Appendix I - Geotechnical Investigation Report prepared by CMW Geosciences

16 September 2021

TAURANGA ROAD INDUSTRIAL SUBDIVISION
194 TAURANGA ROAD (SH24), MATAMATA

GEOTECHNICAL INVESTIGATION REPORT

Calcutta Farms Limited

TGA2020-0304AC Rev 3

TGA2020-0304AC		
Date	**Revision**	**Comments**
30 August 2021	0	Final issue to support Resource Consent Application
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1 INTRODUCTION

1.1 Project Brief

CMW Geosciences (CMW) was engaged by Veros Property Group (Veros) on behalf of Calcutta Farms Limited to carry out a geotechnical investigation of a site located at 194 Tauranga Road (SH24), Matamata, which is being considered for an 80 lot industrial subdivision.

The scope of work and associated terms and conditions of our engagement are detailed in our services proposal letter dated 26 March 2021 (ref. TGA2020-0304AA Rev 2).

This report is to support a plan change application, that will be made to Matamata-Piako District Council (MPDC) for the rezoning of the land from rural to industrial, to confirm that the site is geotechnically suitable for that development outcome. Thereafter the report may be used to inform the industrial subdivision of the land.

1.2 Scope of Work

As detailed in our proposal letter, the agreed scope of work to be conducted by CMW was defined as follows:

- A site familiarisation walkover;
- The drilling of 25 hand augers and advancement of 10 cone penetrometer tests (CPT's);
- 12 soakage tests to provide factual permeability data for preliminary stormwater disposal design;
- Identification of any geohazards to the proposed development, including slope stability, liquefaction, static settlement and bearing capacity and provide strategies to mitigate these where necessary;
- Provide recommendations relating to the proposed development including earthworks requirements, foundation design requirements and geotechnical design parameters;
- Compile all of the above detail into a geotechnical investigation report (GIR) suitable to support a Resource Consent application, incorporating relevant plans, field investigation data, and calculations.

2 SITE DESCRIPTION

2.1 Site Location

The site has a plan area of approximately 40ha and is located at 194 State Highway 2 (Tauranga Road), Matamata as shown on Figure 01 below.

Figure 1: Site Location Plan (Openstreetmap.org)

2.2 Landform

The current general landform, together with associated features located within and adjacent to the site, is presented on the attached Geotechnical Investigation Plan as ***Drawing 01*** provided in ***Appendix A***.

The landform across the site and surrounding properties is level to gently undulating, with existing ground levels ranging from RL 63m (Moturiki) in the northwest to RL 59m in the southeast. The site is currently used for crop farming and contains several farm sheds within the central portion of the site and is accessed from State Highway 24 to the north.

The nearest watercourse to the site is the Mangawhero Stream approximately 300m to the southeast, which lies within a 20 metre deep incised gully and flows towards the north.

The site is bound by State Highway 24 to the north, pasture/cropland to the south and west, and by a recycling centre to the east.

3 PROPOSED DEVELOPMENT

The current development proposal, as shown on the plans provided by Veros Limited[1], depicted on ***Drawing 01*** and provided in ***Appendix A***, is to develop the site into industrial lots of varying size with associated access roads extending off State Highway 24 in the north as well as within the subdivision.

A stormwater drainage channel/ swale and attenuation pond will be formed along the southern site boundary and it is understood that flows from the pond will dissipate into the Mangahwero Stream catchment via a controlled outlet, although details regarding this are not yet known.

Earthworks plans were not provided at the time of preparing this report, however given the relatively level nature of the landform proposed earthworks are expected to typically involve cuts and fills of up to 2.0m to create level to very gently graded lots.

Onsite stormwater attenuation/disposal is proposed however as specific design is being carried out by others it is therefore beyond the scope of this report.

At this stage it is not yet known if wastewater flows will connect to existing council reticulation or whether these will be treated onsite by specifically designed systems.

4 INVESTIGATION SCOPE

4.1 Historic Aerial Photographs

A review of available aerial photographs[2] indicates that the site was in pasture and used for grazing purposes since 1943 (earliest available image). The farmstead was constructed prior to 1943 with a number of small sheds constructed within the central part of the property since the 1960's.

The site appears to have remained relatively unchanged from the 1960's until the present day.

No significant earthworks were noted during our review though it appears that some minor earthworks occurred near the southeast property boundary during the early 1980's.

4.2 Field Investigation

Following a dial before you dig search, and onsite service location, the field investigation was carried out between 14 and 27 July 2021. All fieldwork was carried out under the direction of CMW Geosciences in general accordance with the NZGS guidance[3].

[1] Veros Limited, Development Area Plan, Drawing No. CL-01, Rev D, Dated 22/10/2021
[2] http://retrolens.nz/
[3] NZ Geotechnical Society et al, New Zealand Ground Investigation Specification, Vol 1, April 2017 NZ Geotechnical Society (2005)

The scope of fieldwork carried out was as follows:

- A walkover survey of the site was undertaken to assess the general landform and site conditions;
- Twenty four hand auger boreholes, denoted HA01 to HA24, were drilled using a 50mm diameter auger to target depths of up to 5.0m below existing ground levels to visually observe the near surface soil profile and to facilitate in-situ vane shear strength testing. The hand augers were logged by a CMW Engineering Geologist in general accordance with NZGS guidelines[4]. Engineering logs of the hand auger boreholes, together with peak and remoulded vane shear strengths are in ***Appendix B***;
- Dynamic cone penetrometer (DCP) tests were carried out within each hand auger borehole to depths of up to 5.0m to provide soil density profiles, for use as a comparison with the CPT data and to provide a subgrade CBR value for pavement design purposes. Graphical results of the DCP testing are shown on the engineering logs of the hand augers in ***Appendix B***;
- Ten Cone Penetrometer Tests (CPT's), denoted CPT01 to CPT10, were pushed to target depths of up to 25m to help us define the ground model beneath the site. Results of the CPT's, presented as traces of cone resistance (qc), sleeve friction (fs), friction ratio (Rf) and Dynamic pore pressure (u2) are presented in ***Appendix C***;
- Permeability testing, with twelve falling head permeability and five constant head permeability tests undertaken. Boreholes were initially drilled using a 50mm diameter auger head, then reamed out using a 100mm diameter auger head, and a slotted PVC pipe installed to the base of the holes. The holes were pre-soaked prior to undertaking the permeability tests. Details regarding the tests and results are provided in the CMW Soil Permeability Report[5].

The approximate locations of the respective auger and CPTs referred to above are shown on ***Drawing 01***.

Auger and CPT locations were measured using handheld GPS with elevations inferred from lidar contours presented on the Waikato Regional Council online GIS[6].

5 GROUND MODEL

5.1 Published Geology

The published geological map[7] for the area depicts the regional geology as comprising Pleistocene age '*laminated, cross-bedded, fluvial sands and gravels, dominated by fragments of pumice and ash*' of the Hinuera Formation (Q3a) which were deposited as part of the ancient Waikato River alignment where illustrated in Figure 2, below.

The Hinuera Formation is typically mantled by thin but numerous tephra layers (each a few millimetres to a few centimetres in thickness). It is also expected to be underlain by Ignimbrite at depth.

Based on the known history of the site and surrounding land levels, some superficial depths of fill could be anticipated as a result of soft landscaping and horticultural use.

5.2 Geomorphology

The landform within and surrounding the site comprises board, near-level, historic braided river channel topography. The site is bisected by low-height ridges and shallow swales which appear to have been formed by recent fluvial and/or aeolian processes.

[4] Field Description of Soil and Rock, Guideline for the field classification and description of soil and rock for engineering purposes.
[5] CMW Soil Permeability Report, ref. TGA2020-0304AD Rev0, dated 30 August 2021
[6] https://waikatomaps.waikatoregion.govt.nz/
[7] Leonard, Begg and Wilson (2010), QMap Geology of the Rotorua Area, GNS, 1:250 000 Geological Map 5.

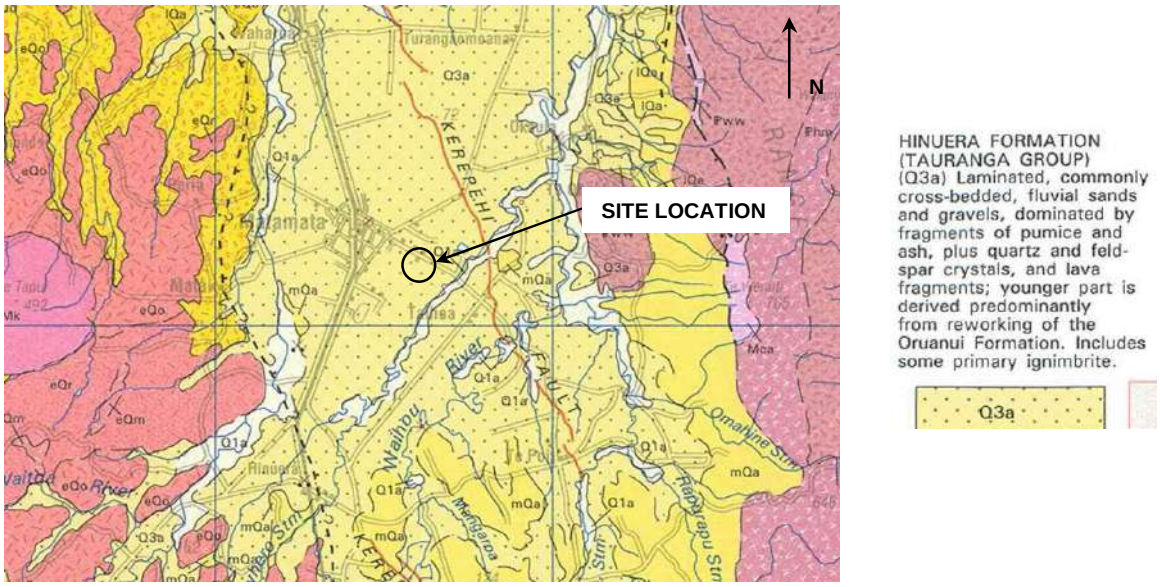


Figure 2: Regional Geology (GNS Qmap 5)

5.3 Stratigraphic Units

The ground conditions encountered and inferred from the investigation are considered to be generally consistent with the published geology for the area and our expectations. The general vertical distribution of the strata is presented in Table1 below.

Table 1: Summary of Strata Encountered

Unit		Depth to top (m)*		Thickness (m)*	
		Min	Max	Min	Max
Topsoil – Organic Silt		Surface		0.1	0.2
Hinuera Formation	Stiff to hard clayey silt and silt (Tephra)	0.1	0.2	0.7	2.5
	Loose to medium dense sand and silty sand	0.9	2.4	0.9	4.8
	Medium dense to dense pumiceous sand	1.0	7.8	9.5	-
	Dense to very dense pumiceous sand	17.8	24.2	-	

Notes: *Depth to top and thickness only recorded where base of strata has been confirmed

5.4 Groundwater

During the investigation, which was carried out in early winter (June 2021), groundwater was measured and/or inferred in a number of the CPTs and hand augers at the depths provided in Table 2.

Groundwater could not be measured at some CPT locations due to hole collapse and at these locations the groundwater depth was inferred from the Dynamic pore pressure (u2) trace.

Table 2: Groundwater Data			
Test Location	**Groundwater Depth (mbgl)**	**Elevation (m RL)**	**Measured or inferred**
CPT01	14.8	46.2	Inferred
CPT02	12.2	47.8	Measured
CPT03	14.8	47.2	Inferred
CPT04	13.5	46.5	Measured
CPT05	13.2	46.8	Measured
CPT06	14.9	45.1	Measured
CPT07	2.9	57.1	Measured
CPT08	3.7	55.3	Measured
CPT09	4.2	55.8	Measured
CPT10	4.8	56.2	Measured
HA12	2.7	57.3	Measured
HA14	3.6	57.4	Measured
HA16	4.0	56.0	Measured
HA17	3.0	58.0	Measured
HA18	2.9	57.1	Measured
HA19	3.4	56.6	Measured
HA20	3.0	56.0	Measured
HA21	3.6	56.4	Measured
HA23	3.8	56.2	Measured
HA24	3.8	55.2	Measured
Note: mbgl = metres below ground level			

The near surface groundwater levels encountered at CPT07 to CPT10 and hand auger boreholes HA12, HA14, HA16, HA17, HA18, HA19, HA20, HA21, HA23 and HA24 are interpreted to represent perched groundwater within the variable and layered near surface deposits.

Below these perched groundwater levels (encountered between RL55.2m and 57.3m), groundwater lies at between approximately 14.9m to 12.2m below existing ground levels, which is approximately RL45.1m to RL47.8m.

6 GEOHAZARDS ASSESSMENT

6.1 Context

Section 106 of the Resource Management Act (RMA) requires an assessment of the risk from natural hazards to be carried out when considering the granting of a subdivision consent. S106 RMA specifically states that the assessment must consider the combined effect of the natural hazard likelihood and material damage to land or structures (consequence).

The following sections of this report provide an assessment of the geohazards relevant to this site and provide the basis for the Natural Hazards Risk Assessment presented in ***Appendix F***.

6.2 Seismic Site Subsoil Category

The geological units encountered beneath the site comprise soil strength materials, which with respect to the seismic site subsoil category defined in Section 3.1.3 of NZS1170.5, is defined as having a UCS < 1MPa.

The seismic site subsoil category is assessed as being Class D (deep soil site) in accordance with NZS1170.5.

6.3 Seismicity

A seismic assessment has been carried out in general accordance with NZGS guidance[8] to calculate the peak horizontal ground acceleration or PGA (a_{max}) as follows:

$$a_{max} = C_{0,1000} \frac{R}{1.3} x\ f\ x\ g$$

Where: $C_{0,1000}$ = unweighted PGA coefficient (refer Section 6.2 for subsoil class)
R = return period factor given in NZS1170.5, Table 3.5 (for an IL2 structure)
f = site response factor subject to subsoil class (for an IL2 structure)
g = acceleration due to gravity

The PGAs for the serviceability limit state (SLS) and ultimate limit state (ULS) earthquake scenarios were calculated based on a 50-year design life in accordance with the New Zealand Building Code and importance level (IL) 2 structures.

The calculated PGAs for the SLS and ULS earthquake scenarios are as shown in Table 3.

Table 3: Design Peak Ground Acceleration (PGA) for Various Limit States

Limit State	AEP	R	PGA(g)	$Magnitude_{eff}$
SLS	25	0.25	0.07	5.8
ULS	500	1.0	0.26	5.8
Note: SLS = serviceability limit state; ULS = ultimate limit state; AEP = annual exceedance probability				

6.4 Fault Rupture

The nearest known active fault to the site is the Kerepehi Fault (GNS Ref #2062) which is approximately 3km east of the site and is depicted on Figure 2 above, with a recurrence interval of 2,000 to 3,500 years.

Given the offset from the fault to the site, the risk of significant damage due to fault rupture is assessed to be low.

6.5 Liquefaction

6.5.1 General

Soil liquefaction is a process where typically saturated, granular soils develop excess pore water pressures during cyclic (earthquake) loading that exceed the effective stress of the soil. In loose soils, some dilation can occur during this process, which can lead to individual soil grains moving into suspension. Following the onset of liquefaction, the shear strength and stiffness of the liquefied soil is effectively lost causing excessive differential settlement of the ground surface, bearing capacity failure and collapse of structures and low-angle lateral spreading of slopes in liquefiable soils.

[8] NZ Geotechnical Society publication "Earthquake geotechnical engineering practice, Module 1: Overview of the standards", (March 2016)

In accordance with NZGS guidance[9] the liquefaction susceptibility of the soils at this site has been considered with respect to geological age, soil fabric and soil consistency / density.

6.5.2 Geological Age

The vast majority of case history data compiled in empirical charts for liquefaction evaluation come from Holocene deposits or man-made fills[10,11].

Published geological records indicate that the Hinuera Formation soils beneath the site are of Pleistocene geological age (>12,000 years old) and therefore have a moderate susceptibility to liquefaction based on that criterion.

Notwithstanding this, age alone is often debated as being of insufficient evidence to discount liquefaction potential due to its qualitative nature. Consideration can therefore be given to applying an ageing factor (K_{DR}) to site specific liquefaction analyses in accordance with methods presented in Saftner et al[12] and represented in Figure 2 below:

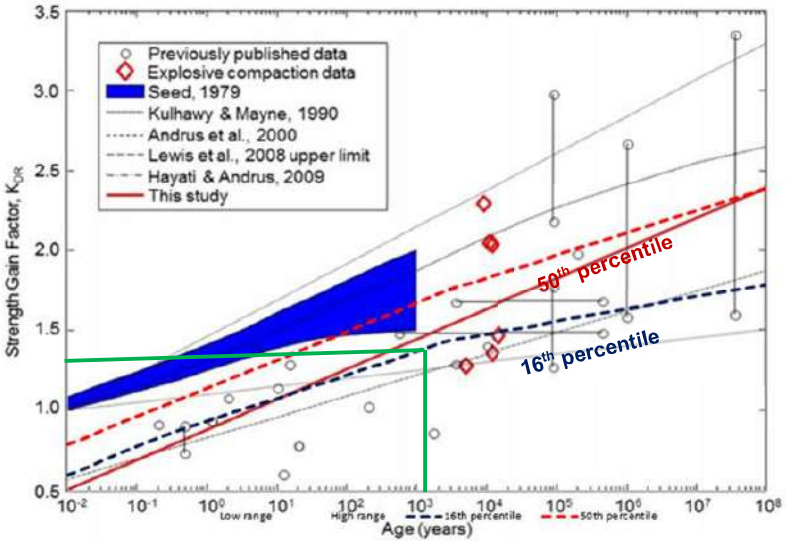


Figure 2: Ageing factors as presented in Saftner et al. with 16th and 50th percentiles

Based on a minimum age of 12,000 years and adopting the 16th percentile trend line an aging factor of 1.3 was applied to Hinuera Formation soils in our liquefaction analysis.

6.5.3 Soil Fabric and Density

Soils are also classified with respect to their grain size and plasticity to assess liquefaction susceptibility. Based on more recent case histories, there is general agreement that sands, non-plastic silts, gravels and their mixtures form soils that are susceptible to liquefaction. Clays, although they may significantly soften under cyclic loading, do not exhibit liquefaction features, and therefore are not considered liquefiable.

[9] Earthquake Geotechnical Engineering Practice, Module 3: Identification, assessment and mitigation of liquefaction hazards", (May 2016)
[10] Seed, H.B. and Idriss, I.M. (1971) A simplified procedure for evaluating soil liquefaction potential, Earthquake Engineering Research Centre, Report No. EERC 70-9, University of California
[11] Youd, T.L. and Perkins, D.M. (1978) Mapping liquefaction-induced ground failure potential, Journal of the Geotechnical Engineering Division, ASCE, Vol. 104, No. GT4, Proc Paper 13659, p. 433-446
[12] Saftner, D.A.; Green, R.A.; Hryciw, R.D. (2015). Use of explosives to investigate liquefaction resistance of aged sand deposits, *Engineering Geology*, Vol 199, p.140-147.

The majority of the soils encountered beneath the watertable comprise medium dense to dense granular sand material, which by definition may be prone to the effects of liquefaction.

6.5.4 Specific Analyses

Specific liquefaction analyses were undertaken using the software package CLiq by comparing the cyclic stress ratio (CSR), being a function of the earthquake magnitude for the design return period event, to the cyclic resistance ratio (CRR), being a function of the CPT cone resistance (qc) and friction ratio. Ageing of the soils was applied to the CLiq models based on the age specified in Section 6.5.2 above.

Our liquefaction assessment of the soils beneath the site was carried out for Importance Level 2 (IL2) structures in accordance with NZS1170.0:2002.

The presence of a localised perched groundwater table was noted in the south-eastern portion of site and has been included in the analysis for CPT's 07 to 10 with groundwater modelled at between 2.9m and 4.8m depth.

The effect of the non-liquefiable layer between the perched and regional groundwater tables for these CPT's has been allowed for in the calculation of the ULS estimated index settlements, which are included in Table 4 below.

Results show no liquefaction for the SLS design scenario.

Copies of the results are presented in ***Appendix E*** and are summarised in Table 4.

Table 4: Liquefaction Analyses Results

CPT No.	ULS Estimated Index* Settlement (mm)	Depth to Liquefied Layer (m)	Approximate Liquefaction Soil Profile Thickness (m) Cumulative Total
1	<10	N/A	N/A
2	<10	N/A	N/A
3	<10	N/A	N/A
4	<10	N/A	N/A
5	<10	N/A	N/A
6	<10	N/A	N/A
7	25	5.1	0.5
8	50	3.7	1.5
9	40	5.1	0.7
10	20	5.0	0.4

Note: Settlements and depths are based on current ground elevations

*Index settlement based on that derived in the upper 10m of the soil profile

N/A due to not being observed within upper 10m of soil profile.

In CPT07 to CPT10 much of the 'liquifiable' strata plots are within the 'unlikely to liquify' zone on the factor of safety plots with the rest within the 'equally likely /unlikely to liquify' zone and the risk of the full 50mm of estimate settlement occurring is considered low (refer ***Appendix G***). Nonetheless we recommend that specific structural design for proposed buildings in the south-east quadrant as shown on ***Drawing 01*** takes into account this magnitude of total and differential settlement so that it does not lead to building collapse during a ULS seismic scenario.

6.6 Lateral Spread

Following the onset of liquefaction, the liquefied soils behave as a very weak undrained material, which can give rise to lateral spreading where a free face is present within the vicinity of the site or where proposed cut and fill batters are proposed over or within liquefied soils.

Due to the flat nature of the site and distance to the nearest existing free face (a gully at approximately 230m) we consider the risk of liquefaction induced lateral spreading to be very low.

6.7 Slope Stability

The landform surrounding the proposed development area is generally level. On this basis, the risk of deep-seated slope instability is low.

