Additional Geotechnical Investigation for Causeway Pedestrian and Cyclist Bridge: Factual Report

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1. INTRODUCTION

This report presents the factual field and laboratory geotechnical results obtained during the Phase 2 Ground Investigation (GI) carried out to inform the detailed design of the Causeway Pedestrian and Cyclist Bridge (CPCB) project.

In June 2020, WSP was contracted by MRWA to carry out a preliminary GI (WSP, 2021) adjacent to, and along the alignment of the proposed CPCB project. The scope of phase 1 GI was developed by WSP and carried out in August 2021 for MRWA to provide tenderers with site-specific geotechnical data. A second phase of GI (phase 2 GI) was carried out between 23 June 2022 and 15 July 2022 to inform the detailed design of the CPCB project. The scope of work included investigation of geotechnical and hydrogeological conditions along the alignment of the proposed CPCB. The purpose of the investigation was to provide data and information for characterisation of soils and rocks and ground conditions to supplement detailed design and construction of the project. WSP was responsible for supervision of the GI and for collation of the factual data. Subcontractors used for the GI were procured, engaged, and inducted by WSP.

Geotechnical investigation works for the CPCB project were carried out at McCallum Park, Heirisson Island and Point Fraser. WSP and CLA were responsible for coordinating site access and arranging necessary permits to undertake the works at Point Fraser, Heirisson Island and McCallum Park.

Figure 1 shows the Phase 1 and 2 investigation location relative to the CPCB alignment. Drawings SK01A to SK01C (presented after text) present the CPCB alignment and Phase 1 and 2 GI test locations.

A program of geotechnical laboratory testing is being undertaken on samples recovered during the fieldwork. This report presents results for geotechnical laboratory testing received up to 12 August 2022 only. Outstanding geotechnical laboratory test results will be included in subsequent revisions of this report.



Figure 1: Phase 1 and 2 Investigation Test Locations

The scope of work for the Phase 2 GI included the following:

- Intrusive site investigation by drilling of boreholes with sampling and in situ testing (including Standard Penetration Tests (SPTs) and/or thin wall tube sampling, at 1.5 m intervals and coring in rock) and electric friction cone penetrometer tests (CPT and CPTu).
- Survey of all investigation locations, including position and elevation.
- Geotechnical laboratory testing on recovered samples to obtain design parameters, including classification, deformation, and strength testing.
- Geotechnical factual report.

1.1 Relevant Reports and Published Information

This report supplements geotechnical investigations conducted by WSP between June and August 2021. The following reports and published information are relevant to the CPCB project:

- BGE (2021). RN 1098 Preliminary Waterways Assessment. (Ref: BGE-P0181-REP-W-0001 REV/0 Date 28/01/2021
- Golder (2019). Waterbank Development Geotechnical Interpretive Report. (Ref: 137642103-017-R-Rev1).
- Golder (2021). Compilation of Historic Geotechnical Field Investigation Data. New Causeway Pedestrian Bridges, Perth. (Ref: 20391097-001-R-Rev0).
- Gordon, F. R. (2003). Sea Level Change and Paleochannels in the Perth Area. Australian Geomechanics Vol 38(4). The Engineering Geology of Perth, Part 2.
- Gozzard, B. (1986). Perth Sheet 2034 II and part 2034 III and 2134 III. Perth Metropolitan Region Environmental Geology Series. Geological Survey of Western Australia GSWA).
- Gozzard, B. (2007). The Guildford Formation Re-Evaluated. Australian Geomechanics Vol 42, pp.59-80.
- The Department of Water and Environmental Regulation (DWER) Perth Groundwater Map (2021). https://maps.water.wa.gov.au/Groundwater/
- WSP (2021a). Causeway Pedestrian and Cyclist Bridge Geotechnical Factual Report (Ref: PS124806-GTT-REP-001Rev0).
- WSP (2021b). Causeway Pedestrian and Cyclist Bridge Geotechnical Interpretive Report. Ref: PS124806-GTT-REP-002.

2. PROJECT BACKGROUND

The CPCB project involves the provision of a new active transport river crossing linking Point Fraser in East Perth to McCallum Park in the Town of Victoria Park via Heirisson Island. Comprising two cable stay bridges, the proposed crossing will be located approximately 80 m downstream of the existing Causeway bridge. The scope of the CPCB project includes:

- Point Fraser (north-western) bridge crossing the Swan River consisting of bridge abutments and an offset central support pier.
- McCallum Park (south-eastern) bridge crossing the Swan River consisting of bridge abutments and two offset central support piers.

• 6.0 m wide separated path on bridge, associated footpath approach ramps, connections, and footpath pavements. Increased navigational clearances for both structures in particular the Point Fraser structure i.e., the primary river navigational channel.

3. OBJECTIVES

The objectives of the Phase 2 GI described in this report were to obtain additional information about the subsurface ground and groundwater conditions along the alignment of the CPCB project and to supplement geotechnical information gained from the preliminary GI. The scope of work comprised the following items:

- Intrusive ground investigation including borehole drilling (BHs), cone penetration tests (CPTs) and hand auger boreholes (HAs),
- Laboratory and in situ testing on recovered soil samples,
- This factual report describing the works completed and presentation of the results of the field and laboratory investigations.

The extent of the investigatory works carried out to date are shown on drawings SK01A to SK01C (3 drawings).

4. SITE CONDITIONS

4.1 Site History

The proposed CPCB will be situated on reclaimed land at Point Fraser, McCallum Park and Heirisson Island which have been modified and reclaimed through the following activities at various times:

- Point Fraser: Reclamation by placement of uncontrolled fill, sometime between 1953 and 1961.
- Heirisson Island: Reclamation of parts of the river by placement of uncontrolled fill including industrial and domestic landfill and clean sand, sometime before 1953.
- McCallum Park: Reclamation by placement of uncontrolled fill, sometime before 1953.

4.2 Geological Setting

This section of the report describes the topography along the CPCB alignment and prevailing geological conditions in both a regional and local context. The character, distribution and depositional history of the geological units outlined in Section 4.2.4 are described in detail in Gordon (2003), Gozzard (2007), Gordon (2012) and WSP (2021b).

4.2.1 **Topography**

Based on available Landgate ground contour information, the CPCB alignment is typically characterised as flat lying. Elevations along the alignment vary relative to the Australian Height Datum (AHD) as follows:

- Point Fraser and McCallum Park: elevations typically vary between RL 0.4 m and 2 m AHD.
- Heirisson Island: elevations typically vary between RL 0.4 m and 3 m AHD.

4.2.2 Geomorphology

The Geological Survey of Western Australia (GSWA) Perth Sheet 2034 II, part of 2034 III and 2134 III (Gozzard, 1986), 1:50,000 scale environmental geology series map indicates that the CPCB alignment is situated within a geomorphological domain that is characterised by a gently undulating surfaces associated with a river floodplain and undifferentiated river terraces with slope angles that range between 0° and 3°.

4.2.3 Regional Geology

The Swan Coastal Plain is the surface expression of the Perth Basin, which contains sedimentary rocks and soils of Mesozoic Age (Jurassic to Early Cretaceous Age) which are widespread and represent filling of the basin. Erosion of the Cretaceous Age sediments during the Late Tertiary (Pliocene Age) created a planar unconformity surface on which Pliocene Age to recent superficial deposits were laid down in marine, alluvial and aeolian environments.

Rivers that cross the Swan Coastal Plain have formed a network of channels in the Pliocene and recent superficial formations and older underlying Mesozoic sedimentary rocks, filling the channels with a complex suite of granular and cohesive soils. These channels are referred to in the published literature as paleochannels.

At the Causeway site, Gordon, (2012) suggests that two paleochannels are present in a broad valley that was created by erosion of the underlying Kings Park and Osborne Formations (Mullaloo Sandstone and Kardinya Shale Members respectively) by an ancestral Swan River. The paleochannels are assigned names i.e., Channel 2 (Last Glacial) and Channel 6 (Penultimate Glacial), which correspond to two separate drops in global sea levels that are believed to have occurred sometime around 20,000 and 150,000 years ago respectively. Gordon, (2012) also suggests that Channel 2, situated below the East Perth side of the Swan River, is infilled with superficial deposits that have been assigned to the Swan River Formation. The thalweg for Channel 2 (i.e., line of lowest elevation within a channel) is believed to be located at a depth of around 26 m, however this remains speculative at present.

Similarly, Gordon, (2012) suggests that Channel 6, located below the Victoria Park side of the Swan River, is infilled with superficial deposits that are now assigned to the Perth Formation. The thalweg for Channel 6 is believed to be located at a depth of around 35 m, however this remains speculative at present.

4.2.4 Site Geology

Historical records and information from historic and recent ground investigations indicates that a superficial layer of uncontrolled fill, derived from landfill and reclamation activities is present at the Causeway site i.e., at Point Fraser, Heirisson Island and McCallum Park. Available GI information indicates that the thickness of fill varies along the project alignment e.g., at Heirisson Island the fill is up to 6 m thick. At Point Fraser and McCallum Park, fill is up to 4.5 and 1.5 m in thickness respectively.

Gozzard, (1986) indicates that the superficial layer of uncontrolled fill is underlain by geological Unit C1 (unit terminology adopted in Gozzard, 1986) which is described as "*mid to dark grey, soft, saturated CLAY of alluvial origin, with prominent 0.2 m thick oyster shell bed near the surface.*" Geological Unit C1 is inferred to be the Swan River Alluvium (SRA), which is referred to as Sulphurous Silt and Holocene Alluvium in Gordon, (2003) and Gozzard, (2007) respectively.

Available GI information (WSP, 2021a and 2021b) and information derived from this GI indicates that the SRA (Unit 2 of this study) is around 15 m thick at Point Fraser and decreases in thickness along the CPCB project alignment to the southern end of Heirisson Island, where it appears to be absent. The SRA is believed to be underlain by Pleistocene Alluvium, i.e., soils that are now assigned to the Swan River Formation (formerly categorised as the Guildford Formation in the literature). The Swan River Formation (Unit 3 of this study) may also be underlain by soils belonging to the Perth Formation (Unit 4 of this study); however the thickness and spatial distribution of both the Swan River and Perth Formations along the CPCB alignment is uncertain at present. Soils belonging to the Perth Formation may be restricted in occurrence to the Victoria Park channel of the Swan River.

The unconsolidated soils of Holocene and Pleistocene Age (Units 2 to 4 of this study) are in turn underlain by unconsolidated and partly lithified sediments assigned to the Palaeocene-Eocene Age Mullaloo Sandstone Member (Unit 5 of this study) of the Kings Park Formation. Information from boreholes undertaken at McCallum Park suggests that the fill and superficial deposits at McCallum Park may be underlain by the Kardinya Shale Member (Unit 6 of this study), which is assigned to the Osborne Formation.

A summary of the project specific geological units and lithological descriptions developed from published geological information and available GI information adopted for the CPCB project are presented in Table 1. Reference should be made to WSP, (2021b) for a detailed description of the thicknesses, distribution, and extent of geological units along the alignment of the CPCB.

Table 1: Summary of F	Project Specific	Geological Units
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Unit Name	Unit ID	Lithological Description	Depositional Environment
Uncontrolled Fill	Unit 1 Fill	Designated as uncontrolled fill (Sand fill, possible domestic waste).	Deposited / placed in recent history
		(Filling records unavailable).	
Swan River Alluvium	Unit 2 SRA	Typically comprises SAND and CLAY: mid to dark grey, black, blue, soft, saturated, prominent 0.2 m thick oyster shell bed near surface of alluvial origin.	Fluvial / Estuarine
		(Described in Gozzard, (2007) as Holocene Alluvium and as Black Sulphurous Silt in Baker (1954).	
Swan River Formation	Unit 3 SRF (Formerly Guildford Formation)	Typically comprises clean, coarse, grey sands and conglomerates to red, brown, yellow, and black clays and occasional shell beds.	Fluvial / Estuarine
		(Unit 3 may unconformably overlie the Kings Park Formation and may also be restricted in occurrence to the East Perth side of Swan River Channel)	
Perth Formation	Unit 4 PF (Formerly Guildford Formation)	Medium dense sands, interbedded with stiff clay lenses and some gravel layers. (Unit 4 may unconformably overlie the Kings Park Formation and may also be restricted in occurrence to the Victoria Park side of Swan River Channel).	Fluvial / Estuarine
Mullaloo Sandstone Member	Unit 5 MSM (KPF)	Typically comprises unconsolidated and partly lithified soils and rocks. Mullaloo Sandstone Member: Poorly sorted, fine to very coarse grained, pale brownish green, slightly glauconitic and clayey sand. (Unit 5 believed to be incised into the siltstones and shales of the Kings Park Formation)	Fluvial / Estuarine / Marine
Kardinya Shale Member (Osborne Formation)	Unit 6 KSM (OF)	Typically comprises Interbedded siltstones and shales. (Unit 6 may be restricted in occurrence to McCallum Park)	Fluvial / Estuarine / Marine

4.3 Groundwater

The Perth Groundwater Atlas, which shows the inferred historical maximum groundwater level (1m contour intervals) does not show contours over the site but indicates that the historical maximum groundwater level is less than RL 2.0 m AHD. The 1997 Groundwater Atlas also indicates that the estimated river flood level at Heirisson Island is RL 1.5 m AHD (unknown Annual Exceedance Probability (AEP). BGE (2021) has estimated that the surface water level at the proposed bridges for a 1 in 100-year AEP is RL 2.3 m AHD.

Due to the proximity of the site to the Swan River, groundwater levels in the Upper Aquifer would mainly be governed by the Swan River and thereby affected by flood events, seasonal fluctuations, and tidal

fluctuations. The tidal influence will depend on the distance to the river. Based on our experience in the area we would expect the groundwater level fluctuations in the Upper Aquifer could be up to 1 m.

The groundwater levels during geotechnical drilling during the investigation phases in June and July 2022 indicated that groundwater levels (one-off measurement) ranged between approximately RL 0 m AHD and RL 0.85 m AHD. It is noted that the observed measurements are one-off measurements, which may not have fully stabilised and that range in levels could reflect geographical locations of boreholes and tidal effects. Long-term groundwater level monitoring would be required across the site to better understand the groundwater behaviour and changes (daily and seasonal).

4.3.1 Groundwater Levels

Groundwater level measurement were undertaken in monitoring wells installed as part of Phase 1 geotechnical investigation. Groundwater level measurements are summarised in Table A2, Appendix A.

5. DESCRIPTION OF FIELDWORK

5.1 Scope

The GI was undertaken in accordance with Australian Standard AS1726:2017 Geotechnical site investigations. The following fieldwork was undertaken between 23 June 2022 and 15 July 2022:

- 8 boreholes designated CPCB-BH01 to CPCB-BH08 inclusive. Boreholes were drilled by subcontractor National Geotech using PQ3 (83 mm) core drilling techniques to depths up to 44.45 m below ground level. Details of the strata encountered are provided on the individual borehole logs in addition to an assessment of Total Core Recovery (TCR), Solid Core Recovery (SCR) and Rock Quality Designation (RQD) (where appropriate), each expressed as a percentage of the individual core runs.
- 17 CPTs designated CPCB-CPTU03 to CPCB-CPTU06 inclusive, CPCB-CPTU06A, CPTU06B, CPCB-CPTU07A, CPCB-CPTU07B, CPCB-CPTU08, CPCB-CPTU09, CPCB-CPT11, CPCB-CPT12, CPCB-CPT12A and CPCB-CPT13 to CPCB-CPT16 inclusive without pore water pressure measurement by Probedrill Geotechnical Survey Pty Ltd (Probedrill) and tested in accordance with AS 1289.6.5.1-1999 to depths of up to 30.1 m.
- 4 CPTUs designated CPCB-CPTU01, CPCB-CPTU02, CPCB-CPTU07 and CPCB-CPTU10 with pore water pressure measurement by Probedrill and tested in accordance with AS 1289.6.5.1-1999 and IRTP 2001 for friction reducer to depths of up to 20.48 m.
- 11 Hand Auger (HA) boreholes designated CPCB-HACPT01 to CPCB-HACPT06, CPCB-HACPT11, CPCB-HACPT12, and CPCB-HACPTU07 to CPCB-HACPTU09 inclusive to depths up to 2 m to clear BH and CPT test locations for underground services.

During the investigation, the positions of some proposed test locations were changed or removed from the scope of work due to heritage and archaeological restrictions.

A summary of the individual test location details including unique identification numbers, coordinates and levels of each test type are presented in Table A1 Appendix A. BH, CPT and HA Logs are provided in Appendix B to D respectively.

5.2 Fieldwork Supervision

Site access to enable the investigatory works was coordinated by representatives from Causeway Link Alliance (CLA) who were responsible for the following planning and GI management tasks:

• Liaison with the City of Perth to obtain the relevant permits, and approvals to undertake investigatory works at Point Fraser and Heirisson Island. The Town of Victoria Park were also consulted prior to undertaking investigatory works at McCallum Park.

- Dial-Before-You-Dig (DBYD) requests.
- Coordination with approved service locator.
- On-site relocation and positioning of test locations to confirm that they avoided underground services. Test locations were adjusted in accordance with the criteria set out within the WSP permit to dig system which was adopted for the investigatory works.

Geotechnical engineers from CLA completed the following fieldwork tasks:

- Supervision of drilling and probing of BHs and CPTs respectively, and hand auguring to clear test locations of underground services.
- Logging of soils and rocks encountered during the investigation.
- Collection of soil and rock samples for laboratory testing.
- In-situ testing e.g., infiltration testing.
- Coordination of access with City of Perth Rangers to facilitate the investigation.
- Coordination of Traditional Owner who were engaged to monitor the investigation.

5.3 Permits and Approvals

Representatives from CLA liaised with the City of Perth to obtain the relevant permits, and approvals to undertake investigatory works at Point Fraser and Heirisson Island. The Town of Victoria Park were also consulted prior to undertaking investigatory works at McCallum Park, although no permit was required to undertake investigatory works.

5.4 Service Location

A phased approach was adopted for the identification and avoidance of underground services along the CPCB alignment. Investigation locations were positioned away from services deemed to be highrisk (e.g., high-pressure gas pipelines and water/sewer mains) to reduce the risk of impact to the service.

Prior to intrusive ground activities, CLA conducted a Dial Before You Dig (DBYD) request to assess the location of underground services along the CPCB alignment. Abaxa, an accredited MRWA service locator, was engaged to assess the locations of underground services along the CPCB alignment. Potholing for underground services at Point Fraser was sub-contracted to National Geotech and their sub-contractor Abaxa and coordinated by representatives from CLA. Potholing for underground services e.g., Telstra fibre-optic cable and an abandoned gas main that could not be adequately confirmed by Cable Avoidance Tool (CAT) techniques and non-destructive methods. Geotechnical Engineers from CLA were provided with a site plan showing the locations of all geotechnical tests and locations relative to existing underground services (abandoned or otherwise).

The following tasks pertaining to the identification and avoidance of underground services were undertaken:

- Desktop study of DBYD information and site-based visual inspection of all test locations.
- Service detection using Cable Avoidance Tool (CAT) techniques prior to breaking ground.
- Investigation by HA (with geotechnical logging to depths up to 1.5 m) at each test location at McCallum Park and Heirisson Island.
- Investigation by vacuum potholing (with geotechnical logging to depths of up to 2 m) at each test location at Point Fraser.

5.5 Survey Information

Test locations were initially surveyed by an Engineering Surveyor using a Leica Real Time Kinematic (RTK) Global Positioning System (GPS) and a Leica total station, accurate to ± 0.05 m and relative to the Perth Coastal Grid Coordinate System (PCG94) and AHD.

Following completion of the investigations, the locations of test positions were also recorded using a hand-held GPS by geotechnical engineers from CLA, accurate to ± 5 m, with visual reference to surface features.

The surveyed coordinates and ground surface levels of the test locations are presented in Table A1 Appendix A. Test locations are also shown on drawings SK01A to SK01C (3 No. drawings).

5.6 Geotechnical Boreholes

Geotechnical borehole drilling was conducted using a Geoprobe 7822DT track mounted drill rig supplied and operated by National Geotech Pty Ltd. The boreholes were drilled by PQ3 drilling techniques to depths between 25 m and 44.45 m below the existing ground surface.

All retrieved core was photographed, logged and sub-sampled prior to packaging in lay flat plastic within the core boxes to minimise moisture loss. Geotechnical borehole logs and core photographs are presented in Appendix B. In addition, a list of explanatory notes, abbreviations and a description of the soil classification system used to develop the descriptions on the logs are also presented in Appendix B.

All boreholes were backfilled with grout and topped with spoil material at the conclusion of drilling. No permanent monitoring installations (e.g., PVC casing, wells, piezometers, etc) were installed in the boreholes prior to completion.

All other waste was collected from the drilling sites following completion of the boreholes and disposed of by National Geotech.

5.6.1 Standard Penetration Testing

Standard Penetration Tests (SPTs) were carried out at 1.5 m intervals to assess the relative density of the soil encountered and recover disturbed samples. The SPT termination criteria adopted was in accordance with ASTM D1586 / D1586M:2018 (EDT 1) as this was deemed more onerous than the criteria specified in AS1289.6.3.1. ASTM D1586:2018 termination criteria specifies 50 blows in any 300 mm interval, 10 blows with no observable advancement or hammer bouncing. SPT values presented on borehole reports are uncorrected for overburden pressure; however, the relative density descriptions presented on borehole reports were corrected due to overburden pressure. The following formula (Liao and Whitman, 1986) was used to correct SPT N values for this purpose:

COP=(95.76/σ'vo)^{1/2}

COP= correction for overburden pressure

 σ'_{vo} = effective overburden pressure (kPa)

5.7 Hand Auger Boreholes

HA boreholes were excavated by a geotechnical engineer from CLA to depths up to 1.5 m below ground surface level. On completion, HA boreholes were loosely backfilled with arisings and tamped with the auger.

HA borehole reports are presented in Appendix D in addition to photographs of the recovered material. All material recovered from the hand auger boreholes was logged in accordance with AS1726:2017.

5.8 Geotechnical Logging

Geotechnical boreholes and hand auger boreholes were logged by a geotechnical engineer from CLA in accordance with AS1726-2017.

5.9 Cone Penetration Testing

5.9.1 **Cone Penetration and Piezocone Penetration Tests**

CPT and CPTu were undertaken using a 22-tonne truck mounted CPT rig supplied and operated by Probedrill Pty Ltd under contract to WSP. Where access prevented the use of the 22-tonne truck mounted rig, an 11-tonne track mounted CPT rig was used. CPTs were undertaken in accordance with AS 1289.6.5.1-1999. A piezocone configuration was used to enable measurements of pore water pressures for the CPTu tests conducted at the proposed bridge abutments.

Results of the testing are presented as plots of cone resistance (qc), sleeve friction (fs), friction ratio (FR = (fs/qt) \times 100%) and porewater pressure versus depth in Appendix C. A method of soil classification proposed by Robertson et al, (1986) based on values of qt and FR is also included in Appendix C.

Refusal of the CPT probe was considered to have occurred when the probe deviated significantly from the vertical (inclination) or encountered material that could not be penetrated. Refusal occurred at several locations at shallow depths (less than 2 m below ground level). Where shallow refusal occurred, or if refusal was encountered above target depth, probing was re-attempted at up to two further locations in the vicinity of the original proposed CPT site (within an approximate 2 m radius). Where penetration testing was repeated, suffixes are included in the test location identifier (i.e. -A, -B, etc). A summary of the locations where CPT refusal was encountered, and the termination reasons is presented Table A1 of Appendix A.

Where underground services were anticipated, CPTs were pre-drilled with a hand auger to depths of up to 1.5 m to check for the absence of underground services. Cone penetration tests were then undertaken through the backfilled hole. The length of the disturbed section is noted on the relevant CPT logs. These zones are not representative of the in-situ conditions.

Groundwater depth measurements were taken after the removal of the CPT rods. These are shown on the CPT/CPTu reports, where groundwater was encountered. It should be noted that groundwater levels observed following extraction of the CPT rods may not necessarily correspond with the static groundwater level at each CPT/CPTu location.

5.10 Test Pits

Test pits were not undertaken as part of the Phase 2, Additional GI.

5.11 Infiltration Testing

5.11.1 Hand Auger Infiltration Testing

At the time of writing, infiltration tests were not undertaken as part of the Phase 2, Additional GI. Infiltration tests will be conducted and reported in Appendix E of subsequent revision of this report

6. DESCRIPTION OF LABORATORY TESTING

6.1 Geotechnical Laboratory Testing

A program of geotechnical laboratory testing is being undertaken on samples recovered during the fieldwork. Laboratory testing on selected soil samples was performed at the following NATA-accredited laboratories:

• WSP Golder,

- E-Precision Laboratory Pty Ltd, and
- Trilab Pty Ltd

Laboratory test results will be reported in Appendix F of subsequent revision of this report.

Table 2: Summary of Geotechnical Laboratory Testing

Test Type	Testing Laboratory	Test Method	No. of Tests Scheduled	No. of Tests Completed
Geotechnical – Soil Testing				
Particle size distribution	WSP Golder	AS1289 3.6.1	17	17
Atterberg limits and linear shrinkage	WSP Golder	AS1289 3.1.2, 3.2.1, 3.3.1 and 3.4.1	17	17
Consolidated Undrained (CU) Triaxial test with pore pressure measurement (single stage)	E-Precision	AS1289 6.4.2	4	2
One-Dimensional (1-D) Consolidation	Trilab / WSP Golder	AS1289.6.6.1	7	0
Geotechnical – Rock Testing				
Uniaxial Compressive Strength (UCS)	WSP Golder	AS4133 4.2.1, 4.2.2	8	0
Point Load Index (PLI)	WSP Golder	AS4133 4.1	16	16

6.1.1 Classification Testing

Particle size distribution, Atterberg limits and linear shrinkage classification tests have been scheduled as shown in Table 2. Testing will be undertaken in accordance with AS1289 3.6.1, AS1289 3.1.2, 3.2.1, 3.3.1 and 3.4.1.

6.1.2 Triaxial and Consolidation Testing

One single stage, consolidated, isotropic and undrained (CU) triaxial test with pore water pressure measurement was scheduled on 4 undisturbed tube samples recovered from the boreholes CPCB-BH01, CPCB-BH05, CPCB-BH06.

One-Dimensional (1-D) consolidation tests were scheduled on seven undisturbed tube samples recovered from boreholes CPCB-BH01, CPCB-BH05, CPCB-BH06 and CPCB-BH08.

6.1.3 Rock Testing

Uniaxial compressive strength (UCS) testing was scheduled on samples of rock strength material with Point Load Index (PLI) testing was also scheduled on samples generally adjacent to the USC samples. UCS testing will be carried out in accordance with AS4133 4.2.1 and 4.2.2.

Axial and diametral tests were scheduled on rock strength materials to assess the effects of anisotropy on the testing. PLI testing will be undertaken in accordance with AS4133.4.1 in diametral and axial directions, with results corrected to a standard 50 mm core diameter.

7. **REFERENCES**

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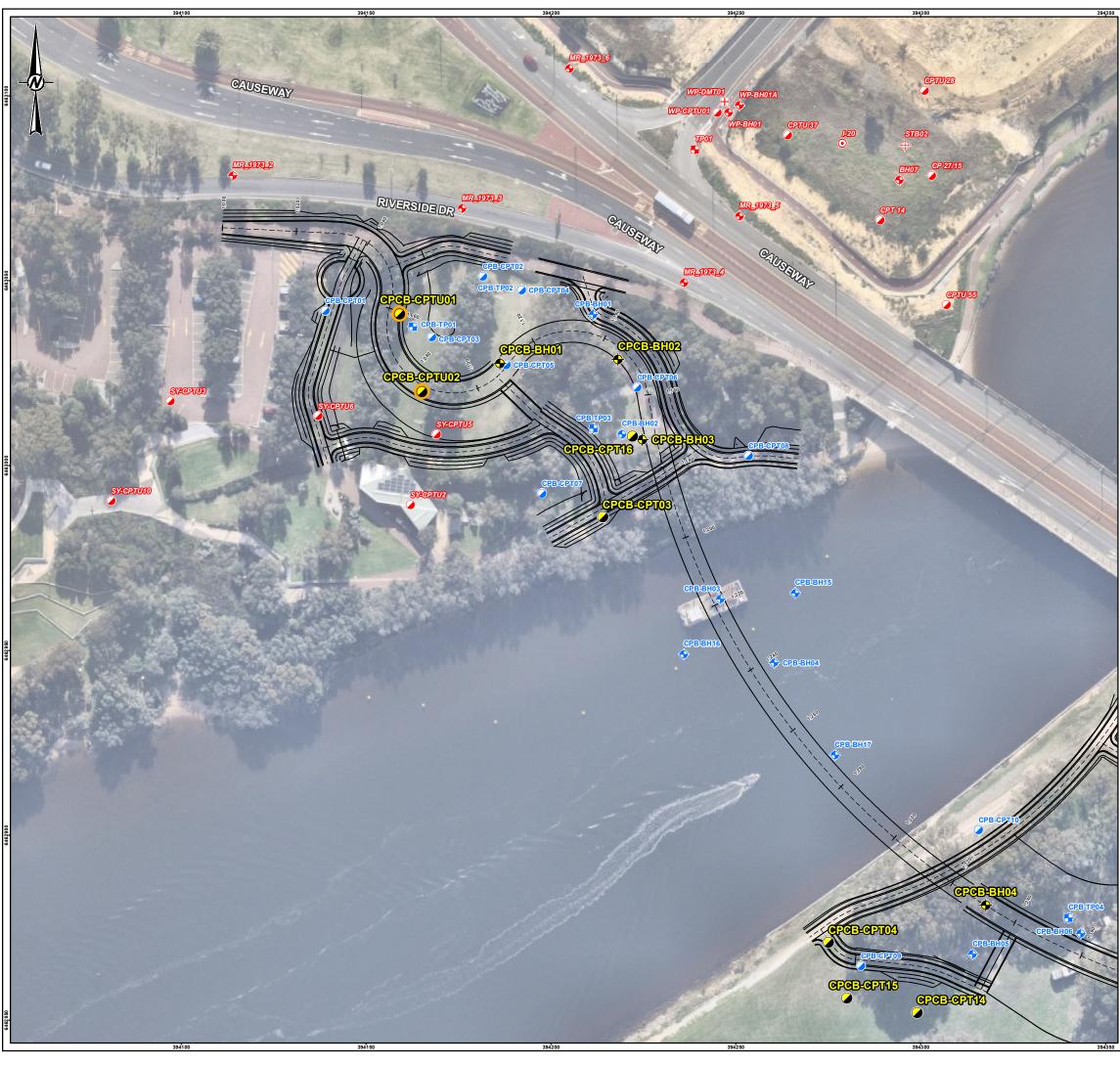
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LEGEND

PHASE 2 ADDITIONAL INVESTIGATION:

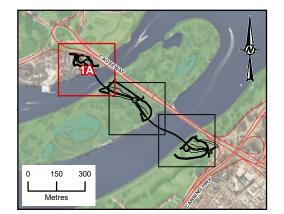
- \bullet BOREHOLE LOCATION
- CONE PENETRATION TEST LOCATION
- CPTUs WITH DISSIPATION TEST LOCATION

PHASE 1 INVESTIGATION:

- TEST PIT LOCATION **+**
- BOREHOLE LOCATION \bullet
- CONE PENETRATION TEST LOCATION

HISTORICAL INVESTIGATION:

- -TEST PIT LOCATION
- + BOREHOLE LOCATION
- Φ MONITORING WELL LOCATION
- \odot INFILTRATION TEST LOCATION
- ⊞ DILATOMETER TEST LOCATION
- CONE PENETRATION TEST LOCATION 0



0	25	50	NOT FOR CONSTRUCTION
			DRAFT
1:1,000		METRES	DRAFI
NOTE			

NOTE: 1. COORDINATE SYSTEM: GDA2020 MGA ZONE 50

1. COORDINATE SYSTEM: GDA2U2U MGA 2 UNE SU REFERENCES: 1. SITE LAYOUT OVERLAY PROVIDED BY CLIENT. DRAWING FILES: * C301-CLA-0000-CL-REF-00002-REFERENCE-LINES.DWG * CORRIDOR 3D-ALL.DWG 2. CADASTRE BASED ON INFORMATION PROVIDED BY AND WITH THE PERMISSION OF THE WESTERN AUSTRALIAN LAND INFORMATION AUTHORITY TRADING AS LANDGATE (2021). 3. AERIAL IMAGERY SOURCED FROM NEARMAP DATED JULY 2021.

CLIEN.

CAUSEWAY LINK ALLIANCE

PROJECT

TITLE

CAUSEWAY PEDESTRIAN AND CYCLIST BRIDGE

GROUND INVESTIGATION LAYOUT PLAN

CLIENT	Causeway Link Alliance	YYYY-MM-DD	2022-08-05	
		DESIGNED	IB	
		PREPARED	JRP	
		REVIEWED		
		APPROVED		
PROJECT C87.20		REV. A		FIGURE



LEGEND

PHASE 2 ADDITIONAL INVESTIGATION:

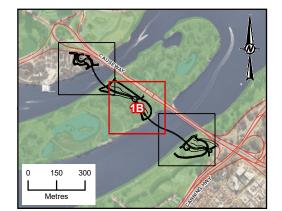
- + BOREHOLE LOCATION
- CONE PENETRATION TEST LOCATION
- CPTUs WITH DISSIPATION TEST LOCATION

PHASE 1 INVESTIGATION:

- TEST PIT LOCATION **+**
- BOREHOLE LOCATION \bullet
- CONE PENETRATION TEST LOCATION

HISTORICAL INVESTIGATION:

- TEST PIT LOCATION -
- BOREHOLE LOCATION ÷
- \oplus MONITORING WELL LOCATION
- INFILTRATION TEST LOCATION \odot
- ₽ DILATOMETER TEST LOCATION
- CONE PENETRATION TEST LOCATION 0



0	25	50	NOT FOR CONSTRUCTION
			DRAFT
1:1,000		METRES	DRAFT

NOTE: 1. COORDINATE SYSTEM: GDA2020 MGA ZONE 50

COORDINATE SYSTEM: GDA2U2U MGA 2 UNE 30
 REFERENCES:
 SITE LAYOUT OVERLAY PROVIDED BY CLIENT. DRAWING FILES:
 * C301-CLA-0000-CI-REF-00002-REFERENCE-LINES.DWG
 * CORRIDOR 3D-ALL.DWG
 2. CADASTRE BASED ON INFORMATION PROVIDED BY AND WITH THE PERMISSION OF THE
 WESTERN AUSTRALIAN LAND INFORMATION AUTHORITY TRADING AS LANDGATE (2021).
 3. AERIAL IMAGERY SOURCED FROM NEARMAP DATED JULY 2021.

CLIEN

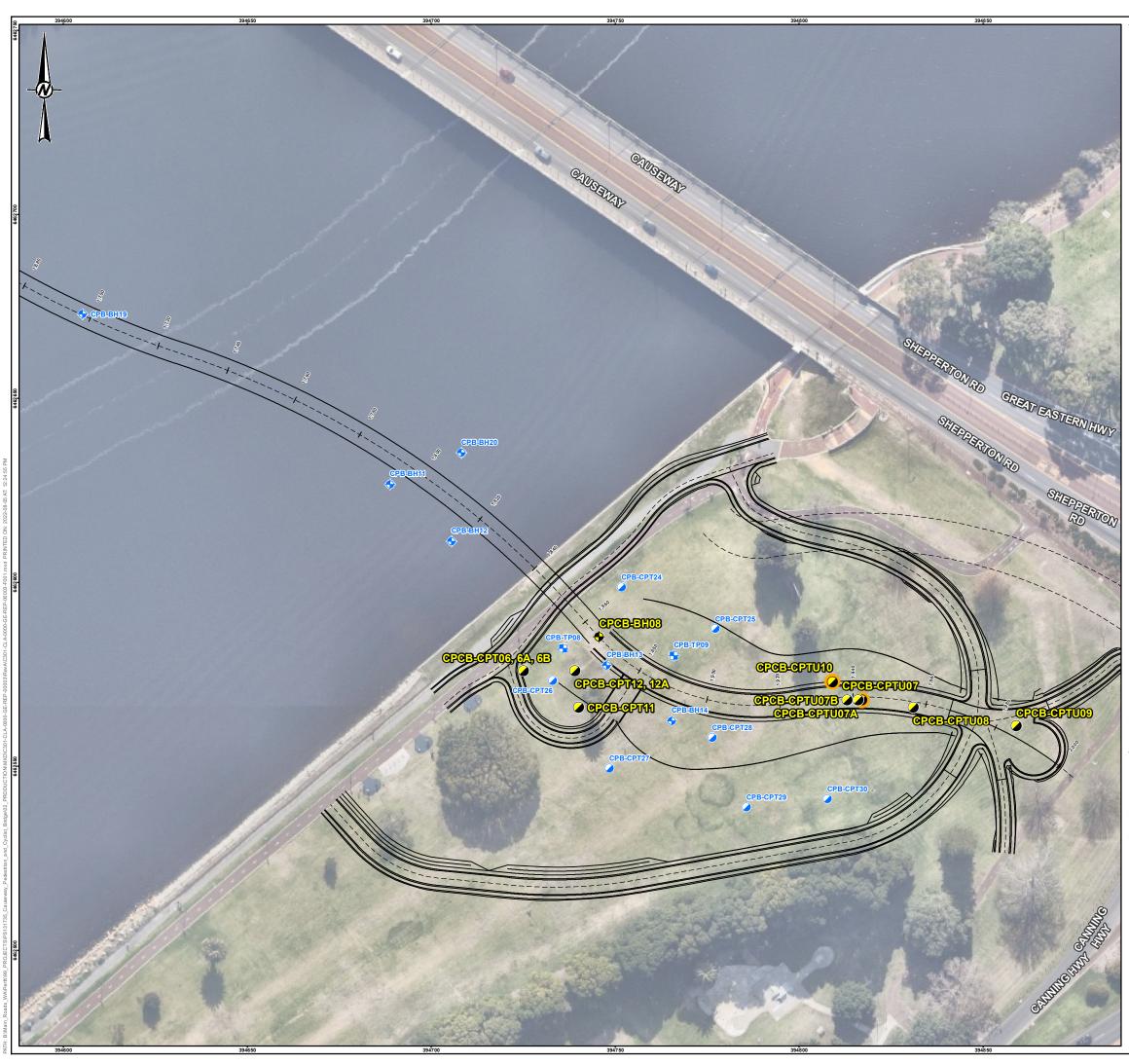
CAUSEWAY LINK ALLIANCE

PROJECT

CAUSEWAY PEDESTRIAN AND CYCLIST BRIDGE

TITLE GROUND INVESTIGATION LAYOUT PLAN

CLIENT		YYYY-MM-DD	2022-08-05	
	Causeway Link Alliance	DESIGNED	IB	
		PREPARED	JRP	
		REVIEWED		
		APPROVED		
PROJECT C87.20		REV. A		FIGURE



LEGEND

PHASE 2 ADDITIONAL INVESTIGATION:

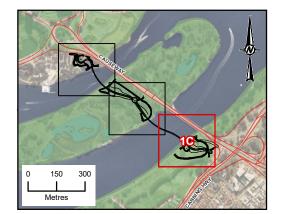
- + BOREHOLE LOCATION
- 0 CONE PENETRATION TEST LOCATION
- CPTUs WITH DISSIPATION TEST LOCATION

PHASE 1 INVESTIGATION:

- TEST PIT LOCATION **+**
- BOREHOLE LOCATION +
- CONE PENETRATION TEST LOCATION

HISTORICAL INVESTIGATION:

- TEST PIT LOCATION -
- ÷ BOREHOLE LOCATION
- \oplus MONITORING WELL LOCATION
- \odot INFILTRATION TEST LOCATION
- ₽ DILATOMETER TEST LOCATION
- CONE PENETRATION TEST LOCATION 0



0	25	50	NOT FOR CONSTRUCTION
			DRAFT
1:1,000		METRES	DRAFI
NOTE			

NOTE: 1. COORDINATE SYSTEM: GDA2020 MGA ZONE 50

1. COORDINATE SYSTEM: GDA2U2U MGA 2 UNE SU REFERENCES: 1. SITE LAYOUT OVERLAY PROVIDED BY CLIENT. DRAWING FILES: * C301-CLA-0000-CL-REF-00002-REFERENCE-LINES.DWG * CORRIDOR 3D-ALL.DWG 2. CADASTRE BASED ON INFORMATION PROVIDED BY AND WITH THE PERMISSION OF THE WESTERN AUSTRALIAN LAND INFORMATION AUTHORITY TRADING AS LANDGATE (2021). 3. AERIAL IMAGERY SOURCED FROM NEARMAP DATED JULY 2021.

CLIEN.

CAUSEWAY LINK ALLIANCE

PROJECT

TITLE

CAUSEWAY PEDESTRIAN AND CYCLIST BRIDGE

GROUND INVESTIGATION LAYOUT PLAN

CLIENT		YYYY-MM-DD	2022-08-05	
	Causeway	DESIGNED	IB	
		PREPARED	JRP	
	Alliance	REVIEWED		
		APPROVED		
PROJECT		REV. A		FIGURE

APPENDIX A: SUMMARY OF TEST LOCATIONS

C301-CLA-0000-GE-REP-00003_A THIS DOCUMENT IS UNCONTROLLED IN HARD COPY Page 15 of 20

Test Location ID	Location / Design Element	Operation Date	Easting (GDA2020)	Northing (GDA2020)	Proposed Target Depth (m)	Actual Depth (m)	Ground Surface Elevation (mAHD)	Base Elevation (mAHD)	Termination Reason	
	Point Fraser Bridge / Abutment 1	7-8/07/2022	394186	6463028	40	40	2.24	-37.76	Target Depth	
CPCB-BH02	Point Fraser Bridge / Pier 2	12-13/07/2022	394218	6463029	40	40	1.71	-38.29	Target Depth	Groundwater encountere
CPCB-BH03	Point Fraser Bridge / Pier 3	14/072022	394225	6463007	40	40	1.43	-38.57	Target Depth	
CPCB-BH04	Heirisson Island / Embankment	5-6/07/2022	394318	6462881	45	44.45	1.83	-42.62	Target Depth	
CPCB-BH05	Heirisson Island / Embankment	4-5/07/2022	394375	6462859	25	25	1.84	-23.16	Target Depth	
CPCB-BH06	Heirisson Island / Embankment	30/06/2022 - 4/07/2022	394490	6462780	25	40	3.24	-36.76	Target Depth	
CPCB-BH07	Heirisson Island Bridge / Pier	27-29/06/2022	394518	6462738	40	40	1.45	-38.55	Target Depth	
CPCB-BH08	McCallum Park Bridge/ Pier	23-27/06/2022	394746	6462585	40	40	1.52	-38.48	Target Depth	
CPCB-CPTU01	Point Fraser / Approach Embankment	05/07/2022	394159	6463041	30	20.48	2.15	-18.33	Refusal	Dissipation tests carried o m (384, 226 kPa) 30 min at 15.0 m (401, 295 kPa)
CPCB-CPTU02	Point Fraser / Approach Embankment	05/07/2022	394165	6463020	30	19.1	2.03	-17.07	Refusal	Dissipation test carried or
CPCB-CPT03	Point Fraser / Crane Pad	11/07/2022	394214	6462986	20	18	1.67	-16.33	Refusal	Groundwater encountere
CPCB-CPT04	Heirisson Island / North Crane Pad	24/06/2022	394275	6462871	6	15.2	1.74	-13.46	Target Depth	
CPCB-CPT05	Heirisson Island / South Crane Pad	24/06/2022	394554	6462744	6	15.2	1.03	-14.17	Target Depth	
CPCB-CPT06	McCallum Park / Crane Pad	23/06/2022	394725	6462576	6	6.5	1.4	-5.1	Target Depth	
CPCB-CPT06A	McCallum Park / Crane Pad	24/06/2022	394725	6462576	15	15.2	1.4	-13.8	Target Depth	
CPCB-CPT06B	McCallum Park / Crane Pad	24/06/2022	394725	6462576	20	17.8	1.4	-16.4	Refusal	
CPCB-CPTU07	McCallum Park / Approach Embankment	23/06/2022	394817	6462568	30	4.7	1.52	-3.18	Refusal	Dissipation test carried or
	McCallum Park / Approach Embankment	23/06/2022	394816	6462568	30	4.8	1.52	-3.28	Refusal	
CPCB-CPTU07B	McCallum Park / Approach Embankment	23/06/2022	394813	6462568	30	4.7	1.52	-3.18	Refusal	
CPCB-CPTU08	McCallum Park / Approach Embankment	23/06/2022	394831	6462566	30	30.1	1.64	-28.46	Target Depth	
CPCB-CPTU09	McCallum Park / Approach Embankment	23/06/2022	394859	6462561	30	30.1	1.65	-28.45	Target Depth	
CPCB-CPTU10	McCallum Park / Approach Embankment	11/07/2022	394809	6462573	30	15.7	1.4	-14.3	Refusal	Dissipation test carried or
CPCB-CPT11	McCallum Park / Crane Pad	05/07/2022	394740	6462566	6	10	1.6	-8.4	Target Depth	Groundwater encountere
CPCB-CPT12	McCallum Park / Crane Pad	05/07/2022	394739	6462576	6	10	1.49	-8.51	Target Depth	Groundwater encountere
CPCB-CPT12A	McCallum Park / Crane Pad	11/07/2022	394739	6462576	6	6	1.49	-4.51	Target Depth	
	Heirisson Island / North Crane Pad	11/07/2022	394530	6462761	6	6	1.98	-4.02	Target Depth	
	Heirisson Island / North Crane Pad	11/07/2022	394299	6462852	6	6	2.09	-3.91	Target Depth	
	Heirisson Island / South Crane Pad	11/07/2022	394280	6462856	6	6	1.9	-4.1	Target Depth	
	Point Fraser / Crane Pad	11/07/2022	394222	6463008	6	6	1.48	-4.52	Target Depth	

Notes:

Total BH metreage Total CPT metreage 309.45 267.58

Test Location ID	Location/Design Element	GI Phase	Operation Date	Easting (GDA2020)	Northing (GDA2020)	Ground Surface Elevation (mAHD)	Groundwater Level (mbgl)	
CPCB-CPTU09	McCallum Park	Phase 2	23/06/2022	6462561	394859	1.65	~1.5	
CPCB-CPTU08	McCallum Park	Phase 2	23/06/2022	6462566	394831	1.64	~1.5	
CPCB-CPTU07	McCallum Park	Phase 2	23/06/2022	6462568	394817	1.52	~1.5	
CPCB-CPT06	McCallum Park	Phase 2	23/06/2022	6462576	394725	1.4	~1.1	
CPCB-CPT05	Heirisson Island	Phase 2	24/06/2022	6462744	394554	1.03	~0.8	
CPCB-CPT04	Heirisson Island	Phase 2	24/06/2022	6462871	394275	1.74	-	Groundwater not encoun
CPCB-CPT02	Point Fraser	Phase 2	29/06/2022	6463020	394165	2.03	_	Groundwater not encoun
CPCB-CPT01	Point Fraser	Phase 2	29/06/2022	6463041	304159	2.15	_	Groundwater not encoun
CPCB-BH01	Point Fraser	Phase 2	29/06/2022	6463029	394190	2.23	_	Groundwater not encoun
CPCB-BH02	Point Fraser	Phase 2	29/06/2022	6463028	394220	1.71	~1.25	
CPCB-BH03	Point Fraser	Phase 2	29/06/2022	6463014	394228	1.43	_	Groundwater not encoun
CPCB-CPT03	Point Fraser	Phase 2	29/06/2022	6462989	394210	1.67	~1.5	
CPCB-CPT02	Point Fraser	Phase 2	5/07/2022	6463020	394165	2.03	1.2	
CPCB-CPT01	Point Fraser	Phase 2	5/07/2022	6463041	304159	2.15	1.3	
CPCB-CPT11	McCallum Park	Phase 2	5/07/2022	6462566	394740	1.6	~1.05	
CPCB-CPT12	McCallum Park	Phase 2	5/07/2022	6462576	394739	1.49	~1.0	
		Dhasa 1	7/04/2022	0400707	204504	0.50	3.12	
CPB-BH07	Heirisson Island	Phase 1	4/08/2022	6462767	394504	3.52	2.75	Close to CPCB-BH06
CPB-BH02	Point Fraser	Phase 1	7/04/2022	6463012	394218	1.63	1.07	
	Point Frasei	Phase I	4/08/2022	0403012	394210	1.03	0.36	Strong odour, white pow
CPB-BH05	Heirisson Island	Phase 1	7/04/2022	6462867	394314	1.91	1.34	
		Fliase I	4/08/2022	0402007	394314	1.91	1.13	
CPB-BH14	McCallum Park	Phase 1	7/04/2022	6462565	394767	1.59	1.16	
			4/08/2022	0402000	394/07	1.09	0.65	
Telstra Cable	McCallum Park	Phase 2	7/07/2022	6462575	394836	-	1.25	Groundwater level meas location of Telstra cable

Notes:

Remarks
Intered
Intered
Intered
Intered
Intered
wdery material observed on well tube
sured during potholing (by Abaxa) to investigate e during Phase 2 GI works

APPENDIX B: BOREHOLE LOGS

****SD GOLDER

METHOD OF SOIL DESCRIPTION USED ON BOREHOLE AND TEST PIT REPORTS

FILL
GRAVEL (GW, GP, GM or GC) GRAVEL (GW, GP, GM or GC) ORGANIC SOILS (OL, OH or Pt) SAND (SW, SP, SM or SC) Grave and the set of the se
SILT (ML or MH) Combinations of these basic symbols may be used to indicate mixed materials such as sandy clay. CLASSIFICATION AND INFERRED STRATIGRAPHY Soil and Rock is classified and described in Reports of Boreholes and Test Pits using the preferred method given in AS1726-20 The material properties are assessed in the field by visual/tactile methods. Particle Size Plasticity Properties BOULDERS > 200 mm COBBLES 63 to 200 mm Coarse 19 to 63 mm
X X Combinations of these basic symbols may be used to indicate mixed materials such as sandy clay. CLASSIFICATION AND INFERRED STRATIGRAPHY Soil and Rock is classified and described in Reports of Boreholes and Test Pits using the preferred method given in AS1726-20 The material properties are assessed in the field by visual/tactile methods. Particle Size Plasticity Properties Soil Group Sub Division Particle Size Plasticity Properties BOULDERS > 200 mm COBBLES 63 to 200 mm Coarse 19 to 63 mm
CLASSIFICATION AND INFERRED STRATIGRAPHY Soil and Rock is classified and described in Reports of Boreholes and Test Pits using the preferred method given in AS1726-20 The material properties are assessed in the field by visual/tactile methods. Plasticity Properties Soil Group Sub Division Particle Size BOULDERS > 200 mm COBBLES 63 to 200 mm 50 Coarse 19 to 63 mm 50
Soil and Rock is classified and described in Reports of Boreholes and Test Pits using the preferred method given in AS1726-20 The material properties are assessed in the field by visual/tactile methods. Plasticity Properties Soil Group Sub Division Plasticity Properties BOULDERS > 200 mm Soil Group Soil Group COBBLES 63 to 200 mm Soil Group Soil Coarse 19 to 63 mm Soil Group
The material properties are assessed in the field by visual/tactile methods. Particle Size Soil Group Sub Division Particle Size BOULDERS > 200 mm 50 COBBLES 63 to 200 mm 50 Coarse 19 to 63 mm 50
Particle Size Soil Group Sub Division Particle Size BOULDERS > 200 mm COBBLES 63 to 200 mm Coarse 19 to 63 mm
Soil Group Sub Division Particle Size BOULDERS > 200 mm COBBLES 63 to 200 mm Coarse 19 to 63 mm
BOULDERS > 200 mm COBBLES 63 to 200 mm Coarse 19 to 63 mm
BOOLDERS > 200 mm COBBLES 63 to 200 mm Coarse 19 to 63 mm
Coarse 19 to 63 mm
GRAVEL Medium 6.7 to 19 mm
GRAVEL Medium 6.7 to 19 mm Fine 2.36 to 6.7 mm Coarse 0.6 to 2.36 mm Medium 0.21 to 0.6 mm
Coarse 0.6 to 2.36 mm
Fine 0.075 to 0.21 mm
SILT 0.002 to 0.075 mm
CLAY < 0.002 mm
MOISTURE CONDITION
Symbol Term Description D Dry Sands and gravels are free flowing. Clays and silts may be brittle or friable and powdery. M Moist Soils are darker than in dry condition and may feel cool. Sands and gravels tend to cohere. W Wet Soils exude free water. Sand and gravels tend to cohere. Moisture condition for fine grained soils is described relative to the plastic limit or liquid limit as specified in AS1726-2017. CONSISTENCY AND DENSITY
Fine Grained Soils Coarse Grained Soils
Symbol Term Undrained Shear Strength Symbol Term Density Index (%) SPN "N" *
VS Very Soft 0 to 12 kPa VL Very Loose Less than 15 0 to 4
S Soft 12 to 25 kPa L Loose 15 to 35 4 to 10
F Firm 25 to 50 kPa MD Medium Dense 35 to 65 10 to 30
St St iff 50 to 100 kPa D Dense 65 to 85 30 to 50
VSt Very Stiff 100 to 200 kPa VD Very Dense Above 85 Above 50
H Hard Above 200 kPa Fr Friable -
In the absence of test results, consistency and density may be assessed from correlations with the observed behaviour of the
material.
* SPT correlations are not stated in AS1726-2017, and may be subject to corrections for overburden pressure and equipment ty
CEMENTATION
Weakly Cemented The soil may be easily disaggregated by hand in air or water.
Moderately Cemented Effort is required to disaggregate the soil by hand in air or water.

