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Project Number 28396.000.001

Geotechnical Assessment for Proposed Plan Change

Edwards Road, Burnham, Canterbury

Submitted to:
Rolly Central Limited
31 Hill Street
Onehunga
Auckland

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Project No.		28396.000.001	**Doc ID**	03	
Client		Rolly Central Limited	**Client Contact**	Jatinder Pal Singh	
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06/06/2025	1	Revised Report	BC	JC	JT

Executive Summary

ENGEO Ltd carried out a geotechnical assessment for Jatinder Pal Singh at Edwards Road, Burnham, to support an application for a Plan Change relating to future subdivision of the site.

The approximately 50-hectare site is situated on the south-western outskirts of Rolleston township, approximately 4.5 km from the town centre and is generally flat and surrounded by other rural greenfield sites.

Key findings from the desktop study and geotechnical investigation as follows:

- The site is classified as "*Rural and Unmapped*" by MBIE.
- Subsurface geology generally consists of up to 0.4 m of topsoil underlain by native sandy gravel to depths of at least 77.0 m.
- Groundwater is inferred to be at depths between 5.0 to 10.0 m below ground.
- One of the primary natural hazards to the site is a potential 1 in 200-year flood event from the Selwyn River, with inundation of up to 0.5 m predicted across the site.
- Based on our assessment of the ground conditions at the site, we consider the site to generally meet the "*good ground*" classification as defined by NZS 3604:2011 (Standards New Zealand, 2011) below topsoil (encountered up to 0.4 m depth).
- For pavement design, a California Bearing Ratio (CBR) value of 4% to 10% is considered reasonable for preliminary design on native soils below topsoil.

This assessment, in accordance with Section 106 of the Resource Management Act, concludes that future residential use is unlikely to cause material damage if proper engineering practices are followed. Therefore, the site is deemed suitable for the proposed plan change. Further geotechnical investigation may be required to satisfy Council requirements at the subdivision and / or building consent stage.

1 Introduction

ENGEO Ltd was requested by Rolly Central Limited to undertake a Geotechnical Assessment for Proposed Plan Change for the proposed Edwards Road Burnham, Canterbury (herein referred to as 'the site'). This work has been carried out in accordance with our signed agreement P28396.000.001 dated 25 March 2025. The purpose of the assessment is to support the application for a Plan Change application for multiple parcels of land for the purpose of subdivision and development.

Our scope of work includes:

- Review of available published geotechnical and geological information relevant to the site. This includes the New Zealand Geotechnical and Environmental Canterbury Databases.
- Completion of a site walkover assessment by an experienced geotechnical professional.
- Geotechnical logging of materials from approximately 16 shallow hand augers and test pits over a two-day period with associated Scala penetrometer testing.
- Collation and interpretation of field data and production of a conceptual geological site model.
- Preparation of this geotechnical investigation report based on the findings of our desktop study and the site investigations.

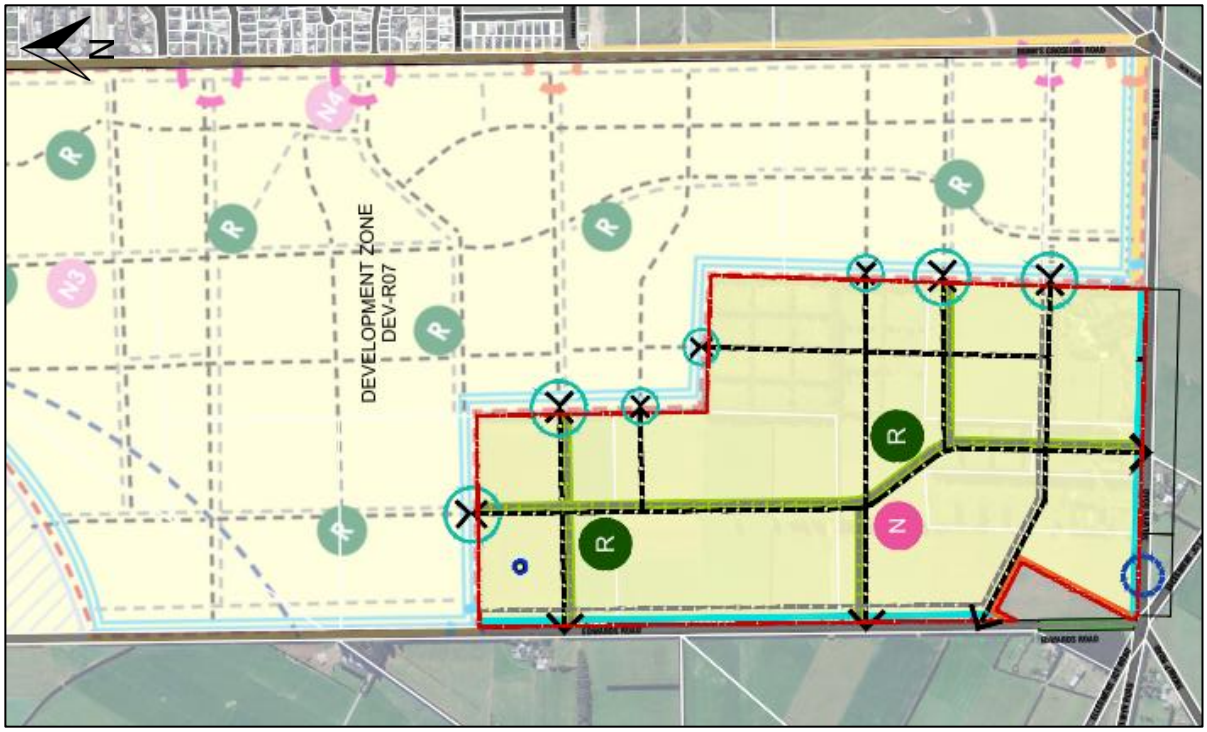
2 Site Description & Proposed Development

The subject site is generally flat and comprised of approximately 50 hectares of rural-zoned agricultural land, situated approximately 4.5 km southwest of the Rolleston township (Figure 1). Access to the site is via Edwards Road, which remains unpaved at the time of writing.