6.8 Fill Induced Static Settlement

Assuming only minor earthworks are required on account of the level to very gently graded nature of the site landform, fill induced settlement is not considered to be a significant risk for the development. Nonetheless, static settlement analyses have been undertaken to consider the effect of the placement of a nominal 1m thick fill as well as simulating future footing and widespread building loads as discussed in Section 7.4, below.

7 GEOTECHNICAL RECOMMENDATIONS

7.1 Earthworks

7.1.1 General

All earthwork activities must be carried out in general accordance with NZS 4431 and the requirements of the Regional Infrastructure Technical Specification (RITS) under the guidance of a Chartered Professional Geotechnical Engineer.

The earthworks requirements are summarised below.

7.1.2 Re-use of Onsite Materials

The silts that will be encountered with the shallow earthworks cuts below the topsoil should be suitable for re-use as engineered fill. However, it is of note that these soils are sensitive which can make them challenging to earthwork. These materials can be used within engineered fills although an amount of moisture conditioning, blending and compaction effort will likely be required.

Where sands are exposed within shallow cuts, these will be suitable for re-use as engineered fill and should require less moisture conditioning.

7.1.3 Subgrade Preparation

Preparation of the stiff / loose to medium dense subgrade beneath any proposed fill areas should comprise stripping of all vegetation and topsoil, and existing fill if encountered. A proof roll observation should then be undertaken to confirm competent subsoils.

Where any particularly weak materials are encountered at the surface they should be undercut to a nominal depth as specified by the project geotechnical engineer and removed prior to placing engineered fill.

7.1.4 Compaction

Earthfill must be placed, spread and compacted in controlled lifts under the direction of a geotechnical engineer. The fill may comprise either granular or cohesive material subject to being free of any organic material and having no particles greater than 150mm diameter.

Most of the proposed cut material should be suitable for reuse as Engineer Certified Fill. Soil textures and moisture contents will however vary widely and careful management, conditioning and compaction control will be required.

All earthfill must be placed to ensure adequate knitting of successive fill lifts by ripping any natural subgrade or fill surfaces that have become dry prior to placing the following fill lift.

7.1.5 Compaction Quality Control

The stripping of existing topsoil, cutting of soft/loose material, where required from across the site must be subject to observation by the project geotechnical engineer to ensure that all unsuitable materials have been removed.

The source and / or type of material used for engineered fill will dictate the type of quality control testing undertaken.

For granular (sand and gravel) fill materials, testing following compaction should be principally in terms of the maximum dry density within the appropriate water content range, which may be calibrated with a dynamic cone (Scala) penetrometer test. Where the source or quality of fill changes, re-calibration will be required.

Where silts and clays are used as fill, alternative test criteria using vane shear strength and air voids should be used.

Representative laboratory compaction curves will be required for each new fill type. The results of these may affect the compliance criteria below.

Table 5: Summary of Earthfill Testing Requirements

Fill Type	Test Method	Frequency*	Compliance Criteria
Granular	Maximum Dry Density	1 x 1m test / 1000m^3	95% MDD
	Scala Penetrometer	1 x 0.9m test / 500m^3	5 blows per 100mm
Cohesive	Vane Shear Strength	5 tests / 1000m^3	Min. average 140kPa over 10 tests, min. single value of 110kPa
	Air voids	1 test / 1000m^3	Max. average 10% over 10 tests, Max. single value 12%

Note: *Testing frequency to be confirmed when volume of earthworks is known and may vary at the discretion of the geotechnical engineer, which may include small and / or deep isolated fill areas.

The source of the fill should be discussed with and approved by the project geotechnical engineer to verify its appropriateness and quality control testing requirements.

7.1.6 Cuts/Fills

To reduce the effects of ongoing minor slumping and scour, permanent cut or fill batters should be formed to no steeper than 1(V):2.5(H) to a maximum height of 3 metres. Where proposed batters exceed this grade, they should be specifically designed or supported by engineer designed retaining walls.

Temporary engineered fill batters shall be formed no steeper than 1(V):1.5(H) to a maximum height of 3 metres provided they are provided with a stable foundation support. Where batters are proposed to exceed this height or grade during earthworks, they should be inspected by the geotechnical engineer and may require specific design or be supported by engineer designed retaining walls.

All formed permanent batters, or where temporary batters are to remain for a period of at least several weeks, surface protection against erosion shall be considered. Surface protection may include topsoiling and grassing or the use of geofabrics.

7.2 Foundation Bearing Capacity

Once earthworks are completed in accordance with the recommendations provided in Section 7.1 above, a preliminary geotechnical ultimate bearing pressure of 300kPa should be available for shallow strip and/or pad foundations constructed within the natural ground or engineered fill subject to the short axis of pad/strip foundations being limited to 2.5m.

There may be areas where localised variations in shear strength within the natural cut ground occur. Further confirmation of available bearing pressures will be addressed at the time of post earthworks soil testing and preparation of the Geotechnical Completion Report (GCR) for the development.

7.3 Liquefaction Mitigation

In the ULS seismic event, the NZ Building Code requires that buildings do not collapse and therefore preserve life but do not need to remain serviceable. On this basis the project structural engineer must take into consideration the above-given magnitudes of total and differential liquefaction induced settlement for the southeast quadrant, so that structural collapse does not occur under the ULS earthquake scenario.

7.4 Geotechnical Strength Reduction Factor

As required by section B1/VM4 of the New Zealand Building Code Handbook, a strength reduction factor of 0.5 and 0.8 must be applied to all recommended geotechnical ultimate soil capacities in conjunction with their use in factored design load cases for static and earthquake overload conditions respectively.

7.5 Foundation Settlement

Static foundation settlement calculations were undertaking for CPT01 to CPT10 using Schmertmann's method, which correlates raw CPT cone resistance (qc) to soil modulus using a multiplication factor of 3.5 for normally consolidated subsoils. In the absence of specific load combinations and foundation dimensions, for preliminary assessment purposes the scenarios described on Table 6 below were analysed.

Table 6: Results of Static Settlement Analyses

Scenario	**Calculated Settlement (mm) Uniform vertical loads**	
	70kN/m^2	**100kN/m^2**
Shallow pad footing of 1.0m wide by 0.4m depth	<10mm	15mm to 45mm
Shallow pad footing of 2.0m wide by 0.4m depth	<10mm to 45mm	15mm to 60mm
Shallow pad footing of 2.5m wide by 0.4m depth	10mm to 45mm	15mm to 65mm
Shallow continuous footing of 0.3m wide by 0.4m depth	<10mm to 15mm	<10mm to 25mm
Shallow continuous footing of 1.0m wide by 0.4m depth	<10mm to 25mm	10mm to 45mm
16kPa widespread load to represent 1m depth of engineered fill*	<10mm to 20mm	
10kPa to represent a widespread floor load *	<10mm to 20mm	
20kPa to represent a widespread floor load*	10mm to 25mm	
* Note: Fill and floor loads were applied to a range of floor dimensions with the greatest amounts of settlement for the critical dimension then presented in this table.		

7.6 Civil Works

7.6.1 Subgrade CBR

The Hinuera silts are highly sensitive and degrade rapidly with trafficking and exposure to moisture ingress. Where traffic can be left off these materials, they are moisture conditioned, recompacted at optimum moisture contents and located at least 1m above the peak perched winter watertable, there could be some opportunity to use them as a pavement subgrade material. Following earthworks and subgrade trimming, a CBR of approximately 2% to 3% is anticipated for the Hinuera silt subsoils. Where in sand, a CBR of approximately 4% to 6% is anticipated

Specific consideration to construction methodologies, such as the use of long reach excavators, progressive excavation, use of geotextiles, etc, will also be required to avoid trafficking over sensitive silt subgrades.

It is recommended that a programme of penetration resistance testing is carried out at routine intervals along road alignments as part of the road pavement design prior to road construction to confirm actual CBR values.

7.6.2 Service Trenches

For service trench excavations, the expected subsoils likely to be encountered beneath subgrade level are stiff silts, with loose to medium dense sands below these.

Groundwater levels are likely to be low, therefore service trenches within the upper 2m metres of natural subsoils should be relatively straightforward to construct and should provide adequate support to buried services with trench bedding and backfill in accordance with Council requirements and the manufactures specifications.

7.6.3 Retaining Walls

Although likely to be low height, it is recommended that the walls are specifically engineer designed where in proximity to lot boundaries and residential building platforms.

Retaining walls should be designed by a suitably qualified and experienced Chartered Professional Engineer familiar with the contents of this report and taking into consideration toe slope, seismic loads, vehicle loads, building loads etc. It is noted that some ground movement will occur behind temporary or permanent retaining walls. The extent of this movement is dependent on the height of retaining, type of wall selected and construction methodology. This must be considered during the design and construction of the retaining walls to ensure adjacent facilities are not adversely affected.

7.6.4 Stormwater Disposal

The site is considered suitable for the construction of the proposed soakage parks.

Although soakage to ground is considered suitable, the potential implications for the approximately 20-metre-high escarpment alongside the Mangawhero Stream, located 1km to the southeast of the site need to be considered. Water disposed to the sand units beneath the site has the potential to travel towards the stream and have implications for the stability of the stream embankments. This risk is difficult to quantify; however, stability will need to be monitored and setbacks from the river embankments for any future development along the eastern side of the river in the vicinity of the subject site may need to be increased.

8 FURTHER WORK

The following summarises the further geotechnical works that are required prior to and in conjunction with the proposed development:

- Review of the final development plans;
- Monitoring of the watertable over a period of several months to confirm stabilised groundwater levels, in particular across the eastern part of the property where the perched watertable was encountered.

- Specific geotechnical review of any temporary and / or permanent stormwater attenuation ponds;
- Provision of laboratory test results and preparation of Geotechnical Earthworks Specification;
- Review of the Approved Resource Consent Conditions.
- Further investigation and reporting for site specific assessment of settlement and liquefaction for each building development at building consent stage. This would include deep investigation such as cone penetration tests once the nature of the building development is known. The investigation and reporting would need to be undertaken by a Chartered Professional Engineer who is experienced in the field of geomechanics and who is familiar with this report.

USE OF THIS REPORT

Site subsurface conditions cause more construction problems than any other factor and therefore are generally the largest technical risk to a project. These notes have been prepared to help you understand the limitations of your geotechnical report.

Your geotechnical report is based on project specific criteria

Your geotechnical report has been developed on the basis of our understanding of your project specific requirements and applies only to the site area investigated. Project requirements could include the general nature of the project; its size and configuration; the location of any structures on or around the site; and the presence of underground utilities. If there are any subsequent changes to your project you should seek geotechnical advice as to how such changes affect your report's recommendations. Your geotechnical report should not be applied to a different project given the inherent differences between projects and sites.

Subsurface conditions can change

Subsurface conditions are created by natural processes and the activity of man. For example, water levels can vary with time, fill may be placed on a site and pollutants may migrate with time. Because a report is based on conditions which existed at the time of subsurface investigation, the conditions may have changed, particularly when large periods of time have elapsed since the investigations were performed.

Interpretation of factual data

Site investigations identify actual subsurface conditions at points where samples are taken. Additional geotechnical information (e.g. literature and external data source review, laboratory testing on samples, etc) are interpreted by geologists, engineers or scientists to provide an opinion about overall site conditions, their likely impact on the proposed development and recommended actions. Actual conditions may differ from those inferred to exist, because no professional, no matter how qualified, can exactly predict what is hidden by earth, rock and time. The actual interface between materials may be far more gradual or abrupt than assumed based on the facts obtained. Nothing can be done to change the actual site conditions which exist, but steps can be taken to reduce the impact of unexpected conditions.

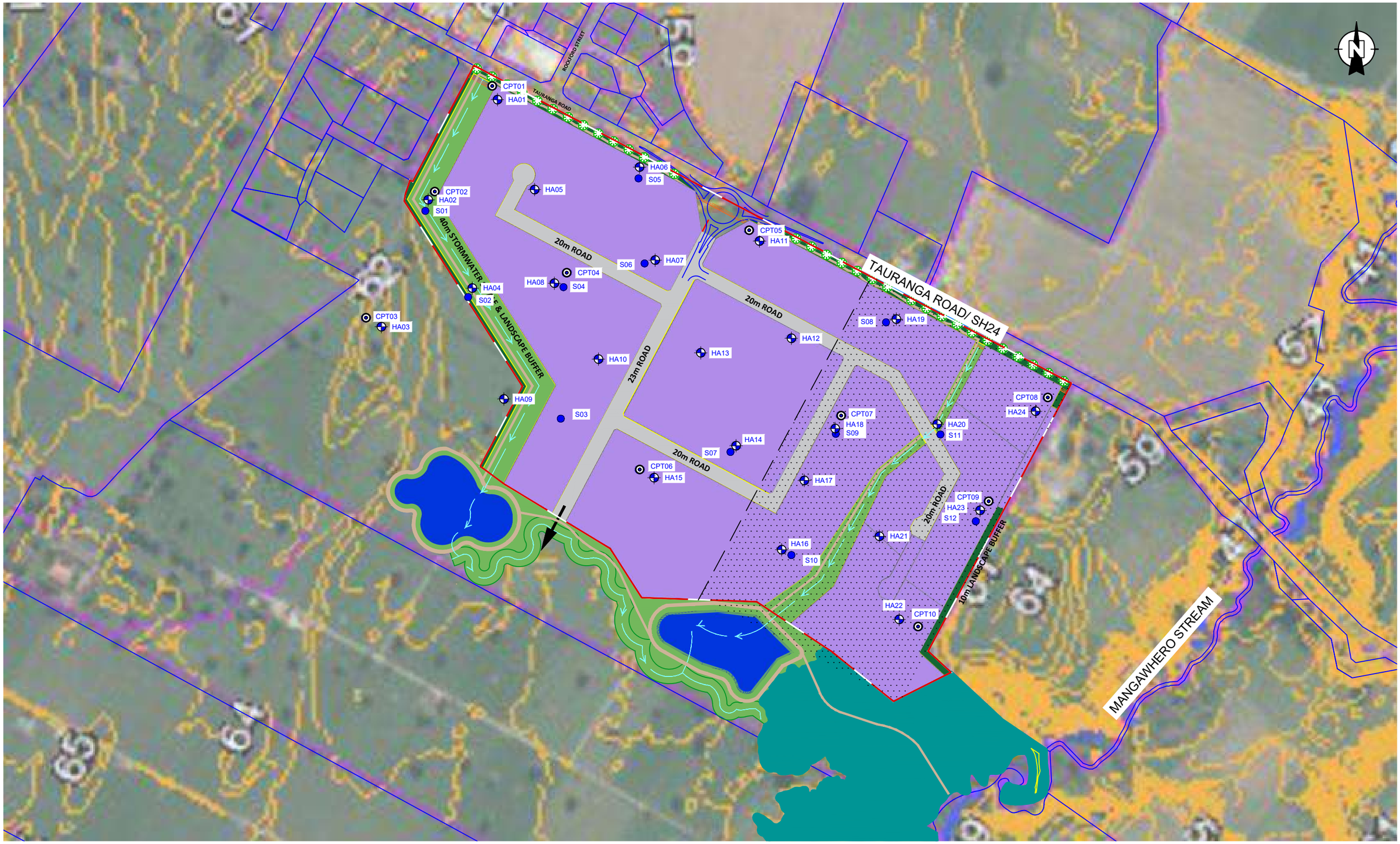
Your report's recommendations require confirmation during construction

Your report is based on the assumption that the site conditions as revealed through selective point sampling are indicative of actual conditions throughout an area. This assumption cannot be substantiated until project implementation has commenced. For this reason, you should retain geotechnical services throughout the construction stage, to identify variances, conduct additional tests if required, and recommend solutions to problems encountered on site. A geotechnical designer, who is fully familiar with the background information, is able to assess whether the report's recommendations are valid and whether changes should be considered as the project develops. An unfamiliar party using this report increases the risk that the report will be misinterpreted.

Interpretation by other design professionals

Costly problems can occur when other design professionals develop their plans based on misinterpretations of a geotechnical report. Read all geotechnical documents closely and do not hesitate to ask any questions you may have. To help avoid misinterpretations, retain the assistance of geotechnical professionals familiar with the contents of the geotechnical report to work with other project design professionals who need to take account of the contents of the report. Have the report implications explained to design professionals who need to take account of them, and then have the design plans and specifications produced reviewed by a competent Geotechnical Engineer.

Drawings



LEGEND:

- HA01 — HAND AUGER (HA) LOCATION
- CPT01 — CONE PENETROMETER TEST (CPT) LOCATION
- S01 — SOAKAGE TEST LOCATION
- SITE BOUNDARY
- APPROXIMATE AREA OF POTENTIAL LIQUEFACTION SETTLEMENT RISK
- GENERAL INDUSTRIAL
- ECOLOGICAL AREA
- PROPOSED STORMWATER RESERVE/ SWALE
- PROPOSED STORMWATER MANAGEMENT

NOTES:

1. BASE PLAN ADAPTED FROM: WAIKATO REGIONAL COUNCIL MAPS.
2. CONTOURS ARE IN 1.0m INTERVALS AND ARE IN TERMS OF MOTURIKI DATUM.
3. PROPOSED SCHEME PLAN ADAPTED FROM VEROS DEVELOPMENT AREA PLAN, DRAWING CL-01, REV. D, DATED 22/10/2021
4. TEST LOCATIONS ARE APPROXIMATE ONLY.

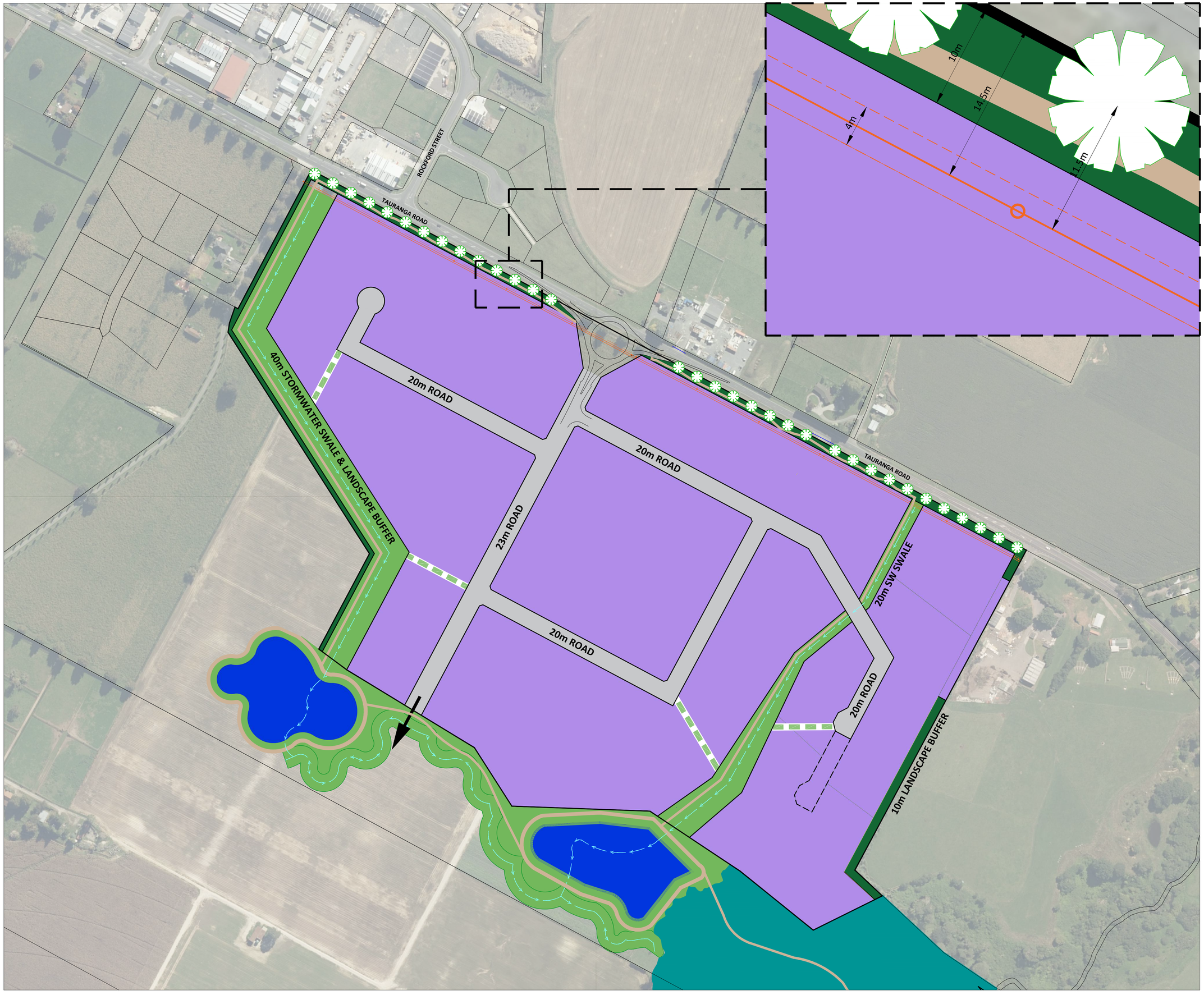
1:4000 0 40 80 120 160 200 m

CMW Geosciences

CLIENT: CALCUTTA FARMS LIMITED.		DRAWN: PB	PROJECT No: TGA2020-0304
PROJECT: 194 TAURANGA ROAD MATAMATA		CHECKED: LPM	DRAWING: 01
		REVISION: 1	SCALE: 1:4000
TITLE: GEOTECHNICAL INVESTIGATION PLAN		DATE: 24/06/2021	SHEET: A3

C:\USERS\LUKEM\CMW GEOSCIENCES PTY LTD\CMW CONNECT - TGA2020-0304 TAURANGA ROAD INDUSTRIAL SUBDIVISION, MATAMATA\DRAWINGS\TGA2020-0304 REV.1 09112021.DWG

Appendix A: Veros Development Area Plan



Key.

