



ENGEO

— Expect Excellence —

Geotechnical Investigation

Faringdon Subdivision

697 Selwyn Road & 417 Springston-Rolleston Road

Rolleston

Submitted to:

Hughes Developments Ltd
Canterbury

ENGEO Limited

124 Montreal Street, Sydenham, Christchurch 8023
PO Box 373, Christchurch 8140, New Zealand
Tel +64 3 328 9012 Fax +64 3 328 9013
www.engeo.co.nz

12.12.2016
12903.000.000_6/02



Contents

1	Introduction.....	4
2	Site Description	4
3	Proposed Development.....	5
4	Geological Model	5
4.1	Regional Geology.....	5
4.2	Geomorphology.....	5
4.3	Geohazards.....	6
4.3.1	Seismicity	6
4.3.2	Liquefaction and Lateral Spreading	6
4.4	Site Investigation	6
4.5	ECan Boreholes	7
4.6	Groundwater.....	8
4.7	Site Seismic Class	8
5	Liquefaction Assessment	9
6	RMA Section 106 Requirements and Suitability to Subdivide	9
7	Geotechnical Recommendations	9
7.1	Earthworks	9
7.2	Subdivision Roding	10
7.3	Stormwater Control	10
7.4	Foundations.....	10
8	References	11
9	Limitations	12

Tables

Table 1: Generalised Summary of Subsurface Conditions

Figures

Figure 1: Site Location

Figure 2: Nearby ECan Borehole Locations

Appendices (at the rear of this report)

Appendix 1: Test Location Plan

Appendix 2: Test Pit and Hand Auger Borehole Logs

Appendix 3: ECan Boreholes

ENGEO Document Control:

Report Title	Geotechnical Investigation - Faringdon Subdivision, 697 Selwyn Road & 417 Springston-Rolleston Road				
Project No.	12903.000.000	Phase & Doc ID	6/02		
Client	Hughes Developments Ltd	Client Contact	Kelvin Back		
Distribution (PDF)	Hughes Developments Ltd				
Date	Revision Details/Status		WP	Author	Reviewer
12/12/2016	Final		NF	JW	GM

1 Introduction

ENGEO Ltd was requested by Hughes Developments Ltd to undertake a Geotechnical Investigation for the proposed Faringdon Subdivision, at the sections currently denoted as 697 Selwyn Road and 417 Springston-Rolleston Road, Rolleston, as outlined in our variation proposals (ref. P2016.000.248, dated 17 November and 2 December 2016). The testing and reporting for both sections has been combined in the following document.

The purpose of this investigation was to determine 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 up to 14 hand augers and Scala Penetrometer tests to a maximum depth of approximately 0.9 m below ground level to assess the near surface material types and strength characteristics;
- Organise and technically supervise the excavation of up to 14 test pits to a maximum depth of 2 m, including geotechnical logging of the exposed soils; and
- Prepare a report outlining our findings on the ground conditions and the suitability of the site for residential subdivision. This will include 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.

2 Site Description

The two sites proposed to be subdivided are located approximately 3.1 km south-east of Rolleston town centre and are bound to the south by Selwyn road, the east by Springston-Rolleston Road, and farmland to the north and west (Figure 1).

The site comprises approximately 10 ha of relatively flat ground currently occupied by two residential dwellings, with associated gardens and lawn areas, and a number of barn and shed structures. The remainder of the site is currently used for a mixture of grazing and cropping, with well-established shelter belts and pine stands.

There are no significant watercourses in the area and the site is outside of any ECan defined flood zones as indicated in the Selwyn District Council (SDC) Operative District Plan (SDC, 2015).

CERA has categorised the site as 'N/A Rural & Unmapped', meaning future development can proceed following normal consenting processes.

Figure 1: Site Location



Image obtained from Google Earth.

3 Proposed Development

It is understood the site (currently comprising two lots) is to be subdivided into approximately 150 residential lots (to be confirmed).

4 Geological Model

4.1 Regional Geology

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

4.2 Geomorphology

The site comprises relatively flat ground, with gentle undulations and depressions in some areas. As evident on aerial imagery (Canterbury Maps, 2016) and observed during our site walkover conducted on 8 December 2016, undulating and depressed ground can be attributed to paleo-channels, which traverse the site in a general northwest to southeast trend. Based on observations, silt and sand deposits with variable thickness (up to 0.9 m) are expected to have in-filled the paleo-channels. Inferred paleo-channels have been mapped to give an indication of areas with potential channel in-fill (Appendix 1).

A shallow depression in the south-eastern corner of the site had shallow pooled water and a stand of willow trees. The depression is approximately 600 mm lower than the surrounding ground. A trash pit was observed on the north-eastern side of 417 Springston-Rolleston road.

4.3 Geohazards

4.3.1 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 10 km northwest / west of the site and trends roughly east-west with a surface rupture of approximately 28 km (GNS, 2015), while the Port Hills Fault remains unmapped as the fault did not rupture at the surface. Movement on the Port Hills Fault is believed to have occurred at a depth of 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).

4.3.2 Liquefaction and Lateral Spreading

The site is located within an area mapped as 'damaging liquefaction unlikely' (CGD Map 5140, 2014).

Aerial photography available on the CGD and taken in the days following the September 2010 seismic event shows no sign of any ejected sand and silt at the site and surrounding areas.

4.4 Site Investigation

Site investigations to assess the shallow subsurface material types and strength characteristics were undertaken by ENGEO between 5 December and 8 December 2016. The investigations comprised of 14 hand augers Scala Penetrometer tests, and logging of materials from 14 machine excavated test pits.

The investigations revealed subsurface conditions across the site are consistent with the published geological mapping, as summarised in Table 1.

Investigations undertaken within or adjacent to inferred paleo-channels revealed deeper silt deposits to depths up to 0.9 m.

Table 1: Generalised Summary of Subsurface Conditions

Soil Type	Depth to top of layer (m)	Layer Thickness (m)	Density/Consistency	Comment
Topsoil	0.0	0.2 – 0.3	Stiff to Very Stiff	-
SILT	0.2 – 0.4	0.1 – 0.5	Very Stiff to Hard	Not encountered in all test pits
Sandy GRAVEL	0.2 – 0.8	Unknown	Very Dense	-

“Good ground” (as defined in NZS 3604:2010) under static conditions was typically encountered immediately beneath the topsoil layer (typically 0.2 m) and at a maximum depth of 0.4 m below ground level.

