

BY URBAN ESTATES

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1 Introduction

ENGEO Ltd was requested by Urban Estates Ltd to undertake a geotechnical investigation of several properties (herein referred to as 'the site'). This work has been carried out in accordance with our signed variation agreement dated 5 July 2023.

We have previously completed an initial iteration of this report (dated 9 December 2020) to support a plan change application from general rural zone to general residential zone with an approximate density of 12 lots per hectare. We understand this has now been granted and we have been requested to update our report to address subdivision consent for 40 hectares, including 10 hectares set aside for a retirement village.

This report has been updated with additional testing (presented in Section 4) and includes the following scope of works:

- Review of published geotechnical and geological information relevant to the site.
- Site assessment by an experienced ground engineering professional.
- Coordinate local buried services location contractor.
- Shallow testing including 31 test pits with associated Scala Penetrometers to supplement the
 previous 18 test pits that were completed in 2020. Davie Lovell Smith have provided us 20 hand
 auger and Scala Penetrometer logs for the retirement village site which we have used to inform
 the ground model in this area.
- Commentary on the liquefaction potential for the site based on our site investigations and published literature.
- Prepare a report outlining our findings on the ground conditions and the suitability of the site for residential subdivision. This will include:
 - o Foundation recommendations for typical timber framed residential dwellings.
 - Seismic Subsoil category.
 - o Address likely geohazards that may affect the site.
 - o Provide general geotechnical recommendations related to the proposed development.
 - Provide an assessment against Section 106 of the Resource Management Act (RMA) and a Statement of Professional Opinion for Residential Subdivision.



2 Site Description

The 40 ha site is located on a relatively flat area in Rolleston and made up of the following addresses (Appendix 1):

- 127 Lincoln Rolleston Road
- 391 Lincoln Rolleston Road
- 548 Selwyn Road
- 2/554 Selwyn Road
- 3/554 Selwyn Road
- 1/554 Selwyn Road
- 1/572 Selwyn Road (Lot 2 DP 337894)
- 2/572 Selwyn Road (Lot 3 DP 337894)
- 4/572 Selwyn Road (Lot 4 DP 337894)

The site is currently lifestyle blocks mostly used for light grazing with various existing dwellings and sheds on-site.

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, 2020) and observed during our site walkover conducted on 2 December 2020, a number of areas of undulating and depressed ground can be attributed to paleo-channels, which traverse the site in a general northwest to southeast direction. Based on observations, sandy silt deposits with variable thickness are expected to have in-filled the paleo-channels where they have not remained as channel features.



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 other faults.

The site is located between two recently discovered fault systems, the Greendale Fault and the Port Hills Fault, the ruptures of which initiated the ongoing Canterbury Earthquake Sequence (CES). The Greendale Fault has been mapped approximately 6 km northwest of the site and trends roughly east-west with a surface rupture of approximately 28 km (GNS, 2015), while the Port Hills Fault remains unmapped as the fault did not rupture the surface. Movement on the Port Hills Fault is believed to have occurred at a depth of 1 km to 2 km below the ground surface.

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

3.3.2 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 Flooding

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

The Selwyn District Council have carried out computer-based flood modelling to predict the extent and depth of flooding that could happen during a one-in-200-year and a one-in-500-year flood. Based on this modelling, the water depth through the site may be up to 0.8 m deep in the existing channel feature (Figure 1) during the 500 year flood.





Figure 1: SDC Flooding Map

From Canterbury Maps and Selwyn Council. Not to scale.

3.5 ECan Boreholes

We have reviewed deep ECan borehole logs located on the site (as shown in Figure 2), and have reviewed the monitoring well data from the monitoring wells on the site (part of the ECan Water Level Monitoring Network).

The logs for the wells located on the site, or close to the site boundary indicate the underlying soil generally comprises of gravels which extend to the bottom of the drill holes with isolated clay and silt layers at depth. The groundwater levels recorded in these wells are an average of approximately 10.6 m depth. The details for the wells are provided in Appendix 2 (including available drill logs).



ECan Borehole	Total Depth (m)	Initial Water Level Below Ground Level (m)	Generalised Borelog as Logged by Driller
M36/4015	28	10.5	Gravel to 28.3 m depth.
M36/7850	42	12.2	Gravel to 42 m depth.
BX23_0262	42	7.3	Gravel to the maximum depth of testing with a 3 m thick clay layer from 26 m to 29 m depth.
M36_1816	13.67	7.64	No data available.
M36_2996	59.4	9.6	No data available.
M26_3018	65.7	9.32	Not logged up to 39 m depth. Gravel from 39 m to 65.7 m depth.
M36_3836	56.6	10.7	Gravel to the maximum depth of drilling.
M36_4433	30	9.7	Gravel to the maximum depth of testing with a 1 m thick clay layer from 26 m to 27 m depth.
M36_7975	37.5	10	Gravel to the maximum depth of testing with a 1 m thick silt layer from 25 m to 26 m depth.
M36_7976	36	10.2	Gravel to the maximum depth of drilling.
M36_8002	66	12.1	Gravel to the maximum depth of testing with 1 m thick clay layers from 26 m to 27 m depth and 32 m to 33 m.
M36_8009	36	11.8	Gravel to the maximum depth of drilling.
M36_8138	36	14.2	Gravel to the maximum depth of drilling.
M36_8299	90	20.4*	Gravel to the maximum depth of drilling with a 6 m layer of river sands with some clay from 8 m to 14 m depth.
M36_8300	42	13.4	Gravel to the maximum depth of drilling.
M36_8392	36	10	Gravel to the maximum depth of drilling
Average Grou	indwater depth	10.6	

Table 1: Generalised Summary of ECan Boreholes

*Excluded from the average as an outlier.





Figure 2: Nearby ECan Borehole Locations

Aerial photograph sourced from Canterbury Maps. Not to scale.

3.6 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 Site Investigation

4.1 Site Investigation

Site investigations to assess the shallow subsurface material types and strength characteristics were undertaken by ENGEO on 3 to 4 December 2020, and 21 to 22 June 2023. A total of 49 test pits with associated Scala Penetrometer tests have been completed to a maximum depth of 2.2 m below ground level. A further 20 hand augers and Scala penetrometers have been completed by Davie Lovell Smith on 10 February 2023 for the retirement village site.

The Davie Lovell Smith testing refused on the top of the gravel layer and is supplemented by three test pits from our 2020 investigation over the retirement village area. Given the consistency of the near surface geology in this area we consider the date provided sufficient to inform the ground model.



The investigations revealed subsurface conditions across the site are consistent with the published geological mapping, as summarised in Table 2.

Soil Type	Depth to Top of Layer (m)	General Layer Thickness (m)	Density / Consistency	Additional Comments
TOPSOIL	0.0	0.3	-	-
SILT / SAND*	0.3	0.5**	Very Stiff to Hard / Medium Dense	-
Sandy GRAVEL	0.3	Unknown	Medium Dense to Very Dense	Tightly packed and consistent across the site. Deep roots observed up to 2 m depth.

Table 2: Summary of Subsurface Investigations

*Not observed in all test pit locations.

**Thickness varies.

All investigation locations are provided in Appendix 1 with the ENGEO test pits logs in Appendix 3 and the Davie Lovell Smith plan and logs in Appendix 4.

5 Geotechnical Assessment

5.1 Site Seismic Class

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

5.2 Liquefaction Assessment

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.

5.3 Foundations

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



The retirement village may have larger buildings than those noted above, however, they will be subject to specific engineering design and in our opinion the ground is geotechnically suitable to support the typical buildings associated with retirement villages.

6 RMA Section 106 Assessment

Section 106 of the Resource Management Act 1991 (updated October 2017) states a consent authority may refuse to grant subdivision consent, or may grant a consent subject to specific consent conditions, if it considers that there is a risk from natural hazards and which requires a combined assessment of:

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

Based on our observations and the nature of the site, and the site's distance from the nearest significant watercourse, we consider it unlikely for the site to be subject to the potential hazards noted in Section 3.3 and, as such, the site is considered suitable for subdivision from a geotechnical perspective.

As discussed in Section 3.4 of this report, we recommend that flooding hazard is considered during subdivision design.

7 Statement of Professional Opinion

In our opinion, we consider that the site is suitable for subdivision from a geotechnical perspective. Prior to construction a geo-professional should be given the opportunity to review the civil earthworks plans and provide an Earthworks Specification to guide the bulk earthworks required to form the new subdivision.



8 References

Canterbury Maps, Groundwater. Retrieved December 2020 from http://canterburymaps.govt.nz/Viewer.

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.

New Zealand Geotechnical Database (NZGD). Retrieved December 2020 from https://www.nzgd.org.nz/

Selwyn District Council (2015), Selwyn District Council Operative District Plan. Retrieved December 2020, from http://www.selwyn.govt.nz/services/planning/district-plan.

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

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

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



9 Limitations

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

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

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Bore or Well No	BX23/0262			E	nvironment
Well Name Selwyn Road					anterbury
Owner	MR & MRS J	E & A T HEYL		Ka	unihera Taiao ki Waitaha
Well Number		BX23/0262		File Number	CRC141970
Owner		MR & MRS J E & A T HE	YL	Well Status	Active (exist, present)
Street/Road		Selwyn Road		NZTM Grid Reference	BX23:52560-70858
Locality		ROLLESTON		NZTM X and Y	1552560 - 5170858
Location Description				Location Accuracy	10 - 50m
CWMS Zone		Selwyn - Waihora		Use	Domestic Supply, Stock Supply
Groundwater Allocation	Zone	Selwyn-Waimakariri		Water Level Monitoring	
Depth		42.00m		Water Level Count	1
Diameter		150mm		Initial Water Level	7.80m below MP
Measuring Point Descri	ption	Top of Casing		Highest Water Level	7.80m below MP
Measuring Point Elevat	ion			Lowest Water Level	7.80m below MP
Elevation Accuracy				First reading	05 Nov 2013
Ground Level		0.50m below MP		Last reading	05 Nov 2013
Strata Layers		9		Calc Min 80%	
Aquifer Name				Aquifer Tests	0
Aquifer Type				Yield Drawdown Tests	1
Drill Date		05 Nov 2013		Max Tested Yield	
Driller		McMillan Drilling Ltd		Drawdown at Max Tested Yield	
Drilling Method		Rotary/Percussion		Specific Capacity	0.28 l/s/m
Casing Material		Steel		Last Updated	29 Nov 2013
Ритр Туре				Last Field Check	05 Nov 2013
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	40.48	42	2.5		125	

Step Tests

Step Test Date	Step	Yield	Yield GPM	DrawDown	Step Duration
05 Nov 2013	1	1.67	22.040966	5.93	1.25

Comments

Comment Date	Comment
14 Nov 2013	NZMG Map Reference updated from: M36:62523-32589 shifted 124m
14 Nov 2013	Driller confirms

Bore Log

Borelog for well BX23/0262

Grid Reference (NZTM): 1552561 mE, 5170859 mN Location Accuracy: 10 - 50m Ground Level Altitude: m +MSD Accuracy: Driller: McMillan Drilling Ltd Drill Method: Rotary/Percussion Borelog Depth: 42.0 m Drill Date: 05-Nov-2013