- Plan Change Boundary
- Existing Trees
- Existing Powerlines
- 4m Powerline Easement
- Proposed General Industrial Zone
- Proposed Road Network
- Proposed Stormwater Reserve (Swale)
- Proposed Overland Flow Path
- Proposed Landscape Buffer
- Stormwater Management
- Ecological Area
- Proposed Pedestrian Connection
- Future Vehicle Connection

Rev	Date	Issued for	Drawn
D	22.10.21	Information	TM
C	21.10.21	Information	TM
B	19.10.21	Information	TM
A	11.10.21	Information	TM

Veros
www.veros.co.nz

Calcutta Matamata
Client

Employment Zone
Job Name

Development Area Plan
Drawing Title

CL-01 — Drawing Number
D — Revision

N

Scale: 1:4000 @ A3, 1:2000 @ A1

Appendix B: Hand Auger Borehole Logs

CMW Geosciences – SOIL (Field Logging Guide)

SEQUENCE OF TERMS:
Fine: Soil Symbol – Soil Type – Colour – Structure – (Consistency) – (Moisture) – Bedding – Plasticity – Sensitivity – Additional Comments – Origin/Geological Unit
Coarse: Soil Symbol – Soil Type – Colour – Structure – Grading – Particle shape – (Relative Density) – (Moisture) – Bedding – Additional Comments – Origin/Geological Unit

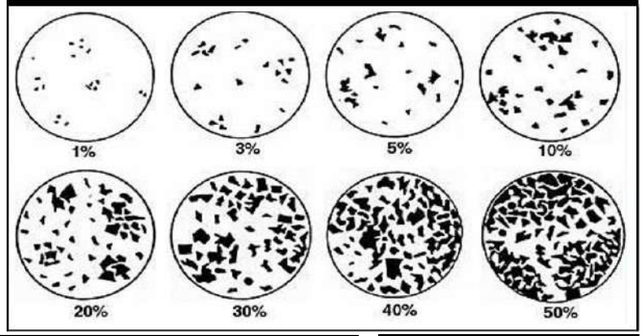
BEHAVIOURAL SOIL CLASSIFICATION SYSTEM

Major Divisions (behaviour based logging)			Soil Symbol	Soil Name
Coarse grained soils more than 65%>0.06mm	Gravel >50% of coarse fraction >2mm	Clean gravel <5% smaller 0.075mm	GW	Well graded gravel, fine to coarse gravel
			GP	Poorly graded gravel
		Gravel with >12% fines	GM	Silty gravel
			GC	Clayey gravel
	Sand ≥50% of coarse fraction <2mm	Clean sand	SW	Well-graded sand, fine to coarse sand
			SP	Poorly graded sand
		Sand with >12% fines	SM	Silty sand
			SC	Clayey sand
Fine grained soils 35% or more <0.06mm	Exhibits dilatant behaviour	inorganic	ML	Silt
			MH	Silt of high plasticity
		organic	OL	Organic silt
	No dilatant behaviour	inorganic	CL	Clay of low plasticity
			CH	Clay of high plasticity
		organic	OH	Organic clay
Highly Organic Soils			Pt	Peat

PROPORTIONAL TERMS DEFINITION

Fraction	Term	% of Soil Mass	Example
Major	(…) [UPPER CASE]	≥50 [major constituents]	GRAVEL
Subordinate	(…) [lower case]	20 – 50	Sandy
Minor	with some…	12 – 20	with some sand
	with minor…	5 – 12	with minor sand
	with trace of (or slightly)	< 5	with trace of sand (slightly sandy)

VISUAL PROPORTION PERCENTAGE



GRAIN SIZE CRITERIA

TYPE	COARSE									FINE		ORGANIC
	Boulders	Cobbles	Gravel			Sand				Silt	Clay	Organic Soil
			coarse	medium	fine	coarse	medium	fine				
Size Range (mm)	200	60	20	6	2	0.6	0.2	0.06	0.002			
Graphic Symbol												

ADDITIONAL GRAPHIC LOG SYMBOLS

Term	Symbol
Topsoil	
Fill	
Bitumen	
Concrete	

ORGANIC SOILS / DESCRIPTORS

Term	Description
Topsoil	Surficial organic soil layer that may contain living matter. However, topsoil may occur at greater depth, having been buried by geological processes or man-made fill, and should be termed a buried topsoil.
Organic clay, silt or sand	Contains finely divided organic matter; may have distinctive smell; may stain; may oxidize rapidly. Describe as for inorganic soils.
Peat	Consists predominantly of plant remains. **Firm:** Fibres already compressed together **Spongy:** Very compressible and open structure **Plastic:** Can be moulded in hand and smears in fingers **Fibrous:** Plant remains recognisable and retain some strength **Amorphous:** No recognisable plant remains
Rootlets	Fine, partly decomposed roots, normally found in the upper part of a soil profile or in a redeposited soil (e.g. colluvium or fill)
Carbonaceous	Discrete particles of hardened (carbonised) plant material.

SHADE AND COLOUR

1	2	3
light dark mottled streaked	pinkish reddish yellowish brownish greenish bluish greyish	pink red orange yellow brown green blue white grey black

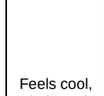
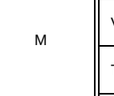
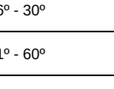
SOIL STRUCTURE

Term	Description
Homogeneous	The total lack of visible bedding and the same colour and appearance throughout
Bedded	The presence of layers
Fissured	Breaks along definite planes of fracture with little resistance to fracturing
Polished	Fracture planes are polished or glossy
Slickensided	Fracture planes are striated
Blocky	Cohesive soil that can be broken down into small angular lumps which resist further breakdown
Lensoidal	Discontinuous pockets of a soil within a different soil mass

GRADING (GRAVELS & SANDS)

Term	Description	
Well Graded	Good representation of all particle size ranges from largest to smallest	
Poorly Graded	Limited representation of grain sizes – further divided into:	
	Uniformly graded	Most particles about the same size
	Gap graded	Absence of one or more intermediate sizes

ROUNDING/PARTICLE SHAPE

Rounded	Subrounded	Subangular	Angular
			

CONSISTENCY TERMS FOR FINE SOILS

Descriptive term	Undrained Shear Strength (kPa)	Diagnostic Features	Abbreviation
Very Soft	<12	Easily exudes between fingers when squeezed	VS
Soft	12-25	Easily indented by fingers	S
Firm	25-50	Indented by strong finger pressure and can be indented by thumb pressure	F
Stiff	50-100	Cannot be indented by thumb pressure	St
Very Stiff	100-200	Can be indented by thumb nail	VSt
Hard	200-500	Difficult to indent by thumb nail	H

DENSITY INDEX (RELATIVE DENSITY) TERMS FOR COARSE SOILS

Descriptive term	Density Index (RD)	SPT "N" value (blows/300mm)	Dynamic Cone (blows/100mm)	Abbreviation
Very Dense	> 85	> 50	> 17	VD
Dense	65 - 85	30 - 50	7 - 17	D
Medium dense	35 - 65	10 - 30	3 - 7	MD
Loose	15 - 35	4 - 10	1 - 3	L
Very loose	< 15	< 4	0 - 2	VL

Note:
- Where strength data cannot be confirmed Loosely Packed (LP) and Tightly Packed (TP) may be used.
- No correlation is implied between Standard Penetration Test (SPT) and Dynamic Cone Penetrometer (Scala) Test values.
- SPT "N" values are uncorrected.

MOISTURE CONDITION

Condition	Description	Coarse Soils	Fine Soils	Abbreviation
Dry	Looks and feels dry	Runs freely through hands	Hard, powdery or friable	D
Moist	Feels cool, darkened in colour	Tends to cohere	Weakened by moisture, but no free water on hands when remoulding	M
Wet			Weakened by moisture, free water forms on hands when handling	W
Saturated	Feels cool, darkened in colour and free water is present on the sample			S

BEDDING THICKNESS (Sedimentary)

Term	Bed Thickness
Thinly laminated	< 2mm
Laminated	2mm - 6mm
Very thin	6mm - 20mm
Thin	20mm - 60mm
Moderately thin	60mm - 200mm
Moderately thick	0.2m - 0.6m
Thick	0.6m - 2m
Very thick	> 2m

BEDDING INCLINATION

Term	Inclination (from horizontal)
Sub-horizontal	0º - 5º
Gently inclined	6º - 15º
Moderately inclined	16º - 30º
Steeply inclined	31º - 60º
Very steeply inclined	61º - 80º
Sub vertical	81º - 90º

PLASTICITY (CLAYS & SILTS)

Term	Description
High plasticity	Can be moulded or deformed over a wide range of moisture contents without cracking or showing any tendency to volume change
Low plasticity	When moulded can be crumbled in the fingers; may show quick or dilatant behaviour

SENSITIVITY OF SOIL

Descriptive Term	Shear Strength Ratio = $\frac{undisturbed}{remoulded}$
Insensitive, normal	< 2
Moderately sensitive	2 – 4
Sensitive	4 – 8
Extra sensitive	8 – 16
Quick	> 16

Revision 3 April 2018

HAND AUGER BOREHOLE LOG - HA01

Client: Calcutta Farms Ltd
Project: Tauranga Road Industrial Subdivision
Site Location: Matamata
Project No.: TGA2020-0304
Date: 15/06/2021
Borehole Location: Refer to Drawing 01 Logged by: MS Checked by: LPM Scale: 1:25 Sheet 1 of 1
Position: 1846004.0mE; 5810610.0mN Projection: BOP 2000
Datum: Moturiki Survey Source: Hand held GPS

Groundwater	Samples & Insitu Tests: Depth	Samples & Insitu Tests: Type & Results	RL (m)	Depth (m)	Graphic Log	Material Description	Moisture Condition	Consistency/ Relative Density	Dynamic Cone Penetrometer (Blows/100mm)
				0		OL: Organic SILT: black. Non plastic. (Topsoil)			
	0.3	Peak = 121kPa Residual = 27kPa				ML: Clayey SILT with trace sand: orange brown. Low plasticity; sand, fine to medium. (Hinuera Formation)		St to VSt	
	0.6	Peak = 80kPa Residual = 15kPa							
	0.9	Peak = 180kPa Residual = 30kPa		1					
	1.2	Peak = >207kPa				ML: Sandy SILT: light brownish grey. Non plastic, tightly packed; sand, fine. (Hinuera Formation)		H	
						SM: Silty fine SAND: white. Poorly graded, siliceous. (Hinuera Formation)		MD	3, 4, 4, 4
						... at 1.90m, Becoming fine to medium grained.			
				2		SW: Fine to coarse SAND with minor silt and trace gravel: grey. Well graded; gravel, fine to medium, siliceous, subangular. (Hinuera Formation)			7, 8, 5, 6, 7, 7, 8, 5, 6, 7
						... at 2.30m, Contains minor fine to medium gravel.	M		
				3				MD to D	4, 7, 8, 7, 6, 9, 9, 8, 8, 8, 8
				4					15, 10, 10, 13, 15, 14, 14, 14
				5		Borehole terminated at 5.0 m			

Termination Reason: Target depth
Shear Vane No: 2562 DCP No: 17
Remarks: Groundwater not encountered.

This report is based on the attached field description for soil and rock, CMW Geosciences - Field Logging Guide, Revision 3 - April 2018.

HAND AUGER BOREHOLE LOG - HA02 & S01

Client: Calcutta Farms Ltd
Project: Tauranga Road Industrial Subdivision
Site Location: Matamata
Project No.: TGA2020-0304
Date: 17/06/2021
Borehole Location: Refer to Drawing 01 Logged by: MS Checked by: LPM Scale: 1:25 Sheet 1 of 1
Position: 1845912.0mE; 5810463.0mN Projection: BOP 2000
Datum: Moturiki Survey Source: Hand held GPS

Groundwater	Samples & Insitu Tests: Depth	Samples & Insitu Tests: Type & Results	RL (m)	Depth (m)	Graphic Log	Material Description	Moisture Condition	Consistency/ Relative Density	Dynamic Cone Penetrometer (Blows/100mm)
						OL: Organic SILT: black. Non plastic. (Topsoil)			
						ML: Clayey SILT with trace sand: orange brown. Low plasticity; sand, fine to medium. (Hinuera Formation)			
	0.3	Peak = 80kPa Residual = 21kPa					M	St to VSt	
	0.6	Peak = 148kPa Residual = 33kPa							
						... at 0.70m, Becoming light brown.	W		
	0.9	Peak = 74kPa Residual = 24kPa							
						... at 0.90m, Contains some fine to medium sand.			
				1		ML: Sandy SILT: light brownish grey. Non plastic, loosely packed; sand, fine. (Hinuera Formation)		VSt	
	1.2	Peak = 124kPa Residual = 36kPa							
						SP: Fine to medium SAND with minor silt: dark grey mottled yellowish brown. Well graded, silicious, subangular. (Hinuera Formation)		L to MD	2, 3, 2, 3, 3, 3, 3
				2					5
						SP: Silty fine SAND: white. Poorly graded. (Hinuera Formation)		MD	5, 5, 4, 5, 5, 4, 5, 5
				3			D to M		5
						SW: Fine to medium SAND with some silt: light grey mottled yellowish brown. Well graded, silicious, subangular. (Hinuera Formation)			6
						SW: Fine to coarse SAND with minor silt: grey. Well graded, silicious, subangular. (Hinuera Formation)			7
						... at 3.40m, Contains trace fine to medium gravel, siliceous.			6, 5, 7, 7, 6, 6, 7
				4				MD to D	10, 10, 12, 10, 7, 8, 10, 12, 12
				5		Borehole terminated at 5.0 m			

Termination Reason: Target depth
Shear Vane No: 2562 DCP No: 17
Remarks: Groundwater not encountered.

This report is based on the attached field description for soil and rock, CMW Geosciences - Field Logging Guide, Revision 3 - April 2018.

HAND AUGER BOREHOLE LOG - HA03

Client: Calcutta Farms Ltd
Project: Tauranga Road Industrial Subdivision
Site Location: Matamata
Project No.: TGA2020-0304
Date: 15/06/2021
Borehole Location: Refer to Drawing 01 Logged by: MS Checked by: LPM Scale: 1:25 Sheet 1 of 1
Position: 1845835.0mE; 5810289.0mN Projection: BOP 2000
Datum: Moturiki Survey Source: Hand held GPS

Groundwater	Samples & Insitu Tests: Depth	Samples & Insitu Tests: Type & Results	RL (m)	Depth (m)	Graphic Log	Material Description	Moisture Condition	Consistency/ Relative Density	Dynamic Cone Penetrometer (Blows/100mm)
						OL: Organic SILT: black. Non plastic. (Topsoil)			
	0.3	Peak = 95kPa Residual = 21kPa				ML: Clayey SILT with trace sand: orange brown. Low plasticity; sand, fine to medium. (Hinuera Formation)		St to VSt	
	0.6	Peak = 148kPa Residual = 27kPa				*... at 0.60m, Becoming greyish brown.*			
	0.9	Peak = 180kPa Residual = 36kPa		1		ML: SILT: grey mottled brownish orange. Non plastic. (Hinuera Formation)		VSt	
	1.2	Peak = 192kPa Residual = 38kPa				SM: Silty fine SAND: white. Poorly graded. (Hinuera Formation)		MD	4, 4, 3
						... from 1.80m to 2.00m, Becoming brownish grey, contains fine to medium sand.			
				2		*... from 2.10m to 2.20m, Becoming brownish grey, contains fine to medium sand.*			5, 3, 8
						SP: Fine to medium SAND with some silt: grey. Poorly graded, pumiceous, siliceous. (Hinuera Formation)	M	D	10, 8, 10, 10
						SW: Fine to coarse SAND with minor silt and trace gravel: ; grey. Well graded; gravel, fine to medium, siliceous, subangular. (Hinuera Formation)		MD to D	6, 9, 11
				3		*... from 2.90m to 3.20m, Becoming brownish orange, pumiceous.*			15, 12, 10, 9, 7, 5
						... at 3.60m, Contains a 100mm silt lense.			4, 4, 5, 8
						SM: Silty fine SAND: dark grey. Poorly graded. (Hinuera Formation)			
				4		SW: Fine to coarse SAND with minor silt and minor gravel: grey with brownish orange. Well graded; gravel, fine to medium, siliceous, subangular. (Hinuera Formation)		D	11, 10, 9, 10, 10, 11, 13, 11, 12
				5		Borehole terminated at 5.0 m			

Termination Reason: Target depth
Shear Vane No: 2562 DCP No: 17
Remarks: Groundwater not encountered.

This report is based on the attached field description for soil and rock, CMW Geosciences - Field Logging Guide, Revision 3 - April 2018.

HAND AUGER BOREHOLE LOG - HA04 & S02

Client: Calcutta Farms Ltd
Project: Tauranga Road Industrial Subdivision
Site Location: Matamata
Project No.: TGA2020-0304
Date: 16/06/2021
Borehole Location: Refer to Drawing 01 Logged by: MS Checked by: LPM Scale: 1:25 Sheet 1 of 1
Position: 1845966.0mE; 5810338.0mN Projection: BOP 2000
Datum: Moturiki Survey Source: Hand held GPS

Groundwater	Samples & Insitu Tests: Depth	Samples & Insitu Tests: Type & Results	RL (m)	Depth (m)	Graphic Log	Material Description	Moisture Condition	Consistency/ Relative Density	Dynamic Cone Penetrometer (Blows/100mm)
						OL: Organic SILT: black. Non plastic. (Topsoil)			
	0.3	Peak = 118kPa Residual = 18kPa				ML: Clayey SILT with trace sand: orange brown. Low plasticity; sand, fine to medium. (Hinuera Formation)	M to W	St to VSt	
	0.6	Peak = 74kPa Residual = 15kPa							
						... at 0.80m, Becoming light brown.			
	0.9	Peak = 139kPa Residual = 18kPa		1					
	1.2	Peak = 175kPa Residual = 38kPa				SM: Sandy SILT: light brownish grey. Non plastic, loosely packed; sand, fine. (Hinuera Formation)		VSt	
						SM: Silty fine SAND: white. Poorly graded. (Hinuera Formation)		MD	3, 4, 6
						SW: Fine to coarse SAND with minor silt and trace gravel: dark grey. Well graded; gravel, fine, siliceous, subangular. (Hinuera Formation)		MD to D	6, 14, 13, 11, 10, 7, 8, 5, 5
				2					
						SM: Silty fine SAND: dark grey. Poorly graded. (Hinuera Formation)		MD	3, 3
						ML: SILT: grey mottled brownish orange. Non plastic, loosely packed. (Hinuera Formation)		VSt	
	3.0	Peak = 175kPa Residual = 50kPa		3		SW: Fine to coarse SAND with minor silt and minor gravel: dark grey. Well graded; gravel, fine to medium, siliceous, subangular. (Hinuera Formation)	D to M	D	10, 12, 12, 10, 9, 8, 8, 10, 9, 9, 14, 8, 8, 11, 10, 11, 11, 14
				4					
				5		Borehole terminated at 5.0 m			

Termination Reason: Target depth
Shear Vane No: 2562 DCP No: 17
Remarks: Groundwater not encountered.

This report is based on the attached field description for soil and rock, CMW Geosciences - Field Logging Guide, Revision 3 - April 2018.

HAND AUGER BOREHOLE LOG - HA05

Client: Calcutta Farms Ltd
Project: Tauranga Road Industrial Subdivision
Site Location: Matamata
Project No.: TGA2020-0304
Date: 15/06/2021
Borehole Location: Refer to Drawing 01 Logged by: MS Checked by: LPM Scale: 1:25 Sheet 1 of 1
Position: 1846056.0mE; 5810476.0mN Projection: BOP 2000
Datum: Moturiki Survey Source: Hand held GPS

Groundwater	Samples & Insitu Tests: Depth	Samples & Insitu Tests: Type & Results	RL (m)	Depth (m)	Graphic Log	Material Description	Moisture Condition	Consistency/ Relative Density	Dynamic Cone Penetrometer (Blows/100mm)
						OL: Organic SILT: black. Non plastic. (Topsoil)			
	0.3	Peak = 62kPa Residual = 12kPa				ML: Clayey SILT with trace sand: orange brown. Low plasticity; sand, fine to medium. (Hinuera Formation)		St to VSt	
	0.6	Peak = 74kPa Residual = 30kPa							
	0.9	Peak = 98kPa Residual = 30kPa				*... at 0.90m, Becoming light brown, contains some fine to medium sand, siliceous.*			
	1.2	Peak = 142kPa Residual = 27kPa		1		*... at 1.20m, Becoming greyish brown.*			
						ML: SILT: grey mottled orange. Non plastic, loosely packed. (Hinuera Formation)		VSt	
	1.6	Peak = UTP				SW: Fine to coarse SAND with trace silt and minor gravel: brownish orange. Well graded; gravel, fine to medium, siliceous subangular. (Hinuera Formation)		MD	
						SM: Silty fine SAND: light grey. Poorly graded. (Hinuera Formation)			2
						... at 1.70m, Contains a 50mm silt lense.			3
				2		*... from 1.80m to 1.90m, Becoming brownish orange, contains fine to medium grained sand.*		L to MD	3
						... from 2.15m to 2.20m, Contains fine to medium grained sand, becoming brownish orange.	D		3
									5
									5
									5
						SW: Fine to coarse SAND with trace silt and minor gravel: dark grey. Well graded; gravel, fine to medium, siliceous, subangular. (Hinuera Formation)			10
									7
									9
									7
									9
				3					9
									8
									10
									11
									10
									11
									10
									8
						... from 3.70m to 3.90m, Becoming pinkish grey, pumiceous.		D	8
									12
									17
				4					15
									15
									11
									8
									9
									14
							M to W		13
									11
									14
				5		Borehole terminated at 5.0 m			

Termination Reason: Target depth
Shear Vane No: 2562 DCP No: 17
Remarks: Groundwater not encountered.

This report is based on the attached field description for soil and rock, CMW Geosciences - Field Logging Guide, Revision 3 - April 2018.

