

INITIA

GEOTECHNICAL SPECIALISTS

ASP BEI LAND CO

AUCKLAND SURF PARK COMMUNITY

GEOTECHNICAL FACTUAL REPORT

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Contents

1. Introduction 3
   - 1.1 General 3
   - 1.2 Proposed Development 3
2. Geotechnical Investigations 5
   - 2.1 Historical Investigations 5
   - 2.2 Initia Investigations 7
     - 2.2.1 General 7
     - 2.2.2 Machine Boreholes – Stage 1 8
     - 2.2.3 Cone Penetration Tests – Stage 1 and 2 8
     - 2.2.4 Hand Auger Boreholes – Stage 1 and 2 10
     - 2.2.5 Test Pits – Stage 1 and 2 12
   - 2.3 Laboratory Testing 14
     - 2.3.1 Initia Stage 1 and 2 14
     - 2.3.2 Aurecon – Data Centre 16
   - 2.4 Groundwater Monitoring 16
     - 2.4.1 Piezometers 16
     - 2.4.2 Groundwater Levels 17
3. Applicability 20

Appendix A Figures 22

Appendix B Initia Investigation Logs 23

Appendix C Historic Investigation Logs 24

Appendix D Initia Laboratory Test Results 25

Appendix E Aurecon Laboratory Testing Results 26

Appendix F Initia Groundwater Monitoring Plots 27

1. Introduction

1.1 General

This Geotechnical Factual Report (GFR) presents the results of geotechnical investigations undertaken for the proposed Auckland Surf Park Community (ASPC), including the surrounding solar farms, neighbourhood precincts, data centres and light industrial precinct. The proposed project area encompasses 1320 & 1350 Dairy Flat Highway, 237 & 253 Postman Road and 89 & 105 Lascelles Drive, Dairy Flat.

This GFR (rev G) has been updated to include supplementary investigations undertaken by Initia in August 2025 to support preliminary design and consent application under the Fast Track Approvals Act 2024 (FTAA) of the proposed Stage 2 Development Masterplan[1]. Investigations were also previously undertaken by Initia in March-April 2023 to support the Stage 1 Masterplan. In addition, geotechnical investigations were completed by Aurecon in April 2023 to support the design of the western Data Centre and by Tonkin & Taylor Ltd in May 2022 to support the pre-purchase assessment of 1350 Dairy Flat Highway and 237 & 253 Postman Road. The results and details of the Aurecon and Tonkin & Taylor geotechnical investigations are also in this GFR for completeness. However, reference should be made to Aurecon Geotechnical Investigation Report[2] and Tonkin & Taylor Pre-purchase Report[3] for further detail.

Geotechnical interpretation of the investigation results is presented in a separate Geotechnical Assessment Report (GAR) for the Stage 2 Fast Track Consent Application. The GAR describes the ground and groundwater conditions of the site and provides preliminary geotechnical design and construction advice for the development. Initia also previously prepared a Geotechnical Interpretative Report (GAR)[4] to support the Stage 1 Fast Track Consent Application.

Supplementary geotechnical investigations, analysis and reporting will be required to support the detailed design of all stages of the project.

1.2 Proposed Development

The Masterplan for the ASPC Development is presented in Figure 1-1 below. It shows the development will include the following core elements across the 54ha development:

1. **Surf Lagoon:** A proposed 2.3ha, 1 to 3 m deep body of water arrayed around a curved 'beach'. The lagoon will be formed largely below existing ground levels and will include a central bulkhead structure and a servicing building at the northern end of the lagoon.
2. **Surf Amenity Precinct**: The Surf Amenity Precinct supports the Surf Lagoon operations and includes 5 No. single storey buildings and 1 No. two storey restaurant located to the south and west of the surf lagoon. An 8 storey hotel building is also proposed to the south-east of the lagoon. On-grade carparking will be provided around the southern and western perimeters of the precinct.
3. **Accommodation Precinct**: The accommodation precinct is located to the north of the lagoon and includes a two storey clubhouse building and approximately 60 No. single storey accommodation villas. The villas are proposed to include terraced units, duplexes and

[1] Studio Pacific Architecture (14/04/2026). *Auckland Surf Park Community. Masterplan. Illustrative Masterplan.* Layout ID RC_1.01 Job No. 4663.
[2] Aurecon (1 June 2023). *Spark Dairy Flat Campus. Geotechnical Investigation report.* Ref: 523573. Revision A.
[3] Tonkin & Talor Ltd (8/06/2022). *1350 Dairy Flat Highway – Geotechnical report to support Due Diligence & Concept Design. Geotechnical Factual Report.* Rev V01. Ref: 1016501.1000.
[4] Initia Ltd (23/06/2023). *Auckland Surf Park Community. Geotechnical Interpretative Report.* Rev B. Ref: P-001537.

standalone units. The northern most villas are proposed to be elevated on posts above a low-lying flood storage area. The remaining buildings are proposed to be founded on-grade on higher ground.

4. **Village Centre Precinct**: The Village Centre is proposed to include 3 No. four storey apartment buildings, 4 No. three storey apartment buildings and single storey market, food & beverage, wellness centre and early childhood buildings. The precinct also includes on-grade parking and internal roading.
5. **Neighbourhood Precincts (North-West, North-East and South):** Three separate residential neighbourhood precincts are proposed, totalling approximately 13ha. It is understood the residential neighbourhoods will include 1 – 3 storey standalone and duplex dwellings with associated roading and green space.
6. **Live-Work Precinct:** The Live-Work Precinct is to include approximately 25 No. two storey terraced units with both home-office and living spaces. On-grade parking is also proposed. The southern end of the Live-Work precinct is reserved for Water and Wastewater infrastructure to support the wider development.
7. **Solar Farms (North, Centre and South):** Three separate solar farms are proposed in disparate locations, with a total area of approximately 8.5ha.
8. **Data Centres:** Two separate Data Centre Buildings are proposed at the eastern end of the project. It is understood these will likely comprise Importance Level 4 structures.
9. **Surf Industry Precinct:** A light industrial precinct is proposed adjacent to Postman Road totalling approximately 1.5 ha. It is understood this will facilitate light-industrial buildings with typical footprints of approximately 550 m^2.
10. **Stream Park:** A green space including walking trails, stormwater ponds and flood storage areas is proposed through the centres of the site. A vehicle bridge is to provide access across the existing creek.

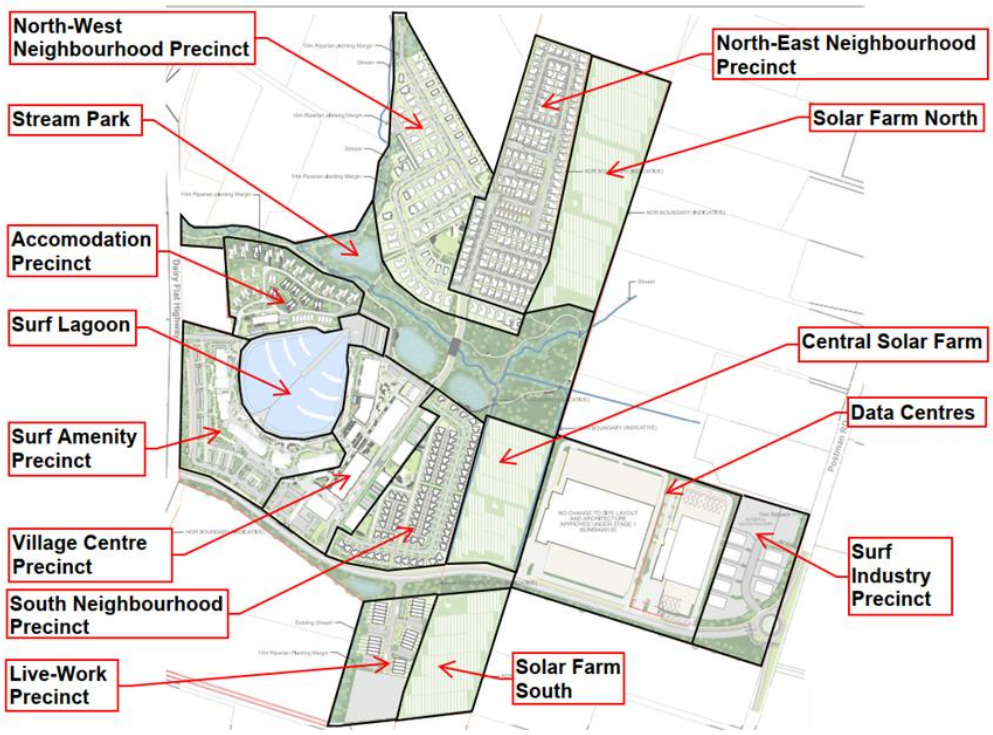


Figure 1-1: Proposed Stage 2 Masterplan (Reference: Studio Pacific Architecture 14/04/2026)

2. Geotechnical Investigations

2.1 Historical Investigations

Pre-Purchase Stage

A geotechnical investigation was undertaken by Tonkin & Taylor[5] (T&T) in May 2022 as part of a pre-purchase assessment for due diligence of 1350 Dairy Flat Highway, 237 Postman Road and 253 Postman Road. The geotechnical investigations included:

- 23 No. hand auger boreholes with Scala Penetrometer (DCP) testing advanced from the base of the holes; and
- 6 No. machine excavated test pits

Standpipe piezometers were installed within 6 No. of the hand auger boreholes. These piezometers have either been destroyed or are unable to be located.

A summary of the T&T investigations is provided in Table 2-1 below and the locations of all T&T investigations are presented on Figure 1537-001 attached in Appendix A. Investigation logs are presented in Appendix C.

Spark Data Centre Investigations

A geotechnical investigation was undertaken by Aurecon[6] in April 2023 to support the design of the proposed Spark Western Data at 237 Postman Road and 253 Postman Road. The investigations included:

- 15 No. Cone Penetration Tests
- 3 No. Seismic Dilatometer Tests
- 8 No. Hand Auger Boreholes;
- 8 No. Machine Drilled Boreholes; and

Standpipe piezometers were installed within 6 No. of the machine boreholes. Groundwater monitoring undertaken by Aurecon is summarised in Section 2.4.

A summary of the Aurecon investigations is provided in Table 2-1 below and investigation locations are presented on Figure 1537-001 in Appendix A. Investigation logs are attached in Appendix C.

It is noted that the coordinates and elevations of the Aurecon investigations were presented in a different coordinate system on the logs but have been converted into project coordinate and datum using the LINZ online coordinate convertor.

Table 2-1: Summary of Historical Investigations by others

Investigation ID	Investigation Type	Supervising Company	Coordinates (NZTM)		Ground Surface Elevation (m RL)	Termination Depth (m BGL)
			Easting (mE)	Northing (mN)		
HA01P	Hand Auger + DCP	T&T	1746998 [1]	5942131 [1]	55 [2]	6.0
HA02	Hand Auger + DCP	T&T	1746956 [1]	5942106 [1]	55 [2]	6.0
HA03P	Hand Auger + DCP	T&T	1746900 [1]	5942063 [1]	55 [2]	6.0
HA04P	Hand Auger + DCP	T&T	1746836 [1]	5942039 [1]	55 [2]	6.0
HA05	Hand Auger + DCP	T&T	1746857 [1]	5942122 [1]	55 [2]	8.0

[5] Tonkin & Taylor, June 2022 – 1350 Dairy Flat Highway – Geotechnical report to support Due Diligence & Concept Design. Rev 1, Job Number: 1016502.1000.v01

[6] Aurecon (1 June 2023). *Spark Dairy Flat Campus. Geotechnical Investigation report.* Ref: 523573. Revision A.

Investigation ID	Investigation Type	Supervising Company	Coordinates (NZTM)		Ground Surface Elevation (m RL)	Termination Depth (m BGL)
			Easting (mE)	Northing (mN)		
HA06	Hand Auger + DCP	T&T	1746939 [1]	5941998 [1]	55 [2]	3.7
HA07	Hand Auger + DCP	T&T	1746807 [1]	5942260 [1]	52 [2]	4.0
HA08	Hand Auger + DCP	T&T	1746733 [1]	5942005 [1]	57 [2]	8.8
HA09	Hand Auger + DCP	T&T	1746981 [1]	5941829 [1]	54 [2]	5.9
HA10	Hand Auger + DCP	T&T	1747128 [1]	5942113 [1]	53 [2]	6.0
HA11P	Hand Auger + DCP	T&T	1747132 [1]	5941928 [1]	54 [2]	6.0
HA12	Hand Auger + DCP	T&T	1747372 [1]	5941925 [1]	54 [2]	6.0
HA13	Hand Auger + DCP	T&T	1747290 [1]	5941778 [1]	54 [2]	5.1
HA14	Hand Auger + DCP	T&T	1747521 [1]	5941828 [1]	59 [2]	2.4
HA15P	Hand Auger + DCP	T&T	1747566 [1]	5941713 [1]	63 [2]	1.8
HA16	Hand Auger + DCP	T&T	1747325 [1]	5942168 [1]	54 [2]	6.0
HA17	Hand Auger + DCP	T&T	1747193 [1]	5942250 [1]	60 [2]	1.6
HA18	Hand Auger + DCP	T&T	1747274 [1]	5942356 [1]	63 [2]	2.0
HA19	Hand Auger + DCP	T&T	1747408 [1]	5942451 [1]	62 [2]	1.5
HA20P	Hand Auger + DCP	T&T	1747320 [1]	5942542 [1]	67 [2]	1.5
HA21	Hand Auger + DCP	T&T	1746998 [1]	5942147 [1]	55 [2]	7.0
HA22	Hand Auger + DCP	T&T	1746943 [1]	5942119 [1]	55 [2]	9.6
HA23	Hand Auger + DCP	T&T	1746903 [1]	5942077 [1]	55 [2]	7.0
TP01	Test Pit	T&T	1746978 [1]	5942115 [1]	55 [2]	4.0
TP02	Test Pit	T&T	1746846 [1]	5942017 [1]	55 [2]	4.0
TP03	Test Pit	T&T	1747124 [1]	5941893 [1]	54 [2]	3.9
TP04	Test Pit	T&T	1747486 [1]	5941794 [1]	59 [2]	3.0
TP05	Test Pit	T&T	1747244 [1]	5942097 [1]	53 [2]	3.8
TP06	Test Pit	T&T	1747338 [1]	5942423 [1]	64 [2]	2.4
CPT01	Cone Penetration Test	Aurecon	1747324.7 [3]	5941951.7 [3]	53.7 [4]	10.0
CPT02	Cone Penetration Test	Aurecon	1747388.5 [3]	5941919.5 [3]	53.8 [4]	11.9
CPT03	Cone Penetration Test	Aurecon	1747387.5 [3]	5941906.9 [3]	54.2 [4]	9.8
CPT04	Cone Penetration Test	Aurecon	1747333.6 [3]	5941920.4 [3]	53.7 [4]	10.8
CPT05	Cone Penetration Test	Aurecon	1747438.5 [3]	5941876.1 [3]	53.6 [4]	10.5
CPT06	Cone Penetration Test	Aurecon	1747284.4 [3]	5941893.7 [3]	54.3 [4]	10.5
CPT07	Cone Penetration Test	Aurecon	1747434.7 [3]	5941839.1 [3]	53.9 [4]	9.4
CPT08	Cone Penetration Test	Aurecon	1747363.4 [3]	5941840.4 [3]	53.8 [4]	10.0
CPT09	Cone Penetration Test	Aurecon	1747318.9 [3]	5941841.6 [3]	53.8 [4]	10.1
CPT10	Cone Penetration Test	Aurecon	1747262.6 [3]	5941839.3 [3]	54.0 [4]	9.6
CPT11	Cone Penetration Test	Aurecon	1747345.7 [3]	5941802.4 [3]	54.0 [4]	9.9
CPT12	Cone Penetration Test	Aurecon	1747278.0 [3]	5941793.3 [3]	54.0 [4]	6.1
CPT13	Cone Penetration Test	Aurecon	1747404.6 [3]	5941747.8 [3]	55.1 [4]	10.2

Investigation ID	Investigation Type	Supervising Company	Coordinates (NZTM)		Ground Surface Elevation (m RL)	Termination Depth (m BGL)
			Easting (mE)	Northing (mN)		
CPT14	Cone Penetration Test	Aurecon	1747552.5 [3]	5941802.9 [3]	60.6 [4]	11.5
CPT15	Cone Penetration Test	Aurecon	1747655.1 [3]	5941835.0 [3]	63.3 [4]	9.3
SDMT01	Flat Plate Dilatometer	Aurecon	1747332.2 [3]	5941911.9 [3]	53.6 [4]	10.0
SDMT02	Flat Plate Dilatometer	Aurecon	1747362.2 [3]	5941864.5 [3]	53.8 [4]	9.6
SDMT03	Flat Plate Dilatometer	Aurecon	1747413.2 [3]	5941797.7 [3]	54.5 [4]	9.8
HA01	Hand Auger	Aurecon	1747295.1 [3]	5941930.6 [3]	53.4 [4]	3.1
HA02	Hand Auger	Aurecon	1747386.7 [3]	5941924.3 [3]	53.8 [4]	4.0
HA03	Hand Auger	Aurecon	1747336.1 [3]	5941884.0 [3]	53.8 [4]	4.5
HA04	Hand Auger	Aurecon	1747412.9 [3]	5941851.5 [3]	54.1 [4]	2.4
HA05	Hand Auger	Aurecon	1747412.5 [3]	5941804.1 [3]	54.5 [4]	2.4
HA06	Hand Auger	Aurecon	1747259.2 [3]	5941836.8 [3]	53.7 [4]	2.1
HA07	Hand Auger	Aurecon	1747343.9 [3]	5941797.1 [3]	54.1 [4]	2.4
HA08	Hand Auger	Aurecon	1747606.5 [3]	5941819.4 [3]	62.3 [4]	1.5
BH01	Machine Borehole	Aurecon	1747327.5 [3]	5941943.3 [3]	53.6 [4]	12.2
BH02	Machine Borehole	Aurecon	1747459.7 [3]	5941898.5 [3]	54.3 [4]	10.7
BH03	Machine Borehole	Aurecon	1747377.4 [3]	5941885.7 [3]	53.9 [4]	15.2
BH04	Machine Borehole	Aurecon	1747301.4 [3]	5941886.4 [3]	53.7 [4]	12.3
BH05	Machine Borehole	Aurecon	1747358.5 [3]	5941838.2 [3]	53.9 [4]	12.2
BH06	Machine Borehole	Aurecon	1747438.2 [3]	5941836.9 [3]	54.4 [4]	10.6
BH07	Machine Borehole	Aurecon	1747277.1 [3]	5941799.2 [3]	53.9 [4]	7.6
BH08	Machine Borehole	Aurecon	1747397.4 [3]	5941753.6 [3]	54.9 [4]	10.6

Note [1]: Coordinate system NZTM2000. Test location survey method and accuracy not noted in T&T reporting.
Note [2]: Datum – AUCKHT1946. Ground surface elevations survey method and accuracy not noted in T&T reporting.
Note [3]: Coordinate system NZTM2000. Test locations were surveyed using a GPS rover with a reported accuracy greater than +/- 200 mm. Locations have been converted from Mt Eden 2000 coordinate system using LINZ online coordinate converter.
Note [4]: Datum – AUCKHT1946. Ground surface elevations were surveyed using a GPS rover with a reported accuracy greater than +/- 100 mm. Elevations have been converted from NZVD 2016 to AUCKHT 1946 using LINZ online coordinate converter.

2.2 Initia Investigations

2.2.1 General

An initial stage of geotechnical investigations was undertaken by Initia between 20th March 2023 and 5th April 2023 to support the preliminary design and Fast Track Consent of the "Stage 1" Surf Park Community Masterplan. The 2023 field investigations (referred to herein as the Initia Stage 1 investigations) included 5 No. machine boreholes, 25 No. Cone Penetration Tests, 11 No. hand auger boreholes and 31 No. machine excavated test pits. Locations were selected based on the proposed development plans at the time of the investigation.

Supplementary geotechnical field investigations were undertaken by Initia between 5th August 2025 and 22nd August 2025 to support the preliminary design and Fast Track Consent of the "Stage 2" Masterplan. The August 2025 field investigations (referred to herein as the Initia Stage 2 investigations) included 39 No. Cone Penetration Tests, 43 No. hand auger boreholes and 10 No.

machine excavated test pits. Locations were selected based on the development plans at the time of the investigation and access constraints.

A summary of the investigations is provided in Table 2-2, Table 2-3, Table 2-4 and Table 2-5 below. Investigation locations for both stages were surveyed using a GPS rover unit and are presented on Figure 1537-G01.

The sub-sections below present an aggregated summary of the machine boreholes, test pits, hand auger boreholes, CPTs and laboratory testing completed by Initia over both stages of investigation.

2.2.2 Machine Boreholes – Stage 1

Five (5 No.) rotary cored boreholes were drilled by DCN Drilling between the 21st and 28th March 2023 under the full-time supervision of an Initia Engineering Geologist. The boreholes were drilled to depths of between 12.1 and 15.1 m bgl. The boreholes were positioned under the proposed lagoon central bulkhead and side wall locations (at the time of the investigation) to confirm the depth of rock and to enable undisturbed sampling of the upper soils.

Standard Penetration Tests (SPTs) and or push tube sampling was undertaken at regular 1.5 m intervals. Standpipe piezometers were installed to monitor groundwater levels in all 5 No. boreholes as outlined in Section 2.4.1.

The recovered core was logged in general accordance with the NZGS logging guidelines[7]. Borehole logs are presented in Appendix B.

Table 2-2: Summary of Initia Machine Borehole Investigations (Stage 1 only).

Investigation ID	Coordinates (NZTM)[1]		Ground Surface Elevation (m RL)[2]	Termination Depth (m bgl)
	Easting (mE)	Northing (mN)		
MBH01	1746801.2	5942120.0	55.3	15.0
MBH02	1746978.3	5942156.8	54.7	15.1
MBH03	1746937.3	5942113.6	55.2	12.1
MBH04	1746898.2	5942073.6	54.9	15.0
MBH05	1746945.6	5942009.4	54.8	15.0

Note 1: Coordinate system NZTM2000. Test location coordinates are determined via precise survey and are expected to be accurate to ± 100 mm.
Note 2: Datum – AUCKHT1946. Ground surface elevations are determined via precise survey and are expected to be accurate to ± 100 mm.

2.2.3 Cone Penetration Tests – Stage 1 and 2

25 No. Cone Penetration Tests (CPT01 to CPT25) were carried out by WSP between the 3rd and 5th April 2023 to support the Stage 1 Fast Track Consent. The CPTs were completed by an anchored CPT rig. All CPTs terminated due to refusal between 6.7 – 13.0 m depth on a hard/dense stratum or due to accumulation of rod friction.

An additional 39 No. Cone Penetration Tests (CPT101 to CPT140) were carried out by WSP between the 18th and 22nd August 2025 to support the Stage 2 Fast Track Consent. The Stage 2 CPTs were completed by a 10-tonne tracked dead weight rig. All CPTs terminated due to refusal between 1.7 - 14.9 m depth on a hard/dense stratum or due to accumulation of rod friction.

A summary of the Stage 1 and 2 CPTs is presented in Table 2-3 below and logs are attached in Appendix B.

[7] New Zealand Geotechnical Society Inc (December 2005). *Field Description of Soils and Rock.*

Table 2-3: Summary of Initia Cone Penetration Tests.

Investigation ID	Initia Investigation Stage	Coordinates (NZTM)[1]		Ground Surface Elevation (m RL)[2]	Termination Depth (m bgl)
		Easting (mE)	Northing (mN)		
CPT01	Stage 1	1746957.1	5942132.8	54.8	11.3
CPT02	Stage 1	1746921.2	5942141.2	55.3	11.9
CPT03	Stage 1	1746972.5	5942154.8	54.7	11.0
CPT04	Stage 1	1746807.2	5942119	55.3	9.2
CPT05	Stage 1	1746870.3	5942140.5	54.8	10.1
CPT06	Stage 1	1746941.6	5942115.1	55.2	12.4
CPT07	Stage 1	1746960.3	5942089.0	55.3	13.0
CPT08	Stage 1	1747046.3	5942103.8	54.7	11.2
CPT09	Stage 1	1746756.1	5942092.0	55.4	9.0
CPT10	Stage 1	1746828.3	5942074.1	55.2	11.0
CPT11	Stage 1	1746893.8	5942065.8	54.9	10.5
CPT12	Stage 1	1746951.4	5942054.7	55.0	12.3
CPT13	Stage 1	1746765.5	5942035.3	55.2	10.0
CPT14	Stage 1	1746869.9	5942041.9	54.9	8.5
CPT15	Stage 1	1746886.1	5942010.1	54.9	9.0
CPT16	Stage 1	1746946.5	5942014.6	54.7	11.8
CPT17	Stage 1	1746793.5	5942000.3	55.1	10.7
CPT18	Stage 1	1746917.5	5941966.3	54.7	11.2
CPT19	Stage 1	1747039.4	5941971.6	54.3	6.7
CPT20	Stage 1	1746821.3	5941969.1	55.2	8.0
CPT21	Stage 1	1746832	5942007.5	55.0	7.3
CPT22	Stage 1	1746902.5	5941941.3	54.6	12.2
CPT23	Stage 1	1746951.9	5941928.2	54.6	12.0
CPT24	Stage 1	1747007	5941890.1	54.3	8.8
CPT25	Stage 1	1746974.1	5941801.5	54.1	11.8
CPT101	Stage 2	1747025.4	5942338.8	51.4	2.3
CPT102	Stage 2	1747026.9	5942293.4	53.4	3.5
CPT103	Stage 2	1747039.7	5942256.2	53.6	7.7
CPT104	Stage 2	1747061.7	5942207.3	52.2	4.4
CPT105	Stage 2	1747114.0	5942167.3	54.0	1.7
CPT106	Stage 2	1747022.7	5941564.9	56.1	3.1
CPT107	Stage 2	1746969.8	5941567.1	53.9	9.4
CPT108	Stage 2	1746982.3	5941615.5	54.0	4.6
CPT109	Stage 2	1747030.5	5941694.3	54.3	8.5
CPT110	Stage 2	1747022.2	5941731.4	54.1	5.8
CPT111	Stage 2	1747067.2	5941736.9	54.3	8.3
CPT112	Stage 2	1747198.3	5941749.6	54.5	4.6
CPT113	Stage 2	1746809.6	5942296.7	51.2	12.5
CPT114	Stage 2	1746871.4	5942288.2	51.0	11.2
CPT115	Stage 2	1746860.6	5942236.4	55.0	12.3

Investigation ID	Initia Investigation Stage	Coordinates (NZTM)[1]		Ground Surface Elevation (m RL)[2]	Termination Depth (m bgl)
		Easting (mE)	Northing (mN)		
CPT116	Stage 2	1746816.6	5942199.7	54.3	10.3
CPT117	Stage 2	1746931.8	5942220.6	53.4	10.2
CPT118	Stage 2	1746976.4	5942229.3	51.7	8.2
CPT119	Stage 2	1747213.7	5942144.4	54.4	6.0
CPT120	Stage 2	1747221.6	5942095.8	53.1	7.5
CPT121	Stage 2	1746999.6	5942009.4	54.7	11.8
CPT122	Stage 2	1746955.3	5941976.3	54.8	14.2
CPT123	Stage 2	1746891.6	5941855.7	55.9	13.7
CPT124	Stage 2	1746952.8	5941876.3	56.1	13.5
CPT125	Stage 2	1746876.3	5941905.9	56.5	14.3
CPT126	Stage 2	1746999.6	5941930.6	55.0	13.2
CPT127	Stage 2	1747040.0	5941845.0	54.9	12.6
CPT128	Stage 2	1747040.1	5941797.5	54.8	10.1
CPT129	Stage 2	1747118.2	5941962.3	53.8	10.7
CPT131	Stage 2	1747093.1	5942015.2	53.3	9.6
CPT132	Stage 2	1747163.0	5942019.2	53.6	10.5
CPT133	Stage 2	1747002.7	5942046.7	54.7	11.7
CPT134	Stage 2	1746992.5	5942133.6	54.8	11.0
CPT135	Stage 2	1747168.4	5941967.1	54.4	14.0
CPT136	Stage 2	1746876.1	5942179.6	54.5	12.7
CPT137	Stage 2	1747077.0	5941904.5	54.7	10.8
CPT138	Stage 2	1747300.3	5942128.2	54.2	10.8
CPT139	Stage 2	1746907.0	5942273.3	50.9	10.1
CPT140	Stage 2	1746771.7	5942136.9	55.4	14.9

Note 1: Coordinate system NZTM2000. Test location coordinates are determined via precise survey and are expected to be accurate to ± 100 mm.
Note 2: Datum – AUCKHT1946. Ground surface elevations are determined via precise survey and are expected to be accurate to ± 100 mm.

2.2.4 Hand Auger Boreholes – Stage 1 and 2

11 No. hand augered boreholes were drilled by an Initia Geotechnical Engineer between the 20th and 30th March 2023 to support the Stage 1 Masterplan. The hand augers were terminated due to effective refusal, or at a target depth of 4.0 m.

An additional 43 No. hand augered boreholes were drilled by Geotechnical Technicians under the direction of an Initia Geotechnical Engineer between the 5th and 18th August 2025, to support the Stage 2 Masterplan. The hand augers were terminated due to effective refusal, excess water suction, lack of soil recovery or at a target depth of 4.0 – 5.0 m. Scala Penetrometer Tests were advanced from the base of 41 of the 43 the hand auger holes until effective refusal of to a target depth of 4.8 – 5.0 m.

In-situ shear vane testing was undertaken at 0.3 – 0.4 m intervals in fine-grained soils within all hand augers, and soil samples recovered for laboratory testing (refer Section 2.3). Groundwater, where

encountered, was recorded at the completion of drilling. The soil arisings were logged in general accordance with the NZGS logging guidelines[8].

A summary of the hand augers from the Stage 1 and 2 investigations is presented below in Table 2-4 and logs are attached in Appendix B.

Table 2-4: Summary of Initia Hand Auger Borehole Investigations

Investigation ID	Initia Investigation Stage	Coordinates (NZTM)[1]		Ground Surface Elevation (m RL)[2]	Hand Auger Termination Depth (m bgl)	Scala Penetrometer Termination Depth (m bgl)
		Easting (mE)	Northing (mN)			
HA01	Stage 1	1747157.1	5942145.4	54.0	2.4	N/A
HA03	Stage 1	1747032.4	5942080.2	54.6	4.0	N/A
HA04	Stage 1	1747085.0	5942069.3	54.1	4.0	N/A
HA06	Stage 1	1747107.3	5941991.5	54.0	4.0	N/A
HA07	Stage 1	1747022.6	5941927.5	54.4	4.0	N/A
HA09	Stage 1	1746920.6	5941924.4	54.5	4.0	N/A
HA10	Stage 1	1746870.1	5941871.3	54.5	4.0	N/A
HA11	Stage 1	1746918.0	5941827.2	54.4	4.0	N/A
HA12	Stage 1	1746841.2	5941891.5	54.7	4.0	N/A
HA13	Stage 1	1746745.4	5941941.2	56.8	4.0	N/A
HA14	Stage 1	1746745.1	5942160.6	55.8	4.0	N/A
HA101	Stage 2	1747099.5	5942556.0	56.0	1.5	1.9
HA102	Stage 2	1747129.9	5942501.5	59.8	1.4	2.0
HA103	Stage 2	1747163.5	5942442.6	62.8	1.5	2.3
HA104	Stage 2	1747185.8	5942405.4	63.7	1.4	1.8
HA105	Stage 2	1747234.6	5941910.8	53.4	1.2	5.0
HA106	Stage 2	1747134.2	5942404.0	61.2	1.2	1.7
HA107	Stage 2	1747113.1	5942451.9	59.1	1.4	1.8
HA108	Stage 2	1747094.3	5942491.7	56.5	1.9	2.6
HA109	Stage 2	1747060.8	5942450.3	53.1	1.3	1.9
HA110	Stage 2	1747043.2	5942386.6	52.0	1.2	1.5
HA111	Stage 2	1747023.9	5942326.5	52.0	1.8	2.0
HA112	Stage 2	1746772.1	5942103.9	55.3	2.4	5.0
HA113	Stage 2	1747061.0	5942233.4	54.2	4.0	4.9
HA114	Stage 2	1747110.8	5942202.7	56.1	1.1	1.3
HA115	Stage 2	1747086.8	5942386.9	58.0	1.4	1.7
HA116	Stage 2	1747102.0	5942359.1	59.4	1.2	1.5
HA117	Stage 2	1747060.0	5942350.3	56.1	1.6	1.9
HA118	Stage 2	1747089.1	5942268.4	57.5	1.1	1.6
HA119	Stage 2	1747126.8	5942308.9	60.2	1.5	1.9
HA120	Stage 2	1747136.1	5942235.1	58.2	1.2	1.6
HA121	Stage 2	1747052.1	5942291.2	55.5	4.8	5.1

[8] New Zealand Geotechnical Society Inc (December 2005). *Field Description of Soils and Rock.*

Investigation ID	Initia Investigation Stage	Coordinates (NZTM)[1]		Ground Surface Elevation (m RL)[2]	Hand Auger Termination Depth (m bgl)	Scala Penetrometer Termination Depth (m bgl)
		Easting (mE)	Northing (mN)			
HA122	Stage 2	1746968.4	5941564.3	53.9	2.5	4.1
HA123	Stage 2	1747021.1	5941572.7	55.9	1.1	1.6
HA124	Stage 2	1747076.8	5941701.4	55.2	1.7	2.1
HA125	Stage 2	1746979.3	5941601.5	54.0	1.8	2.1
HA126	Stage 2	1746987.1	5941630.7	54.0	1.8	1.9
HA127	Stage 2	1747012.3	5941730.5	54.1	4.0	4.8
HA128	Stage 2	1747027.3	5941699.0	54.2	1.8	4.8
HA129	Stage 2	1747061.3	5941734.4	54.1	2.3	2.8
HA130	Stage 2	1747111.3	5941673.1	57.1	1.1	1.5
HA131	Stage 2	1747145.8	5941574.3	60.3	1.2	1.8
HA132	Stage 2	1747086.5	5941623.1	58.1	1.4	1.5
HA133	Stage 2	1747167.9	5941651.7	58.8	1.4	1.9
HA134	Stage 2	1747203.4	5941741.6	54.8	2.0	3.2
HA135	Stage 2	1747127.9	5941731.9	55.1	1.6	2.2
HA136	Stage 2	1746778.0	5942060.8	55.2	2.2	4.8
HA137	Stage 2	1746880.5	5942178.5	54.6	4.0	4.9
HA138	Stage 2	1746857.1	5942280.9	51.6	4.0	4.9
HA139	Stage 2	1746925.3	5942255.5	50.6	5.0	N/A
HA140	Stage 2	1746969.7	5942225.1	52.0	5.0	N/A
HA141	Stage 2	1746805.7	5942022.2	55.2	2.2	5.0
HA142	Stage 2	1746979.2	5941984.1	55.3	4.0	5.0
HA143	Stage 2	1747028.8	5942020.7	53.9	4.0	5.0

Note 1: Coordinate system NZTM2000. Test location coordinates are determined via precise survey and are expected to be accurate to ± 100 mm.
Note 2: Datum – AUCKHT1946. Ground surface elevations are determined via precise survey and are expected to be accurate to ± 100 mm.

2.2.5 Test Pits – Stage 1 and 2

31 No. machine excavated test pits (TP01 to TP31) were excavated on 27th and 28th March 2023 to support the Stage 1 Masterplan. The test pits were excavated by Wilkinson Civil Ltd using a 12 tonne excavator, under the full time supervision of an Initia Geotechnical Engineer. The test pits were terminated at depths between 1.5 – 4.2 m below ground level due to refusal on a hard/dense stratum or from maximising excavator reach.

10 No. additional machine excavated test pits (TP101 to TP112) were excavated on 7th August 2025 to support the Stage 2 Masterplan. The test pits were excavated by McKenzie Civil Contracting using a 12 tonne excavator, under the full time supervision of an Initia Geotechnical Engineer. The test pits were terminated at depths between 3.0 – 3.7 m.

In-situ shear vane tests were undertaken in fine-grained soils at regular intervals in all test pits and excavated soils were logged in general accordance with the NZGS guidelines[9]. Bulk samples were

[9] New Zealand Geotechnical Society Inc (December 2005). *Field Description of Soils and Rock.*

collected from selected test pits for the purpose of laboratory testing for earthworks. A summary of the test pit investigations is presented in Table 2-5 below and the logs are attached in Appendix B.

Table 2-5: Summary of Test Pit Investigations.

Investigation ID	Initia Investigation Stage	Coordinates (NZTM)[1]		Ground Surface Elevation (m RL)[2]	Termination Depth (m bgl)
		Easting (mE)	Northing (mN)		
TP01	Stage 1	1747452.0	5942523.0	64.0	1.9
TP02	Stage 1	1747275.2	5942472.3	66.2	1.8
TP03	Stage 1	1747231.6	5942385.8	64.3	1.8
TP04	Stage 1	1747391.8	5942348.0	61.0	2.2
TP05	Stage 1	1747207.2	5942296.6	61.4	1.8
TP06	Stage 1	1747361.9	5942284.6	59.8	2.1
TP07	Stage 1	1747272.8	5942229.6	58.9	2.0
TP08	Stage 1	1747356.3	5942217.5	56.7	2.3
TP09	Stage 1	1747163.5	5942207.8	57.7	1.5
TP10	Stage 1	1747251.7	5942150.7	54.7	4.0
TP11	Stage 1	1747176.5	5942041.1	53.0	4.1
TP12	Stage 1	1747279.2	5942032.9	52.9	4.0
TP13	Stage 1	1746809.9	5942216.7	53.8	3.8
TP14	Stage 1	1746914.9	5942211.6	55.0	3.8
TP15	Stage 1	1746826.1	5942153.9	55.0	4.0
TP16	Stage 1	1746749.0	5942119.6	55.4	3.7
TP17	Stage 1	1746896.6	5942113.9	54.9	4.0
TP18	Stage 1	1746951.3	5942133.7	55.0	4.2
TP19	Stage 1	1746824.2	5942088.9	55.3	3.6
TP20	Stage 1	1746879.8	5942075.4	54.9	3.3
TP21	Stage 1	1746944.1	5942056.3	55.0	4.1
TP22	Stage 1	1747055.0	5942085.5	54.4	4.0
TP23	Stage 1	1746869.7	5942034.2	54.9	3.8
TP24	Stage 1	1746885.5	5941987.7	55.0	4.2
TP25	Stage 1	1747046.8	5941988.3	54.5	3.7
TP26	Stage 1	1747072.3	5941902.8	54.2	3.5
TP27	Stage 1	1746943.2	5941865.3	54.6	3.6
TP28	Stage 1	1747016.4	5941829.2	54.1	3.6
TP29	Stage 1	1746858.8	5941880.5	54.6	4.0
TP30	Stage 1	1746995.8	5941883.1	54.3	3.3
TP31	Stage 1	1747112.3	5942063.4	53.9	3.9
TP101	Stage 2	1746861.9	5942228.9	54.9	3.3
TP102	Stage 2	1746943.2	5942173.2	54.3	3.5
TP104	Stage 2	1746947.8	5941946.8	54.8	3.0
TP105	Stage 2	1746993.1	5942066.7	54.1	3.3

Investigation ID	Initia Investigation Stage	Coordinates (NZTM)[1]		Ground Surface Elevation (m RL)[2]	Termination Depth (m bgl)
		Easting (mE)	Northing (mN)		
TP107	Stage 2	1747087.3	5941780.3	54.2	3.7
TP108	Stage 2	1747156.2	5941964.5	53.9	3.3
TP109	Stage 2	1747205.7	5941815.3	54.9	3.5
TP110	Stage 2	1746843.0	5941995.8	54.5	3.0
TP111	Stage 2	1746776.6	5941948.1	55.6	3.5
TP112	Stage 2	1746747.6	5942038.9	55.4	3.5

Note 1: Coordinate system NZTM2000. Test location coordinates are determined via precise survey and are expected to be accurate to ± 100 mm.
Note 2: Datum – AUCKHT1946. Ground surface elevations are determined via precise survey and are expected to be accurate to ± 100 mm.

2.3 Laboratory Testing

2.3.1 Initia Stage 1 and 2

Laboratory testing has been undertaken on a select number of soil samples obtained from machine boreholes, test pits and hand auger boreholes as part of both the Initia Stage 1 (2023) and Stage 2 (2025) Initia Investigations. Testing completed across both investigation stages has included the following:

- 6 No. Standard Compaction Tests (NZS 4402:1986 Test 4.1.1)
- 8 No. Soaked CBR Tests (NZS 4402:1986 Test 6.1.1)
- 32 No. Atterberg Limits Tests (NZS 4402:1986 Tests 2.1, 2.2, 2.3 and 2.4)
- 22 No. Linear Shrinkage Tests (NZS 4402:1986 Test 2.6)
- 8 No. One Dimensional T_{90} Consolidation Tests (NZS4402:1986 Test 7.1)
- 1 No. Water Content Test (NZS4402:1986 Test 2.1)
- 3 No. Organic Matter Content Test (NZS 4402:1986 Test 3.1.1)

A summary of the Initia Stage 1 and 2 laboratory tests and results are detailed in Table 2-6, Table 2-7, Table 2-8 and Table 2-9 below. The full laboratory results are attached in Appendix D.

All laboratory tests (Initia and Aurecon) were completed by the IANZ Accredited Babbage Geotechnical Laboratory, except for the organic content tests which were completed by Hill Labs.

Table 2-6: Standard Compaction Test Summary.

Investigation ID	Sample ID	Depth		Maximum Dry Density (t/m³)	Natural Water Content (%)	Optimum Water Content (%)
		From	To			
TP18	TP18-01	1.0	1.5	1.3	51.3	35
TP19	TP19-01	0.5	1.0	1.44	37.1	27
TP20	TP20-01	1.5	2.0	1.26	46.9	36
TP21	TP21-01	0.5	1.0	1.3	56.4	33
TP24	TP24-01	1.0	1.5	1.28	60.7	34
TP101	TP101-01	0.5	1.0	1.40	34.5	29

Table 2-7: Soaked CBR Test Summary.

Investigation ID	Sample ID	Depth		Application rate of lime/cement (% of dry weight)	Soaked CBR (%)
		From	To		
TP15	TP15-01	1.5	2.0	2% Lime, 2% Cement	13 %
TP26	TP26-01	1.0	1.5	Natural	3 %
TP29	T29-01	1.0	1.5	Natural	1 %
TP29	TP29-01	1.0	1.5	1% Lime, 3% Cement	30 %
TP30	TP30-01	1.5	2.0	3% Lime, 1 % Cement	20 %
TP31	TP31-01	0.7	1.2	2% Lime, 2% Cement	30 %
TP101	TP101-01	0.5	1.0	Natural	2.5 %
TP112	TP112-01	1.0	1.5	Natural	1 %

Table 2-8: Atterberg Limit, Linear Shrinkage, Water Content and Organic Content Test Summary

Investigation ID	Sample ID	Depth		Natural Water Content (%)	Plastic Limit	Liquid Limit	Plasticity Index	Linear Shrinkage (%)	Organic Content (%)
		From	To						
MBH02	MBH02-01	1.0	1.5	42.8	22	67	45	16	-
MBH03	MBH03-01	1.5	2.0	42.7	30	94	64	-	-
MBH05	MBH05-01	1.0	1.5	60.1	33	93	60	16	-
HA03	HA03-01	1.0	1.3	29.8	22	55	33	14	-
HA04	HA04-01	1.0	1.4	46.8	36	81	45	17	-
HA09	HA09-01	1.0	1.3	56.3	29	73	44	-	-
HA10	HA10-01	1.0	1.3	36.9	24	54	30	-	-
HA13	HA13-01	2.0	2.2	51.2	29	104	75	-	-
HA14	HA14-01	1.0	1.3	46.1	30	107	77	-	-
TP16	TP16-01	1.0	1.5	78.5	44	123	79	22	-
TP17	TP17-01	1.0	1.5	55.6	34	106	72	-	-
TP19	TP19-01	0.5	1.0	35.2	22	65	43	17	-
TP20	TP20-01	1.5	2.0	32.3	27	84	57	-	-
TP21	TP21-01	0.5	1.0	56.5	32	106	74	18	-
TP22	TP22-01	1.9	2.5	92.7	42	146	104	-	-
TP23	TP23-01	2.0	2.5	45.0	25	63	38	-	-
TP24	TP24-01	1.0	1.5	64.1	34	104	70	18	-
TP26	TP26-01	1.0	1.5	33.4	19	43	24	12	-
TP27	TP27-01	1.0	1.5	44.9	28	73	45	14	-
TP28	TP28-01	1.5	2.0	34.0	18	39	21	-	-
TP101	TP101-01	0.5	1.0	37.0	25	78	53	19	-
TP107	TP107-01	1.0	1.5	88.0	35	99	64	18	9.7
TP108	TP108-01	0.5	1.0	127	53	148	95	22	12.7
TP108	TP108-02	2.0	2.5	112	-	-	-	-	11.8
HA102	HA102-01	1.2	1.4	35.3	19	74	55	17	-
HA104	HA104-01	0.5	0.8	63.0	29	146	117	28	-
HA114	HA114-01	0.4	0.7	59.6	28	144	116	24	-
HA116	HA116-01	1.1	1.4	46.4	20	88	68	22	-
HA121	HA121-01	0.3	0.6	51.7	19	131	112	25	-
HA122	HA122-01	0.5	0.8	43.4	17	104	87	23	-
HA128	HA128-01	0.5	0.8	33.8	22	62	40	14	-
HA133	HA133-01	1.2	1.4	31.9	21	66	45	16	-
HA140	HA140-01	0.3	0.5	28.4	33	55	22	12	-

Table 2-9: One Dimensional Consolidation Test Summary.

Investigation ID	Sample ID	Depth		Modulus of volume compressibility (Mv) at in situ stress) m^2/MN)	Coefficient of consolidation at in situ stress (Cv), m^2/yr
		From	To		
MBH01	MBH01-01	4.5	5.0	0.08	12
MBH02	MBH02-02	3.0	3.5	0.2	5
MBH02	MBH02-03	6.0	6.5	0.04	31
MBH02	MBH02-03	7.5	8.0	0.1	11
MBH03	MBH03-02	1.5	2.0	0.01	26
MBH04	MBH04-01	4.5	5.0	0.57	0.6
MBH05	MBH05-02	3.0	3.5	0.25	11
MBH05	MBH05-03	6.0	6.5	0.59	11

2.3.2 Aurecon – Data Centre

In addition to the Initia Stage 1 and 2 investigations, a suite of laboratory tests was also completed for the Spark Data Centre investigation, by Aurecon. The Aurecon testing included the following:

- 6 No. Atterberg Limits Tests (NZS 4402:1986 Tests 2.1, 2.2, 2.3 and 2.4)
- 3 No. Linear Shrinkage Tests (NZS 4402:1986 Test 2.6)
- 3 No. Particle Size Distribution Tests (NZS4402:1986 Tests 2.8.1 and 2.8.4)
- 2 No. Shrink-Swell Index Tests (AS1289 Test 7.1.1)
- 1 No. Soaked CBR Test (NZS 4402:1986 Test 6.1.1)
- 3 No. Consolidated Undrained Triaxial Tests (BS EN ISO 17892-9:2018, Part 9)
- 2 No. One Dimensional Consolidation Tests (NZS4402:1986 Test 7.1)

The laboratory results for the Aurecon managed laboratory tests are summarised in the Aurecon Investigation Report[10] for the Data Centres. The full laboratory test reports have been attached in Appendix E.

2.4 Groundwater Monitoring

2.4.1 Piezometers

Standpipe piezometers were installed by Tonkin & Taylor, Aurecon and Initia within hand auger boreholes and machine boreholes respectively. Installation details are summarised in Table 2-10 below and are presented on the investigation logs in Appendix B and C.

Table 2-10: Piezometer Details

Borehole ID	Supervising Company	Piezometer Type	Screen Depth (m bgl)	Geological Units Over Screen Depth
MBH01	Initia	Standpipe (32 mm PVC)	5.0 – 8.0	Tauranga Group
MBH02	Initia	Standpipe (32 mm PVC)	2.0 – 5.0	Tauranga Group
MBH03	Initia	Standpipe (32 mm PVC)	2.0 – 5.0	Tauranga Group
MBH04	Initia	Standpipe (32 mm PVC)	2.0 – 5.0	Tauranga Group
MBH05	Initia	Standpipe (32 mm PVC)	2.0 – 5.0	Tauranga Group
HA01P	Tonkin & Taylor	Standpipe	0.2 – 3.5	Tauranga Group
HA03P	Tonkin & Taylor	Standpipe	0.2 – 4.0	Tauranga Group
HA04P	Tonkin & Taylor	Standpipe	0.2 – 3.5	Tauranga Group

[10] Aurecon (1 June 2023). *Spark Dairy Flat Campus. Geotechnical Investigation report.* Ref: 523573. Revision A.

Borehole ID	Supervising Company	Piezometer Type	Screen Depth (m bgl)	Geological Units Over Screen Depth
HA11P	Tonkin & Taylor	Standpipe	0.2 – 4.0	Tauranga Group
HA15P	Tonkin & Taylor	Standpipe	0.2 – 0.8	Tauranga Group
HA20P	Tonkin & Taylor	Standpipe	0.2 – 0.7	Tauranga Group
BH01	Aurecon	Standpipe (32 mm PVC)	2.0 – 6.0	Tauranga Group
BH02	Aurecon	Standpipe (32 mm PVC)	2.0 – 6.0	Tauranga Group
BH03	Aurecon	Standpipe (32 mm PVC)	11.0 – 15.0	Tauranga Group
BH06	Aurecon	Standpipe (32 mm PVC)	1.0 – 4.0	Tauranga Group
BH07	Aurecon	Standpipe (32 mm PVC)	1.0 – 4.0	Tauranga Group
BH08	Aurecon	Standpipe (32 mm PVC)	1.0 – 4.0	Tauranga Group

2.4.2 Groundwater Levels

Groundwater level monitoring, involving manual measurements and/or continuous measurements using electronic level loggers (recording at 15 minute intervals) was undertaken within the standpipe piezometers outlined in Table 2-10. Results from the groundwater monitoring within the standpipe piezometers are presented in Table 2-11 below. Plots of groundwater measurements over time from the Initia level logger measurements are presented in Appendix F.

Table 2-11: Summary of Groundwater Measurements in Piezometers

Investigation ID	Monitoring By	Dates of Measurement	Measurement Type	Groundwater depth (m bgl)	Groundwater elevation (m RL) [AUCKHT1946]
MBH01	Initia	21/04/2023 to 7/06/2023	Continuous (Level Logger)	0.1 – 0.8	54.5 – 55.2
MBH02	Initia	21/04/2023 to 7/06/2023	Continuous (Level Logger)	0.3 – 1.8	52.9 – 54.4
MBH03	Initia	01/05/2023	Manual Measurement	0.8	54.4
MBH04	Initia	21/04/2023 to 7/06/2023	Continuous (Level Logger)	0.1 – 0.6	54.3 – 54.8
MBH05	Initia	21/04/2023 to 7/06/2023	Continuous (Level Logger)	0.2 – 0.6	54.2 – 54.6
HA01P	Tonkin & Taylor	6/05/2022 17/05/2022 24/05/2022	Manual Measurements	2.6 – >3.5[1]	<51.5 – 52.4
HA03P	Tonkin & Taylor	6/05/2022 17/05/2022 24/05/2022	Manual Measurements	0.8 – 3.8	51.0 – 54.0
HA04P	Tonkin & Taylor	6/05/2022 17/05/2022 24/05/2022	Manual Measurements	1.9 – 3.0	52.3 – 53.4
HA11P	Tonkin & Taylor	6/05/2022 17/05/2022 24/05/2022	Manual Measurements	0.9 – 1.1	53.0 – 53.2
HA15P	Tonkin & Taylor	6/05/2022 17/05/2022 24/05/2022	Manual Measurements	>0.8 [1]	<62.0
HA20P	Tonkin & Taylor	6/05/2022 17/05/2022 24/05/2022	Manual Measurements	>0.7 [1]	<66.0
BH01	Aurecon	1/05/2023 to 17/05/2023	Continuous (Level Logger)	0.2 – 3.2	50.4 – 53.4
BH02	Aurecon	1/05/2023 17/05/2023	Manual Measurements	0.2 – 0.6	53.7 – 54.1

Investigation ID	Monitoring By	Dates of Measurement	Measurement Type	Groundwater depth (m bgl)	Groundwater elevation (m RL) [AUCKHT1946]
BH03	Aurecon	1/05/2023 to 17/05/2023	Continuous (Level Logger)	0[2] – 0.4	53.5 – 54.3
BH06	Aurecon	1/05/2023 17/05/2023	Manual Measurements	0.1 – 0.4	54.0 – 54.3
BH07	Aurecon	1/05/2023 17/05/2023	Manual Measurements	0.1 – 0.2	53.7 – 53.8
BH08	Aurecon	1/05/2023 to 17/05/2023	Continuous (Level Logger)	0.3 – 3.4	51.5 – 54.6

Note [1] : Piezometer dry on measurement
Note [2] : Groundwater readings provided by Aurecon indicate groundwater was measured above ground surface level in the standpipe upstand.

Where encountered, groundwater inflows were recorded in the test pit excavations and standing groundwater levels were recorded in the hand auger boreholes at the completion of drilling. It is noted that the groundwater within test pits had initial significant inflow with a rapid attenuation of flow rates.

A summary of the groundwater inflows and levels (where encountered) at the completion of drilling is summarised in Table 2-12 below. Where hand auger holes were dry on the completion of drilling, this is noted on the investigation logs.

Table 2-12: Test Pit Inflow Observations and Groundwater Measurements in Hand Augers at the Completion of Drilling

Investigation ID	Investigation by	Date of Measurement	Measurement Type	Groundwater depth (m bgl)	Groundwater elevation (m RL) [AUCKHT1946]
HA01	Initia	21/03/2023	Level at Completion of Drilling	2.0	52.0
HA03	Initia	23/03/2023	Level at Completion of Drilling	3.4	51.2
HA06	Initia	20/03/2023	Level at Completion of Drilling	1.6	52.4
HA09	Initia	24/03/2023	Level at Completion of Drilling	0.9	53.6
HA10	Initia	22/03/2023	Level at Completion of Drilling	1.0	53.5
HA11	Initia	23/03/2023	Level at Completion of Drilling	1.0	53.4
HA12	Initia	22/03/2023	Level at Completion of Drilling	1.1	53.6
HA14	Initia	24/03/2023	Level at Completion of Drilling	3.6	52.2
HA103	Initia	6/08/2025	Level at Completion of Drilling	1.3	61.5
HA105	Initia	18/08/2025	Level at Completion of Drilling	0.1	53.3
HA108	Initia	6/08/2025	Level at Completion of Drilling	1.6	54.9
HA111	Initia	6/08/2025	Level at Completion of Drilling	1.7	50.3
HA112	Initia	18/08/2025	Level at Completion of Drilling	0.1	55.1
HA113	Initia	6/08/2025	Level at Completion of Drilling	2.3	51.9
HA121	Initia	6/08/2025	Level at Completion of Drilling	2.2	53.3
HA122	Initia	6/08/2025	Level at Completion of Drilling	1.5	52.4
HA124	Initia	6/08/2025	Level at Completion of Drilling	1.6	53.6
HA125	Initia	5/08/2025	Level at Completion of Drilling	0.7	53.3
HA126	Initia	5/08/2025	Level at Completion of Drilling	0.8	53.2
HA127	Initia	6/08/2025	Level at Completion of Drilling	1.1	53.0
HA128	Initia	5/08/2025	Level at Completion of Drilling	0.3	53.9
HA129	Initia	6/08/2025	Water Inflow	1.5	52.6
HA134	Initia	6/08/2025	Level at Completion of Drilling	0.2	54.6
HA136	Initia	11/08/2025	Level at Completion of Drilling	0.1	55.1
HA137	Initia	11/08/2025	Level at Completion of Drilling	0.4	54.3

Investigation ID	Investigation by	Date of Measurement	Measurement Type	Groundwater depth (m bgl)	Groundwater elevation (m RL) [AUCKHT1946]
HA138	Initia	11/08/2025	Level at Completion of Drilling	2.9	48.7
HA139	Initia	11/08/2025	Level at Completion of Drilling	1.4	49.2
HA140	Initia	11/08/2025	Level at Completion of Drilling	0.6	51.4
HA141	Initia	11/08/2025	Level at Completion of Drilling	0.3	54.9
TP11	Initia	28/03/2023	Water Inflow	0.7	52.4
TP12	Initia	28/03/2023	Water Inflow	0.6	52.3
TP16	Initia	27/03/2023	Water Inflow	1.3	54.1
TP22	Initia	28/03/2023	Water Inflow	2.0	52.4
TP23	Initia	27/03/2023	Water Inflow	0.8	54.1
TP24	Initia	27/03/2023	Water Inflow	0.9	54.1
TP28	Initia	27/03/2023	Water Inflow	0.7	53.4
TP29	Initia	27/03/2023	Water Inflow	1.0	53.6
TP30	Initia	27/03/2023	Water Inflow	0.6	53.7
TP31	Initia	27/03/2023	Water Inflow	0.6	53.3
TP112	Initia	7/08/2025	Water Inflow	0.5	54.9
TP107	Initia	7/08/2025	Water Inflow	2.7	51.5
TP108	Initia	7/08/2025	Water Inflow	1.5	52.4
TP109	Initia	7/08/2025	Water Inflow	1.7	53.2
HA06	T&T	3/05/2022	Level 1 day after Drilling	0.9	53.7
HA07	T&T	3/05/2022	Level at Completion of Drilling	0.9	50.9
HA10	T&T	6/05/2022	Level at Completion of Drilling	1.1	52.2
HA12	T&T	2/05/2022	Water Inflow	1.1	52.6
HA13	T&T	2/05/2022	Level at Completion of Drilling	3.0	51.2
HA14	T&T	9/05/2022	Level at Completion of Drilling	1.0	58.1
HA16	T&T	2/05/2022	Level at Completion of Drilling	2.2	52.0
HA01	Aurecon	11/04/2023	Level at Completion of Drilling	0.5	52.9
HA02	Aurecon	11/04/2023	Level at Completion of Drilling	0.5	53.3
HA03	Aurecon	11/04/2023	Level at Completion of Drilling	0.5	53.3
HA04	Aurecon	12/04/2023	Level at Completion of Drilling	0.7	53.4
HA05	Aurecon	12/04/2023	Level at Completion of Drilling	1.4	53.1
HA06	Aurecon	12/04/2023	Level at Completion of Drilling	0.6	53.1
HA07	Aurecon	12/04/2023	Level at Completion of Drilling	0.8	53.3

3. Applicability

This report has been prepared for our client, ASP Bei Land Co, with respect to the brief provided to us. The results of this investigation should not be applied to any other project or used in any other context without prior written approval from Initia Limited.

Report prepared by:



Kieran Bursell
Geotechnical Engineer

Report reviewed by:



Nick Speight
Senior Geotechnical Engineer, Director

Document control record

Report Title		Auckland Surf Park Community Geotechnical Factual Report			
Initia Project Reference		P-001537			
Client		ASP Bei Land Co			
Revision	Date	Revision detail	Author	Reviewer	Approved by
A	03-05-2023	Draft Issue (awaiting laboratory results)	Q. Sorensen	N. Speight	N. Speight
B	13-06-2023	For Resource Consent	Q. Sorensen	N. Speight	N. Speight
C	23-06-2023	Minor revision	Q. Sorensen	N. Speight	N. Speight
D	5-09-2025	Stage 2 Investigations added. Draft Issue (awaiting laboratory results)	K. Bursell	N. Speight	N. Speight
E	7-11-2025	For Stage 2 Substantive Application	K. Bursell	N. Speight	N. Speight
F	18-12-2025	Minor revisions for Stage 2 Substantive Application	K. Bursell	N. Speight	N. Speight
G	15-04-2026	Minor development layout amendment for Stage 2 Substantive Application	K. Bursell	N. Speight	N. Speight
Current Revision		G			

Appendix A Figures

LEGEND

INITIA INVESTIGATION (AUG 2025)

- CPT118 — CONE PENETRATION TEST
- TP101 — TEST PIT
- HA112 — HAND AUGER

INITIA INVESTIGATION (MAR - APR 2023)

- CPT01 — CONE PENETRATION TEST
- MBH01 — MACHINE BOREHOLE
- HA01 — HAND AUGER
- TP01 — TEST PIT

HISTORICAL INVESTIGATION

- HA01P — HAND AUGER WITH PEIZOMETER (T&T - MAY 2022)
- HA10 — HAND AUGER (T&T - MAY 2022)
- TP01 — TEST PIT (T&T - MAY 2022)
- CPT06 — FLAT PLATE DILATOMETER (AURECON - APRIL 2023)
- BH04 — MACHINE BOREHOLE (AURECON - APRIL 2023)
- HA03 — HAND AUGER (AURECON - APRIL 2023)

SITE BOUNDARY

0.5 — EXISTING GROUND CONTOUR (0.5m INTEVAL) TOPOGRAPHICAL SURVEY (DATED 24/03/2023)

0.5 — EXISTING GROUND CONTOUR (0.5m INTEVAL) AUCKLAND COUNCIL LIDAR (DATED 2016)

SCALE A3 1:5000

0 50 100 150 200 250m

NOTES

1. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
2. PROPERTY BOUNDARY AND EXISTING SERVICES TAKEN FROM AUCKLAND COUNCIL DATE 2017.
3. CONTOURS FOR 1350 DAIRY FLAT HIGHWAY, 237 POSTMAN ROAD AND 253 POSTMAN ROAD SOURCED FROM MCKENZIE & CO TOPOGRAPHICAL SURVEY, DATED 24/03/2023, DATUM AUCKHT1946
4. CONTOURS FOR 89 LASCELLES DRIVE, 105 LASCELLES DRIVE AND 1320 DAIRY FLAT HIGHWAY SOURCED FROM AUCKLAND COUNCIL LIDAR SURVEY, DATED 2016. CONTOURS LEVELS HAVE BEEN TRANSPOSED FROM NZVD2016 TO AUCKHT1946
5. COORDINATE DATUM: MOUNT EDEN 2000
6. LEVEL ARE IN TERMS OF AUCKLAND VERTICAL DATUM 1946(MSL). ORIGIN OF LEVELS - MARK:BACV DAIRY FLAT RL: 46.107m (LINZ NZVD2016 CONVERSION)
7. SITE DEVELOPMENT PLAN SUPPLIED BY STUDIO PACIFIC ARCHITECTURE. DATED 14/04/2026
8. AERIAL SHOWN TAKEN FROM NEARMAP DATE MAY 2025

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D	UPDATED SITE DEVELOPMENT PLAN (15/04/2026)	KB	JG	KB
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GEOTECHNICAL INVESTIGATION LOCATION PLAN

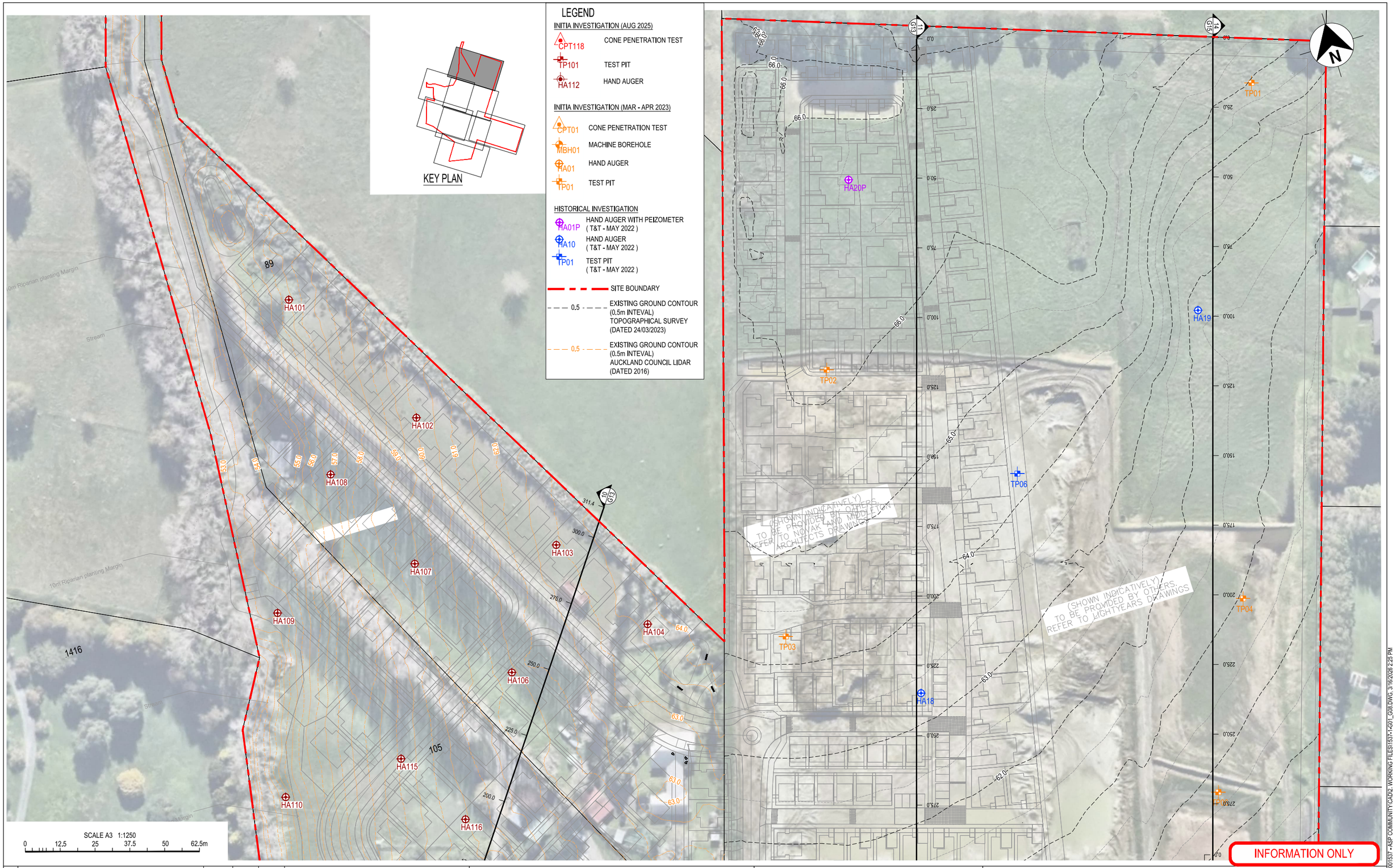
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Figure Number 1537-1-G01

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A	FIRST ISSUE (05/09/2025)	KB	JG	KB

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Figure Number 1537-1-G02

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LEGEND

INITIA INVESTIGATION (AUG 2025)

- CPT118 — CONE PENETRATION TEST
- TP101 — TEST PIT
- HA112 — HAND AUGER

INITIA INVESTIGATION (MAR - APR 2023)

- CPT01 — CONE PENETRATION TEST
- MBH01 — MACHINE BOREHOLE
- HA01 — HAND AUGER
- TP01 — TEST PIT

HISTORICAL INVESTIGATION

- HA01P — HAND AUGER WITH PEIZOMETER (T&T - MAY 2022)
- HA10 — HAND AUGER (T&T - MAY 2022)
- TP01 — TEST PIT (T&T - MAY 2022)

- SITE BOUNDARY
- 0.5 — EXISTING GROUND CONTOUR (0.5m INTEVAL) TOPOGRAPHICAL SURVEY (DATED 24/03/2023)
- 0.5 — EXISTING GROUND CONTOUR (0.5m INTEVAL) AUCKLAND COUNCIL LIDAR (DATED 2016)

KEY PLAN

SCALE A3 1:1250

0 12.5 25 37.5 50 62.5m

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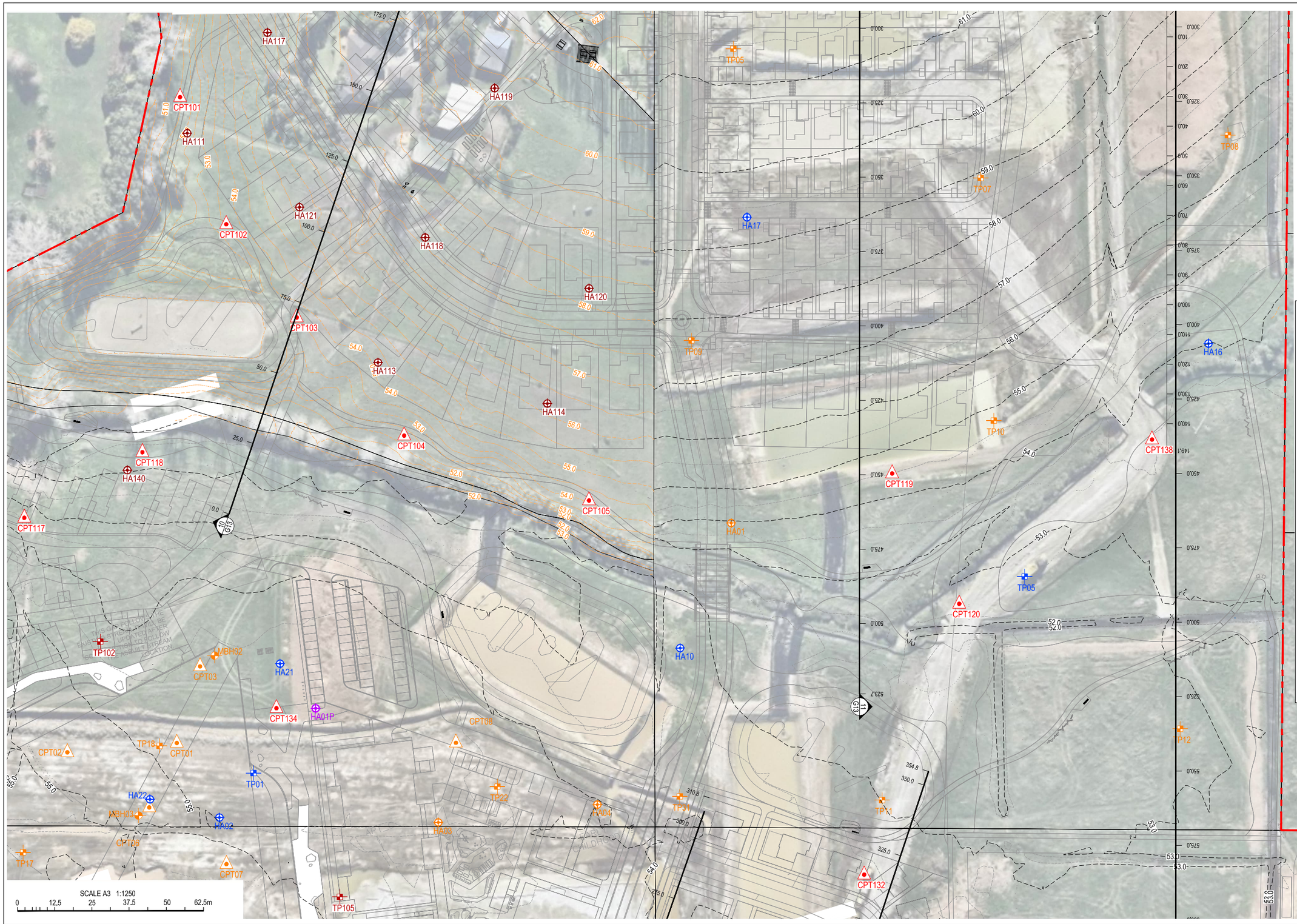
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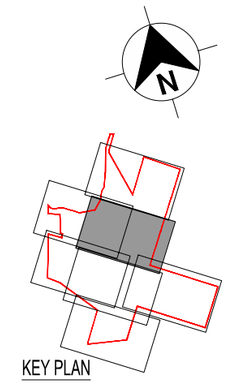
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INITIA INVESTIGATION (AUG 2025)

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- TP101 — TEST PIT
- HA112 — HAND AUGER

INITIA INVESTIGATION (MAR - APR 2023)

- CPT01 — CONE PENETRATION TEST
- MBH01 — MACHINE BOREHOLE
- HA01 — HAND AUGER
- TP01 — TEST PIT

HISTORICAL INVESTIGATION

- HA01P — HAND AUGER WITH PEIZOMETER (T&T - MAY 2022)
- HA10 — HAND AUGER (T&T - MAY 2022)
- TP01 — TEST PIT (T&T - MAY 2022)
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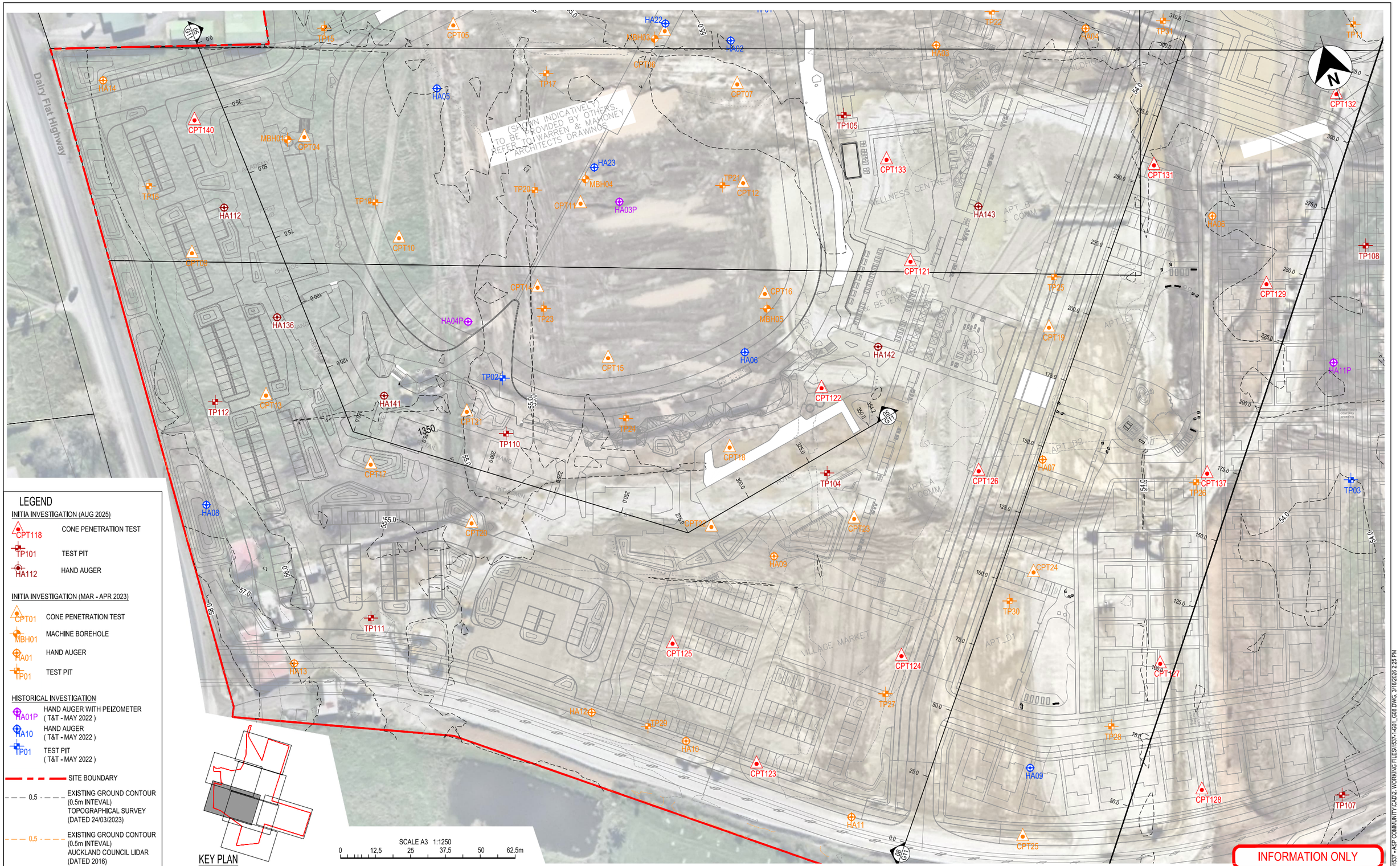
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- HA112 — HAND AUGER

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- HA01 — HAND AUGER
- TP01 — TEST PIT

HISTORICAL INVESTIGATION

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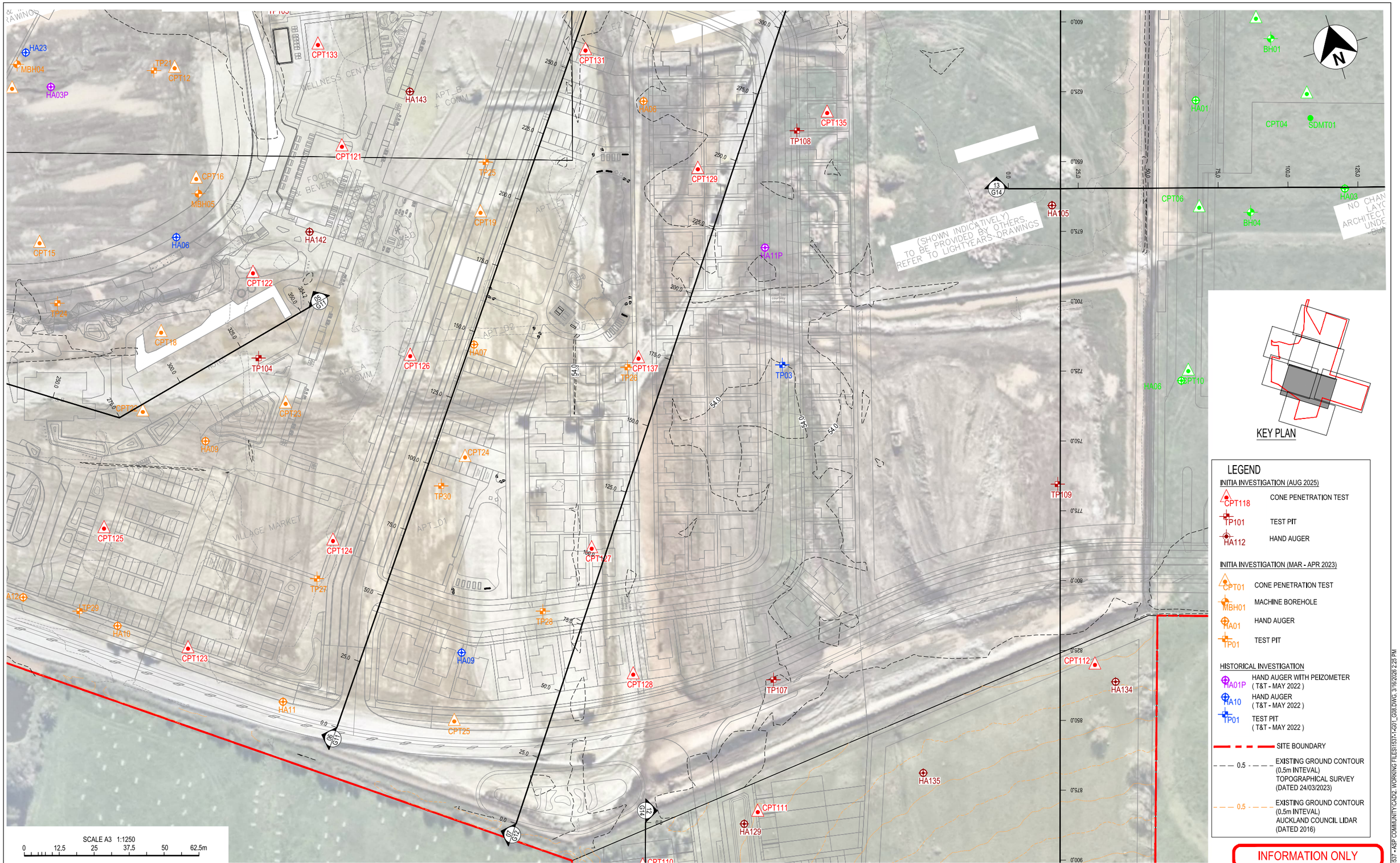
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LEGEND

INITIA INVESTIGATION (AUG 2025)

- CPT118 — CONE PENETRATION TEST
- TP101 — TEST PIT
- HA112 — HAND AUGER

INITIA INVESTIGATION (MAR - APR 2023)

- CPT01 — CONE PENETRATION TEST
- MBH01 — MACHINE BOREHOLE
- HA01 — HAND AUGER
- TP01 — TEST PIT

HISTORICAL INVESTIGATION

- HA01P — HAND AUGER WITH PEIZOMETER (T&T - MAY 2022)
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- TP01 — TEST PIT (T&T - MAY 2022)

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A	FIRST ISSUE (05/09/2025)	KB	JG	KB

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GEOTECHNICAL INVESTIGATION LOCATION PLAN (SHEET 5 OF 7)

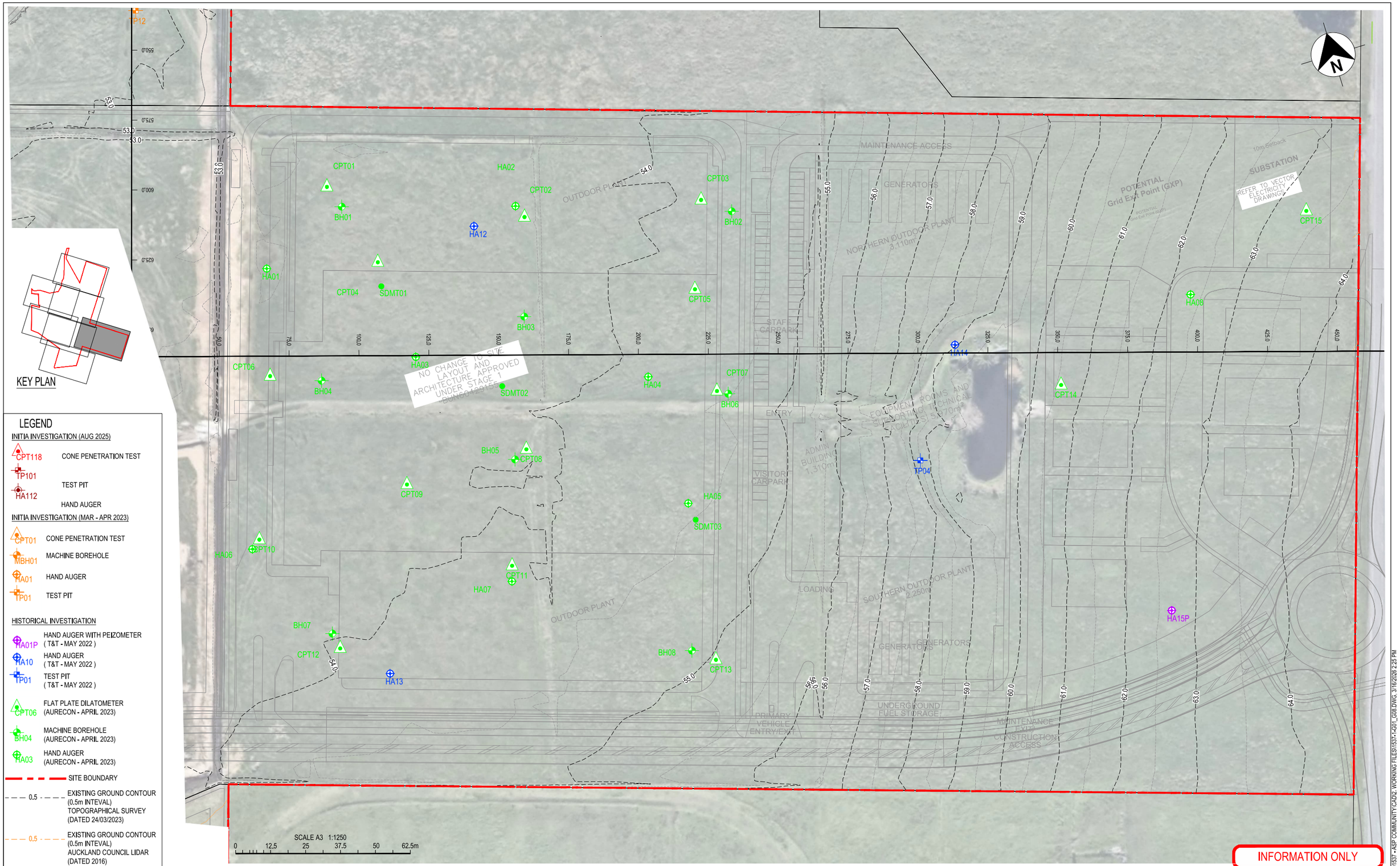
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INITIA INVESTIGATION (AUG 2025)

- CPT118 — CONE PENETRATION TEST
- TP101 — TEST PIT
- HA112 — HAND AUGER

INITIA INVESTIGATION (MAR - APR 2023)

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- MBH01 — MACHINE BOREHOLE
- HA01 — HAND AUGER
- TP01 — TEST PIT

HISTORICAL INVESTIGATION

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- HA10 — HAND AUGER (T&T - MAY 2022)
- TP01 — TEST PIT (T&T - MAY 2022)

- SITE BOUNDARY
- 0.5 — EXISTING GROUND CONTOUR (0.5m INTEVAL) TOPOGRAPHICAL SURVEY (DATED 24/03/2023)
- 0.5 — EXISTING GROUND CONTOUR (0.5m INTEVAL) AUCKLAND COUNCIL LIDAR (DATED 2016)

SCALE A3 1:1250

0 12.5 25 37.5 50 62.5m

INFORMATION ONLY

Rev	Revision Description	Designed	Drawn	Checked
D	UPDATED SITE DEVELOPMENT PLAN (15/04/2026)	KB	JG	KB
C	UPDATED SITE DEVELOPMENT PLAN (17/12/2025)	KB	GG	KB
B	UPDATED SIRE DEVELOPMENT PLAN (03/11/2025)	KB	JG	KB
A	FIRST ISSUE (05/09/2025)	KB	JG	KB

NOT FOR CONSTRUCTION

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APPROVED:

DATE:

Scale AS SHOWN | Original Size A3

INITIA
GEOTECHNICAL SPECIALISTS

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Email: enquiries@initia.co.nz

ASP BEI LAND CO

AUCKLAND SURF PARK

GEOTECHNICAL INVESTIGATION
LOCATION PLAN
(SHEET 7 OF 7)

Initia Project ref: P-001537

Figure Number 1537-1-G08

Revision D

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D:\ONEDRIVE - INITIA LIMITED\P-001537 - ASP COMMUNITY\CAD\2. WORKING FILES\1537-1-G01_G08.DWG, 3/16/2026 2:25 PM

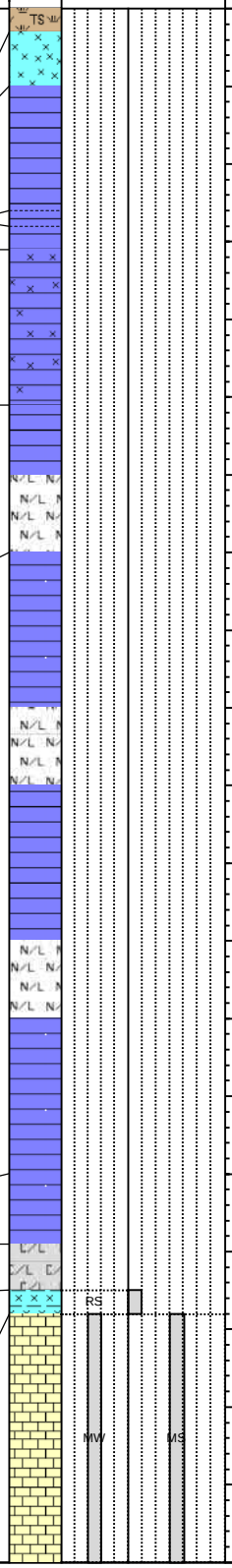
Appendix B Initia Investigation Logs

DRILLHOLE LOG

INITIA
GEOTECHNICAL SPECIALISTS

HOLE NO.: MBH01		
CLIENT: AW Holdings	**SITE LOCATION:** 1350 Dairy Flat Highway, Dairy Flat	**Project Ref.:** P-001537
PROJECT: ASP Community		
CO-ORDINATES: 1746801.2mE, 5942120.0mN	**ELEVATION:** 55.3m	**CONTRACTOR:** DCN Drilling
START DATE: 20/03/2023		
Co-ordinate system: NZTM	**Datum:** AUCKHT1946	**RIG:** Morooka
END DATE: 21/03/2023		
Location method: SURVEY	**Level method:** SURVEY	**DRILLER:** Corey
LOGGED BY: QS		
ORIENTATION (°): Vertical	**INCLINATION (°):** 90	**CHECKED BY:** BPR

UNIT	MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	DEPTH	RL
Tauranga Group Alluvium	SILT, with some clay, with minor rootlets; dark brown. Firm; non-plastic; moist; [Topsoil].	0.0	
	SILT, with minor clay; brown. Firm; low plasticity; moist.	0.3	
	CLAY, with some silt; light grey. Stiff; high plasticity; moist.	0.5	
	1.30m - 1.40m: some wood	1.3	
	Silty CLAY, with minor organics; grey. Stiff; high plasticity; moist; organics, amorphous.	1.4	
	CLAY, with some silt; brownish grey. Stiff; high plasticity; moist.	2.8	
	3.0 m - 3.5 m: Push Tube	3.0	
	3.50m: grades to light grey, trace amorphous organics	3.5	
	4.5 m - 5.0 m: Push Tube	4.5	
	6.0 m - 6.5 m: Push Tube	6.0	
	7.50m: grades to very stiff	7.5	
	7.95 m - 8.25 m: No Recovery	7.95	
Mahurangi Limestone	Clayey SILT, with minor gravel; grey. Very stiff; low plasticity; moist; [Residually Weathered Limestone].	8.25	
	Moderately weathered; light grey; LIMESTONE; moderately strong; highly fractured, extremely closely spaced defects, Limestone in a muddy matrix. (Recovered as gravel).		



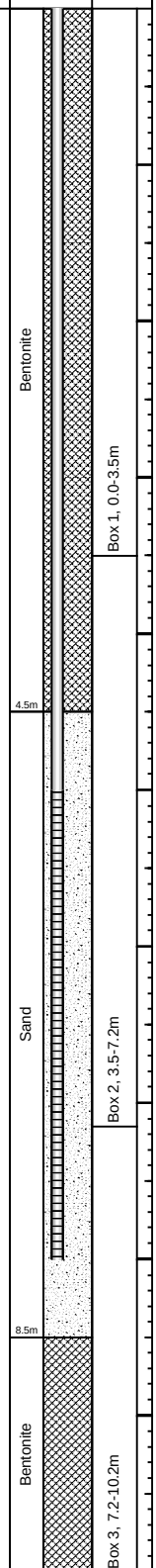
INSITU TESTING (SPT 'N' Vane shear strength)
0, 1 / 0, 0, 2, 2 N=4
22, 28 for 65mm N=50+

DISCONTINUITIES

DESCRIPTION

WATER

01/05/2023



REMARKS:
Target Depth Reached

Ver 3.0, Generated with CORE-GS by Geroc - Drillhole_Initia - 2/05/2023 6:43:44 pm

DRILLHOLE LOG

INITIA
GEOTECHNICAL SPECIALISTS

HOLE NO.: MBH01

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1746801.2mE, 5942120.0mN
Co-ordinate system: NZTM
Location method: SURVEY
ORIENTATION (°): Vertical
ELEVATION: 55.3m
Datum: AUCKHT1946
Level method: SURVEY
INCLINATION (°): 90
CONTRACTOR: DCN Drilling
RIG: Morooka
DRILLER: Corey
START DATE: 20/03/2023
END DATE: 21/03/2023
LOGGED BY: QS
CHECKED BY: BPR

UNIT	MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	GRAPHIC	WEATHERING (LW SW MW HW CW EW)	STRENGTH (VW W MS S VS ES)	DEPTH	RL	SAMPLES	METHOD	TCR (%) (25 50 75)	RQD (%) (25 50 75)	INSITU TESTING (SPT 'N' Vane shear strength)	DISCONTINUITIES DESCRIPTION	WATER	INSTALLATION	CORE BOXES
Mahurangi Limestone	Moderately weathered; light grey; LIMESTONE; moderately strong; highly fractured, extremely closely spaced defects, Limestone in a muddy matrix. (Recovered as gravel).					45.0		SPT	100		25, 25 for 45mm N=50+				
	10.50m - 12.00m: grades to very closely spaced defects		MW	MS	11	44.0		HQTT	100						
	EOH: 12.35m				12	43.0		SPT	100		10, 15 / 16, 21, 13 for 45mm N=50+ for 195mm			12.35m	Box 4, 10.2-12.4m

42.0
41.0
40.0
39.0
38.0
37.0
36.0

REMARKS:
Target Depth Reached

Ver 3.0, Generated with CORE-GS by Geroc - Drillhole_Initia - 2/05/2023 6:43:44 pm

CORE PHOTOS

HOLE NO.: MBH01

JOB NO.: P-001537

Box 1, 0.0-3.5m



Box 2, 3.5-7.2m



Box 3, 7.2-10.2m



Generated with CORE-GS by Geroc - Drillhole_Initia - 2/05/2023 6:43:44 pm

CORE PHOTOS

HOLE NO.: MBH01

JOB NO.: P-001537

Box 4, 10.2-12.4m



Generated with CORE-GS by Geroc - Drillhole_Initia - 2/05/2023 6:43:44 pm

DRILLHOLE LOG

INITIA
GEOTECHNICAL SPECIALISTS

HOLE NO.: MBH02

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1746978.3mE, 5942156.8mN
ELEVATION: 54.7m
CONTRACTOR: DCN Drilling
START DATE: 21/03/2023

Co-ordinate system: NZTM
Datum: AUCKHT1946
RIG: Morooka
END DATE: 22/03/2023

Location method: SURVEY
Level method: SURVEY
DRILLER: Corey
LOGGED BY: FPT

ORIENTATION (°): Vertical
INCLINATION (°): 90
CHECKED BY: BPR

UNIT	MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	GRAPHIC	WEATHERING (UW SW MW HW CW EW)	STRENGTH (VW W MS S VS ES)	DEPTH	RL	SAMPLES	METHOD	TCR (%) (25 50 75)	RQD (%) (25 50 75)	INSITU TESTING SPT 'N' Vane shear strength	DISCONTINUITIES DESCRIPTION	WATER	INSTALLATION	CORE BOXES
Topsoil	0.00m - 0.60m: Core Loss (inferred as topsoil)				0	54.0		HQTT	60						
	SILT, with minor clay, with trace rootlets; dark brown. Firm; low plasticity; moist; [Topsoil].														
Tauranga Group Alluvium	Silty CLAY; light grey, with occasional orange brown streaks. Stiff; high plasticity; moist.				1	53.0		DPT	100						
	1.50 m - 2.00 m: Push Tube (note push tube was discarded due to large piece of wood being stuck in the tube)														
	Wood				2	52.0		HQTT	60						
	2.60 m - 3.00 m: No Recovery														
	3.0 m - 3.5 m: Push Tube				3	51.0		DPT	100						
	CLAY, with some silt; light grey, speckled black. Stiff; high plasticity; moist; minor fibrous organics.							HQTT	100						
	4.40m: Grades to trace fibrous organics.				4	50.0									
	4.5 m - 5.0 m: Push Tube				5	49.0		DPT	100						
								HQTT	100						
	6.0 m - 6.5 m: Push Tube				6	48.0		DPT	100						
					7	47.0		HQTT	100						
	7.5 m - 8.0 m: Push Tube							DPT	100						
					8	46.0		HQTT	100						
	Clayey SILT, with trace sand; grey, speckled black. Stiff; high plasticity; moist; sand, fine; trace fibrous organics.				9	45.0		SPT	100		0, 1 / 1, 0, 1, 1 N=3		01/05/2023	Bentonite 2m; Sand 5.5m; Bentonite	Box 1, 0.0-5.0m; Box 2, 5.0-8.8m; Box 3, 8.8-12.1m
								HQTT	100						

REMARKS:
Target Depth Reached

Ver 3.0, Generated with CORE-GS by Geroc - Drillhole_Initia - 2/05/2023 6:43:50 pm

DRILLHOLE LOG

INITIA
GEOTECHNICAL SPECIALISTS

HOLE NO.: MBH02

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1746978.3mE, 5942156.8mN
Co-ordinate system: NZTM
Location method: SURVEY
ORIENTATION (°): Vertical
ELEVATION: 54.7m
Datum: AUCKHT1946
Level method: SURVEY
INCLINATION (°): 90
CONTRACTOR: DCN Drilling
RIG: Morooka
DRILLER: Corey
START DATE: 21/03/2023
END DATE: 22/03/2023
LOGGED BY: FPT
CHECKED BY: BPR

UNIT	MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	GRAPHIC	WEATHERING (UW SW MW HW CW EW)	STRENGTH (VW W MS S VS ES)	DEPTH	RL	SAMPLES	METHOD	TCR (%) (25 50 75)	RQD (%) (25 50 75)	INSITU TESTING SPT 'N' Vane shear strength	DISCONTINUITIES DESCRIPTION	WATER	INSTALLATION	CORE BOXES
Tauranga Group Alluvium	[CONT] Clayey SILT, with trace sand; grey, speckled black. Stiff; high plasticity; moist; sand, fine; trace fibrous organics.							HQTT	100						
Mahurangi Limestone	SILT, with some gravel, with minor clay and sand. Hard; low plasticity; moist; sand, fine to coarse; [Residually Weathered Limestone].		RS		11	44.0		SPT	100		0, 0 / 10, 1, 2, 6 N=19				
	Moderately weathered; light grey; LIMESTONE; moderately strong; highly fractured, extremely closely spaced defects, Limestone in a muddy matrix.					43.0		HQTT	100						
	11.50m - 12.20m: recovered as gravels, very closely spaced defects				12						37, 13 for 7mm N=50+				Box 3, 8.8-12.1m
			MW	MS		42.0		HQTT	100						
	13.40m - 14.00m: recovered as gravels, extremely closely spaced defects				13	41.0					50 for 70mm N=50+				
	14.20m - 14.30m: recovered as gravels, extremely closely spaced defects				14	40.0		HQTT	93	24					Box 4, 12.1-15.1m
	EOH: 15.06m				15						50 for 60mm N=50+			15.06m	
						39.0									
						38.0									
						37.0									
						36.0									
						35.0									

REMARKS:
Target Depth Reached

Ver 3.0, Generated with CORE-GS by Geroc - Drillhole_Initia - 2/05/2023 6:43:50 pm

CORE PHOTOS

HOLE NO.: MBH02

JOB NO.: P-001537

Box 1, 0.0-5.0m



Box 2, 5.0-8.8m



Box 3, 8.8-12.1m



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CORE PHOTOS

HOLE NO.: MBH02

JOB NO.: P-001537

Box 4, 12.1-15.1m



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DRILLHOLE LOG

INITIA
GEOTECHNICAL SPECIALISTS

HOLE NO.: MBH03		
CLIENT: AW Holdings	**SITE LOCATION:** 1350 Dairy Flat Highway, Dairy Flat	**Project Ref.:** P-001537
PROJECT: ASP Community		
CO-ORDINATES: 1746937.3mE, 5942113.6mN	**ELEVATION:** 55.2m	**CONTRACTOR:** DCN Drilling
START DATE: 28/03/2023		
Co-ordinate system: NZTM	**Datum:** AUCKHT1946	**RIG:** Tractor Mounted Rig
END DATE: 28/03/2023		
Location method: SURVEY	**Level method:** SURVEY	**DRILLER:** Evan
LOGGED BY: FPT		
ORIENTATION (°): Vertical	**INCLINATION (°):** 90	**CHECKED BY:** BPR

UNIT	MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	GRAPHIC	WEATHERING (UW SW MW HW CW EW)	STRENGTH (VW W MS S VS ES)	DEPTH	RL	SAMPLES	METHOD	TCR (%) (25 50 75)	RQD (%) (25 50 75)	INSITU TESTING (SPT 'N' Vane shear strength)	DISCONTINUITIES DESCRIPTION	WATER	INSTALLATION	CORE BOXES
Topsoil	SILT, with minor clay; dark brown. Firm; low plasticity; moist; trace rootlets.	TS			0	55.0		HQTT	100				01/05/2023	Bentonite	
Tauranga Group Alluvium	Silty CLAY; light grey, streaked light orange brown. Firm; high plasticity; moist.														
	1.5 m - 2.0 m: Push Tube	N/L			1	54.0		DPT						1.5m	
	Silty CLAY; organic stained brownish grey. Stiff; high plasticity; moist.				2	53.0		HQTT	100						Box 1, 0.0-2.5m
	Peat (fibrous) CLAY, with some silt; black. Stiff; high plasticity; moist.														
	Silty CLAY; organic stained brownish grey. Stiff; high plasticity; moist.														
	3.0 m - 3.5 m: Push Tube	N/L			3	52.0		DPT						Sand	
					4	51.0		HQTT	100						Box 2, 2.5-5.0m
	4.5 m - 5.0 m: Push Tube	N/L						DPT							
	Silty CLAY; light grey, speckled black. Firm; high plasticity; moist; trace fibrous organics.				5	50.0		HQTT	100					5.5m	
	6.0 m - 6.5 m: Push Tube	N/L			6	49.0		DPT							
	6.45m: Grades to stiff.							HQTT	100						Box 3, 5.0-7.5m
	7.5 m - 8.0 m: Push Tube	N/L			7	48.0		DPT						Bentonite	
					8	47.0		HQTT	100						
	9.40m: Grades to grey. Organics absent.				9	46.0		SPT	100		1, 1 / 2, 2, 2, 2 N=8				Box 4, 7.5-10.2m
								HQTT	100						

REMARKS:
Target Depth Reached

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DRILLHOLE LOG

INITIA
GEOTECHNICAL SPECIALISTS

HOLE NO.: MBH03

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1746937.3mE, 5942113.6mN
Co-ordinate system: NZTM
Location method: SURVEY
ORIENTATION (°): Vertical
ELEVATION: 55.2m
Datum: AUCKHT1946
Level method: SURVEY
INCLINATION (°): 90
CONTRACTOR: DCN Drilling
RIG: Tractor Mounted Rig
DRILLER: Evan
START DATE: 28/03/2023
END DATE: 28/03/2023
LOGGED BY: FPT
CHECKED BY: BPR

UNIT	MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	DEPTH	RL	METHOD	TCR (%)	RQD (%)	INSITU TESTING (SPT 'N' Vane shear strength)	DISCONTINUITIES DESCRIPTION	WATER	INSTALLATION	CORE BOXES
Group Alluvium	[CONT] Silty CLAY; grey, speckled black. stiff; high plasticity; moist.		45.0	HQTT	100						
Mahurangi Limestone	Clayey SILT, with minor gravel; grey. Hard; low plasticity; moist; [Residually Weathered Limestone].			SPT	100		1, 1 / 4, 21, 25 N=50+ for 225mm				
	Moderately weathered; grey; LIMESTONE; moderately strong; Highly fractured, very closely spaced defects. Limestone in a muddy matrix. 11.00m - 11.20m: recovered as gravel, extremely closely spaced defects	11	44.0	HQTT	100						
	EOH: 12.12m	12					21, 29 for 45mm N=50+			12.12m	Box 5, 10.2-12.1m
			43.0								
			42.0								
			41.0								
			40.0								
			39.0								
			38.0								
			37.0								
			36.0								

GRAPHIC: RS; MW; MS
WEATHERING: UW SW MW HW CW EW
STRENGTH: VW W MS S VS ES

REMARKS:
Target Depth Reached

Ver 3.0, Generated with CORE-GS by Geroc - Drillhole_Initia - 2/05/2023 6:43:55 pm

CORE PHOTOS

HOLE NO.: MBH03

JOB NO.: P-001537

Box 1, 0.0-2.5m



Box 2, 2.5-5.0m



Box 3, 5.0-7.5m



Generated with CORE-GS by Geroc - Drillhole_Initia - 2/05/2023 6:43:55 pm

CORE PHOTOS

HOLE NO.: MBH03

JOB NO.: P-001537

Box 4, 7.5-10.2m



Box 5, 10.2-12.1m



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DRILLHOLE LOG

INITIA
GEOTECHNICAL SPECIALISTS

HOLE NO.: MBH04

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1746898.3mE, 5942073.6mN
Co-ordinate system: NZTM
Location method: SURVEY
ORIENTATION (°): Vertical
ELEVATION: 54.9m
Datum: AUCKHT1946
Level method: SURVEY
INCLINATION (°): 90
CONTRACTOR: DCN Drilling
RIG: Tractor Mounted Rig
DRILLER: Dave
START DATE: 21/03/2023
END DATE: 22/03/2023
LOGGED BY: FPT
CHECKED BY: BPR

UNIT	MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	GRAPHIC	WEATHERING (UW SW MW HW CW EW)	STRENGTH (VW W MS S VS ES)	DEPTH	RL	SAMPLES	METHOD	TCR (%) (25 50 75)	RQD (%) (25 50 75)	INSITU TESTING SPT 'N' Vane shear strength	DISCONTINUITIES DESCRIPTION	WATER	INSTALLATION	CORE BOXES
Topsoil	SILT, with minor clay; dark brown. Firm; low plasticity; moist; trace rootlets.	TS			0	54.9							01/05/2023		
Tauranga Group Alluvium	Silty CLAY; light grey. Firm; high plasticity; moist.				1	54.0		OB	66					Bentonite	
	1.00 m - 1.50 m: Core Loss	C/L													
	1.5 m - 2.0 m: Push Tube	N/L						DPT	100						
	2.00m: Grades to organic stained grey, speckled black. Trace fibrous organics				2	53.0		OB	80					2m	
	2.80 m - 3.00 m: Core Loss	C/L													
	3.0 m - 3.5 m: Push Tube	N/L			3	52.0		DPT	100						
	3.70m: Grades to light grey, absence of organic fragments.							OB	60					Sand	
	4.10 m - 4.50 m: Core Loss	C/L			4	51.0									Box 1, 0.0-5.0m
	4.5 m - 5.0 m: Push Tube	N/L						DPT	100						
					5	50.0		OB	100					5m	
	6.0 m - 6.5 m: Push Tube	N/L						DPT	100						
	6.60m - 6.75m: Clayey SILT, with trace sand and gravel; brownish grey, mottled grey. Hard; high plasticity; moist.				6	49.0		OB	100					Bentonite	
	7.5 m - 8.0 m: Push Tube	N/L			7	48.0		DPT	100						
	8.30m: Grades to light grey, speckled black. Trace fibrous organics.							OB	100						Box 2, 5.0-8.6m
	Clayey SILT; organic stained grey, mottled black. Stiff; high plasticity; moist; Some fibrous organic material.				8	47.0									
	Clayey SILT, with trace sand; light grey, with occasional orange brown streaks. Very stiff; high plasticity; moist; sand, fine.				9	46.0		SPT	100		1, 1 / 1, 1, 2, 1 N=5				Box 3, 8.6-10.7m
Gl Li	Silty SAND, with minor clay; grey.		RS			45.0		OB	100						

REMARKS:
Target Depth Reached

Checked By: BPR

Ver 3.0, Generated with CORE-GS by Geroc - Drillhole_Initia - 2/05/2023 6:44:01 pm

DRILLHOLE LOG

INITIA
GEOTECHNICAL SPECIALISTS

HOLE NO.: MBH04

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1746898.3mE, 5942073.6mN
ELEVATION: 54.9m
CONTRACTOR: DCN Drilling
START DATE: 21/03/2023

Co-ordinate system: NZTM
Datum: AUCKHT1946
RIG: Tractor Mounted Rig
END DATE: 22/03/2023

Location method: SURVEY
Level method: SURVEY
DRILLER: Dave
LOGGED BY: FPT

ORIENTATION (°): Vertical
INCLINATION (°): 90
CHECKED BY: BPR

UNIT	MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	GRAPHIC	WEATHERING (UW SW MW HW CW EW)	STRENGTH (VW W MS S VS ES)	DEPTH	RL	SAMPLES	METHOD	TCR (%) (25 50 75)	RQD (%) (25 50 75)	INSITU TESTING (SPT 'N' Vane shear strength)	DISCONTINUITIES DESCRIPTION	WATER	INSTALLATION	CORE BOXES
Mahurangi Limestone	CLAY, with some silt; light grey. Hard; high plasticity; moist; [Residually Weathered Limestone].					44.0		OB	100		19, 31 N=50+				
	Moderately weathered; light grey; LIMESTONE; moderately strong; highly fractured, very closely spaced defects. Limestone in a muddy matrix.				11			SPT							
	11.00m - 11.90m: recovered as gravels, extremely closely spaced defects		MW	MS		43.0		HQTT	100	0					
					12			HQTT	100		50 for 70mm N=50+				
	12.70m - 12.95m: recovered as gravels, extremely closely spaced defects					42.0		HQTT	100	27					Box 4, 10.7-13.6m
	EOH: 13.57m				13						50 for 70mm N=50+			13.57m	
						41.0									
						40.0									
						39.0									
						38.0									
						37.0									
						36.0									
						35.0									

REMARKS:
Target Depth Reached

Ver 3.0, Generated with CORE-GS by Geroc - Drillhole_Initia - 2/05/2023 6:44:02 pm

CORE PHOTOS

HOLE NO.: MBH04

JOB NO.: P-001537

Box 1, 0.0-5.0m



Box 2, 5.0-8.6m



Box 3, 8.6-10.7m



Generated with CORE-GS by Geroc - Drillhole_Initia - 2/05/2023 6:44:02 pm

CORE PHOTOS

HOLE NO.: MBH04

JOB NO.: P-001537

Box 4, 10.7-13.6m



Generated with CORE-GS by Geroc - Drillhole_Initia - 2/05/2023 6:44:02 pm

DRILLHOLE LOG

INITIA
GEOTECHNICAL SPECIALISTS

CLIENT: AW Holdings	**SITE LOCATION:** 1350 Dairy Flat Highway, Dairy Flat	**HOLE NO.:** MBH05
PROJECT: ASP Community		**Project Ref.:** P-001537
CO-ORDINATES: 1746945.6mE, 5942009.4mN	**ELEVATION:** 54.8m **CONTRACTOR:** DCN Drilling	**START DATE:** 28/03/2023
Co-ordinate system: NZTM	**Datum:** AUCKHT1946 **RIG:** Tractor Mounted Rig	**END DATE:** 28/03/2023
Location method: SURVEY	**Level method:** SURVEY **DRILLER:** Evan	**LOGGED BY:** FPT
ORIENTATION (°): Vertical	**INCLINATION (°):** 90	**CHECKED BY:** BPR

UNIT	MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	DEPTH	RL	METHOD	TCR (%)	RQD (%)	INSITU TESTING (SPT 'N' Vane shear strength)	DISCONTINUITIES DESCRIPTION	WATER	INSTALLATION	CORE BOXES
Topsoil	SILT, with minor clay; dark brown. Firm; low plasticity; moist.	0	54.8	HQTT	90				01/05/2023	Bentonite 0.0m–1.5m	
Tauranga Group Alluvium	Silty CLAY; light grey. Stiff; high plasticity; moist.	1	54.0								
	1.20 m - 1.95 m: Core Loss			SPT			1, 0 / 1, 1, 1, 1, 1 N=4				
	1.95m: Grades to light grey, speckled black. Trace fibrous organics.	2	53.0	HQTT	100						
	2.50m: Grades to brownish grey, speckled black.										
	Silty CLAY, with trace organics; organic stained brownish grey, speckled black. Firm; high plasticity; moist; organics, fibrous.	3	52.0	DPT						Sand 1.5m–5.5m	Box 1, 0.0-3.5m
	3.0 m - 3.5m: Push Tube			HQTT	100						
	Silty CLAY; light grey, speckled black. Firm; high plasticity; moist; trace fibrous organics.	4	51.0								
	4.5 m - 5.0m: Push Tube	5	50.0	DPT							Box 2, 3.5-6.0m
				HQTT	100						
	6.0 m - 6.5 m: Push Tube	6	49.0	DPT							
	SILT, with some clay and sand; dark grey, speckled black. Stiff; low plasticity; moist; sand, fine to medium; Minor fibrous organics.	7	48.0	HQTT	100						
	7.20m: Grades to some fibrous organics.										
	Silty CLAY; light grey, speckled black. Firm; high plasticity; moist; trace fibrous organics.	8	47.0	SPT			1, 1 / 1, 1, 1, 1, 0 N=3			Bentonite 5.5m–end	
	9.0 m - 9.5 m: Push Tube	9	46.0	HQTT	100						Box 3, 6.0-9.0m
			45.0	DPT							
				HQTT	100						Box 4, 9.0-10.7m

REMARKS:
Target Depth Reached

Ver 3.0, Generated with CORE-GS by Geroc - Drillhole_Initia - 2/05/2023 6:44:09 pm

DRILLHOLE LOG

INITIA
GEOTECHNICAL SPECIALISTS

HOLE NO.: MBH05

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1746945.6mE, 5942009.4mN
Co-ordinate system: NZTM
Location method: SURVEY
ORIENTATION (°): Vertical
ELEVATION: 54.8m
Datum: AUCKHT1946
Level method: SURVEY
INCLINATION (°): 90
CONTRACTOR: DCN Drilling
RIG: Tractor Mounted Rig
DRILLER: Evan
START DATE: 28/03/2023
END DATE: 28/03/2023
LOGGED BY: FPT
CHECKED BY: BPR

UNIT	MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	DEPTH	RL	METHOD	TCR (%)	RQD (%)	INSITU TESTING (SPT 'N' Vane shear strength)	DISCONTINUITIES DESCRIPTION	WATER	INSTALLATION	CORE BOXES
Tauranga Group Alluvium	[CONT] Silty CLAY; light grey, speckled black. Firm; high plasticity; moist; trace fibrous organics.			HQTT	100						
Tauranga Group Alluvium	SILT, with some clay and sand; dark grey. Very stiff; low plasticity; moist; sand, fine to medium.		44.0	SPT	100		0, 0 / 0, 0, 0, 0 N=0				
Mahurangi Limestone	Clayey SILT, with minor gravel; dark grey. Hard; low plasticity; moist; [Residually Weathered Limestone). RS	11		HQTT	100						
Mahurangi Limestone	Highly weathered; grey; LIMESTONE; very weak; extremely closely spaced defects, breaks down to silt some clay, low plasticity.. HW VW	12	43.0	SPT			22, 28 N=50+				
Mahurangi Limestone	Core Loss: 12.15m - 12.50m										
Mahurangi Limestone	Moderately weathered; grey; LIMESTONE; moderately strong; highly fractured, extremely closely spaced defects, recovered as gravels. Limestone in a muddy matrix. MW MS	13	42.0	HQTT	85						
	EOH: 13.55m						50 for 50mm N=50+			13.55m	Box 5, 10.7-13.6m
			41.0								
			40.0								
			39.0								
			38.0								
			37.0								
			36.0								
			35.0								

REMARKS:
Target Depth Reached

Ver 3.0, Generated with CORE-GS by Geroc - Drillhole_Initia - 2/05/2023 6:44:09 pm

CORE PHOTOS

HOLE NO.: MBH05

JOB NO.: P-001537

Box 1, 0.0-3.5m



Box 2, 3.5-6.0m



Box 3, 6.0-9.0m



Generated with CORE-GS by Geroc - Drillhole_Initia - 2/05/2023 6:44:09 pm

CORE PHOTOS

HOLE NO.: MBH05

JOB NO.: P-001537

Box 4, 9.0-10.7m



Box 5, 10.7-13.6m



Generated with CORE-GS by Geroc - Drillhole_Initia - 2/05/2023 6:44:09 pm

TEST PIT LOG

INITIA
GEOTECHNICAL SPECIALISTS

HOLE NO.: TP01

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1747452.0mE, 5942523.0mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 63.4m
Datum: AUCKHT1946
Level method: SURVEY
CONTRACTOR: Wilkinson Civil LTD
MACHINE: 12 Tonne Excavator
OPERATOR: David Wilkinson
START DATE: 28/03/2023
END DATE: 28/03/2023
LOGGED BY: FPT
CHECKED BY: APK

MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)
Topsoil: SILT, with minor clay; dark brown. Firm; low plasticity; moist; Trace rootlets.		0.0
Tauranga Group Alluvium: Clayey SILT; light brownish grey. Stiff; high plasticity; moist.		0.2 – 0.4
Mahurangi Limestone: Silty CLAY; light brownish grey. Stiff; high plasticity; moist; [Residual Soil Limestone].	D	0.6 – 1.0
Clayey SILT, with some gravel; light brownish grey. Hard; low plasticity; moist; [Completely Weathered].		1.2 – 1.4
Highly weathered; bluish grey; LIMESTONE; very weak; highly fractured.		1.6 – 1.8
EOH: 1.90m		2.0 – 4.8

LEGEND

SCALA PENETROMETER (Blows / 0mm): 2, 4, 6, 8, 10, 12, 14, 16, 18

VANE SHEAR STRENGTH (kPa) Vane: 2503A: 50, 100, 150, 200

Values
60
29
72
33

WATER: Groundwater Not Encountered



REMARKS

Refusal on Limestone Rock

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- [ ] Hand Auger
- [x] Test Pit

Ver 2. Generated with CORE-GS by Geroc - Test Pit_Initia - 2/05/2023 1:05:09 pm

Checked By: APK

TEST PIT LOG

INITIA
GEOTECHNICAL SPECIALISTS

HOLE NO.: TP02

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1747275.2mE, 5942472.3mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 66.1m
Datum: AUCKHT1946
Level method: SURVEY
CONTRACTOR: Wilkinson Civil LTD
MACHINE: 12 Tonne Excavator
OPERATOR: David Wilkinson
START DATE: 28/03/2023
END DATE: 28/03/2023
LOGGED BY: FPT
CHECKED BY: APK

MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 0mm)	VANE SHEAR STRENGTH (kPa) Vane: 2503A	WATER
Topsoil SILT, with minor clay; dark brown. Firm; low plasticity; moist; Trace rootlets.		0.0				
Tauranga Group Alluvium Clayey SILT; light grey. Stiff; high plasticity; moist.	D	0.6			72 40	
Mahurangi Limestone SILT, with some clay and sand, with minor gravel; light brownish grey. Hard; low plasticity; moist; sand, fine to coarse; gravel, fine to coarse; [Residual Soil Limestone].		1.0			UTP -	Groundwater Not Encountered
Highly weathered; bluish grey; LIMESTONE; very weak; highly fractured.		1.6				
EOH: 1.80m		1.8				



REMARKS

Refusal on Limestone Rock

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- ☐ Hand Auger
- ☑ Test Pit

Ver 2. Generated with CORE-GS by Geroc - Test Pit_Initia - 2/05/2023 1:05:12 pm

Checked By: APK

TEST PIT LOG

INITIA
GEOTECHNICAL SPECIALISTS

HOLE NO.: TP03

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1747231.6mE, 5942385.8mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 64.3m
Datum: AUCKHT1946
Level method: SURVEY
CONTRACTOR: Wilkinson Civil LTD
MACHINE: 12 Tonne Excavator
OPERATOR: David Wilkinson
START DATE: 28/03/2023
END DATE: 28/03/2023
LOGGED BY: FPT
CHECKED BY: APK

MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 0mm)	VANE SHEAR STRENGTH (kPa) Vane: 2503A	WATER
Topsoil SILT, with minor clay; dark brown. Firm; low plasticity; moist; Trace rootlets.		0.0	TS			
Tauranga Group Alluvium Clayey SILT; light brownish grey. Stiff; high plasticity; moist.		0.4			67 26	
		1.0			86 29	
Mahurangi Limestone Highly weathered; brownish grey; LIMESTONE; very weak; highly fractured. 1.5m: Grades to bluish grey.		1.5				
EOH: 1.80m		1.8				

Groundwater Not Encountered



REMARKS

Refusal on Limestone Rock

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- ☐ Hand Auger
- ☑ Test Pit

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TEST PIT LOG

INITIA
GEOTECHNICAL SPECIALISTS

HOLE NO.: TP04

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1747391.8mE, 5942348.0mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 61m
Datum: AUCKHT1946
Level method: SURVEY
CONTRACTOR: Wilkinson Civil LTD
MACHINE: 12 Tonne Excavator
OPERATOR: David Wilkinson
START DATE: 28/03/2023
END DATE: 28/03/2023
LOGGED BY: FPT
CHECKED BY: APK

MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 0mm)	VANE SHEAR STRENGTH (kPa) Vane: 2503A	Values	WATER
Topsoil: SILT, with minor clay; dark brown. Firm; low plasticity; moist; Trace rootlets.		0.0 – 0.2	TS				
Tauranga Group Alluvium: Silty CLAY; light grey. Stiff; high plasticity; moist.		0.2 – 0.8			69, 20	69 20	
		0.8 – 1.0			57, 23	57 23	
Mahurangi Limestone: SILT, with some clay and gravel, with minor sand and cobbles; light orange brown. Very stiff; low plasticity; moist; gravel, fine to coarse; sand, fine to coarse; [Residual Soil Limestone].		1.0 – 1.6					
Highly weathered; brownish grey; LIMESTONE; very weak; highly fractured.		1.6 – 1.9					
1.9m: Grades to bluish grey.		1.9 – 2.2					
EOH: 2.20m		2.2 – 4.8					

Scala penetrometer scale: 2, 4, 6, 8, 10, 12, 14, 16, 18 (Blows / 0mm)
Vane shear strength scale: 50, 100, 150, 200 (kPa)

Groundwater Not Encountered



REMARKS

Refusal on Limestone Rock

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- ☐ Hand Auger
- ☑ Test Pit

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TEST PIT LOG

HOLE NO.: TP05

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1747207.2mE, 5942296.6mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 61.4m
Datum: AUCKHT1946
Level method: SURVEY
CONTRACTOR: Wilkinson Civil LTD
MACHINE: 12 Tonne Excavator
OPERATOR: David Wilkinson
START DATE: 28/03/2023
END DATE: 28/03/2023
LOGGED BY: FPT
CHECKED BY: APK

MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 0mm)	VANE SHEAR STRENGTH (kPa) Vane: 2503A	WATER
Topsoil SILT, with minor clay; dark brown. Firm; low plasticity; moist; Trace rootlets.		0.2	TS			
Tauranga Group Alluvium Clayey SILT; light brownish grey. Stiff; high plasticity; moist.		0.4 0.6 0.8			57 29 89 54	
Mahurangi Limestone Sandy SILT, with some gravel; greyish brown. Hard; non-plastic; moist; [Residual Soil Limestone].		1.0 1.2 1.4				
Highly weathered; bluish grey; LIMESTONE; very weak; highly fractured.		1.6				
EOH: 1.80m		1.8				
		2.0 2.2 2.4 2.6 2.8 3.0 3.2 3.4 3.6 3.8 4.0 4.2 4.4 4.6 4.8				

Scala Penetrometer: 2 4 6 8 10 12 14 16 18
Vane Shear Strength (kPa): 50 100 150 200
Values

Groundwater Not Encountered



REMARKS

Refusal on Limestone Rock

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- ☐ Hand Auger
- ☑ Test Pit

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TEST PIT LOG

INITIA
GEOTECHNICAL SPECIALISTS

HOLE NO.: TP06

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1747361.9mE, 5942284.6mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 59.8m
Datum: AUCKHT1946
Level method: SURVEY
CONTRACTOR: Wilkinson Civil LTD
MACHINE: 12 Tonne Excavator
OPERATOR: David Wilkinson
START DATE: 28/03/2023
END DATE: 28/03/2023
LOGGED BY: FPT
CHECKED BY: APK

MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 0mm)	VANE SHEAR STRENGTH (kPa) Vane: 2503A	WATER
Topsoil SILT, with minor clay; dark brown. Firm; low plasticity; moist; Trace rootlets.		0.0 – 0.2				
Tauranga Group Alluvium SILT, with some clay; orange brown. Stiff; high plasticity; moist.		0.2 – 0.4				
Silty CLAY; light brownish grey. Stiff; high plasticity; moist.		0.4 – 0.6			54 34	
Mahurangi Limestone Sandy SILT, with some gravel; greyish brown. Hard; moist; [Residual Soil Limestone].		0.6 – 0.8			63 29	
		0.8 – 1.8				
Highly weathered; bluish grey; LIMESTONE; very weak; highly weathered.		1.8 – 2.0				
EOH: 2.10m		2.0 – 4.8				

Scala Penetrometer axis: 2, 4, 6, 8, 10, 12, 14, 16, 18
Vane Shear Strength axis: 50, 100, 150, 200; Values

Groundwater Not Encountered



REMARKS

Refusal on Limestone Rock

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- ☐ Hand Auger
- ☑ Test Pit

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TEST PIT LOG

INITIA
GEOTECHNICAL SPECIALISTS

HOLE NO.: TP07

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1747272.8mE, 5942229.6mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 58.9m
Datum: AUCKHT1946
Level method: SURVEY
CONTRACTOR: Wilkinson Civil LTD
MACHINE: 12 Tonne Excavator
OPERATOR: David Wilkinson
START DATE: 28/03/2023
END DATE: 28/03/2023
LOGGED BY: FPT
CHECKED BY: APK

MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 0mm)	VANE SHEAR STRENGTH (kPa) Vane: 2503A	Values	WATER
Topsoil: SILT, with minor clay; dark brown. Firm; low plasticity; moist; Trace rootlets.		0.0 – 0.2	TS				
Tauranga Group Alluvium: Clayey SILT; light orange brown. Stiff; high plasticity; moist.		0.2 – 1.2				79 40 80 43	
Mahurangi Limestone: Sandy SILT, with some gravel; greyish brown. Hard; non-plastic; moist; [Residual Soil Limestone].		1.2 – 1.8				UTP -	Groundwater Not Encountered
Highly weathered; bluish grey; LIMESTONE; very weak; highly fractured. EOH: 2.00m		1.8 – 2.0					



REMARKS

Refusal on Limestone Rock

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- ☐ Hand Auger
- ☑ Test Pit

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Checked By: APK

TEST PIT LOG

HOLE NO.: TP08

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1747356.3mE, 5942217.5mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 56.7m
Datum: AUCKHT1946
Level method: SURVEY
CONTRACTOR: Wilkinson Civil LTD
MACHINE: 12 Tonne Excavator
OPERATOR: David Wilkinson
START DATE: 28/03/2023
END DATE: 28/03/2023
LOGGED BY: FPT
CHECKED BY: APK

MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 0mm)	VANE SHEAR STRENGTH (kPa) Vane: 2503A	WATER
Topsoil SILT, with minor clay; dark brown. Firm; low plasticity; moist; Trace rootlets.		0.0	TS			
Tauranga Group Alluvium Silty CLAY; light grey. Firm; high plasticity; moist.		0.2				
0.7m: grades to light brown		0.4				
		0.6			46	
		0.8			29	
		1.0			43	
		1.2			29	
		1.4			49	
		1.6			31	
		1.8			31	
		2.0			17	
Waiuarangi Limestone Highly weathered; bluish grey; LIMESTONE; very weak; highly fractured.		2.2				
EOH: 2.30m		2.4				
		2.6				
		2.8				
		3.0				
		3.2				
		3.4				
		3.6				
		3.8				
		4.0				
		4.2				
		4.4				
		4.6				
		4.8				

Groundwater Not Encountered



REMARKS

Refusal on Limestone Rock

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- ☐ Hand Auger
- ☑ Test Pit

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Checked By: APK

TEST PIT LOG

INITIA
GEOTECHNICAL SPECIALISTS

HOLE NO.: TP09

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1747163.5mE, 5942207.8mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 57.7m
Datum: AUCKHT1946
Level method: SURVEY
CONTRACTOR: Wilkinson Civil LTD
MACHINE: 12 Tonne Excavator
OPERATOR: David Wilkinson
START DATE: 28/03/2023
END DATE: 28/03/2023
LOGGED BY: FPT
CHECKED BY: APK

MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 0mm)	VANE SHEAR STRENGTH (kPa) Vane: 2503A	WATER
Topsoil SILT, with minor clay; dark brown. Firm; low plasticity; moist; Trace rootlets.		0.0	TS			
Tauranga Group Alluvium Clayey SILT; light grey brown. Stiff; high plasticity; moist.		0.2				
		0.4				
		0.6			74	
		0.8			43	
1.0m: Grades to very stiff.		1.0			107	
Mahurangi Limestone Sandy SILT, with some gravel; greyish brown. Hard; non-plastic; moist; [Residual Soil Limestone].		1.2			72	
		1.4				
Highly weathered; bluish grey; LIMESTONE; very weak; highly fractured.		1.6				
EOH: 1.50m		1.8				
		2.0				
		2.2				
		2.4				
		2.6				
		2.8				
		3.0				
		3.2				
		3.4				
		3.6				
		3.8				
		4.0				
		4.2				
		4.4				
		4.6				
		4.8				

Scala Penetrometer scale: 2 4 6 8 10 12 14 16 18
Vane Shear Strength scale: 50 100 150 200
Values: 74, 43, 107, 72

Groundwater Not Encountered



REMARKS

Refusal on Limestone Rock

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- ☐ Hand Auger
- ☑ Test Pit

Checked By: APK

Ver 2 Generated with CORE-GS by Geroc - Test Pit_Initia - 2/05/2023 1:05:26 pm

TEST PIT LOG

INITIA
GEOTECHNICAL SPECIALISTS

HOLE NO.: TP10

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1747251.7mE, 5942150.7mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 54.7m
Datum: AUCKHT1946
Level method: SURVEY
CONTRACTOR: Wilkinson Civil LTD
MACHINE: 12 Tonne Excavator
OPERATOR: David Wilkinson
START DATE: 28/03/2023
END DATE: 28/03/2023
LOGGED BY: FPT
CHECKED BY: APK

MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 0mm)	VANE SHEAR STRENGTH (kPa) Vane: 2503A	WATER
Topsoil SILT, with minor clay; dark brown. Firm; low plasticity; moist; Trace rootlets.		0.0 – 0.4	TS			
Tauranga Group Alluvium Clayey SILT; light grey. Firm; high plasticity; moist.		0.4 – 1.2			47 31	
Silty CLAY; organic stained brownish grey. Firm; high plasticity; moist.		1.2 – 2.6			26 14 43 19	Groundwater Not Encountered
Clayey SILT; light greenish grey. Firm; high plasticity; moist.		2.6 – 4.0			31 26	
EOH: 4.00m		4.0				

Scala Penetrometer (Blows / 0mm): 2, 4, 6, 8, 10, 12, 14, 16, 18
Vane Shear Strength (kPa): 50, 100, 150, 200; Values



REMARKS

Target Depth Reached

WATER
- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE
- ☐ Hand Auger
- ☑ Test Pit

Ver 2. Generated with CORE-GS by Geroc - Test Pit_Initia - 2/05/2023 1:05:28 pm

Checked By: APK

TEST PIT LOG

HOLE NO.: TP11

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1747176.5mE, 5942041.1mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 53m
Datum: AUCKHT1946
Level method: SURVEY
CONTRACTOR: Wilkinson Civil LTD
MACHINE: 12 Tonne Excavator
OPERATOR: David Wilkinson
START DATE: 28/03/2023
END DATE: 28/03/2023
LOGGED BY: FPT
CHECKED BY: APK

MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 0mm)	VANE SHEAR STRENGTH (kPa) Vane: 2503A	WATER
Topsoil SILT, with minor clay; dark brown. Firm; low plasticity; moist; Trace rootlets.		0.0 – 0.6	TS		26 11	
Tauranga Group Alluvium Clayey SILT; light grey. Firm; high plasticity; moist.		0.6 – 2.4			43 17 31 17	
Clayey SILT; light greenish grey. Firm; high plasticity; moist.		2.4 – 4.1			37 17 40 17	
EOH: 4.10m		4.1				



REMARKS

Target Depth Reached

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- [ ] Hand Auger
- [x] Test Pit

Ver 2. Generated with CORE-GS by Geroc - Test Pit_Initia - 2/05/2023 1:05:29 pm

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TEST PIT LOG

HOLE NO.: TP12

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1747279.2mE, 5942032.9mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 52.9m
Datum: AUCKHT1946
Level method: SURVEY
CONTRACTOR: Wilkinson Civil LTD
MACHINE: 12 Tonne Excavator
OPERATOR: David Wilkinson
START DATE: 28/03/2023
END DATE: 28/03/2023
LOGGED BY: FPT
CHECKED BY: APK

MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 0mm)	VANE SHEAR STRENGTH (kPa) Vane: 2503A	Values	WATER
Topsoil: SILT, with minor clay; dark greyish brown. Firm; low plasticity; moist; Trace rootlets.		0.0 – 0.4	TS				
Tauranga Group Alluvium: Clayey PEAT (FIBROUS); black. Firm; high plasticity; moist.	B	0.4 – 0.8				29 11	
Silty CLAY; organic stained brownish grey. Firm; high plasticity; moist.		0.8 – 3.4				31 14 34 14 46 17 46 20 49 17	
Clayey SILT; greenish grey. Firm; high plasticity; moist.		3.4 – 4.0					
EOH: 4.00m							



REMARKS

Target Depth Reached

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- ☐ Hand Auger
- ☑ Test Pit

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TEST PIT LOG

INITIA
GEOTECHNICAL SPECIALISTS

HOLE NO.: TP13

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1746809.9mE, 5942216.7mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 53.8m
Datum: AUCKHT1946
Level method: SURVEY
CONTRACTOR: Wilkinson Civil LTD
MACHINE: 12 Tonne Excavator
OPERATOR: David Wilkinson
START DATE: 27/03/2023
END DATE: 27/03/2023
LOGGED BY: QS
CHECKED BY: APK

MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 0mm)	VANE SHEAR STRENGTH (kPa) Vane: 2503A	WATER
Topsoil SILT, with minor rootlets; dark brown. Stiff; non-plastic; dry.		0.0	TS			
		0.2	TS			
		0.4	TS			
		0.6	TS			
		0.8	TS			
Tauranga Group Alluvium SILT; grey. Hard; low plasticity; dry.		1.0			200+	
Silty CLAY; brownish grey. Stiff; high plasticity; moist.	B	1.2				
		1.4			50	
1.7m: grades to grey		1.6			31	
		1.8				
		2.0				
		2.2			63	
		2.4			29	
		2.6				
		2.8				
		3.0				
		3.2				
		3.4				
		3.6				
EOH: 3.80m		3.8				
		4.0				
		4.2				
		4.4				
		4.6				
		4.8				Groundwater Not Encountered

SCALA PENETROMETER (Blows / 0mm): 2 4 6 8 10 12 14 16 18
VANE SHEAR STRENGTH (kPa) Vane: 2503A: 50 100 150 200
Values



REMARKS

Target Depth Reached

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- ☐ Hand Auger
- ☑ Test Pit

Ver 2 Generated with CORE-GS by Geroc - Test Pit_Initia - 2/05/2023 1:05:32 pm

Checked By: APK

TEST PIT LOG

HOLE NO.: TP14

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1746914.9mE, 5942211.6mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 55m
Datum: AUCKHT1946
Level method: SURVEY
CONTRACTOR: Wilkinson Civil LTD
MACHINE: 12 Tonne Excavator
OPERATOR: David Wilkinson
START DATE: 27/03/2023
END DATE: 27/03/2023
LOGGED BY: QS
CHECKED BY: APK

MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 0mm)	VANE SHEAR STRENGTH (kPa) Vane: 2503A	WATER
Topsoil: SILT, with minor rootlets; dark brown. Stiff; non-plastic; dry.		0.0 – 0.4	TS			
Fill: Clayey SILT; yellowish brown. Very stiff; low plasticity; dry.		0.4 – 0.6			120, 31	
Tauranga Group Alluvium: Silty CLAY; yellowish brown. Stiff; high plasticity; moist.		0.6 – 1.8			93, 43	Groundwater Not Encountered
Silty CLAY; grey. Stiff; high plasticity; moist.		1.8 – 2.6			72, 31	
2.6m: grades to firm		2.6 – 3.8			40, 26	
EOH: 3.80m						



REMARKS

Target Depth Reached

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- ☐ Hand Auger
- ☑ Test Pit

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TEST PIT LOG

INITIA
GEOTECHNICAL SPECIALISTS

HOLE NO.: TP15

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1746826.1mE, 5942153.9mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 55m
Datum: AUCKHT1946
Level method: SURVEY
CONTRACTOR: Wilkinson Civil LTD
MACHINE: 12 Tonne Excavator
OPERATOR: David Wilkinson
START DATE: 28/03/2023
END DATE: 28/03/2023
LOGGED BY: FPT
CHECKED BY: APK

MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 0mm)	VANE SHEAR STRENGTH (kPa) Vane: 2503A	WATER
Topsoil SILT, with minor clay; dark brown. Firm; low plasticity; moist.		0.0 – 0.6	TS			
Tauranga Group Alluvium Silty CLAY; light grey, speckled black. Stiff; high plasticity; moist; Trace fibrous organics.		0.6 – 1.2			77, 26	
Silty CLAY; greyish brown. Stiff; high plasticity; moist.	B	1.2 – 2.8			63, 37; 57, 17	Groundwater Not Encountered
Clayey SILT; greenish grey. Stiff; high plasticity; moist.		2.8 – 4.0			50, 20	
EOH: 4.00m		4.0				



REMARKS

Target Depth Reached

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- ☐ Hand Auger
- ☑ Test Pit

Ver 2. Generated with CORE-GS by Geroc - Test Pit_Initia - 2/05/2023 1:05:35 pm

Checked By: APK

TEST PIT LOG

INITIA
GEOTECHNICAL SPECIALISTS

HOLE NO.: TP16

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1746749.0mE, 5942119.6mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 55.4m
Datum: AUCKHT1946
Level method: SURVEY
CONTRACTOR: Wilkinson Civil LTD
MACHINE: 12 Tonne Excavator
OPERATOR: David Wilkinson
START DATE: 27/03/2023
END DATE: 27/03/2023
LOGGED BY: QS
CHECKED BY: APK

MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 0mm)	VANE SHEAR STRENGTH (kPa) Vane: 2503A	WATER
Topsoil SILT, with minor rootlets; dark brown. Stiff; non-plastic; dry.		0.0	TS			
Tauranga Group Alluvium Silty CLAY; greyish brown. Firm; high plasticity; moist.		0.6			46 21	
1.2m: grades to grey and stiff	B	1.0			50 31	
1.6m: grades to firm		1.6			46 29	
2.1m: grades to stiff		2.0			63 31	
EOH: 3.70m		3.7				

Scala Penetrometer: 2 4 6 8 10 12 14 16 18
Vane Shear Strength (kPa): 50 100 150 200 | Values



REMARKS

Target Depth Reached

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- ☐ Hand Auger
- ☑ Test Pit

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Checked By: APK

TEST PIT LOG

INITIA
GEOTECHNICAL SPECIALISTS

HOLE NO.: TP17

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1746896.6mE, 5942113.9mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 54.9m
Datum: AUCKHT1946
Level method: SURVEY
CONTRACTOR: Wilkinson Civil LTD
MACHINE: 12 Tonne Excavator
OPERATOR: David Wilkinson
START DATE: 27/03/2023
END DATE: 27/03/2023
LOGGED BY: QS
CHECKED BY: APK

MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 0mm)	VANE SHEAR STRENGTH (kPa) Vane: 2503A	WATER
Topsoil SILT, with minor rootlets; dark brown. Stiff; non-plastic; dry.		0.0	TS			
Tauranga Group Alluvium Clayey SILT; greyish brown. Firm; low plasticity; moist.		0.6			46 23	
1.2m: grades to stiff	B	1.2			57 36	
Silty CLAY; grey. Stiff; high plasticity; moist.		1.4				
1.8m: grades to firm		1.8			46 17	
		2.4			34 14	
Organic CLAY; dark grey. Firm; high plasticity; moist.		3.6				
EOH: 4.00m		4.0				Groundwater Not Encountered



REMARKS

Target Depth Reached

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- Hand Auger
- Test Pit

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Checked By: APK

TEST PIT LOG

HOLE NO.: TP18

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1746951.3mE, 5942133.7mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 55m
Datum: AUCKHT1946
Level method: SURVEY
CONTRACTOR: Wilkinson Civil LTD
MACHINE: 12 Tonne Excavator
OPERATOR: David Wilkinson
START DATE: 28/03/2023
END DATE: 28/03/2023
LOGGED BY: FPT
CHECKED BY: APK

MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 0mm)	VANE SHEAR STRENGTH (kPa) Vane: 2503A	WATER
Topsoil SILT, with minor clay; dark brown. Firm; low plasticity; moist; trace rootlets.		0.0	TS		57 23	
Clayey SILT; light grey, streaked orange brown. Stiff; low plasticity; moist.		0.6				
Tauranga Group Alluvium Silty CLAY; light grey. Stiff; high plasticity; moist.	B	1.0			60 26	
		1.4			69 34	
2.0m: Grades to organic stained greyish brown.		2.0			60 29	
2.6m: grades to very stiff		2.6			110 43	
3.5m: Grades to greenish grey.		3.5				
EOH: 4.20m		4.0				Groundwater Not Encountered



REMARKS

Target Depth Reached

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- ☐ Hand Auger
- ☑ Test Pit

Ver 2. Generated with CORE-GS by Geroc - Test Pit_Initia - 2/05/2023 1:05:40 pm

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TEST PIT LOG

HOLE NO.: TP19

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1746824.2mE, 5942088.9mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 55.3m
Datum: AUCKHT1946
Level method: SURVEY
CONTRACTOR: Wilkinson Civil LTD
MACHINE: 12 Tonne Excavator
OPERATOR: David Wilkinson
START DATE: 27/03/2023
END DATE: 27/03/2023
LOGGED BY: QS
CHECKED BY: APK

MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 0mm)	VANE SHEAR STRENGTH (kPa) Vane: 2503A	WATER
Topsoil SILT, with minor rootlets; dark brown. Stiff; non-plastic; dry.		0.0 – 0.4	TS			
Tauranga Group Alluvium Silty CLAY; greyish brown. Stiff; high plasticity; moist.	B	0.4 – 1.0			80 43	
1.0m: grades to grey and firm		1.0 – 1.2			43 26	
1.8m: grades to stiff		1.2 – 1.8			86 50	
		1.8 – 2.2			64 43	
		2.2 – 2.8			54 21	
EOH: 3.60m		2.8 – 3.6				Groundwater Not Encountered

Scala Penetrometer scale: 2, 4, 6, 8, 10, 12, 14, 16, 18
Vane Shear Strength scale: 50, 100, 150, 200
Values



REMARKS

Target Depth Reached

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- ☐ Hand Auger
- ☑ Test Pit

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TEST PIT LOG

INITIA
GEOTECHNICAL SPECIALISTS

HOLE NO.: TP20

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1746879.8mE, 5942075.4mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 54.9m
Datum: AUCKHT1946
Level method: SURVEY
CONTRACTOR: Wilkinson Civil LTD
MACHINE: 12 Tonne Excavator
OPERATOR: David Wilkinson
START DATE: 27/03/2023
END DATE: 27/03/2023
LOGGED BY: QS
CHECKED BY: APK

MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 0mm)	VANE SHEAR STRENGTH (kPa) Vane: 2503A	Values	WATER
Topsoil SILT, with minor rootlets; dark brown. Stiff; non-plastic; dry.		0.0 – 0.4	TS				
Tauranga Group Alluvium Clayey SILT, with trace rootlets; grey. Firm; low plasticity; dry.		0.4 – 1.4				43 14 40 20	
Silty CLAY; grey. Stiff; high plasticity; moist.	B	1.4 – 2.0				72 31	
Organic CLAY; dark grey. Stiff; high plasticity; moist; some wood present.		2.0 – 2.2				60 21	
Silty CLAY; grey. Firm; high plasticity; moist.		2.2 – 3.2				46 17	
EOH: 3.30m		3.2					Groundwater Not Encountered



REMARKS

Target Depth Reached

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- ☐ Hand Auger
- ☑ Test Pit

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Checked By: APK

TEST PIT LOG

HOLE NO.: TP21

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1746944.1mE, 5942056.3mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 54.6m
Datum: AUCKHT1946
Level method: SURVEY
CONTRACTOR: Wilkinson Civil LTD
MACHINE: 12 Tonne Excavator
OPERATOR: David Wilkinson
START DATE: 27/03/2023
END DATE: 27/03/2023
LOGGED BY: QS
CHECKED BY: APK

MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 0mm)	VANE SHEAR STRENGTH (kPa) Vane: 2503A	Values	WATER
Topsoil SILT, with minor rootlets; dark brown. Stiff; non-plastic; dry.		0.0 – 0.4	TS				
Tauranga Group Alluvium Silty CLAY; greyish brown. Firm; high plasticity; moist.	B	0.4 – 1.4				40 21	
1.4m: grades to stiff Silty CLAY, with trace organics; grey. Stiff; high plasticity; moist.		1.4 – 1.9				60 29	
1.9m: grades to firm		1.9 – 2.8				40 21 49 26	
EOH: 4.10m		2.8 – 4.10				29 14	Groundwater Not Encountered



REMARKS

Target Depth Reached

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- ☐ Hand Auger
- ☑ Test Pit

Ver 2. Generated with CORE-GS by Geroc - Test Pit_Initia - 2/05/2023 1:05:45 pm

Checked By: APK

TEST PIT LOG

HOLE NO.: TP22

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1747055.0mE, 5942085.5mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 54.5m
Datum: AUCKHT1946
Level method: SURVEY
CONTRACTOR: Wilkinson Civil LTD
MACHINE: 12 Tonne Excavator
OPERATOR: David Wilkinson
START DATE: 28/03/2023
END DATE: 28/03/2023
LOGGED BY: FPT
CHECKED BY: APK

MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 0mm)	VANE SHEAR STRENGTH (kPa) Vane: 2503A	WATER
Topsoil SILT, with minor clay, with trace rootlets; dark brown. Firm; low plasticity; moist.		0.0				
Tauranga Group Alluvium Clayey SILT, with trace organics; light grey, speckled black. Stiff; moist; organics, fibrous.		0.6			82 26	
Silty CLAY; organic stained light grey. Stiff; high plasticity; moist.	B	1.2			76 31	
Clayey SILT; light greenish grey. Stiff; high plasticity; moist.		2.4			37 14	
EOH: 4.00m		4.0				



REMARKS

Target Depth Reached

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- ☐ Hand Auger
- ☑ Test Pit

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TEST PIT LOG

INITIA
GEOTECHNICAL SPECIALISTS

HOLE NO.: TP23

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1746869.7mE, 5942034.2mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 54.9m
Datum: AUCKHT1946
Level method: SURVEY
CONTRACTOR: Wilkinson Civil LTD
MACHINE: 12 Tonne Excavator
OPERATOR: David Wilkinson
START DATE: 27/03/2023
END DATE: 27/03/2023
LOGGED BY: QS
CHECKED BY: APK

MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 0mm)	VANE SHEAR STRENGTH (kPa) Vane: 2503A	WATER
Topsoil SILT, with some wood and tree stumps; dark brown. Firm; low plasticity; saturated.		0.0			29 14	
Tauranga Group Alluvium Silty CLAY; greyish brown. Firm; high plasticity; moist.		0.8			43 21	
CLAY, with some organics; dark grey and grey. Firm; high plasticity; moist.	B	2.0			43 17	
2.6m: grades to stiff		2.6			50 29	
EOH: 3.80m		3.8				27/03/2023



REMARKS

Target Depth Reached

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- ☐ Hand Auger
- ☑ Test Pit

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Checked By: APK

TEST PIT LOG

INITIA
GEOTECHNICAL SPECIALISTS

HOLE NO.: TP24

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1746885.5mE, 5941987.7mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 55m
Datum: AUCKHT1946
Level method: SURVEY
CONTRACTOR: Wilkinson Civil LTD
MACHINE: 12 Tonne Excavator
OPERATOR: David Wilkinson
START DATE: 27/03/2023
END DATE: 27/03/2023
LOGGED BY: QS
CHECKED BY: APK

MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 0mm)	VANE SHEAR STRENGTH (kPa) Vane: 2503A	WATER
Topsoil / Fill: SILT; dark brown. Stiff; non-plastic; dry.		0.0	TS	2 4 6 8 10 12 14 16 18	50 100 150 200 Values	
Clayey SILT; yellowish brown. Stiff; low plasticity; dry.		0.2	TS			
Topsoil: SILT; dark brown. Firm; non-plastic; dry.		0.4	TS		31	
		0.6	TS		17	
Tauranga Group Alluvium: Silty CLAY; greyish brown. Firm; high plasticity; moist.		0.8	TS			
1.2m: grades to stiff	B	1.0			52	
		1.2			29	
Silty CLAY, with minor wood; grey. Stiff; high plasticity; moist.		1.4				
		1.6			52	
		1.8			36	
		2.0				
		2.2			57	
		2.4			29	
		2.6				
		2.8				
		3.0				
		3.2				
		3.4				
3.7m - 3.9m: Organic CLAY; dark grey. Firm; high plasticity; moist.		3.6				
		3.8				
EOH: 4.20m		4.0				27/03/2023
		4.2				
		4.4				
		4.6				
		4.8				



REMARKS

Target Depth Reached

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- ☐ Hand Auger
- ☑ Test Pit

Ver 2. Generated with CORE-GS by Geroc - Test Pit_Initia - 2/05/2023 1:05:49 pm

Checked By: APK

TEST PIT LOG

HOLE NO.: TP25

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1747046.8mE, 5941988.3mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 54.5m
Datum: AUCKHT1946
Level method: SURVEY
CONTRACTOR: Wilkinson Civil LTD
MACHINE: 12 Tonne Excavator
OPERATOR: David Wilkinson
START DATE: 27/03/2023
END DATE: 27/03/2023
LOGGED BY: QS
CHECKED BY: APK

MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 0mm)	VANE SHEAR STRENGTH (kPa) Vane: 2503A	WATER
Topsoil SILT, with minor rootlets; dark brown. Stiff; non-plastic; dry.		0.0 – 0.6	TS			
Tauranga Group Alluvium Silty CLAY, with trace organics; greyish brown. Stiff; high plasticity; moist.	B	0.6 – 1.2			57 26	
1.2m: grades to firm					46 29	
Silty CLAY, with trace organics; grey. Firm; high plasticity; moist.		1.2 – 2.8			46 29 43 29	
2.8m: grades to stiff		2.8 – 3.6			60 26	
EOH: 3.70m		3.6				



REMARKS

Target Depth Reached

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- ☐ Hand Auger
- ☑ Test Pit

Checked By: APK

Ver 2 Generated with CORE-GS by Geroc - Test Pit_Initia - 2/05/2023 1:05:51 pm

TEST PIT LOG

HOLE NO.: TP26

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1747072.3mE, 5941902.8mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 54.2m
Datum: AUCKHT1946
Level method: SURVEY
CONTRACTOR: Wilkinson Civil LTD
MACHINE: 12 Tonne Excavator
OPERATOR: David Wilkinson
START DATE: 27/03/2023
END DATE: 27/03/2023
LOGGED BY: QS
CHECKED BY: APK

INITIA
GEOTECHNICAL SPECIALISTS

MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 0mm)	VANE SHEAR STRENGTH (kPa) Vane: 2503A	WATER
Topsoil SILT, with minor rootlets; dark brown. Stiff; non-plastic; dry.		0.0 – 0.4	TS			
Taurnga Group Alluvium Silty CLAY, with trace organics; greyish brown. Firm; high plasticity; moist.		0.4 – 1.0			43, 29	
1.2m: grades to stiff	B	1.0 – 1.4			60, 17	
Organic CLAY; dark grey. Firm; high plasticity; moist.		1.4 – 2.2			26, 14	
2.3m: grades to stiff		2.2 – 2.4			69, 14	
SILT, with some clay; grey. Stiff; low plasticity; moist.		2.4 – 2.8			83, 29	
Silty CLAY; grey. Stiff; high plasticity; moist.		2.8 – 3.4				
EOH: 3.50m		3.4 – 4.8				

Values

Groundwater Not Encountered



REMARKS

Target Depth Reached

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- ☐ Hand Auger
- ☑ Test Pit

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TEST PIT LOG

HOLE NO.: TP27

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1746943.2mE, 5941865.3mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 54.8m
Datum: AUCKHT1946
Level method: SURVEY
CONTRACTOR: Wilkinson Civil LTD
MACHINE: 12 Tonne Excavator
OPERATOR: David Wilkinson
START DATE: 27/03/2023
END DATE: 27/03/2023
LOGGED BY: QS
CHECKED BY: APK

MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 0mm)	VANE SHEAR STRENGTH (kPa) Vane: 2503A	WATER
Topsoil SILT, with minor rootlets; dark brown. Stiff; non-plastic; dry.		0.0	TS			
Tauranga Group Alluvium Silty CLAY, with trace organics; greyish brown. Stiff; moist. 0.8m - 0.9m: Wood fragments up to 100 mm diameter	B	0.8			57 29	
Silty CLAY; grey. Stiff; high plasticity; moist.		1.4			50 29	
		1.6			54 31	
		2.2			60 29	
		2.6			72 31	
EOH: 3.60m		3.6				27/03/2023 ▼



REMARKS

Target Depth Reached

WATER

- ▼ Standing Water Level
- ◁ Out flow
- ▷ In flow

INVESTIGATION TYPE

- ☐ Hand Auger
- ☑ Test Pit

Ver 2. Generated with CORE-GS by Geroc - Test Pit_Initia - 2/05/2023 1:05:54 pm

Checked By: APK

TEST PIT LOG

HOLE NO.: TP28

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1747016.4mE, 5941829.2mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 54.1m
Datum: AUCKHT1946
Level method: SURVEY
CONTRACTOR: Wilkinson Civil LTD
MACHINE: 12 Tonne Excavator
OPERATOR: David Wilkinson
START DATE: 27/03/2023
END DATE: 27/03/2023
LOGGED BY: QS
CHECKED BY: APK

MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 0mm)	VANE SHEAR STRENGTH (kPa) Vane: 2503A	WATER
Topsoil SILT, with minor rootlets; dark brown. Stiff; non-plastic; dry.		0.0 – 0.6	TS			
Tauranga Group Alluvium Silty CLAY, with minor wood fragments; greyish brown. Firm; high plasticity; moist.		0.6 – 1.4			46 20 49 26	
Silty CLAY; grey. Stiff; high plasticity; moist.	B	1.4 – 2.8			77 19	
2.8m: grades to firm		2.8 – 3.6			34 20	27/03/2023
EOH: 3.60m		3.6 – 4.8				



REMARKS

Target Depth Reached

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- ☐ Hand Auger
- ☑ Test Pit

Ver 2 Generated with CORE-GS by Geroc - Test Pit_Initia - 2/05/2023 1:05:55 pm

Checked By: APK

TEST PIT LOG

HOLE NO.: TP29

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1746858.8mE, 5941880.6mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 54.6m
Datum: AUCKHT1946
Level method: SURVEY
CONTRACTOR: Wilkinson Civil LTD
MACHINE: 12 Tonne Excavator
OPERATOR: David Wilkinson
START DATE: 27/03/2023
END DATE: 27/03/2023
LOGGED BY: QS
CHECKED BY: APK

MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 0mm)	VANE SHEAR STRENGTH (kPa) Vane: 2503A	WATER
Topsoil SILT, with minor rootlets; dark brown. Stiff; non-plastic; dry.		0.0	TS			
Tauranga Group Alluvium Silty CLAY, with trace organics; greyish brown. Firm; high plasticity; moist.	B	1.0			34 / 9	
1.3m: grades to stiff		1.2			63 / 29	
1.5m: grades to grey		1.4				
		1.8			72 / 34	
		2.4			60 / 31	
3.7m: grades to with minor wood		3.8				
EOH: 4.00m		4.0				



REMARKS

Target Depth Reached

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- ☐ Hand Auger
- ☑ Test Pit

Ver 2. Generated with CORE-GS by Geroc - Test Pit_Initia - 2/05/2023 1:05:57 pm

Checked By: APK

TEST PIT LOG

HOLE NO.: TP30

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1746995.8mE, 5941883.1mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 54.3m
Datum: AUCKHT1946
Level method: SURVEY
CONTRACTOR: Wilkinson Civil LTD
MACHINE: 12 Tonne Excavator
OPERATOR: David Wilkinson
START DATE: 27/03/2023
END DATE: 27/03/2023
LOGGED BY: QS
CHECKED BY: APK

MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 0mm)	VANE SHEAR STRENGTH (kPa) Vane: 2503A	WATER
Topsoil SILT, with minor rootlets; dark brown. Stiff; non-plastic; dry.		0.0 – 0.6	TS			
Tauranga Group Alluvium Silty CLAY, with trace wood; greyish brown. Firm; high plasticity; moist.		0.6 – 1.4			31 11 46 29	
Silty CLAY, with trace organics; grey. Firm; high plasticity; moist.	B	1.4 – 3.3			40 14 49 14	
EOH: 3.30m		3.3				

Scala Penetrometer scale: 2, 4, 6, 8, 10, 12, 14, 16, 18
Vane Shear Strength scale: 50, 100, 150, 200; Values

27/03/2023



REMARKS

Target Depth Reached

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- ☐ Hand Auger
- ☑ Test Pit

Ver 2. Generated with CORE-GS by Geroc - Test Pit_Initia - 2/05/2023 1:05:58 pm

Checked By: APK

TEST PIT LOG

HOLE NO.: TP31

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1747112.3mE, 5942063.4mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 53.9m
Datum: AUCKHT1946
Level method: SURVEY
CONTRACTOR: Wilkinson Civil LTD
MACHINE: 12 Tonne Excavator
OPERATOR: David Wilkinson
START DATE: 28/03/2023
END DATE: 28/03/2023
LOGGED BY: FPT
CHECKED BY: APK

MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 0mm)	VANE SHEAR STRENGTH (kPa) Vane: 2503A	WATER
Topsoil SILT, with minor clay; dark brown. Firm; low plasticity; moist; Trace rootlets.		0.0 – 0.6	TS		Values: 46, 17	
Tauranga Group Alluvium Silty CLAY; light grey. Firm; high plasticity; moist.	B	0.6 – 1.2			Values: 50, 31	
1.2m: grades to firm		1.2 – 2.8			Values: 43, 11	
Clayey SILT; light greenish grey. Firm; high plasticity; moist.		2.8 – 3.9			Values: 60, 31	28/03/2023
2.8m: Grades to stiff.						
EOH: 3.90m						



REMARKS

Target Depth Reached

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- ☐ Hand Auger
- ☑ Test Pit

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TEST PIT LOG

INITIA
GEOTECHNICAL SPECIALISTS

HOLE NO.: TP101

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1746861.9mE, 5942228.9mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 54.9m
Datum: AUCKHT1946
Level method: SURVEY
CONTRACTOR: McKenzie Contractors
MACHINE: 12T excavator
OPERATOR: Mel
START DATE: 07/08/2025
END DATE: 07/08/2025
LOGGED BY: YK
CHECKED BY: APK

MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 0mm)	VANE SHEAR STRENGTH (kPa) Vane: 4035	Values	WATER
Topsoil Clayey SILT, with trace rootlets; dark brown. Firm; low plasticity; moist.		0.2					
Tauranga Group Alluvium Clayey SILT; light grey with dark brown streaks. Very stiff; low plasticity; moist.		0.4				101 31	
CLAY, with minor silt; light grey with orange streaks. Very stiff; high plasticity; moist.	B	0.6 0.8 1.0				138 38	
1.2m: Grades to stiff		1.2 1.4 1.6 1.8				92 49	
CLAY, with minor organics and silt; dark grey. Firm; high plasticity; moist; organics, amorphous.		2.0 2.2 2.4 2.6 2.8				58 31 43 26	
3.3m: Grades to stiff EOH: 3.30m		3.0 3.2 3.4 3.6 3.8				46 31 57 34	Groundwater Not Encountered



REMARKS

Test pit terminated at target depth.

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- [ ] Hand Auger
- [x] Test Pit

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Checked By: APK

TEST PIT LOG

INITIA
GEOTECHNICAL SPECIALISTS

HOLE NO.: TP102

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1746943.2mE, 5942173.2mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 54.3m
Datum: AUCKHT1946
Level method: SURVEY
CONTRACTOR: McKenzie Contractors
MACHINE: 12T excavato
OPERATOR: Mel
START DATE: 07/08/2025
END DATE: 07/08/2025
LOGGED BY: YK
CHECKED BY: APK

MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 0mm)	VANE SHEAR STRENGTH (kPa) Vane: 4035	Values	WATER
Topsoil: Clayey SILT, with trace rootlets; grey brown. Firm; low plasticity; moist.		0.2		2 4 6 8 10 12 14 16 18	50 100 150 200		
Tauranga Group Alluvium: CLAY, with minor silt; light grey with orange streaks. Stiff; high plasticity; moist.		0.4				84	
		0.6				23	
		0.8					
		1.0				89	
	B	1.2				23	
		1.4				89	
		1.6				61	
		1.8					
2.0m: Grades to firm		2.0				38	
		2.2				23	
CLAY, with minor organics and silt; dark grey. Firm; high plasticity; moist; organics, amorphous.		2.4					
		2.6				49	
		2.8				43	
		3.0					
		3.2				50	
		3.4				38	
EOH: 3.50m		3.6					
		3.8					Groundwater Not Encountered



REMARKS

Test pit terminated at target depth.

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- [ ] Hand Auger
- [x] Test Pit

Ver 2. Generated with CORE-GS by Geroc - Test Pit_Initia_v1 - 5/09/2025 1:12:15 pm

Checked By: APK

TEST PIT LOG

INITIA
GEOTECHNICAL SPECIALISTS

HOLE NO.: TP104

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1746947.8mE, 5941946.8mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 54.8m
Datum: AUCKHT1946
Level method: SURVEY
CONTRACTOR: McKenzie Contractors
MACHINE: 12T excavato
OPERATOR: Mel
START DATE: 07/08/2025
END DATE: 07/08/2025
LOGGED BY: YK
CHECKED BY: APK

MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 0mm)	VANE SHEAR STRENGTH (kPa) Vane: 4035	Values	WATER
Fill SILT, with minor gravel, with trace clay; light grey. Hard; low plasticity; moist; gravel, fine to coarse; [Limestone fill].		0.2, 0.4, 0.6, 0.8		2 4 6 8 10 12 14 16 18	50 100 150 200	UTP -	Groundwater Not Encountered
Tauranga Group Alluvium CLAY, with minor silt, with trace organics; brownish grey with dark streaks. Stiff; high plasticity; moist; organics, fibrous.		1.0, 1.2, 1.4, 1.6, 1.8, 2.0, 2.2, 2.4, 2.6, 2.8, 3.0, 3.2, 3.4, 3.6, 3.8				61 18	
1.5m: Grades to firm						46 23	
2.0m: Grades to dark brown with minor organics, stiff						73 21	
						54 31	
EOH: 3.00m						69 46	



REMARKS

Test pit terminated at target depth.

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- ☐ Hand Auger
- ☑ Test Pit

Ver 2. Generated with CORE-GS by Geroc - Test Pit_Initia_v1 - 5/09/2025 1:12:18 pm

Checked By: APK

TEST PIT LOG

INITIA
GEOTECHNICAL SPECIALISTS

HOLE NO.: TP105

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1746993.1mE, 5942066.7mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 54.1m
Datum: AUCKHT1946
Level method: SURVEY
CONTRACTOR: McKenzie Contractors
MACHINE: 12T excavato
OPERATOR: Mel
START DATE: 07/08/2025
END DATE: 07/08/2025
LOGGED BY: YK
CHECKED BY: APK

MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 0mm)	VANE SHEAR STRENGTH (kPa) Vane: 4035	Values	WATER
Fill Clayey SILT, with minor gravel; light grey with brown streaks. Stiff; low plasticity; moist; gravel, fine to coarse; [Limestone fill].		0.2					
Tauranga Group Alluvium CLAY, with minor silt; light grey. Firm; high plasticity; moist.		0.4 0.6 0.8				46 23	
1.0m: Grades to stiff		1.0 1.2 1.4				61 49 46 23	Groundwater Not Encountered
CLAY, with minor organics and silt; dark grey. Firm; high plasticity; moist; organics, fibrous.		1.6 1.8 2.0					
2.1m: Grades to stiff		2.2 2.4				54 18 40	
2.5m: Grades to firm		2.6 2.8 3.0				28 43 28	
EOH: 3.30m		3.2 3.4 3.6 3.8				46 31	



REMARKS

Test pit terminated at target depth.

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- ☐ Hand Auger
- ☑ Test Pit

Ver 2. Generated with CORE-GS by Geroc - Test Pit_Initia_v1 - 5/09/2025 1:12:20 pm

Checked By: APK

TEST PIT LOG

INITIA
GEOTECHNICAL SPECIALISTS

HOLE NO.: TP107

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1747087.3mE, 5941780.3mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 54.2m
Datum: AUCKHT1946
Level method: SURVEY
CONTRACTOR: McKenzie Contractors
MACHINE: 12 Tonne Excavator
OPERATOR: Mel
START DATE: 07/08/2025
END DATE: 07/08/2025
LOGGED BY: YK
CHECKED BY: APK

MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 0mm)	VANE SHEAR STRENGTH (kPa) Vane: 4035	WATER
TS / Fill: Clayey SILT, with trace rootlets; dark brown. Firm; low plasticity; moist.		0.0				
Buried Topsoil: Clayey SILT; dark brown. Very stiff; low plasticity; moist.		0.2			176	
Clayey SILT, with trace rootlets; dark brown. Very stiff; low plasticity; moist.		0.4			31	
Fill: Clayey SILT; brown with orange streaks. Stiff; low plasticity; moist.		0.6				
Tauranga Group Alluvium: CLAY, with minor organics and silt; dark grey. Firm; high plasticity; moist; organics, fibrous.		0.8				
	B	1.0			49	
		1.2			24	
		1.4			49	
2.0m - 2.3m: Wood logs up to 300mm diameter		1.6			31	
		1.8				
		2.0			34	
		2.2			24	
		2.4				
Organic CLAY, with minor silt; dark grey. Firm; high plasticity; moist; organic, fibrours.		2.6			46	
		2.8			23	
		3.0				
		3.2			31	
		3.4			23	
		3.6				
EOH: 3.70m		3.8			40	
					24	



REMARKS

Test pit terminated at target depth.

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- ☐ Hand Auger
- ☑ Test Pit

Ver 2. Generated with CORE-GS by Geroc - Test Pit_Initia_v1 - 5/09/2025 1:12:27 pm

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TEST PIT LOG

INITIA
GEOTECHNICAL SPECIALISTS

HOLE NO.: TP108

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1747156.2mE, 5941964.5mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 53.9m
Datum: AUCKHT1946
Level method: SURVEY
CONTRACTOR: McKenzie Contractors
MACHINE: 12 Tonne Excavator
OPERATOR: Mel
START DATE: 07/08/2025
END DATE: 07/08/2025
LOGGED BY: YK
CHECKED BY: APK

	MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 0mm)	VANE SHEAR STRENGTH (kPa) Vane: 4035	Values	WATER
Topsoil	Clayey SILT, with trace rootlets; dark brown. Firm; low plasticity; moist.		0.2					
Tauranga Group Alluvium	Silty CLAY, with some organics; brown grey. Stiff; high plasticity; moist.		0.4				61	
			0.6				18	
	0.8m: Grades to firm	B	0.8				46	
			1.0				15	
			1.2					
	Organic CLAY, with minor silt; dark grey. Firm; high plasticity; moist; organic, fibrous.		1.4				31	
			1.6				15	
			1.8				49	
	CLAY, with minor organics and silt; darkish grey. Stiff; high plasticity; moist; organics, fibrous.		2.0				31	
		B	2.2				64	
	Organic CLAY, with minor silt; dark grey. Firm; high plasticity; moist; organic, fibrous.		2.4				18	
			2.6				34	
			2.8				18	
	CLAY, with minor organics and silt; darkish grey. Firm; high plasticity; moist; organics, fibrous.		3.0				43	
			3.2				28	
	EOH: 3.30m		3.4					
			3.6					
			3.8					



REMARKS

Test pit terminated at target depth.

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- [ ] Hand Auger
- [x] Test Pit

Ver 2. Generated with CORE-GS by Geroc - Test Pit_Initia_v1 - 5/09/2025 1:12:39 pm

Checked By: APK

TEST PIT LOG

INITIA
GEOTECHNICAL SPECIALISTS

HOLE NO.: TP109

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1747205.7mE, 5941815.3mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 54.9m
Datum: AUCKHT1946
Level method: SURVEY
CONTRACTOR: McKenzie Contractors
MACHINE: 12 Tonne Excavator
OPERATOR: Mel
START DATE: 07/08/2025
END DATE: 07/08/2025
LOGGED BY: YK
CHECKED BY: APK

MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 0mm)	VANE SHEAR STRENGTH (kPa) Vane: 4035	Values	WATER
Topsoil Clayey SILT, with trace rootlets; dark brown. Firm; low plasticity; moist.		0.0					
Fill Clayey SILT; dark brown with grey mottles. Stiff; low plasticity; moist.		0.2					
Silty CLAY; grey with orange and dark grey streaks. Stiff; high plasticity; moist.		0.4				92 49	
		0.6				64 46	
1.2m: Grades to firm		0.8 1.0 1.2				49 21	
Buried Topsoil SILT, with minor clay, with trace rootlets; dark brown. Firm; low plasticity; moist.		1.4					
Tauranga Group Alluvium Silty CLAY, with minor organics; darkish grey. Stiff; high plasticity; moist; organics, fibrous.		1.6				69 17	
Organic CLAY, with minor silt; dark grey. Firm; high plasticity; moist; organic, fibrous.		1.8 2.0				47 31	
2.5m: Grades to stiff		2.2 2.4 2.6				61 34	
		2.8 3.0				61 38	
EOH: 3.50m		3.2 3.4				73 61	
		3.6 3.8					



REMARKS

Test pit terminated at target depth.