NS GOLDER

EXPLANATION OF NOTES, ABBREVIATIONS & TERMS USED ON BOREHOLE AND TEST PIT REPORTS

DRILLING/E	XCAVATION ME	THOD						
ADH	Hollow auger dr		Excavator		PQ3	Diamor	nd core - 83 mm	
ADT	Auger drilling wi		Hand auger		PT		ube sampling	
ADV	Auger drilling wi		Excavated by	hand method			air blast	
AIRCORE	Aircore	HMLC	Diamond core		RC		e circulation	
AT	Air track	HQ3	Diamond core		RD	Rotary		
BH	Backhoe bucket		Jetting		RT	Rock ro	•	
CT	Cable tool rig	MZ	Mazier tube s	ampling	SONI			
DTC	Diatube coring	NDD	Non-destructiv		SPT		rd penetration tes	tina
EE	Existing excavat		Diamond core		U		urbed tube samplir	
EPT	Extruded push t		Diamond core		WB		ore drilling	ig
	ION/EXCAVATIO		Diamonu core	- 45 1111	VVD	VVaSHD	ore arming	
L		. Rapid penetration	possible with litt	le effort from	the equipmer	nt used.		
Μ		nce. Excavation/pos					e equipment used	
Н		e to penetration/exca						
	effort from the e	quipment.			-			
R		ctical Refusal. No fu	irther progress p	ossible witho	out the risk of	damage or ur	nacceptable wear	to
		ement or machine.						
		ctive and are depend		tors including	g the equipme	ent power, wei	ght, condition of	
	or drilling tools, and	d the experience of th	ne operator.					
WATER	5.6.F -	1 1 6 1 6 1		1 -				
₹		er level at date shown		-	Partial water I			
		er inflow			Complete wat		a abuillia a cost	
GROUNDW		e observation of grou			not, was not p	possible due te	o drilling water,	
		face seepage or cave				undwater es:	Id bo propost in I-	
GROUNDW/ ENCOUNTE		e borehole/test pit wa meable strata. Inflov						:55
ENCOUNTE		ger period.	v may have bee		au the porent	ne/test pit bee	an leit open ior a	
SAMPLING	AND TESTING	ger period.						
SPT	Standard Pe	enetration Test to AS	1289.6.3.1-2004					
4,7,11 N=18	4,7,11 = Blo	ws per 150mm. N = I	Blows per 300m	m penetratior	n following 15	0mm seating		
30/80 mm		tical refusal occurs, th						
RW		occurred under the re						
HW	Penetration	occurred under the h	ammer and rod	weight only				
HB		uble bouncing on any	/il	·				
DS	Disturbed sa							
BDS	Bulk disturb							
G	Gas Sample							
W	Water Samp							
FP		ability test over section						
FV		hear test expressed		shear strengtl	h (sv = peak \	/alue, sr = res	idual value)	
PID		tion Detector reading						
PM		ter test over section i		ot rooding in	kDo			
PP		tube complex pumps				llimotros		
U63 WPT	Water press	tube sample - numbe	er mulcates nom	mai sampie d	nameter in MI	mnetres		
DCP		ne penetration test						
CPT	Cone penet							
CPTu		ration test with pore p	pressure (u) mea	surement				
		SERVABLE CONTA			or specific soil	contaminatio	n assessment	
projects)	. HUGHELI UD					containinatio		
R = 0	No visible evide	nce of contamination		R = A	No non-natu	Iral odours ide	entified	
R = 1		of visible contaminati		R = B		atural odours		
R = 2	Visible contamir			R = C		on-natural odd		
R = 3	Significant visibl			R = D		natural odours		
	E RECOVERY							
TCR = Tota	I Core Recovery	RQD = Rock Quali	ity Designation	SCR =	Solid Core R	lecovery	F = Fracture	
	(%)	(%)			(%)	-	Frequency	
_ Lengthof c	ore recovered ×100	\sum Axial lengths of c	ore > 100 mm	\sum Length o	of cyclindrical core	erecovered ×100	_ No. of defects	S
Length	of core run	= <u>Lengthof co</u>	×100	L	ength of core rur		Euleright of zone	(m)
		2091.01		1			-	. ,

\\S) GOLDER

TERMS FOR ROCK MATERIAL STRENGTH & WEATHERING AND ABBREVIATIONS FOR DEFECT DESCRIPTIONS

STRENG	TH										
Symbol	Term	UCS (MPa)				eld Guide					
VL	Very Low	0.6 to 2				arp end of pick; can be peeled with knife; too har to 30 mm can be broken by finger pressure.					
L	Low	2 to 6	of pick poin	nt; has dul	l sound under hammer	m to 3 mm show in the specimen with firm blows A piece of core 150 mm long by 50 mm lges of core may be friable and break during					
Μ	Medium	6 to 20	Readily scored with a knife; a piece of core 150 mm long by 50 mm diameter can be broken by hand with difficulty.								
Н	High	20 to 60	A piece of core 150 mm long by 50 mm diameter cannot be broken by hand but can be broken with pick with a single firm blow; rock rings under hammer.								
VH	Very High	60 to 200				than one blow; rock rings under hammer.					
EH	Extremely High	>200	Specimen rings unde			jical pick to break through intact material; rock					
fabric or te	xture should	l be noted, if re		be describ	bed using soil characte	ristics. The presence of an original rock structure					
ROCK M/	ATERIAL W	EATHERING									
Syn	nbol	Term				eld Guide					
R	S	Residual Soil	Material is weathered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are no longer visible, but the soil has not been significantly transported.								
Х	W	Extremely Weathered			ed to such an extent the fabric of original rock	at it has soil properties. Mass structure and are still visible.					
DW	HW	Highly Weathered	extent that changed may be in	The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognizable. Rock strength is significantly changed by weathering. Some primary minerals have weathered to clay minerals. Porosity may be increased by leaching, or may be decreased due to deposition of weathering broducts in pores. The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognizable, but shows little or no change of strength from fresh rock.							
	MW	Moderately Weathered	The whole extent the								
S	W	Slightly Weathered	Rock is pa	artially disc		or bleaching along joints but shows little or no					
F	R	Fresh	Rock sho	ws no sign	of decomposition of ir	ndividual minerals or colour changes.					
		OR DEFECT T	YPES AND								
Defect Ty					or Infilling	Roughness					
P X L C J	Parting Foliation Cleavage Contact Joint			Cn Sn Ve Ct In	Clean Stain Veneer Coating Infill	VRo Very Rough Ro Rough Sm Smooth Po Polished SI Slickensided					
SSu SS SZ CS	Sheared S Sheared S Sheared Z Crushed S	Seam Cone		Planarity Pl Cv	Planar	Vertical Boreholes – The dip (inclination from horizontal) of the defect is given. Inclined Boreholes – The inclination is					
IS EWS V	Infilled Sea		eam	Un St Ir	CurvedInclined Boreholes – The incUndulatingmeasured as the acute angle ISteppedthe core axis and the vertical cIrregularInclined Boreholes – The inc						

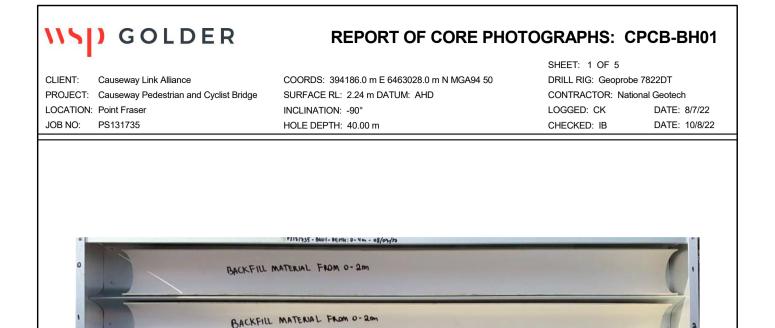
)JE CATI	CT: ON:	Cau Poir PS1	seway It Frase 31735			COORDS: 394186.0 m E 646 Cyclist Bridge SURFACE RL: 2.24 m DATU INCLINATION: -90° HOLE DEPTH: 40.00 m			n N MG/	494 50	SHEET: 1 OF 3 DRILL RIG: Geoprobe 7822DT CONTRACTOR: National Geotec LOGGED: CK DATE: CHECKED: IB DATE:	8/7/		2
	WATER	TCR	RQD (SCR)	DEPTH 60 (metres)	DEPTH RL	GRAPHIC LOG	Field Material Description	VTHER	STRE	ERRED ENGTH S MPa S & S & S S = F H	LABORATORY STRENGTH (MPa)	Defect Information DEFECT DESCRIPTION & Additional Observations	DI SF	ERA EFE PACI (mm	EC IN n)
2	GWNO			0 — - - - - - - - - - - - - - - - - - - -	0.30 0.50 1.74 2.00 0.24 2.45 -0.21 3.24 -1.00 4.37 -2.13 5.20 -3.76 6.30 -3.76 6.30 -4.06 -3.76 6.30 -4.06 -3.76 6.30 -4.06 -3.76 6.30 -4.06 -3.76 6.30 -7.26		TOPSOIL: SAND (SP) fine to coarse grained, dark brown, with rootlets, loose FILL: GRAVEL (GP) (GP) medium dense to dense FILL: Sandy GRAVEL (GP) (GP) fine to coarse grained, sub-rounded to sub-angular, pale yellow, trace limestone cobbles, with, fine to coarse grained sand, medium dense to dense Clayey SAND (Possible Fill) (SC) fine to coarse grained, brown orange, with fines, moist, medium dense SAND (SP) fine to coarse grained, black to dark grey, very loose, trace to with fines CLAY (CL-Cl) low to medium plasticity, dark grey, with silt, with fine to coarse grained, dark grey, with quartz, trace shell fragments, loose, trace fines grey white Clayey SAND (SC) fine to coarse grained, dark grey to black, trace silt, moderate odour, loose Silty CLAY (CI-CH) medium to high plasticity, dark grey, trace sand, trace shell fragments, strong odour, very soft Mathered SAND (SC) fine to coarse grained, dark grey, trace sand, trace / shell fragments, strong odour, very soft medium to high plasticity, dark grey, trace sand, trace / shell fragments, strong odour, very soft					0.00-2.00 m: Material to 2m was logged during vacuum excavation 0.10 m: Geohex and geotextile at 0.1m 0.50 m: Geotextile at 0.5m Rec = 260/450 mm SPT 2.00-2.45 m; 0, 1, 0 N=1 Rec = 200/450 mm SPT 3.50-3.95 m; 1, 0, 0 N=0 Rec = 210/450 mm SPT 5.00-5.45 m; 1, 0, 1 N=1 Rec = 450/450 mm SPT 6.50-6.95 m; 0, 0, 0 N=0 U 8.00-8.45 m; Rec = 450/450 mm			
				10	<u>12.50</u> -10.26 <u>13.50</u> -11.26		high plasticity					SPT 9.50-9.95 m; 0, 0, 0 N=0 U 11.00-11.45 m; Rec = 450/450 mm Rec = 450/450 mm SPT 12.50-12.95 m; 0, 0, 0 N=0 U 14.00-14.45 m; Rec = 450/450 mm			

GAP 10.0.7 LIB LOGOGLB Log GAP CORED BOREHOLE ADDITIONAL CAUSEWAY BRIDGE GI (BACKUP) GPJ <- ChrawingFile>>> 11/08/2022 09-42 10:02:0004 Dargei Tools

PR LO	OJE CAT B NC	CT: ION:	Cau Poin PS1	seway t Frase 31735			COORDS: 394186.0 m E 646 d Cyclist Bridge SURFACE RL: 2.24 m DATU INCLINATION: -90° HOLE DEPTH: 40.00 m			IN MG	A94 50	CHECKED: IB DAT		
			Drillin	ng			Field Material Description				~	Defect Information		
	WATER	TCR	RQD (SCR)	DEPTH (metres)	<i>DEPTH</i> RL	GRAPHIC LOG	ROCK / SOIL MATERIAL DESCRIPTION	WEATHERING	STR UC	RRED ENGTH SMPa	LABORATORY STRENGTH (MPa)	DEFECT DESCRIPTION & Additional Observations	AVEI DEF SPA (n	
				-		*	Sitty CLAY (CI-CH) medium to high plasticity, dark grey, trace sand, trace shell fragments, strong odour, very soft					Rec = 450/450 mm SPT 15.50-15.95 m; 0, 0, 0 N=0		
				16 —	16.00 -13.76 16.70	× × ×	low to medium plasticity, dark grey to black, trace sand							
				-	17.00 -14.76 17.45 -15.21	· · · ·	Clayey SAND (SC) fine grained, grey, trace silt, loose					Rec = 450/450 mm SPT 17.00-17.45 m; 2, 2, 1 N=3		
				- 18 — - -			fine to medium grained, grey, with fines, loose					Rec = 360/450 mm SPT 18.50-18.95 m; 4, 3, 6 N=9		
				- 20 — -	<u>19.72</u> -17.48 <u>21.00</u> -18.76 21.30	0 0	Gravelly SAND (SP) fine to coarse grained, orange brown grey mottled red and yellow, fine to coarse sub-rounded to sub-angular gravel, with fines, very dense SAND (SP)					Rec = 350/450 mm SPT 20.00-20.45 m; 21, 27, 38 N=65		
	0			- 22 —	-19.06 -22.00 -19.76		fine to medium grained, brown and grey mottled vellow, dense to very dense grey, trace fines pale brown, black staining within depth 22.30m to 22.74m					Rec = 450/450 mm SPT 21.50-21.95 m; 8, 16, 21 N=37		
	GWN			-	22.80 -20.56 23.45		grey					Rec = 450/450 mm SPT 23.00-23.45 m; 5, 12, 22 N=34		
				- 24 — -	23.66 -21.42 24.50		CORE LOSS SAND (SP) fine to medium grained, brown and grey mottled yellow, dense							
				-	-22.26 25.13 -22.89		fine to coarse grained, yellow brown					Rec = 450/450 mm SPT 24.50-24.95 m; 10, 18, 19 N=37		
				- 26 — -	<u>26.00</u> -23.76		RESIDUAL SOIL: Clayey SAND (SC) fine to medium grained, medium plasticity, brown yellow and dark grey, trace silt, trace coarse angular gravel, medium dense to dense					Rec = 450/450 mm SPT 26.00-26.45 m; 4, 4, 6 N=10		
					<u>28.00</u> -25.76		SANDSTONE fine to medium grained, massive, dark grey					Rec = 430/450 mm SPT 27.50-27.95 m; 11, 18, 27 N=45		
		100	100 (100) 100	-								Rec = 450/450 mm SPT 29.00-29.45 m; 15, 27, 41 N=68		

CL PR LO	IENT OJE	-: CT: ION:	Cau Cau Poin PS1	seway seway it Frase 31735	Link Alli Pedestr er	ance	ER COORDS: 394186.0 m E 64 SURFACE RL: 2.24 m DATE INCLINATION: -90° HOLE DEPTH: 40.00 m	63028	3.0 m N I			CHECKED: IB DATE		
			Drillin	ng			Field Material Description	(1)			≿	Defect Information		
METHOD	WATER	TCR	RQD (SCR)	DEPTH (metres)	DEPTH RL	GRAPHIC LOG	ROCK / SOIL MATERIAL DESCRIPTION	WEATHERING	INFERRI STRENG UCSMF ଃ ଛ ଛ ଛ ଅ ୁ ହ ହ	STH Pa	LABORATORY STRENGTH (MPa)	DEFECT DESCRIPTION & Additional Observations	AVERA DEFEC SPACII (mm	CT NG I)
		100	100 (100)	30 — -	_		SANDSTONE fine to medium grained, massive, dark grey					Rec = 340/290 mm SPT 30.50-30.79 m; 23, 43/140mm HB N>43		
		100	100 (100)	32 —	-							Rec = 300/250 mm SPT 32.00-32.25 m; 20, 35/100mm HB N>35		-
		100	100 (100)	-	-									
PQ3	GWNO	100	100 (100)	34 — - -	-									-
		100	100 (100)	- 36 — -	-									-
		100	100 (100)	38 —	-									-
		100	100 (100)	-	40.00									
				—40— - -	-37.76		END OF BOREHOLE @ 40.00 m TARGET DEPTH GROUNDWATER NOT OBSERVED Backfilled with grout							
				- 42 — -	-									-
				44 —	-									-
				g	eotechn	ical pur	borehole must be read in conjunction with accom poses only, without attempt to assess possible co tion only and do not necessarily indicate the prese	ntamir	nation. A	Any re	ferences t	o potential contamination are for	INT FN. F	 E02a

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SPT FROM 2-2.45m

CPCB-BH01 - 0.00 - 4.00 m





REPORT OF CORE PHOTOGRAPHS: CPCB-BH01

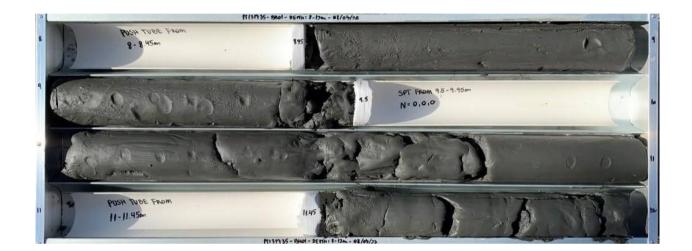
 CLIENT:
 Causeway Link Alliance

 PROJECT:
 Causeway Pedestrian and Cyclist Bridge

 LOCATION:
 Point Fraser

 JOB NO:
 PS131735

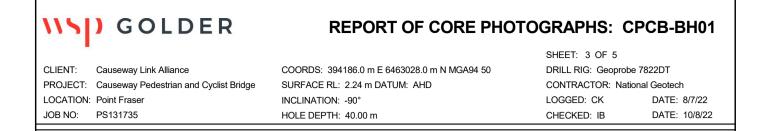
COORDS: 394186.0 m E 6463028.0 m N MGA94 50 SURFACE RL: 2.24 m DATUM: AHD INCLINATION: -90° HOLE DEPTH: 40.00 m SHEET: 2 OF 5 DRILL RIG: Geoprobe 7822DT CONTRACTOR: National Geotech LOGGED: CK DATE: 8/7/22 CHECKED: IB DATE: 10/8/22



CPCB-BH01 - 8.00 - 12.00 m



CPCB-BH01 - 12.00 - 16.00 m





CPCB-BH01 - 16.00 - 20.00 m



CPCB-BH01 - 20.00 - 24.00 m



CLIENT: Causeway Link Alliance PROJECT: Causeway Pedestrian and Cyclist Bridge LOCATION: Point Fraser JOB NO: PS131735 COORDS: 394186.0 m E 6463028.0 m N MGA94 50 SURFACE RL: 2.24 m DATUM: AHD INCLINATION: -90° HOLE DEPTH: 40.00 m SHEET: 4 OF 5 DRILL RIG: Geoprobe 7822DT CONTRACTOR: National Geotech LOGGED: CK DATE: 8/7/22 CHECKED: IB DATE: 10/8/22



CPCB-BH01 - 24.00 - 28.00 m



CPCB-BH01 - 28.00 - 32.00 m



REPORT OF CORE PHOTOGRAPHS: CPCB-BH01

 CLIENT:
 Causeway Link Alliance

 PROJECT:
 Causeway Pedestrian and Cyclist Bridge

 LOCATION:
 Point Fraser

 JOB NO:
 PS131735

COORDS: 394186.0 m E 6463028.0 m N MGA94 50 SURFACE RL: 2.24 m DATUM: AHD INCLINATION: -90° HOLE DEPTH: 40.00 m SHEET: 5 OF 5 DRILL RIG: Geoprobe 7822DT CONTRACTOR: National Geotech LOGGED: CK DATE: 8/7/22 CHECKED: IB DATE: 10/8/22



CPCB-BH01 - 32.00 - 36.00 m



CPCB-BH01 - 36.00 - 40.00 m

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GAP gINT FN. F28 RL1

PR(CT: ON:	Cau Poir				COORDS: 394218.0 m E 6 Cyclist Bridge SURFACE RL: 1.71 m DAT INCLINATION: -90° HOLE DEPTH: 40.00 m				MGA	494 50	SHEET: 1 OF 3 DRILL RIG: Geoprobe 7822DT CONTRACTOR: National Geotec LOGGED: CK DATE: CHECKED: IB DATE:	12/7	
			Drilli	ng			Field Material Description						Defect Information		
	WATER	TCR	RQD (SCR)	DEPTH (metres)	DEPTH RL	GRAPHIC LOG	ROCK / SOIL MATERIAL DESCRIPTION	WEATHERING	STI	ERF REN(CS M	GTH	LABORATORY STRENGTH (MPa)	DEFECT DESCRIPTION & Additional Observations	DI SF	EFE PACI (mm
۵	$^{\prime}$			0 — - - - 2 —	1.71 1.57 0.14 2.00 -0.29		FILL: Gravelly SAND (SP) fine to medium grained, brown and pale grey, fine to coarse rounded to sub-angular limestone gravel, trace limestone cobbles, very loose						0.00-2.00 m: Material to 2m was logged during vacuum excavation		
				- - - 4	<u>3.50</u> 1.79 <u>4.00</u> -2.29		Clayey SAND (SC) fine to medium grained, dark grey, very loose CLAY (CH) high plasticity, dark grey, with silt, strong odour, very soft, some yellow brown band CORE LOSS						Rec = 450/450 mm SPT 2.00-2.45 m; 1, 0, 1 N=1 Rec = 450/450 mm SPT 3.50-3.95 m; 0, 0, 0 N=0		
				- - 6 -	<u>4.94</u> -3.23		CLAY (CH) high plasticity, dark grey, with sand, with silt, very soft						Rec = 450/450 mm SPT 5.00-5.45 m; 0, 0, 0 N=0 Rec = 450/450 mm SPT 6.50-6.95 m; 0, 0, 0 N=0		
0 2 2				8	- <u>7.70</u> -5.99 -6.29 -6.29 - -7.79		with shell fragments						Rec = 450/450 mm SPT 9.50-9.95 m; 0, 0, 0 N=0		
				12 — - - 14 —			Clayey Silty SAND (SC-SM) fine to medium grained, dark grey and brown yellow, with shell fragments, loose						Rec = 450/450 mm SPT 12.50-12.95 m; 0, 0, 0 N=0 Rec = 350/450 mm SPT 14.00-14.45 m; 0, 3, 5 N=8		

PR LO		CT: ION:	Cau Poin	,			COORDS: 394218.0 m E 644 d Cyclist Bridge SURFACE RL: 1.71 m DATL INCLINATION: -90° HOLE DEPTH: 40.00 m			N MG	A94 50		ech E: 12/7/22 E: 10/8/22
			Drillin	ng	1		Field Material Description					Defect Information	
	WATER	TCR	RQD (SCR)	DEPTH (metres)	DEPTH RL	GRAPHIC LOG	ROCK / SOIL MATERIAL DESCRIPTION	WEATHERING	INFEF STRE UCS	NGTH MPa	LABORATORY STRENGTH (MPa)	DEFECT DESCRIPTION & Additional Observations	AVER/ DEFE SPAC (mn
				- - 16 —	<u>15.50</u> -13.79 <u>16.10</u> -14.39		Clayey Sitty SAND (SC-SM) fine to medium grained, dark grey and brown yellow, with shell fragments, loose brown yellow pale brown, trace shell fragments	-				Rec = 430/450 mm SPT 15.50-15.95 m; 1, 2, 1 N=3	
				-	<u>16.80</u> -15.09 17.45 -15.74		mottled brown Silty SAND (SM) fine to medium grained, brown yellow, loose	-				Rec = 450/450 mm SPT 17.00-17.45 m; 1, 0, 2 N=2	
				18 — - -	<u>19.34</u> -17.63	× · · · · · · · · · · · · · · · · · · ·		_				Rec = 450/450 mm SPT 18.50-18.95 m; 1, 2, 3 N=5	
				- 20 — -	-17.03 19.86 -18.29 20.45 -18.74 21.00	× · · · · · · · · · · · · · · · · · · ·	CORE LOSS Gravelly Silty SAND (SM) fine to coarse grained, brown yellow and grey, fine to coarse sub-rounded to angular gravel, medium dense / CORE LOSS	-				Rec = 450/450 mm SPT 20.00-20.45 m; 10, 9, 14 N=23	
				- - 22 —	-19.29	× · · × × · · × × · · × × · · ×	Gravelly Silty SAND (SM) fine to coarse grained, brown yellow and grey, fine to coarse sub-rounded to angular gravel, loose to medium dense					Rec = 450/450 mm SPT 21.50-21.95 m; 5, 9, 10 N=19	
					-	* * * *						Rec = 380/450 mm SPT 23.00-23.45 m; 3, 2, 3 N=5	
				-	<u>24.50</u> -22.79		Clayey Silty SAND (SC) fine to coarse grained, brown yellow and grey, loose (SM)					Rec = 450/450 mm SPT 24.50-24.95 m; 7, 7, 2 N=9	
				- 26 — -	25.64 25.81 26.00 -24.29 26.45 -24.74 27.00	····×	trace fine to coarse sub-rounded to angular cobbles and gravel CORE LOSS Sandy CLAY (CH) high plasticity, grey mottled brown yellow, fine to coarse grained sand, with silt, firm	-				Rec = 380/450 mm SPT 26.00-26.45 m; 3, 1, 1 N=2	
				- 28	-25.29 28.00 -26.29		CORE LOSS Sandy CLAY high plasticity, grey mottled brown yellow, fine to coarse grained sand, with silt, firm SANDSTONE fine to ecorse grained massive, dark gray to black					Rec = 430/450 mm SPT 27.50-27.95 m; 2, 4, 7 N=11 28.10 m: orange brown staining at 28.1m	
		400	100 (100) 100 (100)	-	-		fine to coarse grained, massive, dark grey to black					Rec = 420/375 mm SPT 29.00-29.38 m; 10, 21, 10/75mm HB N>31	

PF LC		CT: ION:	Cau Poir PS1	seway It Frase 31735	er		COORDS: 394218.0 m E 6 SURFACE RL: 1.71 m DAT INCLINATION: -90° HOLE DEPTH: 40.00 m			GA94 50	CHECKED: IB DATI	
METHOD	WATER	TCR	RQD (SCR)	DEPTH (metres)	DEPTH RL	GRAPHIC LOG	Field Material Description	WEATHERING	INFERRED STRENGTH UCS MPa	SORAT Sorrat RENG	Defect Information DEFECT DESCRIPTION & Additional Observations	AVERAG DEFEC SPACIN (mm)
		100	100 (100)	30 —	_		SANDSTONE fine to coarse grained, massive, dark grey to black				Rec = 360/350 mm SPT 30.50-30.85 m; 19, 31, 17/50mm HB N>48	
		100	100 (100)	32—	_						Rec = 170/140 mm SPT 32.00-32.14 m; 32/140mm HB N=R	
		100	100 (100)	24	_							
PQ3		100	100 (100)	34 —	-							
		100	100 (100)	36 —	-							
		100	100 (100)	38 —	-							
		100	100 (100)		40.00							
				40	-38.29		END OF BOREHOLE @ 40.00 m TARGET DEPTH GROUNDWATER ENCOUNTERED @ 1.25 m DEPTH Backfilled with grout					
				42 —	-							
				44 —	-							



REPORT OF CORE PHOTOGRAPHS: CPCB-BH02

CLIENT:Causeway Link AlliancePROJECT:Causeway Pedestrian and Cyclist BridgeLOCATION:Point FraserJOB NO:PS131735

COORDS: 394218.0 m E 6463029.0 m N MGA94 50 SURFACE RL: 1.71 m DATUM: AHD INCLINATION: -90° HOLE DEPTH: 40.00 m SHEET: 1 OF 5 DRILL RIG: Geoprobe 7822DT CONTRACTOR: National Geotech LOGGED: CK DATE: 12/7/22 CHECKED: IB DATE: 10/8/22



CPCB-BH02 - 0.00 - 4.00 m



CPCB-BH02 - 4.00 - 8.00 m

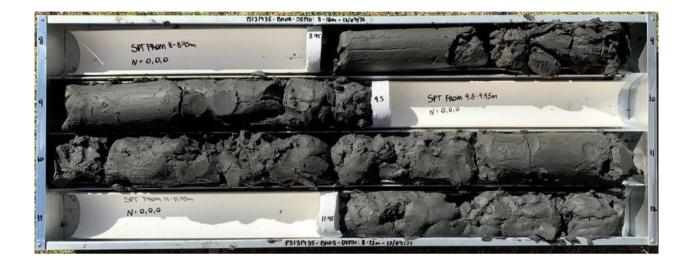
This report of core photographs must be read in conjunction with accompanying notes and abbreviations. It has been prepared for geotechnical purposes only, without attempt to assess possible contamination. Any references to potential contamination are for information only and do not necessarily indicate the presence or absence of soil or groundwater contamination.

GAP gINT FN. F28 RL1



CLIENT:Causeway Link AlliancePROJECT:Causeway Pedestrian and Cyclist BridgeLOCATION:Point FraserJOB NO:PS131735

COORDS: 394218.0 m E 6463029.0 m N MGA94 50 SURFACE RL: 1.71 m DATUM: AHD INCLINATION: -90° HOLE DEPTH: 40.00 m SHEET: 2 OF 5 DRILL RIG: Geoprobe 7822DT CONTRACTOR: National Geotech LOGGED: CK DATE: 12/7/22 CHECKED: IB DATE: 10/8/22



CPCB-BH02 - 8.00 - 12.00 m



CPCB-BH02 - 12.00 - 16.00 m

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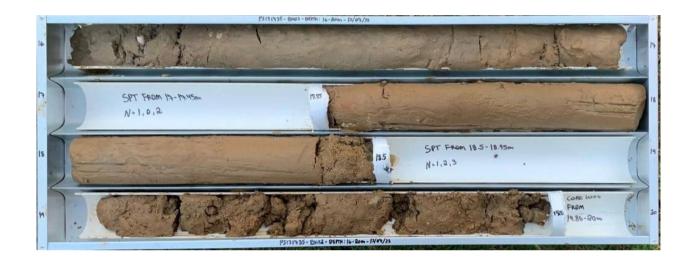
 CLIENT:
 Causeway Link Alliance

 PROJECT:
 Causeway Pedestrian and Cyclist Bridge

 LOCATION:
 Point Fraser

 JOB NO:
 PS131735

COORDS: 394218.0 m E 6463029.0 m N MGA94 50 SURFACE RL: 1.71 m DATUM: AHD INCLINATION: -90° HOLE DEPTH: 40.00 m SHEET: 3 OF 5 DRILL RIG: Geoprobe 7822DT CONTRACTOR: National Geotech LOGGED: CK DATE: 12/7/22 CHECKED: IB DATE: 10/8/22



CPCB-BH02 - 16.00 - 20.00 m



CPCB-BH02 - 20.00 - 24.00 m

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CLIENT:Causeway Link AlliancePROJECT:Causeway Pedestrian and Cyclist BridgeLOCATION:Point FraserJOB NO:PS131735

COORDS: 394218.0 m E 6463029.0 m N MGA94 50 SURFACE RL: 1.71 m DATUM: AHD INCLINATION: -90° HOLE DEPTH: 40.00 m SHEET: 4 OF 5 DRILL RIG: Geoprobe 7822DT CONTRACTOR: National Geotech LOGGED: CK DATE: 12/7/22 CHECKED: IB DATE: 10/8/22



CPCB-BH02 - 24.00 - 28.00 m



CPCB-BH02 - 28.00 - 32.00 m

This report of core photographs must be read in conjunction with accompanying notes and abbreviations. It has been prepared for geotechnical purposes only, without attempt to assess possible contamination. Any references to potential contamination are for information only and do not necessarily indicate the presence or absence of soil or groundwater contamination.

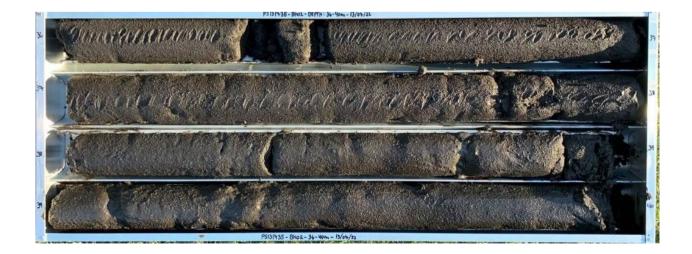


CLIENT:Causeway Link AlliancePROJECT:Causeway Pedestrian and Cyclist BridgeLOCATION:Point FraserJOB NO:PS131735

COORDS: 394218.0 m E 6463029.0 m N MGA94 50 SURFACE RL: 1.71 m DATUM: AHD INCLINATION: -90° HOLE DEPTH: 40.00 m SHEET: 5 OF 5 DRILL RIG: Geoprobe 7822DT CONTRACTOR: National Geotech LOGGED: CK DATE: 12/7/22 CHECKED: IB DATE: 10/8/22



CPCB-BH02 - 32.00 - 36.00 m



CPCB-BH02 - 36.00 - 40.00 m

This report of core photographs must be read in conjunction with accompanying notes and abbreviations. It has been prepared for geotechnical purposes only, without attempt to assess possible contamination. Any references to potential contamination are for information only and do not necessarily indicate the presence or absence of soil or groundwater contamination.

PR LC		CT: ION:	Cau Poir PS1	nt Frase 31735	Pedestr		COORDS: 394225.0 m E 64 d Cyclist Bridge SURFACE RL: 1.43 m DATU INCLINATION: -90° HOLE DEPTH: 40.00 m				//GA	94 50	SHEET: 1 OF 3 DRILL RIG: Geoprobe 7822DT CONTRACTOR: National Geotec LOGGED: CK DATE: CHECKED: IB DATE:	14/7/2	
METHOD	WATER	TCR	RaD (SCR)	DEPTH GU (metres)	DEPTH RL	GRAPHIC LOG	Field Material Description	WEATHERING	STF	ERRE RENG CS MP	TH Pa	LABORATORY STRENGTH (MPa)	Defect Information DEFECT DESCRIPTION & Additional Observations	SPA	FEC ACIN mm)
PQ3	GWNO				<u>0.20</u> 1.23 -0.57 <u>2.45</u> -1.02 <u>6.30</u> -4.87		TOPSOIL: SAND (SP) fine to coarse grained, dark brown, with rootlets FILL: SAND (SP) fine to coarse grained, brown orange, trace gravel, moist Silty Clayey SAND (SC-SM) fine to medium grained, brown and grey, trace gravel, trace shell fragments, loose Silty CLAY (CI-CH) medium to high plasticity, dark grey, trace shell fragments, strong odour, very soft with shell fragments						0.00-2.00 m: Material to 2m was logged during vacuum excavation Rec = 80/450 mm SPT 2.00-2.45 m; 0, 0, 0 N=0 Rec = 450/450 mm SPT 3.50-3.95 m; 0, 0, 0 N=0 Rec = 450/450 mm SPT 5.00-5.45 m; 0, 0, 0 N=0 Rec = 450/450 mm SPT 6.50-6.95 m; 0, 0, 0 N=0		
				- 10 — - - 12 — - - - - - - - - - - - - - - - - - - -	- <u>12.50</u> -11.07		Clayey Silty SAND (SC-SM) fine to medium grained, pale brown, very loose to loose	_					Rec = 450/450 mm SPT 9.50-9.95 m; 0, 0, 0 N=0 Rec = 450/450 mm SPT 11.00-11.45 m; 0, 0, 0 N=0 Rec = 400/450 mm SPT 12.50-12.95 m; 0, 0, 0 N=0 Rec = 400/450 mm		

PR LO		CT: ION:	Cau Poin PS1	seway t Frase 31735			COORDS: 394225.0 m E 644 I Cyclist Bridge SURFACE RL: 1.43 m DATU INCLINATION: -90° HOLE DEPTH: 40.00 m			n N MG	A94 50	SHEET: 2 OF 3 DRILL RIG: Geoprobe 7822DT CONTRACTOR: National Geote LOGGED: CK DATE CHECKED: IB DATE	: 14/		
			Drillir	ng			Field Material Description					Defect Information	T		
MELHOU	WATER	TCR	RQD (SCR)	DEPTH (metres)	<i>DEPTH</i> RL	GRAPHIC LOG	ROCK / SOIL MATERIAL DESCRIPTION	WEATHERING	STF UC ៖ ន	ERRED RENGTH SMPa	LABORATORY STRENGTH (MPa)	DEFECT DESCRIPTION & Additional Observations	SI SI	VER DEFE PAC (mr	EC CIN m)
				- - 16 - -	<u>16.87</u> -15.44	× · · · · · · · · · · · · · · · · · · ·	Clayey Sitty SAND (SC-SM) fine to medium grained, pale brown, very loose to loose SAND (SP) fine to coarse grained, pale brown, trace silt, trace quartz, medium dense	-				Rec = 280/450 mm SPT 15.50-15.95 m; 1, 0, 0 N=0 Rec = 400/450 mm SPT 17.00-17.45 m; 3, 5, 7 N=12			
				- - -	<u>18.50</u> -17.07 19.20 -17.77		brown yellow	-				Rec = 420/450 mm SPT 18.50-18.95 m; 3, 8, 9 N=17			
				- 20	20.00 -18.57 - 20.90 -19.47 21.20 -19.77		Clayey Gravelly SAND (SP) fine to coarse grained, brown mottled red and yellow, fine to coarse sub-rounded to angular gravel, trace cobbles, medium dense Sandy CLAY (CH) high plasticity, grey and yellow brown, fine to medium grained sand, medium dense	-				Rec = 420/450 mm SPT 20.00-20.45 m; 4, 8, 8 N=16			
-	GWNO			- 22 — - -	-21.21 23.00		Clayey Gravelly SAND (SP-SC) fine to coarse grained, brown yellow grey mottled red, medium coarse sub-rounded to angular gravel, medium dense	-				Rec = 420/450 mm SPT 21.50-21.95 m; 8, 10, 11 N=21			
				- - 24 —	-21.57 24.00 -22.57		Clayey Gravelly SAND (SP) fine to coarse grained, brown yellow grey mottled red, medium coarse sub-rounded to angular gravel, medium dense Silty SAND (SM) fine to coarse grained, brown yellow, trace fine to coarse sub-rounded to angular gravel, medium dense	-				Rec = 430/450 mm SPT 23.00-23.45 m; 1, 5, 8 N=13			
				-	24.68		RESIDUAL SOIL: Clayey SAND /Sandy CLAY (SC-CH) fine to coarse grained, brown yellow and grey, high plasticity clay, very dense	-				Rec = 150/140 mm SPT 24.50-24.64 m; 39/140mm N=R			
		100	100 (100)	26 — - -	26.00 -24.57 26.50 -25.07		RESIDUAL SOIL: CLAY (CH) high plasticity, dark grey, stiff SANDSTONE fine to medium grained, massive, dark grey	-				Rec = 450/450 mm SPT 26.00-26.45 m; 3, 4, 10 N=14			
		100	100	- 28 — -								Rec = 230/220 mm SPT 27.50-27.72 m; 20, 17/70mm HB N>17			
		100	(100) 100 (100)	-											

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PF LC		CT: ION:	Cau Poin	-			COORDS: 394225.0 m E 6 Cyclist Bridge SURFACE RL: 1.43 m DAT INCLINATION: -90° HOLE DEPTH: 40.00 m			N MG	A94 50	SHEET: 3 OF 3 DRILL RIG: Geoprol CONTRACTOR: Nat LOGGED: CK CHECKED: IB		14/7		
			Drillin	ng			Field Material Description				1	Defect Info	rmation	_		
MEIHOU	WATER	TCR	RQD (SCR)	DEPTH (metres)	DEPTH RL	GRAPHIC LOG	ROCK / SOIL MATERIAL DESCRIPTION	WEATHERING	INFER STREN UCS N % % % %	IGTH MPa	LABORATORY STRENGTH (MPa)	DEFECT DESCRIPT & Additional Observa		DI SF	(ERA EFEC PACII (mm	IN IN
		100	100 (100)	30 — - -	-		SANDSTONE fine to medium grained, massive, dark grey									
		100	100 (100)													
		100	100 (100)	- - 34 —	-											
202	GWNO	100	100 (100)	-	-											
		100	100 (100)	- 36 — -	-											
		100	100 (100)	- - 38 —	-											
		100	100 (100)	-	40.00				ľ							
				-40	-38.57		END OF BOREHOLE @ 40.00 m TARGET DEPTH GROUNDWATER NOT OBSERVED Backfilled with grout				-					
				- 42 — -	-											
					-											
				_	-											

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PROJECT: Causeway Pedestrian and Cyclist Bridge LOCATION: Point Fraser JOB NO: PS131735 COORDS: 394225.0 m E 6463007.0 m N MGA94 50 SURFACE RL: 1.43 m DATUM: AHD INCLINATION: -90° HOLE DEPTH: 40.00 m SHEET: 1 OF 5 DRILL RIG: Geoprobe 7822DT CONTRACTOR: National Geotech LOGGED: CK DATE: 14/7/22 CHECKED: IB DATE: 10/8/22



CPCB-BH03 - 0.00 - 4.00 m



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CLIENT:Causeway Link AlliancePROJECT:Causeway Pedestrian and Cyclist BridgeLOCATION:Point FraserJOB NO:PS131735

COORDS: 394225.0 m E 6463007.0 m N MGA94 50 SURFACE RL: 1.43 m DATUM: AHD INCLINATION: -90° HOLE DEPTH: 40.00 m SHEET: 2 OF 5 DRILL RIG: Geoprobe 7822DT CONTRACTOR: National Geotech LOGGED: CK DATE: 14/7/22 CHECKED: IB DATE: 10/8/22



CPCB-BH03 - 8.00 - 12.00 m



CPCB-BH03 - 12.00 - 16.00 m

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CLIENT:Causeway Link AlliancePROJECT:Causeway Pedestrian and Cyclist BridgeLOCATION:Point FraserJOB NO:PS131735

COORDS: 394225.0 m E 6463007.0 m N MGA94 50 SURFACE RL: 1.43 m DATUM: AHD INCLINATION: -90° HOLE DEPTH: 40.00 m SHEET: 3 OF 5 DRILL RIG: Geoprobe 7822DT CONTRACTOR: National Geotech LOGGED: CK DATE: 14/7/22 CHECKED: IB DATE: 10/8/22



CPCB-BH03 - 16.00 - 20.00 m



CPCB-BH03 - 20.00 - 24.00 m

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CLIENT:Causeway Link AlliancePROJECT:Causeway Pedestrian and Cyclist BridgeLOCATION:Point FraserJOB NO:PS131735

COORDS: 394225.0 m E 6463007.0 m N MGA94 50 SURFACE RL: 1.43 m DATUM: AHD INCLINATION: -90° HOLE DEPTH: 40.00 m SHEET: 4 OF 5 DRILL RIG: Geoprobe 7822DT CONTRACTOR: National Geotech LOGGED: CK DATE: 14/7/22 CHECKED: IB DATE: 10/8/22



CPCB-BH03 - 24.00 - 28.00 m



GAP 10.0.7 LIB LOGO.GLB Griffli GAP CORE PHOTO 2 PER PAGE ADDITIONAL CAUSEWAY BRIDGE GI (BACKUP).GPJ <</br>

CPCB-BH03 - 28.00 - 32.00 m

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CLIENT:Causeway Link AlliancePROJECT:Causeway Pedestrian and Cyclist BridgeLOCATION:Point FraserJOB NO:PS131735

COORDS: 394225.0 m E 6463007.0 m N MGA94 50 SURFACE RL: 1.43 m DATUM: AHD INCLINATION: -90° HOLE DEPTH: 40.00 m SHEET: 5 OF 5 DRILL RIG: Geoprobe 7822DT CONTRACTOR: National Geotech LOGGED: CK DATE: 14/7/22 CHECKED: IB DATE: 10/8/22



CPCB-BH03 - 32.00 - 36.00 m



CPCB-BH03 - 36.00 - 40.00 m

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PF LC		CT: ION: D:	Cause	way Peo on Islan	k Alliance destrian and Cyclist I d Sampling	Bridg	e	SUI INC	ORDS: 394318.0 m E 6462881.0 m N MGA94 50 RFACE RL: 1.83 m DATUM: AHD :LINATION: -90° LE DEPTH: 44.45 m Field Material Desci		DRILL CONT LOGG CHEC	T: 1 OF 5 RIG: Geoprobe 7822DT RACTOR: National Geotech ED: CK DATE: 5/7/22 KED: IB DATE: 10/8/22
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION		STRUCTURE AND ADDITIONAL OBSERVATIONS
PQ3		GWNO		RL 0.15 1.68 1.68 1.50 0.33 1.80 0.03 1.80 0.00 -0.17 3.50 -1.67 4.00 -2.17 5.45 -3.62 9.20 -7.37 9.50 -7.67	Rec = 400/450 mm SPT 2.00-2.45 m 2, 3, 2 N=5 Rec = 350/450 mm SPT 3.50-3.95 m 1, 1, 0 N=1 Rec = 450/450 mm SPT 5.00-5.45 m 0, 0, 0 N=0 Rec = 450/450 mm SPT 6.50-6.95 m 0, 0, 0 N=0 Rec = 450/450 mm SPT 8.00-8.45 m N=0			SP SP CH SP CH SP CL ⁻ Cl	TOPSOIL: SAND fine to medium grained, dark brown, trace rootlets FILL: SAND fine to coarse grained, dark brown, trace coarse sub-rounded imestone gravel some yellow brown band SAND fine to coarse grained, yellow orange brown Silty Sandy CLAY high plasticity, dark grey, fine to medium grained sand, some grey and orange brown bands SAND fine to coarse grained, grey and dark grey to black, trace silt grey Silty CLAY low to medium plasticity, trace shell fragments, moderate odour medium plasticity medium plasticity medium plasticity		L VL	

	ECT: TION:	Cause	way Peo son Islan	k Alliance destrian and Cyclist d	Bridge	e	SUI INC	ORDS: 394318.0 m E 6462881.0 m N MGA94 50 RFACE RL: 1.83 m DATUM: AHD 2LINATION: -90° LE DEPTH: 44.45 m	 (5 eoprobe 7822DT t: National Geotech DATE: 5/7/22 DATE: 10/8/22
	Dril	ling		Sampling				Field Material Desc	riptic	on	
METHOD PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
		10	-8.17 <u>10.35</u> -8.52 - <u>11.45</u> <u>11.60</u> -9.77	Rec = 450/450 mm SPT 11.00-11.45 m 1, 1, 1 N=2		×	CL- CI CL- CI	Silty CLAY low to medium plasticity, trace shell fragments, moderate odour trace fine grained sand CLAY medium to high plasticity, grey, with fine to medium grained sand CORE LOSS INTERBEDDED SAND and Silty CLAY		vs	
		12 — - - - 13 —	<u>12.00</u> -10.17 -10.17 - - - 13.00 -11.17	Rec = 450/450 mm SPT 12.50-12.95 m 1, 0, 0 N=0			SM /	fine to medium grained, medium plasticity, brown	_	VS	
		- - - 14 — - - -	<u>14.00</u> -12.17	Rec = 450/450 mm SPT 14.00-14.45 m 1, 2, 3 N=5			CI- CH	Silty Sandy CLAY medium to high plasticity, brown, fine to medium grained sand		VL S	
PQ3	GWNO	15 — - - - 16 — - -	<u>15.60</u> -13.77	Rec = 450/450 mm SPT 15.50-15.95 m 2, 4, 6 N=10			SP	SAND fine to medium grained, brown, trace silt		MD	
			- <u>17.45</u> -15.62 - <u>17.86</u> -16.03	Rec = 450/450 mm SPT 17.00-17.45 m 4, 7, 16 N=23		****	СН	CORE LOSS Silty CLAY high plasticity, brown, with fine to medium grained sand	_		
		- - - 19 - -	<u>18.50</u> -16.67	Rec = 450/450 mm SPT 18.50-18.95 m 4, 6, 8 N=14			CH	Silty Gravelly CLAY high plasticity, brown and grey, medium to coarse sub-rounded to sub-angular gravel, trace sand	_	St	

P Li	LIENT ROJE DCAT DB NC	CT: ION:	Cause Cause	way Lini way Peo on Islar	Alliance destrian and Cyclist E		e	SUF INC	ORDS: 394318.0 m E 6462881.0 m N MGA94 50 RFACE RL: 1.83 m DATUM: AHD LINATION: -90° LE DEPTH: 44.45 m	: [(SHEE DRILL CONT LOGG	IOLE: CPCB-BH04 T: 3 OF 5 . RIG: Geoprobe 7822DT RACTOR: National Geotech GED: CK DATE: 5/7/22 KED: IB DATE: 10/8/22
		Dril	ling		Sampling				Field Material Desc			
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	Sample or Field test	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
			20	22.00	Rec = 450/450 mm SPT 20.00-20.45 m 4, 4, 5 N=9 Rec = 450/450 mm SPT 21.50-21.95 m 3, 4, 6 N=10			СН	Silty Gravelly CLAY high plasticity, brown and grey, medium to coarse sub-rounded to sub-angular gravel, trace sand		F	
			22 — - - 23 —	-20.17 22.70 -20.87 23.20	Rec = 450/450 mm SPT 23.00-23.45 m			СН	Silty Sandy CLAY fine to medium, high plasticity, brown and grey, fine to medium grained sand, trace gravel	-		
5			 	-21.37 23.45 -21.62 24.50	7, 13, 19 N=32		× , , , , , , , , , , , , , , , , , , ,	SP	mottled red SAND fine to coarse grained, yellow brown, trace fines, trace to with sub-rounded to angular gravel	-	D	
PQ3		GWNO	- 25 - - -	-22.67	Rec = 450/450 mm SPT 24.50-24.95 m 3, 3, 4 N=7			СН	CLAY high plasticity, grey mottled yellow, trace gravel, trace fine grained sand		F	
~			26 — - - -	26.00 -24.17 26.70 -24.87	Rec = 450/450 mm SPT 26.00-26.45 m 4, 5, 6 N=11				mottled yellow and brown	-	St	
			27 — - - 28 —	27.50 -25.67	Rec = 450/450 mm SPT 27.50-27.95 m 3, 1, 2 N=3			SC	Clayey SAND fine to medium grained, grey and mottled yellow	-	L	
			- - - 29 - - -	28.50 -26.67	SPT 29.00-29.45 m 0, 0, 4 N=4			CI- CH	CLAY medium to high plasticity, grey	-	s	
			30 —	T geot	echnical purposes or	nly, w	ithout a	attem	n conjunction with accompanying notes and abbreviations. pt to assess possible contamination. Any references to pot ssarily indicate the presence or absence of soil or groundwa	entia	I cont	amination are for

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PF LC		CT: ION:	Cause	way Peo son Islan	k Alliance destrian and Cyclist I id	Bridge	e	SUI INC	ORDS: 394318.0 m E 6462881.0 m N MGA94 50 RFACE RL: 1.83 m DATUM: AHD CLINATION: -90° LE DEPTH: 44.45 m			Geoprobe 7822 DR: National G K E	
		Dril	ling		Sampling	_			Field Material Desc				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	Sample or Field test	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE	CONSISTENCY DENSITY	STRUCTU ADDITIO OBSERV/	ONAL
			30 — - - - 31 — - -	30.30 -28.47 30.50 -28.67	Rec = 450/450 mm SPT 30.50-30.95 m 8, 14, 16 N=30			CI- CH SP	CLAY medium to high plasticity, grey SAND fine to coarse grained, yellow brown, trace rock fragments, with fines	, /	S		
			32 — - - - - - - - - - - - - - - - - - - -	32.00 -30.17	Rec = 450/450 mm SPT 32.00-32.45 m 10, 10, 6 N=16				dark grey to black	_	MD		
			- - 34 — -	- <u>33.45</u> -31.62 <u>34.00</u> -32.17 - <u>34.47</u> -32.64	Rec = 330/450 mm SPT 33.50-33.95 m 4, 12, 26 N=38			SP	Some orange brown bands	_	D		
PQ3		GWNO	- 35 — - -	-	Rec = 300/380 mm SPT 35.00-35.38 m 2, 25, 30/80mm HB N>55				fine to coarse grained, pale brown, some orange brown bands				
			36 — - - - - 37 —	<u>36.70</u> -34.87	Rec = 220/240 mm SPT 36.50-36.74 m 6, 30/90mm HB N>30					_	VD		
			- 38 — - - 39 —	<u>38.30</u> -36.47	Rec = 300/240 mm SPT 38.00-38.24 m 9, 30/90mm HB N>30				fine to medium grained, white	_			
				<u>39.60</u> -37.77	Rec = 230/170 mm SPT 39.50-39.67 m 35, 24/20mm HB N>24				fine to coarse grained, some yellow brown bands	_			

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	PR		CT:	Cause	-	k Alliance destrian and Cyclist E	Bridg	e	SU	ORDS: 394318.0 m E 6462881.0 m N MGA94 50 RFACE RL: 1.83 m DATUM: AHD :LINATION: -90°		DRILI CONT	T: 5 OF 5 _ RIG: Geoprobe 7822DT IRACTOR: National Geotech GED: CK DATE: 5/7/22
		3 NC		PS131						LE DEPTH: 44.45 m			CKED: IB DATE: 10/8/22
			Dril	lling		Sampling				Field Material Desc	•		
		PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	Sample or Field test	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
				40 — - - 41 —	<u>41.20</u> -39.37	Rec = 250/200 mm SPT 41.00-41.20 m			SP	SAND fine to coarse grained, pale brown, some orange brown bands		VD	- - - -
				- - 42	41.45 -39.62 42.00	14, 30/50mm HB N>30				trace fines CORE LOSS			
	22		GWNO	-	-40.17	Rec = 300/250 mm SPT 42.50-42.75 m 11, 30/100mm HB N>30			SP	SAND fine to coarse grained, yellow brown			
Datgel Tools				43 — - - -	43.90				•			VD	-
42 10.02.00.04				44	-42.62	Rec = 450/450 mm SPT 44.00-44.45 m 7, 11, 0 N=11		 	SC	some yellow brown bands Clayey SAND fine to coarse grained, black, with silt END OF BOREHOLE @ 44.45 m		MD	
DrawingFile>> 11/08/2022 09:				- 45 — - -						TARGET DEPTH GROUNDWATER NOT OBSERVED Backfilled with grout			
BRIDGE GI (BACKUP).GPJ <<				- 46 — - -									
ADDILIONAL CAUSEWAY BF				47 — - - -									
4-CORED FULL PAGE AD				48 — - - -									
LOGO.GLB Log GAP NON				49 — - - -									
GAP 10.0.7 LIB				50 —		echnical purposes or	nly, v	vithout	atten	n conjunction with accompanying notes and abbreviations. npt to assess possible contamination. Any references to po essarily indicate the presence or absence of soil or groundwa	tentia	al cont	tamination are for CAD GINT EN E010

\\S]) GOLDER

REPORT OF BOREHOLE: CPCB-BH04

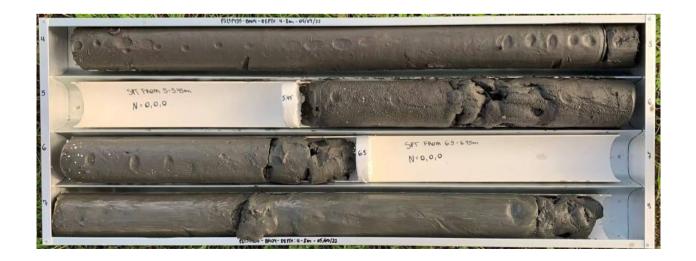


CLIENT:Causeway Link AlliancePROJECT:Causeway Pedestrian and Cyclist BridgeLOCATION:Heirisson IslandJOB NO:PS131735

COORDS: 394318.0 m E 6462881.0 m N MGA94 50 SURFACE RL: 1.83 m DATUM: AHD INCLINATION: -90° HOLE DEPTH: 44.45 m SHEET: 1 OF 6 DRILL RIG: Geoprobe 7822DT CONTRACTOR: National Geotech LOGGED: CK DATE: 5/7/22 CHECKED: IB DATE: 10/8/22

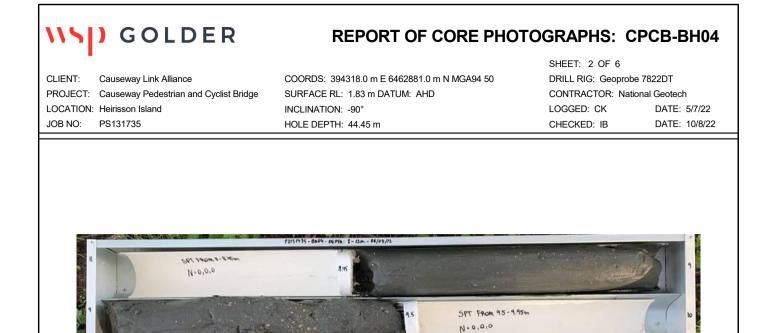


CPCB-BH04 - 0.00 - 4.00 m



CPCB-BH04 - 4.00 - 8.00 m

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CORE Los

11.45-1

1145 FROM

P1131935 - BHOY - DETIN: 1-12 - 06/09/2

N=1.1.1



CPCB-BH04 - 12.00 - 16.00 m

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 CLIENT:
 Causeway Link Alliance

 PROJECT:
 Causeway Pedestrian and Cyclist Bridge

 LOCATION:
 Heirisson Island

 JOB NO:
 PS131735

COORDS: 394318.0 m E 6462881.0 m N MGA94 50 SURFACE RL: 1.83 m DATUM: AHD INCLINATION: -90° HOLE DEPTH: 44.45 m SHEET: 3 OF 6 DRILL RIG: Geoprobe 7822DT CONTRACTOR: National Geotech LOGGED: CK DATE: 5/7/22 CHECKED: IB DATE: 10/8/22



CPCB-BH04 - 16.00 - 20.00 m



CPCB-BH04 - 20.00 - 24.00 m

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CLIENT:Causeway Link AlliancePROJECT:Causeway Pedestrian and Cyclist BridgeLOCATION:Heirisson IslandJOB NO:PS131735

COORDS: 394318.0 m E 6462881.0 m N MGA94 50 SURFACE RL: 1.83 m DATUM: AHD INCLINATION: -90° HOLE DEPTH: 44.45 m SHEET: 4 OF 6 DRILL RIG: Geoprobe 7822DT CONTRACTOR: National Geotech LOGGED: CK DATE: 5/7/22 CHECKED: IB DATE: 10/8/22

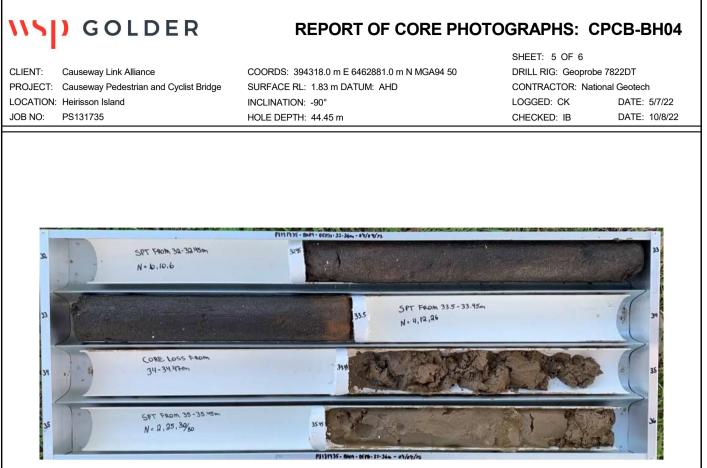


CPCB-BH04 - 24.00 - 28.00 m

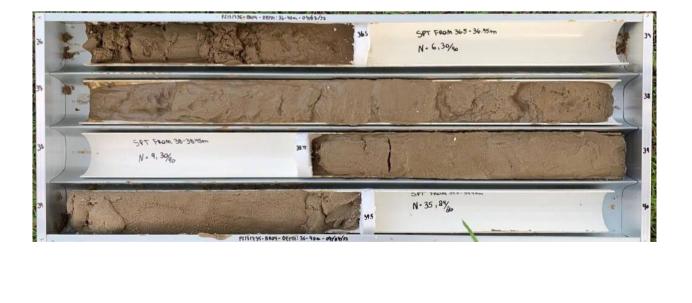


CPCB-BH04 - 28.00 - 32.00 m

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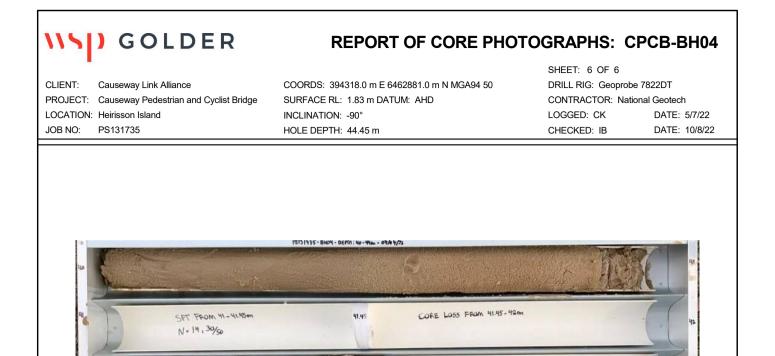


CPCB-BH04 - 32.00 - 36.00 m



CPCB-BH04 - 36.00 - 40.00 m

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SPT FROM 42.5 - 42.95m

N=11, 30/100

CPCB-BH04 - 40.00 - 44.00 m

425

PJ131735 - BROM - BETT : 40 - 41 - 07/07/02

This report of co geotechnical pu inform

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115) (GΟ	LDER	() S			REPORT OF E	BOR	REHO	LE: CPCB-BH05
CLIENT: PROJECT: LOCATION: JOB NO:	Cause	eway Peo son Islan	k Alliance destrian and Cyclist I nd	Bridge	e	SUI INC	ORDS: 394375.0 m E 6462859.0 m N MGA94 50 RFACE RL: 1.84 m DATUM: AHD LINATION: -90° LE DEPTH: 25.00 m	[(G: Geoprobe 7822DT CTOR: National Geotech : CK DATE: 4/7/22
Dri	illing	1	Sampling				Field Material Des			
METHOD PENETRATION RESISTANCE WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
PQ3 FQ4		RL 0.15 1.69 0.84 1.50 0.34 2.35 -2.45 -0.96 3.35 -1.51 4.00 -2.16	Rec = 380/450 mm SPT 2.00-2.45 m 3, 3, 4 N=7 SPT 3.50-3.95 m 0, 0, 0 N=0 U 5.00-5.45 m Rec = 450/450 mm SPT 6.50-6.95 m 0, 0, 0 N=0			SP SM/ SC SP SM/ SC SP	TOPSOIL: SAND fine to coarse grained, dark brown FILL: Sity Clayey SAND fine to medium grained, orange brown and orange brown, trace shell fragments, trace wood FILL: SAND fine to medium grained, orange brown dark brown and yellow brown, with shell fragments Silty Clayey SAND fine to medium grained, orange grey		VL VS	
	-	<u>9.50</u> -7.66	Rec = 450/450 mm SPT 9.50-9.95 m 0, 1, 2		×				s	