Bore or Well No	M36/1816		En En	vironment
Well Name	SELWYN RD			nterbury
Owner	MCLAUGHLAN		Kauni	hera Taiao ki Waitaha
Well Number	M36/1816		File Number	
Owner	MCLAUGHLAN		Well Status	Not Used
Street/Road	SELWYN RD		NZTM Grid Reference	BX23:52806-70690
Locality	ROLLESTON		NZTM X and Y	1552806 - 5170690
Location Description			Location Accuracy	< 50m
CWMS Zone	Selwyn - Waiho	ra	Use	,
Groundwater Allocation Zo	one Selwyn-Waimak	ariri	Water Level Monitoring	
Depth	13.67m		Water Level Count	0
Diameter	150mm		Initial Water Level	7.64m below MP
Measuring Point Description	on		Highest Water Level	
Measuring Point Elevation	35.80m above M	/ISL (Lyttelton 1937)	Lowest Water Level	
Elevation Accuracy	< 2.5 m		First reading	
Ground Level	0.00m above M	P	Last reading	
Strata Layers	0		Calc Min 80%	9.27m below MP (Estimated)
Aquifer Name			Aquifer Tests	0
Aquifer Type	Unknown		Yield Drawdown Tests	0
Drill Date			Max Tested Yield	
Driller	McMillan Drilling	g Ltd	Drawdown at Max Tested Yield	
Drilling Method	Cable Tool		Specific Capacity	
Casing Material	STEEL		Last Updated	29 Jan 2007
Ритр Туре	Unknown		Last Field Check	
Water Use Data	No			



No screen data for this well

No step tests for this well

No comments for this well

Bore or Well No	M36/299	6		Er	nvironment
Well Name	SELWYN	I ROAD			anterbury
Owner	NISBET,	NA & EM		Kaul	nihera Taiao ki Waitaha
Well Number		M36/2996		File Number	CO6C/01455
Owner		NISBET, NA & EM		Well Status	Active (exist, present)
Street/Road		SELWYN ROAD		NZTM Grid Reference	BX23:52913-70536
Locality		ROLLESTON		NZTM X and Y	1552913 - 5170536
Location Description		NEAR HAYSHED		Location Accuracy	2 - 15m
CWMS Zone		Selwyn - Waihora		Use	Irrigation, Domestic Supply
Groundwater Allocation Zone		Selwyn-Waimakariri		Water Level Monitoring	
Depth		59.40m		Water Level Count	0
Diameter		200mm		Initial Water Level	9.60m below MP
Measuring Point Descript	tion			Highest Water Level	
Measuring Point Elevatio	n	35.67m above MSL (Lyttelton 1937)		Lowest Water Level	
Elevation Accuracy		< 2.5 m		First reading	
Ground Level		0.00m above MP		Last reading	
Strata Layers		0		Calc Min 80%	11.50m below MP (Estimated)
Aquifer Name		Linwood Gravel		Aquifer Tests	0
Aquifer Type		Unknown		Yield Drawdown Tests	1
Drill Date		15 Oct 1984		Max Tested Yield	11 l/s
Driller	Driller McMillan Drilling L		d	Drawdown at Max Tested Yield	14 m
Drilling Method	Drilling Method Rotary Rig			Specific Capacity	0.84 l/s/m
Casing Material		STEEL		Last Updated	08 Nov 2013
Ритр Туре		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	55.7	59.4				

Step Tests

Step Test Date	Step	Yield	Yield GPM	DrawDown	Step Duration
15 Oct 1984	1	11.4	150.45929	13.6	18

Comments

Comment Date	Comment
	NO LOG EXISTS. SCREENED IN MEDIUM STAINED GRAVELS.

Bore or Well No	M36/3	018			nvironment
Well Name	SELW	YN RD			anterbury
Owner	BOWE	DEN M.L.		Ка	unihera Taiao ki Waitaha
Well Number		M36/3018		File Number	
Owner		BOWDEN M.L.		Well Status	Active (exist, present)
Street/Road		SELWYN RD		NZTM Grid Reference	BX23:52606-70440
Locality		ROLLESTON		NZTM X and Y	1552606 - 5170440
Location Description		NEAR STABLES		Location Accuracy	50 - 300m
CWMS Zone		Selwyn - Waihora	1	Use	Irrigation, Domestic and Stockwater
Groundwater Allocation Zone		Selwyn-Waimakariri		Water Level Monitoring	
Depth		65.70m		Water Level Count	0
Diameter		200mm		Initial Water Level	9.32m below MP
Measuring Point Descripti	on			Highest Water Level	
Measuring Point Elevation	ı	34.95m above M	SL (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 80%	11.68m below MP (Estimated)
Aquifer Name		Linwood Gravel		Aquifer Tests	0
Aquifer Type		Unknown		Yield Drawdown Tests	1
Drill Date		13 Jan 1986		Max Tested Yield	16 l/s
Driller		McMillan Drilling	Ltd	Drawdown at Max Tested Yield	22 m
Drilling Method		Rotary/Percussio	n	Specific Capacity	0.75 l/s/m
Casing Material		STEEL		Last Updated	08 Nov 2013
Pump Type		Submersible		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	58.4	61.3				
2	Stainless steel	63.3	65.4				

Step Tests

Step Test Date	Step	Yield	Yield GPM	DrawDown	Step Duration
13 Jan 1986	1	16.3	215.130386	21.7	14

Comments

Comment Date	Comment
	DRILLED TO 42M IN 1985.11.4I/s 23M DD

Bore Log

Borelog for well M36/3018

Grid Reference (NZTM): 1552607 mE, 5170441 mN Location Accuracy: 50 - 300m Ground Level Altitude: 35.0 m +MSD Accuracy: < 2.5 m Driller: McMillan Drilling Ltd Drill Method: Rotary/Percussion Borelog Depth: 65.7 m Drill Date: 13-Jan-1986



	Water				Formation
Scale(m)	Level	Depth(m)		Full Drillers Description	Code
Scale(m)	Level	Depth(m)	No Log No Log No og No Log No Log No No Log No Log No og No Log No Log No og No Log No Log No No Log No Log No No Log No Log No No Log No Log No No Log No Log No g No Log No Log No No Log No Log No No Log No Log No No Log No Log No No Log No Log No	Full Onliers Description Not logged	SP-LI
			No Log No Log No g No Log No Log No No Log No Log No g No Log No Log No g No Log No Log No No Log No Log No No Log No Log No J No Log No Log No g No Log No Log No g No Log No Log No No Log No Log No No Log No Log No No Log No Log No No Log No Log No		
26		39.00m _	g No Log No Log No No Log No Log No No Log No Log No g No Log No Log No No Log No Log No		
39		46.50m		Grey and Brown stained gravels, sandy	LI
-		51.50m _	<u>0:.0:0:</u> .0:0:0:0	Grey and Brown Or stained gravels, very sandy and clayey	
53		53.00m	000000	Tight claybound gravels	LI
		55.00m	0.0.0.	Grey and Brown Black stained	LI
Н		56.00m	0	gravels, fine sand and Orange/Yellow clays	

M36/3018 details | Environment Canterbury

	Very hard claybound gravels, very fine sand	LI
	Free Brown and Grey stained gravels, some clay and very sandy	LI
63.00m 000000	Hard claybound gravels	LI
	Grey and Brown stained gravels, sandy and clayey	LI

Bore or Well No	M36/3836			E E	nvironment
Well Name	LINCOLN R	COLLESTON RD			anterbury
Owner	Mr & Mrs K	M & J A Saulsbury		Ка	unihera Taiao ki Waitaha
Well Number		M36/3836		File Number	CO6C/02068
Owner		Mr & Mrs K M & J A Saulsbur	ry	Well Status	Active (exist, present)
Street/Road		LINCOLN ROLLESTON RD		NZTM Grid Reference	BX23:53106-71190
Locality		BROADFIELD		NZTM X and Y	1553106 - 5171190
Location Description				Location Accuracy	50 - 300m
CWMS Zone		Selwyn - Waihora		Use	Irrigation,
Groundwater Allocation Zone		Selwyn-Waimakariri		Water Level Monitoring	
Depth		56.60m		Water Level Count	0
Diameter		220mm		Initial Water Level	10.70m below MP
Measuring Point Descr	iption			Highest Water Level	
Measuring Point Eleva	tion	37.24m 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 80%	11.88m below MP (Estimated)
Aquifer Name		Linwood Gravel		Aquifer Tests	0
Aquifer Type		Unknown		Yield Drawdown Tests	1
Drill Date		01 Nov 1987		Max Tested Yield	11 l/s
Driller		McMillan Drilling Ltd		Drawdown at Max Tested Yield	14 m
Drilling Method		Cable Tool		Specific Capacity	0.83 l/s/m
Casing Material		STEEL		Last Updated	08 Nov 2013
Ритр Туре		Submersible		Last Field Check	
Water Use Data		Yes			



Screens

Screen No.	Screen Type	Top (m)	Bottom (m)	Slot Size (mm)	Slot Length (mm)	Diameter (mm)	Leader Length (mm)
1	Stainless steel	53.6	56.6				

Step Tests

Step Test Date	Step	Yield	Yield GPM	DrawDown	Step Duration
01 Nov 1987	1	11.4	150.45929	13.7	4

Comments

Comment Date	Comment		
21 Jul 2011	Previous owner VAN DE KLUNDERT A.W.		

Bore Log

Borelog for well M36/3836

Grid Reference (NZTM): 1553107 mE, 5171191 mN Location Accuracy: 50 - 300m Ground Level Altitude: 37.2 m +MSD Accuracy: < 2.5 m Driller: McMillan Drilling Ltd Drill Method: Cable Tool Borelog Depth: 56.6 m Drill Date: 01-Nov-1987



	Water				Formation
Scale(m)	Level	Depth(m)		Full Drillers Description	Code
		0.30m		Earth	SP
				Brown clay	SP
Н		2.50m			
			000000	Claybound gravels	SP-BR
Н			000000		
Н			000000		
			000000		
Н					
			000000		
11					
			000000		
			000000		
			000000		
			200000		
			000000		
			000000		
			00000		
			000000		
			000000		
23					
			0000000		
Ш					
Π			000000		
Н			000000		
			00000		
			000000		
П			00000		
			<u> </u>		
Н			000000		
			<u> </u>		
34		33.50m	$\overline{D}\overline{D}\overline{D}\overline{D}\overline{D}\overline{D}\overline{D}\overline{D}$	Grov day	882
		34.50m		Light Brown group way sandy with	
			0.0.0	cleawesh	
н			·····	olaywash	
		38.40m	5. A		
			00=000	Small Brown gravel and some clay	LI
			000000		
		41.20m	X X X X X X		
		-	000000000	Medium sized Brown and Grey gravel	LI
			0000000000		
			0000000000		
			000000000000000000000000000000000000000		
40			0000000000		
			10000000000		
			0000000000		
Н			00000000		1



Bore or Well No	M36/4433				nvironment
Well Name	SELWYN F	ROAD			anterbury
Owner	Mr & Mrs H J & D P Bates			Kai	inihera Taiao ki Waitaha
Well Number		M36/4433		File Number	CO6C/02646
Owner		Mr & Mrs H J & D P Bates		Well Status	Active (exist, present)
Street/Road		SELWYN ROAD		NZTM Grid Reference	BX23:52875-70540
Locality		ROLLESTON		NZTM X and Y	1552875 - 5170540
Location Description				Location Accuracy	2 - 15m
CWMS Zone		Selwyn - Waihora		Use	Irrigation, Domestic Supply
Groundwater Allocation Zone		Selwyn-Waimakariri		Water Level Monitoring	
Depth		30.00m		Water Level Count	0
Diameter		150mm		Initial Water Level	9.70m below MP
Measuring Point Descri	ption			Highest Water Level	
Measuring Point Elevati	on	35.61m above MSL (Lytte	elton 1937)	Lowest Water Level	
Elevation Accuracy		< 2.5 m		First reading	
Ground Level		0.00m above MP		Last reading	
Strata Layers		10		Calc Min 80%	12.08m below MP (Estimated)
Aquifer Name		Bromley Formation		Aquifer Tests	0
Aquifer Type		Unknown		Yield Drawdown Tests	1
Drill Date		20 Dec 1991		Max Tested Yield	2 l/s
Driller		Smiths Welldrilling		Drawdown at Max Tested Yield	4 m
Drilling Method		Cable Tool		Specific Capacity	0.52 l/s/m
Casing Material				Last Updated	08 Nov 2013
Ритр Туре		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	28	30				

Step Tests

Step Test Date	Step	Yield	Yield GPM	DrawDown	Step Duration
20 Dec 1991	1	2.2	29.036005	4.2	2
Comment Date	Comment				
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	Previous owner S Matheson.				

