.0	ALLUVIUM		GW	Fine to coarse GRAVEL with some sand; grey. Well graded, subangular to subrounded. Sand, fine to coarse. Trace cobbles encountered from 0.7 m depth.				D			
1.5				Trace rootlets observed from 1.4 to 1.6 m depth.					L-MD		
2.0				Becomes brownish grey from 1.7 m depth.			M				
				Depth of Excavation: 2 m Termination Condition: Target depth							

GEOTECH TEST PIT LOG 2019.11.27 - TEST PIT LOGS.GPJ NZ MASTER DATA TEMPLATE.GDT 4/12/19

Test pit met target depth
Scala Penetrometer met practical refusal.
Standing groundwater was not encountered.

TS = TOPSOIL
Loosely packed gravel encountered from 0.5 to 1.0 m depth.



LOG OF TEST PIT TP29

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd **Shear Vane No** : N/A
Date : 27/11/2019 **Logged By** : KF
Max Test Pit Depth : 2 m **Reviewed By** : JW
Digger Type/Size : 24 Tonne **Latitude** : -43.632008
Bucket Type/Size : Bucket Excavator **Longitude** : 172.378017

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/Remoulded (kPa)	Scala Penetrometer Blows per 100mm
	TS			ML	SILT with some sand, trace gravel and rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].					F-St		2 4 6 8 10 12
				GW	Fine to medium GRAVEL with some sand and silt; greyish brown. Well graded, subangular to subrounded. Sand, fine.				D	MD-D		
0.5				GW	Fine to coarse GRAVEL with some sand and trace cobbles; brownish grey. Well graded, subangular to subrounded. Sand, fine to coarse.					MD-D		
1.0	ALLUVIUM			GW	Sandy fine to coarse GRAVEL with trace cobbles; grey. Well graded, subangular to subrounded. Sand, fine to coarse.				M	MD-D		
1.5												
2.0					Becomes wet from 1.8 m depth. Cobbles become minor from 1.9 m depth.			W				
Depth of Excavation: 2 m Termination Condition: Target depth												

GEOTECH TEST PIT LOG 2019.11.27 - TEST PIT LOGS.GPJ NZ MASTER DATA TEMPLATE.GDT 4/12/19

Test pit met target depth
Scala Penetrometer met practical refusal.
Standing groundwater was not encountered.

TS = TOPSOIL



LOG OF TEST PIT TP30

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd Shear Vane No : N/A
Date : 27/11/2019 Logged By : KF
Max Test Pit Depth : 2 m Reviewed By : JW
Digger Type/Size : 24 Tonne Latitude : -43.631103
Bucket Type/Size : Bucket Excavator Longitude : 172.378188

Depth (m BGL)	Material	Excavatability (Relative Scale)	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remoulded (kPa)	Scala Penetrometer Blows per 100mm
		Easier	Harder								2 4 6 8 10 12
	TS		ML	SILT with some sand, trace gravel and rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].					F-St		
			GW	Fine to medium GRAVEL with some sand, silt and trace rootlets; greyish brown. Well graded, subangular to subrounded. Sand, fine.					MD-D		
0.5			GW	Fine to coarse GRAVEL with some sand and trace cobbles; brownish grey. Well graded, subangular to subrounded. Sand, fine to coarse.				D	MD-D		
1.0	ALLUVIUM		GW	Sandy fine to coarse GRAVEL with trace cobbles; grey. Well graded, subangular to subrounded. Sand, fine to coarse.							
1.5			GW	Trace cobbles encountered from 1.4 m depth.			M		MD-D		
2.0				Depth of Excavation: 2 m Termination Condition: Target depth							

GEOTECH TEST PIT LOG 2019.11.27 - TEST PIT LOGS.GPJ NZ MASTER DATA TEMPLATE.GDT 4/12/19

Test pit met target depth
Scala Penetrometer met practical refusal.
Standing groundwater was not encountered.

TS = TOPSOIL



LOG OF TEST PIT TP31

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd Shear Vane No : N/A
Date : 27/11/2019 Logged By : KF
Max Test Pit Depth : 1.9 m Reviewed By : JW
Digger Type/Size : 24 Tonne Latitude : -43.628972
Bucket Type/Size : Bucket Excavator Longitude : 172.378419

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/Remoulded (kPa)	Scala Penetrometer Blows per 100mm
	TS			ML	SILT with some sand, trace gravel and rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].					St-Vst		
0.5				GW	Fine to medium GRAVEL with some sand, silt and trace rootlets; brownish grey. Well graded, subangular to subrounded. Sand, fine to coarse.				D	MD-D		
					Becomes moist from 0.6 m depth.							
1.0				GW	Sandy fine to coarse GRAVEL with trace cobbles; grey. Well graded, subangular to subrounded. Sand, fine to coarse.				M	MD-D		
1.5					Gravel becomes fine to medium from 1.4 to 1.6 m depth.							
2.0					Depth of Excavation: 1.9 m Termination Condition: Target depth							

GEOTECH TEST PIT LOG 2019.11.27 - TEST PIT LOGS.GPJ NZ MASTER DATA TEMPLATE.GDT 4/12/19

Test pit met target depth
Scala Penetrometer met practical refusal.
Standing groundwater was not encountered.