HAND AUGER BOREHOLE LOG - HA06 & S05

Client: Calcutta Farms Ltd
Project: Tauranga Road Industrial Subdivision
Site Location: Matamata
Project No.: TGA2020-0304
Date: 16/06/2021
Borehole Location: Refer to Drawing 01 Logged by: MS Checked by: LPM Scale: 1:25 Sheet 1 of 1
Position: 1846204.0mE; 5810507.0mN Projection: BOP 2000
Datum: Moturiki Survey Source: Hand held GPS

Groundwater	Samples & Insitu Tests: Depth	Samples & Insitu Tests: Type & Results	RL (m)	Depth (m)	Graphic Log	Material Description	Moisture Condition	Consistency/ Relative Density	Dynamic Cone Penetrometer (Blows/100mm)
						OL: Organic SILT: black. Non plastic. (Topsoil)			
	0.3	Peak = 151kPa Residual = 30kPa				ML: Clayey SILT with trace sand: orange brown. Low plasticity; sand, fine to medium. (Hinuera Formation)	M	VSt to H	
	0.6	Peak = >207kPa				... at 0.55m, Becoming light brown.			
	0.9	Peak = >207kPa				... at 0.80m, Becoming mottled orange brown.			
				1		SM: Silty fine SAND: white. Poorly graded. (Hinuera Formation)	D to M	MD	4, 7, 5, 6, 6, 6, 5, 5
				2		SW: Fine to medium SAND with some silt: dark grey mottled light grey. Well graded, siliceous, subangular. (Hinuera Formation)	M	MD to D	6, 7, 8, 6, 7, 7
				3		SW: Fine to coarse SAND with minor silt and trace gravel: dark grey. Well graded; gravel, fine to medium, siliceous, subangular. (Hinuera Formation)	D to M	D	9, 7, 8, 9, 8, 8, 10, 10, 8, 9, 9, 13, 10, 10, 9, 13, 11, 10, 11, 11, 8, 8, 7, 10, 11
				4		... at 3.30m, Contains minor fine to medium gravel, siliceous.			
				5		Borehole terminated at 5.0 m			

Termination Reason: Target depth
Shear Vane No: 2562 DCP No: 17
Remarks: Groundwater not encountered.

This report is based on the attached field description for soil and rock, CMW Geosciences - Field Logging Guide, Revision 3 - April 2018.

HAND AUGER BOREHOLE LOG - HA07 & S06

Client: Calcutta Farms Ltd
Project: Tauranga Road Industrial Subdivision
Site Location: Matamata
Project No.: TGA2020-0304
Date: 16/06/2021
Borehole Location: Refer to Drawing 01 Logged by: MS Checked by: LPM Scale: 1:25 Sheet 1 of 1
Position: 1846223.0mE; 5810376.0mN Projection: BOP 2000
Datum: Moturiki Survey Source: Hand held GPS

Groundwater	Samples & Insitu Tests: Depth	Samples & Insitu Tests: Type & Results	RL (m)	Depth (m)	Graphic Log	Material Description	Moisture Condition	Consistency/ Relative Density	Dynamic Cone Penetrometer (Blows/100mm)
						OL: Organic SILT: black. Non plastic. (Topsoil)			
	0.3	Peak = 163kPa Residual = 30kPa				ML: Clayey SILT with trace sand: orange brown. Low plasticity; sand, fine to medium. (Hinuera Formation)	M	St to VSt	
	0.6	Peak = 80kPa Residual = 30kPa				... at 0.50m, Becoming light brown.			
	0.9	Peak = 124kPa Residual = 27kPa				... at 0.65m, Contains some fine sand.			
				1		SM: Silty fine SAND: white. Poorly graded. (Hinuera Formation) ... at 1.10m, Contains 100mm wide silt lenses every 100mm.	D to M	L to MD	2, 2, 3, 3, 3, 3, 3, 3, 2
				2		SP: Silty fine SAND: white. Poorly graded. (Hinuera Formation)			3, 4, 5, 5, 5, 4, 4, 5, 5, 7, 6
				3		ML: SILT: grey mottled brownish orange. Non plastic, tightly packed. (Hinuera Formation)		H	6, 6
						SW: Fine to coarse SAND with minor silt and trace gravel: dark yellowish grey. Well graded; gravel, fine to medium, siliceous, subangular. (Hinuera Formation) ... from 3.40m to 3.50m, Contains minor fine to medium gravel, pumiceous, becoming brownish orange. ... at 3.60m, Becoming grey. ... at 3.70m, Contains minor fine to medium gravel, siliceous.		D to VD	12, 14, 9, 10, 14, 16, 19, 14, 13, 11, 12, 13, 11, 14, 14, 12, 14
				4					
				5		Borehole terminated at 5.0 m			

Termination Reason: Target depth
Shear Vane No: 2562 DCP No: 17
Remarks: Groundwater not encountered.

This report is based on the attached field description for soil and rock, CMW Geosciences - Field Logging Guide, Revision 3 - April 2018.

HAND AUGER BOREHOLE LOG - HA08 & S04

Client: Calcutta Farms Ltd
Project: Tauranga Road Industrial Subdivision
Site Location: Matamata
Project No.: TGA2020-0304
Date: 17/06/2021
Borehole Location: Refer to Drawing 01 Logged by: MS Checked by: LPM Scale: 1:25 Sheet 1 of 1
Position: 1846084.0mE; 5810342.0mN Projection: BOP 2000
Datum: Moturiki Survey Source: Hand held GPS

Groundwater	Samples & Insitu Tests: Depth	Samples & Insitu Tests: Type & Results	RL (m)	Depth (m)	Graphic Log	Material Description	Moisture Condition	Consistency/ Relative Density	Dynamic Cone Penetrometer (Blows/100mm)
						OL: Organic SILT: black. Non plastic. (Topsoil)			
	0.3	Peak = 89kPa Residual = 24kPa				ML: Clayey SILT with trace sand: orange brown. Low plasticity; sand, fine to medium. (Hinuera Formation)	M	St to VSt	
	0.6	Peak = 136kPa Residual = 36kPa				... at 0.60m, Contains some fine to medium sand.			
	0.9	Peak = 89kPa Residual = 15kPa		1			W		
	1.2	Peak = 80kPa Residual = 21kPa							
	1.6	Peak = UTP				SW: Fine to coarse SAND with trace silt and trace gravel: grey. Well graded; gravel, fine, siliceous, subangular. (Hinuera Formation)	D to M	MD to D	3, 3, 4, 7, 8, 7, 7, 6, 6, 6, 6, 7, 9, 9
				2		... at 2.10m, Contains minor fine to medium gravel, siliceous.			
				3		SM: Silty fine SAND: white. Poorly graded. (Hinuera Formation)		MD	4, 5, 5
						ML: SILT: grey mottled brownish orange. Non plastic, loosely packed. (Hinuera Formation)	M to W		3, 2
						SM: Silty fine SAND: grey. Poorly graded. (Hinuera Formation)		MD	3, 5
						SW: Fine to coarse SAND with trace silt and minor gravel: grey. Well graded; gravel, fine, siliceous, subangular. (Hinuera Formation)	D to M	D	9, 8, 6, 6, 11, 11, 8, 9, 9, 10, 10, 9
				4		... from 4.30m to 4.50m, Contains pumiceous gravel.			
				5		Borehole terminated at 5.0 m			

Termination Reason: Target depth
Shear Vane No: 2562 DCP No: 17
Remarks: Groundwater not encountered.

This report is based on the attached field description for soil and rock, CMW Geosciences - Field Logging Guide, Revision 3 - April 2018.

HAND AUGER BOREHOLE LOG - HA09 & S03

Client: Calcutta Farms Ltd
Project: Tauranga Road Industrial Subdivision
Site Location: Matamata
Project No.: TGA2020-0304
Date: 17/06/2021
Borehole Location: Refer to Drawing 01 Logged by: MS Checked by: LPM Scale: 1:25 Sheet 1 of 1
Position: 1846012.0mE; 5810185.0mN Projection: BOP 2000
Datum: Moturiki Survey Source: Hand held GPS

Groundwater	Samples & Insitu Tests: Depth	Samples & Insitu Tests: Type & Results	RL (m)	Depth (m)	Graphic Log	Material Description	Moisture Condition	Consistency/ Relative Density	Dynamic Cone Penetrometer (Blows/100mm)
						OL: Organic SILT: black. Non plastic. (Topsoil)			
	0.3	Peak = 130kPa Residual = 21kPa				ML: Clayey SILT with trace sand: orange brown. Low plasticity; sand, fine to medium. (Hinuera Formation)		St to VSt	
	0.6	Peak = 95kPa Residual = 18kPa							
				1		SM: Silty fine to medium SAND: brown. Poorly graded, siliceous, subangular. (Hinuera Formation)		L	1, 3, 3, 2
						SW: Fine to coarse SAND with some silt: grey mottled yellowish brown. Well graded, siliceous, subangular. (Hinuera Formation)	M	L to MD	2, 2, 1, 1, 2, 2, 3, 4, 4, 5, 5, 5, 5, 6, 7, 4
				3		SM: Silty fine SAND: light grey. Poorly graded. (Hinuera Formation)		MD	3, 3
						ML: SILT: grey mottled brownish orange. Non plastic, loosely packed. (Hinuera Formation)	M to W		2, 3, 2
				4		SW: Fine to coarse SAND with minor gravel and trace silt: grey. Well graded; gravel, fine to medium, siliceous, subangular. (Hinuera Formation)	D to M	D	9, 10, 15, 16, 14, 10, 13, 14, 14, 14, 13, 15, 13, 14, 15
				5		Borehole terminated at 5.0 m			

Termination Reason: Target depth
Shear Vane No: 2562 DCP No: 17
Remarks: Groundwater not encountered.

This report is based on the attached field description for soil and rock, CMW Geosciences - Field Logging Guide, Revision 3 - April 2018.

HAND AUGER BOREHOLE LOG - HA10

Client: Calcutta Farms Ltd
Project: Tauranga Road Industrial Subdivision
Site Location: Matamata
Project No.: TGA2020-0304
Date: 17/06/2021
Borehole Location: Refer to Drawing 01 Logged by: MS Checked by: LPM Scale: 1:25 Sheet 1 of 1
Position: 1846144.0mE; 5810237.0mN Projection: BOP 2000
Datum: Moturiki Survey Source: Hand held GPS

Groundwater	Samples & Insitu Tests: Depth	Samples & Insitu Tests: Type & Results	RL (m)	Depth (m)	Graphic Log	Material Description	Moisture Condition	Consistency/ Relative Density	Dynamic Cone Penetrometer (Blows/100mm)
						OL: Organic SILT: black. Non plastic. (Topsoil)			
	0.3	Peak = 92kPa Residual = 18kPa				ML: Clayey SILT with trace sand: orange brown. Low plasticity; sand, fine to medium. (Hinuera Formation)	M	St to VSt	
	0.6	Peak = 177kPa Residual = 33kPa				... at 0.70m, Becoming brownish grey.			
	0.9	Peak = 65kPa Residual = 21kPa				... at 0.80m, Contains some fine to coarse sand.			
				1		SM: Silty fine to medium SAND: brown. Poorly graded, siliceous. (Hinuera Formation)		L	1
						SW: Fine to coarse SAND with some silt: grey. Well graded, siliceous, subangular. (Hinuera Formation)			2
						... at 1.40m, Contains trace silt and trace fine to medium gravel, siliceous, subangular.	D to M		2
				2					2
									4
									4
									3
									2
									1
									3
								L to MD	5
									4
						SM: Silty fine SAND: white. Poorly graded. (Hinuera Formation)			4
									3
									2
				3			M to W		3
									4
									4
									4
									4
									4
									3
						ML: SILT: grey mottled brownish orange. Non plastic. (Hinuera Formation)			3
									5
									4
									5
									7
									12
									11
				4		SP: Fine to medium SAND with some silt: dark grey mottled light grey. Well graded, silicious, subangular. (Hinuera Formation)		MD to D	6
									10
						SW: Fine to coarse SAND with minor gravel and trace silt: grey. Well graded; gravel, fine to medium, siliceous, subangular. (Hinuera Formation)			11
						... at 4.20m, Becoming brownish red.			15
						... from 4.30m to 4.50m, Over augered.	D to M		20
								D to VD	11
									12
									12
									11
				5		Borehole terminated at 5.0 m			

Termination Reason: Target depth
Shear Vane No: 2562 DCP No: 17
Remarks: Groundwater not encountered.

This report is based on the attached field description for soil and rock, CMW Geosciences - Field Logging Guide, Revision 3 - April 2018.

HAND AUGER BOREHOLE LOG - HA11

Client: Calcutta Farms Ltd
Project: Tauranga Road Industrial Subdivision
Site Location: Matamata
Project No.: TGA2020-0304
Date: 15/06/2021
Borehole Location: Refer to Drawing 01 Logged by: MS Checked by: LPM Scale: 1:25 Sheet 1 of 1
Position: 1846372.0mE; 5810398.0mN Projection: BOP 2000
Datum: Moturiki Survey Source: Hand held GPS

Groundwater	Samples & Insitu Tests: Depth	Samples & Insitu Tests: Type & Results	RL (m)	Depth (m)	Graphic Log	Material Description	Moisture Condition	Consistency/ Relative Density	Dynamic Cone Penetrometer (Blows/100mm)
						OL: Organic SILT: black. Non plastic. (Topsoil)			
	0.3	Peak = 101kPa Residual = 21kPa				ML: Clayey SILT with trace sand: orange brown. Low plasticity; sand, fine to medium. (Hinuera Formation)		St to VSt	
	0.6	Peak = 89kPa Residual = 30kPa							
	0.9	Peak = 180kPa Residual = 30kPa				... at 0.90m, Contains some fine to medium sand, siliceous.			
				1		... at 1.00m, Becoming brownish grey.	M		
	1.2	Peak = 104kPa Residual = 44kPa							
	1.6	Peak = 177kPa Residual = 44kPa				ML: Sandy SILT: grey mottled brownish grey. Non plastic; sand, fine. (Hinuera Formation)		VSt	
	2.0	Peak = 106kPa Residual = 27kPa		2		ML: SILT: grey mottled brownish grey. Non plastic. (Hinuera Formation)			
						... at 2.20m, Becoming grey mottled orange.			
						SM: Silty fine SAND: dark grey. Poorly graded. (Hinuera Formation)	W	MD	3
									3
									5
						... at 2.70m, Contains a 80mm silt lense.			6
									5
									3
				3					5
						... at 3.10m, Contains a 50mm silt lense.			14
						SW: Fine to coarse SAND with trace silt and minor gravel: dark grey. Well graded; gravel, fine to medium, siliceous, subangular. (Hinuera Formation)			13
									14
									12
									12
									9
									9
									9
				4			M	D	13
									10
									13
									9
									10
									9
						... at 4.50m, Contains orange brown mottling.			10
									8
									9
									12
				5		Borehole terminated at 5.0 m			

Termination Reason: Target depth
Shear Vane No: 2562 DCP No: 17
Remarks: Groundwater not encountered.

This report is based on the attached field description for soil and rock, CMW Geosciences - Field Logging Guide, Revision 3 - April 2018.

HAND AUGER BOREHOLE LOG - HA12

Client: Calcutta Farms Ltd
Project: Tauranga Road Industrial Subdivision
Site Location: Matamata
Project No.: TGA2020-0304
Date: 15/06/2021
Borehole Location: Refer to Drawing 01 Logged by: MS Checked by: LPM Scale: 1:25 Sheet 1 of 1
Position: 1846413.0mE; 5810263.0mN Projection: BOP 2000
Datum: Moturiki Survey Source: Hand held GPS

Groundwater	Samples & Insitu Tests: Depth	Samples & Insitu Tests: Type & Results	RL (m)	Depth (m)	Graphic Log	Material Description	Moisture Condition	Consistency/ Relative Density	Dynamic Cone Penetrometer (Blows/100mm)
						OL: Organic SILT: black. Non plastic. (Topsoil)			
	0.3	Peak = 74kPa Residual = 15kPa				ML: Clayey SILT with trace sand: orange brown. Low plasticity; sand, fine to medium. (Hinuera Formation)			
	0.6	Peak = 142kPa Residual = 36kPa				... at 0.50m, Becoming brownish grey mottled orange brown.		St to VSt	
						... at 0.70m, Contains some fine to medium sand.			
				1		SW: Fine to coarse SAND with minor silt and trace gravel: greyish brown mottled orange brown. Well graded; gravel, fine, siliceous, subangular. (Hinuera Formation)	M		4
									3
									3
						... at 1.20m, Becoming light grey.			4
									4
						... at 1.40m, Contains minor fine to medium gravel, siliceous.			3
						... at 1.50m, Contains a 50mm silt lense.			5
						... from 1.55m to 1.70m, Becoming a Fine to medium sand.			5
									3
									4
				2					5
									3
									2
							W	L to MD	3
									2
									2
									3
									4
							S		4
									4
									4
				3		Borehole terminated at 2.9 m			5
									4
									4
									6
									3
									3
									3
									3
									4
				4				D	12
									12
									16
									16
									15
									17
									17
									10
									10
				5					17

Termination Reason: Hole collapse
Shear Vane No: 2562 DCP No: 17
Remarks:

This report is based on the attached field description for soil and rock, CMW Geosciences - Field Logging Guide, Revision 3 - April 2018.

HAND AUGER BOREHOLE LOG - HA13 & S07

Client: Calcutta Farms Ltd
Project: Tauranga Road Industrial Subdivision
Site Location: Matamata
Project No.: TGA2020-0304
Date: 17/06/2021
Borehole Location: Refer to Drawing 01 Logged by: MS Checked by: LPM Scale: 1:25 Sheet 1 of 1
Position: 1846287.0mE; 5810243.0mN Projection: BOP 2000
Datum: Moturiki Survey Source: Hand held GPS

Groundwater	Samples & Insitu Tests: Depth	Samples & Insitu Tests: Type & Results	RL (m)	Depth (m)	Graphic Log	Material Description	Moisture Condition	Consistency/ Relative Density	Dynamic Cone Penetrometer (Blows/100mm)
						OL: Organic SILT: black. Non plastic. (Topsoil)			
	0.3	Peak = 133kPa Residual = 30kPa				ML: Clayey SILT with trace sand: orange brown. Low plasticity; sand, fine to medium. (Hinuera Formation)	M	VSt	
						... at 0.50m, Becoming light brown.			
	0.6	Peak = 127kPa Residual = 33kPa				... at 0.60m, Contains some fine to medium sand.			
	0.9	Peak = 148kPa Residual = 36kPa		1		SM: Silty fine to coarse SAND with trace gravel: brown mottled grey. Well graded; gravel, fine, siliceous, subangular. (Hinuera Formation)	D to M	L	3, 3
						SW: Fine to coarse SAND with minor silt and trace gravel: grey. Well graded; gravel, fine, siliceous, subangular. (Hinuera Formation)		L to MD	2, 1, 3, 4, 4, 4, 4, 5, 5, 6
				2		SM: Silty fine SAND: white. Poorly graded. (Hinuera Formation)		MD	4, 5
						ML: SILT: grey mottled orange. Non plastic. (Hinuera Formation)		VSt to H	4, 2, 2, 3, 6, 4
	3.0	Peak = UTP		3		SM: Silty fine SAND: white. Poorly graded. (Hinuera Formation)		MD to D	9, 6
						ML: SILT: grey mottled orange. Non plastic. (Hinuera Formation)			7
						SW: Fine to coarse SAND with minor silt and trace gravel: grey. Well graded; gravel, fine, siliceous, subangular. (Hinuera Formation)		MD to D	9, 12, 16, 12, 14, 10, 12, 12, 10, 7, 5, 8, 13, 11, 9, 7
						... at 3.70m, Contains minor fine to medium gravel, siliceous.			
				4					
				5		Borehole terminated at 5.0 m			

Termination Reason: Target depth
Shear Vane No: 2562 DCP No: 17
Remarks: Groundwater not encountered.

This report is based on the attached field description for soil and rock, CMW Geosciences - Field Logging Guide, Revision 3 - April 2018.

HAND AUGER BOREHOLE LOG - HA14

Client: Calcutta Farms Ltd
Project: Tauranga Road Industrial Subdivision
Site Location: Matamata
Project No.: TGA2020-0304
Date: 18/06/2021
Borehole Location: Refer to Drawing 01 Logged by: MS Checked by: LPM Scale: 1:25 Sheet 1 of 1
Position: 1846333.0mE; 5810113.0mN Projection: BOP 2000
Datum: Moturiki Survey Source: Hand held GPS

Groundwater	Samples & Insitu Tests: Depth	Samples & Insitu Tests: Type & Results	RL (m)	Depth (m)	Graphic Log	Material Description	Moisture Condition	Consistency/ Relative Density	Dynamic Cone Penetrometer (Blows/100mm)
	0.3	Peak = 139kPa Residual = 30kPa				OL: Organic SILT: black. Non plastic. (Topsoil)			
						ML: Clayey SILT with trace sand: orange brown. Low plasticity; sand, fine to medium. (Hinuera Formation)	M	VSt	
	0.6	Peak = 142kPa Residual = 30kPa				*... at 0.70m, Contains some fine to medium sand.*			
	0.9	Peak = UTP		1		SW: Fine to coarse SAND with minor silt: orange brown. Well graded, siliceous. (Hinuera Formation)			3
									4
									6
									4
						... at 1.30m, Contains trace fine gravel, siliceous. Becoming grey.			3
									6
									5
						... from 1.60m to 2.00m, Contains some silt. Becoming brown.			4
									3
							D to M		3
									2
				2					3
									4
									2
									3
									3
									3
									3
									3
									3
							M to W	L to MD	4
									3
									2
									3
							W		3
									5
									6
							S		6
						Borehole terminated at 3.8 m			5
									5
				4					6
									6
									6
									4
									3
									3
									2
									4
									4
									4
				5					

Termination Reason: Hole collapse
Shear Vane No: 2562 DCP No: 17
Remarks:

This report is based on the attached field description for soil and rock, CMW Geosciences - Field Logging Guide, Revision 3 - April 2018.