Borelog for well M36/4433

Grid Reference (NZTM): 1552876 mE, 5170541 mN Location Accuracy: 2 - 15m Ground Level Altitude: 35.6 m +MSD Accuracy: < 2.5 m Driller: Smiths Welldrilling Drill Method: Cable Tool Borelog Depth: 30.0 m Drill Date: 20-Dec-1991



	Water				Formation
Scale(m)	Level	Depth(m)		Full Drillers Description	Code
		0.25m -	<u></u>	Earth	SP?
		0.60m T	777.77	Clay	SP?
Н				Large rough stones and sand	SP-RI
			1.0.001		
Н					
			Pronu		
П					
			D:::O::O:		
Н					
			PO O 4		
5 🗌			11.01.01		
			0::0::U		
			·· • • • • • • • • • • • • • • • • • •		
		7.19m	\underline{P}		
			00000	Claybound small to medium gravel	RI
			30-030		
			00000		
10			000000		
			00000		
			<u></u>		
Н					
			000000		
Ш			booool		
П			00000		
			00000		
Н			000000		
Н			000000		
15			000000		
			000000		
			000000		
		17.50m	$\underline{D}\underline{O}\underline{O}\underline{O}\underline{O}\underline{O}\underline{O}$		
			0.0.0.	Claybound gravel and sand	RI
			1.0.0.0		
			00.0.		
20					
		20.50m _	60660	Comercia	DI
Н				Some water	RI
			6000000000		
			0000000000		
Π			00000000000		
		23.00m	00000000000		
Н		20.0011	00000	Clavbound	RI
			000000		
Н					
			000000		
25			0000000		
			000000		

27.00m	Patch Yellow clay	BR?
	Free sandy gravel	BR?
29.00m	Small Black/purple free gravel, sandy	BR?
30.00m		

Bore or Well No	M36/7975		Env	vironment	
Well Name	SELWYN ROAD			nterbury	
Owner	MR & MS S	H & EL LOEFFLER & HUISMANS	Kegional Counc Kaunihera Taiao ki Waital		
Well Number		M36/7975	File Number	CO6C/23830	
Owner		MR & MS SH & EL LOEFFLER & HUISMANS	Well Status	Active (exist, present)	
Street/Road		SELWYN ROAD	NZTM Grid Reference	BX23:52316-71000	
Locality		ROLLESTON	NZTM X and Y	1552316 - 5171000	
Location Description	n		Location Accuracy	50 - 300m	
CWMS Zone		Selwyn - Waihora	Use	Domestic Supply,	
Groundwater Alloca	tion Zone	Selwyn-Waimakariri	Water Level Monitoring		
Depth		37.50m	Water Level Count	0	
Diameter		150mm	Initial Water Level	10.00m below MP	
Measuring Point Des	scription	ToC	Highest Water Level		
Measuring Point Ele	vation	38.00m above MSL (Lyttelton 1937)	Lowest Water Level		
Elevation Accuracy		< 2.5 m	First reading		
Ground Level		0.30m below MP	Last reading		
Strata Layers		12	Calc Min 80%	12.03m below MP (Estimated)	
Aquifer Name			Aquifer Tests	0	
Aquifer Type			Yield Drawdown Tests	3	
Drill Date		05 Sep 2005	Max Tested Yield	6 l/s	
Driller		Dynes Road Drilling	Drawdown at Max Tested Yield	17 m	
Drilling Method		Cable Tool	Specific Capacity	0.43 l/s/m	
Casing Material		Steel	Last Updated	08 Nov 2013	
Pump Type			Last Field Check		
Water Use Data		No			

Screen No.	Screen Type	Top (m)	Bottom (m)	Slot Size (mm)	Slot Length (mm)	Diameter (mm)	Leader Length (mm)
1	Stainless steel	35	37.5				

Step Test Date	Step	Yield	Yield GPM	DrawDown	Step Duration
05 Sep 2005	1	3.636864	48	8.5	1
05 Sep 2005	2	5.379528	71	12.2	1

Step Test Date	Step	Yield	Yield GPM	DrawDown	Step Duration
05 Sep 2005	3	6.364512	84	17.3	2

No comments for this well

Borelog for well M36/7975

Grid Reference (NZTM): 1552317 mE, 5171001 mN Location Accuracy: 50 - 300m Ground Level Altitude: 37.7 m +MSD Accuracy: < 2.5 m Driller: Dynes Road Drilling Drill Method: Cable Tool Borelog Depth: 37.5 m Drill Date: 05-Sep-2005







Bore or Well No	No M36/7976				nvironment	
Well Name	SELWYN ROAD				anterbury	
Owner	WEATHERB	Y ESTATE LIMITED		Keyional Counc Kaunihera Taiao ki Waital		
Well Number		M36/7976		File Number	CO6C/23897	
Owner		WEATHERBY ESTATE LIMITE	D	Well Status	Active (exist, present)	
Street/Road		SELWYN ROAD		NZTM Grid Reference	BX23:52386-70950	
Locality		BROADFIELD		NZTM X and Y	1552386 - 5170950	
Location Description				Location Accuracy	10 - 50m	
CWMS Zone		Selwyn - Waihora		Use	Domestic and Stockwater,	
Groundwater Allocatio	on Zone	Selwyn-Waimakariri		Water Level Monitoring		
Depth		36.00m		Water Level Count	0	
Diameter		150mm		Initial Water Level	10.60m below MP	
Measuring Point Desc	ription	ТоС		Highest Water Level		
Measuring Point Eleva	ation	37.00m above MSL (Lyttelton 1937)		Lowest Water Level		
Elevation Accuracy		< 2.5 m		First reading		
Ground Level		0.40m below MP		Last reading		
Strata Layers		11		Calc Min 80%	12.04m below MP (Estimated)	
Aquifer Name				Aquifer Tests	0	
Aquifer Type				Yield Drawdown Tests	1	
Drill Date		24 Aug 2005		Max Tested Yield	2 l/s	
Driller		Daly Water Wells Ltd		Drawdown at Max Tested Yield	3 m	
Drilling Method		Rotary Rig		Specific Capacity	0.63 l/s/m	
Casing Material		Steel		Last Updated	08 Nov 2013	
Pump Type				Last Field Check		
Water Use Data		No				

Screen No.	Screen Type	Top (m)	Bottom (m)	Slot Size (mm)	Slot Length (mm)	Diameter (mm)	Leader Length (mm)
1	Stainless steel	34	36				

Step Test Date	Step	Yield	Yield GPM	DrawDown	Step Duration
24 Aug 2005	1	2	26.396368	3.2	4

Comment Date	Comment
28 Mar 2006	Gridref changed from: M36:6233-3268

Borelog for well M36/7976

Grid Reference (NZTM): 1552387 mE, 5170951 mN Location Accuracy: 10 - 50m Ground Level Altitude: 36.6 m +MSD Accuracy: < 2.5 m Driller: Daly Water Wells Ltd Drill Method: Rotary Rig Borelog Depth: 36.0 m Drill Date: 24-Aug-2005



	Water				Formation
Scale(m)	Level	Depth(m)		Full Drillers Description	Code
		0.30m -	000000000	brown topsoil	
Н			0000000000	grey dry clean gravels	
			0000000000		
Н		2.50m	0000000000		
Ц		3.00m	0	grey sandy moist gravels	
			000000	brown claybound gravels	
Н					
5			000000		
			000000		
- H					
			000000		
			200000		
- H			000000		
			00000		
			200000		
10			000000		
			000000		
Н			000000		
Ц		12.00m	000000		
			0==0==0==	brown silty claybound gravels	
Н					
Ц			<u>==000</u>		
			0==0==0==		
15		15.00m _	000000	arey beavy claybound gravels	
			202200	g,,, s	
			1000000		
			000000		
			000000		
20			000000		
Н		21.00m _	<u>bañvoan</u>	arey condy provals traces of alay	
			0.0.0.	grey sandy gravels traces of clay	
П			<u>t:a::o::a</u>		
Н					
П					
25					
			$\mathbf{p} \cdot \mathbf{v} \cdot \mathbf{o} \cdot \mathbf{p}$		
_					
		28.00~			
		20.000	00000	brown claybound gravels	
			200000		
20			000000		
30			000000		

L	31.00m	000000		
Γ		0==0==0==	brown poor silty water-bearing gravels	
F		==0==0==0		
L	33.00m	00		
		000000000	brown better water-bearing gravels	
L	34.00m	000000000		
			brown good water-bearing gravels	
35		000000000000000000000000000000000000000		
- 1				
	36.00m	0000000000		
	36.00m	000000000000000000000000000000000000000		

Bore or Well No	M36/8002	2		Er Er	vironment
Well Name	SELWYN R	OAD			Interbury
Owner	MR & MRS	AT & JM MULCAY		Kaui	nihera Taiao ki Waitaha
Well Number		M36/8002		File Number	CO6C/24021
Owner		MR & MRS AT & JM MULCA	Y	Well Status	Active (exist, present)
Street/Road		SELWYN ROAD		NZTM Grid Reference	BX23:52536-70700
Locality		ROLLESTON		NZTM X and Y	1552536 - 5170700
Location Description				Location Accuracy	50 - 300m
CWMS Zone		Selwyn - Waihora		Use	Domestic and Stockwater,
Groundwater Allocation Zone		Selwyn-Waimakariri		Water Level Monitoring	
Depth		66.00m		Water Level Count	0
Diameter		150mm		Initial Water Level	12.40m below MP
Measuring Point Desc	ription	ТоС		Highest Water Level	
Measuring Point Eleva	ition	36.00m above MSL (Lyttelton 1937)		Lowest Water Level	
Elevation Accuracy		< 2.5 m		First reading	
Ground Level		0.30m below MP		Last reading	
Strata Layers		13		Calc Min 80%	11.96m below MP (Estimated)
Aquifer Name				Aquifer Tests	0
Aquifer Type				Yield Drawdown Tests	1
Drill Date		28 Oct 2005		Max Tested Yield	4 l/s
Driller		Smiths Welldrilling		Drawdown at Max Tested Yield	11 m
Drilling Method		Rotary/Percussion		Specific Capacity	0.37 l/s/m
Casing Material		Steel		Last Updated	08 Nov 2013
Ритр Туре				Last Field Check	
Water Use Data		No			

Screen No.	Screen Type	Top (m)	Bottom (m)	Slot Size (mm)	Slot Length (mm)	Diameter (mm)	Leader Length (mm)
1	Stainless steel	64.5	66				