Based on our project communications and the provided concept development plans (Architecture Studio – Edwards Road Development Rolleston, Drawing No. A0.01 – A0.05, dated 24.02.2025), we understand that it is proposed to develop the site into a new residential subdivision, including facilities for aged care, a school, and shopping facilities.

We have not been provided with any proposed earthworks or Civil Engineering plans at the time of preparation of this report. However, is assumed from existing levels that minor earthworks will be required to create level building platforms, roading and drainage pathways for the development.

Figure 1: Proposed Development Location Outlined In Red



*Excerpt from Drawing No. L1.0 of the Outline Development Plan for Edwards Road Development.

3 Desktop Study

ENGEO carried out a desktop study of publicly available information prior our geotechnical investigation to gain a better understanding of the site. A summary of our findings is detailed in the following subsections.

3.1 Regional Geology

The site has been regionally mapped by GNS (Forsyth et al., 2008) to be underlain by dominantly brownish grey river alluvium, comprising gravel, sand and silt.

3.2 Topography

The site is generally flat at an elevation of approximately 38.0 to 45.0 mRL (NZGD2000). Remnant paleo channels are visible from historic aerial photos (Canterbury Maps,2025) that trend approximately north to south, formed by historic overland flow paths across the floodplain (Figure 2).

Figure 2: Aerial Photos Showing Paleo Channels

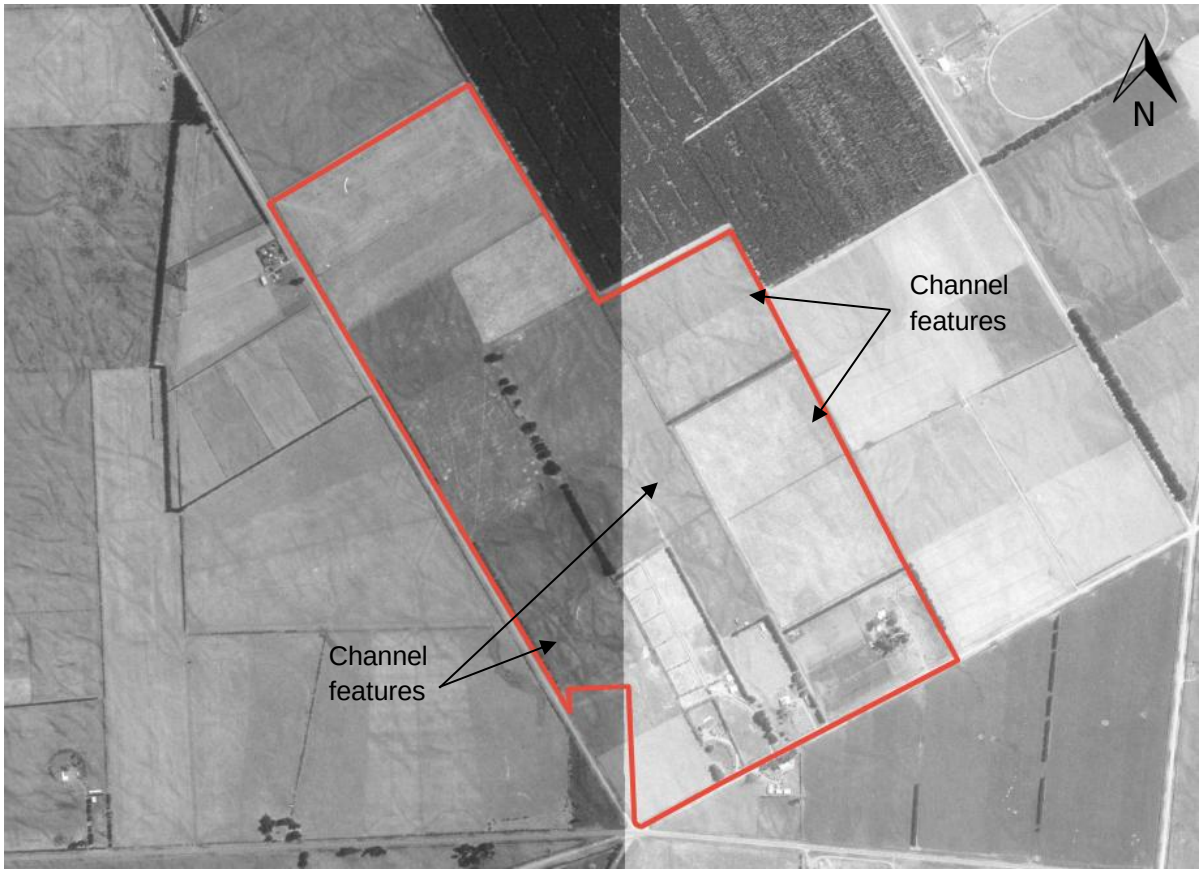


Photo taken between 1990 to 1994 showing paleo channels across the site with site boundary in red.
Source: Canterbury Maps, 2025.

3.3 New Zealand Geotechnical Database

We reviewed the New Zealand Geotechnical Database (NZGD) for nearby geotechnical investigation data and evidence of liquefaction-induced damage following the Canterbury Earthquake Sequence (CES). Our review indicates that there is no investigation data on-site or within 800 m of the site. The site is located beyond the extents of the mapped post-earthquake investigations, suggesting that it was not affected by these events.

3.4 Environment Canterbury Wells

Nine Environment Canterbury (ECan) well boreholes (ECan, 2025) are located within approximately 160 m of the site and have been considered in the preparation of this report to understand the site's geology.