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- ☐ Hand Auger
- ☑ Test Pit

Ver 2. Generated with CORE-GS by Geroc - Test Pit_Initia_v1 - 5/09/2025 1:12:51 pm

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TEST PIT LOG

INITIA
GEOTECHNICAL SPECIALISTS

HOLE NO.: TP110

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1746843.0mE, 5941995.8mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 54.4m
Datum: AUCKHT1946
Level method: SURVEY
CONTRACTOR: McKenzie Contractors
MACHINE: 12 Tonne Excavator
OPERATOR: Mel
START DATE: 07/08/2025
END DATE: 07/08/2025
LOGGED BY: YK
CHECKED BY: APK

MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 0mm)	VANE SHEAR STRENGTH (kPa) Vane: 4035	Values	WATER
Fill SILT, with minor gravel, with trace clay; grey. Hard; low plasticity; moist; gravel, fine to coarse; [Limestone fill].		0.2 0.4					
Tauranga Group Alluvium CLAY, with minor silt, with trace organics; brown grey. Stiff; high plasticity; moist; organics, fibrous.		0.6 0.8 1.0 1.2				73 46 57 26	
1.5m: Grades to darkish grey with minor organics		1.4 1.6 1.8 2.0 2.2				92 46 69 31	Groundwater Not Encountered
Organic CLAY, with minor silt; dark grey. Stiff; high plasticity; moist; organic, fibrous.		2.4 2.6 2.8				89 43 73 34	
EOH: 3.00m		3.0 3.2 3.4 3.6 3.8					



REMARKS

Test pit terminated at target depth.

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- [ ] Hand Auger
- [x] Test Pit

Checked By: APK

Ver 2. Generated with CORE-GS by Geroc - Test Pit_Initia_v1 - 5/09/2025 1:13:02 pm

TEST PIT LOG

INITIA
GEOTECHNICAL SPECIALISTS

HOLE NO.: TP111

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1746776.6mE, 5941948.1mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 55.6m
Datum: AUCKHT1946
Level method: SURVEY
CONTRACTOR: McKenzie Contractors
MACHINE: 12 Tonne Excavator
OPERATOR: Mel
START DATE: 07/08/2025
END DATE: 07/08/2025
LOGGED BY: YK
CHECKED BY: APK

MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 0mm)	VANE SHEAR STRENGTH (kPa) Vane: 4035	Values	WATER
Fill 0.0m - 0.2m : ASPHALT		0.0					
Silty GRAVEL, with minor concrete fragments; grey. Dry; gravel, fine to coarse; [Tightly packed].		0.2					
		0.4					
		0.6					
		0.8					
SILT, with some gravel, with minor clay; greyish brown. Stiff; low plasticity; moist; gravel, fine to coarse.		1.0				46	
Buried Topsoil Clayey SILT, with trace rootlets; dark brown. Firm; low plasticity; moist.		1.2				18	
Tauranga Group Alluvium CLAY, with minor silt, with trace organics; grey with black speckles. Stiff; high plasticity; moist; organics, fibrous.		1.4				61	
		1.6				46	
		1.8					
2.0m: Grades to firm		2.0				46	
		2.2				40	
		2.4					
		2.6				46	
		2.8				18	
3.0m: Grades to stiff		3.0				73	
		3.2				40	
		3.4					
EOH: 3.50m		3.6				73	
		3.8				55	

Groundwater Not Encountered



REMARKS

Test pit terminated at target depth.

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- ☐ Hand Auger
- ☑ Test Pit

Ver 2. Generated with CORE-GS by Geroc - Test Pit_Initia_v1 - 5/09/2025 1:13:13 pm

Checked By: APK

TEST PIT LOG

INITIA
GEOTECHNICAL SPECIALISTS

HOLE NO.: TP112

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1746747.6mE, 5942038.9mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 55.4m
Datum: AUCKHT1946
Level method: SURVEY
CONTRACTOR: McKenzie Contractors
MACHINE: 12 Tonne Excavator
OPERATOR: Mel
START DATE: 07/08/2025
END DATE: 07/08/2025
LOGGED BY: YK
CHECKED BY: APK

MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 0mm)	VANE SHEAR STRENGTH (kPa) Vane: 4035	Values	WATER
Topsoil Clayey SILT, with trace rootlets; dark brown. Firm; low plasticity; moist.		0.0		2 4 6 8 10 12 14 16 18	50 100 150 200		
Tauranga Group Alluvium Clayey SILT; brown with grey streaks. Firm; low plasticity; moist.		0.2				28 9	
CLAY, with minor silt; brownish grey. Stiff; high plasticity; moist.		0.4				61 23	
2.1m: Grades to bluish grey		0.6				61 28	
CLAY, with minor organics and silt; darkish grey. Stiff; high plasticity; moist; organics, fibrous.		0.8				54 38	
3.0m: Grades to firm		1.0				73 46	
3.5m: Grades to stiff		1.2				76 34	
EOH: 3.50m		1.4				46 34	
		1.6				52 34	
		1.8					
		2.0					
		2.2					
		2.4					
		2.6					
		2.8					
		3.0					
		3.2					
		3.4					
		3.6					
		3.8					



REMARKS

Test pit terminated at target depth.

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- [ ] Hand Auger
- [x] Test Pit

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Checked By: APK

HAND AUGER LOG

HOLE NO.: HA01

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1747157.1mE, 5942145.4mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 54m
Datum: AUCKHT1946
Level method: SURVEY
START DATE: 21/03/2023
END DATE: 21/03/2023
LOGGED BY: FPT
CHECKED BY: BPR

UNIT	MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)
to ps oil	SILT, with minor clay, with trace rootlets; dark brown. Firm; low plasticity; moist; [Topsoil].		0.0
Tauranga Group Alluvium	Silty CLAY, with trace sand; organic stained grey. Firm; high plasticity; moist; sand, medium.		0.4
	0.6m: Grades to stiff.		0.6
	Silty CLAY; brownish grey. Stiff; high plasticity; wet.		0.8
	1.2m: Grades to firm. Trace fibrous organics.		1.2
	1.5m: Grades to stiff.		1.6
	1.8m: Grades to firm.		1.8
	SILT, with some clay, with trace sand; bluish grey. Hard; high plasticity; moist; sand, fine.		2.2
	EOH: 2.40m		2.4

LEGEND

SCALA PENETROMETER (Blows / 0mm): 2, 4, 6, 8, 10, 12, 14, 16, 18

VANE SHEAR STRENGTH (kPa) Vane: 2503A: 50, 100, 150, 200

Values
43
26
50
31
52
34
43
29
52
43
43
29
129
46

WATER: 13/03/2023



REMARKS

Practical refusal at 2.4 m - Inferred interface to underlying limestone/rock

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- [x] Hand Auger
- [ ] Test Pit

Ver 2. Generated with CORE-GS by Geroc - Hand Auger_Initia - 2/05/2023 6:47:26 pm

HAND AUGER LOG

HOLE NO.: HA03

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1747032.4mE, 5942080.2mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 54.6m
Datum: AUCKHT1946
Level method: SURVEY
START DATE: 23/03/2023
END DATE: 23/03/2023
LOGGED BY: FPT
CHECKED BY: BPR

UNIT	MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 0mm)	VANE SHEAR STRENGTH (kPa) Vane: 2503A	WATER
Topsoil	SILT, with minor clay; dark brown. Firm; low plasticity; moist; Trace rootlets.		0.0	TS			
	0.3m: grades to soft		0.2			20	
			0.4			14	
Tauranga Group Alluvium	Silty CLAY; grey, with occasional orange brown streaks. Stiff; high plasticity; moist.		0.6			29	
			0.8			17	
			1.0			79	
			1.2			20	
			1.4			74	
			1.6			16	
			1.8			69	
	1.8m: Grades to organic stained dark grey. Grades to very stiff.		2.0			29	
			2.2			110	
			2.4			57	
			2.6			155	
	2.7m: Grades to stiff.		2.8			40	
			3.0			52	
	3.0m: Grades to firm.		3.2			29	
	3.1m: grades to poor sample recovery		3.4			49	
			3.6			26	
			3.8			57	
	EOH: 4.00m		4.0			50	
			4.2			50	
			4.4			40	
			4.6				
			4.8				

23/03/2023



REMARKS

Target Depth Reached

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- [x] Hand Auger
- [ ] Test Pit

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HAND AUGER LOG

INITIA
GEOTECHNICAL SPECIALISTS

HOLE NO.: HA04

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1747085.0mE, 5942069.3mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 54.1m
Datum: AUCKHT1946
Level method: SURVEY
START DATE: 23/03/2023
END DATE: 23/03/2023
LOGGED BY: FPT
CHECKED BY: BPR

UNIT	MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 0mm)	VANE SHEAR STRENGTH (kPa) Vane: 2503A	Values	WATER
Topsoil	SILT, with minor clay; dark brown. Stiff; low plasticity; moist.		0.0	TS	2 4 6 8 10 12 14 16 18	50 100 150 200	72 20	Groundwater Not Encountered
	0.6m: Grades to firm.		0.6				46 29	
Tauranga Group Alluvium	Silty CLAY; light brownish grey. Stiff; high plasticity; moist.		0.8				72 17	
	1.3m: Grades to brownish grey.		1.3				69 43	
			1.4				60 31	
	2.2m: Grades to grey.		2.2				57 34	
			2.4				63 37	
			2.6				63 43	
	3.5m: Grades to wet.		3.5				69 46	
			3.6				80 52	
			3.8				77 57	
			4.0				83 62	
	EOH: 4.00m		4.2				80 63	



REMARKS

Target Depth Reached

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- [x] Hand Auger
- [ ] Test Pit

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HAND AUGER LOG

INITIA
GEOTECHNICAL SPECIALISTS

HOLE NO.: HA06

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1747107.3mE, 5941991.5mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 54m
Datum: AUCKHT1946
Level method: SURVEY
START DATE: 20/03/2023
END DATE: 20/03/2023
LOGGED BY: FPT
CHECKED BY: BPR

UNIT	MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 0mm)	VANE SHEAR STRENGTH (kPa) Vane: 2503A	WATER
Topsoil	SILT, with minor clay; dark brown. Firm; low plasticity; moist; trace rootlets. 0.4m - 0.7m: Some wood fragments		0.0	TS		37 20	
Tauranga Group Alluvium	Silty CLAY; greyish brown. Very stiff; high plasticity; moist. 1.2m: Grades to hard.		0.8			72 14 200+ -	
	Silty CLAY; organic stained greyish brown. Firm; high plasticity; saturated; trace wood fragments, poor sample recovery. 2.4m: Grades to stiff.		1.6			37 17 29 14 49 23 86 31	20/03/2023
	Silty CLAY; light greenish grey. Stiff; high plasticity; wet. 3.3m: Grades to very stiff.		2.4			86 72 86 66 103 72 126 79	
	EOH: 4.00m		4.0				



REMARKS

Target Depth Reached

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- [x] Hand Auger
- [ ] Test Pit

Ver 2. Generated with CORE-GS by Geroc - Hand Auger_Initia - 2/05/2023 6:47:31 pm

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HAND AUGER LOG

HOLE NO.: HA07

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1747022.6mE, 5941927.5mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 54.4m
Datum: AUCKHT1946
Level method: SURVEY
START DATE: 30/03/2023
END DATE: 30/03/2023
LOGGED BY: FPT
CHECKED BY: BPR

INITIA
GEOTECHNICAL SPECIALISTS

UNIT	MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 0mm)	VANE SHEAR STRENGTH (kPa) Vane: 2503A	WATER
Topsoil	SILT, with minor clay; dark brown. Firm; low plasticity; Trace rootlets & fibrous organics.		0.0 – 0.4	TS		Values: 40, 14	
Tauranga Group Alluvium	Silty CLAY; brownish grey, speckled black. Firm; high plasticity; wet; Trace fibrous organics.		0.4 – 1.0	TS		43, 11	
	1.5m: Grades to stiff.		1.0 – 1.2			46, 14	
	1.8m: Grades to firm.		1.2 – 1.8			46, 26	
	2.0m: Grades to saturated.		1.8 – 2.0			69, 31	
	2.1m - 2.3m: Poor sample recovery		2.0 – 2.2			46, 17	
	Clayey SILT; grey. Firm; high plasticity; saturated.		2.2 – 2.4			66, 34	
	2.7m: Grades to stiff.		2.4 – 3.6			43, 20	
	EOH: 4.00m		3.6 – 4.0			63, 34	
	3.9m: Grades to firm		4.0 – 4.8			94, 57	
						79, 52	
						50, 29	
						49, 23	

Groundwater Not Encountered



REMARKS

Target Depth Reached

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- [x] Hand Auger
- [ ] Test Pit

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HAND AUGER LOG

INITIA
GEOTECHNICAL SPECIALISTS

HOLE NO.: HA09

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1746920.6mE, 5941924.4mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 54.5m
Datum: AUCKHT1946
Level method: SURVEY
START DATE: 24/03/2023
END DATE: 24/03/2023
LOGGED BY: FPT
CHECKED BY: BPR

UNIT	MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 0mm)	VANE SHEAR STRENGTH (kPa) Vane: 2503A	Values	WATER
Topsoil	SILT, with minor clay; dark brown. Firm; low plasticity; moist.		0.0	TS	2 4 6 8 10 12 14 16 18	50 100 150 200	29 14	
	0.5m: Minor woody fragments.		0.5	TS				
Tauranga Group Alluvium	Clayey SILT, with trace organics; greyish brown. Stiff; low plasticity; moist; organics, fibrous.		0.8				31 17	24/03/2023
	0.9m: Grades to wet.		1.0					
	1.2m: Grades to stiff.		1.2				54 20	
	1.4m: Grades to poor sample recovery.		1.4				43 14	
	1.5m: Grades to firm.		1.6					
			1.8				46 17	
			2.0				46 17	
			2.2					
			2.4				43 31	
			2.6				44 29	
			2.8					
			3.0				49 30	
			3.2					
	3.3m: Grades to stiff.		3.4				63 37	
			3.6				86 57	
			3.8					
	EOH: 4.00m		4.0				83 60	
			4.2					
			4.4					
			4.6					
			4.8					



REMARKS

Target Depth Reached

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- [x] Hand Auger
- [ ] Test Pit

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Checked By: BPR

HAND AUGER LOG

HOLE NO.: HA10

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1746870.1mE, 5941871.3mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 54.5m
Datum: AUCKHT1946
Level method: SURVEY
START DATE: 22/03/2023
END DATE: 22/03/2023
LOGGED BY: FPT
CHECKED BY: BPR

INITIA
GEOTECHNICAL SPECIALISTS

UNIT	MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 0mm)	VANE SHEAR STRENGTH (kPa) Vane: 2503A	Values	WATER
Topsoil	Clayey SILT; dark brown. Firm; high plasticity; moist; trace rootlets.		0.0 – 0.6	TS			43 20 46 20	
Tauranga Group Alluvium	Silty CLAY; organic stained greyish brown. Stiff; moist.		0.6 – 3.0				63 26 92 43 122 43 110 34 89 31	21/03/2023
	1.1m: Grades to light grey							
	1.5m: Grades to very stiff.							
	2.1m: Grades to stiff.							
	2.4m: Grades to saturated.							
	2.8m: Grades to poor sample recovery. 3.0m: Grades to firm.							
	EOH: 4.00m		3.0 – 4.0				47 29 43 31 49 37 59 36	



REMARKS

Target Depth Reached

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- [x] Hand Auger
- [ ] Test Pit

Ver 2. Generated with CORE-GS by Geroc - Hand Auger_Initia - 2/05/2023 6:47:37 pm

Checked By: BPR

HAND AUGER LOG

INITIA
GEOTECHNICAL SPECIALISTS

HOLE NO.: HA11

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1746918.0mE, 5941827.2mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 54.4m
Datum: AUCKHT1946
Level method: SURVEY
START DATE: 23/03/2023
END DATE: 23/03/2023
LOGGED BY: FPT
CHECKED BY: BPR

UNIT	MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 0mm)	VANE SHEAR STRENGTH (kPa) Vane: 2503A	Values	WATER
Topsoil	SILT, with some clay; dark brown. Firm; high plasticity; moist; trace rootlets.		0.0	TS	2 4 6 8 10 12 14 16 18	50 100 150 200	43 17	
			0.2				49 20	
			0.4					
			0.6				56 29	23/03/2023
Tauranga Group Alluvium	Silty CLAY, with trace organics; light grey. Stiff; high plasticity; moist; organics, fibrous.		0.8				89 57	
			1.0					
			1.2				79 52	
			1.4					
	1.8m: Absence of organics		1.6				67 43	
			1.8					
			2.0				84 43	
			2.2					
			2.4				52 29	
	2.6m: Grades to saturated.		2.6					
			2.8				54 29	
			3.0					
			3.2					
	3.3m: Grades to firm.		3.4				41 23	
	3.5m: Grades to greenish grey.		3.6				46 20	
			3.8					
	EOH: 4.00m 3.9m: Grades to stiff.		4.0				60 43	
			4.2					
			4.4					
			4.6					
			4.8					

REMARKS

Target Depth Reached

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- [x] Hand Auger
- [ ] Test Pit

Ver 2. Generated with CORE-GS by Geroc - Hand Auger_Initia - 2/05/2023 6:47:39 pm

Checked By: BPR

HAND AUGER LOG

HOLE NO.: HA12

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1746841.2mE, 5941891.5mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 54.7m
Datum: AUCKHT1946
Level method: SURVEY
START DATE: 22/03/2023
END DATE: 22/03/2023
LOGGED BY: FPT
CHECKED BY: BPR

UNIT	MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 0mm)	VANE SHEAR STRENGTH (kPa) Vane: 2503A	Values	WATER
Topsoil	SILT, with minor clay; dark brown. Stiff; high plasticity; moist.		0.0	TS	2 4 6 8 10 12 14 16 18	50 100 150 200	74 20	
			0.2	TS			63 29	
			0.4	TS			54 26	
			0.6	TS			89 43	
			0.8	TS			72 46	
Tauranga Group Alluvium	Silty CLAY; organic stained light grey. Stiff; high plasticity; moist; trace fibrous organics.		1.0				74 49	21/03/2023
	1.0m: Grades to wet.		1.2				72 29	
	1.9m: Grades to grey, absence of fibrous organics.		1.4					
			1.6				69 37	
			1.8				74 46	
			2.0				86 60	
			2.2				129 57	
			2.4					
	2.8m: Grades to saturated		2.6					
	3.0m: Grades to poor sample recovery.		2.8					
			3.0					
			3.2					
			3.4					
			3.6					
			3.8					
	EOH: 4.00m 3.9m: Grades to very stiff.		4.0					
			4.2					
			4.4					
			4.6					
			4.8					



REMARKS

Target Depth Reached

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- [x] Hand Auger
- [ ] Test Pit

Ver 2. Generated with CORE-GS by Geroc - Hand Auger_Initia - 2/05/2023 6:47:41 pm

Checked By: BPR

HAND AUGER LOG

HOLE NO.: HA13

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1746745.4mE, 5941941.2mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 56.8m
Datum: AUCKHT1946
Level method: SURVEY
START DATE: 23/03/2023
END DATE: 23/03/2023
LOGGED BY: FPT
CHECKED BY: BPR

INITIA
GEOTECHNICAL SPECIALISTS

UNIT	MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 0mm)	VANE SHEAR STRENGTH (kPa) Vane: 2503A	Values	WATER
Top soil	SILT, with minor clay; dark brown. Firm; low plasticity; Trace rootlets.		0.0	TS	2 4 6 8 10 12 14 16 18	50 100 150 200		
Tauranga Group Alluvium	Silty CLAY; light grey, steaked orange brown. Stiff; high plasticity; moist.		0.2				74	
			0.4				43	
			0.6				89	
			0.8				40	
			1.0				79	
			1.2				46	
			1.4				80	
			1.6				43	
			1.8				86	
	2.0m: Grades to grey.		2.0				57	
			2.2				83	
			2.4				40	
			2.6				67	
	Clayey SILT; grey. Stiff; low plasticity; moist.		2.8				41	
			3.0				94	
	Silty CLAY; grey. Stiff; high plasticity; moist.		3.2				49	
			3.4				77	
	3.6m: Grades to wet.		3.6				52	
			3.8				83	
	EOH: 4.00m		4.0				43	
			4.2				72	
			4.4				43	
			4.6				77	
			4.8				43	
							69	
							29	

Groundwater Not Encountered



REMARKS

Target Depth Reached

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- [x] Hand Auger
- [ ] Test Pit

Ver 2. Generated with CORE-GS by Geroc - Hand Auger_Initia - 2/05/2023 6:47:43 pm

Checked By: BPR

HAND AUGER LOG

INITIA
GEOTECHNICAL SPECIALISTS

HOLE NO.: HA14

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1746745.1mE, 5942160.6mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 55.8m
Datum: AUCKHT1946
Level method: SURVEY
START DATE: 24/03/2023
END DATE: 24/03/2023
LOGGED BY: FPT
CHECKED BY: BPR

UNIT	MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 0mm)	VANE SHEAR STRENGTH (kPa) Vane: 2503A	Values	WATER
Top soil	SILT, with minor clay; dark brown. Firm; low plasticity; moist; Trace rootlets.		0.0	TS				
Tauranga Group Alluvium	Silty CLAY; light grey, with occasional orange brown streaks. Stiff; high plasticity; moist.		0.2				129	
			0.4				74	
			0.6				89	
			0.8				60	
			1.0				86	
			1.2				60	
			1.4				66	
	1.4m - 1.6m: Very stiff.		1.6				43	
			1.8				152	
	1.8m: Grades to grey, streaked black. Trace fibrous organics. Grades to stiff.		2.0				69	
			2.2				83	
	2.3m: Grades to greenish grey, streaked black.		2.4				54	
			2.6				62	
	2.7m: Grades to very stiff.		2.8				37	
			3.0				63	
	SILT, with some clay, with minor sand; greenish grey. Very stiff; low plasticity; moist; sand, fine to medium.		3.2				40	
			3.4				103	
			3.6				43	
			3.8				137	
	SILT, with some clay and sand; grey, speckled black. Very stiff; low plasticity; moist; sand, fine to medium; minor fibrous organics.		4.0				52	
	EOH: 4.00m		4.2				120	
			4.4				47	
			4.6				110	24/03/2023
			4.8				46	
							100	
							40	



REMARKS

Target Depth Reached

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- [x] Hand Auger
- [ ] Test Pit

Ver 2 Generated with CORE-GS by Geroc - Hand Auger_Initia - 2/05/2023 6:47:45 pm

HAND AUGER LOG

INITIA
GEOTECHNICAL SPECIALISTS

HOLE NO.: HA101

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1747099.5mE, 5942556.0mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 56m
Datum: AUCKHT1946
Level method: SURVEY
START DATE: 06/08/2025
END DATE: 06/08/2025
LOGGED BY: RJF
CHECKED BY: APK

UNIT	MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)
TS	Clayey SILT, with trace rootlets; dark brown. Firm; low plasticity; moist.		0.0
Tauranga Group Alluvium	Silty CLAY, with minor organics; orange with mottled brownish grey. Firm; high plasticity; moist; organics, amorphous.		0.4
Mahurangi Limestone	SILT, with some sand and gravel; light grey/white. Hard; non-plastic; moist; sand, coarse, gravel, fine, Limestone; [Inferred weathered Mahurangi Limestone interface]		1.2
	EOH: 1.50m		1.5

LEGEND

SCALA PENETROMETER (Blows / 50mm)

VANE SHEAR STRENGTH (kPa) Vane:

Values
33
9
29
11
UTP
-
UTP
-

WATER: Groundwater Not Encountered



REMARKS

Hand auger practical refusal at 1.1m bgl.

Scala penetrometer practical refusal at 1.9m bgl.

No groundwater was encountered.

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- [x] Hand Auger
- [ ] Test Pit

Ver 2. Generated with CORE-GS by Geroc - Hand Auger_Initia_v1 - 5/09/2025 1:16:18 pm

Checked By: APK

HAND AUGER LOG

INITIA
GEOTECHNICAL SPECIALISTS

HOLE NO.: HA102

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1747129.9mE, 5942501.5mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 59.9m
Datum: AUCKHT1946
Level method: SURVEY
START DATE: 06/08/2025
END DATE: 06/08/2025
LOGGED BY: RJF
CHECKED BY: APK

UNIT	MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)
Topsoil	Clayey SILT, with trace rootlets; dark brown. Firm; low plasticity; moist.		0.0
Tauranga Group Alluvium	Silty CLAY; brownish orange with grey mottles. Firm; high plasticity; moist.		0.4
	0.7m: Grades to brownish grey with minor decomposing wood inclusions.		0.8
angi Limes	SILT, with some sand and gravel; light grey/white. Hard; non-plastic; moist; sand, coarse, gravel, fine, Limestone; [Inferred weathered Mahurangi Limestone interface]		1.2
	EOH: 1.40m		1.4

LEGEND

SCALA PENETROMETER (Blows / 50mm): 2 4 4 4 6 8 10 10 11 11 11 12

VANE SHEAR STRENGTH (kPa) Vane: 50 100 150 200

Values
30
14
35
5
48
8
UTP
-

WATER: Groundwater Not Encountered



REMARKS

Hand auger practical refusal at 1.2m bgl.

Scala penetrometer practical refusal at 2.0m bgl.

No groundwater was encountered.

WATER
- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE
- [x] Hand Auger
- [ ] Test Pit

Ver 2. Generated with CORE-GS by Geroc - Hand Auger_Initia_v1 - 5/09/2025 1:16:21 pm

Checked By: APK

HAND AUGER LOG

INITIA
GEOTECHNICAL SPECIALISTS

HOLE NO.: HA103

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1747163.5mE, 5942442.6mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 62.8m
Datum: AUCKHT1946
Level method: SURVEY
START DATE: 06/08/2025
END DATE: 06/08/2025
LOGGED BY: RJF
CHECKED BY: APK

UNIT	MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)
Topsoil	Clayey SILT, with trace rootlets; dark brown. Firm; low plasticity; moist.		0.0 – 0.2
Tauranga Group Alluvium	Silty CLAY; brownish orange with grey mottles. Stiff; high plasticity; moist.		0.2 – 1.4
	0.9m: Moist to wet.		
rangi Limes	SILT, with some sand and gravel; light grey/white. Hard; non-plastic; moist; sand, coarse, gravel, fine, Limestone.		1.4 – 1.50
	EOH: 1.50m		

LEGEND

SCALA PENETROMETER (Blows / 50mm)

Depth (m)	Blows / 50mm
1.4 – 1.6	5, 6, 6, 6
1.6 – 1.8	7, 5, 6
1.8 – 2.0	5, 5, 3, 6
2.0 – 2.2	8, 8, 8, 13, 25 >>

VANE SHEAR STRENGTH (kPa) Vane:

Depth (m)	Values
0.2 – 0.4	93
0.4 – 0.6	44
0.6 – 0.8	59
0.8 – 1.0	26
1.0 – 1.2	86
1.2 – 1.4	27
1.4 – 1.6	UTP
1.6 – 1.8	-

WATER: 06/08/2025



REMARKS

Hand auger practical refusal at 1.5m bgl.

Scala penetrometer practical refusal at 2.25m bgl.

Groundwater measured at 1.3m bgl at the completion of drilling.

WATER

- ▼ Standing Water Level
- ◁ Out flow
- ▷ In flow

INVESTIGATION TYPE

- ☑ Hand Auger
- ☐ Test Pit

Ver 2. Generated with CORE-GS by Geroc - Hand Auger_Initia_v1 - 5/09/2025 1:16:23 pm

HAND AUGER LOG

HOLE NO.: HA104

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1747185.9mE, 5942405.4mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 63.7m
Datum: AUCKHT1946
Level method: SURVEY
START DATE: 06/08/2025
END DATE: 06/08/2025
LOGGED BY: RJF
CHECKED BY: APK

UNIT	MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 50mm)	VANE SHEAR STRENGTH (kPa) Vane: Values	WATER
Fill	Clayey SILT, with trace topsoil; orange brown with dark brown mottles. Firm; low plasticity; moist.		0.0 – 0.2				Groundwater Not Encountered
d To	Clayey SILT, with trace rootlets; dark brown. Firm; low plasticity; moist; [Buried topsoil].		0.2 – 0.4			45	
Tauranga Group Alluvium	Silty CLAY; brownish grey. Firm; high plasticity; moist.		0.4 – 0.8			21 42	
	SILT, with minor clay; light grey/white. Very stiff; low plasticity; moist.		0.8 – 1.2			17 211+	
angi Limes	SILT, with some sand and gravel; light grey/white. Hard; non-plastic; moist; sand, coarse, gravel, fine, Limestone; [Inferred weathered Mahurangi Limestone]. EOH: 1.40m		1.2 – 1.4		6, 11, 11, 12, 12, 13, 13	- UTP	
			1.4 – 4.8			-	



REMARKS

Hand auger practical refusal at 1.4m bgl.

Scala penetrometer practical refusal at 1.75m bgl.

No groundwater was encountered.

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- [x] Hand Auger
- [ ] Test Pit

Ver 2: Generated with CORE-GS by Geroc - Hand Auger_Initia_v1 - 5/09/2025 1:16:26 pm

HAND AUGER LOG

INITIA
GEOTECHNICAL SPECIALISTS

HOLE NO.: HA105

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1747234.6mE, 5941910.8mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 53.4m
Datum: AUCKHT1946
Level method: SURVEY
START DATE: 18/08/2025
END DATE: 18/08/2025
LOGGED BY: YK
CHECKED BY: APK

UNIT	MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 50mm)	VANE SHEAR STRENGTH (kPa) Vane: 3591	Values	WATER
topsoil	Clayey SILT, with trace rootlets; dark brown. Firm; low plasticity; wet.		0.0					
Tauranga Group Alluvium	Organic silty CLAY; dark grey. Stiff; high plasticity; saturated; organic, amorphous.		0.2				65	
			0.4				17	
			0.6				50	
	0.9m: Grades to firm		0.8				13	
			1.0				40	
	1.0m - 1.2m : No recovery		1.2	N/R N/R N/R N/R N/R N/R			17	
	EOH: 1.20m		1.4				32	
			1.6				12	
			1.8					
			2.0					
			2.2					
			2.4					
			2.6					
			2.8					
			3.0					
			3.2					
			3.4					
			3.6					
			3.8					
			4.0					
			4.2					
			4.4					
			4.6					
			4.8					

Scala penetrometer: 2 4 6 8 10 12 14 16 18
Vane shear strength (kPa): 50 100 150 200

18/08/2025



REMARKS

Hand auger terminated due to hole collapse.

Scala penetrometer terminated at target depth.

Groundwater measured at 0.1m bgl at the completion of drilling.

WATER

- ▼ Standing Water Level
- ◁ Out flow
- ▷ In flow

INVESTIGATION TYPE

- ☑ Hand Auger
- ☐ Test Pit

Ver 2. Generated with CORE-GS by Geroc - Hand Auger_Initia_v1 - 5/09/2025 1:16:32 pm

HAND AUGER LOG

INITIA
GEOTECHNICAL SPECIALISTS

HOLE NO.: HA106

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1747134.2mE, 5942404.0mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 61.2m
Datum: AUCKHT1946
Level method: SURVEY
START DATE: 06/08/2025
END DATE: 06/08/2025
LOGGED BY: MSB
CHECKED BY: APK

UNIT	MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 50mm)	VANE SHEAR STRENGTH (kPa) Vane: Values	WATER
Topsoil	Clayey SILT, with trace rootlets; dark brown. Firm; low plasticity; moist.		0.0				
Tauranga Group Alluvium	Silty CLAY, with minor organics; brownish grey with orange mottles. Stiff; high plasticity; moist; organics, amorphous.		0.6			82 34 81 34 79 37	Groundwater Not Encountered
gi Li	SILT, with some sand and gravel; light grey/white. Hard; non-plastic; moist; sand, coarse, gravel, fine, Limestone; [Inferred weathered Mahurangi Limestone interface]		1.2		8, 3, 2, 2, 2, 4, 7, 5, 16, 25 >>	UTP -	
	EOH: 1.20m		1.2				



REMARKS

Hand auger practical refusal at 1.2m bgl.

Scala penetrometer practical refusal at 1.7m bgl.

No groundwater was encountered.

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- [x] Hand Auger
- [ ] Test Pit

Ver 2. Generated with CORE-GS by Geroc - Hand Auger_Initia_v1 - 5/09/2025 1:16:35 pm

Checked By: APK

HAND AUGER LOG

HOLE NO.: HA107

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1747113.1mE, 5942451.9mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 59.1m
Datum: AUCKHT1946
Level method: SURVEY
START DATE: 06/08/2025
END DATE: 06/08/2025
LOGGED BY: MSB
CHECKED BY: APK

UNIT	MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)
Top soil	Clayey SILT, with trace rootlets; dark brown. Firm; low plasticity; moist.		0.0
Fill	Silty CLAY, with minor gravel; dark brown with orange and grey mottles. Stiff; high plasticity; moist; gravel, fine.		0.2
Tauranga Group Alluvium	Silty CLAY, with some decomposing organics; brownish grey with orange mottles. Stiff; high plasticity; moist.		0.4
gl Li	SILT, with some sand and gravel; light grey/white. Hard; non-plastic; moist; sand, coarse, fine, Limestone; [Inferred weathered Mahurangi Limestone interface]		1.4
	EOH: 1.40m		

LEGEND

SCALA PENETROMETER (Blows / 50mm)

Depth (m)	Blows / 50mm
0.4	4
0.6	5
0.8	8
1.0	10
1.2	10
1.4	16
	25 >>

VANE SHEAR STRENGTH (kPa) Vane:

Depth (m)	Values
0.2	67
0.4	33
0.6	60
0.8	28
1.0	59
1.2	19
1.4	99
	29
	UTP
	-

WATER: Groundwater Not Encountered



REMARKS

Hand auger practical refusal at 1.4m bgl.

Scala penetrometer practical refusal at 1.75m bgl.

No groundwater was encountered.

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- [x] Hand Auger
- [ ] Test Pit

Ver 2. Generated with CORE-GS by Geroc - Hand Auger_Initia_v1 - 5/09/2025 1:16:38 pm

Checked By: APK

HAND AUGER LOG

INITIA
GEOTECHNICAL SPECIALISTS

HOLE NO.: HA108

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1747094.3mE, 5942491.7mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 56.5m
Datum: AUCKHT1946
Level method: SURVEY
START DATE: 06/08/2025
END DATE: 06/08/2025
LOGGED BY: MSB
CHECKED BY: APK

UNIT	MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)
Topsoil	Clayey SILT, with trace rootlets; dark brown. Firm; low plasticity; moist.		0.0
Tauranga Group Alluvium	Silty CLAY; grey with orange mottles. Stiff; high plasticity; moist.		0.0
	0.6m: Grades to firm		0.6
	0.9m: Grades to stiff		0.9
	Clayey SILT, brownish grey/grey, very stiff, sensitive, moist, medium plasticity.		1.4
gl Limeston	SILT, with some sand and gravel; light grey/white. Hard; non-plastic; moist; sand, coarse, gravel, fine, Limestone; [Inferred weathered Mahurangi Limestone interface]		1.6
	EOH: 1.90m		1.9

LEGEND

SCALA PENETROMETER (Blows / 50mm): 2 4 6 8 10 12 14 16 18

VANE SHEAR STRENGTH (kPa) Vane: 50 100 150 200

Values
57
22
37
14
57
26
60
29
185
19
UTP
-

WATER: 06/08/2025



REMARKS

Hand auger practical refusal at 1.9m bgl.

Scala penetrometer practical refusal at 2.55m bgl.

Groundwater measured at 1.6m bgl at the completion of drilling.

WATER

- ▼ Standing Water Level
- ◁ Out flow
- ▷ In flow

INVESTIGATION TYPE

- ☑ Hand Auger
- ☐ Test Pit

Ver 2: Generated with CORE-GS by Geroc - Hand Auger_Initia_v1 - 5/09/2025 1:16:40 pm

Checked By: APK

HAND AUGER LOG

HOLE NO.: HA109

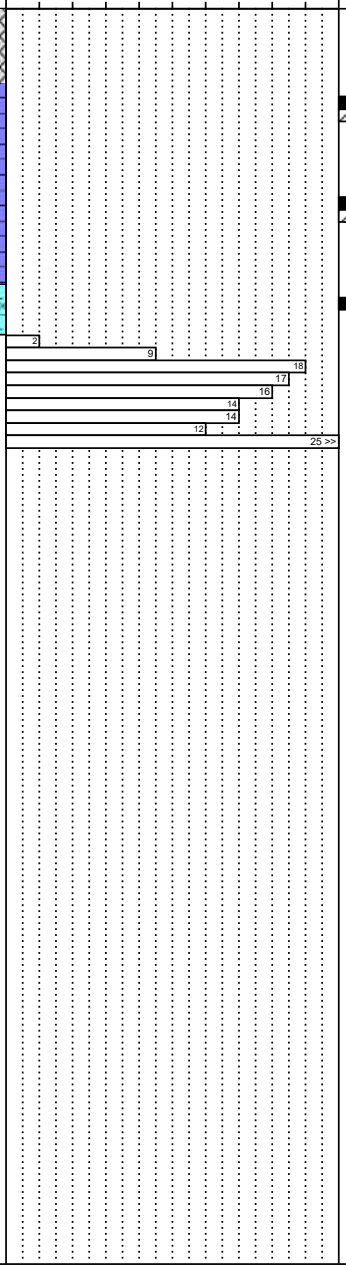
CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1747060.8mE, 5942450.4mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 53.1m
Datum: AUCKHT1946
Level method: SURVEY
START DATE: 06/08/2025
END DATE: 06/08/2025
LOGGED BY: DJP
CHECKED BY: APK

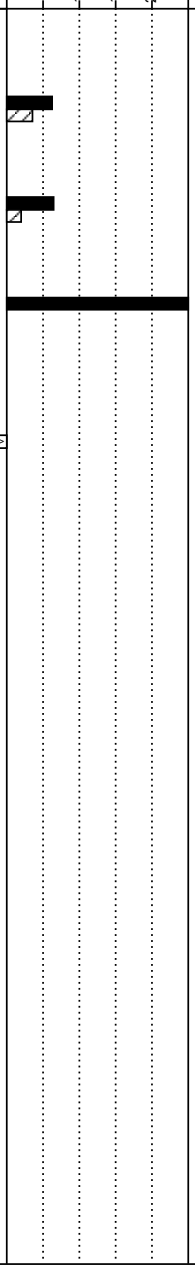
UNIT	MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)
Fill	Clayey SILT, with trace topsoil; dark brown. Firm; low plasticity; moist.		0.0
Tauranga Group Alluvium	Silty CLAY, dark brownish grey, frequent black streaks, stiff, moist to wet, high plasticity, minor limonite fragments and staining, minor carbonaceous incluisions (2-5mm).		0.4
angl Limes	SILT, with some sand and gravel; light grey. Hard; non-plastic; moist; sand, coarse, gravel, fine, Limestone; [Inferred weathered Mahurangi Limestone interface]		1.2
	EOH: 1.30m		1.3

LEGEND

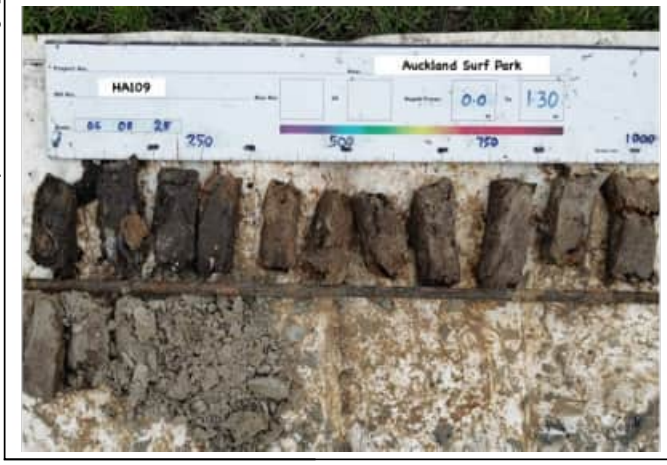
SCALA PENETROMETER (Blows / 50mm)



VANE SHEAR STRENGTH (kPa) Vane:



Values	WATER
62	Groundwater Not Encountered
35	
65	
20	
UTP	
-	



REMARKS

Hand auger practical refusal at 1.3m bgl.

Scala penetrometer practical refusal at 1.75m bgl.

No groundwater was encountered.

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- [x] Hand Auger
- [ ] Test Pit

Ver 2. Generated with CORE-GS by Geroc - Hand Auger_Initia_v1 - 5/09/2025 1:16:43 pm

Checked By: APK

HAND AUGER LOG

INITIA
GEOTECHNICAL SPECIALISTS

HOLE NO.: HA110

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1747043.2mE, 5942386.6mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 52m
Datum: AUCKHT1946
Level method: SURVEY
START DATE: 06/08/2025
END DATE: 06/08/2025
LOGGED BY: DJP
CHECKED BY: APK

UNIT	MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)
Fill	Clayey SILT, with trace topsoil; dark brown. Firm; low plasticity; moist.		0.0
Tauranga Group Alluvium	Silty CLAY, with minor organics; brownish grey. Stiff; high plasticity; moist; organics, amorphous.		0.4
Mahurangi Limestone	Clayey SILT, light brownish grey, very stiff, sensitive, moist, low to medium plasticity, minor clasts (1-5mm).		0.6
	SILT, with some sand and gravel; light grey. Hard; non-plastic; moist; sand, coarse, gravel, fine, Limestone; [Inferred weathered Mahurangi Limestone interface]		1.2
	EOH: 1.20m		

LEGEND

SCALA PENETROMETER (Blows / 50mm)
2 4 6 8 10 12 14 16 18
8
10
17
20
20
25 >>

VANE SHEAR STRENGTH (kPa)
Vane: 50 100 150 200

Values
65
8
170
11
UTP
-

WATER: Groundwater Not Encountered



REMARKS

Hand auger practical refusal at 1.2m bgl.

Scala penetrometer practical refusal at 1.5m bgl.

No groundwater was encountered.

WATER
- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE
- [x] Hand Auger
- [ ] Test Pit

Ver 2. Generated with CORE-GS by Geroc - Hand Auger_Initia_v1 - 5/09/2025 1:16:46 pm

HAND AUGER LOG

INITIA
GEOTECHNICAL SPECIALISTS

HOLE NO.: HA111

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1747023.9mE, 5942326.5mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 52m
Datum: AUCKHT1946
Level method: SURVEY
START DATE: 06/08/2025
END DATE: 06/08/2025
LOGGED BY: DJP
CHECKED BY: APK

UNIT	MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)
Topsoil	Clayey SILT, with trace rootlets; dark brown. Firm; low plasticity; moist.		0.0
Tauranga Group Alluvium	Silty CLAY; grey with orange mottles. Stiff; high plasticity; moist.		0.2 – 0.4 – 0.6 – 0.8
	0.9m: Grades to with minor clasts (1-10mm).		1.0
	1.2m: Grades to firm		1.2
	Clayey SILT, with minor clasts (1-5mm); brownish grey with orange mottles. Firm; low plasticity; moist.		1.4 – 1.6
gl Li	SILT, with some sand and gravel; light grey. Hard; non-plastic; moist; sand, coarse, gravel, fine, Limestone; [Inferred weathered Mahurangi Limestone interface]		1.8
	EOH: 1.80m		2.0 – 2.2 – 2.4 – 2.6 – 2.8 – 3.0 – 3.2 – 3.4 – 3.6 – 3.8 – 4.0 – 4.2 – 4.4 – 4.6 – 4.8

LEGEND

SCALA PENETROMETER (Blows / 50mm)
2 4 6 8 10 12 14 16 18
6 | 18 | 25 >>

VANE SHEAR STRENGTH (kPa) Vane:
50 100 150 200

Values
89
35
77
41
44
14
53
8
UTP
-

WATER
06/08/2025



REMARKS

Hand auger practical refusal at 1.8m bgl.

Scala penetrometer practical refusal at 1.95m bgl.

Groundwater measured at 1.8m bgl at the completion of drilling.

WATER
- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE
- [x] Hand Auger
- [ ] Test Pit

Ver 2. Generated with CORE-GS by Geroc - Hand Auger_Initia_v1 - 5/09/2025 1:16:48 pm

Checked By: APK

HAND AUGER LOG

INITIA
GEOTECHNICAL SPECIALISTS

HOLE NO.: HA112

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1746772.1mE, 5942103.9mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 55.2m
Datum: AUCKHT1946
Level method: SURVEY
START DATE: 18/08/2025
END DATE: 18/08/2025
LOGGED BY: YK
CHECKED BY: APK

UNIT	MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)
Topsoil	Silty CLAY, with trace rootlets; dark brown. Firm; high plasticity; wet.		0.0
Tauranga Group Alluvium	Silty CLAY; brownish grey. Stiff; high plasticity; wet.		0.0
	0.9m: Grades to saturated		0.9
	1.4m: Grades to grey		1.4
	EOH: 2.40m		2.4

LEGEND

SCALA PENETROMETER (Blows / 50mm)

VANE SHEAR STRENGTH (kPa) Vane: 3591

Values
50
13
100
70
88
82
100
50
70
52
83
48
82
53
100
50

WATER: 18/08/2025



REMARKS

Hand auger terminated due to hole collapse.

Scala penetrometer terminated at target depth.

Groundwater measured at 0.1m bgl at the completion of drilling.

WATER
- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE
- [x] Hand Auger
- [ ] Test Pit

Ver 2. Generated with CORE-GS by Geroc - Hand Auger_Initia_v1 - 5/09/2025 1:16:54 pm

Checked By: APK

HAND AUGER LOG

INITIA
GEOTECHNICAL SPECIALISTS

HOLE NO.: HA113

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1747061.0mE, 5942233.4mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 54.2m
Datum: AUCKHT1946
Level method: SURVEY
START DATE: 06/08/2025
END DATE: 06/08/2025
LOGGED BY: MSB
CHECKED BY: APK

UNIT	MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)
Topsoil	Clayey SILT; dark brown. Firm; low plasticity; moist.		0.0
Tauranga Group Alluvium	Silty CLAY; orange with light brown mottles. Stiff; high plasticity; moist.		0.4
	0.6m: Grades to light brownish grey with minor organics, firm.		0.6
	0.9m: Grades to stiff.		1.0
	1.2m: Grades to stiff		1.2
	1.5m: Grades to Stiff.		1.6
	Clayey SILT; light brownish grey with orange mottles. Stiff; low plasticity; moist to wet.		1.8
	2.1m: Grades to very stiff.		2.2
	Clayey SILT; bluish grey/grey. Very stiff; low plasticity; wet.		2.4
	3.0m: Grades to Stiff, saturated.		3.0
	3.3m: Grades to hard.		3.4
	EOH: 4.00m		4.0

LEGEND

SCALA PENETROMETER (Blows / 50mm)

VANE SHEAR STRENGTH (kPa) Vane:

Values
67
37
48
16
51
37
43
16
71
17
95
19
119
26
123
22
121
20
87
20
217+
-
UTP
-
217+
-

WATER: 06/08/2025



REMARKS

Hand auger terminated at target depth.

Scala penetrometer terminated at target depth.

Groundwater measured at 2.3m bgl at the completion of drilling.

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- [x] Hand Auger
- [ ] Test Pit

Ver 2: Generated with CORE-GS by Geroc - Hand Auger_Initia_v1 - 5/09/2025 1:16:56 pm

Checked By: APK

HAND AUGER LOG

INITIA
GEOTECHNICAL SPECIALISTS

HOLE NO.: HA114

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1747110.8mE, 5942202.7mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 56.1m
Datum: AUCKHT1946
Level method: SURVEY
START DATE: 06/08/2025
END DATE: 06/08/2025
LOGGED BY: RJF
CHECKED BY: APK

UNIT	MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)
Top soil	Clayey SILT, with trace rootlets; dark brown. Firm; low plasticity; moist.		0.0
Tauranga Group Alluvium	Silty CLAY, with minor organics; brownish grey. Firm; high plasticity; moist; organics, amorphous.		0.2 – 0.8
rangi Limes	SILT, with some sand and gravel; light grey/white. Hard; non-plastic; moist; sand, coarse, gravel, fine, Limestone; [Inferred weathered Mahurangi Limestone interface]		1.0
	EOH: 1.10m		1.2

LEGEND

SCALA PENETROMETER (Blows / 50mm)
2 4 6 8 10 12 14 16 18
5
17
25 >>

VANE SHEAR STRENGTH (kPa)
Vane: 50 100 150 200

Values
42
24
47
23
UTP
-

WATER: Groundwater Not Encountered



REMARKS

Hand auger practical refusal at 1.1m bgl.

Scala penetrometer practical refusal at 1.25m bgl.

No groundwater was encountered.

WATER
- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE
- [x] Hand Auger
- [ ] Test Pit

Ver 2: Generated with CORE-GS by Geroc - Hand Auger_Initia_v1 - 5/09/2025 1:16:59 pm

HAND AUGER LOG

HOLE NO.: HA115

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1747086.8mE, 5942386.9mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 58m
Datum: AUCKHT1946
Level method: SURVEY
START DATE: 06/08/2025
END DATE: 06/08/2025
LOGGED BY: DJP
CHECKED BY: APK

UNIT	MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)
Topsoil	Clayey SILT, with trace rootlets; dark brown. Firm; low plasticity; moist.		0.0 – 0.2
Tauranga Group Alluvium	Silty CLAY; brownish grey with orange mottles. Stiff; high plasticity; moist.		0.2 – 0.8
Tauranga Group Alluvium	Clayey SILT; dark brownish grey with black streaks. Firm; low plasticity; moist.		0.8 – 1.2
gl Li	SILT, with some sand and gravel; grey. Hard; non-plastic; moist; sand, coarse, gravel, fine, Limestone; [Inferred weathered Mahurangi Limestone interface] EOH: 1.40m		1.2 – 1.4

LEGEND

SCALA PENETROMETER (Blows / 50mm): 2 4 6 8 10 12 14 16 18
Scala blows: 11 | 14 | 14 | 15 | 25 >>

VANE SHEAR STRENGTH (kPa) Vane: 50 100 150 200

Values
62
23
59
17
54
15
UTP
-

WATER: Groundwater Not Encountered



REMARKS

Hand auger practical refusal at 1.4m bgl.

Scala penetrometer practical refusal at 1.65m bgl.

No groundwater was encountered.

WATER
- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE
- [x] Hand Auger
- [ ] Test Pit

Ver 2. Generated with CORE-GS by Geroc - Hand Auger_Initia_v1 - 5/09/2025 1:17:02 pm

Checked By: APK

HAND AUGER LOG

INITIA
GEOTECHNICAL SPECIALISTS

HOLE NO.: HA116

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1747102.0mE, 5942359.1mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 59.4m
Datum: AUCKHT1946
Level method: SURVEY
START DATE: 06/08/2025
END DATE: 06/08/2025
LOGGED BY: DJP
CHECKED BY: APK

UNIT	MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)	LEGEND
Fill	Clayey SILT, with trace topsoil; dark brown. Firm; low plasticity; moist.		0.0 – 0.4	
Tauranga Group Alluvium	Silty CLAY, with minor organics; brownish grey with orange mottles. Firm; high plasticity; moist; organics, amorphous.		0.4 – 1.2	
rangi Limes	SILT, with some sand and gravel; grey. Hard; non-plastic; moist; sand, coarse, gravel, fine, Limestone; [Inferred weathered Mahurangi Limestone interface] EOH: 1.20m		1.2 – 1.4	

SCALA PENETROMETER (Blows / 50mm)
2 4 6 8 10 12 14 16 18
3 3 4 4 13 25 >>

VANE SHEAR STRENGTH (kPa)
Vane: 50 100 150 200

Values
44
17
158
8
UTP
-

WATER
Groundwater Not Encountered



REMARKS

Hand auger practical refusal at 1.2m bgl.

Scala penetrometer practical refusal at 1.5m bgl.

No groundwater was encountered.

WATER
- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE
- [x] Hand Auger
- [ ] Test Pit

Ver 2: Generated with CORE-GS by Geroc - Hand Auger_Initia_v1 - 5/09/2025 1:17:05 pm

Checked By: APK

HAND AUGER LOG

HOLE NO.: HA117

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1747060.0mE, 5942350.3mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 56.1m
Datum: AUCKHT1946
Level method: SURVEY
START DATE: 06/08/2025
END DATE: 06/08/2025
LOGGED BY: MG
CHECKED BY: APK

UNIT	MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)
Topsoil	Clayey SILT, with trace rootlets; dark brown. Firm; low plasticity; moist.		0.0 – 0.2
Tauranga Group Alluvium	Silty CLAY, with minor carbonaceous; orange with brownish grey mottles. Firm; high plasticity; moist.		0.2 – 0.8
Tauranga Group Alluvium	Clayey SILT; brownish grey. Firm; low plasticity; moist.		0.8 – 1.2
Mahurangi Limestone	SILT, with some sand and gravel; grey. Hard; non-plastic; moist; sand, coarse, gravel, fine, Limestone; [Inferred weathered Mahurangi Limestone interface] EOH: 1.60m		1.2 – 1.6

LEGEND

SCALA PENETROMETER (Blows / 50mm): 3; 16; 17; 17; 25 >>

VANE SHEAR STRENGTH (kPa) Vane:

Values
39
17
36
7
33
11
UTP
-

WATER: Groundwater Not Encountered



REMARKS

Hand auger practical refusal at 1.6m bgl.

Scala penetrometer practical refusal t 1.85m bgl.

No groundwater was encountered.

WATER
- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE
- [x] Hand Auger
- [ ] Test Pit

Ver 2. Generated with CORE-GS by Geroc - Hand Auger_Initia_v1 - 5/09/2025 1:17:07 pm

Checked By: APK

HAND AUGER LOG

HOLE NO.: HA118

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1747089.1mE, 5942268.4mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 57.5m
Datum: AUCKHT1946
Level method: SURVEY
START DATE: 06/08/2025
END DATE: 06/08/2025
LOGGED BY: MSB
CHECKED BY: APK

UNIT	MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)
Topsoil	Clayey SILT, with trace rootlets; dark brown. Firm; low plasticity; moist.		0.0
Tauranga Group Alluvium	Silty CLAY; brownish grey with orange mottles. Very stiff; high plasticity; moist.		0.0
	0.6m: Grades to stiff.		0.6
Li	SILT, with some sand and gravel; grey. Hard; moist; sand, coarse, gravel, fine, Limestone; [Inferred weathered Mahurangi Limestone interface]		1.0
	EOH: 1.10m		1.1

LEGEND

SCALA PENETROMETER (Blows / 50mm): 6, 6, 6, 5, 3, 3, 8, 13, 19, 25 >>

VANE SHEAR STRENGTH (kPa) Vane:

Values
177
37
76
28
73
25
UTP
-

WATER: Groundwater Not Encountered



REMARKS

Hand auger practical refusal at 1.1m bgl.

Scala penetrometer practical refusal at 1.6m bgl.

No groundwater was encountered

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- [x] Hand Auger
- [ ] Test Pit

Ver 2. Generated with CORE-GS by Geroc - Hand Auger_Initia_v1 - 5/09/2025 1:17:10 pm

Checked By: APK

HAND AUGER LOG

INITIA
GEOTECHNICAL SPECIALISTS

HOLE NO.: HA119

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1747126.8mE, 5942308.9mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 60.2m
Datum: AUCKHT1946
Level method: SURVEY
START DATE: 06/08/2025
END DATE: 06/08/2025
LOGGED BY: RJF
CHECKED BY: APK

UNIT	MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)
Fill	Clayey SILT, with trace topsoil; dark brown. Firm; low plasticity; moist.		0.0
Tauranga Group Alluvium	Silty CLAY, with minor organics; orange with brownish grey mottles. Stiff; high plasticity; moist; organics, amorphous.		0.4
	0.8m: Grades to firm.		0.8
	1.2m: Grades to stiff.		1.2
rangi Limes	SILT, with some sand and gravel; light grey. Hard; non-plastic; moist; sand, coarse, gravel, fine, Limestone; [Inferred weathered Mahurangi Limestone interface]		1.4
	EOH: 1.50m		1.6

LEGEND

SCALA PENETROMETER (Blows / 50mm)
2 4 6 8 10 12 14 16 18
8 8 12 13 15 16 18 21 >>

VANE SHEAR STRENGTH (kPa)
Vane: 50 100 150 200

Values
54
18
44
17
78
18
UTP
-

WATER: Groundwater Not Encountered



REMARKS

Hand auger practical refusal at 1.5m bgl.

Scala penetrometer practical refusal at 1.9m bgl.

No groundwater was encountered.

WATER
- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE
- [x] Hand Auger
- [ ] Test Pit

Ver 2. Generated with CORE-GS by Geroc - Hand Auger_Initia_v1 - 5/09/2025 1:17:12 pm

Checked By: APK

HAND AUGER LOG

INITIA
GEOTECHNICAL SPECIALISTS

HOLE NO.: HA120

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1747136.1mE, 5942235.1mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 58.2m
Datum: AUCKHT1946
Level method: SURVEY
START DATE: 06/08/2025
END DATE: 06/08/2025
LOGGED BY: RJF
CHECKED BY: APK

UNIT	MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)
Top soil	Clayey SILT, with trace rootlets; dark brown. Firm; low plasticity; moist.		0.0
Tauranga Group Alluvium	Silty CLAY, with some limonite fragments and staining; orange with grey mottles. Firm; high plasticity; moist.		0.2
	0.6m: Grades to brownish grey with orange mottles, with minor amorphous organics, stiff.		0.4
			0.6
			0.8
gi Limeston	SILT, with some sand and gravel; light grey/white. Hard; non-plastic; moist; sand, coarse, gravel, fine, Limestone; [Inferred weathered Mahurangi Limestone interface]		1.0
	EOH: 1.20m		1.2
			1.4
			1.6
			1.8
			2.0
			2.2
			2.4
			2.6
			2.8
			3.0
			3.2
			3.4
			3.6
			3.8
			4.0
			4.2
			4.4
			4.6
			4.8

LEGEND: TS

SCALA PENETROMETER (Blows / 50mm)
2 4 6 8 10 12 14 16 18
9, 11, 13, 12, 12, 13, 13

VANE SHEAR STRENGTH (kPa) Vane:
50 100 150 200

Values
48
20
69
17
UTP
-

WATER
Groundwater Not Encountered



REMARKS

Hand auger practical refusal at 1.2m bgl.

Scala penetrometer practical refusal at 1.55m bgl.

No groundwater was encountered.

WATER
- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE
- [x] Hand Auger
- [ ] Test Pit

Ver 2. Generated with CORE-GS by Geroc - Hand Auger_Initia_v1 - 5/09/2025 1:17:15 pm

HAND AUGER LOG

HOLE NO.: HA121

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1747052.1mE, 5942291.2mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 55.5m
Datum: AUCKHT1946
Level method: SURVEY
START DATE: 06/08/2025
END DATE: 06/08/2025
LOGGED BY: DJP
CHECKED BY: APK

UNIT	MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)
p s	Clayey SILT, with trace rootlets; dark brown. Firm; low plasticity; moist.		0.0
Tauranga Group Alluvium	Silty CLAY; orange with light brownish grey mottles. Stiff; high plasticity; moist.		0.4
	Clayey SILT; light brownish grey with orange mottles. Stiff; low plasticity; wet.		1.2
	1.6m: Grades to with minor decomposing wood inclusions.		1.6
	1.9m: Grades to firm, saturated.		1.9
	Clayey SILT; grey. Hard; low plasticity; wet.		2.8
	3.2m: Grades to stiff.		3.2
	3.6m: Grades to very stiff.		3.6
	3.9m: Grades to stiff.		3.9
	SILT, with some clay; bluish grey. Hard; low plasticity; saturated.		4.6
	EOH: 4.80m		4.8

SCALA PENETROMETER (Blows / 50mm): 2 4 6 8 10 12 14 16 18

VANE SHEAR STRENGTH (kPa) Vane: 50 100 150 200

Values
65
29
50
20
50
23
62
14
35
8
38
11
211+
-
65
17
143
20
80
23
65
14
UTP
-

WATER: 05/08/2025



REMARKS

Hand auger practical refusal at 4.8m bgl.

Scala penetrometer terminated at target depth.

Groundwater measured at 2.2m bgl at the completion of drilling.

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- [x] Hand Auger
- [ ] Test Pit

Ver 2. Generated with CORE-GS by Geroc - Hand Auger_Initia_v1 - 5/09/2025 1:17:17 pm

Checked By: APK

HAND AUGER LOG

HOLE NO.: HA122

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1746968.4mE, 5941564.3mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 53.9m
Datum: AUCKHT1946
Level method: SURVEY
START DATE: 06/08/2025
END DATE: 06/08/2025
LOGGED BY: YK
CHECKED BY: APK

UNIT	MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)
Topsoil	Silty CLAY, with trace rootlets; dark brown. Firm; high plasticity; moist.		0.0
Tauranga Group Alluvium	CLAY, with minor silt; brownish grey. Firm; high plasticity; moist.	D	0.6
	0.9m: Grades to stiff		1.0
	1.2m: Grades to firm		1.2
	1.5m: Grades to stiff		1.6
	1.8m: Grades to with trace organics, firm. Organics; Fibrous		1.8
	2.1m: Grades to stiff		2.2
	EOH: 2.50m		2.5

SCALA PENETROMETER (Blows / 50mm): 2, 4, 6, 8, 10, 12, 14, 16, 18

VANE SHEAR STRENGTH (kPa) Vane: 4035: 50, 100, 150, 200

Values
46
31
46
34
69
38
46
31
54
34
46
28
61
34
64
31

WATER: 06/08/2025



REMARKS

Hand auger terminated due to hole collapse/excess suction.

Scala penetrometer practical refusal at 4.1m bgl.

Groundwater measured at 1.5m bgl at the completion of drilling.

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- [x] Hand Auger
- [ ] Test Pit

Ver 2. Generated with CORE-GS by Geroc - Hand Auger_Initia_v1 - 5/09/2025 1:17:20 pm

Checked By: APK

HAND AUGER LOG

HOLE NO.: HA123

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1747021.1mE, 5941572.7mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 55.9m
Datum: AUCKHT1946
Level method: SURVEY
START DATE: 06/08/2025
END DATE: 06/08/2025
LOGGED BY: YK
CHECKED BY: APK

UNIT	MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)
Topsoil	Silty CLAY, with trace rootlets; dark brown. Firm; high plasticity; moist.		0.0
Fill	Clayey SILT; grey with orange brown mottles. Stiff; low plasticity; moist.		0.2
Tauranga Group Alluvium	Silty CLAY; brownish grey. Firm; high plasticity; moist.	D	0.6
	0.9m: Grades to very stiff		0.8
gi Li	SILT, with minor clay and gravel; brownish grey. Very stiff; low plasticity; moist; gravel, fine to medium; [Inferred weathered Mahurangi Limestone interface]. EOH: 1.10m		1.0

SCALA PENETROMETER (Blows / 50mm): 6, 6, 7, 7, 8, 9, 10, 21 >>

VANE SHEAR STRENGTH (kPa) Vane: 4035

Values
84
46
46
31
115
54

WATER: Groundwater Not Encountered



REMARKS

Hand auger practical refusal at 1.1m bgl.

Scala penetrometer practical refusal at 1.5m bgl.

No groundwater was encountered.

WATER
- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE
- [x] Hand Auger
- [ ] Test Pit

Ver 2. Generated with CORE-GS by Geroc - Hand Auger_Initia_v1 - 5/09/2025 1:17:23 pm

Checked By: APK

HAND AUGER LOG

INITIA
GEOTECHNICAL SPECIALISTS

HOLE NO.: HA124

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1747076.8mE, 5941701.4mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 55.2m
Datum: AUCKHT1946
Level method: SURVEY
START DATE: 06/08/2025
END DATE: 06/08/2025
LOGGED BY: RJF
CHECKED BY: APK

UNIT	MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)
Topsoil	Clayey SILT, with trace rootlets; dark brown. Firm; low plasticity; moist.		0.0 – 0.2
Tauranga Group Alluvium	Clayey SILT, with some gum fragments; brownish grey. Stiff; low plasticity; moist.		0.2 – 0.4
Tauranga Group Alluvium	Silty CLAY, with minor organics; orange with grey mottles. Firm; high plasticity; moist; organics, amorphous.		0.4 – 1.2
Tauranga Group Alluvium	Clayey SILT; brownish grey. Firm; low plasticity; wet.		1.2 – 1.6
Waitemata Limestone	SILT, with some sand and gravel; light grey/white. Hard; non-plastic; moist; sand, coarse, gravel, fine, Limestone; [Inferred weathered Mahurangi Limestone interface] EOH: 1.70m		1.6 – 1.70

LEGEND

SCALA PENETROMETER (Blows / 50mm)
2 4 6 8 10 12 14 16 18
7 12 13 16 18 20 23 >>

VANE SHEAR STRENGTH (kPa) Vane:
50 100 150 200

Values
84
42
39
14
47
12
UTP
-

WATER: 06/08/2025



REMARKS

Hand auger practical refusal at 1.7m bgl.

Scala penetrometer practical refusal at 2.1m bgl.

Groundwater measured at 1.6m bgl at the completion of drilling.

WATER
- ▼ Standing Water Level
- ◁ Out flow
- ▷ In flow

INVESTIGATION TYPE
- ☑ Hand Auger
- ☐ Test Pit

Ver 2. Generated with CORE-GS by Geroc - Hand Auger_Initia_v1 - 5/09/2025 1:17:25 pm

Checked By: APK

HAND AUGER LOG

HOLE NO.: HA125

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1746979.3mE, 5941601.4mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 54m
Datum: AUCKHT1946
Level method: SURVEY
START DATE: 05/08/2025
END DATE: 05/08/2025
LOGGED BY: YK
CHECKED BY: APK

UNIT	MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)
Topsoil	Silty CLAY, with trace rootlets; dark brown. Firm; high plasticity; moist.		0.0
Tauranga Group Alluvium	CLAY, with minor silt; brownish grey. Stiff; high plasticity; moist.		
	0.6m: Grades to firm		0.6
angi Limes	SILT, with minor clay and gravel; grey. Hard; low plasticity; moist; gravel, fine to medium; [Inferred weathered Mahurangi Limestone interface].		1.8
	EOH: 1.80m		

SCALA PENETROMETER (Blows / 50mm): 2 4 6 8 10 12 14 16 18
Scala values: 8, 9, 14, 25 >>

VANE SHEAR STRENGTH (kPa) Vane: 4035: 50 100 150 200

Values
50
32
43
31
34
28
31
23
46
28
UTP
-

WATER: 05/08/2025



REMARKS

Hand auger practical refusal at 1.8m bgl.

Scala penetrometer practical refusal at 2.0m bgl.

Groundwater measured at 0.7m bgl at the completion of drilling.

WATER
- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE
- [x] Hand Auger
- [ ] Test Pit

Ver 2. Generated with CORE-GS by Geroc - Hand Auger_Initia_v1 - 5/09/2025 1:17:28 pm

Checked By: APK

HAND AUGER LOG

HOLE NO.: HA126

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1746987.1mE, 5941630.7mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 54m
Datum: AUCKHT1946
Level method: SURVEY
START DATE: 05/08/2025
END DATE: 05/08/2025
LOGGED BY: YK
CHECKED BY: APK

UNIT	MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)
Topsoil	Silty CLAY, with trace rootlets; dark brown. Firm; high plasticity; moist.		0.0
Tauranga Group Alluvium	Silty CLAY; grey. Very stiff; high plasticity; moist.	D	0.4
	CLAY, with minor silt; brownish grey. Firm; high plasticity; moist.		1.0
gi Limeston	SILT, with minor clay and sand; brownish grey. Hard; low plasticity; moist; sand, fine to medium; [Inferred weathered Mahurangi Limestone interface].		1.6
	EOH: 1.80m		1.8

SCALA PENETROMETER (Blows / 50mm): 14, 20

VANE SHEAR STRENGTH (kPa) Vane: 4035

Values
101
55
107
49
46
31
73
23
214+
-
UTP
-

WATER: 05/08/2025



REMARKS

Hand auger practical refusal at 1.8m bgl.

Scala penetrometer practical refusal at 1.9m bgl.

Groundwater measured at 0.8m bgl at the completion of drilling.

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- [x] Hand Auger
- [ ] Test Pit

Ver 2. Generated with CORE-GS by Geroc - Hand Auger_Initia_v1 - 5/09/2025 1:17:30 pm

Checked By: APK

HAND AUGER LOG

INITIA
GEOTECHNICAL SPECIALISTS

HOLE NO.: HA127

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1747012.3mE, 5941730.5mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 54.1m
Datum: AUCKHT1946
Level method: SURVEY
START DATE: 06/08/2025
END DATE: 06/08/2025
LOGGED BY: MSB
CHECKED BY: APK

UNIT	MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)
Top soil	Clayey SILT, with trace rootlets; dark brown. Firm; low plasticity; moist.		0.0
Fill	GRAVEL; white. Dense; moist; gravel, fine, Limestone.		0.2
Fill	Clayey SILT, with trace topsoil; dark brown. Firm; low plasticity; moist.		0.4
Buried Topsoil	Clayey SILT; dark brown. Soft; low plasticity; moist; [Buried topsoil].		1.0
Tauranga Group Alluvium	Silty CLAY; brown with brownish grey mottles. Soft; high plasticity; wet.		1.2
Tauranga Group Alluvium	1.7m: Grades to with minor decomposing wood inclusions, firm, saturated.		1.6
Tauranga Group Alluvium	3.3m: Grades to stiff.		3.2
Mahurangi Limestone	Clayey SILT, with some sand and gravel; grey. Hard; low plasticity; moist; sand, coarse, gravel, fine, Limestone; [Inferred weathered Mahurangi Limestone interface]. EOH: 4.00m		3.6

LEGEND: TS (Topsoil)

SCALA PENETROMETER (Blows / 50mm): 2 4 6 8 10 12 14 16 18

VANE SHEAR STRENGTH (kPa) Vane: 50 100 150 200

Values
UTP
-
31
8
26
5
19
8
14
3
34
8
28
16
31
17
29
12
45
6
60
17
217+
-
UTP
-

WATER: 06/08/2025



REMARKS

Hand auger terminated at target depth.

Scala penetrometer practical refusal at 4.75m bgl.

Groundwater measured at 1.1m bgl at the completion of drilling.

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- [x] Hand Auger
- [ ] Test Pit

Ver 2. Generated with CORE-GS by Geroc - Hand Auger_Initia_v1 - 5/09/2025 1:17:33 pm

Checked By: APK

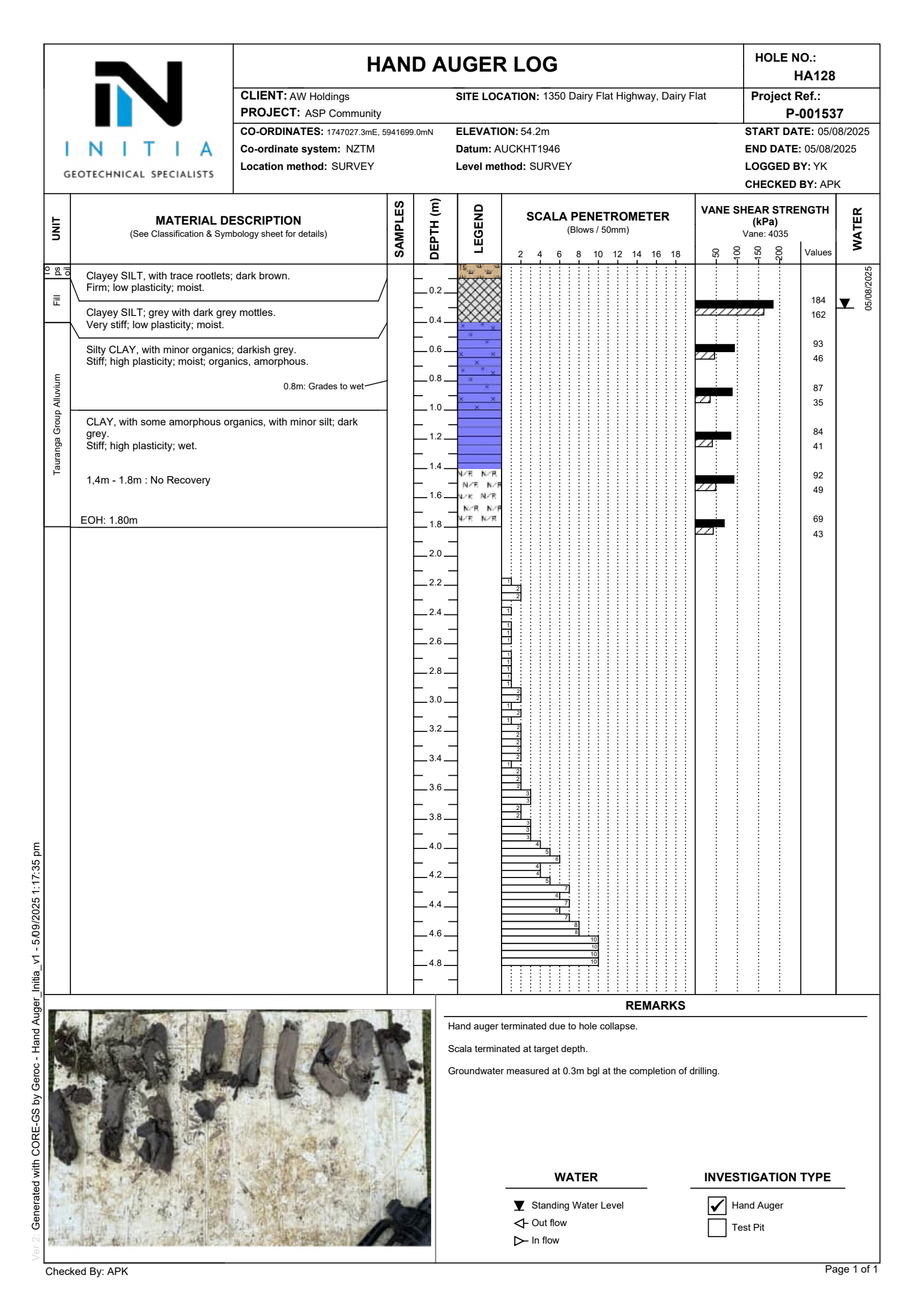
HAND AUGER LOG

HOLE NO.: HA128

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1747027.3mE, 5941699.0mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 54.2m
Datum: AUCKHT1946
Level method: SURVEY
START DATE: 05/08/2025
END DATE: 05/08/2025
LOGGED BY: YK
CHECKED BY: APK

UNIT	MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)
Topsoil	Clayey SILT, with trace rootlets; dark brown. Firm; low plasticity; moist.		0.0
Fill	Clayey SILT; grey with dark grey mottles. Very stiff; low plasticity; moist.		0.2
Tauranga Group Alluvium	Silty CLAY, with minor organics; darkish grey. Stiff; high plasticity; moist; organics, amorphous.		0.4
	0.8m: Grades to wet		0.6
	CLAY, with some amorphous organics, with minor silt; dark grey. Stiff; high plasticity; wet.		0.8
	1,4m - 1.8m : No Recovery		1.0
	EOH: 1.80m		1.2
			1.4
			1.6
			1.8
			2.0
			2.2
			2.4
			2.6
			2.8
			3.0
			3.2
			3.4
			3.6
			3.8
			4.0
			4.2
			4.4
			4.6
			4.8



REMARKS

Hand auger terminated due to hole collapse.

Scala terminated at target depth.

Groundwater measured at 0.3m bgl at the completion of drilling.

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- [x] Hand Auger
- [ ] Test Pit

Ver 2. Generated with CORE-GS by Geroc - Hand Auger_Initia_v1 - 5/09/2025 1:17:35 pm

Checked By: APK

HAND AUGER LOG

INITIA
GEOTECHNICAL SPECIALISTS

HOLE NO.: HA129

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1747061.3mE, 5941734.4mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 54.1m
Datum: AUCKHT1946
Level method: SURVEY
START DATE: 06/08/2025
END DATE: 06/08/2025
LOGGED BY: MSB
CHECKED BY: APK

UNIT	MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)
Topsoil	Clayey SILT; dark brown. Firm; low plasticity; moist.		0.0
Tauranga Group Alluvium	Silty CLAY, with minor organics; brownish grey with orange mottles. Stiff; high plasticity; moist; organics, amorphous.		0.2
	0.4m: Grades to light grey		0.4
	0.6m: Grades to firm		0.6
	0.9m: Grades to stiff		0.8
			1.0
			1.2
			1.4
			1.6
Mahurangi Limestone	Clayey SILT, with minor gravel; brownish grey. Hard; low plasticity; moist; gravel, fine to medium, Limestone.		1.8
	SILT, with some sand and gravel; grey. Hard; non-plastic; moist; sand, coarse, gravel, fine, Limestone; [Inferred weathered Mahurangi Limestone interface]		2.0
	EOH: 2.30m		2.2
			2.4
			2.6
			2.8
			3.0
			3.2
			3.4
			3.6
			3.8
			4.0
			4.2
			4.4
			4.6
			4.8

LEGEND

SCALA PENETROMETER (Blows / 50mm)
2 4 6 8 10 12 14 16 18
7 7 8 7 12 13 15 20 22 >> 24 >>

VANE SHEAR STRENGTH (kPa)
Vane: 50 100 150 200

Values
51
17
48
19
53
20
53
14
50
5
217+
-
UTP
-

WATER



REMARKS

Hand auger practical refusal at 2.3m bgl.

Scala penetrometer practical refusal at 2.8m bgl.

Groundwater inflow measured at 1.5m bgl.

WATER
- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE
- [x] Hand Auger
- [ ] Test Pit

Ver 2. Generated with CORE-GS by Geroc - Hand Auger_Initia_v1 - 5/09/2025 1:17:38 pm

Checked By: APK

HAND AUGER LOG

HOLE NO.: HA130

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1747111.3mE, 5941673.1mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 57.1m
Datum: AUCKHT1946
Level method: SURVEY
START DATE: 06/08/2025
END DATE: 06/08/2025
LOGGED BY: RJF
CHECKED BY: APK

UNIT	MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)	LEGEND
Fill	Clayey SILT, with trace topsoil; dark brown. Stiff; low plasticity; moist.		0.0 – 0.6	
Tauranga Group Alluvium	Silty CLAY; brownish grey with brown mottles. Stiff; high plasticity; moist.		0.6 – 0.8	
rangi Limes	SILT, with some sand and gravel; ligjht grey/white. Hard; non-plastic; moist; sand, coarse, gravel, fine, Limestone; [Inferred weathered Mahurangi Limestone interface]		0.8 – 1.10	
	EOH: 1.10m		1.10	

SCALA PENETROMETER (Blows / 50mm)

Depth (m)	Blows / 50mm
1.0 – 1.2	4
1.2 – 1.4	5
1.4 – 1.6	8
1.6 – 1.8	9
1.8 – 2.0	7
2.0 – 2.2	11
2.2 – 2.4	25 >>

VANE SHEAR STRENGTH (kPa) Vane:

Depth (m)	Values
0.4 – 0.6	66
	18
0.8 – 1.0	57
	14
1.0 – 1.2	UTP
	-

WATER: Groundwater Not Encountered



REMARKS

Hand auger practical refusal at 1.1m bgl.

Scala penetrometer practical refusal at 1.45m bgl.

No groundwater was encountered.

WATER
- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE
- [x] Hand Auger
- [ ] Test Pit

Ver 2. Generated with CORE-GS by Geroc - Hand Auger_Initia_v1 - 5/09/2025 1:17:40 pm

Checked By: APK

HAND AUGER LOG

HOLE NO.: HA131

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1747145.8mE, 5941574.3mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 60.3m
Datum: AUCKHT1946
Level method: SURVEY
START DATE: 06/08/2025
END DATE: 05/08/2025
LOGGED BY: YK
CHECKED BY: APK

UNIT	MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)
Topsoil	Silty CLAY, with trace rootlets; dark brown. Firm; high plasticity; moist.		0.0
Tauranga Group Alluvium	Silty CLAY; brownish grey. Stiff; high plasticity; moist.	D	0.4
Mahurangi Limestone	SILT, with minor clay and gravel; grey. Very stiff; low plasticity; moist; gravel, fine to medium; [Inferred weathered Mahurangi Limestone interface].		1.2
	EOH: 1.20m		

LEGEND

SCALA PENETROMETER (Blows / 50mm)
2 4 6 8 10 12 14 16 18
3 4 6 6 6 7 6 7 9 13 22 >>

VANE SHEAR STRENGTH (kPa)
Vane: 4035
50 100 150 200

Values
76
46
84
61
184
61
199
80

WATER: Groundwater Not Encountered



REMARKS

Hand auger practical refusal at 1.2m bgl.

Scala penetrometer practical refusal at 1.75m bgl.

No groundwater was encountered.

WATER
- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE
- [x] Hand Auger
- [ ] Test Pit

Ver 2. Generated with CORE-GS by Geroc - Hand Auger_Initia_v1 - 5/09/2025 1:17:43 pm

Checked By: APK

HAND AUGER LOG

INITIA
GEOTECHNICAL SPECIALISTS

HOLE NO.: HA132

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1747086.5mE, 5941623.1mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 58.1m
Datum: AUCKHT1946
Level method: SURVEY
START DATE: 06/08/2025
END DATE: 06/08/2025
LOGGED BY: YK
CHECKED BY: APK

UNIT	MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 50mm)	VANE SHEAR STRENGTH (kPa) Vane: 4035	Values	WATER
Topsoil	Silty CLAY, with trace rootlets; dark brown. Firm; high plasticity; moist.		0.0					
Tauranga Group Alluvium	Silty CLAY; brownish grey. Stiff; high plasticity; moist.		0.4				61 44	
			0.6				61 38	
Mahurangi Limestone	SILT, with minor clay and sand; grey. Hard; low plasticity; moist; sand, fine to medium; [Inferred weathered Mahurangi Limestone interface].		1.0				214+ -	
	EOH: 1.40m		1.4		17 / 20		214+ -	Groundwater Not Encountered



REMARKS

Hand auger practical refusal at 1.4m bgl.

Scala penetrometer practical refusal at 1.5m bgl.

No groundwater was encountered.

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- [x] Hand Auger
- [ ] Test Pit

Ver 2. Generated with CORE-GS by Geroc - Hand Auger_Initia_v1 - 5/09/2025 1:17:45 pm

Checked By: APK

HAND AUGER LOG

HOLE NO.: HA133

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1747167.9mE, 5941651.7mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 58.8m
Datum: AUCKHT1946
Level method: SURVEY
START DATE: 06/08/2025
END DATE: 06/08/2025
LOGGED BY: MG
CHECKED BY: APK

UNIT	MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)
Topsoil	Clayey SILT, with trace rootlets; dark brown. Firm; low plasticity; moist.		0.0
Tauranga Group Alluvium	Silty CLAY; brownish grey. Firm; high plasticity; moist.		0.4
Mahurangi Limestone	SILT, with some sand and gravel; light grey/white. Very stiff; non-plastic; moist; sand, coarse, gravel, fine, Limestone; [Inferred weathered Mahurangi Limestone interface].		1.2
	EOH: 1.40m		1.4

LEGEND

SCALA PENETROMETER (Blows / 50mm)
2 4 6 8 10 12 14 16 18
5, 7, 8, 8, 9, 9, 10, 12, 22 >>, 25 >>

VANE SHEAR STRENGTH (kPa)
Vane: 50 100 150 200

Values
36
8
45
11
132
7
UTP
-

WATER: Groundwater Not Encountered



REMARKS

Hand auger practical refusal at 1.4m bgl.

Scala penetrometer practical refusal at 1.9m bgl.

No groundwater was encountered.

WATER
- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE
- [x] Hand Auger
- [ ] Test Pit

Ver 2. Generated with CORE-GS by Geroc - Hand Auger_Initia_v1 - 5/09/2025 1:17:48 pm

Checked By: APK

HAND AUGER LOG

INITIA
GEOTECHNICAL SPECIALISTS

HOLE NO.: HA134

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1747203.4mE, 5941741.6mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 54.8m
Datum: AUCKHT1946
Level method: SURVEY
START DATE: 06/08/2025
END DATE: 06/08/2025
LOGGED BY: DJP
CHECKED BY: APK

UNIT	MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)
Top soil	Clayey SILT, with trace rootlets; dark brown. Firm; low plasticity; moist.		0.0
Tauranga Group Alluvium	Silty CLAY, with minor organics; brownish grey with orange mottles. Firm; high plasticity; wet; organics, amorphous.		0.4
	0.6m: Grades to saturated.		0.6
	Clayey SILT; orange with light brownish grey mottles. Firm; low plasticity; saturated.		1.4
	Silty CLAY; dark grey with brown mottles. Stiff; high plasticity; saturated.		1.6
	EOH: 2.00m		2.0

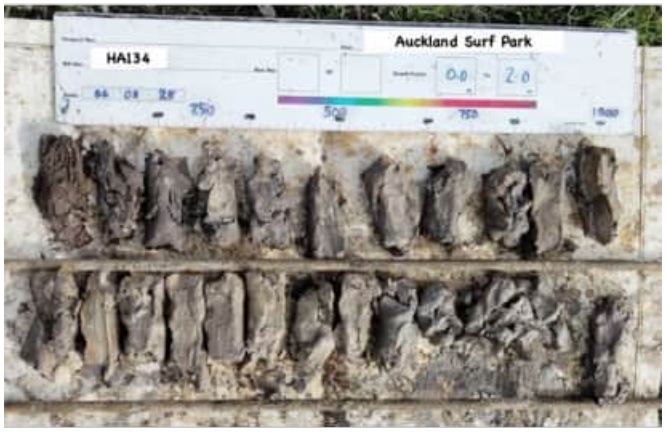
LEGEND

SCALA PENETROMETER (Blows / 50mm): 2 4 6 8 10 12 14 16 18

VANE SHEAR STRENGTH (kPa) Vane: 50 100 150 200

Values
26
11
32
9
47
17
32
20
62
17

WATER: 06/08/2025



REMARKS

Hand auger terminated due to high suction and hole collapse.

Scala penetrometer practical refusal at 3.2m bgl.

Groundwater measured at 0.2m bgl at the completion of drilling

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- [x] Hand Auger
- [ ] Test Pit

Ver 2. Generated with CORE-GS by Geroc - Hand Auger_Initia_v1 - 5/09/2025 1:17:50 pm

Checked By: APK

HAND AUGER LOG

HOLE NO.: HA135

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1747127.9mE, 5941731.9mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 55.1m
Datum: AUCKHT1946
Level method: SURVEY
START DATE: 06/08/2025
END DATE: 06/08/2025
LOGGED BY: RJF
CHECKED BY: APK

UNIT	MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)
Topsoil	Clayey SILT, with trace rootlets; dark brown. Firm; low plasticity; moist.		0.0
Tauranga Group Alluvium	Clayey SILT; brownish grey with orange mottles. Stiff; low plasticity; moist.		0.4
	Silty CLAY; brownish grey with orange and brown mottles. Stiff; high plasticity; moist.		0.6
	1.2m: Grades to firm.		1.2
gl Limeston	SILT, with some sand and gravel; light grey/white. Hard; non-plastic; moist; sand, coarse, gravel, fine, Limestone; [Inferred weathered Mahurangi Limestone interface]		1.4
	EOH: 1.60m		1.6

LEGEND

SCALA PENETROMETER (Blows / 50mm): 2 4 6 8 10 12 14 16 18

VANE SHEAR STRENGTH (kPa) Vane: 50 100 150 200

Values	WATER
80	Groundwater Not Encountered
29	
60	
18	
48	
14	
UTP	
-	



REMARKS

Hand auger practical refusal at 1.6m bgl.

Scala penetrometer practical refusal at 2.15m bgl.

Groundwater was not encountered.

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- [x] Hand Auger
- [ ] Test Pit

Ver 2. Generated with CORE-GS by Geroc - Hand Auger_Initia_v1 - 5/09/2025 1:17:53 pm

Checked By: APK

HAND AUGER LOG

HOLE NO.: HA136

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1746778.0mE, 5942060.8mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 55.2m
Datum: AUCKHT1946
Level method: SURVEY
START DATE: 11/08/2025
END DATE: 11/08/2025
LOGGED BY: DJP
CHECKED BY: APK

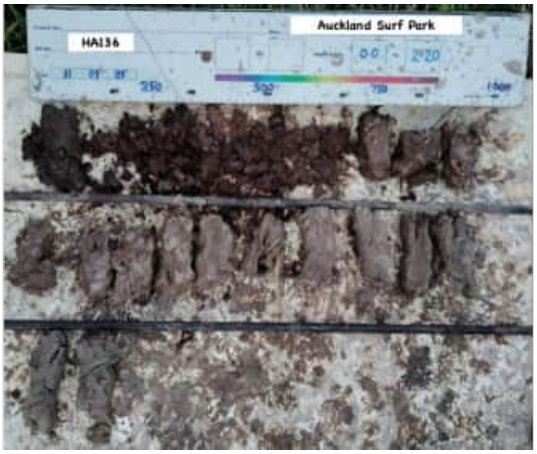
UNIT	MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)
Topsoil	Clayey SILT, with trace rootlets; dark brown. Firm; low plasticity; moist.		0.0
Fill	SILT, with some clay; reddish brown. Firm; low plasticity; wet.		0.2
	0.4m: Grades to with trace clay.		0.4
Tauranga Group Alluvium	Silty CLAY, with minor organics; brownish grey/grey. Firm; high plasticity; saturated; organics, amorphous.		0.6
	1.2m: Grades to stiff.		1.2
	EOH: 2.20m		2.2

SCALA PENETROMETER (Blows / 50mm): 2 4 6 8 10 12 14 16 18

VANE SHEAR STRENGTH (kPa) Vane: 50 100 150 200

Values
44
3
47
23
53
32
56
29
50
15

WATER: 11/08/2025



REMARKS

Hand auger terminated due to high suction and hole collapse.

Scala penetrometer terminated at target depth.

Groundwater measured at 0.1m bgl at the completion of drilling.

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- [x] Hand Auger
- [ ] Test Pit

Ver 2. Generated with CORE-GS by Geroc - Hand Auger_Initia_v1 - 5/09/2025 1:17:55 pm

Checked By: APK

HAND AUGER LOG

HOLE NO.: HA137

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1746880.5mE, 5942178.5mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 54.7m
Datum: AUCKHT1946
Level method: SURVEY
START DATE: 11/08/2025
END DATE: 11/08/2025
LOGGED BY: DJP
CHECKED BY: APK

UNIT	MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 50mm)	VANE SHEAR STRENGTH (kPa) Vane: Values	WATER
To ps oil	Clayey SILT, with trace rootlets; grey brown. Firm; low plasticity; moist.		0.0				
Tauranga Group Alluvium	Silty CLAY; brown. Stiff; high plasticity; wet.		0.2			65 11	11/08/2025
	0.8m: Grades to brownish grey with brown mottles, minor amorphous organics.		0.4			50 2	
	1.2m: Grades to firm.		0.6			44 20	
	2.1m: Grades to with some decomposing organics (1-5mm).		0.8			38 17	
	2.9m: Grades to saturated.		1.0			44 14	
	3.2m: Grades to soft.		1.2			29 11	
	3.6m: Grades to firm.		1.4			38 23	
	EOH: 4.00m		1.6			23 11	
			1.8			35 14	
			2.0			47 17	
			2.2				
			2.4				
			2.6				
			2.8				
			3.0				
			3.2				
			3.4				
			3.6				
			3.8				
			4.0				
			4.2				
			4.4				
			4.6				
			4.8				



REMARKS

Hand auger terminated at target depth.

Scala penetrometer terminated at target depth.

Groundwater measured at 0.4m bgl at the completion of drilling.

WATER

- ▼ Standing Water Level
- ◁ Out flow
- ▷ In flow

INVESTIGATION TYPE

- ☑ Hand Auger
- ☐ Test Pit

Ver 2. Generated with CORE-GS by Geroc - Hand Auger_Initia_v1 - 5/09/2025 1:17:58 pm

Checked By: APK

HAND AUGER LOG

INITIA
GEOTECHNICAL SPECIALISTS

HOLE NO.: HA138

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1746857.1mE, 5942280.9mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 51.6m
Datum: AUCKHT1946
Level method: SURVEY
START DATE: 11/08/2025
END DATE: 11/08/2025
LOGGED BY: DJP
CHECKED BY: APK

UNIT	MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 50mm)	VANE SHEAR STRENGTH (kPa) Vane: Values	WATER
topsoil	Clayey SILT, with trace rootlets; dark brown. Firm; low plasticity; moist.		0.0				
Tauranga Group Alluvium	SILT, with some clay; orange with brown mottles. Stiff; low plasticity; moist.		0.4			59 / 8	
	Clayey SILT; brownish grey. Very stiff; low plasticity; moist.		0.8			146 / 68	
	Silty CLAY, with minor organics; brownish grey. Very stiff; high plasticity; moist; organics, amorphous.		1.2			113 / 59	
	1.7m: Grades to with minor carbonaceous inclusions (2-5mm), wet.		1.6			119 / 56	
	2.0m: Grades to very stiff.		2.0			89 / 47	
	2.3m: Grades to blackish grey with grey mottles, firm.		2.4			44 / 17	
	SILT, with some clay, with minor decomposing organics; dark brown with black mottles. Firm; low plasticity; saturated.		3.2			32 / 11	
	3.6m: Grades to stiff, difficult recovery.		3.6			50 / 6	
	EOH: 4.00m		4.0			56 / 23	11/08/2025



REMARKS

Hand auger terminated at target depth.

Scala penetrometer terminated at target depth.

Groundwater measured at 2.9m bgl at the completion of drilling.

WATER

- ▼ Standing Water Level
- ◁ Out flow
- ▷ In flow

INVESTIGATION TYPE

- ☑ Hand Auger
- ☐ Test Pit

Ver 2. Generated with CORE-GS by Geroc - Hand Auger_Initia_v1 - 5/09/2025 1:18:00 pm

Checked By: APK

HAND AUGER LOG

INITIA
GEOTECHNICAL SPECIALISTS

HOLE NO.: HA139

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1746925.3mE, 5942255.5mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 50.6m
Datum: AUCKHT1946
Level method: SURVEY
START DATE: 11/08/2025
END DATE: 11/08/2025
LOGGED BY: MG
CHECKED BY: APK

UNIT	MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)
Fill	Clayey SILT, with trace topsoil; dark brown. Firm; low plasticity; moist.		0.0
Fill	Clayey SILT, brownish grey, brown, orange, stiff, moist to wet, low to medium plasticity, occasional organic inclusions (1-5mm).		0.4
Tauranga Group Alluvium	Clayey SILT, brownish grey, mottled brown, firm, moist to wet, low to medium plasticity.		1.0
Tauranga Group Alluvium	Silty CLAY, orange, mottled light brownish grey, stiff, wet, medium plasticity.		1.2
Tauranga Group Alluvium	2.1m: Grades to brownish grey/grey, occasional decomposing wood inclusions, saturated.		2.1
Tauranga Group Alluvium	3.6m: Grades to firm.		3.6
Tauranga Group Alluvium	4.3m: Grades to soft, difficult recovery.		4.3
Tauranga Group Alluvium	4.8m: Grades to stiff.		4.8
	EOH: 5.00m		5.0

LEGEND

SCALA PENETROMETER (Blows / 0mm): 2, 4, 6, 8, 10, 12, 14, 16, 18

VANE SHEAR STRENGTH (kPa) Vane: 50, 100, 150, 200

Values
67
3
47
3
53
14
50
11
61
19
51
11
75
31
68
19
47
11
53
14
25
11
89
49

WATER: 11/08/2025



REMARKS

Hand auger extended to 5 m target depth in lieu of a Scala test from 4 - 5 m.
Groundwater measured at 1.4m bgl at the completion of drilling.

WATER
- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE
- [x] Hand Auger
- [ ] Test Pit

Ver 2: Generated with CORE-GS by Geroc - Hand Auger_Initia_v1 - 5/09/2025 1:18:03 pm

Checked By: APK

HAND AUGER LOG

HOLE NO.: HA140

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1746969.7mE, 5942225.1mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 52m
Datum: AUCKHT1946
Level method: SURVEY
START DATE: 11/08/2025
END DATE: 11/08/2025
LOGGED BY: MG
CHECKED BY: APK

UNIT	MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)
to pso II	SILT, with minor clay, with trace rootlets; dark brown. Firm; low plasticity; moist.		0.0
	SILT, trace of clay, orange, mottled brown, very stiff, moist, non plastic.		0.2
	Clayey SILT, orange, mottled light brownish grey, very stiff, moist, low to medium plasticity.		0.4
	1.2m: Grades to stiff.		1.2
	Silty CLAY, light brownish grey, mottled orange, very stiff, wet, medium plasticity.		1.6
	2.0m: Grades to stiff		2.0
	2.4m: Saturated, brownish grey/grey, medium to high plasticity.		2.4
	2.8m: Grades to very stiff.		2.8
	Clayey SILT, brownish grey/grey, mottled brown, stiff, moist, low to medium plasticity, minor organic inclusions.		3.0
	Silty CLAY, brownish grey/grey, mottled brown, stiff, saturated, medium plasticity, minor decomposing organic matter (1-5mm).		3.4
Tauranga Group Alluvium	EOH: 5.00m		5.0

LEGEND

SCALA PENETROMETER (Blows / 0mm): 2 4 6 8 10 12 14 16 18

VANE SHEAR STRENGTH (kPa) Vane: 50 100 150 200

Values
160
56
156
67
75
33
103
35
64
22
75
18
100
11
56
17
72
17
53
15
77
28
72
25

WATER: 11/08/2025



REMARKS

Hand auger extended to 5 m target depth in lieu of a Scala test from 4 - 5 m.

Groundwater measured at 0.6m bgl at the completion of drilling.

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- [x] Hand Auger
- [ ] Test Pit

Ver 2. Generated with CORE-GS by Geroc - Hand Auger_Initia_v1 - 5/09/2025 1:18:05 pm

Checked By: APK

HAND AUGER LOG

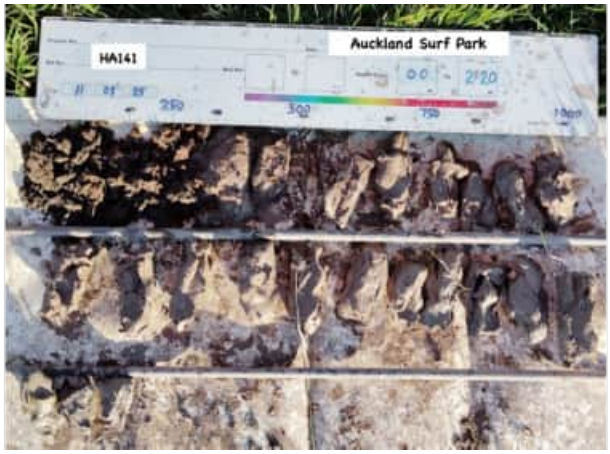
INITIA
GEOTECHNICAL SPECIALISTS

HOLE NO.: HA141

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1746805.7mE, 5942022.2mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 55.2m
Datum: AUCKHT1946
Level method: SURVEY
START DATE: 11/08/2025
END DATE: 11/08/2025
LOGGED BY: DJP
CHECKED BY: APK

UNIT	MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 50mm)	VANE SHEAR STRENGTH (kPa) Vane: Values	WATER
Topsoil	SILT, with minor clay, with trace rootlets; dark brown. Firm; low plasticity; moist.		0.0				11/08/2025
Tauranga Group Alluvium	Silty CLAY, brownish grey/grey, firm, wet, high plasticity, occasional minor organic inclusions.		0.2			44	
			0.4			2	
			0.6			47	
			0.8			20	
			1.0			29	
			1.2			11	
	1.4m: Grades to stiff.		1.4			59	
			1.6			29	
	1.7m: Hole collapsing, difficult recovery.		1.8			59	
			2.0			14	
	EOH: 2.20m		2.2				
			2.4				
			2.6				
			2.8				
			3.0				
			3.2				
			3.4				
			3.6				
			3.8				
			4.0				
			4.2				
			4.4				
			4.6				
			4.8				



REMARKS

Hand auger terminated due to high suction and hole collapse.

Scala penetrometer terminated at target depth.

Groundwater measured at 0.3m bgl at the completion of drilling.

WATER

- ▼ Standing Water Level
- ◁ Out flow
- ▷ In flow

INVESTIGATION TYPE

- ☑ Hand Auger
- ☐ Test Pit

Ver 2. Generated with CORE-GS by Geroc - Hand Auger_Initia_v1 - 5/09/2025 1:18:08 pm

Checked By: APK

HAND AUGER LOG

INITIA
GEOTECHNICAL SPECIALISTS

HOLE NO.: HA142

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1746979.2mE, 5941984.1mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 55.3m
Datum: AUCKHT1946
Level method: SURVEY
START DATE: 08/08/2025
END DATE: 08/08/2025
LOGGED BY: YK
CHECKED BY: APK

UNIT	MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)
Fill	Clayey SILT; brownish. Hard; low plasticity; moist.		0.0 – 0.2
Fill	SILT, with minor gravel, with trace clay; light grey. Hard; low plasticity; moist; gravel, fine to medium; [Limestone fill].		0.2 – 1.2
Tauranga Group Alluvium	CLAY, with minor silt; brown grey. Stiff; high plasticity; moist.	D	1.2 – 1.8
Tauranga Group Alluvium	2.1m: Grades to firm		1.8 – 2.2
Tauranga Group Alluvium	CLAY, with minor organics and silt; darkish grey. Stiff; high plasticity; moist; organics, amorphous.		2.2 – 3.4
Tauranga Group Alluvium	Organic CLAY; dark grey. Firm; moist; organic, amorphous.	D	3.4 – 3.8
	EOH: 4.00m		3.8 – 4.0

SCALA PENETROMETER (Blows / 50mm)

Depth (m)	Blows / 50mm
0.0 – 0.2	1
0.2 – 0.4	1
0.4 – 0.6	1
0.6 – 0.8	1
0.8 – 1.0	1
1.0 – 1.2	2
1.2 – 1.4	2
1.4 – 1.6	2
1.6 – 1.8	2
1.8 – 2.0	2
2.0 – 2.2	2
2.2 – 2.4	3
2.4 – 2.6	2
2.6 – 2.8	3
2.8 – 3.0	3

VANE SHEAR STRENGTH (kPa) Vane: 4035

Depth (m)	Values
0.0 – 0.2	UTP
0.2 – 0.4	-
0.4 – 0.6	214+
0.6 – 0.8	-
0.8 – 1.0	UTP
1.0 – 1.2	-
1.2 – 1.4	61
1.4 – 1.6	38
1.6 – 1.8	63
1.8 – 2.0	43
2.0 – 2.2	60
2.2 – 2.4	29
2.4 – 2.6	44
2.6 – 2.8	31
2.8 – 3.0	46
3.0 – 3.2	38
3.2 – 3.4	73
3.4 – 3.6	43
3.6 – 3.8	64
3.8 – 4.0	46
4.0 – 4.2	58
4.2 – 4.4	44
4.4 – 4.6	46
4.6 – 4.8	31
	44
	32

WATER: Groundwater Not Encountered



REMARKS

Hand auger terminated at target depth.

Scala penetrometer terminated at target depth.

No groundwater was encountered.

WATER

- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE

- [x] Hand Auger
- [ ] Test Pit

Ver 2: Generated with CORE-GS by Geroc - Hand Auger_Initia_v1 - 5/09/2025 1:18:10 pm

Checked By: APK

HAND AUGER LOG

INITIA
GEOTECHNICAL SPECIALISTS

HOLE NO.: HA143

CLIENT: AW Holdings
PROJECT: ASP Community
SITE LOCATION: 1350 Dairy Flat Highway, Dairy Flat
Project Ref.: P-001537

CO-ORDINATES: 1747028.8mE, 5942020.7mN
Co-ordinate system: NZTM
Location method: SURVEY
ELEVATION: 54m
Datum: AUCKHT1946
Level method: SURVEY
START DATE: 08/08/2025
END DATE: 08/08/2025
LOGGED BY: YK
CHECKED BY: APK

UNIT	MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)
Fill	SILT, with minor gravel, with trace clay; light grey. Hard; low plasticity; moist; gravel, fine to medium; [Limestone fill].		0.2
Tauranga Group Alluvium	CLAY, with minor silt; brown grey. Stiff; high plasticity; moist.	D	0.4, 0.6, 0.8
	1.1m: Grades to darkish grey with minor organics. organics; amorphous		1.0, 1.2, 1.4, 1.6, 1.8
	CLAY, with some organics, with minor silt; dark grey. Stiff; high plasticity; moist; organics, amorphous.		2.0, 2.2
	CLAY, with minor organics and silt; darkish grey. Firm; high plasticity; moist; organics, amorphous.	D	2.4, 2.6, 2.8, 3.0
	CLAY, with minor silt; grey. Firm; high plasticity; moist.		3.2, 3.4, 3.6, 3.8
	EOH: 4.00m		4.0, 4.2, 4.4, 4.6, 4.8

LEGEND

SCALA PENETROMETER (Blows / 50mm)
2 4 6 8 10 12 14 16 18

VANE SHEAR STRENGTH (kPa)
Vane: 4035
50 100 150 200

Values
76
29
73
34
57
21
54
15
72
31
99
49
57
28
61
34
38
28
31
17
31
24
34
21
29
24

WATER
Groundwater Not Encountered



REMARKS

Hand auger terminated at target depth.

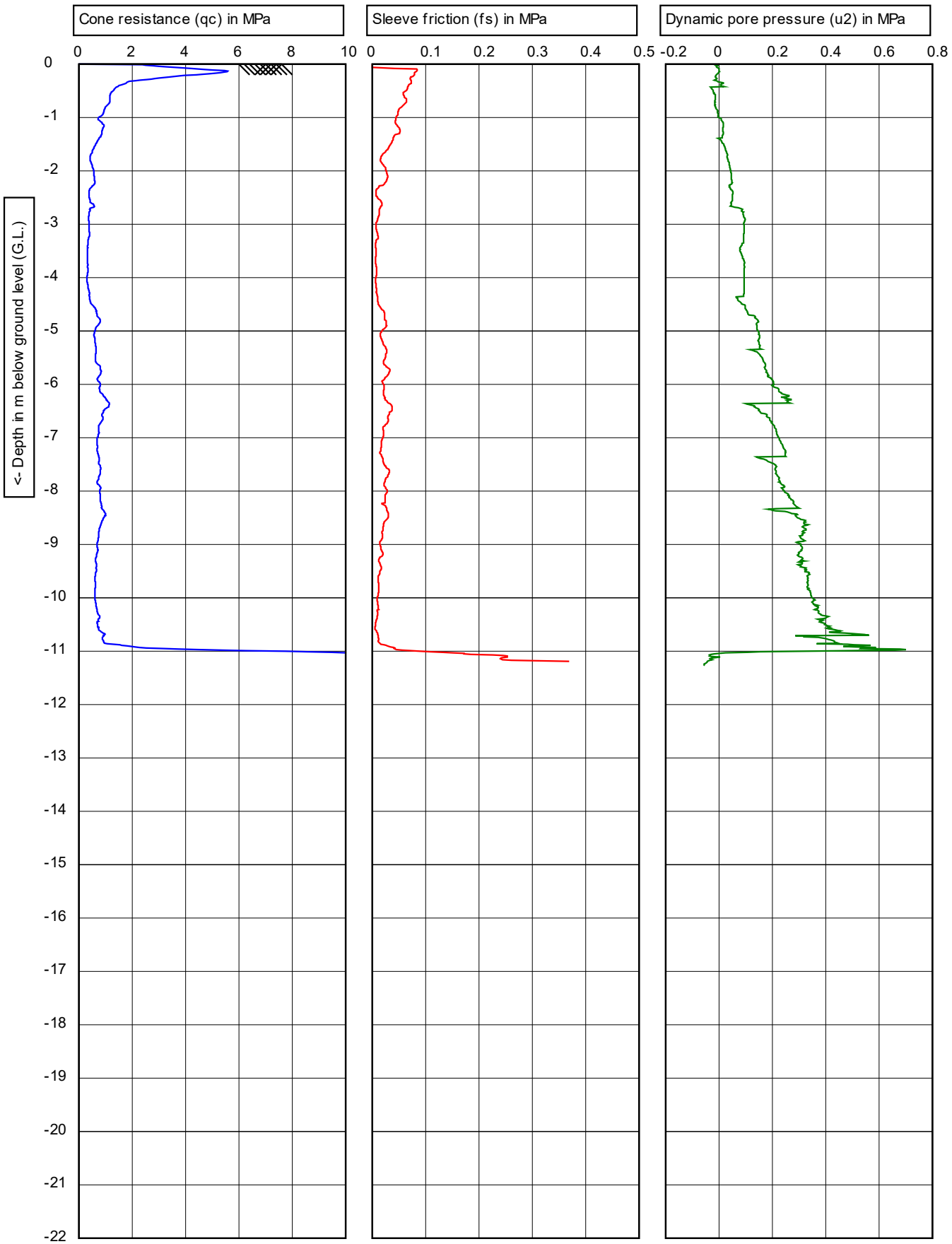
Scala penetrometer terminated at target depth.

No groundwater was encountered.

WATER
- Standing Water Level
- Out flow
- In flow

INVESTIGATION TYPE
- [x] Hand Auger
- [ ] Test Pit

Ver 2. Generated with CORE-GS by Geroc - Hand Auger_Initia_v1 - 5/09/2025 1:18:13 pm



Refusal (qc 40+ MPa.)

EOH - Dipped - Collapsed Dry @ 1.0m

WSP

ACCREDITED TESTING LABORATORY

Test results indicated as not accredited are outside the scope of the laboratory's accreditation

r u2
L 150 cm²
10 cm²

Test according ASTM D5778:12 & ISO 22476-1:2012

G.L.: **0.00 m MSL**

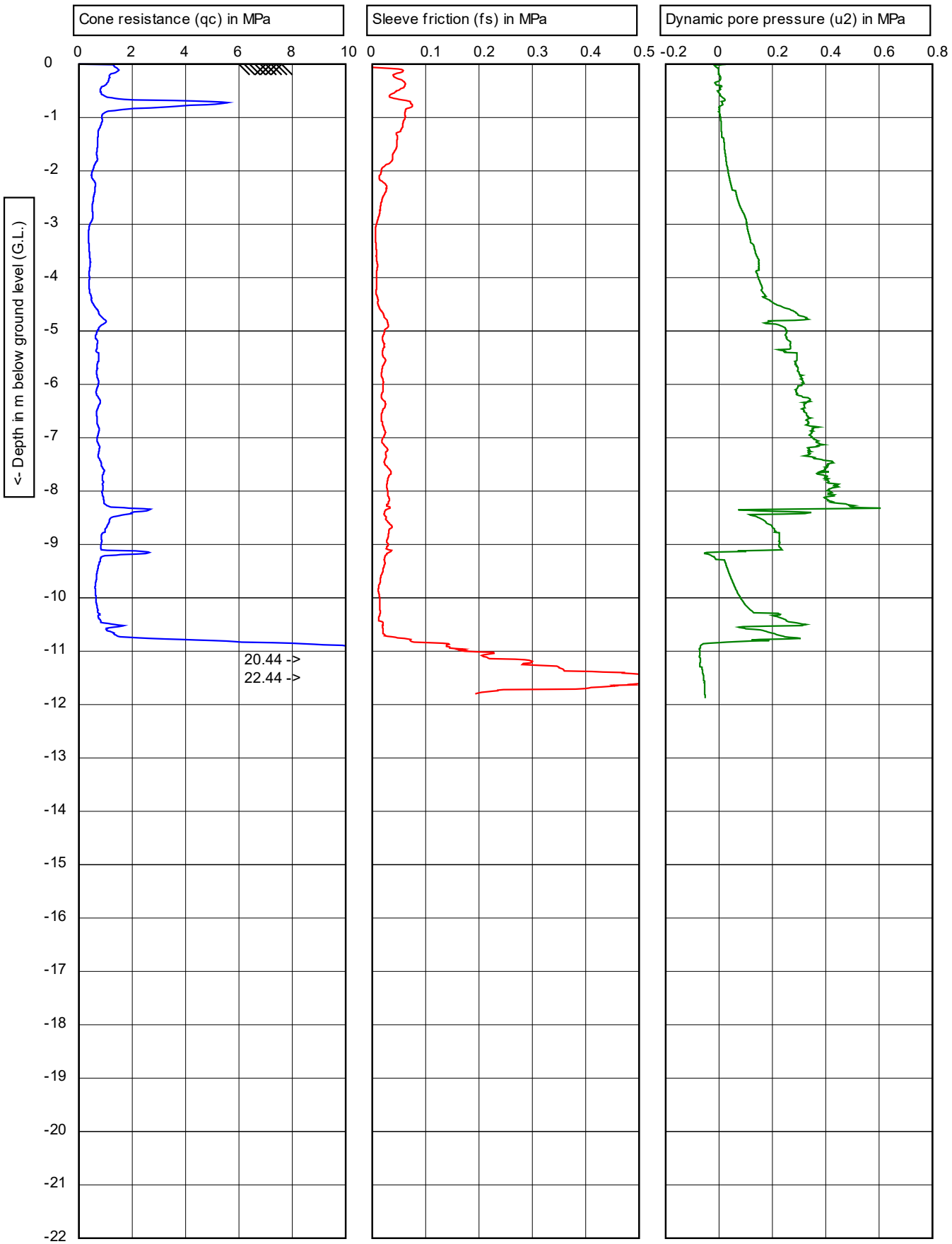
Project: **1350 Dairy Flat Highway**

Location: **Auckland (P-001539)**

Position: **1746939, 5942134 NZTM**

Predrill:	**0.00 m Predrilled**
Date:	**5/04/2023**
Cone no.:	**C10CFIIP.C13236**
Project no.:	**2-68207.00_HA10639**
CPT no.:	**01**

1.49



Test results indicated as not accredited are outside the scope of the laboratory's accreditation

r u2
L 150 cm²
10 cm²

Test according ASTM D5778:12 & ISO 22476-1:2012

G.L.: **0.00 m MSL**

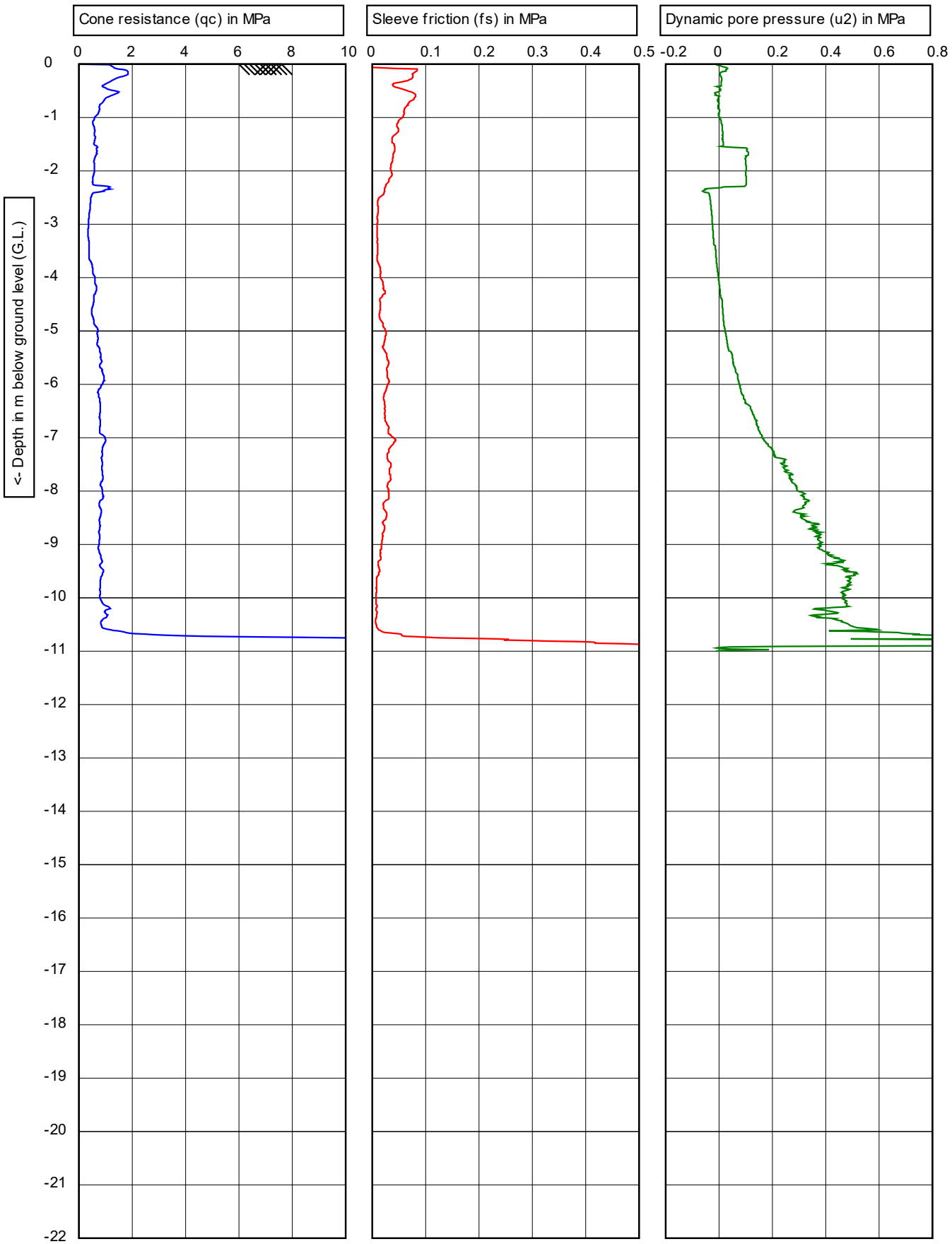
Project: **1350 Dairy Flat Highway**

Location: **Auckland (P-001539)**

Position: **1746921, 5942143 NZTM**

Predrill:	**0.00 m Predrilled**
Date:	**5/04/2023**
Cone no.:	**C10CFIIP.C21109**
Project no.:	**2-68207.00_HA10639**
CPT no.:	**02**

1.49



Refusal (qc 40+ MPa.)

EOH - Dipped - Collapsed Dry @ 1.0m

Test results indicated as not accredited are outside the scope of the laboratory's accreditation

r u2
L 150 cm²
10 cm²

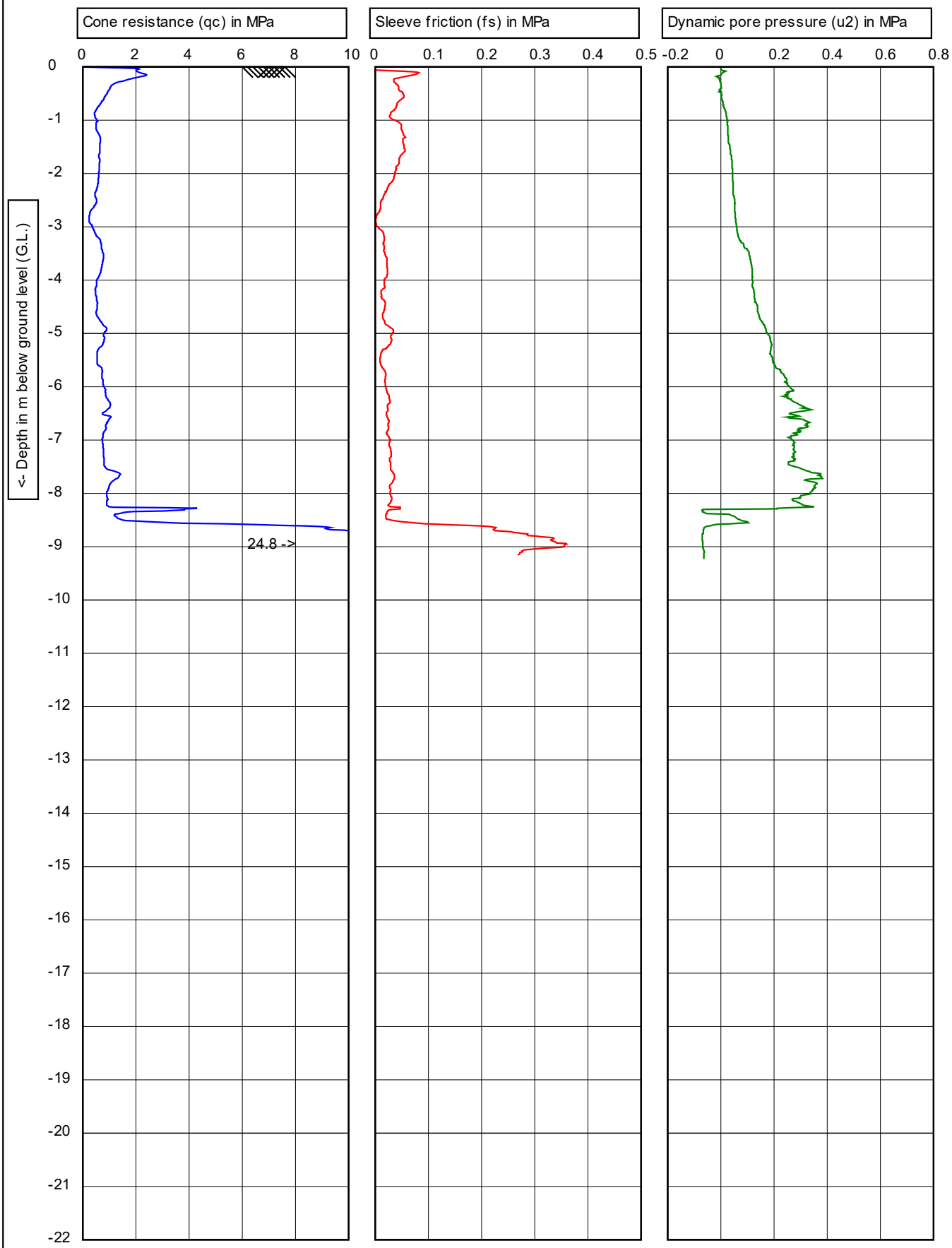
Test according ASTM D5778:12 & ISO 22476-1:2012

G.L.: **0.00 m MSL**

Project: **1350 Dairy Flat Highway**
Location: **Auckland (P-001539)**
Position: **1746974, 5942155 NZTM**

Predrill:	**0.00 m Predrilled**
Date:	**5/04/2023**
Cone no.:	**C10CFIIP.C21109**
Project no.:	**2-68207.00_HA10639**
CPT no.:	**03**

1.49



Test results indicated as not accredited are outside the scope of the laboratory's accreditation

u2 150 cm² 10 cm²

Test according ASTM D5778:12 & ISO 22476-1:2012

G.L.: **0.00 m MSL**

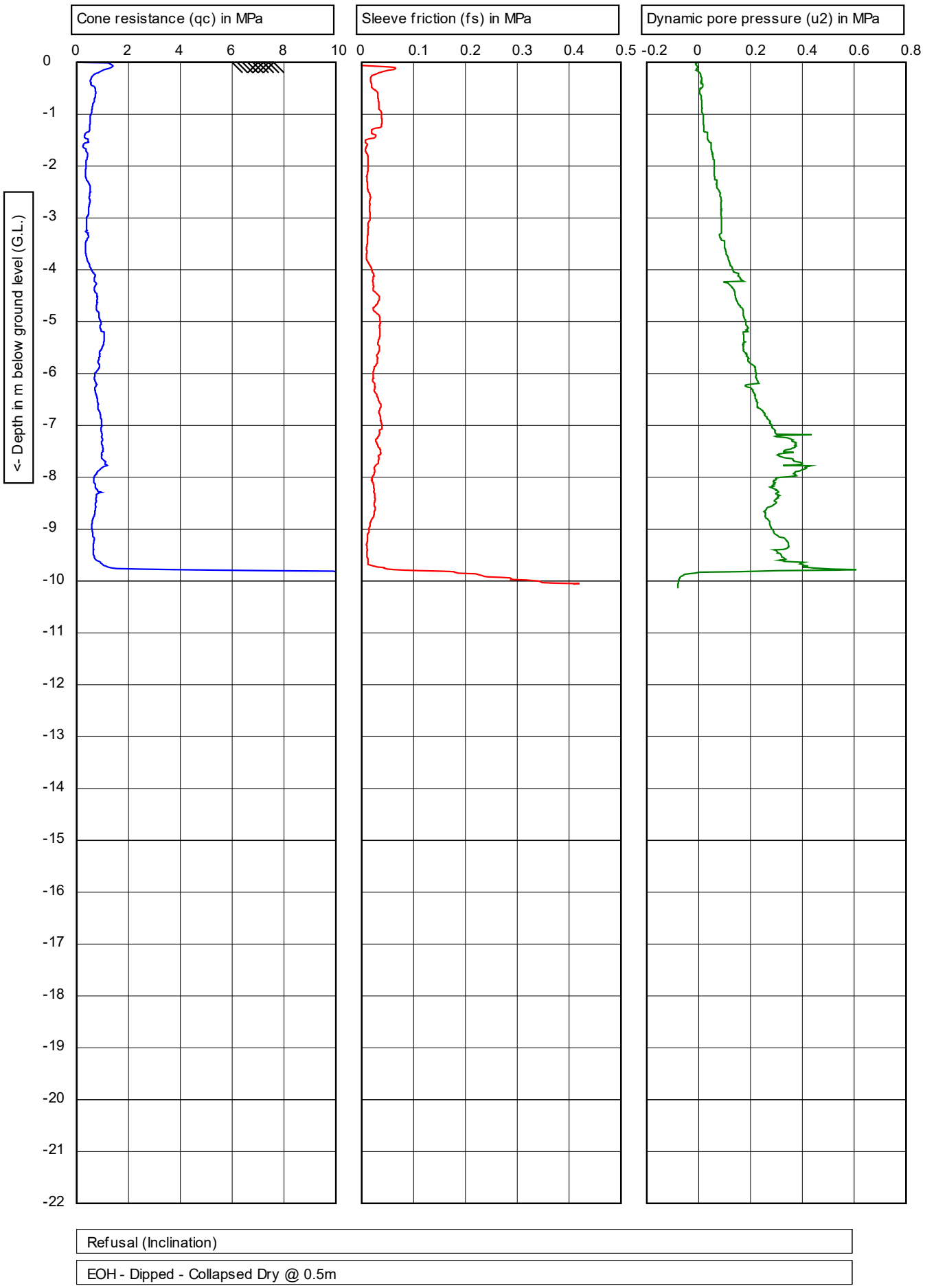
Project: **1350 Dairy Flat Highway**

Location: **Auckland (P-001539)**

Position: **1746809, 5942119 NZTM**

Predrill:	**0.00 m Predrilled**
Date:	**3/04/2023**
Cone no.:	**C10CFIIP.C21109**
Project no.:	**2-68207.00_HA10639**
CPT no.:	**04**

1.49



Refusal (Inclination)

EOH - Dipped - Collapsed Dry @ 0.5m

Test results indicated as not accredited are outside the scope of the laboratory's accreditation

r u2
L 150 cm²
10 cm²

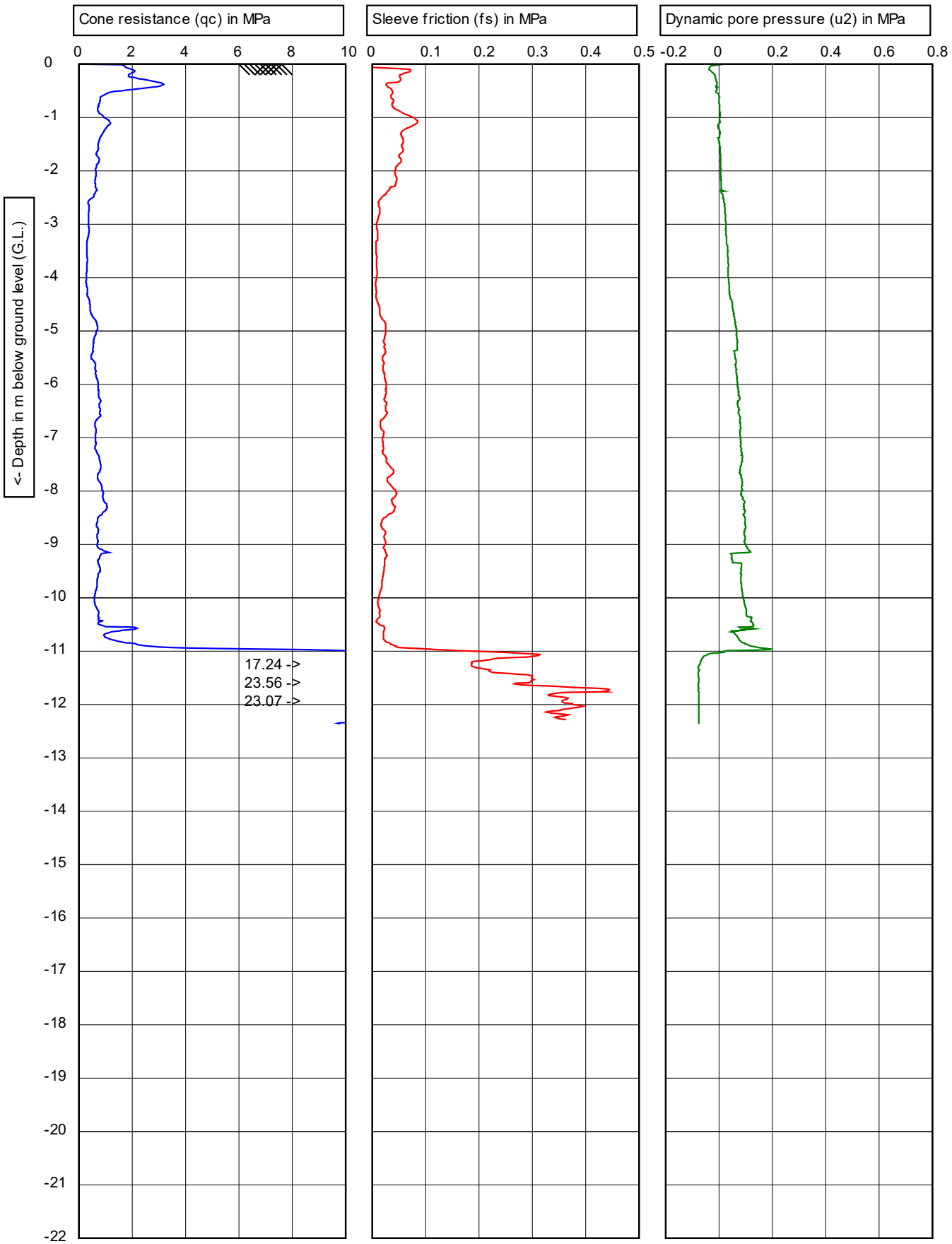
Test according ASTM D5778:12 & ISO 22476-1:2012

G.L.: **0.00 m MSL**

Project: **1350 Dairy Flat Highway**
Location: **Auckland (P-001539)**
Position: **1746869, 5942147 NZTM**

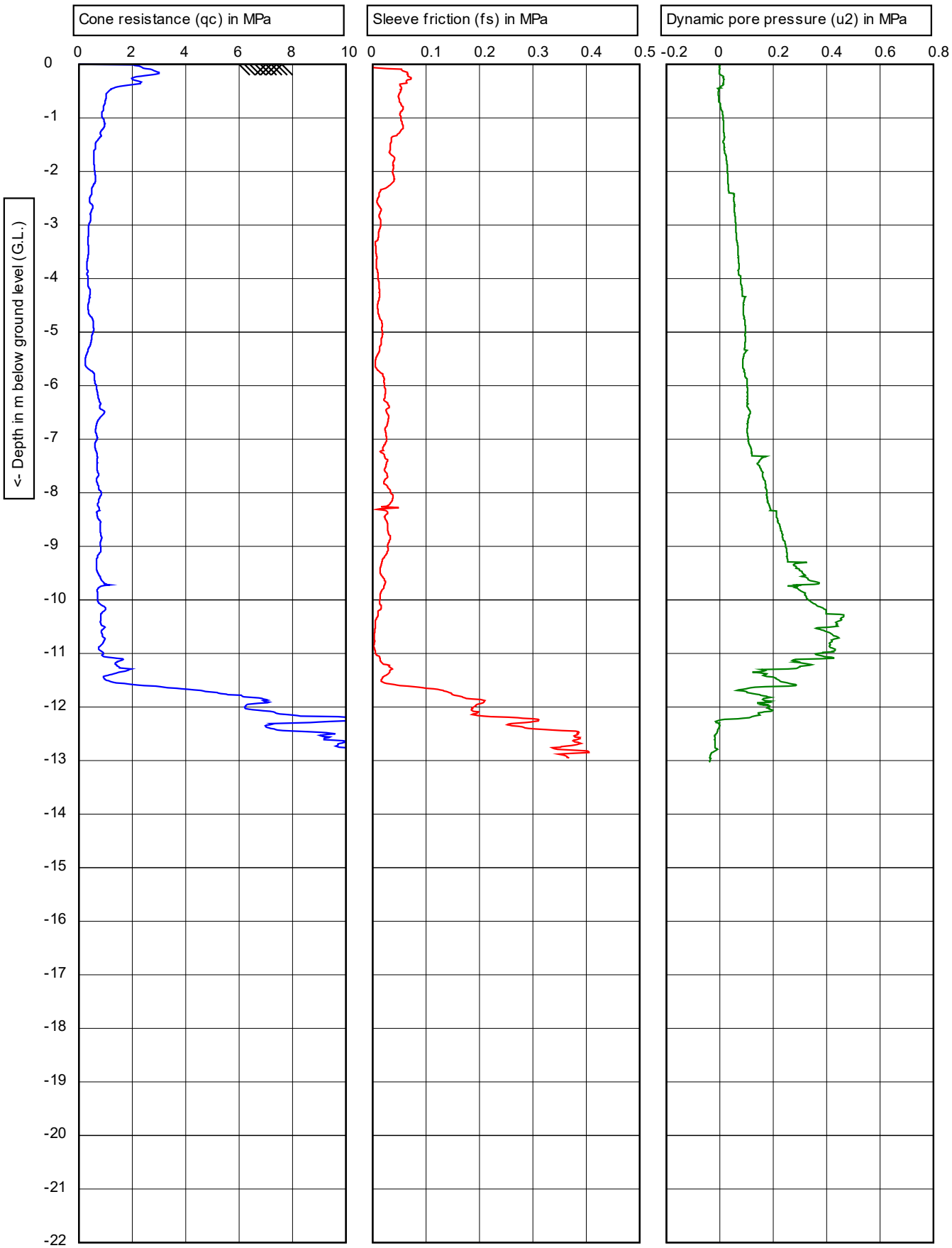
Predrill:	**0.00 m Predrilled**
Date:	**5/04/2023**
Cone no.:	**C10CFIIP.C13236**
Project no.:	**2-68207.00_HA10639**
CPT no.:	**05**

1.49



WSP ACCREDITED IANZ TESTING LABORATORY. Test results indicated as not accredited are outside the scope of the laboratory's accreditation	r u2 L 150 cm² 10 cm²	Test according ASTM D5778:12 & ISO 22476-1:2012	Predrill: **0.00 m Predrilled**
		G.L.: **0.00 m MSL**	Date: **5/04/2023**
	Project: **1350 Dairy Flat Highway**		Cone no.: **C10CFIIP.C13236**
	Location: **Auckland (P-001539)**		Project no.: **2-68207.00_HA10639**
	Position: **1746940, 5942116 NZTM**		CPT no.: **06** **1/6**

1.49



Refusal 10t.

EOH - Dipped - Collapsed Dry @ 1.1m

WSP

ACCREDITED IANZ TESTING LABORATORY

Test results indicated as not accredited are outside the scope of the laboratory's accreditation

r u2
150 cm²
10 cm²

Test according ASTM D5778:12 & ISO 22476-1:2012

G.L.: **0.00 m MSL**

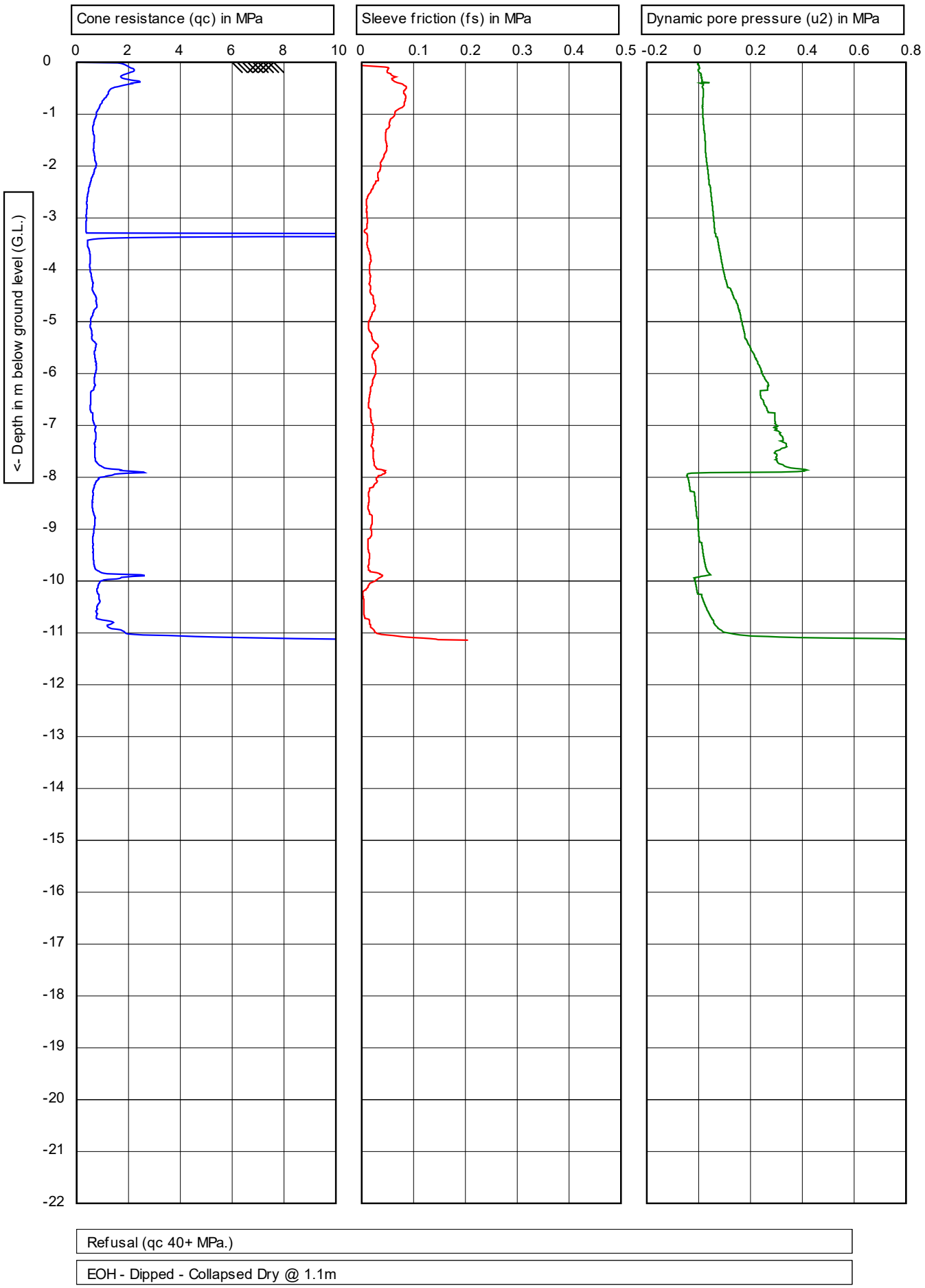
Project: **1350 Dairy Flat Highway**

Location: **Auckland (P-001539)**

Position: **1746961, 5942089 NZTM**

Predrill:	**0.00 m Predrilled**
Date:	**4/04/2023**
Cone no.:	**C10CFIIP.C13236**
Project no.:	**2-68207.00_HA10639**
CPT no.:	**07** **1/6**

1.49



Refusal (qc 40+ MPa.)

EOH - Dipped - Collapsed Dry @ 1.1m

Test results indicated as not accredited are outside the scope of the laboratory's accreditation

r u2
L 150 cm²
10 cm²

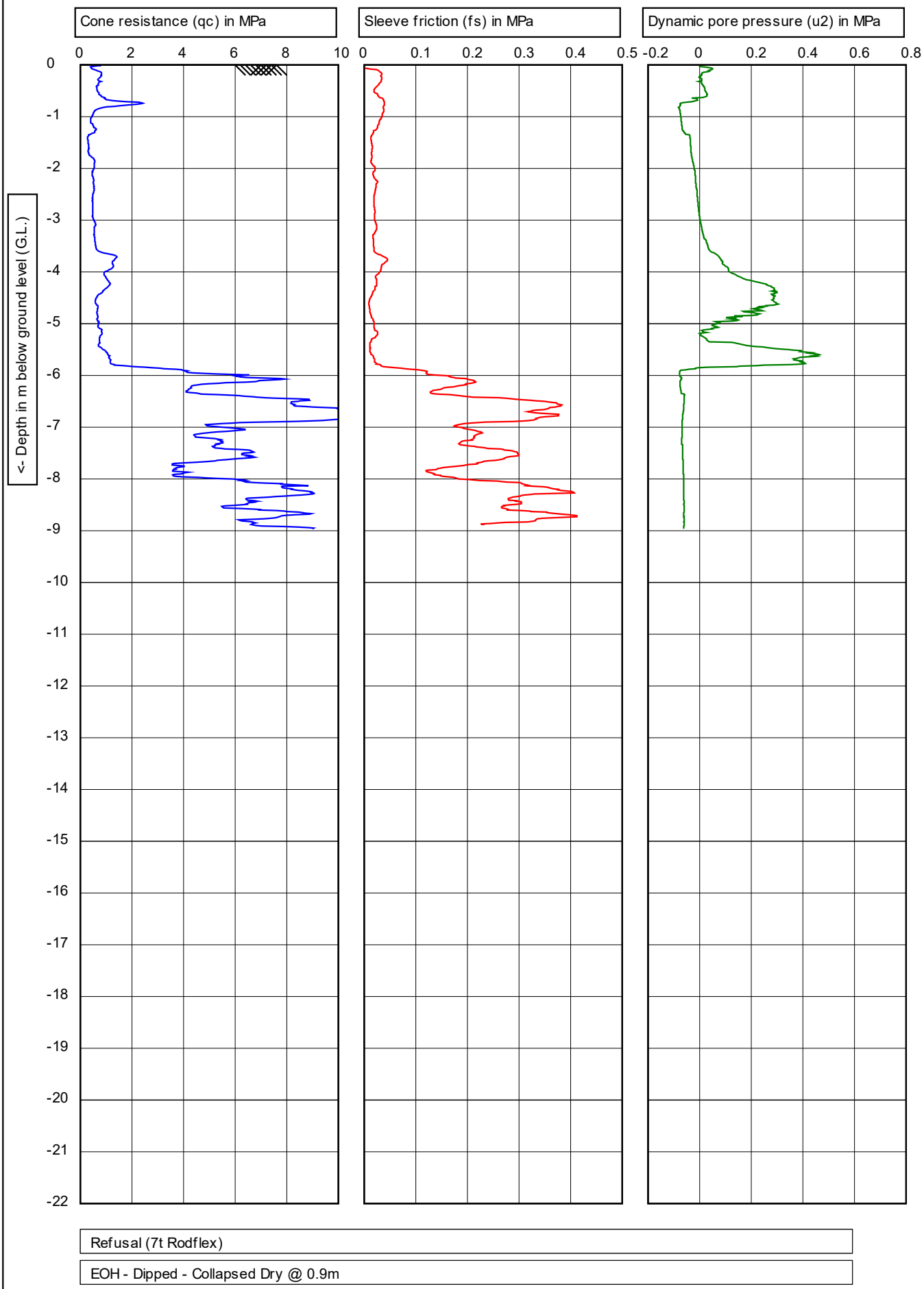
Test according ASTM D5778:12 & ISO 22476-1:2012

G.L.: **0.00 m MSL**

Project: **1350 Dairy Flat Highway**
Location: **Auckland (P-001539)**
Position: **1747048, 5942106 NZTM**

Predrill:	**0.00 m Predrilled**
Date:	**5/04/2023**
Cone no.:	**C10CFIIP.C21109**
Project no.:	**2-68207.00_HA10639**
CPT no.:	**08**

1.49



Refusal (7t Rodflex)

EOH - Dipped - Collapsed Dry @ 0.9m

Test results indicated as not accredited are outside the scope of the laboratory's accreditation

r u2
150 cm²
10 cm²

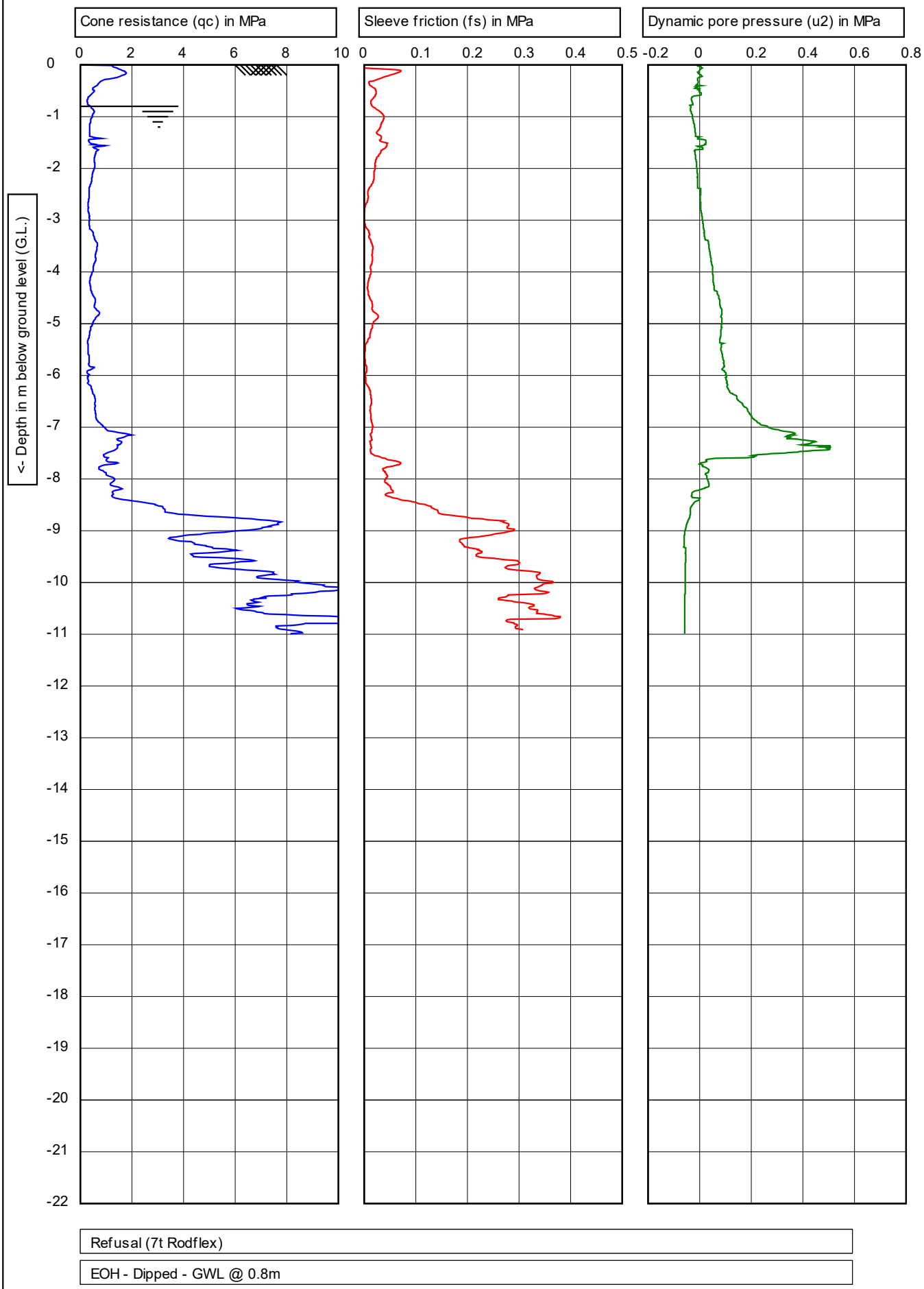
Test according ASTM D5778:12 & ISO 22476-1:2012

G.L.: **0.00 m MSL**

Project: **1350 Dairy Flat Highway**
Location: **Auckland (P-001539)**
Position: **1746755, 5942094 NZTM**

Predrill:	**0.00 m Predrilled**
Date:	**3/04/2023**
Cone no.:	**C10CFIIP.C13236**
Project no.:	**2-68207.00_HA10639**
CPT no.:	**09** **1/6**

1.49



Refusal (7t Rodflex)

EOH - Dipped - GWL @ 0.8m

Test results indicated as not accredited are outside the scope of the laboratory's accreditation

u2
150 cm²
10 cm²

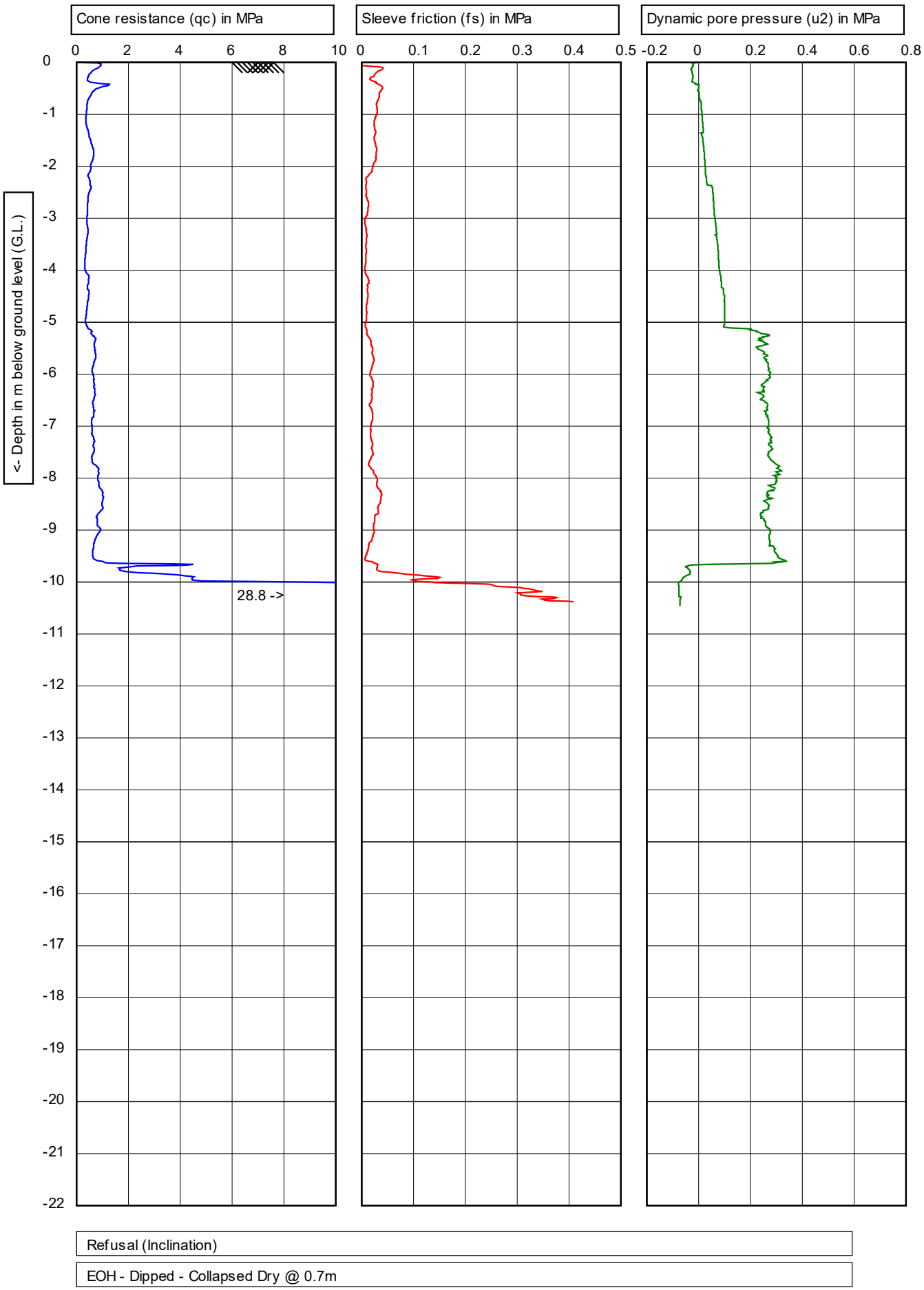
Test according ASTM D5778:12 & ISO 22476-1:2012

G.L.: **0.00 m MSL** | W.L.: **-0.80 m**

Project: **1350 Dairy Flat Highway**
Location: **Auckland (P-001539)**
Position: **1746836, 5942078 NZTM**

Predrill:	**0.00 m Predrilled**
Date:	**3/04/2023**
Cone no.:	**C10CFIIP.C13236**
Project no.:	**2-68207.00_HA10639**
CPT no.:	**10**

1.49



Test results indicated as not accredited are outside the scope of the laboratory's accreditation

r u2
150 cm²
10 cm²

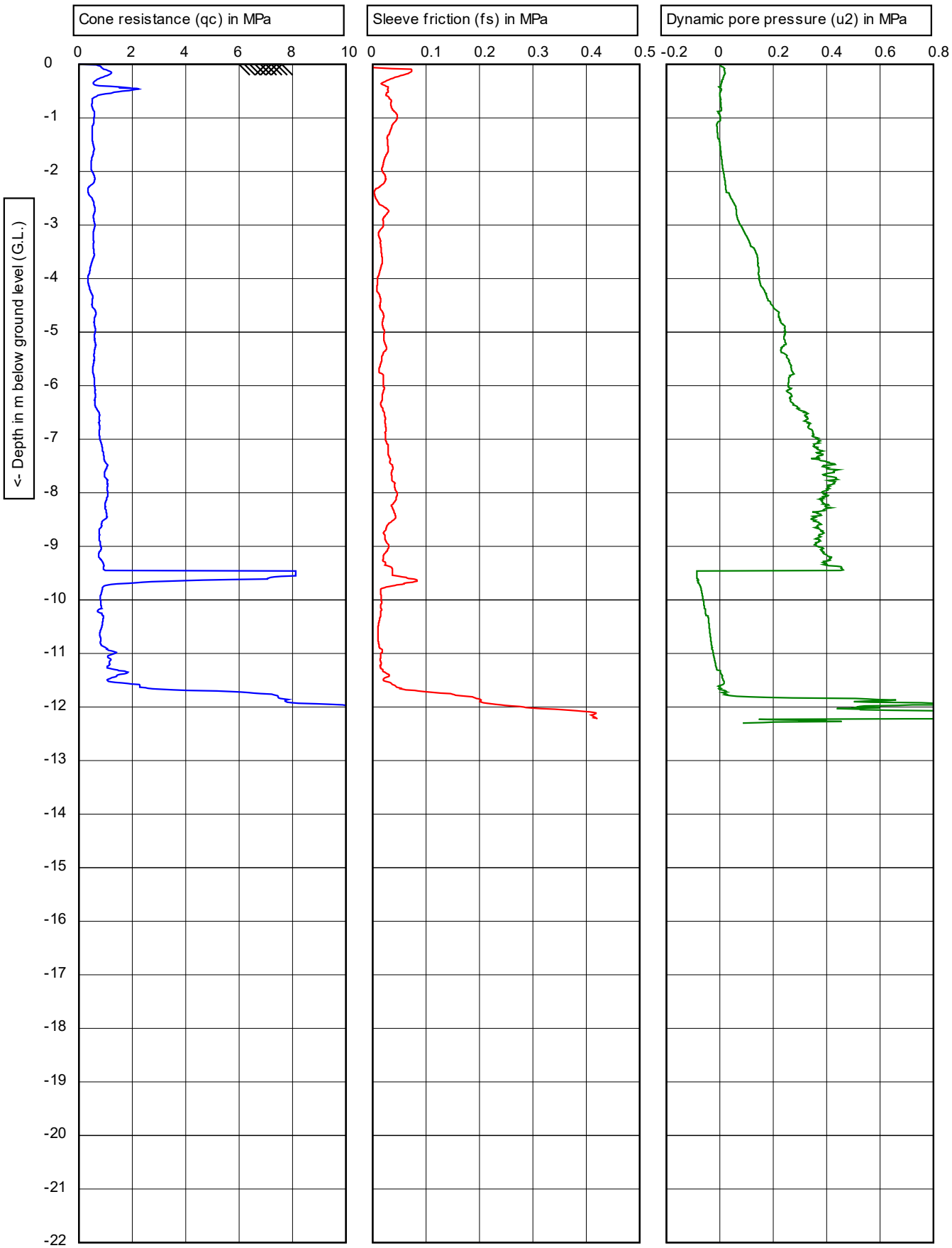
Test according ASTM D5778:12 & ISO 22476-1:2012

G.L.: **0.00 m MSL**

Project: **1350 Dairy Flat Highway**
Location: **Auckland (P-001539)**
Position: **1746896, 5942067 NZTM**

Predrill:	**0.00 m Predrilled**
Date:	**4/04/2023**
Cone no.:	**C10CFIIP.C13236**
Project no.:	**2-68207.00_HA10639**
CPT no.:	**11** **1/6**

1.49



Refusal (8t Rodflex)

EOH - Dipped - Collapsed Dry @ 0.4m

Test results indicated as not accredited are outside the scope of the laboratory's accreditation

r u2
150 cm²
10 cm²

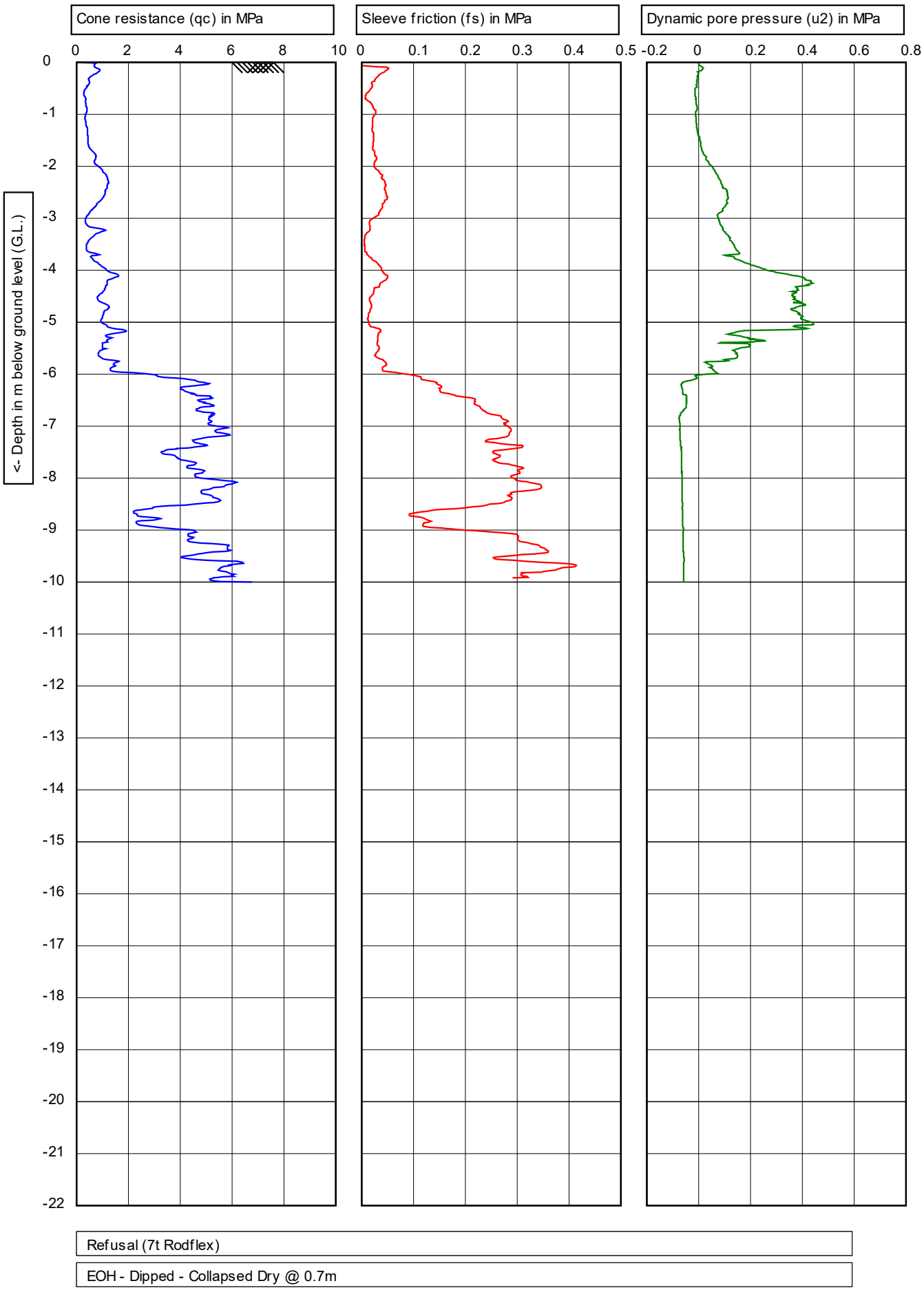
Test according ASTM D5778:12 & ISO 22476-1:2012

G.L.: **0.00 m MSL**

Project: **1350 Dairy Flat Highway**
Location: **Auckland (P-001539)**
Position: **1746951, 5942058 NZTM**

Predrill:	**0.00 m Predrilled**
Date:	**4/04/2023**
Cone no.:	**C10CFIIP.C21109**
Project no.:	**2-68207.00_HA10639**
CPT no.:	**12**

1.49



Refusal (7t Rodflex)

EOH - Dipped - Collapsed Dry @ 0.7m

WSP

ACCREDITED IANZ TESTING LABORATORY

Test results indicated as not accredited are outside the scope of the laboratory's accreditation

u2 150 cm² 10 cm²

Test according ASTM D5778:12 & ISO 22476-1:2012

G.L.: **0.00 m MSL**

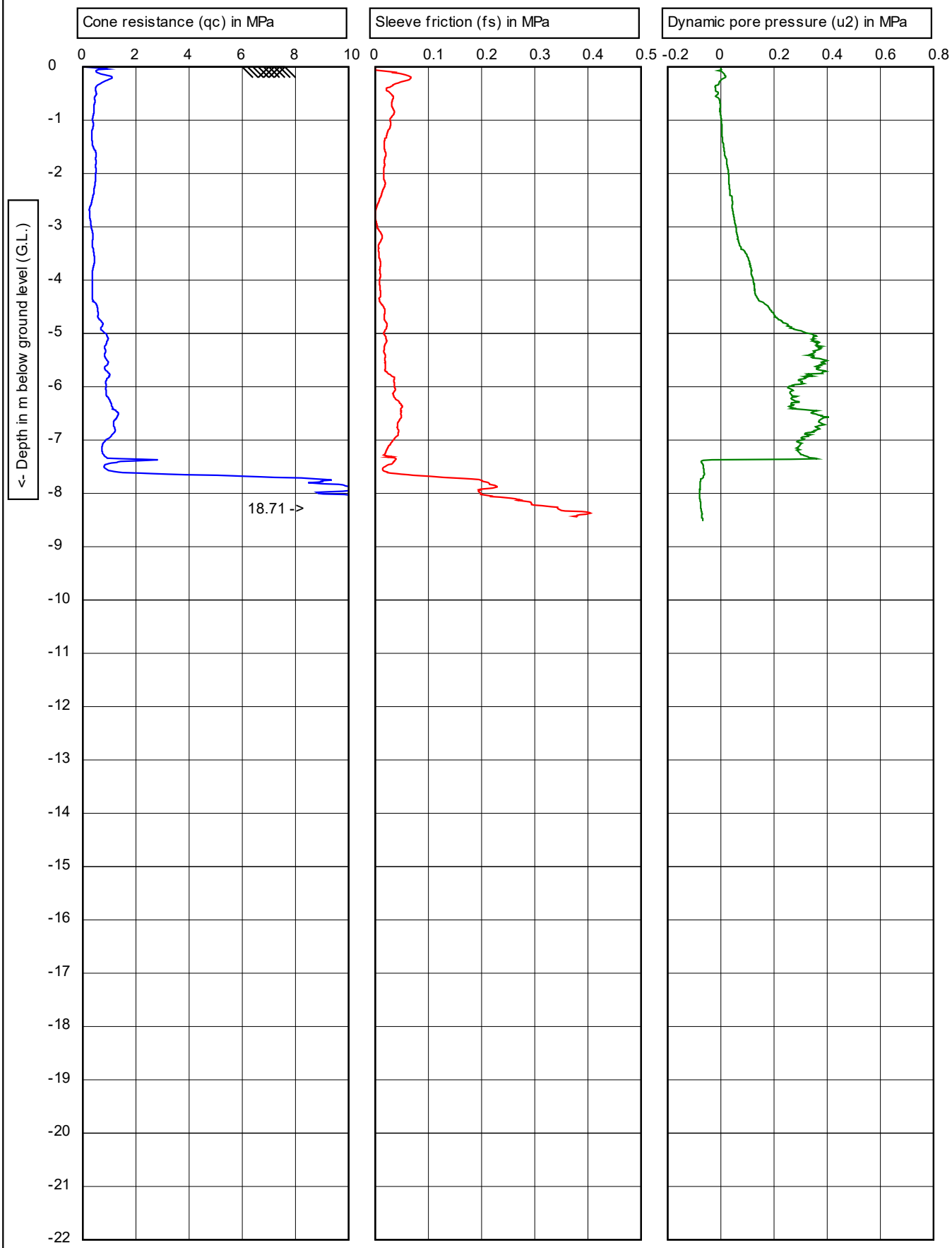
Project: **1350 Dairy Flat Highway**

Location: **Auckland (P-001539)**

Position: **1746769, 5942040 NZTM**

Predrill:	**0.00 m Predrilled**
Date:	**3/04/2023**
Cone no.:	**C10CFIIP.C21109**
Project no.:	**2-68207.00_HA10639**
CPT no.:	**13** **1/6**

1.49



WSP

ACCREDITED IANZ TESTING LABORATORY

Test results indicated as not accredited are outside the scope of the laboratory's accreditation

u2
150 cm²
10 cm²

Test according ASTM D5778:12 & ISO 22476-1:2012

G.L.: **0.00 m MSL**

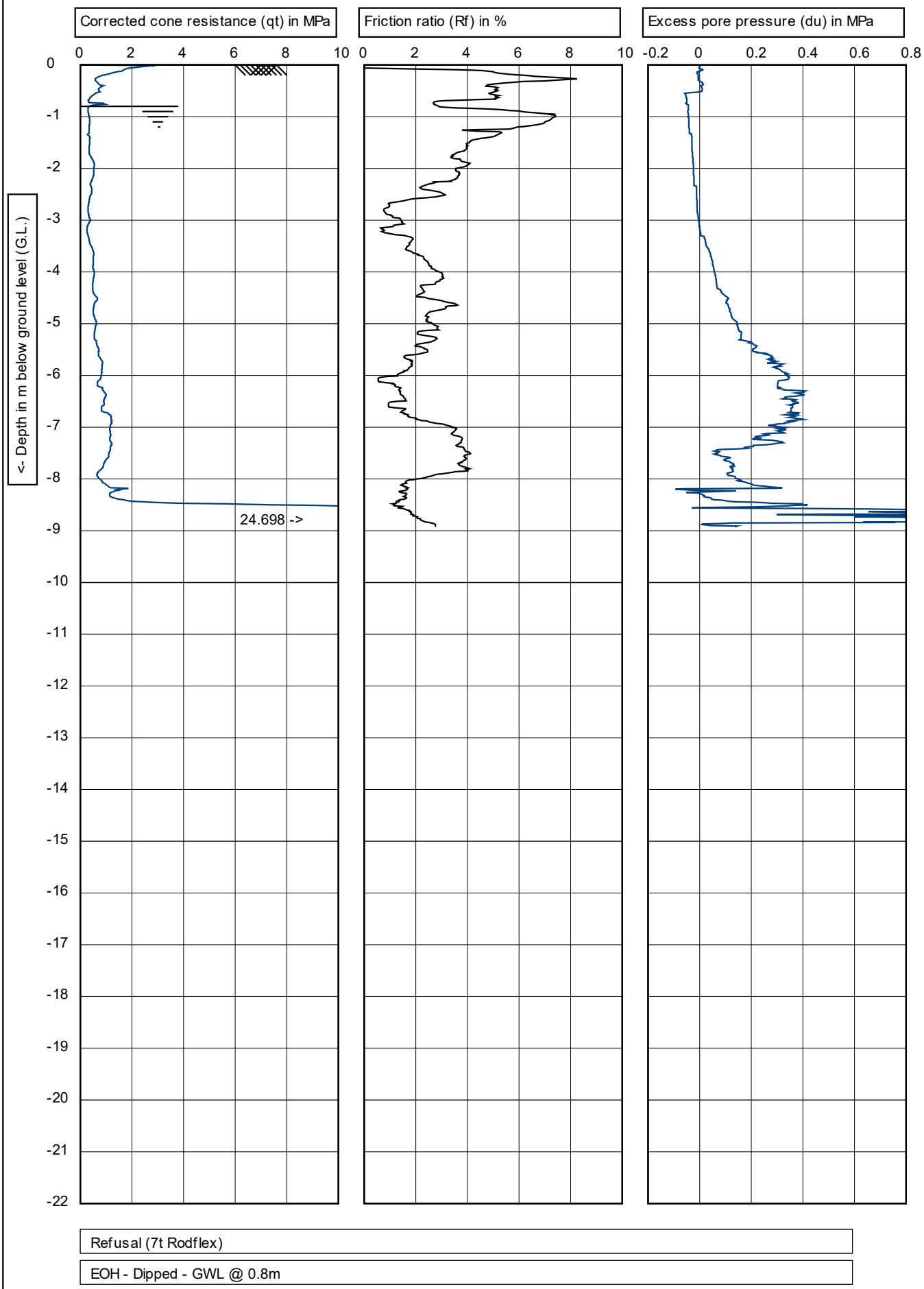
Project: **1350 Dairy Flat Highway**

Location: **Auckland (P-001539)**

Position: **1746871, 5942044 NZTM**

Predrill:	**0.00 m Predrilled**
Date:	**4/04/2023**
Cone no.:	**C10CFIIP.C21109**
Project no.:	**2-68207.00_HA10639**
CPT no.:	**14**

1.49



Refusal (7t Rodflex)

EOH - Dipped - GWL @ 0.8m

Graphs on this page are not IANZ accredited

u2
150 cm²
10 cm²

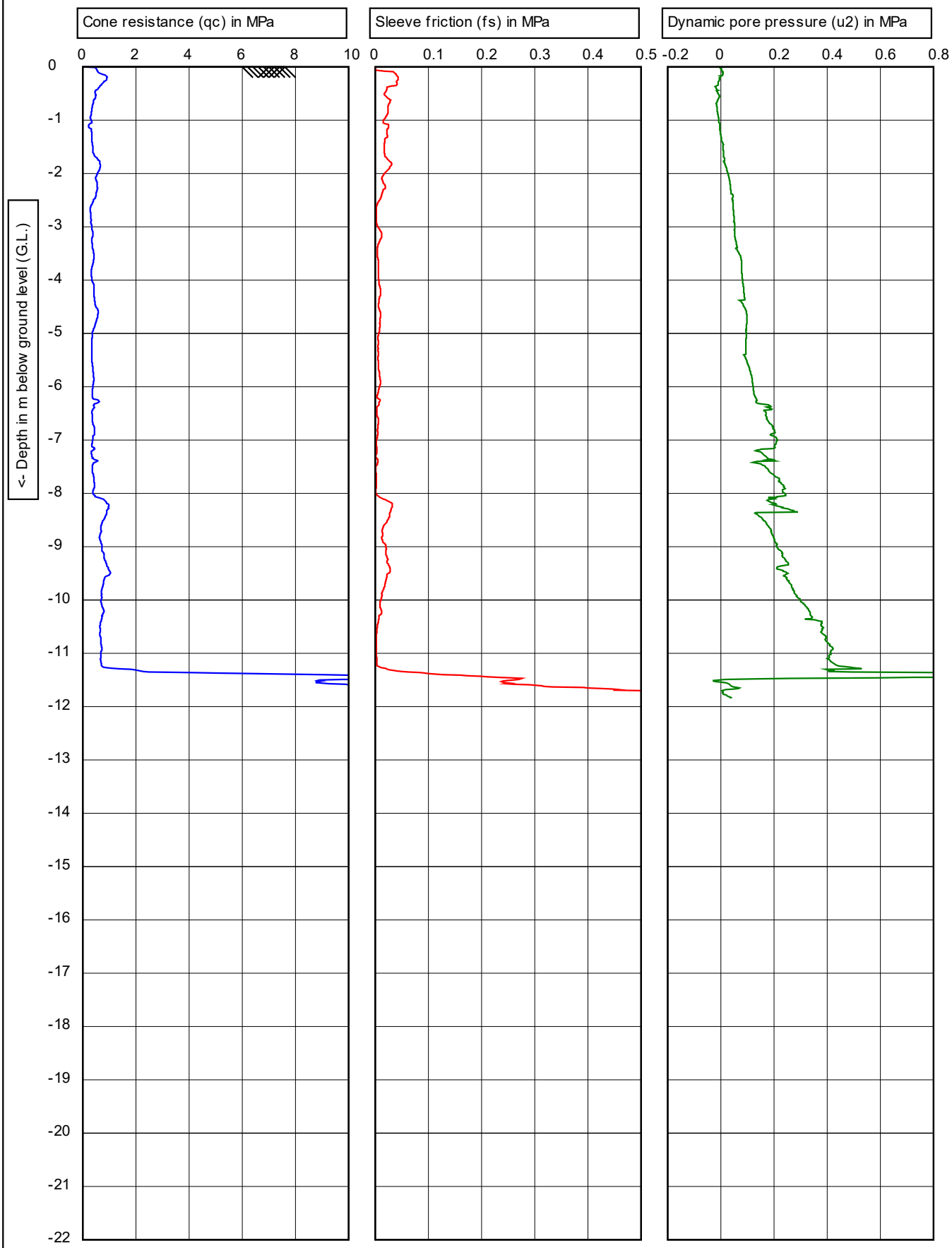
Test according ASTM D5778:12 & ISO 22476-1:2012

G.L.: **0.00 m MSL** W.L.: **-0.80 m**

Project: **1350 Dairy Flat Highway**
Location: **Auckland (P-001539)**
Position: **1746887, 5942009 NZTM**

Predrill:	**0.00 m Predrilled**
Date:	**4/04/2023**
Cone no.:	**C10CFIIP.C21109**
Project no.:	**2-68207.00_HA10639**
CPT no.:	**15** **2/6**

1.49



Refusal (6t Rodflex)

EOH - Dipped - Collapsed Dry @ 0.6m

WSP

ACCREDITED IANZ TESTING LABORATORY

Test results indicated as not accredited are outside the scope of the laboratory's accreditation

r u2
150 cm²
10 cm²

Test according ASTM D5778:12 & ISO 22476-1:2012

G.L.: **0.00 m MSL**

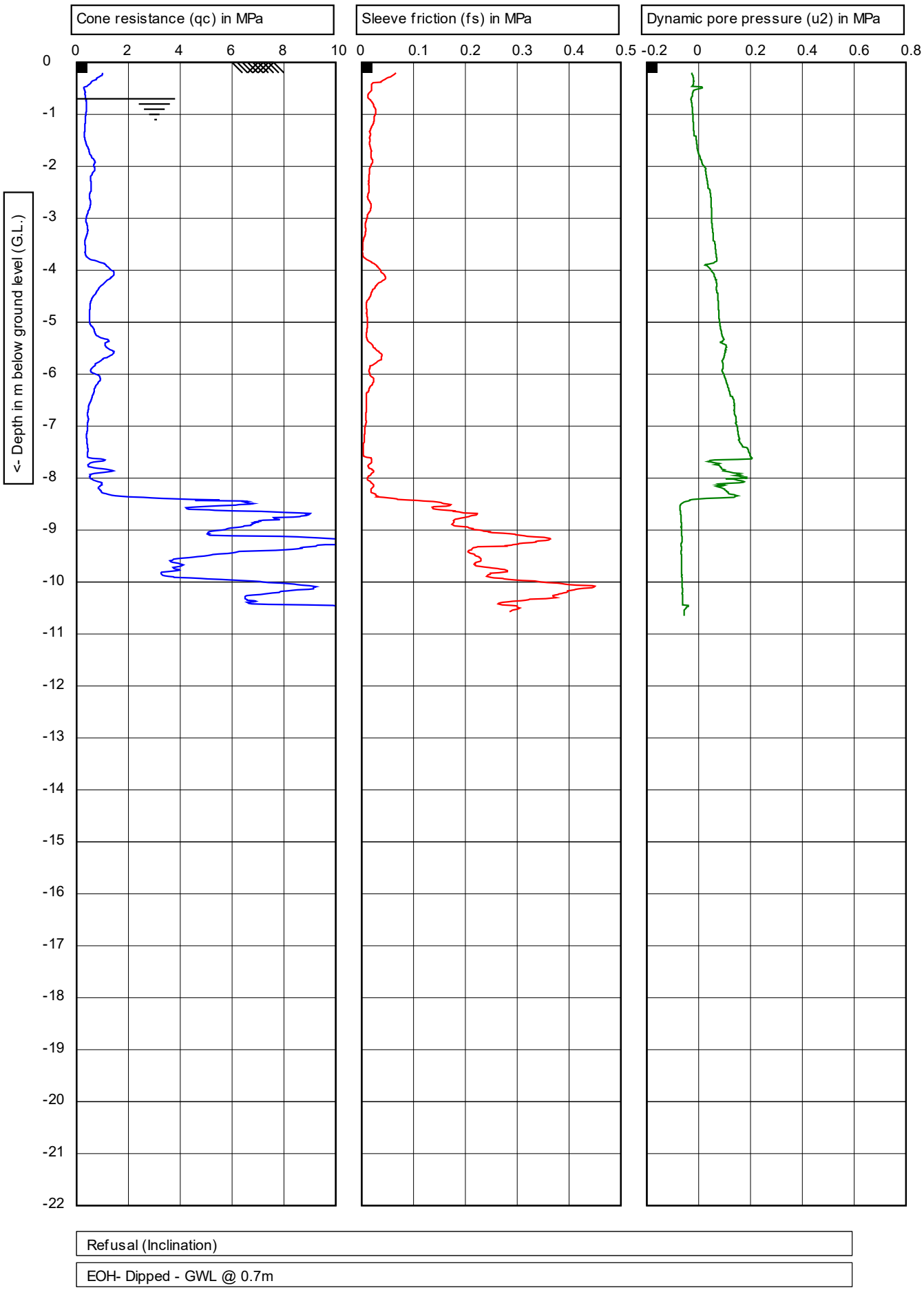
Project: **1350 Dairy Flat Highway**

Location: **Auckland (P-001539)**

Position: **1746947, 5942022 NZTM**

Predrill:	**0.00 m Predrilled**
Date:	**4/04/2023**
Cone no.:	**C10CFIIP.C13236**
Project no.:	**2-68207.00_HA10639**
CPT no.:	**16**

1.49



Refusal (Inclination)

EOH- Dipped - GWL @ 0.7m

Test results indicated as not accredited are outside the scope of the laboratory's accreditation

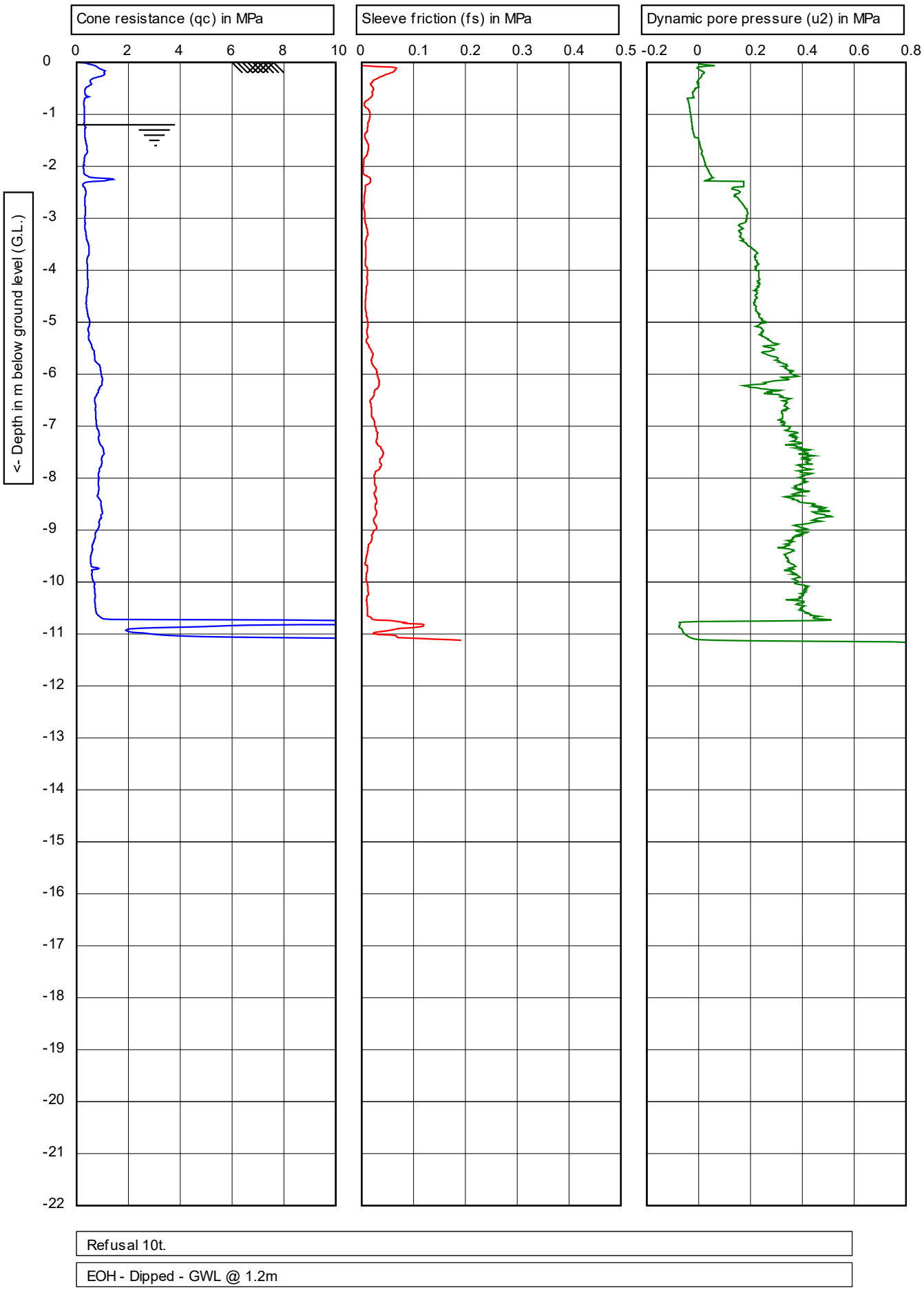
Test according ASTM D5778:12 & ISO 22476-1:2012

G.L.: **0.00 m MSL** W.L.: **-0.70 m**

Project: **1350 Dairy Flat Highway**
Location: **Auckland (P-001539)**
Position: **1746797, 5941996 NZTM**

Predrill:	**0.20 m Predrilled**
Date:	**3/04/2023**
Cone no.:	**C10CFIIP.C13236**
Project no.:	**2-68207.00_HA10639**
CPT no.:	**17** **1/6**

1.49



Refusal 10t.