TS = TOPSOIL



LOG OF TEST PIT TP32

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd Shear Vane No : N/A
Date : 27/11/2019 Logged By : KF
Max Test Pit Depth : 2 m Reviewed By : JW
Digger Type/Size : 24 Tonne Latitude : -43.630257
Bucket Type/Size : Bucket Excavator Longitude : 172.378612

Depth (m BGL)	Material	Excavatability (Relative Scale)	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remoulded (kPa)	Scala Penetrometer Blows per 100mm
		Easier Harder									2 4 6 8 10 12
	TS		ML	SILT with some sand, trace gravel and rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].					St-VSt		
0.5				Fine to medium GRAVEL with some sand, silt and trace rootlets; greyish brown. Well graded, subangular to subrounded. Sand, fine to medium.							
1.0	ALLUVIUM		GW	Gravel and sand become fine to coarse from 0.6 m depth. No silt encountered from 0.7 m depth.				D	MD-D		
1.5				Cobbles become minor from 1.5 m depth.				M			
2.0				Sand becomes trace from 1.8 m depth.							
				Depth of Excavation: 2 m Termination Condition: Target depth							

GEOTECH TEST PIT LOG 2019.11.27 - TEST PIT LOGS.GPJ NZ MASTER DATA TEMPLATE.GDT 4/12/19

Test pit met target depth
Scala Penetrometer met practical refusal.
Standing groundwater was not encountered.

TS = TOPSOIL



LOG OF TEST PIT TP33

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd Shear Vane No : N/A
Date : 05/12/2019 Logged By : KF/CR
Max Test Pit Depth : 2 m Reviewed By : JW
Digger Type/Size : 24 Tonne Latitude : -43.625244
Bucket Type/Size : Bucket Excavator Longitude : 172.377003

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/Remoulded (kPa)	Scala Penetrometer Blows per 100mm
	TS			ML	SILT with some sand, trace gravel and rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].					F-St		
0.5				GW	Fine to coarse GRAVEL with some sand and silt; greyish brown. Well graded, subangular to subrounded. Sand, fine.				D	MD-D		
1.0	ALLUVIUM			GW	Sandy fine to coarse GRAVEL with trace cobbles; grey. Well graded, subangular to subrounded. Sand, fine to coarse.							
1.5				GW	Trace sand and gravel becomes fine to medium from 1.0 to 1.1 m depth.				M	MD-D		
2.0				GW	Cobbles become minor from 1.6 m depth.							
Depth of Excavation: 2 m Termination Condition: Target depth												

GEOTECH TEST PIT LOG 2019.12.XX - REMAINING TP LOGS.GPJ NZ MASTER DATA TEMPLATE.GDT 9/12/19

Test pit met target depth.
Scala Penetrometer met target depth
Standing groundwater was not encountered.

TS = TOPSOIL
Partial sidewall collapse observed from 0.8 to 1.2 m depth.



LOG OF TEST PIT TP34

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd Shear Vane No : N/A
Date : 05/12/2019 Logged By : KF/CR
Max Test Pit Depth : 2 m Reviewed By : JW
Digger Type/Size : 24 Tonne Latitude : -43.62571
Bucket Type/Size : Bucket Excavator Longitude : 172.37585

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/Remoulded (kPa)	Scala Penetrometer Blows per 100mm
	TS			ML	SILT with some sand, trace gravel and rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].					St-VSt		
0.5				GW	Fine to coarse GRAVEL with some sand, silt and trace cobbles; greyish brown. Well graded, subangular to subrounded. Sand, fine.				D	MD-D		
1.0												
1.5				GW	Sandy fine to coarse GRAVEL with trace cobbles; grey. Well graded, subangular to subrounded. Sand, fine to coarse.				M	MD-D		
2.0					Depth of Excavation: 2 m Termination Condition: Target depth							

GEOTECH TEST PIT LOG 2019.12.XX - REMAINING TP LOGS.GPJ NZ MASTER DATA TEMPLATE.GDT 9/12/19

Test pit met target depth.
Scala Penetrometer met target depth
Standing groundwater was not encountered.

TS = TOPSOIL



LOG OF TEST PIT TP35

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd Shear Vane No : N/A
Date : 05/12/2019 Logged By : KF/CR
Max Test Pit Depth : 2 m Reviewed By : JW
Digger Type/Size : 24 Tonne Latitude : -43.626261
Bucket Type/Size : Bucket Excavator Longitude : 172.374476

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/Remoulded (kPa)	Scala Penetrometer Blows per 100mm
	TS			ML	SILT with some sand, trace gravel and rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].					F-St		
0.5				GW	Fine to coarse GRAVEL with some sand and silt; greyish brown. Well graded, subangular to subrounded. Sand, fine. Becomes grey with trace cobbles and no silt from 0.4 m depth. Sand becomes fine to coarse from 0.6 m depth.			D		MD-D		
1.0								M				
1.5				GW	Sandy fine to coarse GRAVEL with trace cobbles; grey. Well graded, subangular to subrounded. Sand, fine to coarse. Cobbles become minor from 1.9 m depth.					MD-D		
2.0					Depth of Excavation: 2 m Termination Condition: Target depth							

GEOTECH TEST PIT LOG 2019.12.XX - REMAINING TP LOGS.GPJ NZ MASTER DATA TEMPLATE.GDT 9/12/19

Test pit met target depth.
Scala Penetrometer met target depth
Standing groundwater was not encountered.

TS = TOPSOIL



LOG OF TEST PIT TP36

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd Shear Vane No : N/A
Date : 05/12/2019 Logged By : KF/CR
Max Test Pit Depth : 2 m Reviewed By : JW
Digger Type/Size : 24 Tonne Latitude : -43.62611
Bucket Type/Size : Bucket Excavator Longitude : 172.373398

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/Remoulded (kPa)	Scala Penetrometer Blows per 100mm
	TS			ML	SILT with some sand, trace gravel and rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].					St-VSt		
0.5				GW	Sandy fine to coarse GRAVEL with some silt; greyish brown. Well graded, subangular to subrounded. Sand, fine.				D	MD-D		
				SW	Fine to coarse SAND with trace gravel; grey. Well graded.					MD-D		
1.0	ALLUVIUM			GW	Sandy fine to coarse GRAVEL with trace cobbles; grey. Well graded, subangular to subrounded. Sand, fine to coarse.				M	MD-D		
1.5												
2.0												
Depth of Excavation: 2 m Termination Condition: Target depth												

GEOTECH TEST PIT LOG 2019.12.XX - REMAINING TP LOGS.GPJ NZ MASTER DATA TEMPLATE.GDT 9/12/19

Test pit met target depth.
Scala Penetrometer met target depth
Standing groundwater was not encountered.