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LIEN ROJE DCAT DB N	ECT: FION:	Cause	way Peo on Islan	k Alliance destrian and Cyclist I nd	Bridge	e	SUI INC	ORDS: 394375.0 m E 6462859.0 m N MGA94 50 RFACE RL: 1.84 m DATUM: AHD LINATION: -90° LE DEPTH: 25.00 m	(
PENETRATION RESISTANCE		DEPTH (metres)	DEPTH RL	Sampling SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	Field Material Desc		CONSISTENCY U DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS	
		10 — - - - 11 —	<u>10.60</u> -8.76	U 11.00-11.45 m Rec = 450/450 mm		×	CI- CH CI	Silty CLAY medium to high plasticity, dark grey, trace shell fragments, strong odour Silty Sandy CLAY medium plasticity, brown, fine grained sand		S		
		- - 12 - -	<u>11.50</u> -9.66	Rec = 330/450 mm			SC	Clayey SAND fine to medium grained, brown, trace silt				
		 13 - - - 14		SPT 12.50-12.95 m 0, 1, 2 N=3						L		
	GWNO	14 — - - 15 —		Rec = 400/450 mm SPT 14.00-14.45 m 2, 1, 3 N=4								
		- - 16 - -		Rec = 400/450 mm SPT 15.50-15.95 m 2, 5, 7 N=12								
			<u>17.00</u> -15.16	Rec = 400/450 mm SPT 17.00-17.45 m 4, 7, 9 N=16		× · · · · · · · · · · · · · · · · · · ·	SM	Silty SAND fine to coarse grained, brown yellow		MD		
		18 — - - - 19 —	<u>18.20</u> -16.36 <u>18.50</u> -16.66	Rec = 350/450 mm SPT 18.50-18.95 m 21, 4, 2 N=6			GM / GC	with fine to coarse sub-rounded to sub-angular gravel Silty Clayey GRAVEL fine to coarse grained, sub-rounded to sub-angular, grey and brown, medium to high plasticity clay	-	L		
			-17.46				СН	Sity CLAY high plasticity, grey		F		

١	14	1) (GO	LDER	2			REPORT OF E	BOF	REH	HOLE: CPCB-BH05
Pi L(CT: ION:	Cause	eway Peo son Islar	k Alliance destrian and Cyclist I nd	Bridg	e	SUI INC	ORDS: 394375.0 m E 6462859.0 m N MGA94 50 RFACE RL: 1.84 m DATUM: AHD :LINATION: -90° LE DEPTH: 25.00 m		DRILI CON ⁻ LOG(ET: 3 OF 3 L RIG: Geoprobe 7822DT TRACTOR: National Geotech GED: CK DATE: 4/7/22 CKED: IB DATE: 10/8/22
		-	lling	1	Sampling				Field Material Des			1
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE	CONSISTENCY	STRUCTURE AND ADDITIONAL OBSERVATIONS
			20	20.45	Rec = 450/450 mm SPT 20.00-20.45 m 2, 4, 5 N=9		*	СН	Silty CLAY high plasticity, grey		F	
			- - 21—	-18.61				SP	SAND fine to coarse grained, brown yellow		L	
			-	<u>21.30</u> -19.46	Rec = 450/450 mm SPT 21.50-21.95 m 2, 9, 9 N=18			•				
PQ3		GWNO	22 — - -	<u>22.50</u> -20.66			× · · · · · · · · · · · · · · · · · · ·	SM	Silty SAND fine to coarse grained, pale grey mottled red and yellow brown,	_	MD	
1 ools			23 —	- <u>23.45</u> -21.61	Rec = 430/450 mm SPT 23.00-23.45 m 10, 12, 14 N=26		× × × ··· × ···	СН	with fine to medium sub-rounded to sub-angular gravel	_		
			- 24 — -	<u>24.00</u> -22.16			×		high plasticity, grey mottled yellow		VSt	
11/08/2022 09:43			- - 25	-23.16	Rec = 450/450 mm SPT 24.50-24.95 m 5, 9, 12 N=21		^		END OF BOREHOLE @ 25.00 m			
J < <drawingfile>></drawingfile>			-	-					TARGET DEPTH GROUNDWATER NOT OBSERVED Backfilled with grout			
e gi (BAUNUP).GP			26 — - -	-								
			- 27 —	-								
AGE AUDITIONAL			- - 28 —	-								
			- - - 29—	-								
OUGLE LOG GALT IN			-	-								
			30 —		echnical purposes o	nly, v	vithout	atten	n conjunction with accompanying notes and abbreviations. npt to assess possible contamination. Any references to p ssarily indicate the presence or absence of soil or ground	otentia	al con	tamination are for CAR dINT EN E01

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CLIENT:Causeway Link AlliancePROJECT:Causeway Pedestrian and Cyclist BridgeLOCATION:Heirisson IslandJOB NO:PS131735

COORDS: 394375.0 m E 6462859.0 m N MGA94 50 SURFACE RL: 1.84 m DATUM: AHD INCLINATION: -90° HOLE DEPTH: 25.00 m SHEET: 1 OF 4 DRILL RIG: Geoprobe 7822DT CONTRACTOR: National Geotech LOGGED: CK DATE: 4/7/22 CHECKED: IB DATE: 10/8/22



CPCB-BH05 - 0.00 - 4.00 m



CPCB-BH05 - 4.00 - 8.00 m

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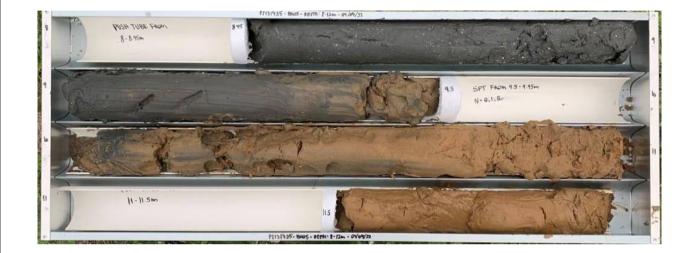
 CLIENT:
 Causeway Link Alliance

 PROJECT:
 Causeway Pedestrian and Cyclist Bridge

 LOCATION:
 Heirisson Island

 JOB NO:
 PS131735

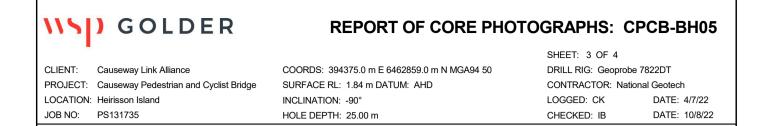
COORDS: 394375.0 m E 6462859.0 m N MGA94 50 SURFACE RL: 1.84 m DATUM: AHD INCLINATION: -90° HOLE DEPTH: 25.00 m SHEET: 2 OF 4 DRILL RIG: Geoprobe 7822DT CONTRACTOR: National Geotech LOGGED: CK DATE: 4/7/22 CHECKED: IB DATE: 10/8/22



CPCB-BH05 - 8.00 - 12.00 m



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CPCB-BH05 - 16.00 - 20.00 m



CPCB-BH05 - 20.00 - 24.00 m

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 CLIENT:
 Causeway Link Alliance

 PROJECT:
 Causeway Pedestrian and Cyclist Bridge

 LOCATION:
 Heirisson Island

 JOB NO:
 PS131735

COORDS: 394375.0 m E 6462859.0 m N MGA94 50 SURFACE RL: 1.84 m DATUM: AHD INCLINATION: -90° HOLE DEPTH: 25.00 m SHEET: 4 OF 4 DRILL RIG: Geoprobe 7822DT CONTRACTOR: National Geotech LOGGED: CK DATE: 4/7/22 CHECKED: IB DATE: 10/8/22



CPCB-BH05 - 24.00 - 25.00 m

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PI L(ect: Tion:	Cause	way Peo on Islan	k Alliance destrian and Cyclist E ld	iridgi	e	SUI	ORDS: 394490.0 m E 6462780.0 m N MGA94 50 RFACE RL: 3.24 m DATUM: AHD CLINATION: -90° LE DEPTH: 40.00 m	[([G: Geoprobe 7822DT CTOR: National Geot): CK DAT	
		Dril	ling	1	Sampling				Field Material Desc	<u> </u>			
METHOD	PENETRATION	WATER	DEPTH (metres)	DEPTH RL	Sample or Field test	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE	CONSISTENCY DENSITY	STRUCTURE ADDITION/ OBSERVATIO	AL.
		1.5 m	0 - - 2	<u>0.15</u> 3.09 <u>1.50</u> 1.74	Rec = 400/450 mm SPT 2.00-2.45 m			SP SP	TOPSOIL: SAND fine to medium grained, dark brown, trace rootlets FILL: SAND fine to medium grained, dark brown, with fines with 20-30% fines	-	L		
			- - - 4	2.50 0.74 3.20 0.04 -	5, 10, 12 N=22 Rec = 350/450 mm SPT 3.50-3.95 m 1, 2, 1 N=3			SC CL- CI SP	Clayey SAND fine to medium grained, orange brown and red, medium plasticity clay shell & sand fine to coarse grained, dark white Sandy CLAY low to medium plasticity, grey, fine to coarse grained sand, with shell fragments, strong odour SAND	-	VL S		
			- - 6 -	5.20 5.45 -2.21 6.00 -2.76 6.40 -3.26 7.20	Rec = 450/450 mm SPT 5.00-5.45 m 0, 0, 1 N=1			SC CL- CI	fine to coarse grained, dark grey, trace shell fragments medium plasticity clay small lense from 5.2 m to 5.4m CORE LOSS Clayey SAND fine to coarse grained, dark grey, low to medium plasticity clay with shell fragments Sandy CLAY low to medium plasticity, dark grey, fine to medium grained sand, trace shell fragments, strong odour	-	MD		
PQ3			- - -	-3.96	U 8.00-8.45 m Rec = 450/450 mm				with shell fragments		s		
			- 10 — - -	<u>9.50</u> -6.26 -10.50 -7.26 -11.00 -7.76	Rec = 450/450 mm SPT 11.00-11.45 m 0, 0, 0		×	CL- ML SC CL- CI	Silty Sandy CLAY low to medium plasticity, grey and yellow brown, fine to medium grained sand, strong odour Clayey SAND fine to coarse grained, brown and grey Sandy CLAY low to medium plasticity, grey, fine grained sand	-	VL		
			- 12 — - -	<u>12.00</u> -8.76	U 12.50-12.95 m Rec = 450/450 mm				medium to high plasticity	-	VS		
			- 14 	<u>13.80</u> -10.56 <u>14.70</u> -11.46	Rec = 450/450 mm SPT 14.00-14.45 m 1, 3, 12 N=15			SP	SAND fine to coarse grained, grey and yellow brown 	-	MD		

PRC LOC	CLIENT: Causeway Link Alliance PROJECT: Causeway Pedestrian and Cyclist Bridge LOCATION: Heirisson Island JOB NO: PS131735							SUI INC	ORDS: 394490.0 m E 6462780.0 m N MGA94 50 RFACE RL: 3.24 m DATUM: AHD :LINATION: -90° LE DEPTH: 40.00 m	SHEET: 2 OF 3 DRILL RIG: Geoprobe 7822DT CONTRACTOR: National Geotech LOGGED: CK DATE: 30/6/22 CHECKED: IB DATE: 10/8/22			
		Dril	ling		Sampling				Field Material Des	criptio	n		
	RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE ADDITION OBSERVAT	IAL
			- 16 —	10.25	Rec = 450/450 mm SPT 15.50-15.95 m 11, 16, 29 N=45			SP	SAND fine to coarse grained, grey and yellow brown CORE LOSS		MD D		
			-	-13.01 <u>17.00</u> -13.76	Rec = 380/450 mm			SP SC	SAND fine to coarse grained, grey and pale brown Clayey SAND		MD -		
				<u>18.00</u> -14.76	SPT 17.00-17.45 m N=31		 	CH- MH	fine to medium grained, yellow brown and grey, with silt Silty CLAY	_	D		
			-	<u>18.50</u> -15.26	Rec = 450/450 mm SPT 18.50-18.95 m 1, 2, 3 N=5				high plasticity, red and grey mottled yellow brown, trace sand		F		
			20		Rec = 450/450 mm SPT 20.00-20.45 m 0, 0, 1 N=1		×× ×× ×× ×× ××				s		
LQ3			- 22 — -	<u>22.20</u> -18.96	Rec = 450/450 mm SPT 21.50-21.95 m 2, 2, 4 N=6 Rec = 450/450 mm		× · · · · · · · · · · · · · · · · · · ·				F		
			24 —	24.80	SPT 23.00-23.45 m 1, 2, 3 N=5 Rec = 450/450 mm SPT 24.50-24.95 m								
			-	-21.56 25.80	2, 9, 13 N=22			SC	Clayey SAND fine to medium grained, yellow brown, low to medium plasticity clay		MD		
			26 — - -	26.00 -22.76 26.45	Rec = 410/450 mm SPT 26.00-26.45 m 2, 3, 2 N=5		· · · · · · · · · · · · · · · · ·	CL- CI SC	mottled orange brown Silty Sandy CLAY low to medium plasticity, yellow brown, fine to medium grained sand Clayey SAND fine to medium grained, brown mottled orange brown, trace silt		F		
					Rec = 330/450 mm SPT 27.50-27.95 m 2, 5, 6 N=11		· - · · · · - · · · ·		brown yellow		MD		
			-	28.50 -25.26	Rec = 450/450 mm SPT 29.00-29.45 m		 	SC	Clayey SAND fine to medium grained, brown yellow, low to medium plasticity clay		MD		
				-29.45 -26.21 2, 2, 10 N=12		· · · · ·	SP	SAND fine to medium grained, grey brown					

PR LO	CLIENT: Causeway Link Alliance PROJECT: Causeway Pedestrian and Cyclist Bridge LOCATION: Heirisson Island JOB NO: PS131735						e	COORDS: 394490.0 m E 6462780.0 m N MGA94 50 SURFACE RL: 3.24 m DATUM: AHD INCLINATION: -90° HOLE DEPTH: 40.00 m				SHEET: 3 OF 3 DRILL RIG: Geoprobe 7822DT CONTRACTOR: National Geotech LOGGED: CK DATE: 30/6/22 CHECKED: IB DATE: 10/8/22			
Drilling Sampling									Field Material Des						
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION			STRUCTURE AND ADDITIONAL OBSERVATIONS			
			30 —					SP	SAND fine to medium grained, grey brown		MD				
			-	30.50 -27.26 31.50	Rec = 450/450 mm SPT 30.50-30.95 m 1, 4, 13 N=17			CH	Sandy CLAY high plasticity, dark grey and yellow brown, fine to coarse grained sand, with silt		VSt				
			32 — -	-28.26 32.00 -28.76 32.50 -29.26				SC GC	Clayey SAND fine to coarse grained, brown, medium plasticity clay trace gravel, trace silt, some yellow brown and red band Clayey Sandy GRAVEL	-	MD - D				
			-	33.00 -29.76 33.50 -30.26	SPT 33.50-33.95 m			SP	medium to coarse grained, sub-rounded to sub-angular, grey brown, fine to medium grained sand, medium plasticity clay, with silt CORE LOSS SAND fine to coarse grained, brown and yellow brown, trace gravel,	/					
PQ3			34		2, 5, 17 N=22 Rec = 230/230 mm			•	trace silt		MD - D				
			- 36—		SPT 35.00-35.23 m 29, 30/80mm HB N>30			•							
			-		Rec = 200/200 mm SPT 36.50-36.70 m 18, 30/50mm HB N>30			•			D				
			38 —		Rec = 220/220 mm SPT 38.00-38.22 m 30, 30/70mm HB N>30										
			- - 40	-36.76	Rec = 270/270 mm SPT 39.50-39.77 m 23, 34/120mm HB N>34			•	END OF BOREHOLE @ 40.00 m						
			-						TARGET DEPTH GROUNDWATER ENCOUNTERED @ 1.50 m DEPTH Backfilled with grout						
			- 42—												
			-												
			44												



CLIENT:Causeway Link AlliancePROJECT:Causeway Pedestrian and Cyclist BridgeLOCATION:Heirisson IslandJOB NO:PS131735

COORDS: 394490.0 m E 6462780.0 m N MGA94 50 SURFACE RL: 3.24 m DATUM: AHD INCLINATION: -90° HOLE DEPTH: 40.00 m SHEET: 1 OF 5 DRILL RIG: Geoprobe 7822DT CONTRACTOR: National Geotech LOGGED: CK DATE: 30/6/22 CHECKED: IB DATE: 10/8/22



CPCB-BH06 - 0.00 - 4.00 m



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 CLIENT:
 Causeway Link Alliance

 PROJECT:
 Causeway Pedestrian and Cyclist Bridge

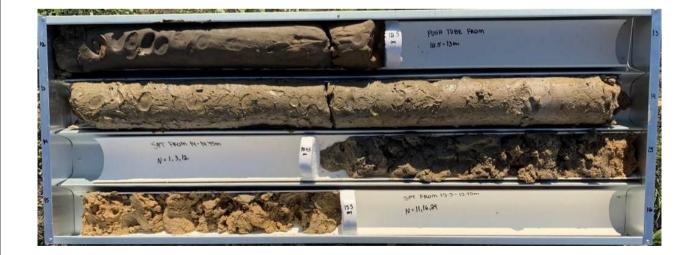
 LOCATION:
 Heirisson Island

 JOB NO:
 PS131735

COORDS: 394490.0 m E 6462780.0 m N MGA94 50 SURFACE RL: 3.24 m DATUM: AHD INCLINATION: -90° HOLE DEPTH: 40.00 m SHEET: 2 OF 5 DRILL RIG: Geoprobe 7822DT CONTRACTOR: National Geotech LOGGED: CK DATE: 30/6/22 CHECKED: IB DATE: 10/8/22



CPCB-BH06 - 8.00 - 12.00 m



CPCB-BH06 - 12.00 - 16.00 m

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 CLIENT:
 Causeway Link Alliance

 PROJECT:
 Causeway Pedestrian and Cyclist Bridge

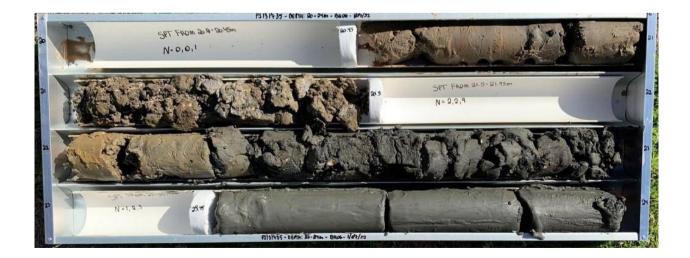
 LOCATION:
 Heirisson Island

 JOB NO:
 PS131735

COORDS: 394490.0 m E 6462780.0 m N MGA94 50 SURFACE RL: 3.24 m DATUM: AHD INCLINATION: -90° HOLE DEPTH: 40.00 m SHEET: 3 OF 5 DRILL RIG: Geoprobe 7822DT CONTRACTOR: National Geotech LOGGED: CK DATE: 30/6/22 CHECKED: IB DATE: 10/8/22



CPCB-BH06 - 16.00 - 20.00 m



CPCB-BH06 - 20.00 - 24.00 m

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 CLIENT:
 Causeway Link Alliance

 PROJECT:
 Causeway Pedestrian and Cyclist Bridge

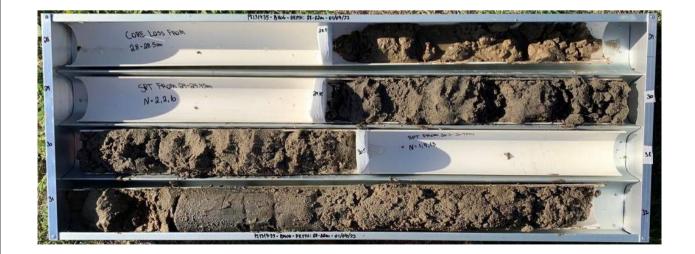
 LOCATION:
 Heirisson Island

 JOB NO:
 PS131735

COORDS: 394490.0 m E 6462780.0 m N MGA94 50 SURFACE RL: 3.24 m DATUM: AHD INCLINATION: -90° HOLE DEPTH: 40.00 m SHEET: 4 OF 5 DRILL RIG: Geoprobe 7822DT CONTRACTOR: National Geotech LOGGED: CK DATE: 30/6/22 CHECKED: IB DATE: 10/8/22



CPCB-BH06 - 24.00 - 28.00 m



CPCB-BH06 - 28.00 - 32.00 m

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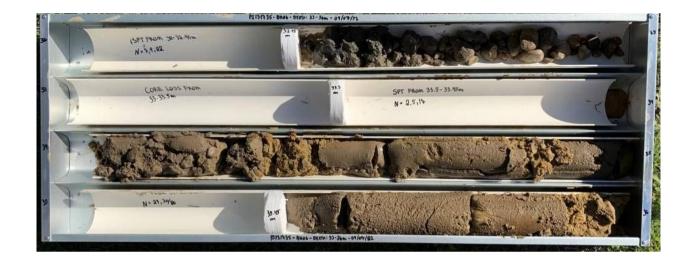
 CLIENT:
 Causeway Link Alliance

 PROJECT:
 Causeway Pedestrian and Cyclist Bridge

 LOCATION:
 Heirisson Island

 JOB NO:
 PS131735

COORDS: 394490.0 m E 6462780.0 m N MGA94 50 SURFACE RL: 3.24 m DATUM: AHD INCLINATION: -90° HOLE DEPTH: 40.00 m SHEET: 5 OF 5 DRILL RIG: Geoprobe 7822DT CONTRACTOR: National Geotech LOGGED: CK DATE: 30/6/22 CHECKED: IB DATE: 10/8/22



CPCB-BH06 - 32.00 - 36.00 m



CPCB-BH06 - 36.00 - 40.00 m

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	GOLDER							SHEET: 1 OF 3							
			_												
					k Alliance	- ام اس	_		ORDS: 394518.0 m E 6462738.0 m N MGA94 50	DRILL RIG: Geoprobe 7822DT CONTRACTOR: National Geotech					
				way Peo son Islan	destrian and Cyclist B	sriage	9		RFACE RL: 1.45 m DATUM: AHD LINATION: -90°			GED: CK DATE: 27/6/22			
			PS131						LEINATION: -90 LE DEPTH: 40.00 m			DATE: 27/6/22 CKED: IB DATE: 10/8/22			
F		Dril	lling		Sampling				Field Material Descr						
┢	z	-	my		Samping			Ъ		. <u> </u>					
	PENETRATION				SAMPLE OR	RECOVERED	U	GROUP SYMBOL		E N	CONSISTENCY DENSITY	STRUCTURE AND			
METHOD	NETR SIST/	WATER	DEPTH (metres)		FIELD TEST	NO2	GRAPHIC LOG	OUP (SOIL/ROCK MATERIAL DESCRIPTION	UTU TIDN	NSIS	ADDITIONAL OBSERVATIONS			
ME		WA		DEPTH RL		REC	GRA LOG	GRO			БÜ				
			0	0.25			<u></u>	SP	TOPSOIL: SAND						
			-	1.20 0.60				SP	fine to medium grained, brown, trace gravel, trace rootlets FILL: SAND]					
			-	0.85					fine to medium grained, brown mottled orange brown, trace		L				
			-	-					pale grey, many shell fragments						
		\square	-	-											
			2—	2.00	SPT 2.00-2.45 m		XXX	CL /	CLAY	-	<u> </u>				
			-		0, 0, 0 N=0		[CH	CLAY low plasticity, grey, presence of odour, trace shell fragments		Ne				
			-				t				VS				
			_	<u>3.00</u> -1.55					CORE LOSS	1	<u> </u>				
				<u>3.50</u> -2.05	Rec = 160/450 mm		_	CL /			<u> </u>				
				4.00	SPT 3.50-3.95 m 0, 0, 1		[CH	CLAY low plasticity, grey						
			4 —	-2.55	N=1		L		many shell fragments	1					
			-	<u>4.50</u> -3.05											
			-				[5						
Tools			-	5.45	SPT 5.00-5.45 m 0, 0, 0 N=0		[
Datge			-	-4.00					low to medium plasticity, many shell fragments						
00.04			6—	6.00 -4.55			[-]								
10.02.0			-	-							vs				
1:50			-	-	Rec = 450/450 mm SPT 6.50-6.95 m										
2022 1			-	7.20	0, 0, 0 N=0		[
11/08/ PQ3			_	-5.75			[low plasticity, mottled brown and brown						
gFile>> 11/08/2022 11:50 10.02.00.04 Datgel Tools PQ3			8—	8.00											
awingF				-6.55 8.45	Rec = 410/450 mm U 8.00-8.50 m		[low to medium plasticity, yellow brown						
×Ω×			-	-7.00	Rec = /500 mm SPT 8.00-8.45 m		t		brown, trace fine grained sand, some red brown bands	1					
).GPJ			-	9.00	0, 0, 0 N=0		+			-					
CKUP			-				[medium to high plasticity, grey						
GI (BA			-	1	Rec = 420/450 mm SPT 9.50-9.95 m		t								
IDGE			10 —	10.00 -8.55	1, 1, 2 N=3				with fine grained sand	1					
AY BK			-	10.70			F=-				S				
USEW			-	<u>10.70</u> -9.25			[1					
AL CAI			-	-	Rec = 450/450 mm SPT 11.00-11.45 m		<u>t</u>								
NOL			-	<u>11.50</u> -10.05	3, 3, 5		F			-	_				
ADD			12 —	4			L				F				
PAGE			-				L								
FULL				12.80	Rec = 440/450 mm U 12.50-13.00 m		f==								
ORED			-	- 13.05 -11.55	Rec = /500 mm SPT 12.50-12.95 m		t		grey mottled brown, with fine to coarse grained sand						
ON-C			-	1	3, 6, 9 N=15		<u> </u>		high plasticity, mottled yellow brown red brown and dark grey		St	yellow staining at 13.3m and 13.7m			
GAP N			-	1			F==								
, Log			14 —	14.25	Rec = 450/450 mm		L				\vdash				
0.GLB			-	-12.80	SPT 14.00-14.45 m 2, 3, 5 N=8		<u> </u>		high plasticity, mottled yellow brown and red brown		F				
LOGC			-	<u>14.75</u> -13.30			[<u> </u>		high plasticity, mottled red and orange brown						
GAP 10.0.7 LIB LOGO GLB Log GAP NON-CORED FULL PAGE ADDITIONAL CAUSEWAY BRIDGE GI (BACKUP) GPJ < <drawin< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>n conjunction with accompanying notes and abbreviations. I</td><td></td><td></td><td></td></drawin<>									n conjunction with accompanying notes and abbreviations. I						
P 10.0					echnical purposes on	ily, w	rithout	atten	npt to assess possible contamination. Any references to pot ssarily indicate the presence or absence of soil or groundwa	entia	l con	tamination are for GAP gINT FN. F01			
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INSI GOLDER

REPORT OF BOREHOLE. CPCB-BH07

CLIENT: Causeway Link Alliance PROJECT: Causeway Pedestrian and Cyclist Bridge LOCATION: Heirisson Island JOB NO: PS131735						Bridg	e	SUI INC	ORDS: 394518.0 m E 6462738.0 m N MGA94 50 RFACE RL: 1.45 m DATUM: AHD LINATION: -90° LE DEPTH: 40.00 m	DRILL CONT LOGO	IEET: 2 OF 3 RILL RIG: Geoprobe 7822DT ONTRACTOR: National Geotech IGGED: CK DATE: 27/6/22 IECKED: IB DATE: 10/8/22		
		Dril	ling		Sampling				Field Material De				
MEIHOU	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS	
			- - 16 —	15.30 -13.85 16.00 -14.55	Rec = 450/450 mm SPT 15.50-15.95 m 2, 3, 4 N=7			CL / CH	CLAY low plasticity, grey high plasticity, mottled red, some yellow and black bands high plasticity, mottled yellow brown yellow and red				
			- - - 18 —	17.70 -16.25 18.00 -16.55	Rec = 450/450 mm SPT 17.00-17.45 m 1, 3, 4 N=7				mottled yellow brown		F	presence of crystalline mineral at the depth of 18-18.15m and	
			- - - 20	<u>20.00</u> -18.55	Rec = 450/450 mm SPT 18.50-18.95 m 1, 1, 2 N=3 Rec = 450/450 mm SPT 20.00-20.45 m 1, 1, 3 N=4				trace shell fragments		S	18.35-18.5m	
			- - 22 —		Rec = 450/450 mm SPT 21.50-21.95 m 11.5,5 N=10						F	presence of crystalline mineral	
			- - 24 —	23.70	Rec = 450/450 mm SPT 23.00-23.45 m 1, 3, 3 N=6			SP	SAND fine to medium grained, pale brown				
			- - 26 — -	25.40 -23.95 -24.85 -24.35 26.20 26.35 -24.90 -25.05	Rec = 450/450 mm SPT 24.50-24.95 m 1, 2, 2 N=4 Rec = 450/450 mm SPT 26.00-26.45 m 9, 15, 21 N=36			CH SP / CH	fine to coarse grained, brown yellow fine to medium grained, pale grey and white fine to coarse grained, brown yellow pale white and brown CLAY high plasticity, dark grey, with fine to medium grained sand INTERBEDDED SAND AND CLAY		L D VSt		
			- - 28 — -	28.20 -26.75 28.80	Rec = 250/450 mm SPT 27.50-27.95 m 6, 9, 10 N=19				fine to coarse grained, high plasticity, grey dark grey and brown some red brown bands, rock fragments (cobbles), some quartz [fragments] SAND fine to medium grained, grey GRAVEL coarse grained, sub-rounded to sub-angular		D		
			- - 30 —	-27.35 29.45 -28.00	Rec = 380/450 mm SPT 29.00-29.45 m 3, 5, 8 N=13			SP / CH	INTERBEDDED SAND AND CLAY fine to coarse grained, high plasticity, dark grey and red brown				

PF LC		CT: ION:	Cause	way Peo son Islan	k Alliance Jestrian and Cyclist Id	Bridg	e	SUI INC	ORDS: 394518.0 m E 6462738.0 m N MGA94 50 RFACE RL: 1.45 m DATUM: AHD LINATION: -90° LE DEPTH: 40.00 m			: Geoprobe CTOR: Nation CK	
		Dril	ling		Sampling				Field Material De	scriptio	on		
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE	CONSISTENCY DENSITY	AD	CTURE AND DITIONAL ERVATIONS
			30 — - -	<u>30.20</u> -28.75 <u>31.00</u> -29.55	Rec = 280/450 mm SPT 30.50-30.95 m 7, 12, 16 N=28))	SAND fine to coarse grained, sub-rounded to sub-angular, brown orange GRAVEL coarse grained, sub-rounded to sub-angular		MD		
			32 — - -	<u>32.00</u> -30.55 - <u>32.50</u> -31.05	Rec = 280/450 mm SPT 32.00-32.45 m 2, 3, 6 N=9			SC GP	INTERBEDDED SAND AND CLAY fine to coarse grained, black brown yellow and, trace quartz fragments Sandy GRAVEL coarse grained, brown grey and grey, fine to coarse grained sand, sub-rounded to angular		L		
			34 —	33.50	Rec = 400/450 mm SPT 33.50-33.95 m 6, 20, 46 N=66		0 0 0 0 0 0 0	SP	brown grey and grey, trace fine				
PQ3			- - 36 —	-	Rec = 380/450 mm SPT 35.00-35.45 m 6, 26, 30 N=56						VD		
			-	-	Rec = 250/450 mm SPT 36.50-36.95 m 26, 30, 0 N=30			•					
			38 — - -	-	Rec = 300/450 mm SPT 38.00-38.45 m 13, 50, 0 N=50						D		
				- <u>39.70</u> -38.25 -38.55	Rec = 400/450 mm SPT 39.50-39.95 m 13, 50, 0 N=50				pale grey white END OF BOREHOLE @ 40.00 m TARGET DEPTH GROUNDWATER ENCOUNTERED @ 1.50 m DEPTH Backfilled with grout				
			- - 42 —	-									
			- - -	-									
			44 — - -										

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 CLIENT:
 Causeway Link Alliance

 PROJECT:
 Causeway Pedestrian and Cyclist Bridge

 LOCATION:
 Heirisson Island

 JOB NO:
 PS131735

COORDS: 394518.0 m E 6462738.0 m N MGA94 50 SURFACE RL: 1.45 m DATUM: AHD INCLINATION: -90° HOLE DEPTH: 40.00 m SHEET: 1 OF 5 DRILL RIG: Geoprobe 7822DT CONTRACTOR: National Geotech LOGGED: CK DATE: 27/6/22 CHECKED: IB DATE: 10/8/22



CPCB-BH07 - 0.00 - 4.00 m



CPCB-BH07 - 4.00 - 8.00 m

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 CLIENT:
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 Causeway Pedestrian and Cyclist Bridge

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 PS131735

COORDS: 394518.0 m E 6462738.0 m N MGA94 50 SURFACE RL: 1.45 m DATUM: AHD INCLINATION: -90° HOLE DEPTH: 40.00 m SHEET: 2 OF 5 DRILL RIG: Geoprobe 7822DT CONTRACTOR: National Geotech LOGGED: CK DATE: 27/6/22 CHECKED: IB DATE: 10/8/22



CPCB-BH07 - 8.00 - 12.00 m



CPCB-BH07 - 12.00 - 16.00 m

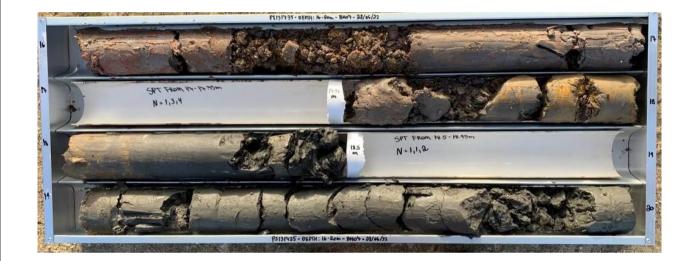
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CLIENT: Causeway Link Alliance PROJECT: Causeway Pedestrian and Cyclist Bridge LOCATION: Heirisson Island PS131735 JOB NO:

COORDS: 394518.0 m E 6462738.0 m N MGA94 50 SURFACE RL: 1.45 m DATUM: AHD INCLINATION: -90° HOLE DEPTH: 40.00 m

SHEET: 3 OF 5 DRILL RIG: Geoprobe 7822DT CONTRACTOR: National Geotech LOGGED: CK DATE: 27/6/22 CHECKED: IB DATE: 10/8/22



CPCB-BH07 - 16.00 - 20.00 m



CPCB-BH07 - 24.00 - 28.00 m

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GAP 10.0.7 LIB LOGO.GLB Griffli GAP CORE PHOTO 2 PER PAGE ADDITIONAL CAUSEWAY BRIDGE GI (BACKUP).GPJ <</ style="text-align: center;">chrawingFile>> 11/08/2022 11:50 10.02.00.04 Datgel Tools</style="text-align: center;">Canton 2 PER PAGE ADDITIONAL CAUSEWAY BRIDGE GI (BACKUP).GPJ <</style="text-align: center;">chrawingFile>> 11/08/2022 11:50 10.02.00.04 Datgel Tools



 CLIENT:
 Causeway Link Alliance

 PROJECT:
 Causeway Pedestrian and Cyclist Bridge

 LOCATION:
 Heirisson Island

 JOB NO:
 PS131735

COORDS: 394518.0 m E 6462738.0 m N MGA94 50 SURFACE RL: 1.45 m DATUM: AHD INCLINATION: -90° HOLE DEPTH: 40.00 m SHEET: 4 OF 5 DRILL RIG: Geoprobe 7822DT CONTRACTOR: National Geotech LOGGED: CK DATE: 27/6/22 CHECKED: IB DATE: 10/8/22



CPCB-BH07 - 28.00 - 32.00 m



CPCB-BH07 - 32.00 - 36.00 m

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 CLIENT:
 Causeway Link Alliance

 PROJECT:
 Causeway Pedestrian and Cyclist Bridge

 LOCATION:
 Heirisson Island

 JOB NO:
 PS131735

COORDS: 394518.0 m E 6462738.0 m N MGA94 50 SURFACE RL: 1.45 m DATUM: AHD INCLINATION: -90° HOLE DEPTH: 40.00 m SHEET: 5 OF 5 DRILL RIG: Geoprobe 7822DT CONTRACTOR: National Geotech LOGGED: CK DATE: 27/6/22 CHECKED: IB DATE: 10/8/22



CPCB-BH07 - 36.00 - 40.00 m

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PI LC	CLIENT: Causeway Link Alliance PROJECT: Causeway Pedestrian and Cyclist Bridge LOCATION: McCallum Park JOB NO: PS131735 Drilling Sampling							SUI INC	ORDS: 394746.0 m E 6462585.0 m N MGA94 50 RFACE RL: 1.52 m DATUM: AHD :LINATION: -90° LE DEPTH: 40.00 m Field Material Des	SHEET: 1 OF 3 DRILL RIG: Geoprobe 7822DT CONTRACTOR: National Geotech LOGGED: CK DATE: 23/6/22 CHECKED: IB DATE: 10/8/22			
	z,	-			Sampling			ğ					
METHOD	PENETRATION	WATER	_	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE	CONSISTENCY	STRUCTURE AND ADDITIONAL OBSERVATIONS	
Pa				<u>0.15</u> - 1.37 - 1.40 - 0.02 2.00 -0.48 	Rec = 250/450 mm SPT 2.00-2.45 m 0, 0, 0 N*=0 Rec = 450/450 mm SPT 3.50-3.95 m 0, 0, 2 N*=2 U 5.00-5.45 m Rec = 450/450 mm S75 m PP = 564 kPa Rec = 450/450 mm SPT 6.00-6.45 m 5, 75 m N*=16 6.70 m 6.70 m PP = 412 kPa 7.20 m PP = 407 kPa Rec = 450/450 mm SPT 8.00-8.45 m Rec = 450/450 mm SPT 8.00-8.45 m 0, 6, 3 N*=9 Rec = 450/450 mm SPT 9.00-9.95 m 0, 6, 3 N*=9 Rec = 450/450 mm			SP SP CL SC C나 CH C나 CH SP CH SP CH CH SP CH SP CH SP CH CH SP	TOPSOIL: SAND fine to medium grained, dark brown, trace rootlets FILL: SAND fine to medium grained, yellow brown CLAY low plasticity, yellow brown CORE LOSS Clayey SAND /Sandy CLAY fine to medium grained, grey mottled yellow brown, medium to high plasticity clay dark grey CLAY medium to high plasticity, grey mottled yellow brown Sandy CLAY medium to high plasticity, grey mottled yellow brown Sandy CLAY medium to high plasticity, grey mottled yellow brown dark grey, fine to medium grained sand, trace shell fragments CORE LOSS SAND Sandy CLAY medium to high plasticity, grey mottled yellow brown Sandy CLAY medium to high plasticity, grey mottled yellow brown Sandy CLAY medium to high plasticity, grey mottled yellow brown Sandy CLAY medium to high plasticity, grey mottled yellow brown Sandy CLAY medium to high plasticity, grey mottled orange brown and brown fine to medium grained, grey mottled orange brown and brown		L St L F		
			12-		N*=10				CORE LOSS				
			14 -	- - - -	- 13.50 m 13.50 m PP = 235 kPa Rec = 450/450 mm SPT 14.00-14.45 m 2, 2, 4 N*=6 14.80 m				mottled red orange brown		F		

	JECT: ATION:	Cause	way Peo lum Parl	k Alliance destrian and Cyclist B k	ridge	•	SUI INC	ORDS: 394746.0 m E 6462585.0 m N MGA94 50 RFACE RL: 1.52 m DATUM: AHD :LINATION: -90° LE DEPTH: 40.00 m		DRILI CON ⁻ LOG(ET: 2 OF 3 _ RIG: Geoprobe 7822DT IRACTOR: National Geotech GED: CK DATE: 23/6/2 CKED: IB DATE: 10/8/2	
	Dri	lling		Sampling				Field Material Des	criptic	on		
METHOD PENETRATION	RESISTANCE WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS	
		-		14.80 m PP = 470 kPa			1	mottled red orange brown				
		- 16—		Rec = 450/450 mm SPT 15.50-15.95 m 1, 3, 5 N*=8								
		-	<u>17.00</u> -15.48 18.00	U 17.00-17.45 m Rec = 450/450 mm				grey	-	F		
		- 18 -	-16.48 -19.00 -17.48	18.20 m 18.20 m PP = 127 kPa Rec = 450/450 mm SPT 18.50-18.95 m 2, 2, 3				dark grey				
		- 20	-17.40					CORE LOSS				
		-	<u>20.50</u> -18.98 <u>21.00</u> -19.48	U 20.00-20.45 m Rec = 450/450 mm			SP	SAND fine to coarse grained, sub-rounded to sub-angular, grey mottled brown and yellow				
DA		- 22— -	<u>22.00</u> -20.48	Rec = 450/450 mm SPT 21.50-21.95 m 8, 20, 36 N*=56				some orange brown bands and yellow brown and grey		VD		
		- - - 24 —	23.50 -21.98 24.00 -22.48	Rec = 450/450 mm SPT 23.00-23.45 m 8, 15, 26 N*=41				yellow brown grey mottled orange brown		D		
		-	<u>25.00</u> -23.48	Rec = 450/450 mm SPT 24.50-24.95 m 8, 12, 18 N=30		×	SC / SM	Silty Clayey SAND fine to coarse grained, black	_			
		- 26 — -	<u>26.50</u> -24.98	Rec = 450/450 mm SPT 26.00-26.45 m 7, 10, 12 N=22		×				MD	clay content becoming more predomina from 26.5m to 27.5m	ant
		- 28	<u>27.50</u> -25.98	Rec = 400/450 mm SPT 27.50-27.95 m 2, 7, 11 N=18		×	SP	SAND fine to medium grained, yellow brown				
		-		Rec = 400/450 mm SPT 29.00-29.45 m 0, 2, 7 N=9						L		

114	sp)	GC	DLDER			REPORT OF BOREHOLE: CPCB-BH08								
	CT: Ca ION: Mo	-	nk Alliance edestrian and Cyclist E ırk	Bridge	SI IN	DORDS: 394746.0 m E 6462585.0 m N MGA94 50 JRFACE RL: 1.52 m DATUM: AHD CLINATION: -90° DLE DEPTH: 40.00 m	 (DRILL F CONTR LOGGE	: 3 OF 3 RIG: Geoprobe 7822DT AACTOR: National Geotech D: CK DATE: 23/6/22 (ED: IB DATE: 10/8/22					
	Drilling]	Sampling			Field Material De								
METHOD PENETRATION RESISTANCE		(metres) LTAD LEPTI RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC	LOG GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS					
	3	0	Rec = 400/450 mm SPT 30.50-30.95 m 1, 4, 7 N=11	-	SF	SAND fine to medium grained, yellow brown		L						
	3	2				pale brown								
	3	4						MD						
PQ	3	- <u>35.45</u> 33.93 6 <u>36.00</u> -34.48	N=24			brown								
	3	- - 8 -	Rec = 450/450 mm SPT 36.50-36.95 m 4, 10, 23 N=33 Rec = 450/450 mm SPT 38.00-38.45 m 2, 8, 18					MD - D						
	4	- <u>38.90</u> -37.36 - 0	Rec = 450/450 mm SPT 39.50-39.95 m 9, 12, 23			black staining								
		-38.48 - - - -	N=35			END OF BOREHOLE @ 40.00 m TARGET DEPTH GROUNDWATER ENCOUNTERED @ 1.50 m DEPTH Backfilled with grout								
	4	2												
	4	4												
		geo	otechnical purposes or	nly, with	out atte	in conjunction with accompanying notes and abbreviation mpt to assess possible contamination. Any references to essarily indicate the presence or absence of soil or groun	potentia	al contar	mination are for					

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CLIENT:Causeway Link AlliancePROJECT:Causeway Pedestrian and Cyclist BridgeLOCATION:McCallum ParkJOB NO:PS131735

COORDS: 394746.0 m E 6462585.0 m N MGA94 50 SURFACE RL: 1.52 m DATUM: AHD INCLINATION: -90° HOLE DEPTH: 40.00 m SHEET: 1 OF 5 DRILL RIG: Geoprobe 7822DT CONTRACTOR: National Geotech LOGGED: CK DATE: 23/6/22 CHECKED: IB DATE: 10/8/22



CPCB-BH08 - 0.00 - 4.00 m



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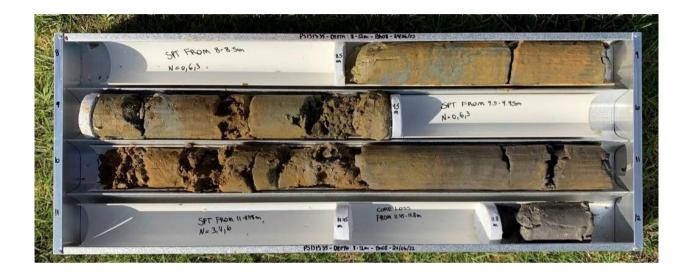
 CLIENT:
 Causeway Link Alliance

 PROJECT:
 Causeway Pedestrian and Cyclist Bridge

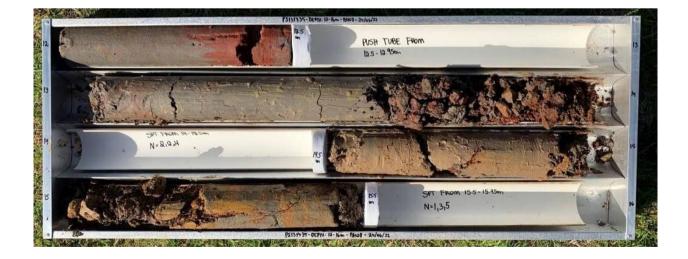
 LOCATION:
 McCallum Park

 JOB NO:
 PS131735

COORDS: 394746.0 m E 6462585.0 m N MGA94 50 SURFACE RL: 1.52 m DATUM: AHD INCLINATION: -90° HOLE DEPTH: 40.00 m SHEET: 2 OF 5 DRILL RIG: Geoprobe 7822DT CONTRACTOR: National Geotech LOGGED: CK DATE: 23/6/22 CHECKED: IB DATE: 10/8/22



CPCB-BH08 - 8.00 - 12.00 m



CPCB-BH08 - 12.00 - 16.00 m

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 CLIENT:
 Causeway Link Alliance

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 Causeway Pedestrian and Cyclist Bridge

 LOCATION:
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 PS131735

COORDS: 394746.0 m E 6462585.0 m N MGA94 50 SURFACE RL: 1.52 m DATUM: AHD INCLINATION: -90° HOLE DEPTH: 40.00 m SHEET: 3 OF 5 DRILL RIG: Geoprobe 7822DT CONTRACTOR: National Geotech LOGGED: CK DATE: 23/6/22 CHECKED: IB DATE: 10/8/22



CPCB-BH08 - 16.00 - 20.00 m



CPCB-BH08 - 20.00 - 24.00 m

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CLIENT:Causeway Link AlliancePROJECT:Causeway Pedestrian and Cyclist BridgeLOCATION:McCallum ParkJOB NO:PS131735

COORDS: 394746.0 m E 6462585.0 m N MGA94 50 SURFACE RL: 1.52 m DATUM: AHD INCLINATION: -90° HOLE DEPTH: 40.00 m SHEET: 4 OF 5 DRILL RIG: Geoprobe 7822DT CONTRACTOR: National Geotech LOGGED: CK DATE: 23/6/22 CHECKED: IB DATE: 10/8/22



CPCB-BH08 - 24.00 - 28.00 m



CPCB-BH08 - 28.00 - 32.00 m

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 CLIENT:
 Causeway Link Alliance

 PROJECT:
 Causeway Pedestrian and Cyclist Bridge

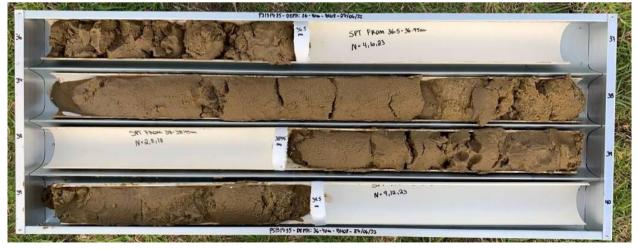
 LOCATION:
 McCallum Park

 JOB NO:
 PS131735

COORDS: 394746.0 m E 6462585.0 m N MGA94 50 SURFACE RL: 1.52 m DATUM: AHD INCLINATION: -90° HOLE DEPTH: 40.00 m SHEET: 5 OF 5 DRILL RIG: Geoprobe 7822DT CONTRACTOR: National Geotech LOGGED: CK DATE: 23/6/22 CHECKED: IB DATE: 10/8/22



CPCB-BH08 - 32.00 - 36.00 m



CPCB-BH08 - 36.00 - 40.00 m

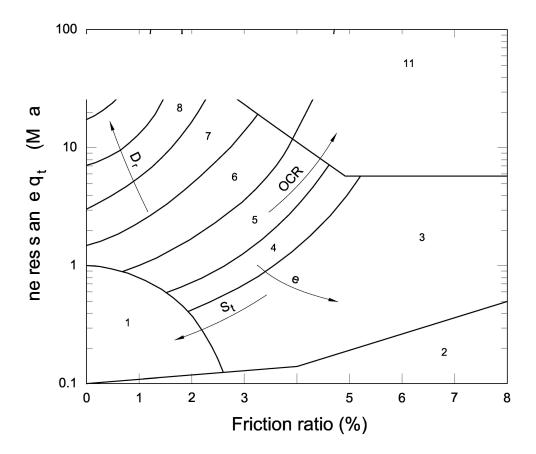
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APPENDIX C: CONE PENETRATION TEST LOGS

C301-CLA-0000-GE-REP-00003_A THIS DOCUMENT IS UNCONTROLLED IN HARD COPY Page 17 of 20



INTERPRETATION OF SOIL TYPE FROM CONE PENETRATION TEST DATA



ZONE NUMBERS AND SOIL BEHAVIOUR TYPE:

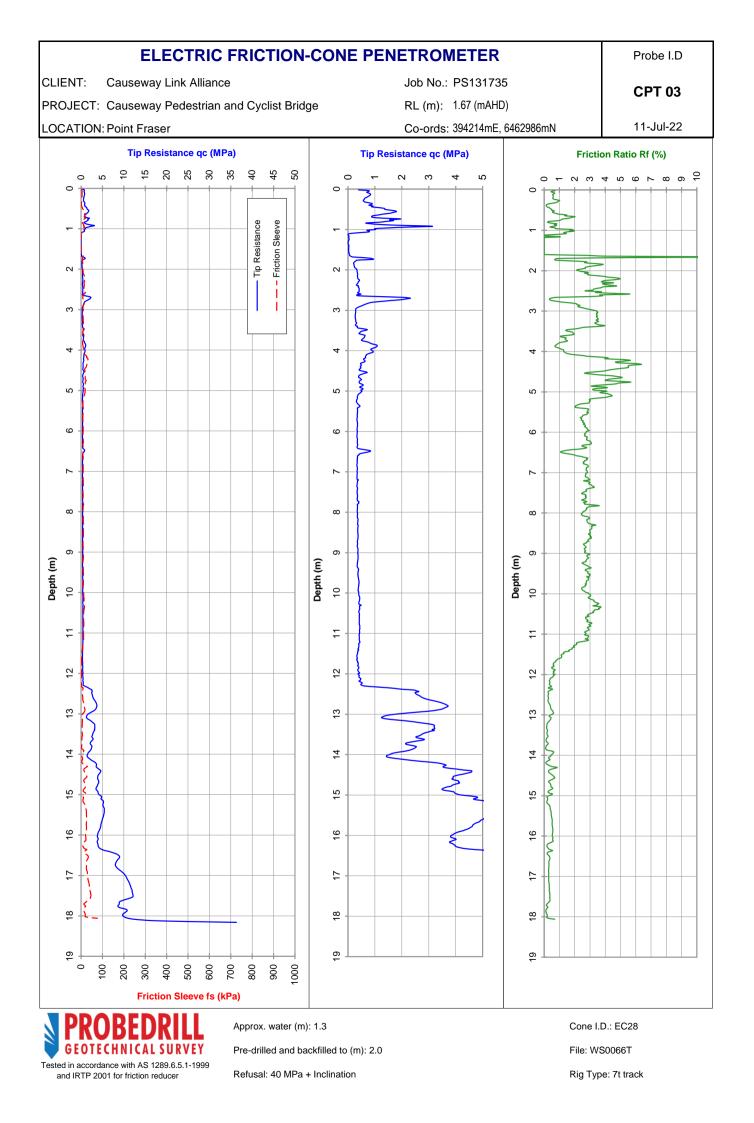
- 1. SENSITIVE FINE GRAINED
- 2. ORGANIC MATERIAL
- 3. CLAY
- 4. SILTY CLAY TO CLAY
- 5. CLAYEY SILT TO SILTY CLAY
- 6. SANDY SILT TO CLAYEY SILT
- 7. SILTY SAND TO SANDY SILT
- 8. SAND TO SILTY SAND
- 9. SAND
- 10. GRAVELLY SAND TO SAND
- 11. VERY STIFF FINE GRAINED*
- 12. SAND TO CLAYEY SAND*

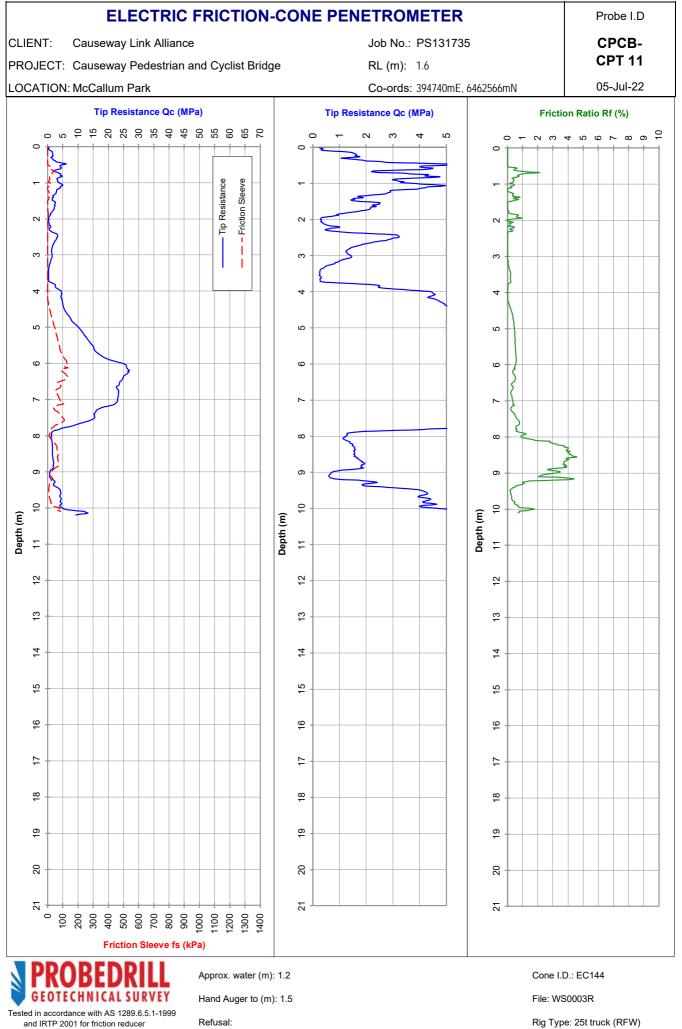
- **DEFINITIONS:**
- q, CONE TIP RESISTANCE CORRECTED
- ^t FOR PORE PRESSURE
- St SENSITIVITY e - VOID RATIO
- D_r RELATIVE DENSITY
- OCR OVERCONSOLIDATION RATIO
 - * OVERCONSOLIDATED OR CEMENTED.

DIRECTION OF ARROWS INDICATES PARAMETER INCREASING.

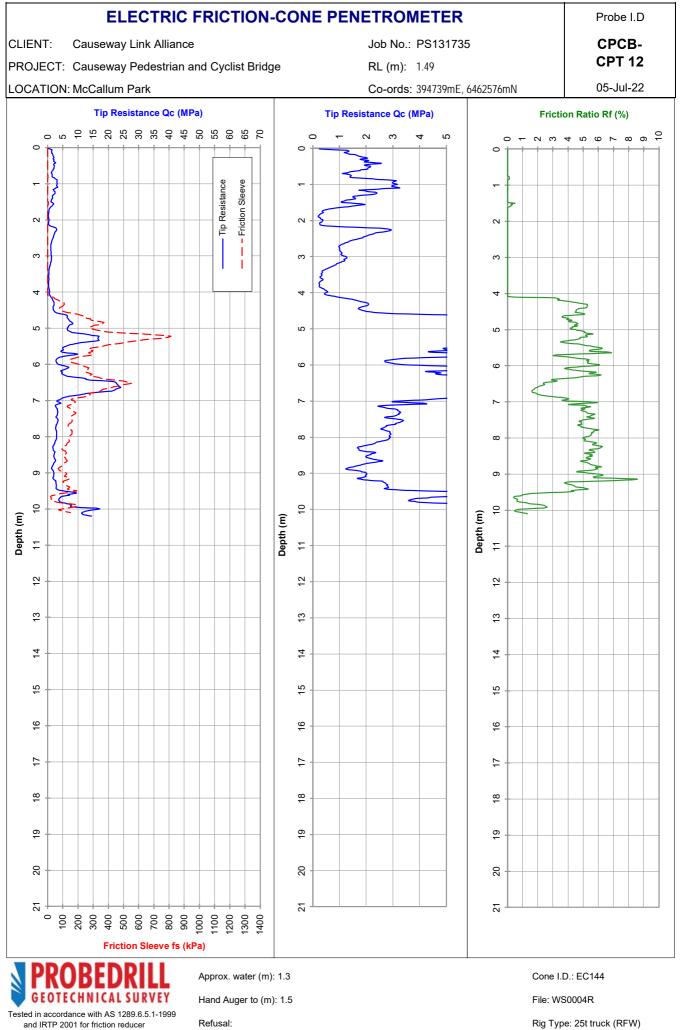
EXPECT SOME OVERLAP IN SOIL TYPE-ZONES. LOCAL CORRELATIONS ARE PREFERRED AND MAY INDICATE SOIL TYPE BOUNDARIES THAT DIFFER FROM THOSE SHOWN.

Robertson, P.K., Campanella, R.G., Gillespie, D. and Greig, J. (1986) "Use of piezometer cone data". Proceedings of the ASCE Specialty Conference In Situ' 86: Use of In Situ Tests in Geotechnical Engineering, Blacksburg, 1263-80, American Society of Engineers (ASCE).