EOH - Dipped - GWL @ 1.2m

Test results indicated as not accredited are outside the scope of the laboratory's accreditation

u2
150 cm²
10 cm²

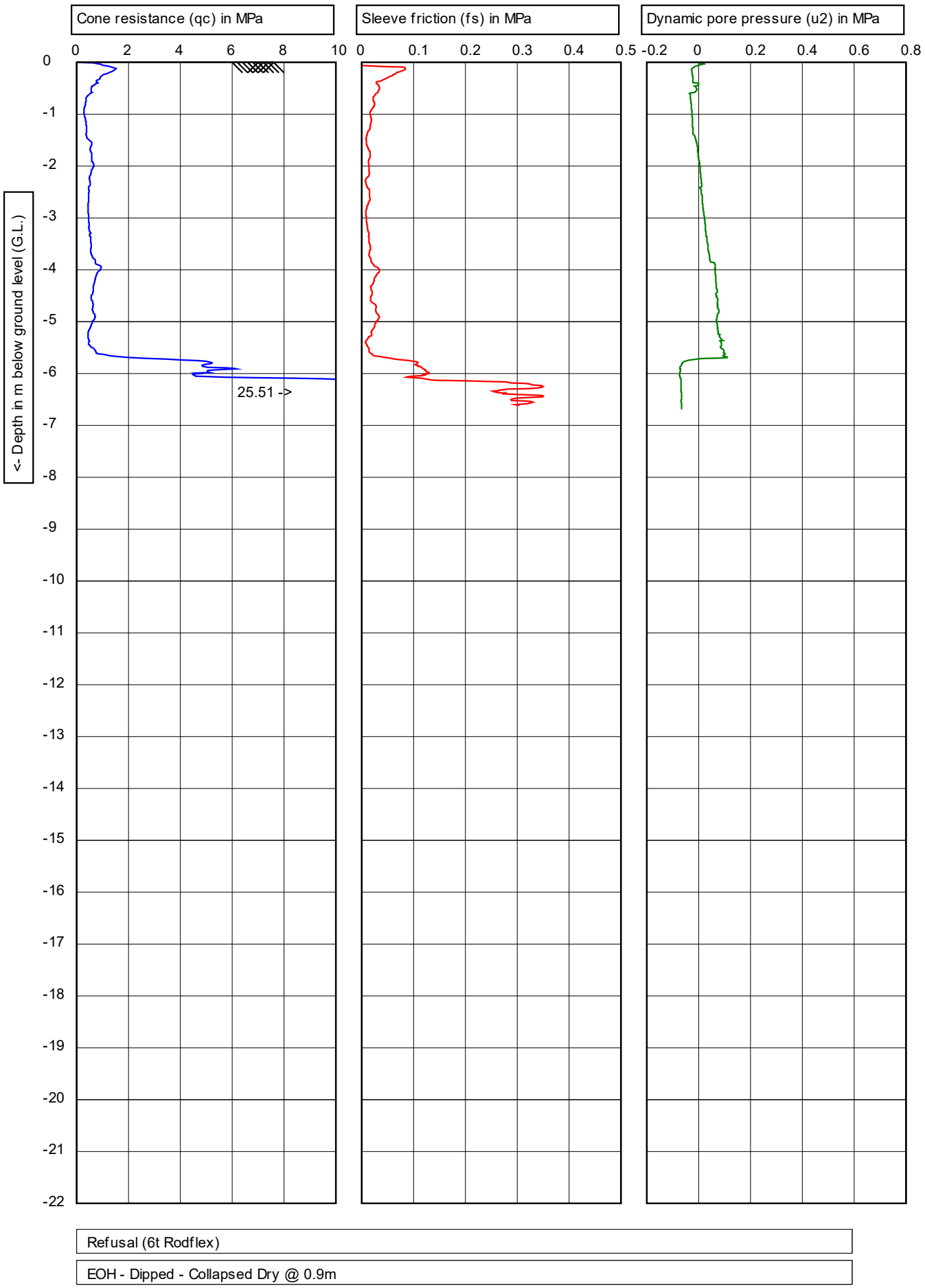
Test according ASTM D5778:12 & ISO 22476-1:2012

G.L.: **0.00 m MSL** W.L.: **-1.20 m**

Project: **1350 Dairy Flat Highway**
Location: **Auckland (P-001539)**
Position: **1746920, 5941968 NZTM**

Predrill:	**0.00 m Predrilled**
Date:	**4/04/2023**
Cone no.:	**C10CFIIP.C21109**
Project no.:	**2-68207.00_HA10639**
CPT no.:	**18** **1/6**

1.49



Refusal (6t Rodflex)

EOH - Dipped - Collapsed Dry @ 0.9m

WSP

ACCREDITED TESTING LABORATORY

Test results indicated as not accredited are outside the scope of the laboratory's accreditation

r u2
L 150 cm²
10 cm²

Test according ASTM D5778:12 & ISO 22476-1:2012

G.L.: **0.00 m MSL**

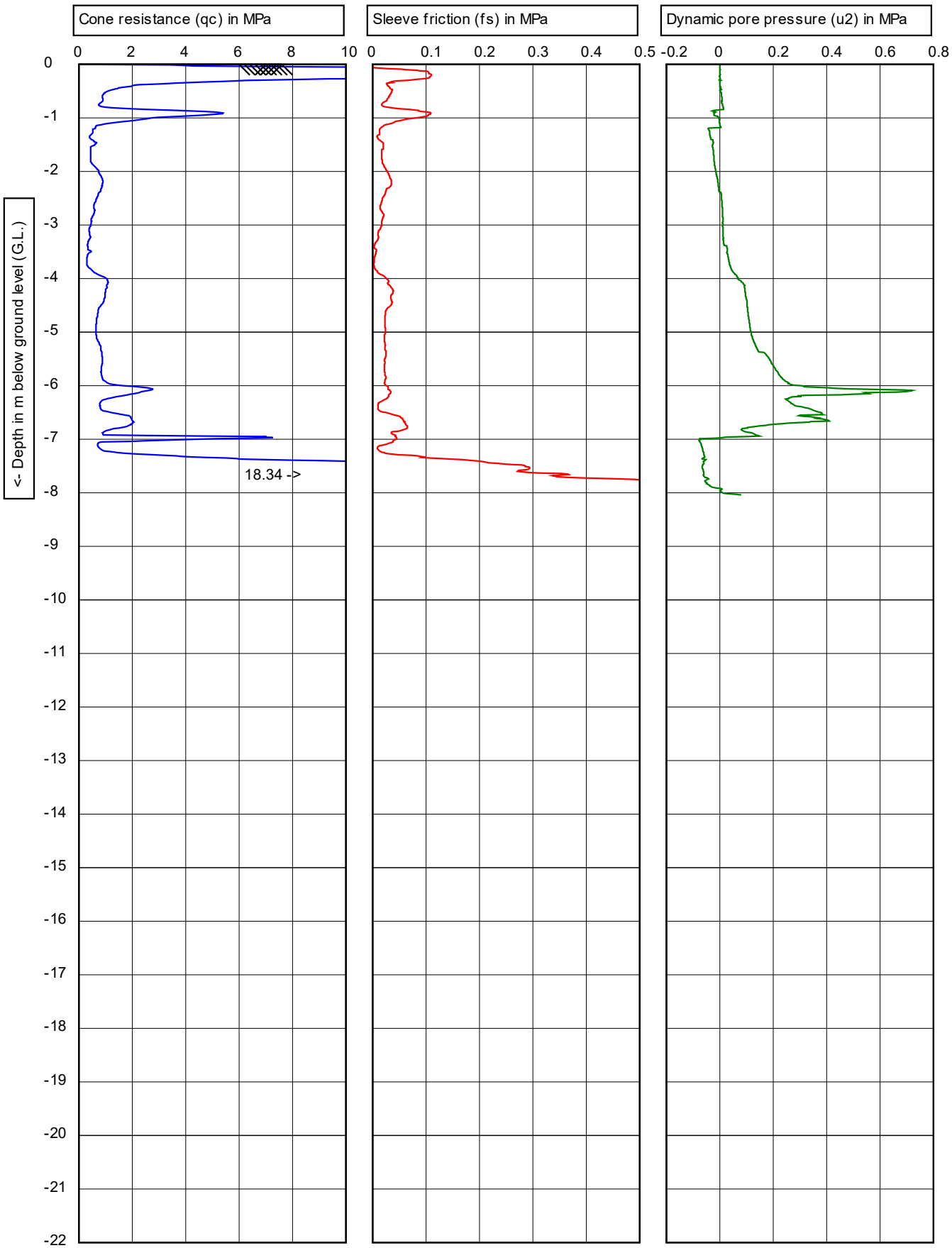
Project: **1350 Dairy Flat Highway**

Location: **Auckland (P-001539)**

Position: **1747042, 5941973 NZTM**

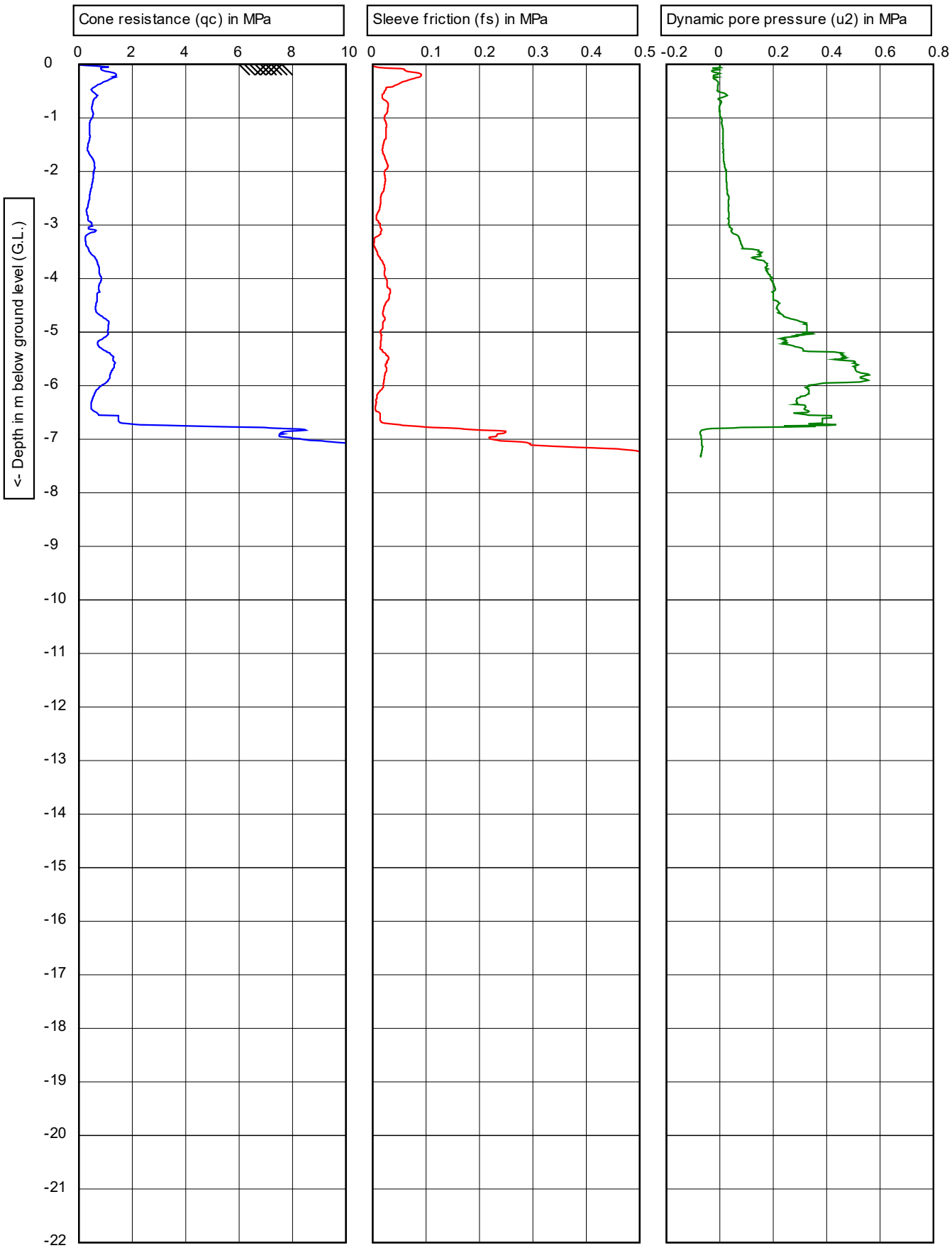
Predrill:	**0.00 m Predrilled**
Date:	**5/04/2023**
Cone no.:	**C10CFIIP.C13236**
Project no.:	**2-68207.00_HA10639**
CPT no.:	**19**

1.49



WSP ACCREDITED IANZ TESTING LABORATORY. Test results indicated as not accredited are outside the scope of the laboratory's accreditation	r u2 / L 150 cm² / 10 cm²	Test according ASTM D5778:12 & ISO 22476-1:2012	Predrill: **0.00 m Predrilled**
		G.L.: **0.00 m MSL**	Date: **3/04/2023**
		Project: **1350 Dairy Flat Highway**	Cone no.: **C10CFIIP.C21109**
		Location: **Auckland (P-001539)**	Project no.: **2-68207.00_HA10639**
		Position: **1746823, 5941967 NZTM**	CPT no.: **20** **1/6**

1.49



Refusal 10t.

EOH - Dipped - Collapsed Dry @ 1.7m

Test results indicated as not accredited are outside the scope of the laboratory's accreditation

u2
150 cm²
10 cm²

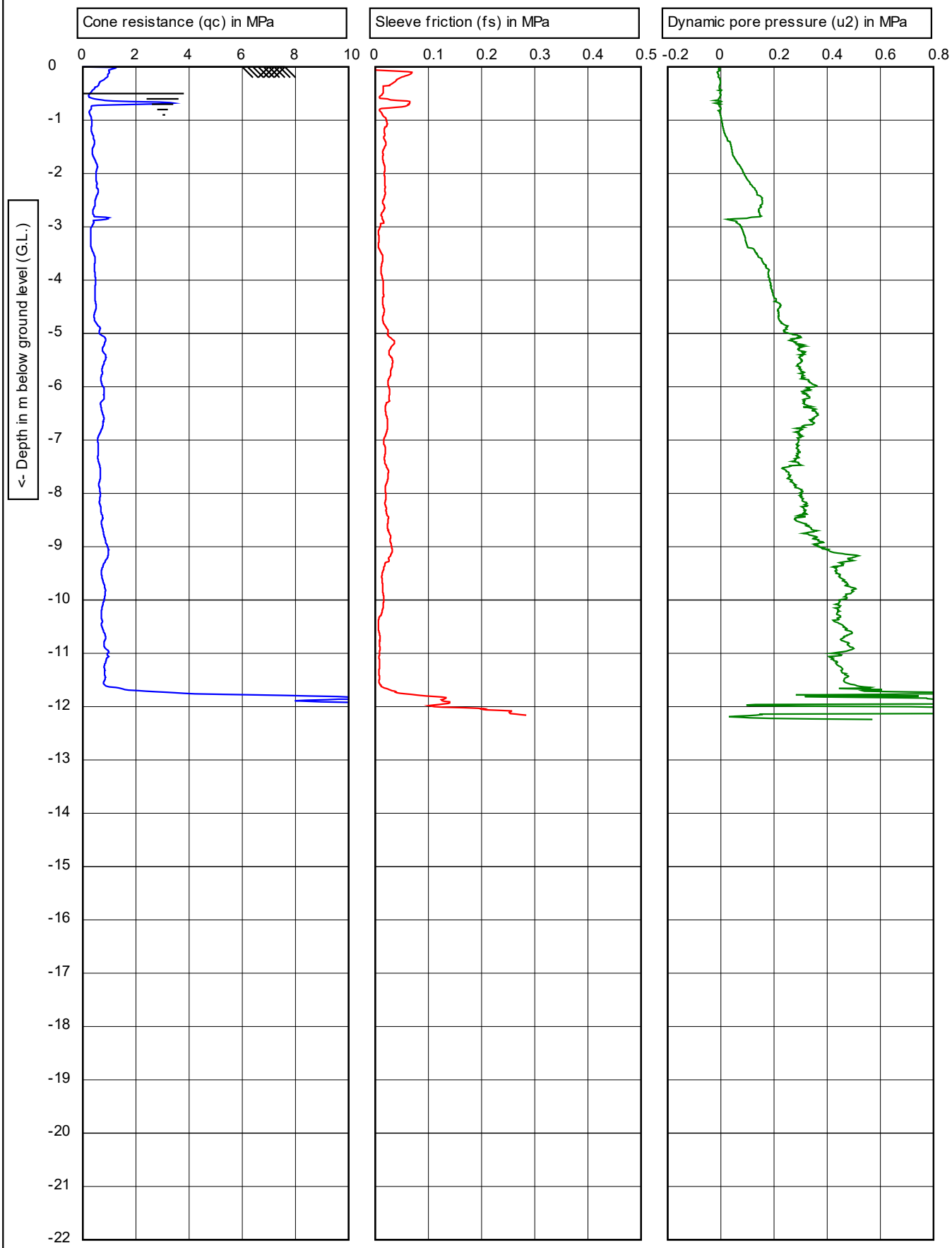
Test according ASTM D5778:12 & ISO 22476-1:2012

G.L.: **0.00 m**

Project: **1350 Dairy Flat Highway**
Location: **Auckland (P-001537)**
Position: **1746845, 5942022**

Predrill:	**0.00 m Predrilled**
Date:	**3/04/2023**
Cone no.:	**C10CFIIP.C13236**
Project no.:	**2-68207.00_HA10639**
CPT no.:	**21** **1/6**

1.49



Refusal 10t.

EOH - Dipped - GWL @ 0.5m

Test results indicated as not accredited are outside the scope of the laboratory's accreditation

u2
150 cm²
10 cm²

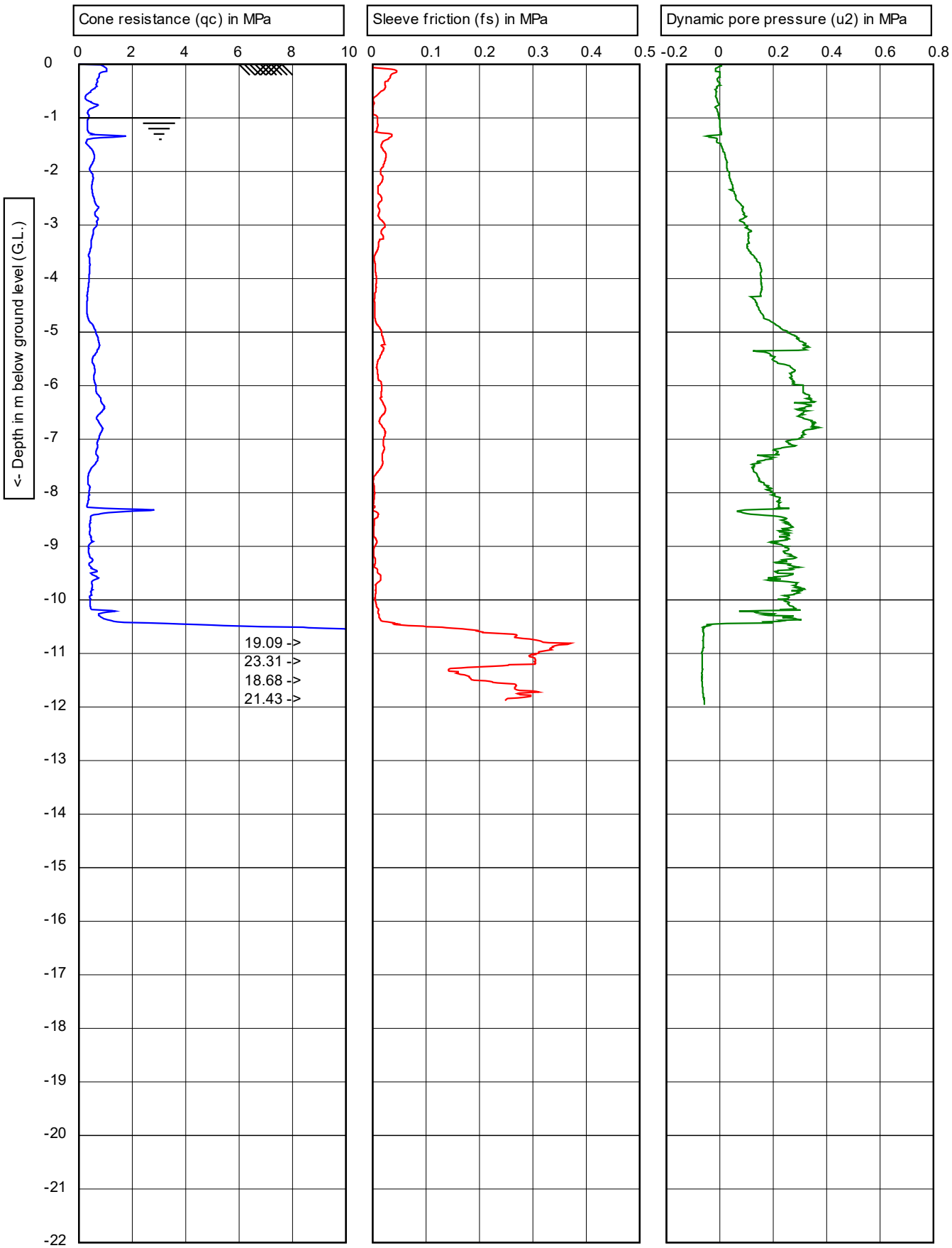
Test according ASTM D5778:12 & ISO 22476-1:2012

G.L.: **0.00 m MSL** W.L.: **-0.50 m**

Project: **1350 Dairy Flat Highway**
Location: **Auckland (P-001539)**
Position: **1746904, 5941940 NZTM**

Predrill:	**0.00 m Predrilled**
Date:	**4/04/2023**
Cone no.:	**C10CFIIP.C21109**
Project no.:	**2-68207.00_HA10639**
CPT no.:	**22** **1/6**

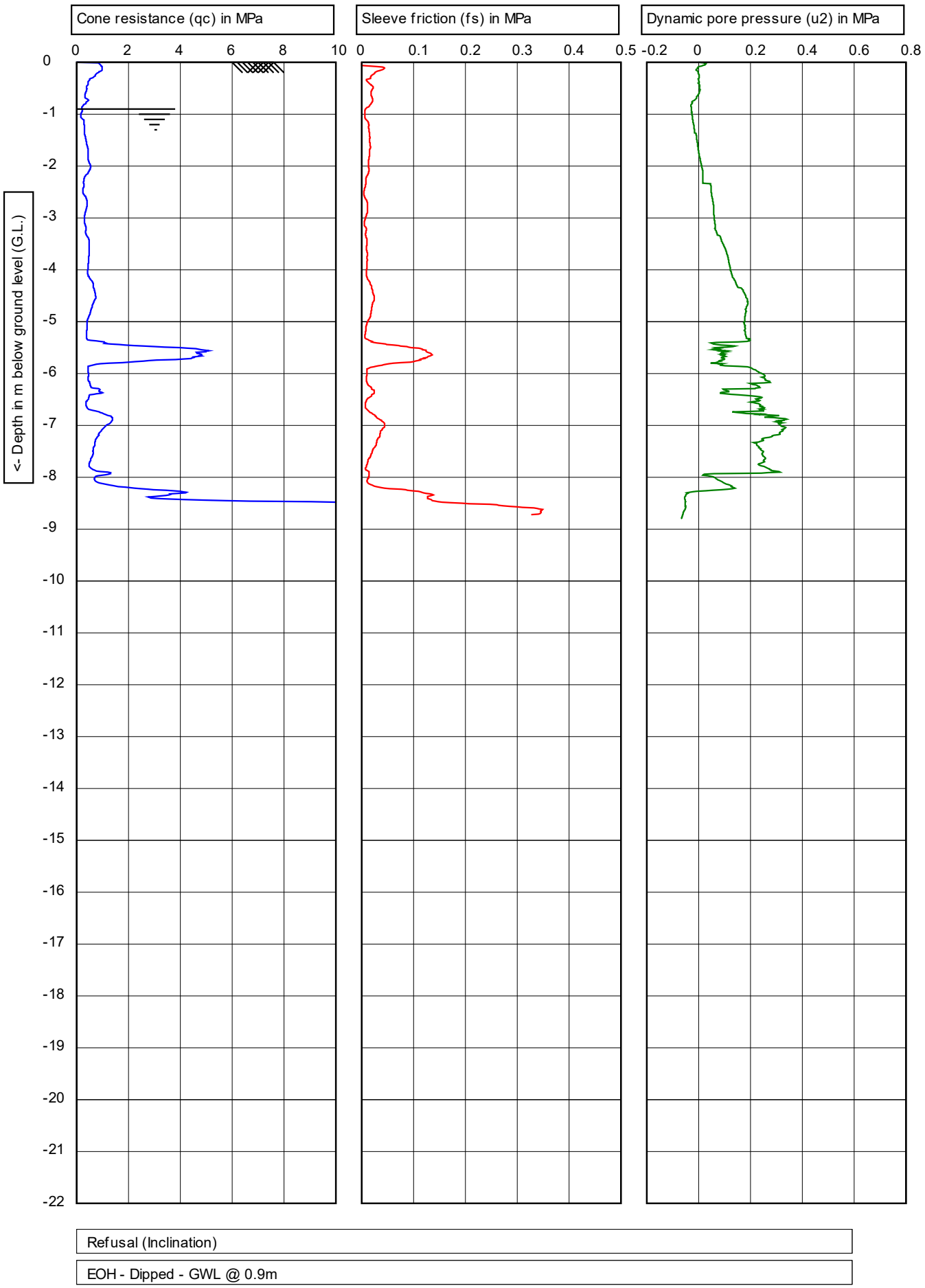
1.49



Test according ASTM D5778:12 & ISO 22476-1:2012		Predrill:	0.00 m Predrilled
G.L.: 0.00 m MSL	W.L.: -1.00 m	Date:	4/04/2023
Project: 1350 Dairy Flat Highway		Cone no.:	C10CFIIP.C13236
Location: Auckland (P-001539)		Project no.:	2-68207.00_HA10639
Position: 1749654, 5941925 NZTM		CPT no.:	23 1/6

Test results indicated as not accredited are outside the scope of the laboratory's accreditation

1.49



Refusal (Inclination)

EOH - Dipped - GWL @ 0.9m

Test results indicated as not accredited are outside the scope of the laboratory's accreditation

r u2
L 150 cm²
10 cm²

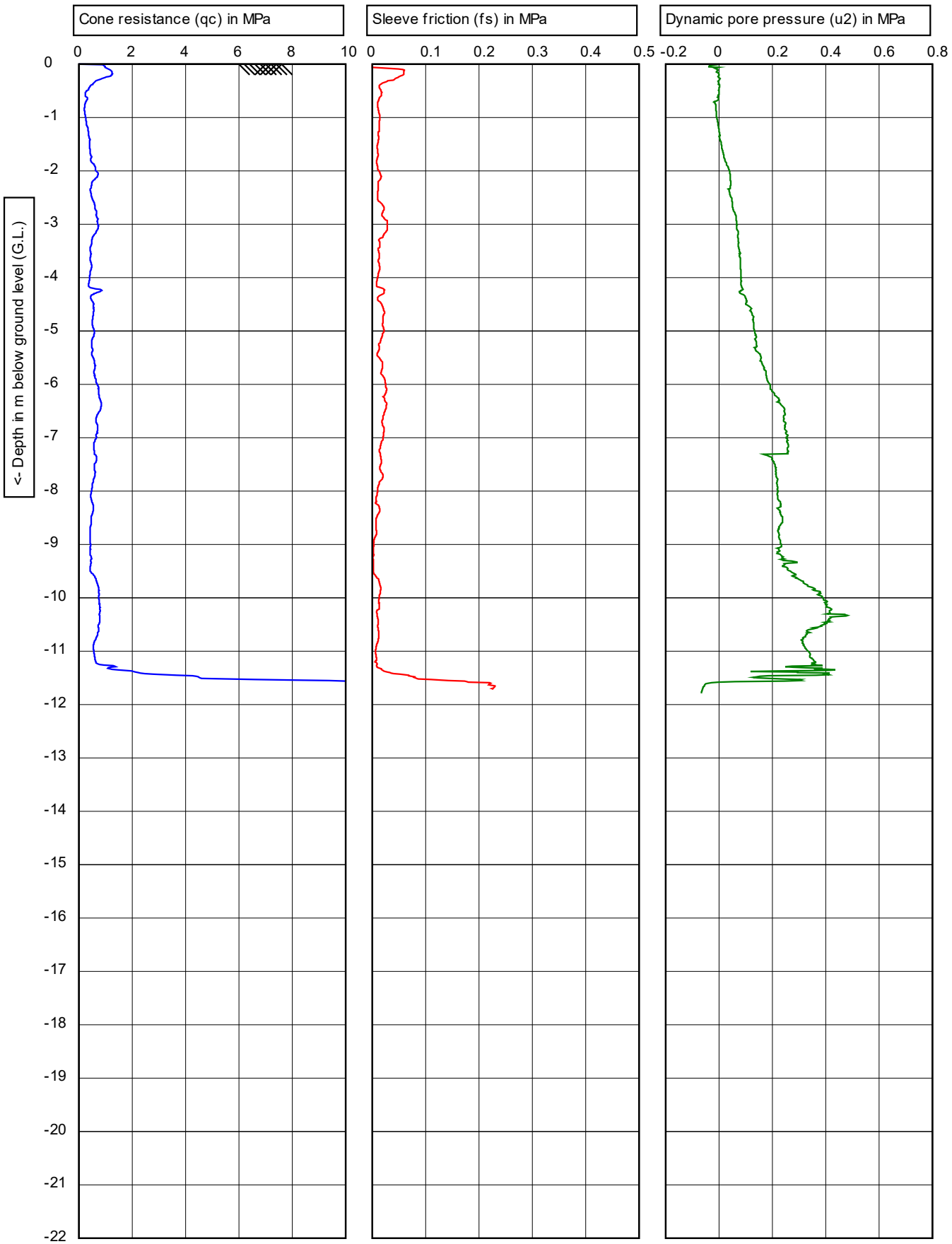
Test according ASTM D5778:12 & ISO 22476-1:2012

G.L.: **0.00 m MSL** | W.L.: **-0.90 m**

Project: **1350 Dairy Flat Highway**
Location: **Auckland (P-001539)**
Position: **1747007, 5941890 NZTM**

Predrill:	**0.00 m Predrilled**
Date:	**5/04/2023**
Cone no.:	**C10CFIIP.C21109**
Project no.:	**2-68207.00_HA10639**
CPT no.:	**24**

1.49



Refusal (7t Rodflex)

EOH - Dipped - Collapsed Dry @ 0.9m

Test results indicated as not accredited are outside the scope of the laboratory's accreditation

r u2
L 150 cm²
10 cm²

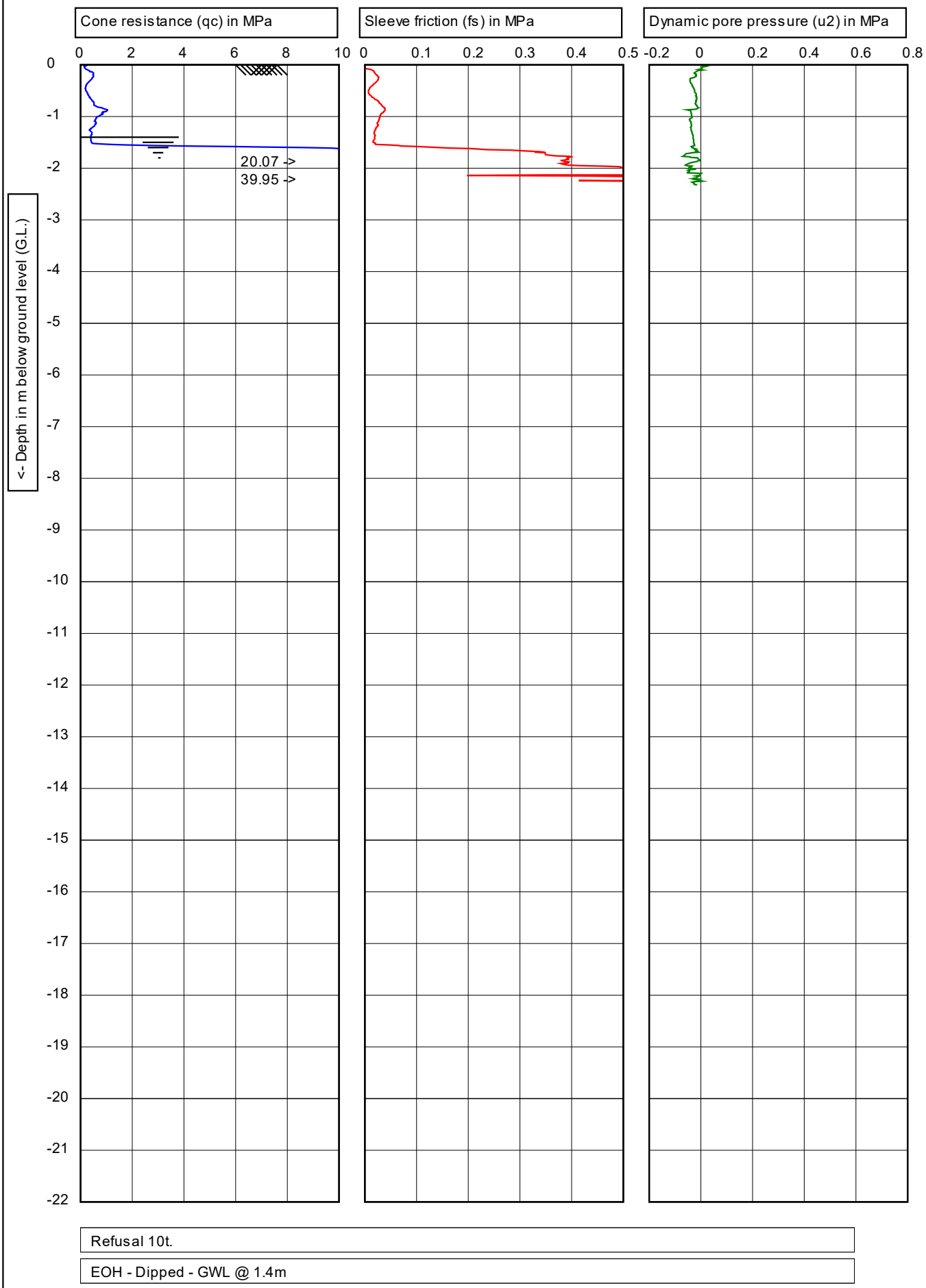
Test according ASTM D5778:12 & ISO 22476-1:2012

G.L.: **0.00 m MSL**

Project: **1350 Dairy Flat Highway**
Location: **Auckland (P-001539)**
Position: **1746976, 5941801 NZTM**

Predrill:	**0.00 m Predrilled**
Date:	**5/04/2023**
Cone no.:	**C10CFIIP.C13236**
Project no.:	**2-68207.00_HA10639**
CPT no.:	**25**

1.49



Refusal 10t.

EOH - Dipped - GWL @ 1.4m

Test results indicated as not accredited are outside the scope of the laboratory's accreditation

u2 150 cm² 10 cm²

Method:ASTM D5778-20&ISO 22476:1:2012cor.2013

G.L.: **0.00 m MSL** W.L.: **-1.40 m**

Project: **Surf Park Site (P-002405)**

Location: **Dairy Flat - Auckland**

Position: **1747028, 5942339 NZTM**

Predrill: **0.00 m Predrilled**

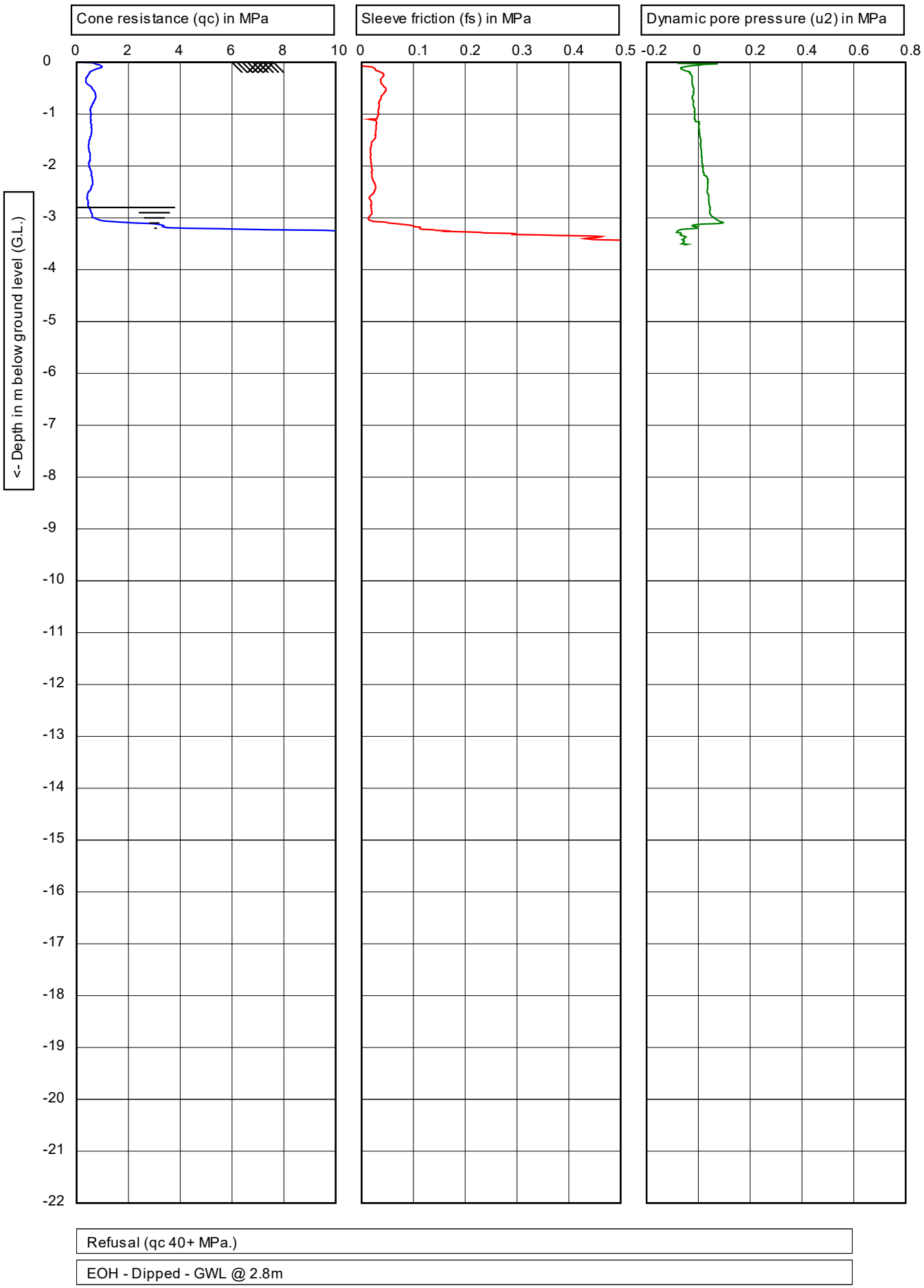
Date: **18/08/2025**

Cone no.: **C10CFIIP.C241654**

Project no.: **2-68207.00_HA15435**

CPT no.: **101** **1/6**

1.49



Refusal (qc 40+ MPa.)

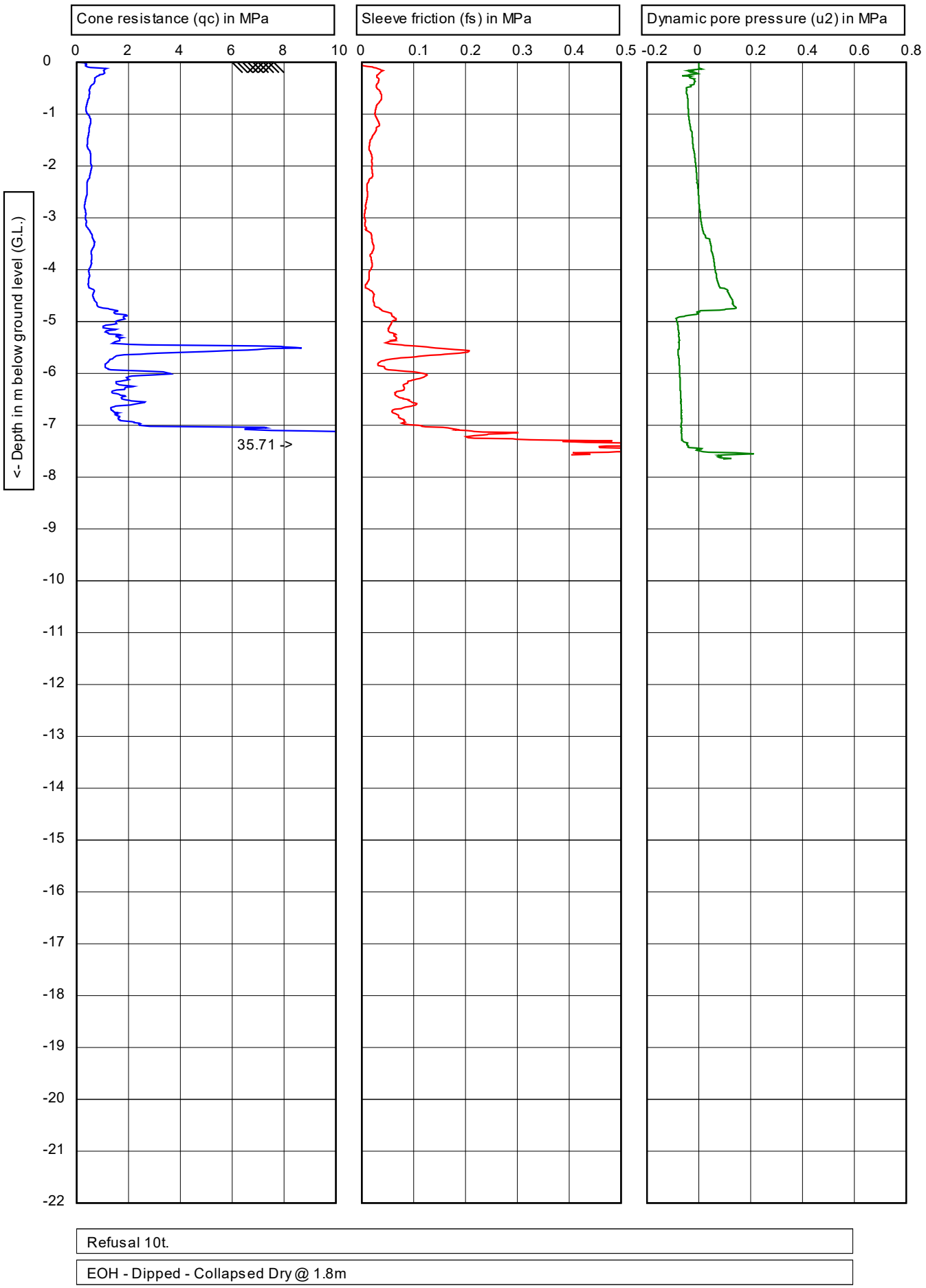
EOH - Dipped - GWL @ 2.8m

Test results indicated as not accredited are outside the scope of the laboratory's accreditation

u2 150 cm² 10 cm²

Method:ASTM D5778-20&ISO 22476:1:2012cor.2013		Predrill:	**0.00 m Predrilled**
G.L.: **0.00 m MSL**	W.L.: **-2.80 m**	Date:	**18/08/2025**
Project: **Surf Park Site (P-002405)**		Cone no.:	**C10CFIIP.C21094**
Location: **Dairy Flat - Auckland**		Project no.:	**2-68207.00_HA15435**
Position: **1747031, 5942293 NZTM**		CPT no.:	**102** 1/6

1.49



Test results indicated as not accredited are outside the scope of the laboratory's accreditation

u2 150 cm² 10 cm²

Method:ASTM D5778-20&ISO 22476:1:2012cor.2013

G.L.: **0.00 m MSL**

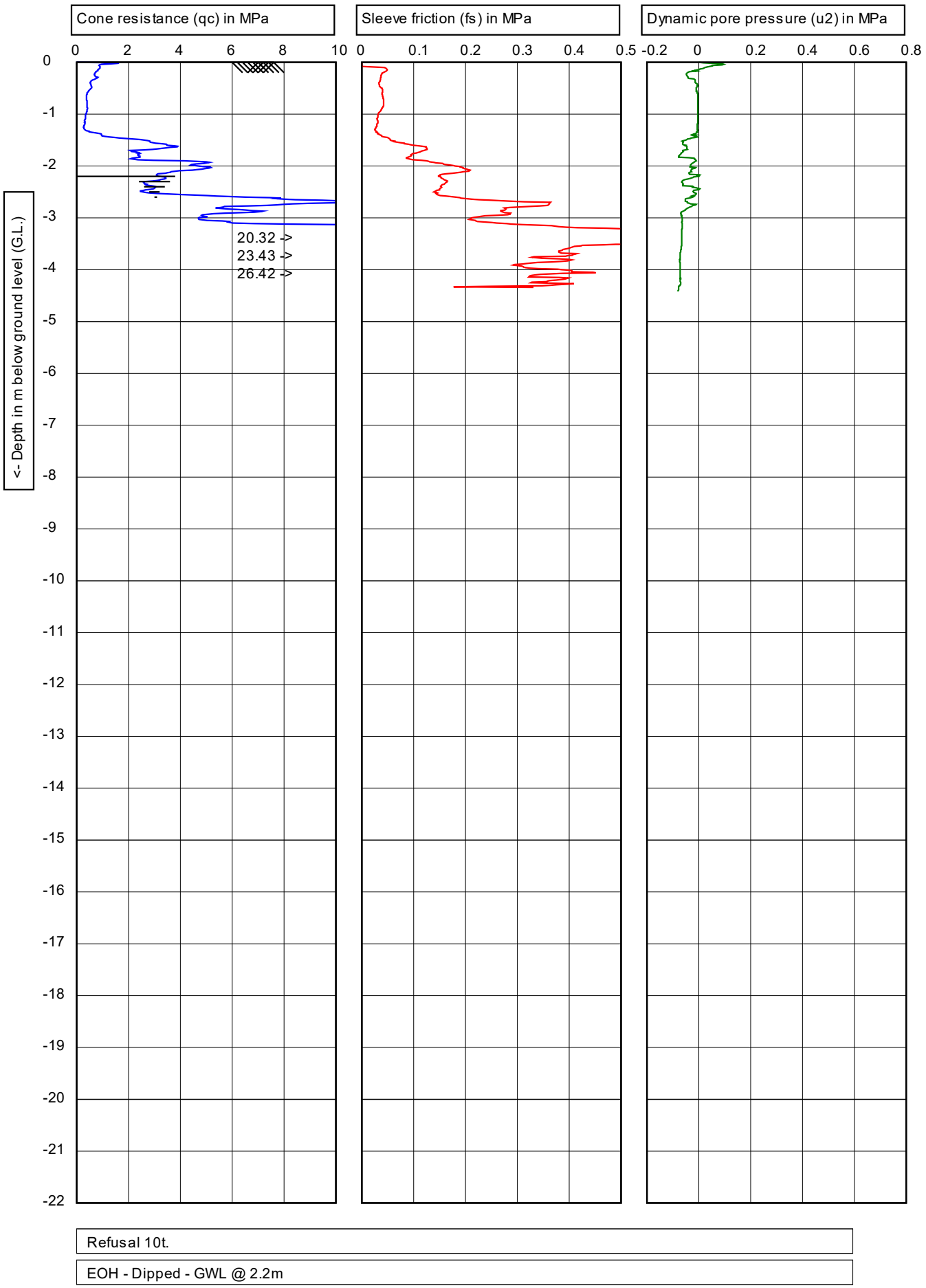
Project: **Surf Park Site (P-002405)**

Location: **Dairy Flat - Auckland**

Position: **1747039, 5942254 NZTM**

Predrill:	**0.00 m Predrilled**
Date:	**18/08/2025**
Cone no.:	**C10CFIIP.C241654**
Project no.:	**2-68207.00_HA15435**
CPT no.:	**103**

1.49



Refusal 10t.

EOH - Dipped - GWL @ 2.2m

WSP — ACCREDITED IANZ TESTING LABORATORY. Test results indicated as not accredited are outside the scope of the laboratory's accreditation

u2 150 cm² 10 cm²

Method:ASTM D5778-20&ISO 22476:1:2012cor.2013

G.L.: **0.00 m MSL** W.L.: **-2.20 m**

Project: **Surf Park Site (P-002405)**

Location: **Dairy Flat - Auckland**

Position: **1747062, 5942208 NZTM**

Predrill: **0.00 m Predrilled**

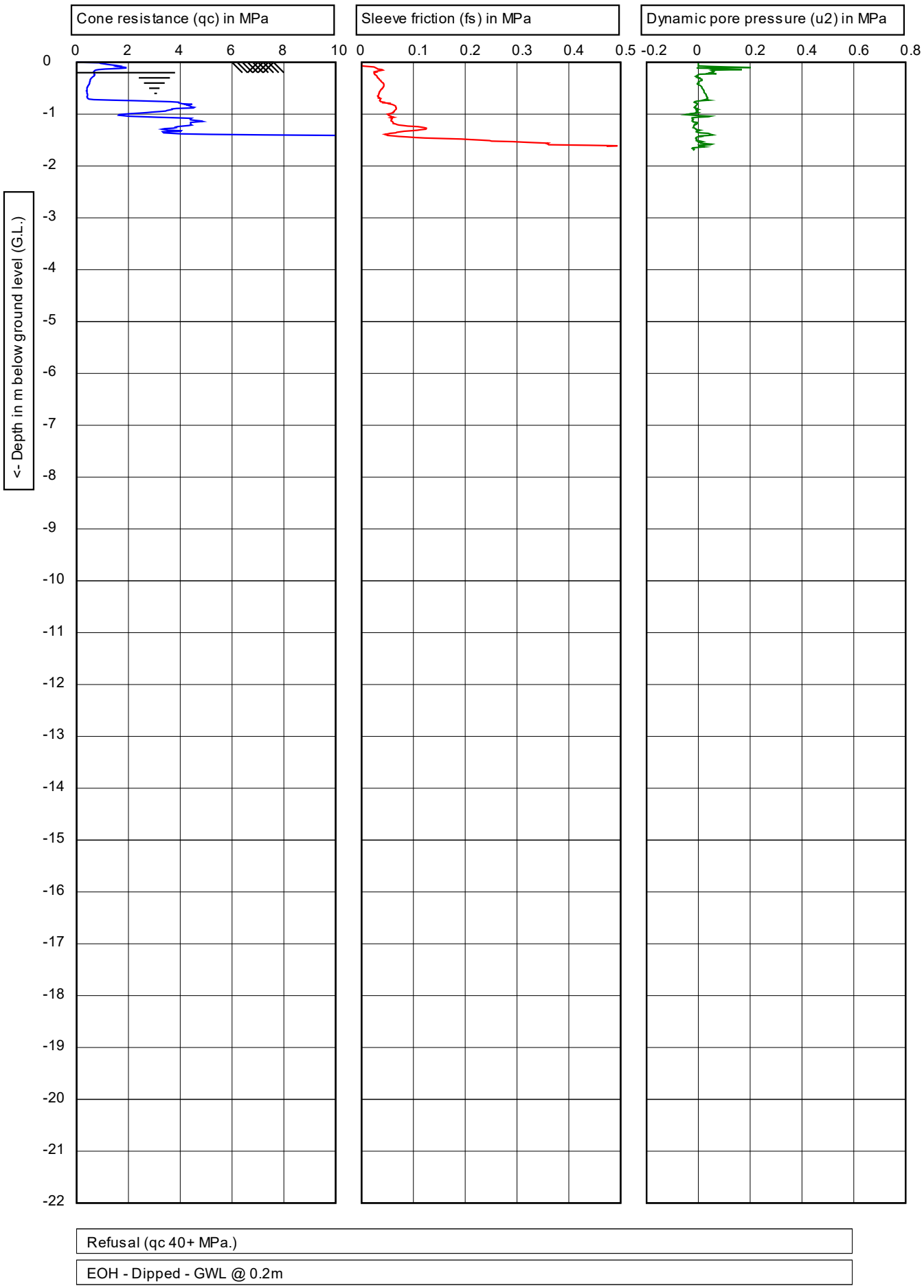
Date: **18/08/2025**

Cone no.: **C10CFIIP.C21094**

Project no.: **2-68207.00_HA15435**

CPT no.: **104** **1/6**

1.49



Refusal (qc 40+ MPa.)

EOH - Dipped - GWL @ 0.2m

Test results indicated as not accredited are outside the scope of the laboratory's accreditation

u2 150 cm² 10 cm²

Method:ASTM D5778-20&ISO 22476:1:2012cor.2013

G.L.: **0.00 m MSL** W.L.: **-0.20 m**

Project: **Surf Park Site (P-002405)**

Location: **Dairy Flat - Auckland**

Position: **1747115, 5942170 NZTM**

Predrill: **0.00 m Predrilled**

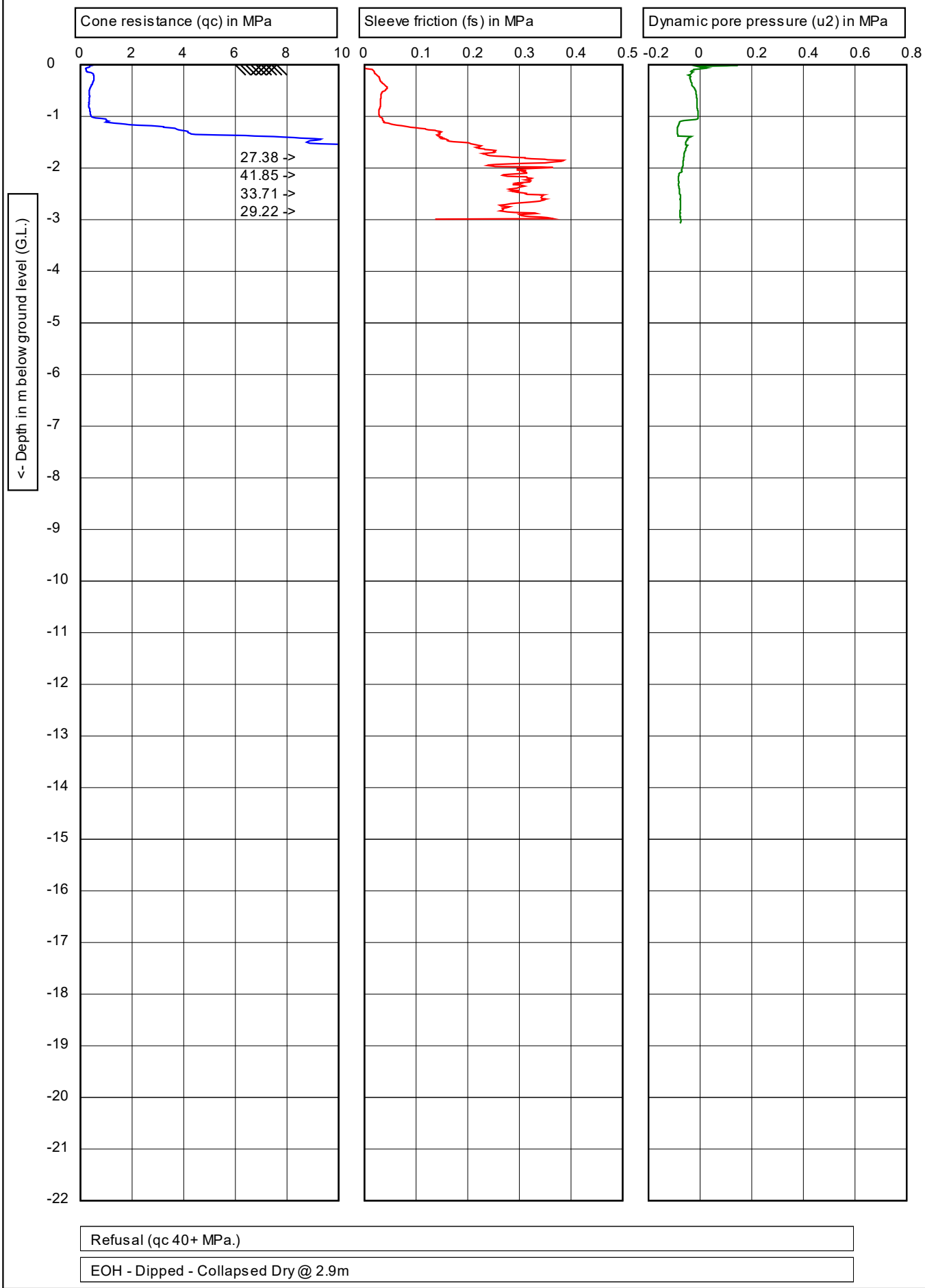
Date: **18/08/2025**

Cone no.: **C10CFIIP.C241654**

Project no.: **2-68207.00_HA15435**

CPT no.: **105** **1/6**

1.49



Refusal (qc 40+ MPa.)

EOH - Dipped - Collapsed Dry @ 2.9m

Test results indicated as not accredited are outside the scope of the laboratory's accreditation

u2 150 cm² 10 cm²

Method:ASTM D5778-20&ISO 22476:1:2012cor.2013

G.L.: **0.00 m MSL**

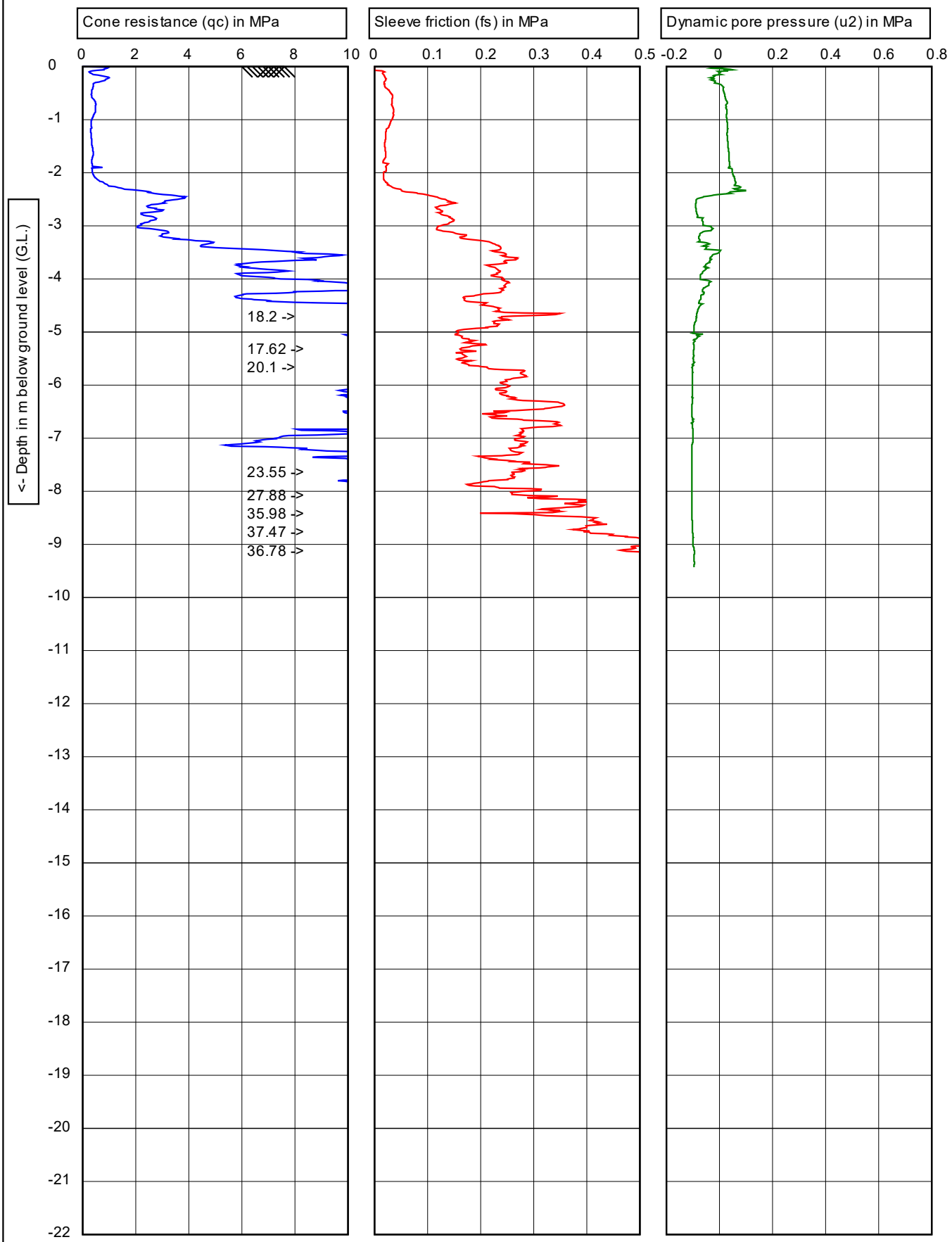
Project: **Surf Park Site (P-002405)**

Location: **Dairy Flat - Auckland**

Position: **1747022, 5941566 NZTM**

Predrill:	**0.00 m Predrilled**
Date:	**21/08/2025**
Cone no.:	**C10CFIIP.C21094**
Project no.:	**2-68207.00_HA15435**
CPT no.:	**106**

1.49



Test results indicated as not accredited are outside the scope of the laboratory's accreditation

Method:ASTM D5778-20&ISO 22476:1:2012cor.2013

G.L.: **0.00 m MSL**

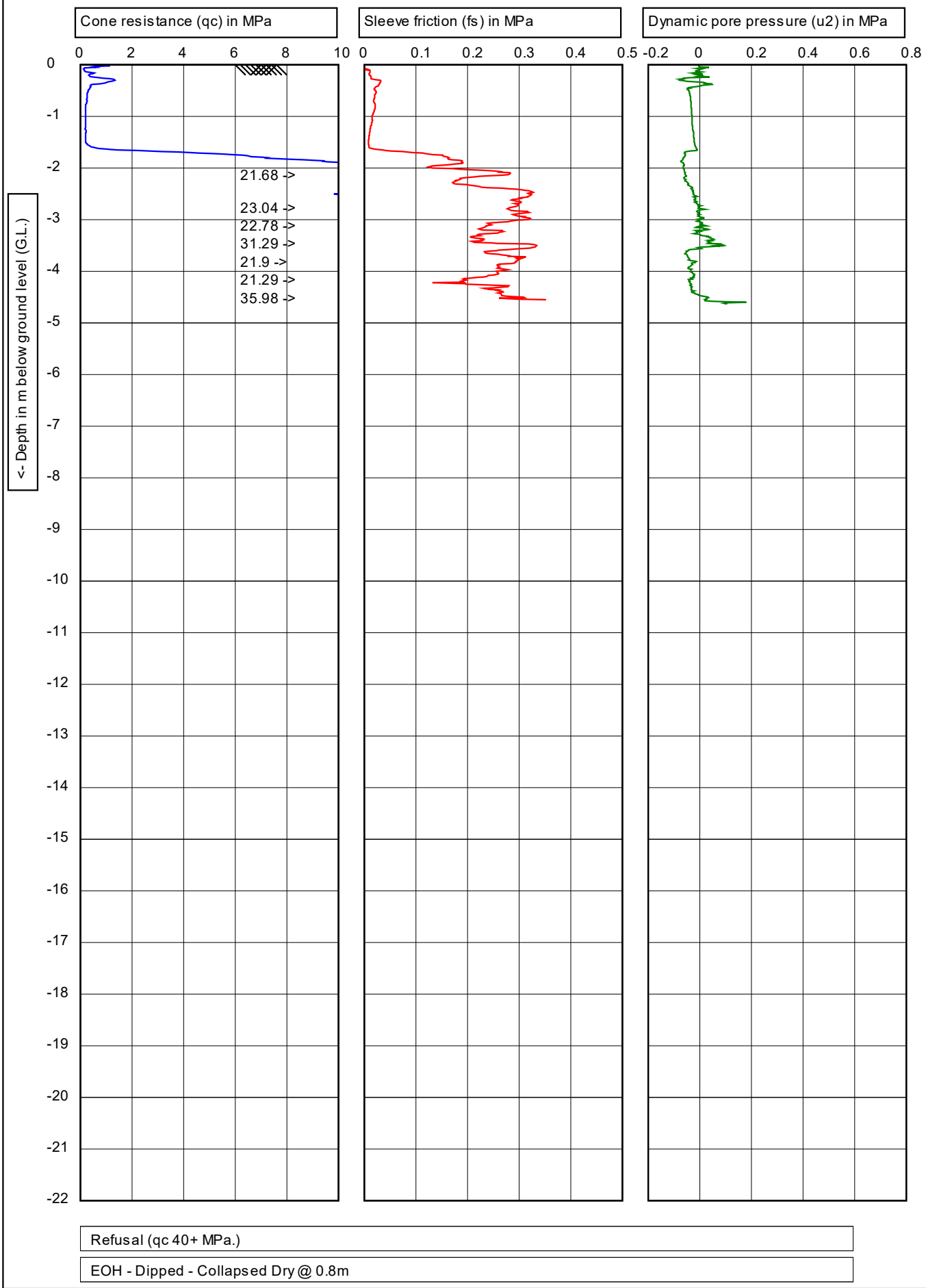
Project: **Surf Park Site (P-002405)**

Location: **Dairy Flat - Auckland**

Position: **1746968, 5941567 NZTM**

Predrill:	**0.00 m Predrilled**
Date:	**22/08/2025**
Cone no.:	**C10CFIIP.C21094**
Project no.:	**2-68207.00_HA15435**
CPT no.:	**107**

1.49



Test results indicated as not accredited are outside the scope of the laboratory's accreditation

u2
150 cm²
10 cm²

Method:ASTM D5778-20&ISO 22476:1:2012cor.2013

G.L.: **0.00 m MSL**

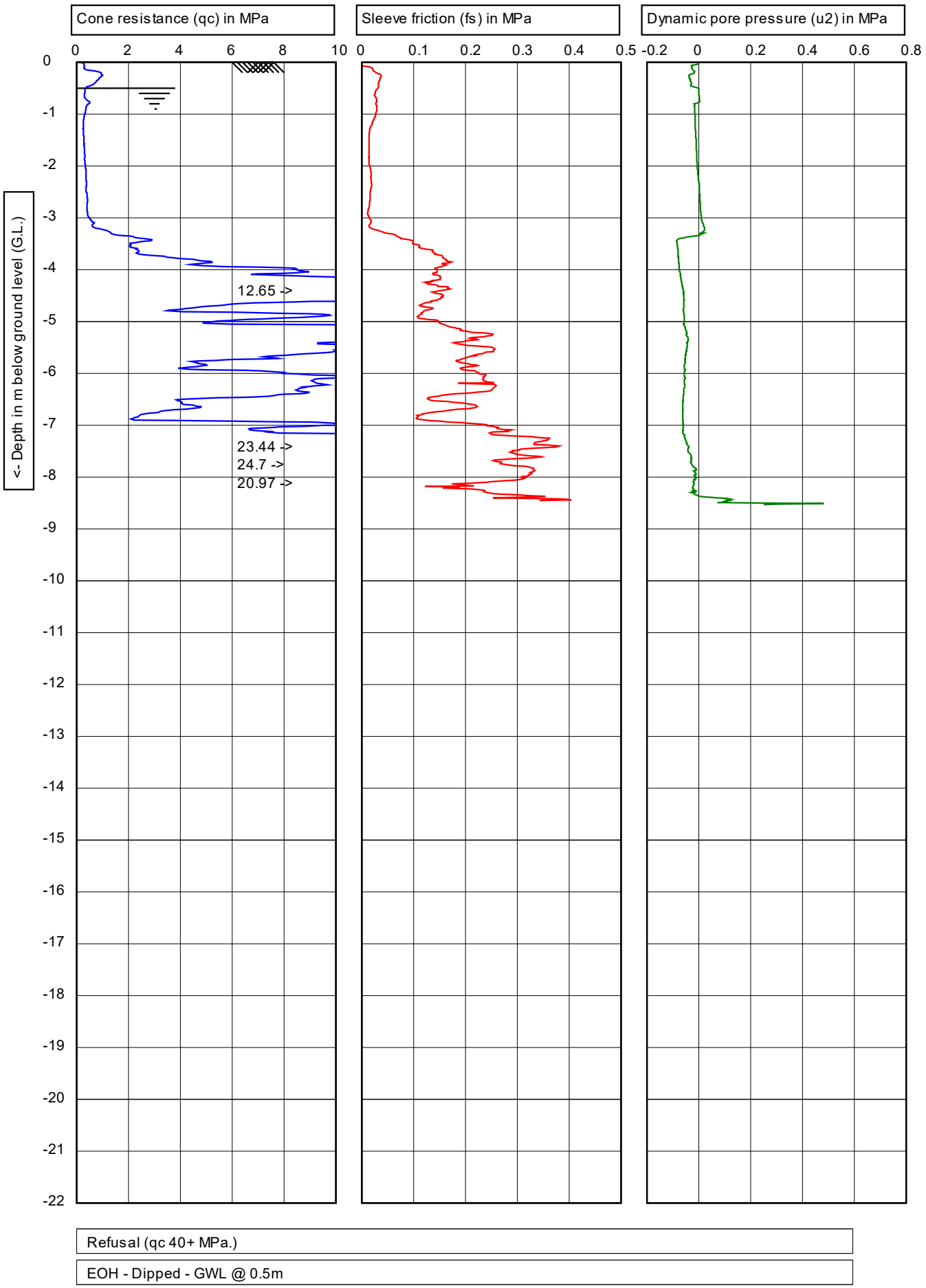
Project: **Surf Park Site (P-002405)**

Location: **Dairy Flat - Auckland**

Position: **1746984, 5941615 NZTM**

Predrill:	**0.00 m Predrilled**
Date:	**21/08/2025**
Cone no.:	**C10CFIIP.C241654**
Project no.:	**2-68207.00_HA15435**
CPT no.:	**108**

1.49



WSP

ACCREDITED IANZ TESTING LABORATORY

Test results indicated as not accredited are outside the scope of the laboratory's accreditation

u2 150 cm² 10 cm²

Method:ASTM D5778-20&ISO 22476:1:2012cor.2013

G.L.: **0.00 m MSL** W.L.: **-0.50 m**

Project: **Surf Park Site (P-002405)**

Location: **Dairy Flat - Auckland**

Position: **1747031, 5941693 NZTM**

Predrill: **0.00 m Predrilled**

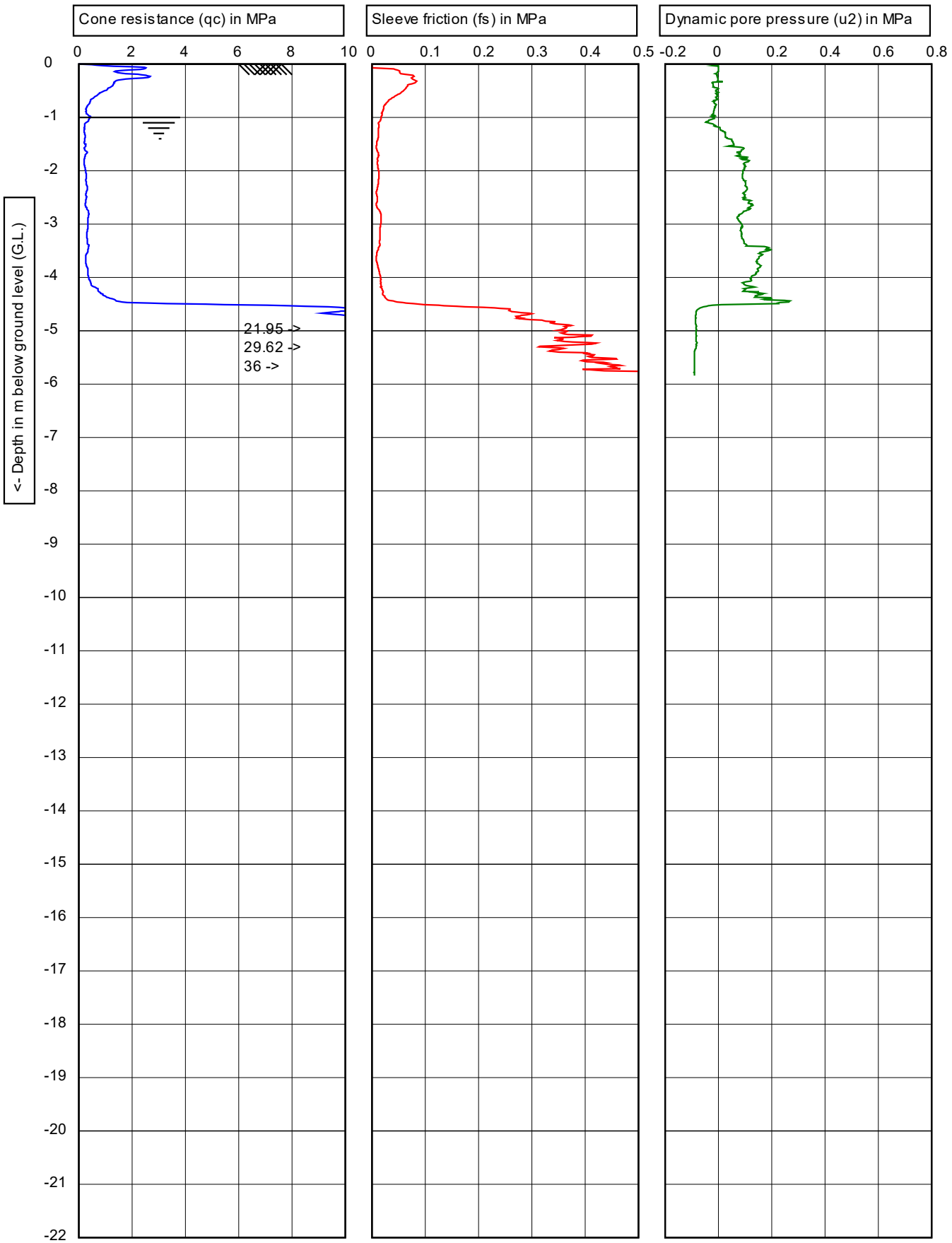
Date: **22/08/2025**

Cone no.: **C10CFIIP.C241654**

Project no.: **2-68207.00_HA15435**

CPT no.: **109** **1/6**

1.49



Refusal 10t.

EOH - Dipped - GWL @ 1.0m

Test results indicated as not accredited are outside the scope of the laboratory's accreditation

Method:ASTM D5778-20&ISO 22476:1:2012cor.2013

G.L.: **0.00 m MSL** W.L.: **-1.00 m**

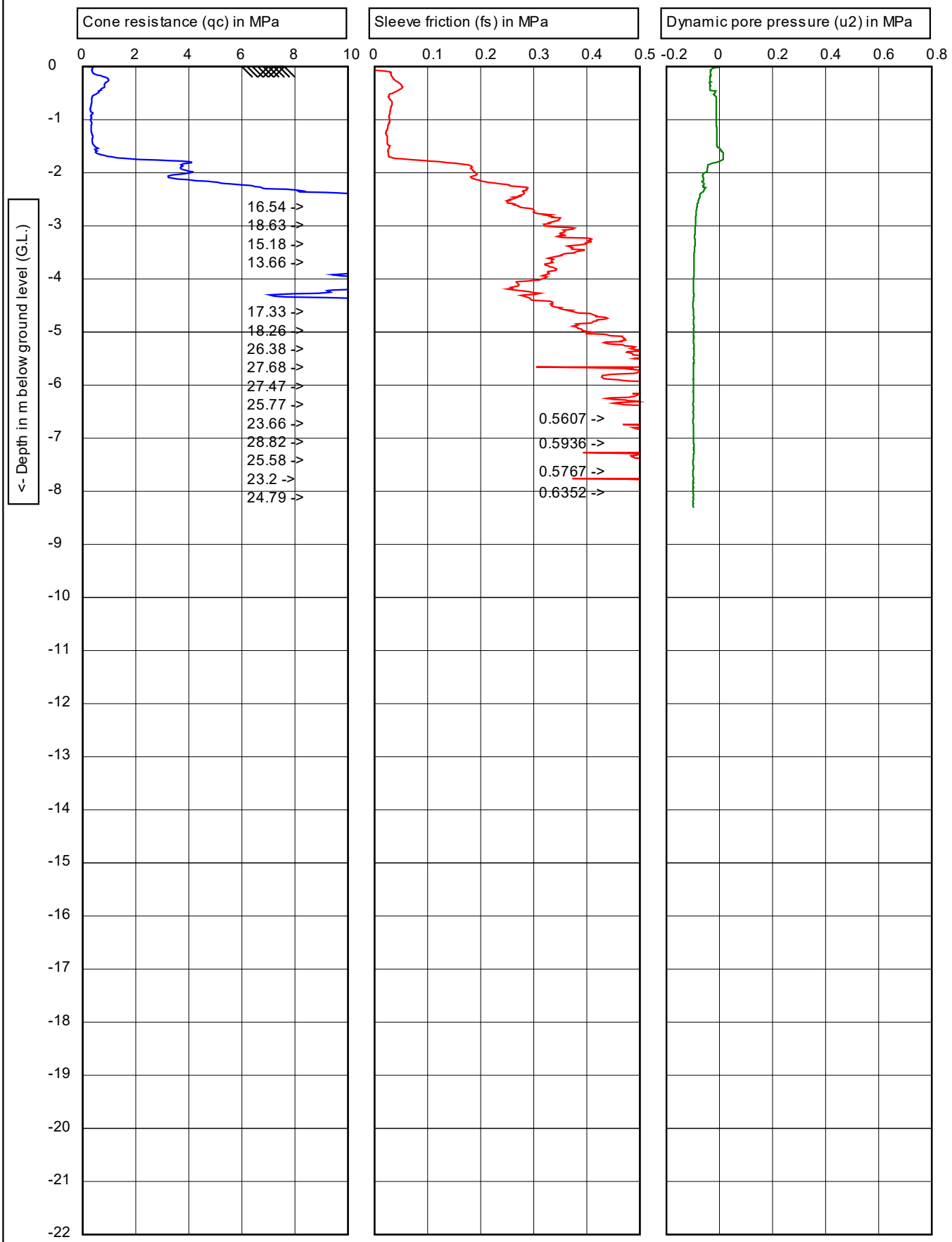
Project: **Surf Park Site (P-002405)**

Location: **Dairy Flat - Auckland**

Position: **1747025, 5941732 NZTM**

Predrill:	**0.00 m Predrilled**
Date:	**22/08/2025**
Cone no.:	**C10CFIIP.C21094**
Project no.:	**2-68207.00_HA15435**
CPT no.:	**110**

1.49



Test results indicated as not accredited are outside the scope of the laboratory's accreditation

u2 150 cm² 10 cm²

Method:ASTM D5778-20&ISO 22476:1:2012cor.2013

G.L.: **0.00 m MSL**

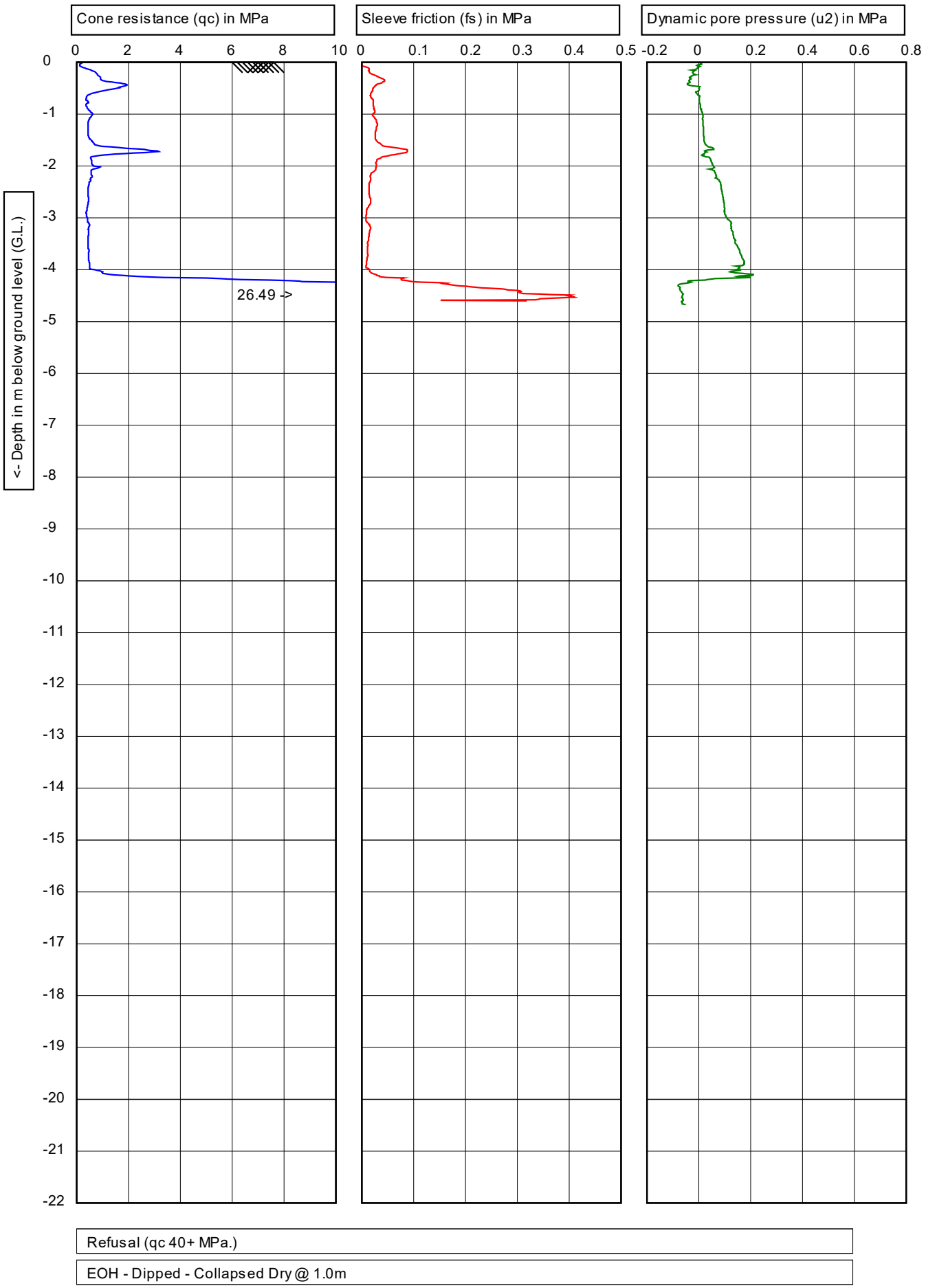
Project: **Surf Park Site (P-002405)**

Location: **Dairy Flat - Auckland**

Position: **1747069, 5941736 NZTM**

Predrill:	**0.00 m Predrilled**
Date:	**22/08/2025**
Cone no.:	**C10CFIIP.C21094**
Project no.:	**2-68207.00_HA15435**
CPT no.:	**111**

1.49



Test results indicated as not accredited are outside the scope of the laboratory's accreditation

u2
150 cm²
10 cm²

Method:ASTM D5778-20&ISO 22476:1:2012cor.2013

G.L.: **0.00 m MSL**

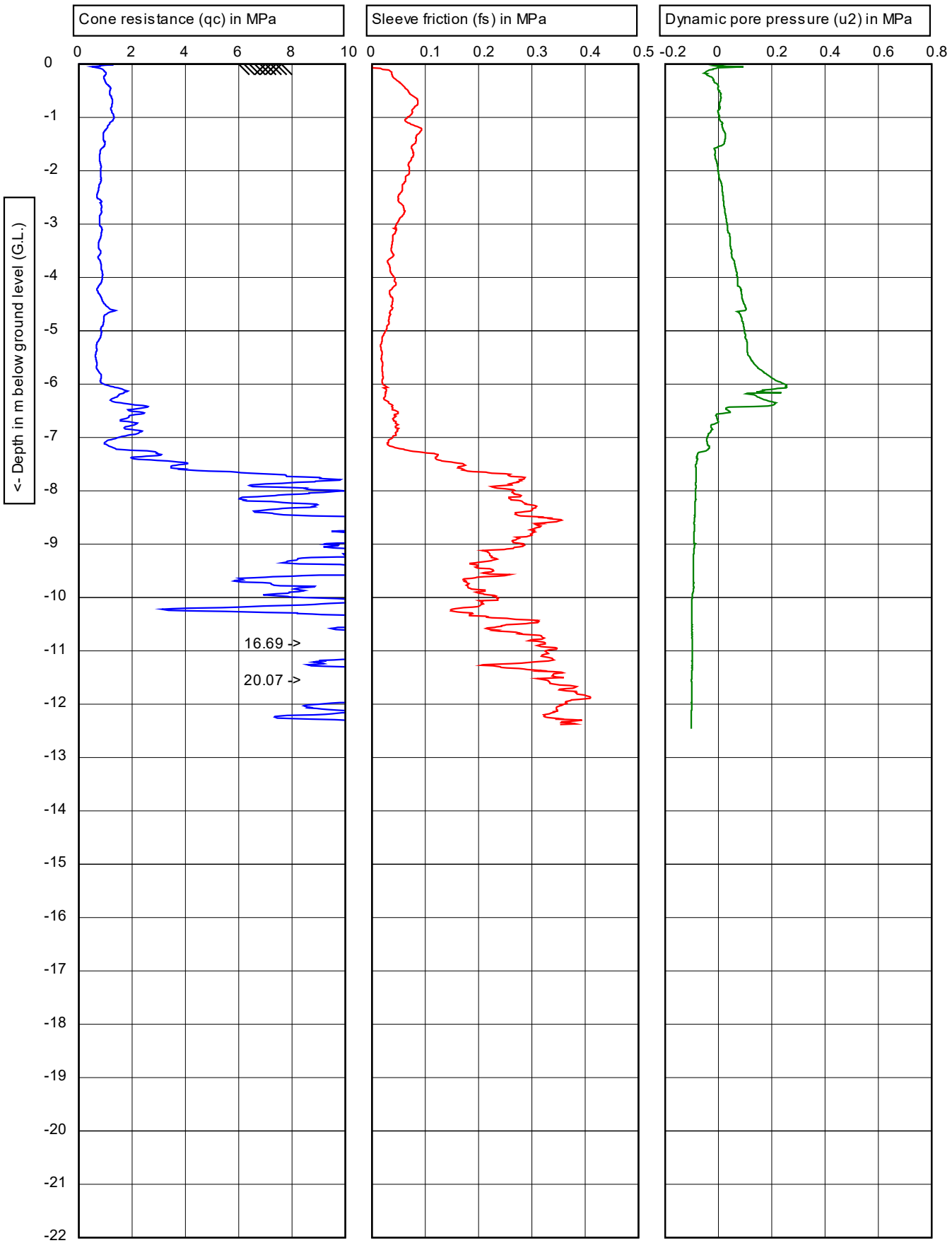
Project: **Surf Park Site (P-002405)**

Location: **Dairy Flat - Auckland**

Position: **1747198, 5941748 NZTM**

Predrill:	**0.00 m Predrilled**
Date:	**22/08/2025**
Cone no.:	**C10CFIIP.C241654**
Project no.:	**2-68207.00_HA15435**
CPT no.:	**112**

1.49

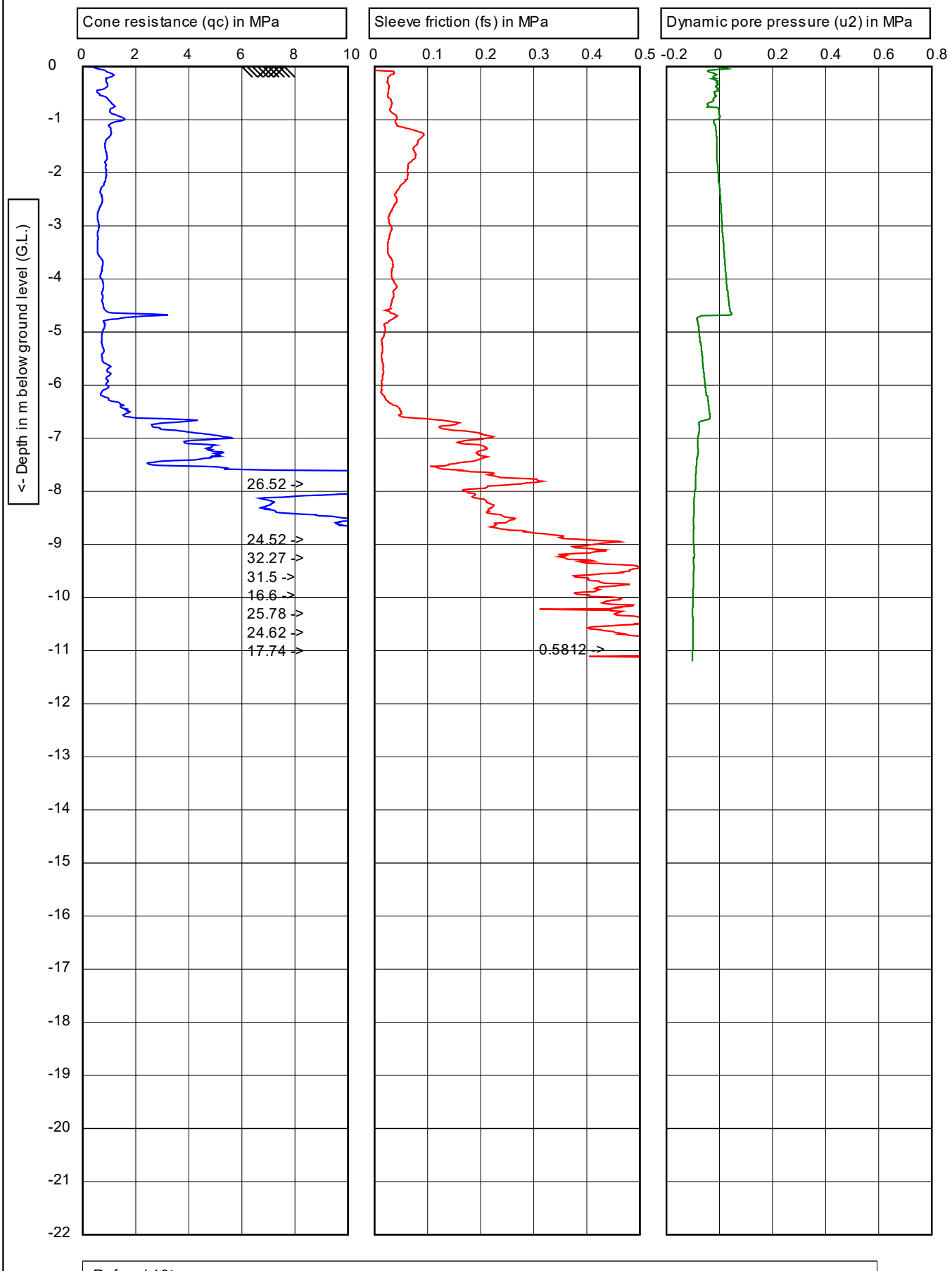


Method:ASTM D5778-20&ISO 22476:1:2012cor.2013		Predrill:	**0.00 m Predrilled**
G.L.: **0.00 m MSL**		Date:	**20/08/2025**
Project:	**Surf Park Site (P-002405)**	Cone no.:	**C10CFIIP.C21094**
Location:	**Dairy Flat - Auckland**	Project no.:	**2-68207.00_HA15435**
Position:	**1746809, 5942298 NZTM**	CPT no.:	**113** 1/6

u2 150 cm² 10 cm²

Test results indicated as not accredited are outside the scope of the laboratory's accreditation

1.49



Refusal 10t.

EOH - Dipped - Collapsed Dry @ 0.8m

Test results indicated as not accredited are outside the scope of the laboratory's accreditation

Method:ASTM D5778-20&ISO 22476:1:2012cor.2013

G.L.: **0.00 m MSL**

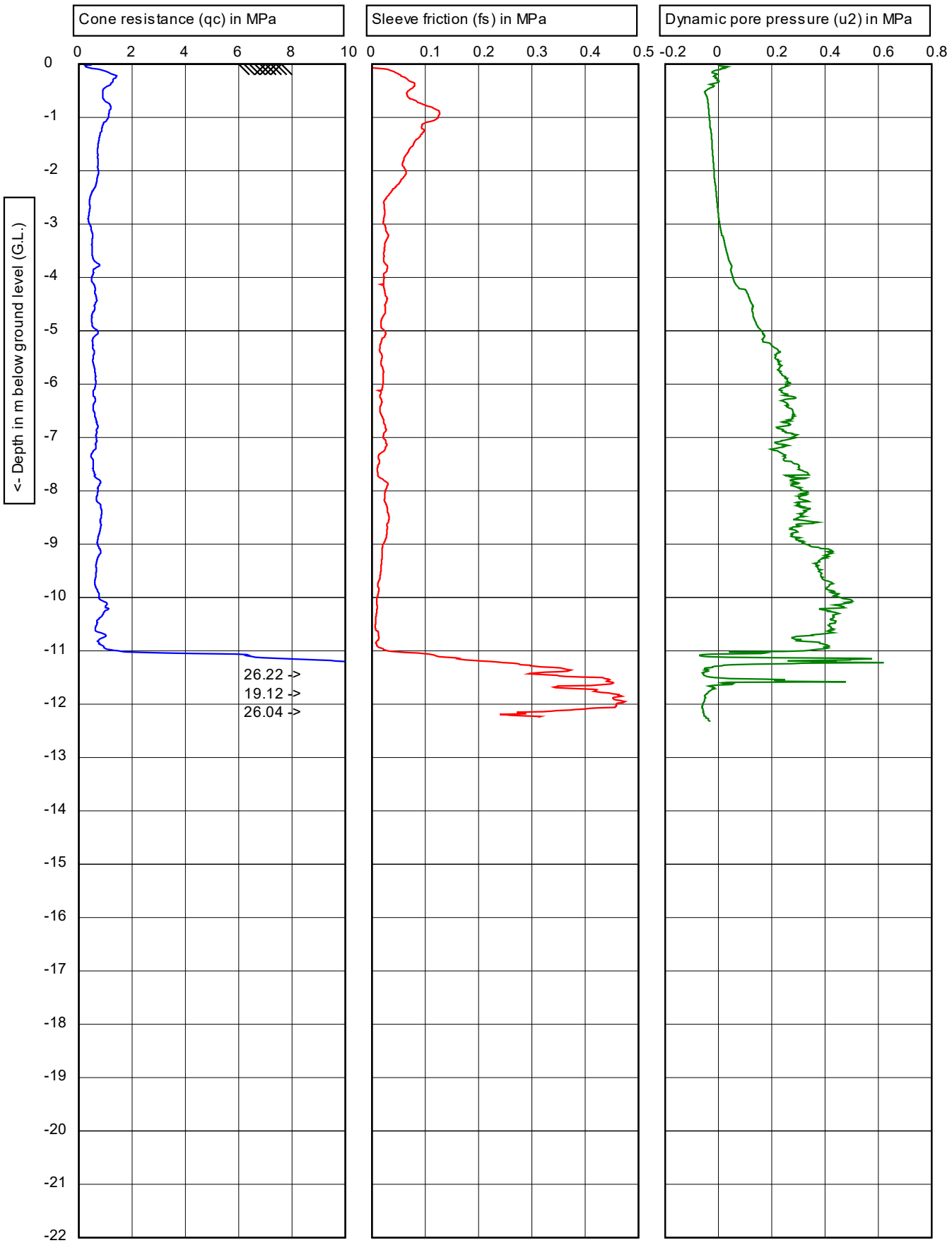
Project: **Surf Park Site (P-002405)**

Location: **Dairy Flat - Auckland**

Position: **1746877, 5942290 NZTM**

Predrill:	**0.00 m Predrilled**
Date:	**20/08/2025**
Cone no.:	**C10CFIIP.C21094**
Project no.:	**2-68207.00_HA15435**
CPT no.:	**114**

1.49



Refusal 10t.

EOH - Dipped - Collapsed Dry @ 1.4m

wsp

ACCREDITED IANZ TESTING LABORATORY

Test results indicated as not accredited are outside the scope of the laboratory's accreditation

u2 150 cm² 10 cm²

Method:ASTM D5778-20&ISO 22476:1:2012cor.2013

G.L.: **0.00 m MSL**

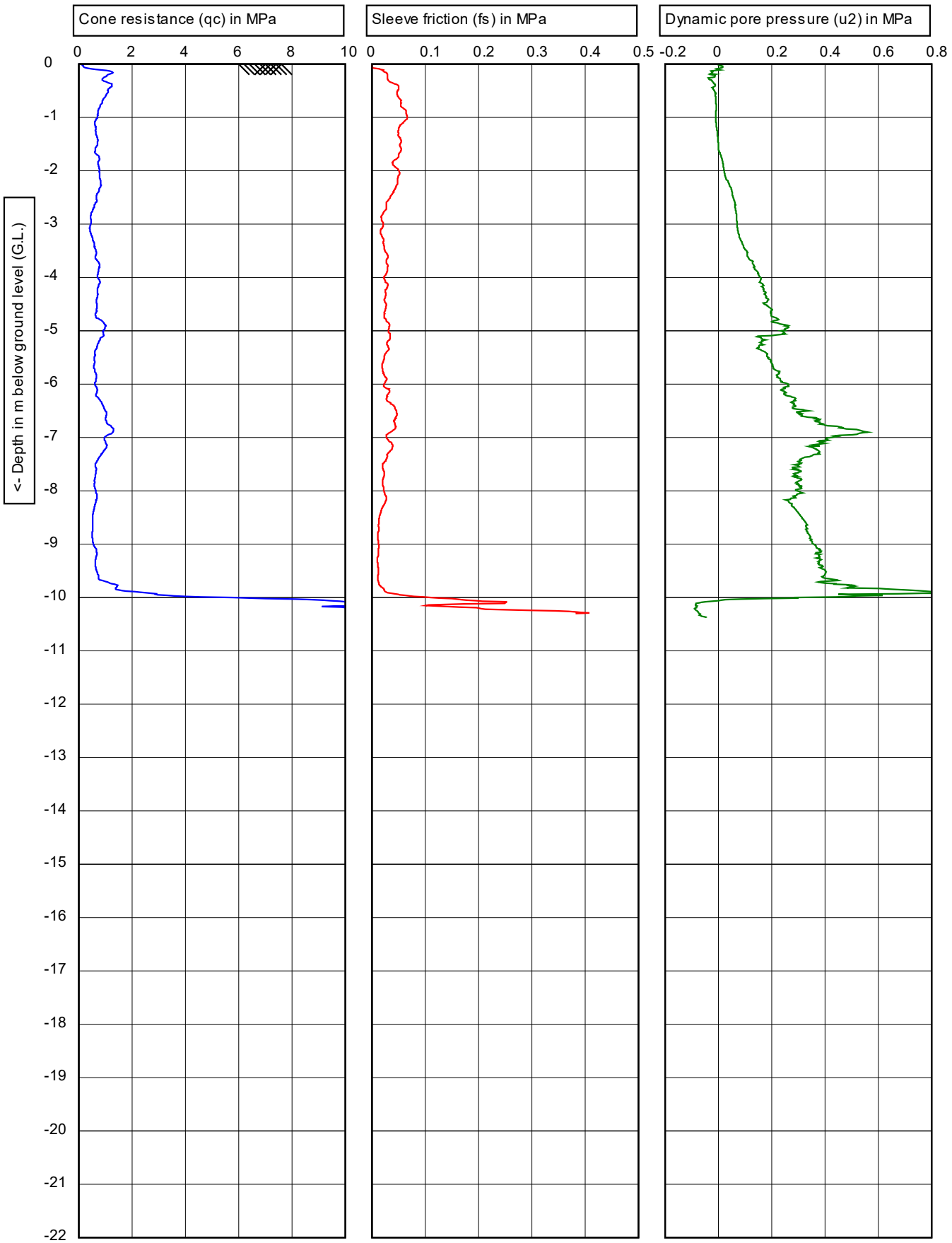
Project: **Surf Park Site (P-002405)**

Location: **Dairy Flat - Auckland**

Position: **1746862, 5942239 NZTM**

Predrill:	**0.00 m Predrilled**
Date:	**20/08/2025**
Cone no.:	**C10CFIIP.C241654**
Project no.:	**2-68207.00_HA15435**
CPT no.:	**115**

1.49



Refusal (qc 40+ MPa.)

EOH - Dipped - Collapsed Dry @ 0.8m

Test results indicated as not accredited are outside the scope of the laboratory's accreditation

u2
150 cm²
10 cm²

Method:ASTM D5778-20&ISO 22476:1:2012cor.2013

G.L.: **0.00 m MSL**

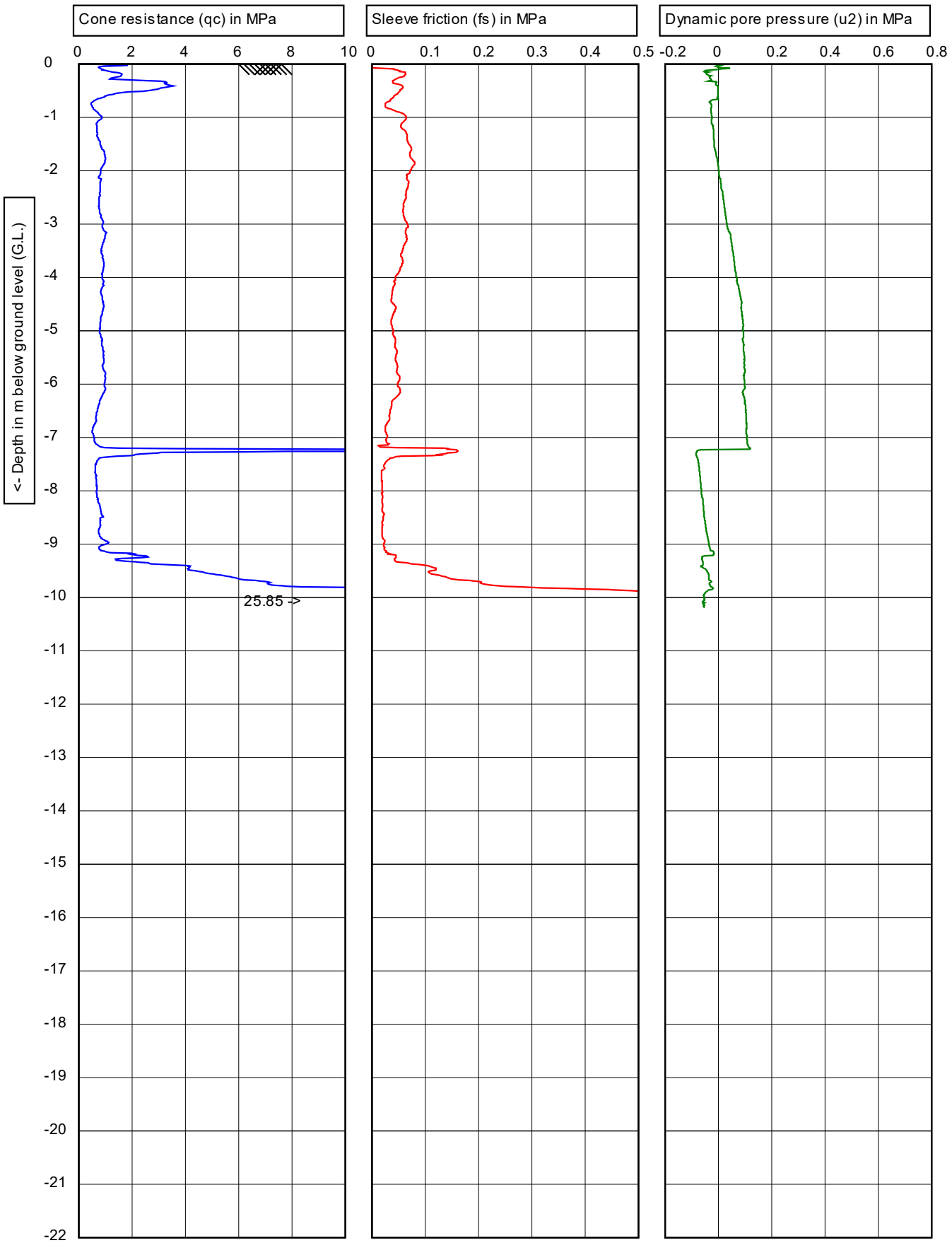
Project: **Surf Park Site (P-002405)**

Location: **Dairy Flat - Auckland**

Position: **1746814, 5942198 NZTM**

Predrill:	**0.00 m Predrilled**
Date:	**20/08/2025**
Cone no.:	**C10CFIIP.C241654**
Project no.:	**2-68207.00_HA15435**
CPT no.:	**116**

1.49



Test results indicated as not accredited are outside the scope of the laboratory's accreditation

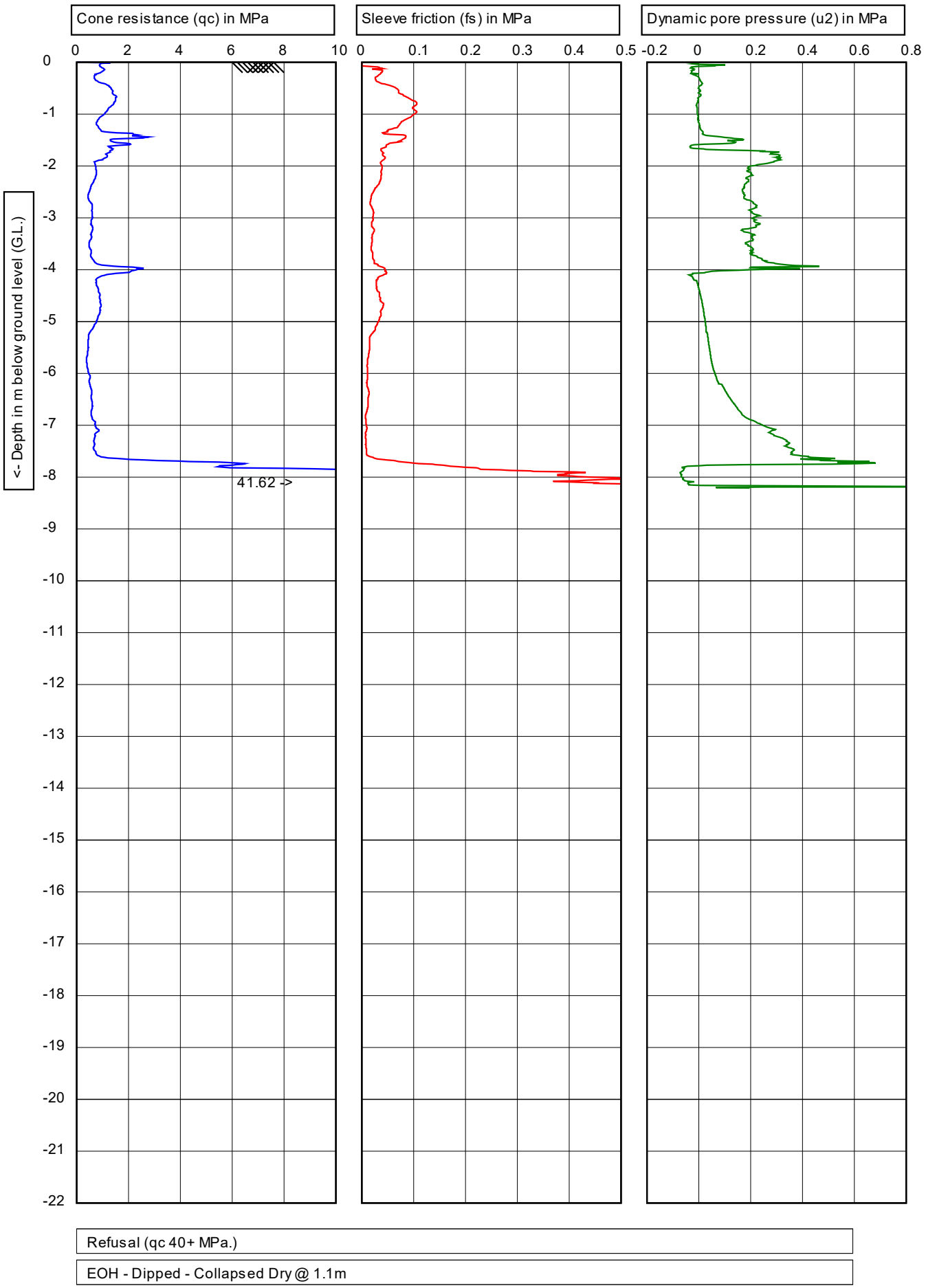
u2
150 cm²
10 cm²

Method:ASTM D5778-20&ISO 22476:1:2012cor.2013
G.L.: **0.00 m MSL**

Project: **Surf Park Site (P-002405)**
Location: **Dairy Flat - Auckland**
Position: **1746934, 5942221 NZTM**

Predrill:	**0.00 m Predrilled**
Date:	**20/08/2025**
Cone no.:	**C10CFIIP.C21094**
Project no.:	**2-68207.00_HA15435**
CPT no.:	**117**

1.49



Test results indicated as not accredited are outside the scope of the laboratory's accreditation

u2
150 cm²
10 cm²

Method:ASTM D5778-20&ISO 22476:1:2012cor.2013

G.L.: **0.00 m MSL**

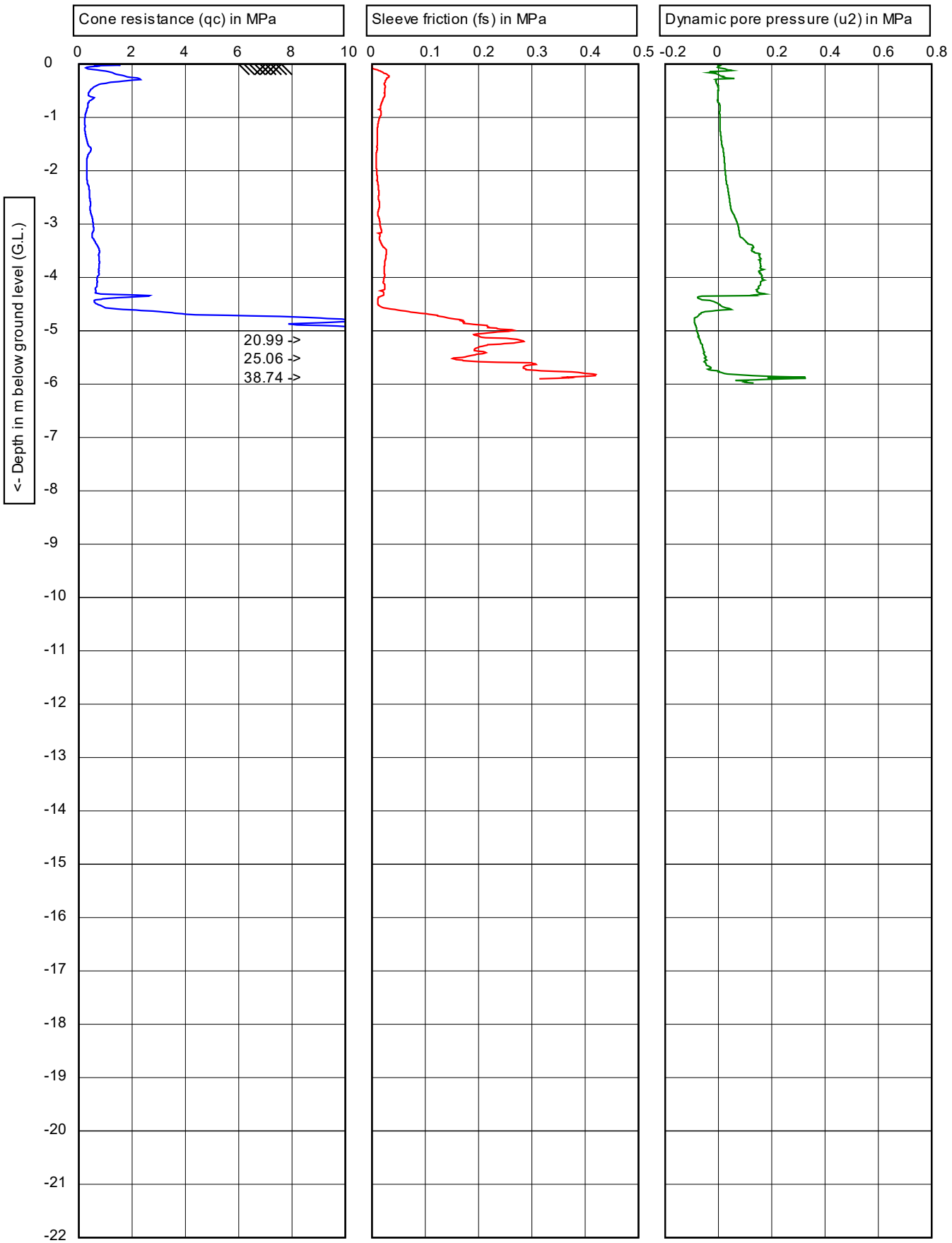
Project: **Surf Park Site (P-002405)**

Location: **Dairy Flat - Auckland**

Position: **1746983, 5942230 NZTM**

Predrill:	**0.00 m Predrilled**
Date:	**20/08/2025**
Cone no.:	**C10CFIIP.C241654**
Project no.:	**2-68207.00_HA15435**
CPT no.:	**118**

1.49



Test results indicated as not accredited are outside the scope of the laboratory's accreditation

u2
150 cm²
10 cm²

Method:ASTM D5778-20&ISO 22476:1:2012cor.2013

G.L.: **0.00 m MSL**

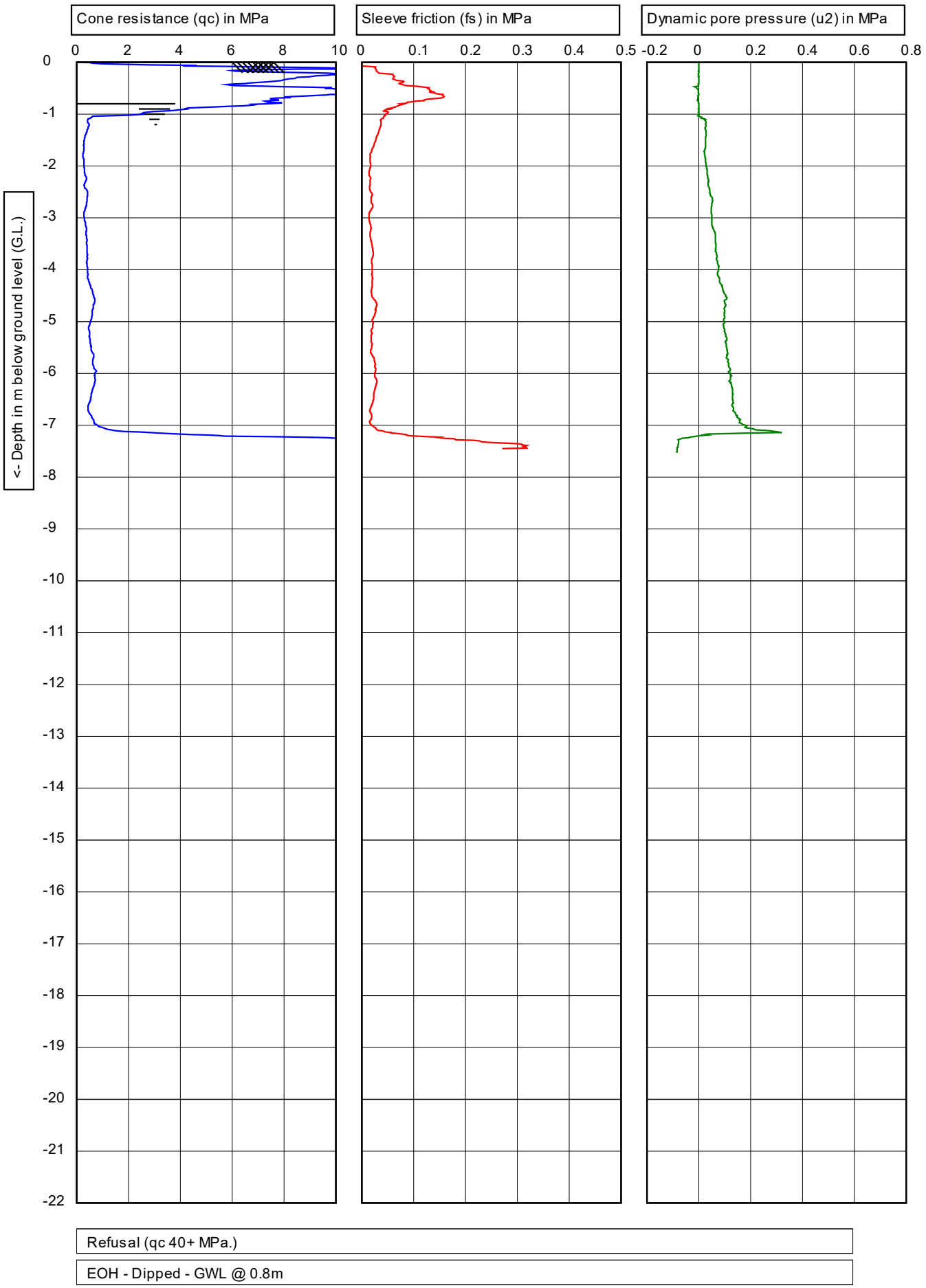
Project: **Surf Park Site (P-002405)**

Location: **Dairy Flat - Auckland**

Position: **1747217, 5942145 NZTM**

Predrill:	**0.00 m Predrilled**
Date:	**21/08/2025**
Cone no.:	**C10CFIIP.C241654**
Project no.:	**2-68207.00_HA15435**
CPT no.:	**119**

1.49



Refusal (qc 40+ MPa.)

EOH - Dipped - GWL @ 0.8m

Test results indicated as not accredited are outside the scope of the laboratory's accreditation

u2 150 cm² 10 cm²

Method:ASTM D5778-20&ISO 22476:1:2012cor.2013

G.L.: **0.00 m MSL** W.L.: **-0.80 m**

Project: **Surf Park Site (P-002405)**

Location: **Dairy Flat - Auckland**

Position: **1747223, 5942097 NZTM**

Predrill: **0.00 m Predrilled**

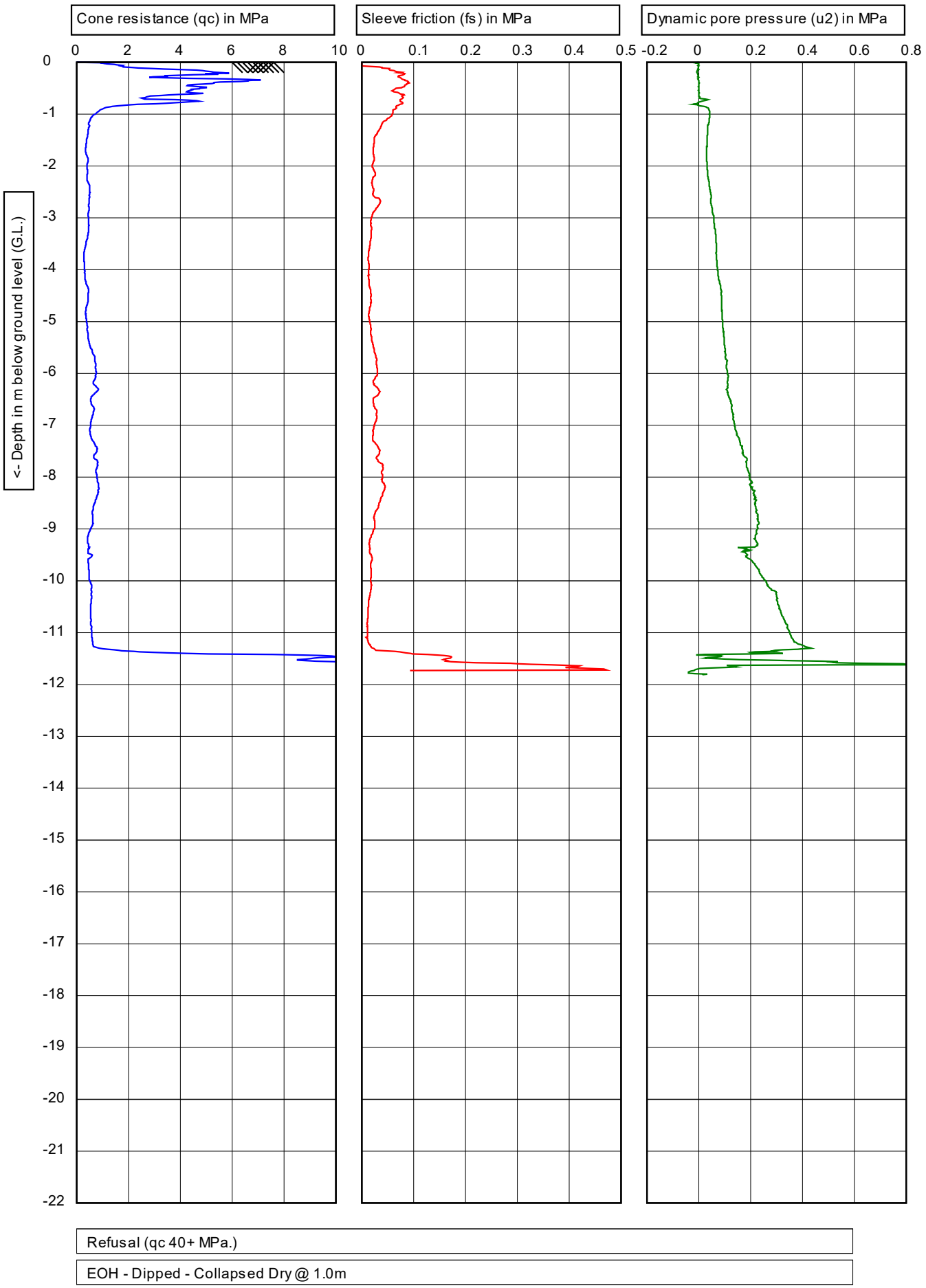
Date: **19/08/2025**

Cone no.: **C10CFIIP.C21094**

Project no.: **2-68207.00_HA15435**

CPT no.: **120** **1/6**

1.49



Refusal (qc 40+ MPa.)

EOH - Dipped - Collapsed Dry @ 1.0m

Test results indicated as not accredited are outside the scope of the laboratory's accreditation

u2 150 cm² 10 cm²

Method:ASTM D5778-20&ISO 22476:1:2012cor.2013

G.L.: **0.00 m MSL**

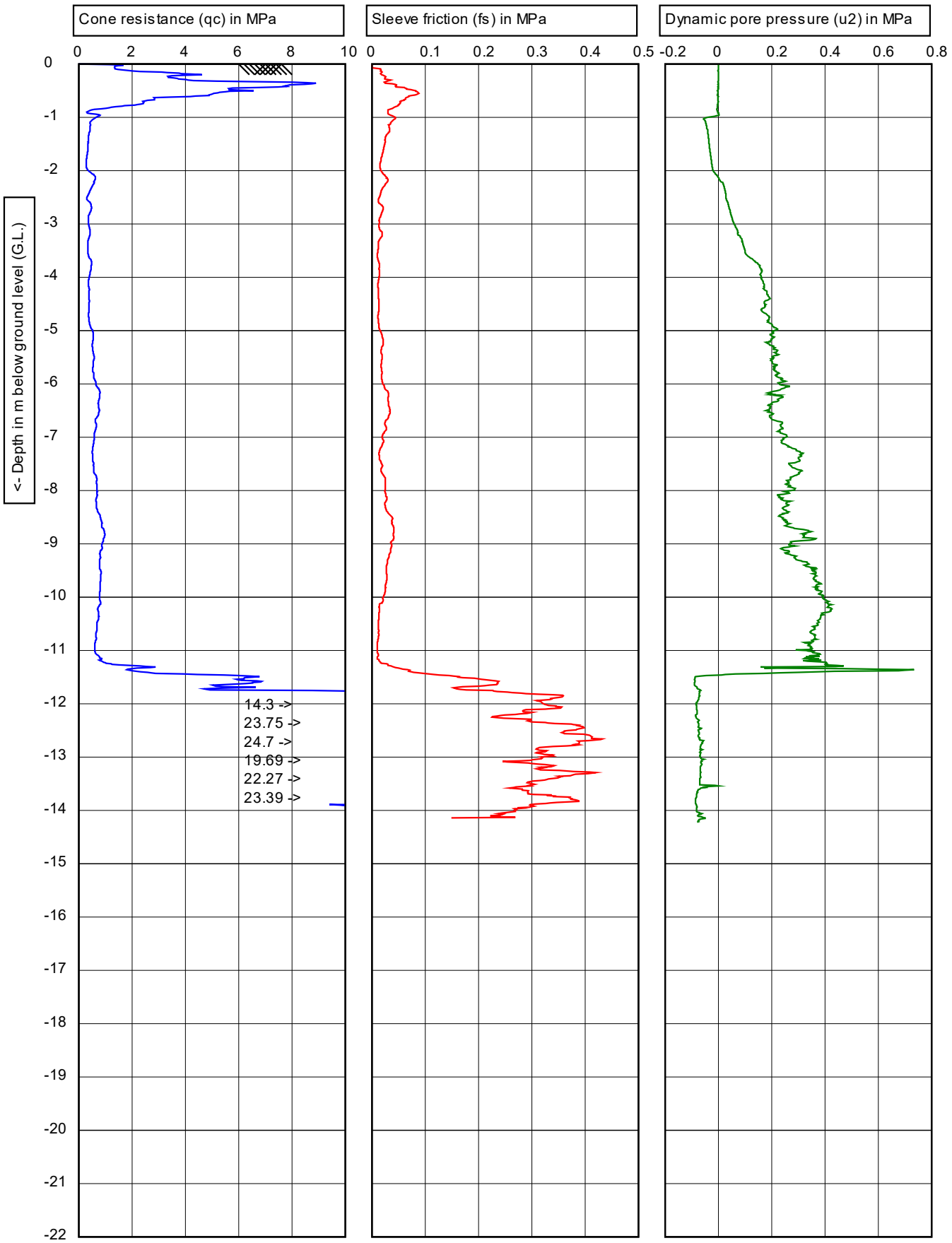
Project: **Surf Park Site (P-002405)**

Location: **Dairy Flat - Auckland**

Position: **1746997, 5942010 NZTM**

Predrill:	**0.00 m Predrilled**
Date:	**21/08/2025**
Cone no.:	**C10CFIIP.C21094**
Project no.:	**2-68207.00_HA15435**
CPT no.:	**121**

1.49

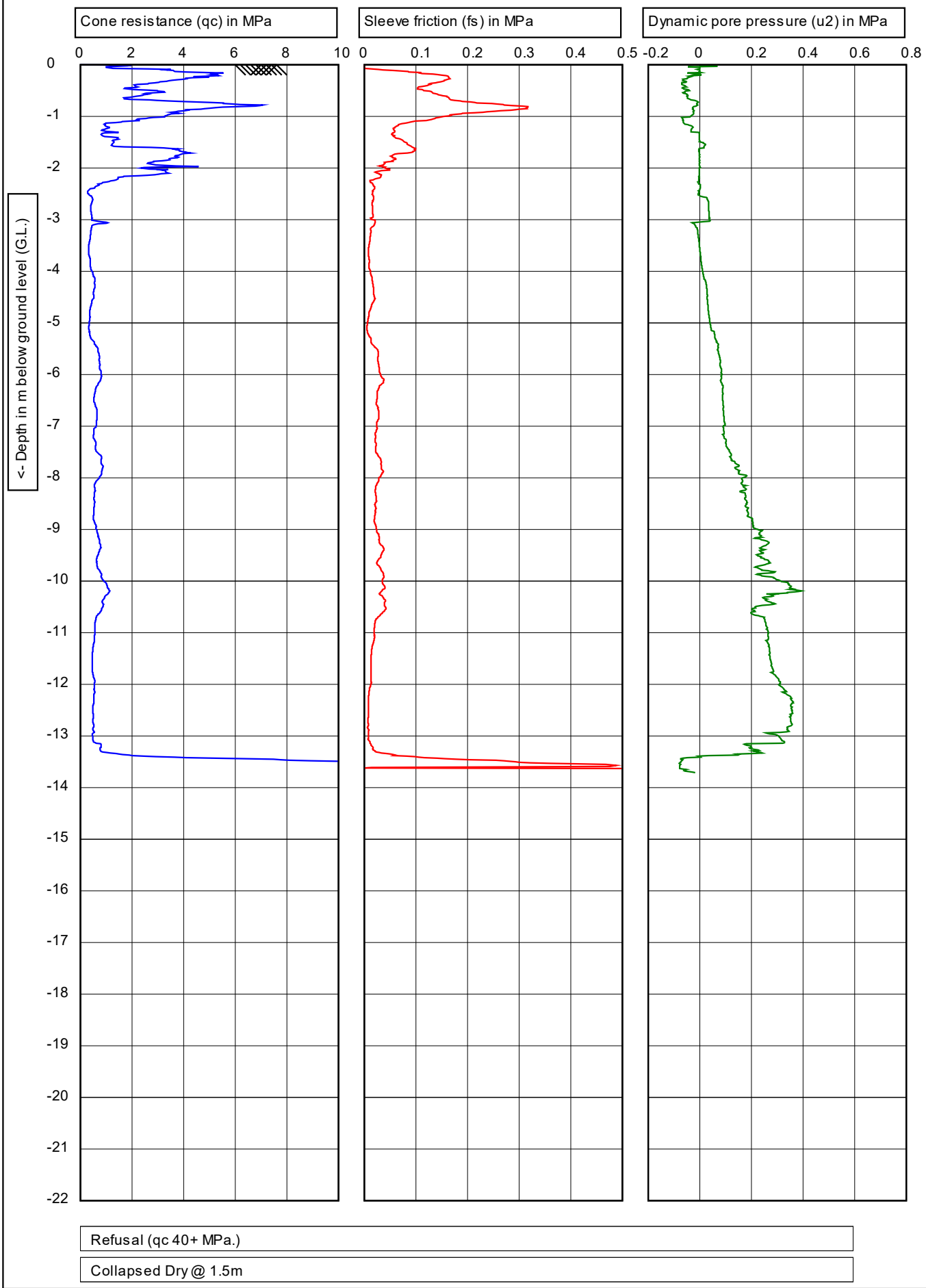


Method:ASTM D5778-20&ISO 22476:1:2012cor.2013		Predrill:	**0.00 m Predrilled**
G.L.: **0.00 m MSL**		Date:	**21/08/2025**
Project:	**Surf Park Site (P-002405)**	Cone no.:	**C10CFIIP.C21094**
Location:	**Dairy Flat - Auckland**	Project no.:	**2-68207.00_HA15435**
Position:	**1746957, 5941975 NZTM**	CPT no.:	**122** 1/6

u2 150 cm² 10 cm²

Test results indicated as not accredited are outside the scope of the laboratory's accreditation

1.49



Refusal (qc 40+ MPa.)

Collapsed Dry @ 1.5m

Test results indicated as not accredited are outside the scope of the laboratory's accreditation

u2
150 cm²
10 cm²

Method:ASTM D5778-20&ISO 22476:1:2012cor.2013

G.L.: **0.00 m MSL**

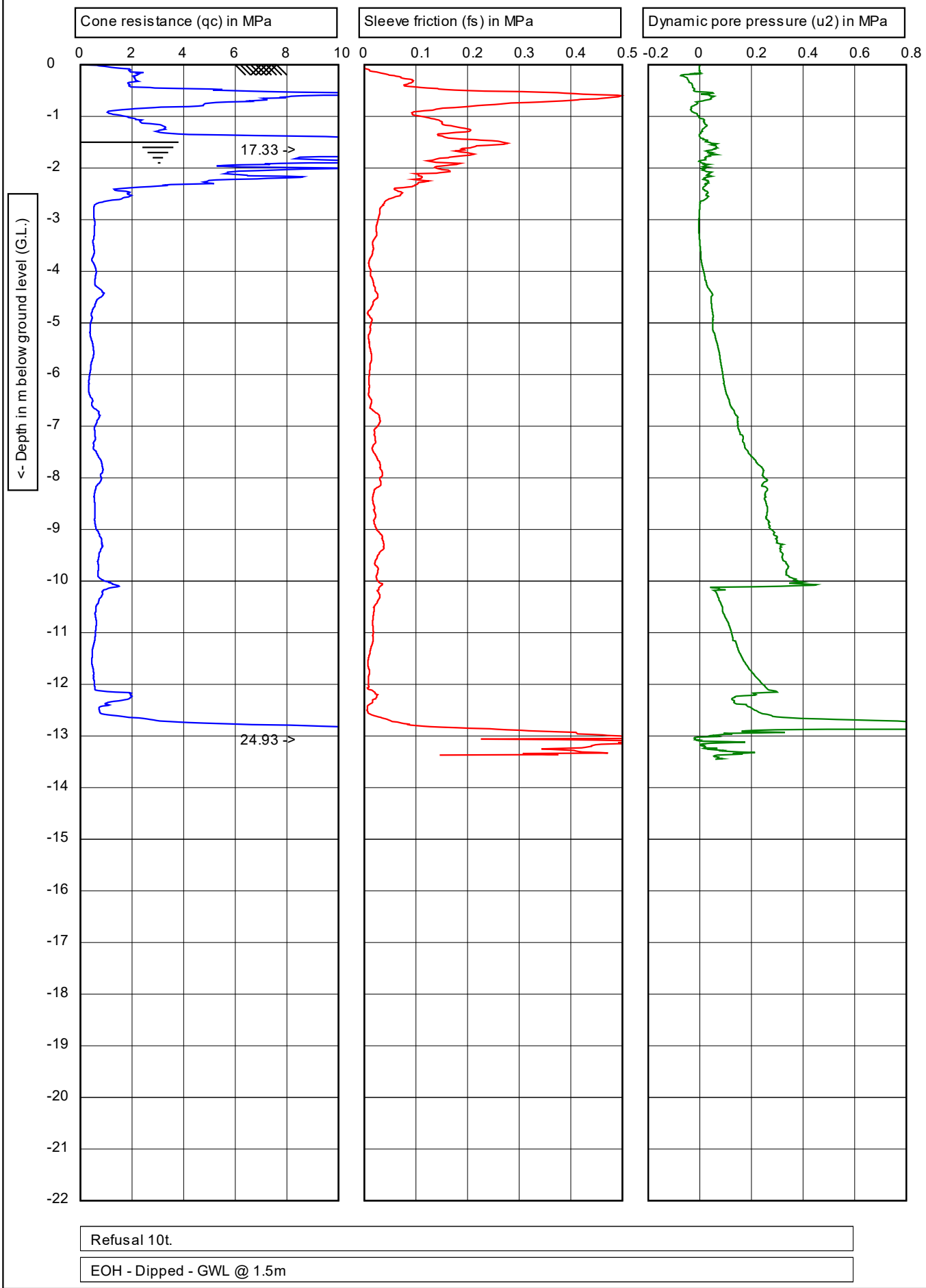
Project: **Surf Park Site (P-002405)**

Location: **Dairy Flat - Auckland**

Position: **1746889, 5941855 NZTM**

Predrill:	**0.00 m Predrilled**
Date:	**20/08/2025**
Cone no.:	**C10CFIIP.C21094**
Project no.:	**2-68207.00_HA15435**
CPT no.:	**123**

1.49



Refusal 10t.

EOH - Dipped - GWL @ 1.5m

Test results indicated as not accredited are outside the scope of the laboratory's accreditation

u2
150 cm²
10 cm²

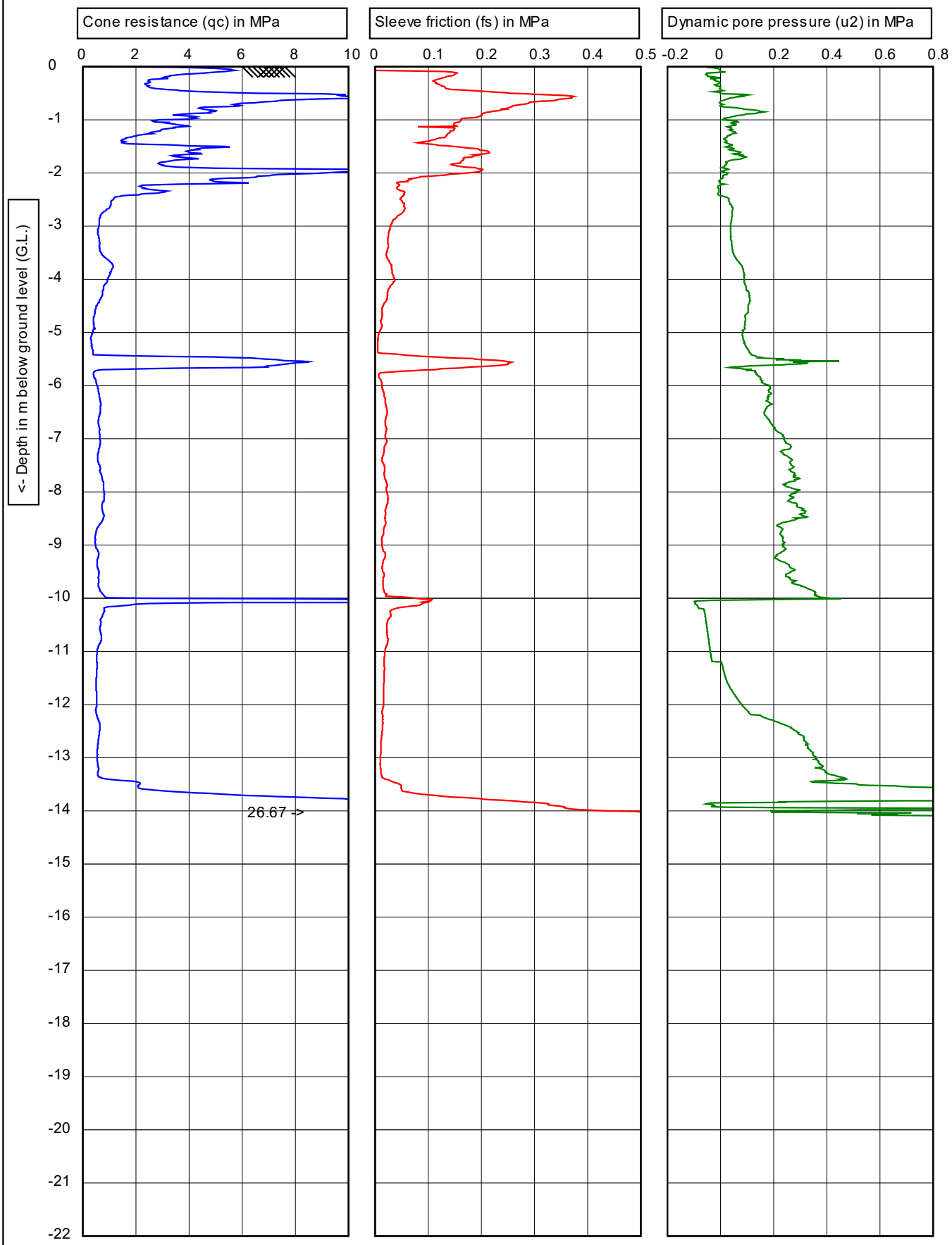
Method:ASTM D5778-20&ISO 22476:1:2012cor.2013

G.L.: **0.00 m MSL** W.L.: **-1.50 m**

Project: **Surf Park Site (P-002405)**
Location: **Dairy Flat - Auckland**
Position: **1746952, 5941878 NZTM**

Predrill: **0.00 m Predrilled**
Date: **19/08/2025**
Cone no.: **C10CFIIP.C241654**
Project no.: **2-68207.00_HA15435**
CPT no.: **124** **1/6**

1.49



Refusal 10t.

EOH - Dipped - Collapsed Dry @ 0.8m

Test results indicated as not accredited are outside the scope of the laboratory's accreditation

u2
150 cm²
10 cm²

Method:ASTM D5778-20&ISO 22476:1:2012cor.2013

G.L.: **0.00 m MSL**

Project: **Surf Park Site (P-002405)**

Location: **Dairy Flat - Auckland**

Position: **1746076, 5941909 NZTM**

Predrill: **0.00 m Predrilled**

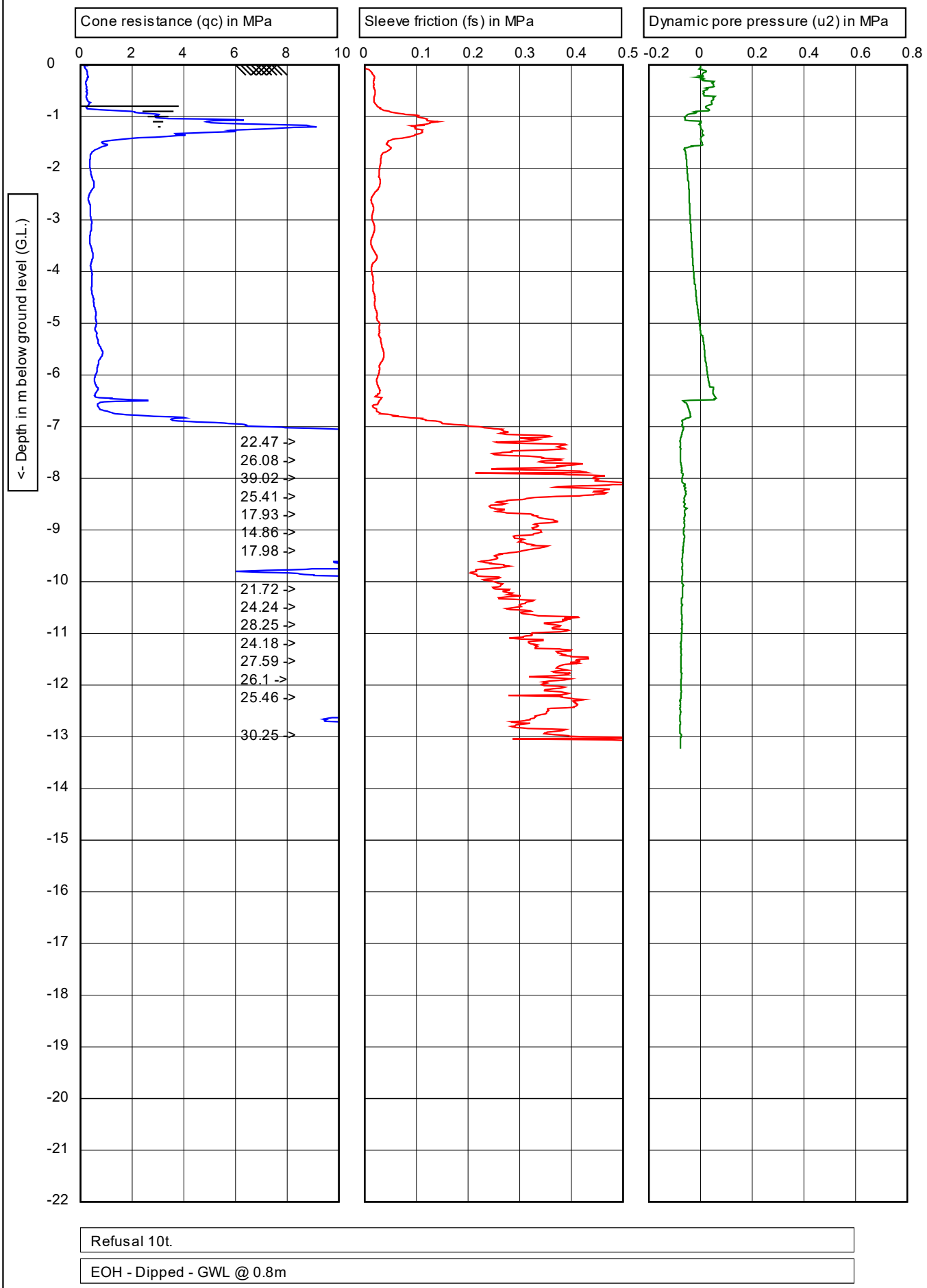
Date: **20/08/2025**

Cone no.: **C10CFIIP.C241654**

Project no.: **2-68207.00_HA15435**

CPT no.: **125**

1.49



Test results indicated as not accredited are outside the scope of the laboratory's accreditation

Method:ASTM D5778-20&ISO 22476:1:2012cor.2013

G.L.: **0.00 m MSL** W.L.: **-0.80 m**

Project: **Surf Park Site (P-002405)**

Location: **Dairy Flat - Auckland**

Position: **1746999, 5941932 NZTM**

Predrill: **0.00 m Predrilled**

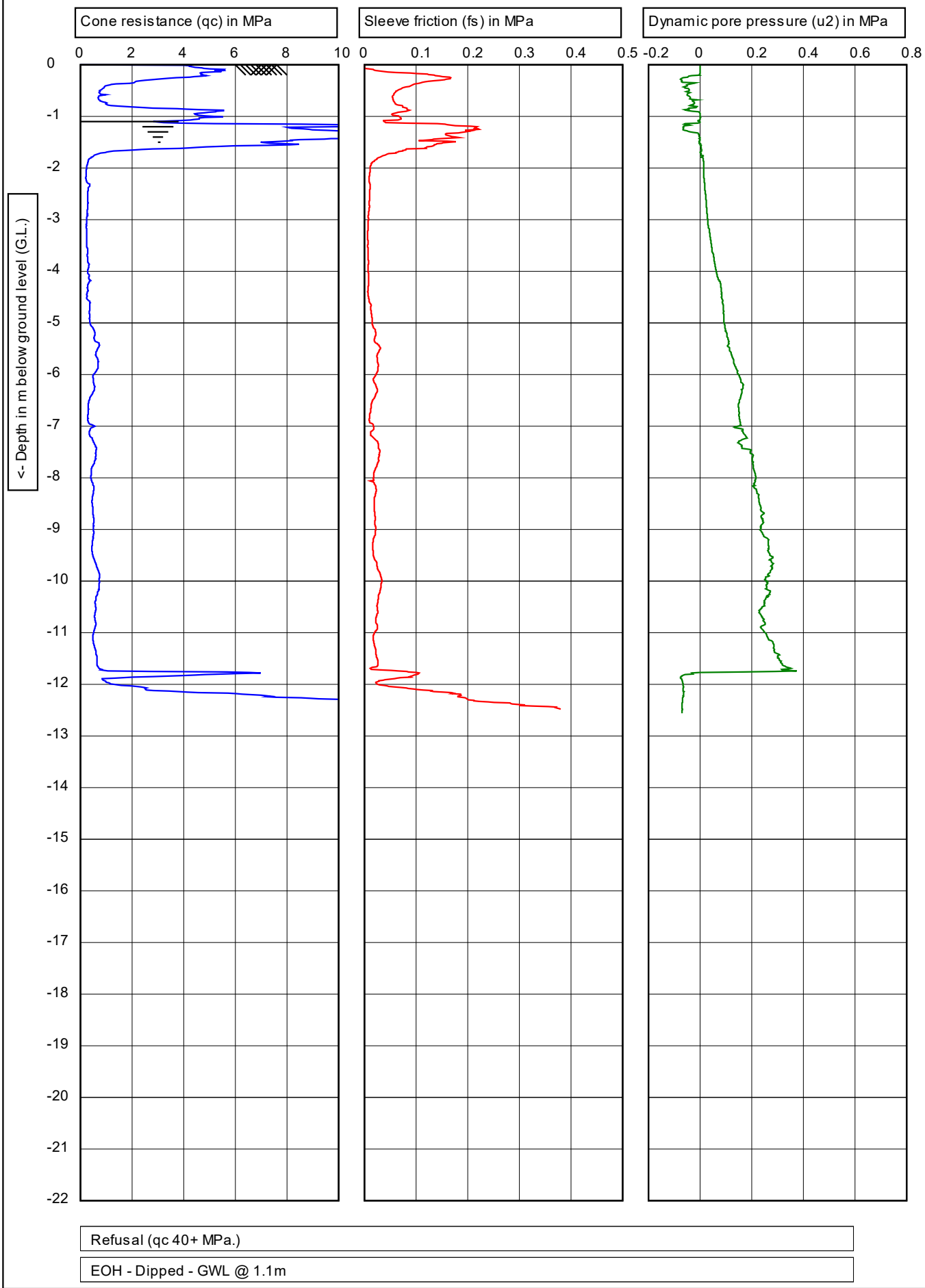
Date: **21/08/2025**

Cone no.: **C10CFIIP.C21094**

Project no.: **2-68207.00_HA15435**

CPT no.: **126** **1/6**

1.49



Refusal (qc 40+ MPa.)

EOH - Dipped - GWL @ 1.1m

Test results indicated as not accredited are outside the scope of the laboratory's accreditation

u2 150 cm² 10 cm²

Method:ASTM D5778-20&ISO 22476:1:2012cor.2013

G.L.: **0.00 m MSL** W.L.: **-1.10 m**

Project: **Surf Park Site (P-002405)**

Location: **Dairy Flat - Auckland**

Position: **1747040, 5941846 NZTM**

Predrill: **0.00 m Predrilled**

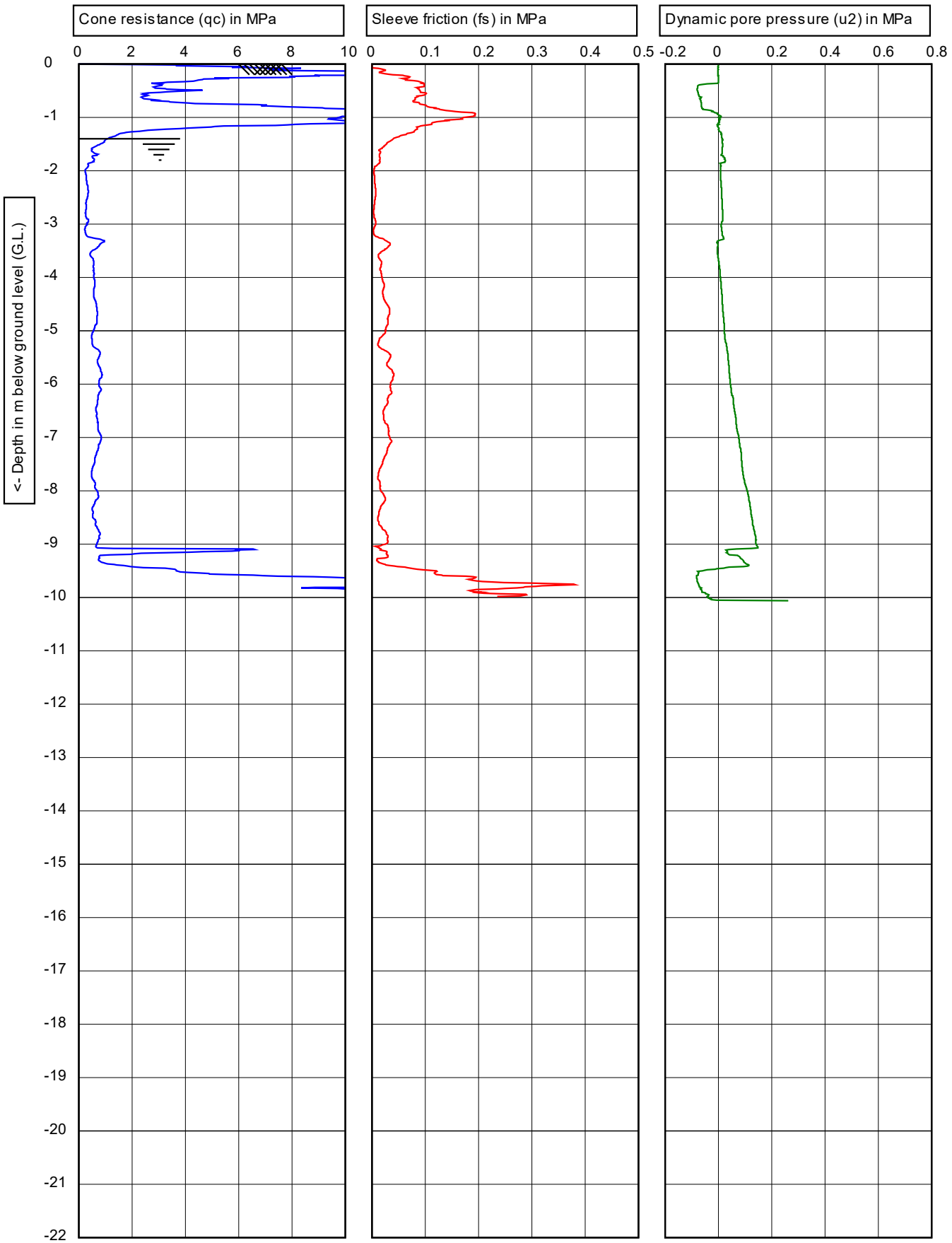
Date: **19/08/2025**

Cone no.: **C10CFIIP.C21094**

Project no.: **2-68207.00_HA15435**

CPT no.: **127** **1/6**

1.49



Refusal (qc/inclination)

EOH - Dipped - GWL @ 1.4m

Test results indicated as not accredited are outside the scope of the laboratory's accreditation

u2 150 cm² 10 cm²

Method:ASTM D5778-20&ISO 22476:1:2012cor.2013

G.L.: **0.00 m MSL** W.L.: **-1.40 m**

Project: **Surf Park Site (P-002405)**

Location: **Dairy Flat - Auckland**

Position: **1747040, 5941799 NZTM**

Predrill: **0.00 m Predrilled**

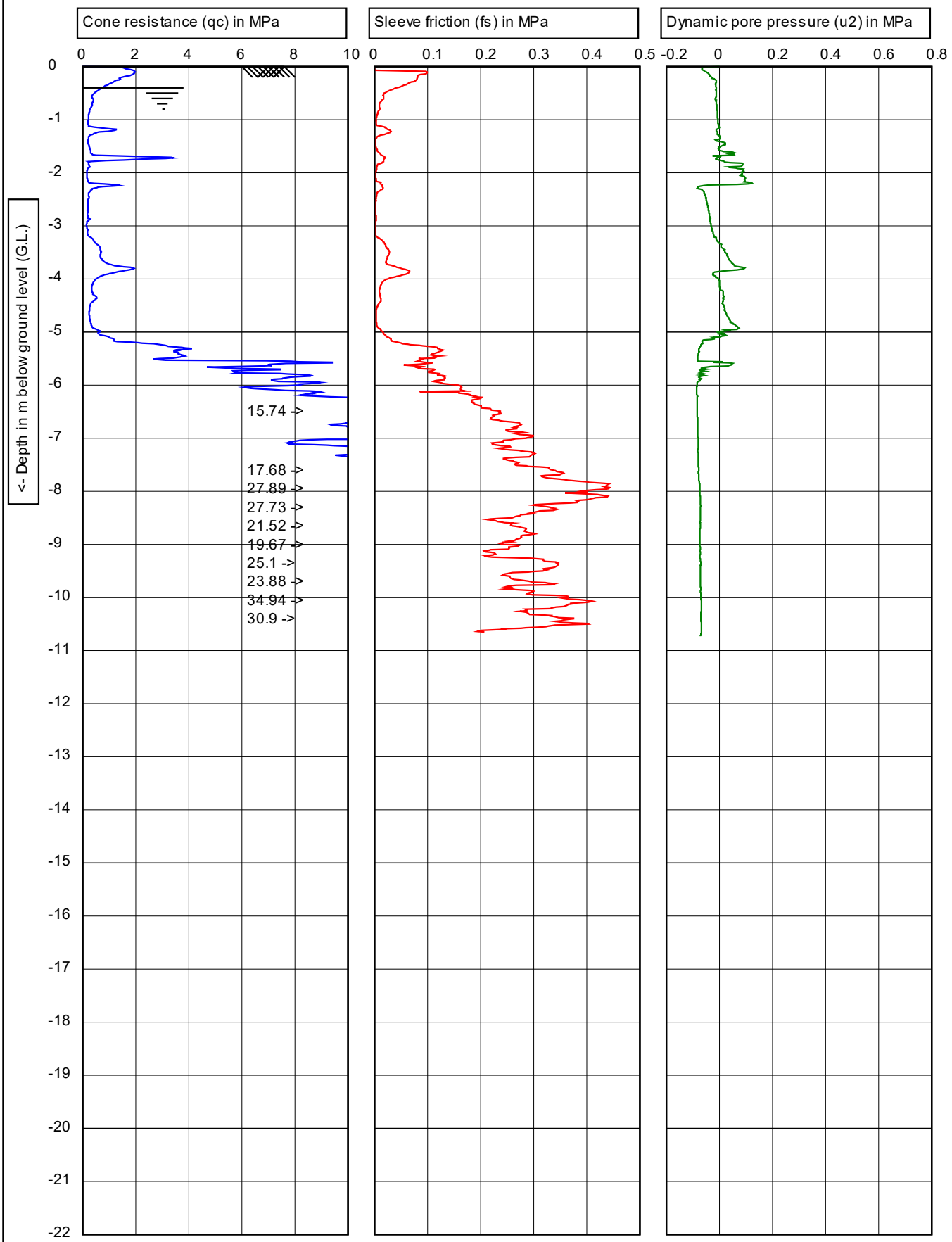
Date: **19/08/2025**

Cone no.: **C10CFIIP.C241654**

Project no.: **2-68207.00_HA15435**

CPT no.: **128** **1/6**

1.49



wsp

ACCREDITED IANZ TESTING LABORATORY

Test results indicated as not accredited are outside the scope of the laboratory's accreditation

u2 150 cm² 10 cm²

Method:ASTM D5778-20&ISO 22476:1:2012cor.2013

G.L.: **0.00 m MSL** W.L.: **-0.40 m**

Project: **Surf Park Site (P-002405)**

Location: **Dairy Flat - Auckland**

Position: **1747119, 5941965 NZTM**

Predrill: **0.00 m Predrilled**

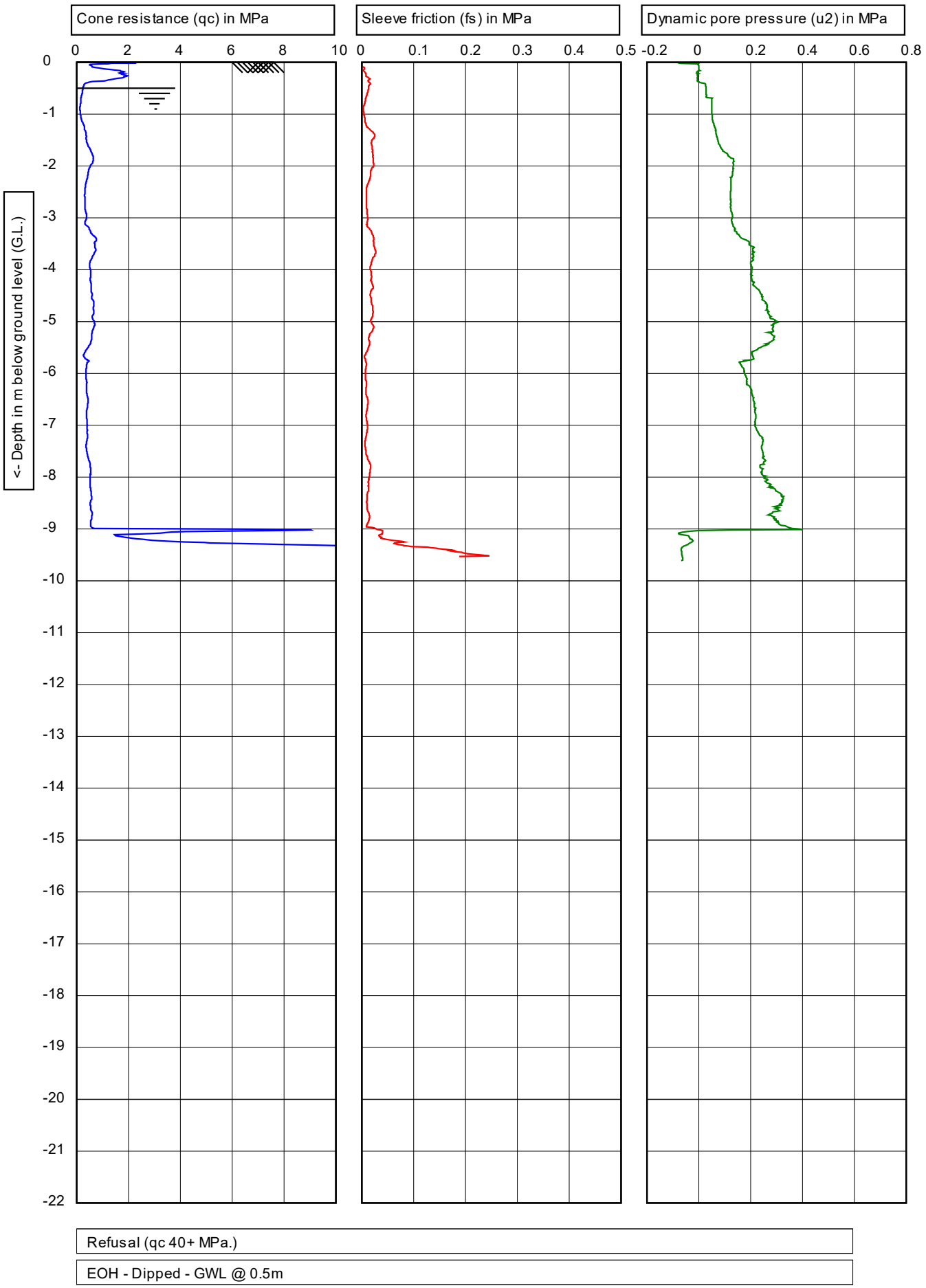
Date: **19/08/2025**

Cone no.: **C10CFIIP.C241654**

Project no.: **2-68207.00_HA15435**

CPT no.: **129** **1/6**

1.49



Refusal (qc 40+ MPa.)