The ECan well boreholes generally indicate layers of sandy gravel and clayey gravel from the surface to depths of at least 77.0 m, the maximum depth explored. Groundwater was recorded in these boreholes at depths between 4.0 to 6.0 m below ground level (bgl).

Borehole M36/5881 recorded a groundwater level of 19.4 m; however, this may not be representative of the overall site. Material strength logging was not recorded.

The identified wells are shown in Table 1 and their relative distance to the nearest site boundary, depth and groundwater levels. The location of well boreholes and the associated logs are included in Appendices 1.

Table 1: ECan Well Borehole Summary (ECan, 2025)

Well ID	Distance from the Nearest Site Boundary	Depth of Well Borehole (m bgl)	Depth to Groundwater (metres below ground level)
M36 / 5022	100 m North	25.2	5.1
M36 / 5881	100 m West	29.0	19.4
M36 / 5023	30 m East	24.0	6.1
M36 / 7416	75 m North	47.7	5.2
M36 / 7663	10 m East	30.0	6.1
M36 / 0018	10 m East	11.0	4.0
M36 / 7362	100 m West	77.0	4.2
M36 / 7584	100 East	23.8	5.1
BX23 / 0735	160 Northwest	48.0	5.6

3.5 Regional Groundwater Regime

The "*Depth to Groundwater*" layer published on Canterbury Maps (Canterbury Maps, 2025) indicates that groundwater is likely to be present at depths between 5.0 to 10.0 m. This is generally consistent with the groundwater depths measured in the ECan wells listed in Table 1, with the exception of M36/5881, where groundwater was recorded at 19.4 m bgl.

3.6 CERA Land Classification

The Canterbury Earthquake Recovery Authority (CERA, now disbanded) mapped the site within the '*Green Zone*,' where buildings are typically considered suitable for repair or rebuilding. The Ministry of Business, Innovation and Employment (MBIE) (MBIE, 2012) further divided the CERA '*Green Zone'* into Technical Categories. The site's Technical Category (TC) is not categorised and is labeled as "*Rural and Unmapped*" for both the site and its vicinity.

3.7 Historical Aerial Imagery Review

We have reviewed the historical aerial photographs of the site available through Canterbury Maps from 1940 to the present (Canterbury Maps, 2025). These photographs were examined to identify any changes to site use and / or land alterations.

Based on our review, we understand that the site remained largely unchanged as a greenfield site, predominantly used for grazing, from 1940 to the present day. Paleo channels can be seen that trend approximately north to south and are discussed further in Section 3.2.

1002 Selwyn Road was developed pre 1940 and redeveloped with a new dwelling in the late 1960s or early 1970s. 986 Selwyn Road was originally developed in the late 1960s or early 1970s. 966 Selwyn Road was developed in the late 1980s or early 1990s and has had minor additions and improvements to present day. These residential properties have remained mostly unchanged since their original construction with some addition and maturation of hedges and vegetation on-site.

4 Geotechnical Site Investigation

ENGEO visited the site between 2 and 14 May 2025 to carry out shallow geotechnical investigations. Due to weather, time and subcontractor availability constraints the original scope of test pits was replaced with hand augers. One test pit investigation (denoted TP08) was carried out on 02 May 2025 to a target depth of 2 m bgl where sandy gravel was observed within the full depth of the test pit. On 14 May 2025 fifteen hand augured boreholes were carried out to a maximum depth of 0.6 m bgl where they refused on inferred gravel.

Scala penetrometer testing was undertaken adjacent to our test locations from the surface level to refusal where greater than 15 blows per 100 mm penetration was recorded.

In summary, our test pit and hand auger investigations generally encountered 0.2 to 0.4 m thick topsoil underlain by dense, alluvial, sandy gravel. Standing groundwater was not encountered during our investigation.

The investigation locations and investigation logs are presented in Appendices 1 and 2 and were logged in general accordance with the New Zealand Geotechnical Society field classification guidelines (NZGS, 2005).

5 Engineering Geological Model

Based on our desktop study and geotechnical investigation, our interpretation of the underlying geology at the site is presented in Table 2.

The alluvium layers identified are broadly consistent with published mapping (Forsyth et al., 2008). Based on the nearby ECan Well borehole logs, the alluvial gravel layers continue to at least 77.0 m depth.

Table 2: Summary of the Subsurface Conditions Across the Site

Unit	Description	Base of Unit (m bgl)	Thickness Range (m)	Consistency/Density
Topsoil	Silt with minor to some sand and trace rootlets	0.2 to 0.4	0.2 to 0.4	Not Applicable
Alluvium	Sandy medium to coarse gravel	> 77.0[1]	Not proven	Dense to Very Dense

1. Soil depths beyond 2 m are inferred from onsite and nearby ECan wells

5.1 Groundwater Regime

Groundwater was not encountered at the time of our investigation. As noted in Section 3.4, the groundwater across the site is likely to be present between 5.0 to 10.0 m bgl.

6 Geohazard Assessment

6.1 Flood Risk

The Canterbury Maps Flood Model, based on the Regional Policy Statement Modelling for Selwyn District Council report (Selwyn District Council, 2019), indicates up to 0.5 m depth of water could occur in a 1 in 200 years Average Recurrence Interval (ARI) rainfall event from both heavy rainfall and the Selwyn River overflow. The areas where ponding could occur appear to generally follow historic overland flow paths within the western part of the site, as shown in Figure 3.

Figure 3: Selwyn 1 in 200 rainfall Flood Map

Site boundary in red.
Source: (ECan, 2025).

6.2 Seismic Hazard

There are no known or mapped faults in the immediate area of the site; therefore we consider the risk of ground rupture to be low. However, the site may be at risk of ground shaking induced by movement of proximal or distal faults. According to GNS New Zealand active fault database (GNS, 2025), the site is located approximately 25 km south of the Greendale fault.