Test Locations are shown on Figure 1, Appendix 1. Test pit and hand auger hole logs, showing detailed soil descriptions are presented in Appendix 2.

4.5 ECan Boreholes

A review of three representative deep ECan borehole logs on the site and in the surrounding area has been conducted. The logs from these holes are presented in Appendix 4 and indicate the site is underlain by a mixture of silt bound gravels to depths of at least 37 m below ground level.

Figure 2: Nearby ECan Borehole Locations



All images sourced from Google Maps. Not to scale.

4.6 Groundwater

Groundwater is recorded in the ECan borehole M36/7928 at 7.6 m depth.

4.7 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'.

5 Liquefaction Assessment

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

6 RMA Section 106 Requirements 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 the land is likely to be subject to the following:

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

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 any of the above hazards and as such, the site is considered suitable for subdivision from a geotechnical perspective.

7 Geotechnical Recommendations

7.1 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 Earthfilling for Residential Development. In particular, any areas to receive fill should be stripped of any 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. Filling should be limited to no more than 600 mm above existing ground level without referring the matter 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 of 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 inspections/testing regime agreed, along with a robust erosion and sediment control plan.

7.2 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. The shallow depression and trash pit noted in Section 4.2 of this document may require further excavation and backfilling during construction.

7.3 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.

7.4 Foundations

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

An Ultimate Bearing Capacity of 300kPa may be assumed for foundations bearing on natural sandy gravel or engineered fill, below any topsoil or non-engineered fill.

8 References

Canterbury Earthquake Recovery Authority. (2016). Canterbury Geotechnical Database. Retrieved April 2016, from <https://canterburyrecovery.projectorbit.com/cgd>

Forsyth, P., Barrell, D. J., & Jongens, R. (2008). Sheet 16 - Geology of the Christchurch Area 1:250,000. Lower Hutt: Institute of Geological and Nuclear Sciences.

GNS Science, Earthquake Commission. (n.d.). Aftershocks. Retrieved 2013, from Geonet: www.geonet.org.nz/canterbury-quakes/aftershocks

GNS Science (2015). New Zealand Active Faults Database. Retrieved 2016, from <http://data.gns.cri.nz/af/>

NZS 1170.5:2004. Structural Design Actions Part 5: Earthquake Actions – New Zealand.

NZS 3604:2010. Timber Framed Buildings.

NZS 4404:2010. Land Development and Subdivision Infrastructure.

NZS 4431:1989. Code of Practice for Earthfilling for Residential Development

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

Selwyn District Council (2015), Selwyn District Council Operative District Plan. Retrieved 2016, from <http://www.selwyn.govt.nz/services/planning/district-plan>

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

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

9 Limitations

- i. We have prepared this report in accordance with the brief as provided. This report has been prepared for the use of our client, 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 IPENZ / ACENZ Standard Terms of Engagement.
- v. This report is not to be reproduced either wholly or in part without our prior written permission.

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

Report prepared by



Jed Watts

Engineering Geologist

Report reviewed by



Greg Martin, PEngGeol

Principal Engineering Geologist

APPENDIX 1:
Test Location Plan



-								
Rev	Date	Description					Drwn	Ckld



Christchurch Office
124 Montreal Street
Sydenham, Christchurch 8023
Tel: 03 328 9012
www.engeo.co.nz

Title:	
--------	--

TEST LOCATION PLAN

Client: HUGHES DEVELOPMENTS		Figure No:	
Project: FARINGDON SUBDIVISION 694 SELWYN ROAD 417 SPRINGSTON-ROLLESTON ROAD	Designed: JW	1	Size: A3
	Drawn: JW		
	Checked: -		
	Date: 13.04.16		
Proj No: 12903.000.000	Scale: 1:4000	Rev: 0	

APPENDIX 2:

Test Pit and Hand Auger Hole Logs

LOG OF TEST PIT TP01

Faringdon Subdivision
694 Selwyn Road
Rolleston
12903

Client : Hughes Development Ltd
Date : 05/12/16
Max Test Pit Depth : 2 m
Digger Type/Size : Bucket Excavator
Bucket Type/Size : 3 tooth 300 mm

Shear Vane No :
Logged By : RB
Reviewed By : JW
Latitude :
Longitude :

Depth (m)	Material	Excavatability (Relative Scale)	USCS Symbol	DESCRIPTION	Graphic Symbol	Water Level	Moisture Cond.	Consistency/Density Index	Shear Vane Undrained Shear Strength Peak/Remolded (kPa)	Scala Penetrometer
		Easier	Harder							Blows per 100mm
										2 4 6 8 10 12
	TS		ML	SILT with trace gravel, sand and rootlets; brown. Low plasticity [TOPSOIL].				H		
0.5				Sandy fine to coarse GRAVEL with minor cobbles; brownish grey. Well graded, subrounded. Sand, fine to coarse, well graded. Pit walls are vertical and tightly packed.				D		
1.0	ALLUVIUM		GW			M				
1.5										
2.0										
2.5				Depth of Excavation: 2 m Termination Condition: Target depth						

GEOSCIENCE TEST PIT LOG. BLANK TEMPLATE.GPJ NZ MASTER DATA TEMPLATE.GDT 9/12/16

Test pit met target depth at 2.0 m.
Scala Penetrometer met practical refusal
Standing groundwater was not encountered

TS = TOPSOIL

LOG OF TEST PIT TP02

Faringdon Subdivision
694 Selwyn Road
Rolleston
12903

Client : Hughes Development Ltd
Date : 05/12/16
Max Test Pit Depth : 2 m
Digger Type/Size : Bucket Excavator
Bucket Type/Size : 4 tooth 500 mm

Shear Vane No :
Logged By : RB
Reviewed By : JW
Latitude :
Longitude :