TS = TOPSOIL



LOG OF TEST PIT TP37

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd Shear Vane No : N/A
Date : 05/12/2019 Logged By : KF/CR
Max Test Pit Depth : 2 m Reviewed By : JW
Digger Type/Size : 24 Tonne Latitude : -43.625636
Bucket Type/Size : Bucket Excavator Longitude : 172.37306

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/Remoulded (kPa)	Scala Penetrometer Blows per 100mm
	TS			ML	SILT with some sand, trace gravel and rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].					F-St		
0.5				GW	Fine to coarse GRAVEL with some sand, silt and trace rootlets; greyish brown. Well graded, subangular to subrounded. Sand, fine.				D	MD-D		
1.0				GW	Sandy fine to coarse GRAVEL with trace cobbles; grey. Well graded, subangular to subrounded. Sand, fine to coarse.					MD-D		
1.5				GW	Fine to coarse GRAVEL with some sand and trace cobbles; grey. Well graded, subangular to subrounded. Sand, fine to coarse.			M		MD-D		
2.0					Sand becomes trace from 1.8 m depth.							
Depth of Excavation: 2 m Termination Condition: Target depth												

GEOTECH TEST PIT LOG 2019.12.XX - REMAINING TP LOGS.GPJ NZ MASTER DATA TEMPLATE.GDT 9/12/19

Test pit met target depth.
Scala Penetrometer met target depth
Standing groundwater was not encountered.

TS = TOPSOIL



LOG OF TEST PIT TP38

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd Shear Vane No : N/A
Date : 05/12/2019 Logged By : KF/CR
Max Test Pit Depth : 2 m Reviewed By : JW
Digger Type/Size : 24 Tonne Latitude : -43.625349
Bucket Type/Size : Bucket Excavator Longitude : 172.373725

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/Remoulded (kPa)	Scala Penetrometer Blows per 100mm
	TS			ML	SILT with some sand, trace gravel and rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].					St-Vst		
				GW	Fine to coarse GRAVEL with some sand, silt and trace rootlets; greyish brown. Well graded, subangular to subrounded. Sand, fine.				D	MD-D		
0.5					Sandy fine to coarse GRAVEL with trace cobbles; grey. Well graded, subangular to subrounded. Sand, fine to coarse.							
1.0	ALLUVIUM			GW	Sand becomes trace from 0.9 to 1.2 m depth.				M	MD-D		
1.5					Cobbles become minor from 1.4 m depth.							
2.0					No rootlets encountered from 1.6 m depth.							
Depth of Excavation: 2 m Termination Condition: Target depth												

GEOTECH TEST PIT LOG 2019.12.XX - REMAINING TP LOGS.GPJ NZ MASTER DATA TEMPLATE.GDT 9/12/19

Test pit met target depth.
Scala Penetrometer met target depth
Standing groundwater was not encountered.

TS = TOPSOIL



LOG OF TEST PIT TP39

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd Shear Vane No : N/A
Date : 05/12/2019 Logged By : KF/CR
Max Test Pit Depth : 2 m Reviewed By : JW
Digger Type/Size : 24 Tonne Latitude : -43.625512
Bucket Type/Size : Bucket Excavator Longitude : 172.374782

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
		Easier	Harder								2 4 6 8 10 12
	TS		ML	SILT with some sand, trace gravel and rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].					F-St		
0.5			GW	Fine to coarse GRAVEL with some sand and silt; greyish brown. Well graded, subangular to subrounded. Sand, fine to coarse.				D	MD-D		
1.0	ALLUVIUM		GW	Sandy fine to coarse GRAVEL with trace cobbles; brownish grey. Well graded, subangular to subrounded. Sand, fine to coarse.				M	MD-D		
1.5											
2.0											
Depth of Excavation: 2 m Termination Condition: Target depth											

Test pit met target depth.
Scala Penetrometer met target depth
Standing groundwater was not encountered.

TS = TOPSOIL



LOG OF TEST PIT TP40

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd **Shear Vane No** : N/A
Date : 05/12/2019 **Logged By** : KF/CR
Max Test Pit Depth : 2 m **Reviewed By** : JW
Digger Type/Size : 24 Tonne **Latitude** : -43.62479
Bucket Type/Size : Bucket Excavator **Longitude** : 172.375034

Depth (m BGL)	Material	Excavatability (Relative Scale)	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remoulded (kPa)	Scala Penetrometer Blows per 100mm
		Easier	Harder								2 4 6 8 10 12
	TS		ML	SILT with some sand and trace rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].					F-St		
			ML	SILT with some sand, trace gravel and rootlets; brown. Low plasticity. Sand, fine. Gravel becomes minor from 0.3 m depth.					St-VSt		
0.5			GW	Fine to coarse GRAVEL with some sand, silt and trace rootlets; brownish grey. Well graded, subangular to subrounded. Sand, fine to coarse.				D	MD-D		
1.0	ALLUVIUM		GW	Sandy fine to coarse GRAVEL with trace cobbles and rootlets; grey. Well graded, subangular to subrounded. Sand, fine to coarse.				M	MD-D		
1.5				Cobbles become minor from 1.6 m depth.							
2.0				Depth of Excavation: 2 m Termination Condition: Target depth							

GEOTECH TEST PIT LOG 2019.12.XX - REMAINING TP LOGS.GPJ NZ MASTER DATA TEMPLATE.GDT 9/12/19

Test pit met target depth.
Scala Penetrometer met target depth
Standing groundwater was not encountered.