Step Test Date	Step	Yield	Yield GPM	DrawDown	Step Duration
30 Oct 2005	1	4.06	53.5846252	11	2

Comment Date	Comment
04 May 2007	Gridref changed from: M36:6249-3232, original gridref incorrect (on road) still waiting for BCR

Borelog for well M36/8002

Grid Reference (NZTM): 1552537 mE, 5170701 mN Location Accuracy: 50 - 300m Ground Level Altitude: 35.7 m +MSD Accuracy: < 2.5 m Driller: Smiths Welldrilling Drill Method: Rotary/Percussion Borelog Depth: 66.0 m Drill Date: 28-Oct-2005







Bore or Well No	M36/8009				Environment
Well Name	SELWYN RO	DAD			Canterbury
Owner	MR & MRS	GC & PM MORGAN		ĸ	aunihera Taiao ki Waitaha
Well Number		M36/8009		File Number	CO6C/24231
Owner		MR & MRS GC & PM MORGA	N	Well Status	Active (exist, present)
Street/Road		SELWYN ROAD		NZTM Grid Reference	BX23:52356-70860
Locality		BROADFIELD		NZTM X and Y	1552356 - 5170860
Location Description				Location Accuracy	50 - 300m
CWMS Zone		Selwyn - Waihora		Use	Domestic and Stockwater,
Groundwater Allocation Zone		Selwyn-Waimakariri		Water Level Monitoring	
Depth		36.00m		Water Level Count	0
Diameter		150mm		Initial Water Level	12.20m below MP
Measuring Point Desc	ription	ТоС		Highest Water Level	
Measuring Point Eleva	ation	36.18m above MSL (Lyttelton 1937)		Lowest Water Level	
Elevation Accuracy		< 5 m		First reading	
Ground Level		0.40m below MP		Last reading	
Strata Layers		10		Calc Min 80%	11.92m below MP (Estimated)
Aquifer Name				Aquifer Tests	0
Aquifer Type				Yield Drawdown Tests	1
Drill Date		01 Nov 2005		Max Tested Yield	2 l/s
Driller		Daly Water Wells Ltd		Drawdown at Max Tested Yield	3 m
Drilling Method		Rotary Rig		Specific Capacity	0.63 l/s/m
Casing Material		Steel		Last Updated	08 Nov 2013
Ритр Туре				Last Field Check	
Water Use Data		No			

Screen No.	Screen Type	Top (m)	Bottom (m)	Slot Size (mm)	Slot Length (mm)	Diameter (mm)	Leader Length (mm)
1	Slotted PVC	34	36				

Step Test Date	Step	Yield	Yield GPM	DrawDown	Step Duration
01 Nov 2006	1	2	26.396368	3.2	3

No comments for this well

Borelog for well M36/8009 page 1 of 2

Grid Reference (NZTM): 1552357 mE, 5170861 mN Location Accuracy: 50 - 300m Ground Level Altitude: 35.8 m +MSD Accuracy: < 0.5 m Driller: Daly Water Wells Ltd Drill Method: Rotary Rig Borelog Depth: 36.0 m Drill Date: 01-Nov-2005



Scale(m)	Water Level	Depth(m)		Full Drillers Description	Formation Code
		0.25m		brown top soil	
		0.25m		brown top soil	
		0.60m -	000000000	yellow/brown dry clay	
Н		0.60m	0000000000	yellow/brown dry clay	
			000000000000000000000000000000000000000	11.8m)	
			000000000000000000000000000000000000000		
Н			00000000000		
			000000000000000000000000000000000000000		
			000000000000000000000000000000000000000		
Ц			00000000000		
			000000000000000000000000000000000000000		
Ц			0000000000		
			D00000000000		
		4.70m			
5		4.70m	<u>000000</u>	grey dry gravels small-large (swl = 11.8m)	
			<u>000000</u> 000	yellow small-medium claybound gravels	
			<u>000000</u>		
			000000		
			000000		
			000000		
10			000000		
Ĩ			000000		
			000000		
Н			000000		
H			000000		
			000000		
H			000000		
			000000		
H			000000		
			000000		
15					
			000000		



Bore or Well No	M36/8138			En En	vironment
Well Name	LINCOLN R	OLLESTON ROAD			Interbury
Owner	MR & MRS I	RG & VA HUBBARD		Kaur	nihera Taiao ki Waitaha
Well Number		M36/8138		File Number	CO6C/24642
Owner		MR & MRS RG & VA HUBBAR	D	Well Status	Active (exist, present)
Street/Road		LINCOLN ROLLESTON ROAD)	NZTM Grid Reference	BX23:52946-71200
Locality		ROLLESTON		NZTM X and Y	1552946 - 5171200
Location Description				Location Accuracy	10 - 50m
CWMS Zone		Selwyn - Waihora		Use	Domestic and Stockwater,
Groundwater Allocation Zone		Selwyn-Waimakariri		Water Level Monitoring	
Depth		36.00m		Water Level Count	0
Diameter		150mm		Initial Water Level	14.60m below MP
Measuring Point Desc	ription	ТоС		Highest Water Level	
Measuring Point Eleva	ation	35.69m above MSL (Lyttelton 1937)		Lowest Water Level	
Elevation Accuracy		< 5 m		First reading	
Ground Level		0.40m below MP		Last reading	
Strata Layers		5		Calc Min 80%	12.83m below MP (Estimated)
Aquifer Name				Aquifer Tests	0
Aquifer Type				Yield Drawdown Tests	1
Drill Date		16 Jan 2006		Max Tested Yield	2 l/s
Driller		Daly Water Wells Ltd		Drawdown at Max Tested Yield	4 m
Drilling Method		Rotary Rig		Specific Capacity	0.51 l/s/m
Casing Material		Steel		Last Updated	08 Nov 2013
Pump Type				Last Field Check	
Water Use Data		No			

Screen No.	Screen Type	Top (m)	Bottom (m)	Slot Size (mm)	Slot Length (mm)	Diameter (mm)	Leader Length (mm)
1	Stainless steel	34	36				

Step Test Date	Step	Yield	Yield GPM	DrawDown	Step Duration
16 Jan 2006	1	2	26.396368	3.9	0

Comment Date	Comment
27 May 2008	Gridref changed from: M36:6294-3282 (BCP received)

Borelog for well M36/8138

Grid Reference (NZTM): 1552947 mE, 5171201 mN Location Accuracy: 10 - 50m Ground Level Altitude: 35.3 m +MSD Accuracy: < 0.5 m Driller: Daly Water Wells Ltd Drill Method: Rotary Rig Borelog Depth: 36.0 m Drill Date: 16-Jan-2006







Bore or Well No	M36/8299				nvironment
Well Name	SELWYN R	SELWYN ROAD			anterbury
Owner	MR GJ & N	IRS BA SCURR		Και	inihera Taiao ki Waitaha
Well Number		M36/8299		File Number	CO6C/24910
Owner		MR GJ & MRS BA SCUR	R	Well Status	Active (exist, present)
Street/Road		SELWYN ROAD		NZTM Grid Reference	BX23:52686-70750
Locality		BROADFIELDS		NZTM X and Y	1552686 - 5170750
Location Description				Location Accuracy	10 - 50m
CWMS Zone		Selwyn - Waihora		Use	Domestic Supply,
Groundwater Allocation Zone		Selwyn-Waimakariri		Water Level Monitoring	
Depth		90.00m		Water Level Count	0
Diameter		150mm		Initial Water Level	21.00m below MP
Measuring Point Descri	ption	ТоС		Highest Water Level	
Measuring Point Elevat	ion	34.56m above MSL (Lyttelton 1937)		Lowest Water Level	
Elevation Accuracy		< 5 m		First reading	
Ground Level		0.60m below MP		Last reading	
Strata Layers		7		Calc Min 80%	11.87m below MP (Estimated)
Aquifer Name				Aquifer Tests	0
Aquifer Type				Yield Drawdown Tests	0
Drill Date		20 Feb 2008		Max Tested Yield	
Driller		Giltrap Drilling		Drawdown at Max Tested Yield	
Drilling Method Rota		Rotary Rig		Specific Capacity	
Casing Material		Steel		Last Updated	19 Mar 2010
Ритр Туре				Last Field Check	
Water Use Data No					

Screen No.	Screen Type	Top (m)	Bottom (m)	Slot Size (mm)	Slot Length (mm)	Diameter (mm)	Leader Length (mm)
1	Stainless steel	88.5	90				

No step tests for this well

Comment Date	Comment
19 Mar 2010	Gridref changed from: M36:6266-3237 to M36:6268-3236 BCP confirms

Borelog for well M36/8299

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Grid Reference (NZTM): 1552687 mE, 5170751 mN Location Accuracy: 10 - 50m Ground Level Altitude: 34.0 m +MSD Accuracy: < 0.5 m Driller: Giltrap Drilling Drill Method: Rotary Rig Borelog Depth: 90.0 m Drill Date: 20-Feb-2008



Scale(m)	Water Level	Depth(m)		Full Drillers Description	Formation Code
<u> </u>		1.00m		Top soil	
		1.00m -	802080	Top soil	
Ц		2.00m	0.0.0.	Clay - band of gravels	
		2.00m	1.0.0	Clay - band of gravels	
				River gravel, sand	
Н		8.00m	hi o i o i d		
		8.00m		River gravel, sand	
Ц				Greywacke river sands, some clay	
		14.00m			
Н		14.00m	0000000000	Greywacke river sands, some clay	
			000000000000000000000000000000000000000	Some water, grey gravels	
18		18.00m	000000000000000000000000000000000000000	Same water, any anguals	
		18.00m	000000000000000000000000000000000000000	Some water, grey gravers	
			0000000000	incleased water, giey graveis	
			000000000		
			0000000000		
			0000000000		
			10000000000		
			10000000000		
			000000000000000000000000000000000000000		
			6000000000		
			600000000		
			00000000000		
			000000000		
36			po000000000		
			000000000000000000000000000000000000000		
			1000000000000		
П			10000000000		
			100000000000		
Н			000000000		
			000000000		
			5000000000		
Н			000000000000000000000000000000000000000		
			000000000000000000000000000000000000000		
Ц			b0000000000000000000000000000000000000		
			hoododdodd		
			000000000000000000000000000000000000000		
54			0000000000		
			0000000000		
			10000000000		
			P0000000000000000000000000000000000000		
			b0000000000000000000000000000000000000		
			60000000000		
			500000000		
			0000000000		
			pooooooo		
			000000000		
			000000000000000000000000000000000000000		
			000000000000000000000000000000000000000		
			000000000000000000000000000000000000000		
72			000000000000000000000000000000000000000		
			000000000000000000000000000000000000000		
			100000000000000000000000000000000000000		
Н			600000000000000000000000000000000000000		