HAND AUGER BOREHOLE LOG - HA15

Client: Calcutta Farms Ltd
Project: Tauranga Road Industrial Subdivision
Site Location: Matamata
Project No.: TGA2020-0304
Date: 17/06/2021
Borehole Location: Refer to Drawing 01 Logged by: MS Checked by: LPM Scale: 1:25 Sheet 1 of 1
Position: 1846218.0mE; 5810072.0mN Projection: BOP 2000
Datum: Moturiki Survey Source: Hand held GPS

Groundwater	Samples & Insitu Tests: Depth	Samples & Insitu Tests: Type & Results	RL (m)	Depth (m)	Graphic Log	Material Description	Moisture Condition	Consistency/ Relative Density	Dynamic Cone Penetrometer (Blows/100mm)
				0		OL: Organic SILT: black. Non plastic. (Topsoil)			
	0.3	Peak = 92kPa Residual = 27kPa				ML: Clayey SILT with trace sand: orange brown. Low plasticity; sand, fine to medium. (Hinuera Formation)	M	St to VSt	
	0.6	Peak = 80kPa Residual = 15kPa				... at 0.60m, Becoming light brown			
						... at 0.70m, Becoming brownish grey.			
	0.9	Peak = 177kPa Residual = 24kPa				... at 0.90m, Contains some fine sand.			
				1		SM: Silty fine SAND: white. Poorly graded. (Hinuera Formation)	D to M	MD	3, 3
						SP: Fine to medium SAND with minor silt: light grey. Poorly graded, silicious. (Hinuera Formation)			4
						SW: Fine to coarse SAND with minor silt: grey. Well graded, siliceous. (Hinuera Formation)			4, 4, 4
						... at 1.70m, Contains minor fine to medium gravel, siliceous.			5, 5
				2					3, 3
						SM: Silty fine SAND: grey. Poorly graded. (Hinuera Formation)		L	2, 1, 2, 3, 3, 3, 3
						ML: Sandy SILT: light brownish grey. Non plastic; sand, fine. (Hinuera Formation)	M to W		4, 3
				3					2
						SP: Silty fine SAND: brownish grey. Poorly graded. (Hinuera Formation)		MD	4
						SW: Fine to coarse SAND with minor silt and trace gravel: grey. Well graded; gravel, fine, siliceous, subangular. (Hinuera Formation)			5, 6, 6, 5, 5, 7, 11, 13
				4		... at 4.00m, Becoming brownish red.	M	MD to D	15, 13, 10, 9, 8, 8, 7, 7, 9
						... at 4.30m, Becoming grey.			
				5		Borehole terminated at 5.0 m			

Termination Reason: Target depth
Shear Vane No: 2562 DCP No: 17
Remarks: Groundwater not encountered.

This report is based on the attached field description for soil and rock, CMW Geosciences - Field Logging Guide, Revision 3 - April 2018.

HAND AUGER BOREHOLE LOG - HA16 & S10

Client: Calcutta Farms Ltd
Project: Tauranga Road Industrial Subdivision
Site Location: Matamata
Project No.: TGA2020-0304
Date: 27/07/2021
Borehole Location: Refer to Drawing 01

PRELIMINARY

CMW Geosciences

Logged by: MS Checked by: Scale: 1:25 Sheet 1 of 1

Position: 1846393.0mE; 5809968.0mN Projection: BOP 2000
Datum: Motuirki Survey Source: Hand held GPS

Groundwater	Samples & Insitu Tests: Depth	Samples & Insitu Tests: Type & Results	RL (m)	Depth (m)	Graphic Log	Material Description	Moisture Condition	Consistency/ Relative Density	Dynamic Cone Penetrometer (Blows/100mm)
				0		OL: Organic SILT: black. Non plastic. (Topsoil)			
	0.3	Peak = 104kPa Residual = 18kPa				ML: Clayey SILT with trace sand: orange brown. Low plasticity; sand, fine to medium. (Hinuera Formation)	M	St to VSt	
	0.6	Peak = 89kPa Residual = 15kPa							
	0.9	Peak = 151kPa Residual = 30kPa							
	1.2	Peak = 104kPa Residual = 44kPa		1		... at 1.20m, Contains some fine to medium sand, becoming greyish brown.	W		
						SM: Silty fine SAND: white. Poorly graded. (Hinuera Formation)			3, 2, 3, 2
				2		SP: Fine to medium SAND with some silt: greyish brown. Poorly graded, siliceous. (Hinuera Formation)	M	L	2, 3, 2
						SM: Silty fine SAND: white. Poorly graded. (Hinuera Formation)			1
						ML: SILT: grey mottled orange. Non plastic. (Hinuera Formation)			1
						SW: Fine to coarse SAND with minor silt and trace gravel: grey. Well graded, silicious; gravel, fine, siliceous. (Hinuera Formation)		MD to D	6, 13, 8, 9, 9, 8
				3			W		4, 4, 4
								L to MD	2, 4, 4, 3, 3, 7
▼				4			S		4, 5, 5, 7, 6, 4, 5, 4, 4
						Borehole terminated at 4.2 m			
				5					

Termination Reason: Hole collapse
Shear Vane No: 2562 DCP No: 17
Remarks:

This report is based on the attached field description for soil and rock, CMW Geosciences - Field Logging Guide, Revision 3 - April 2018.

HAND AUGER BOREHOLE LOG - HA17

Client: Calcutta Farms Ltd
Project: Tauranga Road Industrial Subdivision
Site Location: Matamata
Project No.: TGA2020-0304
Date: 15/06/2021
Borehole Location: Refer to Drawing 01 Logged by: MS Checked by: LPM Scale: 1:25 Sheet 1 of 1
Position: 1846429.0mE; 5810063.0mN Projection: BOP 2000
Datum: Moturiki Survey Source: Hand held GPS

Groundwater	Samples & Insitu Tests: Depth	Samples & Insitu Tests: Type & Results	RL (m)	Depth (m)	Graphic Log	Material Description	Moisture Condition	Consistency/ Relative Density	Dynamic Cone Penetrometer (Blows/100mm)
						OL: Organic SILT: black. Non plastic. (Topsoil)			
	0.3	Peak = 136kPa Residual = 33kPa				ML: Clayey SILT with trace sand: orange brown. Low plasticity; sand, fine to medium. (Hinuera Formation)		VSt to H	
	0.6	Peak = 160kPa Residual = 38kPa							
	0.9	Peak = >207kPa		1		... at 1.10m, Contains some fine to medium sand.			
						SW: Fine to coarse SAND with minor silt and trace gravel: orange brown. Well graded; gravel, fine, siliceous, subangular. (Hinuera Formation)	M		3
									2
									2
									2
									2
						... at 1.80m, Contains minor fine to medium gravel.			3
				2		... at 2.00m, Contains grey mottling.			4
									3
						... at 2.20m, Becoming grey.			4
									4
									4
								L to MD	4
									3
									2
							W		3
▼				3					4
									3
							S		3
									4
									6
									6
									6
									2
									2
									2
						Borehole terminated at 3.4 m			15
				4					12
									10
									10
									9
								MD to D	8
									9
									8
									5
				5					6

Termination Reason: Hole collapse
Shear Vane No: 2562 DCP No: 17
Remarks:

This report is based on the attached field description for soil and rock, CMW Geosciences - Field Logging Guide, Revision 3 - April 2018.

HAND AUGER BOREHOLE LOG - HA18 & S09

Client: Calcutta Farms Ltd
Project: Tauranga Road Industrial Subdivision
Site Location: Matamata
Project No.: TGA2020-0304
Date: 16/06/2021
Borehole Location: Refer to Drawing 01 Logged by: MS Checked by: LPM Scale: 1:25 Sheet 1 of 1
Position: 1846475.0mE; 5810141.0mN Projection: BOP 2000
Datum: Moturiki Survey Source: Hand held GPS

Groundwater	Samples & Insitu Tests: Depth	Samples & Insitu Tests: Type & Results	RL (m)	Depth (m)	Graphic Log	Material Description	Moisture Condition	Consistency/ Relative Density	Dynamic Cone Penetrometer (Blows/100mm)
				0		OL: Organic SILT: black. Non plastic. (Topsoil)			
	0.3	Peak = 133kPa Residual = 36kPa				ML: Clayey SILT with trace sand: orange brown. Low plasticity; sand, fine to medium. (Hinuera Formation)			
	0.6	Peak = 104kPa Residual = 21kPa							
	0.9	Peak = >207kPa				*... from 0.85m to 1.00m, Becoming brown, contains some fine to coarse sand.*	M	VSt to H	
				1		*... at 1.00m, Becoming mottled brownish grey.*			
	1.2	Peak = 109kPa Residual = 30kPa							
	1.6	Peak = 112kPa Residual = 30kPa				ML: Sandy SILT: light grey streaked orange brown. Non plastic; sand, fine. (Hinuera Formation)		VSt	
▼	2.0	Peak = 118kPa Residual = 44kPa		2		SW: Fine to coarse SAND with minor silt and trace gravel: orange brown mottled grey. Well graded; gravel, fine, siliceous, subangular. (Hinuera Formation)	W	L to MD	2 3 3 3 3 2 2 2 3 4 4 5 5 6 5 6 6 6 4 4 6 6 7 6 6 7 5 5 6
				3			S		
						Borehole terminated at 3.1 m			
				4					
				5					

Termination Reason: Hole collapse
Shear Vane No: 2562 DCP No: 17
Remarks:

This report is based on the attached field description for soil and rock, CMW Geosciences - Field Logging Guide, Revision 3 - April 2018.

HAND AUGER BOREHOLE LOG - HA19 & S08

Client: Calcutta Farms Ltd
Project: Tauranga Road Industrial Subdivision
Site Location: Matamata
Project No.: TGA2020-0304
Date: 16/06/2021
Borehole Location: Refer to Drawing 01 Logged by: Checked by: LPM Scale: 1:25 Sheet 1 of 1
Position: 1846560.0mE; 5810287.0mN Projection: BOP 2000
Datum: Moturiki Survey Source: Hand held GPS

Groundwater	Samples & Insitu Tests: Depth	Samples & Insitu Tests: Type & Results	RL (m)	Depth (m)	Graphic Log	Material Description	Moisture Condition	Consistency/ Relative Density	Dynamic Cone Penetrometer (Blows/100mm)
						OL: Organic SILT: black. Non plastic. (Topsoil)			
	0.3	Peak = 109kPa Residual = 30kPa				ML: Clayey SILT with trace sand: orange brown. Low plasticity; sand, fine to medium. (Hinuera Formation)		VSt	
	0.6	Peak = 163kPa Residual = 33kPa							
	0.9	Peak = UTP		1		SW: Fine to coarse SAND with minor silt and trace gravel: orange brown. Well graded; gravel, fine, siliceous subangular. (Hinuera Formation)			2
									4
									4
									5
									5
									3
							M		2
						... at 1.60m, Contains minor fine to medium gravel, siliceous, becoming mottled light grey			3
									2
				2					3
									3
									3
								L to MD	3
									3
									3
									4
									4
						... at 2.60m, Becoming light grey.			4
									3
									2
									3
				3					3
							W		5
									3
									4
							S		7
						Borehole terminated at 3.5 m			5
								D	9
									9
									8
				4					8
									2
									2
								L	2
									3
									3
									10
								D	13
									12
									10
				5					

Termination Reason: Hole collapse
Shear Vane No: 2562 DCP No: 17
Remarks:

This report is based on the attached field description for soil and rock, CMW Geosciences - Field Logging Guide, Revision 3 - April 2018.

HAND AUGER BOREHOLE LOG - HA20

Client: Calcutta Farms Ltd
Project: Tauranga Road Industrial Subdivision
Site Location: Matamata
Project No.: TGA2020-0304
Date: 16/07/2021

PRELIMINARY

CMW Geosciences

Borehole Location: Refer to Drawing 01 Logged by: MS Checked by: Scale: 1:25 Sheet 1 of 1

Position: 1846615.0mE; 5810140.0mN Projection: BOP 2000
Datum: Moturiki Survey Source: Hand held GPS

Groundwater	Samples & Insitu Tests: Depth	Samples & Insitu Tests: Type & Results	RL (m)	Depth (m)	Graphic Log	Material Description	Moisture Condition	Consistency/ Relative Density	Dynamic Cone Penetrometer (Blows/100mm)
				0		OL: Organic SILT: black. Non plastic. (Topsoil)			
	0.3	Peak = 121kPa Residual = 24kPa				ML: Clayey SILT with trace sand: orange brown. Low plasticity; sand, fine to medium. (Hinuera Formation)			
	0.6	Peak = 148kPa Residual = 33kPa				... at 0.60m, Becoming greyish brown.	M	St to VSt	
	0.9	Peak = 127kPa Residual = 30kPa				... at 0.90m, Contains some fine to medium sand.			
	1.2	Peak = 92kPa Residual = 30kPa		1					
						SW: Fine to coarse SAND with minor silt and trace gravel: grey. Well graded, silicious; gravel, fine, siliceous. (Hinuera Formation)			6 7 5 4 4
				2		... at 2.30m, Contains minor fine to medium gravel.	W		3 3 8 8 9 10 7 7 6 5
▼				3			S	MD to D	5 3 5 8 6 7 7 5 5 6
						Borehole terminated at 3.4 m			
				4					6 6 7 7 7 8 8 7 8
				5					

Termination Reason: Hole collapse
Shear Vane No: 2562 DCP No: 17
Remarks:

This report is based on the attached field description for soil and rock, CMW Geosciences - Field Logging Guide, Revision 3 - April 2018.

HAND AUGER BOREHOLE LOG - HA21

Client: Calcutta Farms Ltd
Project: Tauranga Road Industrial Subdivision
Site Location: Matamata
Project No.: TGA2020-0304
Date: 14/06/2021
Borehole Location: Refer to Drawing 01 Logged by: MS Checked by: LPM Scale: 1:25 Sheet 1 of 1
Position: 1846532.0mE; 5809985.0mN Projection: BOP 2000
Datum: Moturiki Survey Source: Hand held GPS

Groundwater	Samples & Insitu Tests: Depth	Samples & Insitu Tests: Type & Results	RL (m)	Depth (m)	Graphic Log	Material Description	Moisture Condition	Consistency/ Relative Density	Dynamic Cone Penetrometer (Blows/100mm)
	0.3	Peak = 118kPa Residual = 30kPa		0		OL: Organic SILT: black. Non plastic. (Topsoil)			
	0.6	Peak = 136kPa Residual = 33kPa				ML: Clayey SILT with trace sand: orange brown. Low plasticity; sand, fine to medium. (Hinuera Formation)	M	VSt to H	
	0.9	Peak = UTP				... at 0.70m, Becoming brownish grey.			
				1		SW: Fine to coarse SAND with minor silt and trace gravel: greyish brown mottled orange brown. Well graded; gravel, fine, siliceous, subangular. (Hinuera Formation)			2 2 2 4 2 4 6 5 5
						... at 1.40m, Contains minor fine to medium gravel, siliceous.			3 4 4 6 5 6 7 6
						... at 1.60m, Becoming light grey.			3 4 5
				2			M to W		4 7 5 4 5 4 5 4 4 4
				3			W	L to MD	5 5 7 5 6 6 5 5 5
							S		
				4		Borehole terminated at 3.8 m			
				5					

Termination Reason: Hole collapse
Shear Vane No: 2562 DCP No: 17
Remarks:

This report is based on the attached field description for soil and rock, CMW Geosciences - Field Logging Guide, Revision 3 - April 2018.

HAND AUGER BOREHOLE LOG - HA22 & S11

Client: Calcutta Farms Ltd
Project: Tauranga Road Industrial Subdivision
Site Location: Matamata
Project No.: TGA2020-0304
Date: 14/06/2021
Borehole Location: Refer to Drawing 01 Logged by: MS Checked by: LPM Scale: 1:25 Sheet 1 of 1
Position: 1846557.0mE; 5809868.0mN Projection: BOP 2000
Datum: Moturiki Survey Source: Hand held GPS

Groundwater	Samples & Insitu Tests: Depth	Samples & Insitu Tests: Type & Results	RL (m)	Depth (m)	Graphic Log	Material Description	Moisture Condition	Consistency/ Relative Density	Dynamic Cone Penetrometer (Blows/100mm)
				0		OL: Organic SILT: black. Non plastic. (Topsoil)			
	0.3	Peak = 80kPa Residual = 30kPa				ML: Clayey SILT with trace sand: orange brown. Low plasticity; sand, fine to medium. (Hinuera Formation)		St to VSt	
	0.6	Peak = 98kPa Residual = 24kPa				... at 0.90m, Contains some sand.			
				1		SW: Fine to coarse SAND with minor silt and trace gravel: greyish brown mottled orange brown. Well graded; gravel, fine, siliceous, subangular. (Hinuera Formation)			3, 3, 3, 2, 1, 1, 2, 1, 1, 2
						... at 1.50m, Contains minor silt, becoming light orange.			
						... at 1.80m, Becoming yellowish grey.			
				2		... at 2.30m, Becoming brownish grey.	M		2, 3, 2, 1, 4, 1, 1, 1, 3, 2
						... at 2.90m, Becoming light grey.		L to MD	1, 3, 1, 3, 4, 3, 4, 3, 4, 4
				3					7, 5, 5, 5, 6, 6, 5, 4, 4
				4					
				5		Borehole terminated at 5.0 m			

Termination Reason: Target depth
Shear Vane No: 2562 DCP No: 17
Remarks: Groundwater not encountered.

This report is based on the attached field description for soil and rock, CMW Geosciences - Field Logging Guide, Revision 3 - April 2018.

HAND AUGER BOREHOLE LOG - HA23 & S12

Client: Calcutta Farms Ltd
Project: Tauranga Road Industrial Subdivision
Site Location: Matamata
Project No.: TGA2020-0304
Date: 18/06/2021
Borehole Location: Refer to Drawing 01 Logged by: MS Checked by: LPM Scale: 1:25 Sheet 1 of 1
Position: 1846672.0mE; 5810017.0mN Projection: BOP 2000
Datum: Moturiki Survey Source: Hand held GPS

Groundwater	Samples & Insitu Tests: Depth	Samples & Insitu Tests: Type & Results	RL (m)	Depth (m)	Graphic Log	Material Description	Moisture Condition	Consistency/ Relative Density	Dynamic Cone Penetrometer (Blows/100mm)
				0		OL: Organic SILT: black. Non plastic. (Topsoil)			
	0.3	Peak = 121kPa Residual = 21kPa				ML: Clayey SILT with trace sand: orange brown. Low plasticity; sand, fine to medium. (Hinuera Formation)		St	
	0.6	Peak = 109kPa Residual = 18kPa							
	0.9	Peak = 104kPa Residual = 24kPa		1					
	1.2	Peak = 118kPa Residual = 36kPa				ML: Sandy SILT: grey mottled brownish grey. Non plastic, loosely packed; sand, fine. (Hinuera Formation)		VSt	
						SW: Fine to coarse SAND with minor silt and trace gravel: greyish brown mottled orange brown. Well graded; gravel, fine, siliceous, subangular. (Hinuera Formation)	M	L to MD	3
							M		4
									4
									3
				2					2
						... at 2.00m, Becoming grey.			4
									3
									2
									3
						... at 2.50m, Contains minor fine to medium gravel, siliceous.			5
									3
									1
									3
									5
									2
				3					4
							W		5
									4
									4
									5
									4
									4
									6
							S		7
									7
				4		Borehole terminated at 4.0 m			5
									4
									5
									4
									4
									6
									6
				5					5
									5

Termination Reason: Hole collapse
Shear Vane No: 2562 DCP No: 17
Remarks:

This report is based on the attached field description for soil and rock, CMW Geosciences - Field Logging Guide, Revision 3 - April 2018.