TS = TOPSOIL



LOG OF TEST PIT TP41

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd Shear Vane No : N/A
Date : 05/12/2019 Logged By : KF/CR
Max Test Pit Depth : 2 m Reviewed By : JW
Digger Type/Size : 24 Tonne Latitude : -43.624988
Bucket Type/Size : Bucket Excavator Longitude : 172.376043

Depth (m BGL)	Material	Excavatability (Relative Scale)	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remoulded (kPa)	Scala Penetrometer Blows per 100mm
		Easier	Harder								2 4 6 8 10 12
	TS		ML	SILT with some sand and trace rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].					F-St		
0.5			GW	Fine to coarse GRAVEL with some sand; grey. Well graded, subangular to subrounded. Sand, fine to coarse.				D			
1.0	ALLUVIUM		GW	Sandy fine to coarse GRAVEL with trace cobbles; brownish grey. Well graded, subangular to subrounded. Sand, fine to coarse. Becomes moist from 1.0 m depth.				MD-D			
1.5							M				
2.0				Depth of Excavation: 2 m Termination Condition: Target depth							

Test pit met target depth.
Scala Penetrometer met target depth
Standing groundwater was not encountered.

TS = TOPSOIL



LOG OF TEST PIT TP42

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd Shear Vane No : N/A
Date : 05/12/2019 Logged By : KF/CR
Max Test Pit Depth : 2 m Reviewed By : JW
Digger Type/Size : 24 Tonne Latitude : -43.624293
Bucket Type/Size : Bucket Excavator Longitude : 172.376247

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/Remoulded (kPa)	Scala Penetrometer Blows per 100mm
		Easier										2 4 6 8 10 12
	TS			ML	SILT with some sand and trace rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].					F-St		
				GW	Fine to coarse GRAVEL with some sand, silt and trace rootlets; greyish brown. Well graded, subangular to subrounded. Sand, fine.				D	MD-D		
0.5					Sandy fine to coarse GRAVEL with trace cobbles and rootlets; grey. Well graded, subangular to subrounded. Sand, fine to coarse. Sand becomes trace from 0.7 m depth.							
1.0	ALLUVIUM			GW					M	MD-D		
1.5					Cobbles become minor from 1.4 m depth. No rootlets encountered from 1.6 m depth.							
2.0					Depth of Excavation: 2 m Termination Condition: Target depth							

GEOTECH TEST PIT LOG 2019.12.XX - REMAINING TP LOGS.GPJ NZ MASTER DATA TEMPLATE.GDT 9/12/19

Test pit met target depth.
Scala Penetrometer met target depth
Standing groundwater was not encountered.

TS = TOPSOIL
Partial sidewall collapse observed from 0.4 m depth.
Noticeable sand decrease from 0.7 m depth.



LOG OF TEST PIT TP43

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd Shear Vane No : N/A
Date : 05/12/2019 Logged By : KF/CR
Max Test Pit Depth : 2 m Reviewed By : JW
Digger Type/Size : 24 Tonne Latitude : -43.628731
Bucket Type/Size : Bucket Excavator Longitude : 172.377389

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/Remoulded (kPa)	Scala Penetrometer Blows per 100mm
		Easier										2 4 6 8 10 12
	TS			ML	SILT with some sand and trace rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].					F-St		
0.5				GW	Fine to coarse GRAVEL with some sand; grey. Well graded, subangular to subrounded. Sand, fine to coarse.				D	MD-D		
1.0	ALLUVIUM			GW	Sandy fine to coarse GRAVEL with trace cobbles; brownish grey. Well graded, subangular to subrounded. Sand, fine to coarse.				M	MD-D		
1.5												
2.0					Sand becomes trace from 1.6 to 1.8 m depth.							
					Depth of Excavation: 2 m Termination Condition: Target depth							

GEOTECH TEST PIT LOG 2019.12.XX - REMAINING TP LOGS.GPJ NZ MASTER DATA TEMPLATE.GDT 9/12/19

Test pit met target depth.
Scala Penetrometer met target depth
Standing groundwater was not encountered.

TS = TOPSOIL



LOG OF TEST PIT TP44

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd Shear Vane No : N/A
Date : 05/12/2019 Logged By : KF/CR
Max Test Pit Depth : 2 m Reviewed By : JW
Digger Type/Size : 24 Tonne Latitude : -43.628451
Bucket Type/Size : Bucket Excavator Longitude : 172.378087

Depth (m BGL)	Material	Excavatability (Relative Scale)	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remoulded (kPa)	Scala Penetrometer Blows per 100mm
		Easier	Harder								2 4 6 8 10 12
	TOPSOIL		ML	SILT with some sand and trace rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].					F-St		
0.5			GW	Fine to coarse GRAVEL with some sand; grey. Well graded, subangular to subrounded. Sand, fine to coarse.				D	MD-D		
1.0	ALLUVIUM		GW	Sandy fine to coarse GRAVEL with trace cobbles; grey. Well graded, subangular to subrounded. Sand, fine to coarse.				M	MD-D		
1.5											
2.0											
Depth of Excavation: 2 m Termination Condition: Target depth											

Test pit met target depth.
Scala Penetrometer met target depth
Standing groundwater was not encountered.