Bore or Well No	M36/8300	00			nvironment
Well Name	SELWYN ROAD				anterbury
Owner	Mr & Mrs C	G J & B A Scurr		Kai	unihera Taiao ki Waitaha
Well Number		M36/8300		File Number	CO6C/24910
Owner		Mr & Mrs G J & B A Scur	r	Well Status	Active (exist, present)
Street/Road		SELWYN ROAD		NZTM Grid Reference	BX23:52676-70960
Locality		BROADFIELDS		NZTM X and Y	1552676 - 5170960
Location Description				Location Accuracy	10 - 50m
CWMS Zone		Selwyn - Waihora		Use	Domestic Supply,
Groundwater Allocation Zone		Selwyn-Waimakariri		Water Level Monitoring	
Depth		42.00m		Water Level Count	0
Diameter		150mm		Initial Water Level	14.00m below MP
Measuring Point Description		ТоС		Highest Water Level	
Measuring Point Elevati	on	35.29m above MSL (Lyttelton 1937)		Lowest Water Level	
Elevation Accuracy		< 5 m		First reading	
Ground Level		0.60m below MP		Last reading	
Strata Layers		5		Calc Min 80%	12.33m below MP (Estimated)
Aquifer Name				Aquifer Tests	0
Aquifer Type				Yield Drawdown Tests	0
Drill Date		25 Feb 2008		Max Tested Yield	
Driller Giltrap Drilling		Giltrap Drilling		Drawdown at Max Tested Yield	
Drilling Method Rotary Rig			Specific Capacity		
Casing Material		Steel		Last Updated	19 May 2010
Pump Type				Last Field Check	
Water Use Data		Yes			

Screen No.	Screen Type	Top (m)	Bottom (m)	Slot Size (mm)	Slot Length (mm)	Diameter (mm)	Leader Length (mm)
1	Stainless steel	39	40.5				

No step tests for this well

Comment Date	Comment
19 Mar 2010	Gridref changed from: M36:6262-3256 to M36:6267-3257 BCP confirms

Borelog for well M36/8300

Grid Reference (NZTM): 1552677 mE, 5170961 mN Location Accuracy: 10 - 50m Ground Level Altitude: 34.7 m +MSD Accuracy: < 0.5 m Driller: Giltrap Drilling Drill Method: Rotary Rig Borelog Depth: 42.0 m Drill Date: 25-Feb-2008



	Water				Formation
Scale(m)	Level	Depth(m)		Full Drillers Description	Code
				Clay hand of grouple	
		1.00m	000000	Ciay band of graveis	
Н		1.00m	00000000	Clev hand of grovels	
11		1.00m		Ciay band of gravels	
Н				River graveis	
11			POOOOOOOO		
Н			000000000		
11			1000000000		
Н			000000000		
5			10000000000		
			50000000		
			0000000000		
			666666666		
		7.00m	666666666		
		7.00m	000	River gravels	
				River sands, greywacke gravel getting	
			1:0:•0•01	wet	
Ц					
			DI-OLIUIN		
10			·		
11		44.00			
Н		11.00m _	HARAAAR	Diversede services and estimate	
11		11.00m	0000000000	River sands, greywacke gravel getting	
Н			000000000	wet	
11		12.00m	DOOOOOOO	Top of aquifer, greywacke	
Н		10.00	<u>1888888888</u> 1	Tan of any far any washe	
11		13.00m	Procession and	Top of aquiler, greywacke	
Н			0000000000	Grey gravels - water	
15			poooooooo		
•• H			000000000		
			b000000000		
			0000000000		
			D000000000		
			50000000		
			0000000000		
			6666666666		
			booooooo		
20			POSSOSSOSSO		
П			poooooooo		
Ц			0000000000		
11			D00000000		
Ц			000000000		
11			0000000000		
Н			10000000000		
11			10000000000		
Н					
			600000000		
25					
			000000000000000000000000000000000000000		
H			poooooooo		
			D000000000		
н			000000000		
			000000000		
н			500000000		
			600000000		
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			D00000000		
Н			0000000000		
			0000000000		
Н			6000000000		
			666666666		
Н			P2200000000		
35			POODOOOOOO		
~~ H			F000000000		
			CALCER DATE OF A CALCULATION OF A CALCUL		



Bore or Well No	M36/8392	2		Er	vironment
Well Name	572 SELV	VYN ROAD			anterbury
Owner	A J LLOY	D		Kaui	nihera Taiao ki Waitaha
Well Number		M36/8392		File Number	CO6C/26653
Owner		A J LLOYD		Well Status	Active (exist, present)
Street/Road		572 SELWYN ROAD		NZTM Grid Reference	BX23:52567-70574
Locality		SPRINGSTON		NZTM X and Y	1552567 - 5170574
Location Description				Location Accuracy	2 - 15m
CWMS Zone		Selwyn - Waihora		Use	Domestic Supply,
Groundwater Allocation Zone		Selwyn-Waimakariri		Water Level Monitoring	
Depth		36.00m		Water Level Count	0
Diameter		150mm		Initial Water Level	10.00m below MP
Measuring Point Descrip	otion			Highest Water Level	
Measuring Point Elevation	on	34.26m above MSL (Lyttelton 1937)		Lowest Water Level	
Elevation Accuracy		< 5 m		First reading	
Ground Level		0.00m above MP		Last reading	
Strata Layers		5		Calc Min 80%	11.83m below MP (Estimated)
Aquifer Name				Aquifer Tests	0
Aquifer Type				Yield Drawdown Tests	1
Drill Date		12 Jun 2007		Max Tested Yield	2 l/s
Driller		Daly Water Wells Ltd		Drawdown at Max Tested Yield	11 m
Drilling Method		Rotary Rig		Specific Capacity	0.18 l/s/m
Casing Material		Steel		Last Updated	08 Nov 2013
Ритр Туре				Last Field Check	
Water Use Data		No			

Screen No.	Screen Type	Top (m)	Bottom (m)	Slot Size (mm)	Slot Length (mm)	Diameter (mm)	Leader Length (mm)
1	Stainless steel	34	36				

Step Test Date	Step	Yield	Yield GPM	DrawDown	Step Duration
12 Jun 2007	1	2	26.396368	11	0

Comment Date	Comment
20 Sep 2007	Gridref changed from: M36:6247-3217, BCR confirms
12 Nov 2007	Gridref changed from: M36:6255-3216. New gridref from plan in BCR
09 Jun 2009	Gridref changed from: M36:62572-32149 - Site visit 5 June 09, location GPS'd

Borelog for well M36/8392

Grid Reference (NZTM): 1552568 mE, 5170575 mN Location Accuracy: 2 - 15m Ground Level Altitude: 34.3 m +MSD Accuracy: < 0.5 m Driller: Daly Water Wells Ltd Drill Method: Rotary Rig Borelog Depth: 36.0 m Drill Date: 12-Jun-2007


























ENGEO					LC	G O	F T R	'E olle	S ⁻ stor	F Pl Megas	T TP	08				
	F	548 Selw Rolleston, C 18113.0	/yn F Chris 000.0	Road tchurch 002	Client : Urban Estates Shear Vane No : N/A Date : 21-06-2023 Logged By : DD Max Test Pit Depth : 2 m Reviewed By : JC Digger Type/Size : Bucket Excavator Latitude : -43.6167175 Bucket Type/Size : 0.5 m Longitude : 172.4131495							5				
Depth (m BGL)	Material	Excavatability (Relative Scale)	USCS Symbol	DES	CRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remolded (kPa)	0 2	cala F 4	Penetr 6 8	ometer 10 12	14
-	TOPSOIL		ML	[TOPSOIL] SILT v trace rootlets; darl sand is fine to me	with some sand and k brown. Low plasticity; dium.	14 20 14 14 20 14 14 20 14 14 20 14			м	N/A						
0.5 -	-			Sandy fine to coar cobbles and trace graded; sand is fir cobble size is 200 mm; gravel is sub greywacke.	rse GRAVEL with minc rootlets; brown. Well ne to coarse; maximum mm x 150 mm x 150 rounded to rounded,										Ā	>
1.5			GW	1.2 m - Rootlets c	ease.				w	Tightly Packed						
2.0-	-			Depth of Excavation Termination Cond	on: 2 m lition: Target depth]					
Exc Sca Sta	avato ala Pe Indino	or met target de enetrometer me g groundwater w	pth at : t pract /as not	2 m. ical refusal at 0.4 m : encountered	1	N/A = Not /	Assess	sed								



ENGEO					LC)G C)F 7	FE Rolle	S stor	T PI n Mega	T TP	10			
548 Selwyn Road Rolleston, Christchurch 18113.000.002					Client Date Max Test Pit Depth Digger Type/Size Bucket Type/Size	Client : Urban Estates Shear Vane No : N/A Date : 21-06-2023 Logged By : DD lax Test Pit Depth : 2.1 m Reviewed By : JC Digger Type/Size : Bucket Excavator Latitude : -43.6151119 Bucket Type/Size : 0.5 m Longitude : 172.414189-						19 94			
Depth (m BGL)	Material	Excavatability (Relative Scale	USCS Symbol	DES	DESCRIPTION				Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remolded (kPa)	Scala	a Pene	tromete 8 10 1	er 1214
-	TS		ML	[TOPSOIL] Sandy rootlets; dark brow is fine to medium.	v SILT with trace vn. Low plasticity; sand	$\frac{\underline{x}^{\mathbf{i}} \cdot \underline{y}_{\mathbf{i}}}{\underline{y}_{\mathbf{j}} \cdot \underline{x} \cdot \underline{y}_{\mathbf{j}}}$				N/A					
- - 0.5 -	_		ML	SILT with some sa light brown with or plasticity; sand is	and and trace rootlets; range mottles. Low fine.					F-St			•		
- - - - - - - - - - - - - - - - - - -	ALLUVIUM		GW	Sandy fine to coar cobbles and trace graded; sand is fir cobble size is 200 mm; gravel is sub greywacke. 1.5 m - Rootlets c 1.6 m to 1.7 - Fine grey. Well graded; rounded, greywac	rease. eease. to coarse GRAVEL with mind rounded to rounded, rounded to rounded, eease. to coarse GRAVEL; gravel is subrounded ke.	to			w	Tightly Packed					
Sca Sta	avate ala Pe Inding	enetrometer me g groundwater	epin at et pract was not	∠. Fm. ical refusal at 0.5 m t encountered	- 	TS = TOF N/A = Not	SOIL	sed							







































		ENC	Æ	O	LO	G O	F T R	'E	S ⁻ stor	F Pl Megas	T TP	30			
548 Selwyn Road Rolleston, Christchurch 18113.000.002					Client : Urban Estates Shear Vane No : N/A Date : 21-06-2023 Logged By : DD Max Test Pit Depth : 2.2 m Reviewed By : JC Digger Type/Size : Bucket Excavator Latitude : -43.6152057 Bucket Type/Size : 0.5 m Longitude : 172.416259										
Depth (m BGL)	Material	Excavatability (Relative Scale)	USCS Symbol	DESC	DESCRIPTION					Consistency/ Density Index	Shear Vane Peak/Remolded (kPa)	Scal	a Pe 4 6	netr	ometer 10 1214
-	TS		ML	[TOPSOIL] SILT v trace rootlets; dark sand is fine.	TOPSOIL] SILT with some sand and race rootlets; dark brown. Low plasticity; sand is fine.					N/A					
- 0.5 - - - - 1.0-			ML	SILT with some sa light brown with or plasticity; sand is t 1 m - colour becor orange mottles.	and and trace rootlets; range mottles. Low fine. mes greyish blue with					F				······································	
	ALLUVIU		GW	1.15 m - colour be Sandy fine to coar cobbles and trace brown. Well grade coarse; maximum 100 mm x 100 mr to rounded, greyw	ecomes red. 'se GRAVEL with mino SILT and rootlets; ed; sand is fine to cobble size is 200 mm n; gravel is subrounded acke.				w	Tightly Packed					8
			J	Depth of Excavation Termination Cond	on: 2.2 m ition: Target depth						J				
Exc Sca Sta	Excavator met target depth at 2.2 m. Scala Penetrometer met practical refusal at 1.2 m Standing groundwater was not encountered TS = TOPSOIL N/A = Not Assessed														