HAND AUGER BOREHOLE LOG - HA24

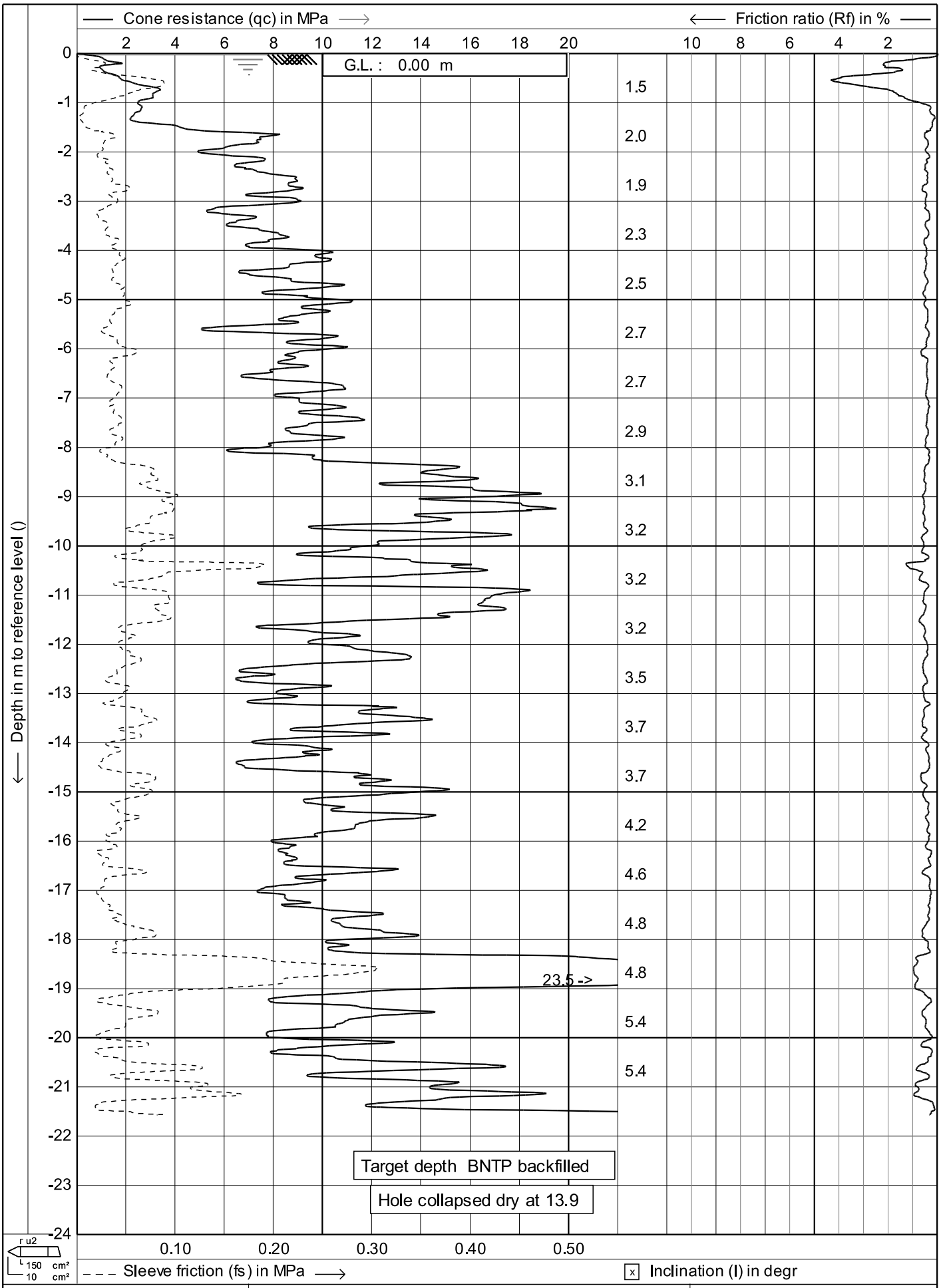
Client: Calcutta Farms Ltd
Project: Tauranga Road Industrial Subdivision
Site Location: Matamata
Project No.: TGA2020-0304
Date: 14/06/2021
Borehole Location: Refer to Drawing 01 Logged by: MS Checked by: LPM Scale: 1:25 Sheet 1 of 1
Position: 1846749.0mE; 5810156.0mN Projection: BOP 2000
Datum: Moturiki Survey Source: Hand held GPS

Groundwater	Samples & Insitu Tests: Depth	Samples & Insitu Tests: Type & Results	RL (m)	Depth (m)	Graphic Log	Material Description	Moisture Condition	Consistency/ Relative Density	Dynamic Cone Penetrometer (Blows/100mm)
						OL: Organic SILT: black. Non plastic. (Topsoil)			
						ML: Clayey SILT with trace sand: orange brown. Low plasticity; sand, fine to medium. (Hinuera Formation)			
	0.3	Peak = 130kPa Residual = 27kPa							
	0.6	Peak = 163kPa Residual = 30kPa						St to VSt	
						... at 0.70m, Becoming greyish brown.			
	0.9	Peak = 89kPa Residual = 27kPa							
				1		... at 1.00m, Contains some fine to medium sand.			
						SW: Fine to coarse SAND with minor silt and trace gravel: greyish brown mottled orange brown. Well graded; gravel, fine, siliceous, subangular. (Hinuera Formation)			3
						... at 1.30m, Becoming yellowish grey.			3
									2
						... at 1.50m, Contains minor fine to medium gravel, siliceous.			4
							M		4
						... at 1.70m, Becoming brownish grey.			4
				2					4
									4
									4
									3
									3
									2
									4
									3
									2
									4
									4
									5
				3				L to MD	3
									1
									4
									4
									2
							W		3
									6
									4
							S		3
									5
				4		Borehole terminated at 4.0 m			6
									5
									5
									6
									4
									4
									4
									4
				5					6

Termination Reason: Hole collapse
Shear Vane No: 2562 DCP No: 17
Remarks:

This report is based on the attached field description for soil and rock, CMW Geosciences - Field Logging Guide, Revision 3 - April 2018.