LOG OF TEST PIT TP45

Geotechnical Investigation
92 Dunns Crossing Road
Rolleston
12903

Client : Hughes Developments Ltd Shear Vane No : N/A
Date : 05/12/2019 Logged By : KF/CR
Max Test Pit Depth : 2.1 m Reviewed By : JW
Digger Type/Size : 24 Tonne Latitude : -43.62816
Bucket Type/Size : Bucket Excavator Longitude : 172.378736

Depth (m BGL)	Material	Excavatability (Relative Scale)	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remoulded (kPa)	Scala Penetrometer Blows per 100mm
	TS	Easier	ML	SILT with some sand and trace rootlets; brown. Low plasticity. Sand, fine [TOPSOIL].					F-St		2 4 6 8 10 12
0.5			GW	Fine to coarse GRAVEL with some sand, silt and trace rootlets; greyish brown. Well graded, subangular to subrounded. Sand, fine.				D	MD-D		
1.0	ALLUVIUM		GW	Sandy fine to coarse GRAVEL with trace cobbles and rootlets; grey. Well graded, subangular to subrounded. Sand, fine to coarse. Sand becomes trace from 1.0 to 1.1 m depth.				M	MD-D		
1.5			GW	Sand becomes trace from 1.5 to 1.7 m depth.							
2.0				Cobbles become minor from 1.8 m depth.							
				Depth of Excavation: 2.1 m Termination Condition: Target depth							

GEOTECH TEST PIT LOG 2019.12.XX - REMAINING TP LOGS.GPJ NZ MASTER DATA TEMPLATE.GDT 9/12/19

Test pit met target depth.
Scala Penetrometer met target depth
Standing groundwater was not encountered.

TS = TOPSOIL
Partial sidewall collapse observed from 0.8 m depth.

APPENDIX 3:
ECan Borelogs



Bore or Well No	BX23/0895		
Well Name	Selwyn Road		
Owner	Mike & Tania Croucher		
Well Number	BX23/0895	File Number	
Owner	Mike & Tania Croucher	Well Status	Active (exist, present)
Street/Road	Selwyn Road	NZTM Grid Reference	BX23:49887-68726
Locality	Springston	NZTM X and Y	1549887 - 5168726
Location Description		Location Accuracy	50 - 300m
CWMS Zone	Selwyn - Waihora	Use	Domestic and Stockwater,
Groundwater Allocation Zone	Selwyn-Waimakariri	Water Level Monitoring	--
Depth	53.50m	Water Level Count	1
Diameter	150mm	Initial Water Level	5.80m below MP
Measuring Point Description	Top of Casing	Highest Water Level	5.80m below MP
Measuring Point Elevation		Lowest Water Level	5.80m below MP
Elevation Accuracy		First reading	06 May 2019
Ground Level	0.45m below MP	Last reading	06 May 2019
Strata Layers	9	Calc Min 95%	
Aquifer Name		Aquifer Tests	0
Aquifer Type		Yield Drawdown Tests	1
Drill Date	16 Apr 2019	Max Tested Yield	
Driller	Clemence Drilling Contractors	Drawdown at Max Tested Yield	
Drilling Method	Rotary/Percussion	Specific Capacity	0.56 l/s/m
Casing Material	Steel	Last Updated	01 Oct 2019
Pump Type		Last Field Check	06 May 2019
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	Stainless steel	51.5	53.5				

Step Tests

Step Test Date	Step	Yield	Yield GPM	DrawDown	Step Duration
06 May 2019	1	2.5	32.99546	4.5	15