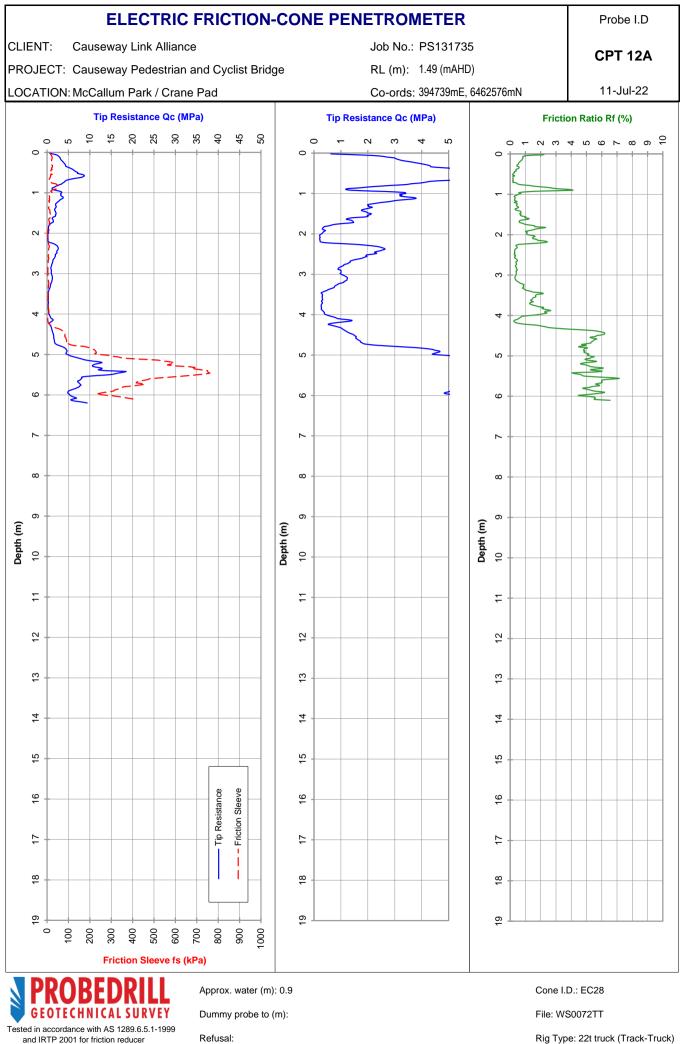




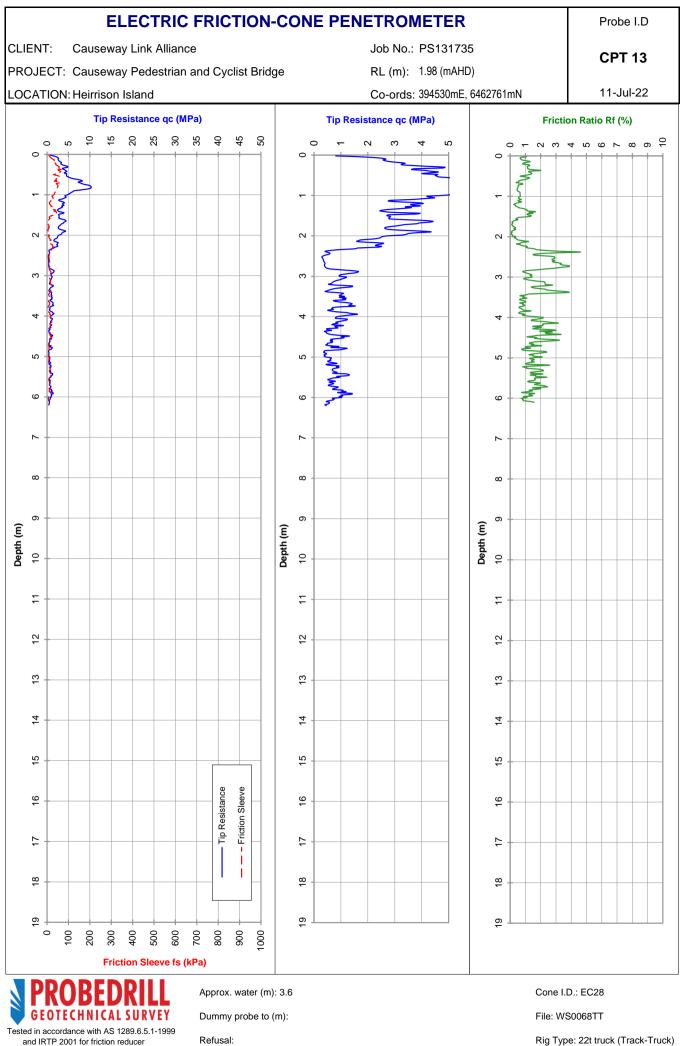
Rig Type: 25t truck (RFW)

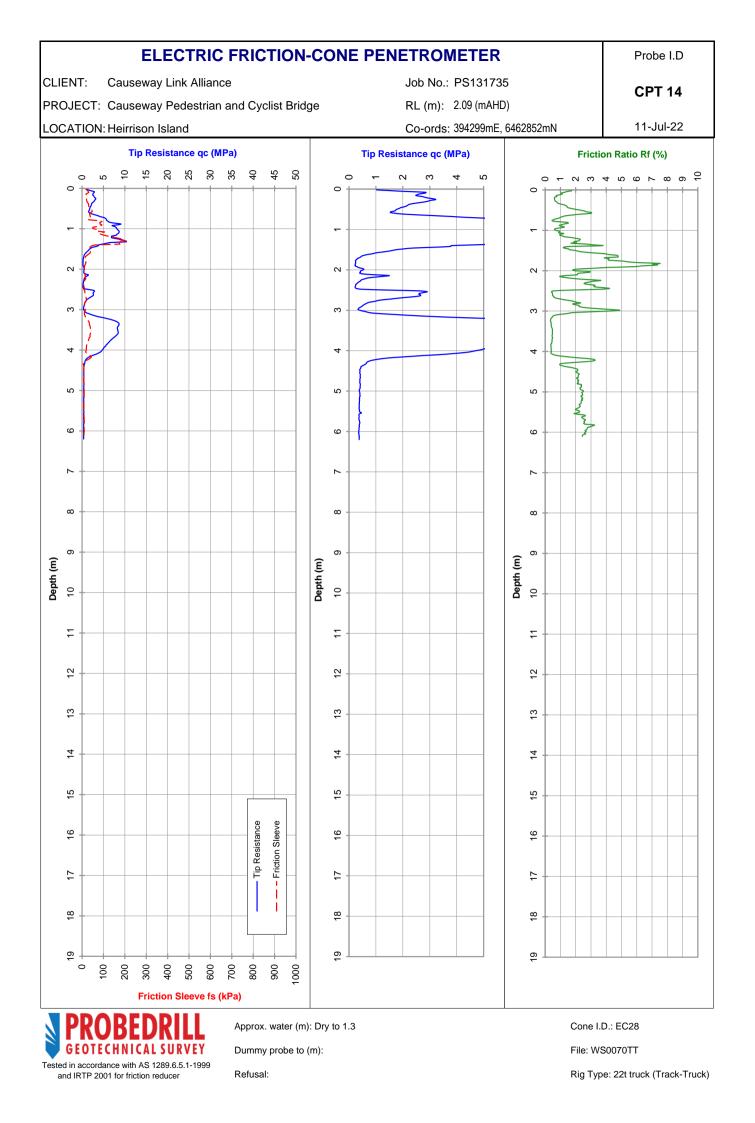


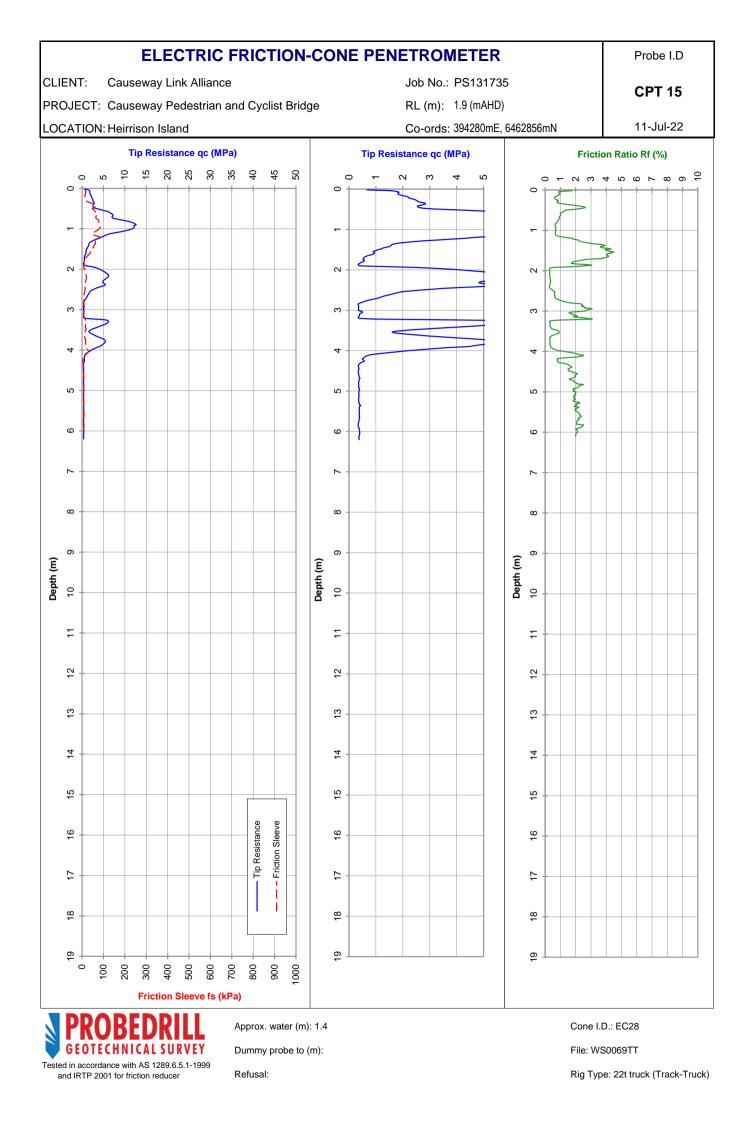
Rig Type: 25t truck (RFW)

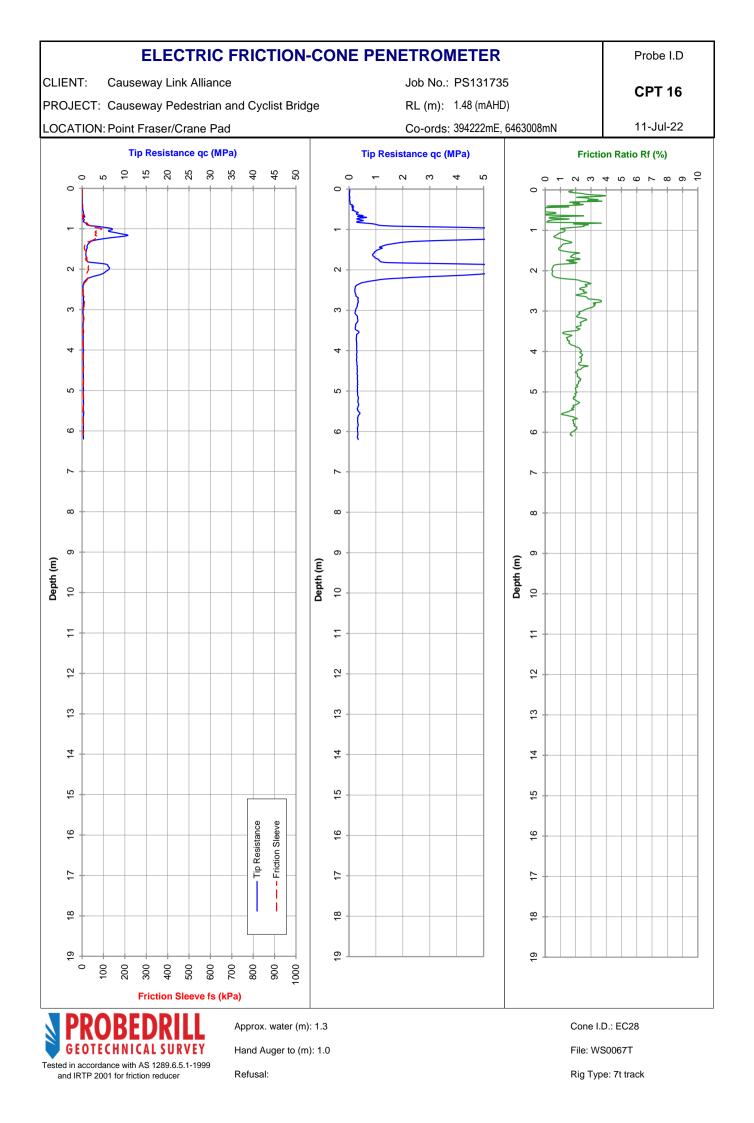


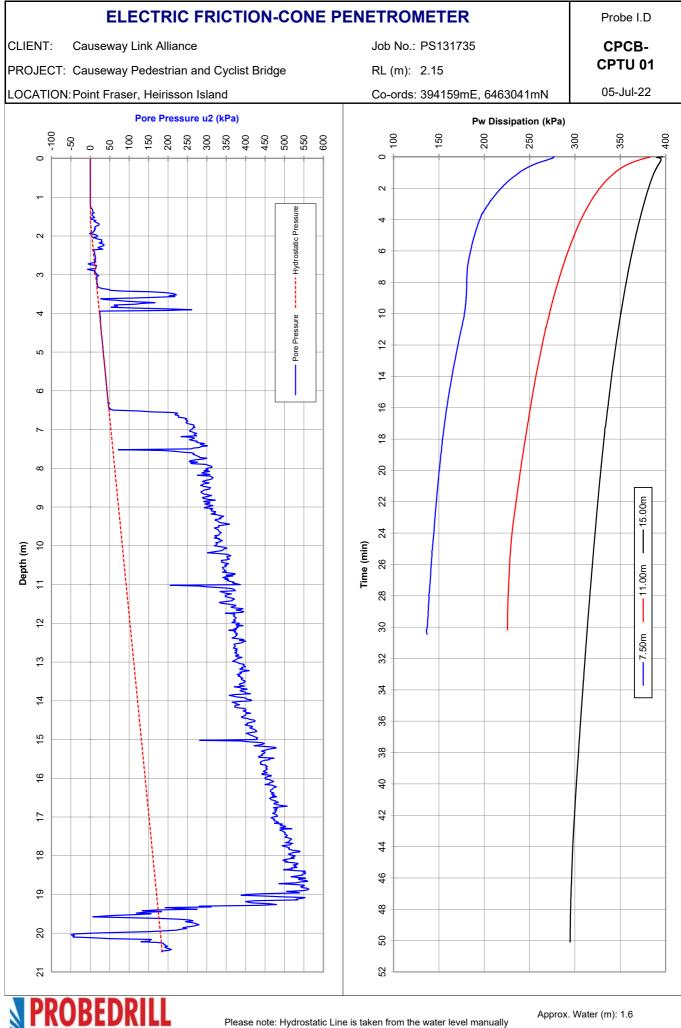
Rig Type: 22t truck (Track-Truck)











Tested in accordance with AS 1289.6.5.1-1999 and IRTP 2001 for friction reducer

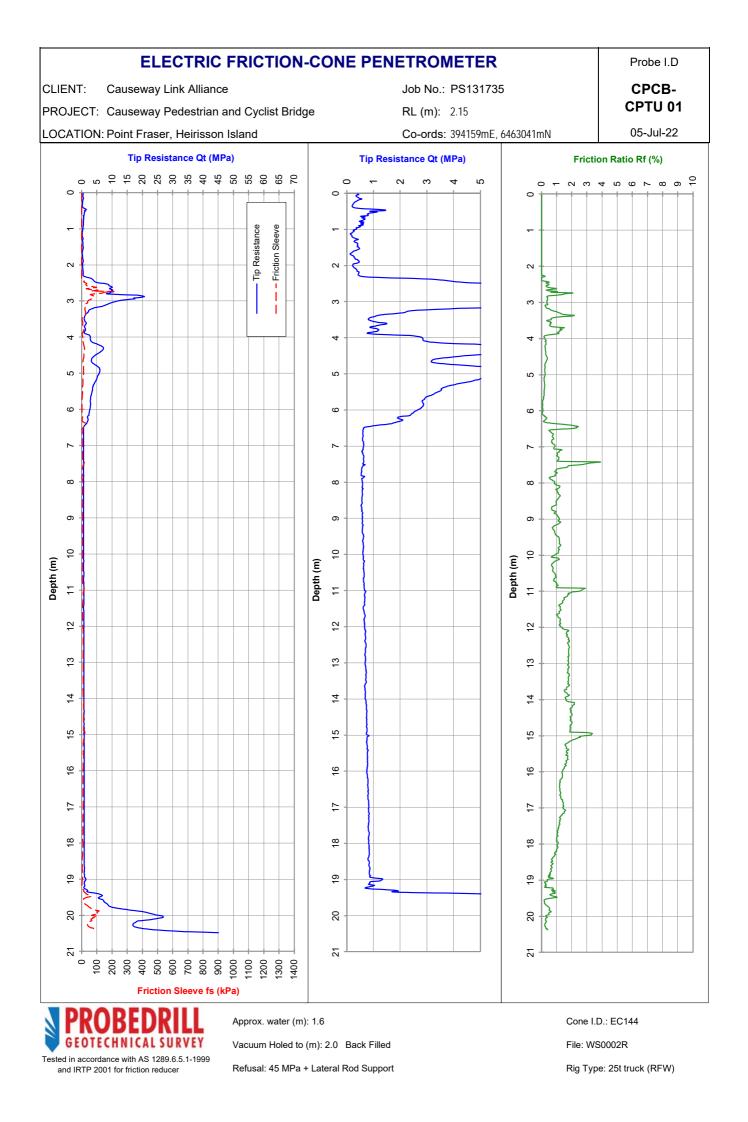
CAL SURVEY

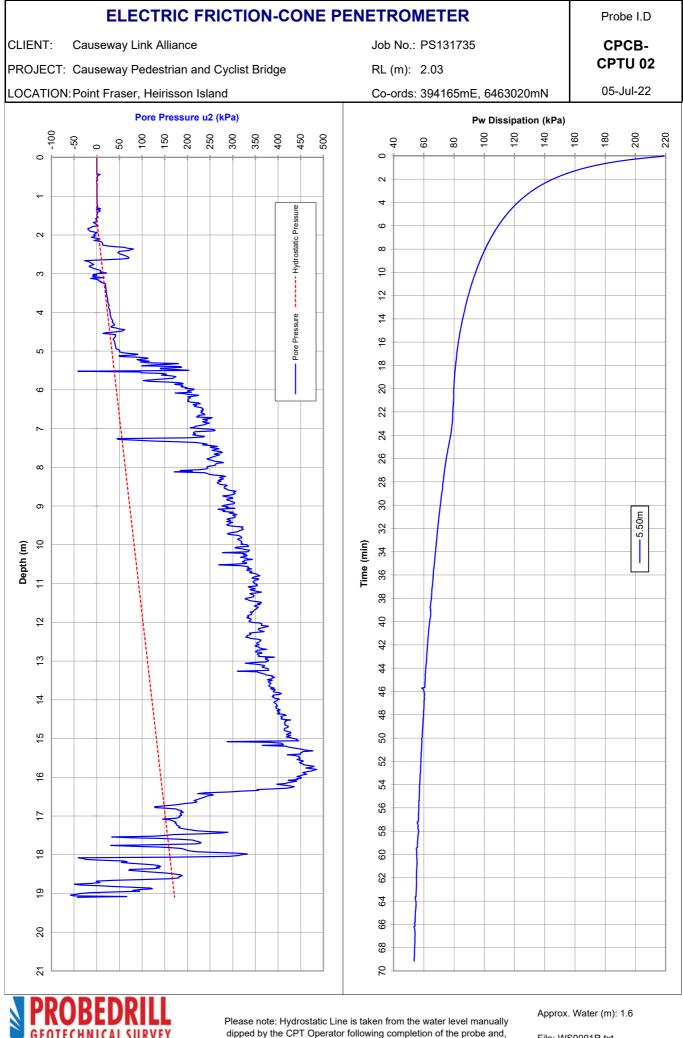
GF

Please note: Hydrostatic Line is taken from the water level manually dipped by the CPT Operator following completion of the probe and, as such, should be used as a guide only.

File: WS0002R.txt

Rig type: 25t truck (RFW)



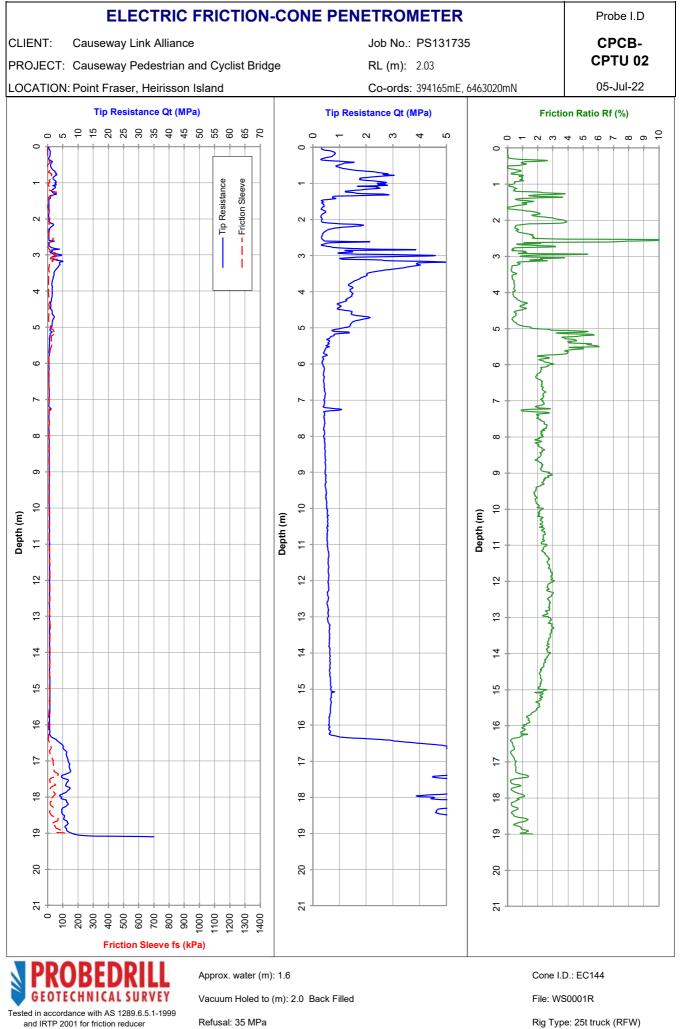


Tested in accordance with AS 1289.6.5.1-1999 and IRTP 2001 for friction reducer

dipped by the CPT Operator following completion of the probe and, as such, should be used as a guide only.

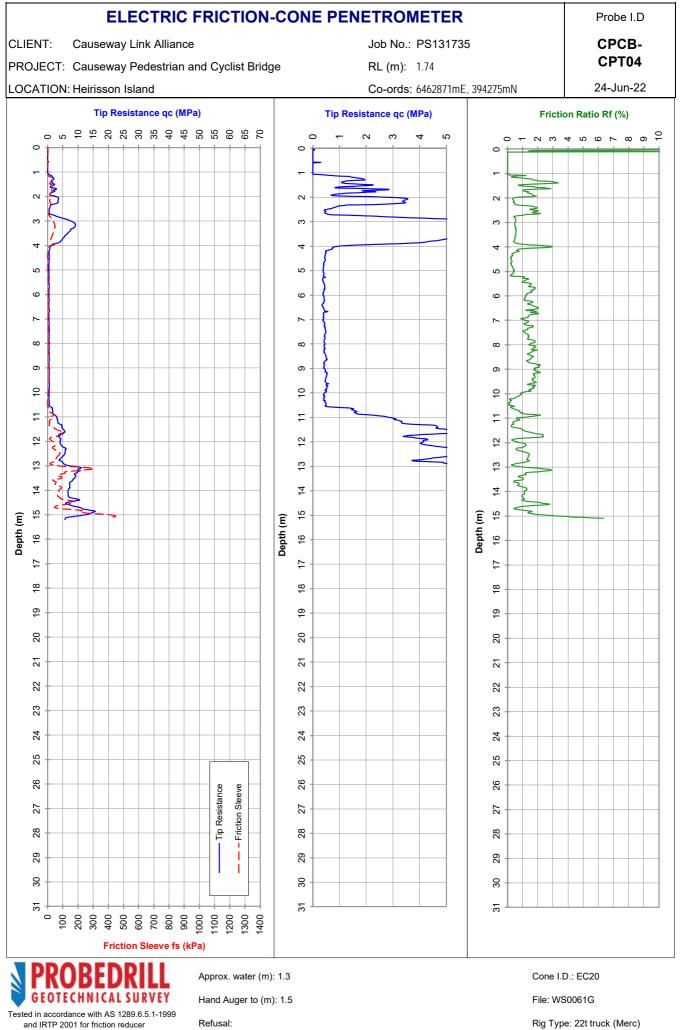
File: WS0001R.txt

Rig type: 25t truck (RFW)

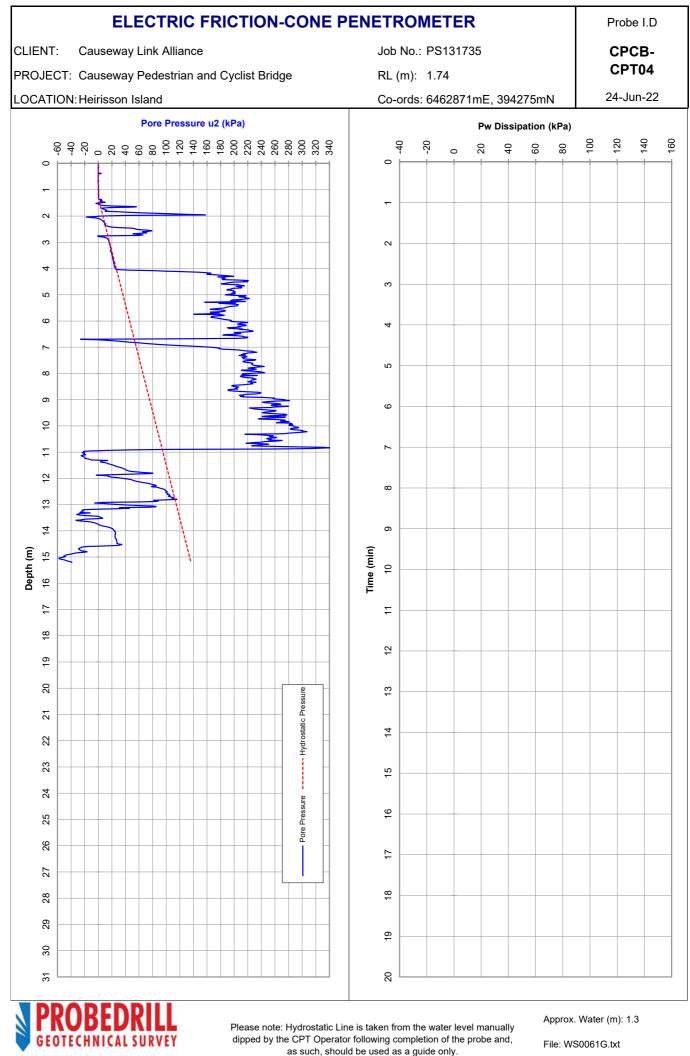


Refusal: 35 MPa

Rig Type: 25t truck (RFW)

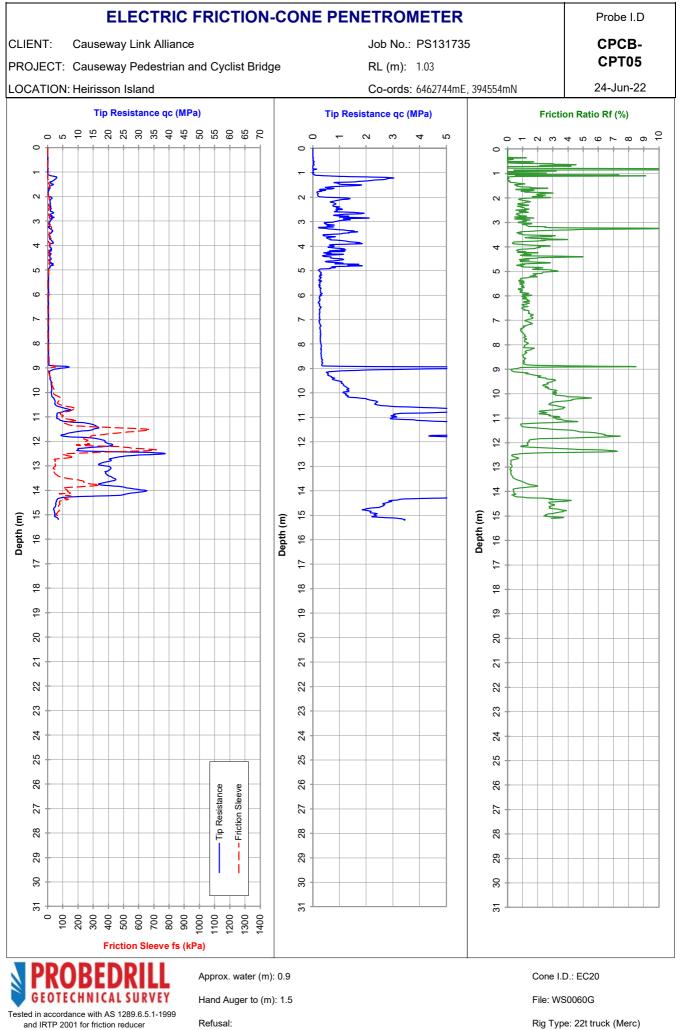


Rig Type: 22t truck (Merc)

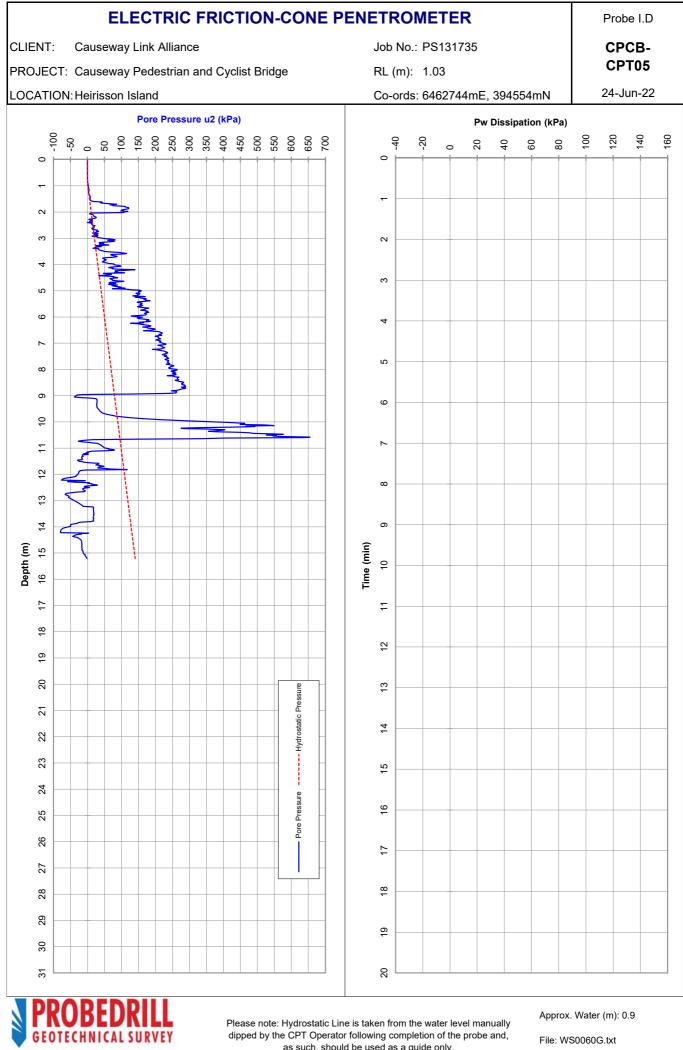


Tested in accordance with AS 1289.6.5.1-1999 and IRTP 2001 for friction reducer

Rig type: 22t truck (Merc)



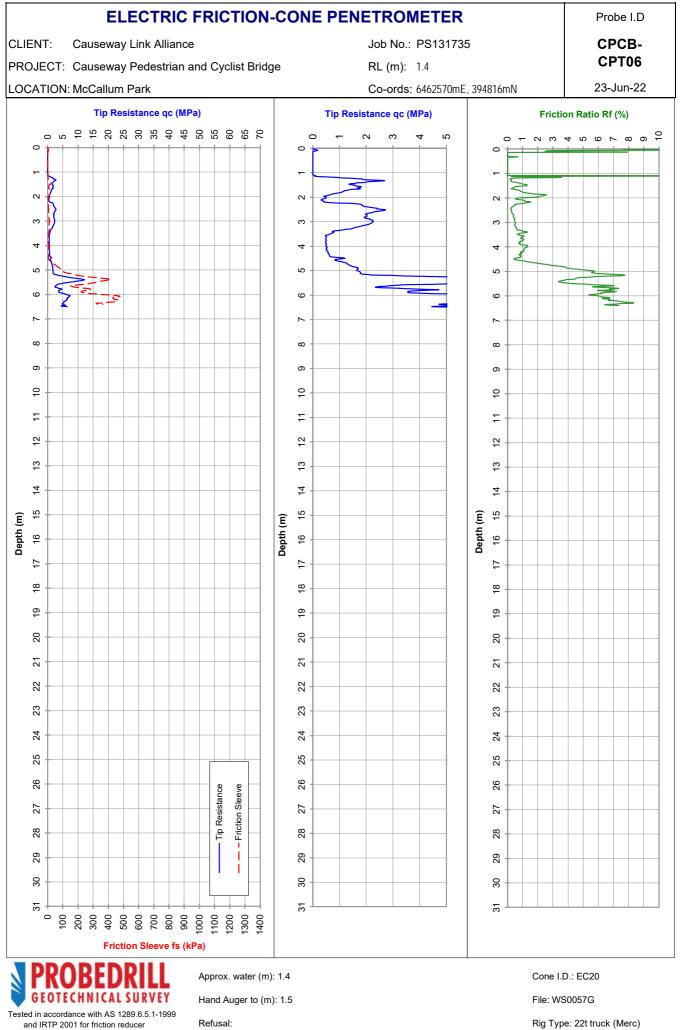
Rig Type: 22t truck (Merc)



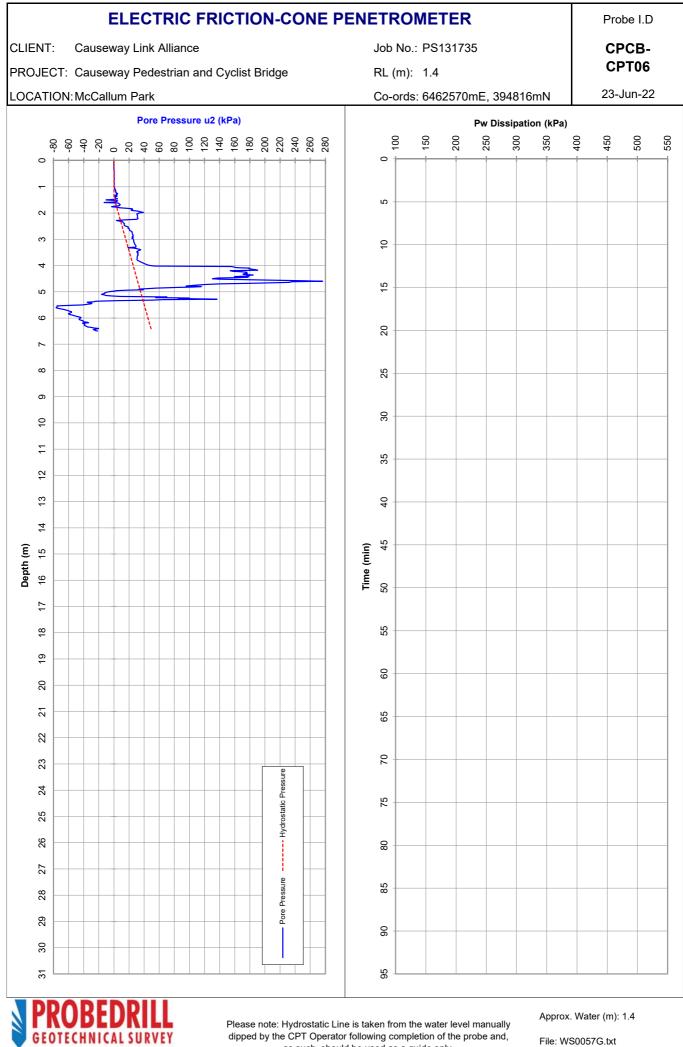
Tested in accordance with AS 1289.6.5.1-1999 and IRTP 2001 for friction reducer

as such, should be used as a guide only.

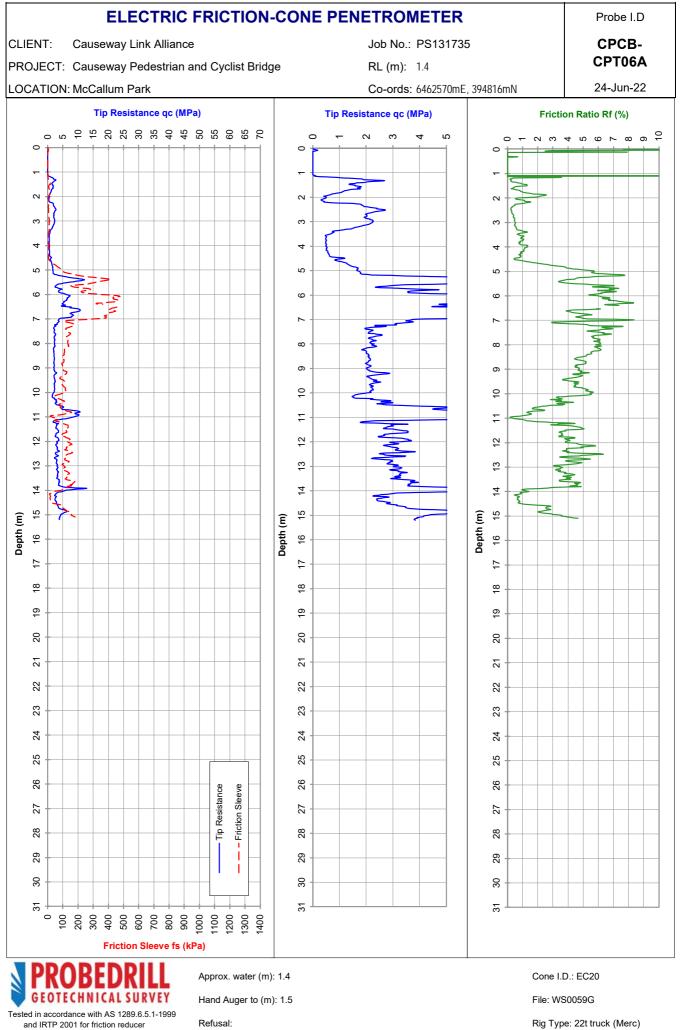
Rig type: 22t truck (Merc)



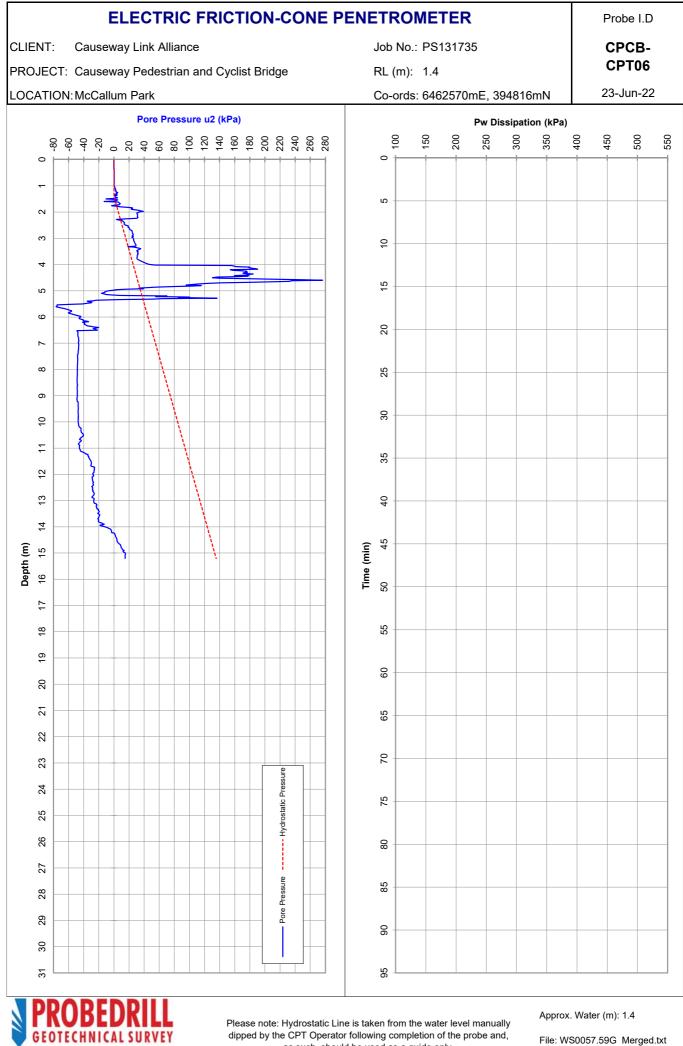
Refusal:



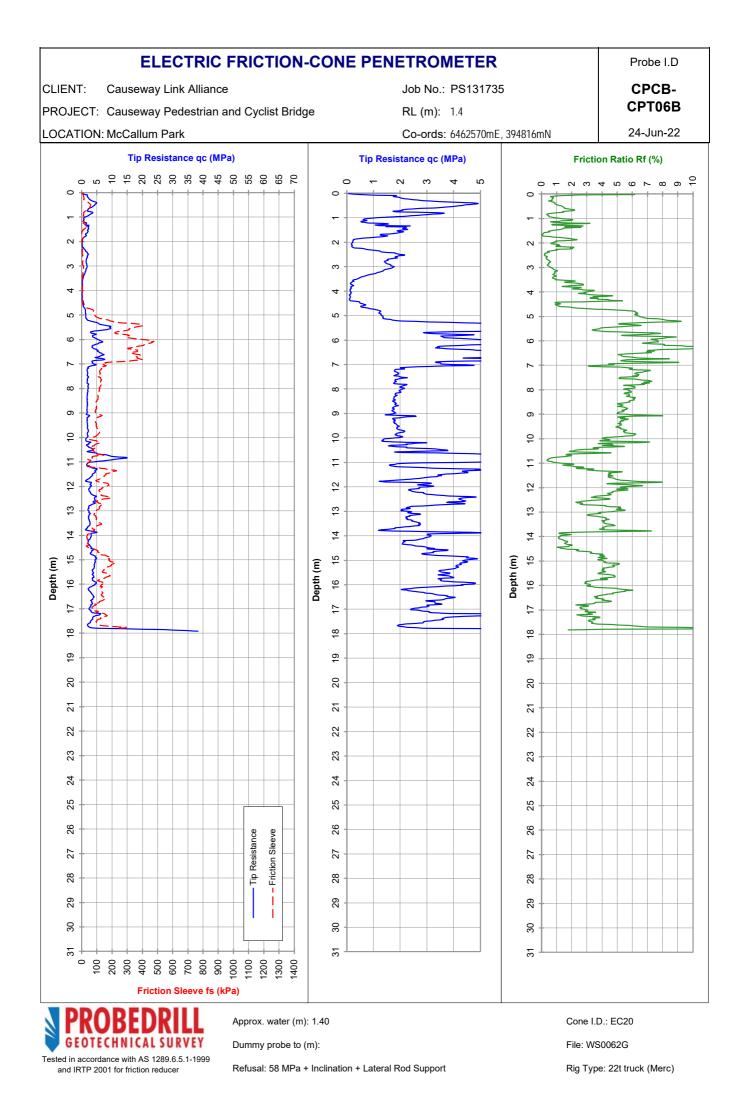
as such, should be used as a guide only.

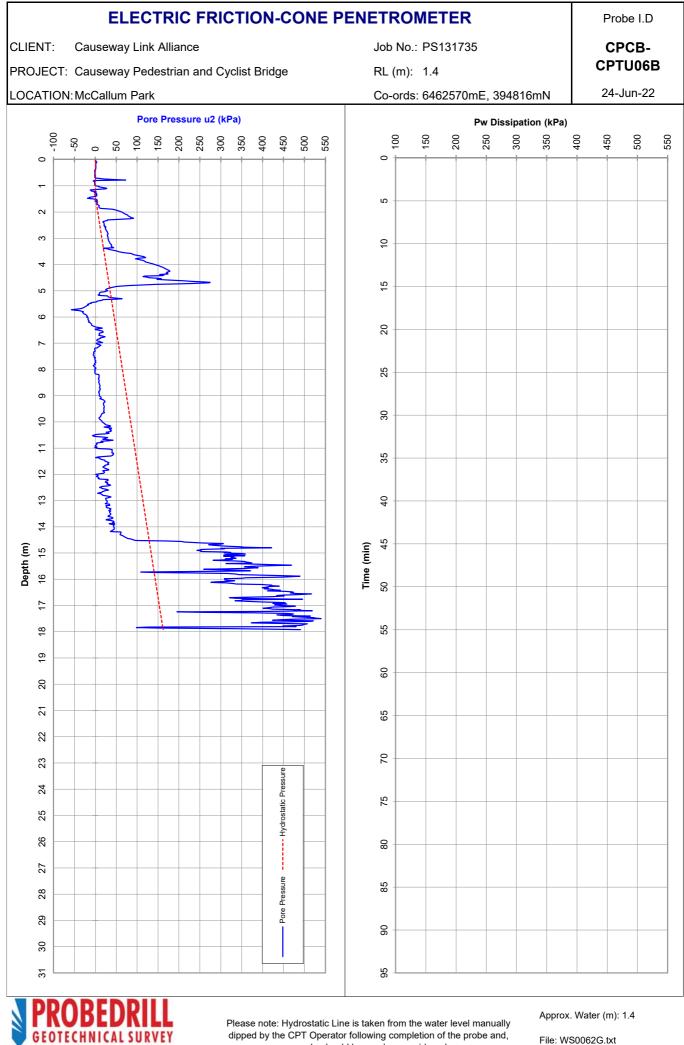


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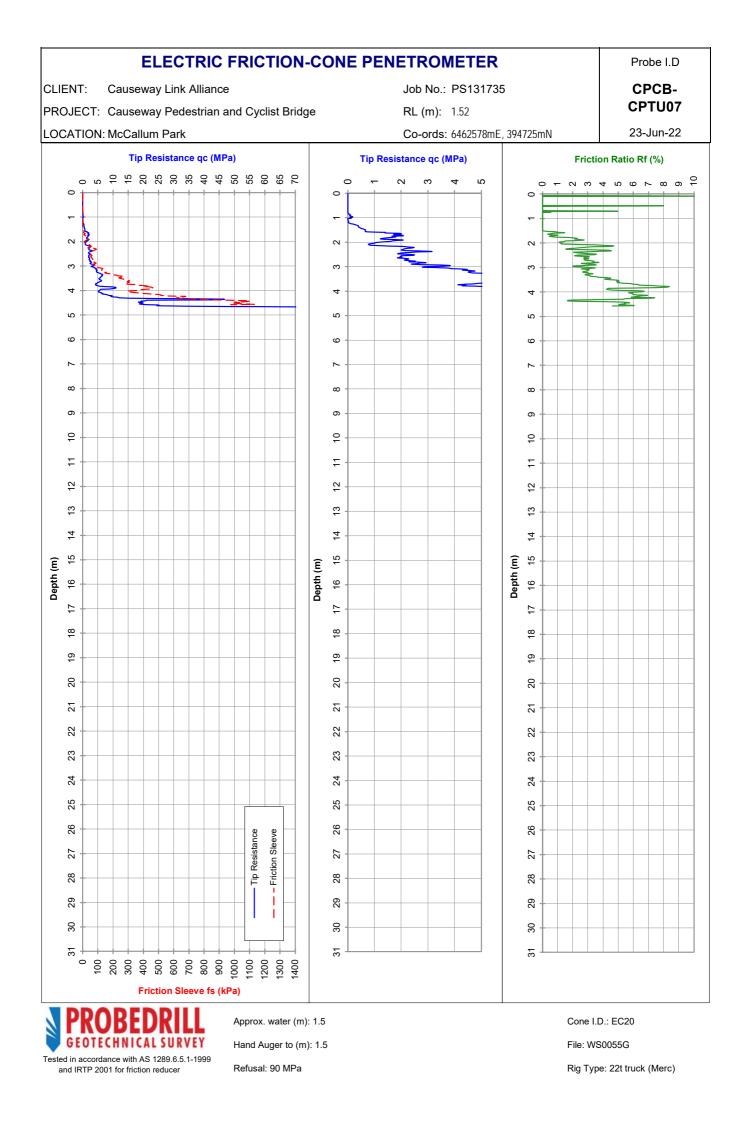


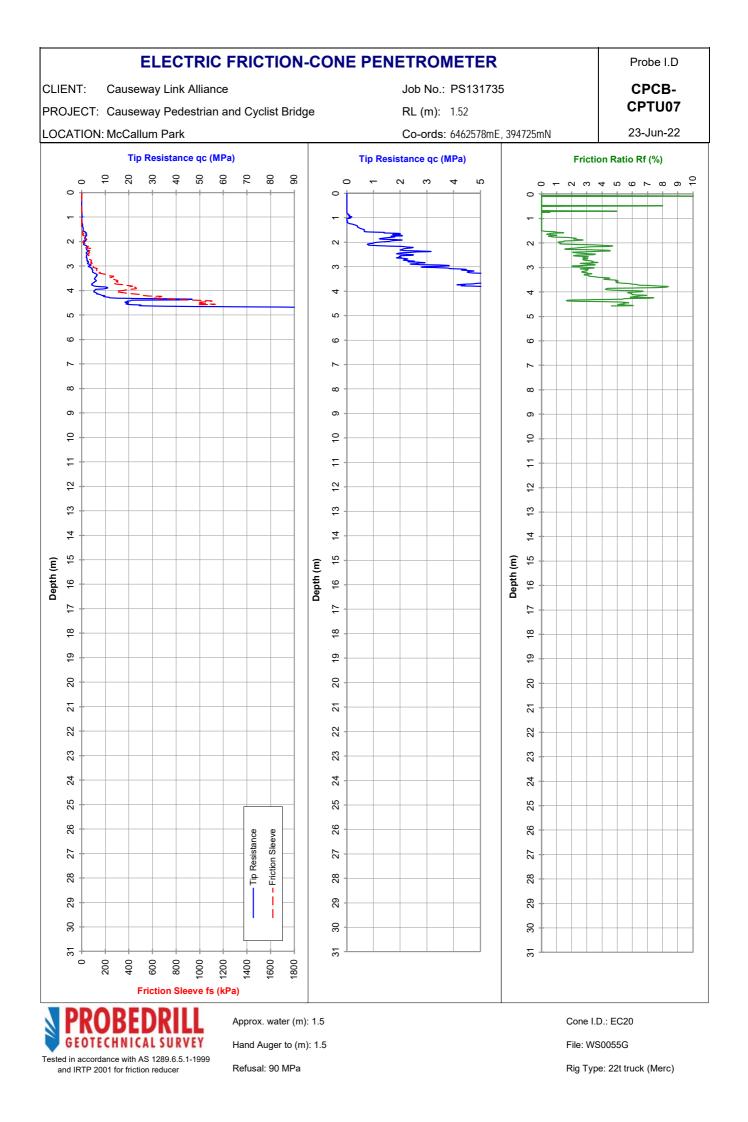
as such, should be used as a guide only.

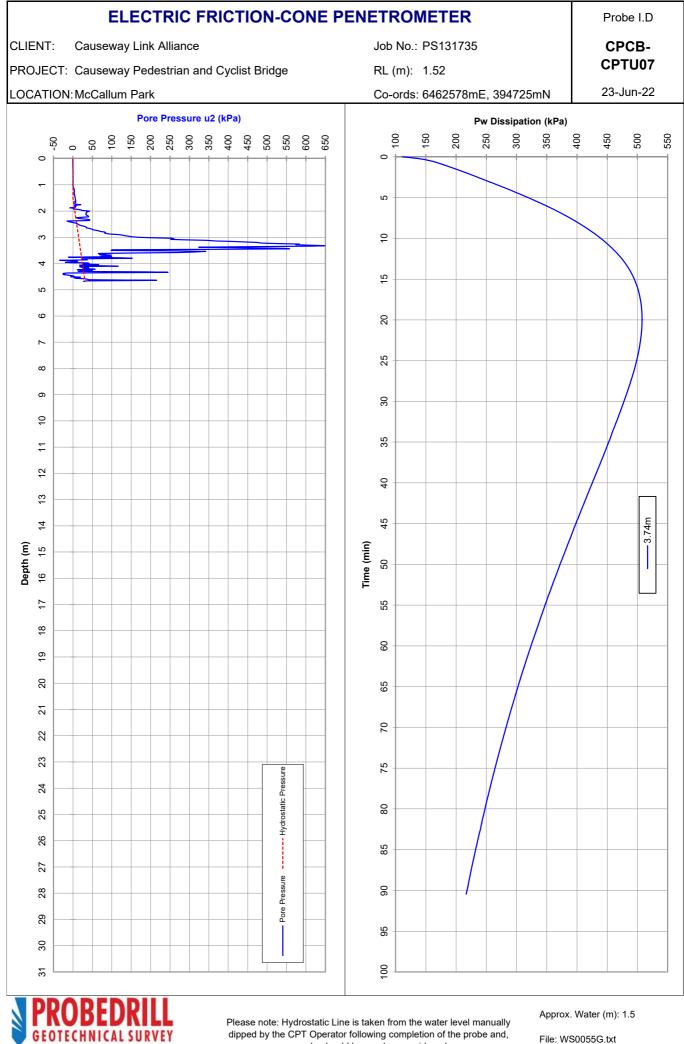




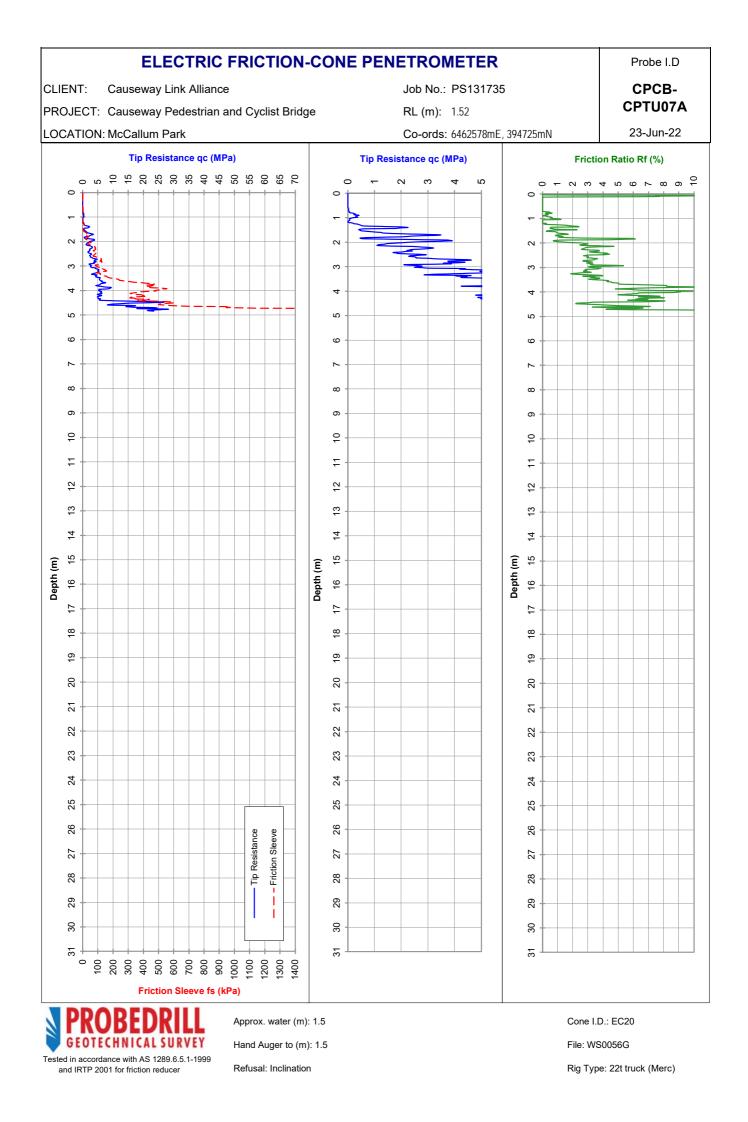
as such, should be used as a guide only.