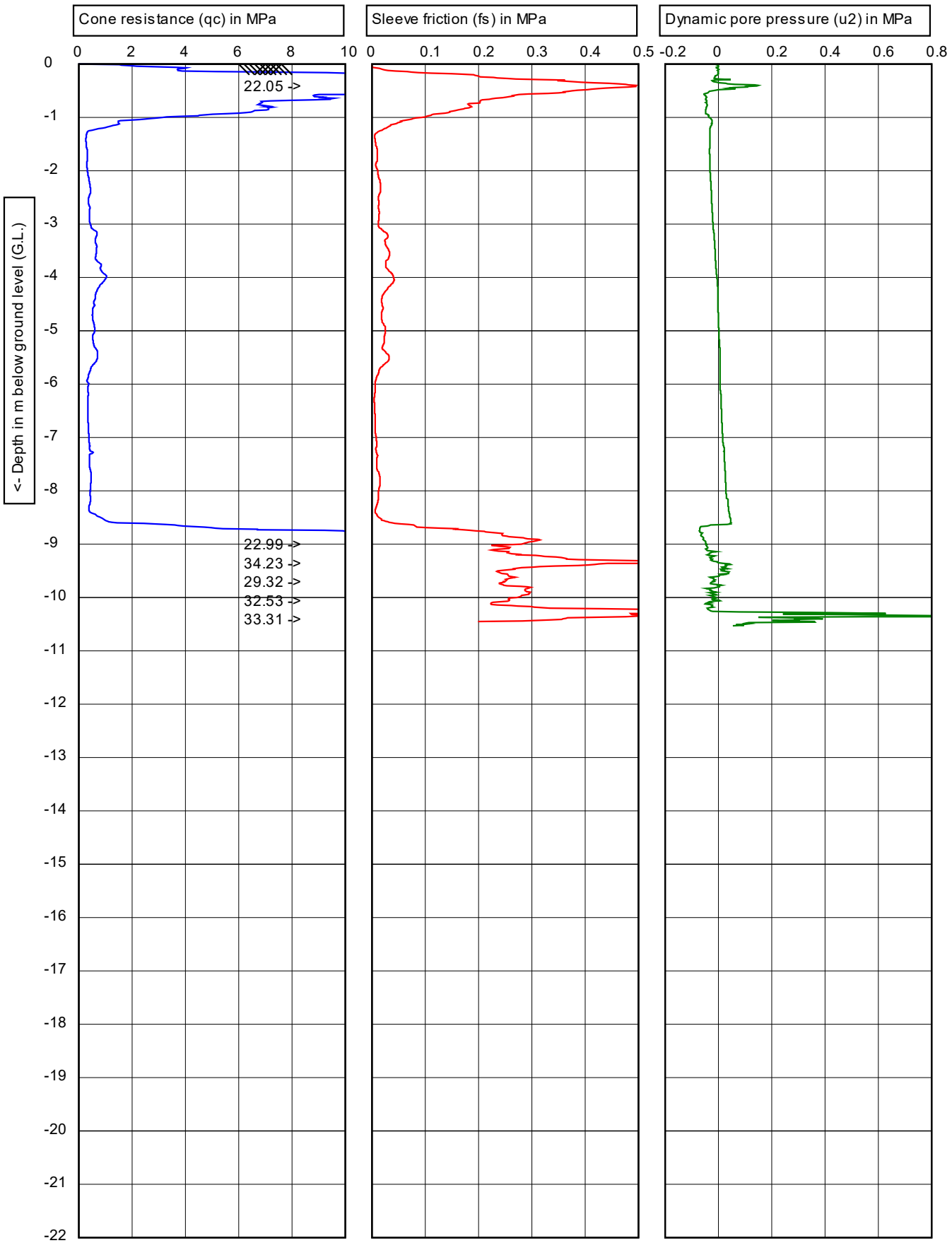
EOH - Dipped - GWL @ 0.5m

Test results indicated as not accredited are outside the scope of the laboratory's accreditation

u2
150 cm²
10 cm²

Method:ASTM D5778-20&ISO 22476:1:2012cor.2013		Predrill:	**0.00 m Predrilled**
G.L.: **0.00 m MSL**	W.L.: **-0.50 m**	Date:	**21/08/2025**
Project: **Surf Park Site (P-002405)**		Cone no.:	**C10CFIIP.C241654**
Location: **Dairy Flat - Auckland**		Project no.:	**2-68207.00_HA15435**
Position: **1747094, 5942013 NZTM**		CPT no.:	**131** **1/6**

1.49



Test results indicated as not accredited are outside the scope of the laboratory's accreditation

u2
150 cm²
10 cm²

Method:ASTM D5778-20&ISO 22476:1:2012cor.2013

G.L.: **0.00 m MSL**

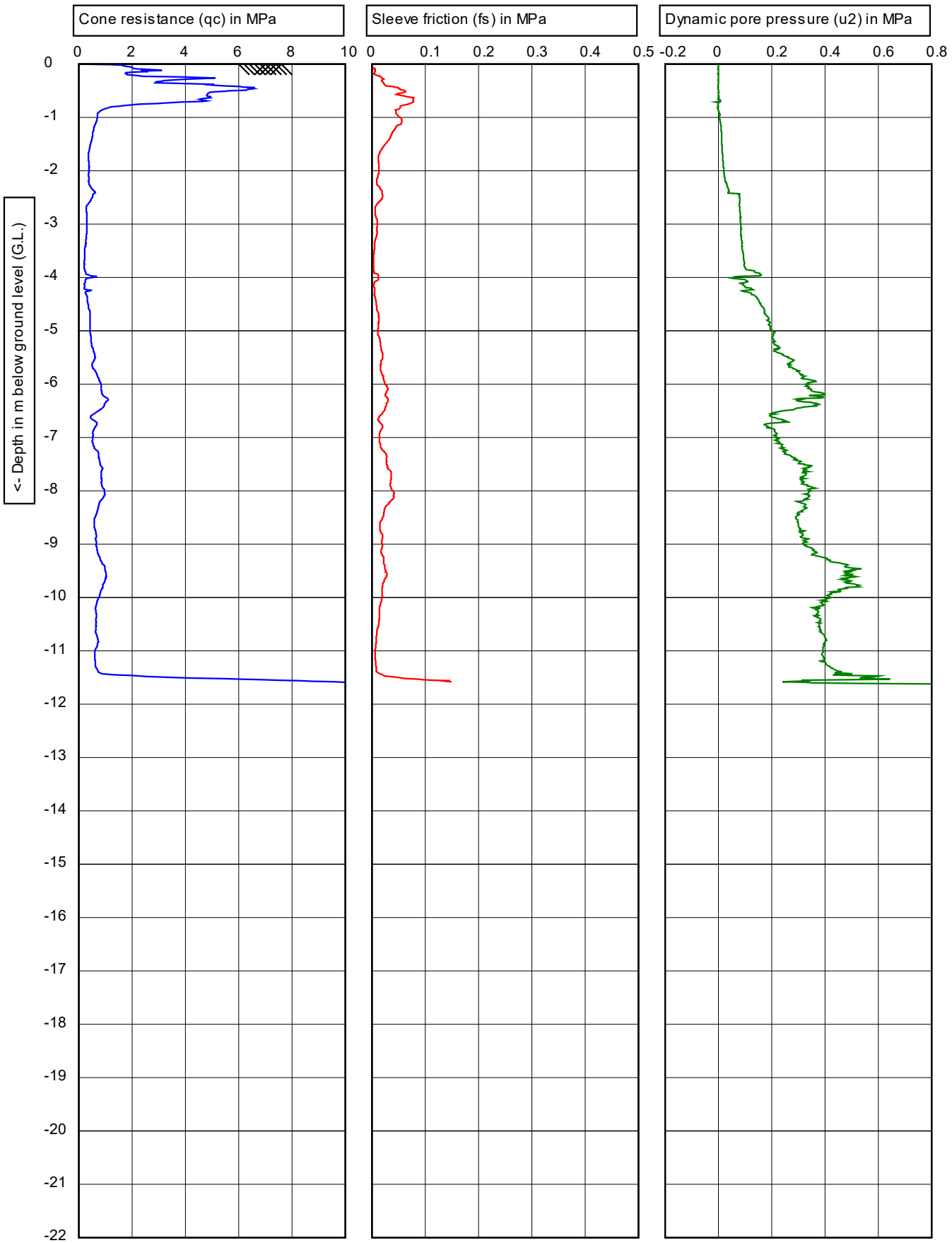
Project: **Surf Park Site (P-002405)**

Location: **Dairy Flat - Auckland**

Position: **1747164, 5942022 NZTM**

Predrill:	**0.00 m Predrilled**
Date:	**19/08/2025**
Cone no.:	**C10CFIIP.C241654**
Project no.:	**2-68207.00_HA15435**
CPT no.:	**132**

1.49



Refusal (qc 40+ MPa.)

EOH - Dipped - Collapsed Dry @ 1.0m

Test results indicated as not accredited are outside the scope of the laboratory's accreditation

u2 150 cm² 10 cm²

Method:ASTM D5778-20&ISO 22476:1:2012cor.2013

G.L.: **0.00 m MSL**

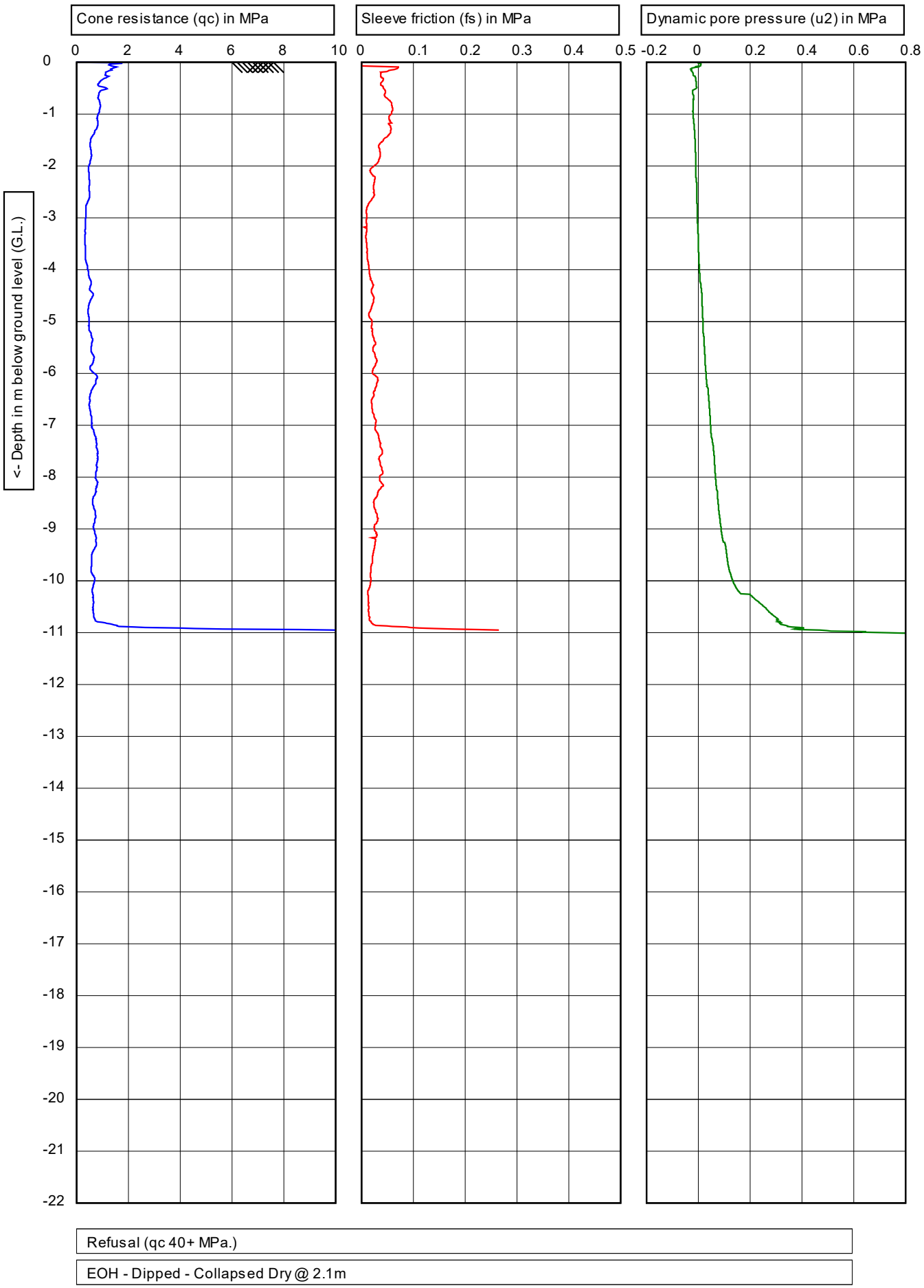
Project: **Surf Park Site (P-002405)**

Location: **Dairy Flat - Auckland**

Position: **1747004, 5942046 NZTM**

Predrill:	**0.00 m Predrilled**
Date:	**21/08/2025**
Cone no.:	**C10CFIIP.C241654**
Project no.:	**2-68207.00_HA15435**
CPT no.:	**133**

1.49



Refusal (qc 40+ MPa.)

EOH - Dipped - Collapsed Dry @ 2.1m

Test results indicated as not accredited are outside the scope of the laboratory's accreditation

u2 150 cm² 10 cm²

Method:ASTM D5778-20&ISO 22476:1:2012cor.2013

G.L.: **0.00 m MSL**

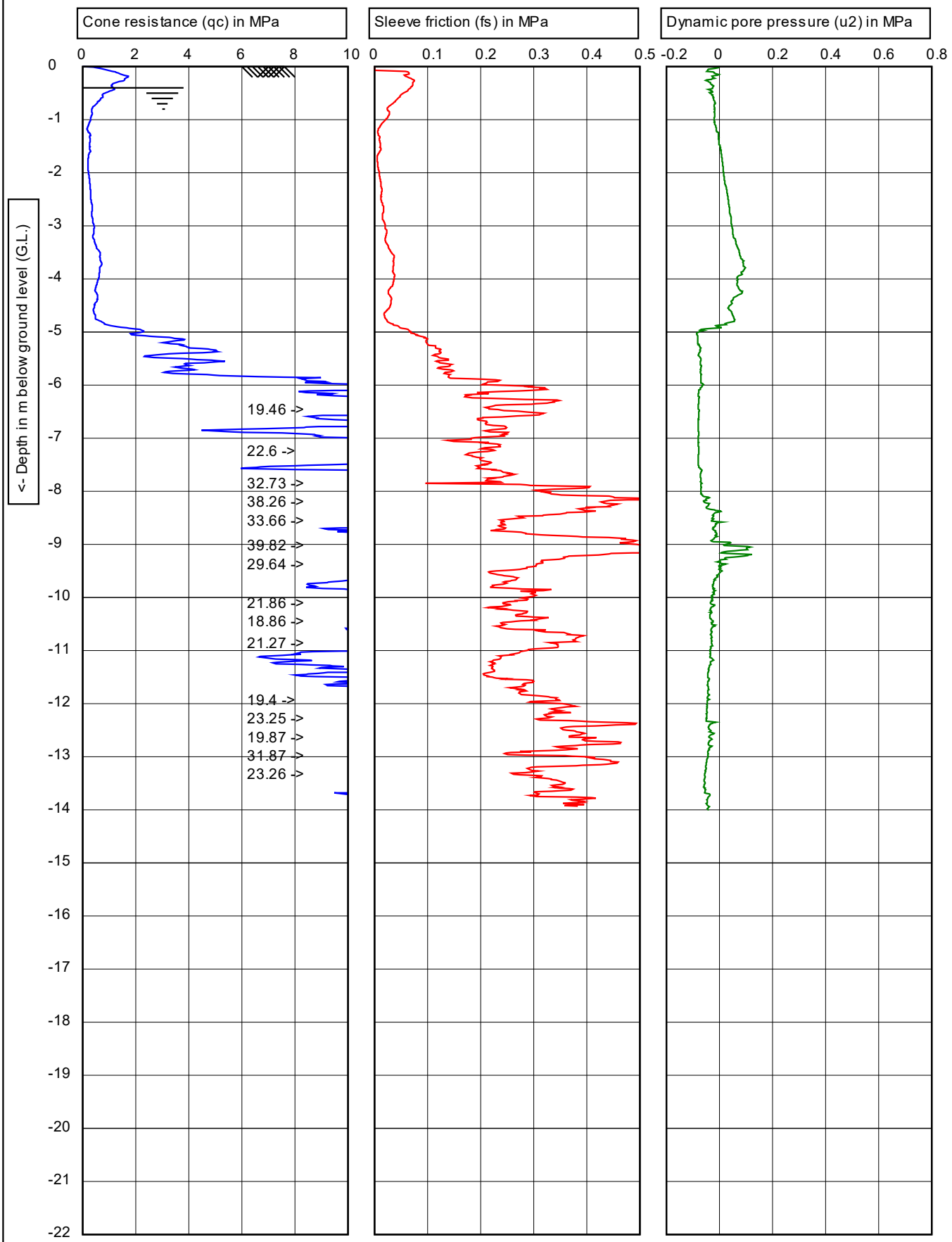
Project: **Surf Park Site (P-002405)**

Location: **Dairy Flat - Auckland**

Position: **1746992, 5942135 NZTM**

Predrill:	**0.00 m Predrilled**
Date:	**21/08/2025**
Cone no.:	**C10CFIIP.C21094**
Project no.:	**2-68207.00_HA15435**
CPT no.:	**134**

1.49



Refusal 10t.

EOH - Dipped - GWL @ 0.4m

Test results indicated as not accredited are outside the scope of the laboratory's accreditation

u2 150 cm² 10 cm²

Method:ASTM D5778-20&ISO 22476:1:2012cor.2013

G.L.: **0.00 m MSL** W.L.: **-0.40 m**

Project: **Surf Park Site (P-002405)**

Location: **Dairy Flat - Auckland**

Position: **1747167, 5941967 NZTM**

Predrill: **0.00 m Predrilled**

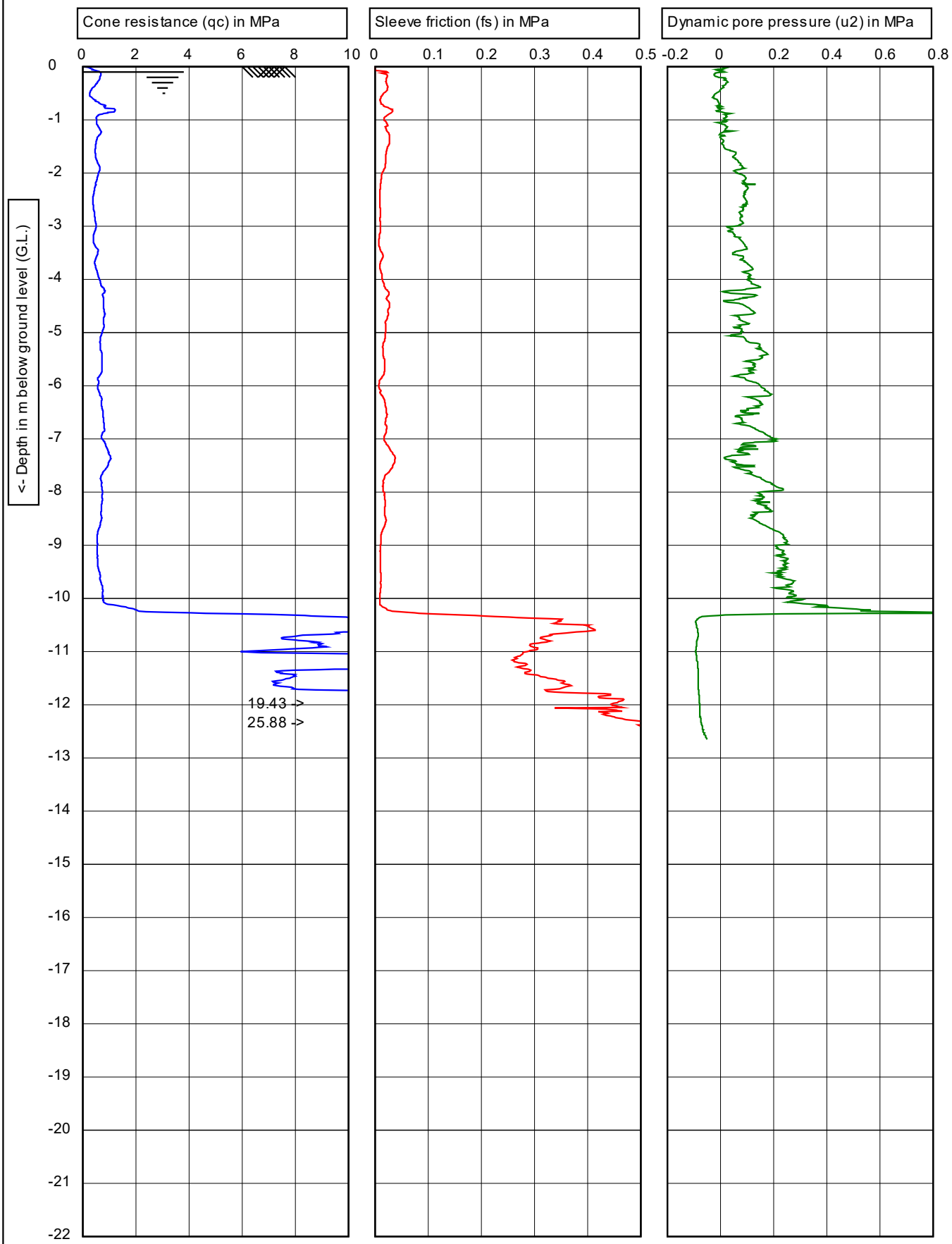
Date: **19/08/2025**

Cone no.: **C10CFIIP.C21094**

Project no.: **2-68207.00_HA15435**

CPT no.: **135** **1/6**

1.49

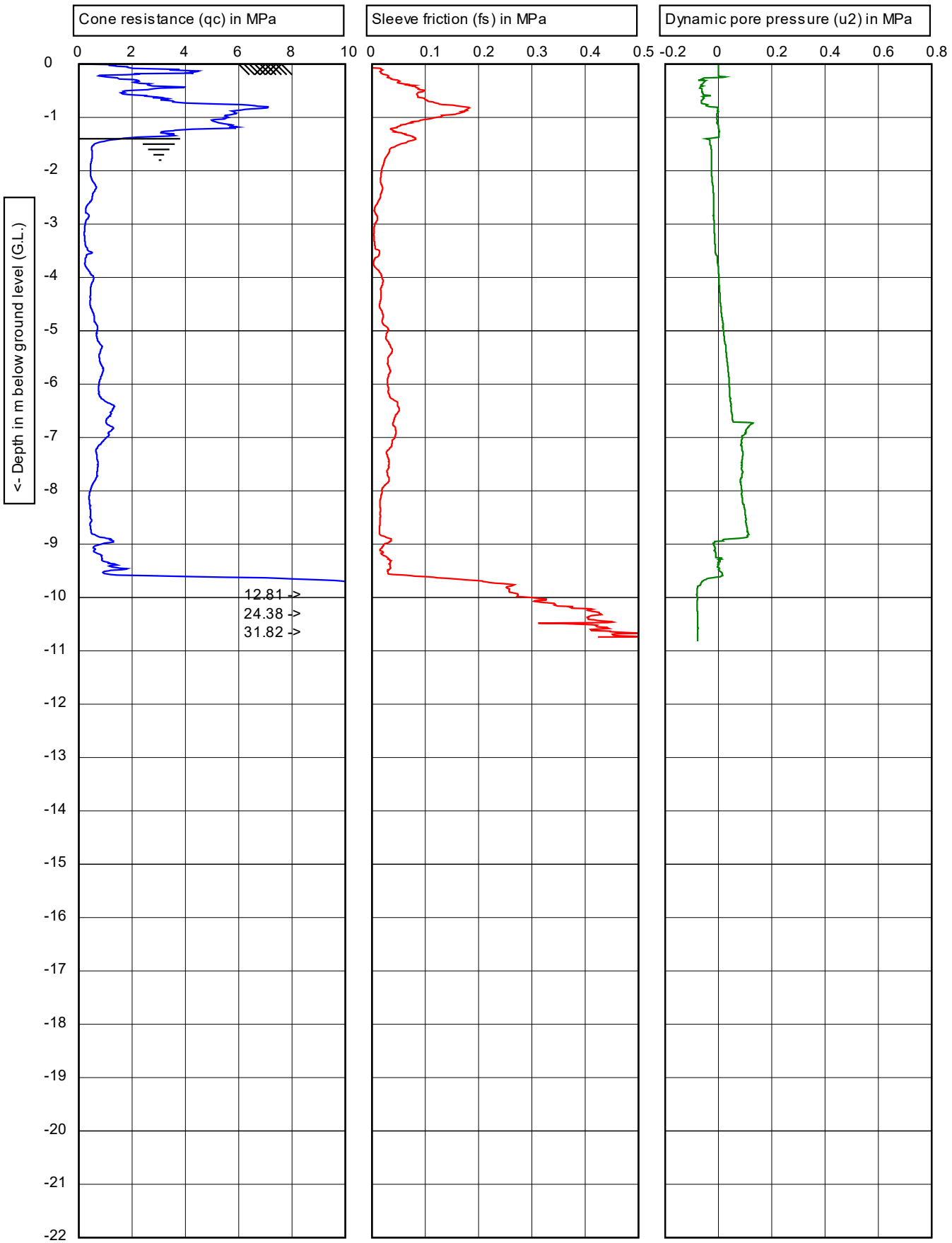


Test results indicated as not accredited are outside the scope of the laboratory's accreditation

u2
150 cm²
10 cm²

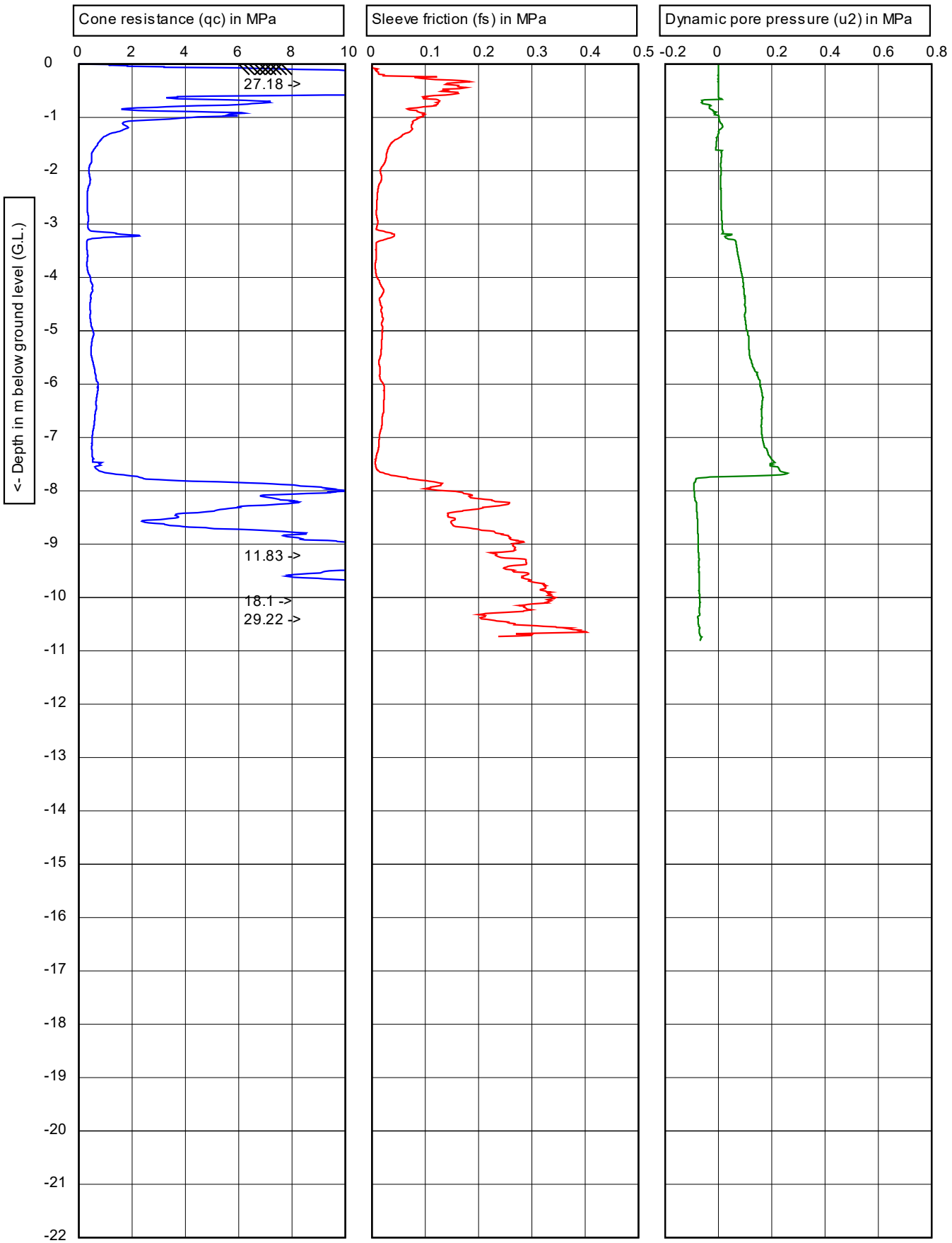
Method:ASTM D5778-20&ISO 22476:1:2012cor.2013		Predrill:	**0.00 m Predrilled**
G.L.: **0.00 m MSL**	W.L.: **-0.10 m**	Date:	**21/08/2025**
Project: **Surf Park Site (P-002405)**		Cone no.:	**C10CFIIP.C241654**
Location: **Dairy Flat - Auckland**		Project no.:	**2-68207.00_HA15435**
Position: **1746874, 5942176 NZTM**		CPT no.:	**136** 1/6

1.49



wsp ACCREDITED IANZ TESTING LABORATORY. Test results indicated as not accredited are outside the scope of the laboratory's accreditation	u2 150 cm² 10 cm²	Method:ASTM D5778-20&ISO 22476:1:2012cor.2013	Predrill: **0.00 m Predrilled**
		G.L.: **0.00 m MSL** W.L.: **-1.40 m**	Date: **19/08/2025**
	Project: **Surf Park Site (P-002405)**		Cone no.: **C10CFIIP.C21094**
	Location: **Dairy Flat - Auckland**		Project no.: **2-68207.00_HA15435**
	Position: **1747077, 5941906 NZTM**		CPT no.: **137** **1/6**

1.49



Refusal 10t.

EOH - Dipped - Collapsed Dry @ 0.5m

Test results indicated as not accredited are outside the scope of the laboratory's accreditation

u2 150 cm² 10 cm²

Method:ASTM D5778-20&ISO 22476:1:2012cor.2013

G.L.: **0.00 m MSL**

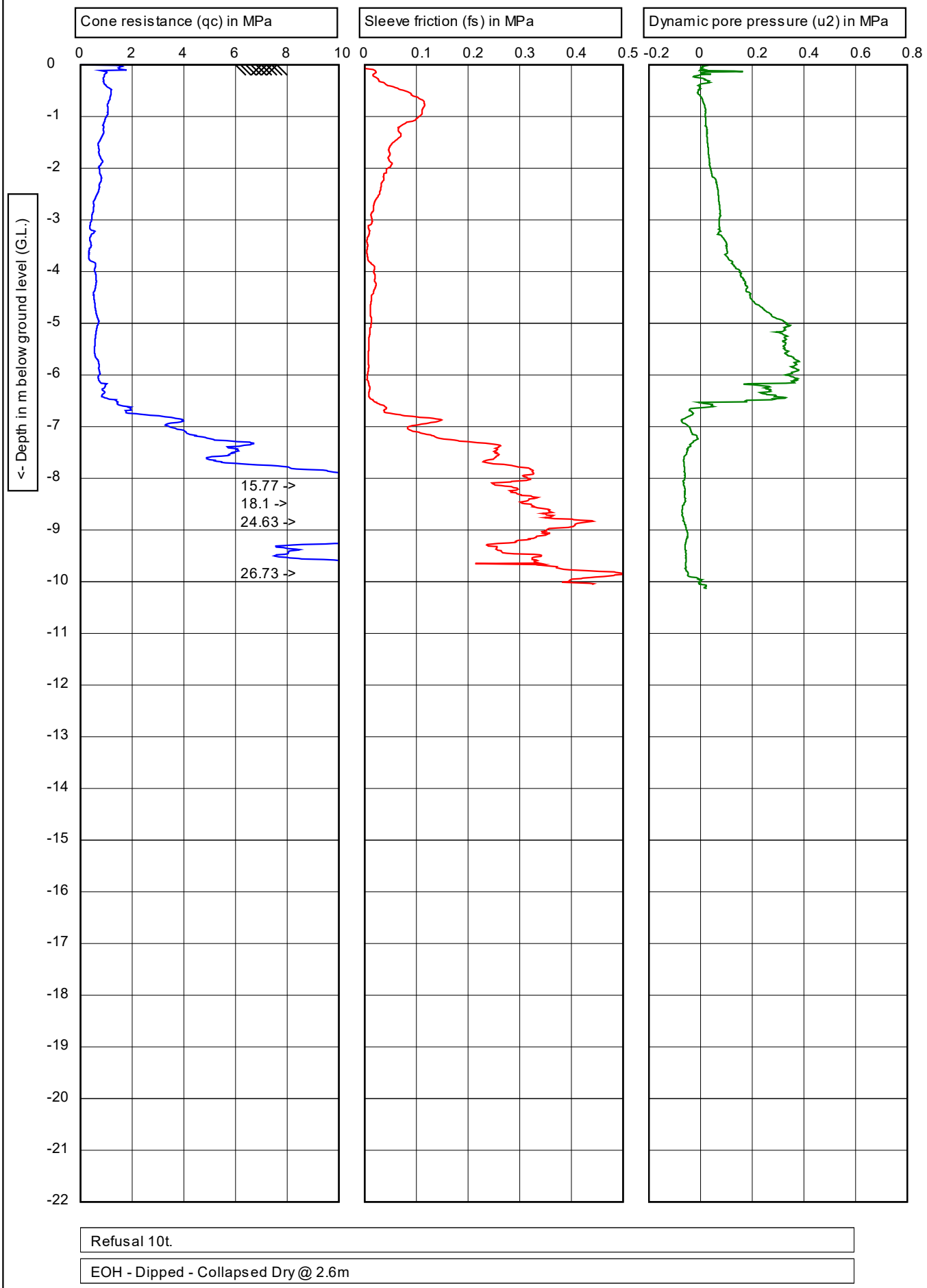
Project: **Surf Park Site (P-002405)**

Location: **Dairy Flat - Auckland**

Position: **1747302, 5942127 NZTM**

Predrill:	**0.00 m Predrilled**
Date:	**19/08/2025**
Cone no.:	**C10CFIIP.C241654**
Project no.:	**2-68207.00_HA15435**
CPT no.:	**138**

1.49



Test results indicated as not accredited are outside the scope of the laboratory's accreditation

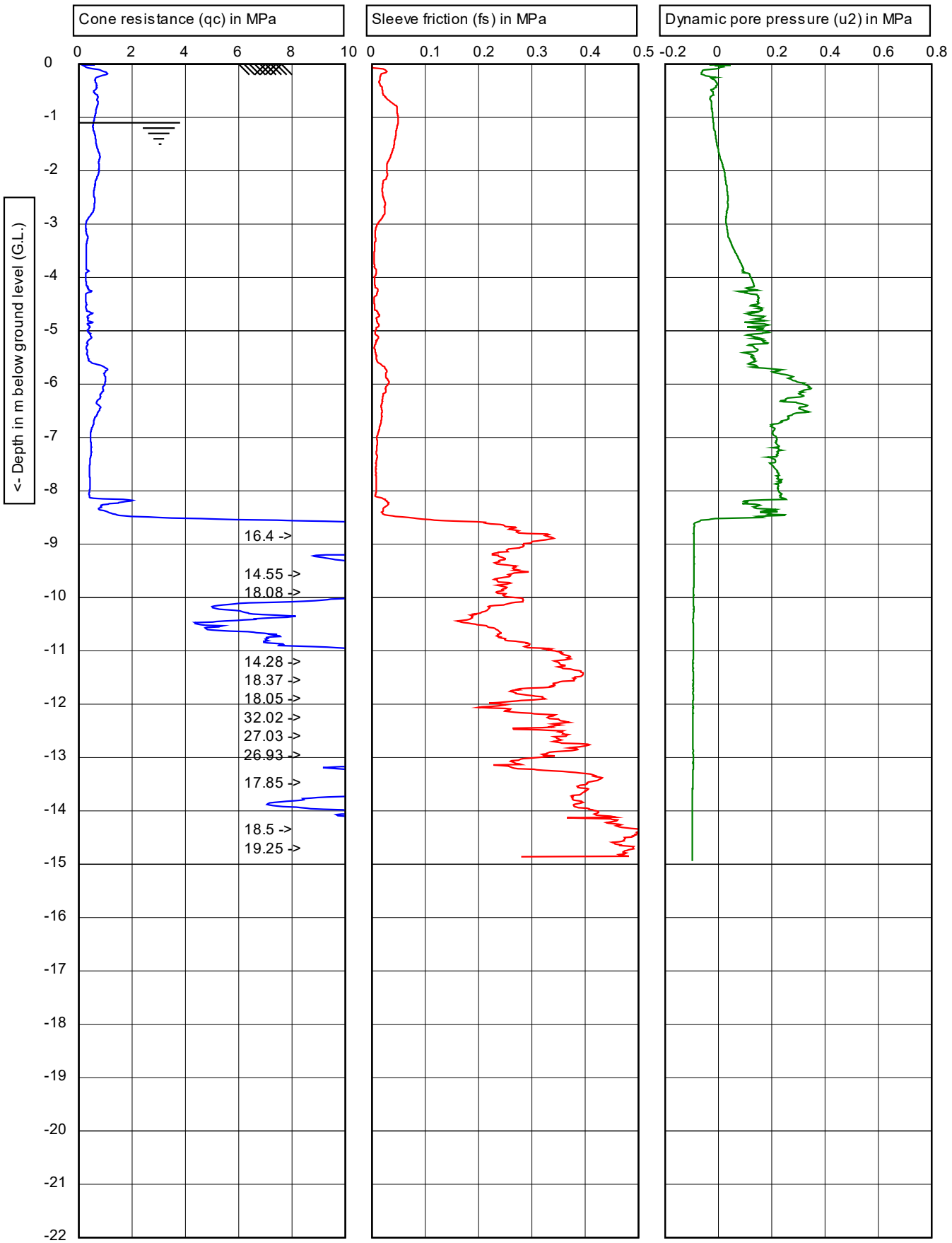
u2
150 cm²
10 cm²

Method:ASTM D5778-20&ISO 22476:1:2012cor.2013
G.L.: **0.00 m MSL**

Project: **Surf Park Site (P-002405)**
Location: **Dairy Flat - Auckland**
Position: **1746912, 5942275 NZTM**

Predrill: **0.00 m Predrilled**
Date: **20/08/2025**
Cone no.: **C10CFIIP.C241654**
Project no.: **2-68207.00_HA15435**
CPT no.: **139** **1/6**

1.49



Method:ASTM D5778-20&ISO 22476:1:2012cor.2013		Predrill:	**0.00 m Predrilled**
G.L.: **0.00 m MSL**	W.L.: **-1.10 m**	Date:	**20/08/2025**
Project:	**Surf Park Site (P-002405)**	Cone no.:	**C10CFIIP.C21094**
Location:	**Dairy Flat - Auckland**	Project no.:	**2-68207.00_HA15435**
Position:	**1746773, 5942138 NZTM**	CPT no.:	**140** 1/6

Test results indicated as not accredited are outside the scope of the laboratory's accreditation

1.49

Appendix C Historic Investigation Logs

HAND AUGER LOG

HOLE Id: **HA01P**

Hole Location: 1350 Dairy Flat Highway

SHEET: 1 OF 1

PROJECT: Dairy Flat Highway Geotech	LOCATION: Dairy Flat Highway	JOB No.: 1016502.1000
CO-ORDINATES: 5942131 mN (NZTM2000) 1746998 mE	DRILL TYPE: 75mm Auger	HOLE STARTED: 03/05/2022
	METHOD: Hand auger with dynamic cone	HOLE FINISHED: 03/05/2022
R.L.: 55m		DRILLED BY: T+T
DATUM: AUCKHT1946		LOGGED BY: SCZH CHECKED: ROM

GEOLOGICAL	METHOD OBSERVATIONS									ENGINEERING DESCRIPTION					
STRATIGRAPHY / ENG GEOLOGICAL UNIT / ADDITIONAL OBSERVATIONS	WATER	CORE RECOVERY (%)	METHOD	SCALA PENETROMETER (Blows/50mm) 0 2 4 6 8 10 12 14 16 18	TESTS	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	WEATHERING CLASSIFICATION	MOISTURE CLASSIFICATION	CONSISTENCY / DENSITY CLASSIFICATION	ESTIMATED SOIL SHEAR STRENGTH (Su, kPa) VS 12 25 50 100 200 VSt H	DESCRIPTION
Topsoil									TS		D	VSt		*0.00m:* Clayey SILT; brown. Very stiff, dry, low plasticity. Trace of rootlets[Topsoil]
Tauranga Group	DRY 03/05/2022	100	HA		140/36 kPa Insitu 176/63 kPa Insitu 170/45 kPa Insitu 123/45 kPa Insitu 120/69 kPa Insitu 78/36 kPa Insitu 78/51 kPa Insitu 63/36 kPa Insitu 36/27 kPa Insitu 27/9 kPa Insitu 66/24 kPa Insitu 21/12 kPa Insitu		54 53 52 51 50 49	1 2 3 4 5 6			M			*0.30m:* Clayey SILT; light grey motted orange. Very stiff, moist, medium plasticity.
												St		*1.50m:* Silty CLAY; grey. Stiff, moist, high plasticity. Trace of organics and rootlets.
											W	F		*2.90m:* Organic CLAY, some silt; black motted grey. Firm, wet, high plasticity. Organic, decomposed.
											M	F-St		*3.10m:* Silty CLAY; dark grey. Firm to stiff, moist, high plasticity. *3.60m:* Light grey
		0	DCP											*4.00m:* Scala penetrometer testing
							8							6m: Target depth

0.0-4.0m

COMMENTS: Piezo installed between 0.2 - 3.5 m bgl; sand 0.2 - 4.0 m bgl; bentonite 0 - 0.2 m bgl; flush toby box

Hole Depth 6m

Scale 1:35

Rev.: A

TTNZ_20210729 - HandAugerLog - 30/05/2022 5:13:15 pm - Produced with Core-GS by GeRoc

HAND AUGER PHOTOS

BOREHOLE No.: **HA01P**

Hole Location: 1350 Dairy Flat Highway

SHEET: 1 OF 1

PROJECT: Dairy Flat Highway Geotech	LOCATION: Dairy Flat Highway	JOB No.: 1016502.1000
CO-ORDINATES: 5942131 mN (NZTM2000) 1746998 mE R.L.: 55m DATUM: AUCKHT1946	DRILL TYPE: 75mm Auger METHOD: Hand auger with dynamic cone	HOLE STARTED: 03/05/2022 HOLE FINISHED: 03/05/2022 DRILLED BY: T+T LOGGED BY: SCZH CHECKED: ROM



0.00-4.00m

TTNZ_20210729 - HandAugerLog - 30/05/2022 5:13:15 pm - Produced with Core-GS by GeRoc

HAND AUGER LOG

HOLE Id: **HA02**

Hole Location: 1350 Dairy Flat Highway

SHEET: 1 OF 1

PROJECT: Dairy Flat Highway Geotech	LOCATION: Dairy Flat Highway	JOB No.: 1016502.1000
CO-ORDINATES: 5942106 mN (NZTM2000) 1746956 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 02/05/2022
R.L.: 55m	METHOD: Hand auger with dynamic cone	HOLE FINISHED: 03/05/2022
DATUM: AUCKHT1946		DRILLED BY: T+T
		LOGGED BY: SCZH CHECKED: ROM

GEOLOGICAL	METHOD OBSERVATIONS							ENGINEERING DESCRIPTION						
STRATIGRAPHY / ENG GEOLOGICAL UNIT / ADDITIONAL OBSERVATIONS	WATER	CORE RECOVERY (%)	METHOD	SCALA PENETROMETER (Blows/50mm) 0 2 4 6 8 10 12 14 16 18	TESTS	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	WEATHERING CLASSIFICATION	MOISTURE CLASSIFICATION	CONSISTENCY / DENSITY CLASSIFICATION	ESTIMATED SOIL SHEAR STRENGTH (Su, kPa) VS 12 25 50 100 200 VSt H	DESCRIPTION
Topsoil									TS		M	VSt		*0.00m:* Clayey SILT; light brown. Very stiff, moist, medium plasticity.
														0.20m: Silty CLAY; light brown. Very stiff, moist, high plasticity.
					185/54 kPa Insitu		54	1						
					146/51 kPa Insitu									
					146/39 kPa Insitu									
					137/69 kPa Insitu									*1.20 - 1.60m:* Streaked orange
					146/72 kPa Insitu									
					123/60 kPa Insitu		53	2						
Tauranga Group		100	HA		179/66 kPa Insitu									
					164/75 kPa Insitu									
					111/48 kPa Insitu									*2.60m:* Colour change to greyish brown
					137/57 kPa Insitu		52	3				St		*3.00m:* Silty CLAY, minor organics; brown. Stiff, moist, medium plasticity. Organics, decomposed.
					72/45 kPa Insitu									
					72/36 kPa Insitu									*3.50m:* Silty CLAY; light grey. Stiff, moist, high plasticity.
	DRY 02/05/2022				81/33 kPa Insitu		51	4						
		0	DCP											*4.00m:* Scala penetrometer testing.
							50	5						
														6m: Target depth
							49	6						
							48							

0.0-4.0m

COMMENTS:

Hole Depth 6m

Scale 1:35

Rev.: A

TTNZ_20210729 - HandAugerLog - 30/05/2022 5:13:22 pm - Produced with Core-GS by GeRoc

HAND AUGER PHOTOS

BOREHOLE No.: **HA02**

Hole Location: 1350 Dairy Flat Highway

SHEET: 1 OF 1

PROJECT: Dairy Flat Highway Geotech	LOCATION: Dairy Flat Highway	JOB No.: 1016502.1000
CO-ORDINATES: 5942106 mN (NZTM2000) 1746956 mE R.L.: 55m DATUM: AUCKHT1946	DRILL TYPE: 50mm Auger METHOD: Hand auger with dynamic cone	HOLE STARTED: 02/05/2022 HOLE FINISHED: 03/05/2022 DRILLED BY: T+T LOGGED BY: SCZH CHECKED: ROM



0.00-4.00m

TTNZ_20210729 - HandAugerLog - 30/05/2022 5:13:22 pm - Produced with Core-GS by GeRoc

HAND AUGER LOG

HOLE Id: **HA03P**

Hole Location: 1350 Dairy Flat Highway

SHEET: 1 OF 1

PROJECT: Dairy Flat Highway Geotech	LOCATION: Dairy Flat Highway	JOB No.: 1016502.1000
CO-ORDINATES: 5942063 mN (NZTM2000) 1746900 mE	DRILL TYPE: 75mm Auger	HOLE STARTED: 04/05/2022
	METHOD: Hand auger with dynamic cone	HOLE FINISHED: 04/05/2022
R.L.: 55m		DRILLED BY: T+T
DATUM: AUCKHT1946		LOGGED BY: SCZH CHECKED: ROM

GEOLOGICAL	METHOD OBSERVATIONS							ENGINEERING DESCRIPTION					
STRATIGRAPHY / ENG GEOLOGICAL UNIT / ADDITIONAL OBSERVATIONS	WATER	CORE RECOVERY (%)	METHOD	SCALA PENETROMETER (Blows/50mm) 0 2 4 6 8 10 12 14 16 18	TESTS	SAMPLES	RL (m) / DEPTH (m)	GRAPHIC LOG	WEATHERING CLASSIFICATION	MOISTURE CLASSIFICATION	CONSISTENCY / DENSITY CLASSIFICATION	ESTIMATED SOIL SHEAR STRENGTH (Su, kPa) VS 12 25 50 100 200 H	DESCRIPTION
Topsoil								TS		M	St		*0.00m:* Clayey SILT, trace rootlets; dark brown. Stiff, moist, low to medium plasticity.
													0.20m: SILT, minor clay; dark brown. Stiff, moist, medium plasticity.
													0.50m: Silty CLAY; light grey motted yellow. Stiff, moist, high plasticity. Trace of organics.
Tauranga Group	DRY 04/05/2022	100	HA		93/21 kPa Insitu 81/39 kPa Insitu 66/33 kPa Insitu 63/30 kPa Insitu 60/33 kPa Insitu 66/24 kPa Insitu 66/21 kPa Insitu 60/18 kPa Insitu 51/30 kPa Insitu 78/48 kPa Insitu 51/30 kPa Insitu 48/21 kPa Insitu 63/33 kPa Insitu		54 1 53 2 52 3 51 4 50 5 49 6 48						*2.10m:* Grades dark grey
										W			*3.00m:* Organics silty CLAY; brown. Stiff, wet, high plasticity. Organics, wood fragments (decomposed).
										M	F-St		*3.20m:* Silty CLAY; dark grey. Firm to stiff, moist, high plasticity.
													3.80m: Grades light grey
		300	DCP										*4.00m:* Scala penetrometer testing.
													6m: Target depth

0.0-4.0m

COMMENTS: Piezo installed between 0.2 - 4.0 m bgl; sand 0.2 - 4.0 m bgl; bentonite 0 - 0.2 m bgl; flush toby box

Hole Depth 6m

Scale 1:35

Rev.: A

TTNZ_20210729 - HandAugerLog - 30/05/2022 5:13:29 pm - Produced with Core-GS by GeRoc

HAND AUGER PHOTOS

BOREHOLE No.: **HA03P**

Hole Location: 1350 Dairy Flat Highway

SHEET: 1 OF 1

PROJECT: Dairy Flat Highway Geotech	LOCATION: Dairy Flat Highway	JOB No.: 1016502.1000
CO-ORDINATES: 5942063 mN (NZTM2000) 1746900 mE R.L.: 55m DATUM: AUCKHT1946	DRILL TYPE: 75mm Auger METHOD: Hand auger with dynamic cone	HOLE STARTED: 04/05/2022 HOLE FINISHED: 04/05/2022 DRILLED BY: T+T LOGGED BY: SCZH CHECKED: ROM



0.00-4.00m

TTNZ_20210729 - HandAugerLog - 30/05/2022 5:13:29 pm - Produced with Core-GS by GeRoc

HAND AUGER LOG

HOLE Id: **HA04P**

Hole Location: 1350 Dairy Flat Highway

SHEET: 1 OF 1

PROJECT: Dairy Flat Highway Geotech | LOCATION: Dairy Flat Highway | JOB No.: 1016502.1000

CO-ORDINATES: (NZTM2000) 5942039 mN, 1746836 mE

R.L.: 55m

DATUM: AUCKHT1946

DRILL TYPE: 50mm Auger

METHOD: Hand auger with dynamic cone

HOLE STARTED: 03/05/2022

HOLE FINISHED: 03/05/2022

DRILLED BY: T+T

LOGGED BY: CATA CHECKED: ROM

GEOLOGICAL	METHOD OBSERVATIONS								ENGINEERING DESCRIPTION					
STRATIGRAPHY / ENG GEOLOGICAL UNIT / ADDITIONAL OBSERVATIONS	WATER	CORE RECOVERY (%)	METHOD	SCALA PENETROMETER (Blows/50mm) 0 2 4 6 8 10 12 14 16 18	TESTS	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	WEATHERING CLASSIFICATION	MOISTURE CLASSIFICATION	CONSISTENCY / DENSITY CLASSIFICATION	ESTIMATED SOIL SHEAR STRENGTH (Su, kPa) VS 12 25 50 100 200 VSt H	DESCRIPTION
Topsoil									TS		M	St		*0.00m:* SILT, minor clay; dark brown. Stiff, moist. (TOPSOIL).
														0.20m: SILT, some clay; brown. Stiff, moist, low to medium plasticity.
					90/35 kPa Insitu		55	1						*0.60m:* Silty CLAY; yellowish grey brown. Stiff, moist, high plasticity.
					57/36 kPa Insitu									
					102/39 kPa Insitu		54	2			M-W			*1.40m:* Clayey SILT, minor organics; dark grey. Stiff, moist to wet, medium to high plasticity. Organics, decomposed .
Tauranga Group		100	HA		60/24 kPa Insitu		53	3						
	03/05/2022				81/33 kPa Insitu									
					63/27 kPa Insitu		52	4						*4.00m:* Scala penetrometer testing.
					93/63 kPa Insitu									
					84/57 kPa Insitu		51	5						
		0	DCP				50	6						6m: END OF HANDAUGER. Target depth reached.
							49							

0.0-4.0m

COMMENTS: Piezo installed between 0.2 - 3.5 m bgl; sand 0.2 - 4.0 m bgl; bentonite 0 - 0.2 m bgl; flush toby box

Hole Depth 6m

Scale 1:35

Rev.: A

TTNZ_20210729 - HandAugerLog - 30/05/2022 5:13:36 pm - Produced with Core-GS by GeRoc

HAND AUGER PHOTOS

BOREHOLE No.: **HA04P**

Hole Location: 1350 Dairy Flat Highway

SHEET: 1 OF 1

PROJECT: Dairy Flat Highway Geotech		LOCATION: Dairy Flat Highway	JOB No.: 1016502.1000
CO-ORDINATES: (NZTM2000)	5942039 mN 1746836 mE	DRILL TYPE: 50mm Auger METHOD: Hand auger with dynamic cone	HOLE STARTED: 03/05/2022 HOLE FINISHED: 03/05/2022
R.L.:	55m		DRILLED BY: T+T
DATUM:	AUCKHT1946		LOGGED BY: CATA CHECKED: ROM



0.00-4.00m

TTNZ_20210729 - HandAugerLog - 30/05/2022 5:13:36 pm - Produced with Core-GS by GeRoc

HAND AUGER LOG

HOLE Id: **HA05**

Hole Location: 1350 Dairy Flat Highway

SHEET: 1 OF 2

PROJECT: Dairy Flat Highway Geotech	LOCATION: Dairy Flat Highway	JOB No.: 1016502.1000
CO-ORDINATES: 5942122 mN (NZTM2000) 1746857 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 03/05/2022
	METHOD: Hand auger with dynamic cone	HOLE FINISHED: 03/05/2022
R.L.: 55m		DRILLED BY: T+T
DATUM: AUCKHT1946		LOGGED BY: CATA CHECKED: ROM

GEOLOGICAL	METHOD OBSERVATIONS								ENGINEERING DESCRIPTION					
STRATIGRAPHY / ENG GEOLOGICAL UNIT / ADDITIONAL OBSERVATIONS	WATER	CORE RECOVERY (%)	METHOD	SCALA PENETROMETER (Blows/50mm) 0 2 4 6 8 10 12 14 16 18	TESTS	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	WEATHERING CLASSIFICATION	MOISTURE CLASSIFICATION	CONSISTENCY / DENSITY CLASSIFICATION	ESTIMATED SOIL SHEAR STRENGTH (Su, kPa) VS 12 25 50 100 200 H	DESCRIPTION
Topsoil									TS		M	St		*0.00m:* Clayey SILT; dark brown. Stiff, moist, medium plasticity. (TOPSOIL).
														0.20m: Clayey SILT; dark brown. Stiff, moist, medium plasticity.
					90/51 kPa Insitu									*0.40m:* Silty CLAY; light greyish brown. Stiff, moist, high plasticity.
					78/45 kPa Insitu		54	1						
												F-St		*1.20m:* Clayey SILT; brownish grey. Firm to stiff, moist, high plasticity.
Tauranga Group		100	HA		39/18 kPa Insitu									
					45/18 kPa Insitu		53	2						
					54/24 kPa Insitu									
					114/48 kPa Insitu		52	3						*3.00m:* Stiff to very stiff
					108/87 kPa Insitu									
	DRY 03/05/2022				99/57 kPa Insitu		51	4						0.0-4.0m
														4.00m: Scala penetrometer testing.
							50	5						
							49	6						
							48							

COMMENTS:

Hole Depth 8.25m

Scale 1:35

Rev.: A

TTNZ_20210729 - HandAugerLog - 30/05/2022 5:13:43 pm - Produced with Core-GS by GeRoc

HAND AUGER LOG

HOLE Id: **HA05**

Hole Location: 1350 Dairy Flat Highway

PROJECT: Dairy Flat Highway Geotech	LOCATION: Dairy Flat Highway	JOB No.: 1016502.1000
CO-ORDINATES: 5942122 mN (NZTM2000) 1746857 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 03/05/2022
	METHOD: Hand auger with dynamic cone	HOLE FINISHED: 03/05/2022
R.L.: 55m		DRILLED BY: T+T
DATUM: AUCKHT1946		LOGGED BY: CATA CHECKED: ROM

GEOLOGICAL	METHOD OBSERVATIONS							ENGINEERING DESCRIPTION					
STRATIGRAPHY / ENG GEOLOGICAL UNIT / ADDITIONAL OBSERVATIONS	WATER	CORE RECOVERY (%)	METHOD	SCALA PENETROMETER (Blows/50mm) 0 2 4 6 8 10 12 14 16 18	TESTS	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	WEATHERING CLASSIFICATION	MOISTURE CLASSIFICATION	CONSISTENCY / DENSITY CLASSIFICATION	ESTIMATED SOIL SHEAR STRENGTH (Su, kPa) VS 12 25 50 100 200 H	DESCRIPTION
		0	DCP				47	8						[CONT] *4.00m:* Scala penetrometer testing.
							46	9						8.25m: Effective refusal
							45	10						
							44	11						
							43	12						
							42	13						
							41							

COMMENTS:

Hole Depth 8.25m

Scale 1:35

Rev.: A

TTNZ_20210729 - HandAugerLog - 30/05/2022 5:13:43 pm - Produced with Core-GS by GeRoc

HAND AUGER PHOTOS

BOREHOLE No.: **HA05**

Hole Location: 1350 Dairy Flat Highway

SHEET: 1 OF 1

PROJECT: Dairy Flat Highway Geotech	LOCATION: Dairy Flat Highway	JOB No.: 1016502.1000
CO-ORDINATES: 5942122 mN (NZTM2000) 1746857 mE R.L.: 55m DATUM: AUCKHT1946	DRILL TYPE: 50mm Auger METHOD: Hand auger with dynamic cone	HOLE STARTED: 03/05/2022 HOLE FINISHED: 03/05/2022 DRILLED BY: T+T LOGGED BY: CATA CHECKED: ROM



0.00-4.00m

TTNZ_20210729 - HandAugerLog - 30/05/2022 5:13:43 pm - Produced with Core-GS by GeRoc

Tonkin+Taylor

HAND AUGER LOG

HOLE Id: **HA06**

Hole Location: 1350 Dairy Flat Highway

SHEET: 1 OF 1

PROJECT: Dairy Flat Highway Geotech | LOCATION: Dairy Flat Highway | JOB No.: 1016502.1000

CO-ORDINATES: 5941998 mN, 1746939 mE (NZTM2000)
R.L.: 55m
DATUM: AUCKHT1946

DRILL TYPE: HA 50 mm & DCP
METHOD: Hand auger with dynamic cone

HOLE STARTED: 02/05/2022
HOLE FINISHED: 02/05/2022
DRILLED BY: T+T
LOGGED BY: KENL CHECKED: ROM

GEOLOGICAL	METHOD OBSERVATIONS								ENGINEERING DESCRIPTION					
STRATIGRAPHY / ENG GEOLOGICAL UNIT / ADDITIONAL OBSERVATIONS	WATER	CORE RECOVERY (%)	METHOD	SCALA PENETROMETER (Blows/100mm) 0 1 2 3 4 5 6 7 8 9	TESTS	SAMPLES	RL (m) / DEPTH (m)	GRAPHIC LOG	WEATHERING CLASSIFICATION	MOISTURE CLASSIFICATION	CONSISTENCY / DENSITY CLASSIFICATION	ESTIMATED SOIL SHEAR STRENGTH (Su, kPa) VS 12 25 50 100 200 H	DESCRIPTION
Topsoil								TS		M	St		*0.00m:* Clayey SILT, minor rootlets; dark brown. Stiff, moist, medium plasticity.
	03/05/2022				77/35 kPa		54				F-St		*0.30m:* Silty CLAY; light greyish brown. Firm to stiff, moist, high plasticity.
					64/35 kPa								
					32/16 kPa		1						*1.00m:* Silty CLAY; brown. Firm to stiff, moist, medium to high plasticity.
					38/19 kPa		53						
					80/32 kPa								
					32/16 kPa						S-F		*1.60m:* Clayey SILT; brown. Soft to firm, moist, medium to high plasticity.
Tauranga Group					19/16 kPa		2						
		100	HA50	2 2	24/24 kPa								
				4			52						*2.40m:* Scala penetrometer testing.
				5 5									
				7									
				5 5			3						
		0	DCP	6									
				9 9 9			51						
				8 9									
													3.7m: Effective refusal
							4						
							50						
							5						
							49						
							6						
							48						

0.0-2.4m

COMMENTS: HA termination due to washout

Hole Depth 3.7m

Scale 1:35

Rev.: A

TTNZ_20210729 - HandAugerLog - 30/05/2022 5:13:51 pm - Produced with Core-GS by GeRoc

HAND AUGER PHOTOS

BOREHOLE No.: **HA06**

Hole Location: 1350 Dairy Flat Highway

SHEET: 1 OF 1

PROJECT: Dairy Flat Highway Geotech		LOCATION: Dairy Flat Highway	JOB No.: 1016502.1000
CO-ORDINATES: (NZTM2000)	5941998 mN 1746939 mE	DRILL TYPE: HA 50 mm & DCP METHOD: Hand auger with dynamic cone	HOLE STARTED: 02/05/2022 HOLE FINISHED: 02/05/2022 DRILLED BY: T+T
R.L.:	55m		LOGGED BY: KENL CHECKED: ROM
DATUM:	AUCKHT1946		



0.00-2.40m

TTNZ_20210729 - HandAugerLog - 30/05/2022 5:13:51 pm - Produced with Core-GS by GeRoc

HAND AUGER LOG

HOLE Id: **HA07**

Hole Location: 1350 Dairy Flat Highway

SHEET: 1 OF 1

PROJECT: Dairy Flat Highway Geotech	LOCATION: Dairy Flat Highway	JOB No.: 1016502.1000
CO-ORDINATES: 5942260 mN (NZTM2000) 1746807 mE	DRILL TYPE: HA 50 mm & DCP	HOLE STARTED: 03/05/2022
	METHOD: Hand auger with dynamic cone	HOLE FINISHED: 03/05/2022
R.L.: 52m		DRILLED BY: T+T
DATUM: AUCKHT1946		LOGGED BY: KENL CHECKED: ROM

GEOLOGICAL	METHOD OBSERVATIONS								ENGINEERING DESCRIPTION					
STRATIGRAPHY / ENG GEOLOGICAL UNIT / ADDITIONAL OBSERVATIONS	WATER	CORE RECOVERY (%)	METHOD	SCALA PENETROMETER (Blows/50mm) 0 2 4 6 8 10 12 14 16 18	TESTS	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	WEATHERING CLASSIFICATION	MOISTURE CLASSIFICATION	CONSISTENCY / DENSITY CLASSIFICATION	ESTIMATED SOIL SHEAR STRENGTH (Su, kPa) VS 12 25 50 100 200 H	DESCRIPTION
Tauranga Group	03/05/2022	100	HA50		82/16 kPa 96/40 kPa 56/13 kPa 30/16 kPa 54/19 kPa 71/33 kPa		51 50	1 2			M W S	F St F-St		*0.00m:* SILT, minor sand; dark brown. Firm, moist, medium plasticity *0.30m:* Silty CLAY, minor organic flecks; light brown. Stiff, moist, medium to high plasticity. *0.70m:* Clayey SILT, trace sand; dark brown. Firm to stiff, moist, medium plasticity. *0.90m:* Silty CLAY, some organic flecks; brown. Firm to stiff, wet, high plasticity. Organics, decomposed. *1.50m:* Clayey SILT, some organic flecks; brown. Firm to stiff, saturated, medium to high plasticity. Organics, decomposed. 0.0-1.9m
		0	DCP				49 48	3 4						*1.90m:* Scala penetrometer testing. 4m: END OF HANDAUGER. Target depth reached.
							47 46 45	5 6						

COMMENTS: HA termination due to washout

Hole Depth 4m

Scale 1:35

Rev.: A

TTNZ_20210729 - HandAugerLog - 30/05/2022 5:13:58 pm - Produced with Core-GS by GeRoc

HAND AUGER PHOTOS

BOREHOLE No.: **HA07**

Hole Location: 1350 Dairy Flat Highway

SHEET: 1 OF 1

PROJECT: Dairy Flat Highway Geotech		LOCATION: Dairy Flat Highway	JOB No.: 1016502.1000
CO-ORDINATES: (NZTM2000)	5942260 mN 1746807 mE	DRILL TYPE: HA 50 mm & DCP METHOD: Hand auger with dynamic cone	HOLE STARTED: 03/05/2022 HOLE FINISHED: 03/05/2022 DRILLED BY: T+T
R.L.:	52m		
DATUM:	AUCKHT1946		LOGGED BY: KENL CHECKED: ROM



0.00-1.90m

TTNZ_20210729 - HandAugerLog - 30/05/2022 5:13:58 pm - Produced with Core-GS by GeRoc

HAND AUGER LOG

HOLE Id: **HA08**

Hole Location: 1350 Dairy Flat Highway

SHEET: 1 OF 2

PROJECT: Dairy Flat Highway Geotech	LOCATION: Dairy Flat Highway	JOB No.: 1016502.1000
CO-ORDINATES: 5942005 mN (NZTM2000) 1746733 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 09/05/2022
	METHOD: Hand auger with dynamic cone	HOLE FINISHED: 09/05/2022
R.L.: 57m		DRILLED BY: T+T
DATUM: AUCKHT1946		LOGGED BY: SCZH CHECKED: ROM

GEOLOGICAL	METHOD OBSERVATIONS								ENGINEERING DESCRIPTION					
STRATIGRAPHY / ENG GEOLOGICAL UNIT / ADDITIONAL OBSERVATIONS	WATER	CORE RECOVERY (%)	METHOD	SCALA PENETROMETER (Blows/50mm) 0 2 4 6 8 10 12 14 16 18	TESTS	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	WEATHERING CLASSIFICATION	MOISTURE CLASSIFICATION	CONSISTENCY / DENSITY CLASSIFICATION	ESTIMATED SOIL SHEAR STRENGTH (Su, kPa) VS 12 25 50 100 200 VSt H	DESCRIPTION
Topsoil									TS		M	VSt		*0.00m:* Clayey SILT; dark brown motted orange. Very stiff, moist, medium plasticity. Trace of rootlets.
														0.20m: Silty CLAY; light grey motted orange. Very stiff, moist, high plasticity. Trace of rootlets.
					203/64 kPa									
					177/119 kPa									
					196/80 kPa									
Tauranga Group		100	HA		164/64 kPa									*1.80m:* Silty CLAY; grey. Very stiff, moist, high plasticity.
					64/51 kPa									*2.00m:* Trace wood fragments
					83/35 kPa									*2.30m:* Dark grey; trace rootlets
					80/35 kPa							St		*2.50m:* Stiff
	DRY 09/05/2022				64/29 kPa									*3.50m:* Clayey SILT; light grey. Stiff, moist, medium plasticity.
		100	DCP											*4.00m:* Scala penetrometer testing.
6.0-8.0m: Scala values not recorded - Testing from 8mbgl completed 10/05/2022				0										

0.0-4.0m

COMMENTS:

Hole Depth 8.75m

Scale 1:35

Rev.: A

TTNZ_20210729 - HandAugerLog - 30/05/2022 5:14:05 pm - Produced with Core-GS by GeRoc

HAND AUGER LOG

HOLE Id: **HA08**

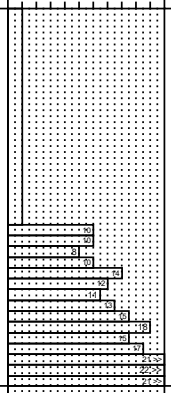
Hole Location: 1350 Dairy Flat Highway

PROJECT: Dairy Flat Highway Geotech	LOCATION: Dairy Flat Highway	JOB No.: 1016502.1000
CO-ORDINATES: 5942005 mN (NZTM2000) 1746733 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 09/05/2022
	METHOD: Hand auger with dynamic cone	HOLE FINISHED: 09/05/2022
R.L.: 57m		DRILLED BY: T+T
DATUM: AUCKHT1946		LOGGED BY: SCZH CHECKED: ROM

GEOLOGICAL | METHOD OBSERVATIONS | ENGINEERING DESCRIPTION

STRATIGRAPHY / ENG GEOLOGICAL UNIT / ADDITIONAL OBSERVATIONS

WATER | CORE RECOVERY (%) | METHOD | SCALA PENETROMETER (Blows/50mm) 0 2 4 6 8 10 12 14 16 18 | TESTS | SAMPLES | RL (m) | DEPTH (m) | GRAPHIC LOG | WEATHERING CLASSIFICATION | MOISTURE CLASSIFICATION | CONSISTENCY / DENSITY CLASSIFICATION | ESTIMATED SOIL SHEAR STRENGTH (Su, kPa) VS 12 25 50 100 200 H | DESCRIPTION



[CONT] *4.00m:* Scala penetrometer testing.

8.75m: Effective refusal

COMMENTS:

Hole Depth 8.75m

Scale 1:35

Rev.: A

TTNZ_20210729 - HandAugerLog - 30/05/2022 5:14:05 pm - Produced with Core-GS by GeRoc

HAND AUGER PHOTOS

BOREHOLE No.: **HA08**

Hole Location: 1350 Dairy Flat Highway

SHEET: 1 OF 1

PROJECT: Dairy Flat Highway Geotech		LOCATION: Dairy Flat Highway	JOB No.: 1016502.1000
CO-ORDINATES: (NZTM2000)	5942005 mN 1746733 mE	DRILL TYPE: 50mm Auger METHOD: Hand auger with dynamic cone	HOLE STARTED: 09/05/2022 HOLE FINISHED: 09/05/2022 DRILLED BY: T+T
R.L.:	57m		
DATUM:	AUCKHT1946		LOGGED BY: SCZH CHECKED: ROM



0.00-4.00m

TTNZ_20210729 - HandAugerLog - 30/05/2022 5:14:05 pm - Produced with Core-GS by GeRoc

HAND AUGER LOG

HOLE Id: **HA09**

Hole Location: 1350 Dairy Flat Highway

SHEET: 1 OF 1

PROJECT: Dairy Flat Highway Geotech		LOCATION: Dairy Flat Highway	JOB No.: 1016502.1000
CO-ORDINATES: (NZTM2000)	5941829 mN 1746981 mE	DRILL TYPE: HA 50 mm & DCP	HOLE STARTED: 03/05/2022
		METHOD: Hand auger with dynamic cone	HOLE FINISHED: 03/05/2022
R.L.:	54m		DRILLED BY: T+T
DATUM:	AUCKHT1946		LOGGED BY: KENL CHECKED: ROM

GEOLOGICAL	METHOD OBSERVATIONS								ENGINEERING DESCRIPTION					
STRATIGRAPHY / ENG GEOLOGICAL UNIT / ADDITIONAL OBSERVATIONS	WATER	CORE RECOVERY (%)	METHOD	SCALA PENETROMETER (Blows/50mm) 0 2 4 6 8 10 12 14 16 18	TESTS	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	WEATHERING CLASSIFICATION	MOISTURE CLASSIFICATION	CONSISTENCY / DENSITY CLASSIFICATION	ESTIMATED SOIL SHEAR STRENGTH (Su, kPa) VS 12 25 50 100 200 H	DESCRIPTION
Topsoil									TS		D	S-F		*0.00m:* SILT, minor rootlets, trace clay; brown brown. Soft to firm, dry, non-plastic to low plasticity. (TOPSOIL).
					98/32 kPa		54				M	F		*0.20m:* SILT, minor clay, trace sand; dark brown. Firm, moist, medium plasticity.
					51/30 kPa									
					30/16 kPa			1				S		*0.60m:* Clayey SILT, minor organic flecks; pinkish brown. Soft, moist, medium plasticity.
					46/19 kPa		53							
					61/42 kPa							St-VSt		*1.30m:* Silty CLAY; greyish brown. Stiff to very stiff, moist, high plasticity.
Tauranga Group		100	HA50		113/71 kPa			2						
					61/35 kPa		52							
					83/51 kPa									
					40/40 kPa						W	F-St		*2.70m:* Clayey SILT, minor organic flecks; greyish brown. Firm to stiff, wet, medium to high plasticity.
					98/56 kPa			3						
					83/45 kPa		51							
					63/63 kPa									
	DRY 03/05/2022				129/109 kPa			4						0.0-4.0m
		0	DCP				50							*4.00m:* Scala penetrometer testing.
								5						
							49							
								6						5.9m: END OF HANDAUGER. Target depth reached.
							48							

COMMENTS: Termination at target depth.

Hole Depth 5.9m

Scale 1:35

Rev.: A

TTNZ_20210729 - HandAugerLog - 30/05/2022 5:14:13 pm - Produced with Core-GS by GeRoc

HAND AUGER PHOTOS

BOREHOLE No.: **HA09**

Hole Location: 1350 Dairy Flat Highway

SHEET: 1 OF 1

PROJECT: Dairy Flat Highway Geotech		LOCATION: Dairy Flat Highway	JOB No.: 1016502.1000
CO-ORDINATES: (NZTM2000)	5941829 mN 1746981 mE	DRILL TYPE: HA 50 mm & DCP METHOD: Hand auger with dynamic cone	HOLE STARTED: 03/05/2022 HOLE FINISHED: 03/05/2022 DRILLED BY: T+T
R.L.:	54m		LOGGED BY: KENL CHECKED: ROM
DATUM:	AUCKHT1946		



0.00-4.00m

TTNZ_20210729 - HandAugerLog - 30/05/2022 5:14:13 pm - Produced with Core-GS by GeRoc

HAND AUGER LOG

HOLE Id: **HA10**

Hole Location: 1350 Dairy Flat Highway

SHEET: 1 OF 1

PROJECT: Dairy Flat Highway Geotech	LOCATION: Dairy Flat Highway	JOB No.: 1016502.1000
CO-ORDINATES: 5942113 mN (NZTM2000) 1747128 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 06/05/2022
	METHOD: Hand auger with dynamic cone	HOLE FINISHED: 06/05/2022
R.L.: 53m		DRILLED BY: T+T
DATUM: AUCKHT1946		LOGGED BY: CATA CHECKED: ROM

GEOLOGICAL	METHOD OBSERVATIONS								ENGINEERING DESCRIPTION					
STRATIGRAPHY / ENG GEOLOGICAL UNIT / ADDITIONAL OBSERVATIONS	WATER	CORE RECOVERY (%)	METHOD	SCALA PENETROMETER (Blows/50mm) 0 2 4 6 8 10 12 14 16 18	TESTS	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	WEATHERING CLASSIFICATION	MOISTURE CLASSIFICATION	CONSISTENCY / DENSITY CLASSIFICATION	ESTIMATED SOIL SHEAR STRENGTH (Su, kPa) VS 12 25 50 100 200 VSt H	DESCRIPTION
Topsoil									TS		M	VSt		*0.00m:* SILT; greyish brown. Very stiff, moist, medium plasticity. (TOPSOIL).
														0.20m: SILT; greyish brown. Very stiff, moist, medium plasticity.
														0.40m: Silty CLAY; brown. Very stiff, moist, medium to high plasticity.
	06/05/2022				150/24 kPa									
					122/15 kPa		53	1						
					64/28 kPa		52					St		*1.20m:* Clayey SILT; yellowish brown. Stiff, moist, medium to high plasticity.
Tauranga Group		100	HA		73/37 kPa			2		CW				*2.00m:* Clayey SILT; dark grey. Stiff, moist, medium to high plasticity.
					82/43 kPa		51							
					134/67 kPa			3						*3.00m:* Very stiff
					171/110 kPa		50					VSt		*3.20m:* Silty CLAY; grey. Very stiff, moist, high plasticity.
					156/119 kPa			4						0.0-4.0m
		0	DCP				49							*4.00m:* Scala penetrometer testing
							48	5						
								6						
							47							6m: END OF HANDAUGER. Target depth reached.

COMMENTS:

Hole Depth 6m

Scale 1:35

Rev.: A

TTNZ_20210729 - HandAugerLog - 30/05/2022 5:14:20 pm - Produced with Core-GS by GeRoc

HAND AUGER PHOTOS

BOREHOLE No.: **HA10**

Hole Location: 1350 Dairy Flat Highway

SHEET: 1 OF 1

PROJECT: Dairy Flat Highway Geotech		LOCATION: Dairy Flat Highway	JOB No.: 1016502.1000
CO-ORDINATES: (NZTM2000)	5942113 mN 1747128 mE	DRILL TYPE: 50mm Auger METHOD: Hand auger with dynamic cone	HOLE STARTED: 06/05/2022 HOLE FINISHED: 06/05/2022
R.L.:	53m		DRILLED BY: T+T
DATUM:	AUCKHT1946		LOGGED BY: CATA CHECKED: ROM



0.00-4.00m

TTNZ_20210729 - HandAugerLog - 30/05/2022 5:14:20 pm - Produced with Core-GS by GeRoc

HAND AUGER LOG

HOLE Id: **HA11P**

Hole Location: 1350 Dairy Flat Highway

SHEET: 1 OF 1

PROJECT: Dairy Flat Highway Geotech	LOCATION: Dairy Flat Highway	JOB No.: 1016502.1000
CO-ORDINATES: 5941928 mN (NZTM2000) 1747132 mE	DRILL TYPE: 75mm Auger	HOLE STARTED: 04/05/2022
	METHOD: Hand auger with dynamic cone	HOLE FINISHED: 04/05/2022
R.L.: 54m		DRILLED BY: T+T
DATUM: AUCKHT1946		LOGGED BY: SCZH CHECKED: ROM

GEOLOGICAL	METHOD OBSERVATIONS								ENGINEERING DESCRIPTION					
STRATIGRAPHY / ENG GEOLOGICAL UNIT / ADDITIONAL OBSERVATIONS	WATER	CORE RECOVERY (%)	METHOD	SCALA PENETROMETER (Blows/50mm) 0 2 4 6 8 10 12 14 16 18	TESTS	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	WEATHERING CLASSIFICATION	MOISTURE CLASSIFICATION	CONSISTENCY / DENSITY CLASSIFICATION	ESTIMATED SOIL SHEAR STRENGTH (Su, kPa) VS 12 25 50 100 200 VSt H	DESCRIPTION
Topsoil							54		TS		D	VSt		*0.00m:* Clayey SILT; brown. Very stiff, dry, low plasticity
					146/51 kPa Insitu						S	F-St		*0.30m:* Clayey SILT, some organics; dark brown. Firm to stiff, saturated, medium to high plasticity. Organics, decomposed. Plastic when dried back from NMC.
					84/36 kPa Insitu			1						
					36/15 kPa Insitu		53							
					36/12 kPa Insitu							F		*1.20m:* Organic clayey SILT; dark brown. Firm, saturated, medium to high plasticity. Trace rootlets and wood fragments.
					33/12 kPa Insitu									
Tauranga Group		100	HA		42/9 kPa Insitu			2						
					18/9 kPa Insitu		52							
					>212 kPa Insitu									*2.40m:* ClayeyPEAT; black. Firm, saturated, high plasticity. Organics, timber fragments (partially decomposed). Non-plastic upon initial remoulding. Highly plastic when dried back from NMC.
					78/36 kPa Insitu			3						
					66/30 kPa Insitu		51				M			*3.00m:* Silty CLAY; light grey. Firm, moist, high plasticity.
	04/05/2022				78/36 kPa Insitu									
					48/21 kPa Insitu			4						
					63/36 kPa Insitu		50							
		100	DCP					5						*4.00m:* Scala penetrometer testing.
							49							
								6						6m: Target depth
							48							

0.0-4.0m

COMMENTS: Piezo installed between 0.2 - 4.0 m bgl; sand 0.2 - 4.0 m bgl; bentonite 0 - 0.2 m bgl; flush toby box

Hole Depth 6m

Scale 1:35

Rev.: A

TTNZ_20210729 - HandAugerLog - 30/05/2022 5:19:53 pm - Produced with Core-GS by GeRoc

HAND AUGER PHOTOS

BOREHOLE No.: **HA11P**

Hole Location: 1350 Dairy Flat Highway

SHEET: 1 OF 1

PROJECT: Dairy Flat Highway Geotech		LOCATION: Dairy Flat Highway	JOB No.: 1016502.1000
CO-ORDINATES: (NZTM2000)	5941928 mN 1747132 mE	DRILL TYPE: 75mm Auger METHOD: Hand auger with dynamic cone	HOLE STARTED: 04/05/2022 HOLE FINISHED: 04/05/2022 DRILLED BY: T+T
R.L.:	54m		
DATUM:	AUCKHT1946		LOGGED BY: SCZH CHECKED: ROM



0.00-4.00m

TTNZ_20210729 - HandAugerLog - 30/05/2022 5:19:53 pm - Produced with Core-GS by GeRoc

HAND AUGER LOG

HOLE Id: **HA12**

Hole Location: 1350 Dairy Flat Highway

SHEET: 1 OF 1

PROJECT: Dairy Flat Highway Geotech	LOCATION: Dairy Flat Highway	JOB No.: 1016502.1000
CO-ORDINATES: 5941925 mN (NZTM2000) 1747372 mE	DRILL TYPE: 50mm Hand Auger	HOLE STARTED: 02/05/2022
	METHOD: Hand auger with dynamic cone	HOLE FINISHED: 02/05/2022
R.L.: 54m		DRILLED BY: T+T
DATUM: AUCKHT1946		LOGGED BY: CATA CHECKED: ROM

GEOLOGICAL	METHOD OBSERVATIONS								ENGINEERING DESCRIPTION					
STRATIGRAPHY / ENG GEOLOGICAL UNIT / ADDITIONAL OBSERVATIONS	WATER	CORE RECOVERY (%)	METHOD	SCALA PENETROMETER (Blows/50mm) 0 2 4 6 8 10 12 14 16 18	TESTS	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	WEATHERING CLASSIFICATION	MOISTURE CLASSIFICATION	CONSISTENCY / DENSITY CLASSIFICATION	ESTIMATED SOIL SHEAR STRENGTH (Su, kPa) VS 12 25 50 100 200 VSt H	DESCRIPTION
Topsoil									TS		M	VSt		*0.00m:* SILT; grey mottled brown. Very stiff, moist, non-plastic. (TOPSOIL).
					174/28 kPa Insitu									*0.20m:* Clayey SILT; grey . Very stiff, moist, medium plasticity.
	02/05/2022				>214 kPa Insitu									
					199/31 kPa Insitu							St-VSt		*0.80m:* Silty CLAY, some organics; dark brown. Stiff to very stiff, moist, medium to high plasticity.
1.5-4.0m: SATURATED SOIL, NO RECOVERY FROM AUGER - UNKNOWN DEPTH OF PEAT. AFTER WHICH SUSPECTED SILTY CLAY GREY HIGHLY PLASTIC					70/24 kPa Insitu									
					46/15 kPa Insitu							F-St		*1.30m:* PEAT; reddish brown and speckled black. Firm to stiff, moist, non-plastic. Spongey ; organics, wood fragments (partially decomposed).
		38	HA50											*1.50m:* NO RECOVERY. SATURATED SOIL NEAR LIQUID LIMIT (?). UNKNOWN DEPTH OF PEAT. Suspected Silty CLAY; grey, Soft, saturated, Medium to High plasticity.
Tauranga Group					40/12 kPa Insitu									
					24/12 kPa Insitu									
					38/15 kPa Insitu									
		0	DCP											*4.00m:* Scala penetrometer testing.
														6m: END OF HANDAUGER. Target depth reached.

0.0-1.5m

COMMENTS: No recovery from 1.5 mbgl due to washout.

Hole Depth 6m

Scale 1:35

Rev.: A

TTNZ_20210729 - HandAugerLog - 30/05/2022 5:20:01 pm - Produced with Core-GS by GeRoc

HAND AUGER PHOTOS

BOREHOLE No.: **HA12**

Hole Location: 1350 Dairy Flat Highway

SHEET: 1 OF 1

PROJECT: Dairy Flat Highway Geotech		LOCATION: Dairy Flat Highway	JOB No.: 1016502.1000
CO-ORDINATES: (NZTM2000)	5941925 mN 1747372 mE	DRILL TYPE: 50mm Hand Auger METHOD: Hand auger with dynamic cone	HOLE STARTED: 02/05/2022 HOLE FINISHED: 02/05/2022 DRILLED BY: T+T
R.L.:	54m		LOGGED BY: CATA CHECKED: ROM
DATUM:	AUCKHT1946		



0.00-1.50m

HAND AUGER LOG

HOLE Id: **HA13**

Hole Location: 1350 Dairy Flat Highway

SHEET: 1 OF 1

PROJECT: Dairy Flat Highway Geotech	LOCATION: Dairy Flat Highway	JOB No.: 1016502.1000
CO-ORDINATES: 5941778 mN (NZTM2000) 1747290 mE	DRILL TYPE: HA 50 mm & DCP	HOLE STARTED: 02/05/2022
	METHOD: Hand auger with dynamic cone	HOLE FINISHED: 03/05/2022
R.L.: 54m		DRILLED BY: T+T
DATUM: AUCKHT1946		LOGGED BY: KENL CHECKED: ROM

GEOLOGICAL	METHOD OBSERVATIONS								ENGINEERING DESCRIPTION					
STRATIGRAPHY / ENG GEOLOGICAL UNIT / ADDITIONAL OBSERVATIONS	WATER	CORE RECOVERY (%)	METHOD	SCALA PENETROMETER (Blows/50mm) 0 2 4 6 8 10 12 14 16 18	TESTS	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	WEATHERING CLASSIFICATION	MOISTURE CLASSIFICATION	CONSISTENCY / DENSITY CLASSIFICATION	ESTIMATED SOIL SHEAR STRENGTH (Su, kPa) VS 12 25 50 100 200 H	DESCRIPTION
Topsoil											D	F-St		*0.00m:* Clayey SILT, minor rootlets, trace sand; brown. Firm to stiff, dry, low plasticity. (TOPSOIL).
					64/25 kPa		54							*0.10m:* Clayey SILT, trace sand; brown banded grey. Firm to stiff, dry, medium to high plasticity.
					196/38 kPa									*0.60m:* Sandy SILT, some clay; greyish brown mixed orange. Firm to stiff, dry, low plasticity. Sand, fine to medium, quartz.
					45/29 kPa			1			M			*1.00m:* Clayey SILT; greyish brown. Firm to stiff, moist, medium to high plasticity.
					32/24 kPa		53							
					64/32 kPa									
					30/22 kPa						W	S		*1.70m:* SiltyPEAT (AMORPHOUS), minor clay; dark dark brown. Soft, wet, medium plasticity.
Tauranga Group		100	HA50		133/48 kPa			2				St		*2.10m:* Peaty CLAY; greyish brown. Stiff, wet, medium to high plasticity, quick. Organics, rootlets (decomposed) and timber fragments (decomposed).
					53/35 kPa		52				S	S-F		*2.30m:* SiltyPEAT (AMORPHOUS); dark brown. Soft to firm, saturated, non-plastic. Organics, wood fragments (decomposed).
					64/38 kPa									
	02/05/2022				48/35 kPa			3						
					96/80 kPa		51				W	St-VSt		*3.10m:* Clayey SILT; greenish grey. Stiff to very stiff, wet, high plasticity.
					109/93 kPa									
					145/113 kPa			4						0.0-4.0m
		0	DCP				50							*4.00m:* Scala penetrometer testing.
								5						
							49							5.05m: END OF HANDAUGER. Target depth reached
								6						
							48							

COMMENTS: Termination at target depth.

Hole Depth 5.05m

Scale 1:35

Rev.: A

TTNZ_20210729 - HandAugerLog - 30/05/2022 5:20:08 pm - Produced with Core-GS by GeRoc

HAND AUGER PHOTOS

BOREHOLE No.: **HA13**

Hole Location: 1350 Dairy Flat Highway

SHEET: 1 OF 1

PROJECT: Dairy Flat Highway Geotech	LOCATION: Dairy Flat Highway	JOB No.: 1016502.1000
CO-ORDINATES: 5941778 mN (NZTM2000) 1747290 mE R.L.: 54m DATUM: AUCKHT1946	DRILL TYPE: HA 50 mm & DCP METHOD: Hand auger with dynamic cone	HOLE STARTED: 02/05/2022 HOLE FINISHED: 03/05/2022 DRILLED BY: T+T LOGGED BY: KENL CHECKED: ROM



0.00-4.00m

TTNZ_20210729 - HandAugerLog - 30/05/2022 5:20:08 pm - Produced with Core-GS by GeRoc

HAND AUGER LOG

HOLE Id: **HA14**

Hole Location: 1350 Dairy Flat Highway

SHEET: 1 OF 1

PROJECT: Dairy Flat Highway Geotech	LOCATION: Dairy Flat Highway	JOB No.: 1016502.1000
CO-ORDINATES: 5941828 mN (NZTM2000) 1747521 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 09/05/2022
	METHOD: Hand auger with dynamic cone	HOLE FINISHED: 09/05/2022
R.L.: 59m		DRILLED BY: T+T
DATUM: AUCKHT1946		LOGGED BY: SCZH CHECKED: ROM

GEOLOGICAL	METHOD OBSERVATIONS								ENGINEERING DESCRIPTION					
STRATIGRAPHY / ENG GEOLOGICAL UNIT / ADDITIONAL OBSERVATIONS	WATER	CORE RECOVERY (%)	METHOD	SCALA PENETROMETER (Blows/50mm) 0 2 4 6 8 10 12 14 16 18	TESTS	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	WEATHERING CLASSIFICATION	MOISTURE CLASSIFICATION	CONSISTENCY / DENSITY CLASSIFICATION	ESTIMATED SOIL SHEAR STRENGTH (Su, kPa) VS 12 25 50 100 200 H	DESCRIPTION
Fill	02/05/2022	100	HA		137/30 kPa		59	0			D	St-VSt		*0.00m:* Fine to medium SAND, minor gravel; white motted brown, yellow and brown. Stiff to very stiff, dry. Gravel, fine to medium. Trace of rootlets. (FILL)
					81/30 kPa									
					114/45 kPa									
Tauranga Group					114/21 kPa		58	1			M	F-St		*0.90m:* Clayey SILT, minor sand; brown motted yellow and white. Firm to stiff, moist, low plasticity. *1.10m:* dark brown
					84/39 kPa									
					81/15 kPa									
		100	DCP	10 14 23 57 69	UTP		57	2						*2.10m:* Scala penetrometer testing.
							56	3						2.35m: Refusal
							55	4						
							54	5						
							53	6						

0.0-2.1m

COMMENTS: Refusal at 2.1m bgl(limestone)

Hole Depth 2.35m

Scale 1:35

Rev.: A

TTNZ_20210729 - HandAugerLog - 30/05/2022 5:20:15 pm - Produced with Core-GS by GeRoc

HAND AUGER PHOTOS

BOREHOLE No.: **HA14**

Hole Location: 1350 Dairy Flat Highway

SHEET: 1 OF 1

PROJECT: Dairy Flat Highway Geotech	LOCATION: Dairy Flat Highway	JOB No.: 1016502.1000
CO-ORDINATES: 5941828 mN (NZTM2000) 1747521 mE R.L.: 59m DATUM: AUCKHT1946	DRILL TYPE: 50mm Auger METHOD: Hand auger with dynamic cone	HOLE STARTED: 09/05/2022 HOLE FINISHED: 09/05/2022 DRILLED BY: T+T LOGGED BY: SCZH CHECKED: ROM



0.00-2.10m

TTNZ_20210729 - HandAugerLog - 30/05/2022 5:20:15 pm - Produced with Core-GS by GeRoc

Tonkin+Taylor

HAND AUGER LOG

HOLE Id: **HA15P**

Hole Location: 1350 Dairy Flat Highway

SHEET: 1 OF 1

PROJECT: Dairy Flat Highway Geotech	LOCATION: Dairy Flat Highway	JOB No.: 1016502.1000
CO-ORDINATES: 5941713 mN (NZTM2000) 1747566 mE	DRILL TYPE: HA 50 mm & DCP	HOLE STARTED: 03/05/2022
	METHOD: Hand auger with dynamic cone	HOLE FINISHED: 03/05/2022
R.L.: 63m		DRILLED BY: T+T
DATUM: AUCKHT1946		LOGGED BY: KENL CHECKED: ROM

GEOLOGICAL	METHOD OBSERVATIONS							ENGINEERING DESCRIPTION						
STRATIGRAPHY / ENG GEOLOGICAL UNIT / ADDITIONAL OBSERVATIONS	WATER	CORE RECOVERY (%)	METHOD	SCALA PENETROMETER (Blows/50mm) 0 2 4 6 8 10 12 14 16 18	TESTS	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	WEATHERING CLASSIFICATION	MOISTURE CLASSIFICATION	CONSISTENCY / DENSITY CLASSIFICATION	ESTIMATED SOIL SHEAR STRENGTH (Su, kPa) VS 12 25 50 100 200 H	DESCRIPTION
Topsoil	DRY; 03/05/2022	100	HA50		209/38 kPa		62	1	TS		M	F-St		*0.00m:* SILT, some clay, minor sand; brown. Firm to stiff, moist, low plasticity.
												VSt		*0.20m:* Silty CLAY, some sand; light brown mottled orange. Very stiff, moist, medium plasticity.
Tauranga Group					83/48 kPa							St		*0.35m:* Gravelly CLAY, some organic flecks; dark brown. Firm to stiff, moist, low to medium plasticity. Gravel, fine, black.
					>225 kPa							VSt		*0.40m:* Silty CLAY, some organic flecks, minor sand; light brown streaked orange. Stiff, moist, high plasticity.
					UTP									*0.80m:* Clayey SILT, minor organic flecks; brownish white. Very stiff, moist, non-plastic to low plasticity.
		0	DCP											*1.30m:* Scala penetrometer testing.
1.75m: DCP bouncing							61	2						1.75m: Scala bouncing
							60	3						
							59	4						
							58	5						
							57	6						
							56							

0.0-1.3m

COMMENTS: HA termination due to washout;Piezo installed between 0.2 - 0.8 m bgl; sand 0.2 - 1.3 m bgl; bentonite 0 - 0.2 m bgl; flush toby box

Hole Depth 1.75m

Scale 1:35

Rev.: A

TTNZ_20210729 - HandAugerLog - 30/05/2022 5:20:23 pm - Produced with Core-GS by GeRoc

HAND AUGER PHOTOS

BOREHOLE No.: **HA15P**

Hole Location: 1350 Dairy Flat Highway

SHEET: 1 OF 1

PROJECT: Dairy Flat Highway Geotech		LOCATION: Dairy Flat Highway	JOB No.: 1016502.1000
CO-ORDINATES: (NZTM2000)	5941713 mN 1747566 mE	DRILL TYPE: HA 50 mm & DCP METHOD: Hand auger with dynamic cone	HOLE STARTED: 03/05/2022 HOLE FINISHED: 03/05/2022 DRILLED BY: T+T
R.L.:	63m		
DATUM:	AUCKHT1946		LOGGED BY: KENL CHECKED: ROM



0.00-1.30m

TTNZ_20210729 - HandAugerLog - 30/05/2022 5:20:23 pm - Produced with Core-GS by GeRoc

HAND AUGER LOG

HOLE Id: **HA16**

Hole Location: 1350 Dairy Flat Highway

SHEET: 1 OF 1

PROJECT: Dairy Flat Highway Geotech	LOCATION: Dairy Flat Highway	JOB No.: 1016502.1000
CO-ORDINATES: 5942168 mN (NZTM2000) 1747325 mE	DRILL TYPE: 50mm auger	HOLE STARTED: 02/05/2022
	METHOD: Hand auger with dynamic cone	HOLE FINISHED: 02/05/2022
R.L.: 54m		DRILLED BY: T+T
DATUM: AUCKHT1946		LOGGED BY: CATA CHECKED: ROM

GEOLOGICAL	METHOD OBSERVATIONS								ENGINEERING DESCRIPTION					
STRATIGRAPHY / ENG GEOLOGICAL UNIT / ADDITIONAL OBSERVATIONS	WATER	CORE RECOVERY (%)	METHOD	SCALA PENETROMETER (Blows/50mm) 0 2 4 6 8 10 12 14 16 18	TESTS	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	WEATHERING CLASSIFICATION	MOISTURE CLASSIFICATION	CONSISTENCY / DENSITY CLASSIFICATION	ESTIMATED SOIL SHEAR STRENGTH (Su, kPa) VS 12 25 50 100 200 H	DESCRIPTION
Topsoil											M	St		*0.00m:* Clayey SILT, minor sand; dark grey. Stiff, moist, medium plasticity. Sand, fine. (TOPSOIL).
														0.10m: Clayey SILT, minor sand; dark grey. Stiff, moist, medium plasticity. Sand, fine.
					92/43 kPa Insitu									*0.40m:* Silty CLAY; light grey. Stiff, moist, high plasticity.
					98/49 kPa Insitu			1						*1.10m:* Organic SILT; dark brown. Stiff, moist, medium to high plasticity.
					89/43 kPa Insitu									*1.70m:* Organic silty CLAY; dark grey. Stiff, moist, high plasticity.
Tauranga Group	02/05/2022	100	HA		61/28 kPa Insitu			2						
					98/61 kPa Insitu						M-W	St-VSt		*2.30m:* Clayey SILT, some organics; dark grey. Stiff to very stiff, moist to wet, medium plasticity.
					180/107 kPa Insitu			3						
					199/122 kPa Insitu									
								4						*4.00m:* Scala penetrometer testing.
		0	DCP					5						
								6						6m: END OF HANDAUGER. Target depth reached.

0.0-4.0m

COMMENTS:

Hole Depth 6m

Scale 1:35

Rev.: A

TTNZ_20210729 - HandAugerLog - 30/05/2022 5:20:30 pm - Produced with Core-GS by GeRoc

HAND AUGER PHOTOS

BOREHOLE No.: **HA16**

Hole Location: 1350 Dairy Flat Highway

SHEET: 1 OF 1

PROJECT: Dairy Flat Highway Geotech	LOCATION: Dairy Flat Highway	JOB No.: 1016502.1000
CO-ORDINATES: 5942168 mN (NZTM2000) 1747325 mE R.L.: 54m DATUM: AUCKHT1946	DRILL TYPE: 50mm auger METHOD: Hand auger with dynamic cone	HOLE STARTED: 02/05/2022 HOLE FINISHED: 02/05/2022 DRILLED BY: T+T LOGGED BY: CATA CHECKED: ROM



0.00-4.00m

HAND AUGER LOG

HOLE Id: **HA17**

Hole Location: 1350 Dairy Flat Highway

SHEET: 1 OF 1

PROJECT: Dairy Flat Highway Geotech	LOCATION: Dairy Flat Highway	JOB No.: 1016502.1000
CO-ORDINATES: 5942250 mN (NZTM2000) 1747193 mE	DRILL TYPE: HA 50 mm & DCP	HOLE STARTED: 02/05/2022
	METHOD: Hand auger with dynamic cone	HOLE FINISHED: 02/05/2022
R.L.: 60m		DRILLED BY: T+T
DATUM: AUCKHT1946		LOGGED BY: KENL CHECKED: ROM

GEOLOGICAL	METHOD OBSERVATIONS							ENGINEERING DESCRIPTION						
STRATIGRAPHY / ENG GEOLOGICAL UNIT / ADDITIONAL OBSERVATIONS	WATER	CORE RECOVERY (%)	METHOD	SCALA PENETROMETER (Blows/50mm) 0 2 4 6 8 10 12 14 16 18	TESTS	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	WEATHERING CLASSIFICATION	MOISTURE CLASSIFICATION	CONSISTENCY / DENSITY CLASSIFICATION	ESTIMATED SOIL SHEAR STRENGTH (Su, kPa) VS 12 25 50 100 200 H	DESCRIPTION
Topsoil		100	HA50		161/38 kPa		59	1	TS		D-M	F		*0.00m:* SILT, some rootlets, minor clay, trace sand; dark dark brown. Firm, dry to moist, low plasticity. (TOPSOIL).
Tauranga Group					109/48 kPa							VSt		*0.30m:* Silty CLAY, minor organic flecks; orange brown. Very stiff, dry to moist, medium plasticity.
					>225 kPa									*0.60m:* SILT, some clay, minor organic flecks; light greyish brown. Very stiff, dry to moist, medium plasticity.
Mahurangi Limestone												H		*1.00m:* Sandy SILT, trace clay; light greyish brown. Hard, dry to moist, non-plastic. [Residual soil, yellowish grey, LIMESTONE. Extremely weak]..
	DRY 02/05/2022	0	DCP	3 5 10 14	UTP		58	2						*1.20m:* Scala penetrometer testing.
							57	3						1.55m: Effective refusal
							56	4						
							55	5						
							54	6						
							53							

0.0-1.2m

COMMENTS: HA termination due to washout

Hole Depth 1.55m

Scale 1:35

Rev.: A

TTNZ_20210729 - HandAugerLog - 30/05/2022 5:20:38 pm - Produced with Core-GS by GeRoc

HAND AUGER PHOTOS

BOREHOLE No.: **HA17**

Hole Location: 1350 Dairy Flat Highway

SHEET: 1 OF 1

PROJECT: Dairy Flat Highway Geotech		LOCATION: Dairy Flat Highway	JOB No.: 1016502.1000
CO-ORDINATES: (NZTM2000)	5942250 mN 1747193 mE	DRILL TYPE: HA 50 mm & DCP METHOD: Hand auger with dynamic cone	HOLE STARTED: 02/05/2022 HOLE FINISHED: 02/05/2022 DRILLED BY: T+T
R.L.:	60m		LOGGED BY: KENL CHECKED: ROM
DATUM:	AUCKHT1946		



0.00-1.20m

TTNZ_20210729 - HandAugerLog - 30/05/2022 5:20:38 pm - Produced with Core-GS by GeRoc

HAND AUGER LOG

HOLE Id: **HA18**

Hole Location: 1350 Dairy Flat Highway

SHEET: 1 OF 1

PROJECT: Dairy Flat Highway Geotech	LOCATION: Dairy Flat Highway	JOB No.: 1016502.1000
CO-ORDINATES: 5942356 mN (NZTM2000) 1747274 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 03/05/2022
	METHOD: Hand auger with dynamic cone	HOLE FINISHED: 03/05/2022
R.L.: 63m		DRILLED BY: T+T
DATUM: AUCKHT1946		LOGGED BY: CATA CHECKED: ROM

GEOLOGICAL	METHOD OBSERVATIONS								ENGINEERING DESCRIPTION					
STRATIGRAPHY / ENG GEOLOGICAL UNIT / ADDITIONAL OBSERVATIONS	WATER	CORE RECOVERY (%)	METHOD	SCALA PENETROMETER (Blows/50mm) 0 2 4 6 8 10 12 14 16 18	TESTS	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	WEATHERING CLASSIFICATION	MOISTURE CLASSIFICATION	CONSISTENCY / DENSITY CLASSIFICATION	ESTIMATED SOIL SHEAR STRENGTH (Su, kPa) VS 12 S 25 F 50 St 100 VSt 200 H	DESCRIPTION
Topsoil									TS		M	VSt		*0.00m:* Clayey SILT; greyish brown. Very stiff, moist, medium plasticity. (TOPSOIL).
Tauranga Group					177/18 kPa Insitu		63							*0.20m:* Peaty SILT; greyish black. Very stiff, moist, medium to high plasticity. Organics, organic flecks.
		100	HA		102/24 kPa Insitu							St-VSt		*0.50m:* Silty CLAY, trace organic flecks; brownish grey. Stiff to very stiff, moist, high plasticity.
Mahurangi Limestone	DRY 03/05/2022				>210 kPa Insitu		62	1				VSt-H		*0.80m:* Sandy SILT; yellowish grey. Very stiff to hard, moist. [Residual soil, yellowish grey, LIMESTONE. Extremely weak].
		0	DCP		UTP Insitu			2						*1.40m:* Scala penetrometer testing
							61	3						2m: Effective refusal
							60	4						
							59	5						
							58	6						
							57							

0.0-1.4m

COMMENTS: Refusal at 1.4m (limestone)

Hole Depth 2m

Scale 1:35

Rev.: A

TTNZ_20210729 - HandAugerLog - 30/05/2022 5:20:45 pm - Produced with Core-GS by GeRoc

HAND AUGER PHOTOS

BOREHOLE No.: **HA18**

Hole Location: 1350 Dairy Flat Highway

SHEET: 1 OF 1

PROJECT: Dairy Flat Highway Geotech	LOCATION: Dairy Flat Highway	JOB No.: 1016502.1000
CO-ORDINATES: 5942356 mN (NZTM2000) 1747274 mE R.L.: 63m DATUM: AUCKHT1946	DRILL TYPE: 50mm Auger METHOD: Hand auger with dynamic cone	HOLE STARTED: 03/05/2022 HOLE FINISHED: 03/05/2022 DRILLED BY: T+T LOGGED BY: CATA CHECKED: ROM



0.00-1.40m

TTNZ_20210729 - HandAugerLog - 30/05/2022 5:20:46 pm - Produced with Core-GS by GeRoc

HAND AUGER LOG

HOLE Id: **HA19**

Hole Location: 1350 Dairy Flat Highway

SHEET: 1 OF 1

PROJECT: Dairy Flat Highway Geotech	LOCATION: Dairy Flat Highway	JOB No.: 1016502.1000
CO-ORDINATES: 5942451 mN (NZTM2000) 1747408 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 02/05/2022
	METHOD: Hand auger with dynamic cone	HOLE FINISHED: 02/05/2022
R.L.: 62m		DRILLED BY: T+T
DATUM: AUCKHT1946		LOGGED BY: SCZH CHECKED: ROM

GEOLOGICAL	METHOD OBSERVATIONS							ENGINEERING DESCRIPTION					
STRATIGRAPHY / ENG GEOLOGICAL UNIT / ADDITIONAL OBSERVATIONS	WATER	CORE RECOVERY (%)	METHOD	SCALA PENETROMETER (Blows/50mm) 0 2 4 6 8 10 12 14 16 18	TESTS	SAMPLES	RL (m) / DEPTH (m)	GRAPHIC LOG	WEATHERING CLASSIFICATION	MOISTURE CLASSIFICATION	CONSISTENCY / DENSITY CLASSIFICATION	ESTIMATED SOIL SHEAR STRENGTH (Su, kPa) VS 12 25 50 100 200 VH	DESCRIPTION
Topsoil		100	HA		143/66 kPa		62	TS		M	VSt		*0.00m:* Clayey SILT; dark brown. Very stiff, moist, low plasticity. Trace of rootlets.
Tauranga Group					78/45 kPa						St-VSt		*0.30m:* Silty CLAY; light grey motted yellow. Stiff to very stiff, moist, high plasticity.
Mahurangi Limestone					81/33 kPa		61 1				St		*0.60m:* CLAY, minor silt; light grey. Stiff, moist, high plasticity. [Residual soil, yellowish grey, LIMESTONE. Extremely weak]..
		100	DCP		UTP								*1.20m:* Scala penetrometer testing.
							60 2						1.5m: Effective refusal
							59 3						
							58 4						
							57 5						
							56 6						

0.0-1.2m

COMMENTS: Refusal at 1.2m bgl(limestone)

Hole Depth 1.5m

Scale 1:35

Rev.: A

TTNZ_20210729 - HandAugerLog - 30/05/2022 5:20:52 pm - Produced with Core-GS by GeRoc

HAND AUGER PHOTOS

BOREHOLE No.: **HA19**

Hole Location: 1350 Dairy Flat Highway

SHEET: 1 OF 1

PROJECT: Dairy Flat Highway Geotech	LOCATION: Dairy Flat Highway	JOB No.: 1016502.1000
CO-ORDINATES: 5942451 mN (NZTM2000) 1747408 mE R.L.: 62m DATUM: AUCKHT1946	DRILL TYPE: 50mm Auger METHOD: Hand auger with dynamic cone	HOLE STARTED: 02/05/2022 HOLE FINISHED: 02/05/2022 DRILLED BY: T+T LOGGED BY: SCZH CHECKED: ROM



0.00-1.20m

TTNZ_20210729 - HandAugerLog - 30/05/2022 5:20:52 pm - Produced with Core-GS by GeRoc

HAND AUGER LOG

HOLE Id: **HA20P**

Hole Location: 1350 Dairy Flat Highway

SHEET: 1 OF 1

PROJECT: Dairy Flat Highway Geotech	LOCATION: Dairy Flat Highway	JOB No.: 1016502.1000
CO-ORDINATES: 5942542 mN (NZTM2000) 1747320 mE	DRILL TYPE: HA 50 mm & DCP	HOLE STARTED: 03/05/2022
	METHOD: Hand auger with dynamic cone	HOLE FINISHED: 03/05/2022
R.L.: 67m		DRILLED BY: T+T
DATUM: AUCKHT1946		LOGGED BY: KENL CHECKED: ROM

GEOLOGICAL	METHOD OBSERVATIONS							ENGINEERING DESCRIPTION					
STRATIGRAPHY / ENG GEOLOGICAL UNIT / ADDITIONAL OBSERVATIONS	DRY (03/05/2022)	CORE RECOVERY (%)	METHOD	SCALA PENETROMETER (Blows/50mm) 0 2 4 6 8 10 12 14 16 18	TESTS	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	WEATHERING CLASSIFICATION	MOISTURE CLASSIFICATION	CONSISTENCY / DENSITY CLASSIFICATION	ESTIMATED SOIL SHEAR STRENGTH (Su, kPa) VS 12 25 50 100 200 H	DESCRIPTION
Topsoil									TS		M	S-F		*0.00m:* Clayey SILT, minor rootlets; dark brown. Soft to firm, moist, low plasticity.
Tauranga Group		100	HA50		113/42 kPa		66					VSt		*0.20m:* Silty CLAY, minor organic flecks; greyish brown mottled orange. Very stiff, moist, high plasticity.
					145/51 kPa									*0.40m:* Silty CLAY, minor organic flecks; greyish brown. Very stiff, moist, high plasticity.
Mahurangi Limestone					UTP			1				H		*0.80m:* SILT, minor sand, trace clay; white. Hard, moist, medium plasticity. (Residual Soil).
		0	DCP		UTP									*1.10m:* Scala penetrometer testing.
							65	2						1.45m: Effective refusal
							64	3						
							63	4						
							62	5						
							61	6						
							60							

0.0-1.1m

COMMENTS: HA termination due to washout;Piezo installed between 0.2 - 0.7 m bgl; sand 0.2 - 1.2 m bgl; bentonite 0 - 0.2 m bgl; flush toby box

Hole Depth 1.45m

Scale 1:35

Rev.: A

TTNZ_20210729 - HandAugerLog - 30/05/2022 5:21:00 pm - Produced with Core-GS by GeRoc

HAND AUGER PHOTOS

BOREHOLE No.: **HA20P**

Hole Location: 1350 Dairy Flat Highway

SHEET: 1 OF 1

PROJECT: Dairy Flat Highway Geotech		LOCATION: Dairy Flat Highway	JOB No.: 1016502.1000
CO-ORDINATES: (NZTM2000)	5942542 mN 1747320 mE	DRILL TYPE: HA 50 mm & DCP METHOD: Hand auger with dynamic cone	HOLE STARTED: 03/05/2022 HOLE FINISHED: 03/05/2022 DRILLED BY: T+T
R.L.:	67m		
DATUM:	AUCKHT1946		LOGGED BY: KENL CHECKED: ROM



0.00-1.10m

TTNZ_20210729 - HandAugerLog - 30/05/2022 5:21:00 pm - Produced with Core-GS by GeRoc

HAND AUGER LOG

HOLE Id: **HA21**

Hole Location: 1350 Dairy Flat Highway

SHEET: 1 OF 1

PROJECT: Dairy Flat Highway Geotech	LOCATION: Dairy Flat Highway	JOB No.: 1016502.1000
CO-ORDINATES: 5942147 mN (NZTM2000) 1746998 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 09/05/2022
	METHOD: Hand auger with dynamic cone	HOLE FINISHED: 09/05/2022
R.L.: 55m		DRILLED BY: T+T
DATUM: AUCKHT1946		LOGGED BY: SCZH CHECKED: ROM

GEOLOGICAL	METHOD OBSERVATIONS								ENGINEERING DESCRIPTION					
STRATIGRAPHY / ENG GEOLOGICAL UNIT / ADDITIONAL OBSERVATIONS	WATER	CORE RECOVERY (%)	METHOD	SCALA PENETROMETER (Blows/50mm) 0 2 4 6 8 10 12 14 16 18	TESTS	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	WEATHERING CLASSIFICATION	MOISTURE CLASSIFICATION	CONSISTENCY / DENSITY CLASSIFICATION	ESTIMATED SOIL SHEAR STRENGTH (Su, kPa) VS 12 25 50 100 200 VSt H	DESCRIPTION
Topsoil									TS		M	VSt		*0.00m:* Clayey SILT; brown. Very stiff, moist, low plasticity. Trace of rootlets.
												St-VSt		*0.20m:* Clayey SILT, trace organics; light grey. Stiff to very stiff, moist, medium plasticity. Organics, rootlets.
					148/48 kPa		54	1						*0.90m:* dark grey
					100/29 kPa									
					116/35 kPa							VSt		*1.20m:* Silty CLAY; brownish grey. Very stiff, moist, high plasticity.
					67/29 kPa		53	2			W	St		*1.80m:* Organic clayey SILT; black. Stiff, wet, high plasticity. Trace decomposed wood fragments.
											M	F-St		*2.00m:* Silty CLAY; brownish grey. Firm to stiff, moist, high plasticity.
Tauranga Group	DRY 09/05/2022	100	HA		67/35 kPa									*2.60m:* light grey
					51/29 kPa		52	3						
					51/32 kPa									
					83/32 kPa		51	4						
					80/48 kPa									
					67/29 kPa		50	5						0.0-5.0m
		100	DCP				49	6						*5.00m:* Scala penetrometer testing.
							48							7m: Effective refusal

COMMENTS:

Hole Depth 7m

Scale 1:35

Rev.: A

TTNZ_20210729 - HandAugerLog - 30/05/2022 5:27:28 pm - Produced with Core-GS by GeRoc

HAND AUGER PHOTOS

BOREHOLE No.: **HA21**

Hole Location: 1350 Dairy Flat Highway

SHEET: 1 OF 1

PROJECT: Dairy Flat Highway Geotech	LOCATION: Dairy Flat Highway	JOB No.: 1016502.1000
CO-ORDINATES: 5942147 mN (NZTM2000) 1746998 mE R.L.: 55m DATUM: AUCKHT1946	DRILL TYPE: 50mm Auger METHOD: Hand auger with dynamic cone	HOLE STARTED: 09/05/2022 HOLE FINISHED: 09/05/2022 DRILLED BY: T+T LOGGED BY: SCZH CHECKED: ROM



0.00-5.00m

TTNZ_20210729 - HandAugerLog - 30/05/2022 5:27:28 pm - Produced with Core-GS by GeRoc

HAND AUGER LOG

HOLE Id: **HA22**

Hole Location: 1350 Dairy Flat Highway

SHEET: 1 OF 2

PROJECT: Dairy Flat Highway Geotech	LOCATION: Dairy Flat Highway	JOB No.: 1016502.1000
CO-ORDINATES: 5942119 mN (NZTM2000) 1746943 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 09/05/2022
	METHOD: Hand auger with dynamic cone	HOLE FINISHED: 09/05/2022
R.L.: 55m		DRILLED BY: T+T
DATUM: AUCKHT1946		LOGGED BY: CATA CHECKED: ROM

GEOLOGICAL	METHOD OBSERVATIONS								ENGINEERING DESCRIPTION					
STRATIGRAPHY / ENG GEOLOGICAL UNIT / ADDITIONAL OBSERVATIONS	WATER	CORE RECOVERY (%)	METHOD	SCALA PENETROMETER (Blows/50mm) 0 2 4 6 8 10 12 14 16 18	TESTS	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	WEATHERING CLASSIFICATION	MOISTURE CLASSIFICATION	CONSISTENCY / DENSITY CLASSIFICATION	ESTIMATED SOIL SHEAR STRENGTH (Su, kPa) VS 12 25 50 100 200 VSt H	DESCRIPTION
Topsoil									TS		M	VSt		*0.00m:* SILT, some clay; brown. Very stiff, moist, medium plasticity. (TOPSOIL).
					199/31 kPa Insitu									*0.30m:* Sandy SILT, minor clay; brownish grey. Very stiff, moist, low plasticity. Sand, fine.
					195/55 kPa Insitu		55	1						*0.80m:* Silty CLAY; streaked orange and grey . Very stiff, moist, high plasticity.
					168/79 kPa Insitu		54	2						
Tauranga Group		91	HA		140/67 kPa Insitu		53					St-VSt		*2.20m:* Clayey SILT, trace organic; brownish grey. Stiff to very stiff, moist, medium plasticity. Organics, carbonaceous flecks.
					95/46 kPa Insitu							St		*2.60m:* Organic SILT, some clay; black. Stiff, moist, medium plasticity. Organics, decomposed.
					89/49 kPa Insitu		52	3						*3.00m:* Silty CLAY; brownish grey. Stiff, moist, medium to high plasticity.
					82/43 kPa Insitu									
	DRY 09/05/2022				92/58 kPa Insitu		51	4						*4.00m:* Clayey SILT; light grey. Stiff, moist, medium to high plasticity.
							50	5						*4.40m:* Scala penetrometer testing.
							49	6						

0.0-4.4m

COMMENTS:

Hole Depth 9.6m

Scale 1:35

Rev.: A

TTNZ_20210729 - HandAugerLog - 30/05/2022 5:21:14 pm - Produced with Core-GS by GeRoc

HAND AUGER LOG

HOLE Id: **HA22**

Hole Location: 1350 Dairy Flat Highway

PROJECT: Dairy Flat Highway Geotech	LOCATION: Dairy Flat Highway	JOB No.: 1016502.1000
CO-ORDINATES: 5942119 mN (NZTM2000) 1746943 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 09/05/2022
	METHOD: Hand auger with dynamic cone	HOLE FINISHED: 09/05/2022
R.L.: 55m		DRILLED BY: T+T
DATUM: AUCKHT1946		LOGGED BY: CATA CHECKED: ROM

GEOLOGICAL	METHOD OBSERVATIONS							ENGINEERING DESCRIPTION					
STRATIGRAPHY / ENG GEOLOGICAL UNIT / ADDITIONAL OBSERVATIONS	WATER	CORE RECOVERY (%)	METHOD	SCALA PENETROMETER (Blows/50mm) 0 2 4 6 8 10 12 14 16 18	TESTS	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	WEATHERING CLASSIFICATION	MOISTURE CLASSIFICATION	CONSISTENCY / DENSITY CLASSIFICATION	ESTIMATED SOIL SHEAR STRENGTH (Su, kPa) VS 12 25 50 100 200 H	DESCRIPTION
		0	DCP				48	8						[CONT] *4.40m:* Scala penetrometer testing.
							47	9						
							46	10						9.6m: Effective refusal
							45	11						
							44	12						
							43	13						
							42							

COMMENTS:

Hole Depth 9.6m

HAND AUGER PHOTOS

BOREHOLE No.: **HA22**

Hole Location: 1350 Dairy Flat Highway

SHEET: 1 OF 1

PROJECT: Dairy Flat Highway Geotech		LOCATION: Dairy Flat Highway	JOB No.: 1016502.1000
CO-ORDINATES: (NZTM2000)	5942119 mN 1746943 mE	DRILL TYPE: 50mm Auger METHOD: Hand auger with dynamic cone	HOLE STARTED: 09/05/2022 HOLE FINISHED: 09/05/2022
R.L.:	55m		DRILLED BY: T+T
DATUM:	AUCKHT1946		LOGGED BY: CATA CHECKED: ROM



0.00-4.40m

TTNZ_20210729 - HandAugerLog - 30/05/2022 5:21:14 pm - Produced with Core-GS by GeRoc

HAND AUGER LOG

HOLE Id: **HA23**

Hole Location: 1350 Dairy Flat Highway

SHEET: 1 OF 1

PROJECT: Dairy Flat Highway Geotech	LOCATION: Dairy Flat Highway	JOB No.: 1016502.1000
CO-ORDINATES: 5942077 mN (NZTM2000) 1746903 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 09/05/2022
	METHOD: Hand auger with dynamic cone	HOLE FINISHED: 09/05/2022
R.L.: 55m		DRILLED BY: T+T
DATUM: AUCKHT1946		LOGGED BY: CATA CHECKED: ROM

GEOLOGICAL	METHOD OBSERVATIONS								ENGINEERING DESCRIPTION					
STRATIGRAPHY / ENG GEOLOGICAL UNIT / ADDITIONAL OBSERVATIONS	WATER	CORE RECOVERY (%)	METHOD	SCALA PENETROMETER (Blows/50mm) 0 2 4 6 8 10 12 14 16 18	TESTS	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	WEATHERING CLASSIFICATION	MOISTURE CLASSIFICATION	CONSISTENCY / DENSITY CLASSIFICATION	ESTIMATED SOIL SHEAR STRENGTH (Su, kPa) VS 12 25 50 100 200 VH	DESCRIPTION
Topsoil									TS		M	St		*0.00m:* SILT, some clay; dark brown. Stiff, moist, low to medium plasticity. (TOPSOIL).
														0.20m: SILT, some clay; dark brown mottled orange. Stiff, moist, low to medium plasticity.
												F-St		*0.40m:* Clayey SILT; brownish grey. Firm to stiff, moist, medium plasticity.
Tauranga Group	DRY 09/05/2022	80	HA		67/31 kPa Insitu 49/28 kPa Insitu 82/49 kPa Insitu 58/31 kPa Insitu 43/12 kPa Insitu 86/46 kPa Insitu 79/46 kPa Insitu 92/52 kPa Insitu >214 kPa Insitu >214 kPa Insitu		54 53 52 51 50 49	1 2 3 4 5 6				St-VSt		*1.80m:* Clayey SILT, minor organics; dark grey. Firm to stiff, moist, medium plasticity. Organics, carbonaceous material. *3.00m:* Silty CLAY; grey. Stiff to very stiff, moist, high plasticity. *4.50m:* Hard
		0	DCP				8							*5.00m:* Scala penetrometer testing. 7m: Effective refusal

0.0-5.0m

COMMENTS:

Hole Depth 7m

Scale 1:35

Rev.: A

TTNZ_20210729 - HandAugerLog - 30/05/2022 5:27:35 pm - Produced with Core-GS by GeRoc

HAND AUGER PHOTOS

BOREHOLE No.: **HA23**

Hole Location: 1350 Dairy Flat Highway

SHEET: 1 OF 1

PROJECT: Dairy Flat Highway Geotech		LOCATION: Dairy Flat Highway	JOB No.: 1016502.1000
CO-ORDINATES: (NZTM2000)	5942077 mN 1746903 mE	DRILL TYPE: 50mm Auger METHOD: Hand auger with dynamic cone	HOLE STARTED: 09/05/2022 HOLE FINISHED: 09/05/2022
R.L.:	55m		DRILLED BY: T+T
DATUM:	AUCKHT1946		LOGGED BY: CATA CHECKED: ROM



0.00-5.00m

TTNZ_20210729 - HandAugerLog - 30/05/2022 5:27:35 pm - Produced with Core-GS by GeRoc

EXCAVATION LOG

Tonkin+Taylor

Excavation Id.: **TP01**

Hole Location: 1350 Dairy Flat Highway

SHEET: 1 OF 2

PROJECT: Dairy Flat Highway Geotech	LOCATION: Dairy Flat Highway		JOB No.: 1016502.1000
CO-ORDINATES: 5942115 mN (NZTM2000) 1746978 mE	METHOD: Trial pit/trench	EXCAV. STARTED:	06/05/2022
	EQUIPMENT: U55-4 5T Track mounted excavator	EXCAV. FINISHED:	06/05/2022
R.L.: 55m	OPERATOR: Active Contracting	LOGGED BY:	ROM
DATUM: AUCKHT1946	DIMENSIONS: 3m by 0.4m	CHECKED BY:	RLXB

EXCAVATION TESTS | ENGINEERING DESCRIPTION | GEOLOGICAL

PENETRATION	SUPPORT	WATER	SAMPLES, TESTS	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	WEATHERING CLASSIFICATION	MOISTURE CLASSIFICATION	CONSISTENCY / DENSITY CLASSIFICATION	ESTIMATED SOIL SHEAR STRENGTH (Su, kPa)	DEFECTS, STRUCTURE, COMMENTS	UNIT
1 2 3												VS 12 S 25 F 50 St 100 VSt 200 H		
			● 171/44 kPa Insitu		54	0.5	TS	*0.00m:* Sandy SILT, trace rootlets; dark brown. Firm, moist, low plasticity. Sand, fine.		M	F			Top
								0.15m: Silty CLAY, trace rootlets; orange brown. Stiff to very stiff, moist, low to medium plasticity.			St-VSt			
			● 95/30 kPa Insitu			1.0		*0.45m:* Silty CLAY, trace rootlets; grey streaked black mottled orange. Stiff to very stiff, moist, high plasticity. , Occasional wood fragments, roots.						
			1.0 - 1.5 @ 1.00m											
			1.5 - 2.0 @ 1.50m			1.5		*1.50m:* Organic SILT, some clay; dark brown. Firm to stiff, moist to wet, high plasticity, moderately sensitive. , Occasional wood fragments, roots; organics, rootlets (decomposed).		M-W	F-St			Tauranga Group
			● 63/29 kPa Insitu		53									
			● 41/13 kPa Insitu			2.0								
			● 35/16 kPa Insitu			2.5		*2.20m:* CLAY and SILT, minor organic flecks; grey streaked black. Firm, moist, high plasticity. , Occasional wood fragments, decomposed rootlets and wood fragments. Occasional lenses of Organic SILT, dark brown. Firm, moist, high plasticity, organics decomposed rootlets.		M	F			
			● 35/13 kPa Insitu		52	3.0								
			● 33/16 kPa Insitu			3.5								
		06/05/2022	● 35/19 kPa Insitu		51	4.0								
								4m: Machine limit						
					50	4.5								

SKETCH / PHOTO:





0.0 - 1.5m:



1.5 - 4.0m:

COMMENTS: Target Depth Reached. Slight seepage at 3.9 m bgl. No observable water pooling.

Hole Depth 4m

Scale 1:42

Rev.: A

TTNZ_20210729 - Excavation - 25/05/2022 9:36:34 am - Produced with Core-GS by GeRoc

EXCAVATION LOG

Excavation Id.: **TP02**

Hole Location: 1350 Dairy Flat Highway

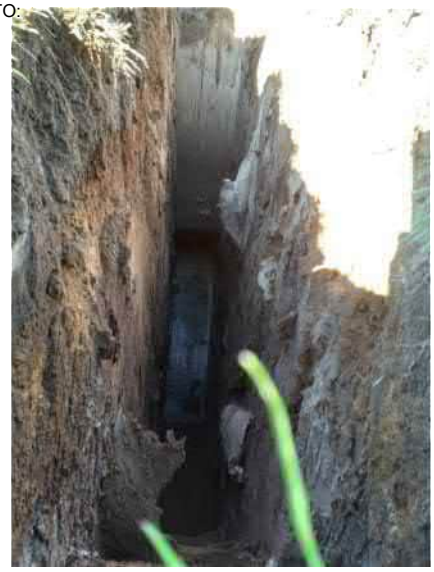
SHEET: 1 OF 2

PROJECT: Dairy Flat Highway Geotech		LOCATION: Dairy Flat Highway	JOB No.: 1016502.1000
CO-ORDINATES: (NZTM2000)	5942017 mN 1746846 mE	METHOD: Trial pit/trench	EXCAV. STARTED: 06/05/2022
		EQUIPMENT: U55-4 5T Track mounted excavator	EXCAV. FINISHED: 06/05/2022
R.L.:	55m	OPERATOR: Active Contracting	LOGGED BY: ROM
DATUM:	AUCKHT1946	DIMENSIONS: 3m by 0.4m	CHECKED BY: RLXB

EXCAVATION TESTS | ENGINEERING DESCRIPTION | GEOLOGICAL

PENETRATION	SUPPORT	WATER	SAMPLES, TESTS	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	WEATHERING CLASSIFICATION	MOISTURE CLASSIFICATION	CONSISTENCY / DENSITY CLASSIFICATION	ESTIMATED SOIL SHEAR STRENGTH (Su, kPa)	DEFECTS, STRUCTURE, COMMENTS	UNIT
1 2 3												VS 12 S 25 F 50 St 100 VSt 200 H		
			● 57/25 kPa Insitu		54	0.5 1.0	TS	*0.00m:* Sandy SILT, minor rootlets; dark brown. Firm, moist, low plasticity. Sand, fine. *0.15m:* Sandy SILT, minor rootlets; dark brown mottled brownish orange. Firm to stiff, moist, low plasticity. Sand, fine. *0.40m:* Silty CLAY, trace organics; grey streaked black. Stiff, moist, high plasticity. Organics, rootlets (decomposed).		M	F F-St St			Top
			● 63/29 kPa Insitu			1.5								
			● 73/22 kPa Insitu		53	2.0								
		06/05/2022	● 60/16 kPa Insitu			2.5								Tauranga Group
			● 32/13 kPa Insitu		52	3.0		*2.90m:* CLAY and SILT, minor organics; grey streaked black. Firm to stiff, wet to saturated, high plasticity. , Organics, occasional partially decomposed wood fragments and rootlets.		W-S	F-St			
			3.5 - 4.0m @ 3.50m ● 70/35 kPa Insitu			3.5		*3.00 - 4.00m:* Occasional lens of SILT Trace organics, brown streaked black. Firm, moist to wet, medium to high plasticity. Organic, partially decomposed rootless and wood fragments.						
			● 38/19 kPa Insitu		51	4.0 4.5		4m: Machine limit						

SKETCH / PHOTO:





0.0 - 4.0m:

COMMENTS: Target Depth Reached. Slight seepage at 2.9 m bgl. No observable water pooling.

Hole Depth 4m

Scale 1:42

Rev.: A

TTNZ_20210729 - Excavation - 25/05/2022 9:36:51 am - Produced with Core-GS by GeRoc

EXCAVATION LOG

Tonkin+Taylor

Excavation Id.: **TP03**

Hole Location: 1350 Dairy Flat Highway

SHEET: 1 OF 2

PROJECT: Dairy Flat Highway Geotech		LOCATION: Dairy Flat Highway	JOB No.: 1016502.1000
CO-ORDINATES: (NZTM2000)	5941893 mN 1747124 mE	METHOD: Trial pit/trench EQUIPMENT: U55-4 5T Track mounted excavator	EXCAV. STARTED: 06/05/2022 EXCAV. FINISHED: 06/05/2022
R.L.:	54m	OPERATOR: Active Contracting	LOGGED BY: ROM
DATUM:	AUCKHT1946	DIMENSIONS: 3m by 0.4m	CHECKED BY: RLXB

EXCAVATION TESTS | ENGINEERING DESCRIPTION | GEOLOGICAL

PENETRATION	SUPPORT	WATER	SAMPLES, TESTS	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	WEATHERING CLASSIFICATION	MOISTURE CLASSIFICATION	CONSISTENCY / DENSITY CLASSIFICATION	ESTIMATED SOIL SHEAR STRENGTH (Su, kPa)	DEFECTS, STRUCTURE, COMMENTS	UNIT
1 2 3					54	0.0	TS	*0.00m:* Sandy SILT, trace organics; brown. Firm, moist, low plasticity.		M	F			Top
			● 73/16 kPa Insitu			0.5		*0.15m:* SILT, some sand, minor clay, trace organics; dark brown. Stiff, moist, low to medium plasticity. Sand, fine.			St			
			● 25/3 kPa Insitu		53	1.0		*0.65m:* Clayey PEAT (FIBROUS AND AMORPHOUS), some silt; dark brown. Soft to firm, wet to saturated, high plasticity. Non-plastic upon initial remoulding. Highly plastic when dried back from NMC.		W-S	S-F			
			● 27/2 kPa Insitu			1.5								
			● 23/3 kPa Insitu		52	2.0								
			● 20/5 kPa Insitu			2.5		*2.30m:* Peaty CLAY, some silt; dark brown. Soft, moist, high plasticity.		M	S			
			2.7 @ 2.70m											
			● 20/6 kPa Insitu		51	3.0		*2.80m:* Silty CLAY, trace organic flecks; grey streaked black. Soft to firm, moist to wet, high plasticity.		M-W	S-F			Tauranga Group
		06/05/2022	● 23/6 kPa Insitu			3.5								
			● 35/17 kPa Insitu					*3.80m:* Firm.						
			● 37/15 kPa Insitu		50	4.0		3.9m: Machine limit						
						4.5								

SKETCH / PHOTO:





2.0 - 4.0m:



0.0 - 2.0m:

COMMENTS: Target Depth Reached. Slight seepage at 3.8 m bgl. No observable water pooling.

Hole Depth 3.9m

Scale 1:42

Rev.: A

TTNZ_20210729 - Excavation - 25/05/2022 9:37:12 am - Produced with Core-GS by GeRoc

EXCAVATION LOG

Tonkin+Taylor

Excavation Id.: **TP04**

Hole Location: 1350 Dairy Flat Highway

SHEET: 1 OF 2

PROJECT: Dairy Flat Highway Geotech	LOCATION: Dairy Flat Highway		JOB No.: 1016502.1000
CO-ORDINATES: 5941794 mN (NZTM2000) 1747486 mE	METHOD: Trial pit/trench	EXCAV. STARTED:	06/05/2022
	EQUIPMENT: U55-4 5T Track mounted excavator	EXCAV. FINISHED:	06/05/2022
R.L.: 59m	OPERATOR: Active Contracting	LOGGED BY:	ROM
DATUM: AUCKHT1946	DIMENSIONS: 3m by 0.4m	CHECKED BY:	RLXB

EXCAVATION TESTS | ENGINEERING DESCRIPTION | GEOLOGICAL

PENETRATION	SUPPORT	WATER	SAMPLES, TESTS	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	WEATHERING CLASSIFICATION	MOISTURE CLASSIFICATION	CONSISTENCY / DENSITY CLASSIFICATION	ESTIMATED SOIL SHEAR STRENGTH (Su, kPa)	DEFECTS, STRUCTURE, COMMENTS	UNIT
1 2 3		DRY 06/05/2022	0.1 - 0.5 @ 0.10m			0.0		*0.00m:* SILT, some sand, trace organic flecks; brown. Firm, moist, low plasticity. Sand, fine.		M	F			Top
								0.10m: Sandy fine to coarse GRAVEL, some silt; light greenish grey. Tightly packed, dry to moist, well graded. Gravel, angular, highly weathered, very weak, limestone. (FILL).		D-M	TP			Fill
			● 100/32 kPa		58	0.5								
			● 37/18 kPa			1.0		*0.60m:* Silty CLAY, some sand, trace organic flecks; light brown mottled orange. Stiff, moist, high plasticity. Sand, fine.		M	St			Tauranga Group
			● 165/32 kPa			1.5		*1.50m:* SILT, some clay, trace organic flecks; orange mottled light brown, blocky. Very stiff, moist, medium to high plasticity. Organics, carbonaceous flecks. (Residual Soil).	RS		VSt			
			● 171/25 kPa		57	2.0		*2.10m:* Completely weathered, light brownish grey, pervasively sheared, very closely spaced, broken LIMESTONE. Extremely weak, well cemented. Soil description: Clayey SILT. Very stiff to hard, moist, low plasticity.	CW		EW			Mahurangi Limestone
						2.5			HW		VW			
			2.8 @ 2.80m		56	3.0		*2.40m:* Highly weathered, light greenish grey, pervasively sheared, very closely spaced, broken LIMESTONE. Very weak, well cemented.						
								3m: Refusal					*3.0m:* No groundwater encountered	
					55	3.5								
						4.0								
					54	4.5								

SKETCH / PHOTO:





0.0 - 3.0m:

COMMENTS: Refusal on limestone at base of test pit. No groundwater encountered.

Hole Depth 3m

Scale 1:42

Rev.: A

TTNZ_20210729 - Excavation - 25/05/2022 9:37:27 am - Produced with Core-GS by GeRoc

EXCAVATION LOG

Excavation Id.: **TP05**

Hole Location: 1350 Dairy Flat Highway

SHEET: 1 OF 2

PROJECT: Dairy Flat Highway Geotech		LOCATION: Dairy Flat Highway		JOB No.: 1016502.1000	
CO-ORDINATES: (NZTM2000)	5942097 mN 1747244 mE	METHOD:	Trial pit/trench	EXCAV. STARTED:	06/05/2022
		EQUIPMENT:	U55-4 5T Track mounted excavator	EXCAV. FINISHED:	06/05/2022
R.L.:	53m	OPERATOR:	Active Contracting	LOGGED BY:	ROM
DATUM:	AUCKHT1946	DIMENSIONS:	3m by 0.4m	CHECKED BY:	RLXB

EXCAVATION TESTS | ENGINEERING DESCRIPTION | GEOLOGICAL

PENETRATION	SUPPORT	WATER	SAMPLES, TESTS	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	WEATHERING CLASSIFICATION	MOISTURE CLASSIFICATION	CONSISTENCY / DENSITY CLASSIFICATION	ESTIMATED SOIL SHEAR STRENGTH (Su, kPa)	DEFECTS, STRUCTURE, COMMENTS	UNIT
1 2 3												VS 12 S 25 F 50 St 100 VSt 200 H		
						0		*0.00m:* Silty CLAY, some sand, trace rootlets; dark brown. Very stiff, dry to moist, high plasticity. Sand, fine; organics, carbonaceous material.		D-M	VSt			Top
			0.5 @ 0.50m 44/19 kPa			0.5		*0.10m:* Silty CLAY, some sand, trace rootlets; dark brown. Very stiff, dry to moist, high plasticity. Sand, fine; organics, carbonaceous material.		M	S-F			
			24/13 kPa		52	1.0		*0.40m:* Organic CLAY, minor sand; dark brown. Soft to firm, moist, high plasticity. , Occasional partially decomposed roots, wood fragments and carbonaceous flecks.						
		06/05/2022	31/7 kPa			1.5		*1.50m:* Silty CLAY, minor rootlets; light greenish grey. Firm, moist to wet, high plasticity. , Decomposed rootlets, Occasional partially decomposed roots and wood fragments.		M-W	F			
			28/11 kPa		51	2.0								
			27/9 kPa			2.5								
			27/9 kPa		50	3.0								
			48/19 kPa			3.5								
			3.7 @ 3.70m 48/35 kPa		49	4.0		3.8m: Machine limit						Tauranga Group
						4.5								
					48									

SKETCH / PHOTO:





0.0 - 1.5m:



1.5 - 3.8m:

COMMENTS: Target Depth Reached. Slight seepage at 1.6 m bgl. No observable water pooling.

Hole Depth
3.8m

Scale 1:42

Rev.: A

TTNZ_20210729 - Excavation - 25/05/2022 9:37:44 am - Produced with Core-GS by GeRoc

EXCAVATION LOG

Tonkin+Taylor

Excavation Id.: **TP06**

Hole Location: 1350 Dairy Flat Highway

SHEET: 1 OF 2

PROJECT: Dairy Flat Highway Geotech	LOCATION: Dairy Flat Highway		JOB No.: 1016502.1000
CO-ORDINATES: (NZTM2000) 5942423 mN 1747338 mE	METHOD: Trial pit/trench	EXCAV. STARTED:	06/05/2022
	EQUIPMENT: U55-4 5T Track mounted excavator	EXCAV. FINISHED:	06/05/2022
R.L.: 64m	OPERATOR: Active Contracting	LOGGED BY:	ROM
DATUM: AUCKHT1946	DIMENSIONS: 3m by 0.4m	CHECKED BY:	RLXB

EXCAVATION TESTS | ENGINEERING DESCRIPTION | GEOLOGICAL

PENETRATION	SUPPORT	WATER	SAMPLES, TESTS	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	WEATHERING CLASSIFICATION	MOISTURE CLASSIFICATION	CONSISTENCY / DENSITY CLASSIFICATION	ESTIMATED SOIL SHEAR STRENGTH (Su, kPa)	DEFECTS, STRUCTURE, COMMENTS	UNIT
1 2 3			0.3 - 1.2 @ 0.30m 86/35 kPa Insitu 89/25 kPa Insitu UTP Insitu		64 63 62 61 60	0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5		*0.00m:* SILT, some sand, trace rootlets; dark brown. Firm, moist, low plasticity. Organics, rootlets (fresh). *0.10m:* Sandy SILT, trace rootlets; dark brown. Stiff, moist, low to medium plasticity. Organics, rootlets (fresh). *0.30m:* Silty CLAY, trace organic flecks; light brown mottled orange brown speckled black. Stiff, moist, high plasticity. Organics, rootlets (fresh) and rootlets (partially decomposed). *1.20m:* Silty CLAY; light brownish grey, blocky. Very stiff, moist, high plasticity. (Residual Soil). *1.40m:* Completely weathered, light brownish grey , broken LIMESTONE. Extremely weak. Soil description: Clayey SILT; light brownish grey, blocky. Hard, moist, low plasticity. *1.50m:* Highly weathered, light greenish grey, pervasively sheared, very closely spaced, broken LIMESTONE. Very weak. 2.4m: Refusal	CW HW	M	F St VSt EW VW	VS 12 S 25 F 50 St 100 VSt 200 H	*2.4m:* No groundwater encountered	Top Tauranga Group Mahurangi Limestone

SKETCH / PHOTO:





0.0 - 1.2m:



1.2 - 2.4m:

COMMENTS: Refusal on limestone at base of test pit. No groundwater encountered.

Hole Depth 2.4m

Scale 1:42

Rev.: A

TTNZ_20210729 - Excavation - 25/05/2022 9:38:08 am - Produced with Core-GS by GeRoc v3.0.0

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Client: **Spark New Zealand**
Project: **Spark Data Centres**
Location: **1350 Dairy Flat Highway, Dairy Flat, AUCKLAND**
Project Reference: **523578**

AU23-BH01

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Morooka Tractor Rig
Contractor: DCN Drilling Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 389647.04m
Northing: 824739.64m
Reduced level: 53.31m (NZVD 2016)

Date started: 17/04/2023
Date completed: 17/04/2023
Inclination: -90°
Azimuth: -090°

Logged by: DWB
Input by: BC
Reviewed by: AM
Verified by: RG

Method	R.L. (m)	Length (m)	Graphic Log	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Fracture Log (VWS WS MWS CS VCS ECS)	Stratigraphy Defect Description Additional Notes	Installation
HQ3	53			**0m:** Organic SILT, minor clay; brownish grey. Firm, moist, high plasticity. Organics; charcoal, rootlets. [TOPSOIL]	OL						**0m: TOPSOIL**	
				0.3m: Organic CLAY with trace silt; brownish grey with black streaks. Firm to stiff, wet, high plasticity. Organics; fibrous, decomposing wood and plant material. [TAURANGA GROUP]	OH						**0.3m: TAURANGA GROUP**	
				0.5m: CORE LOSS - No recovery due to washout.			50					
		1										
U54	52			**1m:** PUSH TUBE SAMPLE - Fibrous PEAT; black. Saturated, non-plastic. [PEAT-H4]	PT		100					
SPT				**1.5m:** Organic CLAY with trace silt; brownish grey with black streaks. Firm, wet, high plasticity. Organics; fibrous, decomposing wood and plant material.	OH	1.5m: SPT 0// 0,0,1,0 N = 1	100					
				1.7m to 1.75m:...Pumiceous fine SAND; light brown. Well packed, moist, low plasticity, uniformly graded.	SP							
		2		**1.9m:** Fibrous PEAT; black. Soft, saturated, low plasticity. Wood, rootlets. [PEAT-H5]								
HQ3	51						100					
					PT							
U54				**2.5m to 3m:**...PUSH TUBE SAMPLE			100					
		3										
SPT	50			**3m:** CLAY with minor organics; light grey. Firm, saturated, high plasticity. Organics; decomposed wood and rootlets.	OH	3m: SPT 0// 0,0,0,0 N = 0	100					
				3.45m: Organic CLAY; brown. Firm, saturated, high plasticity. Organics; wood, decomposed, amorphous, soft.								
HQ3		4					100					
	49				OH							
				4.4m:...20mm fibrous decomposing wood.								
SPT						4.5m: SPT 0// 0,0,0,0 N = 0	100					
		5					100					

Box 1

REMARKS:
1. Investigation collar is recorded to an accuracy of ±8 mm horizontal and ±15mm vertical, using Leica GS16 GNSS RTK Rover and Leica CS20 Field Controller in single baseline RTK configuration.
2. Standpipe piezometer and galvanised upstand installed upon completion of drilling.
3. Peat classification derived from Von-Post Humification Scale [Peat H1-H10]
4. Pushtube samples logged from extruded sample photo.

Hand Shear Vane Serial No: DR4940 Correction Factor: 1.491

Water Level Readings:
Date Time | Hole Depth | Water Level
(1) 18/04/23 07:00 | m | 0.1 m bgl
(2) 01/05/23 10:00 | m | 0.39 m bgl

Database File: SPARK DC_523578__GINTMASTER.GPJ **Library file:** AURECON_AKL_20220728.GLB **Template:** AURECON_AKL_20170201.GDT **Report File:** AURECON DH LOG V3.9 0DP **Date Generated:** 1/06/2023

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Project: **Spark Data Centres**
Location: **1350 Dairy Flat Highway, Dairy Flat, AUCKLAND**
Project Reference: **523578**

AU23-BH01

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Morooka Tractor Rig
Contractor: DCN Drilling Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 389647.04m
Northing: 824739.64m
Reduced level: 53.31m (NZVD 2016)

Date started: 17/04/2023
Date completed: 17/04/2023
Inclination: -90°
Azimuth: -090°

Logged by: DWB
Input by: BC
Reviewed by: AM
Verified by: RG

Method	R.L. (m)	Length (m)	Graphic Log	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Fracture Log (VWS WS MWS CS VCS ECS)	Stratigraphy Defect Description Additional Notes	Installation
Box 1 HQ3	48	6		**3.45m:** Organic CLAY; brown. Firm, saturated, high plasticity. Organics; wood, decomposed, amorphous, soft.	OH		100					
SPT	47			**6m:** CLAY with minor organics; light grey and black streaks. Firm, saturated, high plasticity. Organics, decomposing fibrous wood and rootlets.	CH	6m: SPT 0// 0,0,1,0 N = 1	100					
Box 2 HQ3	46	7		**6.5m:** Organic CLAY; dark brown. Soft, saturated, high plasticity, extra sensitive. Organics; fibrous wood and amorphous peat lenses.	OH	7.5m: SPT 0// 0,0,0,0 N = 0 7.5m: IBHSV 17/2 kPa	100					
SPT		8		**7.85m:**...50mm decomposed wood.			100					
HQ3	45			**8.5m to 8.63m:**...gradational colour change to light grey.			100					
SPT	44	9		**8.65m:** CLAY with trace silt and organics; light grey. Soft, saturated, high plasticity, extra sensitive. Organics; decomposed fibrous plant material.	CH	9m: SPT 0// 0,1,1,3 N = 5 9m: IBHSV 22/5 kPa	100					
Box 3 HQ3		10		**9.3m:** Completely weathered, light grey, pervasively sheared, extremely closely spaced and broken LIMESTONE; extremely weak, recovered as a *SILT, minor clay; wet, low plasticity*. [MAHURANGI LIMESTONE]	CW						**9.3m: NORTHLAND ALLOCHTHON - MAHURANGI LIMESTONE**	
				9.5m: Moderately weathered, light grey, highly fractured, pervasively sheared LIMESTONE; very weak. Extremely closely spaced, breaks down to a *coarse GRAVEL, angular* when disturbed.	MW		71		0	9.8m to 10.3m: CZ	

REMARKS:
1. Investigation collar is recorded to an accuracy of ±8 mm horizontal and ±15mm vertical, using Leica GS16 GNSS RTK Rover and Leica CS20 Field Controller in single baseline RTK configuration.
2. Standpipe piezometer and galvanised upstand installed upon completion of drilling.
3. Peat classification derived from Von-Post Humification Scale [Peat H1-H10]
4. Pushtube samples logged from extruded sample photo.

Hand Shear Vane Serial No: DR4940 Correction Factor: 1.491

Water Level Readings:
Date Time | Hole Depth | Water Level
(1) 18/04/23 07:00 | m | 0.1 m bgl
(2) 01/05/23 10:00 | m | 0.39 m bgl

Database File: SPARK DC_523578__GINTMASTER.GPJ **Library file:** AURECON_AKL_20220728.GLB **Template:** AURECON_AKL_20170201.GDT **Report File:** AURECON DH LOG V3.9 0DP **Date Generated:** 1/06/2023

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Client: **Spark New Zealand**
Project: **Spark Data Centres**
Location: **1350 Dairy Flat Highway, Dairy Flat, AUCKLAND**
Project Reference: **523578**

AU23-BH01

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Morooka Tractor Rig
Contractor: DCN Drilling Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 389647.04m
Northing: 824739.64m
Reduced level: 53.31m (NZVD 2016)

Date started: 17/04/2023
Date completed: 17/04/2023
Inclination: -90°
Azimuth: -090°

Logged by: DWB
Input by: BC
Reviewed by: AM
Verified by: RG

Method	R.L. (m)	Length (m)	Graphic Log	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Fracture Log (VWS WS MWS CS VCS ECS)	Stratigraphy Defect Description Additional Notes	Installation
HQ3	43			**9.5m:** Moderately weathered, light grey, highly fractured, pervasively sheared LIMESTONE; very weak. Extremely closely spaced, breaks down to a *coarse GRAVEL, angular* when disturbed.	MW		71		0			
SPT						10.5m: SPT 50 for 140mm// N = 50+	100		0			
HQ3		11		**10.85m:** Slighly weathered, green grey, pervasively sheared, massive LIMESTONE; moderately strong; extremely closely spaced, brittle along shear planes. Breaks down into a *coarse GRAVEL* along shear planes, when disturbed.			100		0		11m: JT 86° UnSm Cn Closed 11.07m: JT 5° PlSm Cn Subhorizontal	
	42				SW						11.3m: JT 40° UnSm Cn Closed	
HQ3		12					91		0			
SPT						12m: SPT 39// 23 for 45mm N = 50+	100		0			

Box 3

End of borehole at 12.2m (Target depth reached)

REMARKS:
1. Investigation collar is recorded to an accuracy of ±8 mm horizontal and ±15mm vertical, using Leica GS16 GNSS RTK Rover and Leica CS20 Field Controller in single baseline RTK configuration.
2. Standpipe piezometer and galvanised upstand installed upon completion of drilling.
3. Peat classification derived from Von-Post Humification Scale [Peat H1-H10]
4. Pushtube samples logged from extruded sample photo.

Hand Shear Vane Serial No: DR4940 Correction Factor: 1.491

Water Level Readings:
Date Time | Hole Depth | Water Level
(1) 18/04/23 07:00 | m | 0.1 m bgl
(2) 01/05/23 10:00 | m | 0.39 m bgl

Database File: SPARK DC_523578__GINTMASTER.GPJ **Library file:** AURECON_AKL_20220728.GLB **Template:** AURECON_AKL_20170201.GDT **Report File:** AURECON DH LOG V3.9 0DP **Date Generated:** 1/06/2023

SPARK-DC

Borehole Reference:	**AU23-BH01**	Date Drilled:	**17/04/2023-17/04/2023**
Photographed By:	**BC**	Date Photographed:	**17/04/2023-17/04/2023**



Box 1 - Depth: 0.00 m to 6.00 m.



Box 2 - Depth: 6.00 to 9.45m.

SPARK-DC

Borehole Reference:	**AU23-BH01**	Date Drilled:	**17/04/2023-17/04/2023**
Photographed By:	**BC**	Date Photographed:	**17/04/2023-17/04/2023**



Box 3 - Depth: 9.45 to 12.20m.

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Client: **Spark New Zealand**
Project: **Spark Data Centres**
Location: **1350 Dairy Flat Highway, Dairy Flat, AUCKLAND**
Project Reference: **523578**

AU23-BH02

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Morooka Tractor Rig
Contractor: DCN Drilling Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 389780.02m
Northing: 824697.27m
Reduced level: 54.06m (NZVD 2016)

Date started: 20/04/2023
Date completed: 20/04/2023
Inclination: -90°
Azimuth: -090°

Logged by: BC
Input by: BC
Reviewed by: AM
Verified by: RG

Method	R.L. (m)	Length (m)	Graphic Log	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Fracture Log (VWS WS MWS CS VCS ECS)	Stratigraphy Defect Description Additional Notes	Installation
HQ3	54	1		**0m:** Organic SILT, minor clay and organics; brown. Stiff, wet, high plasticity. Organics; rootlets. [TOPSOIL]	OL						**0m: TOPSOIL**	
				0.3m: CLAY, minor silt, trace organics; light brown. Hard, wet, high plasticity. Organics; trace black inclusions. [TAURANGA GROUP]	CH	0.5m: IBHSV UTP	100				**0.3m: TAURANGA GROUP**	
				0.5m:...gradational colour change to a light grey. 50mm decomposing wood.							0.5m: IBHSV Obscured due to wood.	
	53			**1m:** Organic CLAY with minor organics and trace silt; light brownish grey. Firm, wet, high plasticity, extra sensitive. Organics; fibrous, decomposing plant matter.	OH							
SPT		2		**1.3m:** Fibrous PEAT; black with brown mottling. Firm, saturated, high plasticity, sensitive to extra sensitive. Fibrous wood and rootlets, with plant material. [PEAT- H6]	PT	1.5m: SPT 0// 1,0,0,0 N = 1 1.5m: IBHSV 35/4 kPa	0				1.5m: SPT dropped - washed out.	
HQ3	52	3					100					
SPT	51			**3.1m:** Organic CLAY; light brown. Firm, saturated, high plasticity, sensitive. Organics; decomposing wood and rootlets.		3m: SPT 0// 0,0,0,0 N = 0 3m: IBHSV 35/5 kPa	100					
HQ3		4					100					
U54	50			**3.9m to 4m:**...light brown.	OH							
				4.3m:... 100mm piece of decomposing wood.			100					
SPT		5		**4.5m:**...soft		4.5m: SPT 0// 0,0,0,0 N = 0 4.5m: IBHSV 14/2 kPa	100					
					PT		100					

REMARKS:
1. Investigation collar is recorded to an accuracy of ±8 mm horizontal and ±15mm vertical, using Leica GS16 GNSS RTK Rover and Leica CS20 Field Controller in single baseline RTK configuration.
2. Standpipe piezometer and galvanised upstand installed upon completion of drilling.
3. Peat classification derived from Von-Post Humification Scale [Peat H1-H10]
4. Pushtube samples logged from extruded sample photo.

Hand Shear Vane Serial No: DR4940 Correction Factor: 1.491

Water Level Readings:
Date Time | Hole Depth | Water Level
(1) 20/04/23 15:00 | m | 0.0 m bgl
(2) 01/05/23 10:10 | m | 0.55 m bgl

Database File: SPARK DC_523578__GINTMASTER.GPJ **Library file:** AURECON_AKL_20220728.GLB **Template:** AURECON_AKL_20170201.GDT **Report File:** AURECON DH LOG V3.9 0DP **Date Generated:** 1/06/2023

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Client: **Spark New Zealand**
Project: **Spark Data Centres**
Location: **1350 Dairy Flat Highway, Dairy Flat, AUCKLAND**
Project Reference: **523578**

AU23-BH02

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Morooka Tractor Rig
Contractor: DCN Drilling Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 389780.02m
Northing: 824697.27m
Reduced level: 54.06m (NZVD 2016)

Date started: 20/04/2023
Date completed: 20/04/2023
Inclination: -90°
Azimuth: -090°

Logged by: BC
Input by: BC
Reviewed by: AM
Verified by: RG

Method	R.L. (m)	Length (m)	Graphic Log	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Fracture Log (VWS WS MWS CS VCS ECS)	Stratigraphy Defect Description Additional Notes	Installation
Box 2 HQ3	49	6		**4.9m:** Amorphous PEAT with trace fibrous wood; black. Soft, saturated, highly plastic, sensitive. [PEAT- H7]	PT							
				5.1m: Organic CLAY with minor wood fragments and rootlets; dark brown. Soft to firm, saturated, high plasticity, sensitive.	OH		100					
SPT	48	7		**6m:** Organic CLAY with minor organics; light grey. Soft to firm, saturated, high plasticity, extra sensitive. Organics; decomposing fibrous wood and rootlets.		6m: SPT 0// 0,0,0,0 N = 0 6m: IBHSV 26/2 kPa	89				6m to 6.2m: Core disturbed.	
HQ3				**6.6m to 6.8m:**...fibrous wood fragment, black.	OH		100					
U54	47	8		**7m:** PUSH TUBE SAMPLE - Organic CLAY; brown. Soft, wet, high plasticity. Organics; decomposed fibrous plant lenses.		7m: IBHSV 17/2 kPa	100					
Box 3 SPT				**7.5m:** Organic CLAY; light grey. Soft to firm, saturated, high plasticity, extra sensitive. Organics; decomposing fibrous wood and rootlets, brown staining.	OH	7.5m: SPT 0// 0,0,0,0 N = 0	100					
HQ3	46	9		**7.7m:** CLAY with trace organics; light grey. Soft, saturated, high plasticity, extra sensitive. Organics; rootlets.	CH		100					
				8.65m: Completely weathered, light grey, LIMESTONE; recovered as a *Silty CLAY, saturated, high plasticity.* [MAHURANGI LIMESTONE]	CW						**8.65m: NORTHLAND ALLOCHTHON - MAHURANGI LIMESTONE**	
SPT	45	10		**9m:** Moderately weathered, light grey, pervasively sheared LIMESTONE; very weak; extremely closely spaced, massive. Breaks down to a *Silty GRAVEL, fine to coarse, angular* when disturbed **9.2m to 10.71m:**...recovered as *medium to coarse GRAVEL, angular, 10-30mm.*.		9m: SPT 7// 8,16,18,8 for 35mm N = 50+	100		0		9.1m to 10.1m: CZ	
HQ3					MW		81		0			

REMARKS:
1. Investigation collar is recorded to an accuracy of ±8 mm horizontal and ±15mm vertical, using Leica GS16 GNSS RTK Rover and Leica CS20 Field Controller in single baseline RTK configuration.
2. Standpipe piezometer and galvanised upstand installed upon completion of drilling.
3. Peat classification derived from Von-Post Humification Scale [Peat H1-H10]
4. Pushtube samples logged from extruded sample photo.

Hand Shear Vane Serial No: DR4940 Correction Factor: 1.491

Water Level Readings:
Date Time | Hole Depth | Water Level
(1) 20/04/23 15:00 | m | 0.0 m bgl
(2) 01/05/23 10:10 | m | 0.55 m bgl

Database File: SPARK DC_523578__GINTMASTER.GPJ **Library file:** AURECON_AKL_20220728.GLB **Template:** AURECON_AKL_20170201.GDT **Report File:** AURECON DH LOG V3.9 0DP **Date Generated:** 1/06/2023

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Project: **Spark Data Centres**
Location: **1350 Dairy Flat Highway, Dairy Flat, AUCKLAND**
Project Reference: **523578**

AU23-BH02

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Morooka Tractor Rig
Contractor: DCN Drilling Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 389780.02m
Northing: 824697.27m
Reduced level: 54.06m (NZVD 2016)

Date started: 20/04/2023
Date completed: 20/04/2023
Inclination: -90°
Azimuth: -090°

Logged by: BC
Input by: BC
Reviewed by: AM
Verified by: RG

Method	R.L. (m)	Length (m)	Graphic Log	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Fracture Log (VWS WS MWS CS VCS ECS)	Stratigraphy Defect Description Additional Notes	Installation
HQ3	44			**9m:** Moderately weathered, light grey, pervasively sheared LIMESTONE; very weak; extremely closely spaced, massive. Breaks down to a *Silty GRAVEL, fine to coarse, angular* when disturbed	MW		81		0			
SPT						10.5m: SPT 42// 25 for 60mm N = 50+	100		0		10.45m: JT 40° UnRo Cn	

End of borehole at 10.71m (Target depth reached)

REMARKS:
1. Investigation collar is recorded to an accuracy of ±8 mm horizontal and ±15mm vertical, using Leica GS16 GNSS RTK Rover and Leica CS20 Field Controller in single baseline RTK configuration.
2. Standpipe piezometer and galvanised upstand installed upon completion of drilling.
3. Peat classification derived from Von-Post Humification Scale [Peat H1-H10]
4. Pushtube samples logged from extruded sample photo.

Hand Shear Vane Serial No: DR4940 Correction Factor: 1.491

Water Level Readings:
Date Time | Hole Depth | Water Level
(1) 20/04/23 15:00 | m | 0.0 m bgl
(2) 01/05/23 10:10 | m | 0.55 m bgl

Database File: SPARK DC_523578__GINTMASTER.GPJ **Library file:** AURECON_AKL_20220728.GLB **Template:** AURECON_AKL_20170201.GDT **Report File:** AURECON DH LOG V3.9 0DP **Date Generated:** 1/06/2023

Borehole Reference:	**AU23-BH02**	Date Drilled:	**20/04/2023-20/04/2023**
Photographed By:	**BC**	Date Photographed:	**20/04/2023-20/04/2023**



Box 1. - Depth: 0.00 m to 3.00 m.



Box 2. - Depth: 3.00m to 6.00m.

SPARK-DC

Borehole Reference:	**AU23-BH02**	Date Drilled:	**20/04/2023-20/04/2023**
Photographed By:	**BC**	Date Photographed:	**20/04/2023-20/04/2023**



Box 3. - Depth: 6.00 m to 10.05 m.



Box 4. - Depth: 10.05 m to 10.71 m.

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Client: **Spark New Zealand**
Project: **Spark Data Centres**
Location: **1350 Dairy Flat Highway, Dairy Flat, AUCKLAND**
Project Reference: **523578**

AU23-BH03

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Morooka Tractor Rig
Contractor: DCN Drilling Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 389698.01m
Northing: 824682.96m
Reduced level: 53.59m (NZVD 2016)

Date started: 18/04/2023
Date completed: 19/04/2023
Inclination: -90°
Azimuth: -090°

Logged by: BC
Input by: BC
Reviewed by: AM
Verified by: RG

Method	R.L. (m)	Length (m)	Graphic Log	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Fracture Log (VWS WS MWS CS VCS ECS)	Stratigraphy Defect Description Additional Notes	Installation
HQ3	53	1		**0m:** Organic silty CLAY; brownish grey. Stiff, wet, high plasticity. Organics; fibrous wood. [TOPSOIL]	OL						**0m: TOPSOIL**	
				0.2m: CORE LOSS			13				**0.2m: TAURANGA GROUP** 0.2m to 1.5m: Core drop out - not recovered, inferred core washout.	
SPT	52	2				1.5m: SPT 5// 1,1,1,1 N = 4	11				1.5m to 1.95m: No recovery in SPT test.	
HQ3	51	3		**1.95m:** PEAT; black. Soft, saturated, high plasticity. Organics; fibrous wood, decomposing plant matter. [PEAT-H5]	PT		95					
SPT						3m: SPT 0// 0,0,0,0 N = 0						
				3.2m: CLAY with trace organics and sand; light grey. Soft, saturated, high plasticity. Organics; decomposing rootlets. Sand; fine.	CH	3m: IBHSV 26/5 kPa	100					
HQ3	50	4		**3.75m:** Organic CLAY; dark brown. Soft, saturated, high plasticity. Organics; rootlets and moderately spaced, amorphous peat lenses.			100					
U54				**4m to 4.5m:**...PUSH TUBE SAMPLE	OH	4m: IBHSV 17/5 kPa	100					
SPT	49	5		**4.5m:** Organic CLAY; dark brown. Firm, saturated, high plasticity. Organics; decomposing rootlets and amorphous peat lens.	OH	4.5m: SPT 0// 0,0,0,0 N = 0						
				4.65m: CORE LOSS			33					
					OH		38					

REMARKS:
1. Investigation collar is recorded to an accuracy of ±8 mm horizontal and ±15mm vertical, using Leica GS16 GNSS RTK Rover and Leica CS20 Field Controller in single baseline RTK configuration.
2. Standpipe piezometer and galvanised upstand installed upon completion of drilling.
3. Peat classification derived from Von-Post Humification Scale [Peat H1-H10]
4. Pushtube samples logged from extruded sample photo.