Borelog for well BX23/0895

Grid Reference (NZTM): 1549888 mE, 5168727 mN

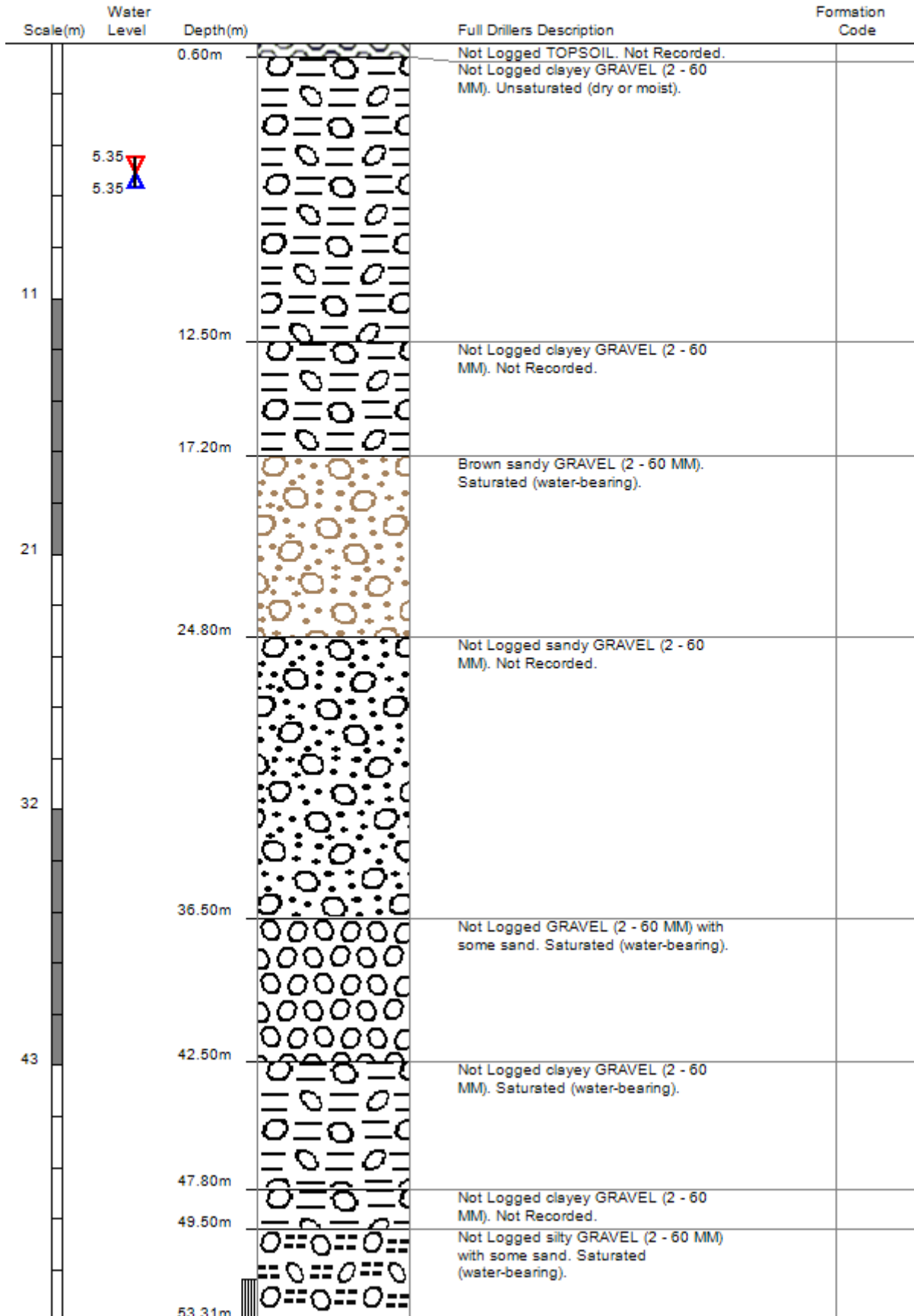
Location Accuracy: 50 - 300m

Ground Level Altitude: m +MSD Accuracy:

Driller: Clemence Drilling Contractors

Drill Method: Rotary/Percussion

Borelog Depth: 53.3 m Drill Date: 16-Apr-2019





Bore or Well No	M36/4387		
Well Name	DUNNS CROSSING RD		
Owner	Mr & Mrs I G & D C Robertson		
Well Number	M36/4387	File Number	CO6C/02792
Owner	Mr & Mrs I G & D C Robertson	Well Status	Active (exist, present)
Street/Road	DUNNS CROSSING RD	NZTM Grid Reference	BX23:49703-68988
Locality	ROLLESTON	NZTM X and Y	1549703 - 5168988
Location Description		Location Accuracy	2 - 15m
CWMS Zone	Selwyn - Waihora	Use	Domestic Supply,
Groundwater Allocation Zone	Selwyn-Waimakariri	Water Level Monitoring	--
Depth	35.60m	Water Level Count	0
Diameter	200mm	Initial Water Level	5.65m below MP
Measuring Point Description		Highest Water Level	
Measuring Point Elevation	36.46m above MSL (Lyttelton 1937)	Lowest Water Level	
Elevation Accuracy	< 2.5 m	First reading	
Ground Level	0.00m above MP	Last reading	
Strata Layers	5	Calc Min 95%	6.50m below MP
Aquifer Name		Aquifer Tests	0
Aquifer Type	Unknown	Yield Drawdown Tests	2
Drill Date	11 Oct 1991	Max Tested Yield	18 l/s
Driller	McMillan Drilling Ltd	Drawdown at Max Tested Yield	10 m
Drilling Method	Rotary/Percussion	Specific Capacity	1.64 l/s/m
Casing Material	STEEL	Last Updated	08 Nov 2013
Pump Type	Unknown	Last Field Check	
Water Use Data	Yes		