Depth (m)	Material	Excavatability (Relative Scale)	USCS Symbol	DESCRIPTION	Graphic Symbol	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Undrained Shear Strength Peak/Remolded (kPa)	Scala Penetrometer Blows per 100mm
		Easier	Harder							2 4 6 8 10 12
	TS		ML	SILT with trace gravel, sand and rootlets; brown. Low plasticity [TOPSOIL].				F-St		
			ML	SILT; greyish brown. Low plasticity.				VSt-H		
0.5							M			
1.0	ALLUVIUM		GW	Sandy fine to coarse GRAVEL with minor cobbles; brownish grey. Well graded, subrounded. Sand, fine to coarse, well graded. Pit walls are vertical and tightly packed. Becomes wet from 0.9 m depth.						
1.5							W			
2.0										
2.5										
Depth of Excavation: 2 m Termination Condition: Target depth										

GEOSCIENCE TEST PIT LOG. BLANK TEMPLATE.GPJ NZ MASTER DATA TEMPLATE.GDT 9/12/16

Test pit met target depth at 2.0 m.
Scala Penetrometer met practical refusal
Standing groundwater was not encountered

TS = TOPSOIL

LOG OF TEST PIT TP03

Faringdon Subdivision
694 Selwyn Road
Rolleston
12903

Client : Hughes Development Ltd
Date : 05/12/16
Max Test Pit Depth : 2 m
Digger Type/Size : Bucket Excavator
Bucket Type/Size : 4 tooth 500 mm

Shear Vane No :
Logged By : RB
Reviewed By : JW
Latitude :
Longitude :

Depth (m)	Material	Excavatability (Relative Scale)	USCS Symbol	DESCRIPTION	Graphic Symbol	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Undrained Shear Strength Peak/Remolded (kPa)	Scala Penetrometer Blows per 100mm
		Easier	Harder							2 4 6 8 10 12
0.5	TS		ML	SILT with trace sand and rootlets; brown. Low plasticity [TOPSOIL].				S-St		
			ML	SILT with trace organics; greyish brown. Low plasticity.				VSt		
0.5				Sandy fine to coarse GRAVEL with minor cobbles; brownish grey. Well graded, subrounded. Sand, fine to coarse, well graded. Pit walls are vertical and tightly packed.			M	D		
1.0	ALLUVIUM		GW	Becomes wet from 1.0 m depth.			W			
1.5										
2.0				Depth of Excavation: 2 m Termination Condition: Target depth						
2.5										

GEOSCIENCE TEST PIT LOG. BLANK TEMPLATE.GPJ NZ MASTER DATA TEMPLATE.GDT 9/12/16

Test pit met target depth at 2.0 m.
Scala Penetrometer met practical refusal
Standing groundwater was not encountered

TS = TOPSOIL

LOG OF TEST PIT TP04

Faringdon Subdivision
694 Selwyn Road
Rolleston
12903

Client : Hughes Development Ltd
Date : 05/12/16
Max Test Pit Depth : 2 m
Digger Type/Size : Bucket Excavator
Bucket Type/Size : 4 tooth 500 mm

Shear Vane No :
Logged By : RB
Reviewed By : JW
Latitude :
Longitude :

Depth (m)	Material	Excavatability (Relative Scale)	USCS Symbol	DESCRIPTION	Graphic Symbol	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Undrained Shear Strength Peak/Remolded (kPa)	Scala Penetrometer Blows per 100mm
		Easier	Harder							2 4 6 8 10 12
	TS		ML	SILT with trace sand and rootlets; brown. Low plasticity [TOPSOIL].				St-H		
			ML	SILT with trace organics; greyish brown. Low plasticity.				H		
0.5				Sandy fine to coarse GRAVEL with minor cobbles; brownish grey. Well graded, subrounded. Sand, fine to coarse, well graded. Pit walls are vertical and tightly packed.			M			
1.0	ALLUVIUM		GW	Becomes wet from 1.0 m depth.			W			
1.5										
2.0				Depth of Excavation: 2 m Termination Condition: Target depth						
2.5										

GEOSCIENCE TEST PIT LOG. BLANK TEMPLATE.GPJ NZ MASTER DATA TEMPLATE.GDT 9/12/16

Test pit met target depth at 2.0 m.
Scala Penetrometer met practical refusal
Standing groundwater was not encountered

TS = TOPSOIL

LOG OF TEST PIT TP05

Faringdon Subdivision
694 Selwyn Road
Rolleston
12903

Client : Hughes Development Ltd
Date : 05/12/16
Max Test Pit Depth : 2.2 m
Digger Type/Size : Bucket Excavator
Bucket Type/Size : 4 tooth 500 mm

Shear Vane No :
Logged By : RB
Reviewed By : JW
Latitude :
Longitude :

Depth (m)	Material	Excavatability (Relative Scale)	USCS Symbol	DESCRIPTION	Graphic Symbol	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Undrained Shear Strength Peak/Remolded (kPa)	Scala Penetrometer Blows per 100mm
		Easier	Harder							2 4 6 8 10 12
0.5	TS		ML	SILT with trace gravel, sand and rootlets; brown. Low plasticity [TOPSOIL].				St-H		
			ML	SILT; greyish brown. Low plasticity.			M	H		
1.0				Sandy fine to coarse GRAVEL with minor cobbles; brownish grey. Well graded, subrounded. Sand, fine to coarse, well graded. Pit walls are vertical and tightly packed.						
1.5			GW	Becomes wet from 1.0 m depth.			W			
2.0										
2.5				Depth of Excavation: 2.2 m Termination Condition: Target depth						

GEOSCIENCE TEST PIT LOG. BLANK TEMPLATE.GPJ NZ MASTER DATA TEMPLATE.GDT 9/12/16

Test pit met target depth at 2.2 m.
Scala Penetrometer met practical refusal
Standing groundwater was not encountered




TS = TOPSOIL

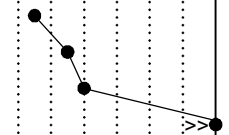
LOG OF TEST PIT TP06

Faringdon Subdivision
694 Selwyn Road
Rolleston
12903

Client : Hughes Development Ltd
Date : 05/12/16
Max Test Pit Depth : 2 m
Digger Type/Size : Bucket Excavator
Bucket Type/Size : 4 tooth 500 mm

Shear Vane No :
Logged By : RB
Reviewed By : JW
Latitude :
Longitude :