Hand Shear Vane Serial No: DR4938 Correction Factor: 1.491

Water Level Readings:
Date Time | Hole Depth | Water Level
(1) 19/04/23 10:00 | m | 0 m Bgl
(2) 01/05/23 10:30 | m | 0 m Bgl

Box 1
Database File: SPARK DC_523578__GINTMASTER.GPJ **Library file:** AURECON_AKL_20220728.GLB **Template:** AURECON_AKL_20170201.GDT **Report File:** AURECON DH LOG V3.9 0DP **Date Generated:** 1/06/2023

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Client: **Spark New Zealand**
Project: **Spark Data Centres**
Location: **1350 Dairy Flat Highway, Dairy Flat, AUCKLAND**
Project Reference: **523578**

AU23-BH03

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Morooka Tractor Rig
Contractor: DCN Drilling Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 389698.01m
Northing: 824682.96m
Reduced level: 53.59m (NZVD 2016)

Date started: 18/04/2023
Date completed: 19/04/2023
Inclination: -90°
Azimuth: -090°

Logged by: BC
Input by: BC
Reviewed by: AM
Verified by: RG

Method	R.L. (m)	Length (m)	Graphic Log	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Fracture Log (VWS WS MWS CS VCS ECS)	Stratigraphy Defect Description Additional Notes	Installation
Box 1 HQ3	48	6		**4.95m:** Organic CLAY; dark brown. Firm, saturated, high plasticity. Organics; decomposing rootlets and amorphous peat lenses.	OH							
				5.3m: Fibrous PEAT; black. Soft, saturated, low plasticity. Organics; decomposed wood and rootlets. [PEAT-H5]	PT							
				5.4m: CORE LOSS			38					
SPT				**6m:** Fibrous PEAT; black. Soft, saturated, low plasticity. Organics; decomposed wood and rootlets. [PEAT-H5]	PT	6m: SPT 0// 0,0,0,0 N = 0 6m: IBHSV 13/2 kPa	100					
HQ3	47	7		**6.3m:** Amorphous PEAT; black. Soft, saturated, low plasticity. [PEAT-H7]	PT							
				6.75m: CORE LOSS			29				6.75m to 7.5m: No Recovery.	
SPT	46	8		**7.5m:** Organic CLAY, trace silt; dark brown. Soft, saturated, high plasticity. Organics; black inclusions.	OH	7.5m: SPT 0// 0,0,0,0 N = 0	100					
Box 2 HQ3				**8.2m:** Fibrous PEAT; black. Soft, saturated, low plasticity. Organics; decomposing wood and plant material with some organics amorphous. [PEAT-H4]	PT		100					
	45	9		**8.5m:** CLAY with trace organics and sand; light grey. Firm, wet, high plasticity. Organics; rootlets, fibrous wood inclusions. Sand; fine.								
SPT					CH	9m: SPT 0// 0,0,0,1 N = 1 9m: IBHSV 29/5 kPa	100					
HQ3	44	10					86					

REMARKS:
1. Investigation collar is recorded to an accuracy of ±8 mm horizontal and ±15mm vertical, using Leica GS16 GNSS RTK Rover and Leica CS20 Field Controller in single baseline RTK configuration.
2. Standpipe piezometer and galvanised upstand installed upon completion of drilling.
3. Peat classification derived from Von-Post Humification Scale [Peat H1-H10]
4. Pushtube samples logged from extruded sample photo.

Hand Shear Vane Serial No: DR4938 Correction Factor: 1.491

Water Level Readings:
Date Time | Hole Depth | Water Level
(1) 19/04/23 10:00 | m | 0 m Bgl
(2) 01/05/23 10:30 | m | 0 m Bgl

Database File: SPARK DC_523578__GINTMASTER.GPJ **Library file:** AURECON_AKL_20220728.GLB **Template:** AURECON_AKL_20170201.GDT **Report File:** AURECON DH LOG V3.9 0DP **Date Generated:** 1/06/2023

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Project: **Spark Data Centres**
Location: **1350 Dairy Flat Highway, Dairy Flat, AUCKLAND**
Project Reference: **523578**

AU23-BH03

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Morooka Tractor Rig
Contractor: DCN Drilling Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 389698.01m
Northing: 824682.96m
Reduced level: 53.59m (NZVD 2016)

Date started: 18/04/2023
Date completed: 19/04/2023
Inclination: -90°
Azimuth: -090°

Logged by: BC
Input by: BC
Reviewed by: AM
Verified by: RG

Method	R.L. (m)	Length (m)	Graphic Log	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Fracture Log (VWS WS MWS CS VCS ECS)	Stratigraphy Defect Description Additional Notes	Installation
HQ3				**10m:** Completety weathered, light grey, LIMESTONE; extremely weak; Recovered as a *Silty CLAY, trace organics. Firm, saturated, high plasticity. Organics; fibrous, rootlets.* [MAHURANGI LIMESTONE]	CW						**10m: NORTHLAND ALLOCHTHON - MAHURANGI LIMESTONE**	
SPT	43	11		**10.2m:** Moderately to slightly weathered, light grey, pervasively sheared LIMESTONE. Very weak to weak, massive, extremely closely spaced. Breaks along shear planes into a *Fine to coarse GRAVEL; angular.* .	MW	10.5m: SPT 15// 12,12,13,19 N = 56	86 67		0			
HQ3	42	12		**10.95m:** CORE LOSS **11.5m:** Moderately to slightly weathered, light grey, pervasively sheared LIMESTONE. Very weak to weak, massive, extremely closely spaced. Breaks along shear planes into a *Fine to coarse GRAVEL; angular.* .			48		0		10.95m to 11.5m: Core dropped, did not recover. 11.65m to 11.9m: CZ	
SPT	41	13		**12.5m:**...black and purple staining on gravel faces.	MW	12m: SPT 50 for 145mm// N = 50+ 13.5m: SPT 50 for 90mm// N = 50+	56 100		0 0		12.7m: JT 45° UnSm Cn Closed 12.75m: JT 2° UnRo Cn Horizontal failure plane Closed 13.05m: JT 40° UnSm Cn Closed 13.1m: JT 60° UnRo Cn Closed 13.4m: JT 68° UnSm Cn Closed	
HQ3	40	14					67		0		13.95m: JT 41° UnRo Cn Closed 14m: JT 55° UnSm Cn Closed	
SPT	39	15					95		0		14.5m: JT 60° UnRo Cn Closed	

REMARKS:
1. Investigation collar is recorded to an accuracy of ±8 mm horizontal and ±15mm vertical, using Leica GS16 GNSS RTK Rover and Leica CS20 Field Controller in single baseline RTK configuration.
2. Standpipe piezometer and galvanised upstand installed upon completion of drilling.
3. Peat classification derived from Von-Post Humification Scale [Peat H1-H10]
4. Pushtube samples logged from extruded sample photo.

Hand Shear Vane Serial No: DR4938 Correction Factor: 1.491

Water Level Readings:
Date Time | Hole Depth | Water Level
(1) 19/04/23 10:00 | m | 0 m Bgl
(2) 01/05/23 10:30 | m | 0 m Bgl

Database File: SPARK DC_523578__GINTMASTER.GPJ **Library file:** AURECON_AKL_20220728.GLB **Template:** AURECON_AKL_20170201.GDT **Report File:** AURECON DH LOG V3.9 0DP **Date Generated:** 1/06/2023

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Project: **Spark Data Centres**
Location: **1350 Dairy Flat Highway, Dairy Flat, AUCKLAND**
Project Reference: **523578**

AU23-BH03

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Morooka Tractor Rig
Contractor: DCN Drilling Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 389698.01m
Northing: 824682.96m
Reduced level: 53.59m (NZVD 2016)

Date started: 18/04/2023
Date completed: 19/04/2023
Inclination: -90°
Azimuth: -090°

Logged by: BC
Input by: BC
Reviewed by: AM
Verified by: RG

Method	R.L. (m)	Length (m)	Graphic Log	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Fracture Log (VWS WS MWS CS VCS ECS)	Stratigraphy Defect Description Additional Notes	Installation
SPT					MW	15m: SPT 40// 27 for 70mm N = 50+	49		0			

Box 4

End of borehole at 15.22m (Target depth reached)

REMARKS:
1. Investigation collar is recorded to an accuracy of ±8 mm horizontal and ±15mm vertical, using Leica GS16 GNSS RTK Rover and Leica CS20 Field Controller in single baseline RTK configuration.
2. Standpipe piezometer and galvanised upstand installed upon completion of drilling.
3. Peat classification derived from Von-Post Humification Scale [Peat H1-H10]
4. Pushtube samples logged from extruded sample photo.

Hand Shear Vane Serial No: DR4938 Correction Factor: 1.491

Water Level Readings:
Date Time | Hole Depth | Water Level
(1) 19/04/23 10:00 | m | 0 m Bgl
(2) 01/05/23 10:30 | m | 0 m Bgl

Database File: SPARK DC_523578__GINTMASTER.GPJ **Library file:** AURECON_AKL_20220728.GLB **Template:** AURECON_AKL_20170201.GDT **Report File:** AURECON DH LOG V3.9 0DP **Date Generated:** 1/06/2023

SPARK-DC

Borehole Reference:	**AU23-BH03**	Date Drilled:	**18/04/2023-19/04/2023**
Photographed By:	**BC**	Date Photographed:	**18/04/2023-19/04/2023**



Box 1. - Depth: 0.00 m to 6.00 m.



Box 2. - Depth: 6.00m to 10.50m.

SPARK-DC

Borehole Reference:	**AU23-BH03**	Date Drilled:	**18/04/2023-19/04/2023**
Photographed By:	**BC**	Date Photographed:	**18/04/2023-19/04/2023**



Box 3. - Depth: 10.50 m to 14.25 m.



Box 4. - Depth: 14.25 m to 15.22 m.

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Client: **Spark New Zealand**
Project: **Spark Data Centres**
Location: **1350 Dairy Flat Highway, Dairy Flat, AUCKLAND**
Project Reference: **523578**

AU23-BH04

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Morooka Tractor Rig
Contractor: DCN Drilling Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 389621.98m
Northing: 824682.28m
Reduced level: 53.45m (NZVD 2016)

Date started: 19/04/2023
Date completed: 20/04/2023
Inclination: -90°
Azimuth: -090°

Logged by: BC
Input by: BC
Reviewed by: AM
Verified by: RG

Method	R.L. (m)	Length (m)	Graphic Log	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Fracture Log (VWS WS MWS CS VCS ECS)	Stratigraphy Defect Description Additional Notes	Installation
HQ3	53			**0m:** Organic SILT with trace clay; dark brown. Stiff, wet, high plasticity. [TOPSOIL]	OL						**0m: TOPSOIL**	
HQ3				**0.4m:** Organic silty CLAY; dark brown. Firm, wet, high plasticity. Organics; decomposing fibrous wood and tree sap. [TAURANGA GROUP] **0.6m to 0.7m:**...piece of tree sap.	OH		100				**0.4m: TAURANGA GROUP**	
HQ3		1		**0.9m:** CLAY with minor silt and organics; light brown. Firm, wet, high plasticity. Organics; decomposing wood fragments.	CH							
SPT	52			**1.2m:** Organic CLAY; black. Soft to firm, saturated, high plasticity. Organics; fibrous wood, decomposing plant material.	OH	1.5m: SPT 0// 0,0,0,0 N = 0	56					
HQ3		2		**1.8m:** Fibrous PEAT; black. Soft, saturated, moderate plasticity. [PEAT- H5]	PT		100					
HQ3	51	3				3m: SPT 0// 0,0,0,0 N = 0 3m: IBHSV 29/4 kPa						
SPT				**3.1m:** CLAY with minor organics and trace silt. Soft, saturated, high plasticity, sensitive. Organics; decomposing plant matter, small black inclusions.	CH		100					
HQ3	50	4		**3.9m:** Organic CLAY; brownish grey. Soft, wet, high plasticity. Organics; decomposing fibrous plant material and amorphous peat lenses.	OH		100					
SPT	49					4.5m: SPT 0// 0,0,0,0 N = 0 4.5m: IBHSV 23/5 kPa	78					
		5		**4.9m:**...gradational colour change to dark brown, fibrous wood			100					

Box 1
Box 2

REMARKS:
1. Investigation collar is recorded to an accuracy of ±8 mm horizontal and ±15mm vertical, using Leica GS16 GNSS RTK Rover and Leica CS20 Field Controller in single baseline RTK configuration.
2. Standpipe piezometer and galvanised upstand installed upon completion of drilling.
3. Additional peat classification derived from Von-Post Humification Scale [Peat H1-H10]
4. Pushtube samples logged from extruded sample photo.

Hand Shear Vane Serial No: DR4940 Correction Factor: 1.491

Water Level Readings:
Date Time | Hole Depth | Water Level
(1) 20/04/23 14:00 | m | 0 m bgl

Database File: SPARK DC_523578__GINTMASTER.GPJ **Library file:** AURECON_AKL_20220728.GLB **Template:** AURECON_AKL_20170201.GDT **Report File:** AURECON DH LOG V3.9 0DP **Date Generated:** 1/06/2023

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Client: **Spark New Zealand**
Project: **Spark Data Centres**
Location: **1350 Dairy Flat Highway, Dairy Flat, AUCKLAND**
Project Reference: **523578**

AU23-BH04

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Morooka Tractor Rig
Contractor: DCN Drilling Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 389621.98m
Northing: 824682.28m
Reduced level: 53.45m (NZVD 2016)

Date started: 19/04/2023
Date completed: 20/04/2023
Inclination: -90°
Azimuth: -090°

Logged by: BC
Input by: BC
Reviewed by: AM
Verified by: RG

Method	R.L. (m)	Length (m)	Graphic Log	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Fracture Log (VWS WS MWS CS VCS ECS)	Stratigraphy Defect Description Additional Notes	Installation
HQ3	48			inclusions. **3.9m:** Organic CLAY; brownish grey. Soft, wet, high plasticity. Organics; decomposing fibrous plant material and amorphous peat lenses.	OH		100					
SPT		6		**5.7m:** Organic CLAY; light grey to dark brown. Firm, saturated, high plasticity, sensitive to extra sensitive. Organics; fibrous wood, decomposing plant material.		6m: SPT 0// 0,0,0,0 N = 0 6m: IBHSV 29/5 kPa	78					
HQ3	47	7		**6.4m:**...gradational colour change to dark brown.	OH		100					
SPT	46	8		**7.35m:** Amorphous PEAT; black. Soft, saturated, low plasticity. [PEAT-H6]	PT	7.5m: SPT 0// 0,0,0,0 N = 0 7.5m: IBHSV 17/2 kPa	100					
HQ3	45	9		**8.1m:** CLAY with minor organics; light grey. Soft to firm, saturated, high plasticity, sensitive to extra sensitive. Organics; decomposing plant material.	CH	9m: SPT 0// 0,0,0,0 N = 0 9m: IBHSV 26/5 kPa	100					
SPT	44						100					
HQ3				**9.5m:** Completely weathered, light grey, indistinctly bedded LIMESTONE; extremely weak; Recovered as a *Clayey SILT, light grey. Firm, wet, low plasticity.* [MAHURANGI LIMESTONE]	CW						**9.5m: NORTHLAND ALLOCHTHON - MAHURANGI LIMESTONE**	
		10		**9.7m:** Moderately weathered, pervasively sheared LIMESTONE; Very weak, massive, extremely closely spaced. Breaks along shear planes, recovered as a *Medium to coarse GRAVEL; angular, 10-60mm.*	MW		100		0			

Box 2 | Box 3 | Box 4

REMARKS:
1. Investigation collar is recorded to an accuracy of ±8 mm horizontal and ±15mm vertical, using Leica GS16 GNSS RTK Rover and Leica CS20 Field Controller in single baseline RTK configuration.
2. Standpipe piezometer and galvanised upstand installed upon completion of drilling.
3. Additional peat classification derived from Von-Post Humification Scale [Peat H1-H10]
4. Pushtube samples logged from extruded sample photo.

Hand Shear Vane Serial No: DR4940 Correction Factor: 1.491

Water Level Readings:
Date Time | Hole Depth | Water Level
(1) 20/04/23 14:00 | m | 0 m bgl

Database File: SPARK DC_523578__GINTMASTER.GPJ **Library file:** AURECON_AKL_20220728.GLB **Template:** AURECON_AKL_20170201.GDT **Report File:** AURECON DH LOG V3.9 0DP **Date Generated:** 1/06/2023

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Client: **Spark New Zealand**
Project: **Spark Data Centres**
Location: **1350 Dairy Flat Highway, Dairy Flat, AUCKLAND**
Project Reference: **523578**

AU23-BH04

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Morooka Tractor Rig
Contractor: DCN Drilling Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 389621.98m
Northing: 824682.28m
Reduced level: 53.45m (NZVD 2016)

Date started: 19/04/2023
Date completed: 20/04/2023
Inclination: -90°
Azimuth: -090°

Logged by: BC
Input by: BC
Reviewed by: AM
Verified by: RG

Method	R.L. (m)	Length (m)	Graphic Log	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Fracture Log (VWS WS MWS CS VCS ECS)	Stratigraphy Defect Description Additional Notes	Installation
HQ3	43			**9.7m:** Moderately weathered, pervasively sheared LIMESTONE; Very weak, massive, extremely closely spaced. Breaks along shear planes, recovered as a *Medium to coarse GRAVEL; angular, 10-60mm.*	MW		100		0		10m: JT 39° UnSm Cn Closed	
SPT				**10.5m:** Slightly weathered, greenish grey, pervasively sheared, LIMESTONE; Weak to moderately strong, extremely closely spaced, massive. Breaks along shear planes, to a *fine to coarse GRAVEL; angular, 10-60mm,* when disturbed.		10.5m: SPT 36// 25 for 60mm N = 50+	100		0			
HQ3		11					94		0		10.95m: JT 86° UnSm Cn Closed	
HQ3	42			**11.25m to 11.6m:**...Core washout, recovered as smooth gravels.	SW		53		0		11.8m to 12m: CZ	
SPT		12				12m: SPT 34// 20,25,5 for 10mm N = 50+	100		0			
				End of borehole at 12.31m (Target depth reached)								

Box 4

REMARKS:
1. Investigation collar is recorded to an accuracy of ±8 mm horizontal and ±15mm vertical, using Leica GS16 GNSS RTK Rover and Leica CS20 Field Controller in single baseline RTK configuration.
2. Standpipe piezometer and galvanised upstand installed upon completion of drilling.
3. Additional peat classification derived from Von-Post Humification Scale [Peat H1-H10]
4. Pushtube samples logged from extruded sample photo.

Hand Shear Vane Serial No: DR4940 Correction Factor: 1.491

Water Level Readings:
Date Time | Hole Depth | Water Level
(1) 20/04/23 14:00 | m | 0 m bgl

Database File: SPARK DC_523578__GINTMASTER.GPJ **Library file:** AURECON_AKL_20220728.GLB **Template:** AURECON_AKL_20170201.GDT **Report File:** AURECON DH LOG V3.9 0DP **Date Generated:** 1/06/2023

SPARK-DC

Borehole Reference:	**AU23-BH04**	Date Drilled:	**19/04/2023-19/04/2023**
Photographed By:	**BC**	Date Photographed:	**19/04/2023-19/04/2023**



Box 1. - Depth: 0.00 m to 3.00 m.



Box 2. - Depth: 3.00m to 6.60m.

SPARK-DC

Borehole Reference:	**AU23-BH04**	Date Drilled:	**19/04/2023-19/04/2023**
Photographed By:	**BC**	Date Photographed:	**19/04/2023-19/04/2023**



Box 3. - Depth: 6.60 m to 9.85 m.



Box 4. - Depth: 9.85 m to 12.31m.

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Client: **Spark New Zealand**
Project: **Spark Data Centres**
Location: **1350 Dairy Flat Highway, Dairy Flat, AUCKLAND**
Project Reference: **523578**

AU23-BH05

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Morooka Tractor Rig
Contractor: DCN Drilling Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 389679.95m
Northing: 824635.09m
Reduced level: 53.58m (NZVD 2016)

Date started: 27/04/2023
Date completed: 28/04/2023
Inclination: -90°
Azimuth: -090°

Logged by: BC
Input by: BC
Reviewed by: AM
Verified by: RG

Method	R.L. (m)	Length (m)	Graphic Log	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Fracture Log (VWS WS MWS CS VCS ECS)	Stratigraphy Defect Description Additional Notes	Installation
HQ3				**0m:** Silty CLAY with some fine gravel and trace rootlets; light brown, mottled black. Stiff, moist, high plasticity. Gravel; fine, angular. [TOPSOIL]	CL-ML						**0m: TOPSOIL**	
				0.2m:...Piece of Tree sap, 10mm.			100					
				0.25m: Organic silty CLAY with minor fibrous wood and rootlets; light brown, mottled black. Hard, wet, high plasticity. Organics; fibrous wood inclusions, rootlets. [TAURANGA GROUP]	OH						**0.25m: TAURANGA GROUP**	
	53					0.5m: IBHSV UTP						
HQ3		1		**0.6m:** Organic CLAY; dark brown mottled black. Firm to hard, wet, high plasticity, moderately sensitive. Organics; decomposing wood fragments, rootlets and bark.	OH		100					
	52			**1.45m:** Fibrous PEAT; black. Soft to firm, saturated, high plasticity, moderately sensitive to quick. Organics; moderately decomposed, black fibrous wood material and rootlets. [PEAT-H5]	PT	1.5m: SPT 0// 0,0,0,0 N = 0	0					
SPT						1.5m: IBHSV 26/7 kPa						
		2										
HQ3	51						100					
		3				3m: SPT 0// 0,0,0,0 N = 0						
SPT				**3.15m:** Organic CLAY; dark brown. Soft, saturated, high plasticity, quick. Organics; wood inclusions, rootlets.	OH	3m: IBHSV 17/0 kPa	100					
				3.4m:...Wood lens, 10mm.								
	50			**3.5m:** CLAY with minor organics; light grey. Soft, saturated, high plasticity, quick. Organics; fibrous inclusions, wood and rootlets.	CH							
		4		**3.95m:** Organic CLAY; light brown and light grey. Soft, saturated, high plasticity, quick. Organics; fibrous wood inclusions, rootlets.	OH							
HQ3				**4.1m:** Organic CLAY; dark brown, mottled black. Soft, saturated, high plasticity, sensitive to quick. Organics; rootlets and fibrous wood fragments.			100					
				4.35m:...Wood, 15mm.								
	49				OH	4.5m: IBHSV 14/0 kPa						
		5										

Box 1
Box 2

REMARKS:
1. Investigation collar is recorded to an accuracy of ±8 mm horizontal and ±15mm vertical, using Leica GS16 GNSS RTK Rover and Leica CS20 Field Controller in single baseline RTK configuration.
2. Standpipe piezometer and galvanised upstand installed upon completion of drilling.
3. Peat classification derived from Von-Post Humification Scale [Peat H1-H10]

Hand Shear Vane Serial No: DR4940 Correction Factor: 1.491

Water Level Readings:
Date Time | Hole Depth | Water Level
No water level recorded

Database File: SPARK DC_523578__GINTMASTER.GPJ **Library file:** AURECON_AKL_20220728.GLB **Template:** AURECON_AKL_20170201.GDT **Report File:** AURECON DH LOG V3.9 0DP **Date Generated:** 1/06/2023

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Client: **Spark New Zealand**
Project: **Spark Data Centres**
Location: **1350 Dairy Flat Highway, Dairy Flat, AUCKLAND**
Project Reference: **523578**

AU23-BH05

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Morooka Tractor Rig
Contractor: DCN Drilling Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 389679.95m
Northing: 824635.09m
Reduced level: 53.58m (NZVD 2016)

Date started: 27/04/2023
Date completed: 28/04/2023
Inclination: -90°
Azimuth: -090°

Logged by: BC
Input by: BC
Reviewed by: AM
Verified by: RG

Method	R.L. (m)	Length (m)	Graphic Log	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Fracture Log (VWS WS MWS CS VCS ECS)	Stratigraphy Defect Description Additional Notes	Installation
SPT				**4.1m:** Organic CLAY; dark brown, mottled black. Soft, saturated, high plasticity, sensitive to quick. Organics; rootlets and fibrous wood fragments.	OH	5m: SPT 3// 0,1,0,1 N = 2	100					
HQ3	48						76					
		6		**5.9m:** CLAY with trace organics; light brown to light grey. Soft, saturated, high plasticity, sensitive. Organics; rootlets.	CH							
SPT				**6m:** Organic CLAY; light grey. Soft, saturated, high plasticity, sensitive. Organics; rootlets and fibrous material.	OH	6m: SPT 0// 0,0,0,0 N = 0 6m: IBHSV 17/4 kPa	100					
HQ3	47			**6.5m:** Amorphous PEAT; black. Soft, saturated, high plasticity. [PEAT-H8]	PT							
		7					100					
				7.1m: Organic CLAY; brown and light brown. Soft, saturated, high plasticity, sensitive to extra sensitive. Fibrous organics; rootlets.								
SPT	46			**7.7m:**...fibrous wood.	OH	7.5m: SPT 0// 0,0,0,0 N = 0 7.5m: IBHSV 17/2 kPa	100					
		8										
HQ3				**8.1m:** CLAY with trace organics; light grey. Soft to firm, saturated, high plasticity, sensitive to extra sensitive. Organics; fibrous decomposing rootlets.	CH		100					
	45											
		9				9m: SPT 0// 0,1,1,3 N = 5 9m: IBHSV 29/7 kPa						
SPT				**9.1m:** Completely weathered, light grey, LIMESTONE; extremely weak; Recovered as a *silty CLAY; firm, saturated, high plasticity.*	CW		100		0		**9.1m: NORTHLAND ALLOCHTHON - MAHURANGI LIMESTONE**	
HQ3	44			**9.4m:** Highly weathered, light grey, pervasively sheared LIMESTONE; very weak, extremely closely spaced. Recovered as *silty GRAVEL; angular.* due to pervasive shearing. [MAHURANGI LIMESTONE]	CW		82		0		9.4m: Drillers mud added to improve recovery.	
		10			MW							

Box 2
Box 3

REMARKS:
1. Investigation collar is recorded to an accuracy of ±8 mm horizontal and ±15mm vertical, using Leica GS16 GNSS RTK Rover and Leica CS20 Field Controller in single baseline RTK configuration.
2. Standpipe piezometer and galvanised upstand installed upon completion of drilling.
3. Peat classification derived from Von-Post Humification Scale [Peat H1-H10]

Hand Shear Vane Serial No: DR4940 Correction Factor: 1.491

Water Level Readings:
Date Time | Hole Depth | Water Level
No water level recorded

Database File: SPARK DC_523578__GINTMASTER.GPJ **Library file:** AURECON_AKL_20220728.GLB **Template:** AURECON_AKL_20170201.GDT **Report File:** AURECON DH LOG V3.9 0DP **Date Generated:** 1/06/2023

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Project: **Spark Data Centres**
Location: **1350 Dairy Flat Highway, Dairy Flat, AUCKLAND**
Project Reference: **523578**

AU23-BH05

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Morooka Tractor Rig
Contractor: DCN Drilling Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 389679.95m
Northing: 824635.09m
Reduced level: 53.58m (NZVD 2016)

Date started: 27/04/2023
Date completed: 28/04/2023
Inclination: -90°
Azimuth: -090°

Logged by: BC
Input by: BC
Reviewed by: AM
Verified by: RG

Method	R.L. (m)	Length (m)	Graphic Log	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Fracture Log (VWS WS MWS CS VCS ECS)	Stratigraphy Defect Description Additional Notes	Installation
HQ3				**9.85m:** Moderately weathered, greenish grey, pervasively sheared LIMESTONE; very weak, extremely closely spaced, massive. Breaks down to a *coarse GRAVEL; angular 20mm-60mm* , when disturbed.			82		0		10.3m to 10.5m: Core Loss.	
SPT	43					10.5m: SPT 31// 29 N = 50+	100		0			
HQ3							100		0			
HQ3		11			MW		100		0		11.1m: JT 68° UnSm Cn Closed	
HQ3	42										11.65m: JT 35° UnSm Cn Closed	
SPT		12				12m: SPT 50 for 145mm// N = 50+	100		0			

End of borehole at 12.15m (Target depth reached)

REMARKS:
1. Investigation collar is recorded to an accuracy of ±8 mm horizontal and ±15mm vertical, using Leica GS16 GNSS RTK Rover and Leica CS20 Field Controller in single baseline RTK configuration.
2. Standpipe piezometer and galvanised upstand installed upon completion of drilling.
3. Peat classification derived from Von-Post Humification Scale [Peat H1-H10]

Hand Shear Vane Serial No: DR4940 Correction Factor: 1.491

Water Level Readings:
Date Time | Hole Depth | Water Level
No water level recorded

Database File: SPARK DC_523578__GINTMASTER.GPJ **Library file:** AURECON_AKL_20220728.GLB **Template:** AURECON_AKL_20170201.GDT **Report File:** AURECON DH LOG V3.9 0DP **Date Generated:** 1/06/2023

SPARK-DC

Borehole Reference:	**AU23-BH05**	Date Drilled:	**27/04/2023-28/04/2023**
Photographed By:	**BC**	Date Photographed:	**27/04/2023-28/04/2023**



Box 1 - Depth: 0.00 m to 3.60 m.



Box 2 - Depth: 3.60m to 7.20m.

SPARK-DC

Borehole Reference:	**AU23-BH05**	Date Drilled:	**27/04/2023-28/04/2023**
Photographed By:	**BC**	Date Photographed:	**27/04/2023-28/04/2023**



Box 3 - Depth: 7.20 m to 10.80 m.



Box 4 - Depth: 10.80 m to 12.145m.

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Client: **Spark New Zealand**
Project: **Spark Data Centres**
Location: **1350 Dairy Flat Highway, Dairy Flat, AUCKLAND**
Project Reference: **523578**

AU23-BH06

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Morooka Tractor Rig
Contractor: DCN Drilling Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 389759.72m
Northing: 824635.26m
Reduced level: 54.16m (NZVD 2016)

Date started: 21/04/2023
Date completed: 21/04/2023
Inclination: -90°
Azimuth: -090°

Logged by: BC
Input by: BC
Reviewed by: AM
Verified by: RG

Method	R.L. (m)	Length (m)	Graphic Log	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Fracture Log (VWS WS MWS CS VCS ECS)	Stratigraphy Defect Description Additional Notes	Installation
HQ3	54			**0m:** Organic SILT with minor clay. Firm, wet, low plasticity. Organics; trace rootlets. [TOPSOIL]	OL		100				**0m: TOPSOIL**	
U54		1		**0.4m:** Organic CLAY with trace silt; light brown. Firm, wet, high plasticity. Organics; trace black organic inclusions, rootlets. [TAURANGA GROUP] **0.5m to 1m:**...PUSH TUBE SAMPLE	OH		100				**0.4m: TAURANGA GROUP**	
HQ3	53			**1m:** CLAY with trace silt and organics; light brown. Firm, wet, high plasticity. Organics; trace amorphous inclusions and rootlets.	CH		100					
SPT		2		**1.7m:** Organic CLAY; dark brown and black. Firm, saturated, high plasticity. Organics; fibrous wood, rootlets, decomposing fibrous plant material.	OH	1.5m: SPT 0// 0,0,0,0 N = 0	100					
HQ3	52	3		**2m:** Fibrous PEAT; black. Soft, saturated, high plasticity. Organics; moderately decomposed wood and rootlets. [PEAT-H5].	PT		100					
SPT	51			**3m:** Organic CLAY; light brown. Stiff, saturated, high plasticity, sensitive. Organics; black fibrous organic inclusions.	OH	3m: SPT 0// 0,0,0,0 N = 0	100					
HQ3		4		**3.15m:** CLAY with trace organics; light grey. Stiff, saturated, high plasticity, sensitive. Organics; decomposing indistinct fibrous organics.	CH	3m: IBHSV 59/11 kPa						
SPT	50	5		**4.05m:** Organic CLAY with minor peat lenses; brown and dark brown. Soft, saturated, highly plastic, sensitive. Organics; decomposed fibrous wood and amorphous peat.	OH	4.5m: SPT 0// 0,0,0,0 N = 0 4.5m: IBHSV 23/5 kPa	100					

Box 1
Box 2

REMARKS:
1. Investigation collar is recorded to an accuracy of ±8 mm horizontal and ±15mm vertical, using Leica GS16 GNSS RTK Rover and Leica CS20 Field Controller in single baseline RTK configuration.
2. Standpipe piezometer and galvanised upstand installed upon completion of drilling.
3. Peat classification derived from Von-Post Humification Scale [Peat H1-H10]
4. Pushtube samples logged from extruded sample photo.

Hand Shear Vane Serial No: DR4940 Correction Factor: 1.491

Water Level Readings:
Date Time | Hole Depth | Water Level
(1) 01/05/23 12:00 | m | 0.37 m bgl

Database File: SPARK DC_523578__GINTMASTER.GPJ **Library file:** AURECON_AKL_20220728.GLB **Template:** AURECON_AKL_20170201.GDT **Report File:** AURECON DH LOG V3.9 0DP **Date Generated:** 1/06/2023

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Client: **Spark New Zealand**
Project: **Spark Data Centres**
Location: **1350 Dairy Flat Highway, Dairy Flat, AUCKLAND**
Project Reference: **523578**

AU23-BH06

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Morooka Tractor Rig
Contractor: DCN Drilling Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 389759.72m
Northing: 824635.26m
Reduced level: 54.16m (NZVD 2016)

Date started: 21/04/2023
Date completed: 21/04/2023
Inclination: -90°
Azimuth: -090°

Logged by: BC
Input by: BC
Reviewed by: AM
Verified by: RG

Method	R.L. (m)	Length (m)	Graphic Log	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Fracture Log (VWS WS MWS CS VCS ECS)	Stratigraphy Defect Description Additional Notes	Installation
HQ3	49			**4.05m:** Organic CLAY with minor peat lenses; brown and dark brown. Soft, saturated, highly plastic, sensitive. Organics; decomposed fibrous wood and amorphous peat.	OH							
HQ3				**5.4m:** Organic CLAY; light brown. Soft, saturated, highly plastic, sensitive. Organics; black organic inclusions, rootlets. **5.5m to 5.6m:**...Peat lense [PEAT-H4]	OH OH		100					
SPT	48	6		**5.9m:** CLAY with minor organics; light grey and light brownish grey. Soft, saturated, high plasticity, sensitive. Organics; decomposing fibrous plant material and wood.	CH	6m: SPT 0// 0,0,0,0 N = 0 6m: IBHSV 20/5 kPa	100					
HQ3	47	7		**6.55m to 6.75m:**...gradational colour change to light grey. **6.75m:** CLAY with trace organics; light grey. Soft to stiff, saturated, highly plastic, moderately sensitive. Organics; fibrous inclusions and rootlets.	CH		100					
SPT						7.5m: SPT 0// 0,0,1,0 N = 1 7.5m: IBHSV 59/16 kPa	100					
HQ3	46	8		**7.75m:** Completely weathered, light grey, LIMESTONE; extremely weak; Recovered as a *silty CLAY; stiff, wet, high plasticity.* [MAHURANGI LIMESTONE]	CW						**7.75m: NORTHLAND ALLOCHTHON - MAHURANGI LIMESTONE**	
				8.15m: Highly weathered, light grey, pervasively sheared LIMESTONE; very weak, extremely closely spaced. Breaks down to a *GRAVEL; angular, 10-30mm*, on shear planes. **8.2m:**...purple and green staining on fracture faces.	CW							
				8.5m: Slightly weathered, light grey, pervasively sheared LIMESTONE; weak, extremely closely spaced, massive. Breaks down to *GRAVEL; angular, 10-80mm*, when disturbed.			100		0		8.75m: JT 20° UnSm Cn Closed 8.8m: JT 40° UnSm Cn Closed	
SPT	45	9			MW	9m: SPT 50// N = 50+	100		0		9.1m to 9.6m: SZ	
HQ3							100		0		9.4m: JT 40° UnSm Cn Closed 9.5m: JT 45° UnSm Cn Closed 9.6m to 9.8m: CZ	
HQ3		10					71		0			

REMARKS:
1. Investigation collar is recorded to an accuracy of ±8 mm horizontal and ±15mm vertical, using Leica GS16 GNSS RTK Rover and Leica CS20 Field Controller in single baseline RTK configuration.
2. Standpipe piezometer and galvanised upstand installed upon completion of drilling.
3. Peat classification derived from Von-Post Humification Scale [Peat H1-H10]
4. Pushtube samples logged from extruded sample photo.

Hand Shear Vane Serial No: DR4940 Correction Factor: 1.491

Water Level Readings:
Date Time | Hole Depth | Water Level
(1) 01/05/23 12:00 | m | 0.37 m bgl

Database File: SPARK DC_523578__GINTMASTER.GPJ Library file: AURECON_AKL_20220728.GLB Template: AURECON_AKL_20170201.GDT Report File: AURECON DH LOG V3.9 0DP Date Generated: 1/06/2023

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Project: **Spark Data Centres**
Location: **1350 Dairy Flat Highway, Dairy Flat, AUCKLAND**
Project Reference: **523578**

AU23-BH06

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Morooka Tractor Rig
Contractor: DCN Drilling Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 389759.72m
Northing: 824635.26m
Reduced level: 54.16m (NZVD 2016)

Date started: 21/04/2023
Date completed: 21/04/2023
Inclination: -90°
Azimuth: -090°

Logged by: BC
Input by: BC
Reviewed by: AM
Verified by: RG

Method	R.L. (m)	Length (m)	Graphic Log	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Fracture Log (VWS WS MWS CS VCS ECS)	Stratigraphy Defect Description Additional Notes	Installation
HQ3	44			**8.5m:** Slightly weathered, light grey, pervasively sheared LIMESTONE; weak, extremely closely spaced, massive. Breaks down to *GRAVEL; angular, 10-80mm*, when disturbed.	MW		71		0		9.99m to 10.5m: SZ 10m: JT 45° UnSlk Cn Closed 10.1m: JT 50° UnSm Cn Closed 10.3m: JT 30° UnSm Cn Closed	
SPT						10.5m: SPT 50 for 135mm// N = 50+	100		0			
				End of borehole at 10.64m (Target depth reached)								

Box 4

REMARKS:
1. Investigation collar is recorded to an accuracy of ±8 mm horizontal and ±15mm vertical, using Leica GS16 GNSS RTK Rover and Leica CS20 Field Controller in single baseline RTK configuration.
2. Standpipe piezometer and galvanised upstand installed upon completion of drilling.
3. Peat classification derived from Von-Post Humification Scale [Peat H1-H10]
4. Pushtube samples logged from extruded sample photo.

Hand Shear Vane Serial No: DR4940 Correction Factor: 1.491

Water Level Readings:
Date Time | Hole Depth | Water Level
(1) 01/05/23 12:00 | m | 0.37 m bgl

Database File: SPARK DC_523578__GINTMASTER.GPJ **Library file:** AURECON_AKL_20220728.GLB **Template:** AURECON_AKL_20170201.GDT **Report File:** AURECON DH LOG V3.9 0DP **Date Generated:** 1/06/2023

SPARK-DC

Borehole Reference:	**AU23-BH06**	Date Drilled:	**21/04/2023-21/04/2023**
Photographed By:	**BC**	Date Photographed:	**21/04/2023-21/04/2023**



Box 1. - Depth: 0.00 m to 4.00 m.



Box 2. - Depth: 4.00 to 7.40m.

SPARK-DC

Borehole Reference:	**AU23-BH06**	Date Drilled:	**21/04/2023-21/04/2023**
Photographed By:	**BC**	Date Photographed:	**21/04/2023-21/04/2023**



Box 3. - Depth: 7.40 m to 10.00 m.



Box 4. - Depth: 10.00 m to 10.64m

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Client: **Spark New Zealand**
Project: **Spark Data Centres**
Location: **1350 Dairy Flat Highway, Dairy Flat, AUCKLAND**
Project Reference: **523578**

AU23-BH07

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Morooka Tractor Rig
Contractor: DCN Drilling Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 389599.26m
Northing: 824594.63m
Reduced level: 53.66m (NZVD 2016)

Date started: 27/04/2023
Date completed: 27/04/2023
Inclination: -90°
Azimuth: -090°

Logged by: BC
Input by: BC
Reviewed by: AM
Verified by: RG

Method	R.L. (m)	Length (m)	Graphic Log	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Fracture Log (VWS WS MWS CS VCS ECS)	Stratigraphy Defect Description Additional Notes	Installation
HQ3				**0m:** Organic SILT; light brown. Hard, moist, low plasticity. Organics; some rootlets, black organic inclusions. [TOPSOIL]	OL						**0m: TOPSOIL**	
HQ3				**0.15m:** Organic CLAY with trace silt; light brown. Stiff, wet, high plasticity. Organics, fibrous organic inclusions, rootlets and tree sap. [TAURANGA GROUP]			100				**0.15m: TAURANGA GROUP**	
HQ3	53	1		**0.5m to 0.6m:**...100mm wood lens.	OH		100					
				1.2m: Organic CLAY; black. Firm, saturated, high plasticity, quick. Organics; fibrous material, rootlets.	OH	1.5m: SPT 0// 0,0,0,0 N = 0 1.5m: IBHSV 29/1 kPa						
SPT	52						100					
Box 1 HQ3		2		**1.8m:** PEAT; black. Soft to firm, saturated, high plasticity, extra sensitive to quick. Organics; fibrous wood inclusions, rootlets. Highly decomposed, indistinct plant structure [H4-H5].	PT		100						
	51	3				3m: SPT 0// 0,0,0,0 N = 0 3m: IBHSV 20/2 kPa						
SPT				**3.1m:** Organic CLAY; light brown and light grey. Soft, saturated, high plasticity, extra sensitive. Organics; trace organic fibres, rootlets, fibrous wood inclusions.			100					
HQ3	50	4			OH		100					
Box 2				**4m:** CLAY; light grey. Stiff, saturated, high plasticity, moderately sensitive.	CH							
HQ3	49	5		**4.5m:** PUSH TUBE SAMPLE - CLAY with trace organics; light brownish grey. Stiff, saturated, high plasticity, moderately sensitive. Organics; fibrous plant material.	CH	4.5m: IBHSV 56/20 kPa	100					

REMARKS:
1. Investigation collar is recorded to an accuracy of ±8 mm horizontal and ±15mm vertical, using Leica GS16 GNSS RTK Rover and Leica CS20 Field Controller in single baseline RTK configuration.
2. Standpipe piezometer and galvanised upstand installed upon completion of drilling.
3. Peat classification derived from Von-Post Humification Scale [Peat H1-H10]
4. Pushtube samples logged from extruded sample photo.

Hand Shear Vane Serial No: DR4940 Correction Factor: 1.491

Water Level Readings:
Date Time | Hole Depth | Water Level
(1) 01/05/23 12:30 | m | 0.2 m bgl

Database File: SPARK DC_523578__GINTMASTER.GPJ **Library file:** AURECON_AKL_20220728.GLB **Template:** AURECON_AKL_20170201.GDT **Report File:** AURECON DH LOG V3.9 0DP **Date Generated:** 1/06/2023

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Client: **Spark New Zealand**
Project: **Spark Data Centres**
Location: **1350 Dairy Flat Highway, Dairy Flat, AUCKLAND**
Project Reference: **523578**

AU23-BH07

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Morooka Tractor Rig
Contractor: DCN Drilling Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 389599.26m
Northing: 824594.63m
Reduced level: 53.66m (NZVD 2016)

Date started: 27/04/2023
Date completed: 27/04/2023
Inclination: -90°
Azimuth: -090°

Logged by: BC
Input by: BC
Reviewed by: AM
Verified by: RG

Method	R.L. (m)	Length (m)	Graphic Log	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Fracture Log (VWS WS MWS CS VCS ECS)	Stratigraphy Defect Description Additional Notes	Installation
SPT				**5m:** CLAY with trace organics; light grey with black streaks. Stiff, saturated, high plasticity, moderately sensitive. Organics; amorphous material.	CH	5m: SPT 0// 1,0,1,1 N = 3	100					
HQ3	48			**5.4m:** Completely weathered, light grey, LIMESTONE; extremely weak; Recovered as a *silty CLAY with minor gravel. Firm, saturated, high plasticity. Gravel; fine, angular.* [MAHURANGI LIMESTONE]	CW		100		0		**5.4m: NORTHLAND ALLOCHTHON - MAHURANGI LIMESTONE**	
SPT		6		**5.8m:** Moderately weathered, light grey, pervasively sheared, LIMESTONE; very weak, extremely closely spaced. Recovered as *silty GRAVEL; angular*	MW	6m: SPT 10// 10,13,17,10 for 40mm N = 50+	100		0			
HQ3	47	7		**6.1m:**...Recovered as medium to coarse GRAVEL; angular, 10-40mm.			100		0		7.1m to 7.3m: CZ 7.4m: JT 0-5° UnSm Cn	
SPT						7.5m: SPT 50 for 130mm// N = 50+	100		0			

Box 2
Box 3

End of borehole at 7.63m (Target depth reached)

REMARKS:
1. Investigation collar is recorded to an accuracy of ±8 mm horizontal and ±15mm vertical, using Leica GS16 GNSS RTK Rover and Leica CS20 Field Controller in single baseline RTK configuration.
2. Standpipe piezometer and galvanised upstand installed upon completion of drilling.
3. Peat classification derived from Von-Post Humification Scale [Peat H1-H10]
4. Pushtube samples logged from extruded sample photo.

Hand Shear Vane Serial No: DR4940 Correction Factor: 1.491

Water Level Readings:
Date Time | Hole Depth | Water Level
(1) 01/05/23 12:30 | m | 0.2 m bgl

Database File: SPARK DC_523578__GINTMASTER.GPJ **Library file:** AURECON_AKL_20220728.GLB **Template:** AURECON_AKL_20170201.GDT **Report File:** AURECON DH LOG V3.9 0DP **Date Generated:** 1/06/2023

SPARK-DC

Borehole Reference:	**AU23-BH07**	Date Drilled:	**27/04/2023-27/04/2023**
Photographed By:	**BC**	Date Photographed:	**27/04/2023-27/04/2023**



Box 1. - Depth: 0.00 m to 3.60 m.



Box 2. - Depth: 3.60m to 7.25m.

SPARK-DC

Borehole Reference:	**AU23-BH07**	Date Drilled:	**27/04/2023-27/04/2023**
Photographed By:	**BC**	Date Photographed:	**27/04/2023-27/04/2023**



Box 3. - Depth: 7.25 m to 7.63 m.

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Client: **Spark New Zealand**
Project: **Spark Data Centres**
Location: **1350 Dairy Flat Highway, Dairy Flat, AUCKLAND**
Project Reference: **523578**

AU23-BH08

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Morooka Trailer Rig
Contractor: DCN Drilling Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 389719.96m
Northing: 824551.06m
Reduced level: 54.60m (NZVD 2016)

Date started: 28/04/2023
Date completed: 28/04/2023
Inclination: -90°
Azimuth: -090°

Logged by: SN
Input by: BC
Reviewed by: AM
Verified by: RG

Method	R.L. (m)	Length (m)	Graphic Log	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Fracture Log (VWS WS MWS CS VCS ECS)	Stratigraphy Defect Description Additional Notes	Installation
OB HQ	54	1		**0m:** Sandy SILT with minor clay, trace gravel and organics; brown. Stiff, moist, high plasticity. Sand; fine to coarse. Gravel; fine, angular. Organics; rootlets. [TOPSOIL]	OL						**0m: TOPSOIL**	
				0.2m: SILT with some clay, trace sand and organics; light grey. Stiff, moist, high plasticity. Sand; fine. Organics; rootlets. [TAURANGA GROUP]	MH		100				**0.2m: TAURANGA GROUP**	
SPT	53	2		**1.3m:** Silty CLAY with trace sand and organics; light grey with orange and black mottling. Stiff, moist, high plasticity, insensitive. Sand; fine. Organics; amorphous, highly decomposed wood fragments.	CH	1.5m: SPT 0// 0,1,1,1 N = 3 1.5m: IBHSV 62/32 kPa	100					
OB HQ	52	3		**2.2m:** Organic CLAY with minor silt and trace sand; black mottled brown. Stiff, moist, high plasticity, insensitive. Organics; spongy fibrous wood. Sand; fine.	OH							
				2.3m: Fibrous PEAT; black. Firm, wet, non-plastic. [PEAT-H4]	PT		100					
U54				**3m to 3.5m:**...PUSH TUBE		3m: IBHSV 29/5 kPa	100					
OB HQ	51	4		**3.5m:** CLAY with trace sand and organics; grey wth black streaks. Firm to stiff, moist, high plasticity, moderately sensitive to sensitive. Sand; fine. Organics; moderately decomposed to slightly decomposed wood fragments.	CH		100					
SPT	50	5		**4.5m:** Organic CLAY; dark brown. Firm, wet, high plasticity. Organics; amorphous plant material.	CH	4.5m: SPT 1// 0,0,0,0 N = 0 4.5m: IBHSV 26/8 kPa	100					
							100					

REMARKS:
1. Investigation collar is recorded to an accuracy of ±8 mm horizontal and ±15mm vertical, using Leica GS16 GNSS RTK Rover and Leica CS20 Field Controller in single baseline RTK configuration.
2. Standpipe piezometer and galvanised upstand installed upon completion of drilling.
3. Peat classification derived from Von-Post Humification Scale [Peat H1-H10]
4. Pushtube samples logged from extruded sample photo.

Hand Shear Vane Serial No: DR4940 Correction Factor: 1.491

Water Level Readings:
Date Time | Hole Depth | Water Level
(1) 01/05/23 11:45 | m | 0.33 m bgl

Database File: SPARK DC_523578__GINTMASTER.GPJ **Library file:** AURECON_AKL_20220728.GLB **Template:** AURECON_AKL_20170201.GDT **Report File:** AURECON DH LOG V3.9 0DP **Date Generated:** 1/06/2023

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Location: **1350 Dairy Flat Highway, Dairy Flat, AUCKLAND**
Project Reference: **523578**

AU23-BH08

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Morooka Trailer Rig
Contractor: DCN Drilling Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 389719.96m
Northing: 824551.06m
Reduced level: 54.60m (NZVD 2016)

Date started: 28/04/2023
Date completed: 28/04/2023
Inclination: -90°
Azimuth: -090°

Logged by: SN
Input by: BC
Reviewed by: AM
Verified by: RG

Method	R.L. (m)	Length (m)	Graphic Log	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Fracture Log (VWS WS MWS CS VCS ECS)	Stratigraphy Defect Description Additional Notes	Installation
OB HQ	49	6		**4.5m:** Organic CLAY; dark brown. Firm, wet, high plasticity. Organics; amorphous plant material.	CH		100					
SPT				**5.7m:** CLAY with trace sand and organics; grey with black mottling. Firm to stiff, moist, high plasticity, moderately sensitive to sensitive. Sand; fine. Organics; moderately decomposed to slightly decomposed wood fragments.		6m: SPT 0// 0,0,1,1 N = 2 6m: IBHSV 56/8 kPa	100					
OB HQ	48	7			CH		100					
SPT	47	8				7.5m: SPT 0// 0,0,1,1 N = 2 7.5m: IBHSV 77/23 kPa	100					
OB HQ	46	9		**8.5m:** Completely weathered, light greenish grey, LIMESTONE; extremely weak; Recovered as a *Silty CLAY with trace sand; grey. Stiff, moist, high plasticity. Sand, fine* [MAHURANGI LIMESTONE]	CW		100				**8.5m: NORTHLAND ALLOCHTHON - MAHURANGI LIMESTONE**	
SPT				**9m:** Highly weathered, light green grey, pervasively sheared LIMESTONE; Weak, extremely closely spaced, massive, recovered as a *GRAVEL; angular, 10mm-40mm.*	HW	9m: SPT 17// 18,26,6 for 10mm N = 50+	69		0			
OB HQ	45	10		**9.35m:** Moderately to slightly weathered, light green grey, pervasively sheared LIMESTONE; Weak, extremely closely spaced, massive, recovered as a *GRAVEL; angular, 10mm-40mm.* **9.5m:** CORE LOSS	MW		26		0		9.5m to 10.2m: Core loss.	

REMARKS:
1. Investigation collar is recorded to an accuracy of ±8 mm horizontal and ±15mm vertical, using Leica GS16 GNSS RTK Rover and Leica CS20 Field Controller in single baseline RTK configuration.
2. Standpipe piezometer and galvanised upstand installed upon completion of drilling.
3. Peat classification derived from Von-Post Humification Scale [Peat H1-H10]
4. Pushtube samples logged from extruded sample photo.

Hand Shear Vane Serial No: DR4940 Correction Factor: 1.491

Water Level Readings:
Date Time | Hole Depth | Water Level
(1) 01/05/23 11:45 | m | 0.33 m bgl

Database File: SPARK DC_523578__GINTMASTER.GPJ **Library file:** AURECON_AKL_20220728.GLB **Template:** AURECON_AKL_20170201.GDT **Report File:** AURECON DH LOG V3.9 0DP **Date Generated:** 1/06/2023

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Location: **1350 Dairy Flat Highway, Dairy Flat, AUCKLAND**
Project Reference: **523578**

AU23-BH08

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Morooka Trailer Rig
Contractor: DCN Drilling Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 389719.96m
Northing: 824551.06m
Reduced level: 54.60m (NZVD 2016)

Date started: 28/04/2023
Date completed: 28/04/2023
Inclination: -90°
Azimuth: -090°

Logged by: SN
Input by: BC
Reviewed by: AM
Verified by: RG

Method	R.L. (m)	Length (m)	Graphic Log	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Fracture Log (VWS WS MWS CS VCS ECS)	Stratigraphy Defect Description Additional Notes	Installation
OB HQ				**9.5m:** CORE LOSS								
OB HQ			× × ×

SPARK-DC

Borehole Reference:	**AU23-BH08**	Date Drilled:	**28/04/2023-28/04/2023**
Photographed By:	**BC**	Date Photographed:	**28/04/2023-28/04/2023**



Box 1. - Depth: 0.00 m to 4.0 m.



Box 2. - Depth: 4.0m to 7.0m.

SPARK-DC

Borehole Reference:	**AU23-BH08**	Date Drilled:	**28/04/2023-28/04/2023**
Photographed By:	**BC**	Date Photographed:	**28/04/2023-28/04/2023**



Box 3. - Depth: 7.0 m to 10.5 m.

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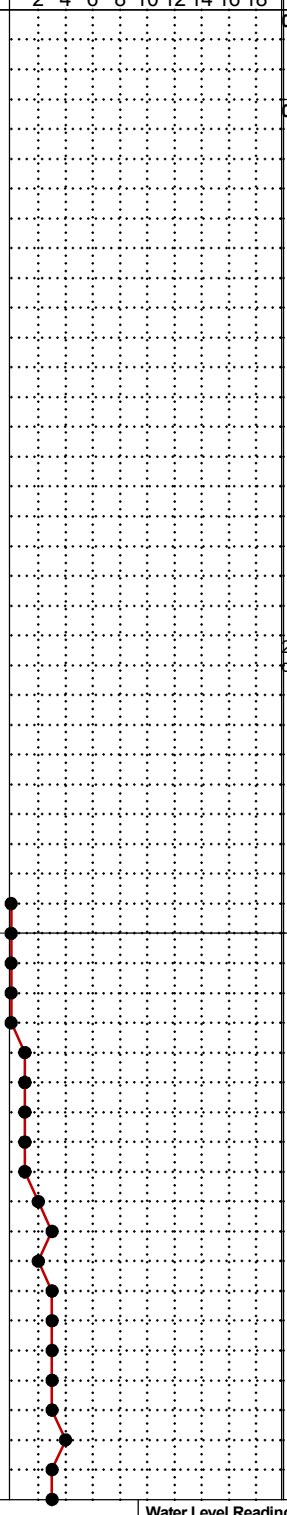
Client: **Spark New Zealand**
Project: **Spark Data Centres**
Location: **1350 Dairy Flat Highway, Dairy Flat, AUCKLAND**
Project Reference: **523578**

AU23-HA01

DRILLING INFORMATION	**CO-ORDINATES:** **Mt Eden Circuit 2000**		
Method: Hand Auger	Easting: 389614.92m	Date started: 11/04/2023	Logged by: BC
Equipment: 50 mm hand auger	Northing: 824726.31m	Date completed: 11/04/2023	Input by: BC
Contractor: Aurecon	Ground Level: 53.12m (NZVD 2016)	Inclination: -90°	Reviewed by: AM
		Orientation: N/A	Verified by: RG

Depth (m)	Graphic Log	Soil Description	Testing	Additional Observations	R.L. (m)
		0m: Organic SILT; dark brown. Moist, low plasticity. [TOPSOIL]		**0m: TOPSOIL**	53
		0.3m: Organic CLAY with minor silt; dark brown. Stiff, wet, high plasticity, moderately sensitive to extra sensitive. Organics, odourous, disseminated. [TAURANGA GROUP]	0.3m: IBHSV 80/25 kPa	**0.3m: TAURANGA GROUP**	
		0.6m:...traces of tree sap, saturated.	0.6m: IBHSV 70/10 kPa		
		0.8m:...light brown, groundwater seepage encountered.	0.9m: IBHSV 50/5 kPa		
1		**1m:** Organic silty CLAY with trace sand; dark brown to black. Stiff, saturated, high plasticity, sensitive. Organics; amorphous, fibrous wood, tree sap inclusions. Sand, fine.	1.2m: IBHSV 70/10 kPa		52
		1.3m: Organic SILT, trace clay and sand; dark brown. Stiff, saturated, low plasticity, moderately sensitive. Organics; amorphous, wood fragments. Sand, fine.	1.5m: IBHSV 65/15 kPa		
			1.8m: IBHSV 80/15 kPa		
2		**1.9m:**...fibrous wood fragments.			
		2.1m: Fibrous PEAT; black. Soft to firm, saturated, high plasticity, insensitive to moderately sensitive. [PEAT - H6]	2.1m: ISFHSV 30/10 kPa	2.1m to 2.7m: Shear vane dropping under own weight.	51
		2.2m: No recovery.			
			2.7m: ISFHSV 20/10 kPa		
3		**3m:** CLAY, minor organics, trace silt and trace sand; greyish black. Firm, saturated, high plasticity, insensitive. Sand, fine. Organics; rootlets.	3m: ISFHSV 25/15 kPa		50
		Hand Auger terminated at 3.1m (Hole collapse)			
4					49

Scala Penetrometer Test (Blows/100mm)



REMARKS:
1. This hand auger has been logged in accordance with NZGS Guidelines for the Field Classification of Soil and Rock for Engineering Purposes, 2005.
2. Vane shear strengths are corrected values.
3. UTP = Unable to Penetrate.
4. Investigation collar is recorded to an accuracy of ±8 mm horizontal and ±15mm vertical, using Leica GS16 GNSS RTK Rover and Leica CS20 Field Controller in single baseline RTK configuration.
5. Peat classification derived from Von-Post Humification Scale [Peat H1-H10]

HSV Serial No: DR4938 Correction Factor: 1.568

Water Level Readings:
Date Time | Hole Depth | Water Level
(1) 11/04/23 10:00 | 3.10m | 0.5 m bgl

Database File: SPARK DC_523578__GINTMASTER.GPJ **Library file:** AURECON_AKL_20220728.GLB **Template:** AURECON_AKL_20130722.GDT **Report File:** AURECON HA LOG WITH SCALA 1.0 **Date Generated:** 1/06/2023

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Project: **Spark Data Centres**
Location: **1350 Dairy Flat Highway, Dairy Flat, AUCKLAND**
Project Reference: **523578**

AU23-HA02

DRILLING INFORMATION	**CO-ORDINATES:** **Mt Eden Circuit 2000**		
Method: Hand Auger	Easting: 389706.59m	Date started: 11/04/2023	Logged by: DWB
Equipment: 50 mm hand auger	Northing: 824721.68m	Date completed: 11/04/2023	Input by: DWB
Contractor: Aurecon	Ground Level: 53.48m (NZVD 2016)	Inclination: -90°	Reviewed by: AM
		Orientation: N/A	Verified by: RG

Depth (m)	Graphic Log	Soil Description	Testing	Scala Penetrometer Test (Blows/100mm)	Additional Observations	R.L. (m)
		0m: Organic SILT; light brown. Moist, low plasticity; organics, traces of tree sap. [TOPSOIL]			**0m: TOPSOIL**	
		0.3m: Organic CLAY, minor silt; dark brown and grey. Stiff, moist, high plasticity, moderately sensitive; organics, decomposing wood and sap.	0.3m: ISHSV 77/22 kPa		**0.3m: TAURANGA GROUP**	53
		0.6m:...brown, wet.	0.6m: ISHSV 65/23 kPa			
1		**0.9m:**...firm.	0.9m: ISHSV 44/17 kPa			
		1m:...saturated.	1.2m: ISHSV 41/11 kPa			
		1.3m:...Groundwater seepage encountered at 1.3m.				
		1.4m: Amorphous PEAT, with trace fibrous organics; black. Very soft to firm, saturated, high plasticity, highly sensitive. Organics, decomposing wood, amorphous. [PEAT-H5].	1.5m: ISHSV 44/7 kPa		1.4m to 3m: Poor sample recovery.	52
			1.8m: ISHSV 47/11 kPa			
2		**2m to 2.1m:**...fibrous wood, 10mm.	2.1m: ISHSV 44/22 kPa			
			2.4m: ISHSV 11/11 kPa			51
			2.7m: ISHSV 22/11 kPa			
3		**3m:** CLAY, some silt, trace sand and organics; blue grey. Stiff to very stiff, wet, high plasticity. Organics; rootlets , decomposed wood.	3m: ISHSV 80/20 kPa			
			3.3m: ISHSV 145/50 kPa			50
			3.6m: ISHSV 65/20 kPa			
4		Hand Auger terminated at 4m (Hole collapse)				
						49
5						
						48

REMARKS:
1. This hand auger has been logged in accordance with NZGS Guidelines for the Field Classification of Soil and Rock for Engineering Purposes, 2005.
2. Vane shear strengths are corrected values.
3. UTP = Unable to Penetrate.
4. Investigation collar is recorded to an accuracy of ±8 mm horizontal and ±15mm vertical, using Leica GS16 GNSS RTK Rover and Leica CS20 Field Controller in single baseline RTK configuration.
5. Peat classification derived from Von-Post Humification Scale [Peat H1-H10]

HSV Serial No: DR4940 Correction Factor: 1.491

Water Level Readings:
Date Time | Hole Depth | Water Level
(1) 11/04/23 12:00 | 4.00m | 0.54 m bgl

Database File: SPARK DC_523578__GINTMASTER.GPJ **Library file:** AURECON_AKL_20220728.GLB **Template:** AURECON_AKL_20130722.GDT **Report File:** AURECON HA LOG WITH SCALA 1.0 **Date Generated:** 1/06/2023

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Project Reference: **523578**

AU23-HA03

Sheet **1** of **1**

DRILLING INFORMATION	**CO-ORDINATES:** **Mt Eden Circuit 2000**		
Method: Hand Auger	Easting: 389656.70m	Date started: 11/04/2023	Logged by: BC
Equipment: 50 mm hand auger	Northing: 824680.53m	Date completed: 11/04/2023	Input by: BC
Contractor: Aurecon	Ground Level: 53.56m (NZVD 2016)	Inclination: -90°	Reviewed by: AM
		Orientation: N/A	Verified by: RG

Depth (m)	Graphic Log	Soil Description	Testing	Additional Observations	R.L. (m)
		0m: Organic SILT, trace clay; light brown. Very stiff, moist, low plasticity, sensitive. [TOPSOIL]	0.3m: 105/25 kPa	**0m: TOPSOIL**	
		0.4m: Organic CLAY, trace silt; dark brown. Stiff to hard, moist, high plasticity, sensitive. [TAURANGA GROUP]	0.6m: 75/10 kPa	**0.4m: TAURANGA GROUP**	53
1		**0.8m:**...black, saturated.	0.9m: 60/10 kPa		
			1.2m: UTP		
		1.4m: PEAT; black. Soft to firm, saturated, low plasticity, insensitive to moderately sensitive. Odourous, fibrous organics, decomposed wood. [PEAT-H5].		1.5m to 1.8m: Shear vane sinks under it's own weight	52
			1.8m: 20/10 kPa		
2					
			2.4m: 30/20 kPa		51
		2.6m:...red fibrous wood fragments.			
3				3m to 3.5m: Poor recovery; unable to undertake shear vane reading.	
		3.5m: CLAY, trace silt; light grey. Very stiff, moist, high plasticity, insensitive to sensitive.	3.5m: 155/40 kPa 3.6m: 185/45 kPa		50
		3.7m: Silty CLAY; light grey. Stiff, moist, high plasticity, insensitive.			
		3.8m: CLAY, minor sand; dark grey mottled brown. Stiff, saturated, medium plasticity, insensitive. Sand is fine to medium. Organics present.	3.8m: 60/45 kPa		
4					
		4.2m: CLAY, trace sand; dark brown mottled black. Firm, saturated, low plasticity, insensitive. Sand is fine to medium. Odourous.	4.2m: 30/15 kPa		
		Hand Auger terminated at 4.5m (Poor recovery)	4.5m: 30/25 kPa		49

Scala Penetrometer Test (Blows/100mm)
2 4 6 8 10 12 14 16 18

REMARKS:
1. This hand auger has been logged in accordance with NZGS Guidelines for the Field Classification of Soil and Rock for Engineering Purposes, 2005.
2. Vane shear strengths are corrected values.
3. UTP = Unable to Penetrate.
4. Investigation collar is recorded to an accuracy of ±8 mm horizontal and ±15mm vertical, using Leica GS16 GNSS RTK Rover and Leica CS20 Field Controller in single baseline RTK configuration.
5. Peat classification derived from Von-Post Humification Scale [Peat H1-H10]

HSV Serial No: DR4938 Correction Factor: 1.568

Water Level Readings:
Date Time | Hole Depth | Water Level
(1) 11/04/23 11:30 | 4.50m | 0.5 m bgl

Database File: SPARK DC_523578__GINTMASTER.GPJ **Library file:** AURECON_AKL_20220728.GLB **Template:** AURECON_AKL_20130722.GDT **Report File:** AURECON HA LOG WITH SCALA 1.0 **Date Generated:** 1/06/2023

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Location: **1350 Dairy Flat Highway, Dairy Flat, AUCKLAND**
Project Reference: **523578**

AU23-HA04

DRILLING INFORMATION	**CO-ORDINATES: Mt Eden Circuit 2000**		
Method: Hand Auger	Easting: 389734.15m	Date started: 12/04/2023	Logged by: DWB
Equipment: 50 mm hand auger	Northing: 824649.40m	Date completed: 12/04/2023	Input by: DWB
Contractor: Aurecon	Ground Level: 53.77m (NZVD 2016)	Inclination: -90°	Reviewed by: AM
		Orientation: N/A	Verified by: RG

Depth (m)	Graphic Log	Soil Description	Testing	Scala Penetrometer Test (Blows/100mm)	Additional Observations	R.L. (m)
		0m: Organic SILT; dark brown. Moist, low plasticity. [TOPSOIL]			**0m: TOPSOIL**	
		0.2m: Organic silty CLAY; dark greyish brown. Stiff to very stiff, wet, high plasticity, moderately sensitive; organics, sap, decomposing fibrous wood. [TAURANGA GROUP]	0.3m: ISHSV 137/29 kPa		**0.2m: TAURANGA GROUP**	
		0.6m: CLAY, trace silt and organics; light grey with dark brown streaks. Firm to stiff, wet, moderate plasticity, moderately sensitive; organics, decomposing wood and rootlets.	0.6m: ISHSV 74/29 kPa			53
1		**0.9m:** Fibrous organic CLAY; dark brown. dark brown and grey. Firm to stiff, wet, high plasticity, moderately sensitive. Organics, decomposing wood, rootlets.	0.9m: ISFHSV 52/20 kPa			
			1.2m: ISFHSV 29/8 kPa			
		1.35m to 1.37m:...piece of decomposing wood.			1.4m: Groundwater seepage encountered, saturated.	
		1.5m to 1.7m:...black.	1.5m: ISFHSV 47/11 kPa			
		1.7m: Amorphous PEAT, with trace fibrous organics; black. Soft to firm, saturated, high plasticity, highly sensitive. Poor sample recovery. [PEAT - H7].	1.8m: ISFHSV 29/11 kPa		1.7m to 2.4m: Poor sample recovery.	52
2			2.1m: ISFHSV 23/11 kPa			
		Hand Auger terminated at 2.4m (Hole collapse)	2.4m: ISFHSV 38/11 kPa			
3						51
						50
4						
						49

Scala Penetrometer Test (Blows/100mm): 2 4 6 8 10 12 14 16 18

REMARKS:
1. This hand auger has been logged in accordance with NZGS Guidelines for the Field Classification of Soil and Rock for Engineering Purposes, 2005.
2. Vane shear strengths are corrected values.
3. UTP = Unable to Penetrate.
4. Investigation collar is recorded to an accuracy of ±8 mm horizontal and ±15mm vertical, using Leica GS16 GNSS RTK Rover and Leica CS20 Field Controller in single baseline RTK configuration.
5. Peat classification derived from Von-Post Humification Scale [Peat H1-H10]

HSV Serial No: DR4390 Correction Factor: 1.491

Water Level Readings:
Date Time | Hole Depth | Water Level
(1) 12/04/23 14:00 | 2.40m | 0.7 m bgl

Database File: SPARK DC_523578__GINTMASTER.GPJ **Library file:** AURECON_AKL_20220728.GLB **Template:** AURECON_AKL_20130722.GDT **Report File:** AURECON HA LOG WITH SCALA 1.0 **Date Generated:** 1/06/2023

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Client: **Spark New Zealand**
Project: **Spark Data Centres**
Location: **1350 Dairy Flat Highway, Dairy Flat, AUCKLAND**
Project Reference: **523578**

AU23-HA05

DRILLING INFORMATION	**CO-ORDINATES: Mt Eden Circuit 2000**		
Method: Hand Auger	Easting: 389734.61m	Date started: 12/04/2023	Logged by: BC
Equipment: 50 mm hand auger	Northing: 824601.97m	Date completed: 12/04/2023	Input by: BC
Contractor: Aurecon	Ground Level: 54.19m (NZVD 2016)	Inclination: -90°	Reviewed by: AM
		Orientation: N/A	Verified by: RG

Depth (m)	Graphic Log	Soil Description	Testing	Additional Observations	R.L. (m)
		0m: Organic SILT; dark brown. Moist, medium plasticity. [TOPSOIL]		**0m: TOPSOIL**	
		0.15m: CLAY; light brownish grey. Stiff, moist, high plasticity, insensitive. [TAURANGA GROUP]	0.3m: ISHSV 50/30 kPa	**0.15m: TAURANGA GROUP**	54
		0.4m: CLAY, trace silt and organics; dark grey mottled black. Firm to very stiff, moist, high plasticity, insensitive to sensitive. Organics present, fibrous wood fragments.			
		0.6m:...tree sap inclusions.	0.6m: ISHSV 115/30 kPa		
1		**0.9m:**...Groundwater seepage encountered at 0.9m, saturated.	0.9m: ISHSV 145/25 kPa		
		1.2m:...firm.	1.2m: ISHSV 45/15 kPa		53
			1.5m: ISHSV 50/15 kPa		
			1.8m: ISHSV 40/25 kPa		
2		**1.9m:** PEAT; black. Firm, saturated, high plasticity, moderately sensitive. Organics, decomposing wood, rootlets. [PEAT-H5].	2.1m: ISFHSV 35/15 kPa		52
		Hand Auger terminated at 2.4m (Poor recovery)			
3					51
4					50

Scala Penetrometer Test (Blows/100mm)
2 4 6 8 10 12 14 16 18

REMARKS:
1. This hand auger has been logged in accordance with NZGS Guidelines for the Field Classification of Soil and Rock for Engineering Purposes, 2005.
2. Vane shear strengths are corrected values.
3. UTP = Unable to Penetrate.
4. Investigation collar is recorded to an accuracy of ±8 mm horizontal and ±15mm vertical, using Leica GS16 GNSS RTK Rover and Leica CS20 Field Controller in single baseline RTK configuration.
5. Peat classification derived from Von-Post Humification Scale [Peat H1-H10]

HSV Serial No: DR4938 Correction Factor: 1.568

Water Level Readings:
Date Time | Hole Depth | Water Level
(1) 12/04/23 13:45 | 2.40m | 1.37 m bgl

Database File: SPARK DC_523578_GINTMASTER.GPJ **Library file:** AURECON_AKL_20220728.GLB **Template:** AURECON_AKL_20130722.GDT **Report File:** AURECON HA LOG WITH SCALA 1.0 **Date Generated:** 1/06/2023

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Client: **Spark New Zealand**
Project: **Spark Data Centres**
Location: **1350 Dairy Flat Highway, Dairy Flat, AUCKLAND**
Project Reference: **523578**

AU23-HA06

DRILLING INFORMATION	**CO-ORDINATES: Mt Eden Circuit 2000**		
Method: Hand Auger	Easting: 389580.70m	Date started: 12/04/2023	Logged by: DWB
Equipment: 50 mm hand auger	Northing: 824631.89m	Date completed: 12/04/2023	Input by: DWB
Contractor: Aurecon	Ground Level: 53.41m (NZVD 2016)	Inclination: -90°	Reviewed by: AM
		Orientation: N/A	Verified by: RG

Depth (m)	Graphic Log	Soil Description	Testing	Additional Observations	R.L. (m)
		0m: Organic SILT; dark brown. Moist, low plasticity. [TOPSOIL]		**0m: TOPSOIL**	
		0.2m: Organic SILT, minor clay; dark brown and black. Stiff to very stiff, wet, moderate plasticity, insensitive; organics, decomposing rootlets, wood and trace charcoal. [TAURANGA GROUP]	0.3m: ISHSV 104/29 kPa	**0.2m: TAURANGA GROUP**	
		0.4m: Organic CLAY; dark brown. Stiff, saturated, high plasticity, moderately sensitive; organics, fibrous wood and peat lenses.	0.6m: ISHSV 56/29 kPa	0.5m: Ground water seepage encountered, saturated.	53
1		**0.7m to 1m:**...300mm of decomposing fibrous wood; reddy brown.			
		1.2m: Amorphous PEAT, with trace fibrous organics; black. Firm, saturated, high plasticity, moderately sensitive. Organics, highly decomposed wood. [PEAT-H7].	1.2m: ISHSV 26/11 kPa 1.5m: ISFHSV 29/11 kPa 1.8m: ISFHSV 47/26 kPa	1.2m to 2.1m: Poor sample recovery.	52
2					
		Hand Auger terminated at 2.1m (Hole collapse)	2.1m: ISFHSV 23/5 kPa		51
3					50
4					49

● Scala Penetrometer Test (Blows/100mm)
2 4 6 8 10 12 14 16 18

REMARKS:
1. This hand auger has been logged in accordance with NZGS Guidelines for the Field Classification of Soil and Rock for Engineering Purposes, 2005.
2. Vane shear strengths are corrected values.
3. UTP = Unable to Penetrate.
4. Investigation collar is recorded to an accuracy of ±8 mm horizontal and ±15mm vertical, using Leica GS16 GNSS RTK Rover and Leica CS20 Field Controller in single baseline RTK configuration.
5. Peat classification derived from Von-Post Humification Scale [Peat H1-H10]

HSV Serial No: DR4390 Correction Factor: 1.491

Water Level Readings:
Date Time | Hole Depth | Water Level
(1) 12/04/23 14:15 | 2.10m | 0.6 m bgl

Database File: SPARK DC_523578__GINTMASTER.GPJ **Library file:** AURECON_AKL_20220728.GLB **Template:** AURECON_AKL_20130722.GDT **Report File:** AURECON HA LOG WITH SCALA 1.0 **Date Generated:** 1/06/2023

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Client: **Spark New Zealand**
Project: **Spark Data Centres**
Location: **1350 Dairy Flat Highway, Dairy Flat, AUCKLAND**
Project Reference: **523578**

AU23-HA07

DRILLING INFORMATION	**CO-ORDINATES: Mt Eden Circuit 2000**		
Method: Hand Auger	Easting: 389666.14m	Date started: 12/04/2023	Logged by: BC
Equipment: 50 mm hand auger	Northing: 824593.72m	Date completed: 12/04/2023	Input by: BC
Contractor: Aurecon	Ground Level: 53.84m (NZVD 2016)	Inclination: -90°	Reviewed by: AM
		Orientation: N/A	Verified by: RG

Depth (m)	Graphic Log	Soil Description	Testing	Additional Observations	R.L. (m)
		0m: Organic clayey SILT; brown. Moist, medium plasticity. [TOPSOIL]		**0m: TOPSOIL**	
		0.15m: CLAY; light brownish grey. Stiff to very stiff, moist, high plasticity, insensitive to moderately sensitive. [TAURANGA GROUP]		**0.15m: TAURANGA GROUP**	
		0.3m: ...wet.	0.3m: ISHSV 50/30 kPa		
		0.5m: ...brown.			
			0.6m: ISHSV 100/45 kPa		
		0.7m: CLAY; dark brown mottled black. Hard, wet, high plasticity, sensitive. Organics; fibrous, wood fragments, odourous.			
1			0.9m: ISHSV 215 kPa		53
		1.2m: Amorphous PEAT; black. Firm to stiff, saturated, low plasticity, moderately sensitive to sensitive. [PEAT - H7]	1.2m: ISFHSV 55/10 kPa		
			1.5m: ISFHSV 55/10 kPa		
			1.8m: ISFHSV 35/10 kPa		
2					52
		Hand Auger terminated at 2.4m (Poor recovery)			
3					51
					50
4					
					49

● Scala Penetrometer Test (Blows/100mm)
2 4 6 8 10 12 14 16 18

REMARKS:
1. This hand auger has been logged in accordance with NZGS Guidelines for the Field Classification of Soil and Rock for Engineering Purposes, 2005.
2. Vane shear strengths are corrected values.
3. UTP = Unable to Penetrate.
4. Investigation collar is recorded to an accuracy of ±8 mm horizontal and ±15mm vertical, using Leica GS16 GNSS RTK Rover and Leica CS20 Field Controller in single baseline RTK configuration.
5. Peat classification derived from Von-Post Humification Scale [Peat H1-H10]

HSV Serial No: DR4938 Correction Factor: 1.568

Water Level Readings:
Date Time | Hole Depth | Water Level
(1) 12/04/23 14:15 | 2.40m | 0.78 m bgl

Database File: SPARK DC_523578_.GINTMASTER.GPJ **Library file:** AURECON_AKL_20220728.GLB **Template:** AURECON_AKL_20130722.GDT **Report File:** AURECON HA LOG WITH SCALA 1.0 **Date Generated:** 1/06/2023

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Client: **Spark New Zealand**
Project: **Spark Data Centres**
Location: **1350 Dairy Flat Highway, Dairy Flat, AUCKLAND**
Project Reference: **523578**

AU23-HA08

Sheet **1** of **1**

DRILLING INFORMATION	CO-ORDINATES: Mt Eden Circuit 2000		
Method: Hand Auger	Easting: 389928.27m	Date started: 11/04/2023	Logged by: DWB
Equipment: 50 mm hand auger	Northing: 824620.85m	Date completed: 11/04/2023	Input by: DWB
Contractor: Aurecon	Ground Level: 62.00m (NZVD 2016)	Inclination: -90°	Reviewed by: AM
		Orientation: N/A	Verified by: RG

Depth (m)	Graphic Log	Soil Description	Testing	Scala Penetrometer Test (Blows/100mm) 2 4 6 8 10 12 14 16 18	Additional Observations	R.L. (m)
		0m: Organic SILT; dark brown. Moist, low plasticity. [TOPSOIL]			**0m: TOPSOIL**	
		0.2m: Silty CLAY, trace sand; brownish grey and orange. Very stiff, moist to wet, high plasticity, moderately sensitive; sand, fine. [FILL]	0.3m: ISHSV 106/35 kPa		**0.2m: FILL**	
		0.4m:...light grey and orange.				
		0.5m:...with minor siltstone gravels and trace sand; Gravels, fine to medium, angular, limonitic nodules; sand, fine.	0.6m: ISHSV 74/32 kPa		**0.6m: TAURANGA GROUP**	
		0.6m: CLAY, minor silt; light grey with orange streaks. Stiff to very stiff, wet, high plasticity, moderately sensitive. [TAURANGA GROUP]				
		0.8m:...with minor silt and trace organics; light brownish orange; Organics, wood fibres.	0.9m: ISHSV 157/47 kPa			
1						61
		1.1m: Completely weathered, light grey LIMESTONE; *Recovered as: Gravelly SILT, minor clay; light grey. Hard, dry, low plasticity, insensitive* [MAHURANGI LIMESTONE]	1.2m: ISHSV UTP		**1.1m: NORTHLAND ALLOCTHON - MAHURANGI LIMESTONE**	
		Hand Auger terminated at 1.5m (Refusal)	1.5m: ISHSV UTP	27 24 26 30		
2						60
3						59
4						58

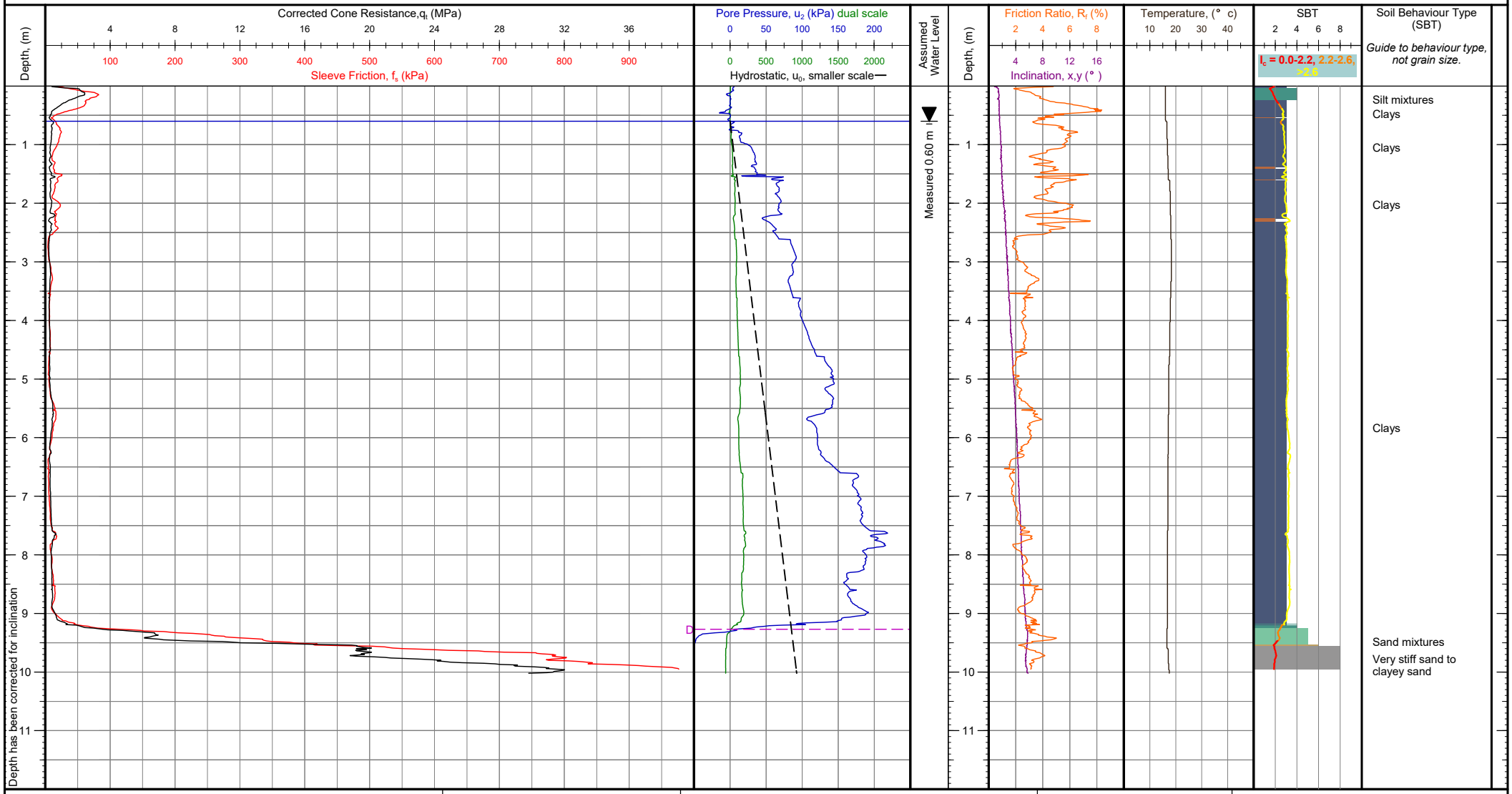
REMARKS:
1. This hand auger has been logged in accordance with NZGS Guidelines for the Field Classification of Soil and Rock for Engineering Purposes, 2005.
2. Vane shear strengths are corrected values.
3. UTP = Unable to Penetrate.
4. Investigation collar is recorded to an accuracy of ±8 mm horizontal and ±15mm vertical, using Leica GS16 GNSS RTK Rover and Leica CS20 Field Controller in single baseline RTK configuration.
5. Peat classification derived from Von-Post Humification Scale [Peat H1-H10]

HSV Serial No: DR4390 Correction Factor: 1.486

Water Level Readings:
Date Time | Hole Depth | Water Level
No water level recorded

Database File: SPARK DC_523578__GINTMASTER.GPJ **Library file:** AURECON_AKL_20220728.GLB **Template:** AURECON_AKL_20130722.GDT **Report File:** AURECON HA LOG WITH SCALA 1.0 **Date Generated:** 1/06/2023

CONE PENETRATION TEST (CPT) LOG



Client:	Aurecon	**Operator:**	Alyssa Malamatenios	**NZTM 2000 N, E (m):**	5941955.90, 1747321.41	**Elevation (m):**	Unknown
Project:	1350 Dairy Flat Highway	**Cone Ref:**	MKJ167	**WGS84 (deg):**	-36.656598,174.648293	**Date of Test:**	6/04/2023
Location:	Dairy Flat	**Cone Type:**	10cm^2 Compression	**Location Method:**	Handheld GPS	**Depth (m):**	10.02
Engineer:	Suresh Nuthalapati	**Area Ratio:**	0.79	**Surveyor:**		**Pre Drill (m):**	N/A
Contractor:	Ground Investigation Ltd	**Filter Type:**	u_2	**Termination Reason:**	Limit of reaction force		

Client Reference:

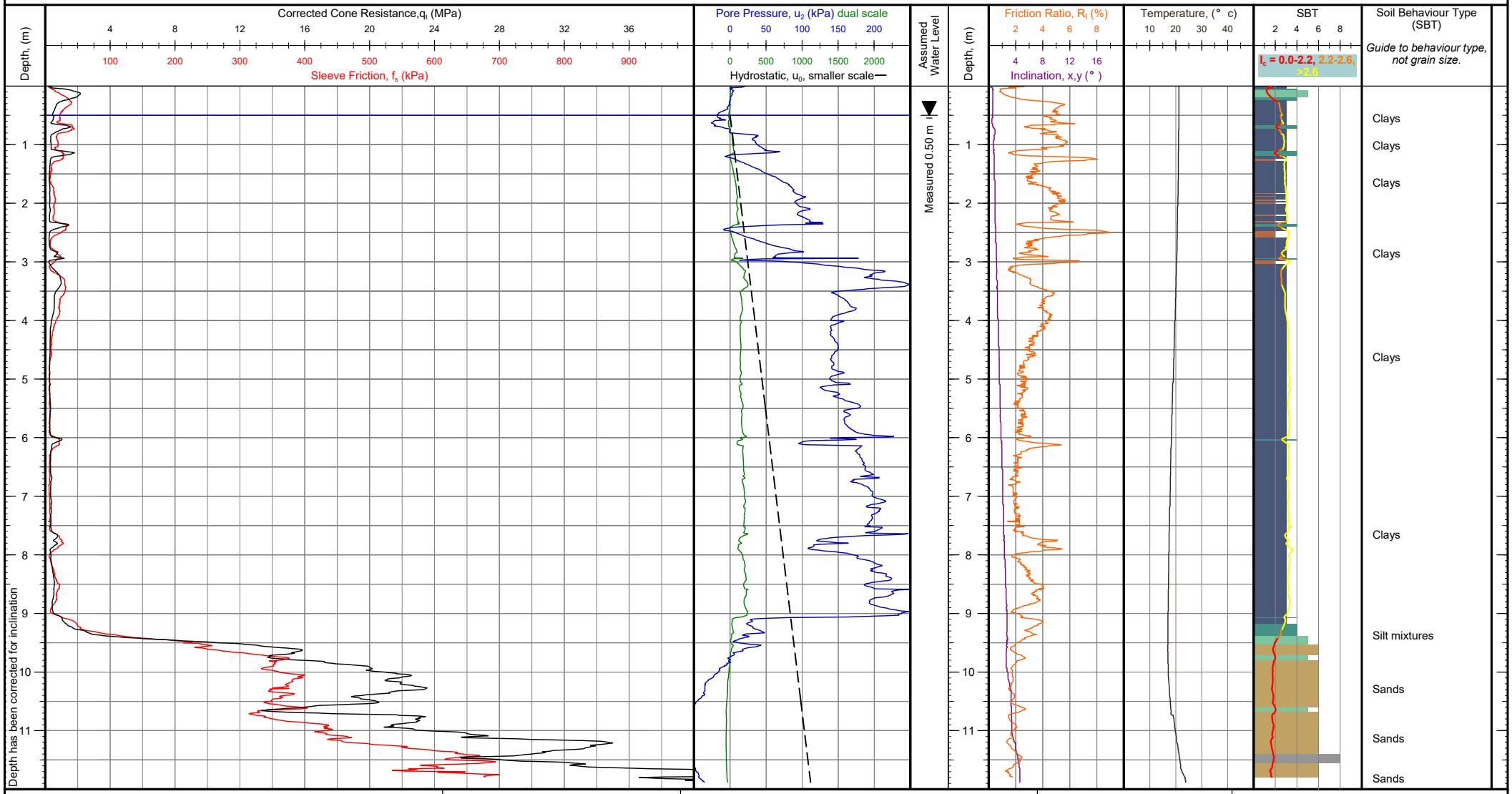
Test Number: **CPT-01**

G.I. Job Ref: 230270

Comments: Dissipation performed at 9.27m.

Where possible GWL is measured after testing, or estimated in the office. This may not represent the true GWL

CONE PENETRATION TEST (CPT) LOG



Client:	Aurecon	**Operator:**	Marcelo Martinez	**NZTM 2000 N, E (m):**	5941913.11, 1747383.17	**Elevation (m):**	Unknown
Project:	1350 Dairy Flat Highway	**Cone Ref:**	71137	**WGS84 (deg):**	-36.656974,174.648992	**Date of Test:**	4/04/2023
Location:	Dairy Flat	**Cone Type:**	15cm^2 Subtraction	**Location Method:**	Handheld GPS	**Depth (m):**	11.88
Engineer:	Suresh Nuthalapati	**Area Ratio:**	0.75	**Surveyor:**		**Pre Drill (m):**	N/A
Contractor:	Ground Investigation Ltd	**Filter Type:**	u_2	**Termination Reason:**	Danger of buckling rods	**G.I. Job Ref:**	230270

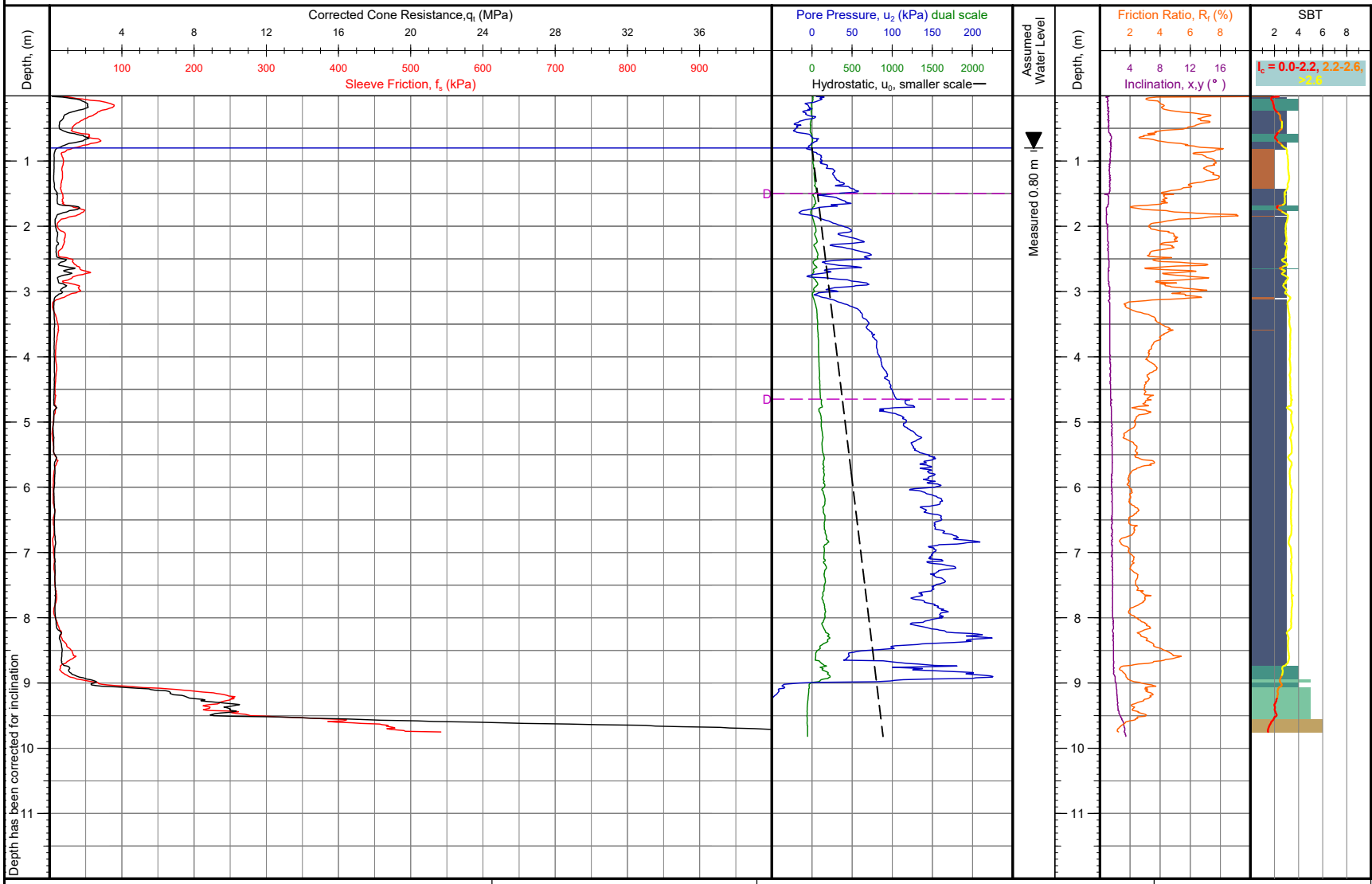
Client Reference:

Test Number: **CPT-02**

Comments:

Where possible GWL is measured after testing, or estimated in the office. This may not represent the true GWL

CONE PENETRATION TEST (CPT) LOG



Soil Behaviour Type (SBT)

CPT Classifications cannot be expected to provide accurate predictions of soil type based on grain size, but provide a guide to behaviour type.

- Clays: clay to silty clay
- Organic soils - clays
- Clays: clay to silty clay
- Clays: clay to silty clay
- Clays: clay to silty clay
- Clays: clay to silty clay
- Clays: clay to silty clay
- Silt mixtures: clayey silt & silty clay
- Sand mixtures: silty sand to sandy silt
- Sands: clean sands to silty sands

Client:	Aurecon	**Operator:**	Alyssa Malamatenios	**NZTM 2000 N, E (m):**	5941920.47, 1747458.41	**Elevation (m):**	Unknown
Project:	1350 Dairy Flat Highway	**Cone Ref:**	MKJ333	**WGS84 (deg):**	-36.656864,174.649839	**Date of Test:**	4/04/2023
Location:	Dairy Flat	**Cone Type:**	10cm^2 Compression	**Location Method:**	Handheld GPS	**Depth (m):**	9.82
Engineer:	Suresh Nuthalapati	**Area Ratio:**	0.80	**Surveyor:**		**Pre Drill (m):**	N/A
Contractor:	Ground Investigation Ltd	**Filter Type:**	u_2	**Termination Reason:**	Limit of reaction force		

Client Reference:

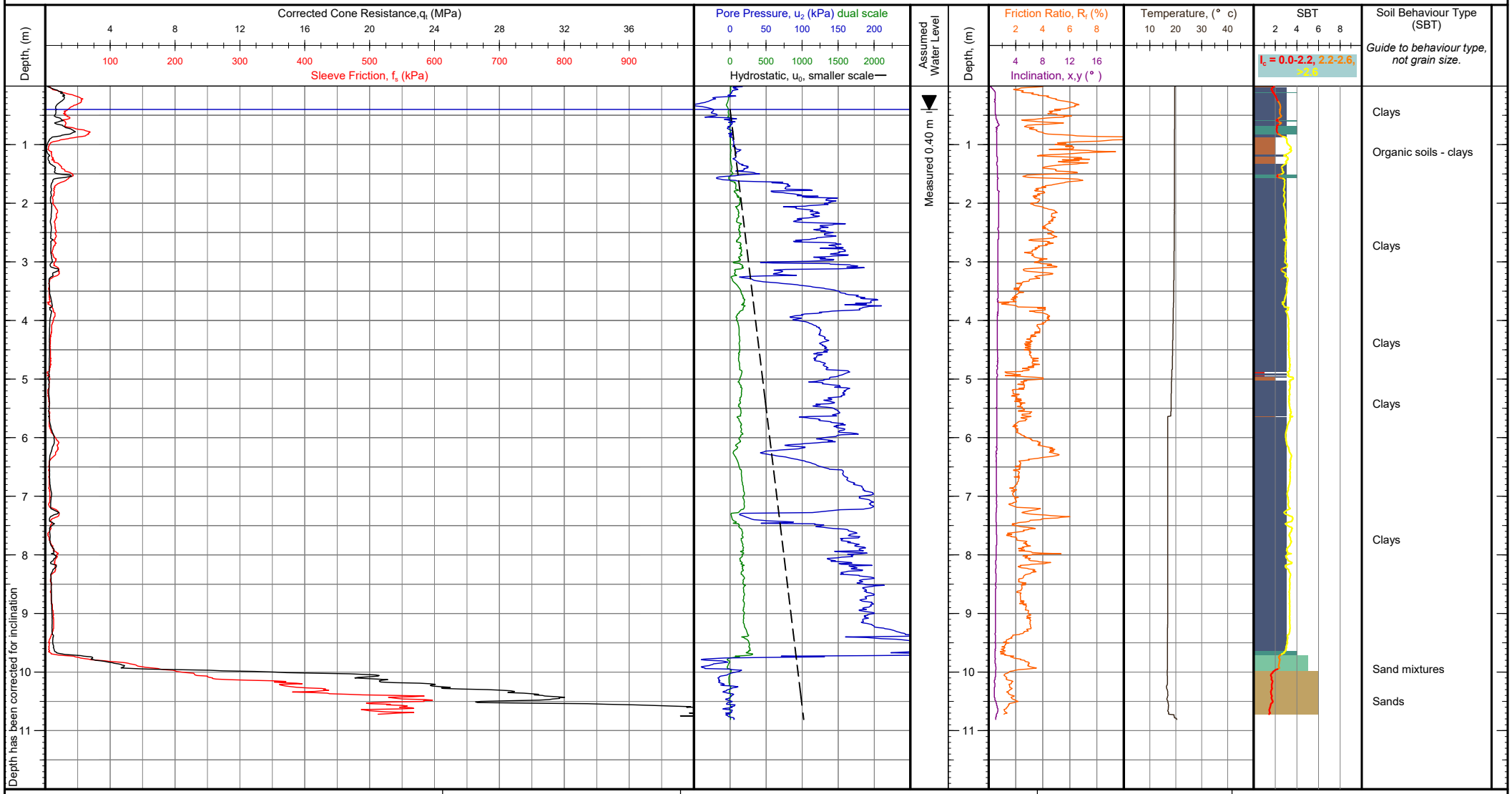
Test Number: **CPT-03**

G.I. Job Ref: 230270

Comments: Dissipation performed at 1.50m.

Where possible GWL is measured after testing, or estimated in the office. This may not represent the true GWL

CONE PENETRATION TEST (CPT) LOG



Client:	Aurecon	**Operator:**	Marcelo Martinez	**NZTM 2000 N, E (m):**	5941917.61, 1747334.16	**Elevation (m):**	Unknown
Project:	1350 Dairy Flat Highway	**Cone Ref:**	71062	**WGS84 (deg):**	-36.656941,174.648443	**Date of Test:**	4/04/2023
Location:	Dairy Flat	**Cone Type:**	15cm^2 Subtraction	**Location Method:**	Handheld GPS	**Depth (m):**	10.81
Engineer:	Suresh Nuthalapati	**Area Ratio:**	0.75	**Surveyor:**		**Pre Drill (m):**	N/A
Contractor:	Ground Investigation Ltd	**Filter Type:**	u_2	**Termination Reason:**	Danger of buckling rods		

Client Reference:

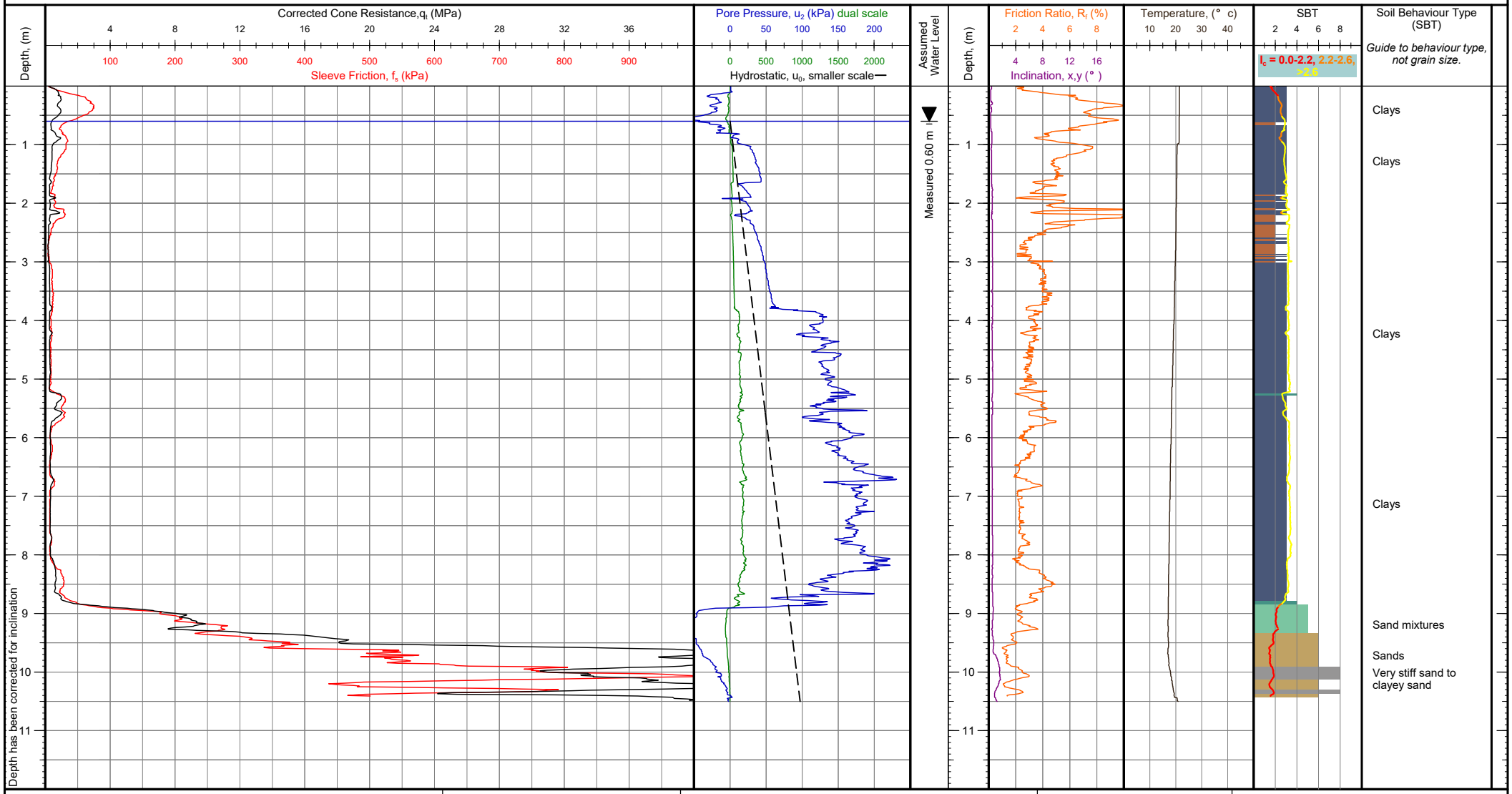
Test Number: **CPT-04**

G.I. Job Ref: 230270

Comments:

Where possible GWL is measured after testing, or estimated in the office. This may not represent the true GWL

CONE PENETRATION TEST (CPT) LOG



Client:	Aurecon	**Operator:**	Marcelo Martinez	**NZTM 2000 N, E (m):**	5941876.09, 1747438.51	**Elevation (m):**	Unknown
Project:	1350 Dairy Flat Highway	**Cone Ref:**	70169	**WGS84 (deg):**	-36.657299,174.649618	**Date of Test:**	4/04/2023
Location:	Dairy Flat	**Cone Type:**	15cm^2 Subtraction	**Location Method:**	Handheld GPS	**Depth (m):**	10.50
Engineer:	Suresh Nuthalapati	**Area Ratio:**	0.75	**Surveyor:**		**Pre Drill (m):**	N/A
Contractor:	Ground Investigation Ltd	**Filter Type:**	u_2	**Termination Reason:**	Danger of buckling rods		

Client Reference:

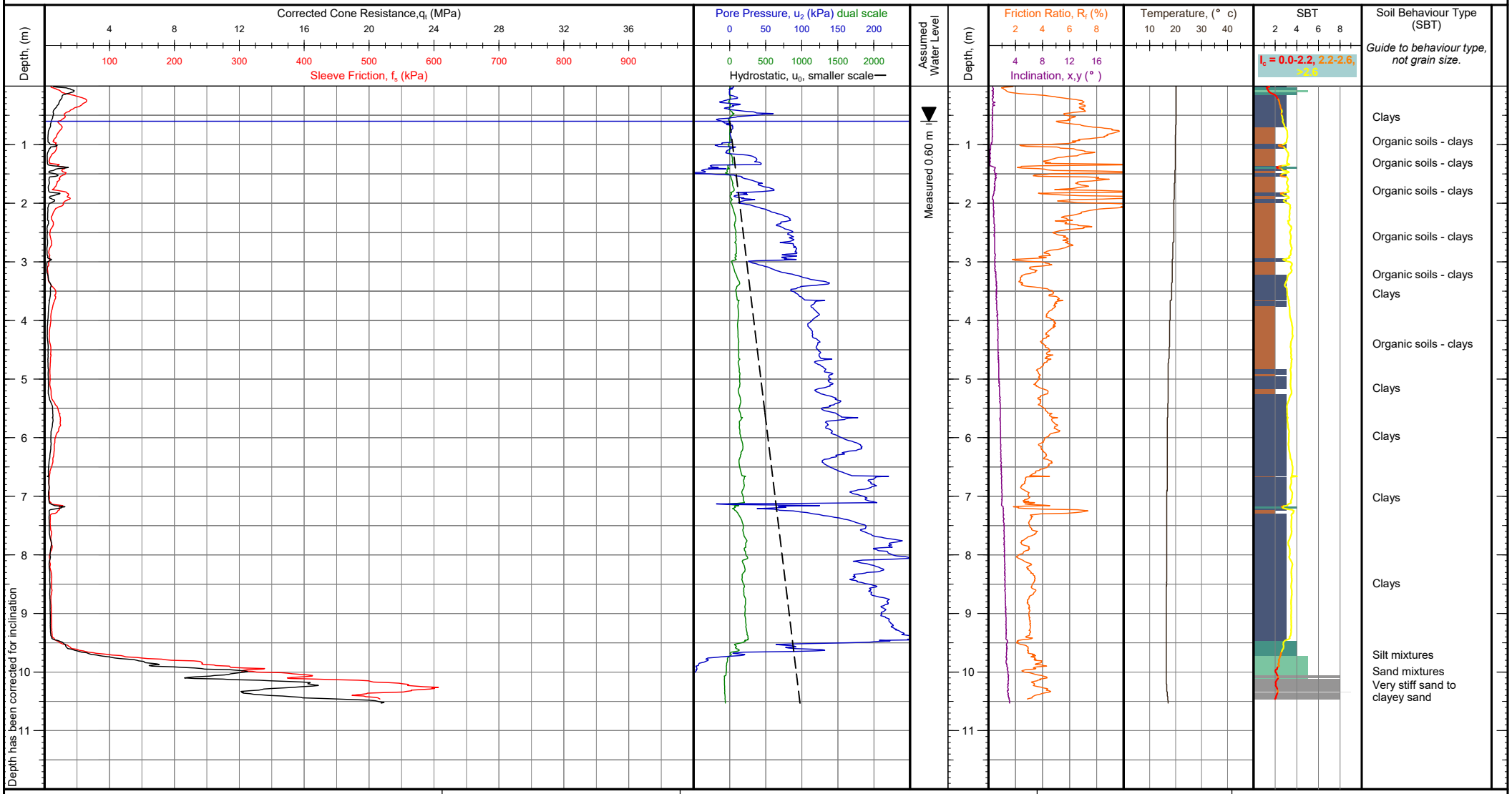
Test Number: **CPT-05**

G.I. Job Ref: 230270

Comments:

Where possible GWL is measured after testing, or estimated in the office. This may not represent the true GWL

CONE PENETRATION TEST (CPT) LOG



Client:	Aurecon	**Operator:**	Alyssa Malamatenios	**NZTM 2000 N, E (m):**	5941895.98, 1747288.37	**Elevation (m):**	Unknown
Project:	1350 Dairy Flat Highway	**Cone Ref:**	MKJ167	**WGS84 (deg):**	-36.657143,174.647935	**Date of Test:**	4/04/2023
Location:	Dairy Flat	**Cone Type:**	10cm^2 Compression	**Location Method:**	Handheld GPS	**Depth (m):**	10.53
Engineer:	Suresh Nuthalapati	**Area Ratio:**	0.79	**Surveyor:**		**Pre Drill (m):**	N/A
Contractor:	Ground Investigation Ltd	**Filter Type:**	u_2	**Termination Reason:**	Limit of reaction force		

Client Reference:

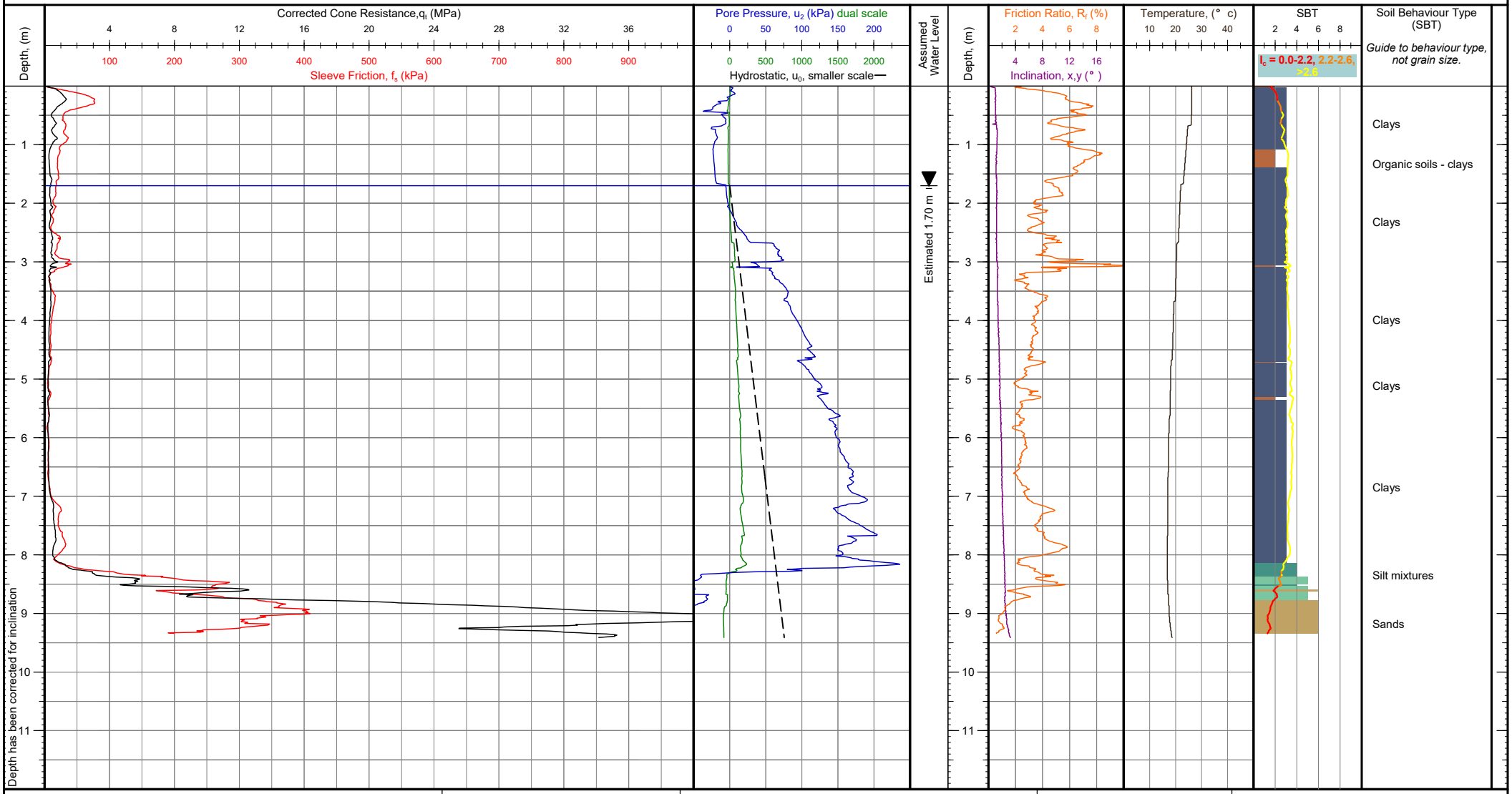
Test Number: **CPT-06**

G.I. Job Ref: 230270

Comments:

Where possible GWL is measured after testing, or estimated in the office. This may not represent the true GWL

CONE PENETRATION TEST (CPT) LOG



Client:	Aurecon	**Operator:**	Alyssa Malamatenios	**NZTM 2000 N, E (m):**	5941838.20, 1747435.08	**Elevation (m):**	Unknown
Project:	1350 Dairy Flat Highway	**Cone Ref:**	MKJ167	**WGS84 (deg):**	-36.657639,174.649605	**Date of Test:**	4/04/2023
Location:	Dairy Flat	**Cone Type:**	10cm^2 Compression	**Location Method:**	Handheld GPS	**Depth (m):**	9.41
Engineer:	Suresh Nuthalapati	**Area Ratio:**	0.79	**Surveyor:**		**Pre Drill (m):**	N/A
Contractor:	Ground Investigation Ltd	**Filter Type:**	u_2	**Termination Reason:**	Limit of reaction force	**G.I. Job Ref:**	230270

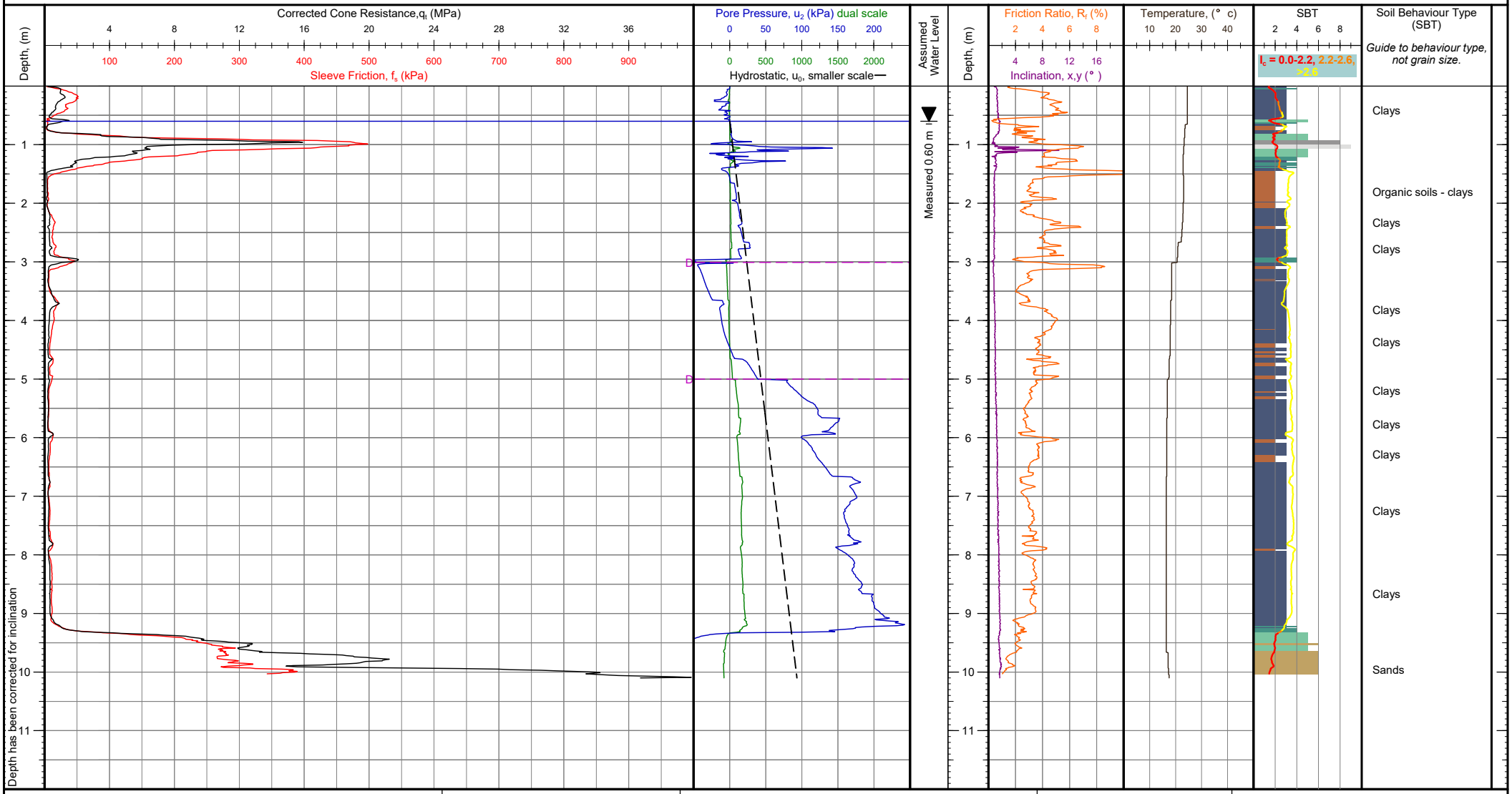
Client Reference:

Test Number: **CPT-07**

Comments: Hole collapsed at 1.00m and dipped dry.

Where possible GWL is measured after testing, or estimated in the office. This may not represent the true GWL

CONE PENETRATION TEST (CPT) LOG



Client:	Aurecon	**Operator:**	Alyssa Malamatenios	**NZTM 2000 N, E (m):**	5941837.32, 1747363.54	**Elevation (m):**	Unknown
Project:	1350 Dairy Flat Highway	**Cone Ref:**	MKJ167	**WGS84 (deg):**	-36.657636,174.648776	**Date of Test:**	4/04/2023
Location:	Dairy Flat	**Cone Type:**	10cm^2 Compression	**Location Method:**	Handheld GPS	**Depth (m):**	10.10
Engineer:	Suresh Nuthalapati	**Area Ratio:**	0.79	**Surveyor:**		**Pre Drill (m):**	N/A
Contractor:	Ground Investigation Ltd	**Filter Type:**	u_2	**Termination Reason:**	Limit of reaction force		

Client Reference:

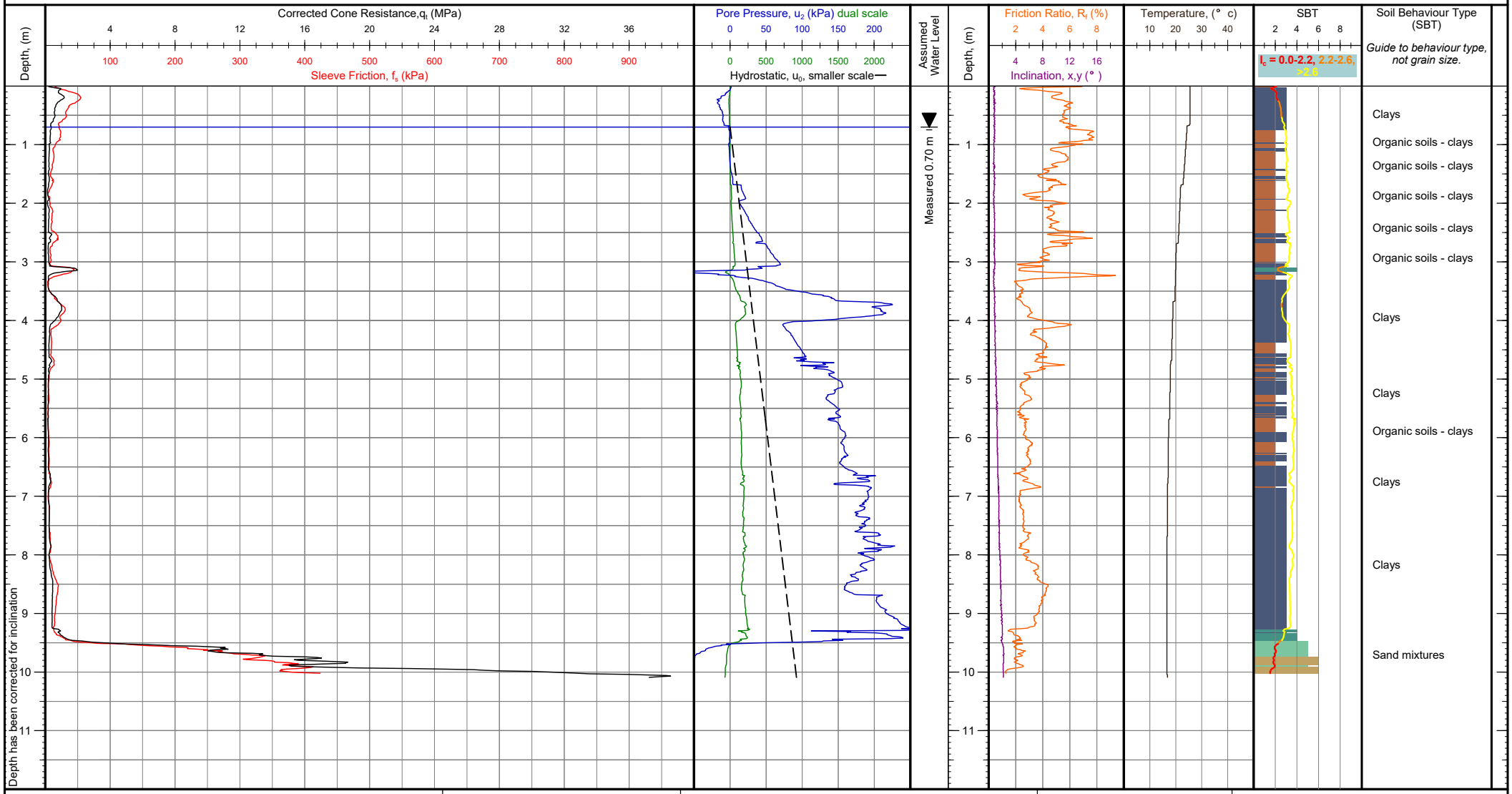
Test Number: **CPT-08**

G.I. Job Ref: 230270

Comments: Dissipations performed at 3.01m and 5.00m.

Where possible GWL is measured after testing, or estimated in the office. This may not represent the true GWL

CONE PENETRATION TEST (CPT) LOG



Client:	Aurecon	**Operator:**	Alyssa Malamatenios	**NZTM 2000 N, E (m):**	5941839.70, 1747328.35	**Elevation (m):**	Unknown
Project:	1350 Dairy Flat Highway	**Cone Ref:**	MKJ167	**WGS84 (deg):**	-36.657545,174.648363	**Date of Test:**	4/04/2023
Location:	Dairy Flat	**Cone Type:**	10cm^2 Compression	**Location Method:**	Handheld GPS	**Depth (m):**	10.09
Engineer:	Suresh Nuthalapati	**Area Ratio:**	0.79	**Surveyor:**		**Pre Drill (m):**	N/A
Contractor:	Ground Investigation Ltd	**Filter Type:**	u_2	**Termination Reason:**	Limit of reaction force		

Client Reference:

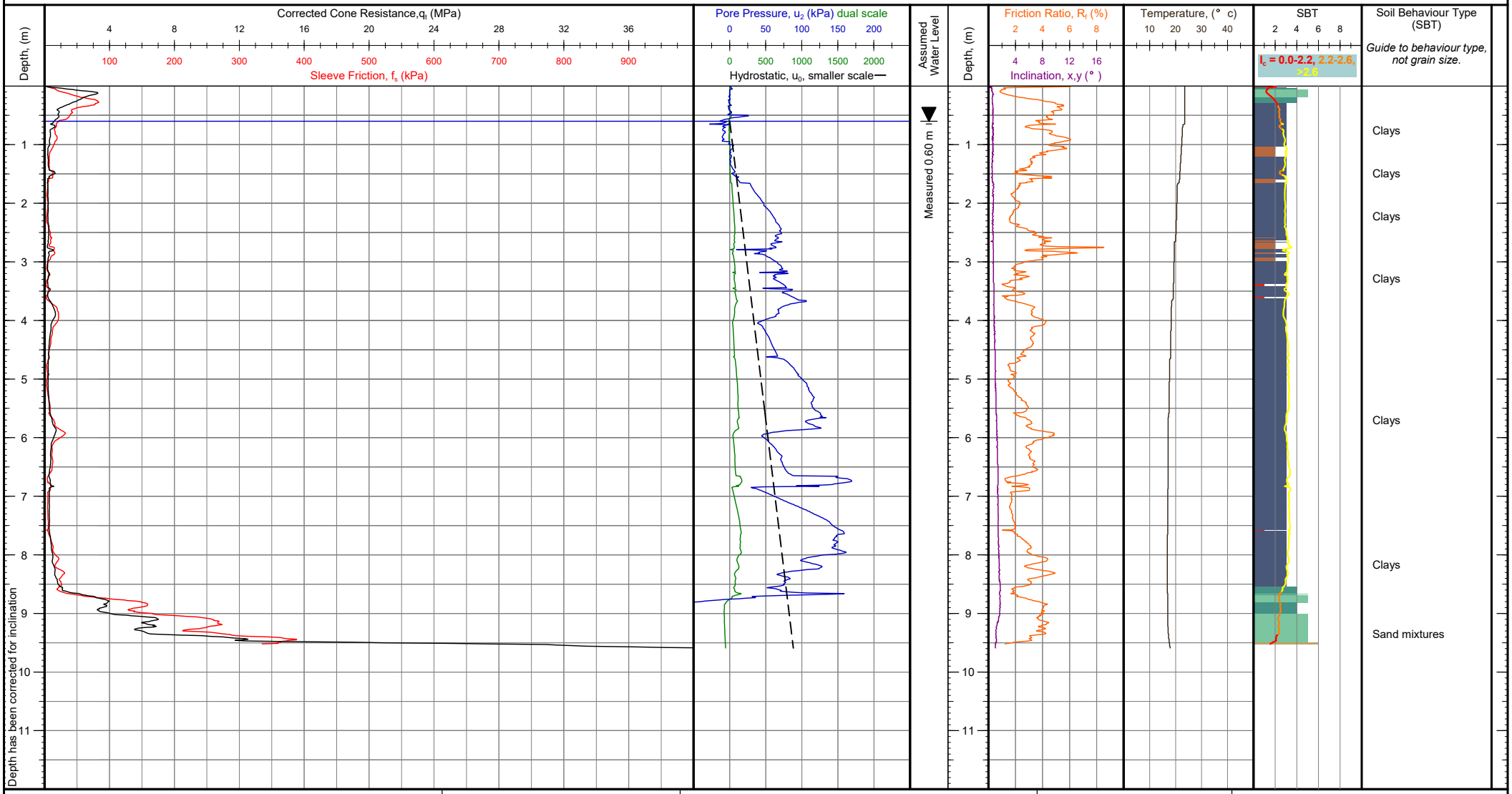
Test Number: **CPT-09**

G.I. Job Ref: 230270

Comments:

Where possible GWL is measured after testing, or estimated in the office. This may not represent the true GWL

CONE PENETRATION TEST (CPT) LOG



Client:	Aurecon	**Operator:**	Alyssa Malamatenios	**NZTM 2000 N, E (m):**	5941840.86, 1747267.31	**Elevation (m):**	Unknown
Project:	1350 Dairy Flat Highway	**Cone Ref:**	MKJ333	**WGS84 (deg):**	-36.657643,174.647710	**Date of Test:**	4/04/2023
Location:	Dairy Flat	**Cone Type:**	10cm^2 Compression	**Location Method:**	Handheld GPS	**Depth (m):**	9.59
Engineer:	Suresh Nuthalapati	**Area Ratio:**	0.80	**Surveyor:**		**Pre Drill (m):**	N/A
Contractor:	Ground Investigation Ltd	**Filter Type:**	u_2	**Termination Reason:**	Limit of reaction force		

Client Reference:

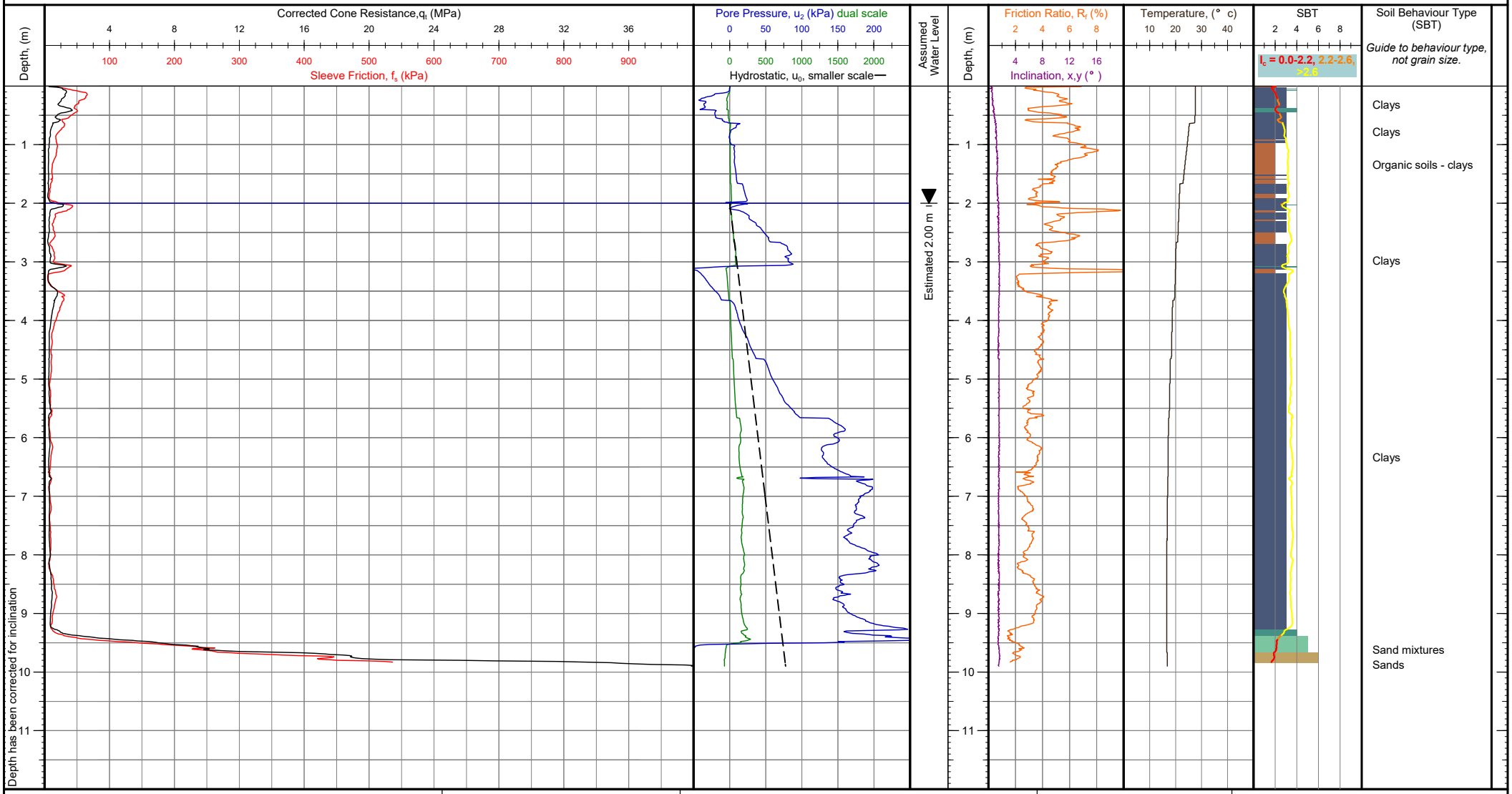
Test Number: **CPT-10**

G.I. Job Ref: 230270

Comments:

Where possible GWL is measured after testing, or estimated in the office. This may not represent the true GWL

CONE PENETRATION TEST (CPT) LOG



Client:	Aurecon	**Operator:**	Alyssa Malamatenios	**NZTM 2000 N, E (m):**	5941796.08, 1747341.46	**Elevation (m):**	Unknown
Project:	1350 Dairy Flat Highway	**Cone Ref:**	MKJ333	**WGS84 (deg):**	-36.658035,174.648548	**Date of Test:**	4/04/2023
Location:	Dairy Flat	**Cone Type:**	10cm^2 Compression	**Location Method:**	Handheld GPS	**Depth (m):**	9.90
Engineer:	Suresh Nuthalapati	**Area Ratio:**	0.80	**Surveyor:**		**Pre Drill (m):**	N/A
Contractor:	Ground Investigation Ltd	**Filter Type:**	u_2	**Termination Reason:**	Limit of reaction force		

Client Reference:

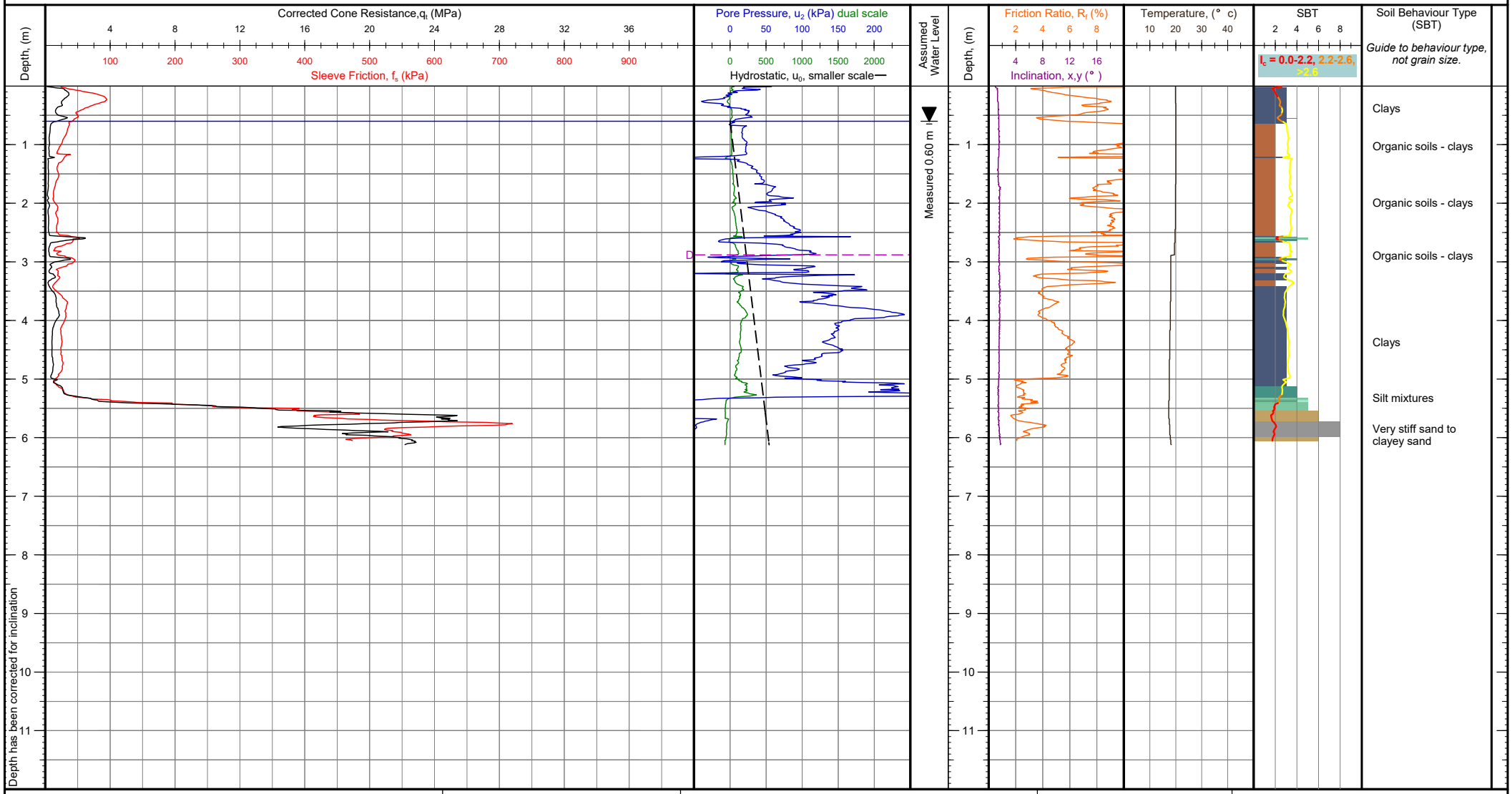
Test Number: **CPT-11**

G.I. Job Ref: 230270

Comments: Hole collapsed at 1.20m and dipped dry.

Where possible GWL is measured after testing, or estimated in the office. This may not represent the true GWL

CONE PENETRATION TEST (CPT) LOG



Client:	Aurecon	**Operator:**	Alyssa Malamatenios	**NZTM 2000 N, E (m):**	5941787.20, 1747277.38	**Elevation (m):**	Unknown
Project:	1350 Dairy Flat Highway	**Cone Ref:**	MKJ167	**WGS84 (deg):**	-36.658135,174.647738	**Date of Test:**	6/04/2023
Location:	Dairy Flat	**Cone Type:**	10cm^2 Compression	**Location Method:**	Handheld GPS	**Depth (m):**	6.12
Engineer:	Suresh Nuthalapati	**Area Ratio:**	0.79	**Surveyor:**		**Pre Drill (m):**	N/A
Contractor:	Ground Investigation Ltd	**Filter Type:**	u_2	**Termination Reason:**	Limit of reaction force		

Client Reference:

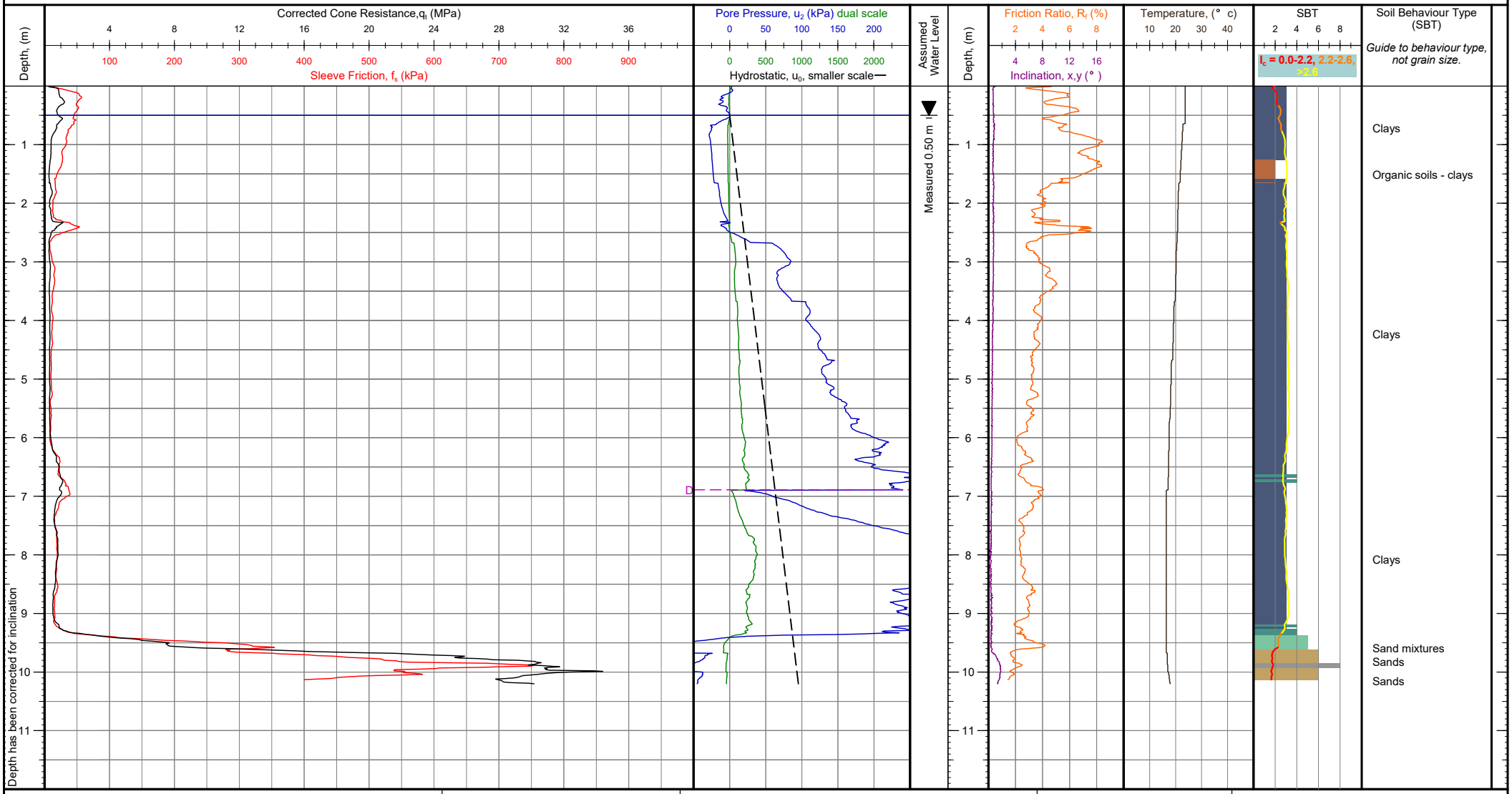
Test Number: **CPT-12**

G.I. Job Ref: 230270

Comments: Dissipation performed at 2.88m.

Where possible GWL is measured after testing, or estimated in the office. This may not represent the true GWL

CONE PENETRATION TEST (CPT) LOG



Client:	Aurecon	**Operator:**	Alyssa Malamatenios	**NZTM 2000 N, E (m):**	5941735.37, 1747413.29	**Elevation (m):**	Unknown
Project:	1350 Dairy Flat Highway	**Cone Ref:**	MKJ167	**WGS84 (deg):**	-36.658617,174.649299	**Date of Test:**	6/04/2023
Location:	Dairy Flat	**Cone Type:**	10cm^2 Compression	**Location Method:**	Handheld GPS	**Depth (m):**	10.20
Engineer:	Suresh Nuthalapati	**Area Ratio:**	0.79	**Surveyor:**		**Pre Drill (m):**	N/A
Contractor:	Ground Investigation Ltd	**Filter Type:**	u_2	**Termination Reason:**	Limit of reaction force	**G.I. Job Ref:**	230270

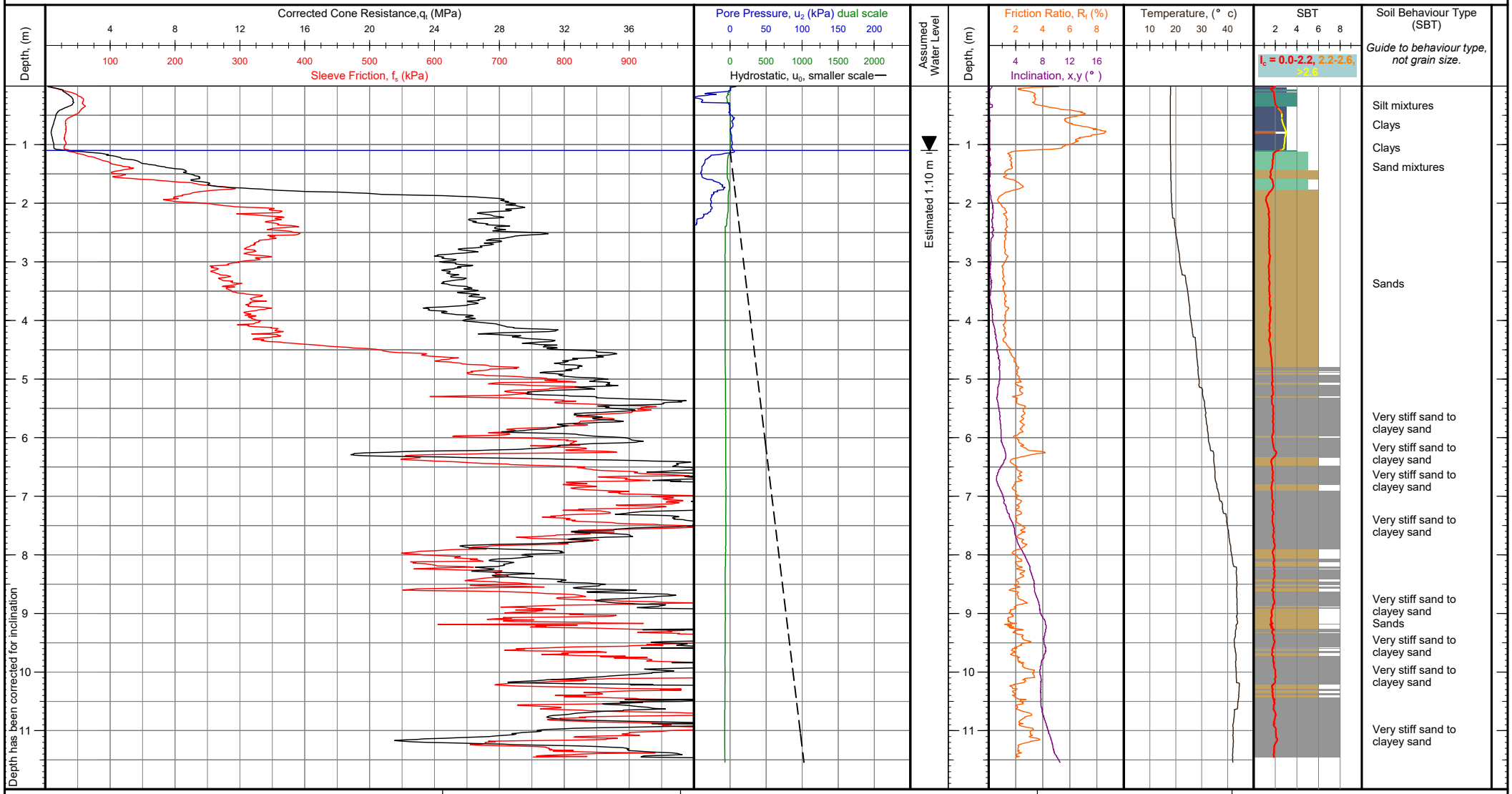
Client Reference:

Test Number: **CPT-13**

Comments: Dissipation performed at 6.89m.

Where possible GWL is measured after testing, or estimated in the office. This may not represent the true GWL

CONE PENETRATION TEST (CPT) LOG



Client:	Aurecon	**Operator:**	Marcelo Martinez	**NZTM 2000 N, E (m):**	5941803.69, 1747550.72	**Elevation (m):**	Unknown
Project:	1350 Dairy Flat Highway	**Cone Ref:**	71136	**WGS84 (deg):**	-36.657934,174.650887	**Date of Test:**	6/04/2023
Location:	Dairy Flat	**Cone Type:**	15cm^2 Subtraction	**Location Method:**	Handheld GPS	**Depth (m):**	11.54
Engineer:	Suresh Nuthalapati	**Area Ratio:**	0.75	**Surveyor:**		**Pre Drill (m):**	N/A
Contractor:	Ground Investigation Ltd	**Filter Type:**	u_2	**Termination Reason:**	Danger of buckling rods		

Client Reference:

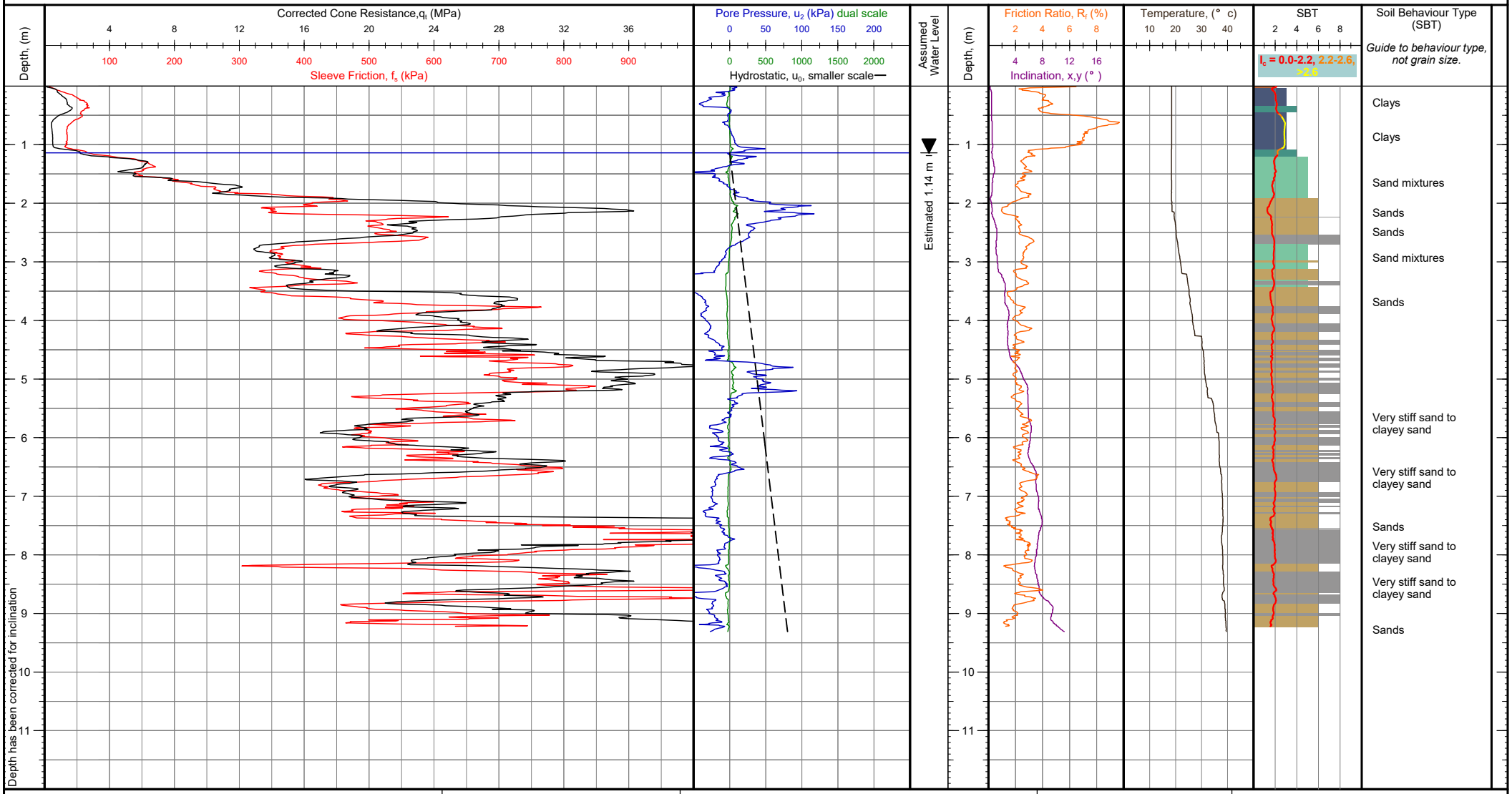
Test Number: **CPT-14**

G.I. Job Ref: 230270

Comments: Hole collapsed at 0.10m and dipped dry.

Where possible GWL is measured after testing, or estimated in the office. This may not represent the true GWL

CONE PENETRATION TEST (CPT) LOG



Client:	Aurecon	**Operator:**	Marcelo Martinez	**NZTM 2000 N, E (m):**	5941835.30, 1747654.99	**Elevation (m):**	Unknown
Project:	1350 Dairy Flat Highway	**Cone Ref:**	71137	**WGS84 (deg):**	-36.657633,174.652047	**Date of Test:**	6/04/2023
Location:	Dairy Flat	**Cone Type:**	15cm^2 Subtraction	**Location Method:**	Handheld GPS	**Depth (m):**	9.31
Engineer:	Suresh Nuthalapati	**Area Ratio:**	0.75	**Surveyor:**		**Pre Drill (m):**	N/A
Contractor:	Ground Investigation Ltd	**Filter Type:**	u_2	**Termination Reason:**	Danger of buckling rods		

Client Reference:

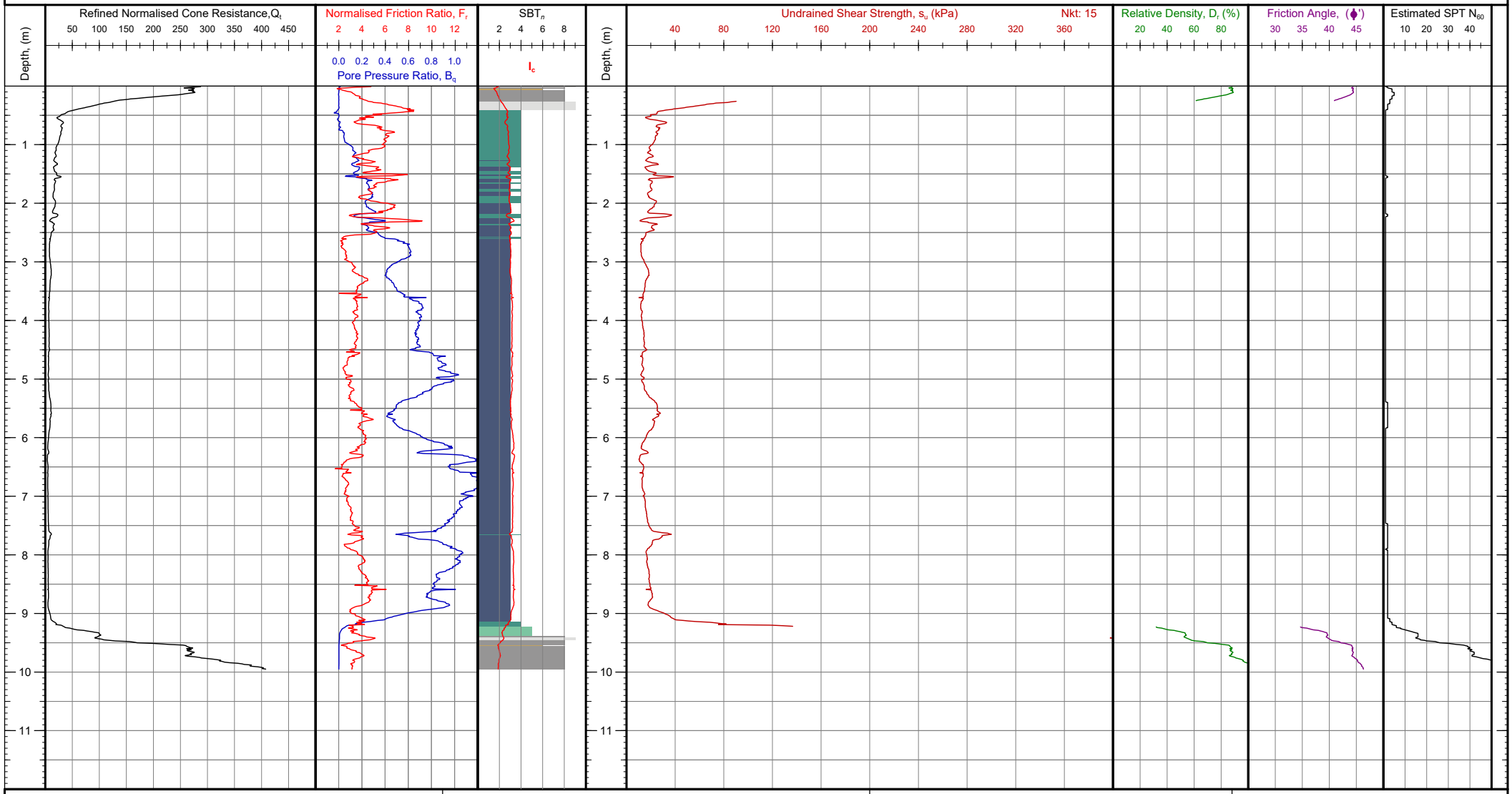
Test Number: **CPT-15**

G.I. Job Ref: 230270

Comments: Hole collapsed at 0.10m and dipped dry.

Where possible GWL is measured after testing, or estimated in the office. This may not represent the true GWL

CPT PARAMETER LOG



Client: Aurecon

Project: 1350 Dairy Flat Highway

Location: Dairy Flat

Engineer: Suresh Nuthalapati

Contractor: Ground Investigation Ltd

Soil Behaviour Type SBT_n - Robertson et al. 1990

0	Undefined	5	Sand mixtures: silty sand to sandy silt
1	Sensitive fine grained	6	Sands: clean sands to silty sands
2	Organic: Organic clay/silt, peat	7	Dense sand to gravelly sand
3	Clay: clay to silty clay	8	Stiff sand to clayey sand
4	Silt mixtures: clayey silt & silty clay	9	Stiff silt/clay

Notes and Limitations:

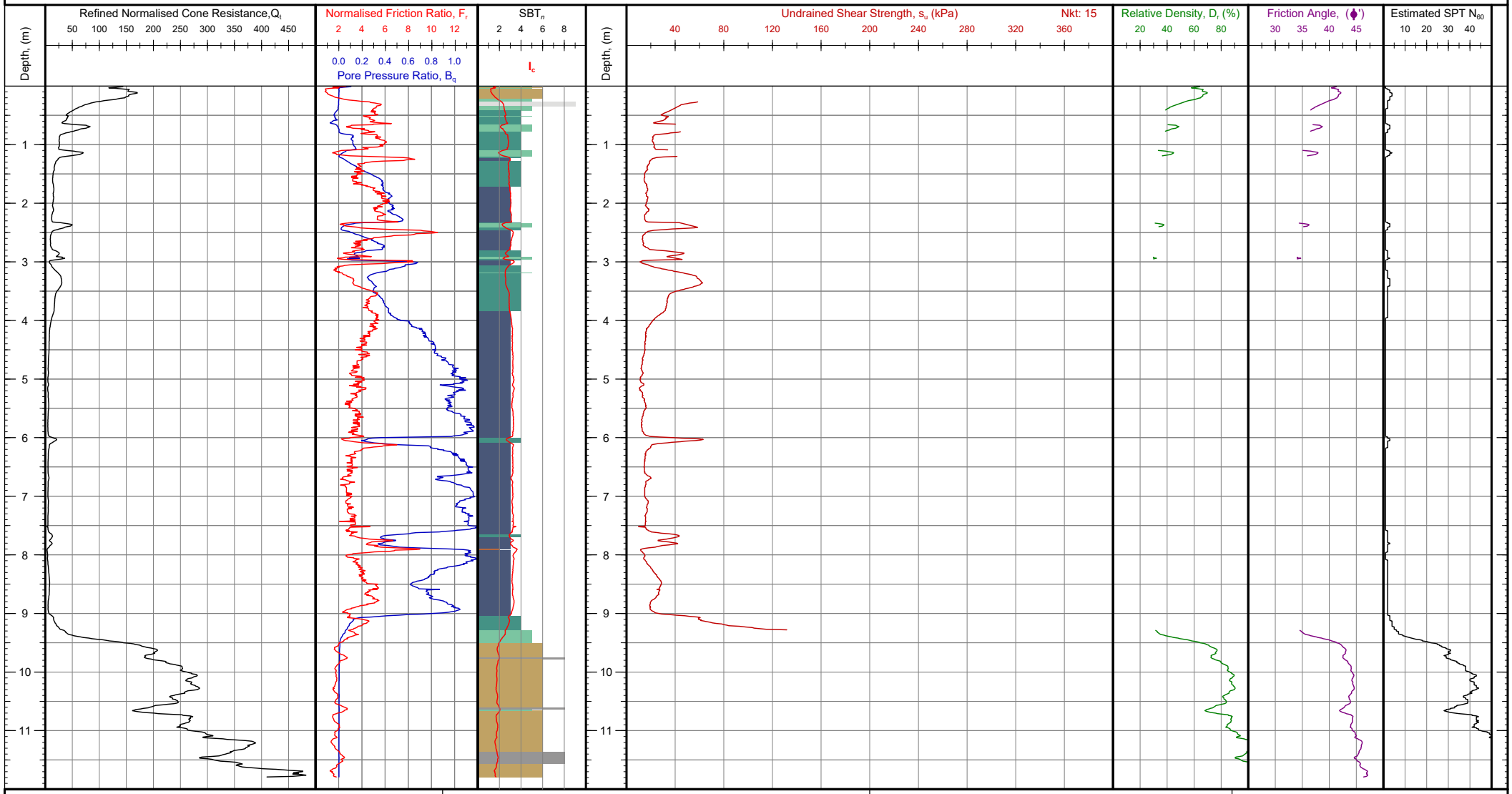
Data shown on this report has been assessed to provide a basic interpretation in terms of Soil Behaviour Type (SBT) and various geotechnical soil and design parameters using methods published in P.K. Robertson and K.L. Cabel (2010), Guide to Cone Penetration Testing for Geotechnical Engineering, 7th Edition. The interpretations are presented only as a guide for geotechnical use and should be carefully reviewed by the user. Ground Investigation Ltd. does not warrant the correctness or applicability of any of the geotechnical soil and design parameter shown and does not assume any liability for any use of the results in any design or review. The user should be fully aware of the techniques and limitations of any method used to derive data shown in this report.

Client Reference:

Test Number: **CPT-01**

G.I. Job Ref: 230270

CPT PARAMETER LOG



Client: Aurecon

Project: 1350 Dairy Flat Highway

Location: Dairy Flat

Engineer: Suresh Nuthalapati

Contractor: Ground Investigation Ltd

Soil Behaviour Type SBT_n - Robertson et al. 1990

0	Undefined	5	Sand mixtures: silty sand to sandy silt
1	Sensitive fine grained	6	Sands: clean sands to silty sands
2	Organic: Organic clay/silt, peat	7	Dense sand to gravelly sand
3	Clay: clay to silty clay	8	Stiff sand to clayey sand
4	Silt mixtures: clayey silt & silty clay	9	Stiff silt/clay

Notes and Limitations:

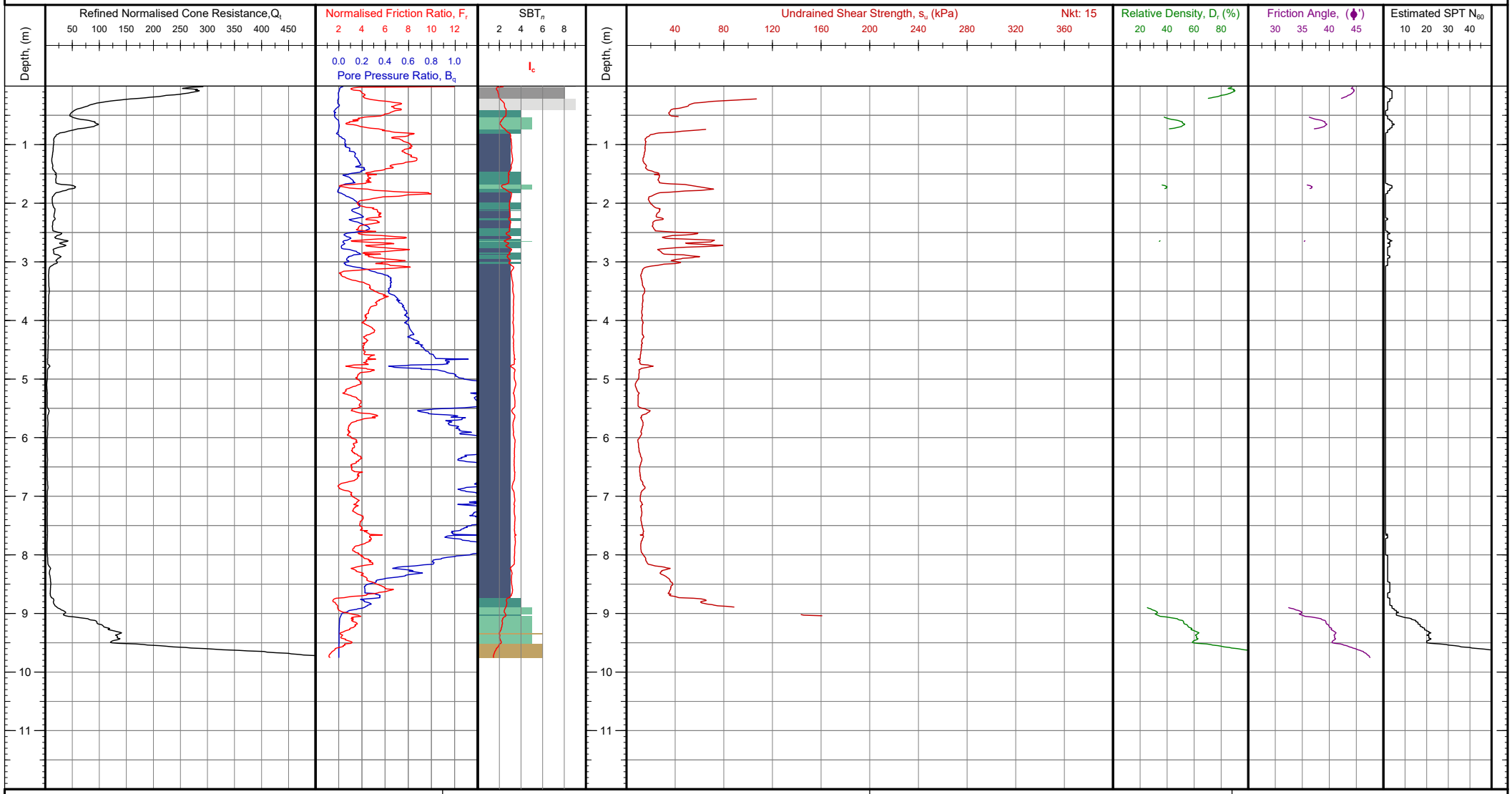
Data shown on this report has been assessed to provide a basic interpretation in terms of Soil Behaviour Type (SBT) and various geotechnical soil and design parameters using methods published in P.K. Robertson and K.L. Cabel (2010), Guide to Cone Penetration Testing for Geotechnical Engineering, 7th Edition. The interpretations are presented only as a guide for geotechnical use and should be carefully reviewed by the user. Ground Investigation Ltd. does not warrant the correctness or applicability of any of the geotechnical soil and design parameter shown and does not assume any liability for any use of the results in any design or review. The user should be fully aware of the techniques and limitations of any method used to derive data shown in this report.