Borelog for well M36/4387

Grid Reference (NZTM): 1549704 mE, 5168988 mN

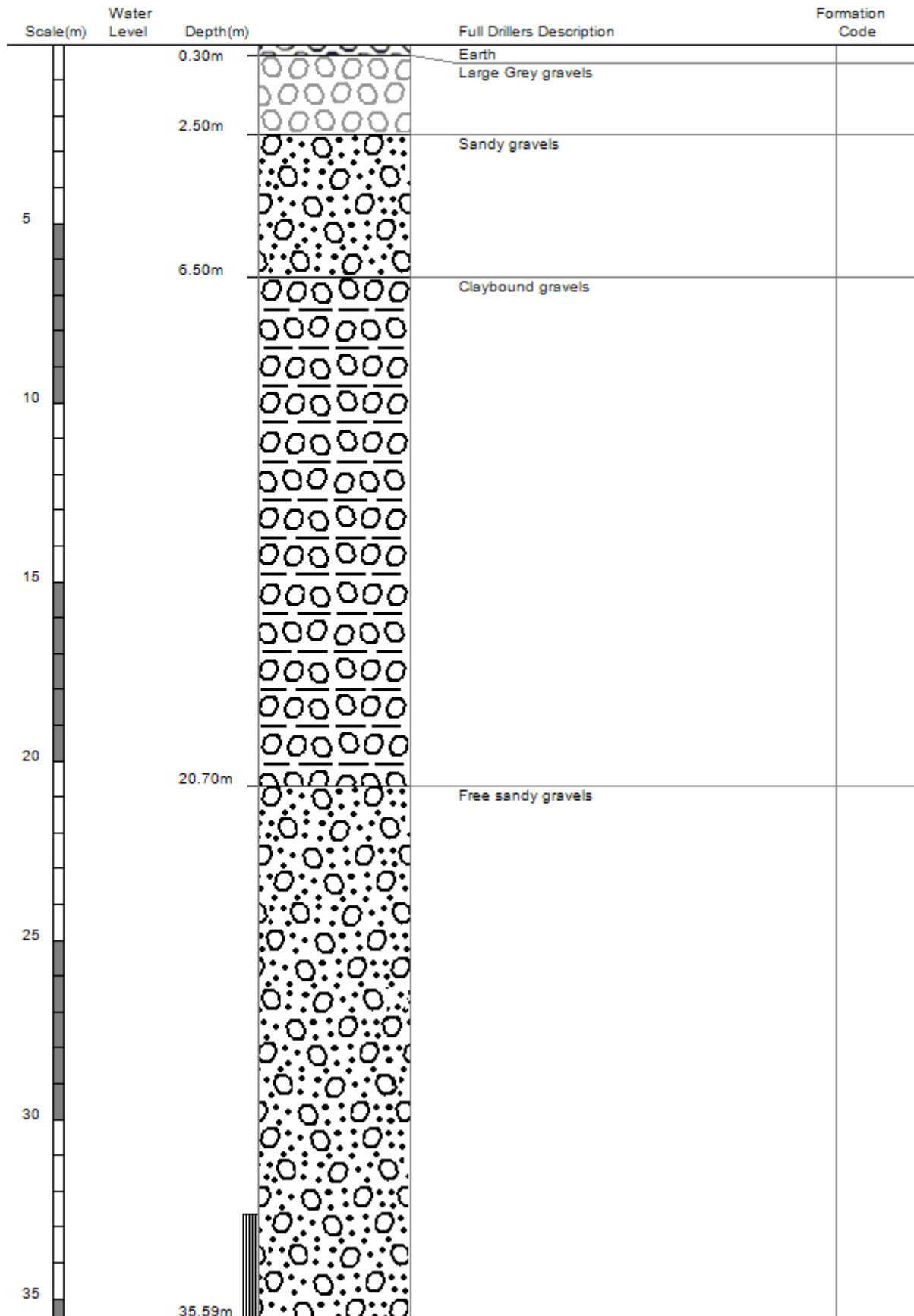
Location Accuracy: 2 - 15m

Ground Level Altitude: 36.5 m +MSD Accuracy: < 2.5 m

Driller: McMillan Drilling Ltd

Drill Method: Rotary/Percussion

Borelog Depth: 35.6 m Drill Date: 11-Oct-1991





Bore or Well No	M36/4449		
Well Name	DUNNS CROSSING RD		
Owner	TYACK GJ & FR		
Well Number	M36/4449	File Number	CO6C/02046
Owner	TYACK GJ & FR	Well Status	Not Used
Street/Road	DUNNS CROSSING RD	NZTM Grid Reference	BX23:49508-69470
Locality	ROLLESTON	NZTM X and Y	1549508 - 5169470
Location Description	LOT 1	Location Accuracy	50 - 300m
CWMS Zone	Selwyn - Waihora	Use	Irrigation,
Groundwater Allocation Zone	Selwyn-Waimakariri	Water Level Monitoring	--
Depth	24.20m	Water Level Count	0
Diameter	150mm	Initial Water Level	
Measuring Point Description		Highest Water Level	
Measuring Point Elevation	38.81m above MSL (Lyttelton 1937)	Lowest Water Level	
Elevation Accuracy	< 2.5 m	First reading	
Ground Level	0.00m above MP	Last reading	
Strata Layers	9	Calc Min 95%	7.70m below MP
Aquifer Name	Riccarton Gravel	Aquifer Tests	0
Aquifer Type	Unknown	Yield Drawdown Tests	1
Drill Date	09 Jun 1992	Max Tested Yield	6 l/s
Driller	Dynes Road Drilling	Drawdown at Max Tested Yield	5 m
Drilling Method	Cable Tool	Specific Capacity	1.36 l/s/m
Casing Material		Last Updated	08 Nov 2013
Pump Type	Unknown	Last Field Check	
Water Use Data	No		

Borelog for well M36/4449

Grid Reference (NZTM): 1549508 mE, 5169471 mN

Location Accuracy: 50 - 300m

Ground Level Altitude: 38.8 m +MSD Accuracy: < 2.5 m

Driller: Dynes Road Drilling

Drill Method: Cable Tool

Borelog Depth: 24.2 m Drill Date: 09-Jun-1992



Scale(m)	Water Level	Depth(m)	Full Drillers Description	Formation Code
			Medium-small gravel	
5		8.00m	Medium-small gravel,very open	
10		10.00m	Medium-small gravel	
		12.00m	Claybound small-medium gravel	
15		14.00m	Small to large sandy gravel	
		18.00m	Medium gravel,Water-bearing	
20		20.00m	Small-medium gravel, clean, open	
		22.00m	Small to medium gravel, stained	
		24.00m		



Bore or Well No	M36/4450		
Well Name	DUNNS CROSSING RD		
Owner	Mr & Mrs L K & J C Blackmore		
Well Number	M36/4450	File Number	CO6C/02046
Owner	Mr & Mrs L K & J C Blackmore	Well Status	Active (exist, present)
Street/Road	DUNNS CROSSING RD	NZTM Grid Reference	BX23:49388-69660
Locality	ROLLESTON	NZTM X and Y	1549388 - 5169660
Location Description	DP61278 LOT 2	Location Accuracy	50 - 300m
CWMS Zone	Selwyn - Waihora	Use	Irrigation,
Groundwater Allocation Zone	Selwyn-Waimakariri	Water Level Monitoring	--
Depth	25.20m	Water Level Count	0
Diameter	150mm	Initial Water Level	
Measuring Point Description		Highest Water Level	
Measuring Point Elevation	39.62m above MSL (Lyttelton 1937)	Lowest Water Level	
Elevation Accuracy	< 2.5 m	First reading	
Ground Level	0.00m above MP	Last reading	
Strata Layers	8	Calc Min 95%	8.10m below MP
Aquifer Name	Riccarton Gravel	Aquifer Tests	0
Aquifer Type	Unknown	Yield Drawdown Tests	1
Drill Date	09 Apr 1992	Max Tested Yield	6 l/s
Driller	Dynes Road Drilling	Drawdown at Max Tested Yield	6 m
Drilling Method	Cable Tool	Specific Capacity	1.00 l/s/m
Casing Material		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	Stainless steel	23.2	25.2				