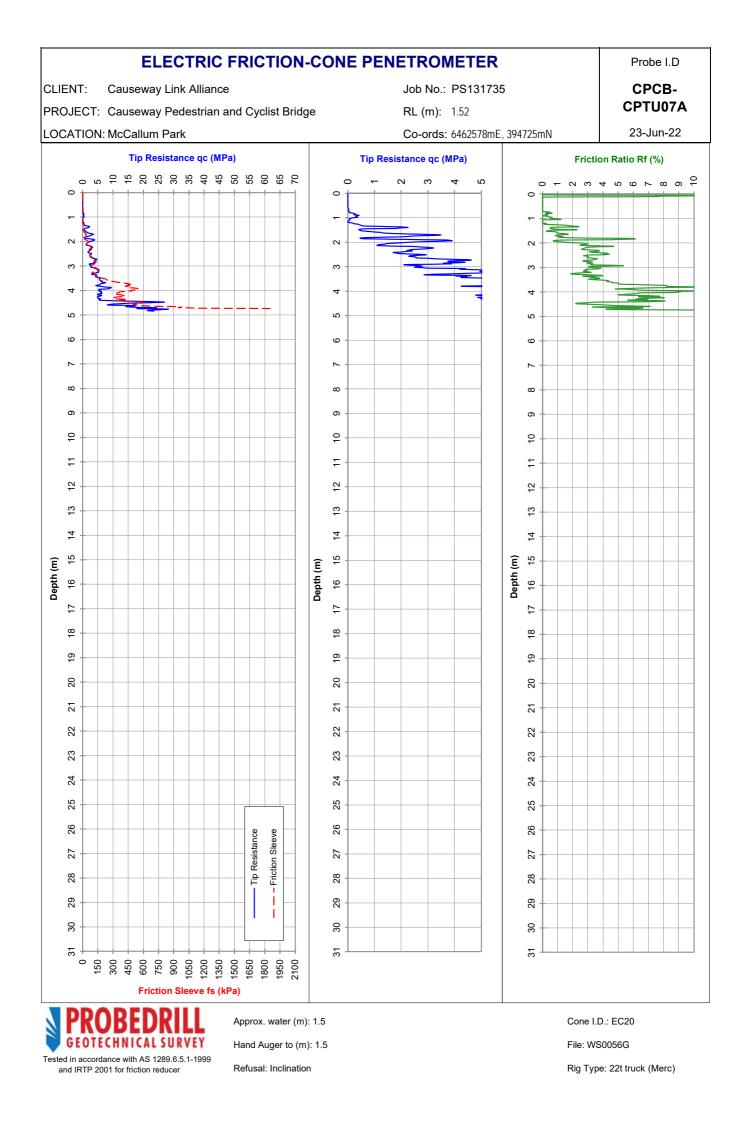


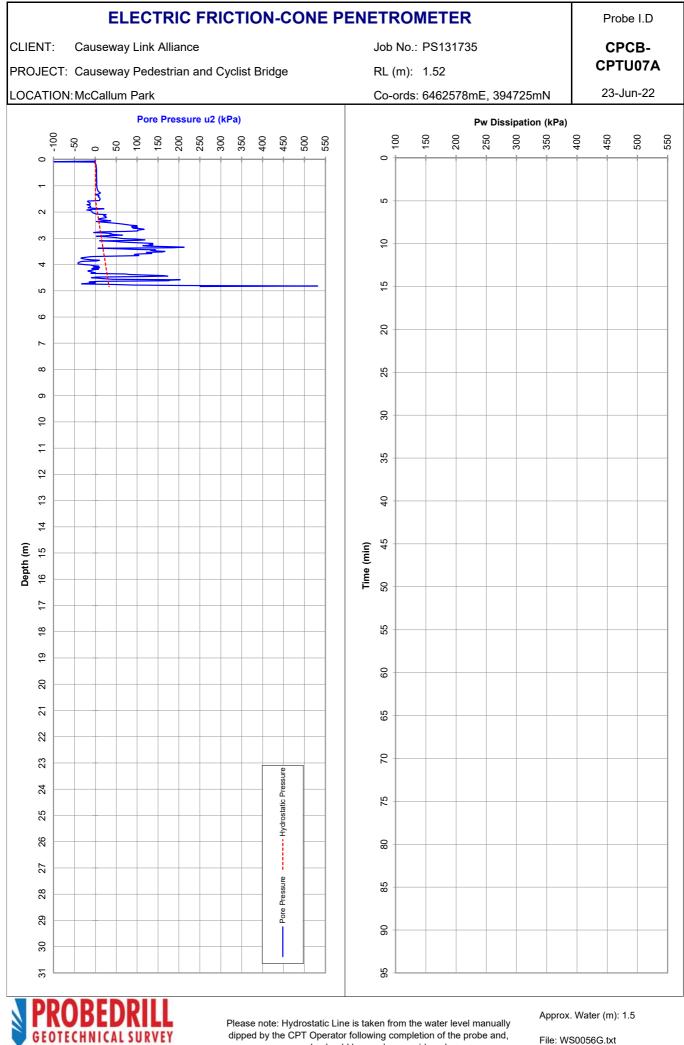




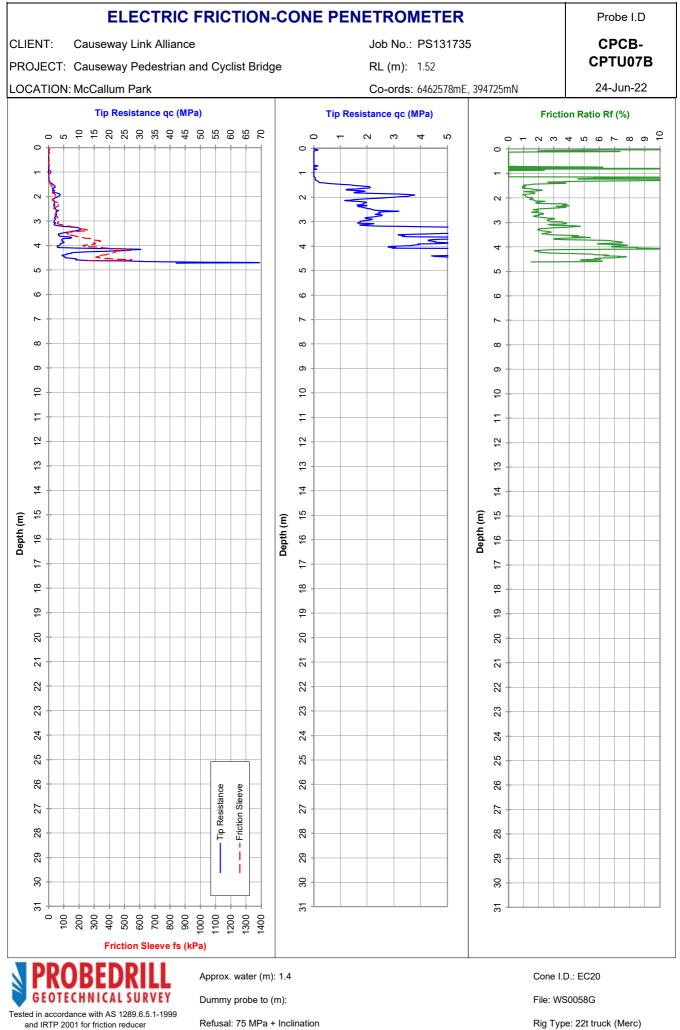
as such, should be used as a guide only.



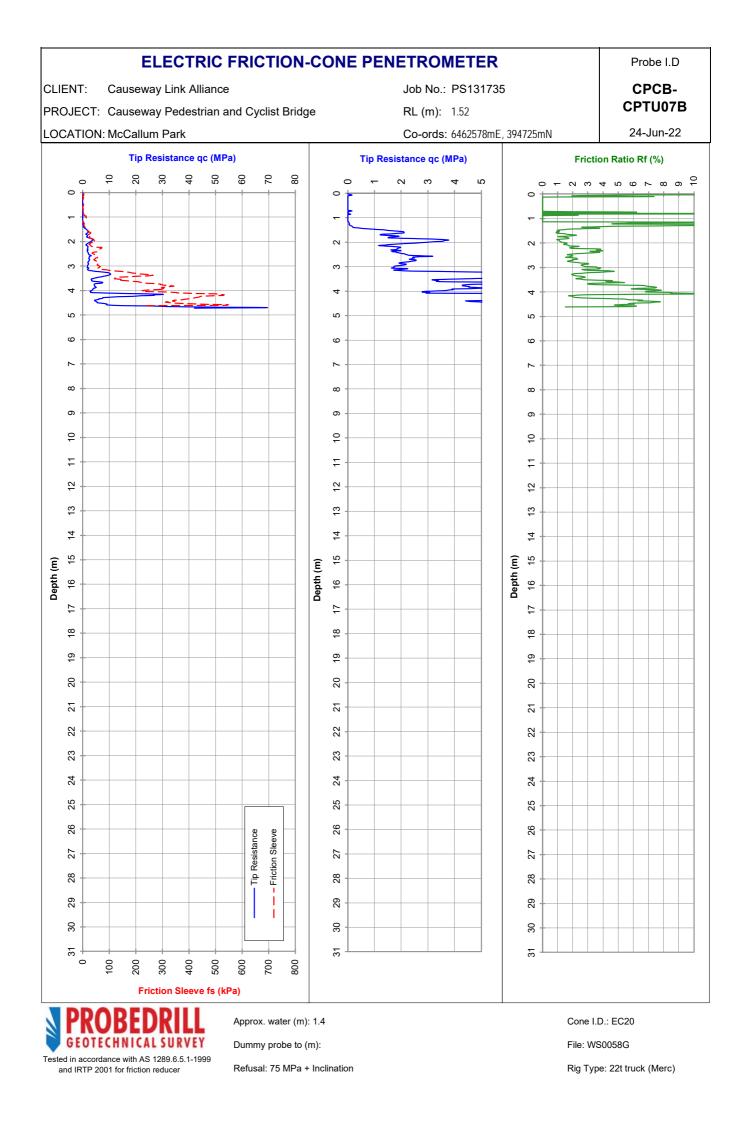


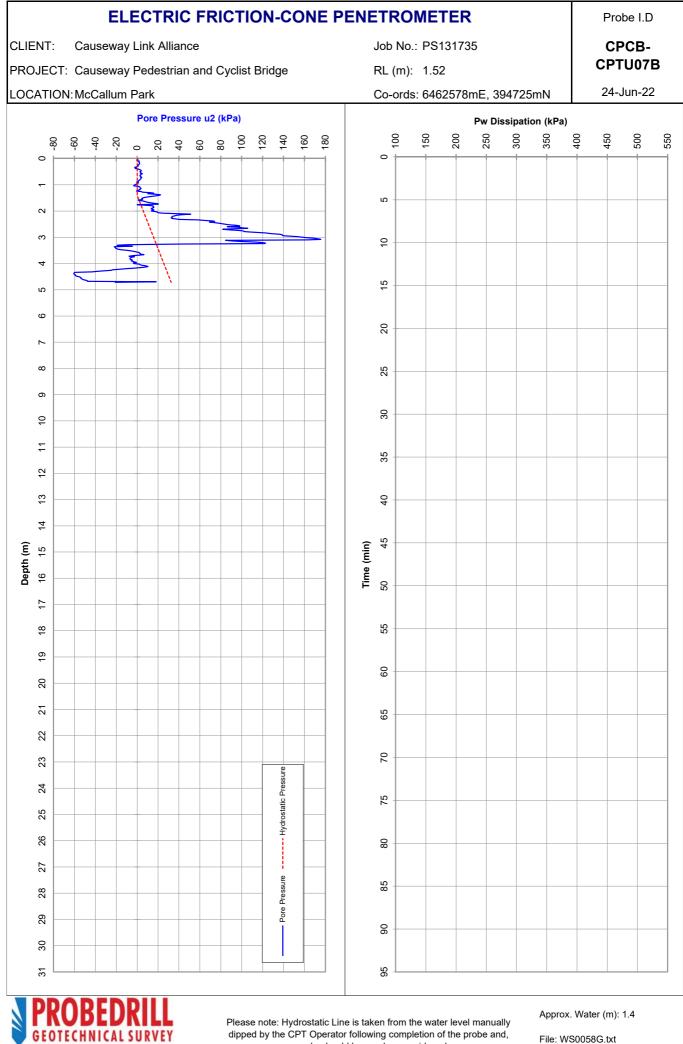


as such, should be used as a guide only.

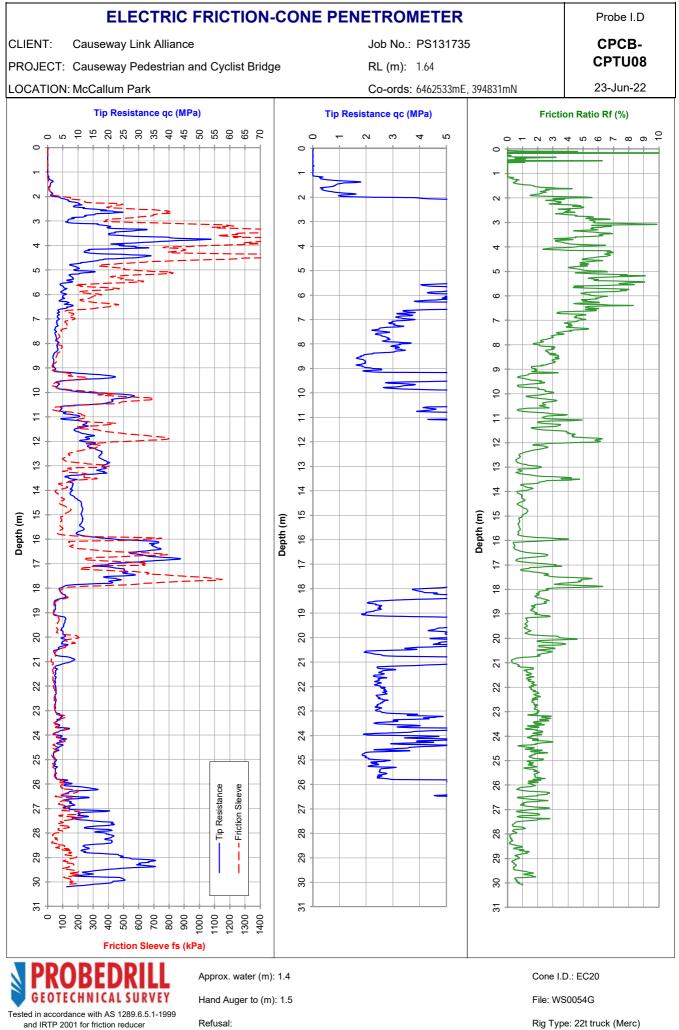


Refusal: 75 MPa + Inclination

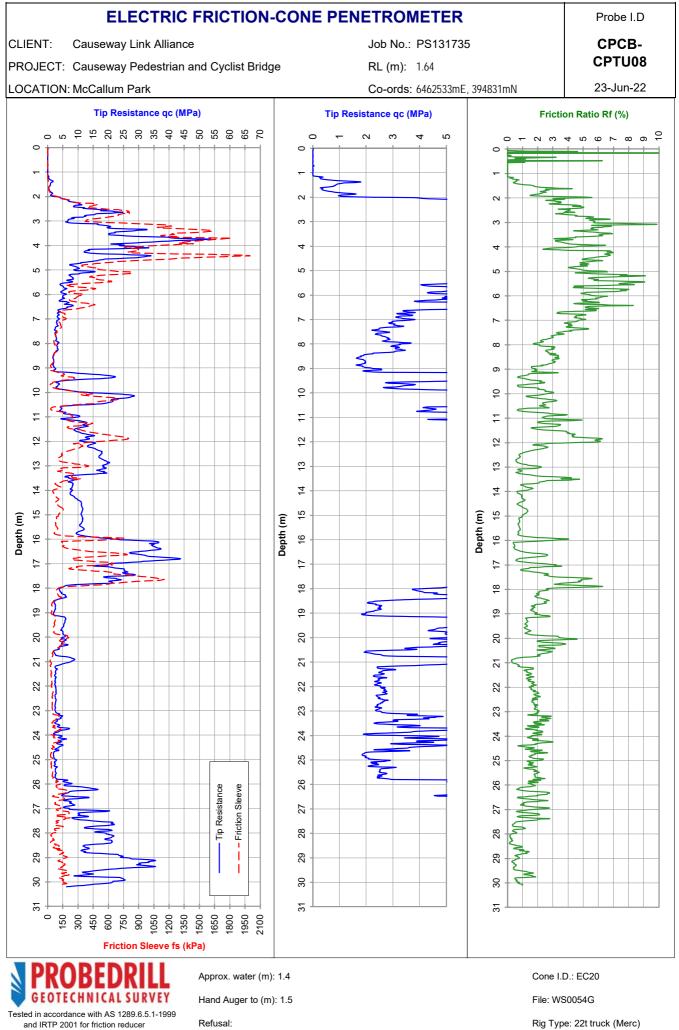




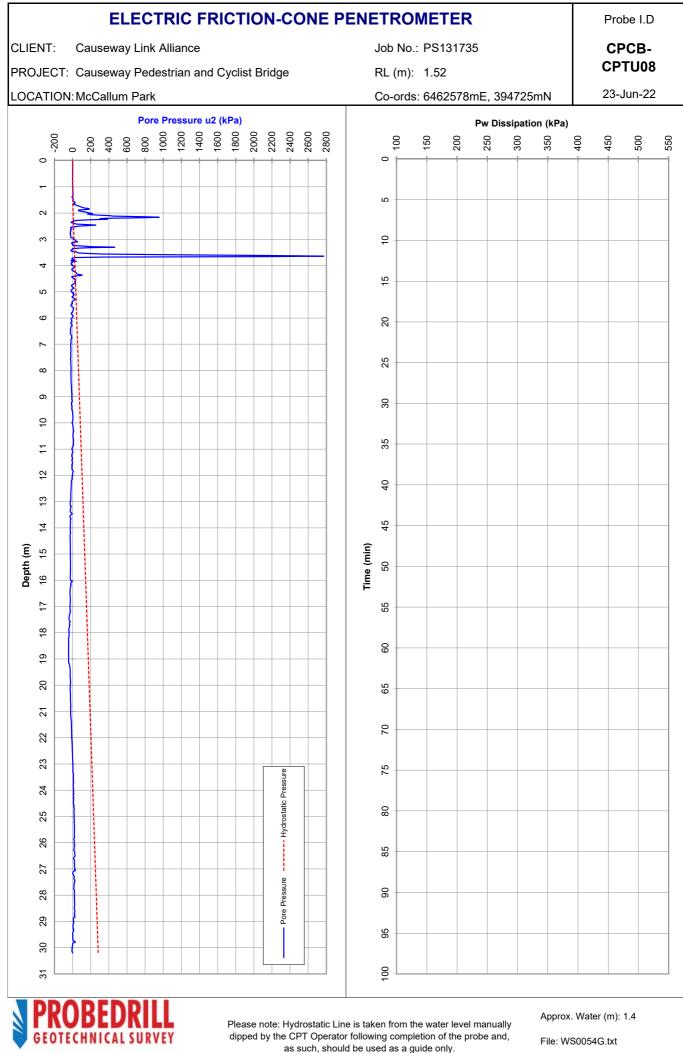
as such, should be used as a guide only.



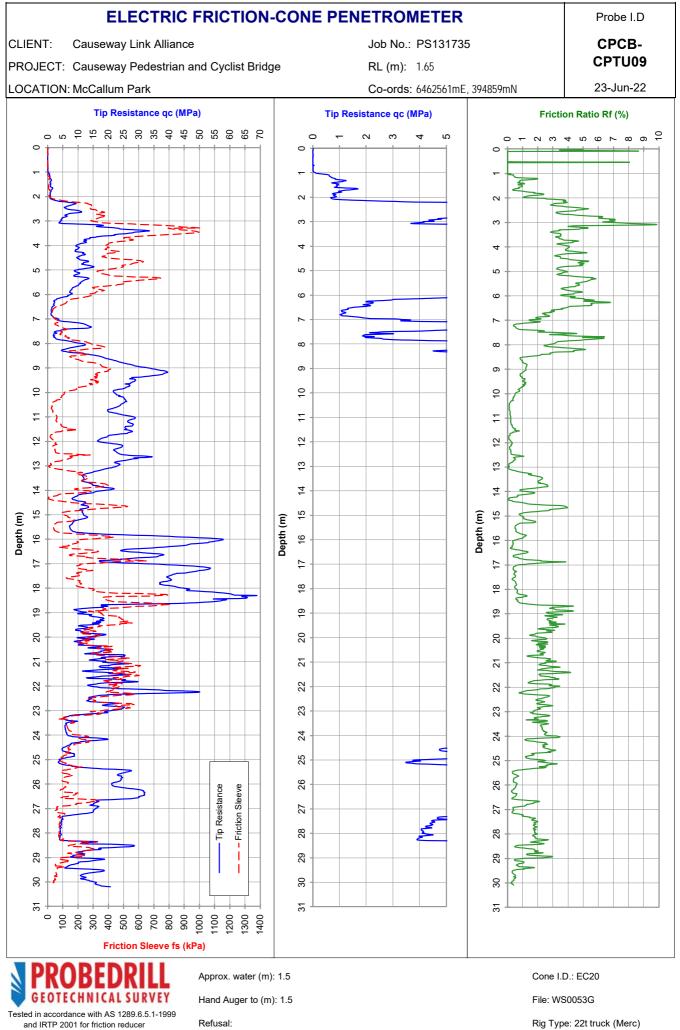
Refusal:



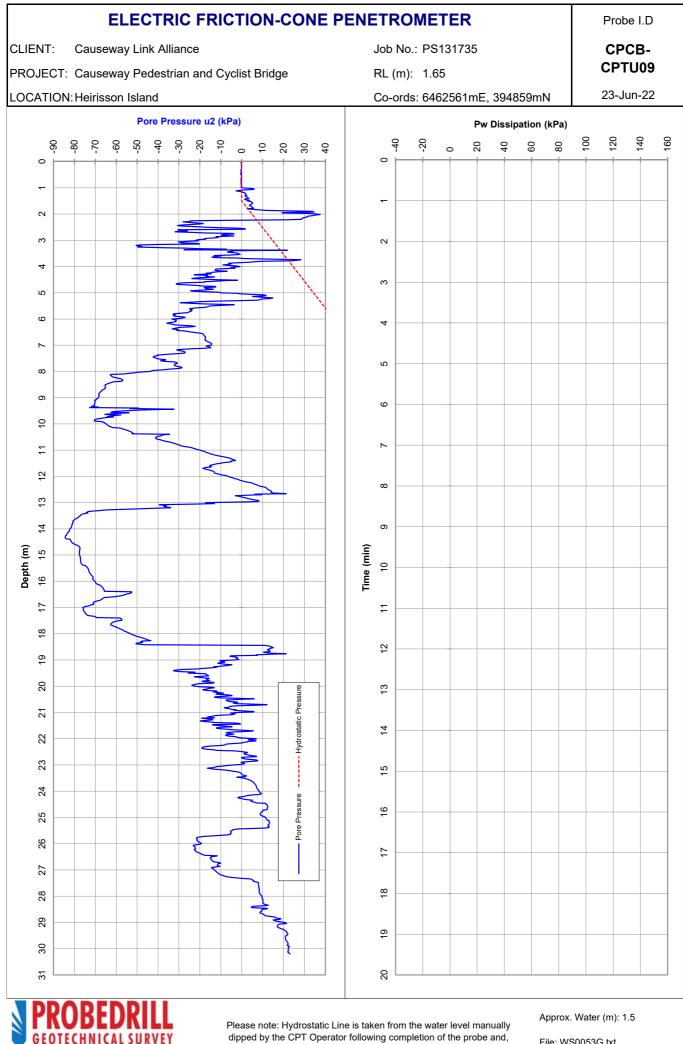
Refusal:



as such, should be used as a guide only.

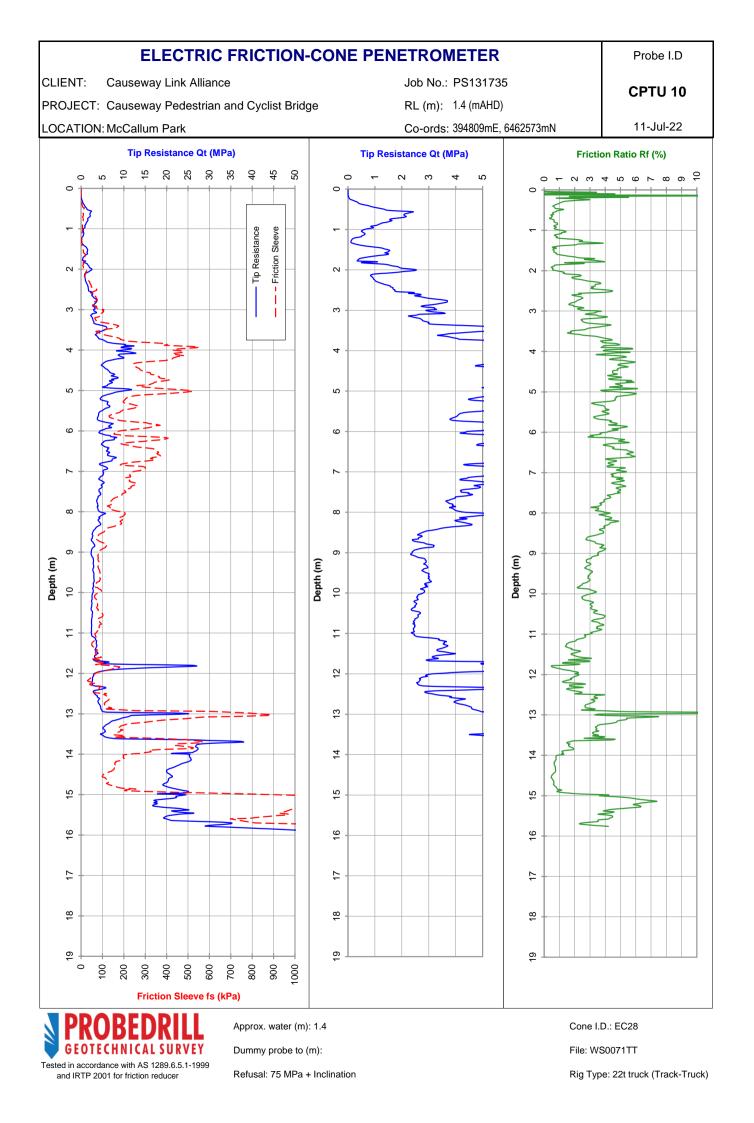


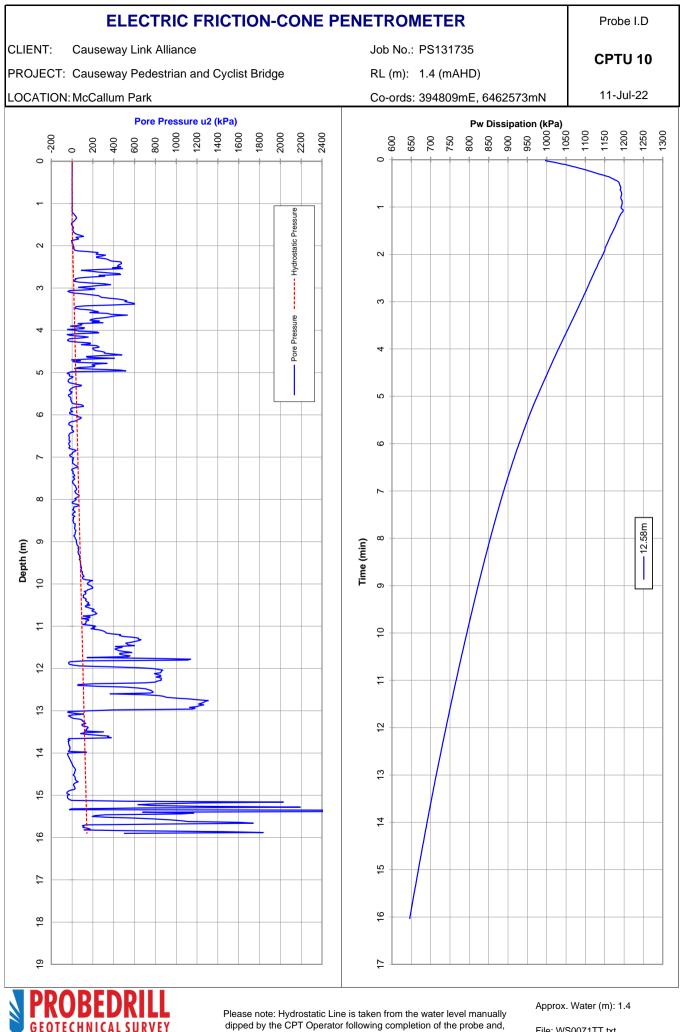
Refusal:



as such, should be used as a guide only.

File: WS0053G.txt





as such, should be used as a guide only.

File: WS0071TT.txt

Rig type: 22t truck (Track-Truck)

APPENDIX D: HAND AUGER LOGS

****SD GOLDER

METHOD OF SOIL DESCRIPTION USED ON BOREHOLE AND TEST PIT REPORTS

FILL
GRAVEL (GW, GP, GM or GC) GRAVEL (GW, GP, GM or GC) ORGANIC SOILS (OL, OH or Pt) SAND (SW, SP, SM or SC) Grave and the set of the se
SILT (ML or MH) Combinations of these basic symbols may be used to indicate mixed materials such as sandy clay. CLASSIFICATION AND INFERRED STRATIGRAPHY Soil and Rock is classified and described in Reports of Boreholes and Test Pits using the preferred method given in AS1726-20 The material properties are assessed in the field by visual/tactile methods. Particle Size Plasticity Properties BOULDERS > 200 mm COBBLES 63 to 200 mm Coarse 19 to 63 mm
X X Combinations of these basic symbols may be used to indicate mixed materials such as sandy clay. CLASSIFICATION AND INFERRED STRATIGRAPHY Soil and Rock is classified and described in Reports of Boreholes and Test Pits using the preferred method given in AS1726-20 The material properties are assessed in the field by visual/tactile methods. Particle Size Plasticity Properties Soil Group Sub Division Particle Size Plasticity Properties BOULDERS > 200 mm COBBLES 63 to 200 mm Coarse 19 to 63 mm
CLASSIFICATION AND INFERRED STRATIGRAPHY Soil and Rock is classified and described in Reports of Boreholes and Test Pits using the preferred method given in AS1726-20 The material properties are assessed in the field by visual/tactile methods. Plasticity Properties Soil Group Sub Division Particle Size BOULDERS > 200 mm COBBLES 63 to 200 mm 50 Coarse 19 to 63 mm 50
Soil and Rock is classified and described in Reports of Boreholes and Test Pits using the preferred method given in AS1726-20 The material properties are assessed in the field by visual/tactile methods. Plasticity Properties Soil Group Sub Division Plasticity Properties BOULDERS > 200 mm Soil Group Soil Group COBBLES 63 to 200 mm Soil Group BOULDERS > 200 mm Soil Group BOULDERS > 200 mm Soil Group BOULDERS Soil 0 0 0 mm Soil 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
The material properties are assessed in the field by visual/tactile methods. Particle Size Soil Group Sub Division Particle Size BOULDERS > 200 mm 50 COBBLES 63 to 200 mm 50 Coarse 19 to 63 mm 50
Particle Size Soil Group Sub Division Particle Size BOULDERS > 200 mm COBBLES 63 to 200 mm Coarse 19 to 63 mm
Soil Group Sub Division Particle Size BOULDERS > 200 mm COBBLES 63 to 200 mm Coarse 19 to 63 mm
BOULDERS > 200 mm COBBLES 63 to 200 mm Coarse 19 to 63 mm
BOOLDERS > 200 mm COBBLES 63 to 200 mm Coarse 19 to 63 mm
Coarse 19 to 63 mm
GRAVEL Medium 6.7 to 19 mm
GRAVEL Medium 6.7 to 19 mm Fine 2.36 to 6.7 mm Coarse 0.6 to 2.36 mm Medium 0.21 to 0.6 mm
Coarse 0.6 to 2.36 mm
Fine 0.075 to 0.21 mm
SILT 0.002 to 0.075 mm
CLAY < 0.002 mm
MOISTURE CONDITION
Symbol Term Description D Dry Sands and gravels are free flowing. Clays and silts may be brittle or friable and powdery. M Moist Soils are darker than in dry condition and may feel cool. Sands and gravels tend to cohere. W Wet Soils exude free water. Sand and gravels tend to cohere. Moisture condition for fine grained soils is described relative to the plastic limit or liquid limit as specified in AS1726-2017. CONSISTENCY AND DENSITY
Fine Grained Soils Coarse Grained Soils
Symbol Term Undrained Shear Strength Symbol Term Density Index (%) SPN "N" *
VS Very Soft 0 to 12 kPa VL Very Loose Less than 15 0 to 4
S Soft 12 to 25 kPa L Loose 15 to 35 4 to 10
F Firm 25 to 50 kPa MD Medium Dense 35 to 65 10 to 30
St St iff 50 to 100 kPa D Dense 65 to 85 30 to 50
VSt Very Stiff 100 to 200 kPa VD Very Dense Above 85 Above 50
H Hard Above 200 kPa Fr Friable -
In the absence of test results, consistency and density may be assessed from correlations with the observed behaviour of the
material.
* SPT correlations are not stated in AS1726-2017, and may be subject to corrections for overburden pressure and equipment ty
CEMENTATION
Weakly Cemented The soil may be easily disaggregated by hand in air or water.
Moderately Cemented Effort is required to disaggregate the soil by hand in air or water.

NS GOLDER

EXPLANATION OF NOTES, ABBREVIATIONS & TERMS USED ON BOREHOLE AND TEST PIT REPORTS

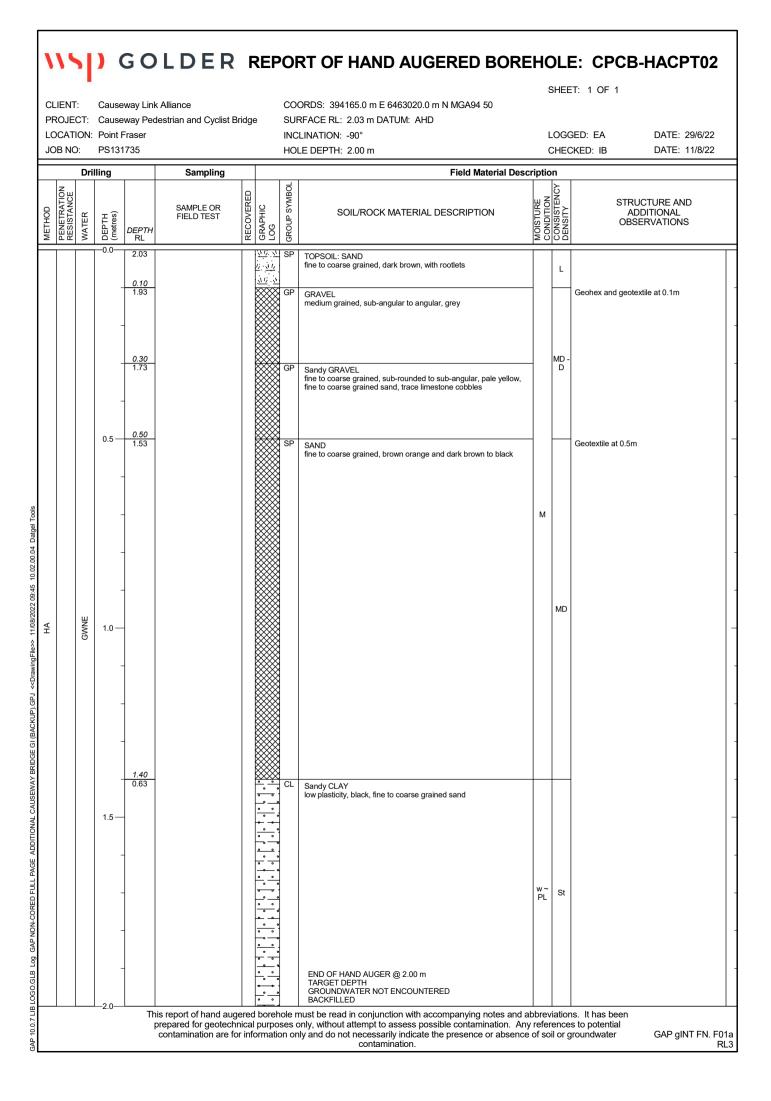
DRILLING/F	XCAVATION ME	THOD						
ADH	Hollow auger dr		Excavator		PQ3	Diamor	nd core - 83 mm	
ADT	Auger drilling wi		Hand auger		PT		ube sampling	
ADV	Auger drilling wi		Excavated by	hand method			air blast	
AIRCORE	Aircore	HMLC	Diamond core		RC		e circulation	
AT	Air track	HQ3	Diamond core		RD	Rotary		
BH	Backhoe bucket		Jetting		RT	Rock ro	•	
CT	Cable tool rig	MZ	Mazier tube s	ampling	SONI			
DTC	Diatube coring	NDD	Non-destructiv		SPT		rd penetration tes	tina
EE	Existing excavat		Diamond core		U		urbed tube samplir	
EPT	Extruded push t		Diamond core		WB		ore drilling	ig
	ION/EXCAVATIO		Diamonu core	- 45 1111	VVD	VVaSHD	ore unling	
L		. Rapid penetration	possible with litt	le effort from	the equipmer	nt used.		
Μ		nce. Excavation/pos					e equipment used	
Н		e to penetration/exca						
	effort from the e	quipment.			-			
R		ctical Refusal. No fu	irther progress p	ossible witho	out the risk of	damage or ur	nacceptable wear	to
		ement or machine.						
		ctive and are depend		tors including	g the equipme	ent power, wei	ght, condition of	
	or drilling tools, and	d the experience of th	ne operator.					
WATER	5.6.F -	1 1 6 1 6 1		1 -				
₹		er level at date shown		-	Partial water I			
		er inflow			Complete wat		a abuillia a cost	
GROUNDW		e observation of grou			not, was not p	possible due te	o drilling water,	
		face seepage or cave				undwater es:	Id bo propost in I-	
GROUNDW/ ENCOUNTE		e borehole/test pit wa meable strata. Inflov						:55
ENCOUNTE		ger period.	v may have bee		au the porent	ne/test pit bee	an leit open ior a	
SAMPLING	AND TESTING	ger period.						
SPT	Standard Pe	enetration Test to AS	1289.6.3.1-2004					
4,7,11 N=18	4,7,11 = Blo	ws per 150mm. N = I	Blows per 300m	m penetratior	n following 15	0mm seating		
30/80 mm		tical refusal occurs, th						
RW		occurred under the re						
HW	Penetration	occurred under the h	ammer and rod	weight only				
HB		uble bouncing on any	/il	·				
DS	Disturbed sa							
BDS	Bulk disturb							
G	Gas Sample							
W	Water Samp							
FP		ability test over section						
FV		hear test expressed		shear strengtl	h (sv = peak \	/alue, sr = res	idual value)	
PID		tion Detector reading						
PM		ter test over section i		ot rooding in	kDo			
PP		tube complex pumps				llimotros		
U63 WPT	Water press	tube sample - numbe	er mulcates nom	mai sampie d	nameter in MI	mnetres		
DCP		ne penetration test						
CPT	Cone penet							
CPTu		ration test with pore p	pressure (iii) mea	surement				
		SERVABLE CONTA			or specific soil	contaminatio	n assessment	
projects)						containinatio		
R = 0	No visible evide	nce of contamination		R = A	No non-natu	Iral odours ide	entified	
R = 1		of visible contaminati		R = B		atural odours		
R = 2	Visible contamir			R = C		on-natural odd		
R = 3	Significant visibl			R = D		natural odours		
	E RECOVERY							
TCR = Tota	I Core Recovery	RQD = Rock Quali	ity Designation	SCR =	Solid Core R	lecovery	F = Fracture	
	(%)	(%)			(%)	-	Frequency	
_ Lengthof c	ore recovered ×100	\sum Axial lengths of c	ore > 100 mm	nm			_ No. of defects	S
Length	of core run	= <u>Lengthof co</u>	×100	×100 =			Euleright of zone	(m)
		2091.01		1			-	. ,

\\S) GOLDER

TERMS FOR ROCK MATERIAL STRENGTH & WEATHERING AND ABBREVIATIONS FOR DEFECT DESCRIPTIONS

STRENG	TH											
Symbol	Term	UCS (MPa)				eld Guide						
VL	Very Low	0.6 to 2				arp end of pick; can be peeled with knife; too har to 30 mm can be broken by finger pressure.						
L	Low	2 to 6	of pick poin	nt; has dul	l sound under hammer	m to 3 mm show in the specimen with firm blows A piece of core 150 mm long by 50 mm lges of core may be friable and break during						
Μ	Medium	6 to 20		adily scored with a knife; a piece of core 150 mm long by 50 mm diameter can be broken hand with difficulty.								
Н	High	20 to 60				meter cannot be broken by hand but can be k rings under hammer.						
VH	Very High	60 to 200		specimen breaks with pick after more than one blow; rock rings under hammer.								
EH	Extremely High	>200	Specimen rings unde	en requires many blows with geological pick to break through intact material; rock								
fabric or te	xture should	l be noted, if re		be describ	bed using soil characte	ristics. The presence of an original rock structure						
ROCK M/	ATERIAL W	EATHERING										
Syn	nbol	Term				eld Guide						
R	S	Residual Soil	material t	Material is weathered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are no longer visible, but the soil has not been significantly transported.								
Х	W	Extremely Weathered			ed to such an extent the fabric of original rock	at it has soil properties. Mass structure and are still visible.						
DW	HW	Highly Weathered	extent that changed may be in	The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognizable. Rock strength is significantly changed by weathering. Some primary minerals have weathered to clay minerals. Porosity may be increased by leaching, or may be decreased due to deposition of weathering products in pores.								
	MW	Moderately Weathered	The whole extent the	The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognizable, but shows little or no change of strength from fresh rock.								
S	W	Slightly Weathered	Rock is pa	artially disc		or bleaching along joints but shows little or no						
F	R	Fresh	Rock sho	ws no sign	of decomposition of ir	ndividual minerals or colour changes.						
		OR DEFECT T	YPES AND									
Defect Ty					or Infilling	Roughness						
P X L C J	Parting Foliation Cleavage Contact Joint			Cn Sn Ve Ct In	Clean Stain Veneer Coating Infill	VRo Very Rough Ro Rough Sm Smooth Po Polished SI Slickensided						
SSu SS SZ CS	Sheared S Sheared S Sheared Z Crushed S	Seam Cone		Planarity Pl Cv	r Planar Curved	Vertical Boreholes – The dip (inclination from horizontal) of the defect is given. Inclined Boreholes – The inclination is						
IS Infilled Seam EWS Extremely Weathered Seam V Vein					Undulating Stepped Irregular	measured as the acute angle between the core axis and the vertical direction.						