Appendix C: CPT Investigation Results



PERRY GEOTECH

Test according A.S.T.M Standard D 5778-12

Project : **Site Investigations**

Location: **194 SH24 - Matamata**

Position: **0, 0**

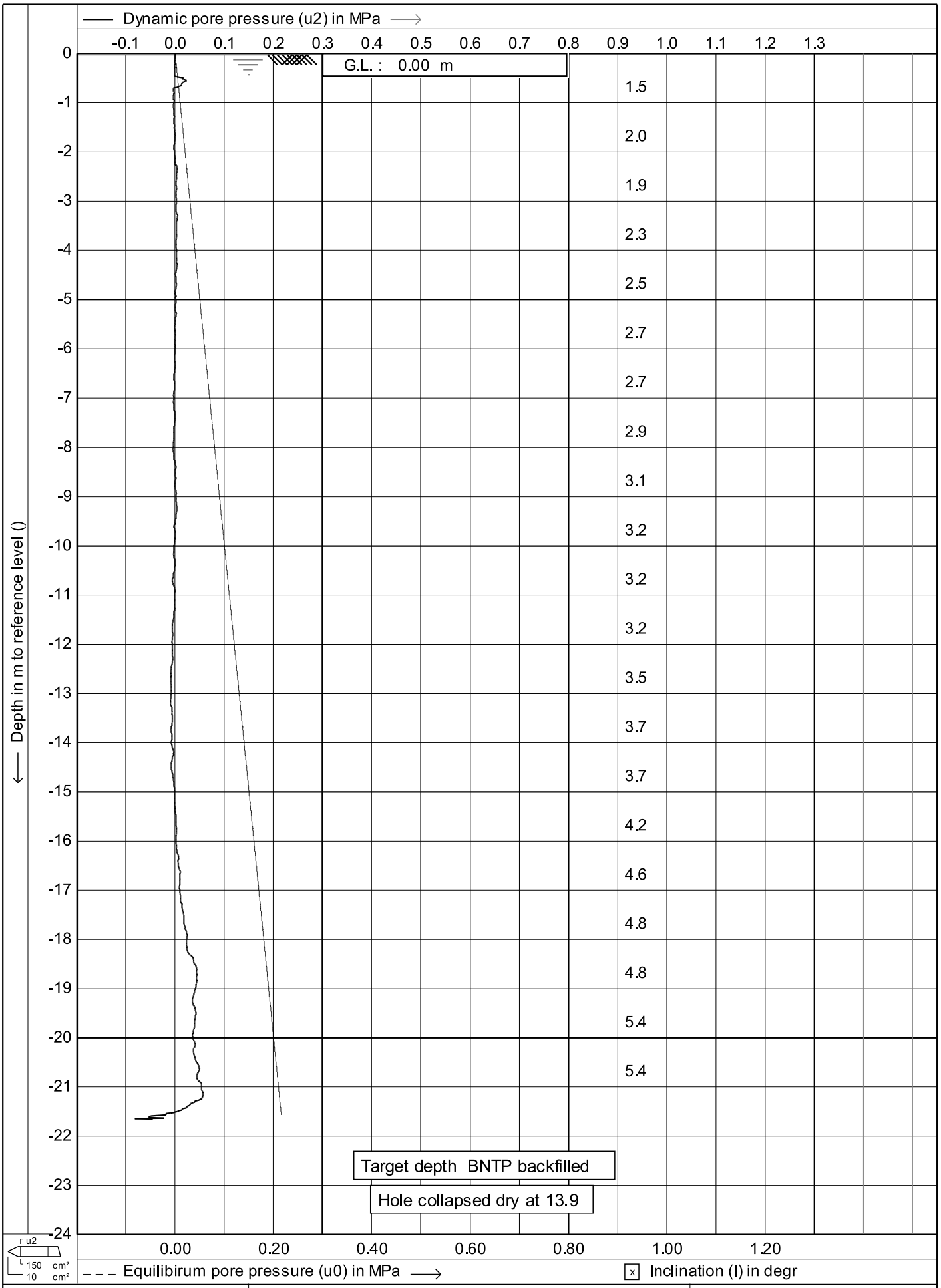
Date : **16/06/2021**

Cone no. : **C10CFIIP.C13068**

Project no. : **CMW055**

CPT no. : **CPT01** 1/14

1.48



PERRY GEOTECH

Test according A.S.T.M Standard D 5778-12

Project : **Site Investigations**

Location: **194 SH24 - Matamata**

Position: **0, 0**

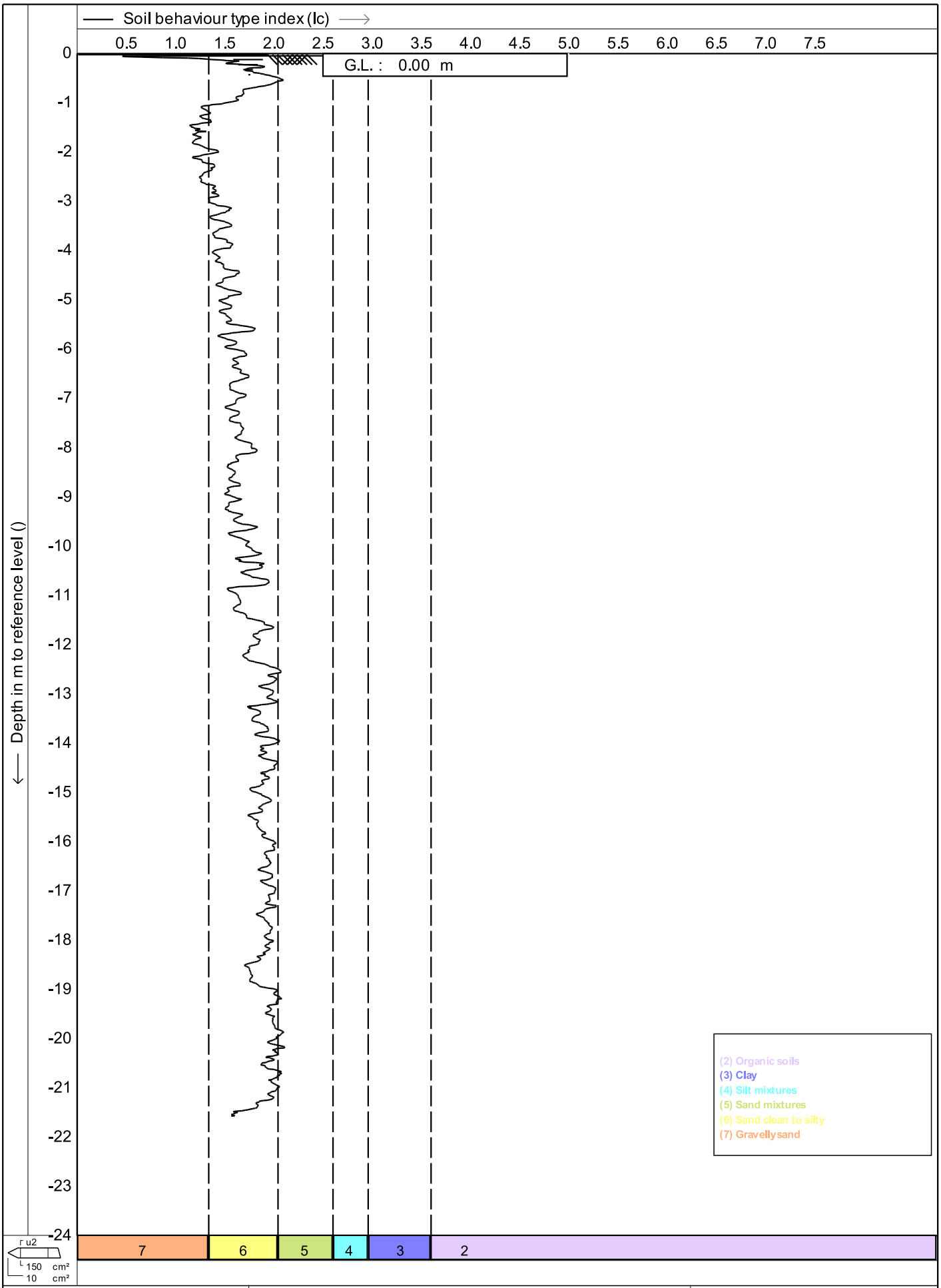
Date : **16/06/2021**

Cone no. : **C10CFIIP.C13068**

Project no. : **CMW055**

CPT no. : **CPT01**

1,48



PERRY GEOTECH

Test according A.S.T.M Standard D 5778-12

Project : **Site Investigations**

Location: **194 SH24 - Matamata**

Position: **0, 0**

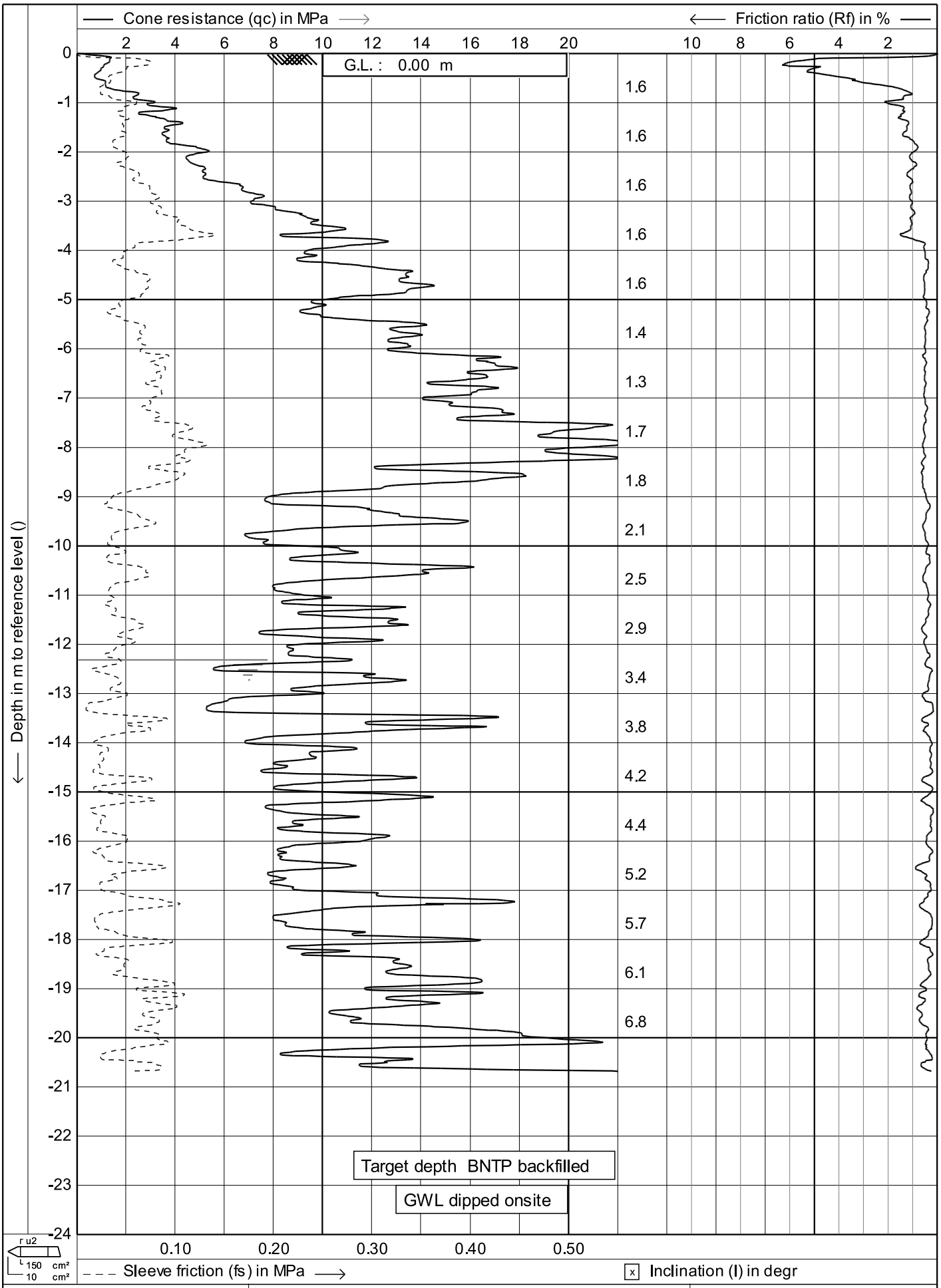
Date : **16/06/2021**

Cone no. : **C10CFIIP.C13068**

Project no. : **CMW055**

CPT no. : **CPT01** **9/14**

1.48



PERRY GEOTECH

Test according A.S.T.M Standard D 5778-12

Project : **Site Investigations**

Location: **194 SH24 - Matamata**

Position: **0, 0**

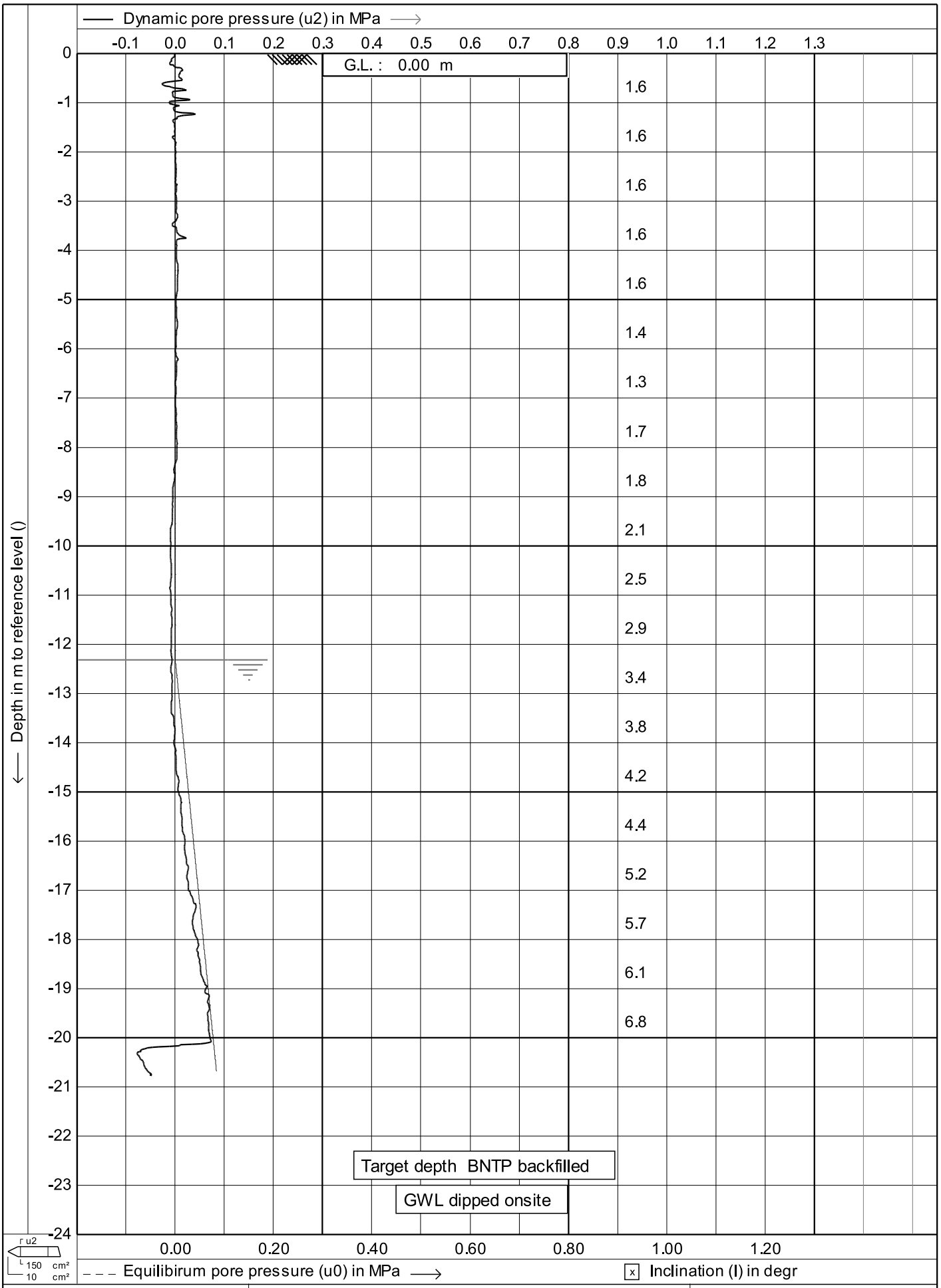
Date : **16/06/2021**

Cone no. : **C10CFIIP.C13068**

Project no. : **CMW055**

CPT no. : **CPT02** 1/14

1,48



PERRY GEOTECH

Test according A.S.T.M Standard D 5778-12

Project : **Site Investigations**

Location: **194 SH24 - Matamata**

Position: **0, 0**

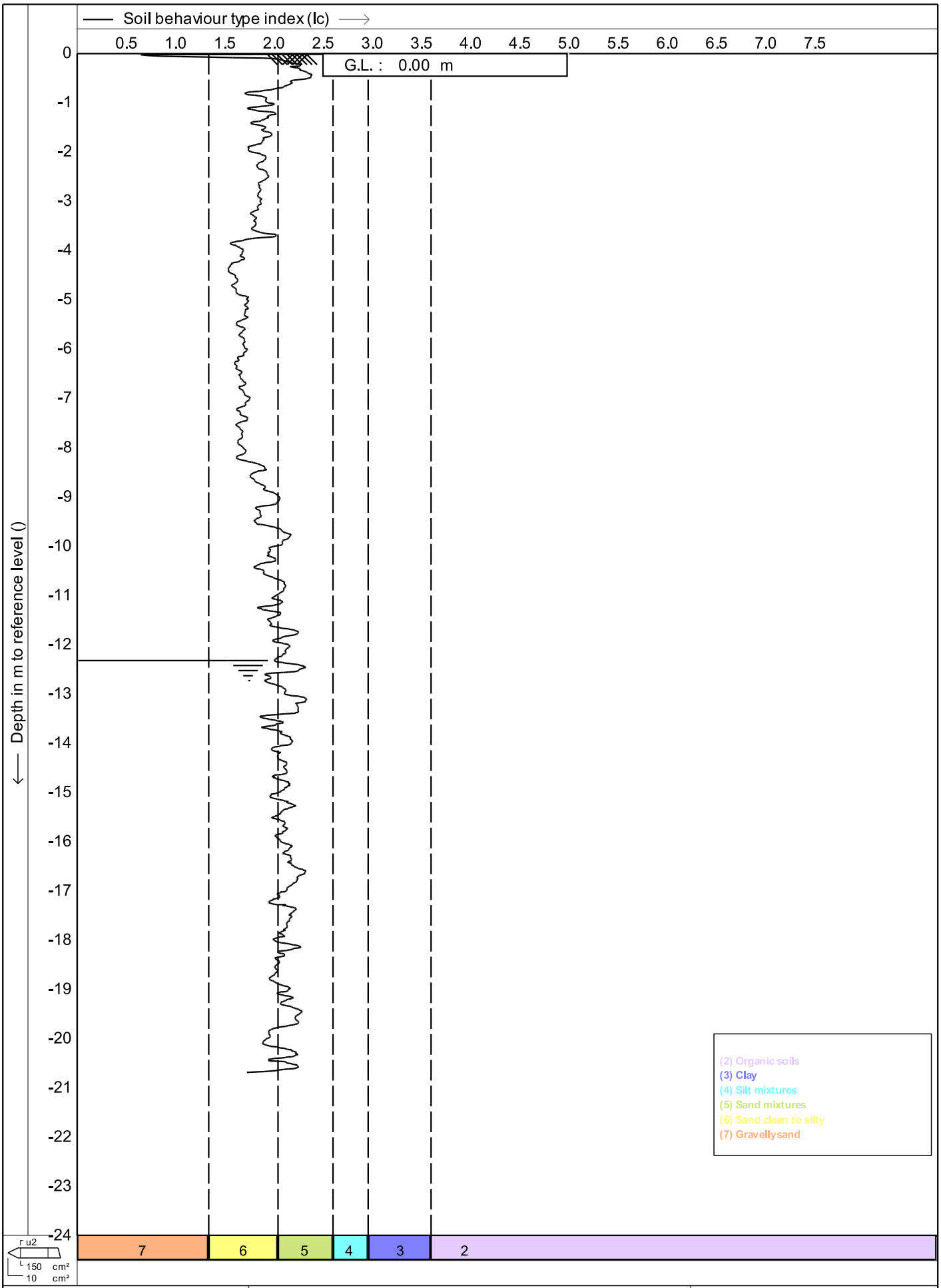
Date : **16/06/2021**

Cone no. : **C10CFIIP.C13068**

Project no. : **CMW055**

CPT no. : **CPT02**

1,48



PERRY GEOTECH

Test according A.S.T.M Standard D 5778-12

Project : **Site Investigations**

Location: **194 SH24 - Matamata**

Position: **0, 0**

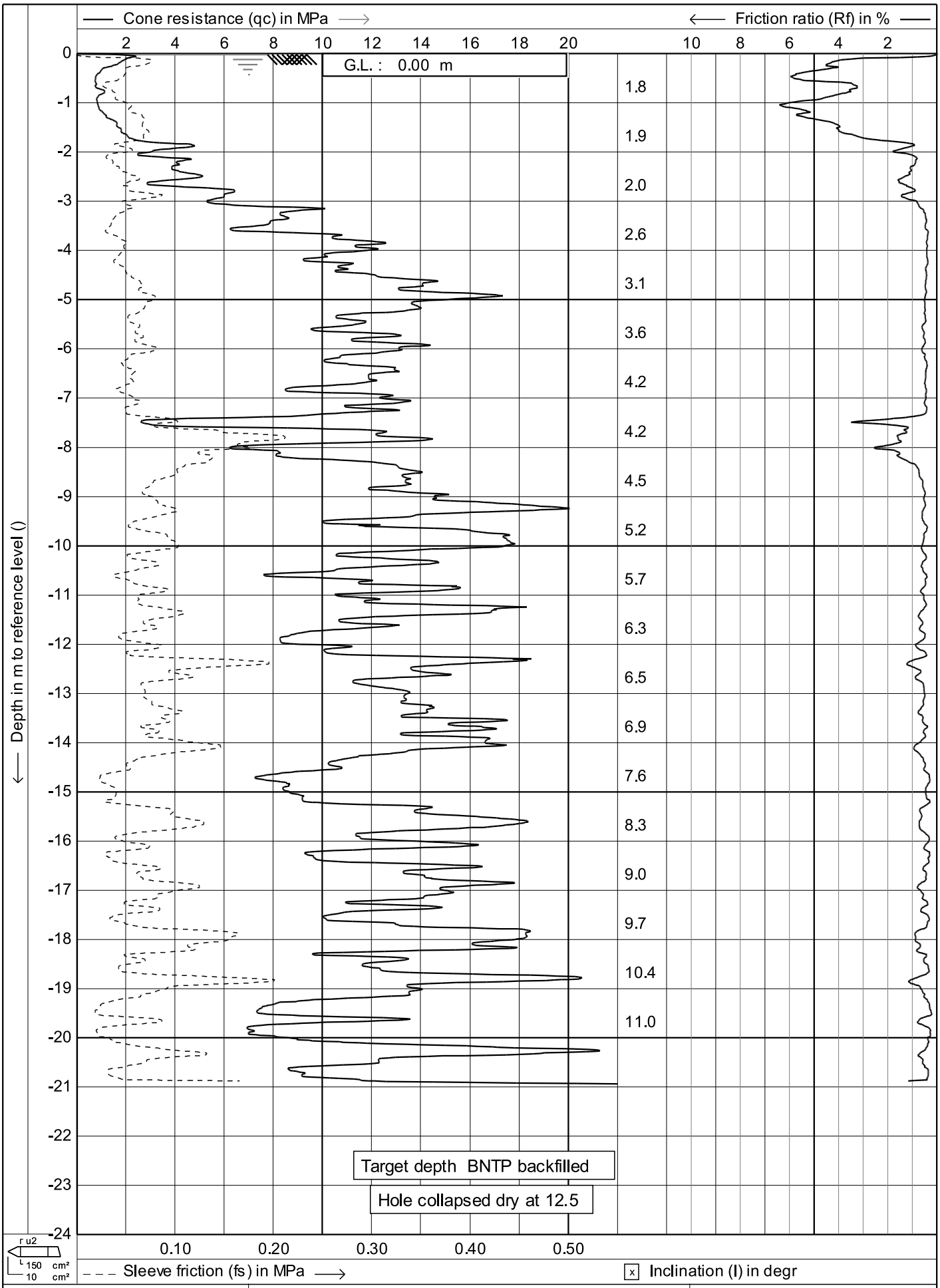
Date : **16/06/2021**

Cone no. : **C10CFIIP.C13068**

Project no. : **CMW055**

CPT no. : **CPT02** **9/14**

1.48



PERRY GEOTECH

Test according A.S.T.M Standard D 5778-12

Project : **Site Investigations**

Location: **194 SH24 - Matamata**

Position: **0, 0**

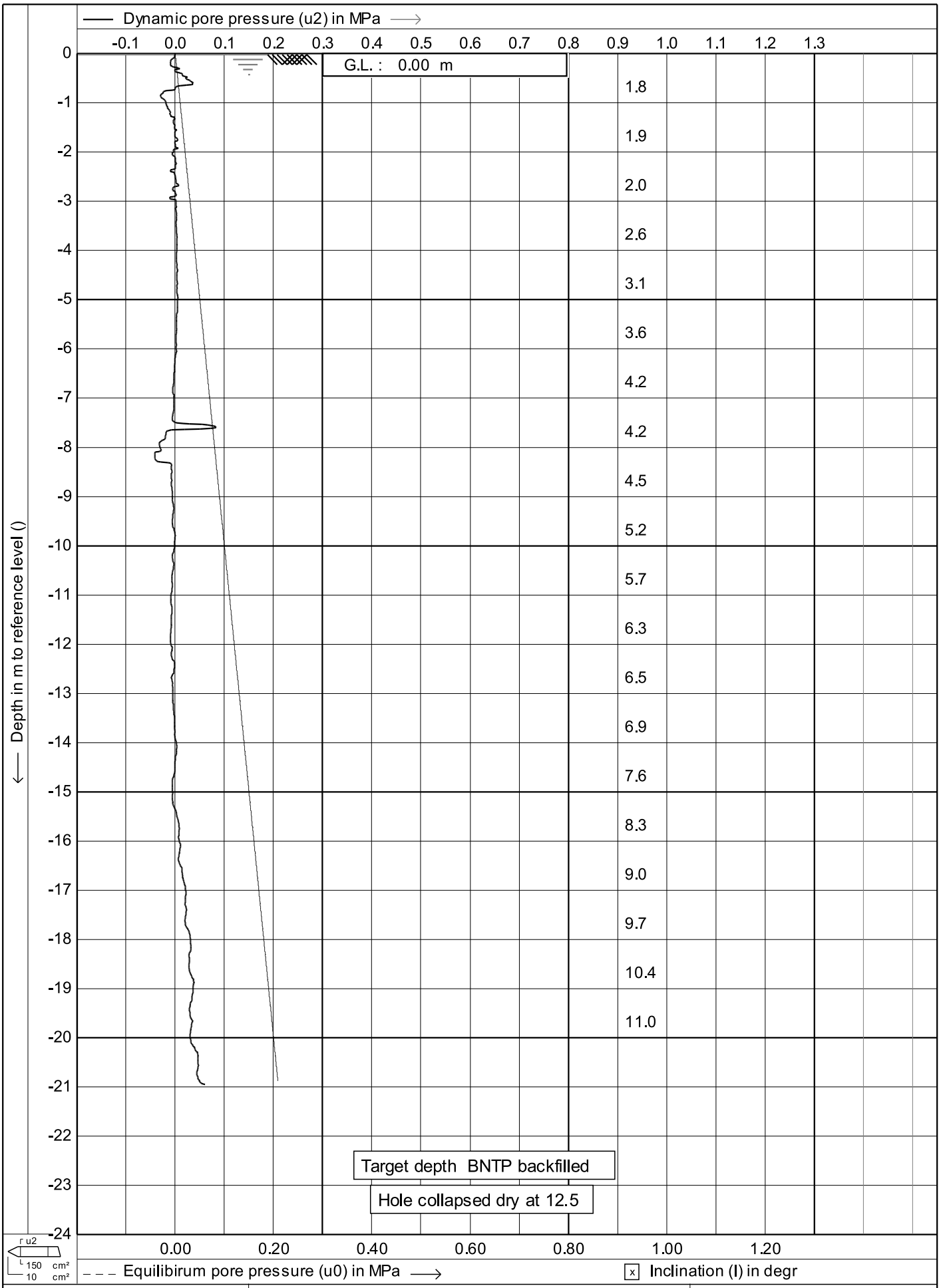
Date : **16/06/2021**

Cone no. : **C10CFIIP.C13068**

Project no. : **CMW055**

CPT no. : **CPT03** 1/14

1.48



PERRY GEOTECH

Test according A.S.T.M Standard D 5778-12

Project : **Site Investigations**

Location: **194 SH24 - Matamata**

Position: **0, 0**

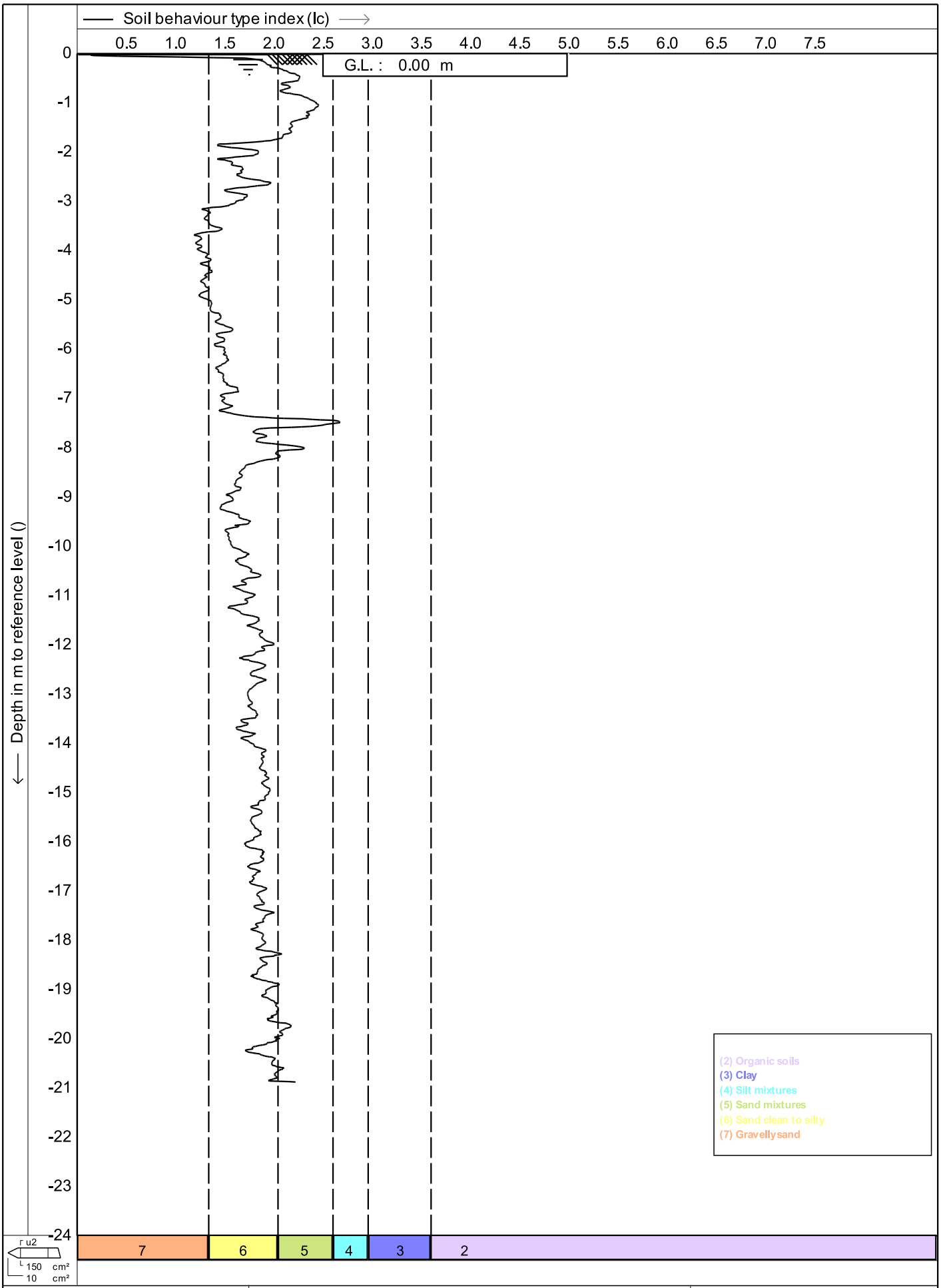
Date : **16/06/2021**

Cone no. : **C10CFIIP.C13068**

Project no. : **CMW055**

CPT no. : **CPT03**

1.48



PERRY GEOTECH

Test according A.S.T.M Standard D 5778-12

Project : **Site Investigations**

Location: **194 SH24 - Matamata**

Position: **0, 0**

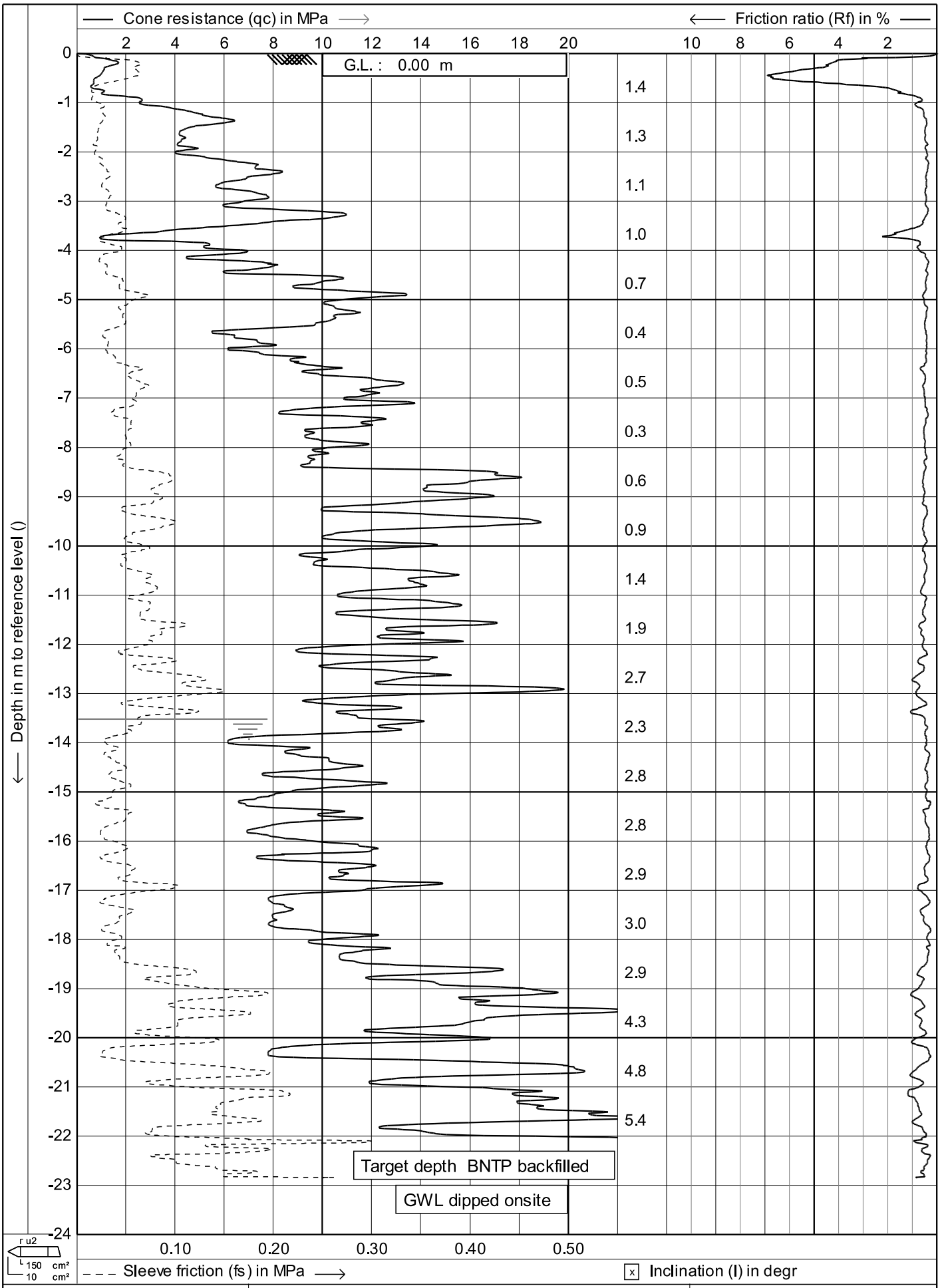
Date : **16/06/2021**

Cone no. : **C10CFIIP.C13068**

Project no. : **CMW055**

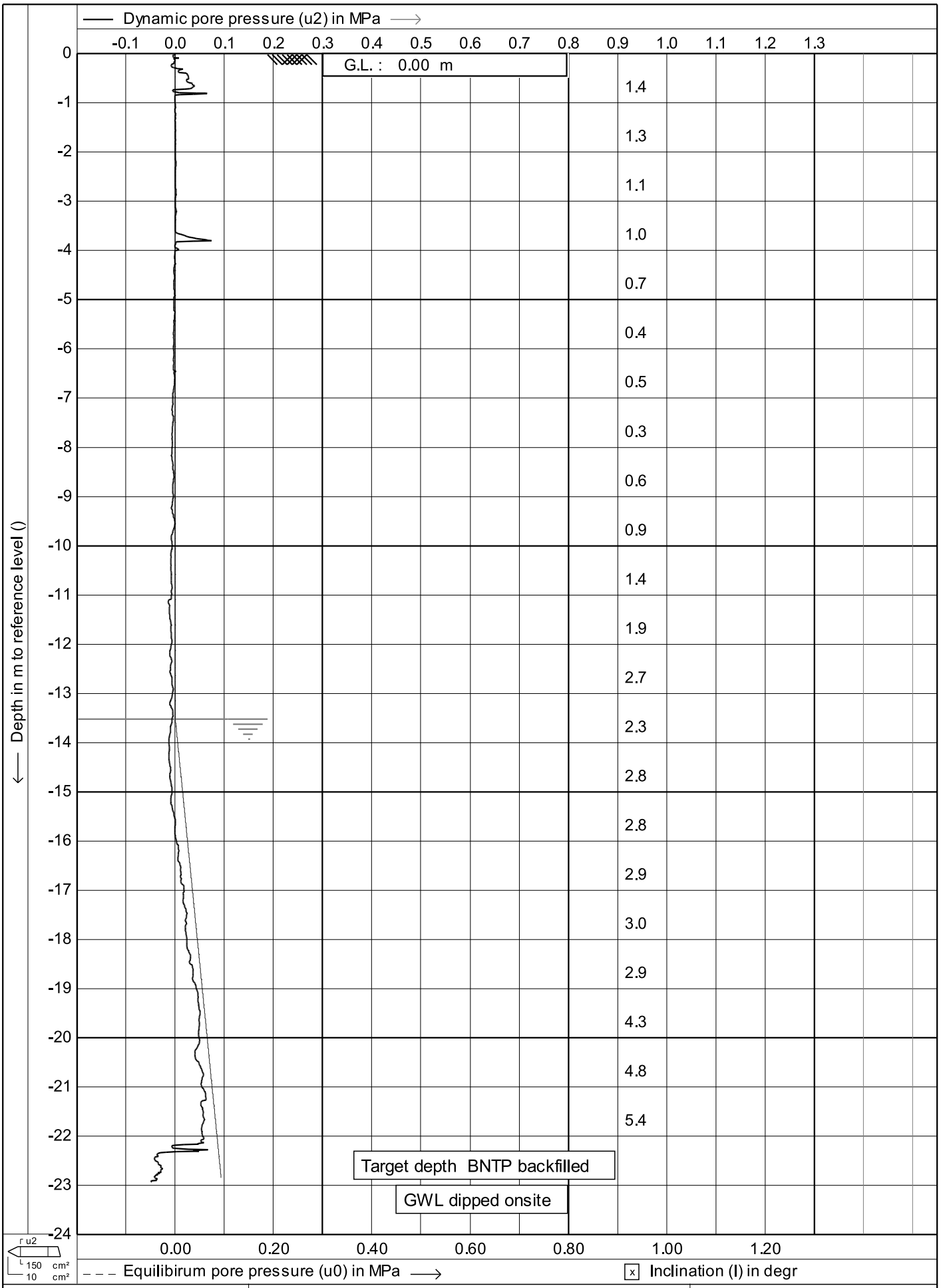
CPT no. : **CPT03** **9/14**

1.48



PERRY GEOTECH	Test according A.S.T.M Standard D 5778-12	Date	: 16/06/2021
	Project : **Site Investigations**	Cone no.	: C10CFIIP.C13068
	Location: **194 SH24 - Matamata**	Project no.	: CMW055
	Position: **0, 0**	CPT no.	: CPT04 1/14