Client Reference:

Test Number: **CPT-02**

G.I. Job Ref: 230270

CPT PARAMETER LOG



Client: Aurecon

Project: 1350 Dairy Flat Highway

Location: Dairy Flat

Engineer: Suresh Nuthalapati

Contractor: Ground Investigation Ltd

Soil Behaviour Type SBT_n - Robertson et al. 1990

0	Undefined	5	Sand mixtures: silty sand to sandy silt
1	Sensitive fine grained	6	Sands: clean sands to silty sands
2	Organic: Organic clay/silt, peat	7	Dense sand to gravelly sand
3	Clay: clay to silty clay	8	Stiff sand to clayey sand
4	Silt mixtures: clayey silt & silty clay	9	Stiff silt/clay

Notes and Limitations:

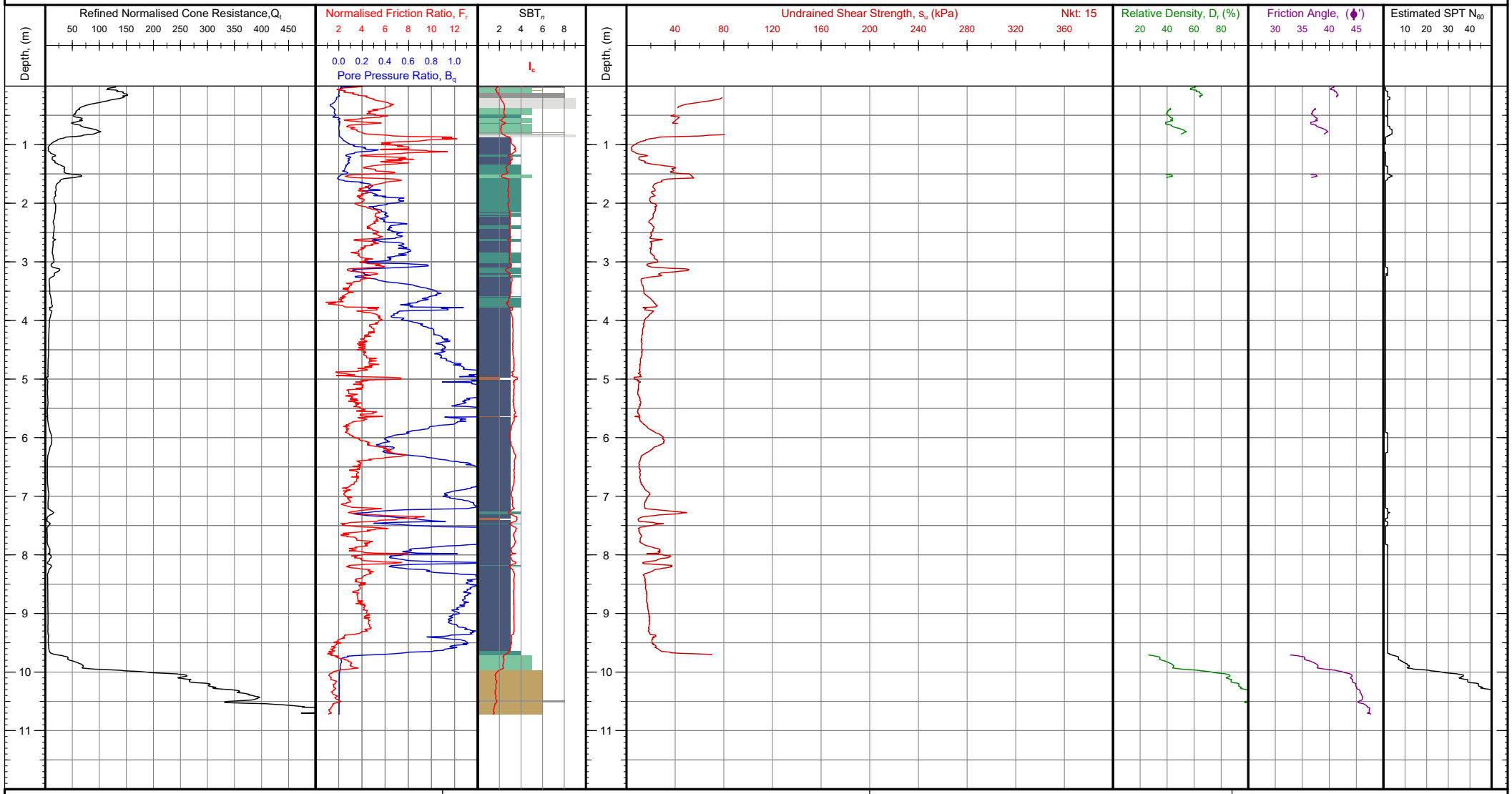
Data shown on this report has been assessed to provide a basic interpretation in terms of Soil Behaviour Type (SBT) and various geotechnical soil and design parameters using methods published in P.K. Robertson and K.L. Cabel (2010), Guide to Cone Penetration Testing for Geotechnical Engineering, 7th Edition. The interpretations are presented only as a guide for geotechnical use and should be carefully reviewed by the user. Ground Investigation Ltd. does not warrant the correctness or applicability of any of the geotechnical soil and design parameter shown and does not assume any liability for any use of the results in any design or review. The user should be fully aware of the techniques and limitations of any method used to derive data shown in this report.

Client Reference:

Test Number: **CPT-03**

G.I. Job Ref: 230270

CPT PARAMETER LOG



Client: Aurecon

Project: 1350 Dairy Flat Highway

Location: Dairy Flat

Engineer: Suresh Nuthalapati

Contractor: Ground Investigation Ltd

Soil Behaviour Type SBT_n - Robertson et al. 1990

0	Undefined	5	Sand mixtures: silty sand to sandy silt
1	Sensitive fine grained	6	Sands: clean sands to silty sands
2	Organic: Organic clay/silt, peat	7	Dense sand to gravelly sand
3	Clay: clay to silty clay	8	Stiff sand to clayey sand
4	Silt mixtures: clayey silt & silty clay	9	Stiff silt/clay

Notes and Limitations:

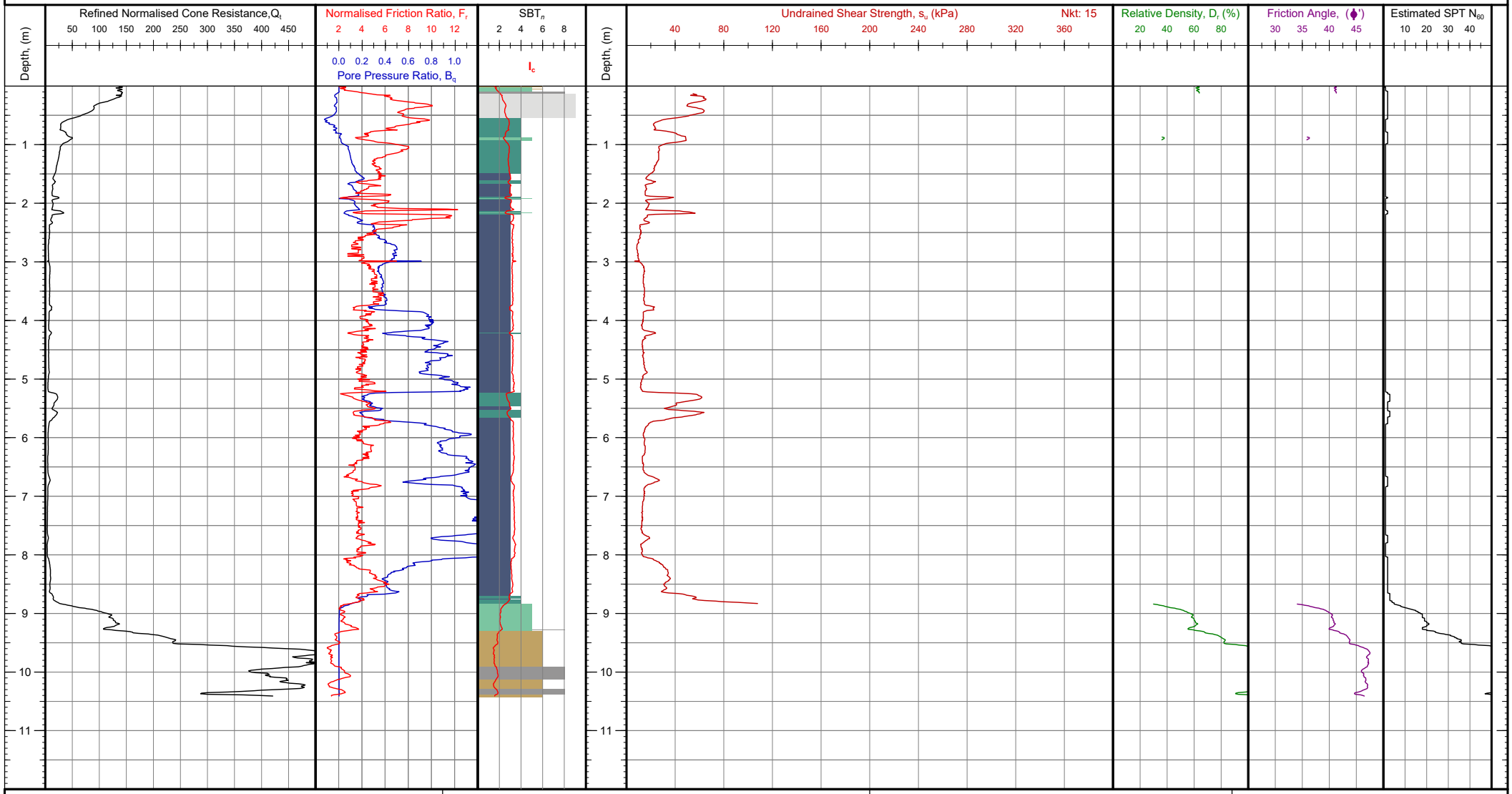
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Client Reference:

Test Number: **CPT-04**

G.I. Job Ref: 230270

CPT PARAMETER LOG



Client: Aurecon

Project: 1350 Dairy Flat Highway

Location: Dairy Flat

Engineer: Suresh Nuthalapati

Contractor: Ground Investigation Ltd

Soil Behaviour Type SBT_n - Robertson et al. 1990

0	Undefined	5	Sand mixtures: silty sand to sandy silt
1	Sensitive fine grained	6	Sands: clean sands to silty sands
2	Organic: Organic clay/silt, peat	7	Dense sand to gravelly sand
3	Clay: clay to silty clay	8	Stiff sand to clayey sand
4	Silt mixtures: clayey silt & silty clay	9	Stiff silt/clay

Notes and Limitations:

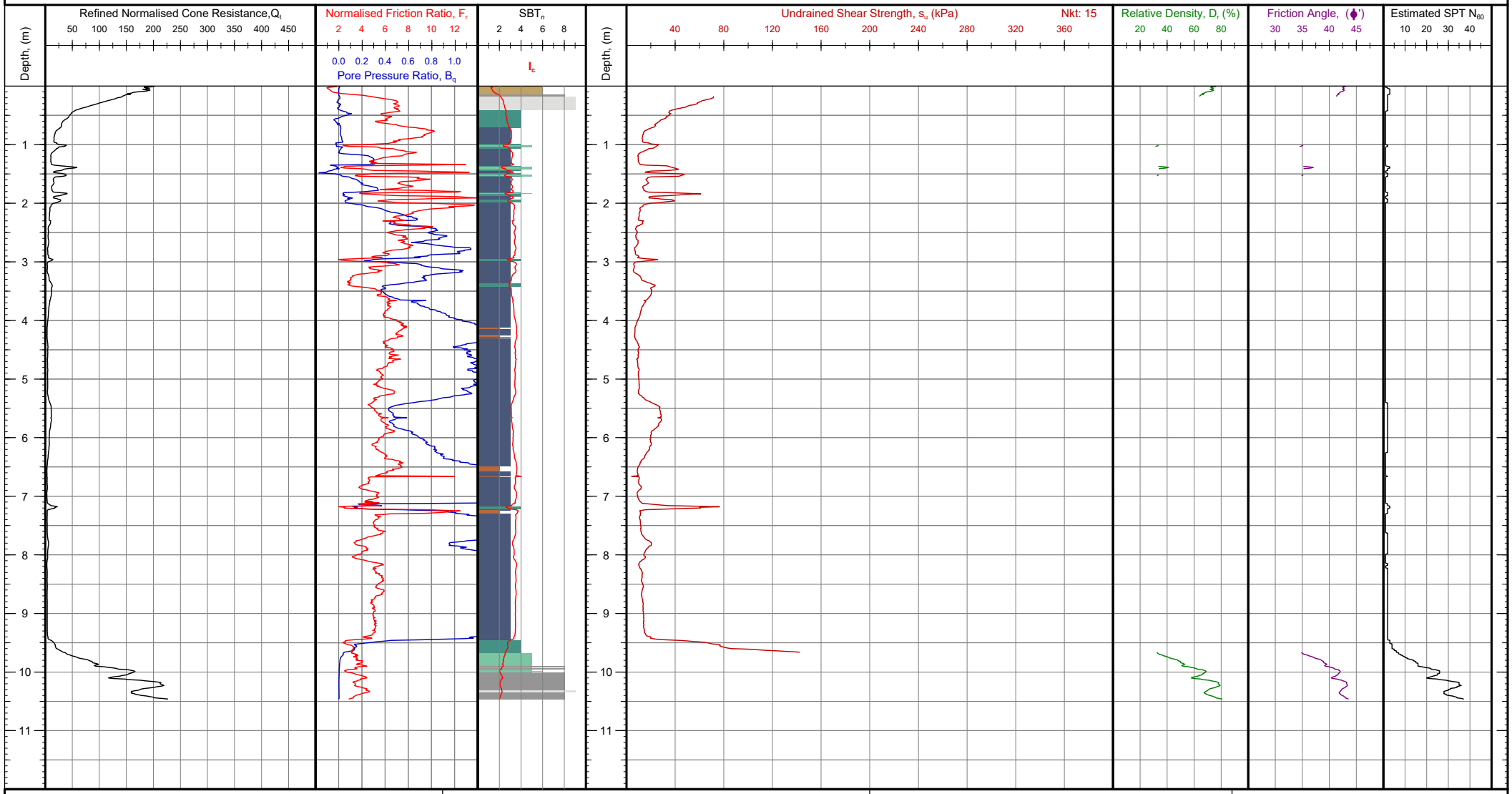
Data shown on this report has been assessed to provide a basic interpretation in terms of Soil Behaviour Type (SBT) and various geotechnical soil and design parameters using methods published in P.K. Robertson and K.L. Cabel (2010), Guide to Cone Penetration Testing for Geotechnical Engineering, 7th Edition. The interpretations are presented only as a guide for geotechnical use and should be carefully reviewed by the user. Ground Investigation Ltd. does not warrant the correctness or applicability of any of the geotechnical soil and design parameter shown and does not assume any liability for any use of the results in any design or review. The user should be fully aware of the techniques and limitations of any method used to derive data shown in this report.

Client Reference:

Test Number: **CPT-05**

G.I. Job Ref: 230270

CPT PARAMETER LOG



Client: Aurecon

Project: 1350 Dairy Flat Highway

Location: Dairy Flat

Engineer: Suresh Nuthalapati

Contractor: Ground Investigation Ltd

Soil Behaviour Type SBT_n - Robertson et al. 1990

0	Undefined	5	Sand mixtures: silty sand to sandy silt
1	Sensitive fine grained	6	Sands: clean sands to silty sands
2	Organic: Organic clay/silt, peat	7	Dense sand to gravelly sand
3	Clay: clay to silty clay	8	Stiff sand to clayey sand
4	Silt mixtures: clayey silt & silty clay	9	Stiff silt/clay

Notes and Limitations:

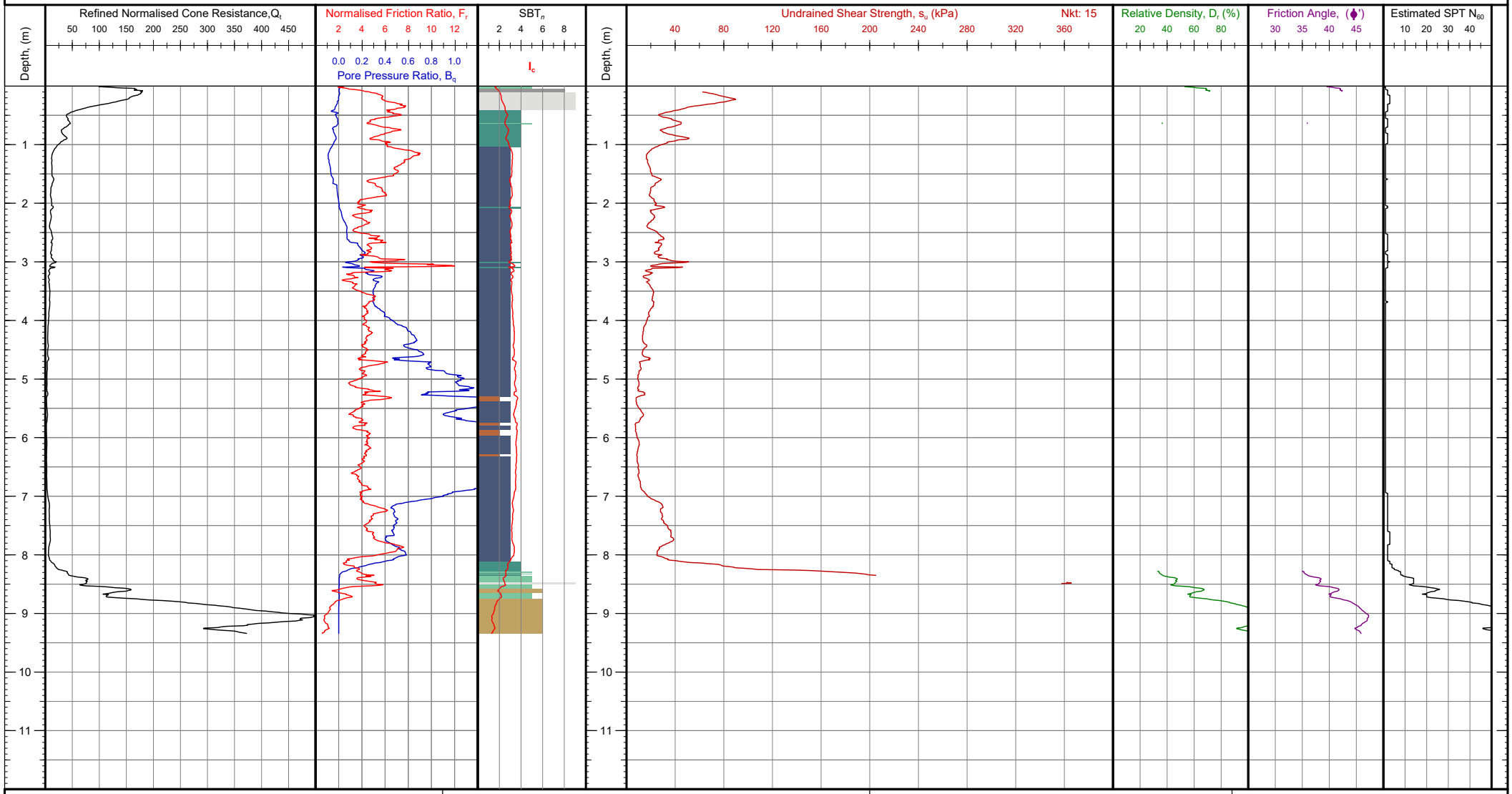
Data shown on this report has been assessed to provide a basic interpretation in terms of Soil Behaviour Type (SBT) and various geotechnical soil and design parameters using methods published in P.K. Robertson and K.L. Cabel (2010), Guide to Cone Penetration Testing for Geotechnical Engineering, 7th Edition. The interpretations are presented only as a guide for geotechnical use and should be carefully reviewed by the user. Ground Investigation Ltd. does not warrant the correctness or applicability of any of the geotechnical soil and design parameter shown and does not assume any liability for any use of the results in any design or review. The user should be fully aware of the techniques and limitations of any method used to derive data shown in this report.

Client Reference:

Test Number: **CPT-06**

G.I. Job Ref: 230270

CPT PARAMETER LOG



Client: Aurecon

Project: 1350 Dairy Flat Highway

Location: Dairy Flat

Engineer: Suresh Nuthalapati

Contractor: Ground Investigation Ltd

Soil Behaviour Type SBT_n - Robertson et al. 1990

0	Undefined	5	Sand mixtures: silty sand to sandy silt
1	Sensitive fine grained	6	Sands: clean sands to silty sands
2	Organic: Organic clay/silt, peat	7	Dense sand to gravelly sand
3	Clay: clay to silty clay	8	Stiff sand to clayey sand
4	Silt mixtures: clayey silt & silty clay	9	Stiff silt/clay

Notes and Limitations:

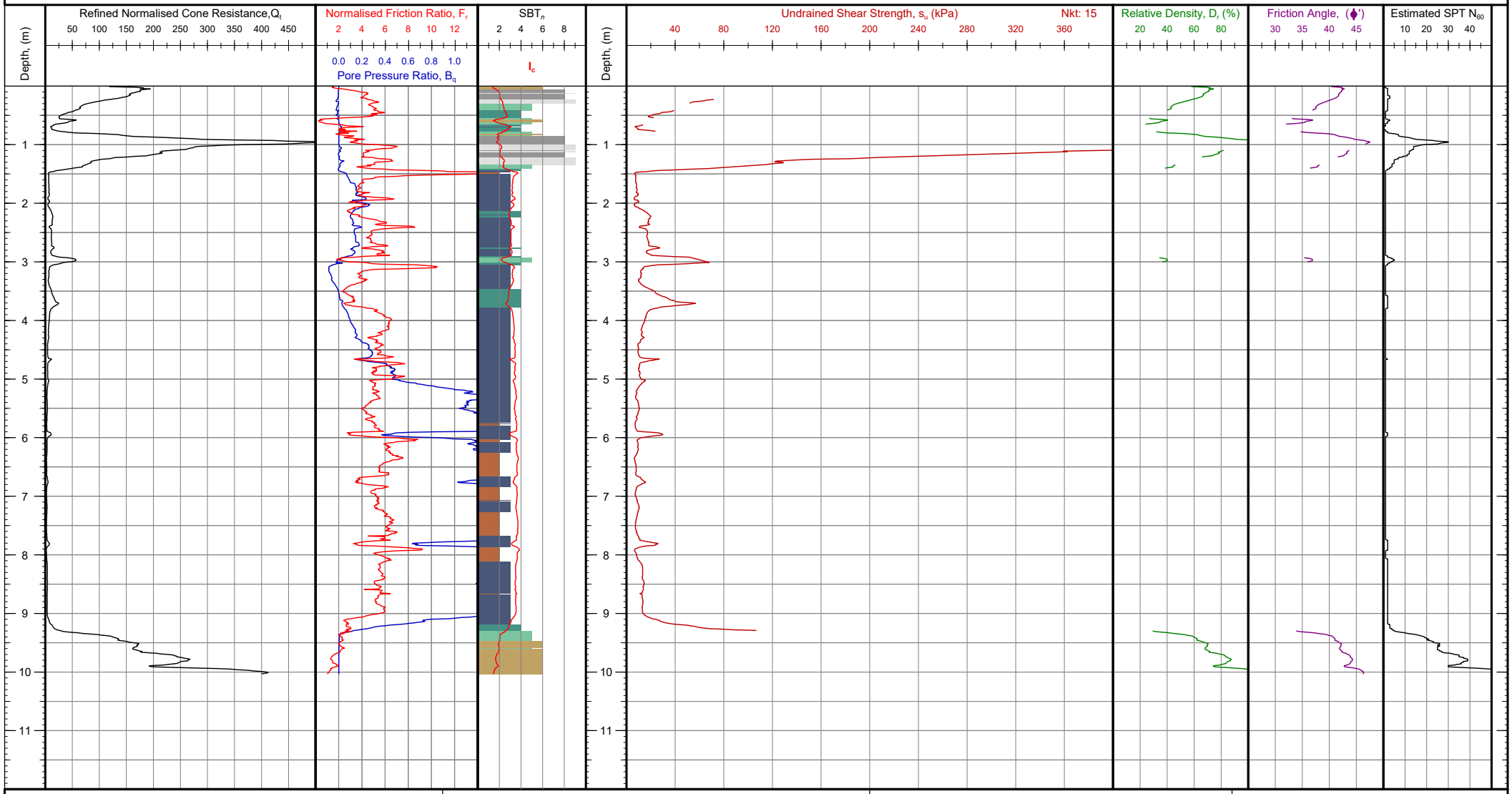
Data shown on this report has been assessed to provide a basic interpretation in terms of Soil Behaviour Type (SBT) and various geotechnical soil and design parameters using methods published in P.K. Robertson and K.L. Cabel (2010), Guide to Cone Penetration Testing for Geotechnical Engineering, 7th Edition. The interpretations are presented only as a guide for geotechnical use and should be carefully reviewed by the user. Ground Investigation Ltd. does not warrant the correctness or applicability of any of the geotechnical soil and design parameter shown and does not assume any liability for any use of the results in any design or review. The user should be fully aware of the techniques and limitations of any method used to derive data shown in this report.

Client Reference:

Test Number: **CPT-07**

G.I. Job Ref: 230270

CPT PARAMETER LOG



Client: Aurecon

Project: 1350 Dairy Flat Highway

Location: Dairy Flat

Engineer: Suresh Nuthalapati

Contractor: Ground Investigation Ltd

Soil Behaviour Type SBT_n - Robertson et al. 1990

0	Undefined	5	Sand mixtures: silty sand to sandy silt
1	Sensitive fine grained	6	Sands: clean sands to silty sands
2	Organic: Organic clay/silt, peat	7	Dense sand to gravelly sand
3	Clay: clay to silty clay	8	Stiff sand to clayey sand
4	Silt mixtures: clayey silt & silty clay	9	Stiff silt/clay

Notes and Limitations:

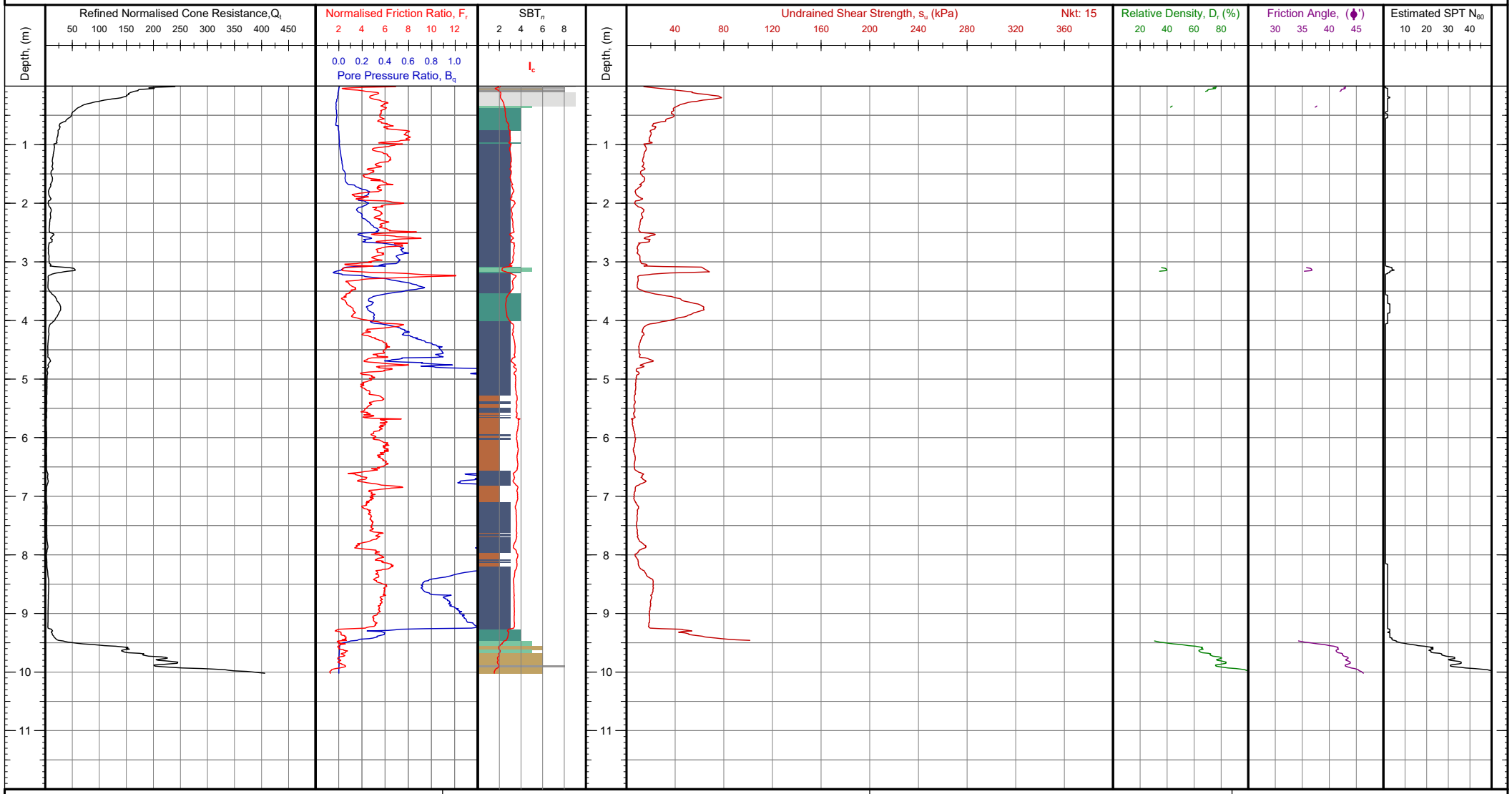
Data shown on this report has been assessed to provide a basic interpretation in terms of Soil Behaviour Type (SBT) and various geotechnical soil and design parameters using methods published in P.K. Robertson and K.L. Cabel (2010), Guide to Cone Penetration Testing for Geotechnical Engineering, 7th Edition. The interpretations are presented only as a guide for geotechnical use and should be carefully reviewed by the user. Ground Investigation Ltd. does not warrant the correctness or applicability of any of the geotechnical soil and design parameter shown and does not assume any liability for any use of the results in any design or review. The user should be fully aware of the techniques and limitations of any method used to derive data shown in this report.

Client Reference:

Test Number: **CPT-08**

G.I. Job Ref: 230270

CPT PARAMETER LOG



Client: Aurecon

Project: 1350 Dairy Flat Highway

Location: Dairy Flat

Engineer: Suresh Nuthalapati

Contractor: Ground Investigation Ltd

Soil Behaviour Type SBT_n - Robertson et al. 1990

0	Undefined	5	Sand mixtures: silty sand to sandy silt
1	Sensitive fine grained	6	Sands: clean sands to silty sands
2	Organic: Organic clay/silt, peat	7	Dense sand to gravelly sand
3	Clay: clay to silty clay	8	Stiff sand to clayey sand
4	Silt mixtures: clayey silt & silty clay	9	Stiff silt/clay

Notes and Limitations:

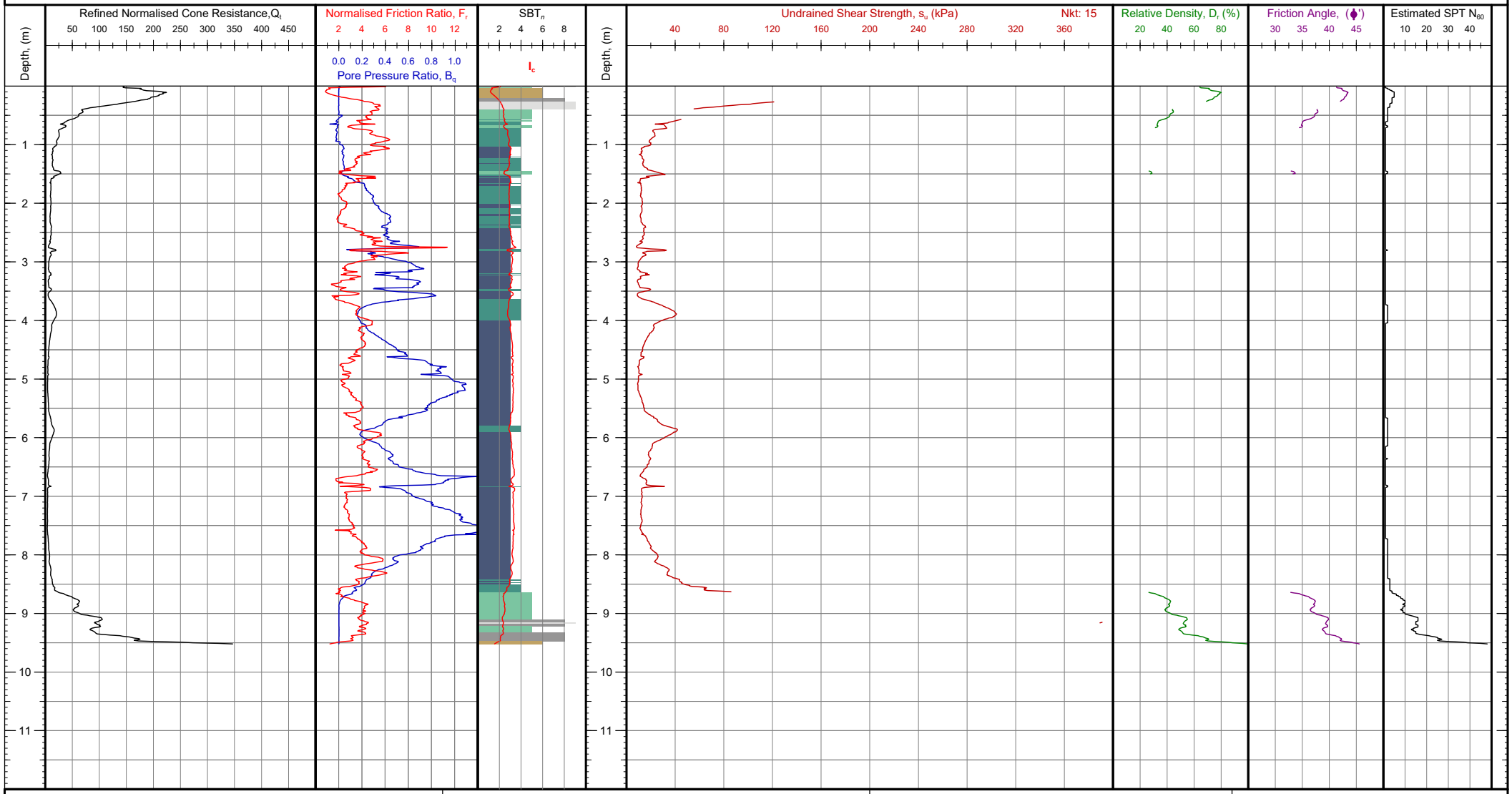
Data shown on this report has been assessed to provide a basic interpretation in terms of Soil Behaviour Type (SBT) and various geotechnical soil and design parameters using methods published in P.K. Robertson and K.L. Cabel (2010), Guide to Cone Penetration Testing for Geotechnical Engineering, 7th Edition. The interpretations are presented only as a guide for geotechnical use and should be carefully reviewed by the user. Ground Investigation Ltd. does not warrant the correctness or applicability of any of the geotechnical soil and design parameter shown and does not assume any liability for any use of the results in any design or review. The user should be fully aware of the techniques and limitations of any method used to derive data shown in this report.

Client Reference:

Test Number: **CPT-09**

G.I. Job Ref: 230270

CPT PARAMETER LOG



Client: Aurecon

Project: 1350 Dairy Flat Highway

Location: Dairy Flat

Engineer: Suresh Nuthalapati

Contractor: Ground Investigation Ltd

Soil Behaviour Type SBT_n - Robertson et al. 1990

0	Undefined	5	Sand mixtures: silty sand to sandy silt
1	Sensitive fine grained	6	Sands: clean sands to silty sands
2	Organic: Organic clay/silt, peat	7	Dense sand to gravelly sand
3	Clay: clay to silty clay	8	Stiff sand to clayey sand
4	Silt mixtures: clayey silt & silty clay	9	Stiff silt/clay

Notes and Limitations:

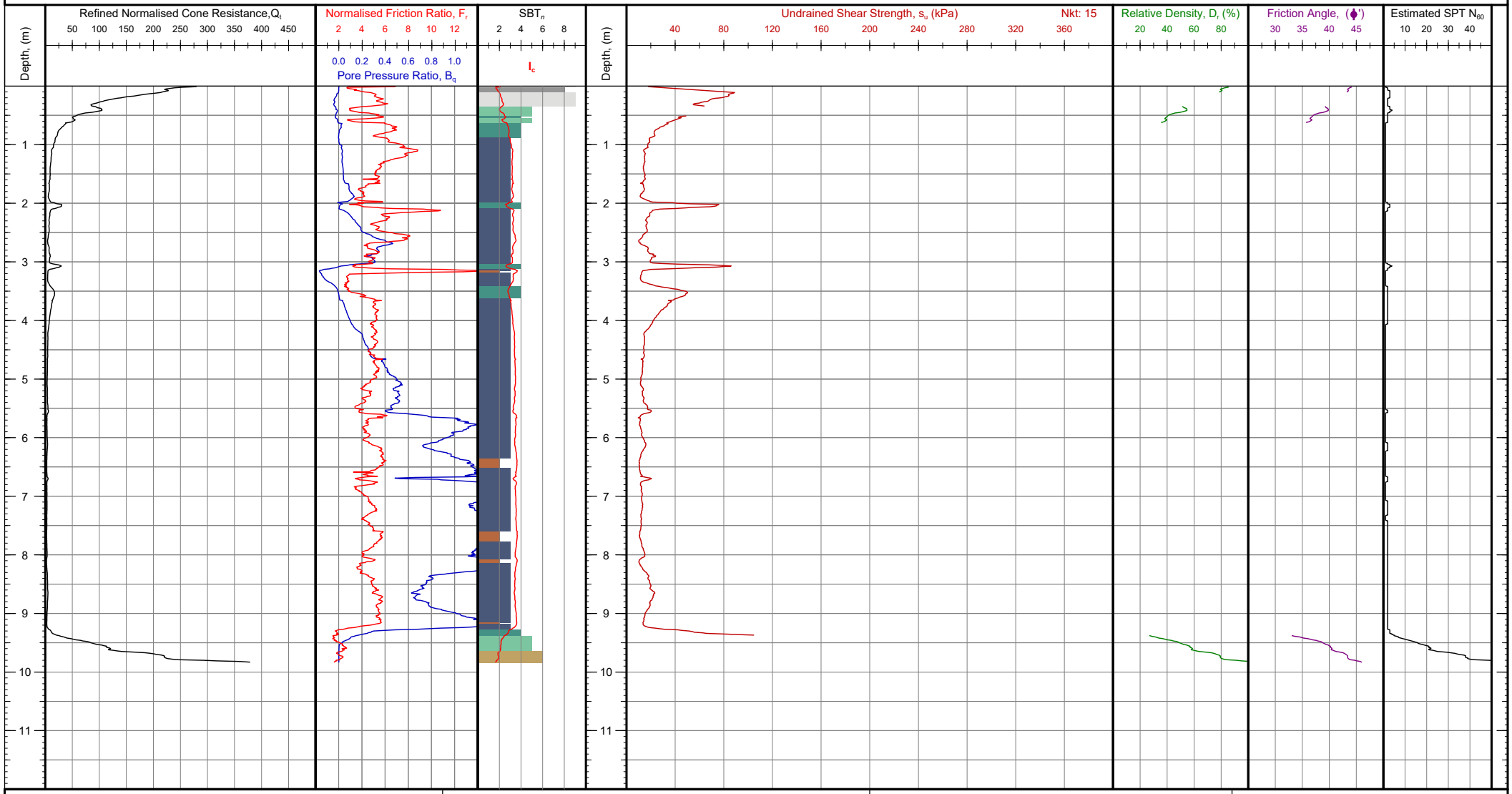
Data shown on this report has been assessed to provide a basic interpretation in terms of Soil Behaviour Type (SBT) and various geotechnical soil and design parameters using methods published in P.K. Robertson and K.L. Cabel (2010), Guide to Cone Penetration Testing for Geotechnical Engineering, 7th Edition. The interpretations are presented only as a guide for geotechnical use and should be carefully reviewed by the user. Ground Investigation Ltd. does not warrant the correctness or applicability of any of the geotechnical soil and design parameter shown and does not assume any liability for any use of the results in any design or review. The user should be fully aware of the techniques and limitations of any method used to derive data shown in this report.

Client Reference:

Test Number: **CPT-10**

G.I. Job Ref: 230270

CPT PARAMETER LOG



Client: Aurecon

Project: 1350 Dairy Flat Highway

Location: Dairy Flat

Engineer: Suresh Nuthalapati

Contractor: Ground Investigation Ltd

Soil Behaviour Type SBT_n - Robertson et al. 1990

0	Undefined	5	Sand mixtures: silty sand to sandy silt
1	Sensitive fine grained	6	Sands: clean sands to silty sands
2	Organic: Organic clay/silt, peat	7	Dense sand to gravelly sand
3	Clay: clay to silty clay	8	Stiff sand to clayey sand
4	Silt mixtures: clayey silt & silty clay	9	Stiff silt/clay

Notes and Limitations:

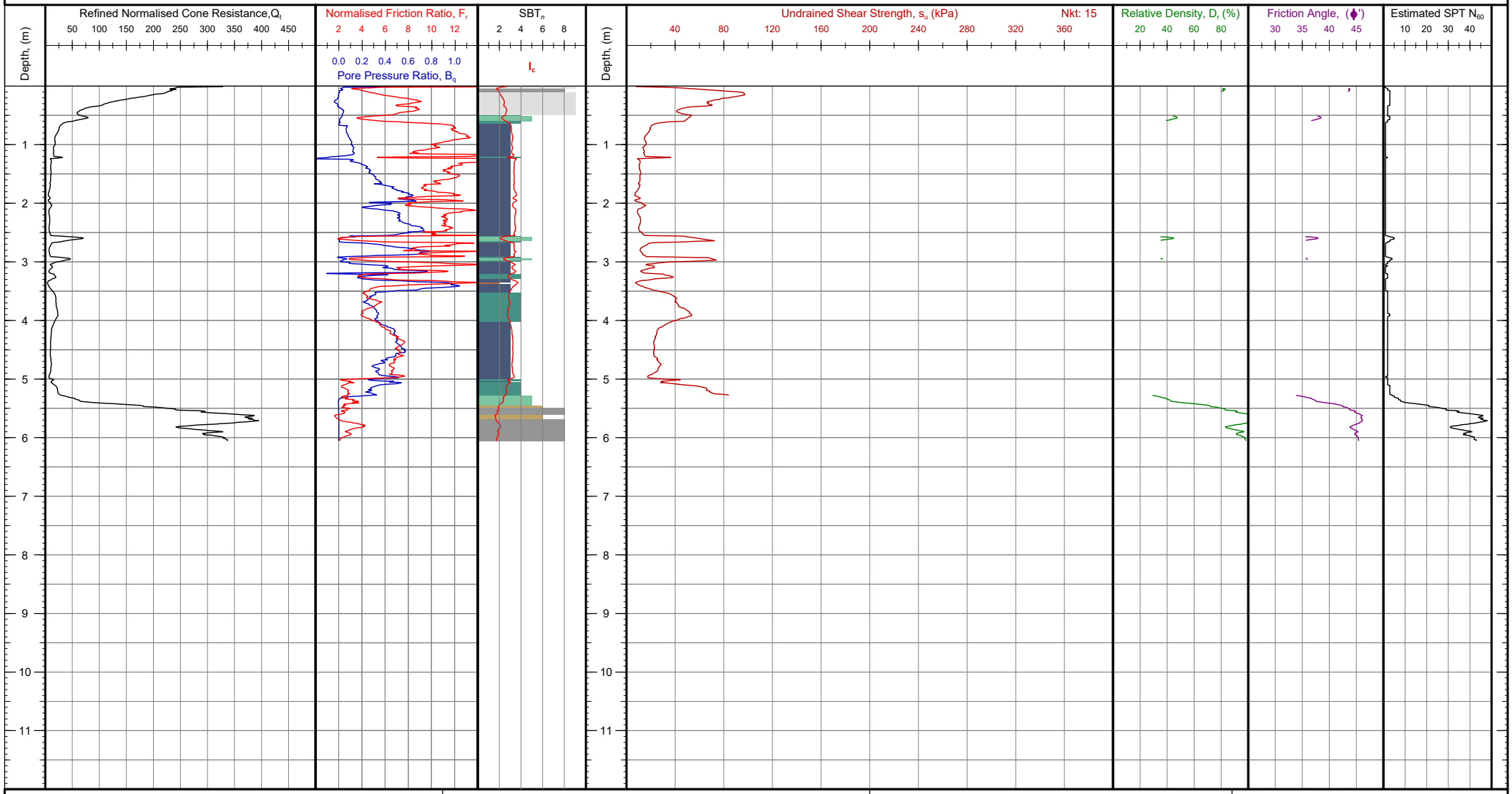
Data shown on this report has been assessed to provide a basic interpretation in terms of Soil Behaviour Type (SBT) and various geotechnical soil and design parameters using methods published in P.K. Robertson and K.L. Cabel (2010), Guide to Cone Penetration Testing for Geotechnical Engineering, 7th Edition. The interpretations are presented only as a guide for geotechnical use and should be carefully reviewed by the user. Ground Investigation Ltd. does not warrant the correctness or applicability of any of the geotechnical soil and design parameter shown and does not assume any liability for any use of the results in any design or review. The user should be fully aware of the techniques and limitations of any method used to derive data shown in this report.

Client Reference:

Test Number: **CPT-11**

G.I. Job Ref: 230270

CPT PARAMETER LOG



Client: Aurecon

Project: 1350 Dairy Flat Highway

Location: Dairy Flat

Engineer: Suresh Nuthalapati

Contractor: Ground Investigation Ltd

Soil Behaviour Type SBT_n - Robertson et al. 1990

0	Undefined	5	Sand mixtures: silty sand to sandy silt
1	Sensitive fine grained	6	Sands: clean sands to silty sands
2	Organic: Organic clay/silt, peat	7	Dense sand to gravelly sand
3	Clay: clay to silty clay	8	Stiff sand to clayey sand
4	Silt mixtures: clayey silt & silty clay	9	Stiff silt/clay

Notes and Limitations:

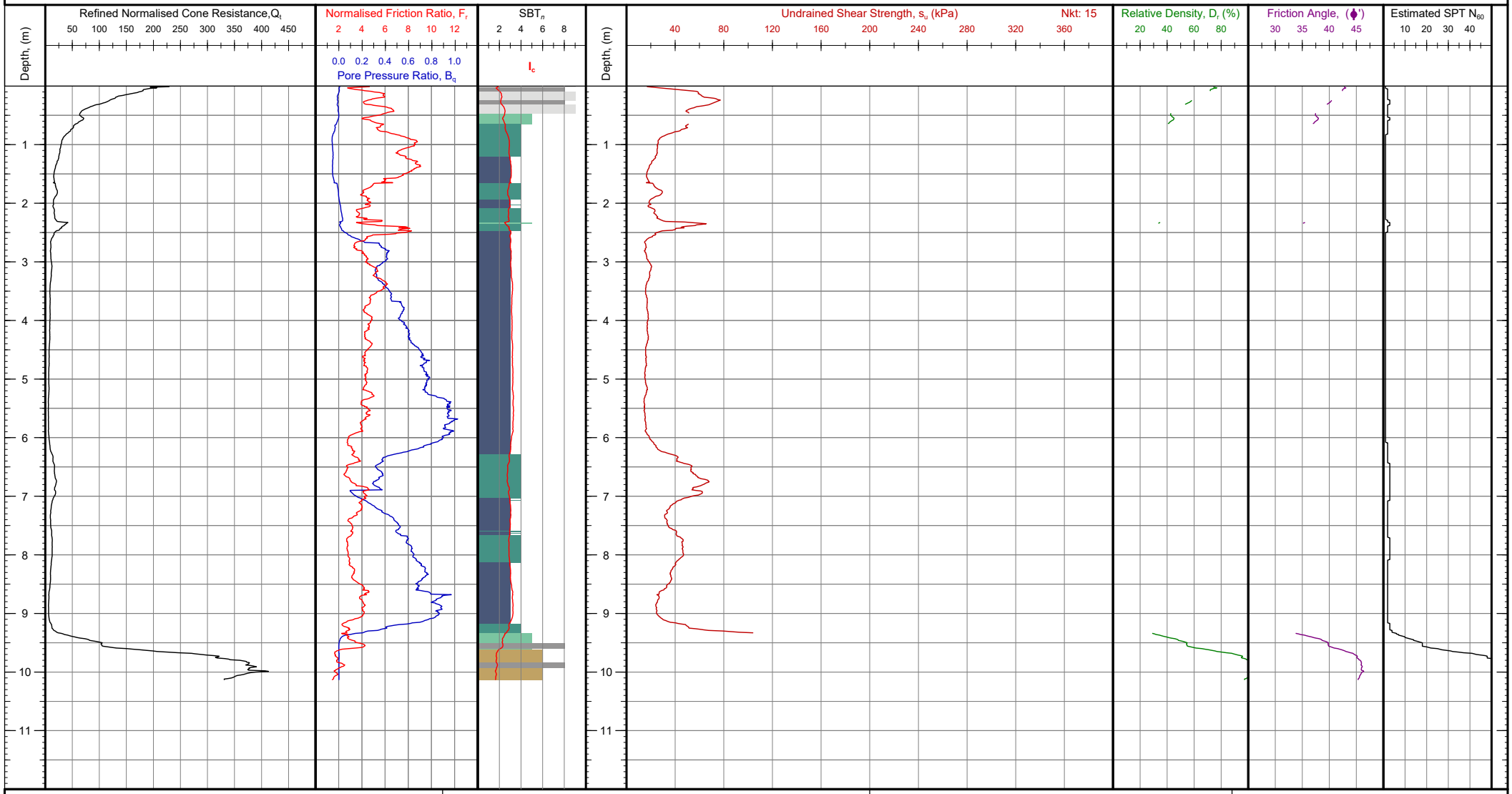
Data shown on this report has been assessed to provide a basic interpretation in terms of Soil Behaviour Type (SBT) and various geotechnical soil and design parameters using methods published in P.K. Robertson and K.L. Cabel (2010), Guide to Cone Penetration Testing for Geotechnical Engineering, 7th Edition. The interpretations are presented only as a guide for geotechnical use and should be carefully reviewed by the user. Ground Investigation Ltd. does not warrant the correctness or applicability of any of the geotechnical soil and design parameter shown and does not assume any liability for any use of the results in any design or review. The user should be fully aware of the techniques and limitations of any method used to derive data shown in this report.

Client Reference:

Test Number: **CPT-12**

G.I. Job Ref: 230270

CPT PARAMETER LOG



Client: Aurecon

Project: 1350 Dairy Flat Highway

Location: Dairy Flat

Engineer: Suresh Nuthalapati

Contractor: Ground Investigation Ltd

Soil Behaviour Type SBT_n - Robertson et al. 1990

0	Undefined	5	Sand mixtures: silty sand to sandy silt
1	Sensitive fine grained	6	Sands: clean sands to silty sands
2	Organic: Organic clay/silt, peat	7	Dense sand to gravelly sand
3	Clay: clay to silty clay	8	Stiff sand to clayey sand
4	Silt mixtures: clayey silt & silty clay	9	Stiff silt/clay

Notes and Limitations:

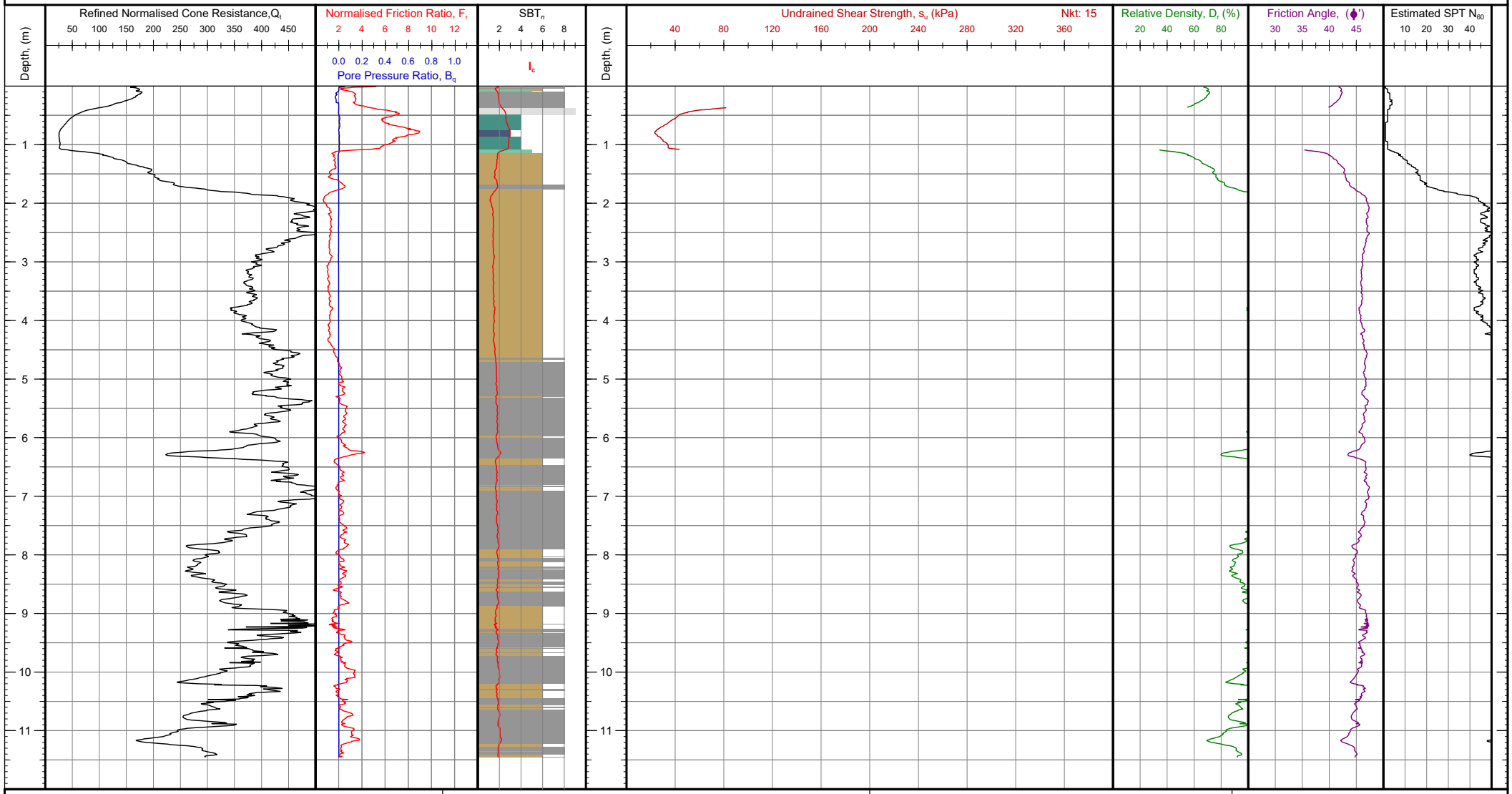
Data shown on this report has been assessed to provide a basic interpretation in terms of Soil Behaviour Type (SBT) and various geotechnical soil and design parameters using methods published in P.K. Robertson and K.L. Cabel (2010), Guide to Cone Penetration Testing for Geotechnical Engineering, 7th Edition. The interpretations are presented only as a guide for geotechnical use and should be carefully reviewed by the user. Ground Investigation Ltd. does not warrant the correctness or applicability of any of the geotechnical soil and design parameter shown and does not assume any liability for any use of the results in any design or review. The user should be fully aware of the techniques and limitations of any method used to derive data shown in this report.

Client Reference:

Test Number: **CPT-13**

G.I. Job Ref: 230270

CPT PARAMETER LOG



Client: Aurecon

Project: 1350 Dairy Flat Highway

Location: Dairy Flat

Engineer: Suresh Nuthalapati

Contractor: Ground Investigation Ltd

Soil Behaviour Type SBT_n - Robertson et al. 1990

0	Undefined	5	Sand mixtures: silty sand to sandy silt
1	Sensitive fine grained	6	Sands: clean sands to silty sands
2	Organic: Organic clay/silt, peat	7	Dense sand to gravelly sand
3	Clay: clay to silty clay	8	Stiff sand to clayey sand
4	Silt mixtures: clayey silt & silty clay	9	Stiff silt/clay

Notes and Limitations:

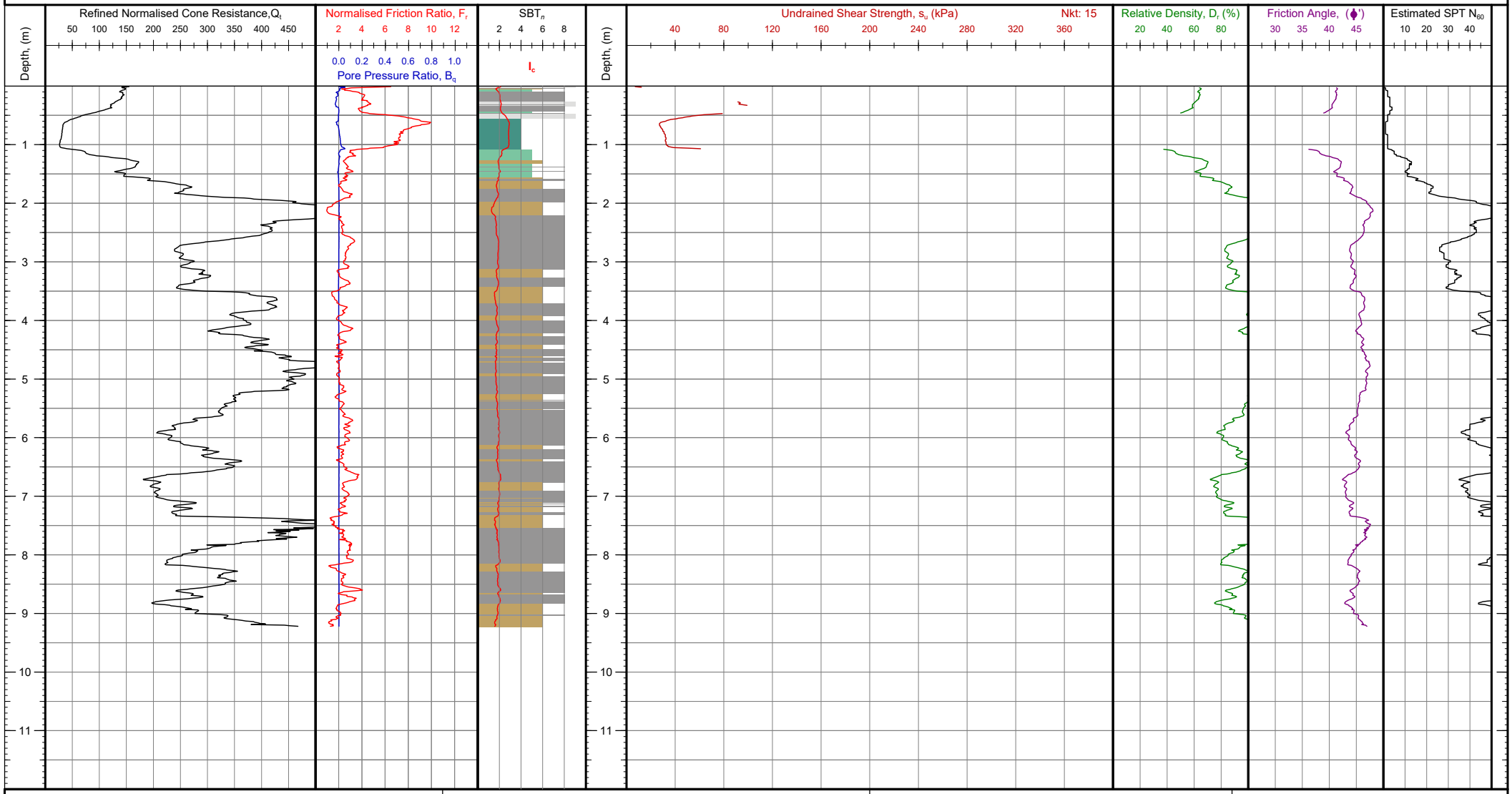
Data shown on this report has been assessed to provide a basic interpretation in terms of Soil Behaviour Type (SBT) and various geotechnical soil and design parameters using methods published in P.K. Robertson and K.L. Cabel (2010), Guide to Cone Penetration Testing for Geotechnical Engineering, 7th Edition. The interpretations are presented only as a guide for geotechnical use and should be carefully reviewed by the user. Ground Investigation Ltd. does not warrant the correctness or applicability of any of the geotechnical soil and design parameter shown and does not assume any liability for any use of the results in any design or review. The user should be fully aware of the techniques and limitations of any method used to derive data shown in this report.

Client Reference:

Test Number: **CPT-14**

G.I. Job Ref: 230270

CPT PARAMETER LOG



Client: Aurecon

Project: 1350 Dairy Flat Highway

Location: Dairy Flat

Engineer: Suresh Nuthalapati

Contractor: Ground Investigation Ltd

Soil Behaviour Type SBT_n - Robertson et al. 1990

0	Undefined	5	Sand mixtures: silty sand to sandy silt
1	Sensitive fine grained	6	Sands: clean sands to silty sands
2	Organic: Organic clay/silt, peat	7	Dense sand to gravelly sand
3	Clay: clay to silty clay	8	Stiff sand to clayey sand
4	Silt mixtures: clayey silt & silty clay	9	Stiff silt/clay

Notes and Limitations:

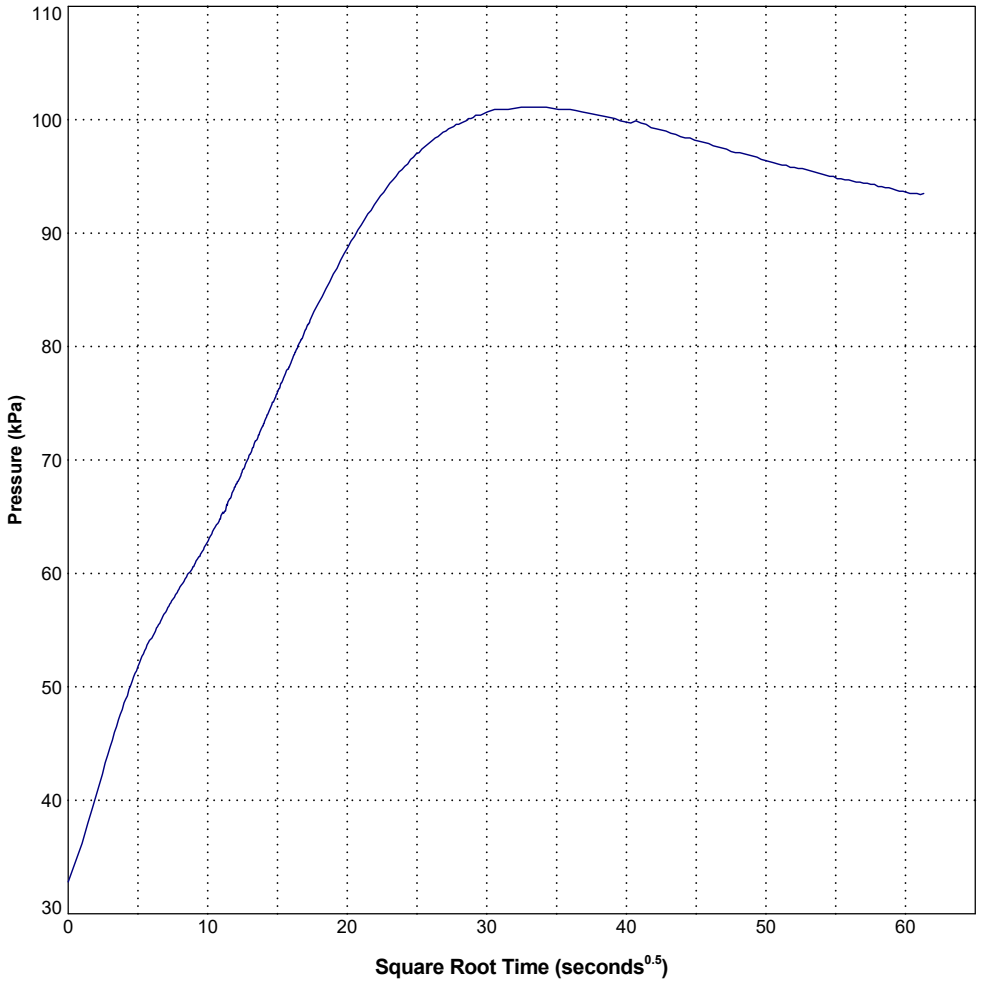
Data shown on this report has been assessed to provide a basic interpretation in terms of Soil Behaviour Type (SBT) and various geotechnical soil and design parameters using methods published in P.K. Robertson and K.L. Cabel (2010), Guide to Cone Penetration Testing for Geotechnical Engineering, 7th Edition. The interpretations are presented only as a guide for geotechnical use and should be carefully reviewed by the user. Ground Investigation Ltd. does not warrant the correctness or applicability of any of the geotechnical soil and design parameter shown and does not assume any liability for any use of the results in any design or review. The user should be fully aware of the techniques and limitations of any method used to derive data shown in this report.

Client Reference:

Test Number: **CPT-15**

G.I. Job Ref: 230270

CPT DISSIPATION TEST



CPT Number: CPT-01

Depth: 9.27 m

Water Depth: 0.6 m Measured

Comments:

Client: Aurecon

Project: 1350 Dairy Flat Highway

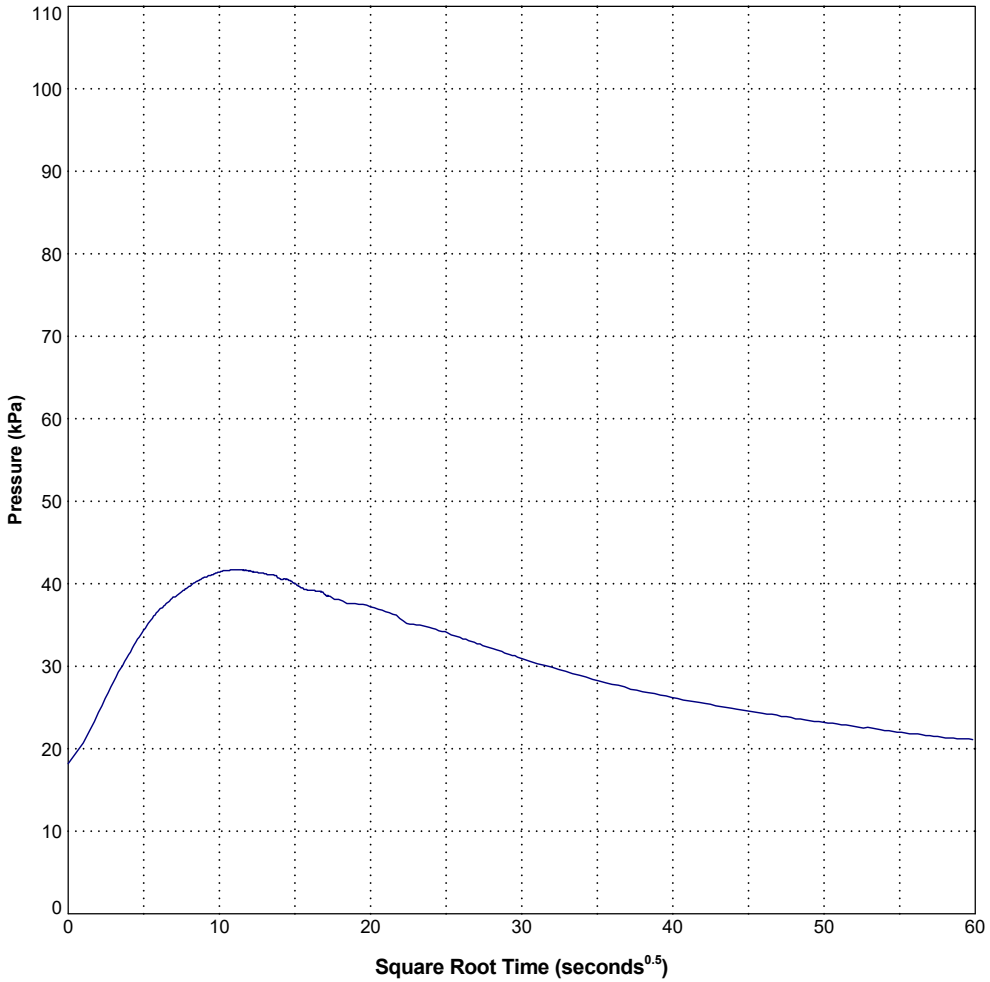
Location: Dairy Flat

Engineer: Suresh Nuthalapati

Contractor: Ground Investigation Ltd

G.I. Job Ref: 230270

CPT DISSIPATION TEST



CPT Number: CPT-03

Depth: 1.5 m

Water Depth: 0.8 m Measured

Comments:

Client: Aurecon

Project: 1350 Dairy Flat Highway

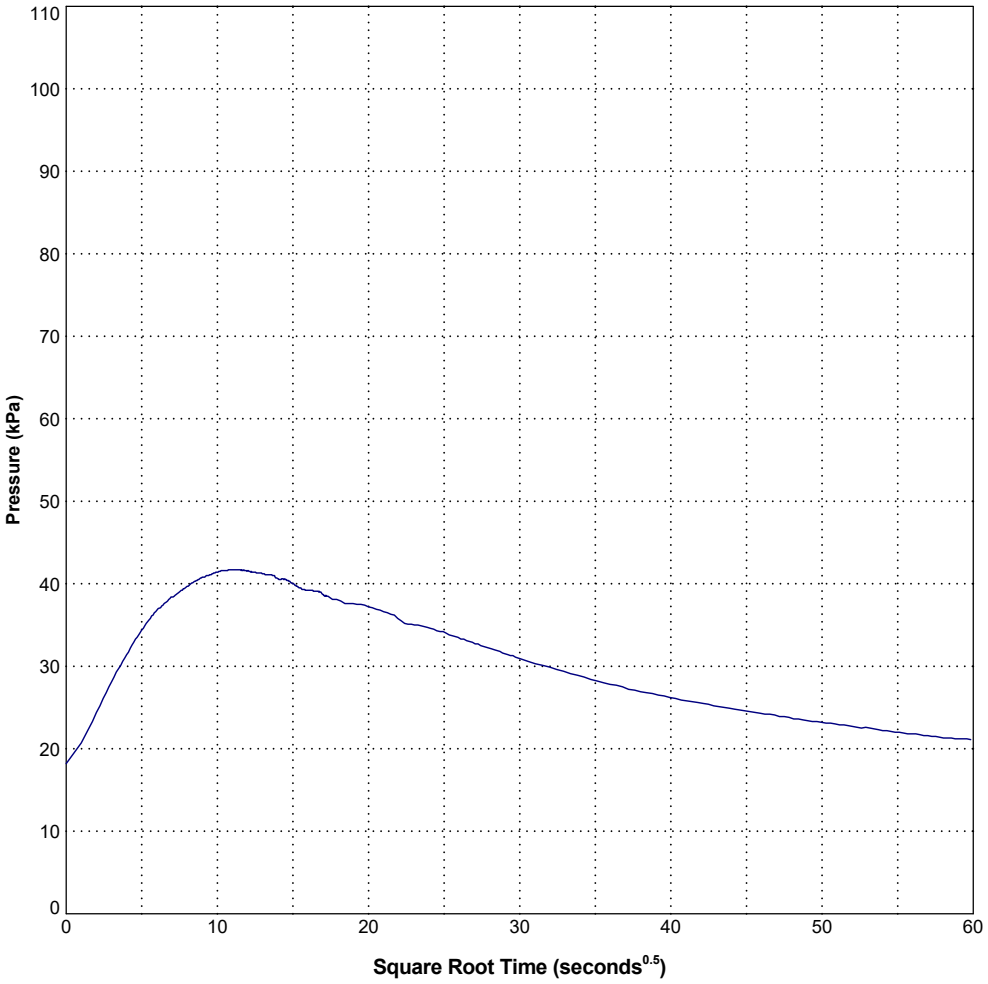
Location: Dairy Flat

Engineer: Suresh Nuthalapati

Contractor: Ground Investigation Ltd

G.I. Job Ref: 230270

CPT DISSIPATION TEST

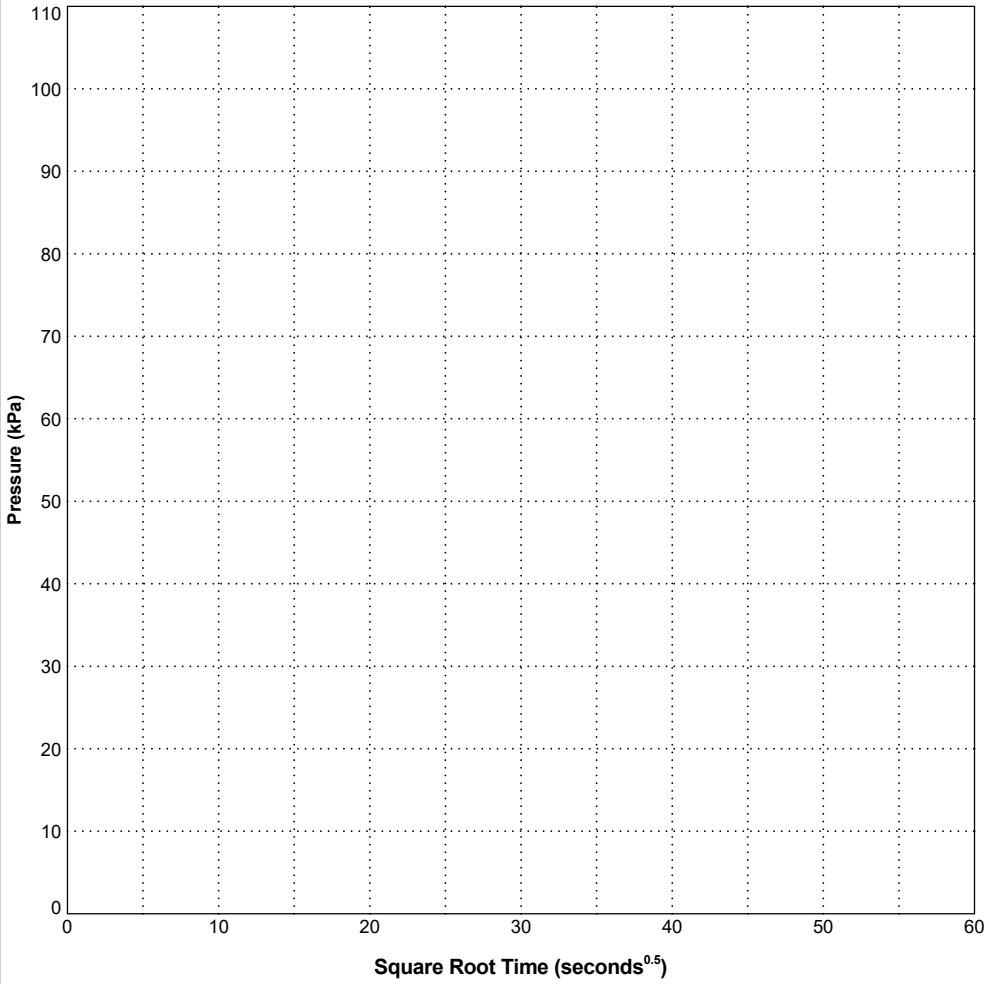


CPT Number: CPT-03

Depth: 1.5 m

Water Depth: 0.8 m Measured

Comments:



CPT Number: CPT-03

Depth: 4.65 m

Water Depth: 0.8 m Measured

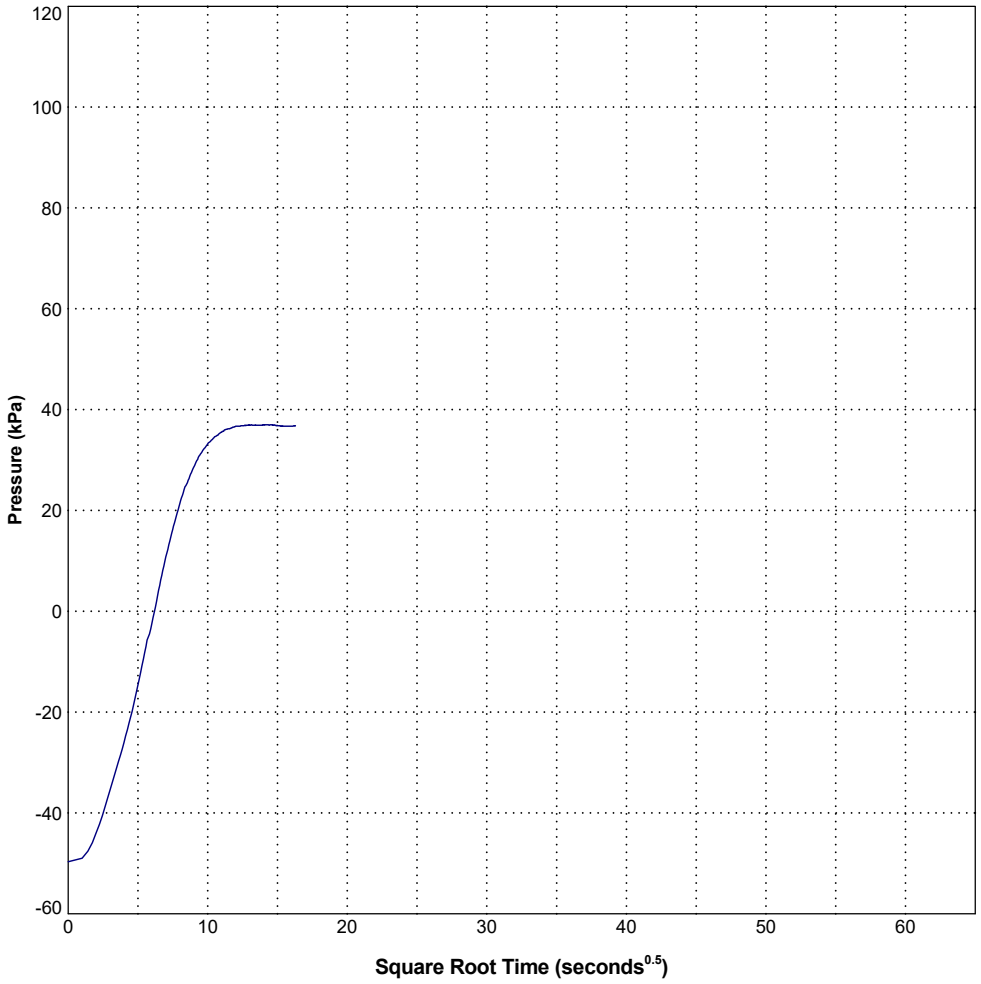
Comments:

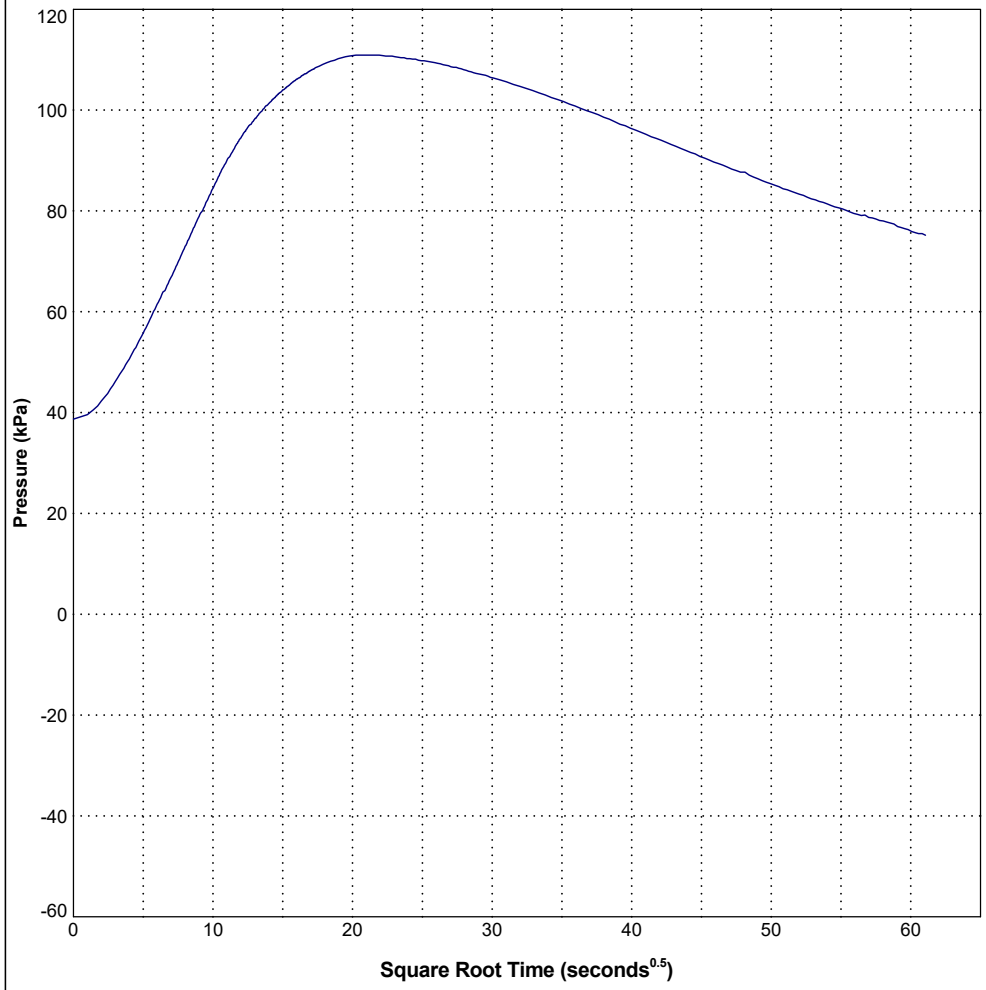
Client: Aurecon
Project: 1350 Dairy Flat Highway

Location: Dairy Flat
Engineer: Suresh Nuthalapati

Contractor: Ground Investigation Ltd
G.I. Job Ref: 230270

CPT DISSIPATION TEST





CPT Number: CPT-08 **Comments:**

Depth: 3.01 m

Water Depth: 0.6 m Measured

CPT Number: CPT-08 **Comments:**

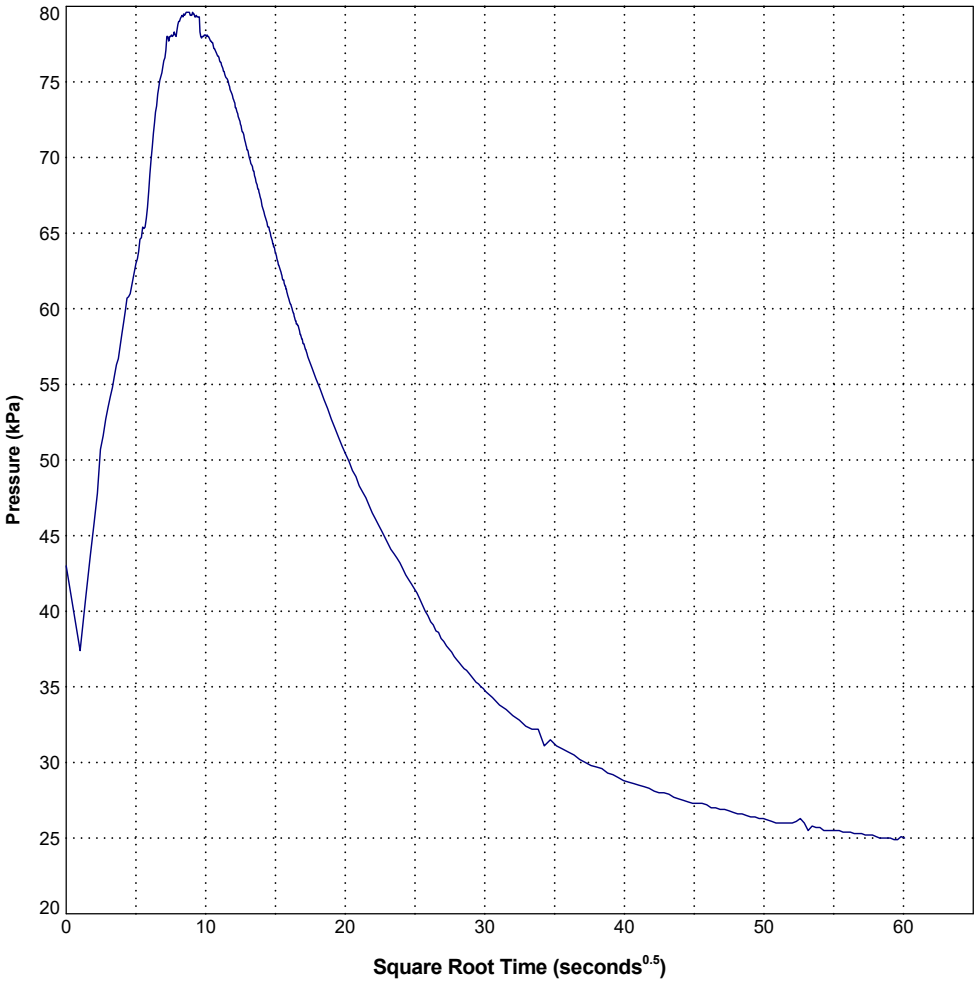
Depth: 5 m

Water Depth: 0.6 m Measured

Client: Aurecon **Location:** Dairy Flat **Contractor:** Ground Investigation Ltd

Project: 1350 Dairy Flat Highway **Engineer:** Suresh Nuthalapati **G.I. Job Ref:** 230270

CPT DISSIPATION TEST



CPT Number: CPT-12

Depth: 2.88 m

Water Depth: 0.6 m Measured

Comments:

Client: Aurecon

Project: 1350 Dairy Flat Highway

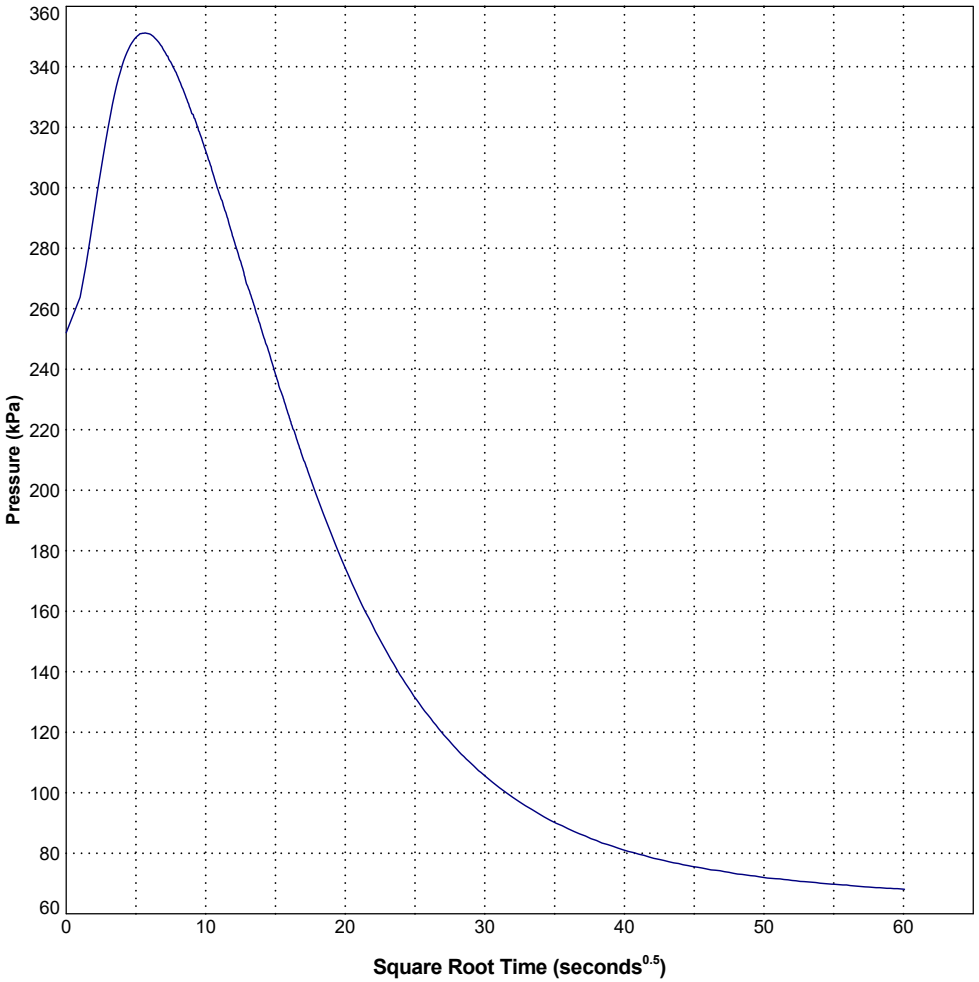
Location: Dairy Flat

Engineer: Suresh Nuthalapati

Contractor: Ground Investigation Ltd

G.I. Job Ref: 230270

CPT DISSIPATION TEST



CPT Number: CPT-13

Depth: 6.89 m

Water Depth: 0.5 m Measured

Comments:

Client: Aurecon

Project: 1350 Dairy Flat Highway

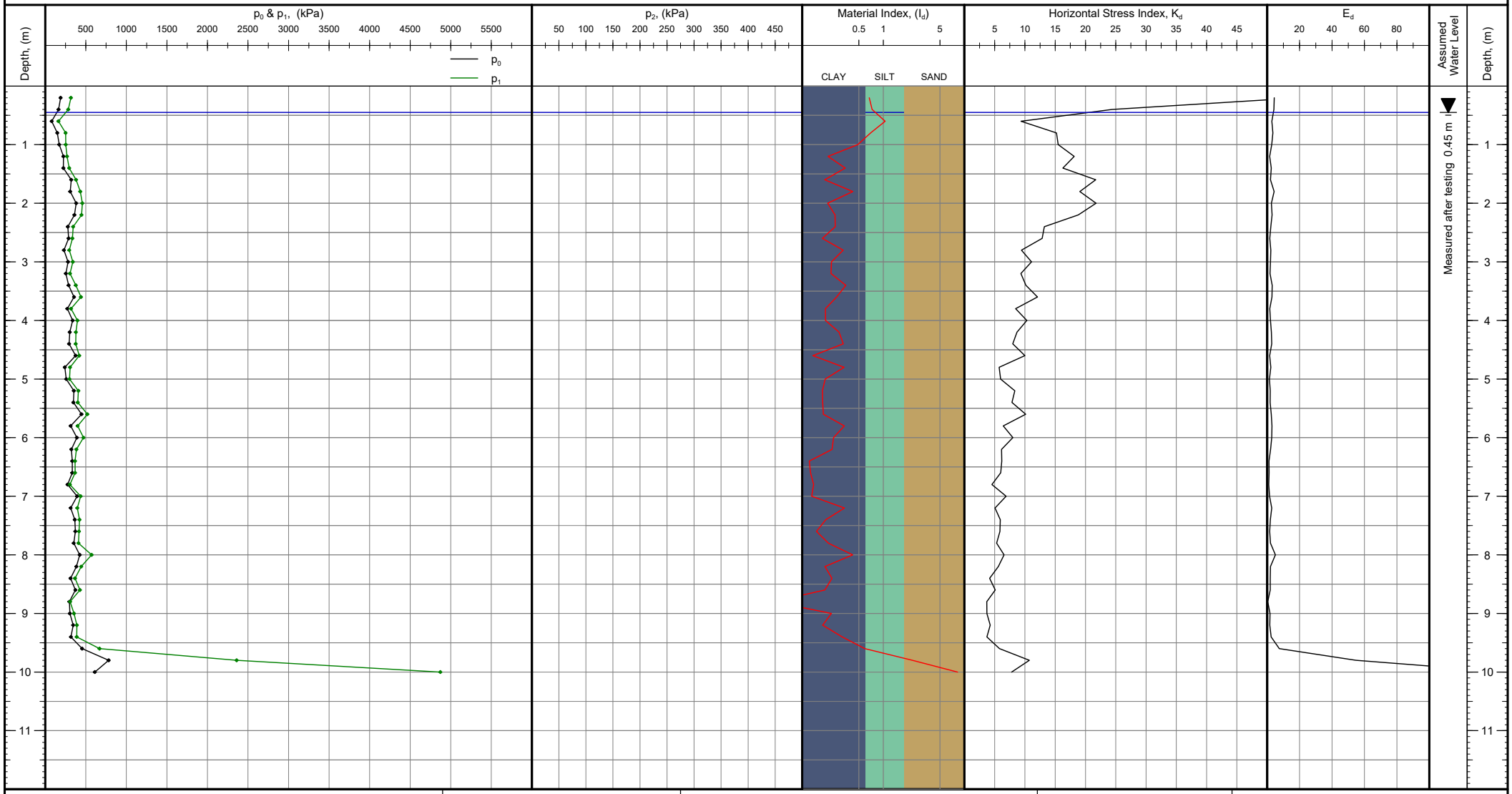
Location: Dairy Flat

Engineer: Suresh Nuthalapati

Contractor: Ground Investigation Ltd

G.I. Job Ref: 230270

FLAT DILATOMETER TEST (DMT) LOG



Client:	Aurecon	**Operator:**	Marcelo Martinez	**NZTM 2000 N, E (m):**	5941912.02, 1747336.93	**Elevation (m):**	Unknown
Project:	1350 Dairy Flat Highway	**Blade Reference:**	N/A	**WGS84 (deg):**	-36.656991,174.648475	**Date of Test:**	4/04/2023
Location:	Dairy Flat	**Diaphragm Thickness:**	0.25 mm	**Location Method:**	Handheld GPS	**Depth (m):**	10.00
Engineer:	Suresh Nuthalapati	**A-Reading Calibration:**	13 kPa	**Surveyor:**		**Pre Drill (m):**	N/A
Contractor:	Ground Investigation Ltd	**B-Reading Calibration:**	44 kPa	**Termination Reason:**	Danger of buckling rods		

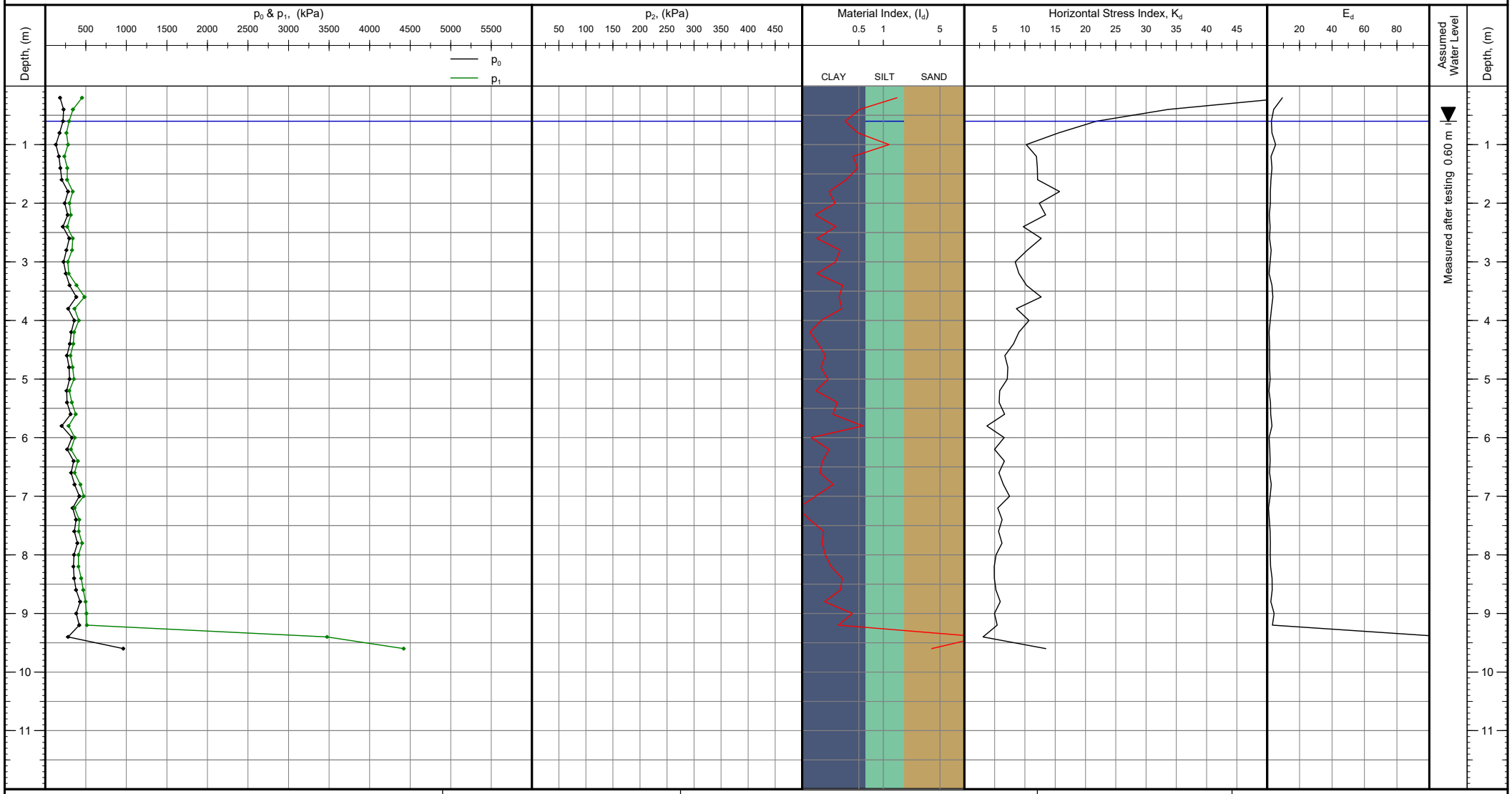
Client Reference:

Test Number: **SDMT-01**

G.I. Job Ref: 230270

Comments:

FLAT DILATOMETER TEST (DMT) LOG



Client:	Aurecon	**Operator:**	Marcelo Martinez	**NZTM 2000 N, E (m):**	5941860.95, 1747363.95	**Elevation (m):**	Unknown
Project:	1350 Dairy Flat Highway	**Blade Reference:**	N/A	**WGS84 (deg):**	-36.657447,174.648787	**Date of Test:**	4/04/2023
Location:	Dairy Flat	**Diaphragm Thickness:**	0.25 mm	**Location Method:**	Handheld GPS	**Depth (m):**	9.60
Engineer:	Suresh Nuthalapati	**A-Reading Calibration:**	15 kPa	**Surveyor:**		**Pre Drill (m):**	N/A
Contractor:	Ground Investigation Ltd	**B-Reading Calibration:**	43 kPa	**Termination Reason:**	Danger of buckling rods		

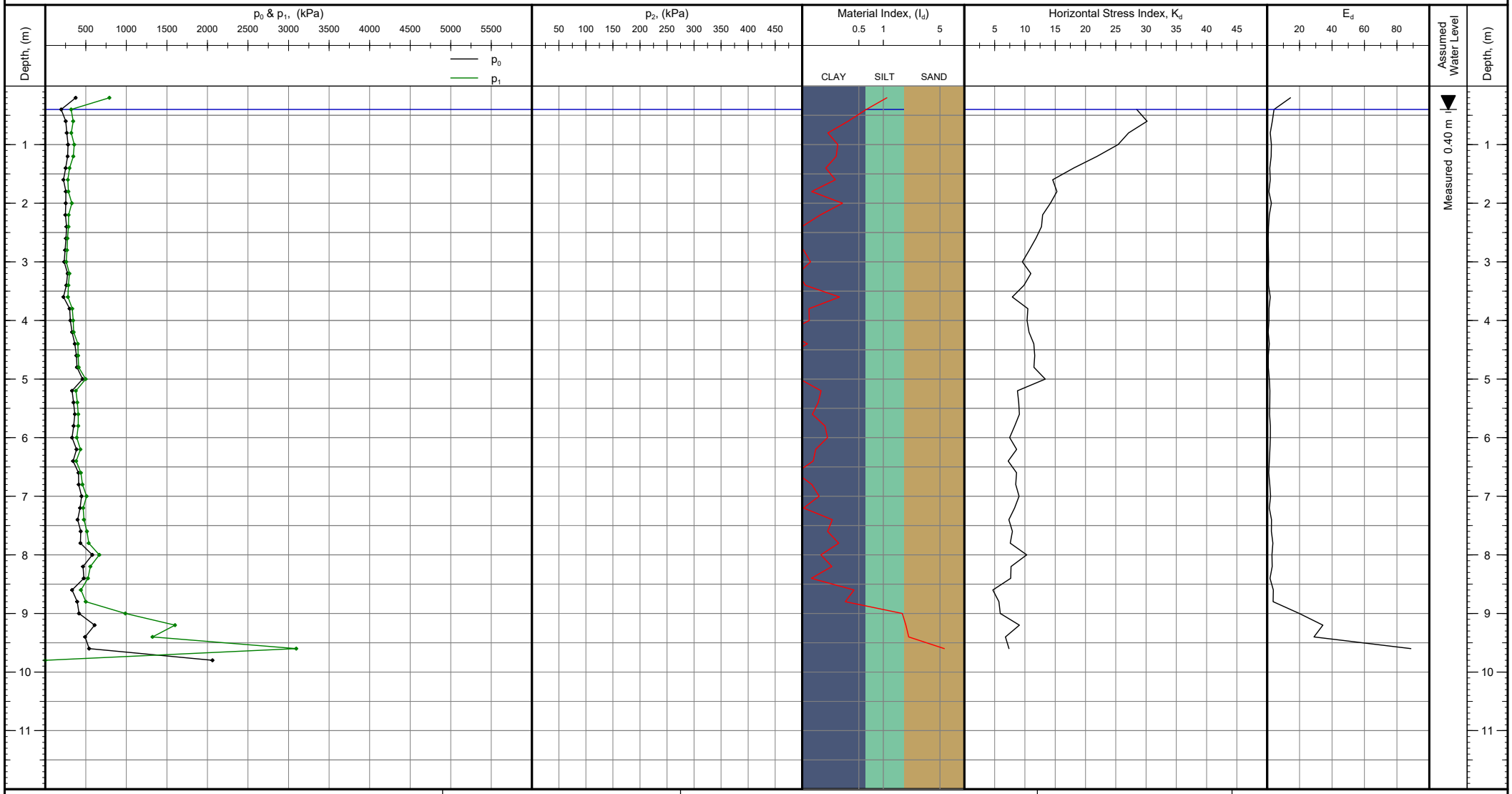
Client Reference:

Test Number: **SDMT-02**

G.I. Job Ref: 230270

Comments:

FLAT DILATOMETER TEST (DMT) LOG



Client:	Aurecon	**Operator:**	Marcelo Martinez	**NZTM 2000 N, E (m):**	5941795.97, 1747412.54	**Elevation (m):**	Unknown
Project:	1350 Dairy Flat Highway	**Blade Reference:**	N/A	**WGS84 (deg):**	-36.658025,174.649343	**Date of Test:**	6/04/2023
Location:	Dairy Flat	**Diaphragm Thickness:**	0.25 mm	**Location Method:**	Handheld GPS	**Depth (m):**	9.80
Engineer:	Suresh Nuthalapati	**A-Reading Calibration:**	12 kPa	**Surveyor:**		**Pre Drill (m):**	N/A
Contractor:	Ground Investigation Ltd	**B-Reading Calibration:**	41 kPa	**Termination Reason:**	High nominal pressure		

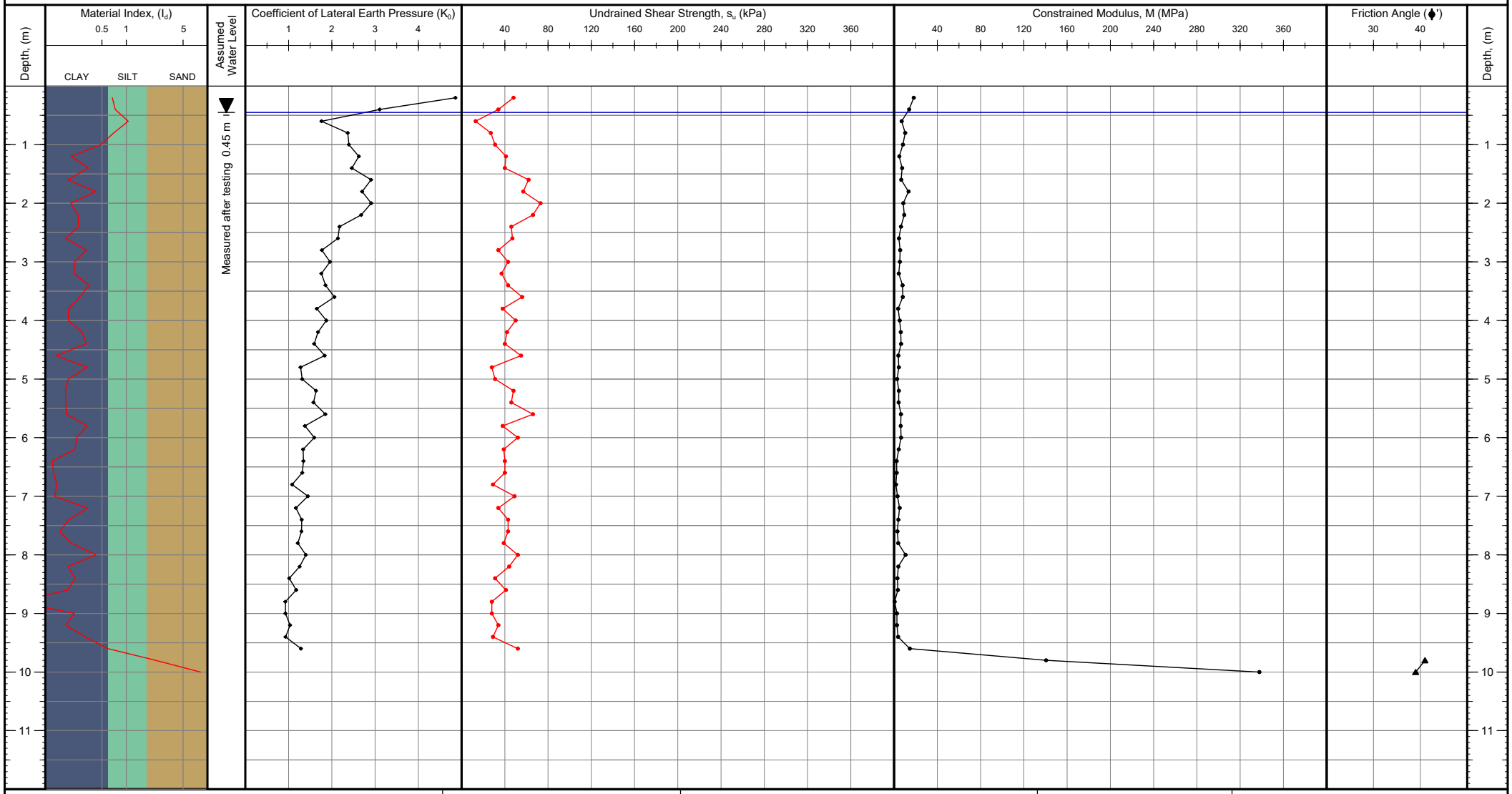
Client Reference:

Test Number: **SDMT-03**

G.I. Job Ref: 230270

Comments: DMT readings at 9.80m: A=20.50 bar, B>50.30 bar.

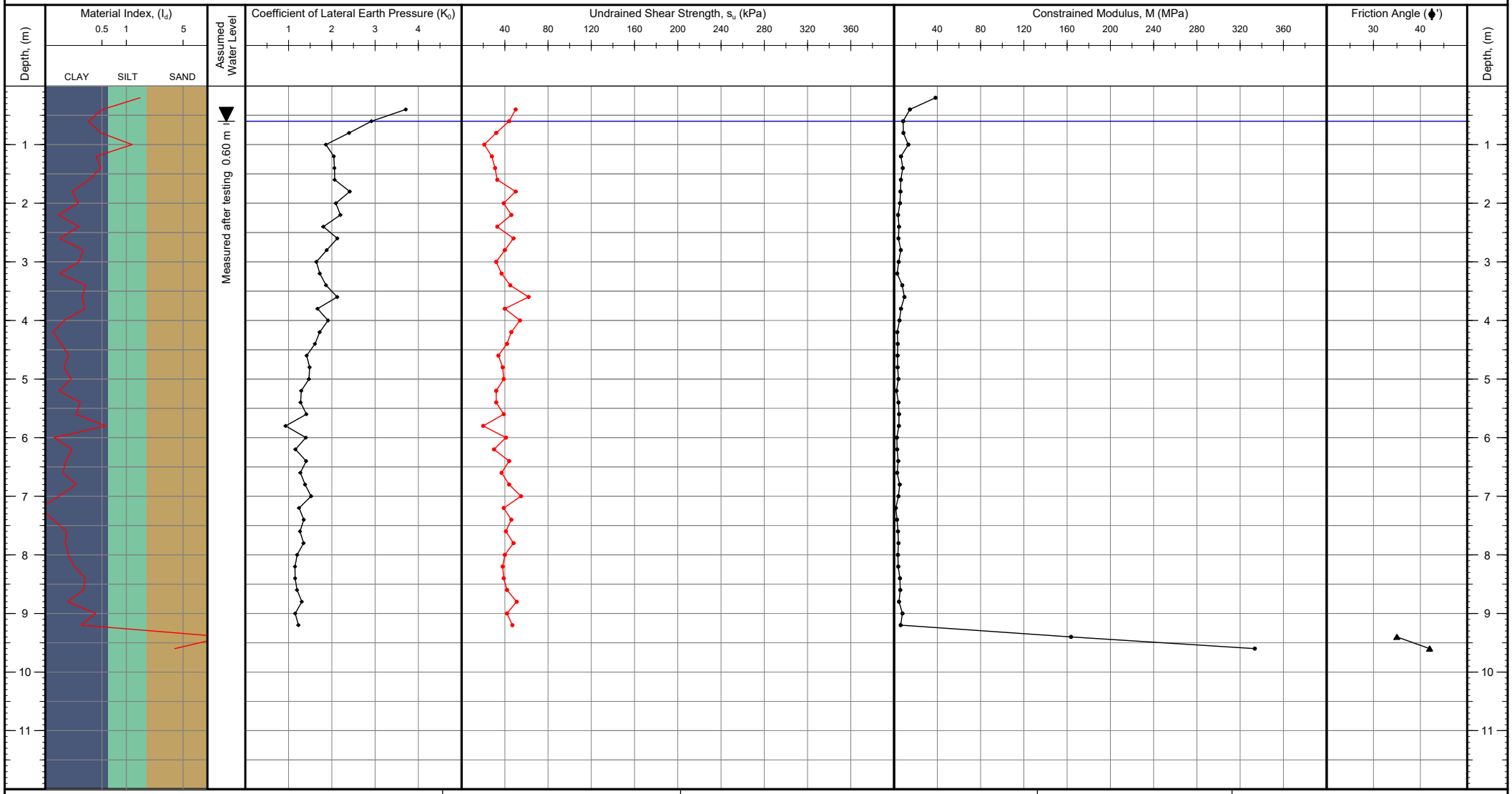
DMT PARAMETER LOG



Client: Aurecon	**Operator:** Marcelo Martinez	**NZTM 2000 N, E (m):** 5941912.02, 1747336.93	**Elevation (m):** Unknown	**Client Reference:**	
Project: 1350 Dairy Flat Highway	**Blade Reference:** N/A	**WGS84 (deg):** -36.656991,174.648475	**Date of Test:** 4/04/2023	**Test Number:** **SDMT-01**	
Location: Dairy Flat	**Diaphragm Thickness:** 0.25 mm	**Location Method:** Handheld GPS	**Depth (m):** 10.00		
Engineer: Suresh Nuthalapati	**A-Reading Calibration:** 13 kPa	**Surveyor:**	**Pre Drill (m):** N/A		
Contractor: Ground Investigation Ltd	**B-Reading Calibration:** 44 kPa	**Termination Reason:** Danger of buckling rods		**G.I. Job Ref:** 230270	

Comments:

DMT PARAMETER LOG



Client:	Aurecon	**Operator:**	Marcelo Martinez	**NZTM 2000 N, E (m):**	5941860.95, 1747363.95	**Elevation (m):**	Unknown
Project:	1350 Dairy Flat Highway	**Blade Reference:**	N/A	**WGS84 (deg):**	-36.657447,174.648787	**Date of Test:**	4/04/2023
Location:	Dairy Flat	**Diaphragm Thickness:**	0.25 mm	**Location Method:**	Handheld GPS	**Depth (m):**	9.60
Engineer:	Suresh Nuthalapati	**A-Reading Calibration:**	15 kPa	**Surveyor:**		**Pre Drill (m):**	N/A
Contractor:	Ground Investigation Ltd	**B-Reading Calibration:**	43 kPa	**Termination Reason:**	Danger of buckling rods		

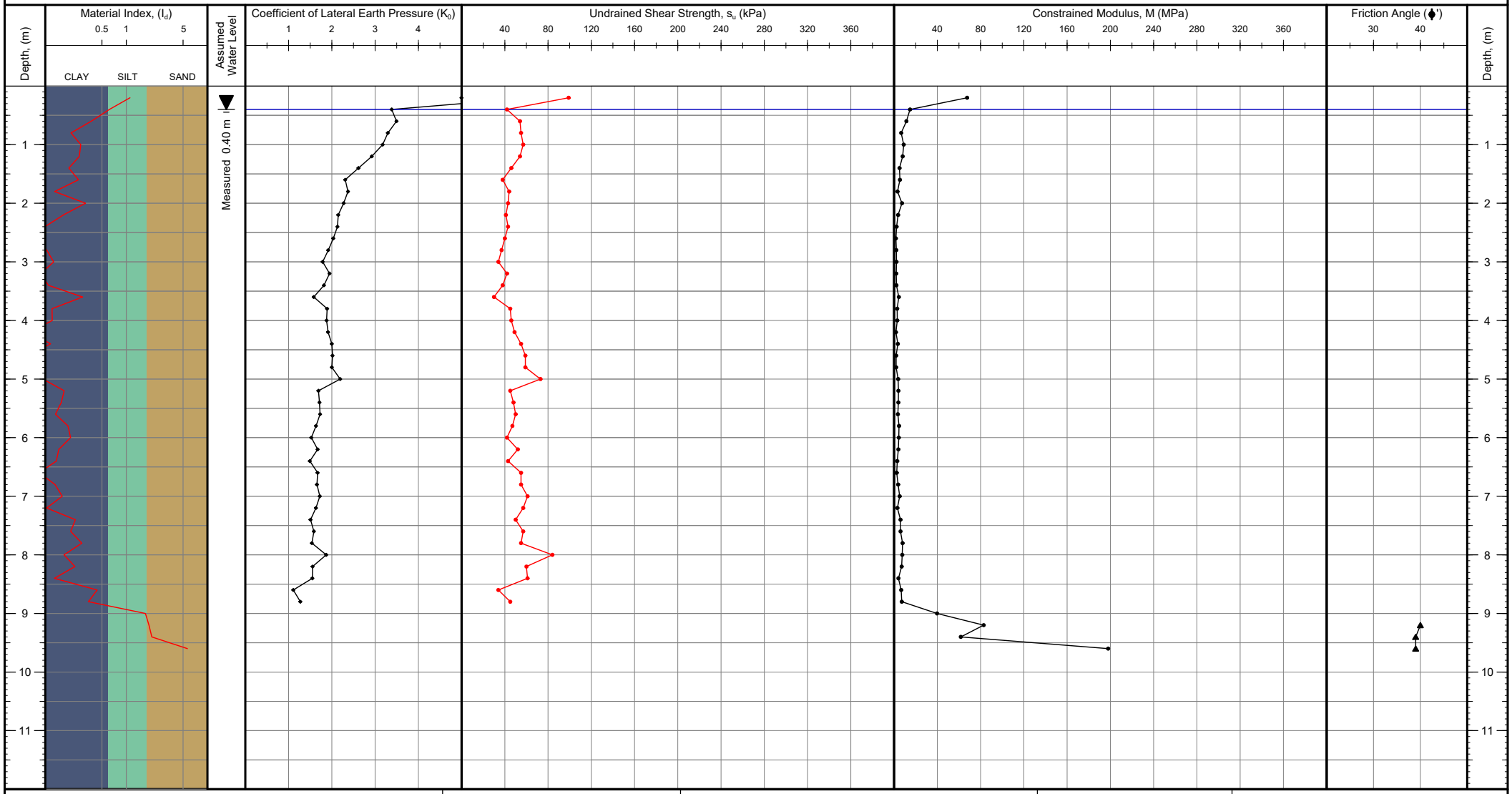
Client Reference:

Test Number: **SDMT-02**

G.I. Job Ref: 230270

Comments:

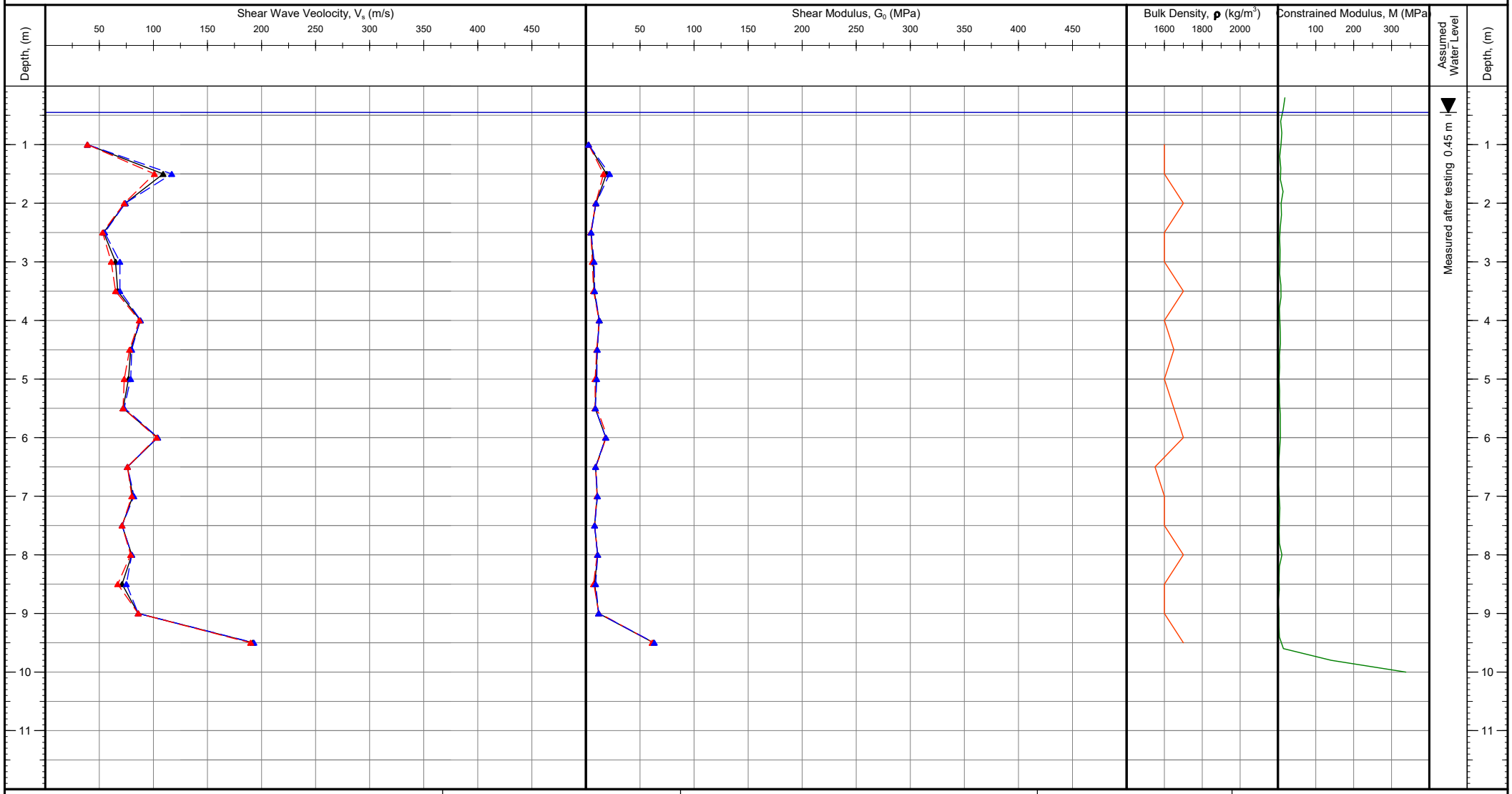
DMT PARAMETER LOG



Client: Aurecon	**Operator:** Marcelo Martinez	**NZTM 2000 N, E (m):** 5941795.97, 1747412.54	**Elevation (m):** Unknown	**Client Reference:**	
Project: 1350 Dairy Flat Highway	**Blade Reference:** N/A	**WGS84 (deg):** -36.658025,174.649343	**Date of Test:** 6/04/2023	**Test Number:**	**SDMT-03**
Location: Dairy Flat	**Diaphragm Thickness:** 0.25 mm	**Location Method:** Handheld GPS	**Depth (m):** 9.80		
Engineer: Suresh Nuthalapati	**A-Reading Calibration:** 12 kPa	**Surveyor:**	**Pre Drill (m):** N/A		
Contractor: Ground Investigation Ltd	**B-Reading Calibration:** 41 kPa	**Termination Reason:** High nominal pressure		**G.I. Job Ref:** 230270	

Comments: DMT readings at 9.80m: A=20.50 bar, B>50.30 bar.

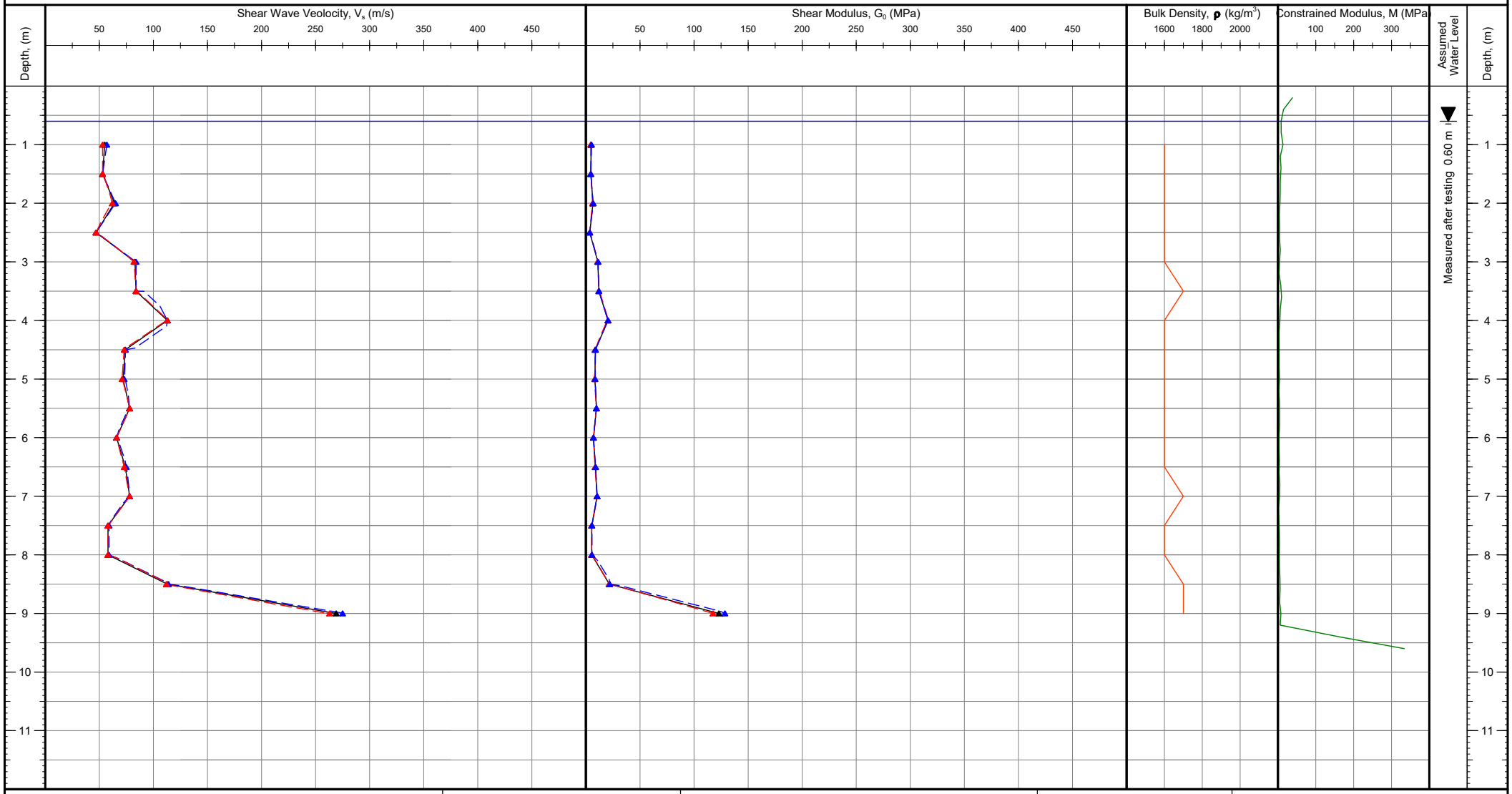
FLAT DILATOMETER TEST (DMT) SEISMIC LOG



Client:	Aurecon	Estimated from DMT	**NZTM 2000 N, E (m):**	5941912.02, 1747336.93	**Elevation (m):**	Unknown	**Client Reference:**
Project:	1350 Dairy Flat Highway	Measured Lower Bound	**WGS84 (deg):**	-36.656991,174.648475	**Date of Test:**	4/04/2023	**Test Number:** **SDMT-01**
Location:	Dairy Flat	Measured Average Bound	**Location Method:**	Handheld GPS	**Depth (m):**	10.00	
Engineer:	Suresh Nuthalapati	Measured Upper Bound	**Surveyor:**		**Pre Drill (m):**	N/A	
Contractor:	Ground Investigation Ltd	ρ from G_0 Calculation	**Termination Reason:**	Danger of buckling rods			**G.I. Job Ref:** 230270

Comments:

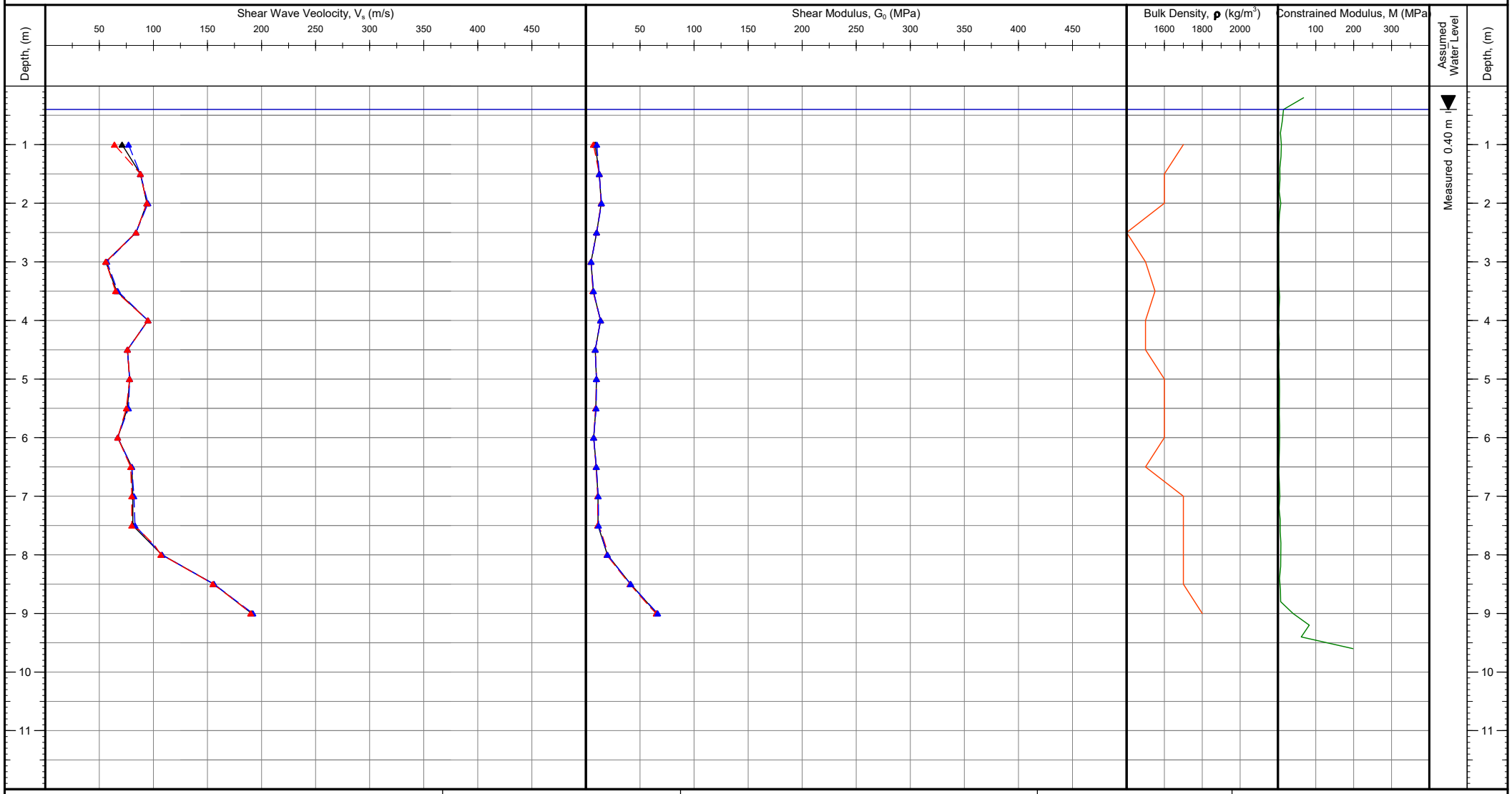
FLAT DILATOMETER TEST (DMT) SEISMIC LOG



Client:	Aurecon	Estimated from DMT	**NZTM 2000 N, E (m):**	5941860.95, 1747363.95	**Elevation (m):**	Unknown	**Client Reference:**
Project:	1350 Dairy Flat Highway	Measured Lower Bound	**WGS84 (deg):**	-36.657447,174.648787	**Date of Test:**	4/04/2023	**Test Number:** **SDMT-02**
Location:	Dairy Flat	Measured Average Bound	**Location Method:**	Handheld GPS	**Depth (m):**	9.60	
Engineer:	Suresh Nuthalapati	Measured Upper Bound	**Surveyor:**		**Pre Drill (m):**	N/A	
Contractor:	Ground Investigation Ltd	ρ from G_0 Calculation	**Termination Reason:**	Danger of buckling rods			**G.I. Job Ref:** 230270

Comments:

FLAT DILATOMETER TEST (DMT) SEISMIC LOG



Client:	Aurecon	Estimated from DMT	**NZTM 2000 N, E (m):**	5941795.97, 1747412.54	**Elevation (m):**	Unknown	**Client Reference:**
Project:	1350 Dairy Flat Highway	Measured Lower Bound	**WGS84 (deg):**	-36.658025,174.649343	**Date of Test:**	6/04/2023	**Test Number:** **SDMT-03**
Location:	Dairy Flat	Measured Average Bound	**Location Method:**	Handheld GPS	**Depth (m):**	9.80	
Engineer:	Suresh Nuthalapati	Measured Upper Bound	**Surveyor:**		**Pre Drill (m):**	N/A	
Contractor:	Ground Investigation Ltd	ρ from G_0 Calculation	**Termination Reason:**	High nominal pressure			**G.I. Job Ref:** 230270

Comments: DMT readings at 9.80m: A=20.50 bar, B>50.30 bar.

aurecon

CPT ZEROS AND DRIFT

GROUND INVESTIGATION

G.I. Job Ref: 230270

Cone Reference	CPT Name	Push	Tip Resistance					Local Friction					Pore Pressure				
			Initial (MPa)	Final (MPa)	Cleaned (MPa)	I - F Difference (kPa)	I - C Difference (kPa)	Initial (MPa)	Final (MPa)	Cleaned (MPa)	I - F Difference (kPa)	I - C Difference (kPa)	Initial (MPa)	Final (MPa)	Cleaned (MPa)	I - F Difference (kPa)	I - C Difference (kPa)
MKJ167	CPT-01	1	18.519	18.524	N/A	5.2	N/A	0.2530	0.2528	N/A	-0.2	N/A	2.8903	2.8904	N/A	0.1	N/A
71137	CPT-02	1	0.650	0.650	N/A	0.3	N/A	0.0419	0.0418	N/A	-0.1	N/A	0.7667	0.7662	N/A	-0.4	N/A
MKJ333	CPT-03	1	20.652	20.637	N/A	-15.7	N/A	0.3038	0.3036	N/A	-0.2	N/A	1.8814	1.8838	N/A	2.4	N/A
71062	CPT-04	1	0.706	0.707	N/A	1.0	N/A	0.0458	0.0455	N/A	-0.3	N/A	0.8247	0.8253	N/A	0.7	N/A
70169	CPT-05	1	0.693	0.684	N/A	-9.1	N/A	0.0454	0.0449	N/A	-0.6	N/A	0.9024	0.9042	N/A	1.8	N/A
MKJ167	CPT-06	1	18.545	18.524	N/A	-20.9	N/A	0.2524	0.2529	N/A	0.5	N/A	2.8912	2.8914	N/A	0.2	N/A
MKJ167	CPT-07	1	18.618	18.577	N/A	-41.7	N/A	0.2530	0.2518	N/A	-1.2	N/A	2.8915	2.8919	N/A	0.5	N/A
MKJ167	CPT-08	1	18.603	18.561	N/A	-41.7	N/A	0.2517	0.2513	N/A	-0.4	N/A	2.8912	2.8916	N/A	0.5	N/A
MKJ167	CPT-09	1	18.597	18.561	N/A	-36.5	N/A	0.2526	0.2529	N/A	0.2	N/A	2.8915	2.8916	N/A	0.2	N/A
MKJ333	CPT-10	1	20.621	20.621	N/A	0.0	N/A	0.3040	0.3041	N/A	0.1	N/A	1.8829	1.8838	N/A	0.9	N/A
MKJ333	CPT-11	1	20.668	20.626	N/A	-41.7	N/A	0.3041	0.3038	N/A	-0.2	N/A	1.8820	1.8840	N/A	2.0	N/A
MKJ167	CPT-12	1	18.524	18.540	N/A	15.7	N/A	0.2530	0.2527	N/A	-0.2	N/A	2.8902	2.8902	N/A	0.0	N/A
MKJ167	CPT-13	1	18.577	18.540	N/A	-36.5	N/A	0.2524	0.2521	N/A	-0.3	N/A	2.8900	2.8903	N/A	0.4	N/A
71136	CPT-14	1	0.648	0.635	N/A	-12.2	N/A	0.0451	0.0445	N/A	-0.6	N/A	0.8401	0.8445	N/A	4.3	N/A

Client: Aurecon
Project: 1350 Dairy Flat Highway

Location: Dairy Flat
Engineer: Suresh Nuthalapati

Note: Zero difference colour-coded based on application classes following ISO 22476-1:2012. Blue indicates Class 1, green Class 2, orange Class 3 and red Class 4. Grey represents if a test is below Class 4.

CPT ZEROS AND DRIFT

G.I. Job Ref: 230270

Cone Reference	CPT Name	Push	Tip Resistance					Local Friction					Pore Pressure				
			Initial (MPa)	Final (MPa)	Cleaned (MPa)	I - F Difference (kPa)	I - C Difference (kPa)	Initial (MPa)	Final (MPa)	Cleaned (MPa)	I - F Difference (kPa)	I - C Difference (kPa)	Initial (MPa)	Final (MPa)	Cleaned (MPa)	I - F Difference (kPa)	I - C Difference (kPa)
71137	CPT-15	1	0.648	0.642	N/A	-6.0	N/A	0.0417	0.0413	N/A	-0.3	N/A	0.7645	0.7636	N/A	-0.9	N/A

Client: Aurecon
Project: 1350 Dairy Flat Highway

Location: Dairy Flat
Engineer: Suresh Nuthalapati

Note: Zero difference colour-coded based on application classes following ISO 22476-1:2012. Blue indicates Class 1, green Class 2, orange Class 3 and red Class 4. Grey represents if a test is below Class 4.

Appendix D Initia Laboratory Test Results

Babbage Geotechnical Laboratory
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64-9-367 4954
wec@babbage.co.nz

Please reply to: W.E. Campton

INITIA LTD.
PO Box 47647,
Ponsonby,
Auckland 1144

Attention: **QUIN SORENSEN**

Job Number: 63578#L
BGL Registration Number: 2819
Checked by: WEC

10th May 2023

ATTERBERG LIMITS & LINEAR SHRINKAGE TESTING

Dear Sir,

Re: ASP
Your Reference: P-001537
Report Number: 63578#L/AL ASP

The following report presents the results of Atterberg Limits & Linear Shrinkage testing at BGL of soil samples delivered to this laboratory on the 14th of April 2023. Test results are summarised below, with page 3 & 4 showing where the samples plot on the Unified Soil Classification System (Casagrande) Chart.

Test standards used were:

Water Content:	NZS4402:1986:Test 2.1
Liquid Limit:	NZS4402:1986:Test 2.2
Plastic Limit:	NZS4402:1986:Test 2.3
Plasticity Index:	NZS4402:1986:Test 2.4
Linear Shrinkage:	NZS4402:1986:Test 2.6

Borehole Number	Sample Number	Depth (m)	Water Content (%)	Liquid Limit	Plastic Limit	Plasticity Index	Linear Shrinkage (%)*
TP16	TP16-01	1.00 – 1.50	78.5	123	44	79	22
TP17	TP17-01	1.00 – 1.50	55.6	106	34	72	-
TP19	TP19-01	0.50 – 1.00	35.2	65	22	43	17
TP20	TP20-01	1.50 – 2.00	32.3	84	27	57	-

The amount of shrinkage of the sample as a percentage of the original sample length.

Borehole Number	Sample Number	Depth (m)	Water Content (%)	Liquid Limit	Plastic Limit	Plasticity Index	Linear Shrinkage (%)*
TP21	TP21-01	0.50 – 1.00	56.5	106	32	74	18
TP22	TP22-01	2.00 – 2.50	92.7	146	42	104	-
TP23	TP23-01	1.00 – 1.50	45.0	63	25	38	-
TP24	TP24-01	1.00 – 1.50	64.1	104	34	70	18
TP26	TP26-01	1.00 – 1.50	33.4	43	19	24	12
TP27	TP27-01	1.00 – 1.50	44.9	73	28	45	14
TP28	TP28-01	1.50 – 2.00	34.0	39 ◆	18 ◆	21 ◆	-
HA03	HA03-01	1.00 – 1.30	29.8	55	22	33	14
HA04	HA04-01	1.00 – 1.40	46.8	81	36	45	17
HA09	HA09-01	1.00 – 1.30	56.3	73	29	44	-
HA10	HA10-01	1.00 – 1.30	36.9	54	24	30	-
HA13	HA13-01	2.00 – 2.20	51.2	104	29	75	-
HA14	HA14-01	1.00 – 1.30	46.1	107	30	77	-
MBH02	MBH02-01	1.00 – 1.50	42.8	67	22	45	16
MBH03	MBH03-01	1.30 – 1.50	42.7	94	30	64	-
MBH05	MBH05-01	1.30 – 1.50	60.1	93	33	60	16

The amount of shrinkage of the sample as a percentage of the original sample length.

◆ = ***The soil fraction passing a 425μm sieve was used for the liquid limit, plastic limit & linear shrinkage tests.***

Please note that the linear shrinkage test was not carried out for the samples with a dash in the Linear Shrinkage column.

The whole soils were used for the water content tests (the soils were in a natural state), and for the liquid limit, plastic limit & linear shrinkage tests without a diamond beside them. The soil fractions passing a 0.425mm sieve were used for the liquid limit, plastic limit & linear shrinkage tests with a diamond (◆) beside them. The soils were wet up and dried where required for the liquid limit, plastic limit & linear shrinkage tests.

As per the reporting requirements of NZS4402: 1986: Test 2.1: water content is reported to two significant figures for values below 10%, and to three significant figures for values of 10% or greater. Test 2.2: liquid limit, test 2.3: plastic limit, and test 2.6: linear shrinkage are reported to the nearest whole number.

Please note that the test results relate only to the samples as-received, and relate only to the samples under test.

Thank you for the opportunity to carry out this testing. If you have any queries regarding the content of this report please contact the person authorising this report below at your convenience.

Yours faithfully,

Justin Franklin
Key Technical Person
Assistant Laboratory Manager
Babbage Geotechnical Laboratory

ACCREDITED
IANZ
TESTING LABORATORY
№ 126

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation. This report may not be reproduced except in full & with written approval from BGL.

Babbage Geotechnical Laboratory

Project: ASP

DETERMINATION OF THE LIQUID LIMIT, PLASTIC LIMIT & THE PLASTICITY INDEX

Test Methods: NZS4402: 1986: Test 2.2, Test 2.3 and Test 2.4

Tested By:	TL / WEC	April / May 2023
Compiled By:	JF	10/05/2023
Checked By:	JF	10/05/2023

SUMMARY OF TESTING

Borehole Number	Sample Number	Depth (m)	Liquid Limit	Plastic Limit	Plasticity Index	Soil Classification Based on USCS Chart Below
TP16	TP16-01	1.00 - 1.50	123	44	79	CH
TP17	TP17-01	1.00 - 1.50	106	34	72	CH
TP19	TP19-01	0.50 - 1.00	65	22	43	CH
TP20	TP20-01	1.50 - 2.00	84	27	57	CH
TP21	TP21-01	0.50 - 1.00	106	32	74	CH
TP22	TP22-01	2.00 - 2.50	146	42	104	OH - organic clay
TP23	TP23-01	1.00 - 1.50	63	25	38	CH
TP24	TP24-01	1.00 - 1.50	104	34	70	CH
TP26	TP26-01	1.00 - 1.50	43	19	24	CL
TP27	TP27-01	1.00 - 1.50	73	28	45	CH

The chart below & soil classification terminology is taken from ASTM D2487-17^{e1} "Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)", April 2020, & is based on the classification scheme developed by A. Casagrande in the 1940's (Casagrande, A., 1948: Classification and identification of soil. Transactions of the American Society of Civil Engineers, v. 113, p. 901-930). The chart below & the soil classification given in the table above are included for your information only, and are not included in the IANZ endorsement for this report.

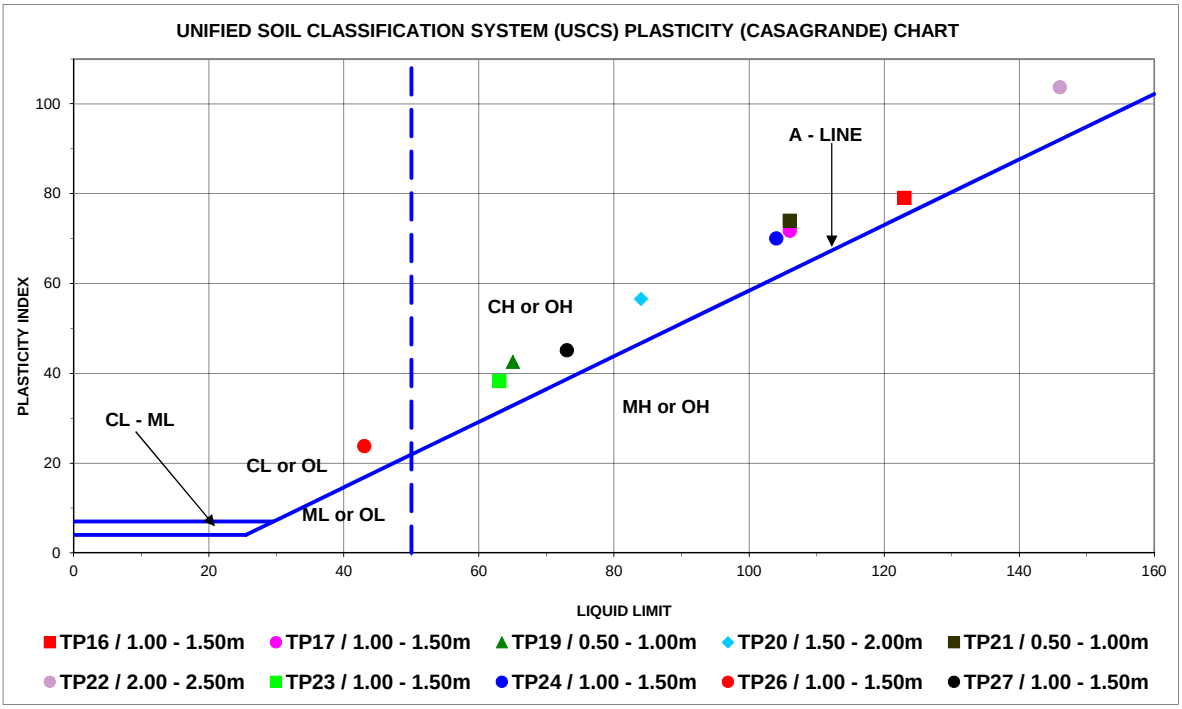


CHART LEGEND

CL = CLAY, low plasticity ('lean' clay)
CH = CLAY, high plasticity ('fat' clay)
OL = ORGANIC CLAY or ORGANIC SILT, low liquid limit
OH = ORGANIC CLAY or ORGANIC SILT, high liquid limit
ML = SILT, low liquid limit
MH = SILT, high liquid limit ('elastic silt')
CL - ML = SILTY CLAY

Babbage Geotechnical Laboratory	Job Number: 63578#L	Sheet 1 of 1	Page 5 of 5
	Reg. Number: 2819	Version No:	7
	Report No: 63578#L/AL ASP	Version Date:	July 2022
	Project: ASP		

DETERMINATION OF THE LIQUID LIMIT, PLASTIC LIMIT & THE PLASTICITY INDEX

Test Methods: NZS4402: 1986: Test 2.2, Test 2.3 and Test 2.4

Tested By:	TL / WEC	April / May 2023
Compiled By:	JF	10/05/2023
Checked By:	JF	10/05/2023

SUMMARY OF TESTING

Borehole Number	Sample Number	Depth (m)	Liquid Limit	Plastic Limit	Plasticity Index	Soil Classification Based on USCS Chart Below
TP28	TP28-01	1.50 - 2.00	39	18	21	CL
HA03	HA03-01	1.00 - 1.30	55	22	33	CH
HA04	HA04-01	1.00 - 1.40	81	36	45	CH / MH
HA09	HA09-01	1.00 - 1.30	73	29	44	CH
HA10	HA10-01	1.00 - 1.30	54	24	30	CH
HA13	HA13-01	2.00 - 2.20	104	29	75	CH
HA14	HA14-01	1.00 - 1.30	107	30	77	CH
MBH02	MBH02-01	1.00 - 1.50	67	22	45	CH
MBH03	MBH03-01	1.30 - 1.50	94	30	64	CH
MBH05	MBH05-01	1.30 - 1.50	93	33	60	CH

The chart below & soil classification terminology is taken from ASTM D2487-17^{e1} "Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)", April 2020, & is based on the classification scheme developed by A. Casagrande in the 1940's (Casagrande, A., 1948: Classification and identification of soil. Transactions of the American Society of Civil Engineers, v. 113, p. 901-930). The chart below & the soil classification given in the table above are included for your information only, and are not included in the IANZ endorsement for this report.

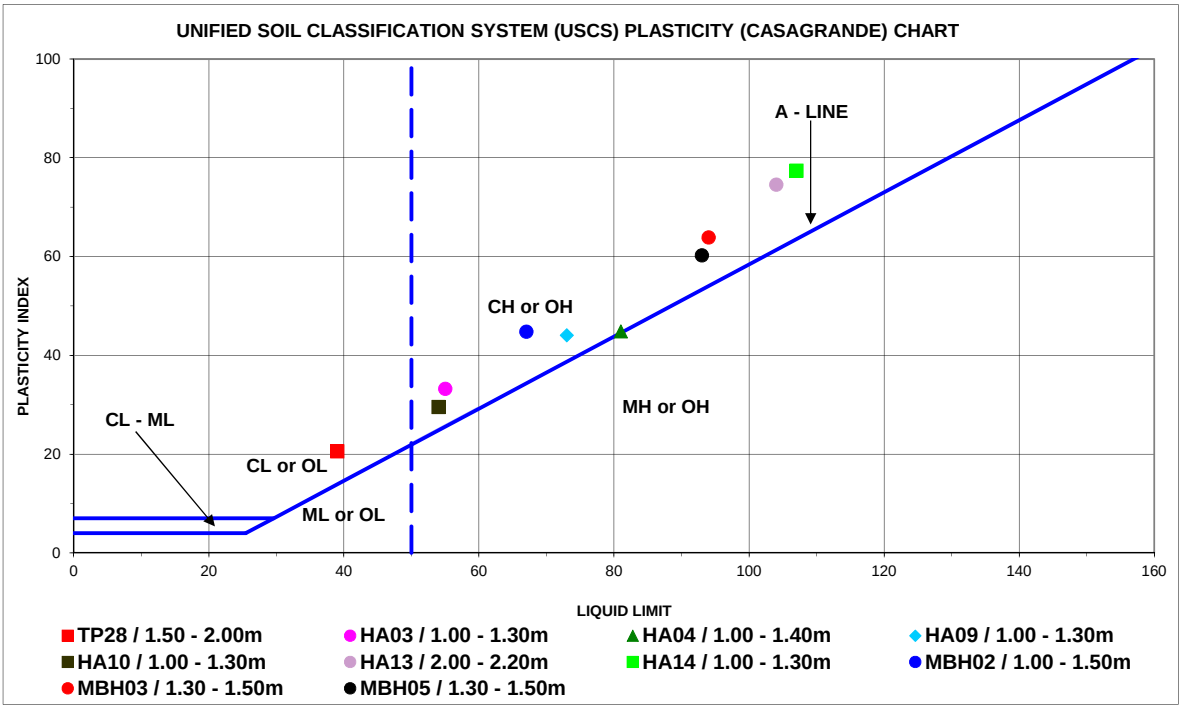


CHART LEGEND

CL = CLAY, low plasticity ('lean' clay)
CH = CLAY, high plasticity ('fat' clay)
OL = ORGANIC CLAY or ORGANIC SILT, low liquid limit
OH = ORGANIC CLAY or ORGANIC SILT, high liquid limit
ML = SILT, low liquid limit
MH = SILT, high liquid limit ('elastic silt')
CL - ML = SILTY CLAY

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wec@babbage.co.nz

Please reply to: W.E. Campton

INITIA LTD.
PO Box 47647,
Ponsonby,
Auckland 1144

Attention: **QUIN SORENSEN**

Job Number: 63578#L
BGL Registration Number: 2819
Checked by: WEC

29th May 2023

DRY DENSITY / WATER CONTENT RELATIONSHIP (COMPACTION CURVE) TESTING

Dear Sir,

Re: ASP

Your Reference: P-001537
Report Number: 63578#L/CC ASP

The following report presents the results of compaction curve testing at BGL of bulk soil samples delivered to this laboratory on the 14th of April 2023. Test results are summarised below, with the following pages showing graphs and detailed results.

A single shear vane test was carried out on each compacted sample while it was still in the proctor mould, and these results are included on the results tables and water content / density graphs. The shear vane results are included for your information only, and are not included in the IANZ endorsement for this report.

Test standards used were:

Water Content:	NZS4402:1986:Test 2.1
NZ Standard Compaction:	NZS4402:1986:Test 4.1.1
Vane Shear Strength:	NZ Geotechnical Society Guideline 2001

Sample Details	Maximum Dry Density (t/m^3)	Optimum Water Content (%)	Natural Water Content (%)
TP18 / TP18-01 / 1.00 – 1.50m	**1.30**	**35**	**51.3**
	CLAY, highly plastic, grey, very moist.		
TP19 / TP19-01 / 0.50 – 1.00m	**1.44**	**27**	**37.1**
	CLAY, highly plastic, grey with black organic mottles & orange staining, moist.		

Note that sample descriptions are not part of BGL IANZ Accreditation.

Sample Details	Maximum Dry Density (t/m^3)	Optimum Water Content (%)	Natural Water Content (%)
TP20 / TP20-01 / 1.50 – 2.00m	**1.26**	**36**	**46.9**
	CLAY, highly plastic, grey with black organic mottles, very moist, common roots & wood fragments.		
TP21 / TP21-01 / 0.50 – 1.00m	**1.30**	**33**	**56.4**
	CLAY, highly plastic, light brown & light grey, very moist.		
TP24 / TP24-01 / 1.00 – 1.50m	**1.28**	**34**	**60.7**
	CLAY, organic stained, highly plastic, dark brown & dark grey, very moist.		

Note that sample descriptions are not part of BGL IANZ Accreditation.

As per the reporting requirements of NZS4402: 1986: Test 2.1: water content is reported to two significant figures for values below 10%, and to three significant figures for values of 10% or greater. As per the reporting requirements of NZS4402: 1986: Test 4.1.1: New Zealand Standard Compaction Test, maximum dry density is reported to the nearest 0.01t/m^3, optimum water content is reported to the nearest 0.2% for values below 5%, to the nearest 0.5% for values from 5 to 10%, and to the nearest whole number for values greater than 10%.

For calculating the air voids percentages a solid density of 2.59t/m^3 was assumed for sample TP18, a solid density of 2.63t/m^3 was assumed for sample TP19, a solid density of 2.60t/m^3 was assumed for sample TP20, a solid density of 2.55t/m^3 was assumed for sample TP21 and a solid density of 2.46t/m^3 was assumed for sample TP24. Note that these assumed values are not part of the IANZ endorsement for this report.

Please note that the test results relate only to the samples as-received, and relate only to the samples under test. Thank you for the opportunity to carry out this testing. If you have any queries regarding the content of this report please contact the person authorising this report below at your convenience.

Yours faithfully,

Justin Franklin
Key Technical Person
Assistant Laboratory Manager
Babbage Geotechnical Laboratory

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№ 126

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation. This report may not be reproduced except in full & with written approval from BGL.

BGL Babbage Geotechnical Laboratory	Job No:	63578#L	Reg. No:	2819	Version No: 5
	Report No:	63578#L/CC ASP			Issue Date: Feb 2023
	PROJECT:	ASP			

Determination of the Dry Density / Water Content Relationship by Standard Compaction

Test Method: NZS4402: 1986: Test 4.1.1

Tested By:	WEC	May 2023
Compiled By:	WEC	24/05/2023
Checked By:	JF	24/05/2023

Sample No: TP18 / TP18-01 **Sample Depth:** 1.00 - 1.50m

Sample History: Air-dried from natural water content

Compaction Used: New Zealand Standard Compaction

Test Performed On: Whole Soil / ~~Fraction Passing the 19mm Sieve~~

Solid Density of Soil Particles: 2.59 t/m^3 (~~measured~~ / assumed)

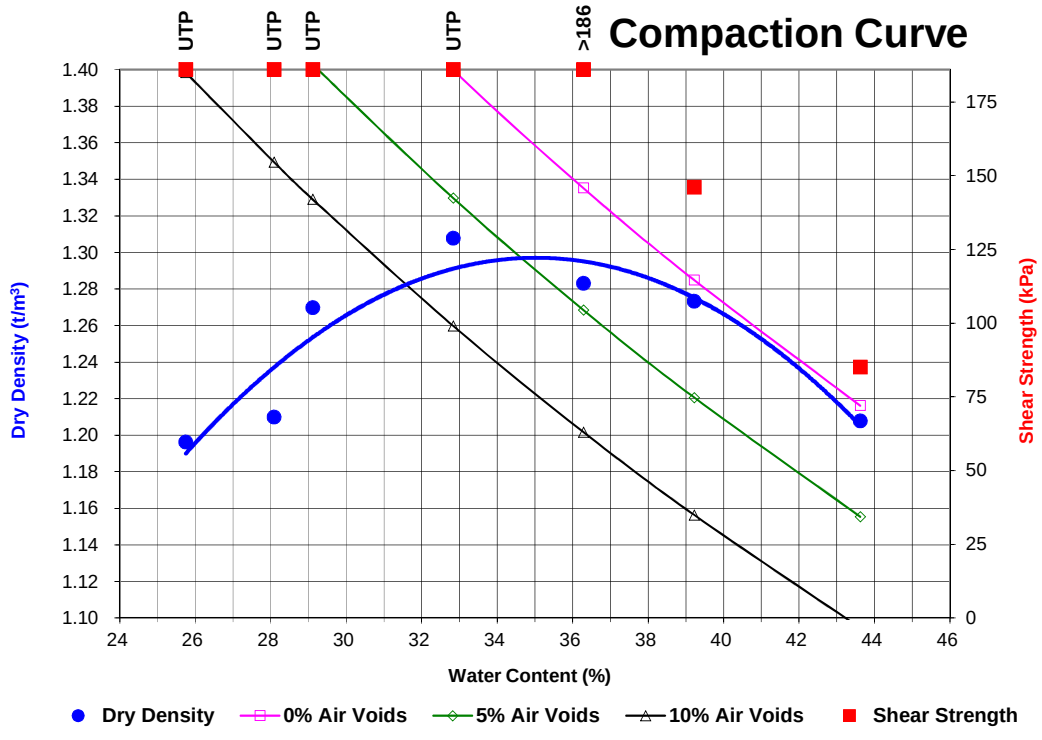
Natural Water Content (%): 51.3

TEST RESULTS

Water Content (%)	25.7	28.1	29.1	32.8	36.3	39.2	43.6
Bulk Density (t/m^3)	1.50	1.55	1.64	1.74	1.75	1.77	1.73
Dry Density (t/m^3)	1.20	1.21	1.27	1.31	1.28	1.27	1.21
Air Voids (%)	23.0	19.3	14.0	6.6	3.9	0.9	0.7
Shear Strength (kPa)	UTP*	UTP*	UTP*	UTP*	>186	146	85

UTP = unable to penetrate sample with the shear vane.

Maximum Dry Density:	1.30 t/m^3	Optimum Water Content:	35 %



Babbage Geotechnical Laboratory

Job No:	63578#L	Reg. No:	2819	Version No:	5
Report No:	63578#L/CC ASP			Issue Date:	Feb 2023
PROJECT:	ASP				

Determination of the Dry Density / Water Content Relationship by Standard Compaction

Test Method: NZS4402: 1986: Test 4.1.1

Tested By:	TL / WC	May 2023
Compiled By:	WEC	24/05/2023
Checked By:	WEC	24/05/2023

Sample No: TP19 / TP19-01 **Sample Depth:** 0.50 - 1.00m

Sample History: Air-dried from natural water content

Compaction Used: New Zealand Standard Compaction

Test Performed On: Whole Soil / ~~Fraction Passing the 19mm Sieve~~

Solid Density of Soil Particles: 2.63 t/m^3 (~~measured~~ / assumed)

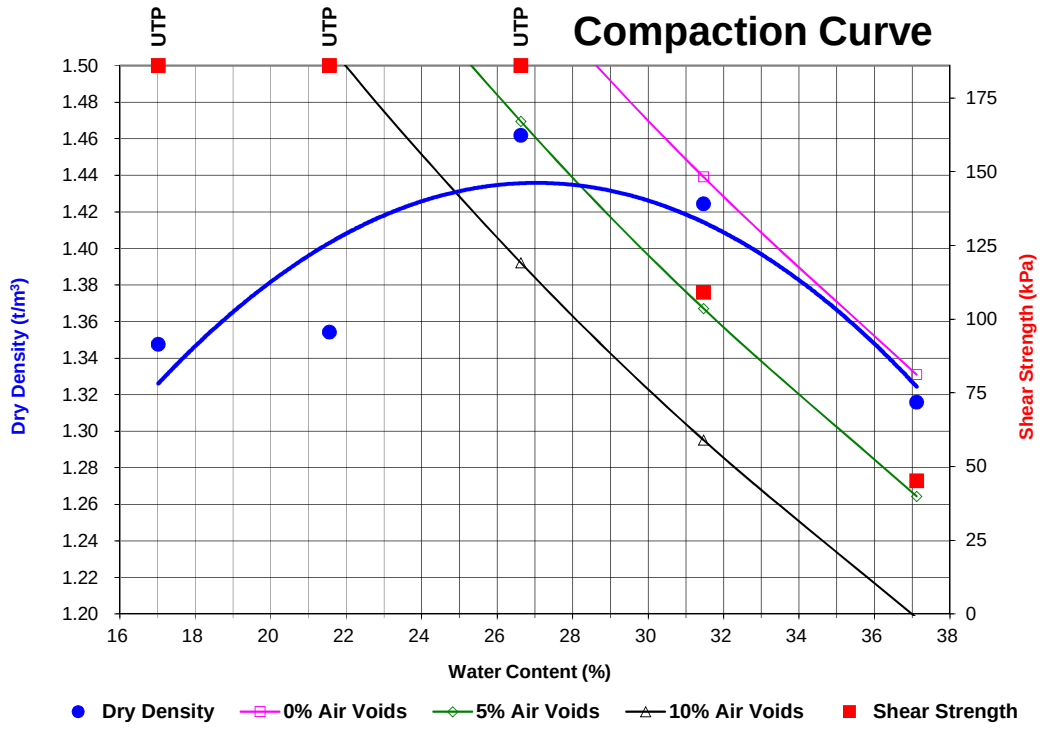
Natural Water Content (%): 37.1

TEST RESULTS

Water Content (%)	17.0	21.6	26.6	31.5	37.1
Bulk Density (t/m^3)	1.58	1.65	1.85	1.87	1.80
Dry Density (t/m^3)	1.35	1.35	1.46	1.42	1.32
Air Voids (%)	25.8	19.3	5.5	1.0	1.1
Shear Strength (kPa)	UTP*	UTP*	UTP*	109	45

UTP = unable to penetrate sample with the shear vane.

Maximum Dry Density: 1.44 t/m^3 **Optimum Water Content:** 27 %



BGL Babbage Geotechnical Laboratory	Job No:	63578#L	Reg. No:	2819	Page 5 of 7
					Version No: 5
	Report No:	63578#L/CC ASP			Issue Date: Feb 2023
	PROJECT:	ASP			

Determination of the Dry Density / Water Content Relationship by Standard Compaction

Test Method: NZS4402: 1986: Test 4.1.1

Tested By:	WEC	May 2023
Compiled By:	WEC	29/05/2023
Checked By:	JF	29/05/2023

Sample No: TP20 / TP20-01 **Sample Depth: 1.50 - 2.00m**

Sample History: Air-dried from natural water content

Compaction Used: New Zealand Standard Compaction

Test Performed On: Whole Soil / ~~Fraction Passing the 19mm Sieve~~

Solid Density of Soil Particles: 2.60 t/m^3 (~~measured~~ / assumed)

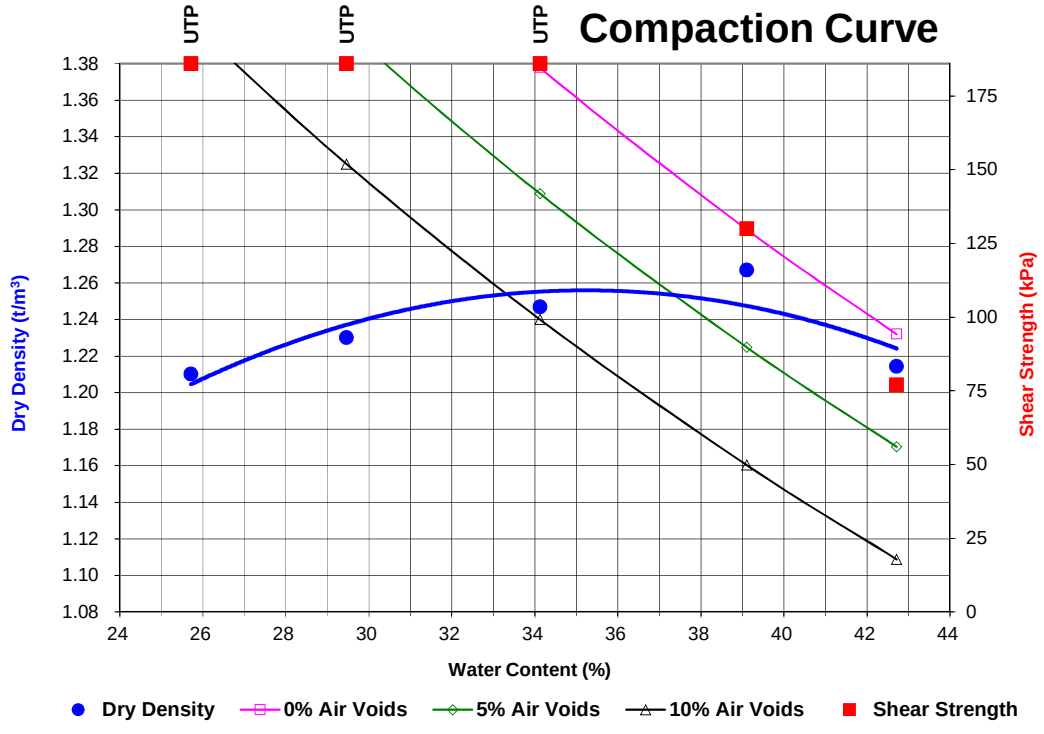
Natural Water Content (%): 46.9

TEST RESULTS

Water Content (%)	25.7	29.5	34.1	39.1	42.7
Bulk Density (t/m^3)	1.52	1.59	1.67	1.76	1.73
Dry Density (t/m^3)	1.21	1.23	1.25	1.27	1.21
Air Voids (%)	22.3	16.4	9.5	1.7	1.4
Shear Strength (kPa)	UTP*	UTP*	UTP*	130	77

UTP = unable to penetrate sample with the shear vane.

Maximum Dry Density:	1.26 t/m^3	Optimum Water Content:	36 %



Babbage Geotechnical Laboratory	Job No:	63578#L	Reg. No:	2819	Version No: 5
	Report No:	63578#L/CC ASP			Issue Date: Feb 2023
	PROJECT:	ASP			

Determination of the Dry Density / Water Content Relationship by Standard Compaction

Test Method: NZS4402: 1986: Test 4.1.1

Tested By:	CB / WEC	May 2023
Compiled By:	WEC	11-May-23
Checked By:	TL	11-May-23

Sample No: TP21 / TP21-01 **Sample Depth: 0.50 - 1.00m**

Sample History: Air-dried from natural water content

Compaction Used: New Zealand Standard Compaction

Test Performed On: Whole Soil / ~~Fraction Passing the 19mm Sieve~~

Solid Density of Soil Particles: 2.55 t/m^3 (~~measured~~ / assumed)

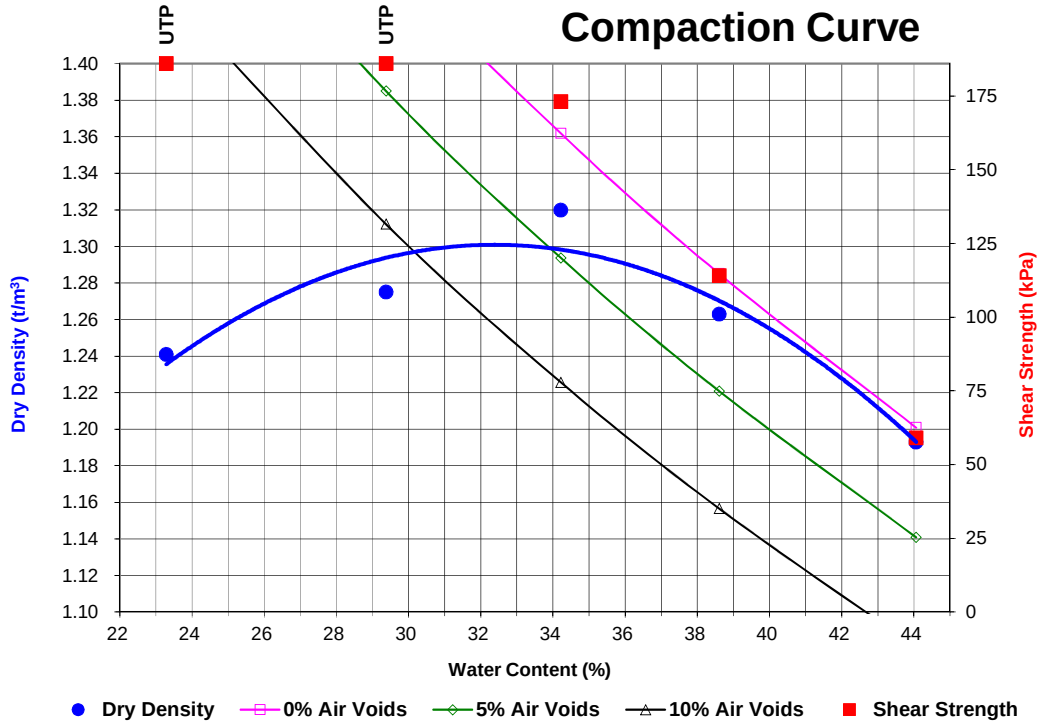
Natural Water Content (%): 56.4

TEST RESULTS

Water Content (%)	23.3	29.4	34.2	38.6	44.1
Bulk Density (t/m^3)	1.53	1.65	1.77	1.75	1.72
Dry Density (t/m^3)	1.24	1.27	1.32	1.26	1.19
Air Voids (%)	22.5	12.6	3.1	1.7	0.7
Shear Strength (kPa)	UTP*	UTP*	173	114	59

UTP = unable to penetrate sample with the shear vane.