CLIF	ENT		Cause	wav Link	Alliance			co	ORDS: 304159.0 m E 6463041.0 m N MGA94 50	:	SHEE	T: 1 OF 1
					lestrian and Cyclist E	Bridge	е		RFACE RL: 2.15 m DATUM: AHD			
	CATI 8 NO		Point F PS131						CLINATION: -90° LE DEPTH: 2.00 m			GED: EA DATE: 29/6/22 CKED: IB DATE: 11/8/22
		Dril			Sampling		[Field Material Des			
Z	<u>z</u>		iiig		oumping			30L				
DENIETDATIC	RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
			-0.0	2.15			<u>717 7</u> 77 77	SP	TOPSOIL: SAND fine to coarse grained, dark brown, with rootlets		L	
			-	0.10 2.05				GP	GRAVEL medium grained, sub-angular to angular, grey			Geohex and geotextile at 0.1m
			-	<u>0.30</u> 1.85				GP	Sandy GRAVEL fine to coarse grained, sub-rounded to sub-angular, pale yellow, fine to coarse grained sand, trace limestone cobbles		MD - D	
			0.5—	<u>0.50</u> 1.65				SC	SAND fine to coarse grained, brown orange	_		Geotextile at 0.5m
			-					~~~~~~~~~~		м		
:		NNE	-								MD	
		GW	-					~~~~~~			MD	
			-									
				1.50								
			1.5—	0.65				CL	Sandy CLAY low plasticity, black, fine to coarse grained sand			
			-					- - - - - -		w~ PL	St	
								- - - -	END OF HAND AUGER @ 2.00 m TARGET DEPTH GROUNDWATER NOT ENCOUNTERED BACKFILLED			



wsp	GOLDER	REPORT OF HAND AUGERED BOREHOLE:	CPCB-HACPT03
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CLIENT: Causeway Link Alliance

LOCATION: Point Fraser

COORDS: 394214.0 m E 6462986.0 m N MGA94 50 PROJECT: Causeway Pedestrian and Cyclist Bridge SURFACE RL: 1.67 m DATUM: AHD INCLINATION: -90°

SHEET: 1 OF 1

LOGGED: EA

DATE: 29/6/22

JC	OB NO	J.	PS131	735				HO	LE DEPTH: 1.50 m		CHEC	CKED: IB DATE: 11/8/22
		<u> </u>	ling		Sampling	1			Field Material Desc			
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
			-0.0	1.67				SP	TOPSOIL: SAND fine to coarse grained, dark brown, with rootlets			
				0.25				SP	FILL: SAND fine to coarse grained, brown orange	M		
HA			-	<u>0.60</u> 1.07				SP	SAND fine to coarse grained, dark brown to black, with fines		-	
HA			- 1.0—									
			-							W-W		
			-									
			-1.5	0.17					END OF HAND AUGER @ 1.50 m TARGET DEPTH GROUNDWATER ENCOUNTERED @ 1.50 m DEPTH BACKFILLED			
			-									
			2.0—									
					prepared for geotech	nical	l purpo	ses o	nust be read in conjunction with accompanying notes and a only, without attempt to assess possible contamination. An nly and do not necessarily indicate the presence or absence contamination.	y refe	rence	s to potential

١	1.	1) (GO	LDER	F	REF	0	RT OF HAND AUGERED BOR	EH	OL	E: CPCB-HACPT04	
		1									SHE	ET: 1 OF 1	
	LIENT ROJE			-	k Alliance destrian and Cyclist Br	rida	e		ORDS: 394275.0 m E 6462871.0 m N MGA94 50 RFACE RL: 1.74 m DATUM: AHD				
				on Islar	-				CLINATION: -90°		LOG	GED: EA DATE: 24/6/22	
JC	OB NO	D:	PS131	735				HO	LE DEPTH: 1.20 m		CHE	CKED: IB DATE: 11/8/22	
		<u> </u>	lling		Sampling	_			Field Material De			I	
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE		STRUCTURE AND ADDITIONAL OBSERVATIONS	
F		-	-0.0	1.74			121.1	SP	TOPSOIL: SAND				$\overline{\top}$
							<u>11. 11.</u> 11. 11.		fine to coarse grained, brown				
			-				<u>i</u> z . <u>v 1</u> /. <u>v 1/</u> . <u>v</u>						
				0.20			<u>11</u> 12 11						
			-	1.54				SP	FILL: Gravelly SAND fine to coarse grained, grey				
			_										
			-										
			0.5 —	0.50 1.24				SC	FILL: Clayey SAND	_			-
		ш							fine to coarse grained, brown				
Η		GWNE	-										
,													
			-										
			-										
			_										
			1.0 —										-
p			-										
	+			0.54					END OF HAND AUGER @ 1.20 m		-		+
									TARGET DEPTH GROUNDWATER NOT ENCOUNTERED BACKFILLED				
5			-										
			_										
5			1.5 —										_
			-										
			-										
			-										
0													
			-										
			2.0										
			2.0 —	Tł	nis report of hand auge prepared for deotechr	erec	d boreh	nole i ses	, must be read in conjunction with accompanying notes and only, without attempt to assess possible contamination.	abbre	viatio	ns. It has been es to potential	
					contamination are for	r inf	formati	on or	ly and do not necessarily indicate the presence or absen contamination.	ce of s	oil or g	groundwater GAP gINT FN. F	01a RL3
L												-	

PR LC		CT: ION:	Cause	on Island	estrian and Cyclist I	Bridge	9	SUI INC	ORDS: 394554.0 m E 6462744.0 m N MGA94 50 RFACE RL: 1.03 m DATUM: AHD LINATION: -90° LE DEPTH: 1.50 m		.ogged: Checked:		DATE: 24/6/22 DATE: 11/8/22
		Dri	ling		Sampling				Field Material D	escriptio	n		
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	ADDI	URE AND TIONAL VATIONS
			—0.0—	1.03			<u>111 1</u> 11 11 11 11 11 11	SP	TOPSOIL: SAND fine to coarse grained, brown, with rootlets				
				<u>0.20</u> 0.83				SP	FILL: SAND fine to coarse grained, grey, with shell fragments				
НА		$ \land $	-										
			1.0 — - - -										
			1.5 - -	-0.47					END OF HAND AUGER @ 1.50 m TARGET DEPTH GROUNDWATER ENCOUNTERED @ 0.80 m DEPTH BACKFILLED				

	1.	1) (GO	LDER	F	REF	POI	RT OF HAND AUGERED BOP	REHO	DLE: (CPCB-HAC	CPT06
F		CT: ION:	Cause	way Peo lum Parl	< Alliance destrian and Cyclist E	ridg	e	SUI INC	ORDS: 394725.0 m E 6462576.0 m N MGA94 50 RFACE RL: 1.40 m DATUM: AHD LINATION: -90° LE DEPTH: 1.50 m	I	Sheet: 1 Logged: E Checked:	EA DAT	E: 23/6/22 E: 11/8/22
		Dri	lling		Sampling				Field Material D	escriptic	n		
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE	CONSISTENCY DENSITY	STRUCTURE ADDITIONA OBSERVATIO	AL.
		Wate		RL 1.40 0.20 1.20 - - - - - - - - - - - - -	is report of hand aug	erec		SP	TOPSOIL: SAND fine to coarse grained, brown, with rootlets FIL1: SAND fine to coarse grained, pale brown mottled grey, with shell fragments END OF HAND AUGER @ 1.50 m TARGET DEPTH GROUNDWATER ENCOUNTERED @ 1.10 m DEPTH BACKFILLED		iations. It h	as been	
				l	contamination are fo	nica or inf	ormati	on or	only, without attempt to assess possible contamination. Ily and do not necessarily indicate the presence or abse contamination.	nce of so	il or ground	water GAP	gINT FN. F01a RL3

GAP 10.0.7 LIB LOGOGLB Log GAP NON-CORED FULL PAGE ADDITIONAL CAUSEMAY BRIDGE GI (BACKUP).GPJ << - ChawingFiles> 11.08/2022 0945 10.02.00.04 blagel fools

1	14	1) (GO	LDER	F	REF	20	RT OF HAND AUGERED BOR	EHC	DLI	E: CPCB-HACPT11
											SHEE	ET: 1 OF 1
	IENT			-	Alliance				ORDS: 394740.0 m E 6462566.0 m N MGA94 50			
				way Pec um Park	lestrian and Cyclist Bi	riag	e		RFACE RL: 1.60 m DATUM: AHD CLINATION: -90°		LOGO	GED: EA DATE: 5/7/22
	B NC		PS131						LE DEPTH: 1.20 m			CKED: IB DATE: 11/8/22
		Dril	ling		Sampling				Field Material Des			
	ION CE					Ð		ABOL			CONSISTENCY DENSITY	
₽	TRAT STAN	R	H. (se		SAMPLE OR FIELD TEST	RECOVERED	HIC	P SYN	SOIL/ROCK MATERIAL DESCRIPTION		SISTE	ADDITIONAL
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL		RECO	GRAPHIC LOG	GROUP SYMBOL			DENS	OBSERVATIONS
			-0.0	1.60			1.1.1.1	SP	TOPSOIL: SAND			
				0.10			<u>17. 17.</u> 17. 17. 17		fine to coarse grained, dark brown, with rootlets			
			-	<u>0.10</u> 1.50				SP	FILL: SAND fine to coarse grained, brown orange			
									line to coarse grained, brown orange			
			_							M		
			_	0.40 1.20				SP			4	
				1.20				5P	SAND fine to coarse grained, pale brown grey, with shell fragments			
			0.5 —									-
Η			-									
			-									
0										м-		
			-							W W		
			_									
			1.0 —									_
		\triangleright										
o			-									
-				0.40			····	-	END OF HAND AUGER @ 1.20 m	_	-	
									TARGET DEPTH GROUNDWATER ENCOUNTERED @ 1.05 m DEPTH			
			-						BACKFILLED			
			-									
			1.5 —									
			_									
			_									
			-									.
Ĭ			-									.
╞──			2.0 —	Th	is report of hand aug	erec	d borel	l 10le I	 nust be read in conjunction with accompanying notes and	abbrev	 /iatior	ns. It has been
				1	prepared for geotechr	nica	l purpo	ses	only, without attempt to assess possible contamination. An any and do not necessarily indicate the presence or absence absence of a statement of the presence of the presence of a statement of the presence of the pre	າy refe	rence	s to potential groundwater GAP gINT FN. F01a
									contamination.			RL3

GAP 10.0.7 LIB LOGO.GLB Log GAP NON-CORED FULL PAGE ADDITIONAL CAUSEWAY BRIDGE GI (BACKUP).GPJ <<

 -ChrawingFile>> 11/08/2022 09:45 10:02:00.04 Bagel Tools

 -GammingFile>> 11/08/2022 09:45 10:02:00.04 Bagel Tools

١	GOLDER REPORT OF HAND AUGERED BOREHOLE: CPCB-HACPT12											
			0					~~		ŝ	SHEE	T: 1 OF 1
	LIENT			-	< Alliance lestrian and Cyclist Bi	ridg	e		ORDS: 394739.0 m E 6462576.0 m N MGA94 50 RFACE RL: 1.49 m DATUM: AHD			
	DCAT		McCal PS131	lum Parl	¢.				CLINATION: -90° LE DEPTH: 1.00 m			GED: EA DATE: 5/7/22 CKED: IB DATE: 11/8/22
			lling	733	Sampling			по	Field Material Desc			RED. ID DATE. 11/0/22
	NOM		inig		Jamping			BOL				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
			-0.0	1.49			<u></u>	1	TOPSOIL: SAND fine to coarse grained, dark brown, with rootlets			
			-	0.10 1.39			<u></u>	SP	FILL: SAND	-		
									fine to coarse grained, brown orange			
			-									-
			-	-								
			-	0.40 1.09				SP	SAND fine to coarse grained, pale brown grey, with shell fragments	м		
ΑH			0.5 —						nne to coarse graineu, pale brown grey, with shell ragments			_
			0.0									
			-									
,												
5			-									
			-	0.80 0.69			· · · ·					
				0.09				SC	Clayey SAND fine to coarse grained, brown grey, low to medium plasticity clay, trace shell fragments			
			-				Ē			M - W		
5		_	10									
			—1.0—	0.49					END OF HAND AUGER @ 1.00 m TARGET DEPTH			
D			-						GROUNDWATER ENCOUNTERED @ 1.00 m DEPTH BACKFILLED			
			-									
			_									
			-									
			1.5 —									-
			-	-								
			-									
			-									
0			-									
	1		2.0 —	L Th	prepared for geotechr	nica	l purpo	oses	 nust be read in conjunction with accompanying notes and a only, without attempt to assess possible contamination. Any	refei	rence	s to potential
					contamination are fo	r inf	ormati	on oi	nly and do not necessarily indicate the presence or absence contamination.	of so	oil or g	roundwater GAP gINT FN. F01a RL3

GAP 10.0.7 LIB LOGO.GLB Log GAP NON-CORED FULL PAGE ADDITIONAL CAUSEWAY BRIDGE GI (BACKUP).GPJ << a href="color:c

wsp	GOLDERREPORT OF HAND AUGERED BOREHOLE:	CPCB-HACPTU07

SHEET: 1 OF 1

CLIENT:Causeway Link AlliancePROJECT:Causeway Pedestrian and Cyclist BridgeLOCATION:McCallum ParkJOB NO:PS131735

COORDS: 394817.0 m E 6462568.0 m N MGA94 50 ge SURFACE RL: 1.52 m DATUM: AHD INCLINATION: -90° HOLE DEPTH: 1.50 m -

LOGGED: EA

CHECKED: IB

DATE: 23/6/22 DATE: 11/8/22

	Drilling			Sampling		Field Material Description						
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
			0.5 	0.20 1.32				SP	TOPSOL: SAND fine to coarse grained, brown, with rootlets FILL: SAND fine to coarse grained, dark brown to black, with pieces of brick, metal, ceramics and glass	M		
		Δ	- - 1.5	<u>1.30</u> 0.22				SP	SAND fine to coarse grained, grey	w	-	
				0.02	prepared for geotechni	ical ı	purpo	ses o	END OF HAND AUGER @ 1.50 m TARGET DEPTH GROUNDWATER ENCOUNTERED @ 1.50 m DEPTH BACKFILLED	/ refe	rence	s to potential
ò					contamination are for	info	rmatio	on or	ly and do not necessarily indicate the presence or absence contamination.	of so	ol or g	roundwater GAP gINT FN. F01a RL3

IS GOLDE	REPORT OF HAND AUGERED BOREHOLE: CPCB-HACPTU08
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SHEET: 1 OF 1

CLIENT: JOB NO:

Causeway Link Alliance PROJECT: Causeway Pedestrian and Cyclist Bridge LOCATION: McCallum Park PS131735

COORDS: 394831.0 m E 6462566.0 m N MGA94 50 SURFACE RL: 1.64 m DATUM: AHD INCLINATION: -90° HOLE DEPTH: 1.50 m

LOGGED: EA

CHECKED: IB

DATE: 23/6/22 DATE: 11/8/22

Drilling Sampling **Field Material Description** MOISTURE CONDITION CONSISTENCY DENSITY PENETRATION RESISTANCE **GROUP SYMBOL** RECOVERED STRUCTURE AND SAMPLE OR FIELD TEST GRAPHIC LOG METHOD SOIL/ROCK MATERIAL DESCRIPTION ADDITIONAL OBSERVATIONS WATER DEPTH (metres) DEPTH RL -0.0 1.64 11. 11 SP TOPSOIL: SAND 1. 11 fine to coarse grained, brown, with rootlets <u> 11/1 (11</u> 1. <u>NI</u>. 0.20 . \\/, FILL: SAND fine to coarse grained, dark brown to black, with pieces of brick, metal, ceramics and glass 0.5 М GAP 10.0.7 LIB LOGO.GLB Log GAP NON-CORED FULL PAGE ADDITIONAL CAUSEWAY BRIDGE GI (BACKUP).GPJ <</br> ٩A 1.0 <u>1.30</u> 0.34 SF SAND fine to coarse grained, black w -1.5 Þ 0.14 END OF HAND AUGER @ 1.50 m TARGET DEPTH GROUNDWATER ENCOUNTERED @ 1.50 m DEPTH BACKFILLED 2.0 This report of hand augered borehole must be read in conjunction with accompanying notes and abbreviations. It has been prepared for geotechnical purposes only, without attempt to assess possible contamination. Any references to potential contamination are for information only and do not necessarily indicate the presence or absence of soil or groundwater GAP gINT FN. F01a contamination. RL3

115)	GOLDERREPORT OF HAND AUGERED BOREHOLE:	CPCB-HACPTU09

CLIENT: Causeway Link Alliance

PROJECT: Causeway Pedestrian and Cyclist Bridge

LOCATION: McCallum Park

JOB NO: PS131735 COORDS: 394859.0 m E 6462561.0 m N MGA94 50 SURFACE RL: 1.65 m DATUM: AHD INCLINATION: -90° HOLE DEPTH: 1.50 m

SHEET: 1 OF 1

LOGGED: EA CHECKED: IB DATE: 23/6/22 DATE: 11/8/22

ŀ			Dril	lling		Sampling				Field Material Desc	riptio	on		-
-	METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS	
GE GI (BACKUP), GPJ ≪ChrawingFile>> 11/08/2022 09:45 10:02.00:04 Datgel Tools	HA				<u>0.20</u> 1.65				SP	TOPSOL: SAND fine to coarse grained, brown, with rootlets FILL: SAND fine to coarse grained, dark brown to black, with pieces of brick, metal, ceramics and glass	M			-
. CAUSEWAY BRIDGE				-						fine to coarse grained, grey	w			
GAP 10.0.7 LIB LOGO.GLB Log GAP NON-CORED FULL PAGE ADDITIONAL CAUSEWAY BRID					0.15					END OF HAND AUGER @ 1.50 m TARGET DEPTH GROUNDWATER ENCOUNTERED @ 1.50 m DEPTH BACKFILLED				_
GAP 10.0.7						prepared for geotechr	nica	l purpo	ses o	nust be read in conjunction with accompanying notes and a only, without attempt to assess possible contamination. Any ly and do not necessarily indicate the presence or absence contamination.	refe	rence	s to potential	a 3

APPENDIX E: INFILTRATION TESTING

APPENDIX F: LABORATORY TEST REPORTS

Rocks testing - I	Determination	of point load	strength index													
Including tests on	; Axial (A) , Diam	etral (D) or irre	gular Lump (L) specime	ns			TEST	r Repo	ORT - S	UMMA	ARY OF	ANAL	YSIS	112	JGC	LDER
AS 4133.4.1-2007																
Test request ID:	TRP22-009	5 Lab sam	nple IDs: 2208011	4 - 2208	30114		Lab rep	ort ref.:		LF	PER_2208	33597			Golder As	sociates Pty Ltd
Client:	Causeway Link A	lliance			Proje	ct referei	nce:							PERTH G	EOTECHNICA	L LABORATORY
Client address:						Locat	ion:			Perth	n, WA					84 Guthrie Street, Osborne Park,
Project ID:	PS13	1735	Project name:				Cause	way Foo	tbridge S	Swan Riv	ver					Western Australia 6017
Exploratory hole	Sample	Specimen	Sub-specimen:	S ₁	S ₂	S₃	S ₄	S₅	S ₆	S ₇	S ₈	S ₉	S ₁₀	Location test co	onducted:	Laboratory
reference	depth (m)	reference	-		-	1	-	, j				3				ludes specimens
CPCB-BH01	29.80		Test type:	Α										which are not c	,	he tolerances
	30.00		**Compliant test:	Yes										specified in the		
Lab sample ID	LPER202	2080114	Failure mode	M										Axial	Diametral	Irregular
Sampling By	Date:		Failure load [kN]	0.94										0.94		
	Method:	-	Defect orientation	70°										-	-	-
Moisture content			Is [MPa]	0.12										0.12		
Moisture content ty	•		Is ₍₅₀₎ [MPa]	0.16									- ·	0.16	1	
Density (t/m ³)	As received	Dry	Lithological description	SANDST	ONE							ent ref.:	lest per	formed on sample:	s submitted to th	e laboratory.
Exploratory hole	Sample	Specimen	Sub-specimen:	S ₁	S ₂	S3	S ₄	S₅	S ₆	S ₇	S ₈	S ₉	S ₁₀	Location test co	onducted:	Laboratory
reference	depth (m)	reference	Jub-specificit.	51	52	J 3	54	5	5	37	28	Jg	510	Mean values:	Calculation exc	ludes specimens
CPCB-BH01	29.80		Test type:	D										which are not c	•	he tolerances
	30.00		**Compliant test:	Yes										specified in the	test method	
Lab sample ID	LPER202	2080114	Failure mode	Μ										Axial	Diametral	Irregular
Sampling By	Date:		Failure load [kN]	0.73											0.73	
	Method:	-	Defect orientation	90°										-	-	-
Moisture content			ls [MPa]	0.12											0.12	
Moisture content ty			ls ₍₅₀₎ [MPa]	0.15											0.15	
Density (t/m ³)	As received	Dry	Lithological description	SANDST	ONE							•	Test per	formed on sample	s submitted to th	e laboratory.
											Clie	ent ref.:				
Tes Definitions:	st types: A = Axial,	D = Diametral, L	. = Lump / Irregular		n/a	a = Not ap	pplicable,	, ND = N	ot deterr	mined					• •	laten gap at failure
			ne, M = Through rock mat		Along joi					, DF = Di			1	0		ance of the method
Cert. ref.: PS1317		-	22080114_Rep-2208359	7			cimens p	•			SW	- /		Appr	oved signatory	:
			: 1961 - Site:1598 - Perth				Tests pe			SW	03/08	3/22			FRE	
NATA			th ISO/IEC 17025 - Testing			I	Results r		-		PKent					
			BE REPRODUCED IN FU					te repor		-	08/2022				Laboratory Ma	_
	: +61 (0)8 9441 0700	7	Fax: +61 (0)8 9441	0701			E-mail:	1	perthlab@	golder.co	om.au			Web:	www.golder.	com.au

Rocks testing - D	Determination	of point load	strength index													
Including tests on;	Axial (A), Diam	etral (D) or irre	gular Lump (L) specime	ns			TEST	REPO	RT - S	UMMA	ARY OF	ANAL	YSIS	112	JGC	LDER
AS 4133.4.1-2007																
Test request ID:	TRP22-009	5 Lab sam	nple IDs: 2208011	6 - 2208	30116		Lab rep	ort ref.:		LF	PER_22083	3598			Golder As	sociates Pty Ltd
Client:	Causeway Link A	lliance			Projec	ct referei	nce:							PERTH GI	OTECHNICA	AL LABORATORY
Client address:						Locat	ion:			Perth	n, WA					84 Guthrie Street, Osborne Park,
Project ID:	PS13	1735	Project name:				Cause	way Foo	tbridge S	Swan Riv	er					Western Australia 6017
Exploratory hole	Sample	Specimen	Sub-specimen:	S₁	S ₂	S ₃	S₄	S₅	S ₆	S ₇	S ₈	S9	S ₁₀	Location test co	nducted:	Laboratory
reference	depth (m)	reference	· ·	-	- 2	- 3	- 4	- 3	- 0	- /	- 0	- 5	- 10	Mean values: (Calculation exc	ludes specimens
CPCB-BH01	31.00		Test type:	Α										which are not co		the tolerances
	31.20		**Compliant test:	Yes										specified in the		
Lab sample ID	LPER202	2080116	Failure mode	Μ										Axial	Diametral	Irregular
Sampling By	Date:		Failure load [kN]	1.4										1.4		
	Method:	-	Defect orientation	180°										-	-	-
Moisture content			ls [MPa]	0.17										0.17		
Moisture content ty	-		Is ₍₅₀₎ [MPa]	0.22										0.22		
Density (t/m ³)	As received	Dry	Lithological description	SANDST	ONE							istory: nt ref.:	Test per	formed on samples	submitted to th	e laboratory.
Exploratory hole	Sample	Specimen	Sub-specimen:	S ₁	S ₂	S ₃	S ₄	S ₅	S ₆	S ₇	S ₈	S9	S ₁₀	Location test co	nducted:	Laboratory
reference	depth (m)	reference		-	-2	-3	-4	-5	-6	•,	-8		-10	Mean values: (Calculation exc	ludes specimens
CPCB-BH01	31.00		Test type:	D										which are not co		the tolerances
	31.20		**Compliant test:	Yes										specified in the	test method	
Lab sample ID	LPER202	2080116	Failure mode	Μ										Axial	Diametral	Irregular
Sampling By	Date:		Failure load [kN]	1.1											1.1	
	Method:	-	Defect orientation	90°										-	-	-
Moisture content			ls [MPa]	0.19											0.19	
Moisture content ty	pe:		ls ₍₅₀₎ [MPa]	0.23											0.23	
Density (t/m³)	As received	Dry	Lithological description	SANDST	ONE							istory: nt ref.:	Test per	formed on samples	submitted to th	e laboratory.
Definitions:		,	. = Lump / Irregular ne, M = Through rock mat	trix I =	-	= Not ap	•				dn't Fail	I				platen gap at failure ance of the method
			22080116_Rep-2208359				cimens p			, 21 - 01	SW			-	oved signatory	
			: 1961 - Site:1598 - Perth	-		•	Tests pe	•		SW	03/08	/22				-
NATA			th ISO/IEC 17025 - Testing	5			Results r		-		PKent	-		1	Flack	
	THIS DOCUME	NT SHALL ONLY	BE REPRODUCED IN FL	JLL				te report	-		08/2022			Paul Kent -	Laboratory Ma	anager
Phone:	+61 (0)8 9441 0700		Fax: +61 (0)8 9441				E-mail:	-		golder.co	-			Web:	www.golder.	-

Rocks testing - D	Determination	of point load	strength index													
Including tests on	; Axial (A) , Diam	etral (D) or irre	gular Lump (L) specime	ns			TEST	r Repo	ORT - S	UMMA	ARY OF	ANAL	.YSIS		JGO	LDER
AS 4133.4.1-2007	_													•		
Test request ID:	TRP22-009	5 Lab sam	nple IDs: 2208011	7 - 2208	30117		Lab rep	ort ref.:		LI	PER_2208	33599			Golder Ass	ociates Pty Ltd
Client:	Causeway Link A	lliance			Proje	t refere	nce:							PERTH G	EOTECHNICA	L LABORATORY
Client address:						Locat	ion:			Perth	n, WA					84 Guthrie Street, Osborne Park,
Project ID:	PS13	1735	Project name:				Cause	way Foo	tbridge S	Swan Riv	ver					Western Australia 6017
Exploratory hole	Sample	Specimen	Sub-specimen:	S₁	S ₂	S3	S₄	S₅	S ₆	S ₇	S ₈	S9	S ₁₀	Location test co	onducted:	Laboratory
reference	depth (m)	reference	•		2	,	•	, 	•	,		5	10	Mean values:	Calculation excl	udes specimens
CPCB-BH01	32.20		Test type:	Α										which are not co	,	ne tolerances
	32.40		**Compliant test:	Yes										specified in the		
Lab sample ID	LPER202	2080117	Failure mode	M										Axial	Diametral	Irregular
Sampling By	Date:		Failure load [kN]	0.85										0.85		
	Method:	-	Defect orientation	180°										-	-	-
Moisture content			Is [MPa]	0.12										0.12		
Moisture content ty		David	Is ₍₅₀₎ [MPa]	0.15									T t	0.15	a deserve al resultant	la ha conta co
Density (t/m ³)	As received	Dry	Lithological description	SANDST	ONE							ent ref.:	Test per	formed on samples	submitted to the	laboratory.
Exploratory hole	Sample	Specimen			_			-						Location test co	onducted:	Laboratory
reference	depth (m)	reference	Sub-specimen:	S ₁	S ₂	S ₃	S ₄	S₅	S ₆	\$ ₇	S ₈	S ₉	S ₁₀	Mean values:		,
	32.20		Test type:	D										which are not co		
CPCB-BH01	32.40		**Compliant test:	Yes										specified in the	test method	
Lab sample ID	LPER202	2080117	Failure mode	М										Axial	Diametral	Irregular
Sampling By	Date:		Failure load [kN]	0.81											0.81	
Samping	Method:	-	Defect orientation	90°										-	-	-
Moisture content			ls [MPa]	0.13											0.13	
Moisture content ty	/pe:		ls ₍₅₀₎ [MPa]	0.16											0.16	
Density (t/m ³)	As received	Dry	Lithological description	SANDST	ONE						ŀ	History:	Test per	formed on samples	submitted to the	laboratory.
				5/11251							Clie	ent ref.:				
Tes Definitions:	st types: A = Axial,	D = Diametral, L	. = Lump / Irregular		n/a	= Not ap	oplicable	, ND = N	ot deterr	mined						aten gap at failure
	lure modes: B = A	long bedding pla	ne, M = Through rock mat	trix, J =	Along joi	nt, W = A	long a pl	lane of w	veakness	, DF = Di	dn't Fail			being outsi	de of the tolera	nce of the method
Cert. ref.: PS1317	35_TRP22-0095_I	PtLd_22080117 -	22080117_Rep-2208359	9		Spe	cimens p	repared	l by:		SW			Appro	oved signatory:	
			: 1961 - Site:1598 - Perth				Tests pe	rformed	l by:	SW	03/08	8/22			Flet	
NATA			th ISO/IEC 17025 - Testing			I	Results r	eviewed	l by:		PKent					
			BE REPRODUCED IN FU					te repor			08/2022				Laboratory Ma	-
Phone	: +61 (0)8 9441 0700	C	Fax: +61 (0)8 9441	0701			E-mail:	1	perthlab@	golder.co	om.au			Web:	www.golder.c	om.au

Rocks testing - D	Determination	of point load	strength index													
Including tests on;	; Axial (A), Diam	etral (D) or irre	gular Lump (L) specime	ns			TEST	REPO	RT - S	UMMA	ARY OF	ANAL	YSIS	112	JGC	LDER
AS 4133.4.1-2007																
Test request ID:	TRP22-009	5 Lab sam	nple IDs: 2208011	9 - 2208	30119		Lab rep	ort ref.:		LF	PER_2208	3600			Golder As	sociates Pty Ltd
Client:	Causeway Link A	lliance			Proje	ct referei	nce:							PERTH GI	OTECHNICA	AL LABORATORY
Client address:						Locat	ion:			Perth	n, WA					84 Guthrie Street, Osborne Park,
Project ID:	PS13	1735	Project name:				Cause	way Foo	tbridge S	Swan Riv	er					Western Australia 6017
Exploratory hole	Sample	Specimen	Sub-specimen:	S ₁	S ₂	S ₃	S₄	S₅	S ₆	S ₇	S ₈	S9	S ₁₀	Location test co	nducted:	Laboratory
reference	depth (m)	reference	· ·	-	- 2	- 3	- 4	- 3	- 0	- /	- 0	- 9	- 10	Mean values: (Calculation exc	ludes specimens
CPCB-BH01	33.80		Test type:	Α										which are not co		the tolerances
	34.00		**Compliant test:	Yes										specified in the		
Lab sample ID	LPER202	2080119	Failure mode	Μ										Axial	Diametral	Irregular
Sampling By	Date:		Failure load [kN]	1.2										1.2		
	Method:	-	Defect orientation	70°										-	-	-
Moisture content			Is [MPa]											0.17		
Moisture content ty			Is ₍₅₀₎ [MPa]	0.21										0.21		
Density (t/m ³)	As received	Dry	Lithological description	SANDST	ONE							listory: nt ref.:	Test per	formed on samples	submitted to th	e laboratory.
Exploratory hole	Sample	Specimen	Sub-specimen:	S ₁	S ₂	S ₃	S ₄	S₅	S ₆	\$ ₇	S ₈	S ₉	S ₁₀	Location test co	nducted:	Laboratory
reference	depth (m)	reference		-	-2	-3	-4	-5	-6	-,	-8	-9	010	Mean values: (Calculation exc	ludes specimens
СРСВ-ВН01	33.80		Test type:	D										which are not co		the tolerances
	34.00		**Compliant test:	Yes										specified in the	test method	
Lab sample ID	LPER202	2080119	Failure mode	Μ										Axial	Diametral	Irregular
Sampling By	Date:		Failure load [kN]	0.88											0.88	
	Method:	-	Defect orientation	90°										-	-	-
Moisture content			ls [MPa]	0.17											0.17	
Moisture content ty	-		Is ₍₅₀₎ [MPa]	0.2											0.2	
Density (t/m ³)	As received	Dry	Lithological description	SANDST	ONE							listory: nt ref.:	Test per	formed on samples	submitted to th	e laboratory.
Definitions:		,	. = Lump / Irregular ne, M = Through rock mat	trix, J =	-	i = Not ap nt, W = A	•				dn't Fail					platen gap at failure ance of the method
			22080119_Rep-2208360				cimens p				SW			Appro	oved signatory	:
			: 1961 - Site:1598 - Perth			-	Tests pe	rformed	by:	SW	03/08	/22				
NATA	Accredited fo	or compliance wi	th ISO/IEC 17025 - Testing	5			Results r		-	F	Kent				Ret	
	THIS DOCUME	NT SHALL ONLY	BE REPRODUCED IN FU	JLL			Dat	te report	ted:	11/	08/2022			Paul Kent -	Laboratory Ma	anager
Phone:	+61 (0)8 9441 070	0	Fax: +61 (0)8 9441	0701			E-mail:	Į	perthlab@	golder.cc	om.au			Web:	www.golder.	com.au

Rocks testing - I	Determination	of point load	strength index													
Including tests on	; Axial (A), Diame	etral (D) or irre	gular Lump (L) specime	ns			TEST	r Repo	ORT - S	UMMA	ARY OF	ANAL	YSIS.	112	JGC	LDER
AS 4133.4.1-2007																
Test request ID:	TRP22-009	5 Lab san	nple IDs: 2208012	1 - 2208	80121		Lab rep	ort ref.:		LI	PER_2208	83601			Golder As	sociates Pty Ltd
Client:	Causeway Link A	lliance			Proje	ct refere	nce:							PERTH G	EOTECHNICA	L LABORATORY
Client address:						Locat	ion:			Perth	n, WA					84 Guthrie Street, Osborne Park,
Project ID:	PS13	1735	Project name:				Cause	way Foo	tbridge S	Swan Riv	/er					Western Australia 6017
Exploratory hole	Sample	Specimen	Sub-specimen:	S ₁	S ₂	S3	S ₄	S ₅	S ₆	S ₇	S ₈	S9	S ₁₀	Location test co	onducted:	Laboratory
reference	depth (m)	reference	-		-	1	-				, , , , , , , , , , , , , , , , , , ,	,	10			ludes specimens
CPCB-BH01	36.00		Test type:	Α										which are not c	,	he tolerances
	36.20		**Compliant test:	Yes										specified in the		
Lab sample ID	LPER202	2080121	Failure mode	М										Axial	Diametral	Irregular
Sampling By	Date:		Failure load [kN]	1.3										1.3		
	Method:	-	Defect orientation	80°										-	-	-
Moisture content			Is [MPa]	0.24										0.24		
Moisture content ty	•	-	Is ₍₅₀₎ [MPa]	0.29									- .	0.29	1	
Density (t/m ³)	As received	Dry	Lithological description	SANDST	ONE							History: ent ref.:	lest per	formed on samples	submitted to the	e laboratory.
Exploratory hole	Sample	Specimen	Sub-specimen:	S ₁	S ₂	S ₃	S ₄	S ₅	S ₆	S ₇	S ₈	S ₉	S ₁₀	Location test co	onducted:	Laboratory
reference	depth (m)	reference	Sub-specimen.	J ₁	52	53	54	5	J 6	37		39	510	Mean values:	Calculation exc	ludes specimens
CPCB-BH01	36.00		Test type:	D										which are not c		the tolerances
	36.20		**Compliant test:	Yes										specified in the	test method	
Lab sample ID	LPER202	2080121	Failure mode	Μ										Axial	Diametral	Irregular
Sampling By	Date:		Failure load [kN]	1.3											1.3	
	Method:	-	Defect orientation	90°										-	-	-
Moisture content			Is [MPa]	0.31											0.31	
Moisture content ty	ype:		Is ₍₅₀₎ [MPa]	0.35											0.35	
Density (t/m ³)	As received	Dry	Lithological description	SANDST	ONE							•	Test per	formed on samples	submitted to th	e laboratory.
											Clie	ent ref.:				
Tes Definitions:	st types: A = Axial,	D = Diametral, I	L = Lump / Irregular		n/a	a = Not ap	plicable,	, ND = N	ot deterr	mined					• •	blaten gap at failure
			ne, M = Through rock mat		Along joi					, DF = Di				0		ance of the method
Cert. ref.: PS1317	35_TRP22-0095_I	PtLd_22080121 ·	- 22080121_Rep-2208360	1		Spe	cimens p	prepared	l by:		SW			Appr	oved signatory	:
			: 1961 - Site:1598 - Perth				Tests pe			SW	03/08	8/22			FRE	
NATA	Accredited fo	or compliance wi	th ISO/IEC 17025 - Testing				Results r	eviewed	l by:	F	PKent					
	Accredited fo	or compliance wi		JLL			Results r	eviewed te repor	l by:	F 11/	PKent 08/2022				Ree Laboratory Ma www.golder.	-

Rocks testing - D	Determination	of point load	strength index													
Including tests on	; Axial (A) , Diam	etral (D) or irre	gular Lump (L) specime	ns			TEST	r Repo	RT - S	UMMA	ARY OF	ANAL	.YSIS		JGO	LDER
AS 4133.4.1-2007																
Test request ID:	TRP22-009	5 Lab sam	nple IDs: 2208012	2 - 2208	80122		Lab rep	ort ref.:		LF	PER_2208	33602			Golder Ass	ociates Pty Ltd
Client:	Causeway Link A	lliance			Proje	ct refere	nce:							PERTH G	EOTECHNICA	L LABORATORY
Client address:						Locat	ion:			Perth	n, WA					84 Guthrie Street, Osborne Park,
Project ID:	PS13	1735	Project name:				Cause	way Foo	tbridge S	Swan Riv	er					Western Australia 6017
Exploratory hole	Sample	Specimen	Sub-specimen:	S₁	S ₂	S3	S₄	S₅	S ₆	S ₇	S ₈	S9	S ₁₀	Location test co	nducted:	Laboratory
reference	depth (m)	reference	- ·	-	-					-		5		Mean values:		
CPCB-BH01	38.00		Test type:	A										which are not co	,	ne tolerances
	38.20		**Compliant test:	Yes										specified in the		
Lab sample ID	LPER202	2080122	Failure mode	M										Axial	Diametral	Irregular
Sampling By	Date:		Failure load [kN]	0.82										0.82		_
	Method:	-	Defect orientation	180°										-	-	-
Moisture content			Is [MPa]	0.11										0.11		
Moisture content ty		Dent	Is ₍₅₀₎ [MPa]	0.14								listowy	Tost por	0.14	submitted to the	laboratory
Density (t/m ³)	As received	Dry	Lithological description	SANDST	ONE							ent ref.:	rest per	formed on samples	submitted to the	laboratory.
Exploratory hole	Sample	Specimen	Cub an a simon	c	<u> </u>	c	ç	ç	ç	c			c	Location test co	nducted:	Laboratory
reference	depth (m)	reference	Sub-specimen:	S ₁	S ₂	S ₃	S ₄	S ₅	S ₆	S ₇	S ₈	S9	S ₁₀	Mean values:	Calculation excl	udes specimens
CPCB-BH01	38.00		Test type:	D										which are not c	ompliant with tl	ne tolerances
	38.20		**Compliant test:	Yes										specified in the	test method	
Lab sample ID	LPER202	2080122	Failure mode	Μ										Axial	Diametral	Irregular
Sampling By	Date:		Failure load [kN]	0.48											0.48	
	Method:	-	Defect orientation	90°										-	-	-
Moisture content			ls [MPa]	0.076											0.076	
Moisture content ty	/pe:		ls ₍₅₀₎ [MPa]	0.094											0.094	
Density (t/m ³)	As received	Dry	Lithological description	SANDST	ONE						ŀ	History:	Test per	formed on samples	submitted to the	laboratory.
											Clie	ent ref.:				
Tes Definitions:	st types: A = Axial,	D = Diametral, L	. = Lump / Irregular		n/a	i = Not ap	oplicable	, ND = N	ot deterr	nined						aten gap at failure
			ne, M = Through rock mat		Along joi					, DF = Die	dn't Fail			being outsi	de of the tolera	nce of the method
Cert. ref.: PS1317			22080122_Rep-2208360	2		•	cimens p	•	•		SW	- /		Appro	oved signatory:	
			: 1961 - Site:1598 - Perth				Tests pe		•	SW	03/08	8/22			Flet	
NATA			th ISO/IEC 17025 - Testing			I	Results r		•		YKent					
	THIS DOCUME	NT SHALL ONLY	BE REPRODUCED IN FU	JLL			Dat	te repor	ted:	11/0	08/2022			Paul Kent -	Laboratory Ma	nager
	: +61 (0)8 9441 0700		Fax: +61 (0)8 9441				E-mail:		perthlab@					Web:	www.golder.c	

Rocks testing - D	Determination	of point load	strength index													
Including tests on;	: Axial (A), Diam	etral (D) or irre	gular Lump (L) specime	ns			TEST	r Repo	RT - S	UMMA	ARY OF		YSIS	112	JGO	LDER
AS 4133.4.1-2007																
Test request ID:	TRP22-009	5 Lab sam	nple IDs: 2208012	3 - 2208	0123		Lab rep	ort ref.:		LF	PER_220	83603			Golder Ass	ociates Pty Ltd
Client:	Causeway Link A	lliance			Proje	ct refere	nce:							PERTH G	EOTECHNICA	L LABORATORY
Client address:						Locat	ion:			Perth	n, WA					84 Guthrie Street, Osborne Park,
Project ID:	PS13	1735	Project name:				Cause	way Foo	tbridge S	Swan Riv	ver					Western Australia 6017
Exploratory hole	Sample	Specimen	Sub-specimen:	S₁	S2	S3	S₄	S₅	S ₆	S ₇	S ₈	S9	S ₁₀	Location test co	onducted:	Laboratory
reference	depth (m)	reference	- ·	-	-				Ŭ	-						udes specimens
CPCB-BH02	29.80		Test type:	A										which are not c		he tolerances
	30.00		**Compliant test:	Yes										specified in the		
Lab sample ID		2080123	Failure mode	M										Axial	Diametral	Irregular
Sampling By	Date:		Failure load [kN]	0.67										0.67		
	Method:	-	Defect orientation	60°										-	-	-
Moisture content			Is [MPa]											0.087		
Moisture content ty	-	D	Is ₍₅₀₎ [MPa]	0.11									Tester	0.11		lab and a s
Density (t/m ³)	As received	Dry	Lithological description	SANDST	ONE								lest per	formed on samples	s submitted to the	a laboratory.
Exploratory hole	Sample	Specimen									CI	ent ref.:		Location test co	nductod	Laboratory
reference	depth (m)	reference	Sub-specimen:	S ₁	S ₂	S ₃	S ₄	S ₅	S ₆	S ₇	S ₈	S ₉	S ₁₀			udes specimens
	29.80		Test type:	D										which are not c		
CPCB-BH02	30.00		**Compliant test:	Yes										specified in the	test method	
Lab sample ID	LPER202	2080123	Failure mode	Μ										Axial	Diametral	Irregular
By	Date:		Failure load [kN]	0.82											0.82	
Sampling	Method:	-	Defect orientation	90°										-	-	-
Moisture content			ls [MPa]	0.14											0.14	
Moisture content ty	/pe:		ls ₍₅₀₎ [MPa]	0.17											0.17	
Demotion (1) (103)	As received	Dry				4	r.					History:	Test per	formed on samples	submitted to the	laboratory.
Density (t/m ³)			Lithological description	SANDST	JINE						Cli	ent ref.:				
Tes Definitions:	t types: A = Axial	, D = Diametral, I	. = Lump / Irregular		n/a	i = Not ap	oplicable	, ND = No	ot deterr	nined				** A non co	mpliant test = p	laten gap at failure
	lure modes: B = A	long bedding pla	ne, M = Through rock mat	trix, J = A	Along joi	nt, W = A	long a p	lane of w	eakness	, DF = Die	dn't Fail			being outsi	de of the tolera	nce of the method
Cert. ref.: PS1317	35_TRP22-0095_	PtLd_22080123 -	22080123_Rep-2208360	3		Spe	cimens p	prepared	by:		SW			Appr	oved signatory:	
	NATA accre	ditation number	: 1961 - Site:1598 - Perth				Tests pe	rformed	by:	SW	03/0	8/22		5 g	Ret	
NATA	Accredited for	or compliance wi	th ISO/IEC 17025 - Testing				Results r	eviewed	by:	P	PKent				hat	
	THIS DOCUME	NT SHALL ONLY	BE REPRODUCED IN FU	JLL			Da	te report	ed:	11/	08/2022			Paul Kent -	Laboratory Ma	nager
Phone	+61 (0)8 9441 070	0	Fax: +61 (0)8 9441	0701			E-mail:	E	perthlab@	golder.cc	om.au			Web:	www.golder.o	com.au

Rocks testing - D	etermination	of point load	strength index													
Including tests on;	Axial (A), Diam	etral (D) or irre	gular Lump (L) specime	ns			TEST	REPO	RT - SI	JMMA	ARY OF		YSIS	112	JGO	LDER
AS 4133.4.1-2007																
Test request ID:	TRP22-009	5 Lab san	nple IDs: 2208012	5 - 2208	30125		Lab rep	ort ref.:		LF	PER_220	83604			Golder Ass	ociates Pty Ltd
Client:	Causeway Link A	lliance			Proje	ct referei	nce:							PERTH G	EOTECHNICA	L LABORATORY
Client address:						Locat	ion:			Perth	n, WA					84 Guthrie Street, Osborne Park,
Project ID:	PS13	1735	Project name:				Cause	way Foo	tbridge S	wan Riv	ver					Western Australia 6017
Exploratory hole	Sample	Specimen	Sub-specimen:	S ₁	S ₂	S₃	S4	S₅	S ₆	S ₇	S ₈	S9	S ₁₀	Location test co	onducted:	Laboratory
reference	depth (m)	reference	-	-1	- 2	- 3	- 4	- 3	- 0	- /	- 0	- 9	- 10	Mean values:	Calculation excl	udes specimens
СРСВ-ВН02	32.40		Test type:	Α										-	ompliant with tl	ne tolerances
	32.60		**Compliant test:	Yes										specified in the		
Lab sample ID	LPER202	2080125	Failure mode	Μ										Axial	Diametral	Irregular
Sampling By	Date:		Failure load [kN]	1.4										1.4		
	Method:	-	Defect orientation	180°										-	-	-
Moisture content			ls [MPa]	0.21										0.21		
Moisture content ty	•		ls ₍₅₀₎ [MPa]	0.26										0.26		
Density (t/m ³)	As received	Dry	Lithological description	SANDST	ONE							History: ent ref.:	Test per	formed on samples	s submitted to the	laboratory.
Exploratory hole	Sample	Specimen	Sub-specimen:	S ₁	S ₂	S₃	S ₄	S₅	S ₆	S 7	S ₈	S9	S ₁₀	Location test co	onducted:	Laboratory
reference	depth (m)	reference	Sub specificit.	•1	•2		04	•5	06	•/	-8	- Gy	010	Mean values:	Calculation excl	udes specimens
СРСВ-ВН02	32.40		Test type:	D										which are not a		a talaran cas
														-	ompliant with tl	le tolerances
	32.60		**Compliant test:	Yes										specified in the	•	le tolerances
Lab sample ID	32.60 LPER202	2080125												-	•	Irregular
Bv		2080125	**Compliant test:	Yes										specified in the	test method	
	LPER202	2080125	**Compliant test: Failure mode	Yes M										specified in the	test method Diametral	
Bv	LPER202 Date:	2080125	**Compliant test: Failure mode Failure load [kN]	Yes M 1.5										specified in the	test method Diametral	
Sampling By	LPER202 Date: Method:	-	**Compliant test: Failure mode Failure load [kN] Defect orientation	Yes M 1.5 90° 0.27										specified in the	test method Diametral 1.5 -	
Sampling By Moisture content Moisture content ty	LPER202 Date: Method:	2080125 - Dry	**Compliant test: Failure mode Failure load [kN] Defect orientation Is [MPa] Is ₍₅₀₎ [MPa]	Yes M 1.5 90° 0.27 0.32								History:	Test peri	specified in the	Test method Diametral 1.5 - 0.27 0.32	Irregular
Sampling By Moisture content	LPER202 Date: Method: pe:	-	**Compliant test: Failure mode Failure load [kN] Defect orientation Is [MPa]	Yes M 1.5 90° 0.27 0.32	ONE							History: ent ref.:	Test per	specified in the Axial -	Test method Diametral 1.5 - 0.27 0.32	Irregular
SamplingByMoisture contentMoisture content tyDensity (t/m³)Definitions:	LPER202 Date: Method: pe: As received t types: A = Axial,	- Dry D = Diametral, I	**Compliant test: Failure mode Failure load [kN] Defect orientation Is [MPa] Is ₍₅₀₎ [MPa] Lithological description	Yes M 1.5 90° 0.27 0.32 SANDST	n/a	= Not ap	•				Clie	•	Test peri	specified in the Axial	test method Diametral 1.5 0.27 0.27 0.32 s submitted to the mpliant test = p	Irregular -
By Sampling By Moisture content Moisture content ty Density (t/m³) Definitions: Tes Fail	LPER202 Date: Method: pe: As received t types: A = Axial, ure modes: B = A	Dry , D = Diametral, I long bedding pla	**Compliant test: Failure mode Failure load [kN] Defect orientation Is [MPa] Is ₍₅₀₎ [MPa]	Yes M 1.5 90° 0.27 0.32 SANDST	n/a	nt, W = A	•	ane of w	veakness		Clie	•	Test peri	specified in the Axial formed on samples ** A non co being outsi	test method Diametral 1.5 0.27 0.27 0.32 s submitted to the mpliant test = p	Irregular - - laboratory.
SamplingByMoisture contentMoisture content tyDensity (t/m³)Definitions:Tes Fail	LPER202 Date: Method: pe: As received t types: A = Axial, ure modes: B = A 35_TRP22-0095_1	Dry , D = Diametral, I long bedding pla PtLd_22080125	**Compliant test: Failure mode Failure load [kN] Defect orientation Is [MPa] Is ₍₅₀₎ [MPa] Lithological description	Yes M 1.5 90° 0.27 0.32 SANDST	n/a	nt, W = A Spe	long a pl	ane of w repared	veakness by:		Clio dn't Fail	ent ref.:	Test per	specified in the Axial Axial formed on samples ** A non co being outsi Appr	test method Diametral 1.5 0.27 0.27 0.32 s submitted to the mpliant test = pi ide of the tolera oved signatory:	Irregular - - laboratory.
SamplingByMoisture contentMoisture content tyDensity (t/m³)Definitions:Tes Fail	LPER202 Date: Method: pe: As received t types: A = Axial, ure modes: B = A 35_TRP22-0095_I NATA accree	Dry D = Diametral, I long bedding pla PtLd_22080125 ditation number	**Compliant test: Failure mode Failure load [kN] Defect orientation Is [MPa] Is ₍₅₀₎ [MPa] Lithological description . = Lump / Irregular ine, M = Through rock mate 22080125_Rep-2208360	Yes M 1.5 90° 0.27 0.32 SANDST trix, J = 1	n/a	nt, W = A Spe	long a pl cimens p	ane of w repared rformed	veakness by: by:	, DF = Die sw	Clie dn't Fail sw	ent ref.:	Test peri	specified in the Axial Axial formed on samples ** A non co being outsi Appr	test method Diametral 1.5 0.27 0.32 submitted to the mpliant test = pliade of the tolera	Irregular - - laboratory.
SamplingByMoisture contentMoisture content tyDensity (t/m³)Definitions:TesFailCert. ref.:PS1317	LPER202 Date: Method: pe: As received t types: A = Axial, ure modes: B = A 35_TRP22-0095_I NATA accred Accredited for	Dry , D = Diametral, I long bedding pla PtLd_22080125 ditation number or compliance wi	 **Compliant test: Failure mode Failure load [kN] Defect orientation Is [MPa] Is₍₅₀₎ [MPa] Lithological description = Lump / Irregular me, M = Through rock mate 22080125_Rep-22083600 : 1961 - Site:1598 - Perth 	Yes M 1.5 90° 0.27 0.32 SANDST trix, J = 4	n/a	nt, W = A Spe	long a pl cimens p Tests pe Results ro	ane of w repared rformed	veakness by: by: by: by:	, DF = Dio sw P	Clie dn't Fail sw 03/0	ent ref.: 18/22	Test per	specified in the Axial formed on samples ** A non co being outsi Appr	test method Diametral 1.5 0.27 0.27 0.32 s submitted to the mpliant test = pi ide of the tolera oved signatory:	Irregular

Rocks testing - D	Determination	of point load	strength index													
Including tests on;	; Axial (A) , Diam	etral (D) or irre	gular Lump (L) specime	ns			TEST	REPO	RT - SI	UMMA	ARY OF	F ANAL	.YSIS		JGO	LDER
AS 4133.4.1-2007	_															
Test request ID:	TRP22-009	5 Lab san	nple IDs: 2208012	7 - 2208	30127		Lab rep	ort ref.:		LI	PER_220	83605			Golder Ass	ociates Pty Ltd
Client:	Causeway Link A	lliance			Proje	ct refere	nce:							PERTH G	EOTECHNICAI	. LABORATORY
Client address:						Locat	ion:			Perth	n, WA					84 Guthrie Street, Osborne Park,
Project ID:	PS13	1735	Project name:				Cause	way Foo	tbridge S	Swan Riv	ver					Western Australia 6017
Exploratory hole	Sample	Specimen	Sub-specimen:	S₁	S ₂	S3	S₄	S₅	S ₆	S ₇	S ₈	S9	S ₁₀	Location test co	onducted:	Laboratory
reference	depth (m)	reference		-	2	,	-		Ū	,	5	,	10	Mean values:	Calculation exclu	ides specimens
СРСВ-ВН02	34.00		Test type:	Α										-	ompliant with th	e tolerances
	34.20		**Compliant test:	Yes										specified in the		
Lab sample ID	LPER202	2080127	Failure mode	M										Axial	Diametral	Irregular
Sampling	Date:		Failure load [kN]	0.46										0.46		
	Method:	-	Defect orientation	60°										-	-	-
Moisture content			Is [MPa]											0.078		
Moisture content ty		D	Is ₍₅₀₎ [MPa]	0.095									T t	0.095	a deservation de la contra	lah sasta s
Density (t/m ³)	As received	Dry	Lithological description	SANDST	ONE							ent ref.:	Test per	formed on samples	submitted to the	laboratory.
Exploratory hole	Sample	Specimen	Sub-specimen:	S ₁	S ₂	S ₃	S ₄	S₅	S ₆	S ₇	S ₈	S9	S ₁₀	Location test co	onducted:	Laboratory
reference	depth (m)	reference		-	- 2	- 3	- 4	- 3	- 0	- /	- 0	- 9	- 10	Mean values:	Calculation exclu	ides specimens
CPCB-BH02	34.00		Test type:	D										-	ompliant with th	e tolerances
	34.20			Vaa												
			**Compliant test:	Yes											test method	
Lab sample ID	LPER202	2080127	Failure mode	М										Axial	Diametral	Irregular
Sampling	Date:	2080127	Failure mode Failure load [kN]	M 0.45												Irregular
Sampling By		-	Failure mode Failure load [kN] Defect orientation	M 0.45 90°											Diametral 0.45 -	Irregular _
Sampling By Moisture content	Date: Method:	-	Failure mode Failure load [kN] Defect orientation Is [MPa]	M 0.45 90° 0.097										Axial	Diametral 0.45 - 0.097	
Sampling By	Date: Method: ype:		Failure mode Failure load [kN] Defect orientation	M 0.45 90° 0.097										Axial -	Diametral 0.45 - 0.097 0.11	-
Sampling By Moisture content	Date: Method:	2080127 - Dry	Failure mode Failure load [kN] Defect orientation Is [MPa]	M 0.45 90° 0.097 0.11	ONE							-	Test per	Axial	Diametral 0.45 - 0.097 0.11	-
By Sampling Moisture content Moisture content ty Density (t/m ³)	Date: Method: /pe: As received	Dry	Failure mode Failure load [kN] Defect orientation Is [MPa] Is ₍₅₀₎ [MPa]	M 0.45 90° 0.097 0.11								History: ent ref.:	Test per	Axial -	Diametral 0.45 - 0.097 0.11 submitted to the	- laboratory.
SamplingByMoisture contentMoisture content tyDensity (t/m³)Definitions:	Date: Method: /pe: As received st types: A = Axial,	- Dry , D = Diametral, I	Failure mode Failure load [kN] Defect orientation Is [MPa] Is ₍₅₀₎ [MPa] Lithological description	M 0.45 90° 0.097 0.11 SANDST	n/a	= Not ap	•				Cli	-	Test per	Axial - formed on samples ** A non con	Diametral 0.45 - 0.097 0.11 submitted to the	- laboratory.
SamplingByMoisture contentMoisture content tyDensity (t/m³)Definitions:Tes Fail	Date: Method: /pe: As received st types: A = Axial, lure modes: B = A	Dry , D = Diametral, I long bedding pla	Failure mode Failure load [kN] Defect orientation Is [MPa] Is ₍₅₀₎ [MPa] Lithological description = Lump / Irregular ine, M = Through rock mat	M 0.45 90° 0.097 0.11 SANDST	n/a	nt, W = A	long a pl	ane of w	veakness		Cli dn't Fail	-	Test per	Axial - formed on samples ** A non con being outsi	Diametral 0.45 - 0.097 0.11 submitted to the mpliant test = plate of the toleran	- laboratory.