6.3 Site Soil Classification

For the purposes of structural design, a site soil classification of '*Class D – Deep or Soft Soil Site'* as per NZS 1170.5:2004 (Standards New Zealand, 2004) is considered appropriate for the site. This is based on soil strength of the materials to the base of the investigations, depth of alluvial gravel in nearby ECAN wells and our understanding of the geological setting.

6.4 Liquefaction and Lateral Spreading Potential

Due to the dense nature of the native soils observed during our investigation, lack of nearby significant free faces, our understanding of the local geology, and depth to groundwater, we consider the risk of liquefaction and lateral spreading to be low.

6.5 Settlement

Given the dense nature of the native site soils, static settlement at the site is expected to be within generally tolerable limits of <25 mm and less than 1 in 240 differential settlement for construction of future residential and light commercial development (as outline in Section 2). Settlement criteria may differ with heavy weight structures. These criteria shall be confirmed during the building consent design stages.

7 Assessment against Section 106 of the Resource Management Act

The proposed development is situated on generally flat land that may be subject to natural hazards. To grant Plan Change and subdivision consent, the consenting authority will need to consider the risk from these natural hazards. Section 106 of the Resource Management Act (RMA) requires a combined assessment of the likelihood of the hazards, the material damage (consequence) of the hazards, and whether the proposed use of the land would accelerate or worsen the hazard.

We have provided an assessment of the natural hazards, summarised in Table 3.

Table 3: Assessment of Section 106

Hazard	Event	Risk	Are the works likely to accelerate or worsen the hazard?
Fault Rupture	Building collapse or major damage; major damage to other infrastructure	Low	No
Slope Instability	Landslide; debris flow; rockfall to cause damage to future development	Low	No
Liquefaction	Static settlement; lateral spreading	Low	No
Settlement	Settlement of future buildings under normal conditions	Low	No
Erosion	Erosion of soils	Low	No

Based on our assessments, we consider the primary natural hazard that may affect the proposed development is flooding from future heavy rainfall events. However, this hazard can be mitigated by siting building platforms out of the lower lying areas of potential flooding, through raising the land with earthworks, and / or via elevated floor levels for future structures. This should be considered during the Civil Engineering assessment process during the subdivision design phase.

We do not consider that the proposed development at the site is likely to accelerate, worsen or result in material damage to the land provided that industry accepted engineering practices are followed during development, including those recommended in this report. On this basis, we consider the risk of natural hazards to the proposed development in Section 106 of the RMA will be acceptably low on the basis the geotechnical recommendations provided in Section 6 and 7 of this report are adhered to.

8 Geotechnical Recommendations

Based on our investigation findings, we consider the site at Edwards Road to be suitable for a plan change from a geotechnical perspective.

Based on our plan change investigation, we provide the following preliminary recommendations to assist in early concept designs. These may be refined via supplementary investigations in later project stages (if required).

8.1 Foundations

Based on our assessment of ground conditions at the site, we consider foundations designed in accordance with NZS 3604:2011 (Standards New Zealand, 2011) to be suitable. Foundations for the proposed lightweight residential buildings and future commercial developments can likely comprise shallow strip pads or raft foundations.

An unfactored geotechnical ultimate bearing capacity of 300 kPa should generally be available for shallow foundations bearing within the native gravel (expected at depths of 0.2 to 0.4 m) or certified engineered fill which extends to the native soils.

Topsoil and potentially infilled paleo channels have been identified on-site, which may not have been captured during our on-site investigation. Topsoil is considered an unsuitable founding material for the proposed development. Although no undocumented fill was encountered during our investigation, there may be unidentified areas of historic filling or where previous buildings were located.

Topsoil and fill within the building platforms and proposed paved areas will need to be stripped to expose the underlying native ground. Where encountered, native infill material may be suitable to support foundations for lightweight structures. However, this would need to be confirmed via further building-specific assessments during the detailed design phase.

In line with B1/VM4 of the New Zealand Building Code, a strength reduction factor of 0.5 must be applied to the geotechnical ultimate bearing capacity when using factored design load cases for static and seismic calculations.

8.2 Pavement Subgrade CBR

Based on our Scala testing, it is anticipated the underlying native soil subgrade will be suitable for standard road design and utility trenches. Scala testing within the upper 1.0 m soil profile indicated penetration resistance was typically greater than 15 blows per 100 mm.

An inferred preliminary California Bearing Ratio (CBR) design value of approximately 4 to 10% (AUSTROADS, 2004) may be adopted for preliminary design on the native soils below topsoil.

The above CBR values are preliminary only. Specific *in situ* testing of the exposed subgrade is recommended following earthworks and prior to finalising pavement designs. Where localised uncontrolled fill is encountered, it will be necessary to remove this fill and replace it with engineered fill. Additional subgrade improvement requirements may be necessary to achieve council requirements. This may include undercut and replacements, and / or the use of triaxial geogrid.

9 Future Works

We recommend that if the development concept varies significantly from the plans referenced in this report, we should be given the opportunity to review the updated working drawings to ensure our recommendations have been interpreted as intended.

ENGEO should also be given the opportunity to review the foundation design and earthworks drawings prior to submission for building consent.

Further geotechnical investigation may be required to satisfy the council requirements at the Subdivision and / or Building Consent stage.

10 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, Rolly Central Limited, their professional advisers and the relevant Territorial Authorities in relation to the specified project brief described in this report. No liability is accepted for the use of any part of the report for any other purpose or by any other person or entity.

ii. The recommendations in this report are based on the ground conditions indicated from published sources, site assessments and subsurface investigations described in this report based on accepted normal methods of site investigations. Only a limited amount of information has been collected to meet the specific financial and technical requirements of the client's brief and this report does not purport to completely describe all the site characteristics and properties. The nature and continuity of the ground between test locations has been inferred using experience and judgement and it should be appreciated that actual conditions could vary from the assumed model.

iii. Subsurface conditions relevant to construction works should be assessed by contractors who can make their own interpretation of the factual data provided. They should perform any additional tests as necessary for their own purposes.

iv. This Limitation should be read in conjunction with the Engineering NZ / ACENZ Standard Terms of Engagement.

v. This report is not to be reproduced either wholly or in part without our prior written permission.