APPENDIX 4:

Davie Lovell Smith Investigation Data



		Scala	Penetrome	ter Log	Job No: 20666	
	Project:	Foundatior	n Testing -	Lincoln Rolleston Roa	SPT No: 1	
	Stage	1	Lot	Concept		•
Distant Distance December	Date:		10/02/2023			
DAVIE LOVELE-SMITH	Location:		Lincoln Rolle	ston Road, Rolleston, C	Christchurch	, Stage 1, Lot Concept
	Logged B	y:	Charlie Hall			
Description of Soils	Graphic	Depth (m)	SPT blows	Average SPT blows per 300mm	CBR (%)	Blows Per 100mm 5 Blows/100mm = 300kPa
TOPSOIL		0.00				2 Blows/100mm = 200kPa
		0.10	5	6.50	10.19	0.00 10.00 20.00 30.00
		0.20	8	7.33	17.25	0.00
		0.30	9	9.00	19.68	
	the state and state and state	0.40	10	11.33	22.15	
SILT		0.50	15	13.33	34.88	
		0.60	15	18.00	34.88	0.50
REFUSAL, GRAVEL		0.70	24	19.50	59.05	
		0.80	1			
		0.90	-			
		1.00	4			
		1.10	-			1.00
		1.20	-			
		1.30	-			
		1.40	-			
		1.50	-			1.50
		1.60	-			
		1.70	-			
		1.80	-			
		1.90	-			
		2.00	-			2.00
		2.10	-			Average SPT blows
		2.20	-			per 300mm
		2.30	-			
		2.40	-			
		2.50	1			2.50 Requirements
		2.60	1			
		2.70	1			NZS3604 Standard
		2.00	1			
		3.00	1			3.00
		3.00				

		Scala	Penetrome	ter Log	Job No: 20666	
	Project:	Foundatior	n Testing -	Lincoln Rolleston Road	SPT No: 2	
	Stage	1	Lot	Concept		Rolleston
A LOUG A LOUGH A LOUGH	Date:		10/02/2023			
DAVIE LOVELL-SMITH	Location:		Lincoln Rolle	ston Road, Rolleston, C	Christchurch	, Stage 1, Lot Concept
	Logged B	y:	Charlie Hall			
Description of Soils	Graphic	Depth (m)	SPT blows	Average SPT blows per 300mm	CBR (%)	Blows Per 100mm 5 Blows/100mm = 300kPa
TOPSOIL		0.00				2 Blows/100mm = 200kPa
		0.10	3	3.00	5.75	
	01001000	0.20	3	4.33	5.75	
	Version das uns analysis d	0.30	7	6.67	14.86	
SILT		0.40	10	12.67	22.15	
REFUSAL, GRAVEL		0.50	21	15.50	50.85	
		0.60	ļ			0.50
		0.70				
		0.80				
		0.90	-			
		1.00	-			
		1.10	-			1.00
		1.20	-			
		1.30	-			
		1.40	ł			
		1.50	{			1.50
		1.00	-			
		1.70	ł			
		1.80	-			
		1.90	ł			
		2.00	{			2.00
		2.10				
		2.20	ł			blows per 300mm
		2.50	1			
		2.50	1			2.50 MBIE TC2
		2.60				Requirements
		2.70	1			
		2.80				NZ\$3604
		2.90	1			Standard
		3.00	1			3.00

		Scala	Job No: 20666					
	Project:	Project: Foundation Te		Lincoln Rolleston Roa	d	SPT No: 3		
	Stage	1	Lot	Concept		Rolleston		
Darren Lourset Champin	Date:		10/02/2023					
DAVIE LOVELL'SMITH	Location:		Lincoln Rolle	ston Road, Rolleston, 0	Christchurch	, Stage 1, Lot Concept		
	Logged E	y:	Charlie Hall					
Description of Soils	Graphic	Depth (m)	SPT blows	Average SPT blows per 300mm	CBR (%)	Blows Per 100mm 5 Blows/100mm = 300kPa		
TOPSOIL		0.00				2 Blows/100mm = 200kPa		
		0.10	4	4.00	7.94	0.00 5.00 10.00 15.00 20.00		
	*****	0.20	4	4.67	7.94	0.00		
		0.30	6	6.33	12.50			
		0.40	9	8.33	19.68			
SILT		0.50	10	9.67	22.15			
		0.60	10	11.33	22.15	0.50		
		0.70	14	13.33	32.29			
		0.80	16	17.33	37.50			
REFUSAL, GRAVEL		0.90	22	19.00	53.57			
		1.00	-					
		1.10	-			1.00		
		1.20	-					
		1.30	-					
		1.40	-					
		1.50	-			1.50		
		1.60	-					
		1.70	-					
		1.80	4					
		1.90	4					
		2.00	-			2.00		
		2.10	-			blows per		
		2.20	-			300mm		
		2.30	-					
		2.40	-			Requirements		
		2.50	-			2.50		
		2.60	{			N753604		
		2.70	-			Standard		
		2.80	1					
		2.90	1			3.00		
		3.00						

		Scala	Penetrome	ter Log		Job No: 20666	Job No: 20666			
	Project:	Foundatior	n Testing -	Lincoln Rolleston Roa	d	SPT No: 4				
	Stage	1	Lot	Concept		Rolleston				
Provide the second decision	Date:		10/02/2023							
DAVIE LOVELL-SMITH	Location:		Lincoln Rolle	ston Road, Rolleston, C	Christchurch,	Stage 1, Lot Concept				
	Logged B	y:	Charlie Hall							
Description of Soils	Graphic	Depth (m)	SPT blows	Average SPT blows per 300mm	CBR (%)	Blows Per 100mm 5 Blows/100mm = 300l	kPa			
TOPSOIL		0.00				2 Blows/100mm = 200	<pa< td=""></pa<>			
		0.10	4	3.50	7.94	0.00 10.00 20.00	30.00			
	0.0000000	0.20	3	4.33	5.75					
		0.30	6	5.00	12.50					
SILT		0.40	6	5.67	12.50					
		0.50	5	7.00	10.19					
		0.60	10	8.00	22.15	0.50	·			
		0.70	9	16.33	19.68					
REFUSAL, GRAVEL		0.80	30	19.50	75.82					
		0.90	-							
		1.00	4							
		1.10	4			1.00				
		1.20	4							
		1.30	-							
		1.40	-							
		1.50	-			1.50				
		1.60	-							
		1.70	-							
		1.80	-							
		1.90	-							
		2.00	-			2.00				
		2.10	-				SPT blows			
		2.20	-			per 300	imm			
		2.30	-							
		2.40	+				~			
		2.50	4			Require	ments			
		2.60	1							
		2.70	4				4 Standard			
		2.80	1							
		3.00	1			3.00				
		3.00								
		Scala	Penetrome	Job No: 20666						
--------------------------	-------------------	------------	---------------	--------------------------------	--------------	---				
	Project:	Foundatior	n Testing -	Lincoln Rolleston Road	d	SPT No: 5				
	Stage	1	Lot	Concept						
Distant Distance Decimal	Date:		10/02/2023							
DAVIE LOVELL-SMITH	Location:		Lincoln Rolle	ston Road, Rolleston, C	Christchurch	, Stage 1, Lot Concept				
	Logged E	y:	Charlie Hall							
Description of Soils	Graphic	Depth (m)	SPT blows	Average SPT blows per 300mm	CBR (%)	Blows Per 100mm 5 Blows/100mm = 300kPa				
TOPSOIL		0.00				2 Blows/100mm = 200kPa				
		0.10	4	3.50	7.94	0.00 5.00 10.00 15.00 20.00				
	anne.	0.20	3	3.67	5.75					
	1101100	0.30	4	4.00	7.94					
		0.40	5	5.00	10.19					
		0.50	6	5.00	12.50					
SILT		0.60	4	5.00	7.94	0.50				
	ni ka ka ka ka ka	0.70	5	4.33	10.19					
		0.80	4	5.00	7.94					
		0.90	6	5.00	12.50					
		1.00	5	5.33	10.19					
		1.10	5	13.33	10.19	1.00				
REFUSAL, GRAVEL		1.20	30	17.50	75.82					
		1.30	-							
		1.40	-							
		1.50	-			1.50				
		1.60	-							
		1.70	1							
		1.80	-							
		1.90	-							
		2.00	-			2.00				
		2.10				Average SPT blows				
		2.20	ł			per 300mm				
		2.30	-							
		2.40				2.50 MBIE TC2				
		2.60				Requirements				
		2.70	1							
		2.80				NZS3604 Standard				
		2.90	1							
		3.00	1			3.00				

		Scala	Penetrome	ter Log		Job No: 20666
	Project:	Foundatior	n Testing -	Lincoln Rolleston Roa	d	SPT No: 6
	Stage	1	Lot	Concept		Rolleston
S GUO S STORE STORE	Date:		10/02/2023			
DAVIE LOVELL'SMITH	Location:	Location:		ston Road, Rolleston, C	, Stage 1, Lot Concept	
	Logged E	sy:	Charlie Hall			
Description of Soils	Graphic	Depth (m)	SPT blows	Average SPT blows per 300mm	CBR (%)	Blows Per 100mm 5 Blows/100mm = 300kPa
TOPSOIL		0.00				2 Blows/100mm = 200kPa
		0.10	3	3.00	5.75	0.00 5.00 10.00 15.00 20.00
	0770010000	0.20	3	4.00	5.75	
		0.30	6	4.33	12.50	
SILT		0.40	4	5.00	7.94	
		0.50	5	4.33	10.19	
		0.60	4	4.67	7.94	0.50
		0.70	5	5.33	10.19	
		0.80	7	11.33	14.86	
REFUSAL, GRAVEL		0.90	22	14.50	53.57	
		1.00	-			1.00
		1.10	-			1.00
		1.20	1			
		1.30	1			
		1.40	1			
		1.60	1			1.50
		1.70	1			
		1.80	1			
		1.90	1			
		2.00	1			
		2.10	1			2.00
		2.20	1			Average SPT
		2.30	1			blows per 300mm
		2.40	1			
		2.50	1			2.50
		2.60				Requirements
		2.70				
		2.80				NZ\$3604
		2.90				Standard
		3.00				3.00 4.4

		Scala	Penetrometer Log				Job No: 20666	
	Project:	Foundatior	n Testing -	Lincoln Rolleston Roa	d	SP	T No: 7	
	Stage	1	Lot	Concept		Rolleston		
Data Lours C. Duran	Date:		10/02/2023					
DAVIE LOVELL'SMITH	Location:		Lincoln Rolle	ston Road, Rolleston, C	Christchurch,	Stage 1, Lot	Concept	
	Logged B	y:	Charlie Hall					
Description of Soils	Graphic	Depth (m)	SPT blows	Average SPT blows per 300mm	CBR (%)	E 5 Blo	Blows Per 100mm ws/100mm = 300kPa	
TOPSOIL	-	0.00				2 Blo	ws/100mm = 200kPa	
-		0.10	3	3.00	5.75	0.00	5.00 10.00 15.00	
	0.000	0.20	3	3.33	5.75	0.00		
		0.30	4	4.00	7.94			
SILT		0.40	5	4.33	10.19			
		0.50	4	4.67	7.94			
		0.60	5	10.00	10.19	0.50		
REFUSAL, GRAVEL		0.70	21	13.00	50.85			
		0.80						
		0.90						
		1.00	ļ					
		1.10				1.00		
		1.20						
		1.30						
		1.40	-					
		1.50	-			1.50		
		1.60	ł					
		1.70	-					
		1.80	-					
		1.90	-					
		2.00	-			2.00	Average SPT	
		2.10					blows per	
		2.20	-				300mm	
		2.30	-				—— MBIE TC2	
		2.40	-			2 50	Requirements	
		2.00				2.55		
		2.00					NZ53604	
		2.80					Standard	
		2.90						
		3.00	1			3.00		