Maximum Dry Density: 1.30 t/m^3 **Optimum Water Content: 33 %**



Determination of the Dry Density / Water Content Relationship by Standard Compaction

Test Method: NZS4402: 1986: Test 4.1.1

Tested By:	CB / WEC	May 2023
Compiled By:	WEC	11-May-23
Checked By:	TL	11-May-23

Sample No: TP24 / TP24-01 **Sample Depth:** 1.00 - 1.50m

Sample History: Air-dried from natural water content

Compaction Used: New Zealand Standard Compaction

Test Performed On: Whole Soil / ~~Fraction Passing the 19mm Sieve~~

Solid Density of Soil Particles: 2.46 t/m^3 (~~measured~~ / assumed)

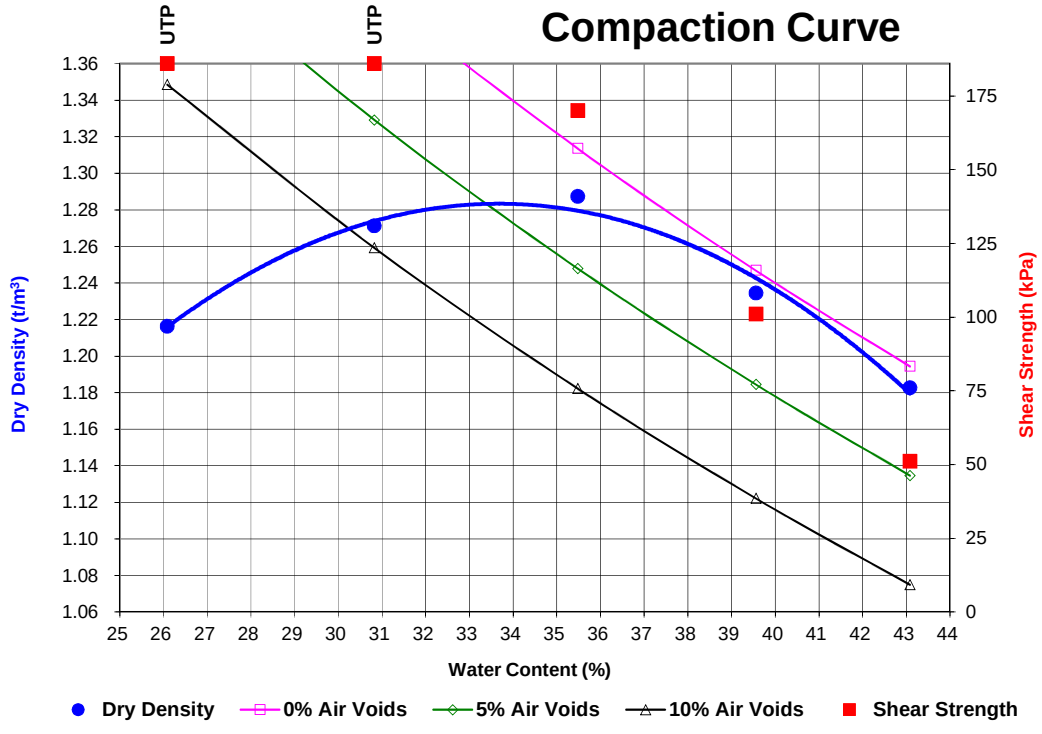
Natural Water Content (%): 60.7

TEST RESULTS

Water Content (%)	26.1	30.8	35.5	39.6	43.1
Bulk Density (t/m^3)	1.53	1.66	1.74	1.72	1.69
Dry Density (t/m^3)	1.22	1.27	1.29	1.23	1.18
Air Voids (%)	18.8	9.1	2.0	1.0	1.0
Shear Strength (kPa)	UTP*	UTP*	170	101	51

UTP = unable to penetrate sample with the shear vane.

Maximum Dry Density:	1.28 t/m^3	Optimum Water Content:	34 %



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Attention: **QUIN SORENSEN**

Job Number: 63578#L
BGL Registration Number: 2819
Checked by: WEC

12th June 2023

LIME & CEMENT REACTIVITY TESTING

Dear Sir,

Re: ASP

Your Reference: P-001537
Report Number: 63578#L/STABILISED CBR ASP

The following report presents the results of lime & cement reactivity testing at BGL of bulk soil samples delivered to this laboratory on the 14th of April 2023. Test results are summarised below, with the following pages showing graphs and detailed results. Test standards used were:

Water Content:	NZS4402:1986:Test 2.1
NZ Standard Compaction:	NZS4402:1986:Test 4.1.1
California Bearing Ratio (CBR) – Remoulded:	NZS4402:1986:Test 6.1.1 (soaked)
Lime / Cement Stabilisation:	National Roads Board Road Research Unit: RRU TR7 1985 – Test 8: Determination of the Californian Bearing Ratio (CBR) of Samples of Stabilised Soil in the Laboratory

Each bulk sample was sieved through a 9.5mm aperture sieve to break up the soil (which is a departure from the NZS4402 Standard which requires a 4.75mm sieve to be used). As the samples were very moist, and were unable to be compacted at the as-received water content, they were dried back to a condition estimated to be near the optimum water content for each sample (as per your instructions).

One of the sieved TP29 1.00 – 1.50m samples was then mixed with 1% lime & 3% cement (*the mass of lime & cement used was a percentage of the dry mass of the sub-sample*). The lime used was CaO, also known as 'quicklime'. A small amount of water was mixed in with the soil and lime & cement to provide water for the hydration reaction of the quicklime (slaking process). The stabilised sample was placed in a large plastic bag and allowed to cure for one hour. The stabilised sample was then compacted into a CBR mould using the NZ Standard Compaction method. The other TP29 1.00 – 1.50m sieved sample (*non-stabilised*) was also compacted into a CBR mould. The compacted stabilised sample was then cured for four days, and soaked for three days before being tested. The compacted non-stabilised sample was soaked for four days before being tested.

TP15 1.50 – 2.00m, TP26 1.00 – 1.50m, TP30/HA08 1.00 – 1.50m and TP31 0.70 – 1.20m were also sieved through a 9.5mm aperture sieve to break up the soil. As with the TP29 samples, the water contents of these bulk samples were dried back to a condition estimated to be near the optimum water content for each sample.

TP15 was mixed with 2% lime & 2% cement before being cured & compacted into a CBR mould. It was then cured for three days & soaked for 4 days before being tested.

TP31 was mixed with 2% lime & 2% cement before being cured & compacted into a CBR mould. It was then cured for four days & soaked for 3 days before being tested.

TP30 was mixed with 3% lime & 1% cement before being cured & compacted into a CBR mould. It was then cured for three days & soaked for 4 days before being tested.

TP26 was not stabilised before being compacted. It was soaked for 4 days before being tested.

The CBR values were measured using a plunger penetration rate of 1mm per minute.

Sample Identification & % Stabiliser	Water Content (%)				Dry Density (t/m^3)	CBR (soaked)	Swell (%)
	As-received	After Adjustment to Estimated OWC*	After Mixing in Stabiliser	After Test (under plunger)			
TP15 / 1.50 – 2.00m	**57.5**	**38.6**	**38.5**	**44.7**	**1.20**	**13**	**1.8**
2% Lime & 2% Cement	CLAY, highly plastic, grey & dark grey with black organic mottles, common wood fragments, very moist.						
TP26 / 1.00 – 1.50m	**35.1**	**24.4**		**28.1**	**1.50**	**3.0**	**2.2**
No stabiliser	CLAY, highly plastic, grey & dark grey with black organic mottles, occasional light grey silt laminations, very moist.						
TP29 / 1.00 – 1.50m	**40.5**	**25.4**		**36.2**	**1.40**	**1.0**	**5.2**
No stabiliser	CLAY, organic stained, common silt pockets & laminations, highly plastic, brown with black & light grey mottles, very moist, occasional wood fragments.						
TP29 / 1.00 – 1.50m	**39.2**	**26.0**	**27.2**	**29.0**	**1.44**	**30**	**0.0**
1% Lime & 3% Cement	CLAY, organic stained, common silt pockets & laminations, highly plastic, brown with black & light grey mottles, very moist, occasional wood fragments.						
TP30/HA08 / 1.00 – 1.50m	**50.1**	**30.2**	**28.7**	**35.5**	**1.30**	**20**	**0.8**
3% Lime & 1% Cement	CLAY, highly plastic, grey with black organic mottles, common wood & roots, very moist.						
TP31 / 0.70 – 1.20m	**54.0**	**33.1**	**35.7**	**36.1**	**1.30**	**30**	**0.0**
2% Lime & 2% Cement	CLAY, highly plastic, grey & dark grey with common black organic mottles, common wood & roots, very moist.						

**OWC = optimum water content.*

Note that sample descriptions are not part of BGL IANZ Accreditation.

Note that a solid density value of 2.65t/m^3 was used in the calculation of the air voids for these compacted samples. This value is assumed, and is not part of the IANZ endorsement for this report. As per the reporting requirements of NZS4402: 1986: Test 6.1.1, dry density is reported to the nearest 0.02t/m^3, swell to the nearest 0.2%, CBR's > 20 to the nearest 5, CBR's between 5 and 20 to the nearest 1, and for CBR's < 5 to the nearest 0.5. As per the reporting requirements of NZS4402: 1986: Test 2.1: water content is reported to two significant figures for values below 10%, and to three significant figures for values of 10% or greater.

Please note that the test results relate only to the samples as-received, and relate only to the samples under test.

Thank you for the opportunity to carry out this testing. If you have any queries regarding the content of this report please contact the person authorising this report below at your convenience.

Yours faithfully,

Justin Franklin
Key Technical Person
Assistant Laboratory Manager
Babbage Geotechnical Laboratory

ACCREDITED
IANZ
TESTING LABORATORY
№ 126

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation. This report may not be reproduced except in full & with written approval from BGL.

Babbage Geotechnical Laboratory	JOB NUMBER:	63578#L	REPORT NUMBER:	Page 4 of 9
	REG. NUMBER:	2819	63578#L/STABILISED CBR ASP	Version 4, Sept 2022
	PROJECT:	ASP		

CALIFORNIA BEARING RATIO TEST:
REMOULDED SAMPLE, SOAKED

Test Method: NZS4402:1986:Test 6.1.1
NZS4402:1986:Test 2.1 Moisture Content

	Initials	Date
Tested By:	WEC / TL	6/06/2023
Compiled By:	TL	6/06/2023
Checked By:	JF	7/06/2023

Sample Number: TP15 / TP15-01
Sample Depth (m): 1.50 - 2.00m
Sample History: dried / ~~wetted~~ / lime added / cement added / ~~unknown / natural~~
Compaction Used: NZ Standard / ~~NZ Heavy~~

Proving Ring No:	122-3-508
Calibration Factor:	99.59

(dial divisions / kN: from calibration worksheet)

SOAKED CBR: 2% LIME & 2% CEMENT

Soil Sieved Through:	9.50	mm sieve
Surcharge Used:	4.00	kg
Mould Number:	B4	

BULK DENSITY

Mass Mould + Base + Soil	10,781.00	(g)
Mass Mould + Base	6,917.90	(g)
Volume Mould (from calibration)	2,308.00	(ml)
Bulk Density	**1.67**	(t/m^3)

WATER CONTENT

	Before (trimmings)	After (under plunger)
Mass Wet Soil + Tin (g)	387.291	319.508
Mass Dry Soil + Tin (g)	309.422	253.777
Mass Tin (g)	107.015	106.801
Water Content (%)	**38.5**	**44.7**
Dry Density (t/m^3)	**1.20**	

DETERMINATION OF SWELL

Initial Reading (mm)	6.39
Final Reading (mm)	8.78
Change in Height (mm)	2.39
Initial Height (mm)	126.94
Swell (%)	**1.8**

Air Voids:	7.9	%
Time of Soaking:	4	days
Plunger Penetration Rate:	1.0	mm / minute

DETERMINATION OF BEARING VALUE

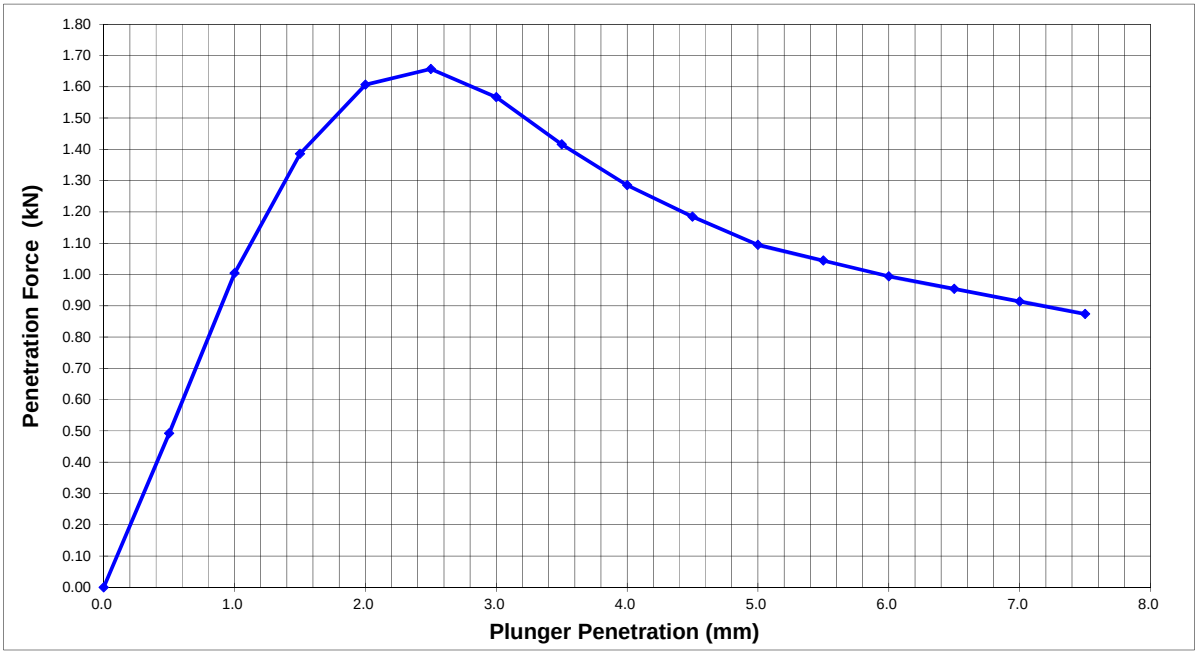
Plunger Penetration (mm)	Proving Ring Dial (divisions)	Force (kN)
0.0	0.0	0.00
0.5	49.0	0.49
1.0	100.0	1.00
1.5	138.0	1.39
2.0	160.0	1.61
2.5	**165.0**	**1.66**
3.0	156.0	1.57
3.5	141.0	1.42
4.0	128.0	1.29
4.5	118.0	1.18
5.0	**109.0**	**1.09**
5.5	104.0	1.04
6.0	99.0	0.99
6.5	95.0	0.95
7.0	91.0	0.91
7.5	87.0	0.87

2.5mm PENETRATION BEARING VALUE	
uncorrected	**12.6**
with curve shape correction (if needed)	**12.6**
5.0mm PENETRATION BEARING VALUE	
uncorrected	**5.5**
with curve shape correction (if needed)	**5.5**

FINAL CBR VALUE: 13

Lime Added:	2.0	%
Cement Added:	2.0	%

CBR FORCE-PENETRATION CURVE



Babbage Geotechnical Laboratory	JOB NUMBER:	63578#L	REPORT NUMBER:	Page 5 of 9
	REG. NUMBER:	2819	63578#L/STABILISED CBR ASP	Version 4, Sept 2022
	PROJECT:	ASP		

CALIFORNIA BEARING RATIO TEST:
REMOULDED SAMPLE, SOAKED

Test Method: NZS4402:1986:Test 6.1.1
NZS4402:1986:Test 2.1 Moisture Content

	Initials	Date
Tested By:	WEC	6/06/2023
Compiled By:	TL	6/06/2023
Checked By:	JF	7/06/2023

Sample Number: TP26 / TP26-01
Sample Depth (m): 1.00 - 1.50m
Sample History: dried / ~~wetted / lime added / cement added / unknown / natural~~
Compaction Used: NZ Standard / ~~NZ Heavy~~

Proving Ring No:	122-3-508
Calibration Factor:	99.59

(dial divisions / kN: from calibration worksheet)

SOAKED CBR: NO STABILISER

Soil Sieved Through:	9.50	mm sieve
Surcharge Used:	4.00	kg
Mould Number:	B1	

BULK DENSITY

Mass Mould + Base + Soil	10,963.40	(g)
Mass Mould + Base	6,629.20	(g)
Volume Mould (from calibration)	2,308.00	(ml)
Bulk Density	**1.88**	(t/m^3)

WATER CONTENT

	Before (trimmings)	After (under plunger)
Mass Wet Soil + Tin (g)	489.381	356.058
Mass Dry Soil + Tin (g)	414.011	300.610
Mass Tin (g)	105.055	103.430
Water Content (%)	**24.4**	**28.1**
Dry Density (t/m^3)	**1.50**	

DETERMINATION OF SWELL

Initial Reading (mm)	6.62
Final Reading (mm)	9.47
Change in Height (mm)	2.85
Initial Height (mm)	126.94
Swell (%)	**2.2**

Air Voids:	6.2	%
Time of Soaking:	4	days
Plunger Penetration Rate:	1.0	mm / minute

DETERMINATION OF BEARING VALUE

Plunger Penetration (mm)	Proving Ring Dial (divisions)	Force (kN)
0.0	0.0	0.00
0.5	12.0	0.12
1.0	21.0	0.21
1.5	28.0	0.28
2.0	35.0	0.35
2.5	**42.0**	**0.42**
3.0	47.0	0.47
3.5	49.0	0.49
4.0	53.0	0.53
4.5	56.0	0.56
5.0	**60.0**	**0.60**
5.5	64.0	0.64
6.0	67.0	0.67
6.5	70.5	0.71
7.0	74.0	0.74
7.5	77.0	0.77

2.5mm PENETRATION BEARING VALUE

uncorrected	**3.2**
with curve shape correction (if needed)	**3.2**

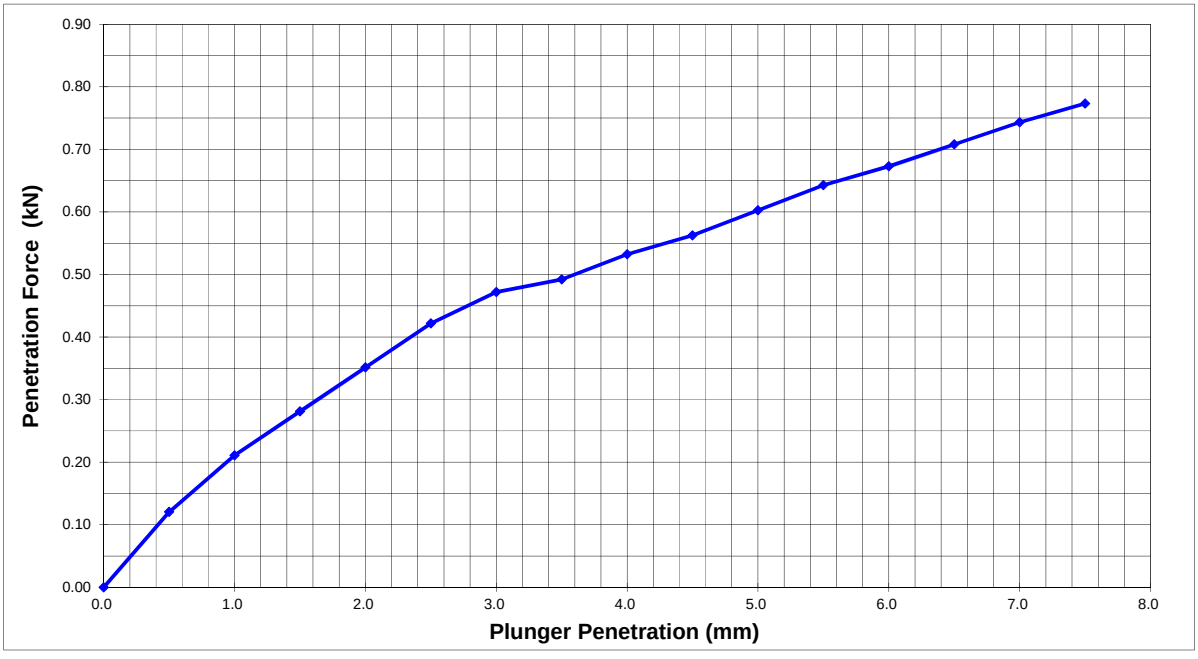
5.0mm PENETRATION BEARING VALUE

uncorrected	**3.0**
with curve shape correction (if needed)	**3.0**

FINAL CBR VALUE: 3.0

Lime Added:	0.0	%
Cement Added:	0.0	%

CBR FORCE-PENETRATION CURVE



BGL Babbage Geotechnical Laboratory	JOB NUMBER:	63578#L	REPORT NUMBER:	Page 6 of 9
	REG. NUMBER:	2819	63578#L/STABILISED CBR ASP	Version 4, Sept 2022
	PROJECT:	ASP		

CALIFORNIA BEARING RATIO TEST:
REMOULDED SAMPLE, SOAKED

Test Method: NZS4402:1986:Test 6.1.1
NZS4402:1986:Test 2.1 Moisture Content

	Initials	Date
Tested By:	WEC	6/06/2023
Compiled By:	TL	6/06/2023
Checked By:	JF	7/06/2023

Sample Number: TP29 / TP29-01
Sample Depth (m): 1.00 - 1.50m
Sample History: dried / ~~wetted / lime added / cement added / unknown / natural~~
Compaction Used: NZ Standard / ~~NZ Heavy~~

Proving Ring No:	122-3-508
Calibration Factor:	99.59

(dial divisions / kN: from calibration worksheet)

SOAKED CBR: NO STABILISER

Soil Sieved Through:	9.50	mm sieve
Surcharge Used:	4.00	kg
Mould Number:	B5	

BULK DENSITY

Mass Mould + Base + Soil	10,812.40	(g)
Mass Mould + Base	6,758.20	(g)
Volume Mould (from calibration)	2,309.00	(ml)
Bulk Density	**1.76**	(t/m^3)

WATER CONTENT

	Before (trimmings)	After (under plunger)
Mass Wet Soil + Tin (g)	470.624	361.862
Mass Dry Soil + Tin (g)	396.588	292.985
Mass Tin (g)	104.910	102.794
Water Content (%)	**25.4**	**36.2**
Dry Density (t/m^3)	**1.40**	

DETERMINATION OF SWELL

Initial Reading (mm)	10.98
Final Reading (mm)	17.71
Change in Height (mm)	6.73
Initial Height (mm)	127.17
Swell (%)	**5.2**

Air Voids:	11.6	%
Time of Soaking:	4	days
Plunger Penetration Rate:	1.0	mm / minute

DETERMINATION OF BEARING VALUE

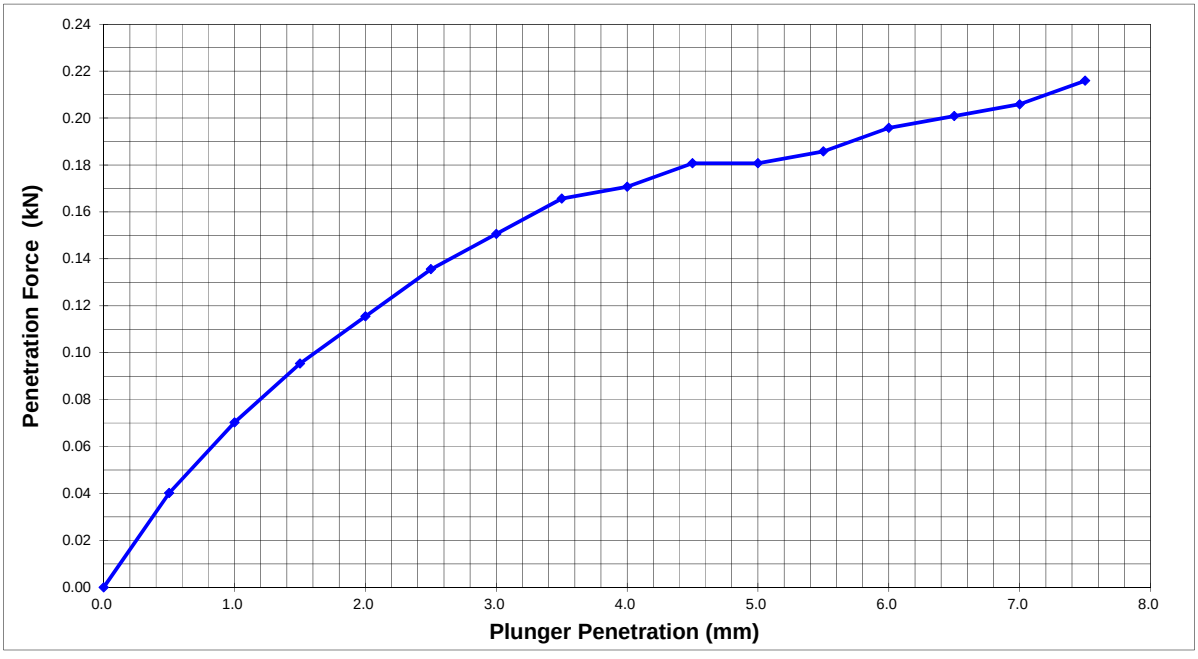
Plunger Penetration (mm)	Proving Ring Dial (divisions)	Force (kN)
0.0	0.0	0.00
0.5	4.0	0.04
1.0	7.0	0.07
1.5	9.5	0.10
2.0	11.5	0.12
2.5	**13.5**	**0.14**
3.0	15.0	0.15
3.5	16.5	0.17
4.0	17.0	0.17
4.5	18.0	0.18
5.0	**18.0**	**0.18**
5.5	18.5	0.19
6.0	19.5	0.20
6.5	20.0	0.20
7.0	20.5	0.21
7.5	21.5	0.22

2.5mm PENETRATION BEARING VALUE	
uncorrected	**1.0**
with curve shape correction (if needed)	**1.0**
5.0mm PENETRATION BEARING VALUE	
uncorrected	**0.9**
with curve shape correction (if needed)	**0.9**

FINAL CBR VALUE: 1.0

Lime Added:	0.0	%
Cement Added:	0.0	%

CBR FORCE-PENETRATION CURVE



BGL Babbage Geotechnical Laboratory	JOB NUMBER:	63578#L	REPORT NUMBER:	Page 7 of 9
	REG. NUMBER:	2819	63578#L/STABILISED CBR ASP	Version 4, Sept 2022
	PROJECT:	ASP		

CALIFORNIA BEARING RATIO TEST:
REMOULDED SAMPLE, SOAKED

Test Method: NZS4402:1986:Test 6.1.1
NZS4402:1986:Test 2.1 Moisture Content

	Initials	Date
Tested By:	WEC	9/06/2023
Compiled By:	WEC	9/06/2023
Checked By:	JF	12/06/2023

Sample Number: TP29 / TP29-01
Sample Depth (m): 1.00 - 1.50m
Sample History: dried / ~~wetted~~ / lime added / cement added / ~~unknown / natural~~
Compaction Used: NZ Standard / ~~NZ Heavy~~

Proving Ring No:	122-3-508
Calibration Factor:	99.59
(dial divisions / kN: from calibration worksheet)	

SOAKED CBR: 1% LIME & 3% CEMENT

Soil Sieved Through:	9.50	mm sieve
Surcharge Used:	4.00	kg
Mould Number:	B7	

BULK DENSITY

Mass Mould + Base + Soil	10,945.00	(g)
Mass Mould + Base	6,698.70	(g)
Volume Mould (from calibration)	2,305.00	(ml)
Bulk Density	**1.84**	(t/m^3)

WATER CONTENT

	Before (trimmings)	After (under plunger)
Mass Wet Soil + Tin (g)	354.618	297.406
Mass Dry Soil + Tin (g)	300.034	247.647
Mass Tin (g)	99.708	76.009
Water Content (%)	**27.2**	**29.0**
Dry Density (t/m^3)	**1.44**	

DETERMINATION OF SWELL

Initial Reading (mm)	1.32
Final Reading (mm)	1.27
Change in Height (mm)	-0.05
Initial Height (mm)	127.03
Swell (%)	**0.0**

Air Voids:	5.9	%
Time of Soaking:	3	days
Plunger Penetration Rate:	1.0	mm / minute

DETERMINATION OF BEARING VALUE

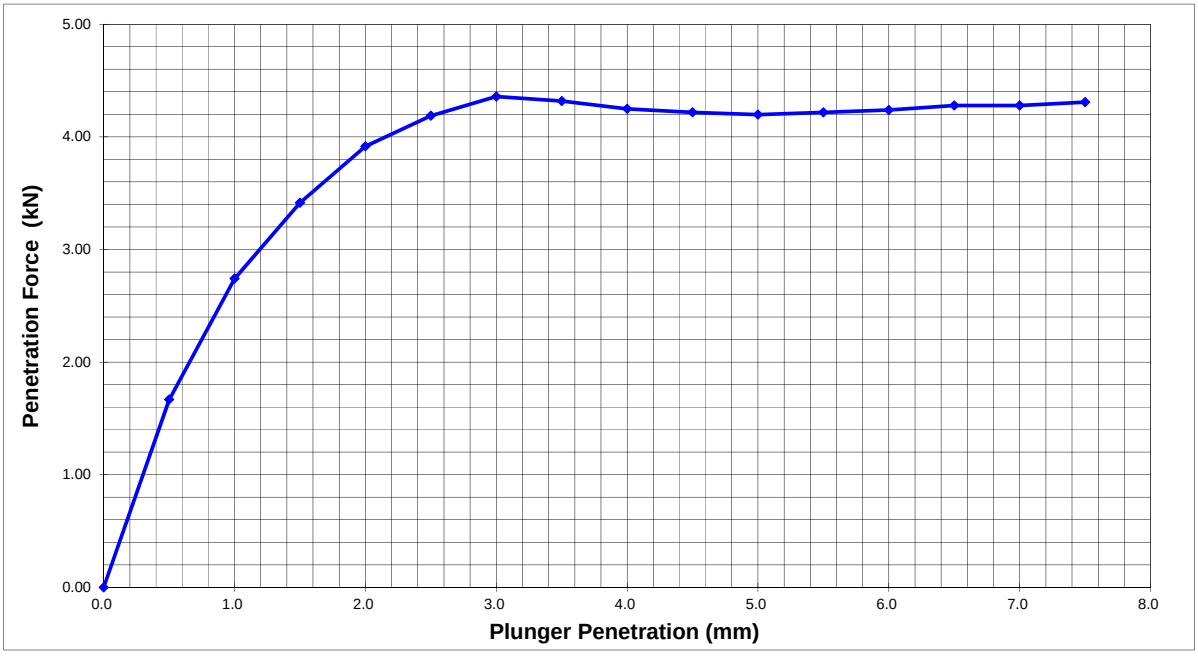
Plunger Penetration (mm)	Proving Ring Dial (divisions)	Force (kN)
0.0	0.0	0.00
0.5	166.0	1.67
1.0	273.0	2.74
1.5	340.0	3.41
2.0	390.0	3.92
2.5	**417.0**	**4.19**
3.0	434.0	4.36
3.5	430.0	4.32
4.0	423.0	4.25
4.5	420.0	4.22
5.0	**418.0**	**4.20**
5.5	420.0	4.22
6.0	422.0	4.24
6.5	426.0	4.28
7.0	426.0	4.28
7.5	429.0	4.31

2.5mm PENETRATION BEARING VALUE	
uncorrected	**31.7**
with curve shape correction (if needed)	**31.7**
5.0mm PENETRATION BEARING VALUE	
uncorrected	**21.0**
with curve shape correction (if needed)	**21.0**

FINAL CBR VALUE: 30

Lime Added:	1.0	%
Cement Added:	3.0	%

CBR FORCE-PENETRATION CURVE



Babbage Geotechnical Laboratory	JOB NUMBER:	63578#L	REPORT NUMBER:	Page 8 of 9
	REG. NUMBER:	2819	63578#L/STABILISED CBR ASP	Version 4, Sept 2022
	PROJECT:	ASP		

CALIFORNIA BEARING RATIO TEST:
REMOULDED SAMPLE, SOAKED

Test Method: NZS4402:1986:Test 6.1.1
NZS4402:1986:Test 2.1 Moisture Content

	Initials	Date
Tested By:	WEC / TL	6/06/2023
Compiled By:	TL	6/06/2023
Checked By:	JF	7/06/2023

Sample Number: TP30/HA08 / TP30-01

Sample Depth (m): 1.00 - 1.50m

Sample History: dried / ~~wetted~~ / lime added / cement added / ~~unknown / natural~~

Compaction Used: NZ Standard / ~~NZ Heavy~~

Proving Ring No:	122-3-508
Calibration Factor:	99.59

(dial divisions / kN: from calibration worksheet)

SOAKED CBR: 3% LIME & 1% CEMENT

Soil Sieved Through:	9.50	mm sieve
Surcharge Used:	4.00	kg
Mould Number:	B9	

BULK DENSITY

Mass Mould + Base + Soil	10,587.80	(g)
Mass Mould + Base	6,721.90	(g)
Volume Mould (from calibration)	2,309.00	(ml)
Bulk Density	**1.67**	(t/m^3)

WATER CONTENT

	Before (trimmings)	After (under plunger)
Mass Wet Soil + Tin (g)	398.096	299.128
Mass Dry Soil + Tin (g)	331.490	248.326
Mass Tin (g)	99.705	105.049
Water Content (%)	**28.7**	**35.5**
Dry Density (t/m^3)	**1.30**	

DETERMINATION OF SWELL

Initial Reading (mm)	12.00
Final Reading (mm)	12.90
Change in Height (mm)	0.90
Initial Height (mm)	127.19
Swell (%)	**0.8**

Air Voids:	13.6	%
Time of Soaking:	4	days
Plunger Penetration Rate:	1.0	mm / minute

DETERMINATION OF BEARING VALUE

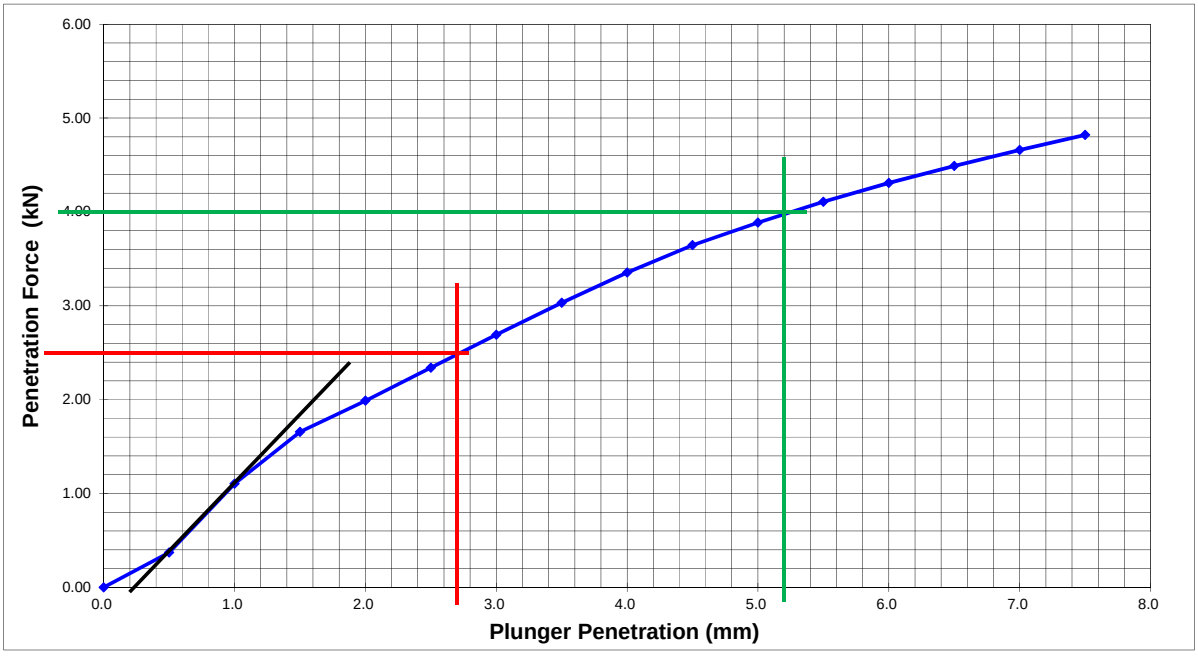
Plunger Penetration (mm)	Proving Ring Dial (divisions)	Force (kN)
0.0	0.0	0.00
0.5	37.0	0.37
1.0	110.0	1.10
1.5	165.0	1.66
2.0	198.0	1.99
2.5	**233.0**	**2.34**
3.0	268.0	2.69
3.5	302.0	3.03
4.0	334.0	3.35
4.5	363.0	3.65
5.0	**387.0**	**3.89**
5.5	409.0	4.11
6.0	429.0	4.31
6.5	447.0	4.49
7.0	464.0	4.66
7.5	480.0	4.82

2.5mm PENETRATION BEARING VALUE	
uncorrected	**17.7**
with curve shape correction (if needed)	**18.9**
5.0mm PENETRATION BEARING VALUE	
uncorrected	**19.4**
with curve shape correction (if needed)	**20.0**

FINAL CBR VALUE: 20

Lime Added:	3.0	%
Cement Added:	1.0	%

CBR FORCE-PENETRATION CURVE



BGL Babbage Geotechnical Laboratory	JOB NUMBER:	63578#L	REPORT NUMBER:	Page 9 of 9
	REG. NUMBER:	2819	63578#L/STABILISED CBR ASP	Version 4, Sept 2022
	PROJECT:	ASP		

CALIFORNIA BEARING RATIO TEST:
REMOULDED SAMPLE, SOAKED

Test Method: NZS4402:1986:Test 6.1.1
NZS4402:1986:Test 2.1 Moisture Content

	Initials	Date
Tested By:	WEC	9/06/2023
Compiled By:	WEC	9/06/2023
Checked By:	JF	12/06/2023

Sample Number: TP31 / TP31-01
Sample Depth (m): 0.70 - 1.20m
Sample History: dried / ~~wetted~~ / lime added / cement added / ~~unknown / natural~~
Compaction Used: NZ Standard / ~~NZ Heavy~~

Proving Ring No:	122-3-508
Calibration Factor:	99.59

(dial divisions / kN: from calibration worksheet)

SOAKED CBR: 2% LIME & 2% CEMENT

Soil Sieved Through:	9.50	mm sieve
Surcharge Used:	4.00	kg
Mould Number:	B2	

BULK DENSITY

Mass Mould + Base + Soil	10,799.00	(g)
Mass Mould + Base	6,760.50	(g)
Volume Mould (from calibration)	2,303.00	(ml)
Bulk Density	**1.75**	(t/m^3)

WATER CONTENT

	Before (trimmings)	After (under plunger)
Mass Wet Soil + Tin (g)	388.996	286.002
Mass Dry Soil + Tin (g)	314.878	229.624
Mass Tin (g)	107.018	73.436
Water Content (%)	**35.7**	**36.1**
Dry Density (t/m^3)	**1.30**	

DETERMINATION OF SWELL

Initial Reading (mm)	8.52
Final Reading (mm)	8.62
Change in Height (mm)	0.10
Initial Height (mm)	127.02
Swell (%)	**0.0**

Air Voids:	5.1	%
Time of Soaking:	3	days
Plunger Penetration Rate:	1.0	mm / minute

DETERMINATION OF BEARING VALUE

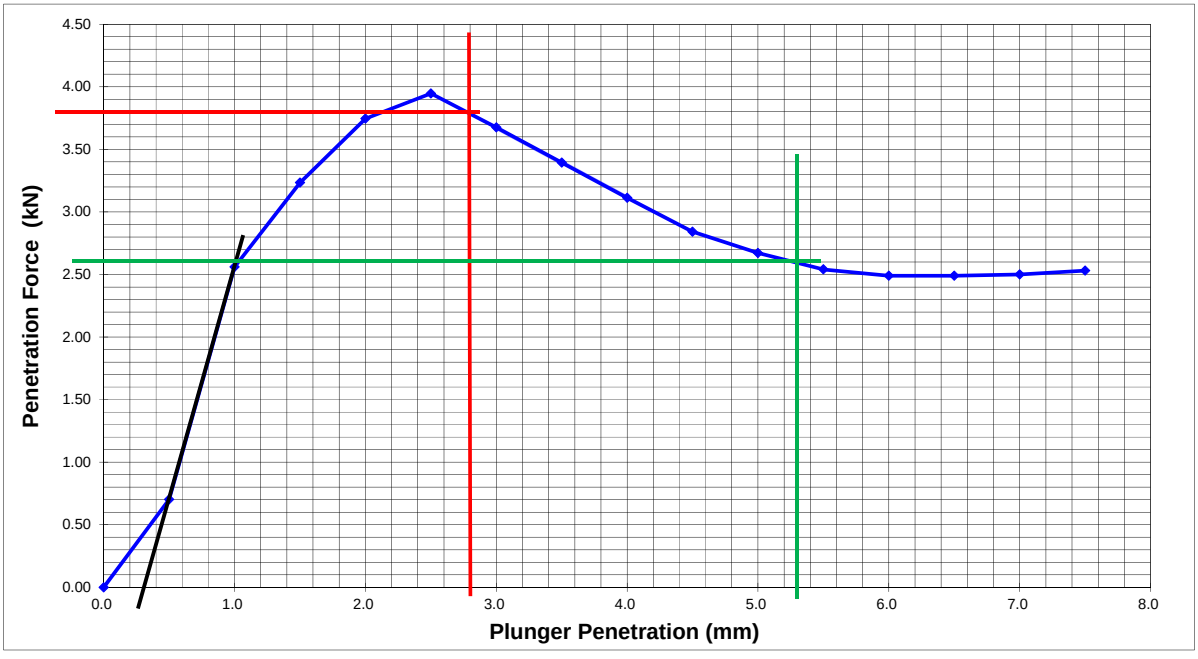
Plunger Penetration (mm)	Proving Ring Dial (divisions)	Force (kN)
0.0	0.0	0.00
0.5	70.0	0.70
1.0	255.0	2.56
1.5	322.0	3.23
2.0	373.0	3.75
2.5	**393.0**	**3.95**
3.0	366.0	3.68
3.5	338.0	3.39
4.0	310.0	3.11
4.5	283.0	2.84
5.0	**266.0**	**2.67**
5.5	253.0	2.54
6.0	248.0	2.49
6.5	248.0	2.49
7.0	249.0	2.50
7.5	252.0	2.53

2.5mm PENETRATION BEARING VALUE	
uncorrected	**29.9**
with curve shape correction (if needed)	**28.8**
5.0mm PENETRATION BEARING VALUE	
uncorrected	**13.4**
with curve shape correction (if needed)	**13.0**

FINAL CBR VALUE: 30

Lime Added:	2.0	%
Cement Added:	2.0	%

CBR FORCE-PENETRATION CURVE



Babbage Geotechnical Laboratory
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E-mail

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New Zealand
64-9-367 4954
wec@babbage.co.nz

Please reply to: W.E. Campton

INITIA LTD.
PO Box 47647,
Ponsonby,
Auckland 1144

Attention: **QUIN SORENSEN**

Job Number: 63578#L
BGL Registration Number: 2819
Checked by: JF

1st May 2023

ONE DIMENSIONAL CONSOLIDATION TESTING

Dear Sir,

Re: ASP
Your Reference: P-001537
Report Number: 63578#L/Consol ASP MBH01 4.50 – 5.00m

Borehole No: MBH01 Sample No: MBH01-02 Depth: 4.50 – 5.00m

The following report presents the results of one dimensional consolidation testing at BGL of a 54mm diameter undisturbed push-tube soil sample delivered to this laboratory on the 14th of April 2023. Our instructions were to carry out a one dimensional consolidation test using cycle times that would give just the $\sqrt{T_{90}}$ values, and using a standard pressure sequence.

The push-tube sample was tested in accordance with the following standards:

Water Content:	NZS4402:1986:Test 2.1
One Dimensional Consolidation:	NZS4402:1986:Test 7.1

Please note that consolidation cycles were of a variable time duration, and hence is a departure from the test standard which states that the cycle time period for the consolidation loads after the initial cycle should be of approximately the same length. Subsequent load cycles were taken to at least the time of the previous cycle.

The sample was extruded from the tube in small increments & trimmed into the consolidation ring, until the sample protruded from both sides of the ring. A wire was then used to cut the sample from the soil remaining in the tube, and a scalpel and straight edge were used to trim the sample flat in the ring.

These test results only relate to the sample tested. The values of m_v shown on the table have been calculated for each pressure increment, using void ratio difference for that increment. Note that a solid density value of 2.65t/m^3 was assumed for this test, and is not part of the IANZ endorsement for this report. This test was carried out in a laboratory in which the temperature is controlled to be kept within the specification of the test standard.

As per the reporting requirements of NZS4402: 1986: Test 2.1: water content is reported to two significant figures for values below 10%, and to three significant figures for values of 10% or greater. As per the reporting requirements of NZS4402: 1986: Test 7.1: one dimensional consolidation, the coefficients of consolidation (c_v's), and coefficients of volume compressibility (m_v's) are reported to two significant figures.

The "Void Ratio vs. Applied Pressure – Linear Scale" plot presented on page 4 is included for your information, and is based on the paper "Soil stiffness measured in oedometer tests" by L. Wesley & M. Pender, Proc. 18th NZGS Geotechnical Symposium on Soil-Structure Interaction, 2008. Please note that the presentation of the data on a linear scale is not part of the test standard, hence page 4 does not form part of the IANZ endorsement for this report.

Sample Description (***not part of BGL IANZ Accreditation***)

MBH01 / MBH01-02 / 4.50 – 5.00m:

CLAY, stiff, highly plastic, greenish light grey with black rootlets, moist.

Each test result is data obtained at a specific test location. The nature and continuity of subsoil conditions away from the test area could vary from the data recovered during this testing, therefore the test results relate only to the sample as-received, and relate only to the sample under test.

Thank you for the opportunity to carry out this testing. If you have any queries regarding the content of this report please contact the person authorising this report below at your convenience.

Yours faithfully,

Wayne Campton
Key Technical Person
Laboratory Manager
Babbage Geotechnical Laboratory

ACCREDITED
IANZ
TESTING LABORATORY
№ 126

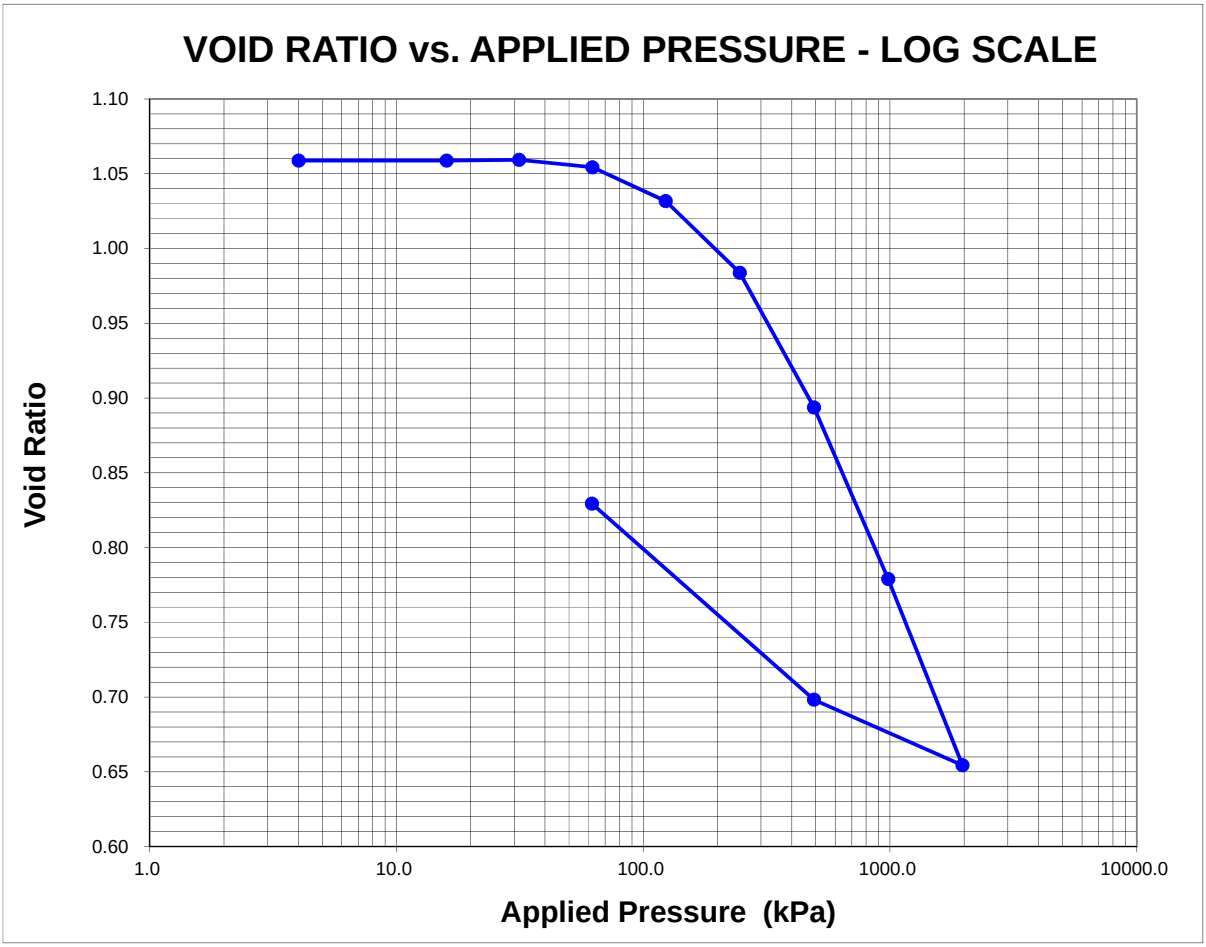
All tests reported herein have been performed in accordance with the laboratory's scope of accreditation. This report may not be reproduced except in full & with written approval from BGL.

Babbage Geotechnical Laboratory	Job No:	Reg. No:	Page	of	Version No:	3
	63578#L	2819	3	5	Issue Date:	July 2022
	PROJECT:				Auth. By:	WEC
	ASP					

ONE DIMENSIONAL CONSOLIDATION

Test Method: NZS4402:1986:Test 2.1 - Water Content	Tested By:	WEC	April 2023
Test Method: NZS4402:1986:Test 7.1 - Consolidation	Compiled By:	WEC	1-May-23
	Checked By:	JF	1-May-23

Borehole No: MBH01 **Sample No:** MBH01-02 **Depth:** 4.50 - 5.00m



SAMPLE HISTORY & PREPARATION

undisturbed / ~~disturbed~~

Sample from 54mm diameter push-tube

Extruded from 54mm diameter tube in small increments & trimmed into consol ring. Both sides of ring then trimmed flat with a scalpel & straight edge.

TEST DETAILS

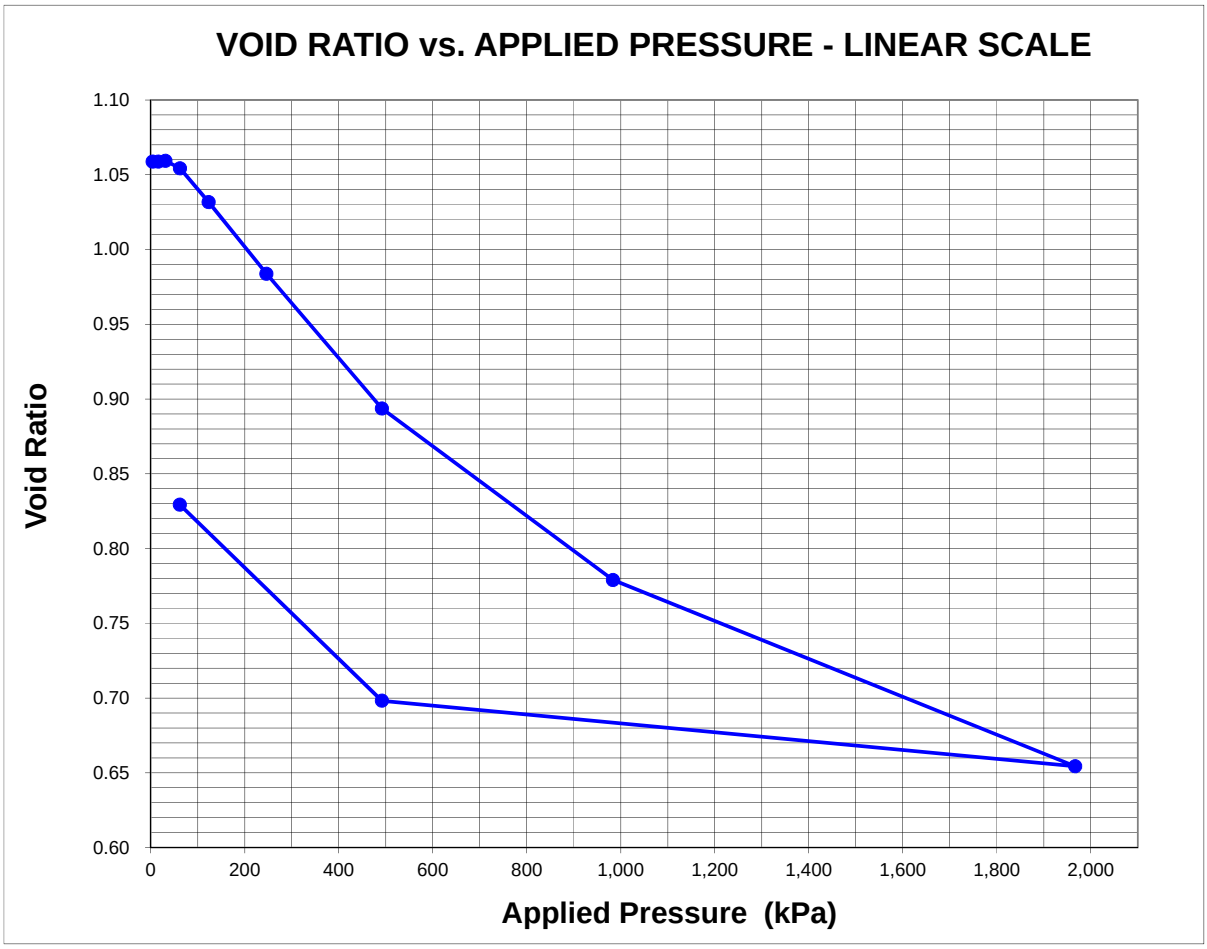
Consol machine number:	3		Surface area of sample top:	1995	mm^2
Consol ring number:	3b		Sample mass:	72.155	g
Sample diameter:	50.40	mm	Initial bulk density:	1.81	t/m^3
Sample height:	20.01	mm	Assumed solid density of soil particles:	2.65	t/m^3

BGL Babbage Geotechnical Laboratory	Job No:	Reg. No:	Page	of	Version No:	3
	63578#L	2819	4	5	Issue Date:	July 2022
	PROJECT:				Auth. By:	WEC
	ASP					

ONE DIMENSIONAL CONSOLIDATION

Test Method: NZS4402:1986:Test 2.1 - Water Content	Tested By:	WEC	April 2023
Test Method: NZS4402:1986:Test 7.1 - Consolidation	Compiled By:	WEC	1-May-23
	Checked By:	JF	1-May-23

Borehole No: MBH01 **Sample No:** MBH01-02 **Depth:** 4.50 - 5.00m



PHOTOGRAPH OF THE SAMPLE PRIOR TO TESTING



Babbage Geotechnical Laboratory	Job No:	Reg. No:	Page	of	Version No:	3
	63578#L	2819	5	5	Issue Date:	July 2022
	PROJECT:				Auth. By:	WEC
	ASP					

ONE DIMENSIONAL CONSOLIDATION

Test Method: NZS4402:1986:Test 2.1 - Water Content	Tested By:	WEC	April 2023
Test Method: NZS4402:1986:Test 7.1 - Consolidation	Compiled By:	WEC	1-May-23
	Checked By:	JF	1-May-23

Borehole No: **MBH01** Sample No: **MBH01-02** Depth: **4.50 - 5.00m**

Applied Pressure	Incremental Deflection	Sample Height	Compression Ratio	Height of Voids	Void Ratio	Coefficient of Volume Compressibility m_v	Coefficient of Consolidation - c_v (sqrt time)
kPa	mm	mm		mm	e	m^2/MN	m^2/year
4.0	0.000	20.010	1.000	10.291	1.059		
16.0	0.000	20.010	1.000	10.291	1.059	sample swelled after initial consolidation	
31.4	-0.005	20.015	1.000	10.296	1.059	sample swelled	
62.2	0.049	19.966	0.998	10.247	1.054	0.079	12
123.4	0.220	19.746	0.987	10.027	1.032	0.18	4.6
246.3	0.466	19.280	0.964	9.561	0.984	0.19	1.7
492.1	0.876	18.404	0.920	8.685	0.894	0.18	0.74
983.6	1.114	17.290	0.864	7.571	0.779	0.12	0.62
1966.8	1.211	16.079	0.804	6.360	0.654	0.071	0.45
492.1	-0.426	16.505	0.825	6.786	0.698	BACKLOAD 1	
62.0	-1.274	17.779	0.889	8.060	0.829	BACKLOAD 2	

Coefficient of Secondary Compression - C_{sec}	
Applied Pressure	C_{sec}

Coefficient of Permeability - k	
Applied Pressure	k (m/s)

	INITIAL	FINAL
Mass of dry sample (g)	51.38	51.38
Height of sample (mm)	20.010	16.079 (after consolidation) 17.779 (after rebound)
Water Content (%)	40.4	32.3
Dry Density (t/m^3)	1.29	1.60
Height of soil particles (mm)	9.719	9.719
Void Ratio	1.059	0.654 (after consolidation) 0.829 (after rebound)
Degree of saturation (%)	-	-

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Telephone
E-mail

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Please reply to: W.E. Campton

INITIA LTD.
PO Box 47647,
Ponsonby,
Auckland 1144

Attention: **QUIN SORENSEN**

Job Number: 63578#L
BGL Registration Number: 2819
Checked by: JF

1st May 2023

ONE DIMENSIONAL CONSOLIDATION TESTING

Dear Sir,

Re: ASP
Your Reference: P-001537
Report Number: 63578#L/Consol ASP MBH02 3.00 – 3.50m

Borehole No: MBH02 Sample No: MBH02-02 Depth: 3.00 – 3.50m

The following report presents the results of one dimensional consolidation testing at BGL of a 54mm diameter undisturbed push-tube soil sample delivered to this laboratory on the 14th of April 2023. Our instructions were to carry out a one dimensional consolidation test using cycle times that would give just the $\sqrt{T_{90}}$ values, and using a standard pressure sequence.

The push-tube sample was tested in accordance with the following standards:

Water Content:	NZS4402:1986:Test 2.1
One Dimensional Consolidation:	NZS4402:1986:Test 7.1

Please note that consolidation cycles were of a variable time duration, and hence is a departure from the test standard which states that the cycle time period for the consolidation loads after the initial cycle should be of approximately the same length. Subsequent load cycles were taken to at least the time of the previous cycle.

The sample was extruded from the tube in small increments & trimmed into the consolidation ring, until the sample protruded from both sides of the ring. A wire was then used to cut the sample from the soil remaining in the tube, and a scalpel and straight edge were used to trim the sample flat in the ring.

These test results only relate to the sample tested. The values of m_v shown on the table have been calculated for each pressure increment, using void ratio difference for that increment. Note that a solid density value of 2.65t/m^3 was assumed for this test, and is not part of the IANZ endorsement for this report. This test was carried out in a laboratory in which the temperature is controlled to be kept within the specification of the test standard.

As per the reporting requirements of NZS4402: 1986: Test 2.1: water content is reported to two significant figures for values below 10%, and to three significant figures for values of 10% or greater. As per the reporting requirements of NZS4402: 1986: Test 7.1: one dimensional consolidation, the coefficients of consolidation (c_v's), and coefficients of volume compressibility (m_v's) are reported to two significant figures.

The "Void Ratio vs. Applied Pressure – Linear Scale" plot presented on page 4 is included for your information, and is based on the paper "Soil stiffness measured in oedometer tests" by L. Wesley & M. Pender, Proc. 18th NZGS Geotechnical Symposium on Soil-Structure Interaction, 2008. Please note that the presentation of the data on a linear scale is not part of the test standard, hence page 4 does not form part of the IANZ endorsement for this report.

Sample Description (***not part of BGL IANZ Accreditation***)

MBH02 / MBH02-02 / 3.00 – 3.50m:

CLAY, firm to stiff, highly plastic, light brownish grey with numerous black rootlets, moist.

Each test result is data obtained at a specific test location. The nature and continuity of subsoil conditions away from the test area could vary from the data recovered during this testing, therefore the test results relate only to the sample as-received, and relate only to the sample under test.

Thank you for the opportunity to carry out this testing. If you have any queries regarding the content of this report please contact the person authorising this report below at your convenience.

Yours faithfully,

Wayne Campton
Key Technical Person
Laboratory Manager
Babbage Geotechnical Laboratory

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TESTING LABORATORY
№ 126

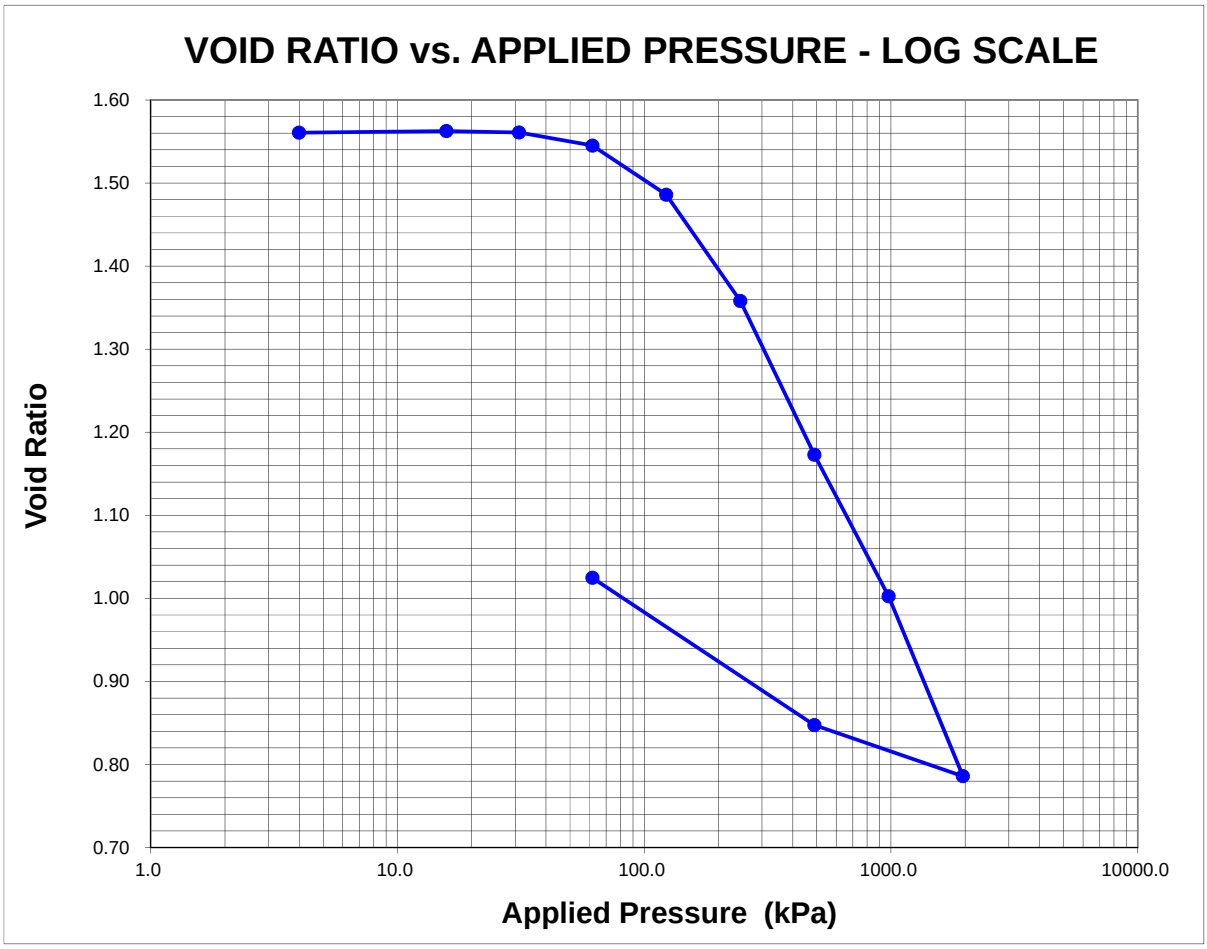
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Babbage Geotechnical Laboratory	Job No:	Reg. No:	Page	of	Version No:	3
	63578#L	2819	3	5	Issue Date:	July 2022
	PROJECT:				Auth. By:	WEC
	ASP					

ONE DIMENSIONAL CONSOLIDATION

Test Method: NZS4402:1986:Test 2.1 - Water Content	Tested By:	WEC	April 2023
Test Method: NZS4402:1986:Test 7.1 - Consolidation	Compiled By:	WEC	1-May-23
	Checked By:	JF	1-May-23

Borehole No: MBH02 **Sample No:** MBH02-02 **Depth:** 3.00 - 3.50m



SAMPLE HISTORY & PREPARATION

undisturbed / ~~disturbed~~

Sample from 54mm diameter push-tube

Extruded from 54mm diameter tube in small increments & trimmed into consol ring. Both sides of ring then trimmed flat with a scalpel & straight edge.

TEST DETAILS

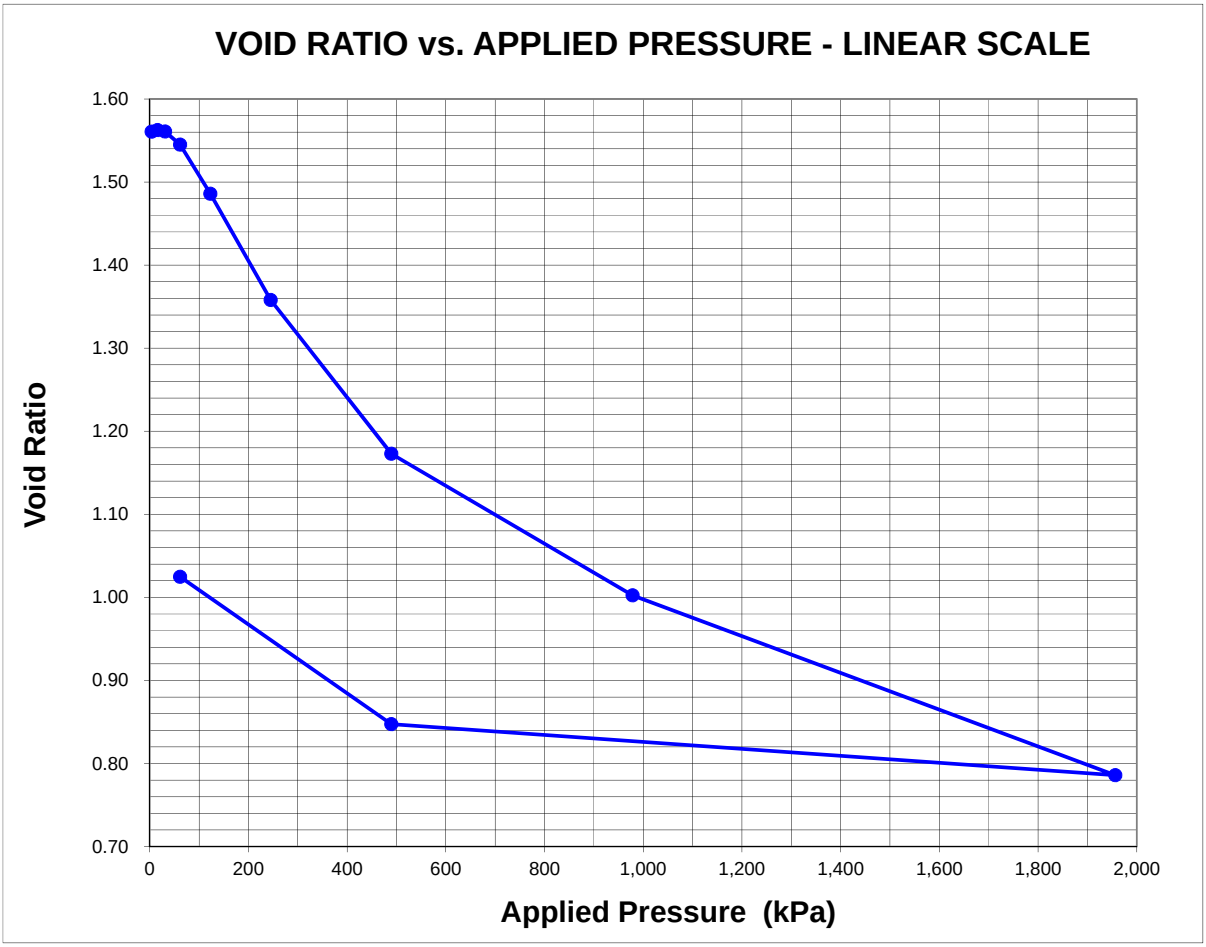
Consol machine number:	4		Surface area of sample top:	2005	mm^2
Consol ring number:	4c		Sample mass:	64.640	g
Sample diameter:	50.53	mm	Initial bulk density:	1.65	t/m^3
Sample height:	19.59	mm	Assumed solid density of soil particles:	2.65	t/m^3

Babbage Geotechnical Laboratory	Job No:	Reg. No:	Page	of	Version No:	3
	63578#L	2819	4	5	Issue Date:	July 2022
	PROJECT:				Auth. By:	WEC
	ASP					

ONE DIMENSIONAL CONSOLIDATION

Test Method: NZS4402:1986:Test 2.1 - Water Content	Tested By:	WEC	April 2023
Test Method: NZS4402:1986:Test 7.1 - Consolidation	Compiled By:	WEC	1-May-23
	Checked By:	JF	1-May-23

Borehole No: MBH02 **Sample No:** MBH02-02 **Depth:** 3.00 - 3.50m



PHOTOGRAPH OF THE SAMPLE PRIOR TO TESTING



Babbage Geotechnical Laboratory	Job No:	Reg. No:	Page	of	Version No:	3
	63578#L	2819	5	5	Issue Date:	July 2022
	PROJECT:				Auth. By:	WEC
	ASP					

ONE DIMENSIONAL CONSOLIDATION

Test Method: NZS4402:1986:Test 2.1 - Water Content	Tested By:	WEC	April 2023
Test Method: NZS4402:1986:Test 7.1 - Consolidation	Compiled By:	WEC	1-May-23
	Checked By:	JF	1-May-23

Borehole No: MBH02 **Sample No:** MBH02-02 **Depth:** 3.00 - 3.50m

Applied Pressure	Incremental Deflection	Sample Height	Compression Ratio	Height of Voids	Void Ratio	Coefficient of Volume Compressibility m_v	Coefficient of Consolidation - c_v (sqrt time)
kPa	mm	mm		mm	e	m^2/MN	m^2/year
4.0	0.000	19.590	1.000	11.940	1.561		
15.8	-0.015	19.605	1.001	11.954	1.563	sample swelled	
31.1	0.013	19.592	1.000	11.941	1.561	0.043	17
61.7	0.120	19.471	0.994	11.821	1.545	0.20	4.7
122.8	0.452	19.019	0.971	11.369	1.486	0.38	1.3
245.0	0.979	18.040	0.921	10.390	1.358	0.42	0.73
489.6	1.416	16.624	0.849	8.973	1.173	0.32	0.54
978.6	1.304	15.319	0.782	7.669	1.002	0.16	1.4
1956.6	1.656	13.663	0.697	6.012	0.786	0.11	0.37
489.6	-0.470	14.133	0.721	6.482	0.847	Backload Cycle 1	
61.7	-1.357	15.490	0.791	7.840	1.025	Backload Cycle 2	

Coefficient of Secondary Compression - C_{sec}	
Applied Pressure	C_{sec}

Coefficient of Permeability - k	
Applied Pressure	k (m/s)

	INITIAL	FINAL
Mass of dry sample (g)	40.66	40.66
Height of sample (mm)	19.590	13.663 (after consolidation) 15.490 (after rebound)
Water Content (%)	59.0	40.5
Dry Density (t/m^3)	1.03	1.48
Height of soil particles (mm)	7.650	7.650
Void Ratio	1.561	0.786 (after consolidation) 1.025 (after rebound)
Degree of saturation (%)	-	-

Babbage Geotechnical Laboratory
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Please reply to: W.E. Campton

INITIA LTD.
PO Box 47647,
Ponsonby,
Auckland 1144

Attention: **QUIN SORENSEN**

Job Number: 63578#L
BGL Registration Number: 2819
Checked by: JF

11th May 2023

ONE DIMENSIONAL CONSOLIDATION TESTING

Dear Sir,

Re: ASP
Your Reference: P-001537
Report Number: 63578#L/Consol ASP MBH02 6.00 – 6.50m

Borehole No: MBH02 Sample No: MBH02-03 Depth: 6.00 – 6.50m

The following report presents the results of one dimensional consolidation testing at BGL of a 54mm diameter undisturbed push-tube soil sample delivered to this laboratory on the 14th of April 2023. Our instructions were to carry out a one dimensional consolidation test using cycle times that would give just the $\sqrt{T_{90}}$ values, and using a standard pressure sequence.

The push-tube sample was tested in accordance with the following standards:

Water Content:	NZS4402:1986:Test 2.1
One Dimensional Consolidation:	NZS4402:1986:Test 7.1

Please note that consolidation cycles were of a variable time duration, and hence is a departure from the test standard which states that the cycle time period for the consolidation loads after the initial cycle should be of approximately the same length. Subsequent load cycles were taken to at least the time of the previous cycle.

The sample was extruded from the tube in small increments & trimmed into the consolidation ring, until the sample protruded from both sides of the ring. A wire was then used to cut the sample from the soil remaining in the tube, and a scalpel and straight edge were used to trim the sample flat in the ring.

These test results only relate to the sample tested. The values of m_v shown on the table have been calculated for each pressure increment, using void ratio difference for that increment. Note that a solid density value of 2.65t/m^3 was assumed for this test, and is not part of the IANZ endorsement for this report. This test was carried out in a laboratory in which the temperature is controlled to be kept within the specification of the test standard.

As per the reporting requirements of NZS4402: 1986: Test 2.1: water content is reported to two significant figures for values below 10%, and to three significant figures for values of 10% or greater. As per the reporting requirements of NZS4402: 1986: Test 7.1: one dimensional consolidation, the coefficients of consolidation (c_v's), and coefficients of volume compressibility (m_v's) are reported to two significant figures.

The "Void Ratio vs. Applied Pressure – Linear Scale" plot presented on page 4 is included for your information, and is based on the paper "Soil stiffness measured in oedometer tests" by L. Wesley & M. Pender, Proc. 18th NZGS Geotechnical Symposium on Soil-Structure Interaction, 2008. Please note that the presentation of the data on a linear scale is not part of the test standard, hence page 4 does not form part of the IANZ endorsement for this report.

Sample Description (***not part of BGL IANZ Accreditation***)

MBH02 / MBH02-03 / 6.00 – 6.50m:

CLAY, stiff, highly plastic, light bluish grey with occasional black organics & yellow staining, slightly moist.

Each test result is data obtained at a specific test location. The nature and continuity of subsoil conditions away from the test area could vary from the data recovered during this testing, therefore the test results relate only to the sample as-received, and relate only to the sample under test.

Thank you for the opportunity to carry out this testing. If you have any queries regarding the content of this report please contact the person authorising this report below at your convenience.

Yours faithfully,

Wayne Campton
Key Technical Person
Laboratory Manager
Babbage Geotechnical Laboratory

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IANZ
TESTING LABORATORY
№ 126

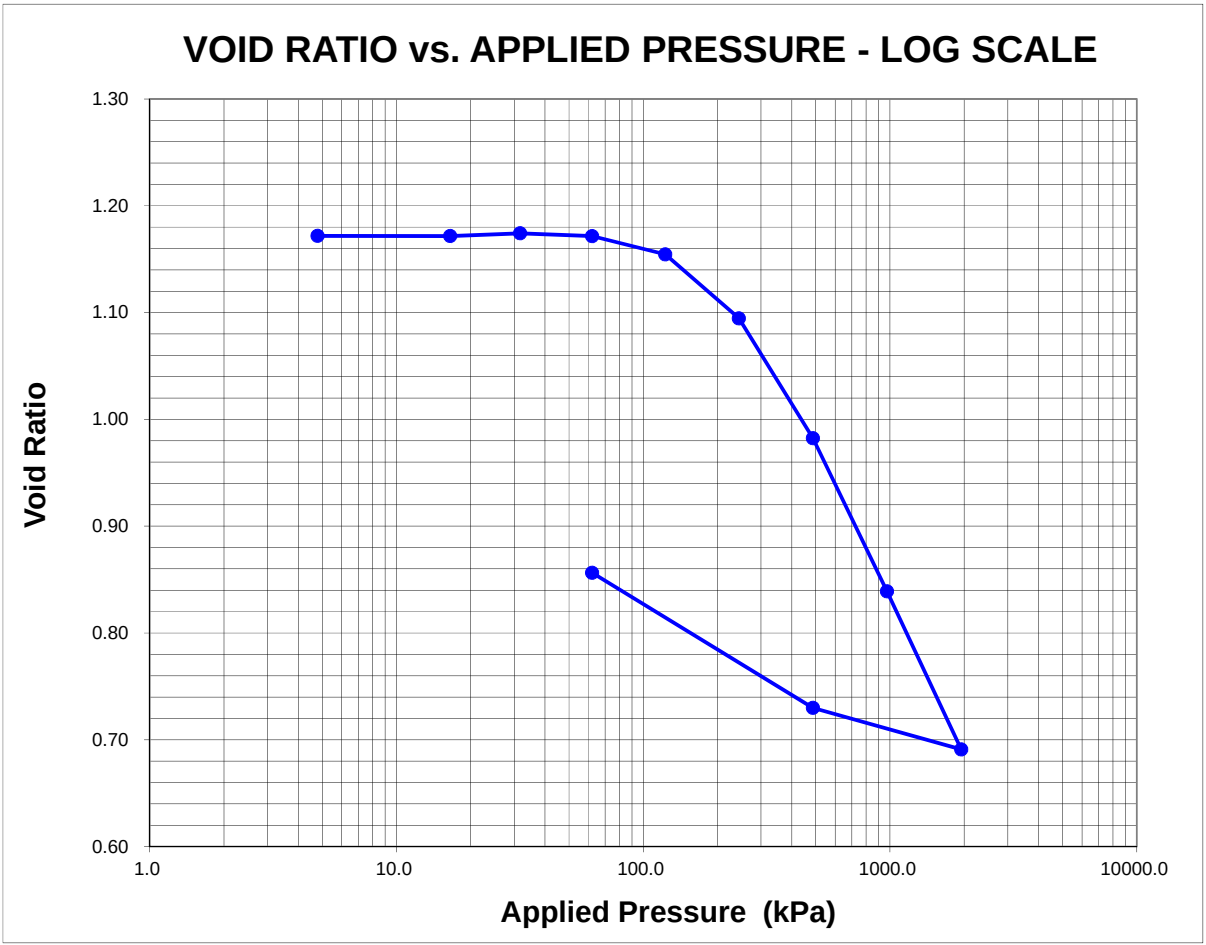
All tests reported herein have been performed in accordance with the laboratory's scope of accreditation. This report may not be reproduced except in full & with written approval from BGL.

BGL Babbage Geotechnical Laboratory	Job No:	Reg. No:	Page	of	Version No:	3
	63578#L	2819	3	5	Issue Date:	July 2022
	PROJECT:				Auth. By:	WEC
	ASP					

ONE DIMENSIONAL CONSOLIDATION

Test Method: NZS4402:1986:Test 2.1 - Water Content	Tested By:	WEC	May 2023
Test Method: NZS4402:1986:Test 7.1 - Consolidation	Compiled By:	WEC	11-May-23
	Checked By:	JF	11-May-23

Borehole No: MBH02 **Sample No:** MBH02-03 **Depth:** 6.00 - 6.50m



SAMPLE HISTORY & PREPARATION

undisturbed / ~~disturbed~~

Sample from 54mm diameter push-tube

Extruded from 54mm diameter tube in small increments & trimmed into consol ring. Both sides of ring then trimmed flat with a scalpel & straight edge.

TEST DETAILS

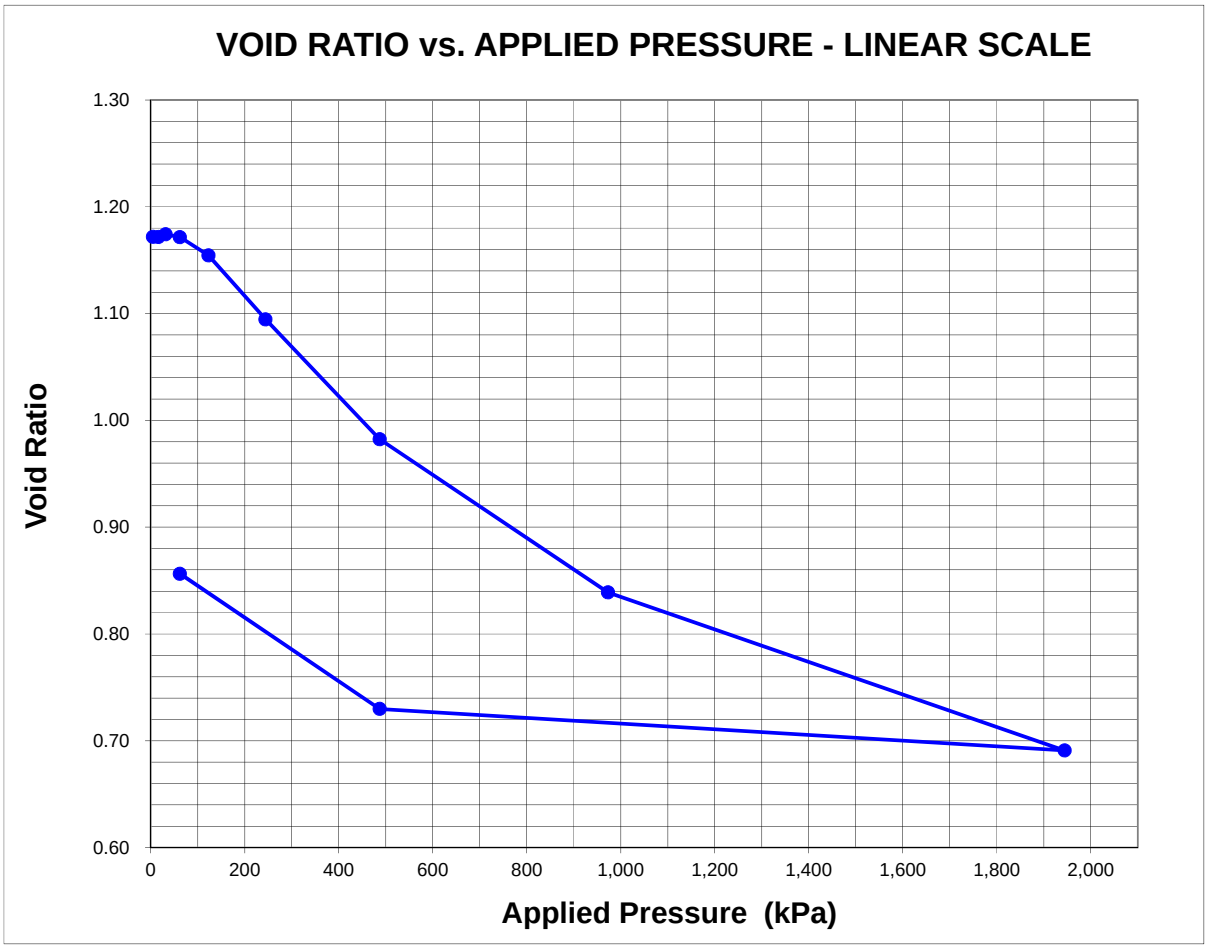
Consol machine number:	2		Surface area of sample top:	2019	mm^2
Consol ring number:	2a		Sample mass:	69.877	g
Sample diameter:	50.70	mm	Initial bulk density:	1.74	t/m^3
Sample height:	19.93	mm	Assumed solid density of soil particles:	2.65	t/m^3

Babbage Geotechnical Laboratory	Job No:	Reg. No:	Page	of	Version No:	3
	63578#L	2819	4	5	Issue Date:	July 2022
	PROJECT:				Auth. By:	WEC
	ASP					

ONE DIMENSIONAL CONSOLIDATION

Test Method: NZS4402:1986:Test 2.1 - Water Content	Tested By:	WEC	May 2023
Test Method: NZS4402:1986:Test 7.1 - Consolidation	Compiled By:	WEC	11-May-23
	Checked By:	JF	11-May-23

Borehole No: MBH02 **Sample No:** MBH02-03 **Depth:** 6.00 - 6.50m



PHOTOGRAPH OF THE SAMPLE PRIOR TO TESTING



Babbage Geotechnical Laboratory	Job No:	Reg. No:	Page	of	Version No:	3
	63578#L	2819	5	5	Issue Date:	July 2022
	PROJECT:				Auth. By:	WEC
	ASP					

ONE DIMENSIONAL CONSOLIDATION

Test Method: NZS4402:1986:Test 2.1 - Water Content	Tested By:	WEC	May 2023
Test Method: NZS4402:1986:Test 7.1 - Consolidation	Compiled By:	WEC	11-May-23
	Checked By:	JF	11-May-23

Borehole No: MBH02 **Sample No:** MBH02-03 **Depth:** 6.00 - 6.50m

Applied Pressure	Incremental Deflection	Sample Height	Compression Ratio	Height of Voids	Void Ratio	Coefficient of Volume Compressibility m_v	Coefficient of Consolidation - c_v (sqrt time)
kPa	mm	mm		mm	e	m^2/MN	m^2/year
4.8	0.000	19.930	1.000	10.754	1.172		
16.5	0.002	19.928	1.000	10.752	1.172	sample swelled after initial consolidation	
31.7	-0.023	19.952	1.001	10.775	1.174	sample swelled	
62.1	0.024	19.928	1.000	10.751	1.172	0.039	31
122.8	0.157	19.771	0.992	10.594	1.155	0.13	20
244.2	0.550	19.221	0.964	10.045	1.095	0.23	6.4
487.1	1.030	18.192	0.913	9.015	0.982	0.22	0.91
972.9	1.317	16.875	0.847	7.698	0.839	0.15	0.60
1944.4	1.358	15.517	0.779	6.340	0.691	0.083	0.49
487.1	-0.357	15.874	0.796	6.698	0.730	BACKLOAD 1	
62.1	-1.161	17.035	0.855	7.859	0.856	BACKLOAD 2	

Coefficient of Secondary Compression - C_{sec}	
Applied Pressure	C_{sec}

Coefficient of Permeability - k	
Applied Pressure	k (m/s)

	INITIAL	FINAL
Mass of dry sample (g)	49.09	49.09
Height of sample (mm)	19.930	15.517 (after consolidation) 17.035 (after rebound)
Water Content (%)	42.3	33.3
Dry Density (t/m^3)	1.22	1.57
Height of soil particles (mm)	9.176	9.176
Void Ratio	1.172	0.691 (after consolidation) 0.856 (after rebound)
Degree of saturation (%)	95.7	-

Babbage Geotechnical Laboratory
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Please reply to: W.E. Campton

INITIA LTD.
PO Box 47647,
Ponsonby,
Auckland 1144

Attention: **QUIN SORENSEN**

Job Number: 63578#L
BGL Registration Number: 2819
Checked by: JF

27th April 2023

ONE DIMENSIONAL CONSOLIDATION TESTING

Dear Sir,

Re: ASP
Your Reference: P-001537
Report Number: 63578#L/Consol ASP MBH02 7.50 – 8.00m

Borehole No: MBH02 Sample No: MBH02-04 Depth: 7.50 – 8.00m

The following report presents the results of one dimensional consolidation testing at BGL of a 54mm diameter undisturbed push-tube soil sample delivered to this laboratory on the 14th of April 2023. Our instructions were to carry out a one dimensional consolidation test using cycle times that would give just the $\sqrt{T_{90}}$ values, and using a standard pressure sequence.

The push-tube sample was tested in accordance with the following standards:

Water Content:	NZS4402:1986:Test 2.1
One Dimensional Consolidation:	NZS4402:1986:Test 7.1

Please note that consolidation cycles were of a variable time duration, and hence is a departure from the test standard which states that the cycle time period for the consolidation loads after the initial cycle should be of approximately the same length. Subsequent load cycles were taken to at least the time of the previous cycle.

The sample was extruded from the tube in small increments & trimmed into the consolidation ring, until the sample protruded from both sides of the ring. A wire was then used to cut the sample from the soil remaining in the tube, and a scalpel and straight edge were used to trim the sample flat in the ring.

These test results only relate to the sample tested. The values of m_v shown on the table have been calculated for each pressure increment, using void ratio difference for that increment. Note that a solid density value of 2.65t/m^3 was assumed for this test, and is not part of the IANZ endorsement for this report. This test was carried out in a laboratory in which the temperature is controlled to be kept within the specification of the test standard.

As per the reporting requirements of NZS4402: 1986: Test 2.1: water content is reported to two significant figures for values below 10%, and to three significant figures for values of 10% or greater. As per the reporting requirements of NZS4402: 1986: Test 7.1: one dimensional consolidation, the coefficients of consolidation (c_v's), and coefficients of volume compressibility (m_v's) are reported to two significant figures.

The "Void Ratio vs. Applied Pressure – Linear Scale" plot presented on page 4 is included for your information, and is based on the paper "Soil stiffness measured in oedometer tests" by L. Wesley & M. Pender, Proc. 18th NZGS Geotechnical Symposium on Soil-Structure Interaction, 2008. Please note that the presentation of the data on a linear scale is not part of the test standard, hence page 4 does not form part of the IANZ endorsement for this report.

Sample Description (***not part of BGL IANZ Accreditation***)

MBH02 / MBH02-04 / 7.50 – 8.00m:

CLAY, stiff, highly plastic, light bluish grey with thin orangish brown staining.

Each test result is data obtained at a specific test location. The nature and continuity of subsoil conditions away from the test area could vary from the data recovered during this testing, therefore the test results relate only to the sample as-received, and relate only to the sample under test.

Thank you for the opportunity to carry out this testing. If you have any queries regarding the content of this report please contact the person authorising this report below at your convenience.

Yours faithfully,

Wayne Campton
Key Technical Person
Laboratory Manager
Babbage Geotechnical Laboratory

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TESTING LABORATORY
№ 126

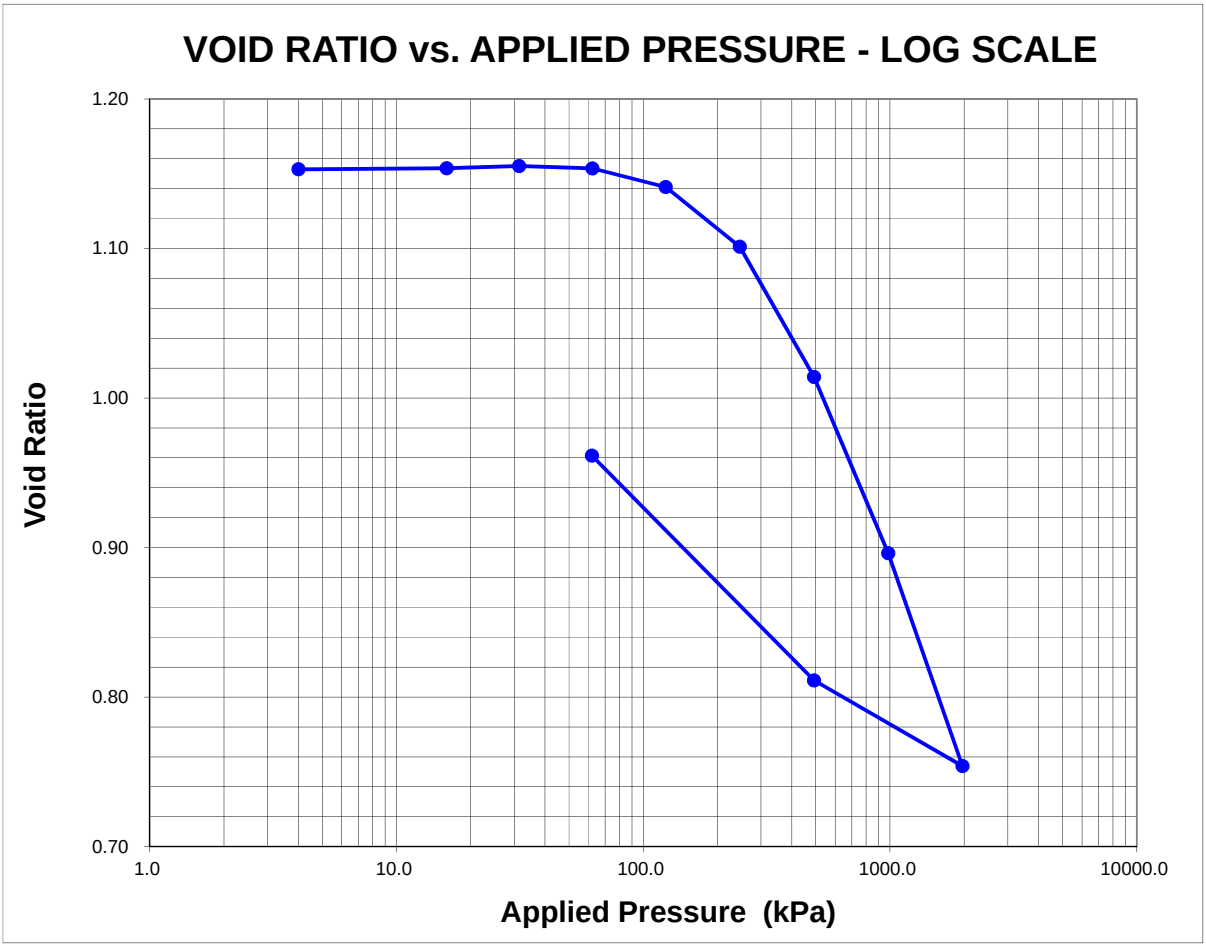
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Babbage Geotechnical Laboratory	Job No:	Reg. No:	Page	of	Version No:	3
	63578#L	2819	3	5	Issue Date:	July 2022
	PROJECT:				Auth. By:	WEC
	ASP					

ONE DIMENSIONAL CONSOLIDATION

Test Method: NZS4402:1986:Test 2.1 - Water Content	Tested By:	WEC	April 2023
Test Method: NZS4402:1986:Test 7.1 - Consolidation	Compiled By:	WEC	27-Apr-23
	Checked By:	JF	27-Apr-23

Borehole No: MBH02 **Sample No:** MBH02-04 **Depth:** 7.50 - 8.00m



SAMPLE HISTORY & PREPARATION

undisturbed / ~~disturbed~~

Sample from 54mm diameter push-tube

Extruded from 54mm diameter tube in small increments & trimmed into consol ring. Both sides of ring then trimmed flat with a scalpel & straight edge.

TEST DETAILS

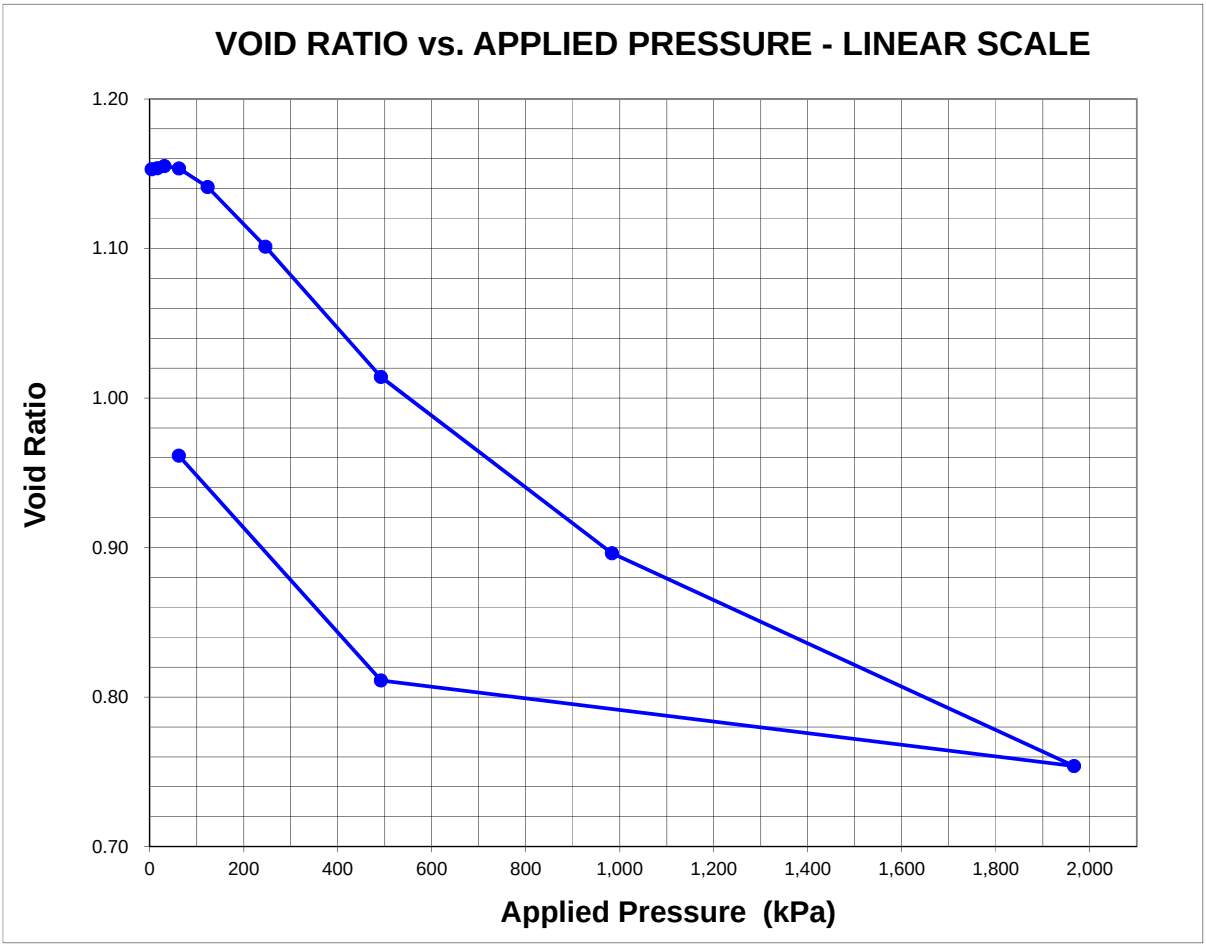
Consol machine number:	3		Surface area of sample top:	1995	mm^2
Consol ring number:	3d		Sample mass:	70.787	g
Sample diameter:	50.40	mm	Initial bulk density:	1.78	t/m^3
Sample height:	19.97	mm	Assumed solid density of soil particles:	2.65	t/m^3

Babbage Geotechnical Laboratory	Job No:	Reg. No:	Page	of	Version No:	3
	63578#L	2819	4	5	Issue Date:	July 2022
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	ASP					

ONE DIMENSIONAL CONSOLIDATION

Test Method: NZS4402:1986:Test 2.1 - Water Content	Tested By:	WEC	April 2023
Test Method: NZS4402:1986:Test 7.1 - Consolidation	Compiled By:	WEC	27-Apr-23
	Checked By:	JF	27-Apr-23

Borehole No: MBH02 **Sample No:** MBH02-04 **Depth:** 7.50 - 8.00m



PHOTOGRAPH OF THE SAMPLE PRIOR TO TESTING



Babbage Geotechnical Laboratory	Job No:	Reg. No:	Page	of	Version No:	3
	63578#L	2819	5	5	Issue Date:	July 2022
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ONE DIMENSIONAL CONSOLIDATION

Test Method: NZS4402:1986:Test 2.1 - Water Content	Tested By:	WEC	April 2023
Test Method: NZS4402:1986:Test 7.1 - Consolidation	Compiled By:	WEC	27-Apr-23
	Checked By:	JF	27-Apr-23

Borehole No: MBH02 **Sample No:** MBH02-04 **Depth:** 7.50 - 8.00m

Applied Pressure	Incremental Deflection	Sample Height	Compression Ratio	Height of Voids	Void Ratio	Coefficient of Volume Compressibility m_v	Coefficient of Consolidation - c_v (sqrt time)
kPa	mm	mm		mm	e	m^2/MN	m^2/year
4.0	0.000	19.970	1.000	10.694	1.153		
16.0	-0.006	19.976	1.000	10.701	1.154	sample swelled	
31.4	-0.014	19.991	1.001	10.715	1.155	sample swelled	
62.2	0.015	19.975	1.000	10.700	1.154	0.025	37
123.4	0.116	19.860	0.994	10.584	1.141	0.095	11
246.3	0.370	19.490	0.976	10.214	1.101	0.15	2.2
492.1	0.808	18.682	0.935	9.406	1.014	0.17	0.64
983.6	1.094	17.588	0.881	8.312	0.896	0.12	0.58
1966.7	1.320	16.268	0.815	6.992	0.754	0.076	0.54
492.1	-0.531	16.799	0.841	7.524	0.811	BACKLOAD 1	
62.0	-1.394	18.194	0.911	8.918	0.961	BACKLOAD 2	

Coefficient of Secondary Compression - C_{sec}	
Applied Pressure	C_{sec}

Coefficient of Permeability - k	
Applied Pressure	k (m/s)

	INITIAL	FINAL
Mass of dry sample (g)	49.04	49.04
Height of sample (mm)	19.970	16.268 (after consolidation) 18.194 (after rebound)
Water Content (%)	44.3	38.1
Dry Density (t/m^3)	1.23	1.51
Height of soil particles (mm)	9.276	9.276
Void Ratio	1.153	0.754 (after consolidation) 0.961 (after rebound)
Degree of saturation (%)	-	-

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Please reply to: W.E. Campton

INITIA LTD.
PO Box 47647,
Ponsonby,
Auckland 1144

Attention: **QUIN SORENSEN**

Job Number: 63578#L
BGL Registration Number: 2819
Checked by: JF

11th May 2023

ONE DIMENSIONAL CONSOLIDATION TESTING

Dear Sir,

Re: ASP
Your Reference: P-001537
Report Number: 63578#L/Consol ASP MBH03 1.50 – 2.00m

Borehole No: MBH03 Sample No: MBH03-02 Depth: 1.50 – 2.00m

The following report presents the results of one dimensional consolidation testing at BGL of a 54mm diameter undisturbed push-tube soil sample delivered to this laboratory on the 14th of April 2023. Our instructions were to carry out a one dimensional consolidation test using cycle times that would give just the $\sqrt{T_{90}}$ values, and using a standard pressure sequence.

The push-tube sample was tested in accordance with the following standards:

Water Content:	NZS4402:1986:Test 2.1
One Dimensional Consolidation:	NZS4402:1986:Test 7.1

Please note that consolidation cycles were of a variable time duration, and hence is a departure from the test standard which states that the cycle time period for the consolidation loads after the initial cycle should be of approximately the same length. Subsequent load cycles were taken to at least the time of the previous cycle.

The sample was extruded from the tube in small increments & trimmed into the consolidation ring, until the sample protruded from both sides of the ring. A wire was then used to cut the sample from the soil remaining in the tube, and a scalpel and straight edge were used to trim the sample flat in the ring.

These test results only relate to the sample tested. The values of m_v shown on the table have been calculated for each pressure increment, using void ratio difference for that increment. Note that a solid density value of 2.65t/m^3 was assumed for this test, and is not part of the IANZ endorsement for this report. This test was carried out in a laboratory in which the temperature is controlled to be kept within the specification of the test standard.

As per the reporting requirements of NZS4402: 1986: Test 2.1: water content is reported to two significant figures for values below 10%, and to three significant figures for values of 10% or greater. As per the reporting requirements of NZS4402: 1986: Test 7.1: one dimensional consolidation, the coefficients of consolidation (c_v's), and coefficients of volume compressibility (m_v's) are reported to two significant figures.

The "Void Ratio vs. Applied Pressure – Linear Scale" plot presented on page 4 is included for your information, and is based on the paper "Soil stiffness measured in oedometer tests" by L. Wesley & M. Pender, Proc. 18th NZGS Geotechnical Symposium on Soil-Structure Interaction, 2008. Please note that the presentation of the data on a linear scale is not part of the test standard, hence page 4 does not form part of the IANZ endorsement for this report.

Sample Description (***not part of BGL IANZ Accreditation***)

MBH03 / MBH03-02 / 1.50 – 2.00m:

CLAY, stiff, highly plastic, organic stained light brown & light grey with dark brown & black streaks, slightly moist.

Each test result is data obtained at a specific test location. The nature and continuity of subsoil conditions away from the test area could vary from the data recovered during this testing, therefore the test results relate only to the sample as-received, and relate only to the sample under test.

Thank you for the opportunity to carry out this testing. If you have any queries regarding the content of this report please contact the person authorising this report below at your convenience.

Yours faithfully,

Wayne Campton
Key Technical Person
Laboratory Manager
Babbage Geotechnical Laboratory

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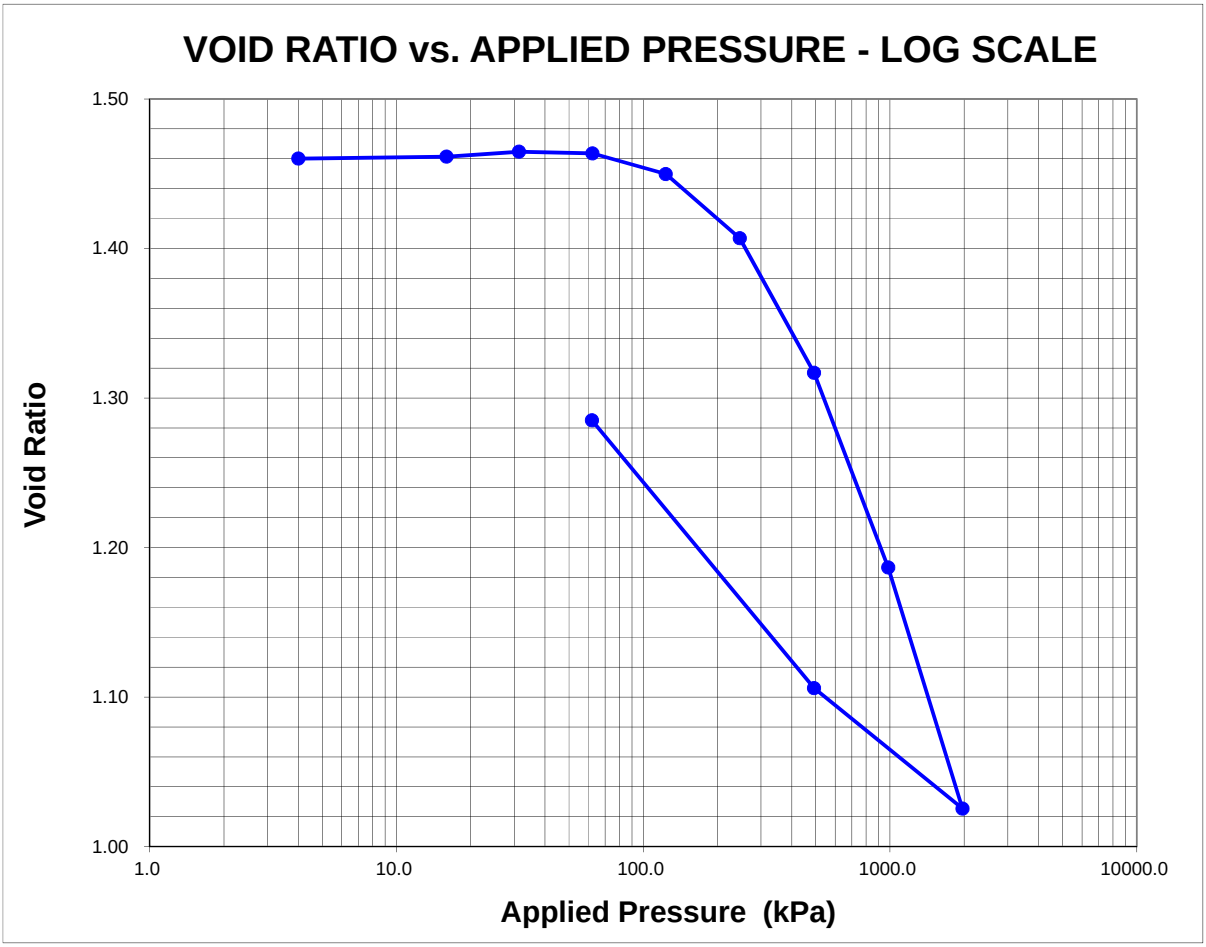
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	63578#L	2819	3	5	Issue Date:	July 2022
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ONE DIMENSIONAL CONSOLIDATION

Test Method: NZS4402:1986:Test 2.1 - Water Content	Tested By:	WEC	May 2023
Test Method: NZS4402:1986:Test 7.1 - Consolidation	Compiled By:	WEC	11-May-23
	Checked By:	JF	11-May-23

Borehole No: MBH03 **Sample No:** MBH03-02 **Depth:** 1.50 - 2.00m



SAMPLE HISTORY & PREPARATION

undisturbed / ~~disturbed~~

Sample from 54mm diameter push-tube

Extruded from 54mm diameter tube in small increments & trimmed into consol ring. Both sides of ring then trimmed flat with a scalpel & straight edge.

TEST DETAILS

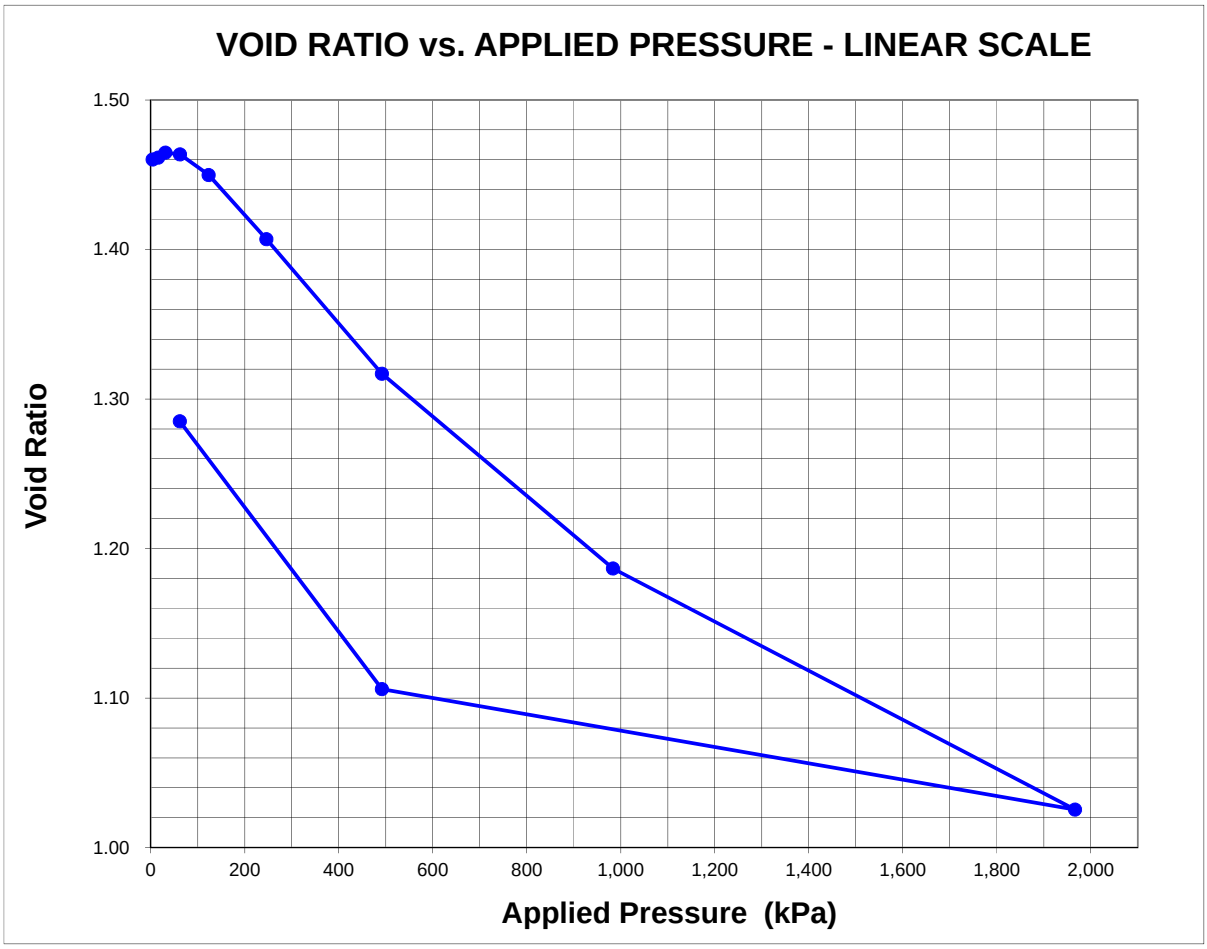
Consol machine number:	3		Surface area of sample top:	1995	mm^2
Consol ring number:	3a		Sample mass:	66.746	g
Sample diameter:	50.40	mm	Initial bulk density:	1.67	t/m^3
Sample height:	19.99	mm	Assumed solid density of soil particles:	2.65	t/m^3

Babbage Geotechnical Laboratory	Job No:	Reg. No:	Page	of	Version No:	3
	63578#L	2819	4	5	Issue Date:	July 2022
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	ASP					

ONE DIMENSIONAL CONSOLIDATION

Test Method: NZS4402:1986:Test 2.1 - Water Content	Tested By:	WEC	May 2023
Test Method: NZS4402:1986:Test 7.1 - Consolidation	Compiled By:	WEC	11-May-23
	Checked By:	JF	11-May-23

Borehole No: MBH03 **Sample No:** MBH03-02 **Depth:** 1.50 - 2.00m



PHOTOGRAPH OF THE SAMPLE PRIOR TO TESTING



Babbage Geotechnical Laboratory	Job No:	Reg. No:	Page	of	Version No:	3
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	ASP					

ONE DIMENSIONAL CONSOLIDATION

Test Method: NZS4402:1986:Test 2.1 - Water Content	Tested By:	WEC	May 2023
Test Method: NZS4402:1986:Test 7.1 - Consolidation	Compiled By:	WEC	11-May-23
	Checked By:	JF	11-May-23

Borehole No: **MBH03** Sample No: **MBH03-02** Depth: **1.50 - 2.00m**

Applied Pressure	Incremental Deflection	Sample Height	Compression Ratio	Height of Voids	Void Ratio	Coefficient of Volume Compressibility m_v	Coefficient of Consolidation - c_v (sqrt time)
kPa	mm	mm		mm	e	m^2/MN	m^2/year
4.0	0.000	19.990	1.000	11.864	1.460		
16.0	-0.011	20.001	1.001	11.875	1.461	sample swelled	
31.4	-0.027	20.027	1.002	11.902	1.465	sample swelled	
62.2	0.009	20.019	1.001	11.893	1.464	0.014	26
123.4	0.112	19.906	0.996	11.781	1.450	0.092	11
246.3	0.349	19.557	0.978	11.432	1.407	0.14	3.8
492.1	0.731	18.826	0.942	10.700	1.317	0.15	1.4
983.6	1.058	17.768	0.889	9.642	1.187	0.11	1.2
1966.7	1.310	16.458	0.823	8.332	1.025	0.075	0.91
492.1	-0.654	17.112	0.856	8.987	1.106	BACKLOAD 1	
62.0	-1.456	18.568	0.929	10.442	1.285	BACKLOAD 2	

Coefficient of Secondary Compression - C_{sec}	
Applied Pressure	C_{sec}

Coefficient of Permeability - k	
Applied Pressure	k (m/s)

	INITIAL	FINAL
Mass of dry sample (g)	42.96	42.96
Height of sample (mm)	19.990	16.458 (after consolidation) 18.568 (after rebound)
Water Content (%)	55.4	50.8
Dry Density (t/m^3)	1.08	1.31
Height of soil particles (mm)	8.126	8.126
Void Ratio	1.460	1.025 (after consolidation) 1.285 (after rebound)
Degree of saturation (%)	-	-

Babbage Geotechnical Laboratory
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Please reply to: W.E. Campton

INITIA LTD.
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Auckland 1144

Attention: **QUIN SORENSEN**

Job Number: 63578#L
BGL Registration Number: 2819
Checked by: JF

12th May 2023

ONE DIMENSIONAL CONSOLIDATION TESTING

Dear Sir,

Re: ASP
Your Reference: P-001537
Report Number: 63578#L/Consol ASP MBH04 4.50 – 5.00m

Borehole No: MBH04 Sample No: MBH04-01 Depth: 4.50 – 5.00m

The following report presents the results of one dimensional consolidation testing at BGL of a 60mm diameter undisturbed push-tube soil sample delivered to this laboratory on the 14th of April 2023. Our instructions were to carry out a one dimensional consolidation test using cycle times that would give just the $\sqrt{T_{90}}$ values, and using a standard pressure sequence.

The push-tube sample was tested in accordance with the following standards:

Water Content:	NZS4402:1986:Test 2.1
One Dimensional Consolidation:	NZS4402:1986:Test 7.1

Please note that consolidation cycles were of a variable time duration, and hence is a departure from the test standard which states that the cycle time period for the consolidation loads after the initial cycle should be of approximately the same length. Subsequent load cycles were taken to at least the time of the previous cycle.

The sample was extruded from the tube in small increments & trimmed into the consolidation ring, until the sample protruded from both sides of the ring. A wire was then used to cut the sample from the soil remaining in the tube, and a scalpel and straight edge were used to trim the sample flat in the ring.

These test results only relate to the sample tested. The values of m_v shown on the table have been calculated for each pressure increment, using void ratio difference for that increment. Note that a solid density value of 2.65t/m^3 was assumed for this test, and is not part of the IANZ endorsement for this report. This test was carried out in a laboratory in which the temperature is controlled to be kept within the specification of the test standard.

As per the reporting requirements of NZS4402: 1986: Test 2.1: water content is reported to two significant figures for values below 10%, and to three significant figures for values of 10% or greater. As per the reporting requirements of NZS4402: 1986: Test 7.1: one dimensional consolidation, the coefficients of consolidation (c_v's), and coefficients of volume compressibility (m_v's) are reported to two significant figures.

The "Void Ratio vs. Applied Pressure – Linear Scale" plot presented on page 4 is included for your information, and is based on the paper "Soil stiffness measured in oedometer tests" by L. Wesley & M. Pender, Proc. 18th NZGS Geotechnical Symposium on Soil-Structure Interaction, 2008. Please note that the presentation of the data on a linear scale is not part of the test standard, hence page 4 does not form part of the IANZ endorsement for this report.

Sample Description (***not part of BGL IANZ Accreditation***)

MBH04 / MBH04-01 / 4.50 – 5.00m:

CLAY, firm, highly plastic, light greenish grey with occasional black organics.

Each test result is data obtained at a specific test location. The nature and continuity of subsoil conditions away from the test area could vary from the data recovered during this testing, therefore the test results relate only to the sample as-received, and relate only to the sample under test.

Thank you for the opportunity to carry out this testing. If you have any queries regarding the content of this report please contact the person authorising this report below at your convenience.

Yours faithfully,

Wayne Campton
Key Technical Person
Laboratory Manager
Babbage Geotechnical Laboratory

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№ 126

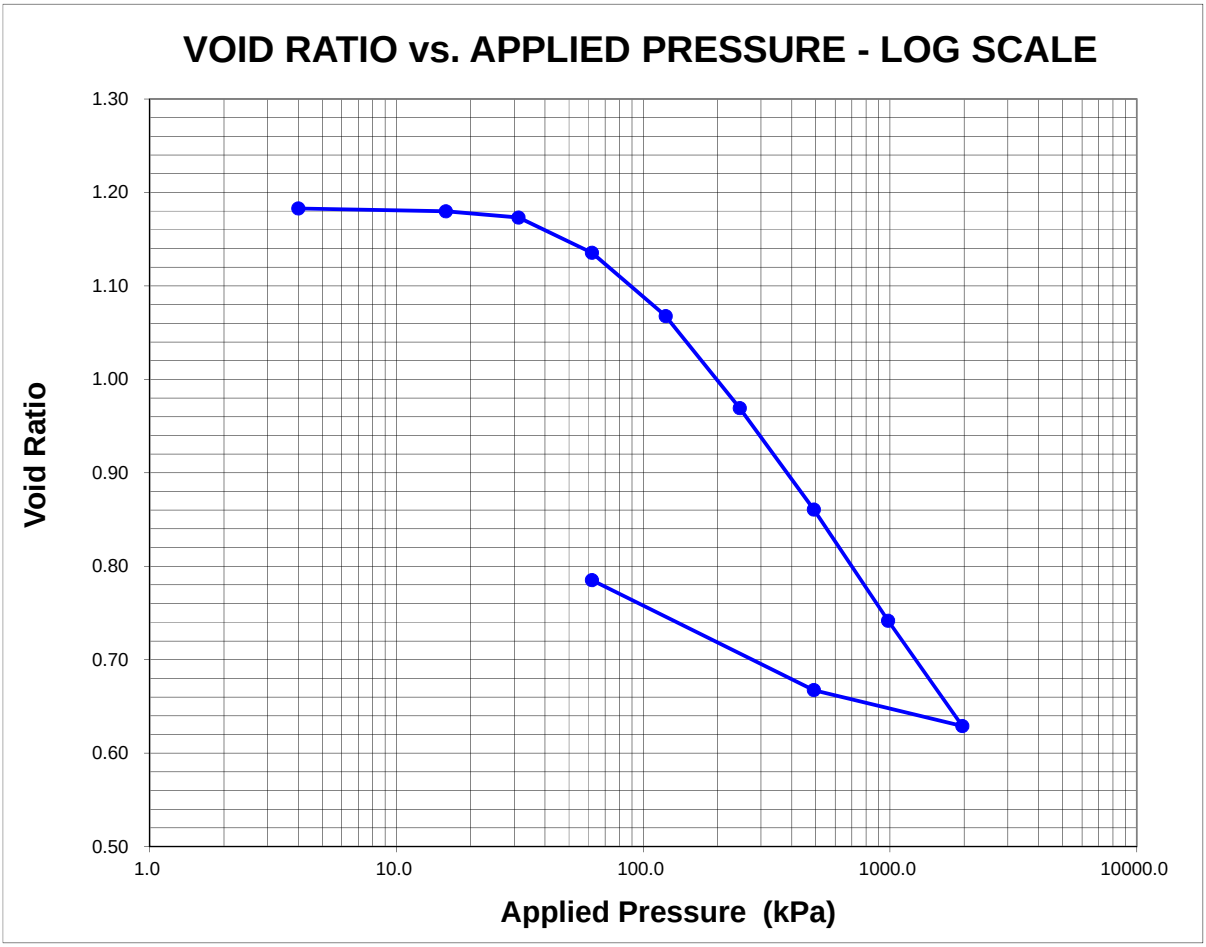
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BGL Babbage Geotechnical Laboratory	Job No:	Reg. No:	Page	of	Version No:	3
	63578#L	2819	3	5	Issue Date:	July 2022
	PROJECT:				Auth. By:	WEC
	ASP					

ONE DIMENSIONAL CONSOLIDATION

Test Method: NZS4402:1986:Test 2.1 - Water Content	Tested By:	WEC	May 2023
Test Method: NZS4402:1986:Test 7.1 - Consolidation	Compiled By:	WEC	12-May-23
	Checked By:	JF	12-May-23

Borehole No: MBH04 **Sample No:** MBH04-01 **Depth:** 4.50 - 5.00m



SAMPLE HISTORY & PREPARATION

undisturbed / ~~disturbed~~

Sample from 60mm diameter push-tube

Extruded from 60mm diameter tube in small increments & trimmed into consol ring. Both sides of ring then trimmed flat with a scalpel & straight edge.

TEST DETAILS

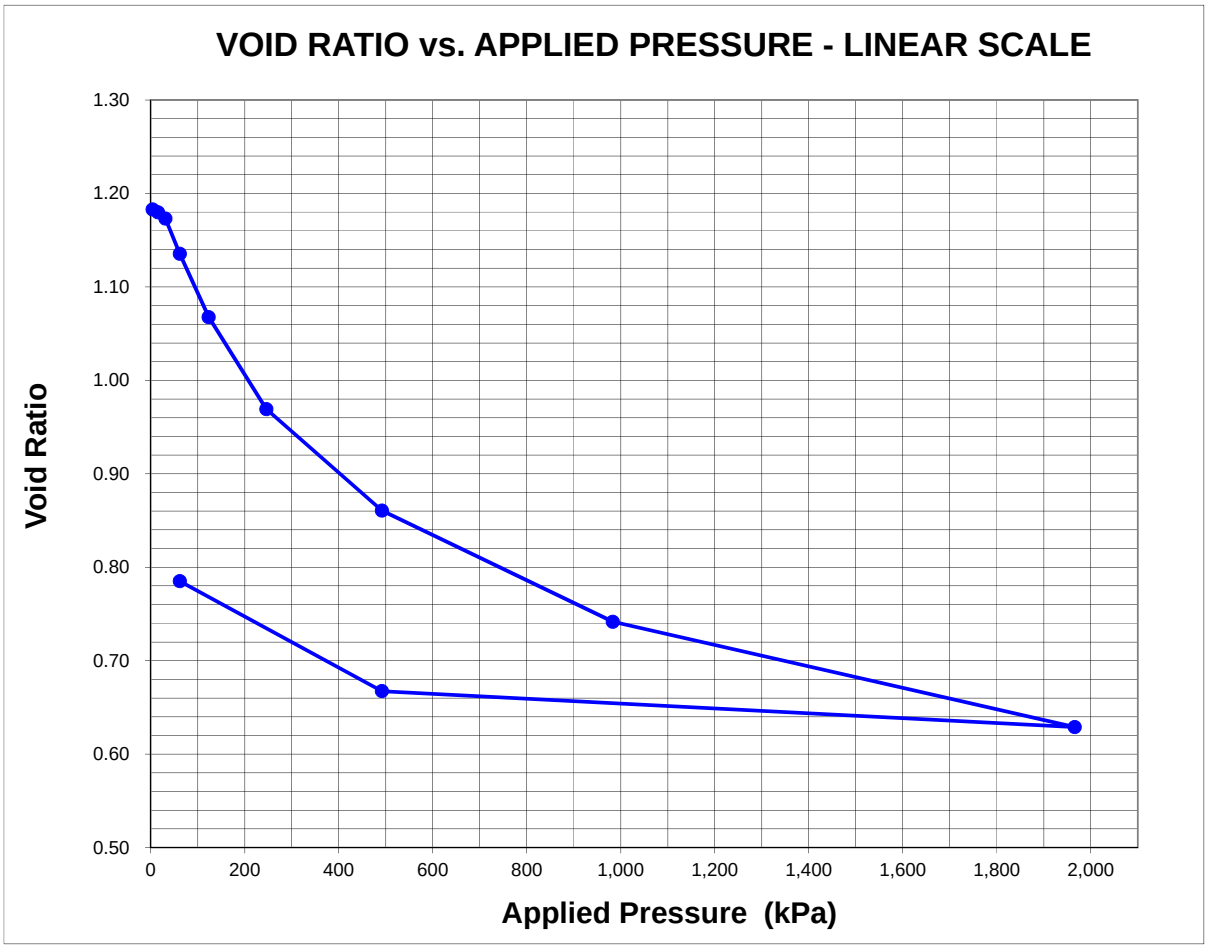
Consol machine number:	4		Surface area of sample top:	1996	mm^2
Consol ring number:	4d		Sample mass:	70.670	g
Sample diameter:	50.41	mm	Initial bulk density:	1.76	t/m^3
Sample height:	20.09	mm	Assumed solid density of soil particles:	2.65	t/m^3

Babbage Geotechnical Laboratory	Job No:	Reg. No:	Page	of	Version No:	3
	63578#L	2819	4	5	Issue Date:	July 2022
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	ASP					

ONE DIMENSIONAL CONSOLIDATION

Test Method: NZS4402:1986:Test 2.1 - Water Content	Tested By:	WEC	May 2023
Test Method: NZS4402:1986:Test 7.1 - Consolidation	Compiled By:	WEC	12-May-23
	Checked By:	JF	12-May-23

Borehole No: MBH04 **Sample No:** MBH04-01 **Depth:** 4.50 - 5.00m



PHOTOGRAPH OF THE SAMPLE PRIOR TO TESTING



Babbage Geotechnical Laboratory	Job No:	Reg. No:	Page	of	Version No:	3
	63578#L	2819	5	5	Issue Date:	July 2022
	PROJECT:				Auth. By:	WEC
	ASP					

ONE DIMENSIONAL CONSOLIDATION

Test Method: NZS4402:1986:Test 2.1 - Water Content	Tested By:	WEC	May 2023
Test Method: NZS4402:1986:Test 7.1 - Consolidation	Compiled By:	WEC	12-May-23
	Checked By:	JF	12-May-23

Borehole No: MBH04 **Sample No:** MBH04-01 **Depth:** 4.50 - 5.00m

Applied Pressure	Incremental Deflection	Sample Height	Compression Ratio	Height of Voids	Void Ratio	Coefficient of Volume Compressibility m_v	Coefficient of Consolidation - c_v (sqrt time)
kPa	mm	mm		mm	e	m^2/MN	m^2/year
4.0	0.000	20.090	1.000	10.886	1.183		
15.9	0.028	20.062	0.999	10.859	1.180	sample swelled after initial consolidation	
31.2	0.061	20.001	0.996	10.797	1.173	0.20	12
62.0	0.347	19.654	0.978	10.450	1.135	0.57	0.64
123.4	0.624	19.030	0.947	9.826	1.068	0.52	0.37
246.2	0.907	18.123	0.902	8.920	0.969	0.39	0.42
491.9	0.999	17.124	0.852	7.921	0.861	0.22	0.39
983.2	1.095	16.030	0.798	6.826	0.742	0.13	0.37
1966.0	1.037	14.992	0.746	5.789	0.629	0.066	0.32
491.9	-0.354	15.346	0.764	6.143	0.667	BACKLOAD 1	
62.0	-1.083	16.429	0.818	7.225	0.785	BACKLOAD 2	

Coefficient of Secondary Compression - C_{sec}	
Applied Pressure	C_{sec}

Coefficient of Permeability - k	
Applied Pressure	k (m/s)

	INITIAL	FINAL
Mass of dry sample (g)	48.68	48.68
Height of sample (mm)	20.090	14.992 (after consolidation) 16.429 (after rebound)
Water Content (%)	45.2	31.2
Dry Density (t/m^3)	1.21	1.63
Height of soil particles (mm)	9.204	9.204
Void Ratio	1.183	0.629 (after consolidation) 0.785 (after rebound)
Degree of saturation (%)	-	-

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Please reply to: W.E. Campton

INITIA LTD.
PO Box 47647,
Ponsonby,
Auckland 1144

Attention: **QUIN SORENSEN**

Job Number: 63578#L
BGL Registration Number: 2819
Checked by: JF

15th May 2023

ONE DIMENSIONAL CONSOLIDATION TESTING

Dear Sir,

Re: ASP
Your Reference: P-001537
Report Number: 63578#L/Consol ASP MBH05 3.00 – 3.50m

Borehole No: MBH05 Sample No: MBH05-02 Depth: 3.00 – 3.50m

The following report presents the results of one dimensional consolidation testing at BGL of a 54mm diameter undisturbed push-tube soil sample delivered to this laboratory on the 14th of April 2023. Our instructions were to carry out a one dimensional consolidation test using cycle times that would give just the $\sqrt{T_{90}}$ values, and using a standard pressure sequence.

The push-tube sample was tested in accordance with the following standards:

Water Content:	NZS4402:1986:Test 2.1
One Dimensional Consolidation:	NZS4402:1986:Test 7.1

Please note that consolidation cycles were of a variable time duration, and hence is a departure from the test standard which states that the cycle time period for the consolidation loads after the initial cycle should be of approximately the same length. Subsequent load cycles were taken to at least the time of the previous cycle.

The sample was extruded from the tube in small increments & trimmed into the consolidation ring, until the sample protruded from both sides of the ring. A wire was then used to cut the sample from the soil remaining in the tube, and a scalpel and straight edge were used to trim the sample flat in the ring.

These test results only relate to the sample tested. The values of m_v shown on the table have been calculated for each pressure increment, using void ratio difference for that increment. Note that a solid density value of 2.65t/m^3 was assumed for this test, and is not part of the IANZ endorsement for this report. This test was carried out in a laboratory in which the temperature is controlled to be kept within the specification of the test standard.

As per the reporting requirements of NZS4402: 1986: Test 2.1: water content is reported to two significant figures for values below 10%, and to three significant figures for values of 10% or greater. As per the reporting requirements of NZS4402: 1986: Test 7.1: one dimensional consolidation, the coefficients of consolidation (c_v's), and coefficients of volume compressibility (m_v's) are reported to two significant figures.

The "Void Ratio vs. Applied Pressure – Linear Scale" plot presented on page 4 is included for your information, and is based on the paper "Soil stiffness measured in oedometer tests" by L. Wesley & M. Pender, Proc. 18th NZGS Geotechnical Symposium on Soil-Structure Interaction, 2008. Please note that the presentation of the data on a linear scale is not part of the test standard, hence page 4 does not form part of the IANZ endorsement for this report.

Sample Description (***not part of BGL IANZ Accreditation***)

MBH05 / MBH05-02 / 3.00 – 3.50m:

ORGANIC CLAY, soft to firm, highly plastic, greyish brown with black organic inclusions, very moist.

Each test result is data obtained at a specific test location. The nature and continuity of subsoil conditions away from the test area could vary from the data recovered during this testing, therefore the test results relate only to the sample as-received, and relate only to the sample under test.

Thank you for the opportunity to carry out this testing. If you have any queries regarding the content of this report please contact the person authorising this report below at your convenience.

Yours faithfully,

Wayne Campton
Key Technical Person
Laboratory Manager
Babbage Geotechnical Laboratory

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№ 126

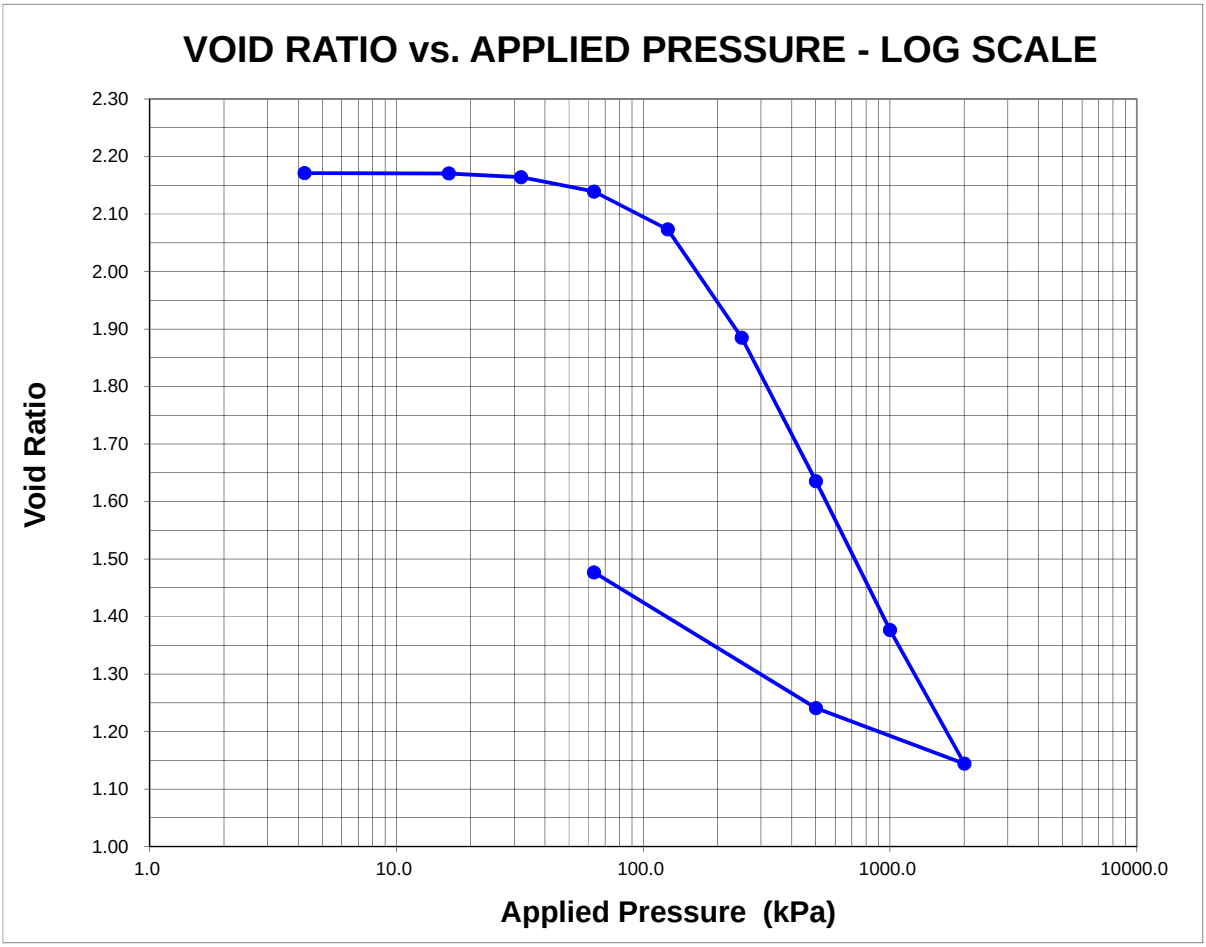
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	63578#L	2819	3	5	Issue Date:	July 2022
	PROJECT:				Auth. By:	WEC
	ASP					

ONE DIMENSIONAL CONSOLIDATION

Test Method: NZS4402:1986:Test 2.1 - Water Content	Tested By:	WEC	May 2023
Test Method: NZS4402:1986:Test 7.1 - Consolidation	Compiled By:	WEC	15-May-23
	Checked By:	JF	15-May-23

Borehole No: MBH05 **Sample No:** MBH05-02 **Depth:** 3.00 - 3.50m



SAMPLE HISTORY & PREPARATION

undisturbed / ~~disturbed~~

Sample from 54mm diameter push-tube

Extruded from 54mm diameter tube in small increments & trimmed into consol ring. Both sides of ring then trimmed flat with a scalpel & straight edge.

TEST DETAILS

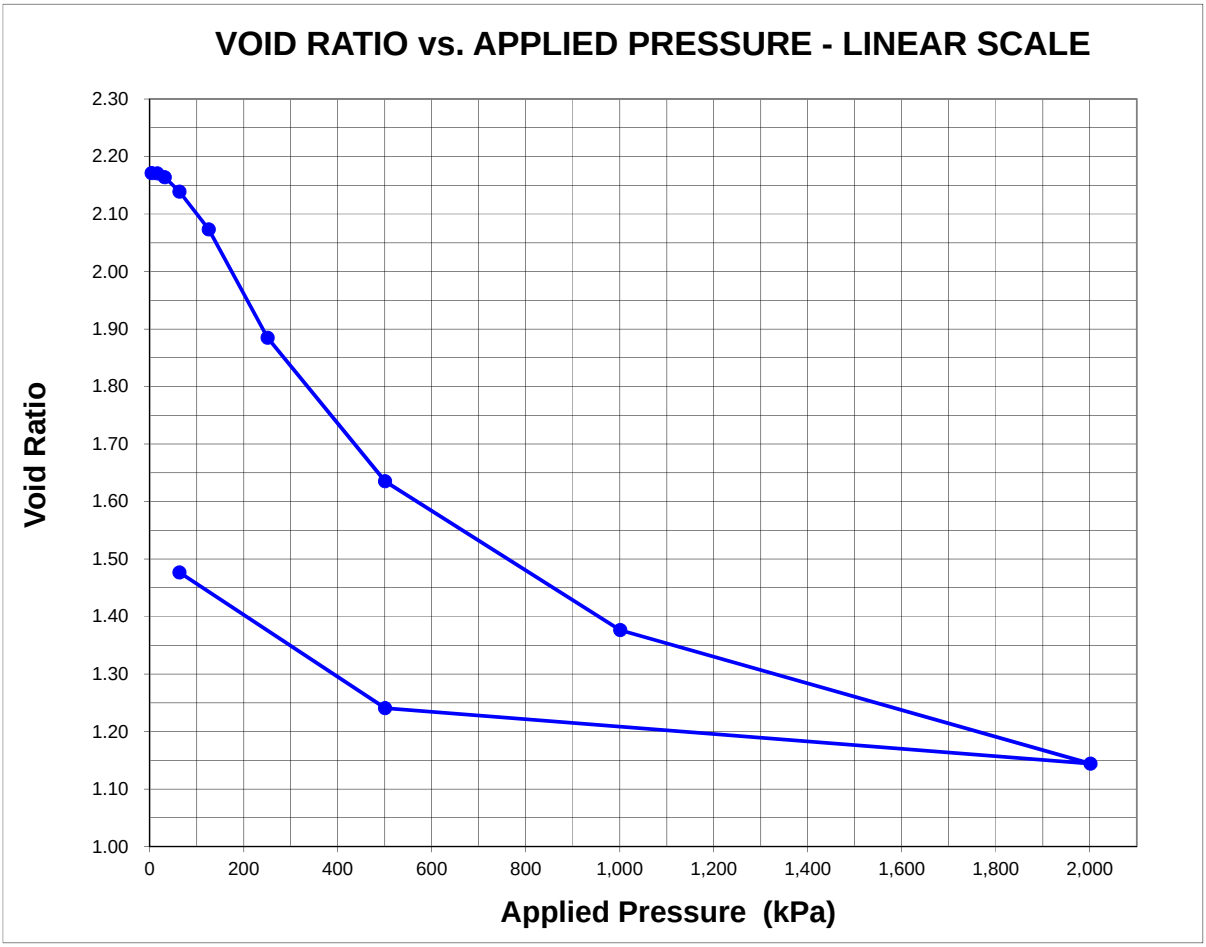
Consol machine number:	1		Surface area of sample top:	1960	mm^2
Consol ring number:	1A		Sample mass:	63.404	g
Sample diameter:	49.96	mm	Initial bulk density:	1.53	t/m^3
Sample height:	21.16	mm	Assumed solid density of soil particles:	2.65	t/m^3

Babbage Geotechnical Laboratory	Job No:	Reg. No:	Page	of	Version No:	3
	63578#L	2819	4	5	Issue Date:	July 2022
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	ASP					

ONE DIMENSIONAL CONSOLIDATION

Test Method: NZS4402:1986:Test 2.1 - Water Content	Tested By:	WEC	May 2023
Test Method: NZS4402:1986:Test 7.1 - Consolidation	Compiled By:	WEC	15-May-23
	Checked By:	JF	15-May-23

Borehole No: MBH05 **Sample No:** MBH05-02 **Depth:** 3.00 - 3.50m



PHOTOGRAPH OF THE SAMPLE PRIOR TO TESTING



BGL Babbage Geotechnical Laboratory	Job No:	Reg. No:	Page	of	Version No:	3
	63578#L	2819	5	5	Issue Date:	July 2022
	PROJECT:				Auth. By:	WEC
	ASP					

ONE DIMENSIONAL CONSOLIDATION

Test Method: NZS4402:1986:Test 2.1 - Water Content	Tested By:	WEC	May 2023
Test Method: NZS4402:1986:Test 7.1 - Consolidation	Compiled By:	WEC	15-May-23
	Checked By:	JF	15-May-23

Borehole No: MBH05 **Sample No:** MBH05-02 **Depth:** 3.00 - 3.50m

Applied Pressure	Incremental Deflection	Sample Height	Compression Ratio	Height of Voids	Void Ratio	Coefficient of Volume Compressibility m_v	Coefficient of Consolidation - c_v (sqrt time)
kPa	mm	mm		mm	e	m^2/MN	m^2/year
4.2	0.000	21.160	1.000	14.487	2.171		
16.3	0.003	21.157	1.000	14.484	2.171	sample swelled after initial consolidation	
32.0	0.044	21.113	0.998	14.440	2.164	0.13	32
63.2	0.167	20.946	0.990	14.273	2.139	0.25	11
125.8	0.440	20.507	0.969	13.834	2.073	0.34	1.9
250.8	1.256	19.251	0.910	12.578	1.885	0.49	0.68
501.0	1.667	17.584	0.831	10.911	1.635	0.35	0.68
1001.2	1.726	15.858	0.749	9.185	1.376	0.20	1.1
2001.7	1.550	14.308	0.676	7.635	1.144	0.098	0.86
501.0	-0.645	14.952	0.707	8.279	1.241	BACKLOAD 1	
63.2	-1.575	16.527	0.781	9.854	1.477	BACKLOAD 2	

Coefficient of Secondary Compression - C_{sec}	
Applied Pressure	C_{sec}

Coefficient of Permeability - k	
Applied Pressure	k (m/s)

	INITIAL	FINAL
Mass of dry sample (g)	34.67	34.67
Height of sample (mm)	21.160	14.308 (after consolidation) 16.527 (after rebound)
Water Content (%)	82.9	56.3
Dry Density (t/m^3)	0.84	1.24
Height of soil particles (mm)	6.673	6.673
Void Ratio	2.171	1.144 (after consolidation) 1.477 (after rebound)
Degree of saturation (%)	-	-

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Please reply to: W.E. Campton

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Attention: **QUIN SORENSEN**

Job Number: 63578#L
BGL Registration Number: 2819
Checked by: JF

16th May 2023

ONE DIMENSIONAL CONSOLIDATION TESTING

Dear Sir,

Re: ASP
Your Reference: P-001537
Report Number: 63578#L/Consol ASP MBH05 6.00 – 6.50m

Borehole No: MBH05 Sample No: MBH05-03 Depth: 6.00 – 6.50m

The following report presents the results of one dimensional consolidation testing at BGL of a 54mm diameter undisturbed push-tube soil sample delivered to this laboratory on the 14th of April 2023. Our instructions were to carry out a one dimensional consolidation test using cycle times that would give just the $\sqrt{T_{90}}$ values, and using a standard pressure sequence.

The push-tube sample was tested in accordance with the following standards:

Water Content:	NZS4402:1986:Test 2.1
One Dimensional Consolidation:	NZS4402:1986:Test 7.1

Please note that consolidation cycles were of a variable time duration, and hence is a departure from the test standard which states that the cycle time period for the consolidation loads after the initial cycle should be of approximately the same length. Subsequent load cycles were taken to at least the time of the previous cycle.

The sample was extruded from the tube in small increments & trimmed into the consolidation ring, until the sample protruded from both sides of the ring. A wire was then used to cut the sample from the soil remaining in the tube, and a scalpel and straight edge were used to trim the sample flat in the ring.

These test results only relate to the sample tested. The values of m_v shown on the table have been calculated for each pressure increment, using void ratio difference for that increment. Note that a solid density value of 2.65t/m^3 was assumed for this test, and is not part of the IANZ endorsement for this report. This test was carried out in a laboratory in which the temperature is controlled to be kept within the specification of the test standard.

As per the reporting requirements of NZS4402: 1986: Test 2.1: water content is reported to two significant figures for values below 10%, and to three significant figures for values of 10% or greater. As per the reporting requirements of NZS4402: 1986: Test 7.1: one dimensional consolidation, the coefficients of consolidation (c_v's), and coefficients of volume compressibility (m_v's) are reported to two significant figures.

The "Void Ratio vs. Applied Pressure – Linear Scale" plot presented on page 4 is included for your information, and is based on the paper "Soil stiffness measured in oedometer tests" by L. Wesley & M. Pender, Proc. 18th NZGS Geotechnical Symposium on Soil-Structure Interaction, 2008. Please note that the presentation of the data on a linear scale is not part of the test standard, hence page 4 does not form part of the IANZ endorsement for this report.

Sample Description (***not part of BGL IANZ Accreditation***)

MBH05 / MBH05-03 / 6.00 – 6.50m:

CLAY with organic inclusions, firm, highly plastic, mottled grey, brown & black, very moist.

Each test result is data obtained at a specific test location. The nature and continuity of subsoil conditions away from the test area could vary from the data recovered during this testing, therefore the test results relate only to the sample as-received, and relate only to the sample under test.

Thank you for the opportunity to carry out this testing. If you have any queries regarding the content of this report please contact the person authorising this report below at your convenience.

Yours faithfully,

Wayne Campton
Key Technical Person
Laboratory Manager
Babbage Geotechnical Laboratory

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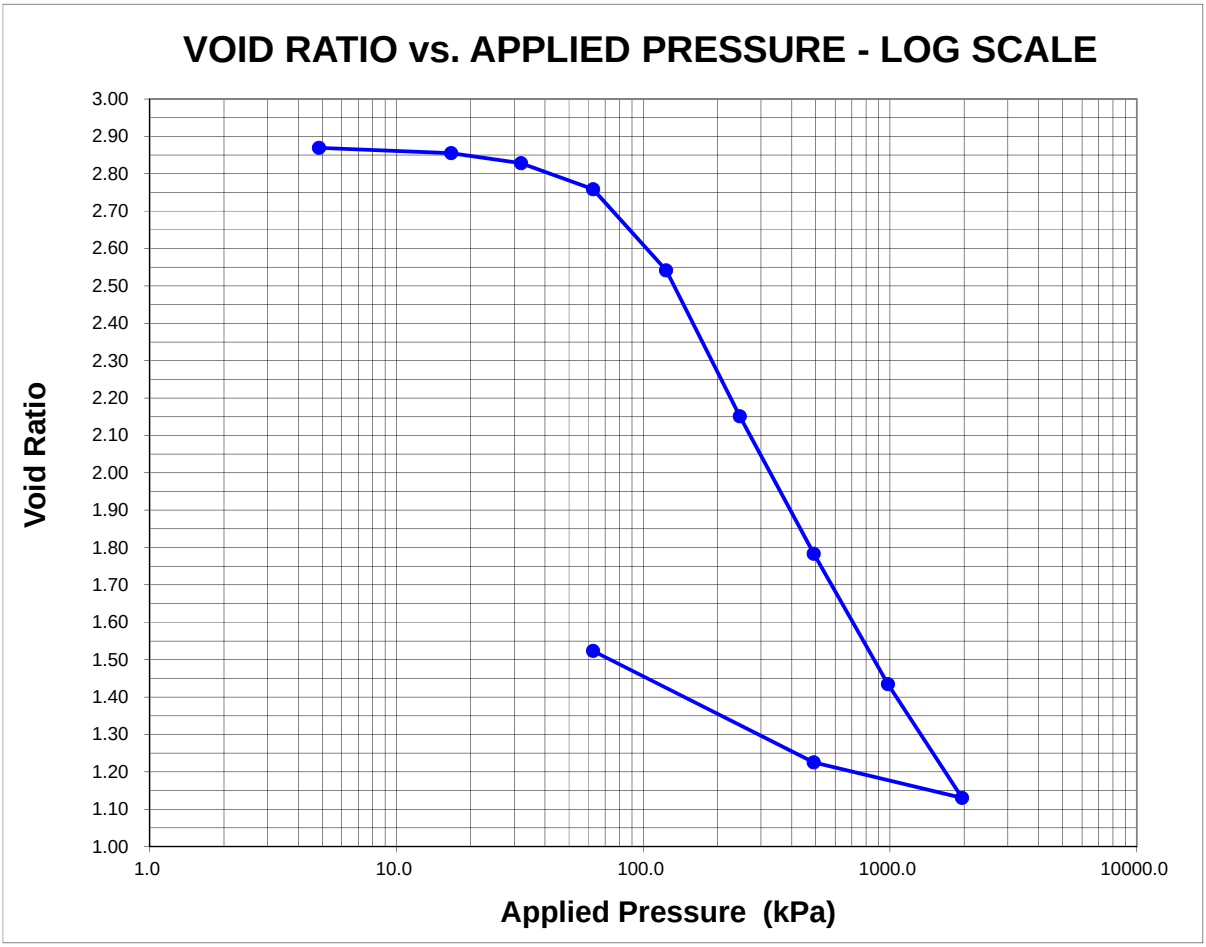
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	63578#L	2819	3	5	Issue Date:	July 2022
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	ASP					

ONE DIMENSIONAL CONSOLIDATION

Test Method: NZS4402:1986:Test 2.1 - Water Content	Tested By:	WEC	May 2023
Test Method: NZS4402:1986:Test 7.1 - Consolidation	Compiled By:	WEC	16-May-23
	Checked By:	JF	16-May-23

Borehole No: MBH05 **Sample No:** MBH05-03 **Depth:** 6.00 - 6.50m



SAMPLE HISTORY & PREPARATION

undisturbed / ~~disturbed~~

Sample from 54mm diameter push-tube

Extruded from 54mm diameter tube in small increments & trimmed into consol ring. Both sides of ring then trimmed flat with a scalpel & straight edge.

TEST DETAILS

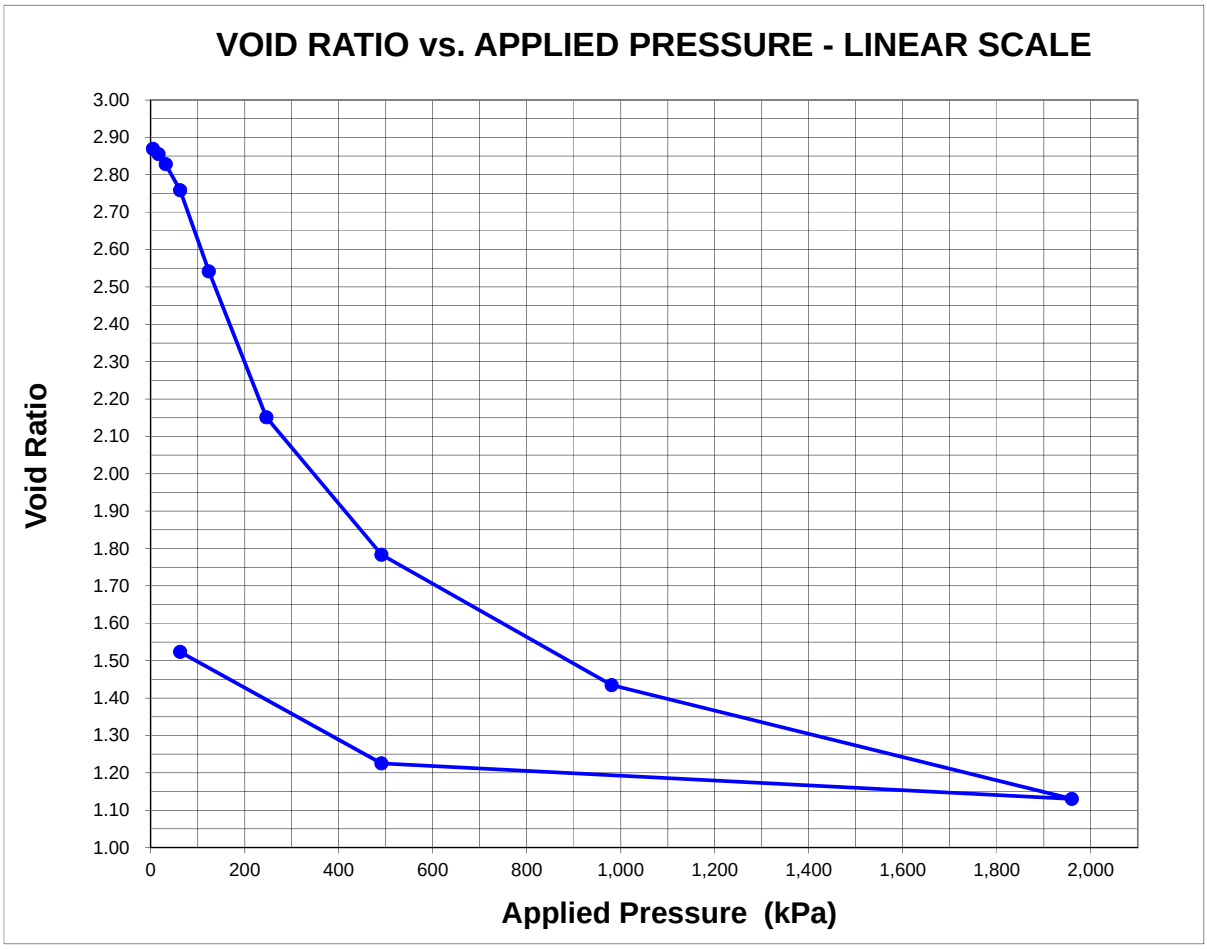
Consol machine number:	2		Surface area of sample top:	2003	mm^2
Consol ring number:	2b		Sample mass:	55.147	g
Sample diameter:	50.50	mm	Initial bulk density:	1.39	t/m^3
Sample height:	19.80	mm	Assumed solid density of soil particles:	2.65	t/m^3

BGL Babbage Geotechnical Laboratory	Job No:	Reg. No:	Page	of	Version No:	3
	63578#L	2819	4	5	Issue Date:	July 2022
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	ASP					

ONE DIMENSIONAL CONSOLIDATION

Test Method: NZS4402:1986:Test 2.1 - Water Content	Tested By:	WEC	May 2023
Test Method: NZS4402:1986:Test 7.1 - Consolidation	Compiled By:	WEC	16-May-23
	Checked By:	JF	16-May-23

Borehole No: MBH05 **Sample No:** MBH05-03 **Depth:** 6.00 - 6.50m



PHOTOGRAPH OF THE SAMPLE PRIOR TO TESTING



BGL Babbage Geotechnical Laboratory	Job No:	Reg. No:	Page	of	Version No:	3
	63578#L	2819	5	5	Issue Date:	July 2022
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	ASP					

ONE DIMENSIONAL CONSOLIDATION

Test Method: NZS4402:1986:Test 2.1 - Water Content	Tested By:	WEC	May 2023
Test Method: NZS4402:1986:Test 7.1 - Consolidation	Compiled By:	WEC	16-May-23
	Checked By:	JF	16-May-23

Borehole No: MBH05 **Sample No:** MBH05-03 **Depth:** 6.00 - 6.50m

Applied Pressure	Incremental Deflection	Sample Height	Compression Ratio	Height of Voids	Void Ratio	Coefficient of Volume Compressibility m_v	Coefficient of Consolidation - c_v (sqrt time)
kPa	mm	mm		mm	e	m^2/MN	m^2/year
4.9	0.000	19.800	1.000	14.683	2.869		
16.7	0.072	19.728	0.996	14.611	2.855	sample swelled after initial consolidation	
32.0	0.138	19.590	0.989	14.473	2.828	0.46	12
62.6	0.357	19.234	0.971	14.116	2.759	0.59	11
123.8	1.111	18.123	0.915	13.006	2.542	0.94	3.0
246.2	1.997	16.126	0.814	11.008	2.151	0.90	0.92
491.0	1.881	14.244	0.719	9.127	1.784	0.48	0.45
980.6	1.786	12.458	0.629	7.341	1.434	0.26	0.30
1959.8	1.558	10.900	0.551	5.783	1.130	0.13	0.20
491.0	-0.487	11.387	0.575	6.270	1.225		BACKLOAD 1
62.6	-1.526	12.913	0.652	7.796	1.523		BACKLOAD 2

Coefficient of Secondary Compression - C_{sec}	
Applied Pressure	C_{sec}

Coefficient of Permeability - k	
Applied Pressure	k (m/s)

	INITIAL	FINAL
Mass of dry sample (g)	27.16	27.16
Height of sample (mm)	19.800	10.900 (after consolidation) 12.913 (after rebound)
Water Content (%)	103	57.6
Dry Density (t/m^3)	0.68	1.24
Height of soil particles (mm)	5.117	5.117
Void Ratio	2.869	1.130 (after consolidation) 1.523 (after rebound)
Degree of saturation (%)	95.2	-

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Please reply to: W.E. Campton

INITIA LTD.
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Auckland 1144

Attention: **KIERAN BURSELL**

Job Number: 63578#L
BGL Registration Number: 2819
Checked by: WEC

8th September 2025

ATTERBERG LIMITS & LINEAR SHRINKAGE TESTING

Dear Kieran,

Re: AUCKLAND SURF PARK, DAIRY FLAT

Your Reference: P-001537-2
Report Number: 63578#L/AL Auckland Surf Park

The following report presents the results of Atterberg Limits & Linear Shrinkage testing at BGL of soil samples delivered to this laboratory on the 14th of August 2025. Test results are summarised below, with pages 3 & 4 showing where the samples plot on the Unified Soil Classification System (Casagrande) Chart.

Test standards used were:

Water Content:	NZS4402: 1986: Test 2.1
Liquid Limit:	NZS4402: 1986: Test 2.2
Plastic Limit:	NZS4402: 1986: Test 2.3
Plasticity Index:	NZS4402: 1986: Test 2.4
Linear Shrinkage:	NZS4402: 1986: Test 2.6

Borehole Number	Sample Number	Depth (m)	Water Content (%)	Liquid Limit	Plastic Limit	Plasticity Index	Linear Shrinkage (%)*
TP101	BULK	0.50 – 1.00	37.0	78	25	53	19
TP107	BULK	1.00 – 1.50	88.0	99	35	64	18
TP108	BULK	0.50 – 1.00	127	148	53	95	22
TP108	BULK	2.00 – 2.50	112	-	-	-	-

The amount of shrinkage of the sample as a percentage of the original sample length.

Borehole Number	Sample Number	Depth (m)	Water Content (%)	Liquid Limit	Plastic Limit	Plasticity Index	Linear Shrinkage (%)*
HA102	BAG	1.20 – 1.40	35.3	74	19	55	17
HA104	BAG	0.50 – 0.80	63.0	146	29	117	28
HA114	BAG	0.40 – 0.70	59.6	144	28	116	24
HA116	BAG	1.10 – 1.40	46.4	88 ◆	20 ◆	68 ◆	22 ◆
HA121	BAG	0.30 – 0.60	51.7	131	19	112	25
HA122	BAG	0.50 – 0.80	43.4	104	17	87	23
HA128	BAG	0.50 – 0.80	33.8	62	22	40	14
HA133	BAG	1.20 – 1.40	31.9	66 ◆	21 ◆	45 ◆	16 ◆
HA140	BAG	0.30 – 0.50	28.4	55	33	22	12

The amount of shrinkage of the sample as a percentage of the original sample length.

◆ = ***The soil fraction passing a 0.425mm sieve was used for the liquid limit, plastic limit & linear shrinkage tests.***

The whole soils were used for the water content tests (the soils were in an unknown state), and for the liquid limit, plastic limit & linear shrinkage tests without a diamond beside them. The soil fractions passing a 0.425mm sieve were used for the liquid limit, plastic limit & linear shrinkage tests with a diamond (◆) beside them. The soils were wet up and dried where required for the liquid limit, plastic limit & linear shrinkage tests.

As per the reporting requirements of NZS4402: 1986: Test 2.1: water content is reported to two significant figures for values below 10%, and to three significant figures for values of 10% or greater. Test 2.2: liquid limit, test 2.3: plastic limit, and test 2.6: linear shrinkage are reported to the nearest whole number.

Please note that the test results relate only to the samples as-received, and relate only to the samples under test. Thank you for the opportunity to carry out this testing. If you have any queries regarding the content of this report please contact the person authorising this report below at your convenience.

Yours faithfully,

Justin Franklin
Key Technical Person
Assistant Laboratory Manager
Babbage Geotechnical Laboratory

ACCREDITED
IANZ
TESTING LABORATORY
№ 126

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation. This report may not be reproduced except in full & with written approval from BGL.

BGL Babbage Geotechnical Laboratory	Job Number:	63578#L	Sheet 1 of 1	Page 3 of 4
	Registration Number:	2819		
	Report Number:	63578#L/AL Auckland Surf Park		
	Project:	AUCKLAND SURF PARK, DAIRY FLAT		

DETERMINATION OF THE LIQUID LIMIT, PLASTIC LIMIT & THE PLASTICITY INDEX

Test Methods: NZS4402: 1986: Test 2.2, Test 2.3 and Test 2.4

Tested By:	WC/JL/SG/CB	Aug / Sept 2025			
Compiled By:	JF	8/09/2025			
Checked By:	JF	8/09/2025			
Version Number:	8	Version Date:	August 2025	Authorised By:	Wayne Campton

SUMMARY OF TESTING

Borehole Number	Sample Number	Depth (m)	Liquid Limit	Plastic Limit	Plasticity Index	Soil Classification Based on USCS Chart Below
TP101	BULK	0.50 - 1.00	78	25	53	CH
TP107	BULK	1.00 - 1.50	99	35	64	OH
TP108	BULK	0.50 - 1.00	148	53	95	OH
HA102	BAG	1.20 - 1.40	74	19	55	CH
HA104	BAG	0.50 - 0.80	146	29	117	CH
HA114	BAG	0.40 - 0.70	144	28	116	CH

The chart below & soil classification terminology is taken from ASTM D2487-17 (Reapproved 2025) "Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)", February 2025, & is based on the classification scheme developed by A. Casagrande in the 1940's (Casagrande, A., 1948: Classification and identification of soil. Transactions of the American Society of Civil Engineers, v. 113, p. 901-930). The chart below & the soil classification given in the table above are included for your information only, and are not included in the IANZ endorsement for this report.

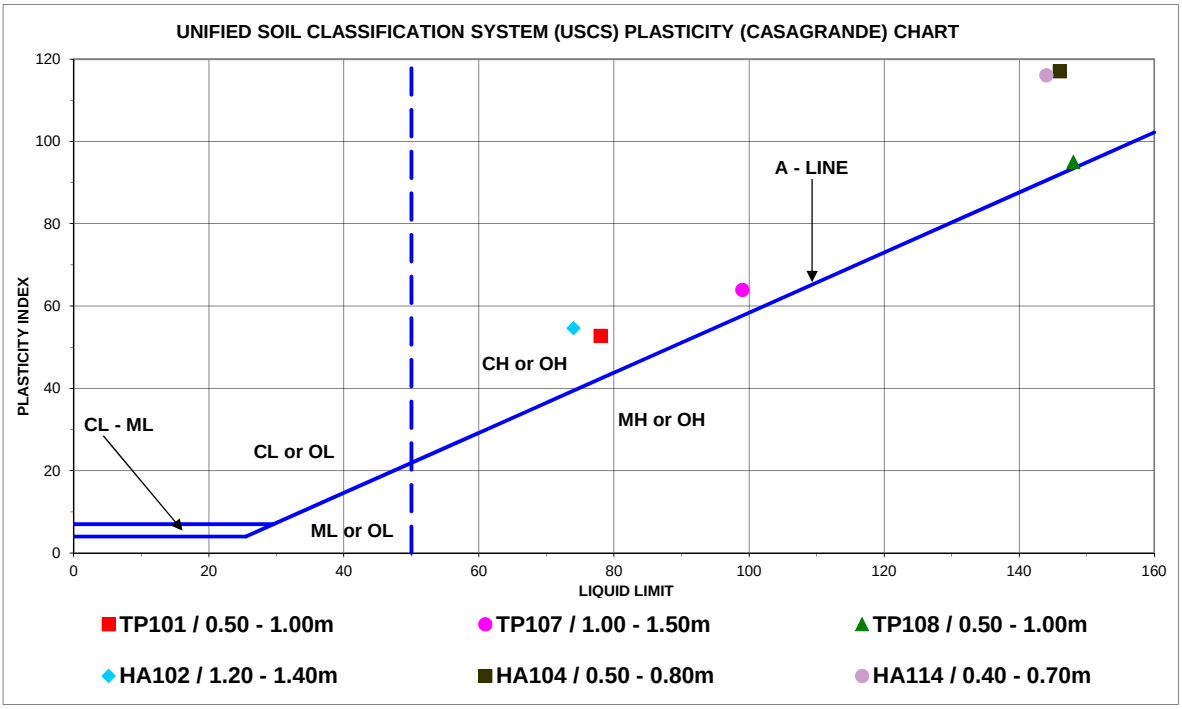


CHART LEGEND

CL = CLAY, low plasticity ('lean' clay)
OL = ORGANIC CLAY or ORGANIC SILT, low liquid limit
ML = SILT, low liquid limit
CL - ML = SILTY CLAY
CH = CLAY, high plasticity ('fat' clay)
OH = ORGANIC CLAY or ORGANIC SILT, high liquid limit
MH = SILT, high liquid limit ('elastic silt')

BGL Babbage Geotechnical Laboratory	Job Number:	63578#L	Sheet 1 of 1	Page 4 of 4	
	Registration Number:	2819			
	Report Number:	63578#L/AL Auckland Surf Park			
	Project:	AUCKLAND SURF PARK, DAIRY FLAT			

DETERMINATION OF THE LIQUID LIMIT, PLASTIC LIMIT & THE PLASTICITY INDEX

Test Methods: NZS4402: 1986: Test 2.2, Test 2.3 and Test 2.4

Tested By:	WC/JL/SG/CB	Aug / Sept 2025	
Compiled By:	JF	8/09/2025	
Checked By:	JF	8/09/2025	
Version Number:	8	Version Date:	August 2025
Authorised By:	Wayne Campton		

SUMMARY OF TESTING

Borehole Number	Sample Number	Depth (m)	Liquid Limit	Plastic Limit	Plasticity Index	Soil Classification Based on USCS Chart Below
HA116	BAG	1.10 - 1.40	88	20	68	CH
HA121	BAG	0.30 - 0.60	131	19	112	CH
HA122	BAG	0.50 - 0.80	104	17	87	CH
HA128	BAG	0.50 - 0.80	62	22	40	CH
HA133	BAG	1.20 - 1.40	66	21	45	CH
HA140	BAG	0.30 - 0.50	55	33	22	MH

The chart below & soil classification terminology is taken from ASTM D2487-17 (Reapproved 2025) "Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)", February 2025, & is based on the classification scheme developed by A. Casagrande in the 1940's (Casagrande, A., 1948: Classification and identification of soil. Transactions of the American Society of Civil Engineers, v. 113, p. 901-930). The chart below & the soil classification given in the table above are included for your information only, and are not included in the IANZ endorsement for this report.