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

Report prepared by

Benjamin Chau

Engineering Geologist

Report reviewed by

Jake Cornall, CMEngNZ (PEngGeol)

Associate Engineering Geologist

11 References

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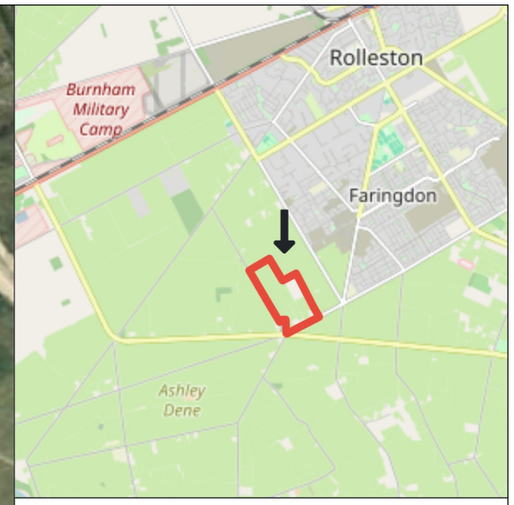
APPENDIX 1:

Site Investigation Location Plan



Legend

- Hand Auger Location
- Test Pit Investigation
- ECan Well
- Site Boundary

0 50 m 100 m

ENGEO

Produced by **Datanest.earth**

Title: Geotechnical Investigation		
Client: Tiranga Aotearoa Group		Size: A3
Project: Edwards Road Subdivision	Drawn: CN	Figure No.: 1
Date: 28-05-2025	Checked: JC	
Proj No: 28396.000.001	Scale: 1:5000	Version: Final

APPENDIX 2:

Site Investigation Logs

LOG OF AUGER HA01

Geotechnical Investigation
Edwards Road
Rolleston

Client : JP Singh
Client Ref. : 28396.000.01
Date : 14-05-2025
Hole Depth : 0.2 m
Hole Diameter : 50 mm

Shear Vane No : N/A
Logged By : BM
Reviewed By : CN
Latitude : -43.6285702
Longitude : 172.3604943

Depth (m BGL)	Material	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Undrained Shear Strength (kPa) Peak/Remolded	Scala Penetrometer Blows per 100mm 2 4 6 8 10 12
	TOPSOIL	ML	[TOPSOIL] SILT with minor sand and trace rootlets; dark brown. Low plasticity; sand is fine.				M	N/A		
			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
Standing groundwater was not encountered

TS= TOPSOIL
N/A = Not Applicable

GEOTECH HAND AUGER EDWARDS ROAD SUBDIVISION.GPJ NZ DATA TEMPLATE 2.GDT 20/5/25

LOG OF AUGER HA02

Geotechnical Investigation
Edwards Road
Rolleston

Client : JP Singh
Client Ref. : 28396.000.01
Date : 14-05-2025
Hole Depth : 0.2 m
Hole Diameter : 50 mm

Shear Vane No : N/A
Logged By : BM
Reviewed By : CN
Latitude : -43.6277256
Longitude : 172.3623928

Depth (m BGL)	Material	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Undrained Shear Strength (kPa) Peak/Remolded	Scala Penetrometer Blows per 100mm
	TOPSOIL	ML	[TOPSOIL] SILT with minor sand and trace rootlets; dark brown. Low plasticity; sand is fine.				M	N/A		
			End of Hole Depth: 0.2 m Termination Condition: Practical refusal							
0.5										
1.0										

Scala Penetrometer: Blows per 100mm — 2 4 6 8 10 12 >>

Hand Auger met practical refusal at 0.2 m depth. on inferred gravel
Standing groundwater was not encountered

TS= TOPSOIL
N/A = Not Applicable

GEOTECH HAND AUGER EDWARDS ROAD SUBDIVISION.GPJ NZ DATA TEMPLATE 2.GDT 20/5/25

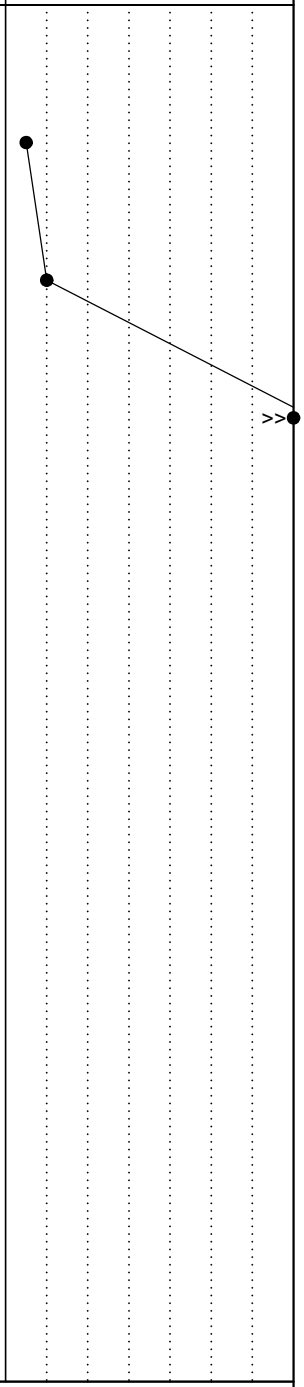
LOG OF AUGER HA03

Geotechnical Investigation
Edwards Road
Rolleston

Client : JP Singh
Client Ref. : 28396.000.01
Date : 14-05-2025
Hole Depth : 0.2 m
Hole Diameter : 50 mm