Depth (m)	Material	Excavatability (Relative Scale)	USCS Symbol	DESCRIPTION	Graphic Symbol	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Undrained Shear Strength Peak/Remolded (kPa)	Scala Penetrometer Blows per 100mm
		Easier	Harder							2 4 6 8 10 12
	TS		ML	SILT with trace gravel, sand and rootlets; brown. Low plasticity [TOPSOIL].				F-VSt		
			ML	SILT; greyish brown. Low plasticity.				VSt		
0.5				Sandy fine to coarse GRAVEL with minor cobbles; brownish grey. Well graded, subrounded. Sand, fine to coarse, well graded. Pit walls are vertical and tightly packed.			M			
1.0	ALLUVIUM		GW	Becomes wet at 1.1 m depth.			W			
1.5										
2.0				Depth of Excavation: 2 m Termination Condition: Target depth						
2.5										



GEOSCIENCE TEST PIT LOG. BLANK TEMPLATE.GPJ NZ MASTER DATA TEMPLATE.GDT 9/12/16

Test pit met target depth at 2.0 m.
Scala Penetrometer met practical refusal
Standing groundwater was not encountered

TS = TOPSOIL

LOG OF TEST PIT TP07

Faringdon Subdivision
694 Selwyn Road
Rolleston
12903

Client : Hughes Development Ltd
Date : 05/12/16
Max Test Pit Depth : 2 m
Digger Type/Size : Bucket Excavator
Bucket Type/Size : 4 tooth 500 mm

Shear Vane No :
Logged By : RB
Reviewed By : JW
Latitude :
Longitude :

Depth (m)	Material	Excavatability (Relative Scale)	USCS Symbol	DESCRIPTION	Graphic Symbol	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Undrained Shear Strength Peak/Remolded (kPa)	Scala Penetrometer Blows per 100mm
	TS	Easier	ML	SILT with trace cobble, gravel, sand and rootlets; brown. Low plasticity [TOPSOIL].				H		2 4 6 8 10 12
0.5				Sandy fine to coarse GRAVEL with minor cobbles; brownish grey. Well graded, subrounded. Sand, fine to coarse, well graded. Pit walls are vertical and tightly packed.			M	D		
1.0			GW	Becomes wet from 1.0 m depth.						
1.5							W			
2.0				Depth of Excavation: 2 m Termination Condition: Target depth						
2.5										

GEOSCIENCE TEST PIT LOG: BLANK TEMPLATE.GPJ NZ MASTER DATA TEMPLATE.GDT 9/12/16

Test pit met target depth at 2.0 m.
Scala Penetrometer met practical refusal
Standing groundwater was not encountered

TS = TOPSOIL

LOG OF TEST PIT TP08

Faringdon Subdivision
694 Selwyn Road
Rolleston
12903

Client : Hughes Development Ltd
Date : 05/12/16
Max Test Pit Depth : 2 m
Digger Type/Size : Bucket Excavator
Bucket Type/Size : 4 tooth 500 mm

Shear Vane No :
Logged By : RB
Reviewed By : JW
Latitude :
Longitude :

Depth (m)	Material	Excavatability (Relative Scale)	USCS Symbol	DESCRIPTION	Graphic Symbol	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Undrained Shear Strength Peak/Remolded (kPa)	Scala Penetrometer Blows per 100mm
		Easier	Harder							2 4 6 8 10 12
	TS		ML	SILT with trace cobble, gravel, sand and rootlets; brown. Low plasticity [TOPSOIL].				S-St		
0.5			ML	SILT; greyish brown. Low plasticity.				H		
1.0	ALLUVIUM		GW	Sandy fine to coarse GRAVEL with minor cobbles; brownish grey. Well graded, subrounded. Sand, fine to coarse, well graded. Pit walls are vertical and tightly packed.			M			
1.5				Becomes wet at 1.1 m depth.			W			
2.0				Depth of Excavation: 2 m Termination Condition: Target depth						
2.5										

GEOSCIENCE TEST PIT LOG. BLANK TEMPLATE.GPJ NZ MASTER DATA TEMPLATE.GDT 9/12/16

Test pit met target depth at 2.0 m.
Scala Penetrometer met practical refusal
Standing groundwater was not encountered

TS = TOPSOIL

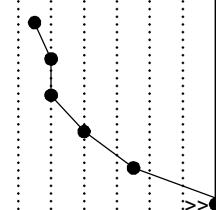
LOG OF TEST PIT TP09

Faringdon Subdivision
417 Springston-Rolleston Road
Rolleston
12903

Client : Hughes Development Ltd
Date : 08/12/16
Max Test Pit Depth : 2 m
Digger Type/Size : Bucket Excavator
Bucket Type/Size : 4 tooth 500 mm

Shear Vane No :
Logged By : RB
Reviewed By : JW
Latitude :
Longitude :

Depth (m)	Material	Excavatability (Relative Scale)	USCS Symbol	DESCRIPTION	Graphic Symbol	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Undrained Shear Strength Peak/Remolded (kPa)	Scala Penetrometer Blows per 100mm
		Easier	Harder							2 4 6 8 10 12
0.5	TS		ML	SILT with trace gravel, sand and rootlets; brown. Low plasticity [TOPSOIL].				St		
			ML	SILT; greyish brown. Low plasticity.				VSt-H		
				Sandy fine to coarse GRAVEL with minor cobbles; brownish grey. Well graded, subrounded. Sand, fine to coarse, well graded. Pit walls are vertical and tightly packed.			M	D		
1.0	ALLUVIUM		GW	Becomes wet from 1.0 m depth.						
1.5							W			
2.0				Depth of Excavation: 2 m Termination Condition: Target depth						
2.5										


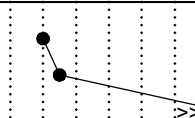




LOG OF TEST PIT TP10

Faringdon Subdivision
417 Springston-Rolleston Road
Rolleston
12903

Client : Hughes Development Ltd
Date : 08/12/16
Max Test Pit Depth : 2 m
Digger Type/Size : Bucket Excavator
Bucket Type/Size : 4 tooth 500 mm

Shear Vane No :
Logged By : RB
Reviewed By : JW
Latitude :
Longitude :