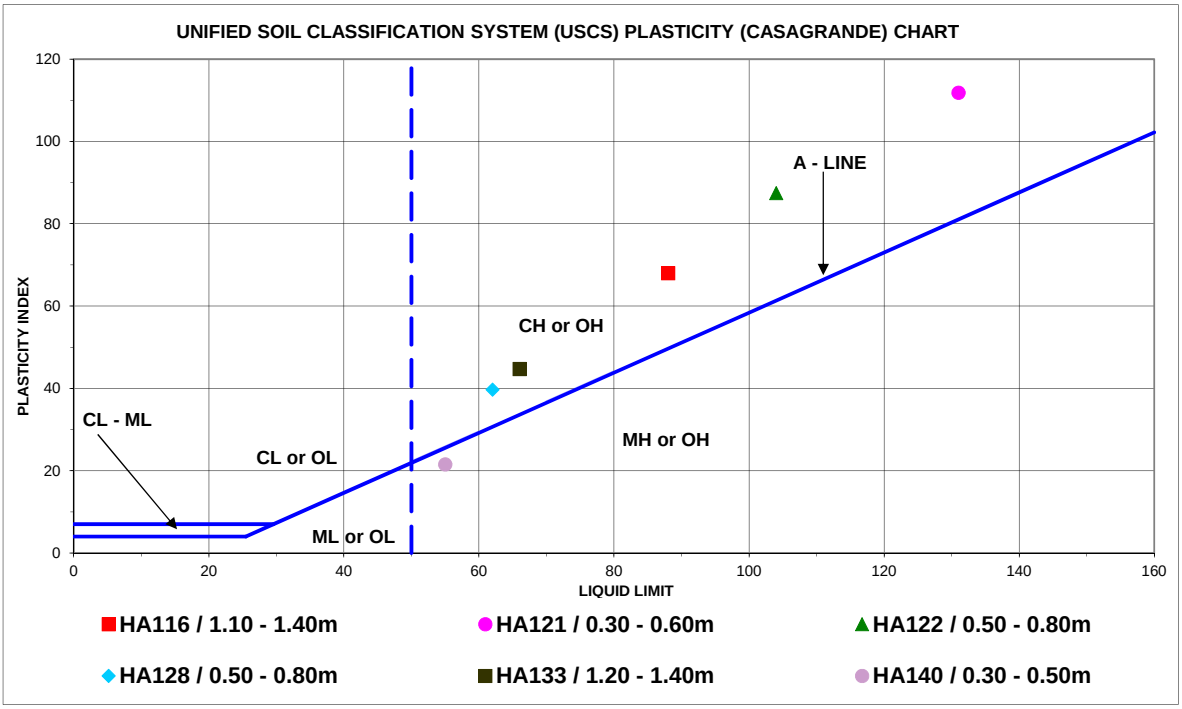


CHART LEGEND

CL = CLAY, low plasticity ('lean' clay)
OL = ORGANIC CLAY or ORGANIC SILT, low liquid limit
ML = SILT, low liquid limit
CL - ML = SILTY CLAY
CH = CLAY, high plasticity ('fat' clay)
OH = ORGANIC CLAY or ORGANIC SILT, high liquid limit
MH = SILT, high liquid limit ('elastic silt')

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Please reply to: W.E. Campton

INITIA LTD.
PO Box 47647,
Ponsonby,
Auckland 1144

Attention: **KIERAN BURSELL**

Job Number: 63578#L
BGL Registration Number: 2819
Checked by: WEC

8th September 2025

DRY DENSITY / WATER CONTENT RELATIONSHIP (COMPACTION CURVE) TESTING

Dear Kieran,

Re: AUCKLAND SURF PARK, DAIRY FLAT

Your Reference: P-001537-2
Report Number: 63578#L/CC Auckland Surf Park

The following report presents the results of compaction curve testing at BGL of a bulk soil sample delivered to this laboratory on the 14th of August 2025. Test results are summarised below, with page 3 showing a graph and detailed results.

A single shear vane test was carried out on each compacted sample while it was still in the proctor mould, and these results are included on the results table and water content / density graph. The shear vane results are included for your information only, and are not included in the IANZ endorsement for this report.

Test standards used were:

Water Content:	NZS4402: 1986: Test 2.1
NZ Standard Compaction:	NZS4402: 1986: Test 4.1.1
Vane Shear Strength:	NZ Geotechnical Society Guideline 2001

Sample Identification	Maximum Dry Density (t/m^3)	Optimum Water Content (%)	As-received Water Content (%)	Assumed Solid Density (t/m^3)
TP101 / BULK / 0.50 – 1.00m	**1.40**	**29**	**34.5**	**2.61**
	CLAY, fine sandy, moderately to highly plastic, light grey with orange mottles, moist.			

Note that sample descriptions are not part of BGL IANZ Accreditation.

As per the reporting requirements of NZS4402: 1986: Test 2.1: water content is reported to two significant figures for values below 10%, and to three significant figures for values of 10% or greater. As per the reporting requirements of NZS4402: 1986: Test 4.1.1: New Zealand Standard Compaction Test, maximum dry density is reported to the nearest 0.01t/m^3, optimum water content is reported to the nearest 0.2% for values below 5%, to the nearest 0.5% for values from 5 to 10%, and to the nearest whole number for values greater than 10%.

For calculating the air voids percentages the assumed solid density in the table above was used. Please note that this assumed values is not part of the IANZ endorsement for this report.

Please note that the test results relate only to the sample as-received, and relate only to the sample under test.

Thank you for the opportunity to carry out this testing. If you have any queries regarding the content of this report please contact the person authorising this report below at your convenience.

Yours faithfully,

Justin Franklin
Key Technical Person
Assistant Laboratory Manager
Babbage Geotechnical Laboratory

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№ 126

Tests indicated as not accredited are outside the scope of the laboratory's accreditation. This report may not be reproduced except in full & with written approval from BGL.

Babbage Geotechnical Laboratory	Job Number:	63578#L	Page 3 of 3
	Registration Number:	2819	
	Report Number:	63578#L/CC Auckland Surf Park	
	PROJECT:	AUCKLAND SURF PARK, DAIRY FLAT	

Determination of the Dry Density / Water Content Relationship by Standard Compaction

Test Method: NZS4402: 1986: Test 4.1.1

Tested By:	SG	Aug / Sept 25	
Compiled By:	SG	5/09/2025	
Checked By:	JF	8/09/2025	

Version Number:	5	Version Date:	February 2023	Authorised By:	W. Campton

Sample ID: TP101 / BULK **Sample Depth:** 0.50 - 1.00m

Sample History: Air-dried and wetted from as-received water content

Compaction Used: New Zealand Standard Compaction

Test Performed On: Whole Soil / ~~Fraction Passing the 19mm Sieve~~

Solid Density of Soil Particles: 2.61 t/m^3 (~~measured~~ / assumed)

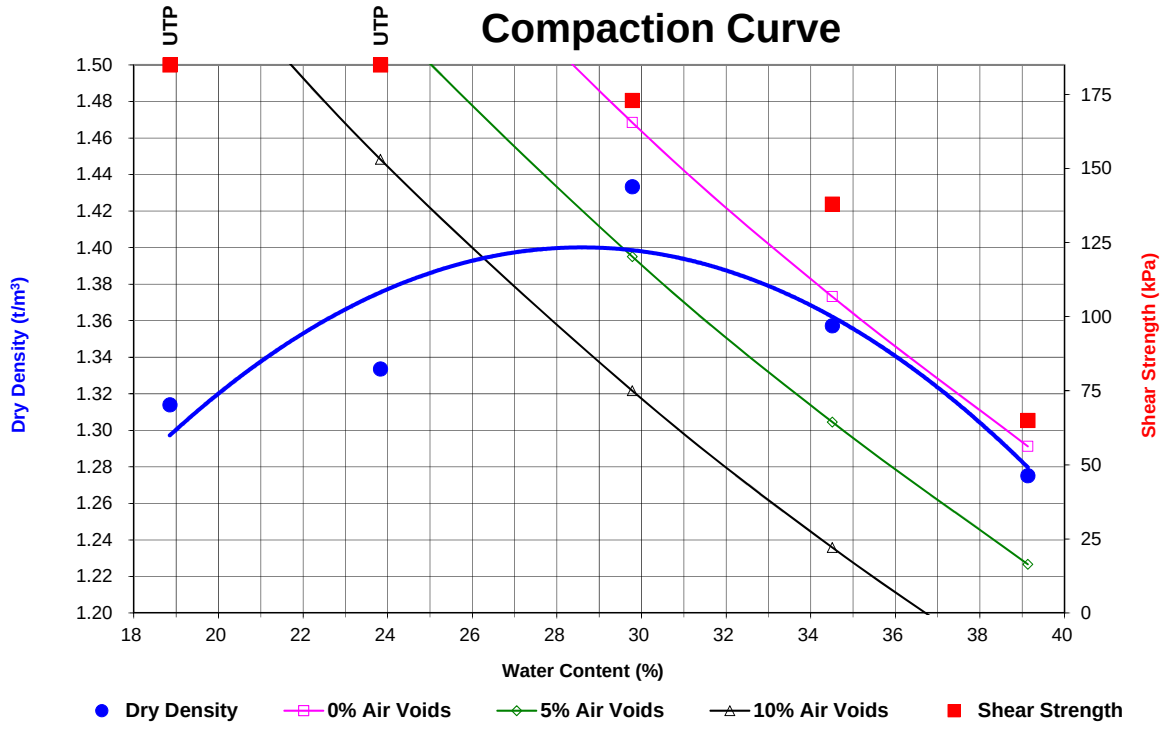
As-received Water Content (%): 34.5

TEST RESULTS

Water Content (%)	18.8	23.8	29.8	34.5	39.1
Bulk Density (t/m^3)	1.56	1.65	1.86	1.83	1.77
Dry Density (t/m^3)	1.31	1.33	1.43	1.36	1.28
Air Voids (%)	24.9	17.1	2.4	1.2	1.2
Shear Strength (kPa)	UTP*	UTP*	173	138	65

UTP = unable to penetrate sample with the shear vane.

Maximum Dry Density:	1.40 t/m^3	Optimum Water Content:	29 %



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wec@babbage.co.nz

Please reply to: W.E. Campton

INITIA LTD.
PO Box 47647,
Ponsonby,
Auckland 1144

Attention: **KIERAN BURSELL**

Job Number: 63578#L
BGL Registration Number: 2819
Checked by: WEC

3rd September 2025

SOAKED CALIFORNIA BEARING RATIO (CBR) TESTING

Dear Kieran,

Re: AUCKLAND SURF PARK, DAIRY FLAT

Your Reference: P-001537-2
Report Number: 63578#L/CBR Auckland Surf Park

The following report presents the results of soaked California Bearing Ratio testing at BGL of bulk soil samples delivered to this laboratory on the 14th of August 2025. Test results are summarised below, with the following pages showing graphs and detailed results.

Test standards used were:

Water Content:	NZS4402: 1986: Test 2.1
NZ Standard Compaction:	NZS4402: 1986: Test 4.1.1
California Bearing Ratio (CBR) – Remoulded:	NZS4402: 1986: Test 6.1.1 (soaked)

The bulk samples were sieved through a 19.0mm sieve to remove any oversized material if present, and then through a 9.5mm aperture sieve to break up the soil (*which is a departure from the NZS4402 Standard which requires a 4.75mm sieve to be used*). The samples were then compacted into CBR moulds using the NZ Standard Compaction method. The compacted samples were then soaked for four days. The CBR values were then measured using a plunger penetration rate of 1mm per minute.

Sample Details	Water Content (%)		Dry Density (t/m^3)	CBR (soaked)	Swell (%)
	Initial (trimmings)	After Testing (under plunger)			
TP101 / BULK / 0.50 – 1.00m	**34.2**	**38.8**	**1.34**	**2.5**	**2.2**
	CLAY, fine sandy, moderately to highly plastic, light grey with orange mottles, moist.				

Note that sample descriptions are not part of BGL IANZ Accreditation.

Sample Details	Water Content (%)		Dry Density (t/m^3)	CBR (soaked)	Swell (%)
	Initial (trimmings)	After Testing (under plunger)			
TP112 / BULK / 1.00 – 1.50m	**42.7**	**41.9**	**1.22**	**1.0**	**0.6**
	CLAY, highly plastic, light grey with orange & brown mottles, very moist, organic inclusions.				

Note that sample descriptions are not part of BGL IANZ Accreditation.

Note that a solid density value of 2.65t/m^3 was used in the calculation of the air voids for these compacted samples. This value is assumed, and is not part of the IANZ endorsement for this report.

As per the reporting requirements of NZS4402: 1986: Test 6.1.1, dry density is reported to the nearest 0.02t/m^3, swell to the nearest 0.2%, CBR's > 20 to the nearest 5, CBR's between 5 and 20 to the nearest 1, and for CBR's < 5 to the nearest 0.5. As per the reporting requirements of NZS4402: 1986: Test 2.1: water content is reported to two significant figures for values below 10%, and to three significant figures for values of 10% or greater.

Please note that the test results relate only to the samples as-received, and relate only to the samples under test.

Thank you for the opportunity to carry out this testing. If you have any queries regarding the content of this report please contact the person authorising this report below at your convenience.

Yours faithfully,

Justin Franklin
Key Technical Person
Assistant Laboratory Manager
Babbage Geotechnical Laboratory

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Babbage Geotechnical Laboratory	Job Number:	63578#L	Report Number:
	Registration Number:	2819	63578#L/CBR Auckland Surf Park
	PROJECT:	AUCKLAND SURF PARK, DAIRY FLAT	

CALIFORNIA BEARING RATIO TEST: REMOULDED SAMPLE, SOAKED

Test Methods: NZS4402: 1986: Test 6.1.1 - California Bearing Ratio / NZS4402: 1986: Test 2.1 - Water Content

	Initials	Date
Tested By:	SG	2/09/2025
Compiled By:	SG	3/09/2025
Checked By:	JF	3/09/2025

Version Number:	4	Version Date:	September 2022	Authorised By:	Wayne Campton

Sample Identification:	TP101 / BULK
Sample Depth (m):	0.50 - 1.00m
Sample History:	~~dried / wetted / lime added / cement added /~~ unknown ~~/ natural~~
Compaction Used:	NZ Standard Compaction / ~~NZ Heavy Compaction~~

Proving Ring Number:	122-3-508
Ring Calibration Factor:	99.84
(dial divisions / kN: from calibration worksheet)	

SOAKED CBR

Soil Sieved Through:	19.0 & 9.5	mm sieves
Surcharge Used:	4.00	kg
Mould Number:	B1	

BULK DENSITY

Mass Mould + Base + Soil	10,767.60	(g)
Mass Mould + Base	6,624.60	(g)
Volume Mould (from calibration)	2,308.00	(ml)
Bulk Density	**1.80**	(t/m^3)

WATER CONTENT	Before (trimmings)	After (under plunger)
Mass Wet Soil + Tin (g)	475.943	363.148
Mass Dry Soil + Tin (g)	380.380	290.492
Mass Tin (g)	101.355	103.402
Water Content (%)	**34.2**	**38.8**
Dry Density (t/m^3)	**1.34**	

DETERMINATION OF SWELL

Initial Reading (mm)	15.21
Final Reading (mm)	18.07
Change in Height (mm)	2.86
Initial Height (mm)	126.94
Swell (%)	**2.2**

Air Voids:	3.7	%
Time of Soaking:	4	days
Plunger Penetration Rate:	1.0	mm / minute

DETERMINATION OF BEARING VALUE

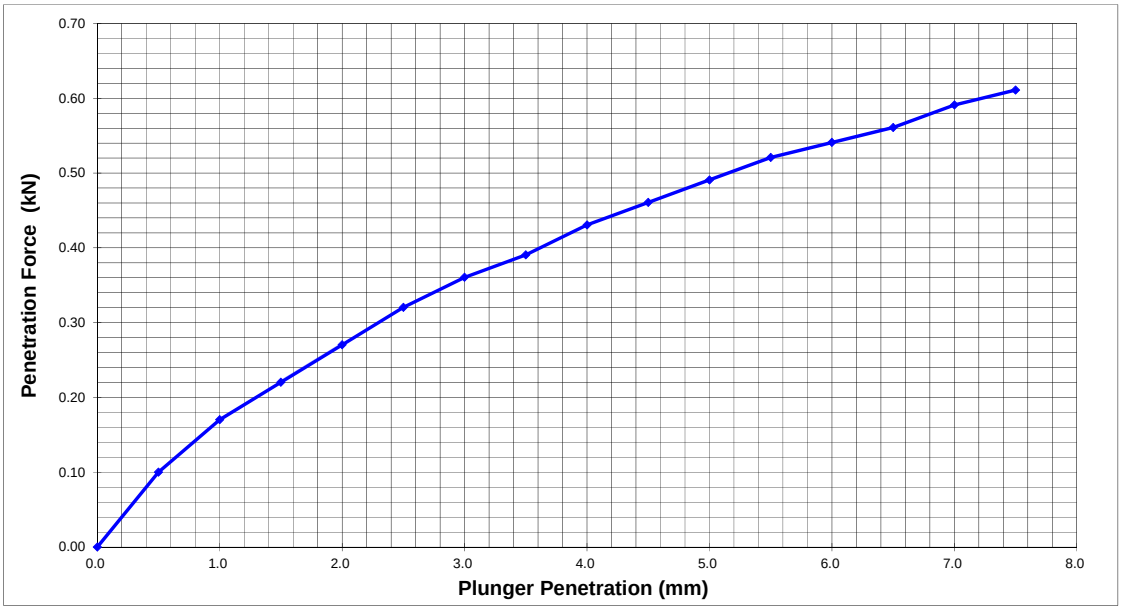
Plunger Penetration (mm)	Proving Ring Dial (divisions)	Force (kN)
0.0	0.0	0.00
0.5	10.0	0.10
1.0	17.0	0.17
1.5	22.0	0.22
2.0	27.0	0.27
2.5	32.0	0.32
3.0	36.0	0.36
3.5	39.0	0.39
4.0	43.0	0.43
4.5	46.0	0.46
5.0	49.0	0.49
5.5	52.0	0.52
6.0	54.0	0.54
6.5	56.0	0.56
7.0	59.0	0.59
7.5	61.0	0.61

2.5mm PENETRATION BEARING VALUE	
uncorrected	**2.4**
with curve shape correction (if needed)	**2.4**
5.0mm PENETRATION BEARING VALUE	
uncorrected	**2.5**
with curve shape correction (if needed)	**2.5**

FINAL CBR VALUE: 2.5

Lime Added:	0.0	%
Cement Added:	0.0	%

CBR FORCE-PENETRATION CURVE



Babbage Geotechnical Laboratory	Job Number:	63578#L	Report Number:
	Registration Number:	2819	63578#L/CBR Auckland Surf Park
	PROJECT:	AUCKLAND SURF PARK, DAIRY FLAT	

CALIFORNIA BEARING RATIO TEST: REMOULDED SAMPLE, SOAKED

Test Methods: NZS4402: 1986: Test 6.1.1 - California Bearing Ratio / NZS4402: 1986: Test 2.1 - Water Content

	Initials	Date
Tested By:	SG	2/09/2025
Compiled By:	SG	3/09/2025
Checked By:	JF	3/09/2025

Version Number:	4	Version Date:	September 2022	Authorised By:	Wayne Campton

Sample Identification:	TP112 / BULK
Sample Depth (m):	1.00 - 1.50m
Sample History:	~~dried / wetted / lime added / cement added /~~ unknown ~~/ natural~~
Compaction Used:	NZ Standard Compaction / ~~NZ Heavy Compaction~~

Proving Ring Number:	122-3-508
Ring Calibration Factor:	99.84
(dial divisions / kN: from calibration worksheet)	

SOAKED CBR

Soil Sieved Through:	19.0 & 9.5	mm sieves
Surcharge Used:	4.00	kg
Mould Number:	B4	

BULK DENSITY

Mass Mould + Base + Soil	10,935.60	(g)
Mass Mould + Base	6,915.00	(g)
Volume Mould (from calibration)	2,308.00	(ml)
Bulk Density	**1.74**	(t/m^3)

WATER CONTENT	Before (trimmings)	After (under plunger)
Mass Wet Soil + Tin (g)	337.125	387.234
Mass Dry Soil + Tin (g)	268.230	303.419
Mass Tin (g)	106.842	103.249
Water Content (%)	**42.7**	**41.9**
Dry Density (t/m^3)	**1.22**	

DETERMINATION OF SWELL

Initial Reading (mm)	9.80
Final Reading (mm)	10.45
Change in Height (mm)	0.65
Initial Height (mm)	126.94
Swell (%)	**0.6**

Air Voids:	1.8	%
Time of Soaking:	4	days
Plunger Penetration Rate:	1.0	mm / minute

DETERMINATION OF BEARING VALUE

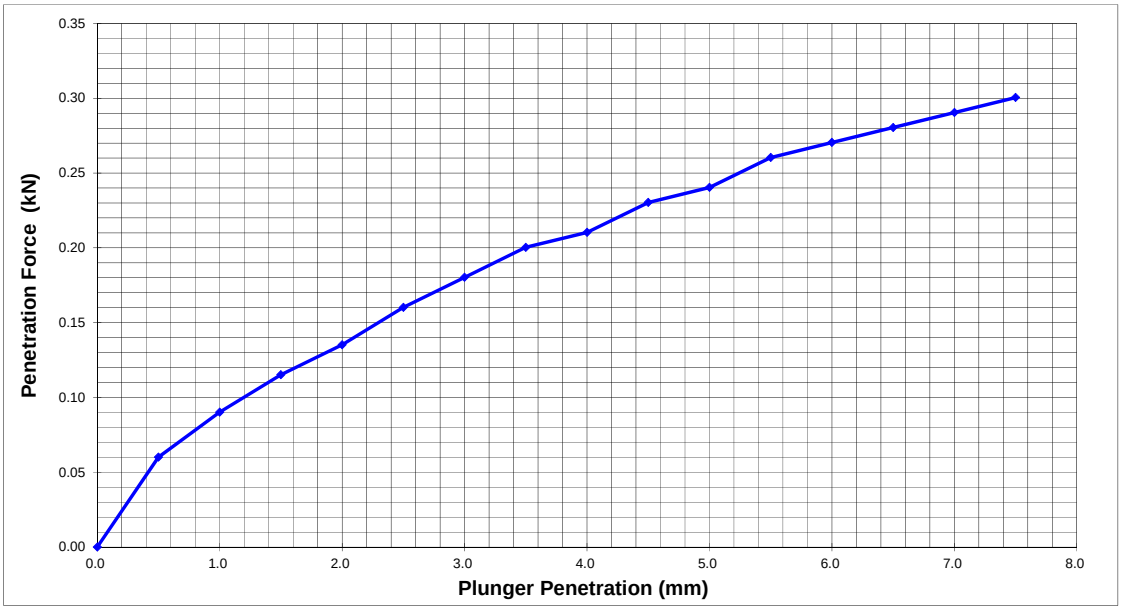
Plunger Penetration (mm)	Proving Ring Dial (divisions)	Force (kN)
0.0	0.0	0.00
0.5	6.0	0.06
1.0	9.0	0.09
1.5	11.5	0.12
2.0	13.5	0.14
2.5	16.0	0.16
3.0	18.0	0.18
3.5	20.0	0.20
4.0	21.0	0.21
4.5	23.0	0.23
5.0	24.0	0.24
5.5	26.0	0.26
6.0	27.0	0.27
6.5	28.0	0.28
7.0	29.0	0.29
7.5	30.0	0.30

2.5mm PENETRATION BEARING VALUE	
uncorrected	**1.2**
with curve shape correction (if needed)	**1.2**
5.0mm PENETRATION BEARING VALUE	
uncorrected	**1.2**
with curve shape correction (if needed)	**1.2**

FINAL CBR VALUE: 1.0

Lime Added:	0.0	%
Cement Added:	0.0	%

CBR FORCE-PENETRATION CURVE



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28 Duke Street Frankton 3204
Private Bag 3205
Hamilton 3240 New Zealand

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Certificate of Analysis

Client:	Initia Limited	**Lab No:**	3963527 SPv1
Contact:	Kieran Bursell	**Date Received:**	18-Aug-2025
	C/- Initia Limited	**Date Reported:**	29-Aug-2025
	PO Box 47647	**Quote No:**	137100
	Ponsonby	**Order No:**	P-001537-2
	Auckland 1144	**Client Reference:**	Surf Park Stage 2
		Submitted By:	Kieran Bursell

Sample Type: Soil

Sample Name:		TP107-1 (1-1.5m depth) 07-Aug-2025	TP108-1 (0.5-1m depth) 07-Aug-2025	TP108-2 (2-2.5m depth) 07-Aug-2025
Lab Number:		3963527.1	3963527.2	3963527.3
Organic Matter Content	%	9.7	12.7	11.8

Summary of Methods

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively simple matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis. A detection limit range indicates the lowest and highest detection limits in the associated suite of analytes. A full listing of compounds and detection limits are available from the laboratory upon request. Unless otherwise indicated, analyses were performed at Hill Labs, 28 Duke Street, Frankton, Hamilton 3204.

Sample Type: Soil

Test	Method Description	Default Detection Limit	Sample No
Organic Matter titration	Organic Matter Content by Titration Determination of the Organic Matter Content; Standard Method by Titration; Methods of Testing Soils for Civil Engineering Purposes; Part 3 Soil Chemical Tests; Standard Association of New Zealand: NZS 4402: 1986: Test 3.1.1.	0.2 %	1-3

These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Testing was completed on 29-Aug-2025. For completion dates of individual analyses please contact the laboratory.

Samples are held at the laboratory after reporting for a length of time based on the stability of the samples and analytes being tested (considering any preservation used), and the storage space available. Once the storage period is completed, the samples are discarded unless otherwise agreed with the customer. Extended storage times may incur additional charges.

This certificate of analysis must not be reproduced, except in full, without the written consent of the signatory.

Ara Heron BSc (Tech)
Client Services Manager - Environmental

Appendix E Aurecon Laboratory Testing Results

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Please reply to: W.E. Campton

Aurecon New Zealand Limited
PO Box 9762
Newmarket
Auckland 1149

Attention: **DAVID BOSSE**

Job Number: 64746#L
BGL Registration Number: 2931
Checked by: WEC

19th May 2023

ATTERBERG LIMITS & LINEAR SHRINKAGE TESTING

Dear Sir,

Re: SPARK DC

Your Reference: P523578
Report Number: 64746#L/AL Spark DC

The following report presents the results of Atterberg Limits & Linear Shrinkage testing at BGL of soil samples delivered to this laboratory on the 2nd of May 2023. Test results are summarised below, with page 3 showing where the samples plot on the Unified Soil Classification System (Casagrande) Chart. Test standards used were:

Water Content:	NZS4402:1986:Test 2.1
Liquid Limit:	NZS4402:1986:Test 2.2
Plastic Limit:	NZS4402:1986:Test 2.3
Plasticity Index:	NZS4402:1986:Test 2.4
Linear Shrinkage:	NZS4402:1986:Test 2.6

Borehole Number	Sample Number	Depth (m)	Water Content (%)	Liquid Limit	Plastic Limit	Plasticity Index	Linear Shrinkage (%)*
AU23-BH01	PT1	1.00 – 1.50	263	170	99	71	31
AU23-BH02	BS1	0.50 – 0.70	32.0	53	27	26	9
AU23-BH02	PT1	7.00 – 7.50	94.0	157	34	123	-
AU23-BH06	PT1	0.50 – 1.00	35.4	68 ◆	25 ◆	43 ◆	21 ◆
AU23-BH06	BS2	7.95 – 8.20	69.8	101	28	73	-
AU23-BH08	PT1	3.00 – 3.45	113	176	44	132	-

The amount of shrinkage of the sample as a percentage of the original sample length.

◆ = ***The soil fraction passing a 425μm sieve was used for the liquid limit, plastic limit & linear shrinkage tests.***

Please note that the linear shrinkage test was not carried out for the samples with a dash in the Linear Shrinkage column.

The whole soils were used for the water content tests (the soils were in a natural state), and for the liquid limit, plastic limit & linear shrinkage tests without a diamond beside them. The soil fractions passing a 0.425mm sieve were used for the liquid limit, plastic limit & linear shrinkage tests with a diamond (◆) beside them. The soils were wet up and dried where required for the liquid limit, plastic limit & linear shrinkage tests.

As per the reporting requirements of NZS4402: 1986: Test 2.1: water content is reported to two significant figures for values below 10%, and to three significant figures for values of 10% or greater. Test 2.2: liquid limit, test 2.3: plastic limit, and test 2.6: linear shrinkage are reported to the nearest whole number.

Please note that the test results relate only to the samples as-received, and relate only to the samples under test.

Thank you for the opportunity to carry out this testing. If you have any queries regarding the content of this report please contact the person authorising this report below at your convenience.

Yours faithfully,

Justin Franklin
Key Technical Person
Assistant Laboratory Manager
Babbage Geotechnical Laboratory

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TESTING LABORATORY
№ 126

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Babbage Geotechnical Laboratory	Job Number: 64746#L	Sheet 1 of 1	Page 3 of 3
	Reg. Number: 2931	Version No:	7
	Report No: 64746#L/AL Spark DC	Version Date:	July 2022
	Project:	SPARK DC	

DETERMINATION OF THE LIQUID LIMIT, PLASTIC LIMIT & THE PLASTICITY INDEX

Test Methods: NZS4402: 1986: Test 2.2, Test 2.3 and Test 2.4

Tested By:	TL	May 2023
Compiled By:	JF	19/05/2023
Checked By:	JF	19/05/2023

SUMMARY OF TESTING

Borehole Number	Sample Number	Depth (m)	Liquid Limit	Plastic Limit	Plasticity Index	Soil Classification Based on USCS Chart Below
AU23-BH01	PT1	1.00 - 1.50	170	99	71	OH - fibrous peat
AU23-BH02	BS1	0.50 - 0.70	53	27	26	CH
AU23-BH02	PT1	7.00 - 7.50	157	34	123	OH - organic clay
AU23-BH06	PT1	0.50 - 1.00	68	25	43	OH - organic clay
AU23-BH06	BS2	7.95 - 8.20	101	28	73	CH
AU23-BH08	PT1	3.00 - 3.45	176	44	132	OH - organic clay

The chart below & soil classification terminology is taken from ASTM D2487-17^{e1} "Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)", April 2020, & is based on the classification scheme developed by A. Casagrande in the 1940's (Casagrande, A., 1948: Classification and identification of soil. Transactions of the American Society of Civil Engineers, v. 113, p. 901-930). The chart below & the soil classification given in the table above are included for your information only, and are not included in the IANZ endorsement for this report.

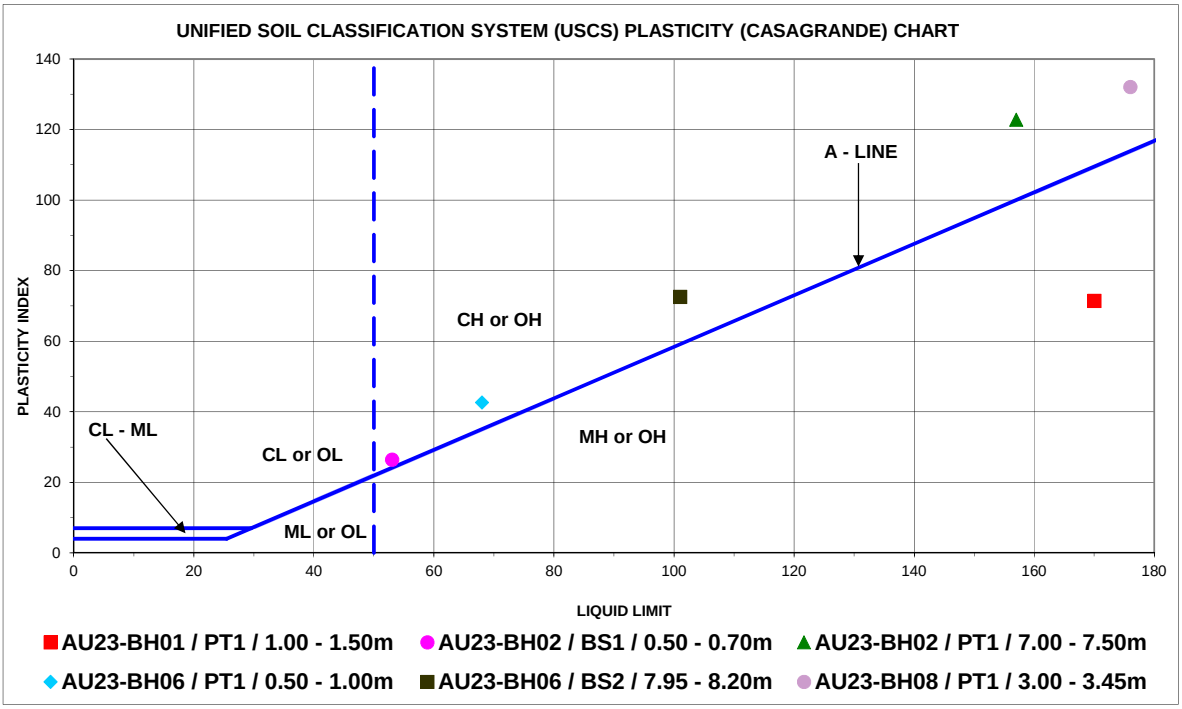


CHART LEGEND

CL = CLAY, low plasticity ('lean' clay)
CH = CLAY, high plasticity ('fat' clay)
OL = ORGANIC CLAY or ORGANIC SILT, low liquid limit
OH = ORGANIC CLAY or ORGANIC SILT, high liquid limit
ML = SILT, low liquid limit
MH = SILT, high liquid limit ('elastic silt')
CL - ML = SILTY CLAY

Babbage Geotechnical Laboratory
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P O Box 2027
New Zealand
Telephone 64-9-367 4954
E-mail wec@babbage.co.nz

Please reply to: W.E. Campton

Aurecon New Zealand Limited
PO Box 9762
Newmarket
Auckland 1149

Attention: **DAVID BOSSE**

Job Number: 64746#L
BGL Registration Number: 2931
Checked by: WEC

23rd May 2023

HYDROMETER PARTICLE-SIZE DISTRIBUTION TESTING

Dear Sir,

Re: SPARK DC

Your Reference: P523578
Report Number: 64746#L/HYD Spark DC

The following report presents the results of hydrometer particle-size distribution testing at BGL of soil samples delivered to this laboratory on the 2nd of May 2023. Test results are summarised below, with the following pages showing graphs and detailed results. Test standards used were:

Water Content:	NZS4402:1986:Test 2.1
Wet Sieve Test:	NZS4402:1986:Test 2.8.1
Hydrometer Test:	NZS4402:1986:Test 2.8.4

Borehole Number	Sample Number	Depth (m)	Hydrometer Grading (% of Dry Mass)			
			GRAVEL (2 – <9.50mm)	SAND (0.06 – 2mm)	SILT FRACTION (0.002 – 0.06mm)	CLAY FRACTION (< 0.002mm)
AU23-BH02	PT1	7.00 – 7.50	0	1	25	74
AU23-BH06	BS1	1.00 – 1.20	0	1	10	89
AU23-BH06	BS2	7.95 – 8.20	0	5	51	44
AU23-BH07	PT1	4.50 – 5.00	0	5	54	41

The whole soils were used for these hydrometer tests. As the organic content of the soils tested was very low, peroxide pretreatment was not carried out. A solid density of 2.65t/m^3 was assumed for these hydrometer tests, and is not part of the IANZ endorsement for this report.

As per the reporting requirements of NZS4402: 1986: Test 2.1: water content is reported to two significant figures for values below 10%, and to three significant figures for values of 10% or greater. Test 2.8.1: wet sieve & Test 2.8.4: hydrometer, the 'percentages passing' and 'percentages finer than' are reported to nearest 1%.

Please note that the test results relate only to the samples as-received, and relate only to the samples under test.

Thank you for the opportunity to carry out this testing. If you have any queries regarding the content of this report please contact the person authorising this report below at your convenience.

Yours faithfully,

Justin Franklin
Key Technical Person
Assistant Laboratory Manager
Babbage Geotechnical Laboratory

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№ 126

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Babbage Geotechnical Laboratory	Job Number:	64746#L	Sheet 1 of 1	Page 3 of 6
	Reg. Number:	2931	Version No:	7
	Report No:	64746#L/HYD Spark DC	Issue Date:	July 2022
	Project:	SPARK DC		

PARTICLE-SIZE DISTRIBUTION BY HYDROMETER

Test Methods: NZS4402: 1986: Test 2.1, Test 2.8.1, Test 2.8.4

Tested By:	WEC	22-May-23
Compiled By:	WEC	23-May-23
Checked By:	JF	23-May-23

BH: AU23-BH02 **Sample No:** PT1 **Depth:** 7.00 - 7.50m

Water Content (%): **94.0**

Sample History: Natural / ~~Air Dried / Oven Dried / Unknown~~

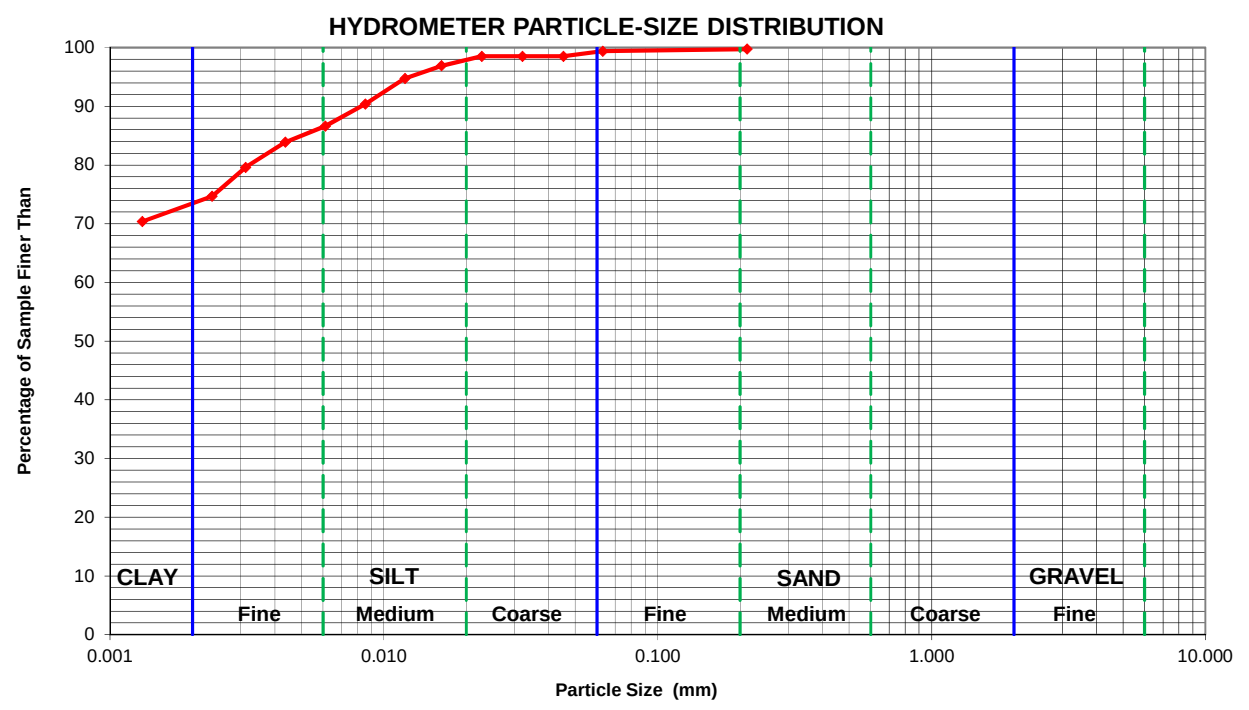
pH of sedimentation suspension: 8.5

Particle Size (mm)	% Finer Than
0.212	100
0.063	99
0.045	99
0.032	99
0.023	99
0.016	97
0.012	95
0.0086	90
0.0061	87
0.0044	84
0.0031	80
0.0024	75
0.0013	70

HYDROMETER ANALYSIS (% of dry mass)

				TOTAL	
GRAVEL:	(Medium)	*< 9.5 - 6mm*	0	0	%
	(Fine)	*6 - 2mm*	0		
SAND:	(Coarse)	*2.0 - 0.6mm*	0		
	(Medium)	*0.6 - 0.2mm*	0	1	%
	(Fine)	*0.2 - 0.06mm*	1		
SILT FRACTION:	(Coarse)	*0.06 - 0.02mm*	1		
	(Medium)	*0.02 - 0.006mm*	12	25	%
	(Fine)	*0.006 - 0.002mm*	12		
CLAY FRACTION:	*< 0.002mm*			74	%
				100%	

HYDROMETER TEST WAS CARRIED OUT ON THE WHOLE SOIL



Babbage Geotechnical Laboratory	Job Number:	64746#L	Sheet 1 of 1	Page 4 of 6
	Reg. Number:	2931	Version No:	7
	Report No:	64746#L/HYD Spark DC	Issue Date:	July 2022
	Project:	SPARK DC		

PARTICLE-SIZE DISTRIBUTION BY HYDROMETER

Test Methods: NZS4402: 1986: Test 2.1, Test 2.8.1, Test 2.8.4

Tested By:	WEC	22-May-23
Compiled By:	WEC	23-May-23
Checked By:	JF	23-May-23

BH: AU23-BH06 **Sample No:** BS1 **Depth:** 1.00 - 1.20m

Water Content (%): **86.4**

Sample History: Natural / ~~Air Dried / Oven Dried / Unknown~~

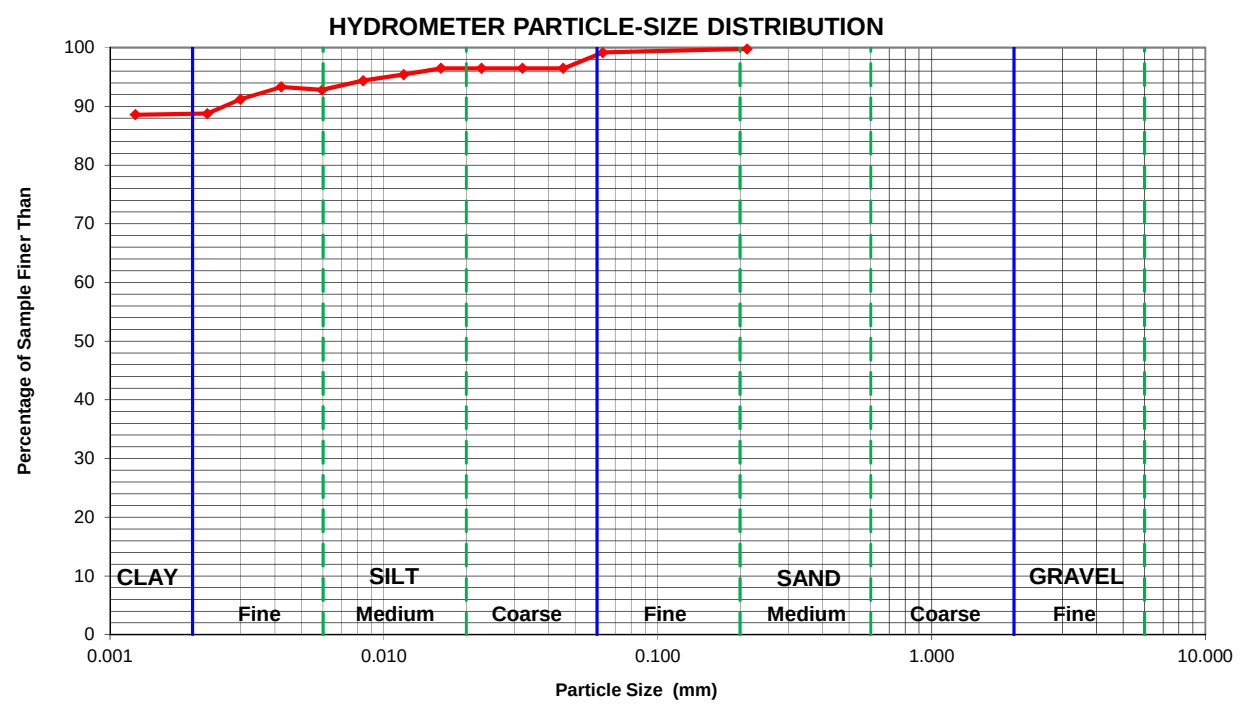
pH of sedimentation suspension: 8.5

Particle Size (mm)	% Finer Than
0.212	100
0.063	99
0.045	96
0.032	96
0.023	96
0.016	96
0.012	95
0.0084	94
0.0060	93
0.0042	93
0.0030	91
0.0023	89
0.0012	89

HYDROMETER ANALYSIS (% of dry mass)

				TOTAL	
GRAVEL:	(Medium)	*< 9.5 - 6mm*	0	0	%
	(Fine)	*6 - 2mm*	0		
SAND:	(Coarse)	*2.0 - 0.6mm*	0		
	(Medium)	*0.6 - 0.2mm*	0	1	%
	(Fine)	*0.2 - 0.06mm*	1		
SILT FRACTION:	(Coarse)	*0.06 - 0.02mm*	3		
	(Medium)	*0.02 - 0.006mm*	3	10	%
	(Fine)	*0.006 - 0.002mm*	4		
CLAY FRACTION:	*< 0.002mm*			89	%
				100%	

HYDROMETER TEST WAS CARRIED OUT ON THE WHOLE SOIL



Babbage Geotechnical Laboratory	Job Number:	64746#L	Sheet 1 of 1	Page 5 of 6
	Reg. Number:	2931	Version No:	7
	Report No:	64746#L/HYD Spark DC	Issue Date:	July 2022
	Project:	SPARK DC		

PARTICLE-SIZE DISTRIBUTION BY HYDROMETER

Test Methods: NZS4402: 1986: Test 2.1, Test 2.8.1, Test 2.8.4

Tested By:	WEC	22-May-23
Compiled By:	WEC	23-May-23
Checked By:	JF	23-May-23

BH: AU23-BH06 **Sample No:** BS2 **Depth:** 7.95 - 8.20m

Water Content (%): **69.8**

Sample History: Natural / ~~Air Dried / Oven Dried / Unknown~~

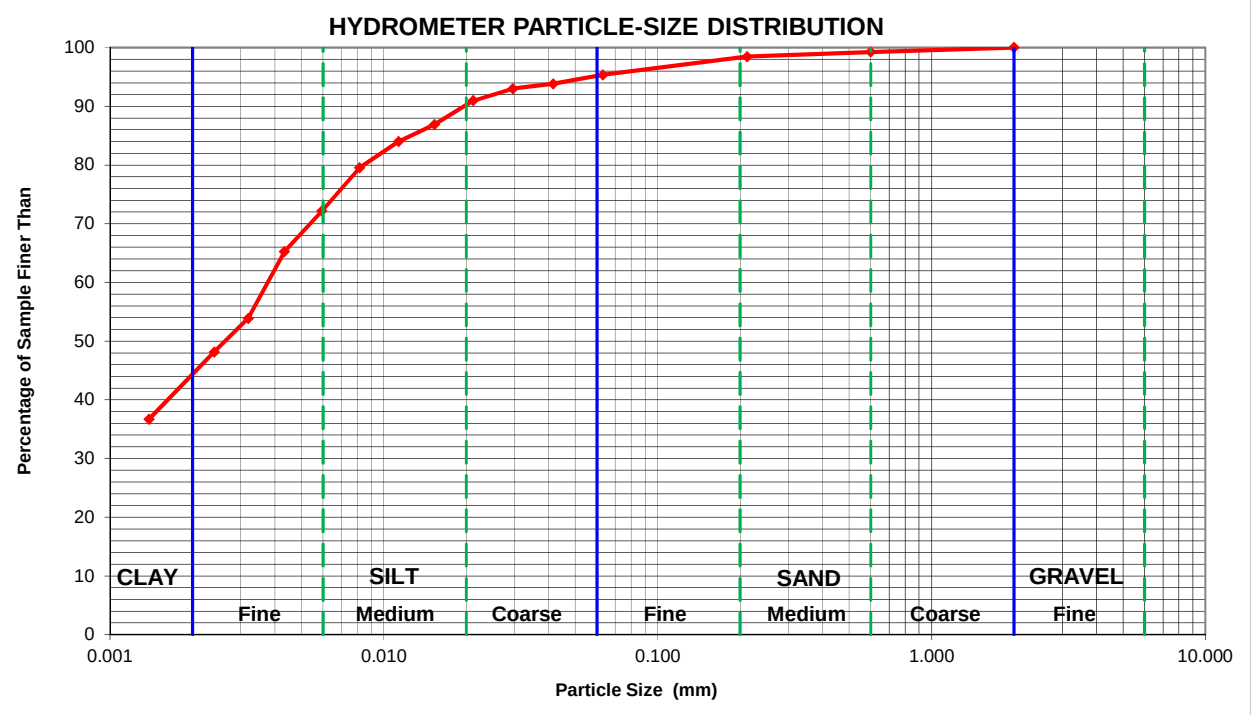
pH of sedimentation suspension: 9.0

Particle Size (mm)	% Finer Than
2.00	100
0.600	99
0.212	98
0.063	95
0.042	94
0.030	93
0.021	91
0.015	87
0.011	84
0.0082	80
0.0059	72
0.0043	65
0.0032	54
0.0024	48
0.0014	37

HYDROMETER ANALYSIS (% of dry mass)

				TOTAL	
GRAVEL:	(Medium)	***< 9.5 - 6mm***	0	**0**	%
	(Fine)	***6 - 2mm***	0		
SAND:	(Coarse)	***2.0 - 0.6mm***	1	**5**	%
	(Medium)	***0.6 - 0.2mm***	1		
	(Fine)	***0.2 - 0.06mm***	3		
SILT FRACTION:	(Coarse)	***0.06 - 0.02mm***	5	**51**	%
	(Medium)	***0.02 - 0.006mm***	18		
	(Fine)	***0.006 - 0.002mm***	28		
CLAY FRACTION:		***< 0.002mm***		**44**	%
				100%	

HYDROMETER TEST WAS CARRIED OUT ON THE WHOLE SOIL



Babbage Geotechnical Laboratory	Job Number:	64746#L	Sheet 1 of 1	Page 6 of 6
	Reg. Number:	2931	Version No:	7
	Report No:	64746#L/HYD Spark DC	Issue Date:	July 2022
	Project:	SPARK DC		

PARTICLE-SIZE DISTRIBUTION BY HYDROMETER

Test Methods: NZS4402: 1986: Test 2.1, Test 2.8.1, Test 2.8.4

Tested By:	WEC	22-May-23
Compiled By:	WEC	23-May-23
Checked By:	JF	23-May-23

BH: AU23-BH07 **Sample No:** PT1 **Depth:** 4.50 - 5.00m

Water Content (%): **34.9**

Sample History: Natural / ~~Air Dried / Oven Dried / Unknown~~

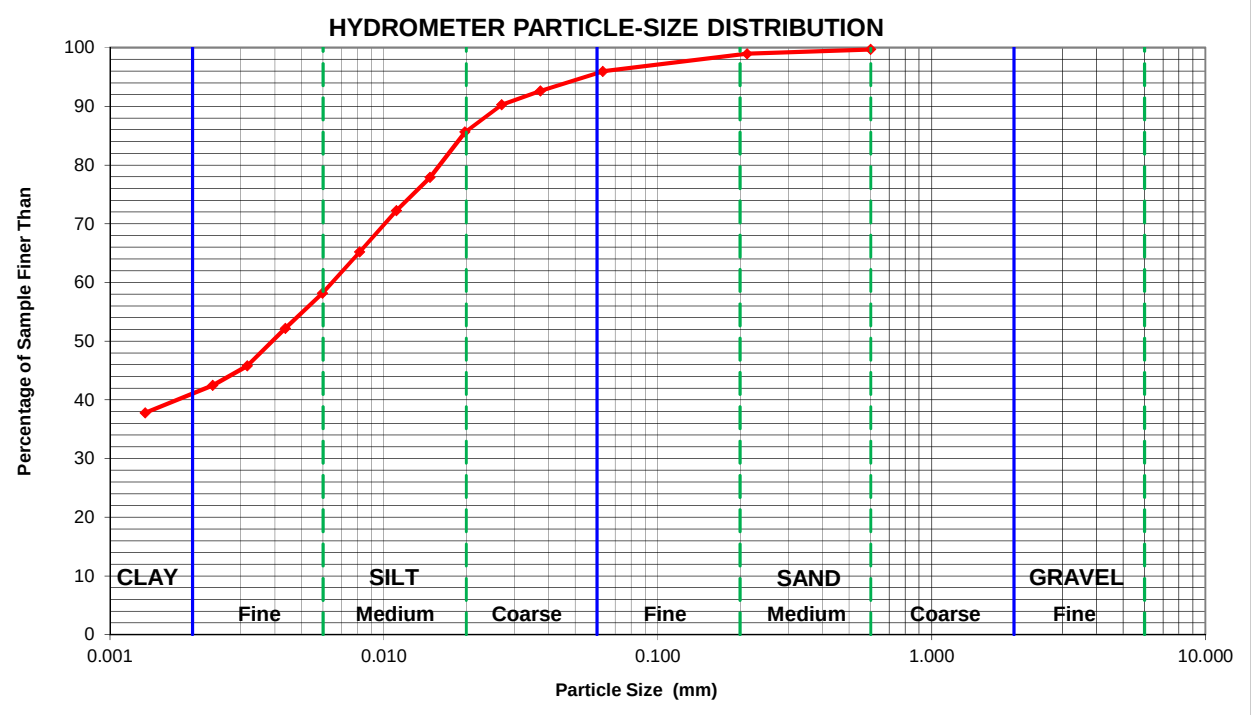
pH of sedimentation suspension: 9.0

Particle Size (mm)	% Finer Than
0.600	100
0.212	99
0.063	96
0.037	93
0.027	90
0.020	86
0.015	78
0.011	72
0.0082	65
0.0060	58
0.0044	52
0.0032	46
0.0024	42
0.0013	38

HYDROMETER ANALYSIS (% of dry mass)

				TOTAL	
GRAVEL:	(Medium)	***< 9.5 - 6mm***	0	**0**	%
	(Fine)	***6 - 2mm***	0		
SAND:	(Coarse)	***2.0 - 0.6mm***	0	**5**	%
	(Medium)	***0.6 - 0.2mm***	1		
	(Fine)	***0.2 - 0.06mm***	4		
SILT FRACTION:	(Coarse)	***0.06 - 0.02mm***	9	**54**	%
	(Medium)	***0.02 - 0.006mm***	28		
	(Fine)	***0.006 - 0.002mm***	17		
CLAY FRACTION:		***< 0.002mm***		**41**	%
				100%	

HYDROMETER TEST WAS CARRIED OUT ON THE WHOLE SOIL



Babbage Geotechnical Laboratory
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New Zealand
64-9-367 4954
wec@babbage.co.nz

Please reply to: W.E. Campton

Aurecon New Zealand Limited
PO Box 9762
Newmarket
Auckland 1149

Attention: **DAVID BOSSE**

Job Number: 64746#L
BGL Registration Number: 2931
Checked by: WEC

19th May 2023

SHRINK-SWELL INDEX TESTING

Dear Sir,

Re: SPARK DC
Your Reference: P523578
Report Number: 64746#L/SS Spark DC

The following report presents the results of Shrink-swell Index testing at BGL of 60mm diameter undisturbed push-tube soil samples delivered to this laboratory on the 2nd May 2023. The test standards used were:

Water Content:	NZS4402:1986:Test 2.1
Shrink-swell Index:	AS1289:Test 7.1.1 - 2003

Sample Descriptions (*not part of BGL IANZ Accreditation*)

AU23-BH01 / PT1 / 1.00 – 1.50m:

PEAT, fibrous, black, very moist, low density.

AU23-BH06 / PT1 / 0.50 – 1.00m:

ORGANIC CLAY, firm, highly plastic, light grey & dark brown, rootlets & organic fibres, very moist.

As per the reporting requirements of AS1289: Test 7.1.1 – 2003: the shrink-swell index value has been reported to the nearest 0.1, and water content is reported to the nearest 0.1%. As per the reporting requirements of NZS4402: 1986: Test 2.1: water content is reported to two significant figures for values below 10%, and to three significant figures for values of 10% or greater. Density & air voids results have been calculated based on the dimensions of the extruded samples. Density results are reported to the nearest 0.01t/m^3, and air voids are reported to the nearest whole number.

For calculating the air voids percentages a solid density of 1.50t/m^3 was assumed for sample AU23-BH01 / PT1 / 1.00 – 1.50m and a solid density of 2.65t/m^3 was assumed for sample AU23-BH06 / PT1 / 0.50 – 1.00m. Note that these assumed values are not part of the IANZ endorsement for this report.

Please note that the test results relate only to the samples as-received, and relate only to the samples under test. Any crumbling of the shrinkage samples did not affect final water content readings.

Thank you for the opportunity to carry out this testing. If you have any queries regarding the content of this report please contact the person authorising this report below at your convenience.

Yours faithfully,

Justin Franklin
Key Technical Person
Assistant Laboratory Manager
Babbage Geotechnical Laboratory

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Babbage Geotechnical Laboratory

SHRINK-SWELL TEST RESULTS

Site Location		SPARK DC	
Borehole Number / Sample Number		AU23-BH01 / PT1	AU23-BH06 / PT1
Depth (m)		1.00 – 1.50m	0.50 – 1.00m
SWELL TEST			
Initial Water Content	%	271	36.2
Initial Bulk Density*	t/m³	1.11	1.83
Initial Dry Density*	t/m³	0.28	1.40
Initial Air Voids*	%	0	4
Total Swell*	mm	0.0	0.0
Swelling Strain*	%	0.0	0.0
SHRINKAGE TEST			
Water Content*	%	263	35.4
Initial Bulk Density*	t/m³	1.16	1.85
Initial Dry Density*	t/m³	0.32	1.37
Initial Air Voids*	%	0	0
Total Shrinkage*	mm	41.7	8.0
Shrinkage Strain*	%	35.3	6.7
Cracking over the drying period		~~none / slight / moderate~~ / extreme	~~none / slight / moderate~~ / extreme
SHRINK-SWELL INDEX			
Estimated Inert Inclusions (%)		0	0
SHRINK-SWELL INDEX		19.6	3.7

**These results are not part of AS1289: Test 7.1.1 – 2003 reporting requirements, and are provided for your information only.*

Aurecon New Zealand Ltd
Unit 1, 150 Cavendish Rd
Casebrook
Christchurch 8051

ACCREDITED TESTING LABORATORY

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

Attention: **David Bosse**

Report **985507-S**
Project name SPARK DC
Project ID P523578
Received Date May 02, 2023

Client Sample ID			**AU23-BH01-3.5M**	**AU23-BH01-8.5M**	**AU23-BH02-2.0M**	**AU23-BH02-8.5M**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**K23-My0003643**	**K23-My0003644**	**K23-My0003645**	**K23-My0003646**
Date Sampled			**May 02, 2023**	**May 02, 2023**	**May 02, 2023**	**May 02, 2023**
Test/Reference	LOR	Unit				
Chloride[N16]	5	mg/kg	130	19	79	21
Conductivity (1:5 aqueous extract at 25 °C as rec.)[N16]	10	uS/cm	86	120	410	120
pH (1:5 Aqueous extract at 25 °C as rec.)[N16]	0.1	pH Units	7.8	8.9	5.7	9.2
Resistivity*[N16]	0.5	ohm.m	120	80	25	84
Sulphate (as SO4)[N16]	30	mg/kg	1200	37	2500	< 30
Sample Properties						
% Moisture[N16]	1	%	59	49	73	42

Client Sample ID			**AU23-BH03-2.0M**	**AU23-BH03-6.5M**	**AU23-BH03-12.0M**	**AU23-BH04-8.9M**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**K23-My0003647**	**K23-My0003648**	**K23-My0003649**	**K23-My0003650**
Date Sampled			**May 02, 2023**	**May 02, 2023**	**May 02, 2023**	**May 02, 2023**
Test/Reference	LOR	Unit				
Chloride[N16]	5	mg/kg	53	50	9.1	26
Conductivity (1:5 aqueous extract at 25 °C as rec.)[N16]	10	uS/cm	66	120	140	120
pH (1:5 Aqueous extract at 25 °C as rec.)[N16]	0.1	pH Units	6.1	7.9	8.7	8.8
Resistivity*[N16]	0.5	ohm.m	150	83	72	84
Sulphate (as SO4)[N16]	30	mg/kg	99	180	< 30	39
Sample Properties						
% Moisture[N16]	1	%	79	74	18	54

Client Sample ID			AU23-BH04-1.0M	AU23-BH05-4.1M	AU23-BH05-7.2M	AU23-BH06-2.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K23-My0003651	K23-My0003652	K23-My0003653	K23-My0003654
Date Sampled			May 02, 2023	May 02, 2023	May 02, 2023	May 02, 2023
Test/Reference	LOR	Unit				
Chloride[N16]	5	mg/kg	86	11	5.7	160
Conductivity (1:5 aqueous extract at 25 °C as rec.)[N16]	10	uS/cm	84	120	140	230
pH (1:5 Aqueous extract at 25 °C as rec.)[N16]	0.1	pH Units	6.9	8.0	8.2	6.7
Resistivity*[N16]	0.5	ohm.m	120	86	71	43
Sulphate (as SO4)[N16]	30	mg/kg	1100	46	< 30	800
Sample Properties						
% Moisture[N16]	1	%	48	61	53	79

Client Sample ID			AU23-BH06-5.2M	AU23-BH07-0.75M	AU23-BH07-5.8M	AU23-BH08-0.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			K23-My0003655	K23-My0003656	K23-My0003657	K23-My0003658
Date Sampled			May 02, 2023	May 02, 2023	May 02, 2023	May 02, 2023
Test/Reference	LOR	Unit				
Chloride[N16]	5	mg/kg	53	5.8	29	64
Conductivity (1:5 aqueous extract at 25 °C as rec.)[N16]	10	uS/cm	110	89	120	210
pH (1:5 Aqueous extract at 25 °C as rec.)[N16]	0.1	pH Units	7.9	6.6	8.8	7.4
Resistivity*[N16]	0.5	ohm.m	94	110	86	47
Sulphate (as SO4)[N16]	30	mg/kg	59	71	78	340
Sample Properties						
% Moisture[N16]	1	%	58	32	30	23

Client Sample ID			AU23-BH08-8.9M
Sample Matrix			Soil
Eurofins Sample No.			K23-My0003659
Date Sampled			May 02, 2023
Test/Reference	LOR	Unit	
Chloride[N16]	5	mg/kg	63
Conductivity (1:5 aqueous extract at 25 °C as rec.)[N16]	10	uS/cm	130
pH (1:5 Aqueous extract at 25 °C as rec.)[N16]	0.1	pH Units	9.3
Resistivity*[N16]	0.5	ohm.m	77
Sulphate (as SO4)[N16]	30	mg/kg	50
Sample Properties			
% Moisture[N16]	1	%	47

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Chloride	Melbourne	May 12, 2023	28 Days
- Method: LTM-INO-4090 Chloride by Discrete Analyser			
Conductivity (1:5 aqueous extract at 25 °C as rec.)	Melbourne	May 12, 2023	7 Days
- Method: LTM-INO-4030 Conductivity			
pH (1:5 Aqueous extract at 25 °C as rec.)	Melbourne	May 12, 2023	7 Days
- Method: LTM-GEN-7090 pH in soil by ISE			
Sulphate (as SO4)	Melbourne	May 12, 2023	28 Days
- Method: LTM-INO-4110 Sulfate by Discrete Analyser			
% Moisture	Melbourne	May 02, 2023	14 Days
- Method: LTM-GEN-7080 Moisture			

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Address: Unit 1, 150 Cavendish Rd
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Christchurch 8051

Project Name: SPARK DC
Project ID: P523578

Order No.: P523578 - David Bosse
Report #: 985507
Phone: 0011 64 3 375 1381
Fax: 0011 64 3 379 6955

Received: May 2, 2023 2:15 PM
Due: May 11, 2023
Priority: 7 Day
Contact Name: David Bosse

Eurofins Analytical Services Manager : Karishma Patel

Sample Detail						Aggressivity Soil Set	Moisture Set
Auckland Laboratory - IANZ# 1327							
Christchurch Laboratory - IANZ# 1290							
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	AU23-BH01-3.5M	May 02, 2023		Soil	K23-My0003643	X	X
2	AU23-BH01-8.5M	May 02, 2023		Soil	K23-My0003644	X	X
3	AU23-BH02-2.0M	May 02, 2023		Soil	K23-My0003645	X	X
4	AU23-BH02-8.5M	May 02, 2023		Soil	K23-My0003646	X	X
5	AU23-BH03-2.0M	May 02, 2023		Soil	K23-My0003647	X	X
6	AU23-BH03-6.5M	May 02, 2023		Soil	K23-My0003648	X	X
7	AU23-BH03-	May 02, 2023		Soil	K23-My0003649	X	X

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Sample Detail						Aggressivity Soil Set	Moisture Set
Auckland Laboratory - IANZ# 1327							
Christchurch Laboratory - IANZ# 1290							
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X
External Laboratory							
	12.0M						
8	AU23-BH04-8.9M	May 02, 2023		Soil	K23-My0003650	X	X
9	AU23-BH04-1.0M	May 02, 2023		Soil	K23-My0003651	X	X
10	AU23-BH05-4.1M	May 02, 2023		Soil	K23-My0003652	X	X
11	AU23-BH05-7.2M	May 02, 2023		Soil	K23-My0003653	X	X
12	AU23-BH06-2.5M	May 02, 2023		Soil	K23-My0003654	X	X
13	AU23-BH06-5.2M	May 02, 2023		Soil	K23-My0003655	X	X
14	AU23-BH07-0.75M	May 02, 2023		Soil	K23-My0003656	X	X

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Eurofins Analytical Services Manager : Karishma Patel

Sample Detail						Aggressivity Soil Set	Moisture Set
Auckland Laboratory - IANZ# 1327							
Christchurch Laboratory - IANZ# 1290							
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X
External Laboratory							
15	AU23-BH07-5.8M	May 02, 2023		Soil	K23-My0003657	X	X
16	AU23-BH08-0.5M	May 02, 2023		Soil	K23-My0003658	X	X
17	AU23-BH08-8.9M	May 02, 2023		Soil	K23-My0003659	X	X
Test Counts						17	17

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres
CFU: Colony forming unit

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank									
Chloride			mg/kg	< 5			5	Pass	
Sulphate (as SO4)			mg/kg	< 30			30	Pass	
LCS - % Recovery									
Chloride			%	101			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
				Result 1	Result 2	RPD			
Conductivity (1:5 aqueous extract at 25 °C as rec.)	K23-My0003643	CP	uS/cm	86	89	2.7	30%	Pass	
pH (1:5 Aqueous extract at 25 °C as rec.)	K23-My0003643	CP	pH Units	7.8	7.8	pass	30%	Pass	
Resistivity*	K23-My0003643	CP	ohm.m	120	110	2.7	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Chloride	K23-My0003644	CP	mg/kg	19	20	3.9	30%	Pass	
pH (1:5 Aqueous extract at 25 °C as rec.)	K23-My0003644	CP	pH Units	8.9	9.1	pass	30%	Pass	
Sulphate (as SO4)	K23-My0003644	CP	mg/kg	37	34	7.6	30%	Pass	
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	K23-My0003649	CP	%	18	17	8.7	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Chloride	K23-My0003653	CP	mg/kg	5.7	5.9	4.4	30%	Pass	
Sulphate (as SO4)	K23-My0003653	CP	mg/kg	< 30	< 30	<1	30%	Pass	
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	K23-My0003659	CP	%	47	48	3.2	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	No
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	Yes

Qualifier Codes/Comments

Code	Description
N16	Analysis performed by Eurofins Environment Testing Australia

Authorised by:

Katyana Gausel	Analytical Services Manager
Mary Makarios	Senior Analyst-Inorganic
Mary Makarios	Senior Analyst-Sample Properties



Michael Ritchie
Head of Semi Volatiles (Key Technical Personnel)

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates IANZ accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Attention: **DAVID BOSSE**

Job Number: 64746#L
BGL Registration Number: 2931
Checked by: WEC

19th May 2023

SOAKED CALIFORNIA BEARING RATIO (CBR) TESTING

Dear Sir,

Re: SPARK DC

Your Reference: P523578
Report Number: 64746#L/CBR Spark DC

The following report presents the results of unsoaked California Bearing Ratio testing at BGL of a bulk soil sample delivered to this laboratory on the 2nd of May 2023. Test results are summarised below, with page 3 showing a graph and detailed results. Test standards used were:

Water Content:	NZS4402:1986:Test 2.1
NZ Standard Compaction:	NZS4402:1986:Test 4.1.1
California Bearing Ratio (CBR) – Remoulded:	NZS4402:1986:Test 6.1.1 (soaked)

The bulk sample was sieved through a 4.75mm aperture sieve to break up the soil. As the soil was far too wet to compact at the natural water content, with your agreement, it was dried-back to a value judged to be close to the optimum water content. The sample was then compacted into a CBR mould using the NZ Standard Compaction method. The compacted sample was then soaked for four days. The CBR value was next measured using a plunger penetration rate of 1mm per minute.

Sample Number / % Stabiliser	Water Content (%)			Dry Density (t/m^3)	CBR (soaked)	Swell (%)
	Natural	After Adjustment to Near Optimum	After Test (under plunger)			
AU23-TP01 / BS1 / 0.40 – 0.60m	**52.8**	**31.8**	**43.0**	**1.16**	**1.0**	**3.6**
	ORGANIC CLAY, highly plastic, brown & grey, very wet.					

Note that sample descriptions are not part of BGL IANZ Accreditation.

Note that a solid density value of 2.00t/m^3 was used in the calculation of the air voids for this compacted sample. This value is assumed, and is not part of the IANZ endorsement for this report.

As per the reporting requirements of NZS4402: 1986: Test 6.1.1, dry density is reported to the nearest 0.02t/m^3, swell to the nearest 0.2%, CBR's > 20 to the nearest 5, CBR's between 5 and 20 to the nearest 1, and for CBR's < 5 to the nearest 0.5. As per the reporting requirements of NZS4402: 1986: Test 2.1: water content is reported to two significant figures for values below 10%, and to three significant figures for values of 10% or greater.

Please note that the test results relate only to the sample as-received, and relate only to the sample under test.

Thank you for the opportunity to carry out this testing. If you have any queries regarding the content of this report please contact the person authorising this report below at your convenience.

Yours faithfully,

Justin Franklin
Key Technical Person
Assistant Laboratory Manager
Babbage Geotechnical Laboratory

ACCREDITED
IANZ
TESTING LABORATORY
№ 126

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation. This report may not be reproduced except in full & with written approval from BGL.

BGL Babbage Geotechnical Laboratory	JOB NUMBER:	64746#L	REPORT NUMBER:	Page 3 of 3
	REG. NUMBER:	2931	64746#L/CBR Spark DC	Version 4, Sept 2022
	PROJECT:	SPARK DC		

CALIFORNIA BEARING RATIO TEST:
REMOULDED SAMPLE, SOAKED

Test Method: NZS4402:1986:Test 6.1.1
NZS4402:1986:Test 2.1 Moisture Content

	Initials	Date
Tested By:	WEC	16-May-23
Compiled By:	WEC	17-May-23
Checked By:	JF	19-May-23

Sample Number: AU23-TP01 / BS1

Sample Depth (m): 0.40 - 0.60m

Sample History: ~~dried / wetted / lime added / cement added / unknown /~~ natural

Compaction Used: NZ Standard / ~~NZ Heavy~~

Proving Ring No:	1155-10-13232
Calibration Factor:	337.81

(dial divisions / kN: from calibration worksheet)

SOAKED CBR

Soil Sieved Over:	4.75	mm sieves
Surcharge Used:	4.00	kg
Mould Number:	B14	

BULK DENSITY

Mass Mould + Base + Soil	10,317.20	(g)
Mass Mould + Base	6,803.60	(g)
Volume Mould (from calibration)	2,299.00	(ml)
Bulk Density	**1.53**	(t/m^3)

WATER CONTENT

	Before (trimmings)	After (under plunger)
Mass Wet Soil + Tin (g)	348.472	279.984
Mass Dry Soil + Tin (g)	284.348	227.370
Mass Tin (g)	82.418	104.905
Water Content (%)	**31.8**	**43.0**
Dry Density (t/m^3)	**1.16**	

DETERMINATION OF SWELL

Initial Reading (mm)	12.43
Final Reading (mm)	16.94
Change in Height (mm)	4.51
Initial Height (mm)	127.10
Swell (%)	**3.6**

Air Voids:	5.2	%
Time of Soaking:	4	days
Plunger Penetration Rate:	1.0	mm / minute

DETERMINATION OF BEARING VALUE

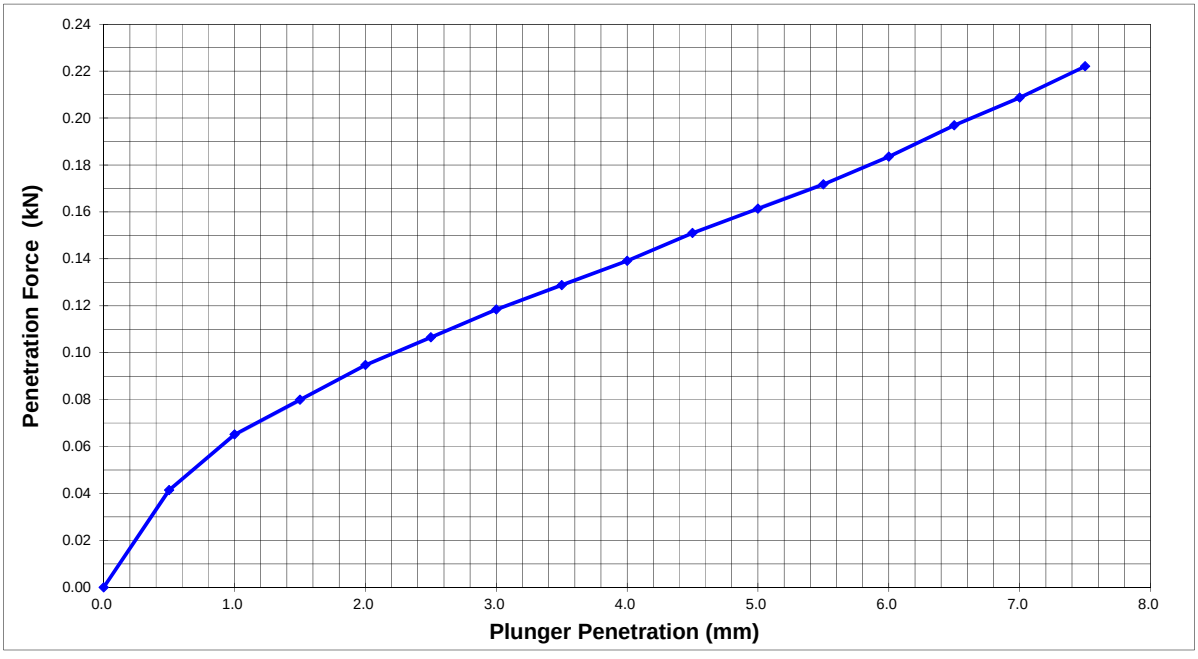
Plunger Penetration (mm)	Proving Ring Dial (divisions)	Force (kN)
0.0	0.0	0.00
0.5	14.0	0.04
1.0	22.0	0.07
1.5	27.0	0.08
2.0	32.0	0.09
2.5	**36.0**	**0.11**
3.0	40.0	0.12
3.5	43.5	0.13
4.0	47.0	0.14
4.5	51.0	0.15
5.0	**54.5**	**0.16**
5.5	58.0	0.17
6.0	62.0	0.18
6.5	66.5	0.20
7.0	70.5	0.21
7.5	75.0	0.22

2.5mm PENETRATION BEARING VALUE	
uncorrected	**0.8**
with curve shape correction (if needed)	**0.8**
5.0mm PENETRATION BEARING VALUE	
uncorrected	**0.8**
with curve shape correction (if needed)	**0.8**

FINAL CBR VALUE: 1.0

Lime Added:	0.0	%
Cement Added:	0.0	%

CBR FORCE-PENETRATION CURVE



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Please reply to: W.E. Campton

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Auckland 1149

Attention: **DAVID BOSSE**

Job Number: 64746#L
BGL Registration Number: 2931
Checked by: WEC

25th May 2023

ISOTROPICALLY CONSOLIDATED, UNDRAINED (CIU), MULTI-STAGE TRIAXIAL COMPRESSIVE STRENGTH TESTING

Dear Sir,

Re: SPARK DC
Your Reference: P523578
Report Number: 64746#L/CIU Triaxial Spark DC AU23-BH07 4.50 – 5.00m

Borehole No: AU23-BH07 Sample No: PT1 Depth: 4.50 – 5.00m

The following report presents the results of triaxial compressive strength testing at BGL of a 54mm diameter undisturbed push-tube soil sample delivered to this laboratory on the 2nd of May 2023.

The client request was to measure the isotropically consolidated, undrained compression of the sample in a triaxial apparatus under known conditions of effective stress, with measurement of porewater pressure. We were instructed to test a single sample at effective stresses of 50kPa, 100kPa, and 200kPa by carrying out a 3-point multi-stage test, where sample compression was terminated just before failure on cycles 1 & 2, and the sample was completely failed on cycle 3.

Test standards used were:

Water Content:	NZS4402: 1986: Test 2.1
Part 9: Consolidated triaxial compression tests on water saturated soils:	BS EN ISO 17892-9:2018

Please note that the multi-stage method described below is a special procedure that is not fully covered by BS EN ISO 17892-9:2018, however, is the most common type of triaxial soil test carried out by soils testing laboratories. The method described below refers to the general procedures described in BS EN ISO 17892-9:2018, and also to the methods described in "Manual of Soil Laboratory Testing Volume 3: Effective Stress Tests" by K.H. Head & R.J. Epps, 3rd Edition, 2014, Section 20.2 – Multistage triaxial test.

ISOTROPICALLY CONSOLIDATED, UNDRAINED (CIU), MULTI-STAGE TRIAXIAL COMPRESSIVE STRENGTH TESTING

Borehole No: AU23-BH07 **Sample No: PT1** **Depth: 4.50 – 5.00m**

Test Procedure

The sample was extruded from the push-tube and trimmed to length. The sample was then set up in a triaxial cell with vertical filter paper side drains and a single covering latex membrane. Saturation was achieved in distinct stages using 50kPa increments of cell pressure and back pressure, with a differential pressure of 10kPa (***the cell pressure was 10kPa greater than the back pressure***) in order to maintain a small positive effective stress. Saturation occurred through both the top and bottom ends of the sample.

The final saturation stage used a cell pressure of 400kPa and a back pressure of 390kPa. The bottom (base drainage) line was then closed & the sample was left overnight, allowing the porewater pressure to equalise throughout the sample. Saturation was then confirmed by closing the top (back pressure) line & increasing the cell pressure to 440kPa, observing the resulting increase in porewater pressure. A porewater pressure coefficient (***B***) of 1.00 was achieved, confirming saturation of the sample (ie. ***B*** ≥ 0.95).

Excess porewater pressure was then dissipated during the first consolidation cycle by opening the top (back pressure) line, resulting in an effective stress of 50kPa. The sample was then compressed at a set rate of 0.012mm per minute (actual rate of 0.011mm per minute). The compression was stopped when the deviator stress & stress ratio appeared to be close to maximum, and the load was taken off the sample. A final axial reading was then taken in order to calculate the rebound of the sample. The compression occurred under undrained conditions – ie. both the top (back pressure) and bottom (base drainage) lines were closed.

For cycle 2 the cell pressure was increased to 490kPa while the back pressure remained at 390kPa. The resulting increased porewater pressure was then dissipated by opening the top (back pressure) line, resulting in an effective stress of 100kPa acting on the same sample. Once consolidated, the 2nd compression cycle was compressed at a set rate of 0.012mm per minute (actual rate of 0.011mm per minute). The compression was stopped when the deviator stress & stress ratio appeared to be close to maximum, and the load was taken off the sample. A final axial reading was then taken in order to calculate the rebound of the sample. The compression occurred under undrained conditions – ie. both the top (back pressure) and bottom (base drainage) lines were closed.

For cycle 3 the cell pressure was increased to 590kPa while the back pressure remained at 390kPa. The resulting increased porewater pressure was dissipated by opening the top (back pressure) line, resulting in an effective stress of 200kPa acting on the same sample. Once consolidated, the 3rd compression cycle was compressed at a set rate of 0.012mm per minute (actual rate of 0.012mm per minute) until complete failure of the sample had occurred. The load was then taken off the sample and a final axial reading was taken in order to calculate the rebound of the sample at the end of the test. Like the previous cycles, the compression occurred under undrained conditions – ie. both the top (back pressure) and bottom (base drainage) lines were closed.

Mohr circle plots for each cycle are presented on page 5 of this report. We leave the determination of the effective angle of shearing resistance / effective angle of internal friction (Ø') and the effective cohesion (c') to our clients, but as a guide to this we tabulate each tangent to sets of circles on the graph.

Babbage Geotechnical Laboratory

ISOTROPICALLY CONSOLIDATED, UNDRAINED (CIU), MULTI-STAGE TRIAXIAL COMPRESSIVE STRENGTH TESTING

Borehole No: AU23-BH07 **Sample No: PT1** **Depth: 4.50 – 5.00m**

This test was carried out in a laboratory in which the temperature is controlled to be kept within the specification of the test standard. Each test result is data obtained at a specific test location. The nature and continuity of subsoil conditions away from the test area could vary from the data recovered during this testing. Please note that the test results relate only to the sample as-received, and relate only to the sample under test.

Thank you for the opportunity to carry out this testing. If you have any queries regarding the content of this report please contact the person authorising this report below at your convenience.

Yours faithfully,

Justin Franklin
Key Technical Person
Assistant Laboratory Manager
Babbage Geotechnical Laboratory

ACCREDITED
IANZ
TESTING LABORATORY
№ 126

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation. This report may not be reproduced except in full & with written approval from BGL.

Babbage Geotechnical Laboratory	Job Number:	Registration No:	Page 4 of 8	Version No:	7
	64746#L	2931		Issue Date:	July 2022
	Report No:	64746#L/CIU Triaxial Spark DC AU23-BH07 4.50 - 5.00m		Auth. By:	WEC

SPARK DC

CIU MULTI-STAGE TRIAXIAL COMPRESSION TEST

BS EN ISO 17892-9:2018: Part 9: Consolidated triaxial compression tests on water saturated soils	**Tested By:**	JF	May 2023
	Compiled By:	JF	23-May-23
NZS4402:1986: Test 2.1 - Water Content	**Checked By:**	WEC	25-May-23

Borehole: AU23-BH07 **Sample No:** PT1 **Depth:** 4.50 - 5.00m

Sample History: undisturbed ~~/ remoulded / compacted / other~~

Sample Description (not part of BGL IANZ accreditation):

CLAY, firm to stiff, highly plastic, light grey with black organic mottles, moist.

SAMPLE DETAILS

Initial Diameter:	54.1 mm	Initial Water Content:	50.9 %
Initial Length:	108.4 mm	Final Water Content:	42.4 %
Initial Mass:	428.83 g	Initial Dry Density:	1.14 t/m^3
Initial Bulk Density:	1.72 t/m^3	Final Dry Density:	1.29 t/m^3

SATURATION CYCLE

At End of Saturation:				
	Cell Pressure Increase:	40.0 kPa	Final Cell Pressure:	440 kPa
	Resulting Increase in Pore Pressure:	39.9 kPa	Final Pore Pressure:	429.8 kPa
	Pore Pressure Coefficient *B*:	1.00		

CONSOLIDATION CYCLES

Cycle Number:		1	2	3
Cell Pressure	kPa	**440**	**490**	**590**
Back Pressure	kPa	**390**	**390**	**390**
Effective Pressure	**kPa**	**50**	**100**	**200**
Pore Pressure at Start of Consolidation	kPa	427.8	449.9	514.6
Pore Pressure to Dissipate	kPa	37.8	59.9	124.6
Dissipation	%	96.0	99.0	100.0
Pore Pressure at End of Consolidation	kPa	391.5	390.6	390.0
Vertical Strain after Consol. (*cumulative)	%	0.94	* 3.09	* 6.83
Volumetric Strain after Consol. (*cumulative)	%	2.81	* 5.63	* 11.39

COMPRESSION CYCLES

Rate of Strain (set)	mm/min	0.012	0.012	0.012
Average Rate of Strain (actual)	mm/min	0.011	0.011	0.012
Average Rate of Strain (actual)	% per hour	0.62	0.48	0.58
Pore Pressure at Start of Compression	kPa	391.5	390.6	390.0
Vertical Effective Stress at Start of Compression	kPa	48.5	99.4	200.0

FAILURE CONDITIONS

Criteria Used to Determine Failure:		**maximum deviator stress / ~~maximum effective stress ratio~~**		
Axial Strain at Failure (*cumulative)	%	1.90	* 3.93	* 8.55
Axial Strain at Failure (*cumulative)	mm	2.04	* 4.89	* 10.43
Axial Strain after rebound (*cumulative)	%	1.21	* 3.07	* 14.79
Axial Strain after rebound (*cumulative)	mm	1.30	* 3.25	* 15.09
Deviator Stress at Failure	kPa	56.4	89.8	146.5
Pore Pressure at Failure	kPa	414.1	444.0	493.0
Vertical Effective Stress at Failure	kPa	82.3	135.8	243.5
Horizontal Effective Stress at Failure	kPa	25.9	46.0	97.0
Effective Stress Ratio at Failure		3.178	2.951	2.511
			Failure Type:	**PLASTIC**

CORRECTIONS APPLIED TO MEASURED DEVIATOR STRESS AT FAILURE

Elastic Membrane Restraining Effect Correction	kPa	0.39	0.81	1.77
Vertical Filter Paper Side Drain Correction	kPa	0.01	0.01	0.01

Babbage Geotechnical Laboratory	3-POINT CIU MULTI-STAGE TRIAXIAL COMPRESSION TEST					Page 5 of 8	Version No:	7
							Issue Date:	July 2022
	BS EN ISO 17892-9:2018: Part 9: Consolidated triaxial compression tests on water saturated soils						Auth. By:	WEC
	PROJECT:	SPARK DC					Initials	Date
						Tested By:	JF	May 2023
	Job No:	64746#L	Borehole Number:	AU23-BH07	Depth: 4.50 - 5.00m	Plotted By:	JF	23-May-23
	Reg. No:	2931	Sample Number:	PT1		Checked By:	WEC	25-May-23

Mohr Circle Plot:

cycle	Vertical Effective Stress σ_v' kPa	Horizontal Effective Stress σ_h' kPa	Effective Stress Path Parameters $(\sigma_v' + \sigma_h') / 2$ kPa	$(\sigma_v' - \sigma_h') / 2$ kPa
1	82	26	54	28
2	136	46	91	45
3	244	97	170	73

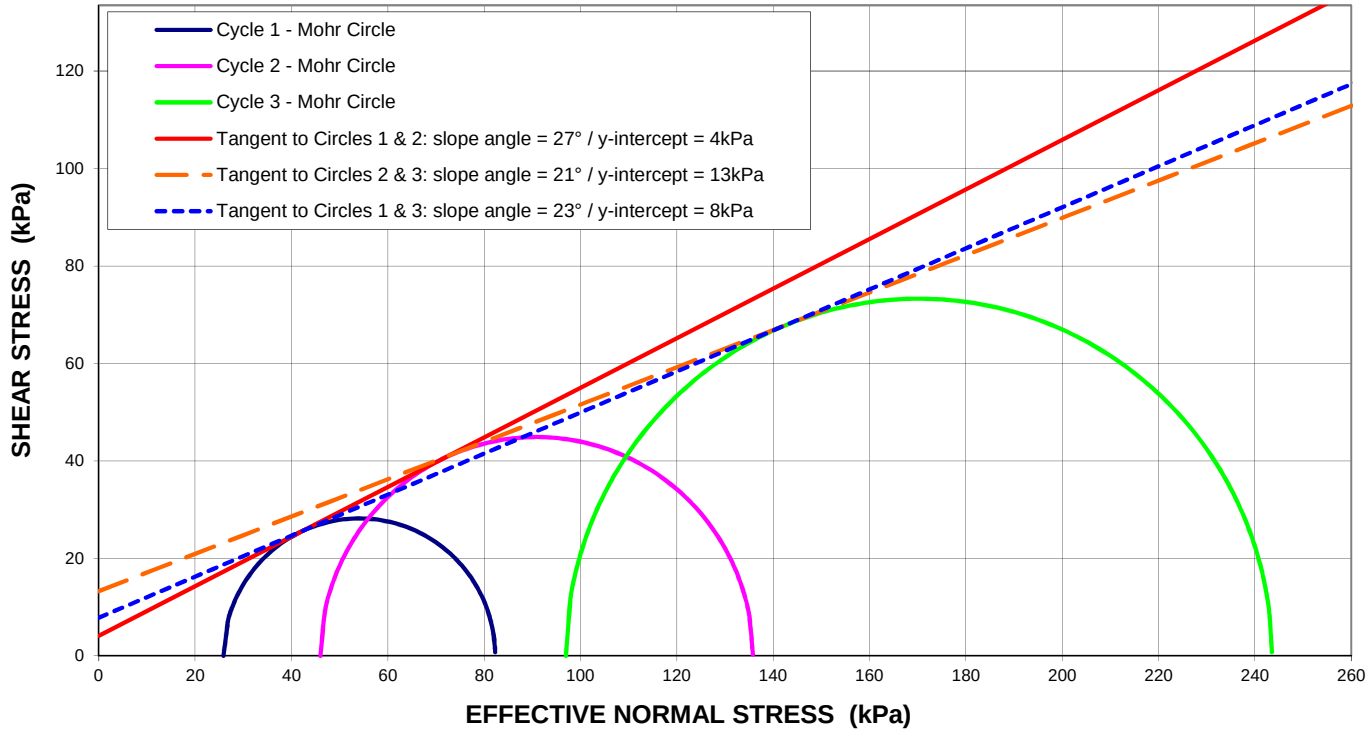
From Graph Below:

Angle of Shear Resistance $\phi'=$ _____ **degrees**

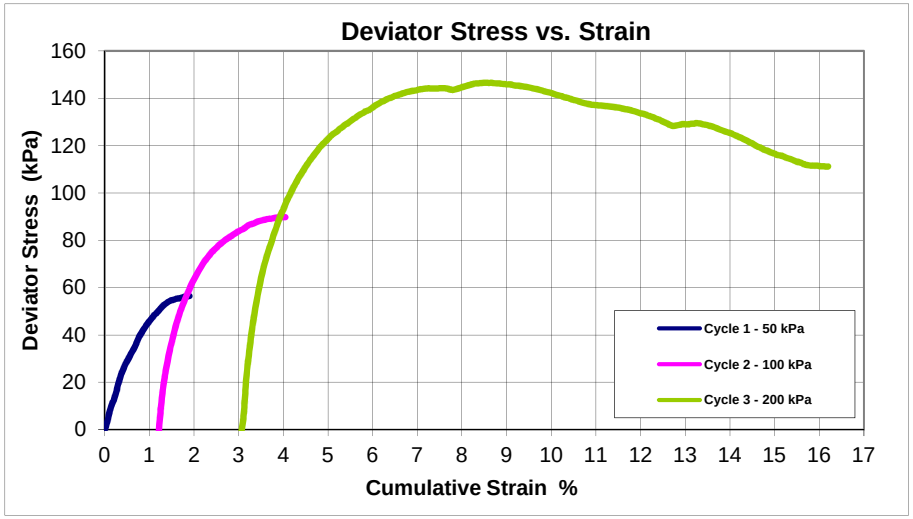
Cohesion $c'=$ _____ **kPa**

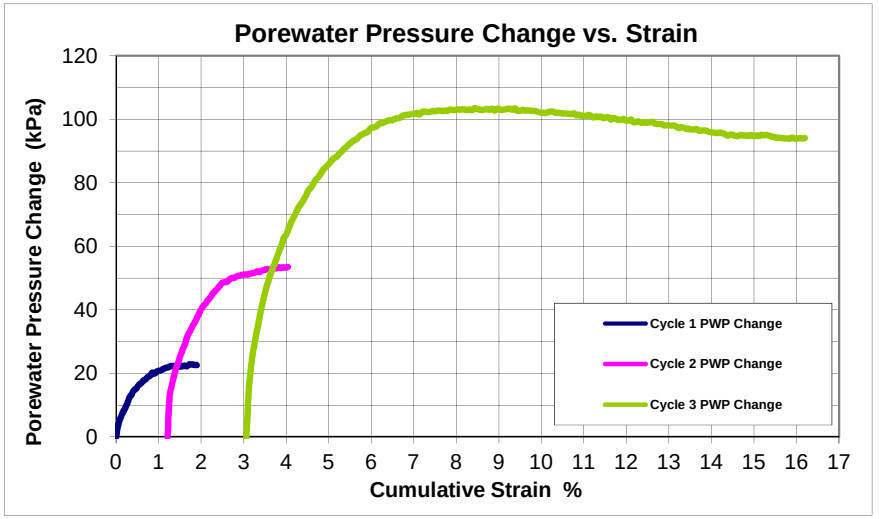
(Values to be decided upon by Geotechnical Engineer)

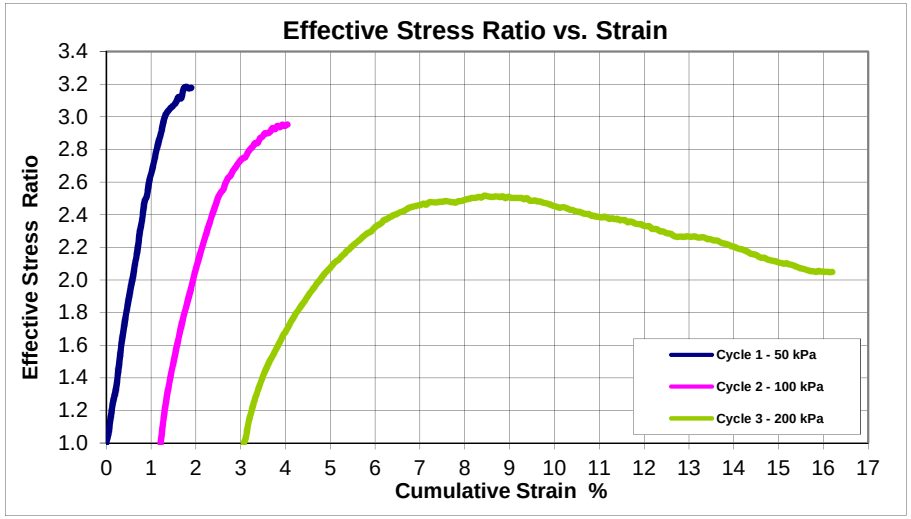
MOHR CIRCLE PLOT

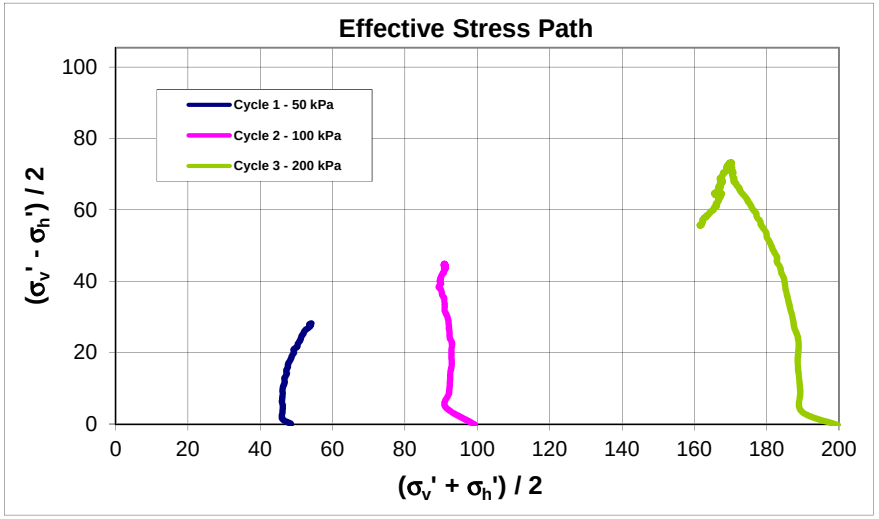


Babbage Geotechnical Laboratory	3-POINT CIU MULTI-STAGE TRIAXIAL COMPRESSION TEST					Page 6 of 8	Version No:	7
							Issue Date:	July 2022
	BS EN ISO 17892-9:2018: Part 9: Consolidated triaxial compression tests on water saturated soils						Auth. By:	WEC
	PROJECT:	SPARK DC					Initials	Date
						Tested By:	JF	May 2023
	Job No:	64746#L	Borehole Number:	AU23-BH07	Depth:	4.50 - 5.00m	Plotted By:	JF	23-May-23
	Reg. No:	2931	Sample Number:	PT1			Checked By:	WEC	25-May-23

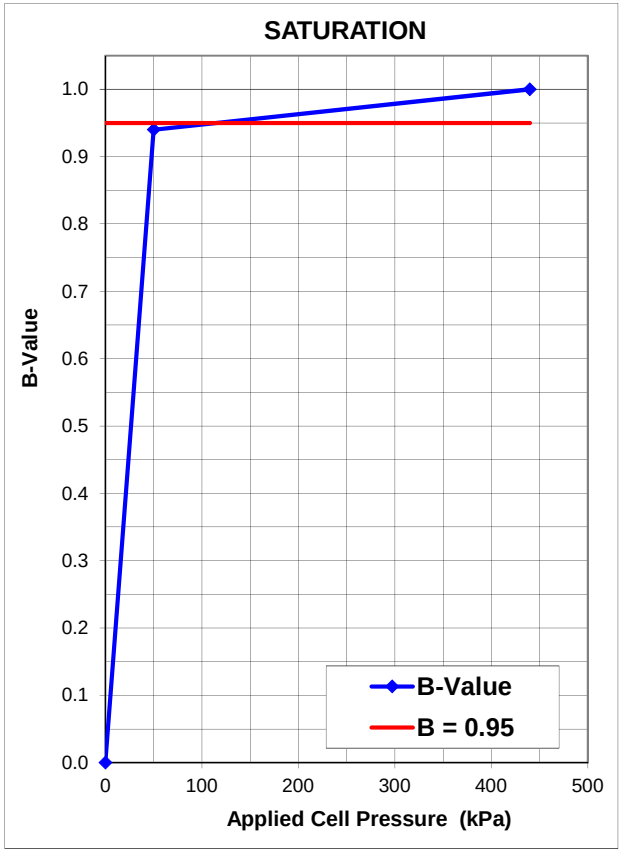


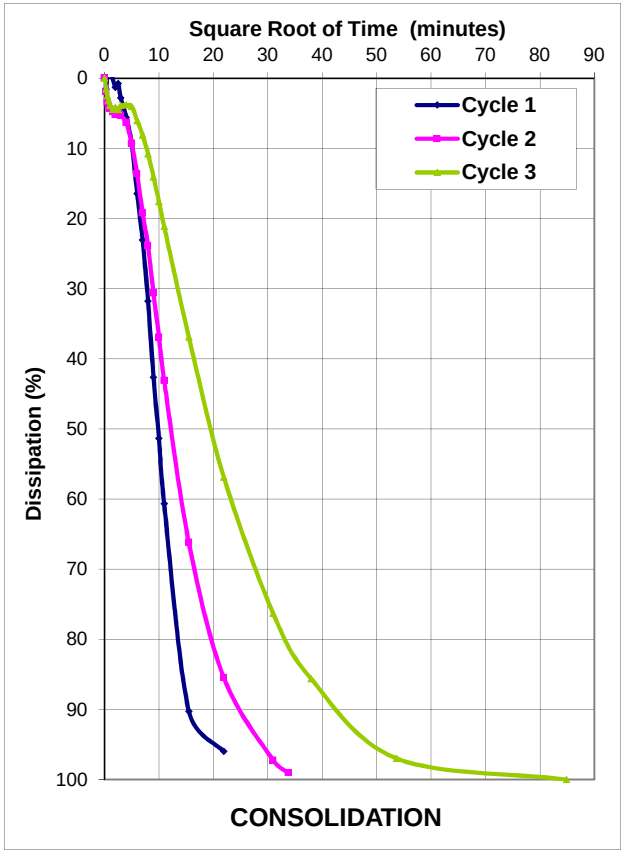


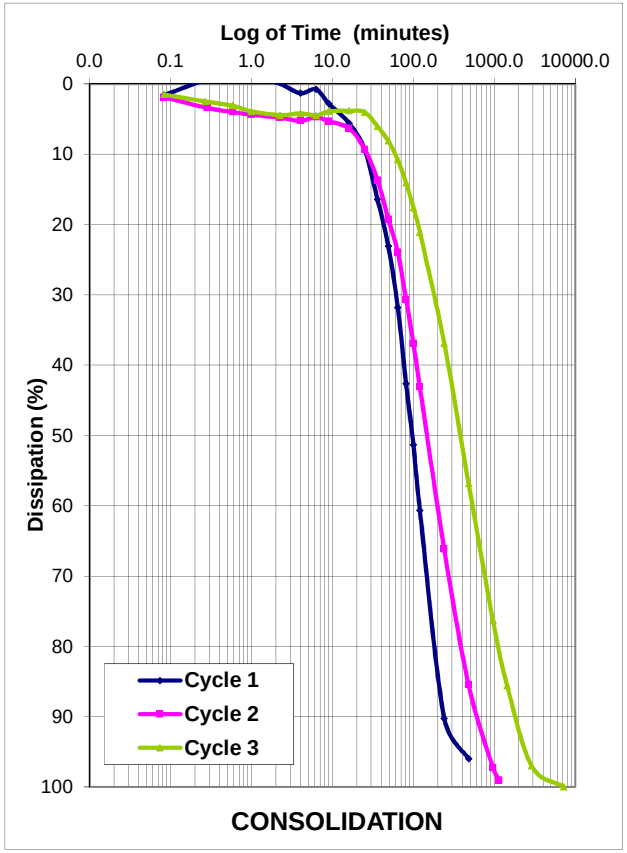




BGL Babbage Geotechnical Laboratory	3-POINT CIU MULTI-STAGE TRIAXIAL COMPRESSION TEST				Page 7 of 8	Version No:	7
						Issue Date:	July 2022
	BS EN ISO 17892-9:2018: Part 9: Consolidated triaxial compression tests on water saturated soils					Auth. By:	WEC
	PROJECT:	SPARK DC				Initials	Date
					Tested By:	JF	May 2023
	Job No: 64746#L	Borehole Number: AU23-BH07		Depth: 4.50 - 5.00m	Plotted By:	JF	23-May-23
	Reg. No: 2931	Sample Number: PT1			Checked By:	WEC	25-May-23







BGL Babbage Geotechnical Laboratory	3-POINT CIU MULTI-STAGE TRIAXIAL COMPRESSION TEST					Page 8 of 8	Version No:	7
							Issue Date:	July 2022
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	Reg. No:	2931	Sample Number:	PT1		Checked By:	WEC	25-May-23

SAMPLE BEFORE TEST



SAMPLE AFTER TEST



Babbage Geotechnical Laboratory
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64-9-367 4954
wec@babbage.co.nz

Please reply to: W.E. Campton

Aurecon New Zealand Limited
PO Box 9762
Newmarket
Auckland 1149

Attention: **DAVID BOSSE**

Job Number: 64746#L
BGL Registration Number: 2931
Checked by: WEC

25th May 2023

ISOTROPICALLY CONSOLIDATED, UNDRAINED (CIU), MULTI-STAGE TRIAXIAL COMPRESSIVE STRENGTH TESTING

Dear Sir,

Re: SPARK DC
Your Reference: P523578
Report Number: 64746#L/CIU Triaxial Spark DC AU23-BH08 3.00 – 3.45m

Borehole No: AU23-BH08 Sample No: PT1 Depth: 3.00 – 3.45m

The following report presents the results of triaxial compressive strength testing at BGL of a 60mm diameter undisturbed push-tube soil sample delivered to this laboratory on the 2nd of May 2023.

The client request was to measure the isotropically consolidated, undrained compression of the sample in a triaxial apparatus under known conditions of effective stress, with measurement of porewater pressure. We were instructed to test a single sample at effective stresses of 50kPa, 100kPa, and 200kPa by carrying out a 3-point multi-stage test, where sample compression was terminated just before failure on cycles 1 & 2, and the sample was completely failed on cycle 3.

Test standards used were:

Water Content:	NZS4402: 1986: Test 2.1
Part 9: Consolidated triaxial compression tests on water saturated soils:	BS EN ISO 17892-9:2018

Please note that the multi-stage method described below is a special procedure that is not fully covered by BS EN ISO 17892-9:2018, however, is the most common type of triaxial soil test carried out by soils testing laboratories. The method described below refers to the general procedures described in BS EN ISO 17892-9:2018, and also to the methods described in "Manual of Soil Laboratory Testing Volume 3: Effective Stress Tests" by K.H. Head & R.J. Epps, 3rd Edition, 2014, Section 20.2 – Multistage triaxial test.

ISOTROPICALLY CONSOLIDATED, UNDRAINED (CIU), MULTI-STAGE TRIAXIAL COMPRESSIVE STRENGTH TESTING

Borehole No: AU23-BH08 **Sample No: PT1** **Depth: 3.00 – 3.45m**

Test Procedure

The sample was extruded from the push-tube and trimmed to length. The sample was then set up in a triaxial cell with vertical filter paper side drains and a single covering latex membrane. Saturation was achieved in distinct stages using 50kPa increments of cell pressure and back pressure, with a differential pressure of 10kPa (***the cell pressure was 10kPa greater than the back pressure***) in order to maintain a small positive effective stress. Saturation occurred through both the top and bottom ends of the sample.

The final saturation stage used a cell pressure of 400kPa and a back pressure of 390kPa. The bottom (base drainage) line was then closed & the sample was left overnight, allowing the porewater pressure to equalise throughout the sample. Saturation was then confirmed by closing the top (back pressure) line & increasing the cell pressure to 440kPa, observing the resulting increase in porewater pressure. A porewater pressure coefficient (***B***) of 1.00 was achieved, confirming saturation of the sample (ie. ***B*** ≥ 0.95).

Excess porewater pressure was then dissipated during the first consolidation cycle by opening the top (back pressure) line, resulting in an effective stress of 50kPa. The sample was then compressed at a set rate of 0.012mm per minute (actual rate of 0.014mm per minute). The compression was stopped when the deviator stress & stress ratio appeared to be close to maximum, and the load was taken off the sample. A final axial reading was then taken in order to calculate the rebound of the sample. The compression occurred under undrained conditions – ie. both the top (back pressure) and bottom (base drainage) lines were closed.

For cycle 2 the cell pressure was increased to 490kPa while the back pressure remained at 390kPa. The resulting increased porewater pressure was then dissipated by opening the top (back pressure) line, resulting in an effective stress of 100kPa acting on the same sample. Once consolidated, the 2nd compression cycle was compressed at a set rate of 0.012mm per minute (actual rate of 0.014mm per minute). The compression was stopped when the deviator stress & stress ratio appeared to be close to maximum, and the load was taken off the sample. A final axial reading was then taken in order to calculate the rebound of the sample. The compression occurred under undrained conditions – ie. both the top (back pressure) and bottom (base drainage) lines were closed.

For cycle 3 the cell pressure was increased to 590kPa while the back pressure remained at 390kPa. The resulting increased porewater pressure was dissipated by opening the top (back pressure) line, resulting in an effective stress of 200kPa acting on the same sample. Once consolidated, the 3rd compression cycle was compressed at a set rate of 0.012mm per minute (actual rate of 0.014mm per minute) until complete failure of the sample had occurred. The load was then taken off the sample and a final axial reading was taken in order to calculate the rebound of the sample at the end of the test. Like the previous cycles, the compression occurred under undrained conditions – ie. both the top (back pressure) and bottom (base drainage) lines were closed.

Mohr circle plots for each cycle are presented on page 5 of this report. We leave the determination of the effective angle of shearing resistance / effective angle of internal friction (Ø') and the effective cohesion (c') to our clients, but as a guide to this we tabulate each tangent to sets of circles on the graph.

Babbage Geotechnical Laboratory

ISOTROPICALLY CONSOLIDATED, UNDRAINED (CIU), MULTI-STAGE TRIAXIAL COMPRESSIVE STRENGTH TESTING

Borehole No: AU23-BH08 **Sample No: PT1** **Depth: 3.00 – 3.45m**

This test was carried out in a laboratory in which the temperature is controlled to be kept within the specification of the test standard. Each test result is data obtained at a specific test location. The nature and continuity of subsoil conditions away from the test area could vary from the data recovered during this testing. Please note that the test results relate only to the sample as-received, and relate only to the sample under test.

Thank you for the opportunity to carry out this testing. If you have any queries regarding the content of this report please contact the person authorising this report below at your convenience.

Yours faithfully,

Justin Franklin
Key Technical Person
Assistant Laboratory Manager
Babbage Geotechnical Laboratory

ACCREDITED
TESTING LABORATORY
№ 126

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Babbage Geotechnical Laboratory	Job Number:	Registration No:	Page 4 of 8	Version No:	7
	64746#L	2931		Issue Date:	July 2022
	Report No:	64746#L/CIU Triaxial Spark DC AU23-BH08 3.00 - 3.45m		Auth. By:	WEC

SPARK DC

CIU MULTI-STAGE TRIAXIAL COMPRESSION TEST

BS EN ISO 17892-9:2018: Part 9: Consolidated triaxial compression tests on water saturated soils	**Tested By:**	JF	May 2023
	Compiled By:	JF	23-May-23
NZS4402:1986: Test 2.1 - Water Content	**Checked By:**	WEC	25-May-23

Borehole: AU23-BH08 **Sample No:** PT1 **Depth:** 3.00 - 3.45m

Sample History: undisturbed ~~/ remoulded / compacted / other~~

Sample Description (not part of BGL IANZ accreditation):

CLAY, soft to firm, highly plastic, light grey with black organic mottles, very moist.

SAMPLE DETAILS

Initial Diameter:	60.0 mm	Initial Water Content:	62.0 %
Initial Length:	120.0 mm	Final Water Content:	47.2 %
Initial Mass:	557.46 g	Initial Dry Density:	1.01 t/m^3
Initial Bulk Density:	1.64 t/m^3	Final Dry Density:	1.18 t/m^3

SATURATION CYCLE

At End of Saturation:	Cell Pressure Increase:	40.0 kPa	Final Cell Pressure:	440 kPa
	Resulting Increase in Pore Pressure:	39.8 kPa	Final Pore Pressure:	429.1 kPa
	Pore Pressure Coefficient *B*:	1.00		

CONSOLIDATION CYCLES

Cycle Number:		1	2	3
Cell Pressure	kPa	**440**	**490**	**590**
Back Pressure	kPa	**390**	**390**	**390**
Effective Pressure	**kPa**	**50**	**100**	**200**
Pore Pressure at Start of Consolidation	kPa	430.4	454.6	515.3
Pore Pressure to Dissipate	kPa	40.4	64.6	125.3
Dissipation	%	99.8	102.9	100.0
Pore Pressure at End of Consolidation	kPa	390.1	388.1	390.0
Vertical Strain after Consol. (*cumulative)	%	1.65	* 4.54	* 8.01
Volumetric Strain after Consol. (*cumulative)	%	4.96	* 8.36	* 14.23

COMPRESSION CYCLES

Rate of Strain (set)	mm/min	0.012	0.012	0.012
Average Rate of Strain (actual)	mm/min	0.014	0.014	0.014
Average Rate of Strain (actual)	% per hour	0.71	0.47	0.57
Pore Pressure at Start of Compression	kPa	390.1	388.1	390.0
Vertical Effective Stress at Start of Compression	kPa	49.9	101.9	200.0

FAILURE CONDITIONS

Criteria Used to Determine Failure:		**maximum deviator stress /** ~~**maximum effective stress ratio**~~		
Axial Strain at Failure (*cumulative)	%	2.55	* 4.14	* 6.85
Axial Strain at Failure (*cumulative)	mm	3.01	* 5.76	* 9.70
Axial Strain after rebound (*cumulative)	%	1.74	* 3.27	* 16.68
Axial Strain after rebound (*cumulative)	mm	2.06	* 3.81	* 18.61
Deviator Stress at Failure	kPa	44.5	69.6	107.9
Pore Pressure at Failure	kPa	419.2	443.1	491.0
Vertical Effective Stress at Failure	kPa	65.3	116.5	206.9
Horizontal Effective Stress at Failure	kPa	20.8	46.9	99.0
Effective Stress Ratio at Failure		3.138	2.485	2.089
			Failure Type:	**PLANAR / PLASTIC**

CORRECTIONS APPLIED TO MEASURED DEVIATOR STRESS AT FAILURE

Elastic Membrane Restraining Effect Correction	kPa	0.48	0.77	1.28
Vertical Filter Paper Side Drain Correction	kPa	0.01	0.01	0.01

Babbage Geotechnical Laboratory	3-POINT CIU MULTI-STAGE TRIAXIAL COMPRESSION TEST					Page 5 of 8	Version No:	7
							Issue Date:	July 2022
	BS EN ISO 17892-9:2018: Part 9: Consolidated triaxial compression tests on water saturated soils						Auth. By:	WEC
	PROJECT:	SPARK DC					Initials	Date
						Tested By:	JF	May 2023
	Job No:	64746#L	Borehole Number:	AU23-BH08	Depth: 3.00 - 3.45m	Plotted By:	JF	23-May-23
	Reg. No:	2931	Sample Number:	PT1		Checked By:	WEC	25-May-23

Mohr Circle Plot:

cycle	Vertical Effective Stress σ_v' kPa	Horizontal Effective Stress σ_h' kPa	Effective Stress Path Parameters $(\sigma_v' + \sigma_h') / 2$ kPa	$(\sigma_v' - \sigma_h') / 2$ kPa
1	65	21	43	22
2	117	47	82	35
3	207	99	153	54

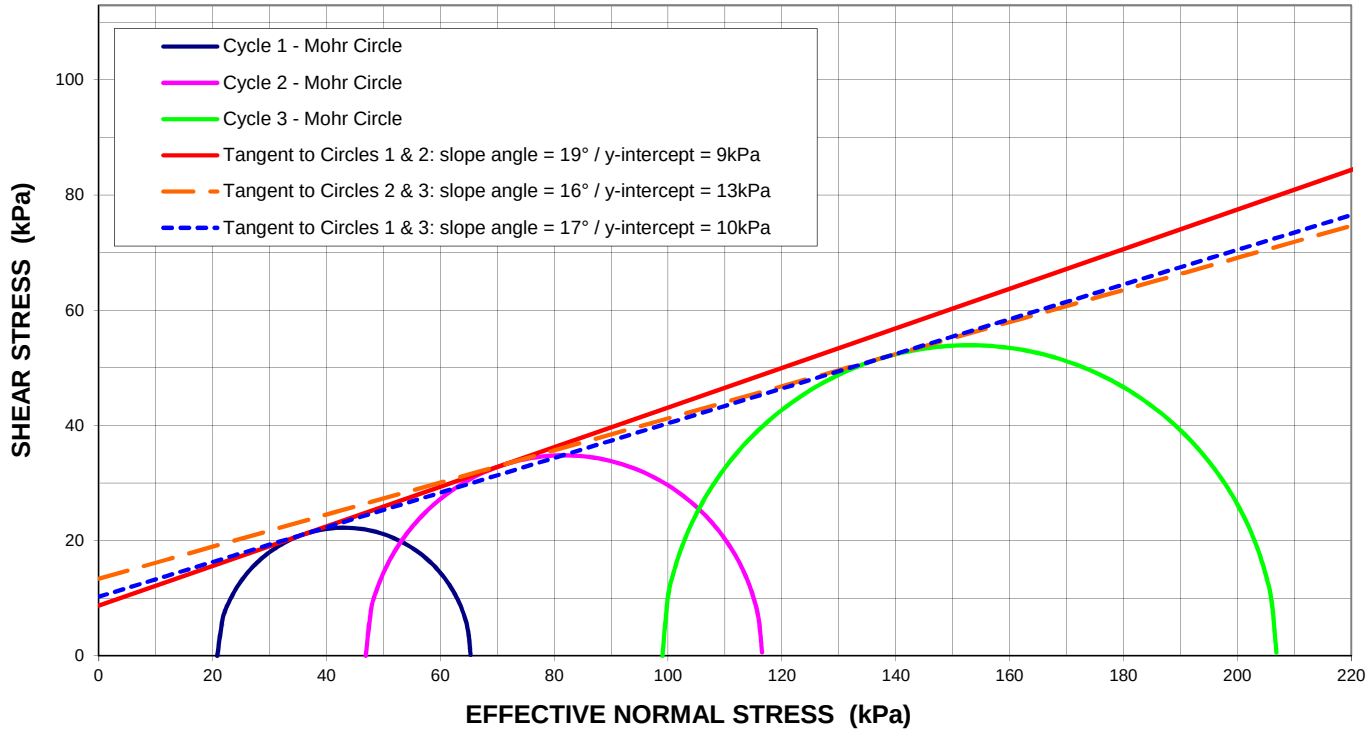
From Graph Below:

Angle of Shear Resistance $\phi'=$ _____ **degrees**

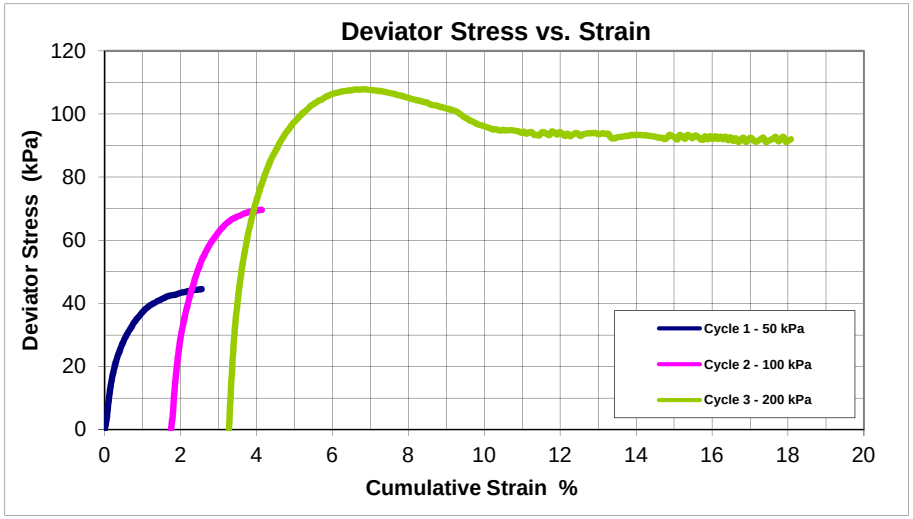
Cohesion $c'=$ _____ **kPa**

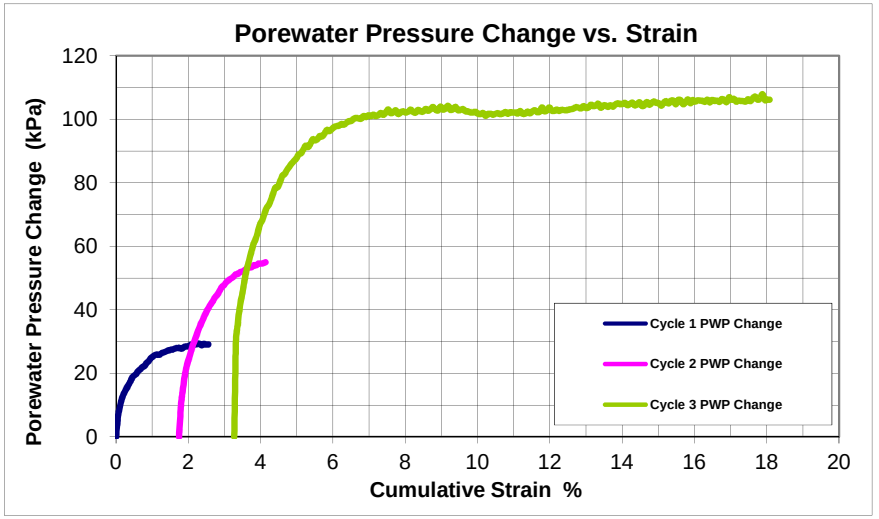
(Values to be decided upon by Geotechnical Engineer)

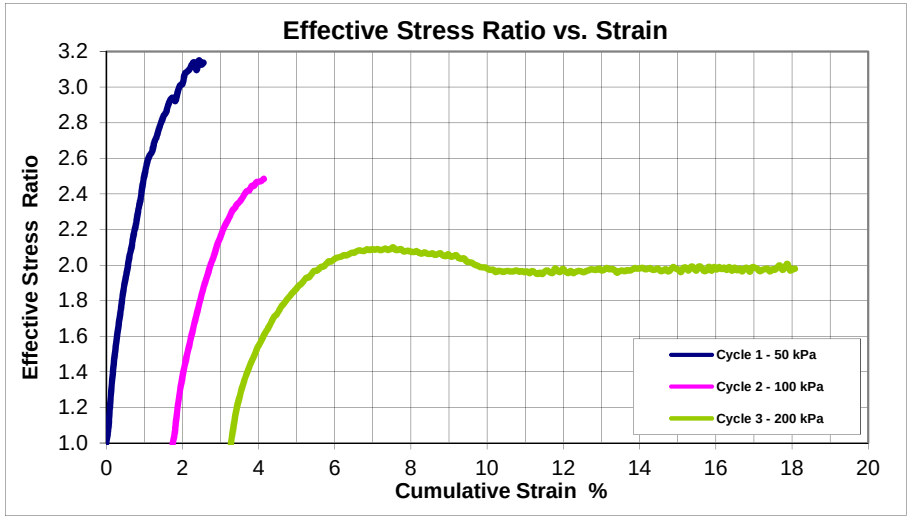
MOHR CIRCLE PLOT

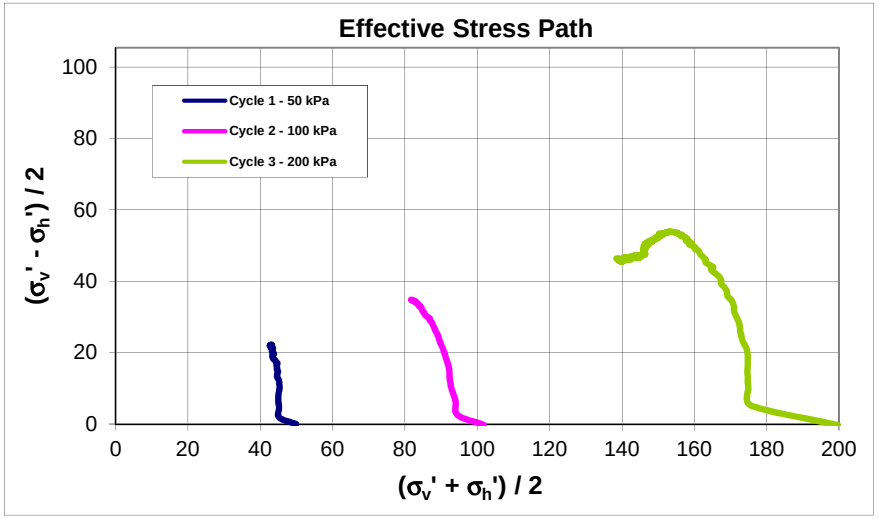


BGL Babbage Geotechnical Laboratory	3-POINT CIU MULTI-STAGE TRIAXIAL COMPRESSION TEST					Page 6 of 8	Version No:	7
							Issue Date:	July 2022
	BS EN ISO 17892-9:2018: Part 9: Consolidated triaxial compression tests on water saturated soils						Auth. By:	WEC
	PROJECT:	SPARK DC					Initials	Date
						Tested By:	JF	May 2023
	Job No:	64746#L	Borehole Number:	AU23-BH08	Depth:	3.00 - 3.45m	Plotted By:	JF	23-May-23
	Reg. No:	2931	Sample Number:	PT1			Checked By:	WEC	25-May-23

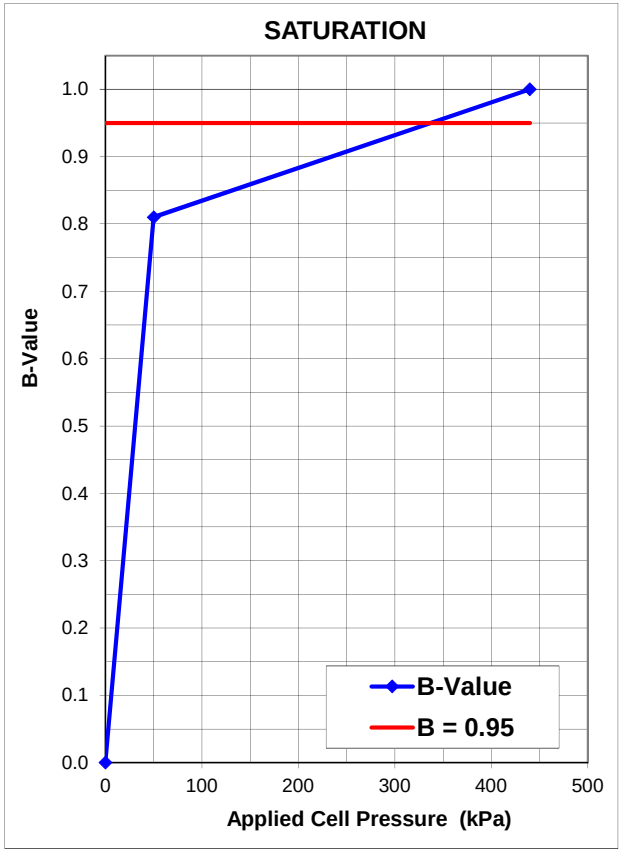


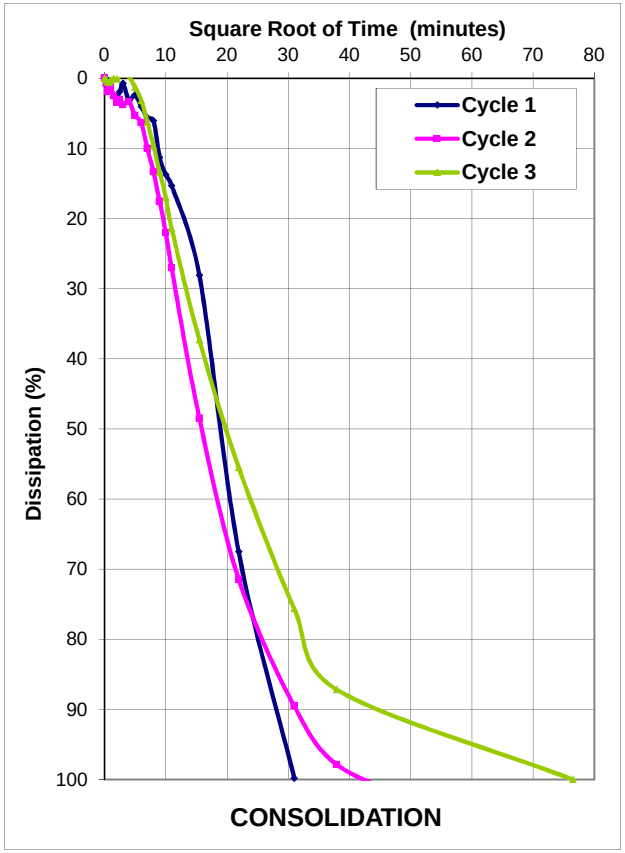


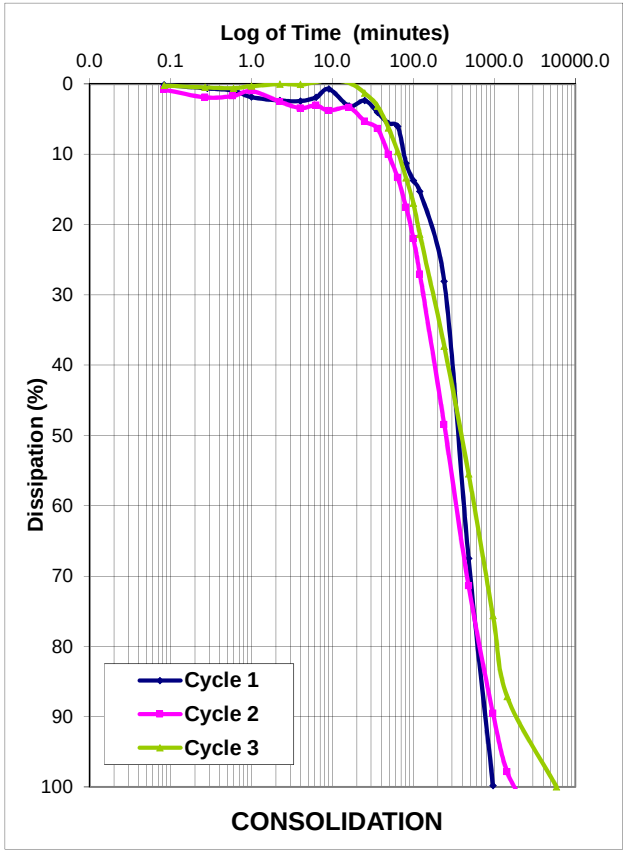




BGL Babbage Geotechnical Laboratory	3-POINT CIU MULTI-STAGE TRIAXIAL COMPRESSION TEST					Page 7 of 8	Version No:	7
							Issue Date:	July 2022
	BS EN ISO 17892-9:2018: Part 9: Consolidated triaxial compression tests on water saturated soils						Auth. By:	WEC
	PROJECT:	SPARK DC					Initials	Date
						Tested By:	JF	May 2023
	Job No:	64746#L	Borehole Number:	AU23-BH08	Depth: 3.00 - 3.45m	Plotted By:	JF	23-May-23
	Reg. No:	2931	Sample Number:	PT1		Checked By:	WEC	25-May-23







BGL Babbage Geotechnical Laboratory	3-POINT CIU MULTI-STAGE TRIAXIAL COMPRESSION TEST					Page 8 of 8	Version No:	7
							Issue Date:	July 2022
	BS EN ISO 17892-9:2018: Part 9: Consolidated triaxial compression tests on water saturated soils						Auth. By:	WEC
	PROJECT:	SPARK DC					Initials	Date
						Tested By:	JF	May 2023
	Job No:	64746#L	Borehole Number:	AU23-BH08	Depth: 3.00 - 3.45m	Plotted By:	JF	23-May-23
	Reg. No:	2931	Sample Number:	PT1		Checked By:	WEC	25-May-23

SAMPLE BEFORE TEST



SAMPLE AFTER TEST



Babbage Geotechnical Laboratory
Level 4
68 Beach Road
Auckland 1010
Telephone
E-mail

P O Box 2027
New Zealand
64-9-367 4954
wec@babbage.co.nz

Please reply to: W.E. Campton

Aurecon New Zealand Limited
PO Box 9762
Newmarket
Auckland 1149

Attention: **DAVID BOSSE**

Job Number: 64746#L
BGL Registration Number: 2931
Checked by: JF

22nd May 2023

ONE DIMENSIONAL CONSOLIDATION TESTING

Dear Sir,

Re: SPARK DC
Your Reference: P523578
Report Number: 64746#L/Consol Spark DC AU23-BH07 4.50 – 5.00m

Borehole No: AU23-BH07 Sample No: PT1 Depth: 4.50 – 5.00m

The following report presents the results of one dimensional consolidation testing at BGL of a 54mm diameter undisturbed push-tube soil sample delivered to this laboratory on the 2nd of May 2023. Our instructions were to carry out a one dimensional consolidation test using cycle times that would give both the $\sqrt{T_{90}}$ and T_{50} values, and using a standard pressure sequence.

The push-tube sample was tested in accordance with the following standards:

Water Content:	NZS4402:1986:Test 2.1
One Dimensional Consolidation:	NZS4402:1986:Test 7.1

Please note that consolidation cycles were of a variable time duration, and hence is a departure from the test standard which states that the cycle time period for the consolidation loads after the initial cycle should be of approximately the same length. Subsequent load cycles were taken to at least the time of the previous cycle.

The sample was extruded from the tube in small increments & trimmed into the consolidation ring, until the sample protruded from both sides of the ring. A wire was then used to cut the sample from the soil remaining in the tube, and a scalpel and straight edge were used to trim the sample flat in the ring.

These test results only relate to the sample tested. The values of m_v shown on the table have been calculated for each pressure increment, using void ratio difference for that increment. Note that a solid density value of 2.65t/m^3 was assumed for this test, and is not part of the IANZ endorsement for this report. This test was carried out in a laboratory in which the temperature is controlled to be kept within the specification of the test standard.

As per the reporting requirements of NZS4402: 1986: Test 2.1: water content is reported to two significant figures for values below 10%, and to three significant figures for values of 10% or greater. As per the reporting requirements of NZS4402: 1986: Test 7.1: one dimensional consolidation, the coefficients of consolidation (c_v's), and coefficients of volume compressibility (m_v's) are reported to two significant figures.

The "Void Ratio vs. Applied Pressure – Linear Scale" plot presented on page 4 is included for your information, and is based on the paper "Soil stiffness measured in oedometer tests" by L. Wesley & M. Pender, Proc. 18th NZGS Geotechnical Symposium on Soil-Structure Interaction, 2008. Please note that the presentation of the data on a linear scale is not part of the test standard, hence page 4 does not form part of the IANZ endorsement for this report.

Note that the Coefficient of Secondary Compression (C_{sec}) and the Coefficient of Permeability (k) values reported on page 5 have been calculated based on the methods described in "Manual of Soil Laboratory Testing Volume 2: Permeability, Shear Strength & Compressibility Tests" by K.H. Head & R.J. Epps, 3rd Edition, 2011. The Coefficient of Permeability values were calculated using the c_v(log) values determined in the test. The reporting of these figures is not part of NZS4402:1986:Test 7.1, therefore these figures are not part of the IANZ endorsement for this report.

Sample Description (***not part of BGL IANZ Accreditation***)

AU23-BH07 / PT1 / 4.50 – 5.00m:

CLAY, stiff, highly plastic, light greenish grey with black speckles (roots), moist.

Each test result is data obtained at a specific test location. The nature and continuity of subsoil conditions away from the test area could vary from the data recovered during this testing, therefore the test results relate only to the sample as-received, and relate only to the sample under test.

Thank you for the opportunity to carry out this testing. If you have any queries regarding the content of this report please contact the person authorising this report below at your convenience.

Yours faithfully,

Wayne Campton
Key Technical Person
Laboratory Manager
Babbage Geotechnical Laboratory

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TESTING LABORATORY
№ 126

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation. This report may not be reproduced except in full & with written approval from BGL.

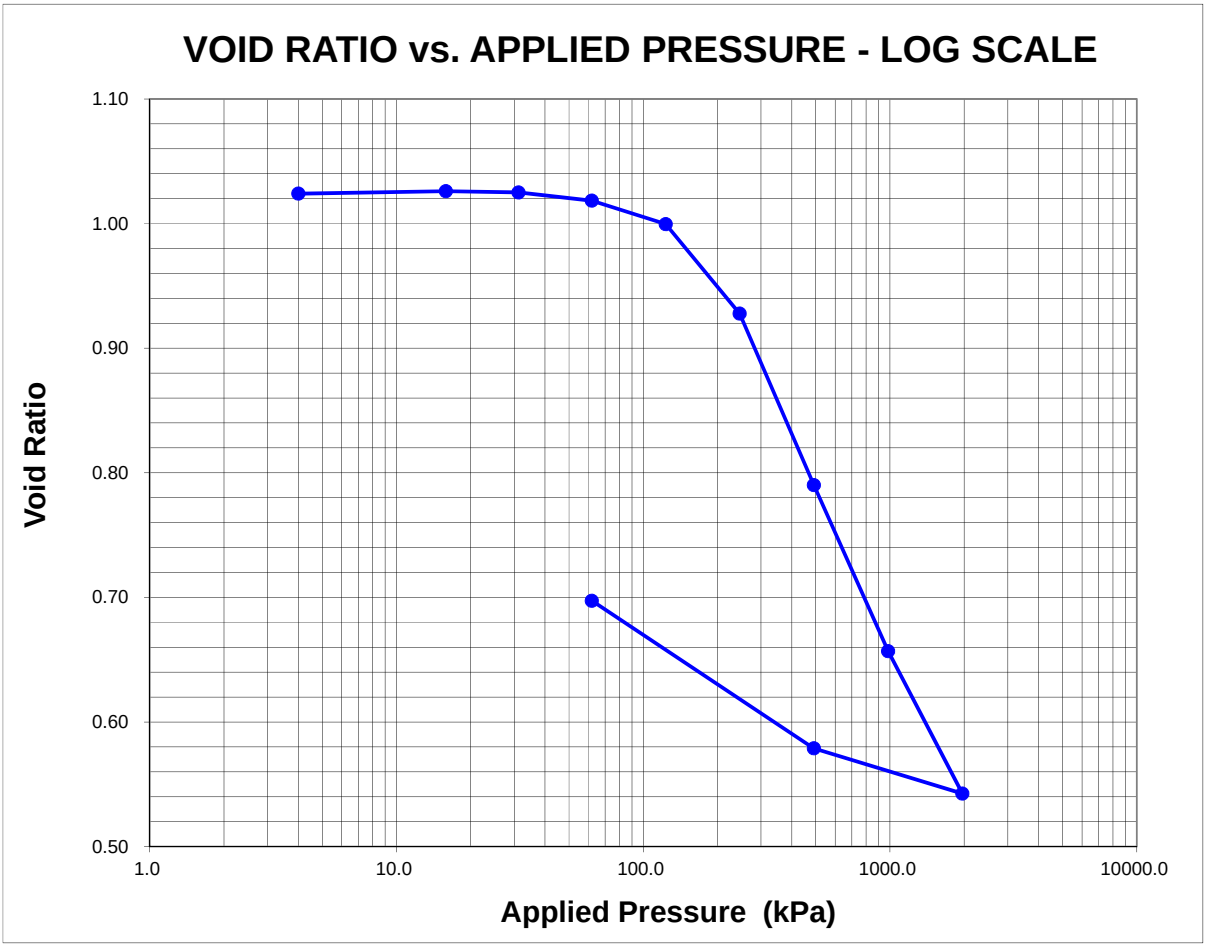
Babbage Geotechnical Laboratory	Job No:	Reg. No:	Page	of	Version No:	13
	64746#L	2931	3	5	Issue Date:	July 2022
	PROJECT:				Auth. By:	WEC

SPARK DC

ONE DIMENSIONAL CONSOLIDATION

Test Method: NZS4402:1986:Test 2.1 - Water Content	Tested By:	WEC	May 2023
Test Method: NZS4402:1986:Test 7.1 - Consolidation	Compiled By:	WEC	22-May-23
	Checked By:	JF	22-May-23

Borehole No: AU23-BH07 **Sample No:** PT1 **Depth:** 4.50 - 5.00m



SAMPLE HISTORY & PREPARATION

undisturbed / ~~disturbed~~

Sample from 54mm diameter push-tube

Extruded from 54mm diameter tube in small increments & trimmed into consol ring. Both sides of ring then trimmed flat with a scalpel & straight edge.

TEST DETAILS

Consol machine number:	3		Surface area of sample top:	1997	mm^2
Consol ring number:	3b		Sample mass:	72.543	g
Sample diameter:	50.43	mm	Initial bulk density:	1.82	t/m^3
Sample height:	19.97	mm	Assumed solid density of soil particles:	2.65	t/m^3

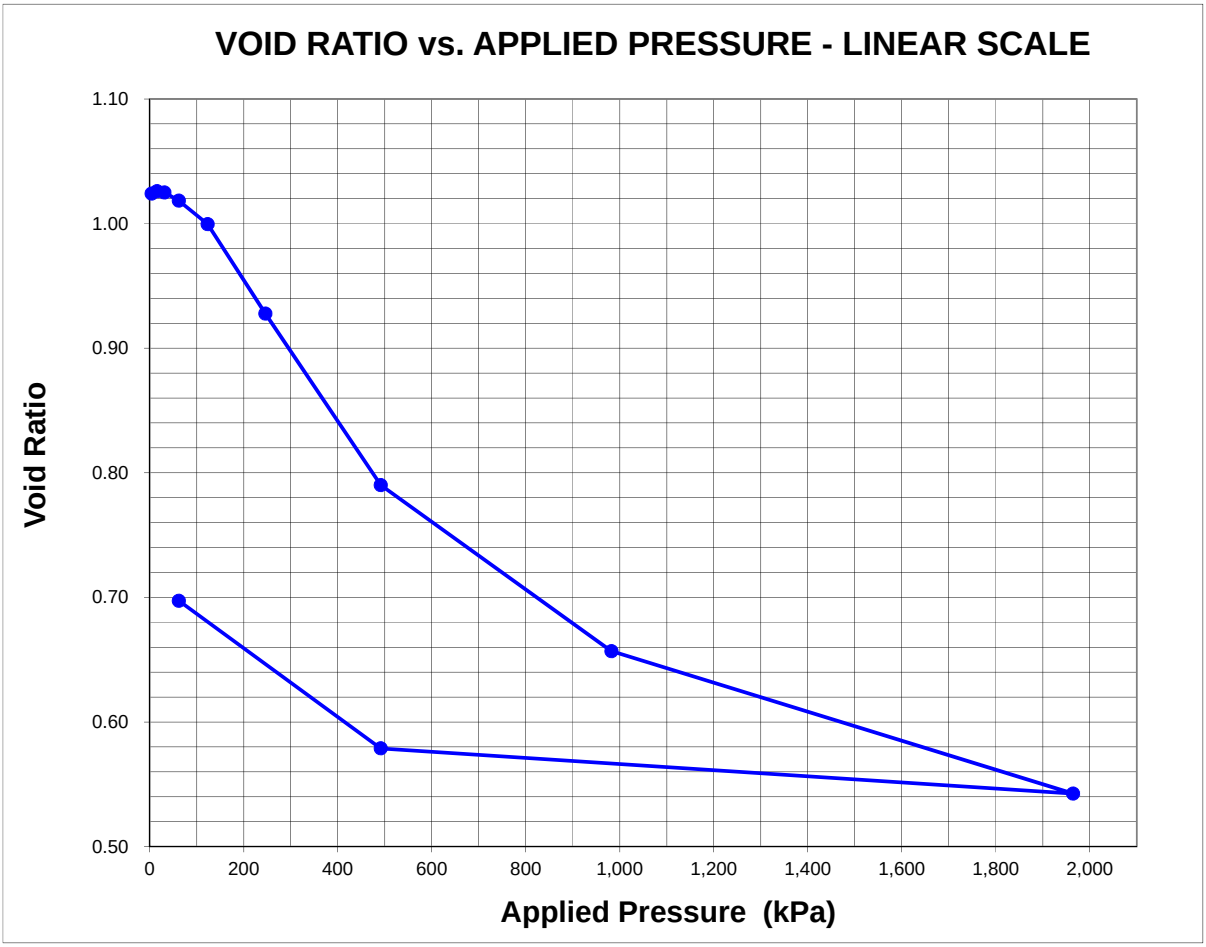
Babbage Geotechnical Laboratory	Job No:	Reg. No:	Page	of	Version No:	13
	64746#L	2931	4	5	Issue Date:	July 2022
	PROJECT:				Auth. By:	WEC

SPARK DC

ONE DIMENSIONAL CONSOLIDATION

Test Method: NZS4402:1986:Test 2.1 - Water Content	Tested By:	WEC	May 2023
Test Method: NZS4402:1986:Test 7.1 - Consolidation	Compiled By:	WEC	22-May-23
	Checked By:	JF	22-May-23

Borehole No: AU23-BH07 **Sample No:** PT1 **Depth:** 4.50 - 5.00m



PHOTOGRAPH OF THE SAMPLE PRIOR TO TESTING



BGL Babbage Geotechnical Laboratory	Job No:	Reg. No:	Page	of	Version No:	13
	64746#L	2931	5	5	Issue Date:	July 2022
	PROJECT:				Auth. By:	WEC

SPARK DC

ONE DIMENSIONAL CONSOLIDATION

Test Method: NZS4402:1986:Test 2.1 - Water Content	Tested By:	WEC	May 2023
Test Method: NZS4402:1986:Test 7.1 - Consolidation	Compiled By:	WEC	22-May-23
	Checked By:	JF	22-May-23

Borehole No: AU23-BH07 **Sample No:** PT1 **Depth:** 4.50 - 5.00m

Applied Pressure	Incremental Deflection	Sample Height	Compression Ratio	Height of Voids	Void Ratio	Coefficient of Volume Compressibility m_v	Coefficient of Consolidation - c_v (log time)	Coefficient of Consolidation - c_v (sqrt time)
kPa	mm	mm		mm	e	m^2/MN	m^2/year	m^2/year
4.0	0.000	19.970	1.000	10.104	1.024			
15.9	-0.020	19.990	1.001	10.123	1.026	sample swelled		
31.2	0.010	19.980	1.000	10.113	1.025	0.032	30	28
61.9	0.066	19.914	0.997	10.048	1.018	0.11	14	15
123.3	0.186	19.729	0.988	9.862	1.000	0.15	3.7	12
246.0	0.708	19.020	0.952	9.154	0.928	0.29	0.83	2.0
491.5	1.359	17.662	0.884	7.795	0.790	0.29	0.39	0.64
982.5	1.315	16.347	0.819	6.481	0.657	0.15	0.25	0.31
1964.4	1.128	15.219	0.762	5.353	0.543	0.070	0.18	0.21
491.5	-0.358	15.577	0.780	5.711	0.579	BACKLOAD 1		
61.9	-1.169	16.746	0.839	6.880	0.697	BACKLOAD 2		

Coefficient of Secondary Compression - C_{sec}	
Applied Pressure	C_{sec}
15.9	-
31.2	0.0004
61.9	0.001
123.3	0.001
246.0	0.005
491.5	0.007
982.5	0.007
1964.4	0.007

Coefficient of Permeability - k	
Applied Pressure	k (m/s)
15.9	-
31.2	3.0E-10
61.9	4.6E-10
123.3	1.7E-10
246.0	7.5E-11
491.5	3.5E-11
982.5	1.2E-11
1964.4	4.0E-12

	INITIAL	FINAL
Mass of dry sample (g)	52.22	52.22
Height of sample (mm)	19.970	15.219 (after consolidation) 16.746 (after rebound)
Water Content (%)	38.9	28.4
Dry Density (t/m^3)	1.31	1.72
Height of soil particles (mm)	9.866	9.866
Void Ratio	1.024	0.543 (after consolidation) 0.697 (after rebound)
Degree of saturation (%)	-	-

Babbage Geotechnical Laboratory
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64-9-367 4954
wec@babbage.co.nz

Please reply to: W.E. Campton

Aurecon New Zealand Limited
PO Box 9762
Newmarket
Auckland 1149

Attention: **DAVID BOSSE**

Job Number: 64746#L
BGL Registration Number: 2931
Checked by: JF

26th May 2023

ONE DIMENSIONAL CONSOLIDATION TESTING

Dear Sir,

Re: SPARK DC
Your Reference: P523578
Report Number: 64746#L/Consol Spark DC AU23-BH08 3.00 – 3.45m

Borehole No: AU23-BH08 Sample No: PT1 Depth: 3.00 – 3.45m

The following report presents the results of one dimensional consolidation testing at BGL of a 60mm diameter undisturbed push-tube soil sample delivered to this laboratory on the 2nd of May 2023. Our instructions were to carry out a one dimensional consolidation test using cycle times that would give both the $\sqrt{T_{90}}$ and T_{50} values, and using a standard pressure sequence.

The push-tube sample was tested in accordance with the following standards:

Water Content:	NZS4402:1986:Test 2.1
One Dimensional Consolidation:	NZS4402:1986:Test 7.1

Please note that consolidation cycles were of a variable time duration, and hence is a departure from the test standard which states that the cycle time period for the consolidation loads after the initial cycle should be of approximately the same length. Subsequent load cycles were taken to at least the time of the previous cycle.

The sample was extruded from the tube straight into the consolidation ring, until the sample protruded from both sides of the ring. A wire was then used to cut the sample from the soil remaining in the tube, and a scalpel and straight edge were used to trim the sample flat in the ring.

These test results only relate to the sample tested. The values of m_v shown on the table have been calculated for each pressure increment, using void ratio difference for that increment. Note that a solid density value of 2.65t/m^3 was assumed for this test, and is not part of the IANZ endorsement for this report. This test was carried out in a laboratory in which the temperature is controlled to be kept within the specification of the test standard.

As per the reporting requirements of NZS4402: 1986: Test 2.1: water content is reported to two significant figures for values below 10%, and to three significant figures for values of 10% or greater. As per the reporting requirements of NZS4402: 1986: Test 7.1: one dimensional consolidation, the coefficients of consolidation (c_v's), and coefficients of volume compressibility (m_v's) are reported to two significant figures.

The "Void Ratio vs. Applied Pressure – Linear Scale" plot presented on page 4 is included for your information, and is based on the paper "Soil stiffness measured in oedometer tests" by L. Wesley & M. Pender, Proc. 18th NZGS Geotechnical Symposium on Soil-Structure Interaction, 2008. Please note that the presentation of the data on a linear scale is not part of the test standard, hence page 4 does not form part of the IANZ endorsement for this report.

Note that the Coefficient of Secondary Compression (C_{sec}) and the Coefficient of Permeability (k) values reported on page 5 have been calculated based on the methods described in "Manual of Soil Laboratory Testing Volume 2: Permeability, Shear Strength & Compressibility Tests" by K.H. Head & R.J. Epps, 3rd Edition, 2011. The Coefficient of Permeability values were calculated using the c_v(log) values determined in the test. The reporting of these figures is not part of NZS4402:1986:Test 7.1, therefore these figures are not part of the IANZ endorsement for this report.

Sample Description (***not part of BGL IANZ Accreditation***)

AU23-BH08 / PT1 / 3.00 – 3.45m:

ORGANIC CLAY, soft, highly plastic, dark grey, brown & black, very moist.

Each test result is data obtained at a specific test location. The nature and continuity of subsoil conditions away from the test area could vary from the data recovered during this testing, therefore the test results relate only to the sample as-received, and relate only to the sample under test.

Thank you for the opportunity to carry out this testing. If you have any queries regarding the content of this report please contact the person authorising this report below at your convenience.

Yours faithfully,

Wayne Campton
Key Technical Person
Laboratory Manager
Babbage Geotechnical Laboratory

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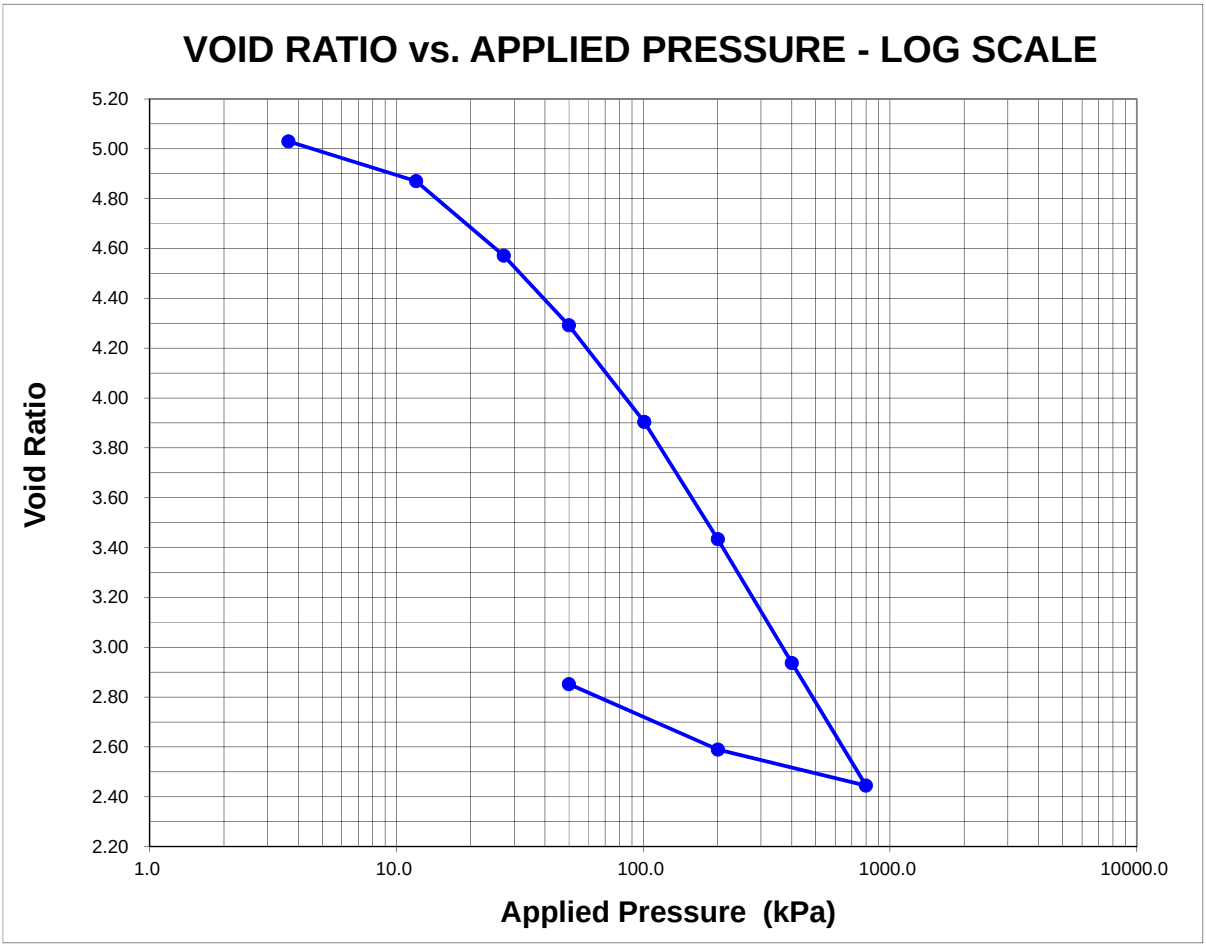
BGL Babbage Geotechnical Laboratory	Job No:	Reg. No:	Page	of	Version No:	13
	64746#L	2931	3	5	Issue Date:	July 2022
	PROJECT:				Auth. By:	WEC

SPARK DC

ONE DIMENSIONAL CONSOLIDATION

Test Method: NZS4402:1986:Test 2.1 - Water Content	Tested By:	WEC	May 2023
Test Method: NZS4402:1986:Test 7.1 - Consolidation	Compiled By:	WEC	25-May-23
	Checked By:	JF	26-May-23

Borehole No: AU23-BH08 **Sample No:** PT1 **Depth:** 3.00 - 3.45m



SAMPLE HISTORY & PREPARATION

undisturbed / ~~disturbed~~

Sample from 60mm diameter push-tube

Extruded from 60mm diameter tube straight into consol ring. Both sides of ring then trimmed flat with a scalpel & straight edge.

TEST DETAILS

Consol machine number:	2		Surface area of sample top:	2827	mm^2
Consol ring number:	60B		Sample mass:	71.409	g
Sample diameter:	60.00	mm	Initial bulk density:	1.23	t/m^3
Sample height:	20.60	mm	Assumed solid density of soil particles:	2.65	t/m^3

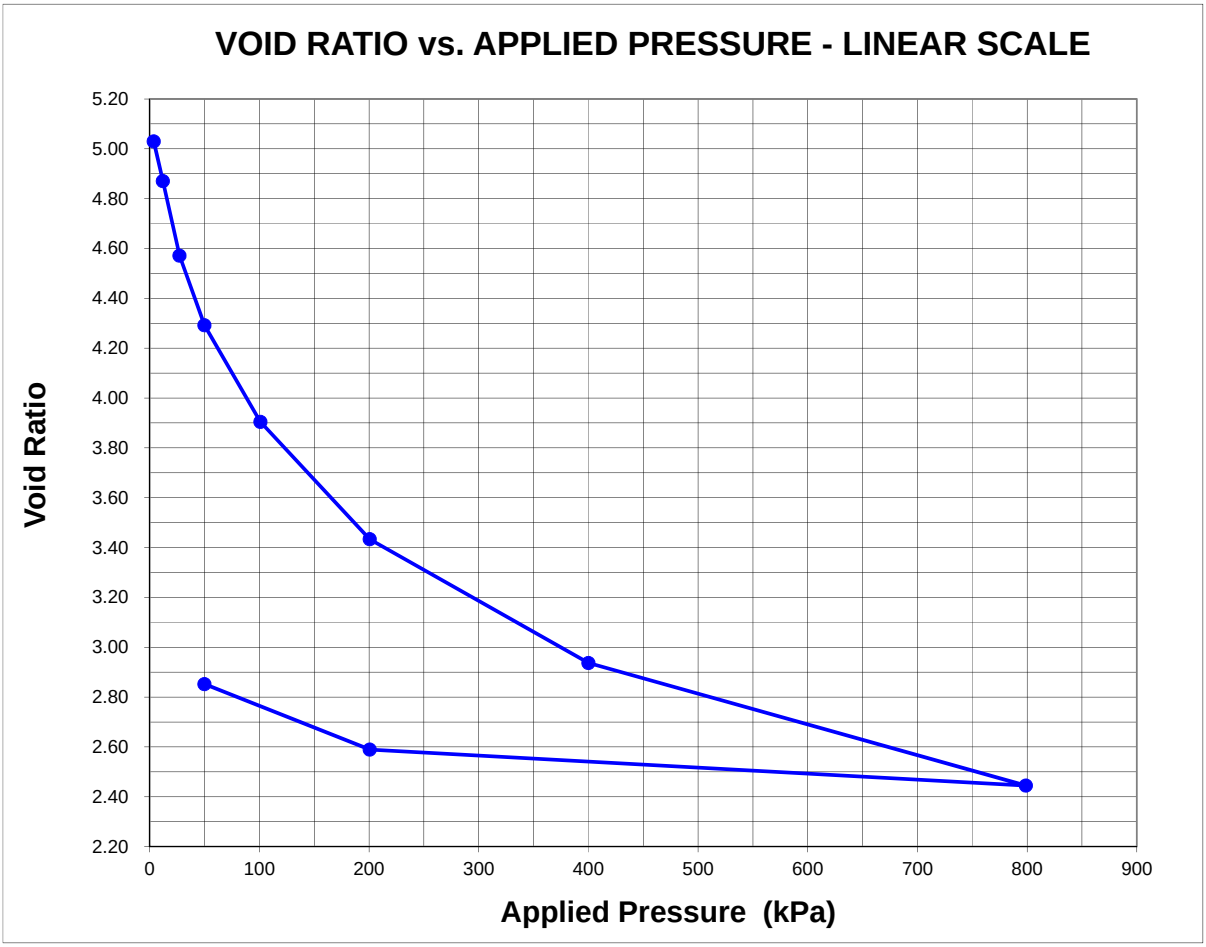
Babbage Geotechnical Laboratory	Job No:	Reg. No:	Page	of	Version No:	13
	64746#L	2931	4	5	Issue Date:	July 2022
	PROJECT:				Auth. By:	WEC

SPARK DC

ONE DIMENSIONAL CONSOLIDATION

Test Method: NZS4402:1986:Test 2.1 - Water Content	Tested By:	WEC	May 2023
Test Method: NZS4402:1986:Test 7.1 - Consolidation	Compiled By:	WEC	25-May-23
	Checked By:	JF	26-May-23

Borehole No: AU23-BH08 **Sample No:** PT1 **Depth:** 3.00 - 3.45m



PHOTOGRAPH OF THE SAMPLE PRIOR TO TESTING



BGL Babbage Geotechnical Laboratory	Job No:	Reg. No:	Page	of	Version No:	13
	64746#L	2931	5	5	Issue Date:	July 2022
	PROJECT:				Auth. By:	WEC

SPARK DC

ONE DIMENSIONAL CONSOLIDATION

Test Method: NZS4402:1986:Test 2.1 - Water Content	Tested By:	WEC	May 2023
Test Method: NZS4402:1986:Test 7.1 - Consolidation	Compiled By:	WEC	25-May-23
	Checked By:	JF	26-May-23

Borehole No: AU23-BH08 **Sample No:** PT1 **Depth:** 3.00 - 3.45m

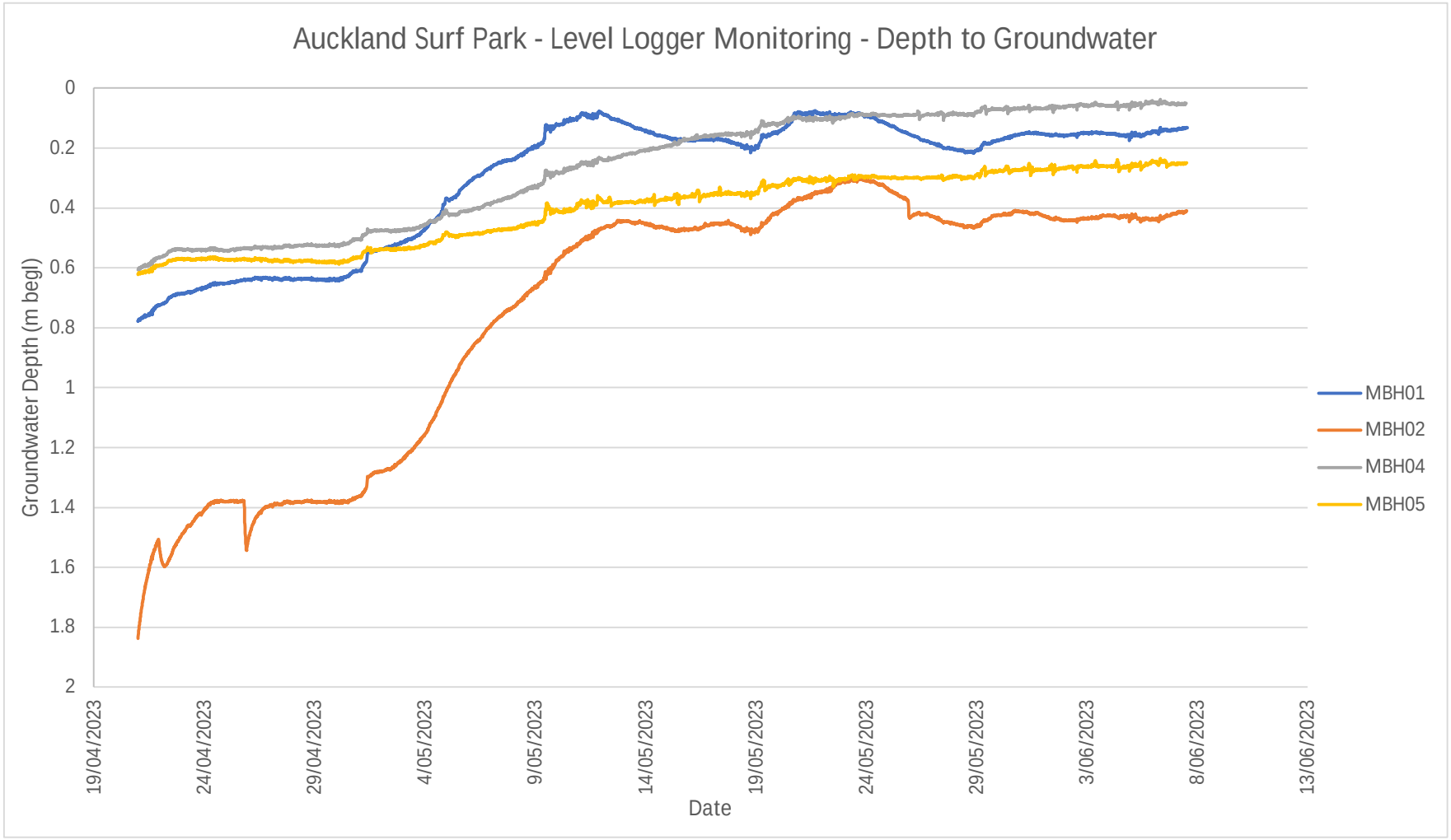
Applied Pressure	Incremental Deflection	Sample Height	Compression Ratio	Height of Voids	Void Ratio	Coefficient of Volume Compressibility m_v	Coefficient of Consolidation - c_v (log time)	Coefficient of Consolidation - c_v (sqrt time)
kPa	mm	mm		mm	e	m^2/MN	m^2/year	m^2/year
3.7	0.000	20.600	1.000	17.184	5.030			
12.0	0.546	20.054	0.974	16.638	4.870	3.2	0.37	0.48
27.2	1.020	19.034	0.924	15.618	4.572	3.3	0.48	0.60
50.0	0.956	18.078	0.878	14.662	4.292	2.2	0.45	0.73
100.9	1.325	16.753	0.813	13.337	3.904	1.4	0.57	0.94
200.6	1.607	15.146	0.735	11.730	3.434	0.96	0.43	0.70
400.1	1.697	13.449	0.653	10.033	2.937	0.56	0.33	0.52
798.9	1.681	11.768	0.571	8.352	2.445	0.31	0.26	0.36
200.6	-0.494	12.262	0.595	8.845	2.589		BACKLOAD 1	
50.0	-0.897	13.159	0.639	9.743	2.852		BACKLOAD 2	

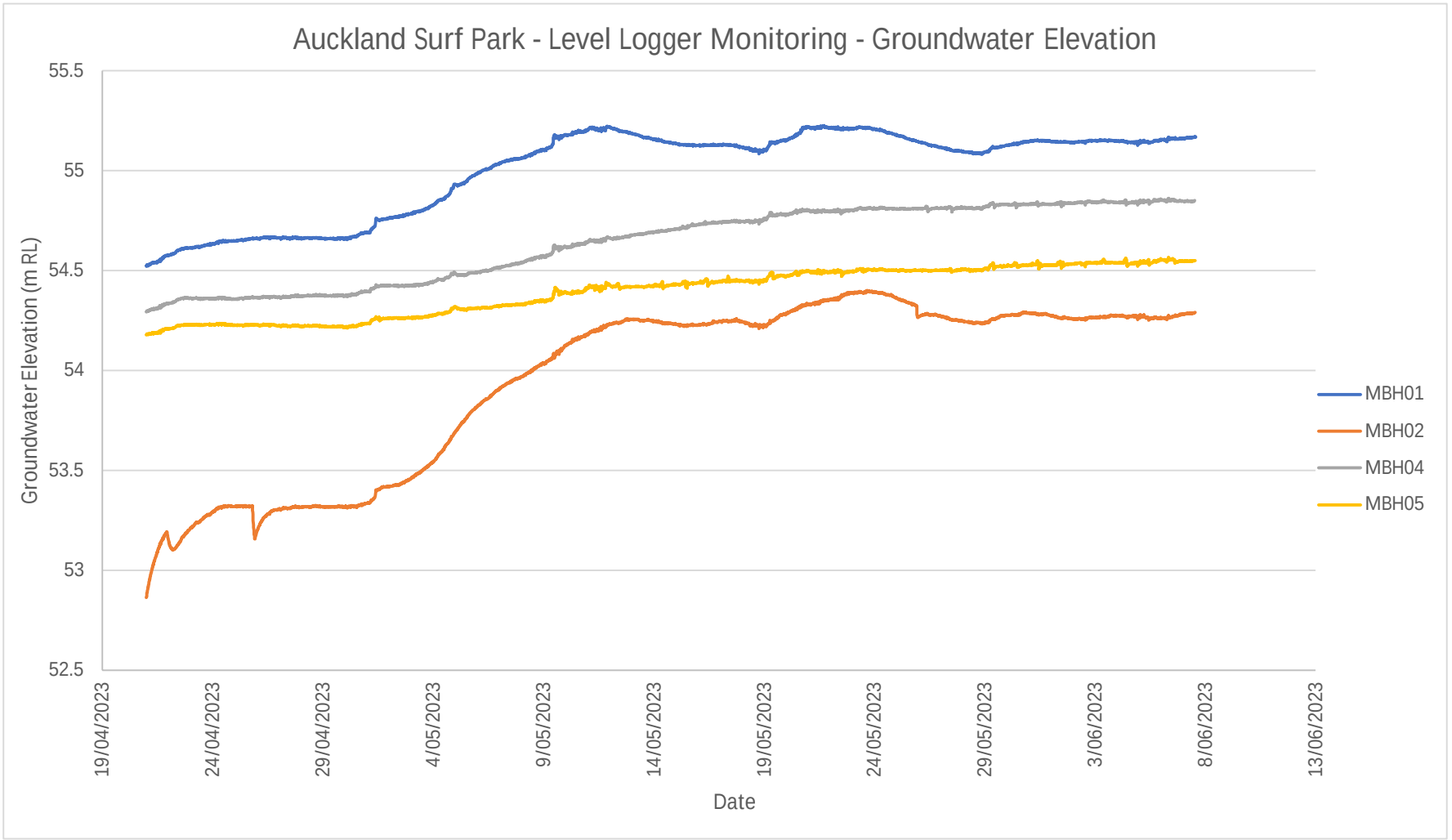
Coefficient of Secondary Compression - C_{sec}	
Applied Pressure	C_{sec}
12.0	0.005
27.2	0.007
50.0	0.007
100.9	0.009
200.6	0.009
400.1	0.010
798.9	0.009

Coefficient of Permeability - k	
Applied Pressure	k (m/s)
12.0	3.6E-10
27.2	4.9E-10
50.0	3.1E-10
100.9	2.5E-10
200.6	1.3E-10
400.1	5.8E-11
798.9	2.5E-11

	INITIAL	FINAL
Mass of dry sample (g)	25.60	25.60
Height of sample (mm)	20.600	11.768 (after consolidation) 13.159 (after rebound)
Water Content (%)	179	99.8
Dry Density (t/m^3)	0.44	0.77
Height of soil particles (mm)	3.416	3.416
Void Ratio	5.030	2.445 (after consolidation) 2.852 (after rebound)
Degree of saturation (%)	94.3	92.7

Appendix F Initia Groundwater Monitoring Plots


Auckland Surf Park - Level Logger Monitoring - Depth to Groundwater
Groundwater Depth (m begl)
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8
2
19/04/2023
24/04/2023
29/04/2023
4/05/2023
9/05/2023
14/05/2023
19/05/2023
24/05/2023
29/05/2023
3/06/2023
8/06/2023
13/06/2023
Date
MBH01
MBH02
MBH04
MBH05


Auckland Surf Park - Level Logger Monitoring - Groundwater Elevation
Groundwater Elevation (m RL)
55.5
55
54.5
54
53.5
53
52.5
19/04/2023
24/04/2023
29/04/2023
4/05/2023
9/05/2023
14/05/2023
19/05/2023
24/05/2023
29/05/2023
3/06/2023
8/06/2023
13/06/2023
Date
MBH01
MBH02
MBH04
MBH05