Shear Vane No : N/A
Logged By : BM
Reviewed By : CN
Latitude : -43.6301379
Longitude : 172.3618585

Depth (m BGL)	Material	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Undrained Shear Strength (kPa) Peak/Remolded	Scala Penetrometer Blows per 100mm
	TOPSOIL	ML	[TOPSOIL] SILT with minor sand and trace rootlets; dark brown. Low plasticity; sand is fine.				M	N/A		
			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
Standing groundwater was not encountered

TS= TOPSOIL
N/A = Not Applicable

GEOTECH HAND AUGER EDWARDS ROAD SUBDIVISION.GPJ NZ DATA TEMPLATE 2.GDT 20/5/25

LOG OF AUGER HA04

Geotechnical Investigation
Edwards Road
Rolleston

Client : JP Singh
Client Ref. : 28396.000.01
Date : 14-05-2025
Hole Depth : 0.1 m
Hole Diameter : 50 mm

Shear Vane No : N/A
Logged By : BM
Reviewed By : CN
Latitude : -43.6293141
Longitude : 172.3635537

Depth (m BGL)	Material	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Undrained Shear Strength (kPa) Peak/Remolded	Scala Penetrometer Blows per 100mm
	TOPSOIL	ML	[TOPSOIL] SILT with minor sand, trace gravel and trace rootlets; dark brown. Low plasticity; gravel is fine, rounded; sand is fine.				M	N/A		
			End of Hole Depth: 0.1 m Termination Condition: Practical refusal							
0.5										
1.0										

Scala Penetrometer: Blows per 100mm — 2 4 6 8 10 12 — >>

Hand Auger met practical refusal at 0.1 m depth. on inferred gravel
Standing groundwater was not encountered

TS= TOPSOIL
N/A = Not Applicable

GEOTECH HAND AUGER EDWARDS ROAD SUBDIVISION.GPJ NZ DATA TEMPLATE 2.GDT 20/5/25

LOG OF AUGER HA05

Geotechnical Investigation
Edwards Road
Rolleston

Client : JP Singh
Client Ref. : 28396.000.01
Date : 14-05-2025
Hole Depth : 0.15 m
Hole Diameter : 50 mm

Shear Vane No : N/A
Logged By : BM
Reviewed By : CN
Latitude : -43.6313514
Longitude : 172.3626395

Depth (m BGL)	Material	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Undrained Shear Strength (kPa) Peak/Remolded	Scala Penetrometer Blows per 100mm (2 4 6 8 10 12)
0	TOPSOIL	ML	[TOPSOIL] SILT with minor sand and trace rootlets; dark brown. Low plasticity; sand is fine.				M	N/A		
			End of Hole Depth: 0.15 m Termination Condition: Practical refusal							
0.5										
1.0										

>>

TS= TOPSOIL
N/A = Not Applicable

Hand Auger met practical refusal at 0.15 m depth. on inferred gravel
Standing groundwater was not encountered

GEOTECH HAND AUGER EDWARDS ROAD SUBDIVISION.GPJ NZ DATA TEMPLATE 2.GDT 20/5/25

LOG OF AUGER HA06

Geotechnical Investigation
Edwards Road
Rolleston

Client : JP Singh
Client Ref. : 28396.000.01
Date : 14-05-2025
Hole Depth : 0.4 m
Hole Diameter : 50 mm

Shear Vane No : N/A
Logged By : BM
Reviewed By : CN
Latitude : -43.630766
Longitude : 172.3646295

Depth (m BGL)	Material	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Undrained Shear Strength (kPa) Peak/Remolded	Scala Penetrometer Blows per 100mm (2 4 6 8 10 12)
0	TOPSOIL	ML	[TOPSOIL] SILT with minor sand and trace rootlets; dark brown. Low plasticity; sand is fine.				M	N/A		
			0.3 m - Becomes brown.							
0.4			End of Hole Depth: 0.4 m Termination Condition: Practical refusal							>>
0.5										
1.0										

Hand Auger met practical refusal at 0.4 m depth. on inferred gravel
Standing groundwater was not encountered

TS= TOPSOIL
N/A = Not Applicable

GEOTECH HAND AUGER EDWARDS ROAD SUBDIVISION.GPJ NZ DATA TEMPLATE 2.GDT 20/5/25

LOG OF AUGER HA07

Geotechnical Investigation
Edwards Road
Rolleston

Client : JP Singh
Client Ref. : 28396.000.01
Date : 14-05-2025
Hole Depth : 0.35 m
Hole Diameter : 50 mm

Shear Vane No : N/A
Logged By : BM
Reviewed By : CN
Latitude : -43.6304665
Longitude : 172.3681373

Depth (m BGL)	Material	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Undrained Shear Strength (kPa) Peak/Remolded	Scala Penetrometer Blows per 100mm
	TOPSOIL	ML	[TOPSOIL] SILT with minor sand and trace rootlets; dark brown. Low plasticity; sand is fine.				M	N/A		
			0.3 m - Becomes brown.							
			End of Hole Depth: 0.35 m Termination Condition: Practical refusal							
0.5										
1.0										

Scala Penetrometer: Blows per 100mm — 2 4 6 8 10 12; >>

Hand Auger met practical refusal at 0.35 m depth. on inferred gravel
Standing groundwater was not encountered

TS= TOPSOIL
N/A = Not Applicable

GEOTECH HAND AUGER EDWARDS ROAD SUBDIVISION.GPJ NZ DATA TEMPLATE 2.GDT 20/5/25

LOG OF AUGER HA09

Geotechnical Investigation
Edwards Road
Rolleston

Client : JP Singh
Client Ref. : 28396.000.01
Date : 14-05-2025
Hole Depth : 0.2 m
Hole Diameter : 50 mm

Shear Vane No : N/A
Logged By : BM
Reviewed By : CN
Latitude : -43.6317735
Longitude : 172.3657172