Depth (m)	Material	Excavatability (Relative Scale)	USCS Symbol	DESCRIPTION	Graphic Symbol	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Undrained Shear Strength Peak/Remolded (kPa)	Scala Penetrometer Blows per 100mm
		Easier	Harder							2 4 6 8 10 12
	TS		ML	SILT with trace gravel, sand and rootlets; brown. Low plasticity [TOPSOIL].			M	St-VSt		
			ML	SILT; greyish brown. Low plasticity.				H		
0.5				Sandy fine to coarse GRAVEL with minor cobbles; brownish grey. Well graded, subrounded. Sand, fine to coarse, well graded. Pit walls are vertical and tightly packed.						
1.0	ALLUVIUM		GW	Becomes wet from 0.9 m depth.						
1.5										
2.0				Depth of Excavation: 2 m Termination Condition: Target depth						
2.5										

GEOSCIENCE TEST PIT LOG. BLANK TEMPLATE.GPJ NZ MASTER DATA TEMPLATE.GDT 9/12/16

Test pit met target depth at 2.0 m.
Scala Penetrometer met practical refusal
Standing groundwater was not encountered

TS = TOPSOIL

LOG OF TEST PIT TP11

Faringdon Subdivision
417 Springston-Rolleston Road
Rolleston
12903

Client : Hughes Development Ltd
Date : 08/12/16
Max Test Pit Depth : 2 m
Digger Type/Size : Bucket Excavator
Bucket Type/Size : 4 tooth 500 mm

Shear Vane No :
Logged By : RB
Reviewed By : JW
Latitude :
Longitude :

Depth (m)	Material	Excavatability (Relative Scale)	USCS Symbol	DESCRIPTION	Graphic Symbol	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Undrained Shear Strength Peak/Remolded (kPa)	Scala Penetrometer Blows per 100mm
		Easier	Harder							2 4 6 8 10 12
	TS		ML	SILT with trace sand and rootlets; brown. Low plasticity [TOPSOIL].				St-VSt		
0.5			ML	SILT with some sand; greyish brown. Low plasticity. Sand, fine, poorly graded.				H		
1.0	ALLUVIUM		GW	Sandy fine to coarse GRAVEL with minor cobbles; brownish grey. Well graded, subrounded. Sand, fine to coarse, well graded. Pit walls are vertical and tightly packed. Becomes wet from 1.0 m depth.						
1.5										
2.0				Depth of Excavation: 2 m Termination Condition: Target depth						
2.5										

GEOSCIENCE TEST PIT LOG. BLANK TEMPLATE.GPJ NZ MASTER DATA TEMPLATE.GDT 9/12/16

Test pit met target depth at 2.0 m.
Scala Penetrometer met practical refusal
Standing groundwater was not encountered

TS = TOPSOIL

LOG OF TEST PIT TP12

Faringdon Subdivision
417 Springston-Rolleston Road
Rolleston
12903

Client : Hughes Development Ltd
Date : 08/12/16
Max Test Pit Depth : 2 m
Digger Type/Size : Bucket Excavator
Bucket Type/Size : 4 tooth 500 mm

Shear Vane No :
Logged By : RB
Reviewed By : JW
Latitude :
Longitude :

Depth (m)	Material	Excavatability (Relative Scale)	USCS Symbol	DESCRIPTION	Graphic Symbol	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Undrained Shear Strength Peak/Remolded (kPa)	Scala Penetrometer Blows per 100mm
		Easier	Harder							2 4 6 8 10 12
	TS		ML	SILT with trace gravel, sand and rootlets; brown. Low plasticity [TOPSOIL].				St-H		
0.5				Sandy fine to coarse GRAVEL with minor cobbles; brownish grey. Well graded, subrounded. Sand, fine to coarse, well graded. Pit walls are vertical and tightly packed.			M			
1.0	ALLUVIUM		GW							
1.5				Becomes wet at 1.2 m depth.			W			
2.0				Depth of Excavation: 2 m Termination Condition: Target depth						
2.5										

GEOSCIENCE TEST PIT LOG. BLANK TEMPLATE.GPJ NZ MASTER DATA TEMPLATE.GDT 9/12/16

Test pit met target depth at 2.0 m.
Scala Penetrometer met target depth
Standing groundwater was not encountered

TS = TOPSOIL

LOG OF TEST PIT TP13

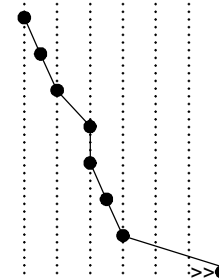
Faringdon Subdivision
417 Springston-Rolleston Road
Rolleston
12903

Client : Hughes Development Ltd
Date : 08/12/16
Max Test Pit Depth : 2 m
Digger Type/Size : Bucket Excavator
Bucket Type/Size : 4 tooth 500 mm

Shear Vane No :
Logged By : RB
Reviewed By : JW
Latitude :
Longitude :

Depth (m)	Material	Excavatability (Relative Scale)	USCS Symbol	DESCRIPTION	Graphic Symbol	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Undrained Shear Strength Peak/Remolded (kPa)	Scala Penetrometer Blows per 100mm
		Easier	Harder							2 4 6 8 10 12
	TS		ML	SILT with trace sand and rootlets; brown. Low plasticity [TOPSOIL].				S-St		
0.5			ML	SILT with trace sand; greyish brown. Low plasticity.			M	VSt-H		
1.0	ALLUVIUM		GW	Sandy fine to coarse GRAVEL with minor cobbles; brownish grey. Well graded, subrounded. Sand, fine to coarse, well graded. Pit walls are vertical and tightly packed.			W			
1.5										
2.0										
2.5										

Depth of Excavation: 2 m
Termination Condition: Target depth



LOG OF TEST PIT TP14

Faringdon Subdivision
417 Springston-Rolleston Road
Rolleston
12903

Client : Hughes Development Ltd
Date : 08/12/16
Max Test Pit Depth : 2 m
Digger Type/Size : Bucket Excavator
Bucket Type/Size : 4 tooth 500 mm

Shear Vane No :
Logged By : RB
Reviewed By : JW
Latitude :
Longitude :

Depth (m)	Material	Excavatability (Relative Scale)	USCS Symbol	DESCRIPTION	Graphic Symbol	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Undrained Shear Strength Peak/Remolded (kPa)	Scala Penetrometer Blows per 100mm
	TS	Easier	ML	SILT with trace sand and rootlets; brown. Low plasticity [TOPSOIL].				S-F		2 4 6 8 10 12
0.5				Sandy fine to coarse GRAVEL with minor cobbles; brownish grey. Well graded, subrounded. Sand, fine to coarse, well graded. Pit walls are vertical and tightly packed.				D		
1.0	ALLUVIUM		GW	Becomes wet from 0.9 m depth.						
1.5										
2.0				Depth of Excavation: 2 m Termination Condition: Target depth						
2.5										