Step Tests

Step Test Date	Step	Yield	Yield GPM	DrawDown	Step Duration
09 Apr 1992	1	6.1	80.50892	6.1	0

No comments for this well

Borelog for well M36/4450

Grid Reference (NZTM): 1549388 mE, 5169661 mN

Location Accuracy: 50 - 300m

Ground Level Altitude: 39.6 m +MSD Accuracy: < 2.5 m

Driller: Dynes Road Drilling

Drill Method: Cable Tool

Borelog Depth: 26.5 m Drill Date: 09-Apr-1992



Scale(m)	Water Level	Depth(m)	Full Drillers Description	Formation Code
			Medium to small gravel	
5		8.00m	Small to medium gravel, clay	
10		12.00m	Clay, small to medium gravel	
15		18.00m	Pea gravel and sand	
20		20.00m	Pea gravel, sand, water	
		22.00m	Tight clay and sand	
25		24.00m	Medium to small gravel, open water	
		26.00m	Tight clay and sand	
		26.50m		



Bore or Well No	M36/7416		
Well Name	SELWYN ROAD		
Owner	Kilsyth Limited		
Well Number	M36/7416	File Number	CO6C/20361
Owner	Kilsyth Limited	Well Status	Active (exist, present)
Street/Road	SELWYN ROAD	NZTM Grid Reference	BX23:49058-68781
Locality	ROLLESTON	NZTM X and Y	1549058 - 5168781
Location Description		Location Accuracy	50 - 300m
CWMS Zone	Selwyn - Waihora	Use	Irrigation,
Groundwater Allocation Zone	Selwyn-Waimakariri	Water Level Monitoring	--
Depth	46.90m	Water Level Count	0
Diameter	200mm	Initial Water Level	5.50m below MP
Measuring Point Description	ToC	Highest Water Level	
Measuring Point Elevation	35.86m above MSL (Lyttelton 1937)	Lowest Water Level	
Elevation Accuracy	< 5 m	First reading	
Ground Level	0.32m below MP	Last reading	
Strata Layers	13	Calc Min 95%	11.10m below MP
Aquifer Name		Aquifer Tests	0
Aquifer Type		Yield Drawdown Tests	1
Drill Date	18 Aug 2003	Max Tested Yield	
Driller	McMillan Drilling Ltd	Drawdown at Max Tested Yield	
Drilling Method	Rotary/Percussion	Specific Capacity	3.83 l/s/m
Casing Material	STEEL	Last Updated	08 Nov 2013
Pump Type		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	Stainless steel	44.9	46.9				

Step Tests

Step Test Date	Step	Yield	Yield GPM	DrawDown	Step Duration
18 Aug 2003	1	15.91128	209.999985	4.15	3

Borelog for well M36/7416 page 1 of 2

Grid Reference (NZTM): 1549058 mE, 5168781 mN

Location Accuracy: 50 - 300m

Ground Level Altitude: 35.5 m +MSD Accuracy: < 0.5 m

Driller: McMillan Drilling Ltd

Drill Method: Rotary/Percussion

Borelog Depth: 47.7 m Drill Date: 18-Aug-2003



Scale(m)	Water Level	Depth(m)	Full Drillers Description	Formation Code
		0.30m	Earth and gravels	
		0.30m	Earth and gravels	
			Sandy gravels	
5		5.60m	Sandy gravels	
		5.60m	Wet claybound sandy gravels	
10		11.00m	Wet claybound sandy gravels	
		11.00m	Water-bearing claybound sandy gravels	
		13.10m	Water-bearing claybound sandy gravels	
		13.10m	Water-bearing claybound sandy gravels	
15		14.70m	Water-bearing claybound sandy gravels	
		14.70m	Medium water-bearing stained gravels, some sand	
		16.80m	Medium water-bearing stained gravels, some sand	
		16.80m	Small to medium water-bearing gravels	
20		19.70m	Small to medium water-bearing gravels	
		19.70m	Medium water-bearing stained gravels	
		22.50m	Medium water-bearing stained gravels	
		22.50m	water-bearing sandy gravels	

Bore or Well No	M36/20535		
Well Name	870 Goulds Road		
Owner	Mr S & Mrs M Baxter		
Well Number	M36/20535	File Number	CO6C/31914
Owner	Mr S & Mrs M Baxter	Well Status	Active (exist, present)
Street/Road	870 Goulds Road	NZTM Grid Reference	BX23:50017-69231
Locality	Rolleston	NZTM X and Y	1550017 - 5169231
Location Description		Location Accuracy	10 - 50m
CWMS Zone	Selwyn - Waihora	Use	Domestic and Stockwater,
Groundwater Allocation Zone	Selwyn-Waimakariri	Water Level Monitoring	--
Depth	30.00m	Water Level Count	0
Diameter	150mm	Initial Water Level	7.10m below MP
Measuring Point Description		Highest Water Level	
Measuring Point Elevation	35.00m 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 95%	
Aquifer Name		Aquifer Tests	0
Aquifer Type		Yield Drawdown Tests	0
Drill Date	04 Feb 2011	Max Tested Yield	
Driller	Daly Water Wells Ltd	Drawdown at Max Tested Yield	
Drilling Method	Rotary Rig	Specific Capacity	
Casing Material	STEEL	Last Updated	07 Dec 2011
Pump Type		Last Field Check	
Water Use Data	No		

No screen data for this well

No step tests for this well

Borelog for well M36/20535

Grid Reference (NZTM): 1550018 mE, 5169231 mN
Location Accuracy: 10 - 50m
Ground Level Altitude: 35.0 m +MSD Accuracy: < 0.5 m
Driller: Daly Water Wells Ltd
Drill Method: Rotary Rig
Borelog Depth: 30.0 m Drill Date: 04-Feb-2011