Depth (m BGL)	Material	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Undrained Shear Strength (kPa) Peak/Remolded	Scala Penetrometer Blows per 100mm
	TOPSOIL	ML	[TOPSOIL] SILT with minor sand and trace rootlets; dark brown. Low plasticity; sand is fine.				M	N/A		
			End of Hole Depth: 0.2 m Termination Condition: Practical refusal							
0.5										
1.0										

Scala Penetrometer: Blows per 100mm — 2, 4, 6, 8, 10, 12; >>

Hand Auger met practical refusal at 0.2 m depth. on inferred gravel
Standing groundwater was not encountered

TS= TOPSOIL
N/A = Not Applicable

GEOTECH HAND AUGER EDWARDS ROAD SUBDIVISION.GPJ NZ DATA TEMPLATE 2.GDT 20/5/25

LOG OF AUGER HA10

Geotechnical Investigation
Edwards Road
Rolleston

Client : JP Singh
Client Ref. : 28396.000.01
Date : 14-05-2025
Hole Depth : 0.1 m
Hole Diameter : 50 mm

Shear Vane No : N/A
Logged By : BM
Reviewed By : CN
Latitude : -43.6320655
Longitude : 172.3690573

Depth (m BGL)	Material	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Undrained Shear Strength (kPa) Peak/Remolded	Scala Penetrometer Blows per 100mm
	TOPSOIL	ML	[TOPSOIL] SILT with minor sand and trace rootlets; dark brown. Low plasticity; sand is fine.				M	N/A		
			End of Hole Depth: 0.1 m Termination Condition: Practical refusal							
0.5										
1.0										

Scala Penetrometer: Blows per 100mm — 2 4 6 8 10 12 >>

Hand Auger met practical refusal at 0.1 m depth. on inferred gravel
Standing groundwater was not encountered

TS= TOPSOIL
N/A = Not Applicable

GEOTECH HAND AUGER EDWARDS ROAD SUBDIVISION.GPJ NZ DATA TEMPLATE 2.GDT 20/5/25

LOG OF AUGER HA11

Geotechnical Investigation
Edwards Road
Rolleston

Client : JP Singh
Client Ref. : 28396.000.01
Date : 14-05-2025
Hole Depth : 0.35 m
Hole Diameter : 50 mm

Shear Vane No : N/A
Logged By : BM
Reviewed By : CN
Latitude : -43.6346135
Longitude : 172.3650412

Depth (m BGL)	Material	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Undrained Shear Strength (kPa) Peak/Remolded
0	TOPSOIL	ML	[TOPSOIL] SILT with minor sand and trace rootlets; dark brown. Low plasticity; sand is fine. 0.3 m - Becomes brown.				M	N/A	
			End of Hole Depth: 0.35 m Termination Condition: Practical refusal						
0.5									
1.0									

Scala Penetrometer

Blows per 100mm

2 4 6 8 10 12

>>

Hand Auger met practical refusal at 0.35 m depth. on inferred gravel
Standing groundwater was not encountered

TS= TOPSOIL
N/A = Not Applicable

GEOTECH HAND AUGER EDWARDS ROAD SUBDIVISION.GPJ NZ DATA TEMPLATE 2.GDT 20/5/25

LOG OF AUGER HA12

Geotechnical Investigation
Edwards Road
Rolleston

Client : JP Singh
Client Ref. : 28396.000.01
Date : 14-05-2025
Hole Depth : 0.2 m
Hole Diameter : 50 mm

Shear Vane No : N/A
Logged By : BM
Reviewed By : CN
Latitude : -43.6368012
Longitude : 172.3669028

Depth (m BGL)	Material	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Undrained Shear Strength (kPa) Peak/Remolded	Scala Penetrometer Blows per 100mm
	TOPSOIL	ML	[TOPSOIL] SILT with minor sand and trace rootlets; dark brown. Low plasticity; sand is fine.				M	N/A		
			End of Hole Depth: 0.2 m Termination Condition: Practical refusal							
0.5										
1.0										

Scala Penetrometer: Blows per 100mm — 2 4 6 8 10 12 >>

Hand Auger met practical refusal at 0.2 m depth. on inferred gravel
Standing groundwater was not encountered

TS= TOPSOIL
N/A = Not Applicable

GEOTECH HAND AUGER EDWARDS ROAD SUBDIVISION.GPJ NZ DATA TEMPLATE 2.GDT 20/5/25

LOG OF AUGER HA13

Geotechnical Investigation
Edwards Road
Rolleston

Client : JP Singh
Client Ref. : 28396.000.01
Date : 14-05-2025
Hole Depth : 0.2 m
Hole Diameter : 50 mm

Shear Vane No : N/A
Logged By : BM
Reviewed By : CN
Latitude : -43.6330491
Longitude : 172.3665006

Depth (m BGL)	Material	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Undrained Shear Strength (kPa) Peak/Remolded	Scala Penetrometer Blows per 100mm
	TOPSOIL	ML	[TOPSOIL] SILT with minor sand and trace rootlets; dark brown. Low plasticity; sand is fine.				M	N/A		
			End of Hole Depth: 0.2 m Termination Condition: Practical refusal							
0.5										
1.0										

Scala Penetrometer: Blows per 100mm — 2 4 6 8 10 12

Hand Auger met practical refusal at 0.2 m depth. on inferred gravel
Standing groundwater was not encountered