		Scala	Penetrome	ter Log		Job No	Job No: 20666	
	Project:	Foundation	n Testing -	Lincoln Rolleston Road	d	SPT N	lo: 8	
	Stage	1	Lot	Concept	F	Rolleston		
P IN COMPANY AND A COMPANY	Date:		10/02/2023					
DAVIE LOVELL-SMITH	Location:		Lincoln Rolle	ston Road, Rolleston, C	Christchurch,	Stage 1, Lot Cor	ncept	
	Logged E	y:	Charlie Hall					
Description of Soils	Graphic	Depth (m)	SPT blows	Average SPT blows per 300mm	CBR (%)	Blow 5 Blows/	vs Per 100mm 100mm = 300kPa	
TOPSOIL		0.00				2 Blows/	100mm = 200kPa	
		0.10	2	2.50	3.65	0.00	10.00 20.00 30.00	
	*****	0.20	3	2.67	5.75			
		0.30	3	3.67	5.75			
		0.40	5	4.00	10.19			
SILT		0.50	4	4.00	7.94			
		0.60	3	3.33	5.75	0.50		
		0.70	3	3.33	5.75			
		0.80	4	4.00	7.94			
	an ta ba ba ba	0.90	5	5.33	10.19			
	the state of the	1.00	7	5.00	14.86			
		1.10	3	4.67	5.75	1.00		
		1.20	4	4.00	7.94			
		1.30	5	4.33	10.19			
	i shaka ka	1.40	4	5.33	7.94			
	a state of the last	1.50	7	6.67	14.86	1.50		
		1.60	9	15.33	19.68			
REFUSAL, GRAVEL		1.70	30	19.50	75.82			
		1.80	-					
		1.90	-					
		2.00	-			2.00		
		2.10	-				Average SPT blows	
		2.20	-				per 300mm	
		2.30	4					
		2.40	-			2.50		
		2.50	4			2.30	Requirements	
		2.00	1					
		2.10	1					
		2.00	1					
		3.00	1			3.00		

		Scala	Penetrome	ter Log		Job No: 20666	
	Project:	Foundatior	n Testing -	Lincoln Rolleston Road	d	SPT No: 9	
	Stage	1	Lot	Concept			
Provide Provide Provident	Date:		10/02/2023				
DAVIE LOVELL-SMITH	Location:		Lincoln Rolle	ston Road, Rolleston, C	Stage 1, Lot Concept		
	Logged E	sy:	Charlie Hall				
Description of Soils	Graphic	Depth (m)	SPT blows	Average SPT blows per 300mm	CBR (%)	Blows Per 100mm 5 Blows/100mm = 300kPa	
TOPSOIL		0.00				2 Blows/100mm = 200kPa	
		0.10	3	3.50	5.75	0.00 5.00 10.00 15.00 20.00	
	*****	0.20	4	3.67	7.94	0.00	
		0.30	4	4.00	7.94		
		0.40	4	4.33	7.94		
SILT		0.50	5	4.00	10.19		
		0.60	3	3.67	5.75	0.50	
		0.70	3	3.00	5.75		
	the balance	0.80	3	3.33	5.75		
		0.90	4	3.67	7.94		
	News	1.00	4	4.00	7.94		
	brit bit	1.10	4	4.00	7.94	1.00	
		1.20	4	3.33	7.94		
		1.30	2	3.00	3.65		
		1.40	3	3.00	5.75		
	REAL ES	1.50	4	3.67	7.94		
		1.60	4	5.00	7.94	1.50	
		1.70	7	13.67	14.86		
REFUSAL, GRAVEL		1.80	30	18.50	75.82		
		1.90]				
		2.00	1			2.00	
		2.10	1			2.00	
		2.20	1			Average SPT blows	
		2.30	1			per 300mm	
		2.40	1				
		2.50	1			2.50	
		2.60	1			Requirements	
		2.70	1				
		2.80	1			NZS3604 Standard	
		2.90	1				
		3.00				3.00	

		Scala	Penetrome	ter Log		Job No: 20666
	Project:	Foundation	n Testing -	Lincoln Rolleston Roa	d	SPT No: 10
	Stage	1	Lot	Concept		Rolleston
S SUCREMENTED Second	Date:		10/02/2023			
DAVIE LOYELL-SMITH	Location:		Lincoln Rolleston Road, Rolleston, Christchurch, Stage 1			Stage 1, Lot Concept
	Logged E	y:	Charlie Hall			
Description of Soils	Graphic	Depth (m)	SPT blows	Average SPT blows per 300mm	CBR (%)	Blows Per 100mm 5 Blows/100mm = 300kPa
TOPSOIL		0.00				2 Blows/100mm = 200kPa
		0.10	2	2.50	3.65	0.00 10.00 20.00 30.00
	0.000.000	0.20	3	2.67	5.75	
	A DESCRIPTION OF A DESCRIPTION	0.30	3	3.00	5.75	
SILT		0.40	3	3.00	5.75	
		0.50	3	3.33	5.75	
		0.60	4	5.00	7.94	0.50
		0.70	8	10.33	17.25	
		0.80	19	19.00	45.46	
REFUSAL, GRAVEL		0.90	30	24.50	75.82	
		1.00				
		1.10	-			1.00
		1.20	-			
		1.30				
		1.40	-			
		1.50	ł			1.50
		1.60	-			
		1.70	-			
		1.80				
		1.90				
		2.00				2.00
		2.10	ł			
		2.20	-			Average SPI
		2.30	-			blows per soonini
		2.40	ł			
		2.00				Requirements
		2.00				
		2.80				NZS3604
		2.00				Standard
		3.00	1			3.00

		Scala	Penetrome	ter Log		Job No: 20666
	Project:	Foundatior	n Testing -	Lincoln Rolleston Road	d	SPT No: 11
	Stage	1	Lot	Concept		Rolleston
Provide the second decision	Date:		10/02/2023			
DAVIE LOYELL-SMITH	Location:		Lincoln Rolle	ston Road, Rolleston, C	, Stage 1, Lot Concept	
	Logged By:		Charlie Hall			
Description of Soils	Graphic	Depth (m)	SPT blows	Average SPT blows per 300mm	CBR (%)	Blows Per 100mm 5 Blows/100mm = 300kPa
TOPSOIL		0.00				2 Blows/100mm = 200kPa
		0.10	2	3.00	3.65	0.00 5.00 10.00 15.00 20.00
	onini.	0.20	4	4.33	7.94	
		0.30	7	5.33	14.86	
		0.40	5	5.33	10.19	
	A DESCRIPTION OF TAXABLE	0.50	4	4.33	7.94	
SILT		0.60	4	4.33	7.94	0.50
	tale to be to be	0.70	5	6.00	10.19	
		0.80	9	7.67	19.68	
	*****	0.90	9	7.67	19.68	
		1.00	5	7.00	10.19	
		1.10	7	12.00	14.86	1.00
REFUSAL, GRAVEL		1.20	24	15.50	59.05	
		1.30				
		1.40	ł			
		1.50				1.50
		1.60	ł			
		1.70	-			
		1.80	-			
		1.90	ł			
		2.00	-			2.00 Average SPT
		2.10				blows per
		2.20	ł			300mm
		2.50	1			
		2.50	1			2.50 Requirements
		2.60				
		2.70	1			NZS3604
		2.80	1			Standard
		2.90	1			
		3.00				3.00

		Scala	Penetrome	ter Log		Job No: 20666
	Project:	Foundation	n Testing -	Lincoln Rolleston Roa	d	SPT No: 12
	Stage	1	Lot	Concept		Rolleston
Party Party Print	Date:		10/02/2023			
DAVIE LOVELL-SMITH	Location:		Lincoln Rolle	ston Road, Rolleston, C	Christchurch,	, Stage 1, Lot Concept
	Logged B	y:	Charlie Hall			
Description of Soils	Graphic	Graphic Depth (m) SPT blows Per 300mm CBR (%)				Blows Per 100mm 5 Blows/100mm = 300kPa
TOPSOIL		0.00				2 Blows/100mm = 200kPa
		0.10	5	4.50	10.19	
	-	0.20	4	4.67	7.94	
_		0.30	5	5.00	10.19	
	the second second second	0.40	6	6.00	12.50	
SILT	the state of the state of the	0.50	7	7.00	14.86	
		0.60	8	10.00	17.25	0.50
		0.70	15	17.67	34.88	
REFUSAL, GRAVEL		0.80	30	22.50	75.82	
		0.90				
		1.00				
		1.10				1.00
		1.20				
		1.30				
		1.40				
		1.50				150
		1.60	1			1.50
		1.70				
		1.80				
		1.90				
		2.00	1			2.00
		2.10				
		2.20				Average SPT blows
		2.30				per 300mm
		2.40				
		2.50				2.50
		2.60				Requirements
		2.70				
		2.80				NZS3604 Standard
		2.90				
		3.00				3.00

		Scala	Penetrome	ter Log		Job No: 20666
	Project:	Foundatior	n Testing -	Lincoln Rolleston Roa	d	SPT No: 13
	Stage	1	Lot	Concept		
Provide Provide Provident	Date:		10/02/2023			
DAVIE LOVELL-SMITH	Location:		Lincoln Rolles	ston Road, Rolleston, C	Christchurch	, Stage 1, Lot Concept
	Logged B	y:	Charlie Hall			
Description of Soils	Graphic	Depth (m)	SPT blows	Average SPT blows per 300mm	CBR (%)	Blows Per 100mm 5 Blows/100mm = 300kPa
TOPSOIL		0.00				2 Blows/100mm = 200kPa
		0.10	2	2.50	3.65	0.00 10.00 20.00 30.00
	******	0.20	3	2.33	5.75	
		0.30	2	5.67	3.65	
		0.40	12	7.67	27.17	
SILT		0.50	9	10.00	19.68	
		0.60	9	11.00	19.68	0.50
		0.70	15	18.00	34.88	
REFUSAL, GRAVEL		0.80	30	22.50	75.82	
		0.90				
		1.00	-			
		1.10	-			1.00
		1.20	-			
		1.30	-			
		1.40	-			
		1.50	-			1.50
		1.60	-			
		1.70	1			
		1.80				
		1.90	-			
		2.00	-			2.00
		2.10	-			Average SPT blows
		2.20	1			per 300mm
		2.50				
		2.50	1			2.50MBIE TC2
		2.60	1			Requirements
		2.70	1			
		2.80	1			NZS3604 Standard
		2.90	1			
		3.00				3.00