GEO SCIENCE TEST PIT LOG. BLANK TEMPLATE.GPJ NZ MASTER DATA TEMPLATE.GDT 9/12/16

Test pit met target depth at 2.0 m.
Scala Penetrometer met practical refusal
Standing groundwater was not encountered



TS = TOPSOIL



LOG OF AUGER HA02

Faringdon Subdivision
694 Selwyn Road
Rolleston
12903

Client : Hughes Developments Ltd Shear Vane No :
Client Ref. : 12903 Logged By : RB
Date : 06/12/16 Reviewed By : JW
Hole Depth : 0.6 m Latitude :
Hole Diameter : 50 mm Longitude :

Depth (m)	Material	USCS Symbol	DESCRIPTION	Graphic Symbol	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 trace rootlets; brown. Low plasticity [TOPSOIL].				S-St							
	ALLUVIUM	ML	SILT; greyish brown. Low plasticity.			M	D							
0.5			Some sand encountered from 0.5 m depth. Sand, fine to medium, poorly graded.											
			End of Hole Depth: 0.6 m Termination Condition: Practical refusal											
1.0														


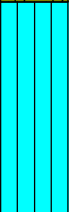
Hand auger met practical refusal at 0.6 m depth on inferred gravel.
Scala Penetrometer met practical refusal at 0.6 m depth.
Standing groundwater was not encountered



LOG OF AUGER HA04

Faringdon Subdivision
694 Selwyn Road
Rolleston
12903

Client : Hughes Developments Ltd Shear Vane No :
Client Ref. : 12903 Logged By : RB
Date : 06/12/16 Reviewed By : JW
Hole Depth : 0.4 m Latitude :
Hole Diameter : 50 mm Longitude :

Depth (m)	Material	USCS Symbol	DESCRIPTION	Graphic Symbol	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 trace gravel and rootlets; brown. Low plasticity [TOPSOIL].				F-VSt							
	ALLUVIUM	ML	SILT; greyish brown. Low plasticity.			M	H							
0.5			End of Hole Depth: 0.4 m Termination Condition: Practical refusal											
1.0														



GEOSCIENCE HAND AUGER HA TEMPLATE - BLANK.GPJ NZ DATA TEMPLATE 2.GDT 9/12/16

Hand auger met practical refusal at 0.4 m depth on inferred gravel.
Scala Penetrometer met practical refusal at 0.5 m depth.
Standing groundwater was not encountered

LOG OF AUGER HA05

Faringdon Subdivision
694 Selwyn Road
Rolleston
12903

Client : Hughes Developments Ltd Shear Vane No :
Client Ref. : 12903 Logged By : RB
Date : 06/12/16 Reviewed By : JW
Hole Depth : 0.3 m Latitude :
Hole Diameter : 50 mm Longitude :

Depth (m)	Material	USCS Symbol	DESCRIPTION	Graphic Symbol	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 trace gravel and rootlets; brown. Low plasticity [TOPSOIL].			M	H							
	ALLUVIUM	ML	SILT; greyish brown. Low plasticity.				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 HA08

Faringdon Subdivision
694 Selwyn Road
Rolleston
12903

Client : Hughes Developments Ltd Shear Vane No :
Client Ref. : 12903 Logged By : RB
Date : 06/12/16 Reviewed By : JW
Hole Depth : 0.4 m Latitude :
Hole Diameter : 50 mm Longitude :

Depth (m)	Material	USCS Symbol	DESCRIPTION	Graphic Symbol	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 trace rootlets; brown. Low plasticity [TOPSOIL].				F-VSt							
	ALLUVIUM	ML	SILT; greyish brown. Low plasticity.			M	H							
0.5			End of Hole Depth: 0.4 m Termination Condition: Practical refusal											
1.0														


GEOSCIENCE HAND AUGER HA TEMPLATE - BLANK.GPJ NZ DATA TEMPLATE 2.GDT 9/12/16

Hand auger met practical refusal at 0.4 m depth on inferred gravel.
Scala Penetrometer met practical refusal at 0.5 m depth.
Standing groundwater was not encountered

LOG OF AUGER HA09

Faringdon Subdivision
417 Springston-Rolleston Road
Rolleston
12903

Client : Hughes Developments Ltd Shear Vane No :
Client Ref. : 12903 Logged By : RB
Date : 08/12/16 Reviewed By : JW
Hole Depth : 0.2 m Latitude :
Hole Diameter : 50 mm Longitude :



Depth (m)	Material	USCS Symbol	DESCRIPTION	Graphic Symbol	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 gravel, trace sand and rootlets; brown. Low plasticity [TOPSOIL].			D	St-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 0.3 m depth.
Standing groundwater was not encountered

LOG OF AUGER HA10

Faringdon Subdivision
417 Springston-Rolleston Road
Rolleston
12903


Client : Hughes Developments Ltd Shear Vane No :
Client Ref. : 12903 Logged By : RB
Date : 08/12/16 Reviewed By : JW
Hole Depth : 0.3 m Latitude :
Hole Diameter : 50 mm Longitude :

Depth (m)	Material	USCS Symbol	DESCRIPTION	Graphic Symbol	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 trace gravel, sand and rootlets; brown. Low plasticity [TOPSOIL].			M	S-H							
	A	ML	SILT; greyish brown. Low plasticity.				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 A = ALLUVIUM														

LOG OF AUGER HA11

Faringdon Subdivision
417 Springston-Rolleston Road
Rolleston
12903

Client : Hughes Developments Ltd Shear Vane No :
Client Ref. : 12903 Logged By : RB
Date : 08/12/16 Reviewed By : JW
Hole Depth : 0.2 m Latitude :
Hole Diameter : 50 mm Longitude :


Depth (m)	Material	USCS Symbol	DESCRIPTION	Graphic Symbol	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 trace gravel, sand and rootlets; brown. Low plasticity [TOPSOIL].			M	S-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 0.3 m depth.
Standing groundwater was not encountered