SamplingByMoisture contentMoisture content tyDensity (t/m³)Definitions:Tes Fail	Date: Method: /pe: As received st types: A = Axial, lure modes: B = A 35_TRP22-0095_I	- Dry , D = Diametral, I long bedding pla PtLd_22080127	Failure mode Failure load [kN] Defect orientation Is [MPa] Is ₍₅₀₎ [MPa] Lithological description = Lump / Irregular ine, M = Through rock mai	M 0.45 90° 0.097 0.11 SANDST	n/a	nt, W = A Spe	long a pl	ane of w repared	veakness by:	, DF = Di	Cli dn't Fail sw	ent ref.:	Test per	Axial - formed on samples ** A non con being outsi Appro	Diametral 0.45 - 0.097 0.11 submitted to the mpliant test = pl. de of the tolerar pved signatory:	- laboratory.
By Sampling By Moisture content Moisture content ty Density (t/m³) Tes Definitions: Tes Fail Cert. ref.: PS1317	Date: Method: /pe: As received st types: A = Axial, lure modes: B = A 35_TRP22-0095_I NATA accred	- Dry , D = Diametral, I long bedding pla PtLd_22080127 - ditation number	Failure mode Failure load [kN] Defect orientation Is [MPa] Is ₍₅₀₎ [MPa] Lithological description L = Lump / Irregular me, M = Through rock mai 22080127_Rep-2208360 : 1961 - Site:1598 - Perth	M 0.45 90° 0.097 0.11 SANDST trix, J = , 5	n/a	nt, W = A Spe	long a pl cimens p Tests pe	ane of w repared rformed	veakness by: by:	sw	Clin dn't Fail sw 03/0	-	Test per	Axial - formed on samples ** A non con being outsi Appro	Diametral 0.45 - 0.097 0.11 submitted to the mpliant test = plate of the toleran	- laboratory.
SamplingByMoisture contentMoisture content tyDensity (t/m³)Definitions:Tes Fail	Date: Method: /pe: As received st types: A = Axial, lure modes: B = A 35_TRP22-0095_1 NATA accred Accredited for	- Dry , D = Diametral, I long bedding pla PtLd_22080127 ditation number or compliance wi	Failure mode Failure load [kN] Defect orientation Is [MPa] Is ₍₅₀₎ [MPa] Lithological description = Lump / Irregular ine, M = Through rock mat 22080127_Rep-2208360 : 1961 - Site:1598 - Perth th ISO/IEC 17025 - Testing	M 0.45 90° 0.097 0.11 SANDST trix, J = 7 5	n/a	nt, W = A Spe	long a pl cimens p Tests pe Results r	ane of w repared rformed eviewed	veakness by: by: by: by:	sw	Clin dn't Fail sw 03/0 PKent	ent ref.: 08/22	Test per	Axial formed on samples ** A non con being outsi Appro	Diametral 0.45 - 0.097 0.11 submitted to the mpliant test = pl de of the toleran oved signatory:	laboratory. aten gap at failure ace of the method
By Sampling By Moisture content Moisture content ty Density (t/m³) Definitions: Tes Fail Cert. ref.: PS1317	Date: Method: /pe: As received st types: A = Axial, lure modes: B = A 35_TRP22-0095_1 NATA accred Accredited for	- Dry , D = Diametral, I ,long bedding pla PtLd_22080127 ditation number or compliance wi NT SHALL ONL	Failure mode Failure load [kN] Defect orientation Is [MPa] Is ₍₅₀₎ [MPa] Lithological description L = Lump / Irregular me, M = Through rock mai 22080127_Rep-2208360 : 1961 - Site:1598 - Perth	M 0.45 90° 0.097 0.11 SANDST trix, J = , 5 g	n/a	nt, W = A Spe	long a pl cimens p Tests pe Results r	ane of w repared rformed eviewed te report	veakness by: by: by: ted:	sw	Clia dn't Fail sw 03/0 PKent 08/2022	ent ref.: 08/22	Test per	Axial formed on samples ** A non con being outsi Appro	Diametral 0.45 - 0.097 0.11 submitted to the mpliant test = pl. de of the tolerar pved signatory:	laboratory.

Rocks testing - D	Determination	of point load	strength index													
Including tests on;	; Axial (A), Diame	etral (D) or irre	gular Lump (L) specime	ns			TEST	r Repo	RT - S	UMMA	ARY OF	ANAL	.YSIS		JGO	LDER
AS 4133.4.1-2007																
Test request ID:	TRP22-009	5 Lab san	nple IDs: 2208012	8 - 2208	80128		Lab rep	ort ref.:		LF	PER_2208	33606			Golder Ass	ociates Pty Ltd
Client:	Causeway Link A	lliance			Proje	ct refere	nce:							PERTH G	EOTECHNICA	L LABORATORY
Client address:						Locat	tion:			Perth	n, WA					84 Guthrie Street, Osborne Park,
Project ID:	PS13	1735	Project name:				Cause	way Foo	tbridge S	Swan Riv	ver					Western Australia 6017
Exploratory hole	Sample	Specimen	Sub-specimen:	S ₁	S ₂	S₃	S₄	S₅	S ₆	S ₇	S ₈	S9	S ₁₀	Location test co	onducted:	Laboratory
reference	depth (m)	reference		-	2	, 	•	, 		,	•	5	10	Mean values:	Calculation excl	udes specimens
СРСВ-ВН02	35.80		Test type:	Α										which are not co	,	he tolerances
	6.00		**Compliant test:	Yes										specified in the		
Lab sample ID	LPER202	2080128	Failure mode	M										Axial	Diametral	Irregular
Sampling	Date:		Failure load [kN]	0.63										0.63		
	Method:	-	Defect orientation	180°										-	-	-
Moisture content			Is [MPa]											0.096		
Moisture content ty		_	Is ₍₅₀₎ [MPa]	0.12										0.12	1 11 11 11	
Density (t/m ³)	As received	Dry	Lithological description	SANDST	ONE							History: ent ref.:	Test per	formed on samples	submitted to the	e laboratory.
Exploratory hole	Sample	Specimen	Sub-specimen:	S₁	S ₂	S3	S ₄	S₅	S ₆	\$ ₇	S ₈	S ₉	S ₁₀	Location test co	onducted:	Laboratory
reference	depth (m)	reference	Jub-specifien.	J 1		J 3	54	5	9 6			39	510	Mean values:	Calculation excl	udes specimens
СРСВ-ВН02	35.80		Test type:	D										which are not co	,	he tolerances
	6.00		**Compliant test:	Yes										specified in the	test method	
Lab sample ID	LPER202	2080128	Failure mode	Μ										Axial	Diametral	Irregular
Sampling By	Date:		Failure load [kN]	0.4											0.4	
	Method:	-	Defect orientation	90°										-	-	-
Moisture content			Is [MPa]												0.07	
Moisture content ty	/pe:		Is ₍₅₀₎ [MPa]	0.085											0.085	
Density (t/m ³)	As received	Dry	Lithological description	SANDST	ONE							-	Test per	formed on samples	submitted to the	laboratory.
											Clie	ent ref.:				
Definitions:		,	L = Lump / Irregular	triv I – J	-		pplicable				da't Eail				• •	laten gap at failure nce of the method
			nne, M = Through rock mat - 22080128_Rep-2208360				cimens p			, D F – DI	SW			0	oved signatory:	
		· · · · · · · · · · · · · · · · · · ·	22000120_Nep-2200300	•		- 40								Аррі	seed Signatory.	
			: 1961 - Site:1598 - Perth				Tests pe	rformed	bv:	SW	03/08	8/22		5.4		
	NATA accred	ditation number	: 1961 - Site:1598 - Perth th ISO/IEC 17025 - Testing	5			Tests pe Results r		•		03/08 PKent	8/22			Fee	
	NATA accred Accredited fo	ditation number or compliance wi					Results r		by:	F		8/22			Fee Laboratory Ma	nager

Rocks testing - I	Determination	of point load	strength index													
Including tests on	; Axial (A) , Diame	etral (D) or irre	gular Lump (L) specime	ns			TEST	REPO	ORT - S	UMMA	ARY OF	ANAL	.YSIS	112	JGO	LDER
AS 4133.4.1-2007																
Test request ID:	TRP22-009	5 Lab sam	nple IDs: 2208012	9 - 2208	30129		Lab rep	ort ref.:		LF	PER_2208	3607			Golder Ass	sociates Pty Ltd
Client:	Causeway Link A	lliance			Proje	ct referei	nce:							PERTH G	EOTECHNICA	L LABORATORY
Client address:						Locat	ion:			Perth	n, WA					84 Guthrie Street, Osborne Park,
Project ID:	PS13	1735	Project name:				Cause	way Foo	tbridge S	Swan Riv	er					Western Australia 6017
Exploratory hole	Sample	Specimen	Sub-specimen:	S ₁	S ₂	S₃	S ₄	S,	S ₆	S7	S ₈	S9	S ₁₀	Location test co	onducted:	Laboratory
reference	depth (m)	reference	-		-	1	-					5	10			ludes specimens
СРСВ-ВН03	29.20		Test type:	Α										which are not c		he tolerances
	29.40		**Compliant test:	Yes										specified in the		
Lab sample ID	LPER202	2080129	Failure mode	Μ										Axial	Diametral	Irregular
Sampling By	Date:		Failure load [kN]	1.5										1.5		
	Method:	-	Defect orientation	180°										-	-	-
Moisture content			Is [MPa]	0.23										0.23		
Moisture content ty	•		Is ₍₅₀₎ [MPa]	0.28										0.28	1	
Density (t/m ³)	As received	Dry	Lithological description	SANDST	ONE							history: nt ref.:	Test per	formed on samples	submitted to the	e laboratory.
Exploratory hole	Sample	Specimen	Sub-specimen:	S ₁	S ₂	S ₃	S ₄	S ₅	S ₆	\$ ₇	S ₈	S ₉	S ₁₀	Location test co	onducted:	Laboratory
reference	depth (m)	reference	Sub-specimen.	J ₁	52	53	54	5	J 6	37	9 8	9	510	Mean values:	Calculation exc	ludes specimens
СРСВ-ВН03	29.20		Test type:	D										which are not c	•	he tolerances
	29.40		**Compliant test:	Yes										specified in the	test method	
Lab sample ID	LPER202	2080129	Failure mode	Μ										Axial	Diametral	Irregular
Sampling By	Date:		Failure load [kN]	1.5											1.5	
B	Method:	-	Defect orientation	90°										-	-	-
Moisture content			ls [MPa]	0.24											0.24	
Moisture content ty	/pe:		Is ₍₅₀₎ [MPa]	0.29											0.29	
Density (t/m ³)	As received	Dry	Lithological description	SANDST	ONE							•	Test per	formed on samples	submitted to the	e laboratory.
			•••								Clie	nt ref.:				
Tes Definitions:	st types: A = Axial,	D = Diametral, L	. = Lump / Irregular		n/a	a = Not ap	oplicable	, ND = N	ot deterr	nined						laten gap at failure
			ne, M = Through rock mat		Along joi					, DF = Di				0		ance of the method
Cert. ref.: PS1317		-	- 22080129_Rep-2208360 : 1961 - Site:1598 - Perth	7			cimens p	•			SW			Appr	oved signatory	:
	rformed		SW	03/08	3/22		5 j	FRE								
NATA	l by:		YKent													
	THIS DOCUME		/ BE REPRODUCED IN FL	11.1			De		A state	11/	00/2022		1	Daul Kont -	Laboratory Mr	nagar
	: +61 (0)8 9441 0700		Fax: +61 (0)8 9441				E-mail:	te repor	ted: perthlab@	-	08/2022			Web:	Laboratory Ma www.golder.	_

Rocks testing - I	Determination	of point load	strength index													
Including tests on	; Axial (A), Diame	etral (D) or irre	gular Lump (L) specime	ns			TEST	REPO	RT - S	UMMA	ARY OF	ANAL	YSIS	112	JGO	LDER
AS 4133.4.1-2007																
Test request ID:	TRP22-009	5 Lab san	nple IDs: 2208013	1 - 2208	30131		Lab rep	ort ref.:		LF	PER_2208	83608			Golder Ass	ociates Pty Ltd
Client:	Causeway Link A	lliance			Proje	ct refere	nce:							PERTH G	EOTECHNICA	L LABORATORY
Client address:						Locat	ion:			Perth	n, WA					84 Guthrie Street, Osborne Park,
Project ID:	PS13	1735	Project name:				Cause	way Foo	tbridge S	Swan Riv	er					Western Australia 6017
Exploratory hole	Sample	Specimen	Sub-specimen:	S₁	S ₂	S3	S₄	S₅	S ₆	S ₇	S ₈	S9	S ₁₀	Location test co	onducted:	Laboratory
reference	depth (m)	reference	•	-	2	,	-	5		,	0	5	10	Mean values:	Calculation excl	udes specimens
СРСВ-ВН03	31.50		Test type:	Α										which are not co	,	he tolerances
	31.70		**Compliant test:	Yes										specified in the		
Lab sample ID	LPER202	2080131	Failure mode	M										Axial	Diametral	Irregular
Sampling By	Date:		Failure load [kN]	1.4										1.4		
	Method:	-	Defect orientation	180°										-	-	-
Moisture content			Is [MPa]	0.23										0.23		
Moisture content ty		Dest	Is ₍₅₀₎ [MPa]	0.28								listowy	Tost por	0.28	submitted to the	laboratory
Density (t/m ³)	As received	Dry	Lithological description	SANDST	ONE							ent ref.:	rest per	formed on samples	submitted to the	laboratory.
Exploratory hole	Sample	Specimen		•	_	•	_	•	•					Location test co	onducted:	Laboratory
reference	depth (m)	reference	Sub-specimen:	S ₁	S ₂	S ₃	S ₄	S ₅	S ₆	S ₇	S ₈	S9	S ₁₀	Mean values:	Calculation excl	udes specimens
СРСВ-ВН03	31.50		Test type:	D										which are not co		
Cr CD-Dh03	31.70		**Compliant test:	Yes										specified in the	test method	
Lab sample ID	LPER202	2080131	Failure mode	Μ										Axial	Diametral	Irregular
Sampling By	Date:		Failure load [kN]	1.1											1.1	
Samping	Method:	-	Defect orientation	90°										-	-	-
Moisture content			ls [MPa]	0.2											0.2	
Moisture content ty	/pe:		Is ₍₅₀₎ [MPa]	0.24											0.24	
Density (t/m ³)	As received	Dry	Lithological description	SANDST	ONE						ł	History:	Test per	formed on samples	submitted to the	laboratory.
			v .								Clie	ent ref.:				
Tes Definitions:	st types: A = Axial,	D = Diametral, I	. = Lump / Irregular		n/a	i = Not ap	oplicable,	, ND = No	ot deterr	nined						laten gap at failure
			-		Along joi					, DF = Di				0		
Cert. ref.: PS1317	Failure modes: B = Along bedding plane, M = Through rock matrix, J = Along joint, W = Along a plane of weakness, DF = Didn't Fail being outside of the tolerance of the method Cert. ref.: PS131735_TRP22-0095_PtLd_22080131 - 22080131_Rep-22083608 Specimens prepared by: sw Approved signatory:														oved signatory:	
	A NATA correction number 1001 Cites 1000 Both Tosts performed by: SW 02/08/22															
	NATA accred						•					8/22			FRE	
NATA	NATA accred Accredited fo	or compliance wi	th ISO/IEC 17025 - Testing				Results re	eviewed	by:	F	YKent	8/22			Flet	
	NATA accred Accredited fo	or compliance wi		JLL			Results re	eviewed te report	by:	F 11/	PKent 08/2022	8/22			Ree Laboratory Ma	-

Rocks testing - I	Determination	of point load	strength index													
Including tests on	; Axial (A), Diame	etral (D) or irre	gular Lump (L) specime	ns			TEST	REPO	RT - S	UMMA	ARY OF		YSIS		JGO	LDER
AS 4133.4.1-2007														•		
Test request ID:	TRP22-009	5 Lab san	nple IDs: 2208013	2 - 2208	0132		Lab rep	ort ref.:		LI	PER_2208	83609			Golder Ass	ociates Pty Ltd
Client:	Causeway Link A	lliance			Proje	ct refere	nce:							PERTH G	EOTECHNICA	L LABORATORY
Client address:						Locat	ion:			Perth	n, WA					84 Guthrie Street, Osborne Park,
Project ID:	PS13	1735	Project name:				Cause	way Foo	tbridge S	Swan Riv	ver					Western Australia 6017
Exploratory hole	Sample	Specimen	Sub-specimen:	S_1	S ₂	S ₃	S4	S ₅	S ₆	S ₇	S ₈	S ₉	S ₁₀	Location test co	nducted:	Laboratory
reference	depth (m)	reference			-	-	-	-	-	1	-					udes specimens
СРСВ-ВН03	32.00		Test type:	A										which are not co specified in the	,	he tolerances
	32.20	2000400	**Compliant test:	Yes												
Lab sample ID	LPER202	2080132	Failure mode	M										Axial	Diametral	Irregular
Sampling By	Date:		Failure load [kN]	0.29 180°										0.29		
Moisture content	Method:	-	Defect orientation											-	-	-
Moisture content ty	1001		ls [MPa] Is ₍₅₀₎ [MPa]	0.054										0.054 0.064		
	As received	Dry	13(50) [1411 21]	0.004								History	Test ner	formed on samples	submitted to the	laboratory
Density (t/m ³)	Asteceived	Diy	Lithological description	SANDST	ONE							ent ref.:	restper	ormed on sumples	Submitted to the	laboratory.
Exploratory hole	Sample	Specimen		-	•	-	•	-	•	•				Location test co	nducted:	Laboratory
reference	depth (m)	reference	Sub-specimen:	S ₁	S2	S ₃	S ₄	S ₅	S ₆	S ₇	S ₈	S9	S ₁₀	Mean values:	Calculation excl	udes specimens
СРСВ-ВН03	32.00		Test type:	D										which are not co		
СРСБ-БНОЗ	32.20		**Compliant test:	Yes										specified in the	test method	
Lab sample ID	LPER202	2080132	Failure mode	Μ										Axial	Diametral	Irregular
Sampling By	Date:		Failure load [kN]	0.29											0.29	
Samping	Method:	-	Defect orientation	90°										-	-	-
Moisture content			Is [MPa]	0.05											0.05	
Moisture content ty	ype:		Is ₍₅₀₎ [MPa]	0.061											0.061	
Density (t/m ³)	As received	Dry	Lithological description	SANDST	ONE						I	History:	Test per	formed on samples	submitted to the	laboratory.
											Clie	ent ref.:				
Tes Definitions:	st types: A = Axial,	, D = Diametral, I	L = Lump / Irregular		n/a	i = Not aj	oplicable	, ND = No	ot deterr	mined					• •	laten gap at failure
			ne, M = Through rock mat		Along joi					, DF = Di			1	being outsi	de of the tolera	nce of the method
Cert. ref.: PS1317			- 22080132_Rep-2208360	9		•	cimens p	•			SW	- 1- 1		Appro	oved signatory:	
A NATA correction number 1001 Site 1500 Death Totts parformed by: SW 02/02/22																
							•								tet	
NATA	Accredited for	or compliance wi	th ISO/IEC 17025 - Testing				Results r	eviewed	by:		PKent				Flet	
	Accredited for	or compliance wi		JLL			Results r	eviewed te report	by:	11/	PKent 08/2022				Haboratory Ma	_

Rocks testing - D	Determination	of point load	strength index													
Including tests on;	; Axial (A) , Diam	etral (D) or irre	gular Lump (L) specime	ns			TEST	REPO	RT - S	UMMA	ARY OF	F ANAL	YSIS	112	JGO	LDER
AS 4133.4.1-2007																
Test request ID:	TRP22-009	5 Lab san	nple IDs: 2208013	4 - 2208	30134		Lab rep	ort ref.:		LF	PER_220	83610			Golder Ass	ociates Pty Ltd
Client:	Causeway Link A	lliance			Proje	ct referei	nce:							PERTH G	EOTECHNICAI	L LABORATORY
Client address:						Locat	ion:			Perth	n, WA					84 Guthrie Street, Osborne Park,
Project ID:	PS13	1735	Project name:				Cause	way Foo	tbridge S	Swan Riv	er					Western Australia 6017
Exploratory hole	Sample	Specimen	Sub-specimen:	S₁	S ₂	S ₃	S₄	S₅	S ₆	S ₇	S ₈	Sq	S ₁₀	Location test co	onducted:	Laboratory
reference	depth (m)	reference		-	- 2	- 3	- 4	- 3	- 0	-7	- 0	- 9	- 10	Mean values:	Calculation exclu	udes specimens
СРСВ-ВН03	35.00		Test type:	Α										-	ompliant with th	ne tolerances
	35.20		**Compliant test:	Yes										specified in the		
Lab sample ID	LPER202	2080134	Failure mode	Μ										Axial	Diametral	Irregular
Sampling	Date:		Failure load [kN]											0.75		
	Method:	-	Defect orientation	180°										-	-	-
Moisture content			Is [MPa]	0.12										0.12		
Moisture content ty			Is ₍₅₀₎ [MPa]	0.15									- .	0.15	1	
Density (t/m ³)	As received	Dry	Lithological description	SANDST	ONE							History: ent ref.:	l est per	formed on samples	submitted to the	laboratory.
Exploratory hole	Sample	Specimen	Sub-specimen:	S ₁	S ₂	S ₃	S ₄	S₅	S ₆	\$ ₇	S ₈	S9	S ₁₀	Location test co	onducted:	Laboratory
reference	depth (m)	reference	Sub-specimen.	J 1	J 2	33	34	35	J ₆	37	38	J 9	J ₁₀	Mean values:	Calculation exclu	ides snecimens
	,		-		1	1									curculation chere	acs specimens
	35.00		Test type:	D											ompliant with th	'
СРСВ-ВН03	1 1 1		Test type: **Compliant test:	D Yes										which are not co specified in the	ompliant with th	'
	35.00	2080134													ompliant with th	'
CPCB-BH03 Lab sample ID By	35.00 35.20	2080134	**Compliant test:	Yes										specified in the	ompliant with th test method	ne tolerances
CPCB-BH03 Lab sample ID	35.00 35.20 LPER202	2080134	**Compliant test: Failure mode	Yes M										specified in the	ompliant with th test method Diametral	ne tolerances
CPCB-BH03 Lab sample ID By	35.00 35.20 LPER202 Date:	-	**Compliant test: Failure mode Failure load [kN] Defect orientation Is [MPa]	Yes M 0.75 90° 0.18										specified in the	ompliant with th test method Diametral	ne tolerances
CPCB-BH03 Lab sample ID Sampling	35.00 35.20 LPER202 Date: Method:	-	**Compliant test: Failure mode Failure load [kN] Defect orientation	Yes M 0.75 90° 0.18										specified in the	ompliant with th test method Diametral 0.75 -	ne tolerances
CPCB-BH03 Lab sample ID Sampling Moisture content Moisture content ty	35.00 35.20 LPER202 Date: Method:	2080134 - Dry	**Compliant test: Failure mode Failure load [kN] Defect orientation Is [MPa] Is ₍₅₀₎ [MPa]	Yes M 0.75 90° 0.18 0.2	ONE							History:	Test per	specified in the	Diametral O.75 O.18 O.2	Irregular -
CPCB-BH03 Lab sample ID Sampling Moisture content	35.00 35.20 LPER202 Date: Method:	-	**Compliant test: Failure mode Failure load [kN] Defect orientation Is [MPa]	Yes M 0.75 90° 0.18 0.2	ONE							History: ent ref.:	Test per	specified in the Axial - formed on samples	Diametral Diametral 0.75 - 0.18 0.2 submitted to the	Irregular
CPCB-BH03 Lab sample ID Sampling By Moisture content Moisture content ty Density (t/m ³)	35.00 35.20 LPER202 Date: Method: /pe: As received	- Dry	**Compliant test: Failure mode Failure load [kN] Defect orientation Is [MPa] Is ₍₅₀₎ [MPa]	Yes M 0.75 90° 0.18 0.2		a = Not ap	pplicable,	. ND = NC	Dt deterr	nined		•	Test per	specified in the Axial - formed on samples ** A non con	Diametral Diametral 0.75 - 0.18 0.2 submitted to the	Irregular - laboratory. aten gap at failure
CPCB-BH03 Lab sample ID Sampling Moisture content Moisture content ty Density (t/m ³) Definitions: Fail	35.00 35.20 LPER202 Date: Method: /pe: As received st types: A = Axial, lure modes: B = A	Dry , D = Diametral, I long bedding pla	**Compliant test: Failure mode Failure load [kN] Defect orientation Is [MPa] Is ₍₅₀₎ [MPa] Lithological description	Yes M 0.75 90° 0.18 0.2 SANDST	n/a	nt, W = A	long a pl	ane of w	veakness		Cli dn't Fail	•	Test per	specified in the Axial formed on samples ** A non con being outsi	Diametral Diametral 0.75 - 0.18 0.2 submitted to the mpliant test = pl de of the toleral	Irregular
CPCB-BH03 Lab sample ID Sampling Moisture content Moisture content ty Density (t/m ³) Definitions: Fail	35.00 35.20 LPER202 Date: Method: /pe: As received st types: A = Axial, lure modes: B = A 35_TRP22-0095_I	Dry , D = Diametral, I long bedding pla PtLd_22080134	 **Compliant test: Failure mode Failure load [kN] Defect orientation Is [MPa] Is₍₅₀₎ [MPa] Lithological description = Lump / Irregular me, M = Through rock mathematics 22080134_Rep-2208361 	Yes M 0.75 90° 0.18 0.2 SANDST	n/a	nt, W = A Spe	long a pl cimens p	ane of w	veakness by:	, DF = Die	Cli dn't Fail sw	ent ref.:	Test per	specified in the Axial formed on samples ** A non con being outsi	Diametral Diametral 0.75 - 0.18 0.2 submitted to the	Irregular - laboratory. aten gap at failure
CPCB-BH03 Lab sample ID Sampling By Moisture content Moisture content ty Density (t/m ³) Definitions: Tes Fail Cert. ref.: PS1317	35.00 35.20 LPER202 Date: Method: //pe: As received st types: A = Axial, lure modes: B = A 35_TRP22-0095_I NATA accred	Dry , D = Diametral, I long bedding pla PtLd_22080134	 **Compliant test: Failure mode Failure load [kN] Defect orientation Is [MPa] Is₍₅₀₎ [MPa] Lithological description = Lump / Irregular me, M = Through rock mate 22080134_Rep-2208361 : 1961 - Site:1598 - Perth 	Yes M 0.75 90° 0.18 0.2 SANDST trix, J = 0	n/a	nt, W = A Spe	long a pl cimens p Tests pe	ane of w repared rformed	veakness by: by:	, DF = Die sw	Cli dn't Fail sw 03/0	•	Test per	specified in the Axial Axial formed on samples ** A non cou being outsi Appro	Diametral Diametral 0.75 - 0.18 0.2 submitted to the mpliant test = pl de of the toleral	Irregular - laboratory. aten gap at failure
CPCB-BH03 Lab sample ID Sampling Moisture content Moisture content ty Density (t/m ³) Definitions: Fail	35.00 35.20 LPER202 Date: Method: /pe: As received st types: A = Axial, lure modes: B = A /35_TRP22-0095_I NATA accred Accredited for	Dry , D = Diametral, I long bedding pla PtLd_22080134 ditation number or compliance wi	**Compliant test: Failure mode Failure load [kN] Defect orientation Is [MPa] Is ₍₅₀₎ [MPa] Lithological description . = Lump / Irregular ine, M = Through rock mat 22080134_Rep-2208361 : 1961 - Site:1598 - Perth th ISO/IEC 17025 - Testing	Yes M 0.75 90° 0.18 0.2 SANDST trix, J = 0	n/a	nt, W = A Spe	long a pl cimens p Tests pe Results r	ane of w repared rformed eviewed	veakness by: by: by: by:	, DF = Die sw F	Cli dn't Fail sw 03/0 ?Kent	ent ref.:	Test per	specified in the Axial formed on samples ** A non con being outsi Appro	Diametral Diametral 0.75 0.18 0.2 0.18 0.2 0.18 0.2 0.19 0.19 0.2 0.19 0.19 0.2 0.19 0.2 0.19 0.2 0.2 0.2 0.19 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2	laboratory.
CPCB-BH03 Lab sample ID Sampling By Moisture content Moisture content ty Density (t/m ³) Definitions: Tes Fail Cert. ref.: PS1317	35.00 35.20 LPER202 Date: Method: /pe: As received st types: A = Axial, lure modes: B = A /35_TRP22-0095_I NATA accred Accredited for	Dry , D = Diametral, I long bedding pla PtLd_22080134 ditation number or compliance wi NT SHALL ONLY	 **Compliant test: Failure mode Failure load [kN] Defect orientation Is [MPa] Is₍₅₀₎ [MPa] Lithological description = Lump / Irregular me, M = Through rock mate 22080134_Rep-2208361 : 1961 - Site:1598 - Perth 	Yes M 0.75 90° 0.18 0.2 SANDST trix, J = 0	n/a	nt, W = A Spe	long a pl cimens p Tests pe Results r	ane of w repared rformed eviewed te report	veakness by: by: by: ted:	, DF = Die sw F	Cli dn't Fail sw 03/0 PKent 08/2022	ent ref.:	Test per	specified in the Axial formed on samples ** A non con being outsi Appro	Diametral Diametral 0.75 - 0.18 0.2 submitted to the mpliant test = pl de of the toleran oved signatory:	Irregular Irregular Interpretation Iaboratory. Iabora

Rocks testing - I	Determination	of point load	strength index													
Including tests on	; Axial (A) , Diam	etral (D) or irre	gular Lump (L) specime	ns			TEST	REPO	RT - S	UMMA	ARY OF	ANAL	YSIS	112	JGC	LDER
AS 4133.4.1-2007																
Test request ID:	TRP22-009	5 Lab san	nple IDs: 2208013	6 - 2208	30136		Lab rep	ort ref.:		LF	PER_2208	3611			Golder As	sociates Pty Ltd
Client:	Causeway Link A	lliance			Proje	ct refere	nce:							PERTH G	EOTECHNICA	L LABORATORY
Client address:						Locat	ion:			Perth	n, WA					84 Guthrie Street, Osborne Park,
Project ID:	PS13	1735	Project name:				Cause	way Foo	tbridge S	Swan Riv	er					Western Australia 6017
Exploratory hole	Sample	Specimen	Sub-specimen:	S ₁	S ₂	S3	S ₄	S₅	S ₆	S7	S ₈	S9	S ₁₀	Location test co	onducted:	Laboratory
reference	depth (m)	reference	-		-	-	-	5	, ,		•		10			ludes specimens
СРСВ-ВН03	37.00		Test type:	Α										which are not c	,	he tolerances
	37.20		**Compliant test:	Yes										specified in the		
Lab sample ID	LPER202	2080136	Failure mode	M										Axial	Diametral	Irregular
Sampling By	Date:		Failure load [kN]											0.79		
	Method:	-	Defect orientation	180°										-	-	-
Moisture content			Is [MPa]	0.13										0.13		
Moisture content ty	•	-	Is ₍₅₀₎ [MPa]	0.16								• •		0.16	1	
Density (t/m ³)	As received	Dry	Lithological description	SANDST	ONE							istory: nt ref.:	l est per	formed on samples	submitted to the	e laboratory.
Exploratory hole	Sample	Specimen			-		•	-		_				Location test co	onducted:	Laboratory
reference	depth (m)	reference	Sub-specimen:	S ₁	S ₂	S ₃	S ₄	S₅	S ₆	S ₇	S ₈	S9	S ₁₀	Mean values:	Calculation exc	ludes specimens
СРСВ-ВН03	37.00		Test type:	D										which are not c		
CPCD-DH05	37.20		**Compliant test:	Yes										specified in the	test method	
Lab sample ID	LPER202	2080136	Failure mode	Μ										Axial	Diametral	Irregular
Sampling By	Date:		Failure load [kN]	0.49											0.49	
Sampling	Method:	-	Defect orientation	90°										-	-	-
Moisture content			Is [MPa]	0.089											0.089	
Moisture content ty	ype:		Is ₍₅₀₎ [MPa]	0.11											0.11	
Density (t/m ³)	As received	Dry	Lithological description	ςδνήςτ	ONE						н	istory:	Test per	formed on samples	submitted to th	e laboratory.
			Littleiogical acscription	5/11251							Clier	nt ref.:				
Tes Definitions:	st types: A = Axial,	D = Diametral, I	L = Lump / Irregular		n/a	a = Not ap	plicable,	, ND = N	ot deterr	nined					• •	laten gap at failure
	lure modes: B = A	long bedding pla	nne, M = Through rock mat	trix, J =	Along joi	nt, W = A	long a pl	ane of w	veakness	, DF = Di	dn't Fail			being outsi	de of the tolera	ance of the method
Cert. ref.: PS1317	/35_TRP22-0095_I	PtLd_22080136	- 22080136_Rep-2208361	1		Spe	cimens p	repared	by:		SW			Appr	oved signatory	:
			02/00	122												
	NATA accred	ditation number	: 1961 - Site:1598 - Perth				Tests pe	rformed	by:	SW	03/08	/22			P.F.	
NATA	Accredited fo	or compliance wi	th ISO/IEC 17025 - Testing	-			Tests pe Results re				03/08 Kent	/22			Flet	
	Accredited fo	or compliance wi		-			Results re		by:	F		/ 22			Fee Laboratory Ma	anager

Rocks testing - D	Determination	of point load	strength index													
Including tests on	; Axial (A) , Diam	etral (D) or irre	gular Lump (L) specime	ns			TEST	REPO	RT - SI	UMMA	ARY OF	ANAL	YSIS		JGO	LDER
AS 4133.4.1-2007														•		
Test request ID:	TRP22-009	5 Lab sam	ple IDs: 2208013	7 - 2208	80137		Lab rep	ort ref.:		LF	PER_2208	3612			Golder Ass	ociates Pty Ltd
Client:	Causeway Link A	lliance			Proje	ct refere	nce:							PERTH G	EOTECHNICA	L LABORATORY
Client address:						Locat	ion:			Perth	n, WA					84 Guthrie Street, Osborne Park,
Project ID:	PS13	1735	Project name:				Cause	way Foo	tbridge S	Swan Riv	er					Western Australia 6017
Exploratory hole	Sample	Specimen	Sub-specimen:	S₁	S ₂	S3	S₄	S₅	S ₆	S ₇	S ₈	S9	S ₁₀	Location test co	onducted:	Laboratory
reference	depth (m)	reference	•	-	-		-			,	U I		10	Mean values:	Calculation exclu	udes specimens
СРСВ-ВН03	38.80		Test type:	Α										which are not co	,	ne tolerances
	39.00		**Compliant test:	Yes										specified in the	1	
Lab sample ID	LPER202	2080137	Failure mode	M										Axial	Diametral	Irregular
Sampling By	Date:		Failure load [kN]	0.86										0.86		
	Method:	-	Defect orientation	180°										-	-	-
Moisture content			Is [MPa]	0.12										0.12		
Moisture content ty		David	Is ₍₅₀₎ [MPa]	0.15									T	0.15	a de contra e de contra de co	la ha casta ca
Density (t/m ³)	As received	Dry	Lithological description	SANDST	ONE							history: nt ref.:	l est per	formed on samples	submitted to the	laboratory.
Exploratory hole	Sample	Specimen												Location test co	nducted:	Laboratory
reference	depth (m)	reference	Sub-specimen:	S ₁	S ₂	S ₃	S ₄	S ₅	S ₆	S ₇	S ₈	S ₉	S ₁₀	Mean values:		,
	38.80		Test type:	D										which are not co		
CPCB-BH03	39.00		**Compliant test:	Yes										specified in the	test method	
Lab sample ID	LPER202	2080137	Failure mode	Μ										Axial	Diametral	Irregular
By	Date:		Failure load [kN]	0.53											0.53	
Sampling	Method:	-	Defect orientation	90°										-	-	-
Moisture content			ls [MPa]	0.095											0.095	
Moisture content ty	/pe:		ls ₍₅₀₎ [MPa]	0.11											0.11	
Density (t/m ³)	As received	Dry	Lithological description	SANDST	ONE						F	listory:	Test per	formed on samples	submitted to the	laboratory.
			Enthological description	SANDST							Clie	nt ref.:				
Tes Definitions:	st types: A = Axial,	D = Diametral, L	. = Lump / Irregular		n/a	i = Not ap	oplicable	, ND = No	ot deterr	nined						aten gap at failure
	lure modes: B = A	long bedding pla	ne, M = Through rock mat	trix, J = /	Along joi	nt, W = A	long a pl	lane of w	veakness	, DF = Die	dn't Fail			being outsi	de of the tolera	nce of the method
Cert. ref.: PS1317	35_TRP22-0095_I	PtLd_22080137 -	22080137_Rep-2208361	2		Spe	cimens p	repared	by:		SW			Appro	oved signatory:	
			: 1961 - Site:1598 - Perth				Tests pe	rformed	by:	SW	03/08	3/22			FRet	
NATA	Accredited fo	or compliance wi	th ISO/IEC 17025 - Testing	5			Results r	eviewed	by:	P	YKent			10 A		
			BE REPRODUCED IN FU				Da	te repor			08/2022			Paul Kent -	Laboratory Ma	nager
Phone	+61 (0)8 9441 0700	C	Fax: +61 (0)8 9441	0701			E-mail:	I	perthlab@	golder.co	om.au			Web:	www.golder.c	om.au

Soils	testi	ng - Pa	rticle	size di	stribution 8	& consistency	limits test	report				
Stand	lard n	nethod	(by sie	ving)						\\ \	GOI	DER
AS12	89.3.6	5.1, 2.1.	1, 3.1.	2, 3.2.1 ,	3.3.1 & 3.4	.1						
Test r	eques	t #:		TRP22	-0095	Specimen ID:	LPE	R202208010			Golder Asso	ciates Pty Ltd
Client	:		Cause	way Link	Alliance					PERTH GE	OTECHNICAL	LABORATORY
Client	addre	ess:										84 Guthrie Street,
Projec	t ID:			PS13	1735			Explorator	y Hole		W	Osborne Park, estern Australia 6017
			-							Sample	depth (m): 6.	50 - 6.95
Projec	t nam	ie:	Cause	way Foot	bridge Swan I	River		CPCB-B	H01	Client	sample ref:	
Projec	t refe	rence:						L	oc. ref.:		Perth, WA	
				Specime	n description:	:				Sampling:	Tested as recei	ved
PAR	TICLE	SIZE DIS	TRIBUT	ION	AS 1289.3.6.1	(CH/MH) Sandy CLAY	//SILT, high plasti	city, dark grey, fi	ne to	Easting (m) Northing (m) Level (m)
Sieve	e Size	Passir	ng	LB S	UB S	coarse grained sand.						
12	.5 mm	100%	6			Method:	AS 1289.2.1.1	AS 1289.3.1.2	AS 1289.3	.2.1 AS 1289.3	3.1 AS	1289.3.4.1
7	′5 mm	100%	6				D.d.a. interne	1 point	Diant	a Diastia		Curling/
6	53 mm	100%	6				Moisture content	Liquid	Plasti limit			Crumbling/
5	53 mm	100%	6				content	limit		inde/	Jinnikage	Cracking
37.	.5 mm	100%	6			Result:	65.0%	62%	31%	31%	9.5%	None
26.	.5 mm	100%	6			Result.	As Rcvd.	0270	5170	5170	5.570	None
1	.9 mm	100%	6			LB S:						-
13.	.2 mm	100%	6			UB S:		1				-
9.	.5 mm	100%	6			Att. preparat	ion method:	Dry s	ieved	LS	M length (mm):	125
6.	.7 mm	100%	6			Specimen	Compliance check	AS 1289.1.1 - Claus	e 5.7 - Table	1 - OK		
4.7	′5 mm	100%	6			history/notes:	Preparation of spe	cimen and testing p	performed or	sample supplied to	the laboratory	
2.3	6 mm	100%	6									
1.1	.8 mm	99%	5			Definitions:	LB S = Lower bo LSM = Linear sh	und specificatior rinkage mould	١	N/A = Not ND = Not d	applicable etermined; SIB = Slip	in bowl
60)0 μm	96%	6				UB S = Upper bo	ound specificatio	n	NO = Not c	btainable; NP = Nor	plastic
	25 μm	93%							DING SU	MMARY		
)0 μm	90%				Fines		Sand*		Gravel*		Cobbles*
	.2 μm	83%				(<75 μm)	(>75 µ	.m - <2.36 mi	m) (>2	2.36 mm - <6	3 mm) (>63n	nm - <200 mm)
	i0 μm	70%				35.1%		64.9%	*	0.0% Proportions based	on auidance in AS172	0.0% 6-2017 Section 6.1.4.2
7	′5 μm	35%	5									
	100%					PARTICLES					•	
	90%											
	80%											
ing	70%					1						
Percentage passing	60%											
itage	50%											
rcen	40%											
Pe	30%		•									
	20%											
	10%		•									
	0%	001		0.01		0.1	1		10		100	1000
	01	CLAY		SILT FRA			RACTION	GF	RAVEL FRACT			ILDERS
			FINE	MEDIU		FINE MEDI		FINE	MEDIUM	COARSE	200	600
Divisi	ons based	0.002 d on AS1289,		0.006 tion based on		0.075 0.2 Par	^{0.6} ticle size (mm)	2 6		20 60	200	600
Testing	g by:		DP	1	Dates: 09/0	8/22 - 10/08/22	Results	reviewed by:	F	PKent	Date reported:	11/08/2022
Cert	:. ref.:	PS1317	35_СРС	CB-BH01	TRP22-0095_	_PSD_2208010_R	ep22083588			Арр	roved signatory	
/	1					nber: 1961 - Site:					P.C	
NA	TA		Ac	credited	for compliand	e with ISO/IEC 17	7025 - Testin	5			i at	
						ONLY BE REPRO					- Laboratory Ma	
F	hone:	+61 (0)8	9441 07	700	Fax: +61 (0)8	9441 0701 E-I	mail:	perthlab@gold	er.com.au	J W	eb: www.	golder.com.au

Soils	testi	ng - Pa	rticle	size dis	tribution 8	& consis	tency	limit	s test	report			•			
Stand	lard n	nethod	(by sie	ving)								112		GO		ER
AS12	89.3.6	5.1, 2.1.	1, 3.1.	2, 3.2.1,	3.3.1 & 3.4	.1										
Test r	eques	t #:		TRP22	-0095	Specir	nen ID:		LPE	R202208014			Go	older Asso	ciates F	۲y Ltd
Client	:		Cause	way Link	Alliance							PERTH G	EOT	ECHNICAL	LABOR	ATORY
Client	addre	ess:														nrie Street,
Projec	t ID:			PS132	L735					Explorator	ry Hole			V	Osb estern Aust/	orne Park, tralia 6017
Droio			Courses		bridge Swop I	Divor					01101	Samp	le de	pth (m): 17	- 00.	17.45
Projec	Lindii	le.	Causer	way root	bridge Swan I	Aivei				CPCB-B		Clien	t san	nple ref:		
Projec	t refe	rence:								L	.oc. ref.:			Perth, WA		
			9	Specime	n description:	:						Sampling	: Tes	ted as recei	ved	
PAR	TICLE	SIZE DIS	TRIBUT	ION	AS 1289.3.6.1			ic fines	, greyish	brown, fine to m	edium	Easting (m)	Northing	m) Lev	vel (m)
Sieve	e Size	Passi	ng	LB S	UB S	grained sar	nd.									
12	!5 mm	1009	6			N	lethod:	AS 12	89.2.1.1	AS 1289.3.1.2	AS 1289.3	8.2.1 AS 1289	.3.3.1	AS	1289.3.4.1	
7	′5 mm	1009	6					Mo	isture	1 point	Plasti	ic Plasti	citv	Linear	Curl	ing/
6	53 mm	1009	6						ntent	Liquid	limit		•	shrinkage	Crum	-
5	53 mm	1009	6							limit					Crac	King
37.	.5 mm	1009	6				Result:		8.3%	SIB	NP	NE)			
26.	.5 mm							As	Rcvd.							
1	.9 mm	1009	6				LB S:								-	-
	.2 mm						UB S:								-	-
9.	.5 mm					Att. p	reparati	ion m	ethod:	Dry s	ieved	L	.SM le	ength (mm):		
	.7 mm					Sp	ecimen			AS 1289.1.1 - Claus						
	'5 mm					history	/notes:	Prepara	tion of spe	cimen and testing	performed or	n sample supplied	to the la	aboratory		
	86 mm							185-	Lower bo	und specification	0	N/A = No	t appli	cable		
	.8 mm					Defi	nitions:			rinkage mould				nined; SIB = Sli	in bowl	
)0 μm	99%						UBS=	Upper b	ound specificatio			obtair	able; NP = Nor	plastic	
	25 μm	97%									DING SU	JMMARY	r.		~ · · · · *	
	00 μm	92%					ines		() 7F (Sand*	···) (5)	Gravel			Cobbles*	
	.2 μm	84%					′5 μm) 5.8%		(>/5 [um - <2.36 m 64.2%	m) (>.	<mark>2.36 mm - <</mark> 0.0%	63 M	m) (>63n	1m - <200 0.0%	J mm)
	i0 μm 15 μm	68% 36%					5.678			04.270	*		ed on g	uidance in AS172		ion 6.1.4.2
/	<u> </u>	3070)			ΡΔΕ	RTICLE S	IZE D	STRIBI	ITION						
	100%							~~~					f°	•		
	90%												l			
	80%												l			
sing	70%					1							l			
Percentage passing	60%												l			
ntag	50%															
ercei	40%															
Ā	30%															
	20%															
	10%				-											
	0% 0.0	001		0.01		0.1			1		10		10	0	100	00
		CLAY		SILT FRA			SAND FR				RAVEL FRACT		COE	BLES BOU	ILDERS	
		0.002	FINE	0.006		0.075	0.2	0.6	COARSE	2 6	MEDIUM	20 6	0	200	600	
Divisi	ons based			ion based on					ze (mm)				-	200	000	
Testing	g by:		DP	[Dates: 09/0	8/22 - 09/0	08/22		Results	reviewed by:	I	PKent	D	ate reported:	11/08	/2022
Cert	:. ref.:	PS1317	35_CPC	B-BH01	TRP22-0095_	PSD_220	8014_R	ep220	83589			Ар	prove	ed signatory		
					editation nun								Ŧ	25		
NA	TA				for compliand											
					ENT SHALL C									boratory Ma	-	0123
F	none:	+61 (0)8	9441 07	00	Fax: +61 (0)8	9441 0701	. E-r	nail:		perthlab@golc	er.com.a	u	Web:	WWW.	golder.con	n.au

Soils	testi	ng - Pa	rticle	size d	istribut	ion 8	& cor	sistency	ı lir	nits	test	report		• • •		~ ~			
Stand	lard n	nethod	(by sie	eving)											יור	GΟ	LI	DE	R
AS12	89.3.6	.1, 2 .1.	1, 3.1.	. 2, 3.2. 1	L, 3.3.1 8	& 3.4	.1												
Test re	eques	: #:		TRP22	2-0095		Sp	ecimen ID	:		LPE	R2022080	15		G	iolder Ass	ociat	tes Pty	Ltd
Client	:		Cause	way Lin	k Alliance									PER	TH GEO	TECHNICA	L LAE	BORATO	ORY
Client	addre	ss:															8	4 Guthrie S Osborne	
Projec	t ID:			PS13	1735							Explorat	tory Hole				Wester	rn Australia	
Projec	t nam	e:	Cause	way Foo	otbridge S	Swan I	River					СРСВ	-BH01		Sample d	epth (m):	26.50	-	
			00000												Client sa	mple ref:			
Projec	t refe	rence:		C									Loc. ref.	1		Perth, W			
DAD					AS 1289.3									-		ested as rec			
Sieve		SIZE DIST		LBS	AS 1289.5		(SC) C plastic	layey SAND, f city.	ine to	o medi	ium grai	ned, brownis	h grey, high	Eas	sting (m)	Northing	; (m)	Level	(m)
		Passir	-	LD 3	U	> >		Method		AS 1289		AS 1289.3.1.	2 AS 1289.	2.2.1	AS 1289.3.3.1		AS 1289.3	2.4.1	
	5 mm	100%						Wethou	. /	45 1265	9.2.1.1			.5.2.1	AS 1269.3.3.1		45 1269.		
	5 mm	100%							1	Vioist	ture	1 point	Plast	tic	Plasticity	Linear		Curling	
	3 mm	100%								cont	ent	Liquid limit	limi	it	index	shrinkag	2	Crumblin Cracking	-
	3 mm	1009																crucking	ь
	5 mm	100%						Result	::	33.8		71%	289	6	43%	13.5%		None	
	5 mm	100%								As Ro	cva.								
	9 mm	100%						LB S										-	
	2 mm	100%						UBS										-	
9.	5 mm	100%					At	tt. prepara	tior	n mei	thod:	Dr	y sieved		LSM	length (mm):	125	
	7 mm	100%						Specime					lause 5.7 - Tabl						
	5 mm	100%					hist	tory/notes	Pre	eparatio	on of spe	cimen and testi	ng performed o	on sample s	supplied to th	e laboratory			
	6 mm	100%								6 - 1 -	warba	und energifier	tion	N	/4 - Not any	licabla			_
1.1	8 mm	100%						Definitions				und specifica inkage moul			/A = Not app D = Not dete	ermined; SIB = S	lip in bo	owl	
	0 μm	99%	5						UE	3 S = U	pper bo	und specifica	ition	N	O = Not obta	ainable; NP = N	on plas	tic	_
	5 µm	44%										-		-					
	0 µm	26%						Fines				Sand*			iravel*			bles*	
	2 µm	24%						(<75 μm)		(>75 μ	m - <2.36	mm) (>		1m - <63 I	nm) (>63		<200 m	m)
	0 μm	23%						21.3%				78.7%			0.0%	guidance in AS1		0% 7 Section 6	1.4.2
7	5 μm	21%	5						617		TDIDI					<u> </u>			
	100% ·							PARTICLE	3121										
	90%									1		İ							
	80%																		
ing	70% -																		
pass	60% ·					-			- 1			1							
tage	50%																		
Percentage passing	40%								ľ										
Ре	30%											-							
	20% ·																		
	10%																		
	0%																		
	0.0)01		0.01 SILT FR	ACTION		0.1	SAND	FRAC	ΓΙΟΝ	1		10 GRAVEL FRAC	TION		100 OBBLES B	OULDER	1000 s	
		CLAY	FINE	MEDI	им с	OARSE	F		NUM	0	COARSE	FINE	MEDIUM	1 CO	ARSE				
Divisio	ons based	0.002 on AS1289,		0.006 tion based o	0.02 n AS1726		0.075	0.2 Pa	rticl	0.6 e size	(mm)	2	6	20	60	200	60	0	
Testing)	DP		Dates:	12/0	8/22 -	13/08/22			. ,	reviewed k	y:	PKent		Date reporte	d: 1	15/08/20	22
	. ref.:	PS1317	35_CP0	CB-BH01	_TRP22-	0095	PSD	2208015_	Rep	2208	3734				Appro	ved signator	y:		
								1961 - Site									-		
NA	TA							n ISO/IEC 1							-	Het			
			THIS	DOCUN	/IENT SH	ALL (ONLY	BE REPRO	DU	JCED	IN FL	JLL		Pau	ul Kent - L	aboratory N	lanag	er	a
								0701 E	-ma				older.com.a		Wel	-	-		1SS

Soils	testi	ng - Pa	rticle	e size	dist	tribu	tion 8	& c	onsisten	cy l	imi	ts test	report					~		D	
Stand	ard n	nethod	(by sie	eving))											115		G		. D	ER
AS128	39.3.6	5.1, 2 .1.	1, 3.1	2, 3.2	2.1,	3.3.1	& 3.4	.1													
Test re	ques	t #:		TRP	22-	0095	;		Specimen	ID:		LPE	R2022080	016			G	older	Assoc	iates	Pty Ltd
Client:			Cause	eway L	.ink A	Allianc	е									PERTH G	EOT	ECHN	ICAL L	ABOR	ATORY
Client	addre	ss:																			hrie Street,
Projec	t ID:			PS	131	735							Explora	tory Ho	ole				We		borne Park, stralia 6017
Projec	t nam	e:	Cause	eway F	ootb	oridge	Swan	Rive	er				CPCE	B-BHO	2			epth (m mple re	-	- 00	14.45
Projec	t refe	rence:												Loc.	ref.:	Clier	it sar	•	n, WA		
				Speci	men	descr	iption	:								Sampling	: Te			ed	
PART		SIZE DIS		-		AS 1289.	-		/) Silty SAND,	fine	o me	dium grai	ned dark gre	v non-pla	astic	Easting (1	thing (n		evel (m)
Sieve	Size	Passir	ng	LB S	S	U	B S	fine						,,			. ,		01		. ,
12	5 mm	100%	6						Meth	od:	AS 1	289.2.1.1	AS 1289.3.1	.2 AS	1289.3.	2.1 AS 1289	9.3.3.1		AS 1	289.3.4.1	
7	5 mm	100%	6										1 poin	t						Cur	ling/
63	3 mm	100%	6									oisture	Liquid	P	Plastie				ear		ibling/
5	3 mm	100%	6								со	ntent	limit		limit	ind	ex	shrin	kage	Cra	cking
	5 mm	100%									2	7.5%						-			
	5 mm	100%							Res	ult:		Rcvd.	SIB		NP	N	D				
	9 mm	100%							L	B S:											-
	2 mm	100%								B S:											_
	5 mm	100%							Att. prepa		on m	nethod:	D	ry sieve	h		LSM I	ength ((mm):		
	7 mm	1007									•			,					,,.		
	5 mm	1007							Specin	nen			AS 1289.1.1 - (ecimen and tes			- OK sample supplied	to the	laboratory			
	5 mm 6 mm	1007						h	history/no	tes:								,			
										-	LB S =	Lower br	ound specific	ation		N/A = No	ot appli	icable			
	8 mm	99%							Definitio	ons:	LSM =	ELinear sh	nrinkage mou	ld		ND = Not	t deter	mined; S			
	0 μm -	97%									UB S =	= Upper b	ound specific				t obtai	nable; N	P = Non	plastic	
	5 μm	93%							E in a	_				KADIN	G 30	MMARY	*			obbles	*
	0 μm	84%							Fines			(> 75 -	Sand*		1.7	Gravel					
	2 μm 0 um	72% 55%							(<75 μι 24.1%			(>/>	um - <2.36 75.9%	mm)	(>2	- < .36 mm - <		im)	(>03111	m - <20 0.0%	o mm)
	5 μm	24%						F	2-7.17	0			73.370		*F	Proportions bas		guidance i	n AS1726		tion 6.1.4.2
		24/0	, L					-	PARTIC	LE SI	ZE D	ISTRIB	JTION								
	100%														— —	••••	Î				
	90% ·																				
	80%																1				
sing	70% -																1				
e pas	60% ·			+		• • •															
Percentage passing	50%																				
rcen	40%																				
Ре	30%																				
	20%							Ţ													
	10% ·						-														
	0%																				
	0.0)01).01 T FRACT	TION			0.1 SA	ND FR/		1		GRAVEL	LO FRACTI	ON	1	00 BBLES	BOUL		00
		CLAY	FINE	M	IEDIUM		COARSE		FINE	MEDIU	м	COARSE	FINE	ME	DIUM	COARSE					
Divisio	ins hase	0.002 0.002 on AS		0.006 ation base	ed on A	0.02 \$1726		0.075	5 0.2	Parti	0.6 icle si	ize (mm	2	6		20 6	60	20	0	600	
Testing		5	dp			ates:	09/0	8/22	2 - 09/08/2				, s reviewed	by:	S	Wai	C	Date rep	orted:	11/0	8/2022
	. ref.:	PS1317		CB-BH			-		D_220801		p22			-				ed sign			
									r: 1961 - S								~		- 11		
NA'	TÀ								vith ISO/IE								+	let			
			THIS	DOC	UME	NT SI	HALL (JNL	Y BE REP	ROE	DUCE	ED IN F	ULL			Paul Ken	nt - La	borato	ry Mai	nager	0
Р	hone:	+61 (0)8	9441 0	700		Fax: +	61 (0)8	944	1 0701	F-n	nail:		perthlab@	older.co	om.au		Web:		www.g	older.co	mau

Soils	testi	ng - Pa	rticle	e size	dist	ribut	ion 8	k co	nsister	ncy	lim	its t	est	report	t		•••		•	~ ~			
Stand	ard n	nethod	(by sie	eving)															GC		DE	= R
AS128	89.3.6	5.1, 2.1.	1, 3.1	.2, 3.	2.1, 3	3.3.1 8	& 3.4	.1															
Test re	eques	t #:		TRP	22-0	0095		S	pecime	n ID:			LPEF	R20220	8017				Go	older As	socia	ites P	ty Ltd
Client	:		Cause	eway l	_ink A	lliance											PEF	RTH G	EOT	ECHNIC	AL LA	BORA	TORY
Client	addre	ess:																					rie Street,
Projec	t ID:			PS	131	735								Explo	rator	y Hole					West		orne Park, ralia 6017
Projec	t nam	e:	Cause	ewav F	ootb	oridge S	wan	River						СРС	B-B	H02		Samp	le de	pth (m):	21.50) -	21.95
				,		0												Clien	t san	nple ref:			
Projec	t refe	rence:		<u>Creat</u>		descri										oc. ref.:	1	e e li e a	. To	Perth, V sted as re		J	
DAP		SIZE DIS				AS 1289.3											-						
Sieve		Passir		LB		UE		1	Silty SANE	D, fine	to m	edium	n graine	ed, yellow	ish bro	own, non-	Ed	sting (m)	Northi	ng (m)	Lev	el (m)
			-	LD .	3	UL			Met	hod	٨٩	1289.2	011	AS 1289.	317	AS 1289.	3 7 1	AS 1289	221		AS 128	9341	
	5 mm								IVIEL	ilou.	~5	1205.2				AS 1205.	5.2.1	A3 1285	.3.3.1		AS 120		
	5 mm										м	oistu	ıre	1 poi Liqu		Plast	tic	Plasti	city	Linea	r	Curliı Crumb	-
	3 mm 2										C	onte	nt	limi		limi	t	inde	ex	shrinka	ge	Crack	-
	3 mm										-	77.40	2/										
	5 mm								Re	sult:		27.49 s Rcv		SIE	}	NP		NE)				
	5 mm	100%								Бς.	~	5 1.00	/u.										
	9 mm 2									LB S: JB S:												-	
	2 mm	100%							Att. prep		ion	math	and .		Druc	ieved			CNA L	ength (m		-	
	5 mm -							-	All, hieh	arat		neu	100.		DIYS	leveu			.31111	engui (in			
	7 mm								Speci	men						e 5.7 - Table performed c		cupplied	to the l	aboratory			
	5 mm							hi	story/no	otes:	riepa	aration	or spec	unien anu i	esting p	Jenonneu c	in sample	e supplieu	to the i	aboratory			
	6 mm										LB S	= Low	/er boi	und specif	ication	1	1	N/A = No	t appli	cable			
	8 mm								Definiti	ons:	LSM	= Line	ear shr	inkage m	ould		1	ND = Not	deteri	mined; SIB :			
	0 μm -	97%									UB S	5 = Upj	per bo	und speci					: obtair	nable; NP =	Non pla	stic	
	5 μm	72%								_				C	GRA	DING SI			*		0	*	
	0 μm	31%							Fine			1.	75	Sand*				Gravel				bbles*	
	2 μm	20%							(<75 μ 13.3			<)	·75 μι	m - <2.3 86.7%		m) (>	2.36 ľ	2 - nm 0.0%	63 m	m) (>		- <200).0%	mm)
	0 μm 5 μm	16% 13%							15.5	/0				00.770			*Proport		ed on g	uidance in A.			on 6.1.4.2
		1570) 					<u> </u>	PARTIC	CLE S	IZE I	DIST	RIBU	TION									
	100%										1		-						Î	•			
	90% ·										7			1					l				
	80% ·										1			1					l				
sing	70% -										Ĩ								l				
Percentage passing	60%									-1									l				
ntage	50% -																						
ercer	40% ·																			I			
Pe	30% ·			-						1													
	20%																						
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	0%	001).01			0	1				1			10			10	0		1000	
	0.0	CLAY			T FRACT	TION				AND FR	ACTIC	DN			GF	RAVEL FRAC	TION		· · · · · · · · · · · · · · · · · · ·	BBLES	BOULDE		í l