TS= TOPSOIL
N/A = Not Applicable

GEOTECH HAND AUGER EDWARDS ROAD SUBDIVISION.GPJ NZ DATA TEMPLATE 2.GDT 20/5/25

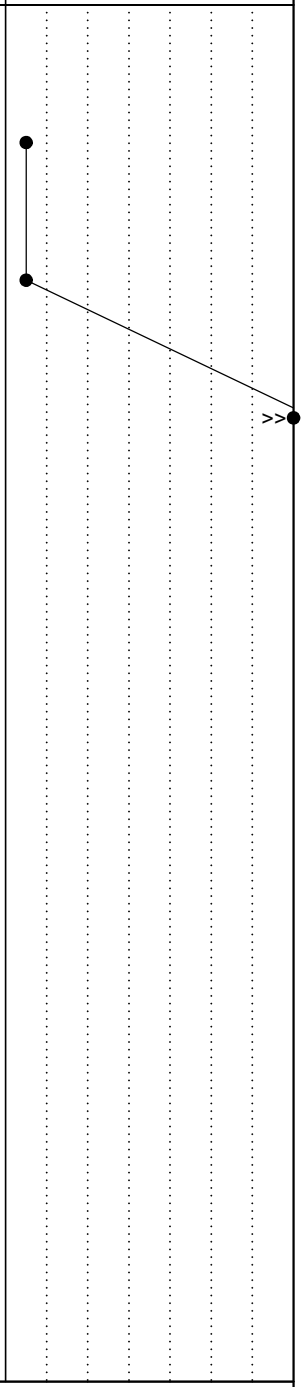
LOG OF AUGER HA14

Geotechnical Investigation
Edwards Road
Rolleston

Client : JP Singh
Client Ref. : 28396.000.01
Date : 14-05-2025
Hole Depth : 0.2 m
Hole Diameter : 50 mm

Shear Vane No : N/A
Logged By : BM
Reviewed By : CN
Latitude : -43.634024
Longitude : 172.3681293

Depth (m BGL)	Material	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Undrained Shear Strength (kPa) Peak/Remolded	Scala Penetrometer Blows per 100mm
	TOPSOIL	ML	[TOPSOIL] SILT with minor sand and trace rootlets; dark brown. Low plasticity; sand is fine.				M	N/A		
			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
Standing groundwater was not encountered

TS= TOPSOIL
N/A = Not Applicable

GEOTECH HAND AUGER EDWARDS ROAD SUBDIVISION.GPJ NZ DATA TEMPLATE 2.GDT 20/5/25

LOG OF AUGER HA15

Geotechnical Investigation
Edwards Road
Rolleston

Client : JP Singh
Client Ref. : 28396.000.01
Date : 14-05-2025
Hole Depth : 0.2 m
Hole Diameter : 50 mm

Shear Vane No : N/A
Logged By : BM
Reviewed By : CN
Latitude : -43.6336196
Longitude : 172.3703685

Depth (m BGL)	Material	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Undrained Shear Strength (kPa) Peak/Remolded	Scala Penetrometer Blows per 100mm
0	TOPSOIL	ML	[TOPSOIL] SILT with some sand, trace gravel and trace rootlets; dark brown. Low plasticity; gravel is fine, rounded; sand is fine.				M	N/A		
0.2			End of Hole Depth: 0.2 m Termination Condition: Practical refusal							
0.5										
1.0										

Scala Penetrometer: Blows per 100mm — 2, 4, 6, 8, 10, 12; >>

Hand Auger met practical refusal at 0.2 m depth. on inferred gravel
Standing groundwater was not encountered

TS= TOPSOIL
N/A = Not Applicable

GEOTECH HAND AUGER EDWARDS ROAD SUBDIVISION.GPJ NZ DATA TEMPLATE 2.GDT 20/5/25

LOG OF AUGER HA16

Geotechnical Investigation
Edwards Road
Rolleston

Client : JP Singh
Client Ref. : 28396.000.01
Date : 14-05-2025
Hole Depth : 0.2 m
Hole Diameter : 50 mm

Shear Vane No : N/A
Logged By : BM
Reviewed By : CN
Latitude : -43.6354561
Longitude : 172.369225

Depth (m BGL)	Material	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Undrained Shear Strength (kPa) Peak/Remolded	Scala Penetrometer Blows per 100mm 2 4 6 8 10 12
	TOPSOIL	ML	[TOPSOIL] SILT with minor sand and trace rootlets; dark brown. Low plasticity; sand is fine.				M	N/A		
			End of Hole Depth: 0.2 m Termination Condition: Practical refusal							>>
0.5										
1.0										

TS= TOPSOIL
N/A = Not Applicable

Hand Auger met practical refusal at 0.2 m depth. on inferred gravel
Standing groundwater was not encountered

GEOTECH HAND AUGER EDWARDS ROAD SUBDIVISION.GPJ NZ DATA TEMPLATE 2.GDT 20/5/25

LOG OF TEST PIT TP08

Geotechnical Investigation
Edwards Road
Rolleston

Client : JP Singh
Date : 01-05-2025
Max Test Pit Depth : 2 m
Digger Type/Size :
Bucket Type/Size : -

Shear Vane No : N/A
Logged By : TW
Reviewed By : CN
Latitude : -43.6326349
Longitude : 172.3636115

Depth (m BGL)	Material	Excavatability (Relative Scale) Easier–Harder	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Peak/Remolded (kPa)	Scala Penetrometer Blows per 100mm
0	TS		ML	[TOPSOIL] SILT with minor sand and trace rootlets; dark brown. Low plasticity; sand is fine.				M	N/A		
0.5	ALLUVIUM		GW	Sandy medium to course GRAVEL with some silt; grey brown; gravel is subangular to subrounded, greywacke.				M	MD-D		
1.0				1.2 m: Becomes grey brown.					D*		
1.5											
2.0				Depth of Excavation: 2 m Termination Condition: Target depth							

Scala Penetrometer: Blows per 100mm — 2 4 6 8 10 12 (>>)

Standing groundwater was not encountered
*Based on excavatability resistance

TS= TOPSOIL
N/A = Not Applicable

GEOTECH TEST PIT LOG EDWARDS ROAD SUBDIVISION.GPJ NZ MASTER DATA TEMPLATE.GDT 20/5/25