LOG OF AUGER HA12

Faringdon Subdivision
417 Springston-Rolleston Road
Rolleston
12903

Client : Hughes Developments Ltd Shear Vane No :
Client Ref. : 12903 Logged By : RB
Date : 08/12/16 Reviewed By : JW
Hole Depth : 0.2 m Latitude :
Hole Diameter : 50 mm Longitude :

Depth (m)	Material	USCS Symbol	DESCRIPTION	Graphic Symbol	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 trace gravel, sand and rootlets; brown. Low plasticity [TOPSOIL].			M	S-Vst							
			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 0.3 m depth.
Standing groundwater was not encountered

LOG OF AUGER HA13

Faringdon Subdivision
417 Springston-Rolleston Road
Rolleston
12903

Client : Hughes Developments Ltd Shear Vane No :
Client Ref. : 12903 Logged By : RB
Date : 08/12/16 Reviewed By : JW
Hole Depth : 0.2 m Latitude :
Hole Diameter : 50 mm Longitude :


Depth (m)	Material	USCS Symbol	DESCRIPTION	Graphic Symbol	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 trace gravel, sand and rootlets; brown. Low plasticity [TOPSOIL].			D	St-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

LOG OF AUGER HA14

Faringdon Subdivision
417 Springston-Rolleston Road
Rolleston
12903

Client : Hughes Developments Ltd Shear Vane No :
Client Ref. : 12903 Logged By : RB
Date : 08/12/16 Reviewed By : JW
Hole Depth : 0.1 m Latitude :
Hole Diameter : 50 mm Longitude :

Depth (m)	Material	USCS Symbol	DESCRIPTION	Graphic Symbol	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 trace gravel, sand and rootlets; brown. Low plasticity [TOPSOIL].			M	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 0.2 m depth.
Standing groundwater was not encountered
TS = TOPSOIL

APPENDIX 3:
ECan Boreholes

Bore or Well No: M36/1683

Well Name:

Owner: YATES R.P.



Street of Well:

Locality: ROLLESTON

NZTM Grid Reference: BX23:51807-69990 QAR 4

NZTM X-Y: 1551807 - 5169990

Location Description:

ECan Monitoring:

Well Status: Active (exist, present)

File No:

Allocation Zone: Selwyn-Waimakariri

CWMS Zone: Selwyn - Waihora

Uses: Domestic and Stockwater

Water Level Observation

Drill Date:

Well Depth: 13.10m -GL

Initial Water Depth:

Diameter: 150mm

Measuring Point Ait: 34.84m MSD QAR 3

GL Around Well: 0.00m -MP

MP Description:

Driller: Smith, J R & I G

Drilling Method: Unknown

Casing Material: STEEL

Pump Type: Unknown

Yield: 1 l/s

Drawdown: 0 m

Specific Capacity: 9.33 l/s/m

Water Level Count: 0

Strata Layers: 4

Aquifer Tests: 0

Yield/Drawdown Tests: 1

Highest GW Level:

Lowest GW Level:

First Reading:

Last Reading:

Calc. Min. (Below MP): -9.00m -MP

Last Updated: 08 Nov 2013

Last Field Check:

Aquifer Type: Unknown

Aquifer Name: Riccarton Gravel

Screens:

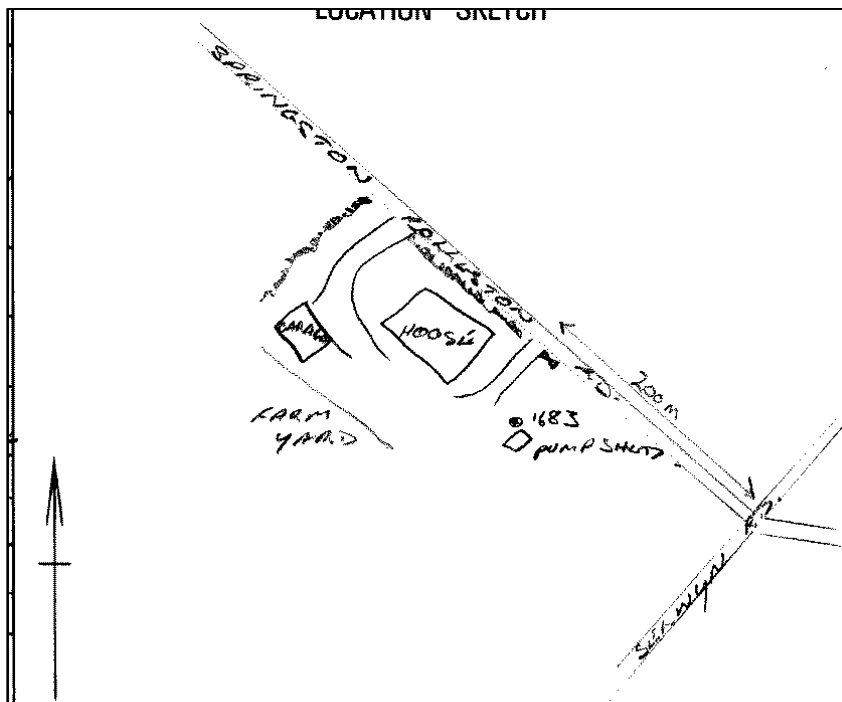
Screen No.	Screen Type	Top (m)	Bottom (m)	Diameter (mm)	Leader Length (mm)	Slot Size (mm)	Slot Length (mm)
1	Stainless steel	10.1	13.1				

Step Tests:

Step Test Date	Step	Yield (l/s)	Drawdown	Duration (mins)
04 Oct 2002	1	1.4	0.15	

Aquifer test date(s) where this is an observation bore

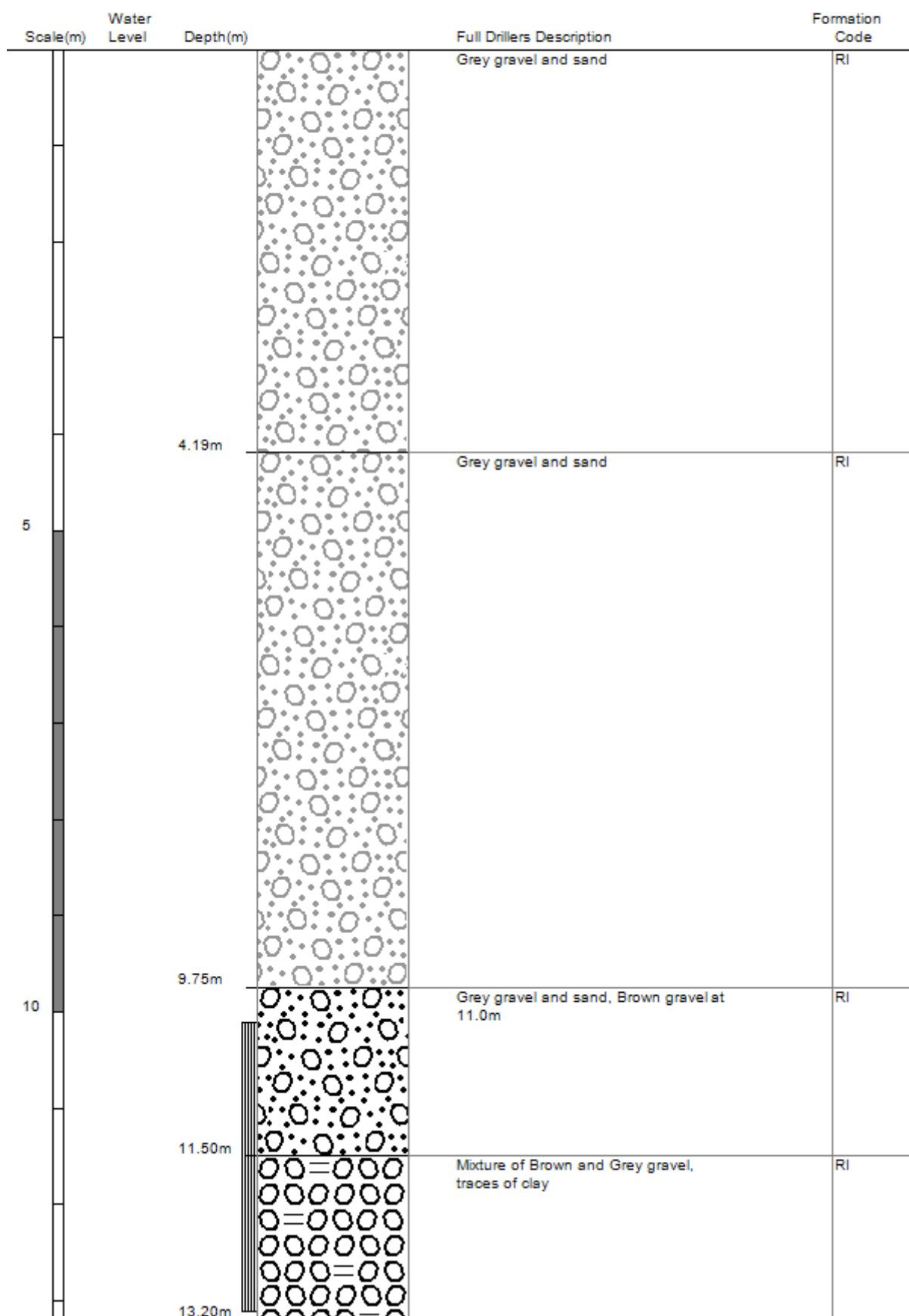
LOCATION SKETCH



OTHER DATA

Borelog for well M36/1683

Grid Reference (NZTM): 1551807 mE, 5169991 mN
 Location Accuracy: 50 - 300m
 Ground Level Altitude: 34.8 m +MSD Accuracy: < 2.5 m
 Driller: Smith, J R & I G
 Drill Method: Unknown
 Borelog Depth: 13.2 m Drill Date:



Bore or Well No: M36/7928

Well Name:

Owner: RP & EM YATES



Street of Well:

Locality: ROLLESTON

NZTM Grid Reference: BX23:51567-70040 QAR 3

NZTM X-Y: 1551567 - 5170040

Location Description:

ECan Monitoring:

Well Status: Active (exist, present)

File No:

Allocation Zone: Selwyn-Waimakariri

CWMS Zone: Selwyn - Waihora

Uses: Domestic and Stockwater

Drill Date: 01 Jun 2005

Well Depth: 37.00m -GL

Initial Water Depth: -7.60m -MP

Diameter: 150mm

Measuring Point Ait: 34.47m MSD QAR 4

GL Around Well: -0.40m -MP

MP Description: ToC

Driller: Dynes Road Drilling

Drilling Method: Cable Tool

Casing Material: Steel

Pump Type:

Yield: 7 l/s

Drawdown: 10 m

Specific Capacity: 0.71 l/s/m

Water Level Count: 0

Strata Layers: 9

Aquifer Tests: 0

Yield/Drawdown Tests: 1

Highest GW Level:

Lowest GW Level:

First Reading:

Last Reading:

Calc. Min. (Below MP):

Last Updated: 08 Nov 2013

Last Field Check:

Aquifer Type:

Aquifer Name:

Screens:

Screen No.	Screen Type	Top (m)	Bottom (m)	Diameter (mm)	Leader Length (mm)	Slot Size (mm)	Slot Length (mm)
1	Stainless steel	35	37				

Step Tests:

Step Test Date	Step	Yield (l/s)	Drawdown	Duration (mins)
01 Jun 2005	1	7.12	10	240

Date	Comments
03 Jun 2005	Proposed LP location M36:6156-3165

Aquifer test date(s) where this is the pump bore

Aquifer test date(s) where this is an observation bore

Borelog for well M36/7928

Grid Reference (NZTM): 1551567 mE, 5170041 mN
Location Accuracy: 10 - 50m
Ground Level Altitude: 34.1 m +MSD Accuracy: < 0.5 m
Driller: Dynes Road Drilling
Drill Method: Cable Tool
Borelog Depth: 37.0 m Drill Date: 01-Jun-2005



Scale(m)	Level	Depth(m)	Full Drillers Description	Code
		0.30m	topsoil	
		0.30m	topsoil medium-large gravels	
5		4.00m	medium-large gravels	
		4.00m	small-medium gravels, silt bound	
		6.00m	small-medium gravels, silt bound	
		6.00m	small-medium gravels, firm silt	
10		8.00m	small-medium gravels, firm silt	
		8.00m	medium gravels, wet silt	
15				
20				
		20.70m	medium gravels, wet silt	
		20.70m	small-medium gravels - driving eased up - some water, 24m waterover night	