		Scala	Penetrome	ter Log		Job No: 20666	Job No: 20666	
	Project:	Foundatior	Testing -	Lincoln Rolleston Road	d	SPT No: 14		
	Stage	1	Lot	Concept		Rolleston		
Provide Provide Provide	Date:		10/02/2023					
DAVIE LOVELL-SMITH	Location:		Lincoln Rolles	ston Road, Rolleston, C	Christchurch,	Stage 1, Lot Concept		
	Logged B	y:	Charlie Hall					
Description of Soils	Graphic Depth (m) SPT blows Average SPT blows CBR (%)					Blows Per 100mm 5 Blows/100mm = 300	kPa	
TOPSOIL		0.00				2 Blows/100mm = 200	kPa	
	o ana ana a	0.10	6	4.50	12.50	0.00 10.00 20.00	30.00	
		0.20	3	6.00	5.75	0.00		
		0.30	9	7.33	19.68			
SILT		0.40	10	10.33	22.15			
		0.50	12	12.00	27.17			
		0.60	14	14.00	32.29	0.50		
		0.70	16	16.33	37.50			
		0.80	19	20.00	45.46			
REFUSAL, GRAVEL		0.90	25	22.00	61.81			
		1.00						
		1.10				1.00		
		1.20						
		1.30						
		1.40	-					
		1.50	-			1.50		
		1.60				1.50		
		1.70						
		1.80						
		1.90						
		2.00				2.00		
		2.10						
		2.20				Average	SPI or 200mm	
		2.30				biows p		
		2.40					· · ·	
		2.00				Require	ments	
		2.00						
		2.80					4	
		2.90				Standar	d	
		3.00				3.00		

		Scala	Penetrome	ter Log		Job No: 20666
	Project:	Foundation	n Testing -	Lincoln Rolleston Road	d	SPT No: 15
	Stage	1	Lot	Concept		Rolleston
Dates Lourses Distants	Date:		10/02/2023			
DAVIE LOVELL-SMITH	Location:		Lincoln Rolle	ston Road, Rolleston, C	, Stage 1, Lot Concept	
	Logged B	y:	Charlie Hall			
Description of Soils	Graphic	Depth (m)	SPT blows	Average SPT blows per 300mm CBR (%)		Blows Per 100mm 5 Blows/100mm = 300kPa
TOPSOIL		0.00				2 Blows/100mm = 200kPa
		0.10	3	2.50	5.75	0.00 5.00 10.00 15.00
	******	0.20	2	3.00	3.65	
		0.30	4	3.67	7.94	
	to the the the sector is	0.40	5	6.33	10.19	
SILT		0.50	10	8.00	22.15	
	14 H H H H	0.60	9	9.33	19.68	0.50
	State to be to be to be	0.70	9	8.33	19.68	
	*****	0.80	7	7.00	14.86	
		0.90	5	5.67	10.19	
	64-14-14-14-14-14-14-14-14-14-14-14-14-14	1.00	5	5.00	10.19	
		1.10	5	4.33	10.19	1.00
		1.20	3	4.33	5.75	
		1.30	5	10.33	10.19	
REFUSAL, GRAVEL		1.40	23	14.00	56.30	
		1.50	-			1.50
		1.60	ł			
		1.70	1			
		1.80	-			
		1.90	-			
		2.00	ł			2.00 Average SPT
		2.10	ł			blows per
		2.20	ł			300mm
		2.30	-			
		2.40	ł			2 50 Requirements
		2.50				
		2.00				NZS3604
		2.10				Standard
		2.00				
		3.00				3.00

		Scala	Penetrome	ter Log		Job	Job No: 20666		
	Project:	Foundation	n Testing -	Lincoln Rolleston Roa	d	SPT	T No: 16		
	Stage	1	Lot	Concept		Rolleston			
Darin Louris Champ	Date:		10/02/2023						
DAVIE LOVELL'SMITH	Location:		Lincoln Rolle	ston Road, Rolleston, C	Christchurch,	, Stage 1, Lot C	Concept		
	Logged B	y:	Charlie Hall						
Description of Soils	Graphic	Depth (m)	SPT blows	Average SPT blows	CBR (%)	Blo 5 Blow	Blows Per 100mm		
TOPSOIL	1	0.00				2 Blow	vs/100mm = 200kPa		
		0.10	4	5.00	7.94	0.00	10.00 20.00		
	******	0.20	6	6.00	12.50	0.00			
1		0.30	8	8.00	17.25				
SILT		0.40	10	9.00	22.15				
	til for he he he he	0.50	9	9.00	19.68		N		
		0.60	8	9.00	17.25	0.50			
		0.70	10	8.33	22.15				
		0.80	7	13.33	14.86				
REFUSAL, GRAVEL		0.90	23	15.00	56.30				
		1.00							
		1.10				1.00			
		1.20							
		1.30							
		1.40							
		1.50	-			1 50			
		1.60	4			1.50			
		1.70	-						
		1.80							
		1.90							
		2.00	-			2.00			
		2.10	4						
		2.20	-				Average SPT blows		
		2.30	-				per soonini		
		2.40	-			2.50			
		2.50	-			2.50	Requirements		
		2.60	-						
		2.70	-				NZ\$3604 Standard		
		2.80	1						
		2.90	-			3.00			
		3.00							

	Scala Penetrometer Log					
	Project:	Project: Foundation Te		Lincoln Rolleston Roa	SPT No: 17	
	Stage	1	Lot	Concept		Rolleston
A DOOR A COURSE AND	Date:		10/02/2023			
DAVIE LOVELL'SMITH	Location:		Lincoln Rolle	ston Road, Rolleston, C	Christchurch,	, Stage 1, Lot Concept
	Logged E	y:	Charlie Hall			
Description of Soils	Graphic	Depth (m)	SPT blows	Average SPT blows per 300mm	CBR (%)	Blows Per 100mm 5 Blows/100mm = 300kPa
TOPSOIL		0.00				2 Blows/100mm = 200kPa
		0.10	7	8.00	14.86	0.00 10.00 20.00
	01201000	0.20	9	10.00	19.68	
		0.30	14	12.00	32.29	
SILT		0.40	13	13.33	29.72	
		0.50	13	12.00	29.72	
		0.60	10	9.67	22.15	0.50
	tik kisisis	0.70	6	7.67	12.50	
		0.80	7	7.00	14.86	
	North Constant	0.90	8	8.00	17.25	
	the base	1.00	9	7.67	19.68	
		1.10	6	7.00	12.50	1.00
		1.20	6	7.00	12.50	
		1.30	9	7.67	19.68	
	664646	1.40	8	8.67	17.25	
		1.50	9	8.00	19.68	150
		1.60	7	13.33	14.86	
REFUSAL, GRAVEL		1.70	24	15.50	59.05	
		1.80	1			
		1.90	1			
		2.00	1			2.00
		2.10	1			
		2.20	1			Average SPT blows
		2.30	1			per soomm
		2.40	1			
		2.50	4			2.50 HEILICZ
		2.60	ł			Requirements
		2.70	4			
		2.80	4			NZS3604 Standard
		2.90	4			3.00
		3.00				5.00

	Scala Penetrometer Log					Job No: 20666
	Project:	Project: Foundation		Lincoln Rolleston Roa	SPT No: 18	
	Stage	1	Lot	Concept		
Provide the second decision	Date:		10/02/2023			
DAVIE LOVELL-SMITH	Location:		Lincoln Rolle	ston Road, Rolleston, C	Christchurch	, Stage 1, Lot Concept
	Logged B	y:	Charlie Hall			
Description of Soils	Graphic	Depth (m)	SPT blows	Average SPT blows per 300mm	CBR (%)	Blows Per 100mm 5 Blows/100mm = 300kPa
TOPSOIL		0.00				2 Blows/100mm = 200kPa
		0.10	3	4.50	5.75	0.00 5.00 10.00 15.00
	******	0.20	6	5.33	12.50	0.00
		0.30	7	6.33	14.86	
		0.40	6	6.67	12.50	
SILT		0.50	7	6.67	14.86	
	and a second second	0.60	7	6.00	14.86	0.50
		0.70	4	5.00	7.94	
		0.80	4	4.33	7.94	
		0.90	5	4.33	10.19	
		1.00	4	5.00	7.94	
	10 ko 40 ko 40 ko	1.10	6	4.67	12.50	1.00
		1.20	4	10.67	7.94	
REFUSAL, GRAVEL		1.30	22	13.00	53.57	
		1.40	-			
		1.50	-			1.50
		1.60	-			
		1.70	-			
		1.80	-			
		1.90	-			
		2.00	-			2.00
		2.10	-			Average SPT blows
		2.20	-			per 300mm
		2.30	-			
		2.40	-			
		2.50	-			2.50 Requirements
		2.60	1			
		2.70	1			NZS3604 Standard
		2.00	1			
		3.00	1			3.00
		3.00				

		Scala	Job No: 20666			
	Project:	Project: Foundatior		Lincoln Rolleston Roa	SPT No: 19	
	Stage	1	Lot	Concept		Rolleston
Distant Description Description	Date:		10/02/2023			
DAVIE LOVELL'SMITH	Location:		Lincoln Rolle	ston Road, Rolleston, 0	Christchurch,	Stage 1, Lot Concept
	Logged B	Logged By:				
Description of Soils	Graphic	Depth (m)	SPT blows	Average SPT blows per 300mm	CBR (%)	Blows Per 100mm 5 Blows/100mm = 300kPa
TOPSOIL		0.00				2 Blows/100mm = 200kPa
		0.10	7	8.00	14.86	0.00 10.00 20.00 30.00
		0.20	9	8.33	19.68	
		0.30	9	9.00	19.68	
1		0.40	9	9.00	19.68	
SILT		0.50	9	9.00	19.68	
	and the second second	0.60	9	9.00	19.68	0.50
	the balance of	0.70	9	8.00	19.68	
		0.80	6	7.00	12.50	
		0.90	6	5.33	12.50	
		1.00	4	4.00	7.94	
		1.10	2	3.33	3.65	1.00
		1.20	4	3.67	7.94	
		1.30	5	7.00	10.19	
		1.40	12	19.00	27.1/	
REFUSAL, GRAVEL		1.50	40	26.00	104.64	1.50
		1.60				
		1.70	-			
		1.80	-			
		1.90				
		2.00	-			2.00
		2.10	-			
		2.20	-			Average SPT
		2.30	-			blows per soumm
		2.40	-			
		2.50	-			2.50
		2.60	-			Requirements
		2.70	1			NZCDCOA
		2.80				Standard
		2.90	-			3.00
		3.00				5.00

		Scala	Job No: 20666			
	Project:	Foundation	n Testing -	Lincoln Rolleston Roa	d	SPT No: 20
	Stage	1	Lot	Concept		Rolleston
Darren Lourset Diamit	Date:		10/02/2023			
DAVIE LOVELL'SMITH	Location:		Lincoln Rolle	ston Road, Rolleston, C	Christchurch	, Stage 1, Lot Concept
	Logged E	y:	Charlie Hall			
Description of Soils	Graphic	Depth (m)	SPT blows	Average SPT blows per 300mm	CBR (%)	Blows Per 100mm 5 Blows/100mm = 300kPa
TOPSOIL	_	0.00				2 Blows/100mm = 200kPa
		0.10	5	6.50	10.19	0.00 5.00 10.00 15.00 20.00
	******	0.20	8	6.67	17.25	0.00
		0.30	7	6.33	14.86	
		0.40	4	6.33	7.94	
SILT		0.50	8	12.00	17.25	
REFUSAL, GRAVEL		0.60	24	16.00	59.05	0.50
		0.70				
		0.80	1			
		0.90				
		1.00				
		1.10				1.00
		1.20	ļ			
		1.30				
		1.40				
		1.50				1.50
		1.60	-			
		1.70	-			
		1.80				
		1.90				
		2.00				
		2.10	-			blows per
		2.20	ł			300mm
		2.30				
		2.40	-			Requirements
		2.50				2.30
		2.60				N753604
		2.70				Standard
		2.80				
		2.90				3.00
		3.00				