			FINE	_	IEDIUM		OARSE		FINE	MEDIU		l	DARSE	FIN		MEDIUM	_	OARSE					
Divisio	ons based	0.002 on AS1289,		0.006 ation base	ed on As	0.02 \$1726		0.075	0.2	Part	0. : icle	.6 size (mm)	2	6		20	e	60	200		500	
Testing	; by:		DP		Da	ates:	09/0	8/22	- 09/08/2	22		Re	sults	reviewe	d by:		SWai		D	ate report	ed:	11/08/	2022
Cert	. ref.:	PS1317	35_CP	CB-BH	102_T	RP22-	0095_	PSD	220801	L7_R	ep22	2083	591					Ар	prove	ed signat	ory:		
	1		N	IATA a	accre	ditatio	n nun	nber	: 1961 -	Site:	1598	8 - Pe	erth						5	0 0			
NA	TA		Ac	ccredi	ted fo	or com	plianc	e wi	th ISO/IE	C 17	025	- Te	sting						+	let			
			THIS	DOC	UME	NT SH	ALL C	DNL	/ BE REF	PROI	DUC	ED I	IN FL	JLL			Ра	ul Ken	t - La	boratory	Mana	ger	
D	hone.	+61 (0)8	9441 0	700		Fax: +6	1 (0)8	9441	0701	E-r	nail:		p	erthlab(apold	er.com.a	au -		Web:	14/1	ww.gol	der.com	

Soils t	esti	ng - Pa	rticle	e sizo	e dis	tribu	tion 8	& co	onsister	ncy	imi	s test	report		• • •			
Standa	rd m	ethod ((by sie	eving	g)										11.		GOI	LDER
AS128	9.3.6	.1, 2.1.	1, 3.1	.2, 3	.2.1,	3.3.1	& 3.4	.1										
Test ree	quest	:#:		TR	P22-	009	5	9	Specimer	n ID:		LPE	R20220801	8		G	older Asso	ciates Pty Ltd
Client:			Cause	eway	Link A	Alliand	e								PERT	H GEOT	ECHNICAL	LABORATORY
Client a	ddre	ss:																84 Guthrie Street
Project	ID:			PS	5131	735							Explorate	ory Hole	1		W	Osborne Park estern Australia 6017/
			~				6	. .					0000	DUOD	S	ample de	epth (m): 24	.50 - 24.95
Project	nam	e:	Cause	eway	Foot	oridge	Swan	Rivei	ſ				CPCB-	BH02		Client sar	nple ref:	
Project	refe	rence:											L	Loc. ref.	-		Perth, WA	
				Spec	cimen	desci	iption	:							Samp	oling: Te	sted as recei	ved
PART	CLE S	SIZE DIST	FRIBU	TION		AS 1289	.3.6.1	(SM) Silty SAND	, fine	to coa	rse graine	ed, brownish gr	ey, non-	East	ing (m)	Northing (m) Level (m)
Sieve	Size	Passir	ng	LB	S	U	IB S	plas	tic fines.									
125	mm	100%	6						Meth	nod:	AS 1	289.2.1.1	AS 1289.3.1.2	AS 1289.	3.2.1 A	S 1289.3.3.1	AS	1289.3.4.1
75	mm	100%	6										1 point	Disc				Curling/
63	mm	100%	6									isture ntent	Liquid	Plast		lasticity index	Linear shrinkage	Crumbling/
53	mm	100%	6										limit			mucx	Shiringe	Cracking
37.5	mm	100%	6						Ree	sult:	2	4.6%	SIB	NF		ND		
26.5	mm	100%	6						ne.	suit.	As	Rcvd.	510			ND		
19	mm	100%	6						L	B S:								-
13.2	mm	100%	6						U	B S:			I					-
9.5	mm	100%	6					1	Att. prep	arati	on m	ethod:	Dry	sieved		LSM I	ength (mm):	
6.7	mm	99%	5						Specii	mon	Compli	ance check	: AS 1289.1.1 - Cla	use 5.7 - Tabl	e 1 - OK			
4.75	mm	99%	,)					hi	story/no		Prepar	ation of spe	ecimen and testir	g performed o	on sample su	upplied to the	laboratory	
2.36	mm	98%	,)															
1.18	mm	89%	,)						Definiti	ons:			ound specificat Irinkage mould	on		A = Not appli = Not deter	icable mined; SIB = Slip	in bowl
600	μm	70%	5										ound specificat	ion			nable; NP = Nor	
425	μm	61%	5										GR	ADING S				
300	μm	48%	5						Fine	s			Sand*		Gr	avel*		Cobbles*
212	μm	35%	5						(<75 µ			(>75 µ	ւm - <2.36 r	nm) (>		m - <63 m	ım) (>63n	nm - <200 mm)
150	μm	22%	,)						12.49	%			85.8%			8%	widanco in AC177	0.0% 6-2017 Section 6.1.4.2
75	μm	12%	5												Ριοροιτιοι	ns buseu on g	Juluunce III AS172	6-2017 Section 6.1.4.2
1	00% -								PARTIC	CLE S	IZE D	ISTRIBL	JTION			╺╷─┍┎┍	•	
1	90% -											- J						
	80% -																	
ß	70% -										×							
Percentage passing	60% -				_													
age	50% -			-														
cent	40% -																	
Per	30% -			+ +					/									
	20% -																	
	10% -							· •										
	0%																	
	0.0			S	0.01 ILT FRAC	TION).1 SA	AND FR	ACTION	1		10 GRAVEL FRAC	TION		DO BBLES BOL	1000 JLDERS
		CLAY	FINE		MEDIUN	1	COARSE		FINE	MEDIU	м	COARSE	FINE	MEDIUN	I COA	RSE		
Division	s hased	0.002 on AS1289,		0.006	ised on A	0.02		0.075	0.2	Part	0.6 icle si	ze (mm)	2	6	20	60	200	600
Testing			JO			ates:	09/0	8/22	- 09/08/2				reviewed b	/:	SWai		Date reported:	11/08/2022
Cert.	-	PS13173		CB-B					_220801		ep22						ed signatory:	
		•														0	3	
NAT	A		Ad	ccred	lited f	or cor	npliand	ce wi	th ISO/IE	C 17	025 -	Testin	5			+	tet	
			THIS	DOC	CUME	ENT S	HALL (ONL	Y BE REF	PROE	DUCE	D IN F	ULL		Paul	Kent - La	boratory Ma	inager
Dh	one:	+61 (0)8	9441 0	700		Fax: +	F01 (0)8	944	1 0701	E-r	nail·		perthlab@go	lder com a		Web:		golder.com.au

Soils	testi	ng - Pa	rticle	e size	e dist	tribut	tion 8	λ C	onsistency	lin	nits	test	report					-	
Stand	ard n	nethod	(by si	eving	g)										112)	GOI		ER
AS128	39.3.6	5.1, 2.1.	1, 3.1	2, 3	.2.1,	3.3.1	& 3.4	.1								•			
Test re	ques	t #:		TR	P22-	0095	5		Specimen ID:	:		LPE	R20220801	9		G	older Asso	ciates l	Pty Ltd
Client			Cause	eway	Link A	llianc	е								PERTH	GEOT	ECHNICAL	LABOR	ATORY
Client	addre	ess:																	hrie Street,
Projec	t ID:			PS	5131	735							Explorate	ory Hole			W		oorne Park, stralia 6017
			6		F = +1		C						CDCD		Sam	ple de	pth (m): 3.	50 -	3.95
Projec	t nam	ie:	Cause	eway	Footb	oridge	Swan	Rive	er				CPCB-	BH03	Clie	ent san	nple ref:		
Projec	t refe	rence:											<u></u>	Loc. ref.:			Perth, WA		
				Spec	imen	descr	iption	:							Samplin	g: Te	sted as recei	ved	
PAR	FICLE :	SIZE DIS	FRIBU	TION		AS 1289.	3.6.1	(C⊦	H) CLAY, high plast	ticity	, dark	grey, ti	race of fine to	medium	Easting	; (m)	Northing (m) Le	vel (m)
Sieve	Size	Passir	ng	LB	S	U	B S	gra	ained sand.										
12	5 mm	100%	6						Method	: A	S 1289	9.2.1.1	AS 1289.3.1.2	AS 1289.	3.2.1 AS 128	89.3.3.1	AS	1289.3.4.1	
7	5 mm	100%	6								10:0	ture	1 point	Diast		+:	Lincor	Cur	ling/
6	3 mm	100%	6								cont		Liquid	Plast limi		ticity dex	Linear shrinkage		bling/
5	3 mm	100%	6										limit				8	Crac	cking
37.	5 mm	100%	6						Result		84.0	0%	65%	26%	6 3	9%	13.0%	No	one
26.	5 mm	100%	6						neoun		As Ro	cvd.	0070	207		570	10.070		
1	9 mm	100%	6						LB S:	:									-
13.	2 mm	100%	6						UB S:	:									
9.	5 mm	100%	6						Att. preparat	tion	me	thod:	Dry	sieved		LSM I	ength (mm):	1	25
6.	6.7 mm 100% 4.75 mm 100% Specimen history/notes: Compliance check AS 1289.1.1 - Clause 5.7 - Table 1 - OK Preparation of specimen and testing performed on sample supplied to the laboratory																		
4.7	4 75 mm 100%																		
2.3	6 mm	100%	6								C 1-								
1.1	8 mm	100%	6						Definitions				und specificati rinkage mould	on		vot appli ot deter	icable mined; SIB = Slip	in bowl	
	0 μm	99%								UB	S = U	pper bo	ound specificat	ion	NO = N	ot obtaiı	nable; NP = Nor	plastic	
	5 μm	98%							_					ADING SU	JMMARY				
	0 μm	97%							Fines				Sand*		Grave			Cobbles'	
	2 μm	96%							(<75 μm)		(>75 μ	14 5%	nm) (>	2.36 mm -		im) (>63n	1m - <20	0 mm)
-	0 μm	94%							85.5%				14.5%		0.0%		uidance in AS172	0.0% 6-2017 Sect	tion 6.1.4.2
1	5 μm	86%)					<u> </u>	PARTICLES	5176		трірі			·				
	100% ·															° î °			
	90% ·							Ý					İ			ĺ			
	80% ·							1					1						
sing	70%							I					1						
Percentage passing	60%							l											
ntage	50%																		
ercer	40% ·																		
ď	30% ·																		
	20% ·																		
	10% ·							1											
	0% · 0.0	001	1 1		0.01		<u> </u>		0.1			1		10		1(00	10	00
		CLAY			LT FRAC				SAND F					GRAVEL FRAC		СО	BBLES BOL	LDERS	
		0.002	FINE	0.006	MEDIUM	0.02	COARSE	0.07	FINE MEDI 5 0.2		0.6	COARSE	FINE 2	6 MEDIUM	20 COARSE	60	200	600	
Divisio	ns based	d on AS1289,			sed on A			5.07.				e (mm)					200		
Testing	by:		DP		Da	ates:	10/0	8/22	2 - 10/08/22		R	lesults	reviewed by	<i>ı</i> :	PKent	D	Date reported:	11/08	3/2022
Cert	. ref.:	PS1317	35_CP	CB-B	H03_1	rrp22	-0095_	PS	D_2208019_R	lep2	2208	3593			A	pprov	ed signatory:		
									er: 1961 - Site							Ŧ	P.t.		
NA	TA						-		vith ISO/IEC 1										
	hone	+61 (0)8						_	LY BE REPRO 41 0701 E-	DU mai			ULL perthlab@go	lder.com a		ent - La Web:	boratory Ma	nager	mau

Soils testing	g - Pa	rticle s	ize dis	tribution 8	& consistency	limits test	report							
Standard me	thod (by siev	ing)						\\ \	GO	LDER			
AS1289.3.6.1	l, 2.1.	1, 3.1.2	, 3.2.1,	3.3.1 & 3.4	.1				•					
Test request #	t :	Т	RP22	0095	Specimen ID:	LPEF	2022080110)		Golder Ass	ociates Pty Ltd			
Client:		Causew	ay Link	Alliance					PERTH GE	OTECHNICA	L LABORATORY			
Client address	:										84 Guthrie Street,			
Project ID:			PS131	735			Explorator	y Hole			Osborne Park, Western Australia 6017			
Ducient nome		Courson		bridge Sweep I	Divor		CPCB-B		Sample	e depth (m):	12.50 - 12.95			
Project name:		Causew	ay FUUL	bridge Swan I	Kiver		CPCD-D	NUS	Client	sample ref:				
Project refere	nce:						L	.oc. ref.:		Perth, W	A			
		S	pecimer	description:	;				Sampling:	Tested as rec	eived			
PARTICLE SIZ	ZE DIST	RIBUTI	ON	AS 1289.3.6.1	(SM) Silty SAND, fine	to medium grain	ned, greyish brov	vn, non-	Easting (m	n) Northing	g (m) Level (m)			
Sieve Size	Passin	g	LB S	UB S	plastic fines.									
125 mm	100%	ó			Method:	AS 1289.2.1.1	AS 1289.3.1.2	AS 1289.3	.2.1 AS 1289.3	3.1	AS 1289.3.4.1			
75 mm	100%	6				Malatura	1 point	Disati	Diastic	tu Lincou	Curling/			
63 mm	100%	6				Moisture content	Liquid	Plasti limit			Crumbling/			
53 mm	100%	6				content	limit			, shining	Cracking			
37.5 mm	100%	6			Result:	24.0%	SIB	NP	ND					
26.5 mm	100%	6			Result:	As Rcvd.	JID	INP						
19 mm	100%	6			LB S:						-			
13.2 mm	100%	ó			UB S:						-			
9.5 mm	100%	ó			Att. preparat	ion method:	Dry s	ieved	LS	M length (mm):			
6.7 mm	100%	6			Specimen	Compliance check	AS 1289.1.1 - Claus	e 5.7 - Table	1 - OK					
4.75 mm	.75 mm 100% Specimen history/notes:													
2.36 mm	.75 mm 100% Specimen history/notes: Compliance check AS 1289.1.1 - Clause 5.7 - Table 1 - OK Preparation of specimen and testing performed on sample supplied to the laboratory													
1.18 mm	100%	6			Definitions:	LB S = Lower bo LSM = Linear shi	und specificatior	ı	N/A = Not ND = Not d	applicable etermined; SIB = 1	lin in howl			
600 µm	99%				Definitions.		und specificatio	n		btainable; NP = N				
425 μm	96%						GRA	DING SU	IMMARY					
300 µm	85%				Fines		Sand*		Gravel*		Cobbles*			
212 µm	71%				(<75 μm)	(>75 μ	m - <2.36 mi	m) (>2	2.36 mm - <6	3 mm) (>63	3mm - <200 mm)			
150 µm	53%				25.4%		74.6%		0.0%		0.0%			
75 μm	25%							*	Proportions based	on guidance in AS1	726-2017 Section 6.1.4.2			
100%		1 1 1			PARTICLE S			<mark>∙ • • •</mark>	<u>- </u>	, <mark>0,,,,0,,,,</mark>				
90%						۶								
80%					1									
≌ 70%														
60% - 40\% - 40\% -		+ + +			╷╷╷╸┛									
0. 80 50%					4									
euta														
Derc 30%														
20%														
10% -														
0%														
0.001			0.01		0.1	1		10		100	1000			
	CLAY	FINE	SILT FRAG		FINE MEDIU	COARSE	FINE	RAVEL FRACT	COARSE	COBBLES E	OULDERS			
	0.002		006		0.075 0.2	0.6	2 6		20 60	200	600			
Divisions based or	n AS1289,					ticle size (mm)								
Testing by:		DP			8/22 - 09/08/22		reviewed by:		SWai	Date reporte	d: 11/08/2022			
Cert. ref.: P	S13173				_PSD_22080110_		1		Арр	roved signato	y:			
					nber: 1961 - Site:					Ret				
NATA				-	e with ISO/IEC 17									
	C4 (0) C 1	THIS D		ENT SHALL (Fax: +61 (0)8	ONLY BE REPRO		JLL perthlab@gold			- Laboratory N /eb: www	V.golder.com.au			

Soils	testi	ng - Pa	rticle	e size	e dist	tribution 8	& consistency	limits test	report					
Stand	ard n	nethod	(by sie	eving	;)						\\S])	G		DER
AS128	39.3.6	5.1, 2 .1.	1, 3.1	.2, 3.	2.1,	3.3.1 & 3.4	.1							
Test re	eques	t #:		TRF	22 -	0095	Specimen ID:	LPE	R2022080111	L		Golder	Associa	tes Pty Ltd
Client:	:		Cause	eway	Link A	lliance					PERTH GE	OTECHN	ICAL LA	BORATORY
Client	addre	ess:												84 Guthrie Street,
Projec	t ID:			PS	131	735			Explorator	y Hole				Osborne Park, ern Australia 6017
Projec	t nam	ie:	Cause	eway	Footb	oridge Swan	River		СРСВ-В	H03	-	depth (m sample re		- 23.45
Projec	t refe	rence:							L	.oc. ref.:			n, WA	
			1	Spec	imen	description	:				Sampling:	Tested as	s received	i
PART	FICLE	SIZE DIST	FRIBU	TION		AS 1289.3.6.1	(SP-SM) SAND with s	ilt, fine to coarse	grained, greyish	yellow,	Easting (m) Nor	thing (m)	Level (m)
Sieve	Size	Passir	ng	LB	S	UB S	non-plastic fines, tra	ce of fine grained	d gravel.					
12	5 mm	100%	6				Method:	AS 1289.2.1.1	AS 1289.3.1.2	AS 1289.3	B.2.1 AS 1289.3.	3.1	AS 1289	0.3.4.1
7.	5 mm	100%	6						1 point					Curling/
6	3 mm	100%	6					Moisture	Liquid	Plast			ear	Crumbling/
5	3 mm	100%	6					content	limit	limi	t index	snrin	ikage	Cracking
37.	5 mm	100%						22.6%						
	5 mm	100%					Result:	As Rcvd.	SIB	NP	ND			
	9 mm						LB S:							
	2 mm	100%					UB S:							_
	5 mm						Att. preparat	ion method:	Dry s	ieved	IS	M length	(mm):	
	7 mm	99%							2.70				().	
	5 mm						Specimen		AS 1289.1.1 - Claus		1 - OK n sample supplied to	the laboratory	,	
						in sumple supplied to	the laboratory							
	6 mm							IBS = Lower bo	ound specification	1	N/A = Not a	oplicable		
	8 mm	93%					Definitions:					etermined; S	SIB = Slip in b	lwoo
1	0 μm							UB S = Upper b	ound specificatio			btainable; N	IP = Non pla	stic
1	5 μm	41%								DING SU	JMMARY			
	0 µm						Fines		Sand*		Gravel*			obles*
21	2 µm	16%					(<75 μm)	(>75 µ	ım - <2.36 mı	m) (>	2.36 mm - <63	3 mm)	•	- <200 mm)
	0 µm						9.0%		88.0%	*	3.0% Proportions based	on quidance		1.0%
7.	5 µm	9%										on galaanee i		
	100%						PARTICLES	SIZE DISTRIBU				•		
	90%							1						
	80%													
вц	70%													
Percentage passing	60%							/						
ge p	50%													
enta	40%							,						
Perc	30%						┥┿┝┽╼╼┾╼┦							
	20%													
	10%													
	0%						Ĭ							
		001			0.01		0.1	1		10		100		1000
		CLAY	FINE		LT FRACT		SAND FI	RACTION UM COARSE	FINE	RAVEL FRACT	COARSE	COBBLES	BOULDE	RS
		0.002		0.006		0.02	0.075 0.2	0.6	2 6		20 60	20	0 6	00
Divisio	ons based	d on AS1289,			sed on A.			ticle size (mm)						
Testing	; by:		DP		Da	ates: 06/0	8/22 - 09/08/22	Results	reviewed by:		SWai	Date rep	oorted:	11/08/2022
Cert	. ref.:	PS1317	35_CP	CB-BI	H03_1	TRP22-0095	_PSD_22080111_	Rep2208359	5		Appr	oved sign	atory:	
	1		N	NATA	accre	ditation nur	nber: 1961 - Site:	1598 - Perth				Pa		
NA'	TA		A	ccred	ited fo	or compliand	ce with ISO/IEC 17	7025 - Testing	8			1 at	11	
			THIS	DOC	UME	NT SHALL	ONLY BE REPRO	DUCED IN F	ULL		Paul Kent	- Laborato	ory Mana	ger
Р	hone:	+61 (0)8	9441 0	700		Fax: +61 (0)8	9441 0701 E-	mail:	perthlab@gold	ler com a	u W	eb:	www.gold	ler.com.au

Soils te	estin	g - Pa	rticle	e siz	e dis	tribut	tion 8	g co	nsistency	limits	test	report						
Standar	d me	ethod	(by sie	evin	g)									NS D		GOI		: R
AS1289	.3.6.	1, 2.1.	1, 3.1	.2, 3	8.2.1,	3.3.1	& 3.4	.1										
Test req	uest	#:		TR	P22-	0093	}	S	pecimen ID:		LPEF	R202207197	,		Gol	der Asso	ciates Pt	ty Ltd
Client:			Cause	eway	Link A	Alliance	е							PERTH GE	ΟΤΕΟ	CHNICAL	LABORA	TORY
Client ad	dres	s:									_						84 Guthri Oshor	ie Street, rne Park,
Project I	D:			P	S131	735						Explorato	ry Hole				estern Austra	alia 6017
Project r	name	:	Cause	eway	Footb	oridge	Swan	River				CPCB-E	BH04	-		th (m): 5. ble ref:	- 00	5.45
Project r	efere	ence:									L		.oc. ref.:		•	Perth, WA		
			I	Spe	cimen	descri	iption:							Sampling:	Test	ed as receiv	ved	
PARTIC	CLE SI	ZE DIST	FRIBU	-		AS 1289.3	-		CLAY, high plast	icity darl	kørev tr	ace of fine to m	edium	Easting (m	-	Northing (el (m)
Sieve Si	ize	Passir	ng	LE	3 S	U	B S		ned sand, trace o					01		01		. ,
125	mm	100%	6						Method:	AS 128	9.2.1.1	AS 1289.3.1.2	AS 1289.3	.2.1 AS 1289.3	3.1	AS	1289.3.4.1	
75	mm	100%	6									1 point					Curlir	ng/
63	mm	100%	6							Mois		Liquid	Plasti limit		-	Linear shrinkage	Crumb	-
53	mm	100%	6							cont	lent	limit	IIMI	. index		Shrinkage	Crack	ing
37.5	mm	100%	6						.	96.	0%	70%	220/			45.00/		
26.5	mm	100%	6						Result:	As R	cvd.	79%	33%	46%		15.0%	Cracki	ing
19	mm	100%	6						LB S:					Ļ			-	
13.2	mm	92%	5						UB S:								-	
9.5	mm	89%						A	Att. preparat	ion me	thod:	Dry s	sieved	LS	M len	ngth (mm):	125	5
6.7	6.7 mm 89% 4.75 mm 89% Specimen mass does not comply with AS1289.1.1 Clause 5.7 Table 1, insufficient sample provided to labororatory Preparation of specimen and testing performed on sample supplied to the laboratory															itory		
4.75	4.75 mm 89% Specimen Specimen mass does not comply with A\$1289.1.1 Clause 5.7 Table 1, insufficient sample provided to labororatory Preparation of specimen and testing performed on sample supplied to the laboratory															cory		
2.36	A 75 mm 80%																	
1.18	mm	87%							Definitions			und specification	n	N/A = Not	•••		in houd	
600	μm	86%							Definitions:			und specificatio	on			ned; SIB = Slip ble; NP = Non		
425	μm	85%	5									GRA	DING SU	IMMARY				
300	μm	84%	5						Fines			Sand*		Gravel*		(Cobbles*	
212	μm	84%	5						(<75 µm)		(>75 μ	m - <2.36 m	m) (>:	2.36 mm - <6	3 mm	n) (>63m	m - <200	mm)
150	μm	84%	5						82.2%			5.8%		12.0%			0.0%	
75	μm	82%											*	Proportions basea	on guid	dance in AS172	5-2017 Section	n 6.1.4.2
100	0% –			1 1 1	111		1 1 1		PARTICLE S	IZE DIS	STRIBU	TION			•	•		
9(0% -																	
80	0% -									••••								
60 70	0% -																	
assin 90	0% -																	
d e b 50	0%							ļ										
Ita	0%																	
Berc 30	0%							.										
20	0% -																	
	0% -							ļ										
(0%																	
	0.00				0.01			0	.1		1				100		1000)
		CLAY	FINE		MEDIUN	1	COARSE		FINE MEDIU	JM	COARSE	FINE	RAVEL FRACT	COARSE	COBBL	LES BOU	LDERS	
		0.002		0.006		0.02		0.075	0.2	0.6		2 (5	20 60		200	600	
		n AS1289,		ation bo			1010	0 / 2 -		icle size	. ,				-		e . 1 *	
Testing by	-		DP			ates:	-		- 10/08/22			reviewed by:		PKent		te reported:	11/08/2	2022
Cert. r	et.: F	·S13173	_						_2207197_R					Арр	roved	l signatory:		
NAT									: 1961 - Site:						R	et		
NAT							-		th ISO/IEC 17		-			Devil Hant	الما	avatau 14		
Pho	ne +	61 (0)8			CONT	Fax: +			BE REPRO	DUCEL		JLL erthlab@gold	ler com a		- Labo /eb:	oratory Ma	nager	

Soils test	ting - Pa	rticle size d	stribution &	& consistency	limits test	report	,			DED				
Standard	method	(by sieving)						עריי	GOL	DER				
AS1289.3	.6.1, 2.1.	1, 3.1.2, 3.2.1	, 3.3.1 & 3.4.	1										
Test reque	st #:	TRP22	2-0093	Specimen ID:	LPE	R202207198		G	older Assoc	iates Pty Ltd				
Client:		Causeway Linl	Alliance					PERTH GEOT	TECHNICAL L	ABORATORY				
Client add	ress:									84 Guthrie Street,				
Project ID:		PS13	1735			Explorator	ry Hole			Osborne Park, estern Australia 6017				
Project na	me:	Causeway Foc	tbridge Swan I	River		CPCB-B	6H04		epth (m): 23. mple ref:	00 - 23.45				
Project ref	erence:					L	.oc. ref.:		Perth, WA					
		Specime	en description:					Sampling: Te	ested as receiv	ed				
PARTICLE	SIZE DIS	TRIBUTION	AS 1289.3.6.1	(SC) Clayey SAND, wit			- · ·	Easting (m)	Northing (r	n) Level (m)				
Sieve Size	e Passii	ng LB S	UB S	orange, low to mediu gravel.	im plasticity, fine	to medium grai	ned							
125 mi	m 1009	6		Method:	AS 1289.2.1.1	AS 1289.3.1.2	AS 1289.3	.2.1 AS 1289.3.3.1	AS 1	289.3.4.1				
75 m	m 1009	6				1 point				Curling/				
63 mi	m 100%	6			Moisture	Liquid	Plasti		Linear	Crumbling/				
53 mi					content	limit	limit	index	shrinkage	Cracking				
37.5 m					16.3%									
26.5 m				Result:	As Rcvd.	35%	13%	22%	6.5%	None				
				LB S:	7.5 1.6 7.4.									
19 mr				UB S:										
13.2 mr						Davis	ta const	1014	Leventhe (425				
9.5 m				Att. preparat	ion method:	Dry s	ieved	LSIVI	length (mm):	125				
6.7 m	m 83%			Specimen						ed to labororatory				
4.75 m	4.75 mm 81% history/notes: Preparation of specimen and testing performed on sample supplied to the laboratory													
2.36 m	m 77%	,)												
1.18 mr	m 72%	, D		Definitions:		und specification	n	N/A = Not app ND = Not dete	licable rmined; SIB = Slip	in bowl				
600 μr	n 61%	,)		Demittorio		ound specificatio	n		inable; NP = Non					
425 μr	n 56%	,)				GRA	DING SU	MMARY						
300 μr	n 49%	,)		Fines		Sand*		Gravel*	C	obbles*				
212 μr	n 40%	,		(<75 μm)	(>75 μ	.m - <2.36 m	m) (>2	2.36 mm - <63 n	nm) (>63m	m - <200 mm)				
150 μr	n 33%	, 		25.3%		52.1%		22.6%		0.0%				
75 μr	n 25%	, 					*	Proportions based on	guidance in AS1726	-2017 Section 6.1.4.2				
100%				PARTICLE S	IZE DISTRIBU	ITION								
90%														
							and a							
80%														
guis 70%														
60% bas														
tage 20%						-								
 Bercentage passing A0% /ul>														
B 30%														
20%				I										
10%														
0%														
(0.001	0.01		0.1	1		10		.00	1000				
	CLAY	FINE MEDI	ACTION UM COARSE	SAND FR		FINE	RAVEL FRACT	COARSE	DBBLES BOUL	DERS				
	0.002			0.075 0.2	0.6	2 6		20 60	200	600				
Divisions bas	ed on AS1289,	interpolation based o	n AS1726	Part	ticle size (mm)									
Testing by:		DP	Dates: 09/08	8/22 - 09/08/22	Results	reviewed by:	P	YKent	Date reported:	11/08/2022				
Cert. ref.	.: PS1317	35_CPCB-BH04	_TRP22-0093_	PSD_2207198_R	ep22083618			Approv	ved signatory:					
		NATA acc	reditation nun	nber: 1961 - Site:	1598 - Perth			5	De					
NATA		Accredited	for complianc	e with ISO/IEC 17	025 - Testing	5								
		THIS DOCUN	IENT SHALL C	ONLY BE REPRO	DUCED IN F	ULL		Paul Kent - L	aboratory Mai	nager				
Phone	e: +61 (0)8	9441 0700	Fax: +61 (0)8	9441 0701 E-r	mail:	perthlab@gold	ler.com.au	u Web	: www.g	older.com.au				

Soils	testi	ng - Pa	rticle	e size	e dis	tribution &	& consis	tency	lim	its t	est r	report					
Stand	ard n	nethod	(by sie	eving	g)									112		GOI	DER
AS128	39.3.6	5.1, 2.1.	1, 3.1	2, 3	.2.1,	3.3.1 & 3.4	.1								•		
Test re	eques	t #:		TR	P22-	0095	Speci	men ID	:	I	LPER	2022080113	3		Go	older Asso	ciates Pty Ltd
Client:	:		Cause	eway	Link A	Alliance								PERTH	GEOT	ECHNICAL	LABORATORY
Client	addre	ss:															84 Guthrie Street,
Projec	t ID:			PS	5131	735						Explorato	ry Hole				Osborne Park, estern Australia 6017
Projec	t nam	e:	Cause	eway	Footb	oridge Swan	River					CPCB-E	8H05		-	pth (m): 17 nple ref:	.00 - 17.45
Project	t refe	rence:									L	I	.oc. ref.:]		Perth, WA	
			1	Spec	cimen	description	:							Sampli	ng: Te	sted as recei	ved
PART	FICLE :	SIZE DIS	TRIBU	TION		AS 1289.3.6.1	(SP-SM) SA	ND with	silt. fir	ne to co	oarse e	grained, pale br	own, non-	Eastin	g (m)	Northing (m) Level (m)
Sieve	Size	Passir	ng	LB	S	UB S	plastic fine						. , .				
125	5 mm	100%	6				N	/lethod	: AS	1289.2.	.1.1	AS 1289.3.1.2	AS 1289.3	.2.1 AS 1	289.3.3.1	AS	1289.3.4.1
7	5 mm	100%	6									1 point					Curling/
	3 mm	100%	6							oistu	_	Liquid	Plast		sticity	Linear	Crumbling/
	3 mm	100%							C	onter	nt	limit	limi	t ir	ndex	shrinkage	Cracking
	5 mm	100%								18.6%	6						
	5 mm	1007						Result	:	s Rcv		SIB	NP		ND		
								LB S	-								_
	9 mm 2	100%						UB S									-
	2 mm	100%					A++			math	od	Dec	ieved		ICAL	ength (mm):	-
	5 mm -	98%					Αιι. ρ	repara	uon	metn	100:	Drys	sieveu		LSIVI	ength (mm):	
	6.7 mm 98% Specimen Compliance check AS 1289.1.1 - Clause 5.7 - Table 1 - OK 75 mm 96% history/notes: Compliance check AS 1289.1.1 - Clause 5.7 - Table 1 - OK																
		nm 96% Specimen Specimen and testing performed on sample supplied to the laboratory history/notes:															
	6 mm	history/notes:															
1.18	8 mm	87%	5				Defi	nitions				nkage mould	n			cable mined; SIB = Slip	in bowl
	0 μm	58%	þ						UB S	5 = Upp	per bou	und specificatio	n	NO =	Not obtair	nable; NP = Nor	plastic
	5 µm	39%	ò									GRA	DING SU	IMMARY			
300	0 µm	25%	5				F	ines				Sand*		Grav	/el*		Cobbles*
212	2 μm	18%	5				(<7	75 μm)		(>)	75 µr	n - <2.36 m	m) (>	2.36 mm	- <63 m	m) (>63n	nm - <200 mm)
150	0 μm	13%	ò				7	7.9%				85.8%		6.3			0.0%
75	5 µm	8%												Proportions	based on g	uidance in AS172	5-2017 Section 6.1.4.2
:	100% ·	· · · ·					PA	RTICLE	SIZE	DIST	RIBU'	TION	<u> </u>		- 0 0 0		
	90% ·																
	80%										1						
50	70% -																
Issin	60%																
Percentage passing	50%								1	P							
intag																	
erce	40%								1								
۵	30%							Å									
	20% ·						_										
	10% ·						1										
	0% ·	001			0.01		0.1			1			10			00	1000
	0.0	CLAY			ILT FRAC	TION	012	SAND F	RACTIO	- DN		G	RAVEL FRACT	ION			LDERS
			FINE		MEDIUN		FINE	MED			ARSE	FINE	MEDIUM	COARS			
Divisio	ons based	0.002 on AS1289,		0.006 ation ba	ised on A		0.075	0.2 Pai		.6 size (r	mm)	2	5	20	60	200	600
Testing)	DP				8/22 - 08/0				-	eviewed by:		SWai	D	ate reported:	11/08/2022
	-	PS1317	35 CP	CB-R		TRP22-0095_		-	Rep							ed signatory:	
						ditation nur											
NA'	TA					or compliand									Ŧ	let	
	/					ENT SHALL (-	111		Paul K	ent-la	boratory Ma	nager
P	hone:	+61 (0)8	-			Fax: +61 (0)8	-	-	mail:	-	-	erthlab@gold	ler com a		Web:	-	golder.com.au

Soils t	estii	ng - Pa	rticle	e size	e dis	tribu	tion 8	& consistency	/ lin	nits test	report			•			
Standa	rd m	ethod	(by sie	eving	g)								\\S		GOI		= R
AS1289	9.3.6	.1, 2.1.	1, 3.1	2, 3	.2.1,	3.3.1	& 3.4	.1					-				
Test rec	quest	#:		TRI	P 22 -	0093	3	Specimen ID):	LPE	R202207196	5		Go	lder Asso	ciates P	ty Ltd
Client:			Cause	eway	Link A	Allianc	е						PERTH G	EOTE	CHNICAL	LABORA	TORY
Client a	ddre	ss:															rie Street,
Project	ID:			PS	5131	735					Explorator	ry Hole				estern Austr	
Project	nam	e:	Cause	eway	Footb	oridge	Swan	River			CPCB-B	BH06	-		oth (m): 30 ple ref:	.50 -	30.95
Project	refer	ence:									l	.oc. ref.:			Perth, WA		
			1	Spec	imen	descr	iption	:					Sampling:	Test	ted as receiv	ved	
PARTI	CLE S		RIBU	-		AS 1289.	-	(SC) Clayey SAND, fi	ine to	coarse grain	ed dark grev lo	1)//	Easting (r		Northing (vel (m)
Sieve S	Size	Passir	ng	LB	S	U	BS	plasticity, trace of fi					01		01		
125	mm	100%	6					Method	I: A	S 1289.2.1.1	AS 1289.3.1.2	AS 1289.3	.2.1 AS 1289.3	3.3.1	AS	1289.3.4.1	
75	mm	100%	6								1 point					Curli	ng/
	mm	100%								/loisture	Liquid	Plast		-	Linear	Crumb	-
	mm	100%								content	limit	limit	t inde	x	shrinkage	Crack	-
37.5		100%								29.6%							
26.5		100%						Result	t:	As Rcvd.	24%	13%	11%	6	2.5%	Non	ie
	mm							LB S	-								
		100%						UBS								_	
13.2		100%								mothody	Druc	sieved			ngth (mm):	12	-
	mm	100%						Att. prepara		methou.	DIYS	sleveu	L	SIVI IE	ingtri (min).	12	5
	6.7 mm 100% 4.75 mm 100% 2.26 000/																
	4 75 mm 100%																
									L D I	S = Lower be	und specification	2		tannlic	abla		
1.18	mm	97%	, ,					Definitions			rinkage mould	n	N/A = Not ND = Not		nined; SIB = Slip	in bowl	
600		87%	, ,						UB	S = Upper bo	ound specificatio	on	NO = Not	obtaina	able; NP = Non	plastic	
425	μm	77%	, ,								GRA	DING SU	IMMARY				
300	μm	57%						Fines			Sand*		Gravel*	¢		Cobbles*	
212	μm	36%	5					(<75 μm)		(>75 µ	.m - <2.36 m	m) (> :	2.36 mm - <6	63 mn	n) (>63m	nm - <200	mm)
150	μm	29%	5					24.9%			74.3%		0.8%			0.0%	
75	μm	25%											Proportions base	a on gu	liaance in AS172	5-2017 Sectio)n 6.1.4.2
10	00% 1							PARTICLE	SIZE	DISTRIBL	JTION	•	- 	₽₽	•		
9	90% -																
5	80% -									/							
<u>60</u> 7	70% -								/								
assin	50% -			-	_												
ge på	50% -							1									
enta	40% -																
erc	30% -																
	20% -			TT				-									
1	10% -																
	0% 0.0	01			0.01			0.1	. :	1		10		100) (1000	0
		CLAY			ILT FRAC			SAND				RAVEL FRACT		COBE	BLES BOU	LDERS	
	l	0.002	FINE	0.006	MEDIUN	0.02	COARSE	FINE MED 0.075 0.2	NUM	COARSE	2 6	MEDIUM	20 60	n	200	600	
Divisions	s based	on AS1289,			ised on A					e size (mm)	2 (20 60	0	200	000	
Testing b	oy:		DP		D	ates:	09/0	8/22 - 09/08/22		Results	reviewed by:	1	PKent	Da	ate reported:	11/08/	2022
Cert.	ref.:	PS13173	35_CP	СВ-В	H06_	rrp22	-0093	_PSD_2207196_I	Rep2	22083619			Арр	orove	d signatory:		
			_					<u> </u>	-					6			
NAT	'À		A	ccred	lited f	or con	npliand	ce with ISO/IEC 1	702	5 - Testing	5			+6	at		
	-		THIS	DOC	CUME	NT SI	HALL (ONLY BE REPRO	DDU	CED IN F	ULL		Paul Kent	t - Lab	oratory Ma	nager	<u>q</u>
Ph	one:	+61 (0)8							-mai		oerthlab@gold	ler com a		Web:		older.com	

Soils t	testi	ng - Pa	rticle siz	e dist	tribution 8	& consistency	limits t	est	report			•	~ ~		
Standa	ard m	nethod	(by sievin	g)							~~~		GΟ	LL	ʹͰϗ
AS128	9.3.6	5.1, 2 .1.	1, 3.1.2, 3	3 .2.1 , 3	3.3.1 & 3.4.	.1									
Test re	quest	t #:	TR	P22-(0093	Specimen ID	:	LPE	R202207191			G	older Asso	ociat	es Pty Ltd
Client:			Causeway	Link A	lliance						PERTH G	EOT	ECHNICAL	LAB	ORATORY
Client a	addre	ss:												84	Guthrie Street,
Project	ID:		Р	S131	735			[Explorator	ry Hole			Ň	Nesterr	Osborne Park, Australia 6017
Duciest			Courses	. To oth	video Curon I	Diver		ĺ			Samp	le de	pth (m): 2	.45	-
Project	nam	e:	Causeway	FOOLD	oridge Swan F	River			CPCB-B	οπυ/	Clien	it san	nple ref:		
Project	refe	rence:							L	.oc. ref.:	-		Perth, WA		
			Spe	cimen	description:						Sampling	: Te	sted as rece	ived	
PART	ICLE S	SIZE DIST	TRIBUTION	1	AS 1289.3.6.1	(CI) Sandy CLAY, me				coarse	Easting (m)	Northing	(m)	Level (m)
Sieve	Size	Passir	ng Ll	3 S	UB S	grained sand, traces	of shell frag	ment	S.						
125	i mm	100%	6			Method	AS 1289.2	.1.1	AS 1289.3.1.2	AS 1289.3	AS 1289	.3.3.1	A	S 1289.3.	4.1
75	i mm	100%	6				Moistu	iro	1 point	Plasti	ic Plasti	city	Linear	1	Curling/
63	mm	100%	6				conte		Liquid	limit		•	shrinkage		umbling/
53	mm	100%	6				_		limit						Cracking
37.5	i mm	100%	6			Result	64.5%		47%	24%	239	%	9.0%		None
26.5	i mm	100%	6				As Rcv	ıd.							
-) mm	100%	6			LB S									-
	2 mm	96%				UB S		.							-
	5 mm	95%				Att. prepara	tion meth	nod:	Dry s	sieved	L	.SIVI I	ength (mm)	:	125
	′ mm	93%				Specime			AS 1289.1.1 - Claus						
	i mm	92%				history/notes	Preparation	of spec	cimen and testing	performed or	n sample supplied	to the I	laboratory		
	i mm	91%					LB S = Low	er boi	und specificatior	n	N/A = No	t appli	icable		
	3 mm	89%				Definitions	: LSM = Line	ear shr	inkage mould		ND = Not	deter	mined; SIB = SI	•	
) μm	82%					UB S = Upp	oer bo	und specificatio			: obtaiı	nable; NP = No	n plasti	c
	iμm)μm	75% 63%				Fines			GRA Sand*		JMMARY Gravel	*		Cobb	loc*
	, μm	57%				(<75 μm)	(>	75	m - <2.36 m	m) (>	2.36 mm - <		um) (>63)		<200 mm)
	. μ) μ.m.	52%				40.3%	1-	<i>γ</i> υμ	50.4%	<u> </u>	9.3%	05 11		0.0	
	μm	40%								*		ed on g	uidance in AS17		
	•	1070				PARTICLE	SIZE DIST	RIBU	TION						
	.00% -											ľ			
	90% -														
	80% -						1								
ssing	70% - 60% -														
Q	50% -					A A A A A A A A A A A A A A A A A A A							l l		
entag	40% -														
erce	30% -														
	20% -			Π											
	10% -														
	0% -														
	0.0			0.01		0.1	1	L		10			00		1000
		CLAY	FINE	MEDIUM		FINE MED		ARSE	FINE	RAVEL FRACT	COARSE	COI	BBLES BC	ULDERS	
		0.002		2.7		0.075 0.2	0.6		2 6	ļ	_	60	200	600	
		l on AS1289,	interpolation b				rticle size (-							
Testing			DP			8/22 - 13/08/22			reviewed by:		PKent		Date reported		5/08/2022
Cert.	ref.:	PS1317				_PSD_2207191_I					Ар	prove	ed signatory	/:	
NAT						n ber: 1961 - Site e with ISO/IEC 1:						Ŧ	let		
					-	ONLY BE REPRO		-			Daul Kon	tela	boratory M	20201	ar .
Pł	none:	+61 (0)8	9441 0700		Fax: +61 (0)8		-mail:		JLL perthlab@gold	der.com.a		Web:		-	r.com.au

Soils	testi	ng - Pa	rticle	size d	istribut	ion 8	k C	onsistency	limits	test	report					
Stand	lard n	nethod	(by sie	ving)											GOL	DER
AS12	89.3.6	5.1, 2.1.	1, 3.1.	2, 3.2.1	l, 3.3.1 8	& 3.4.	1									
Test re	eques	t #:		TRP22	2-0093			Specimen ID:		LPE	R202207192			G	older Asso	ciates Pty Ltd
Client	:		Cause	way Linl	k Alliance	2							PERTH	I GEOT	ECHNICAL	ABORATORY
Client	addre	ess:														84 Guthrie Street,
Projec	t ID:			PS13	1735						Explorato	ry Hole			W	Osborne Park, estern Australia 6017
Ducies			Courses		معامينا مر								Sa	mple de	pth (m): 7.	50 -
Projec	t nam	ie:	Cause	way Foc	otbridge S	swan	RIVE	er.			CPCB-E	SHU/	С	lient san	nple ref:	
Projec	t refe	rence:									I	Loc. ref.:	-		Perth, WA	
			9	Specime	en descri	ption:							Sampl	ling: Te	sted as receiv	ved
PAR	TICLE	SIZE DIS	TRIBUT	ION	AS 1289.3	.6.1	(CI)) Sandy CLAY, med	ium plast	icity, re	d brown, fine to	coarse	Eastii	ng (m)	Northing (m) Level (m)
Sieve	Size	Passir	ng	LB S	UE	3 S	gra	ined sand.								
12	5 mm	100%	6					Method:	AS 1289	9.2.1.1	AS 1289.3.1.2	AS 1289.3	3.2.1 AS	1289.3.3.1	AS 1	289.3.4.1
7	5 mm	100%	6						Mois	ture	1 point	Plast	ic Pla	asticity	Linear	Curling/
6	3 mm	100%	6						cont		Liquid	limi		index	shrinkage	Crumbling/
5	3 mm	100%	6								limit					Cracking
37.	5 mm							Result:	26.2		36%	14%	, 5	22%	8.0%	None
	5 mm								As Ro	cvd.						
	.9 mm							LB S:								-
	2 mm							UB S:			2					-
	5 mm -							Att. preparat	ion me	tnoa:	Dry s	sieved		LSIVI	ength (mm):	125
	7 mm							Specimen			AS 1289.1.1 - Claus cimen and testing			united to the l	laborator (
	5 mm						h	nistory/notes:	rieparatio	on or spe	cimen and testing	performed of	n sample sup	plied to the	aboratory	
	6 mm 8 mm	100% 100%							LB S = Lo	wer bo	und specificatio	n	N/A	= Not appli	cable	
	ο mm 0 μm	1009						Definitions:			-				mined; SIB = Slip	
	5 μm	1007							UB 3 = 0	pper bo	ound specificatio		JMMAR		nable; NP = Non	plastic
	0 μm	99%						Fines			Sand*	Unite Se		ivel*	(Cobbles*
	2 μm	95%						(<75 μm)	(>75 μ	.m - <2.36 m	m) (>	2.36 mm			m - <200 mm)
	Ο μm	87%	, 5					66.8%			33.2%		0.	0%		0.0%
7	5 μm	67%	6										*Proportions	s based on g	uidance in AS1726	5-2017 Section 6.1.4.2
	100%							PARTICLE S		TRIBU		• • •			- O	
	90%															
	80%							1								
8	70%															
Percentage passing	60%					_	9									
d əß	50%															
centa	40%						ļ									
Perc	30%						ļ									
	20%															
	10%															
	0%	ļ														
	0.0	001 >		0.01 SILT FR	ACTION		+	0.1 SAND FR	ACTION	1	G	10 RAVEL FRACT	ΓΙΟΝ	10 CO		1000 LDERS
		CLAY	FINE	MEDI		OARSE		FINE MEDIL		COARSE	FINE	MEDIUM	COAR			
Divisi	anc here:	0.002		0.006	0.02		0.075		0.6 cicle size	(mm)	2	6	20	60	200	600
Testing		d on AS1289,	Interpolat	ion based o	Dates:	12/0	8/23	Part 2 - 13/08/22			reviewed by:		PKent	r.	Date reported:	15/08/2022
	. ref.:	PS1317		B-BH07				D_2207192_R							ed signatory:	
								er: 1961 - Site:								
NA	TA							ith ISO/IEC 17			S			Ŧ	let	
V						-		Y BE REPROI		-			Paul I	Kent - La	boratory Ma	nager
P	hone:	+61 (0)8					_		nail:		erthlab@gold	der.com.a		Web:		older.com.au

Soils	testi	ng - Pa	rticle s	ize dis	tribution 8	& consistency	limits test	report	,					
Standa	ard m	ethod (by sievi	ng)						1	GOI	DER		
AS128	9.3.6	.1, 2.1.	1, 3.1.2,	3.2.1,	3.3.1 & 3.4	.1								
Test re	quest	:#:	Т	RP22-	0093	Specimen ID:	LPE	R202207193		G	older Asso	ciates Pty Ltd		
Client:			Causew	ay Link A	Alliance					PERTH GEOT	ECHNICAL	ABORATORY		
Client	addre	ss:										84 Guthrie Street,		
Project	t ID:			PS131	735			Explorator	y Hole			Osborne Park, estern Australia 6017		
Project	t nam	e:	Causew	ay Foot	oridge Swan	River		CPCB-B	SH07	Sample de Client sai	epth (m): 29 mple ref:	.00 - 29.50		
Project	t refe	rence:						L	.oc. ref.:		Perth, WA			
			Sp	ecimen	description	:				Sampling: Te	ested as receiv	ved		
PART	ICLES	SIZE DIST	RIBUTIC)N	AS 1289.3.6.1	(SP) SAND, trace of s	ilt, fine to mediu	n grained, grey,	non-	Easting (m)	Northing (m) Level (m)		
Sieve	Size	Passir	ıg	LB S	UB S	plastic fines.								
125	5 mm	100%	6			Method:	AS 1289.2.1.1	AS 1289.3.1.2	AS 1289.3	2.1 AS 1289.3.3.1	AS :	1289.3.4.1		
75	5 mm	100%	6					1 point				Curling/		
63	3 mm	100%	6				Moisture	Liquid	Plasti		Linear	Crumbling/		
	3 mm	100%					content	limit	limit	index	shrinkage	Cracking		
	5 mm	100%					22.1%							
	5 mm	100%				Result:	As Rcvd.	SIB	NP	ND				
						LB S:								
	9 mm	100%				UB S:						-		
9.5 mm 100% Att. preparation method: Dry sieved LSM length (mm):														
	6.7 mm 100% Specimen Compliance check AS 1289.1.1 - Clause 5.7 - Table 1 - OK Preparation of specimen and testing performed on sample supplied to the laboratory													
	4.75 mm 100% Specimen Compliance check AS 1289.1.1 - Clause 5.7 - Table 1 - OK Preparation of specimen and testing performed on sample supplied to the laboratory history/notes:													
						history/notes:	Preparation of spe	cimen and testing p	performed on	sample supplied to the	laboratory			
	5 mm	100%						und specificatior	2	N/A - Not app	licabla			
1.18	8 mm	99%				Definitions:	LSM = Linear sh	1	1	N/A = Not app ND = Not deter	rmined; SIB = Slip	in bowl		
)μm	94%					UB S = Upper bo	ound specificatio	n	NO = Not obta	inable; NP = Non	plastic		
425	5μm	76%						GRA	DING SU	MMARY				
300) μm	46%				Fines		Sand*		Gravel*	(Cobbles*		
212	2 µm	21%				(<75 μm)	(>75 μ	m - <2.36 m	m) (>2	2.36 mm - <63 n	nm) (>63m	ım - <200 mm)		
150) μm	8%				3.4%		96.6%		0.0%		0.0%		
75	5μm	3%							~1 	Proportions based on	guidance in AS1726	5-2017 Section 6.1.4.2		
1	100% -					PARTICLE S			• • • •	<u> </u>				
	90% -						F							
	80% -													
60	70% -						1							
assin	60% -													
ge på	50% -													
enta	40% -					1								
Percentage passing	30% -													
<u> </u>														
	20% -													
	10% -													
	- 0% 0.0	01		0.01		0.1	1		10	1	00	1000		
		CLAY		SILT FRAC		SAND FF	RACTION	GI	RAVEL FRACT			LDERS		
			FINE	MEDIUN		FINE MEDI		FINE	MEDIUM	COARSE				
Divisio	ns basea	0.002 on AS1289,	0.0 interpolatior			0.075 0.2 Par	0.6 ticle size (mm)	2 6	0	20 60	200	600		
Testing			DP			8/22 - 08/08/22	. ,	reviewed by:	F	YKent I	Date reported:	11/08/2022		
Cert.	ref.:	PS13173	35 CPCB	-BH07	TRP22-0093	PSD_2207193_R	ep22083620			Approv	ed signatory:			
						nber: 1961 - Site:	-				<u> </u>			
NAT	FA					e with ISO/IEC 17		5		4	let			
					-	ONLY BE REPRO				Paul Kent - La	aboratory Ma	nager		
P	hone:	+61 (0)8	9441 070		Fax: +61 (0)8			perthlab@gold	ler com ai			older.com.au		

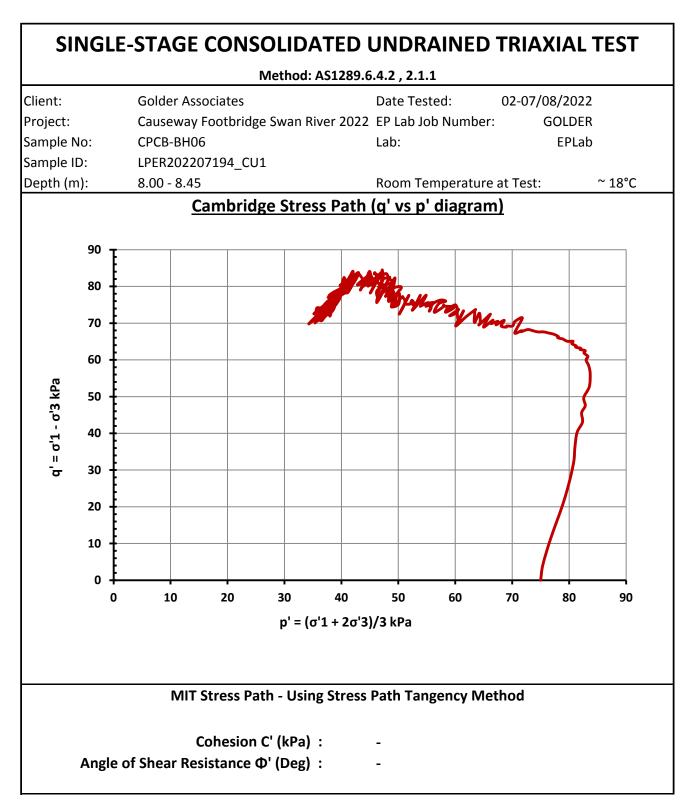
Soils	testi	ng - Pa	rticl	e siz	e dis	tribu	ition 8	<u>દ્ર</u> (consistency	limit	ts t	est ı	repo	rt		,	• •			~		-		
Stand	ard n	nethod	(by s	ievin	g)												•••			G		- L)E	\mathbf{R}
AS128	39.3.6	5.1, 2.1.	1 , 3. :	1.2, 3	3.2.1,	3.3.1	& 3.4	.1																
Test re	eques	t #:		TR	P22-	009	3		Specimen ID:			LPER	2022	07190	0				Go	older	Asso	ciate	es Pty	Ltd
Client:			Caus	seway	y Link	Alliand	ce										PER	TH G	EOT	ECHN	IICAL	LAB	ORATO	ORY
Client	addre	ess:																				84	Guthrie S Osborne	
Projec	t ID:			Ρ	S131	.735							Exp	orato	ory H	lole					W	estern	Australia	
Projec	t nam	ie:	Caus	seway	y Foot	bridge	Swan	Riv	ver				СР	CB-I	BH(08				pth (m nple re	n): 12	.50	- 13	3.00
Projec	t refe	rence:										L			Loc.	. ref.:		enen	it sum	•	h, WA			
	t i ci c			Spe	ecimer	desc	ription								200		San	npling	: Te		s receiv	/ed		
PAR	TICLE S	SIZE DIST	RIBL	-		AS 1289	-		CH) CLAY, high plasti	aitu a			ffingt			ined		sting (1	thing (-	Level	(m)
Sieve		Passir			BS	ι	JB S		rown sand.	city, g	iey, 1		n nne t	U CUAI S	e gra	ineu	20		,			,	2000	(,
	5 mm		- T		_			┢	Method:	AS 1	289.2	.1.1	AS 128	9.3.1.2	A	S 1289.3.	.2.1	AS 1289	.3.3.1		AS	1289.3.	4.1	
	5 mm												1 p	oint									Curling	,
	3 mm										istu		-	uid		Plasti		Plasti			ear		umblin	
	3 mm									со	ntei	nt		nit		limit	:	inde	ex	shrir	nkage		Crackin	-
	5 mm									1	7.19	6												
	5 mm 5 mm								Result:		7.17 Rcv		82	2%		25%		57%	%	15	.0%		None	
	5 mm 9 mm								LB S:											L				
									UB S:															
	2 mm							_		ion m	o th	od.		Dru	ciov	ad			CIVI I	ongth	(mm):		125	
9.5 mm 100% Att. preparation method: Dry sieved LSM length (mm): 6.7 mm 100% Specimen Compliance check AS 1289.1.1 - Clause 5.7 - Table 1 - OK Compliance check AS 1289.1.1 - Clause 5.7 - Table 1 - OK															125									
	6.7 mm 100% 4.75 mm 100% Specimen history/notes: Compliance check AS 1289.1.1 - Clause 5.7 - Table 1 - OK Preparation of specimen and testing performed on sample supplied to the laboratory																							
	4 75 mm 100%																							
										IRS-	Low	er hou	ind sno	cificatio	20		N	I/A = No	t annli	cable				
1.1	8 mm								Definitions:						511						SIB = Slip	in bov	vI	
	0 μm	95%								UB S =	= Upp	ber bou	und spe	cificati	ion		Ν	IO = Not	obtair	nable; N	NP = Non	plasti	5	_
	5 µm	94%														NG SU								
30	0 µm	92%							Fines				Sand					Gravel				Cobb		
	2 μm	91%							(<75 μm)		(>)	75 µr		.36 m	nm)	(>2	2.36 r	nm - <	63 m	m)	(>63m		<200 m	m)
15	0 µm								89.0%				10.49	%		*	Proport	0.6%	ad on a	uidanca	in 15172	0.0	% Section 6	142
7.	5 µm	89%															roport	10113 0030	cu on y		III AJ1720	-2017	Section o	.1.4.2
	100% -								PARTICLE S	IZE D	ISTI	RIBU	TION			• •	•		<u>₽</u> ₽,,,,					
	90% -							9																
	80% -																							
å	70% -																		1					
Percentage passing	60% -							ł											•					
age p	50% -																							
ente	40% -							i											i I					
Perc	30% -							i					İ						İ.					
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	0% -																		L					
		001			0.01				0.1		1					10			10				1000	
		CLAY	FINE		SILT FRAG		COARSE	+	FINE MEDIL	1		ARSE	F	INE	1	EL FRACTI	1	DARSE	COE	BBLES	BOU	LDERS		
		0.002		0.006		0.02		0.0		0.6			2		6		20		60	20	00	600		
		d on AS1289,		lation b						icle si	· ·													
Testing	by:		DP		D	ates:	03/0	8/2	22 - 10/08/22		Res	sults i	review	ed by	:	P	PKent		D	ate rep	ported:	11	L/08/20	22
Cert	ref.:	PS1317	35_CI	PCB-I	BH08_	TRP22	2-0093	_PS	SD_2207190_R	e p22	083	621						Ар	prove	ed sign	natory:			
									er: 1961 - Site:										F	et.				
NA'	TA						-		with ISO/IEC 17			-												
	hone	+61 (0)8			CUM				ILY BE REPROI	DUCE nail:	DI			തെപ	Ider	com.au			t - La Web:		ory Ma	-	r.com.au	- issin



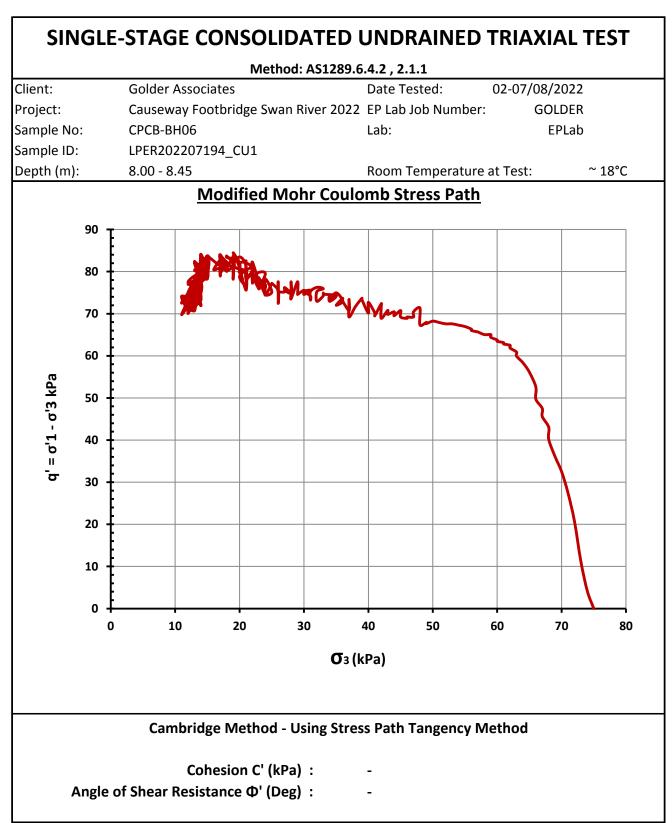
SINGLE-STAGE CONSOLIDATED UNDRAINED TRIAXIAL TEST

			Meth	od: AS1289.6	.4.2 , 2.1.1			
Client:		Golder Asso	ciates		Date Teste	d: 02-07,	/08/2022	
Project:	Causeway Footbridge Swan River 2022					Number:	GOLDER	
Sample No:	mple No: CPCB-BH06						EPLab	
ample ID: LPER202207194_CU1					Issue Date:	. 08,	/08/2022	
					Room Temperature at Test:		: ^	~ 18°C
Tested by:	ested by: Phil Li		Initial I	Initial Moisture (%):		Strain Rate (n	nm/min):	0.007
Height (mm):		128.85	Final Moisture (%):		54.57	Skemp	ton's (B):	1
Diameter (mm):		61.96	Bulk Density (t/m³):		1.66	Initial Void I	Ratio (e _i):	-
L/D Ratio:		2.08	Dry Density (t/m³):		0.93	Particle Densi	ty (t/m³):	-
		F	ailure Criteria	used : Max P	rinciple Stre	ess Ratio		
		60 T						
		E						
		50						
		Ę						
		40						
(kPa)	(kPa)	[
	ress	30 -						
	Shear Stress (kPa)							
		20				<u> </u>		
		ł						
		10	/			\		
		ł						
		o · · · ·	20 4	10 60	<u> </u>	80 100		
		-		Normal St				
			Final Result	s as Measur	ed after T	<u>esting</u>		
		Fi	nal Dry Densi	ty (t/m³):	-			
		Fi	nal Void Ratio	o (e _f):	-			
		Interpretation	from Mohr C	ircle: Stag	e 1 & 2	Stage 1 &	3	Stage 2 & 3
			Cohesion C' (kPa):	-	-		-
Ang	le o	f Shear Resista	-	-	-	-		-
					in is contracting to be the first state			
Accredited for	or co	ompliance with	-		/	δ		
NATA: 19078		Α	uthorised Sig	natory (Geote	chnical Eng	gineer):	A	CCREDITATION NO: 19078

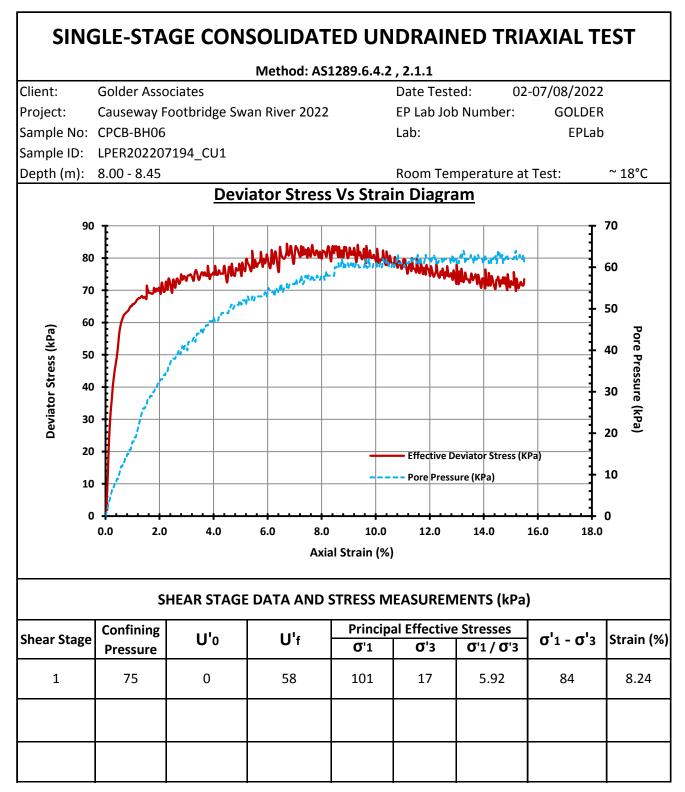














SINGLE-STAGE CONSOLIDATED UNDRAINED TRIAXIAL TEST

Method: AS1289.6.4.2 , 2.1.1

Client:Golder AssociatesProject:Causeway Footbridge Swan River 2022Sample No:CPCB-BH06Sample ID:LPER202207194_CU1Depth (m):8.00 - 8.45

Date Tested: 02-07/08/2022 EP Lab Job Number: GOLDER Lab: EPLab

Room Temperature at Test:

~ 18°C

Photo After Test

Sample ID: CPCB-BH06 Lab ID: LPER202207194_CU1 Depth (m): Date Tested: 8.00 - 8.45 02-07/08/2022



Failure Mode:

Bulging Failure

Notes: Sample collected from Shelby Tube

Stored and Tested the Sample as received

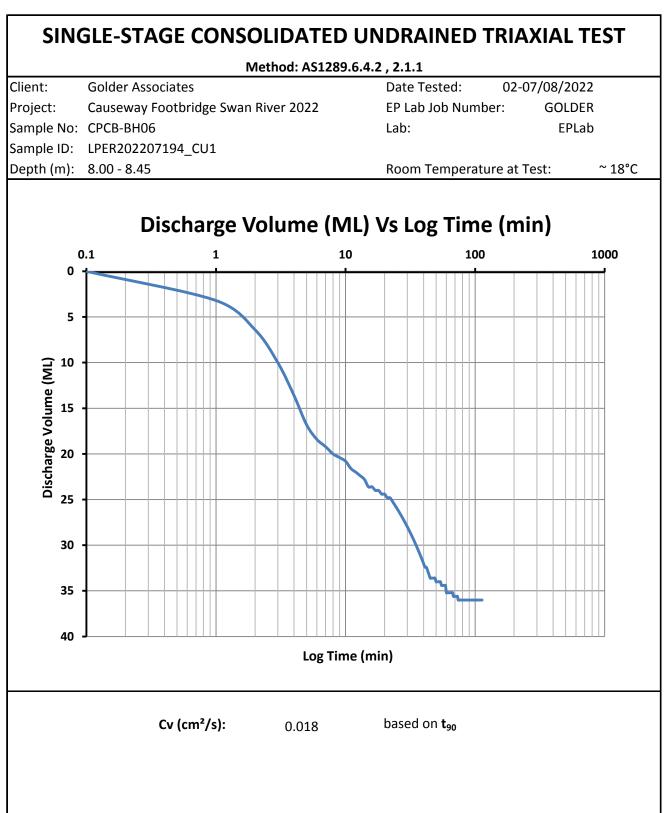
Samples supplied by the Client

Authorised Signatory (Geotechnical Engineer):

The results of tests performed apply only to the specific sample at time of test unless otherwise clearly stated. Reference should be made to E-Precision Laboratory's "Standard Terms and Conditions" E-Precision Laboratory ABN 431 559 578 87

NATA: 19078



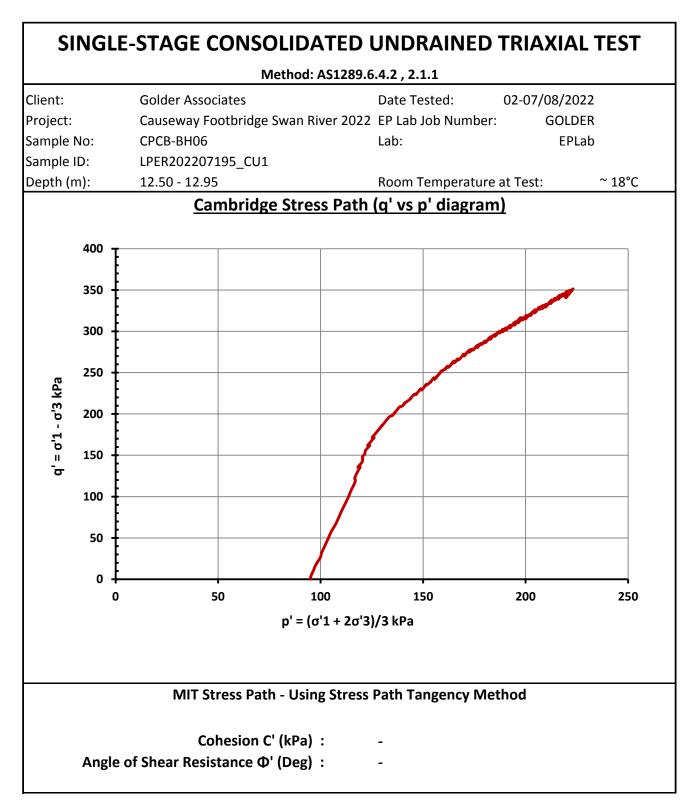




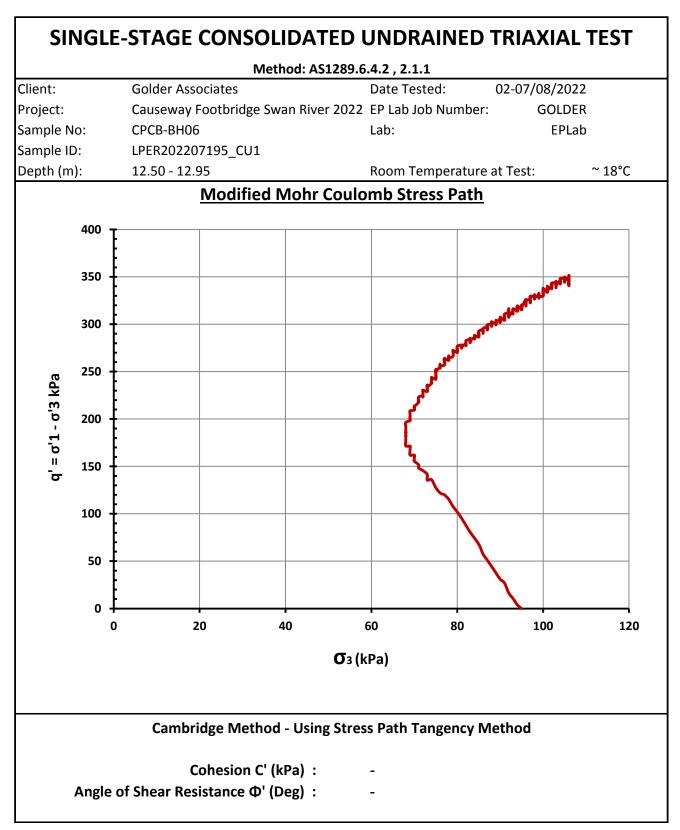
SINGLE-STAGE CONSOLIDATED UNDRAINED TRIAXIAL TEST

Client:	Golder Associa	Method: AS1289.6	Date Teste	d: 02-07/08/2022	
Project:		tbridge Swan River 2022	, ,		
Sample No:	CPCB-BH06	IDHUge Swall River 2022	Lap:)	
Sample ID:	LPER20220719	95 CU1	Lab: EPLab Issue Date: 08/08/2022 Room Temperature at Test:		
Depth (m):	12.50 - 12.95	5_001			
Tested by:	Phil Li	Initial Moisture (%):	17.55	Strain Rate (mm/min):	0.007
Height (mm):	124.63	Final Moisture (%):		Skempton's (B):	
Diameter (mm):		Bulk Density (t/m ³):		Initial Void Ratio (e _i):	
L/D Ratio:	1.99	Dry Density (t/m³):		Particle Density (t/m ³):	
		lure Criteria used: Max P			
	140				
	120				_
	100				
Pa)					
Shear Stress (kPa)	80				
ar Stre	60	/			
Shea					
	40				_
	20				
	20				
	0				_
	0 50		50 itress (kPa)	200 250	300
	F	inal Baculta as Maasur	ad aftar T	octing	
		inal Results as Measur al Dry Density (t/m³):		esting	
		al Void Ratio (e _f):	-		
	Interpretation fr	om Mohr Circle: Stag	e 1 & 2	Stage 1 & 3	Stage 2 & 3
	Co	ohesion C' (kPa):	-	-	-
Angle o	f Shear Resistanc	еФ' (Degrees) :	-	-	-
A 10. 10				and a	NATA
Accredited for c	ompliance with IS	O/IEC 17025-TESTING			NATA

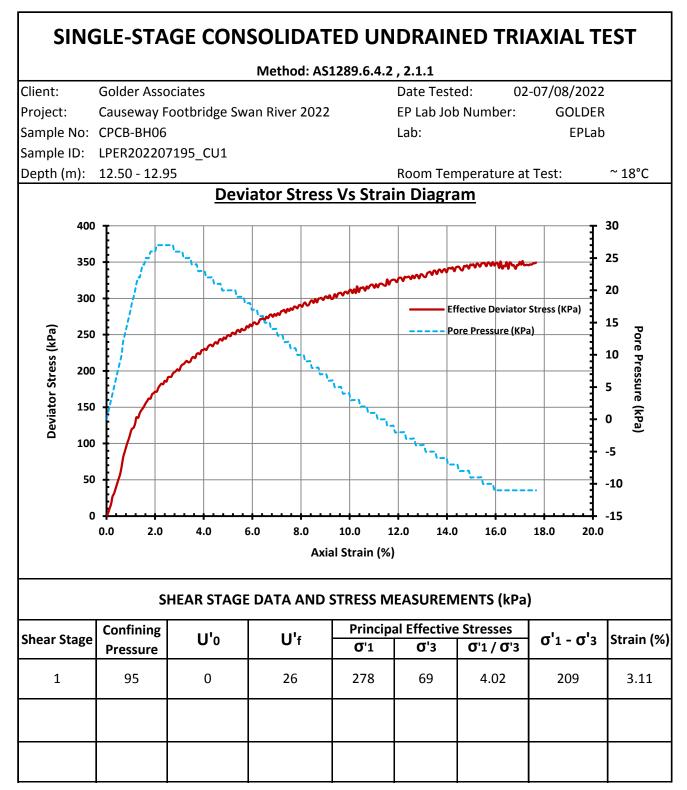














SINGLE-STAGE CONSOLIDATED UNDRAINED TRIAXIAL TEST

Method: AS1289.6.4.2 , 2.1.1

Client:Golder AssociatesProject:Causeway Footbridge Swan River 2022Sample No:CPCB-BH06Sample ID:LPER202207195_CU1Depth (m):12.50 - 12.95

Date Tested: 02-07/08/2022 EP Lab Job Number: GOLDER Lab: EPLab

Room Temperature at Test:

~ 18°C

Photo After Test

Sample ID: CPCB-BH06 Lab ID: LPER202207195_CU1 Depth (m): Date Tested: 12.50 - 12.95 02-07/08/2022



Failure Mode:

Shear Failure to Vertical @ 37.3°

Notes: Sample collected from Shelby Tube

Stored and Tested the Sample as received

Samples supplied by the Client

Authorised Signatory (Geotechnical Engineer):



The results of tests performed apply only to the specific sample at time of test unless otherwise clearly stated. Reference should be made to E-Precision Laboratory's "Standard Terms and Conditions" E-Precision Laboratory ABN 431 559 578 87

NATA: 19078