1.48



PERRY GEOTECH

Test according A.S.T.M Standard D 5778-12

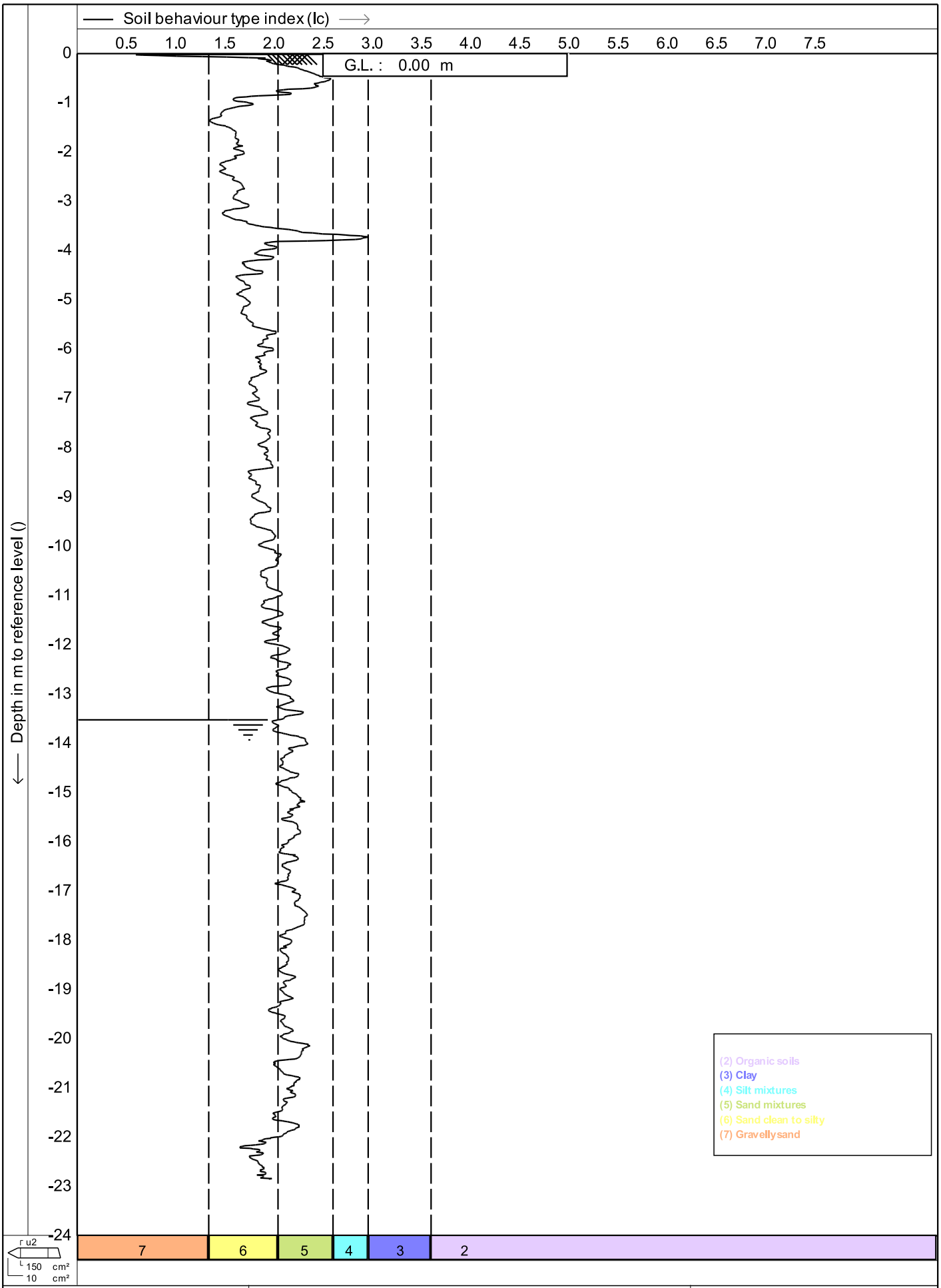
Project : **Site Investigations**

Location: **194 SH24 - Matamata**

Position: **0, 0**

Date	: **16/06/2021**
Cone no.	: **C10CFIIP.C13068**
Project no.	: **CMW055**
CPT no.	: **CPT04**

1.48



PERRY GEOTECH

Test according A.S.T.M Standard D 5778-12

Project : **Site Investigations**

Location: **194 SH24 - Matamata**

Position: **0, 0**

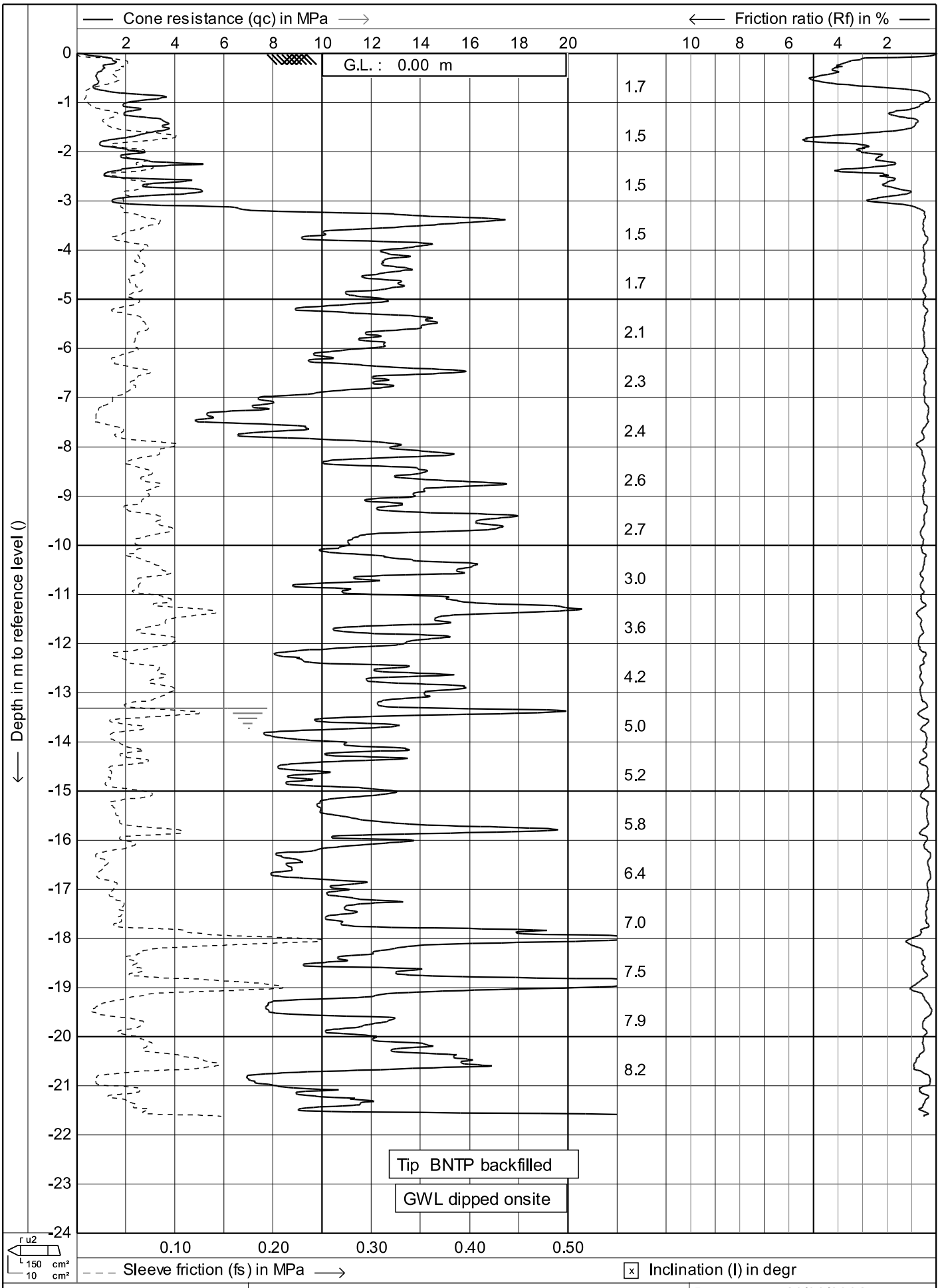
Date : **16/06/2021**

Cone no. : **C10CFIIP.C13068**

Project no. : **CMW055**

CPT no. : **CPT04** **9/14**

1.48



PERRY GEOTECH

Test according A.S.T.M Standard D 5778-12

Project : **Site Investigations**

Location: **194 SH24 - Matamata**

Position: **0, 0**

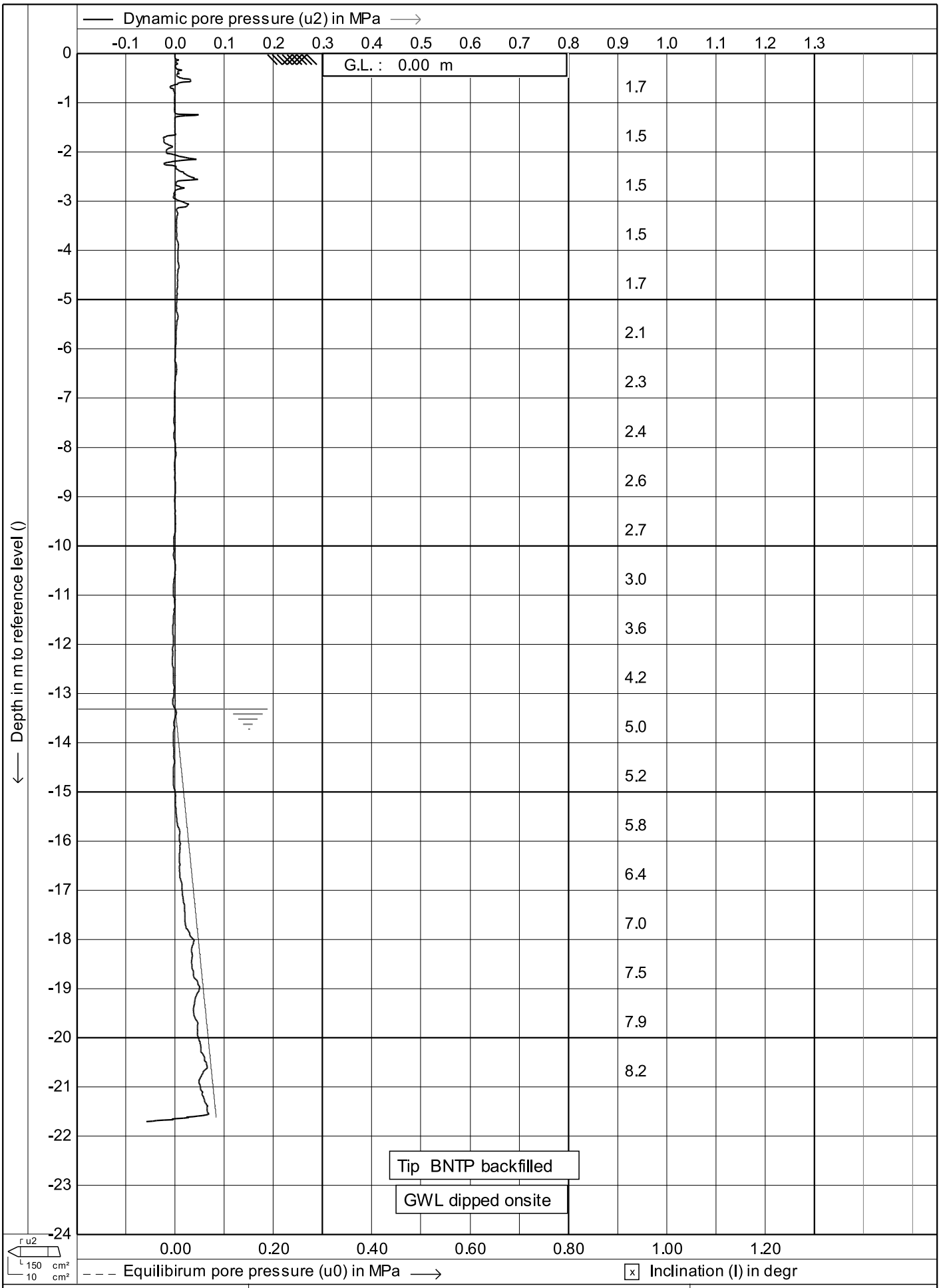
Date : **16/06/2021**

Cone no. : **C10CFIIP.C13068**

Project no. : **CMW055**

CPT no. : **CPT05** 1/14

1.48



PERRY GEOTECH

Test according A.S.T.M Standard D 5778-12

Project : **Site Investigations**

Location: **194 SH24 - Matamata**

Position: **0, 0**

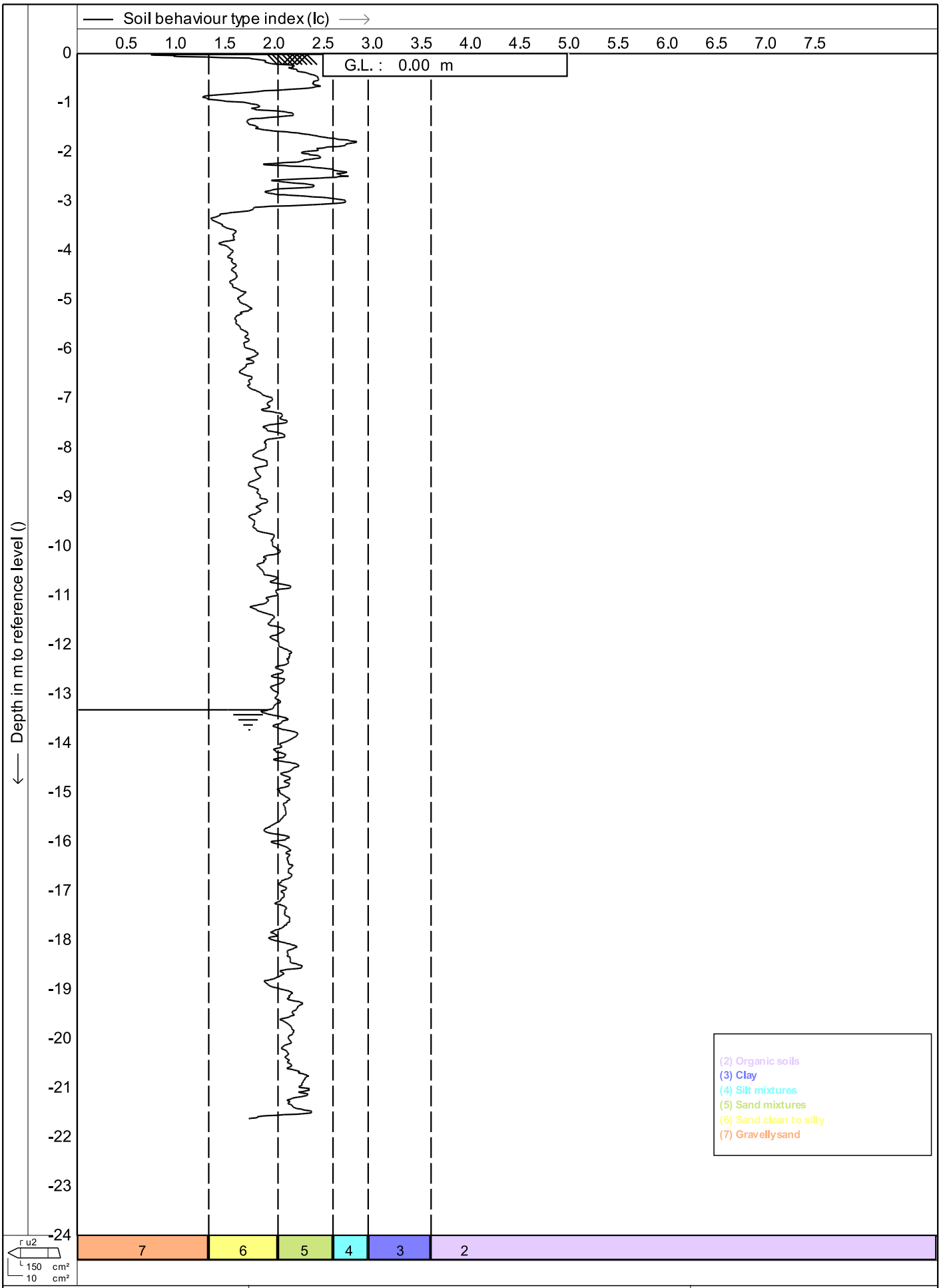
Date : **16/06/2021**

Cone no. : **C10CFIIP.C13068**

Project no. : **CMW055**

CPT no. : **CPT05**

1.48



PERRY GEOTECH

Test according A.S.T.M Standard D 5778-12

Project : **Site Investigations**

Location: **194 SH24 - Matamata**

Position: **0, 0**

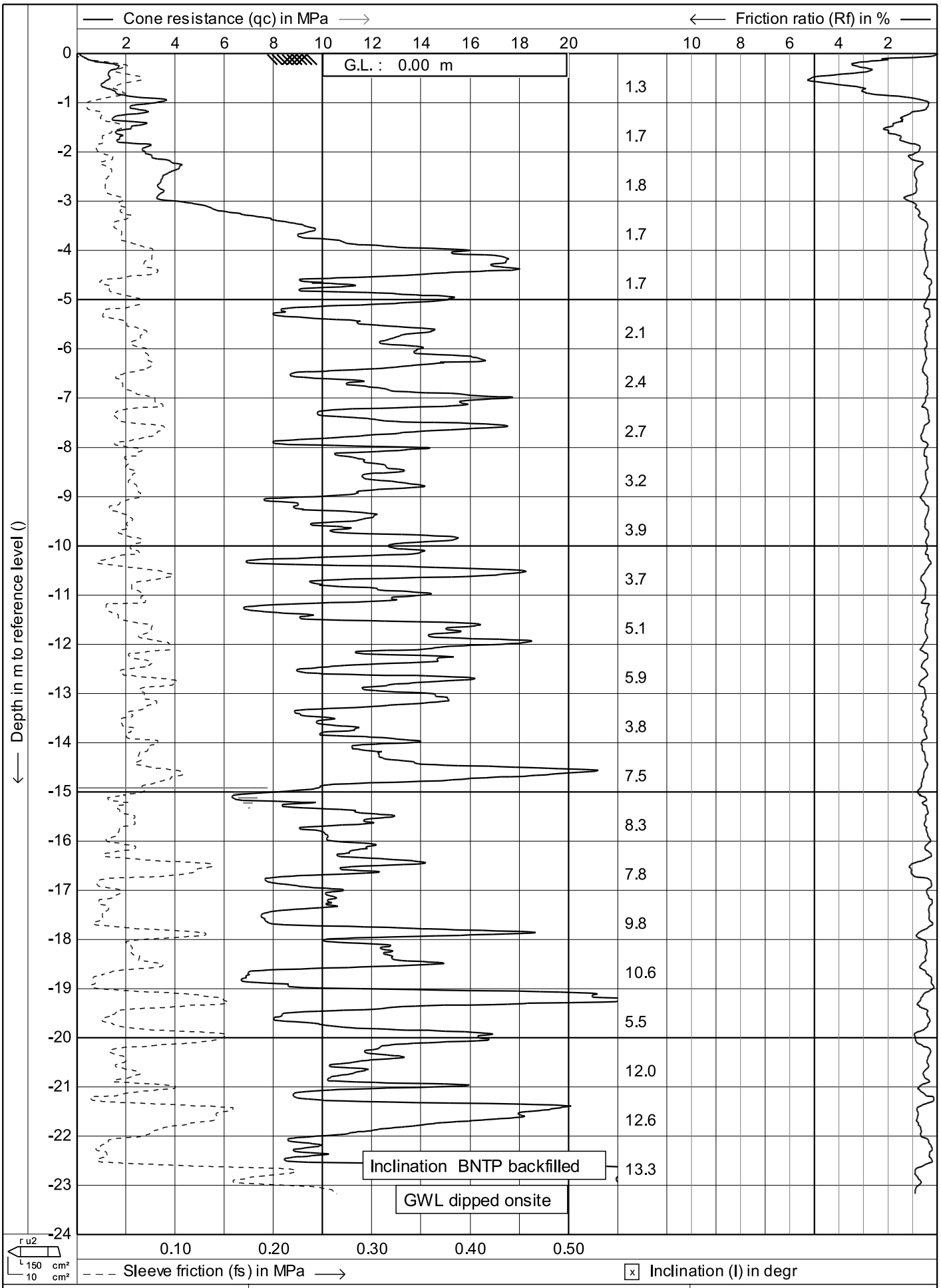
Date : **16/06/2021**

Cone no. : **C10CFIIP.C13068**

Project no. : **CMW055**

CPT no. : **CPT05** **9/14**

1.48



PERRY GEOTECH

Test according A.S.T.M Standard D 5778-12

Project : **Site Investigations**

Location: **194 SH24 - Matamata**

Position: **0, 0**

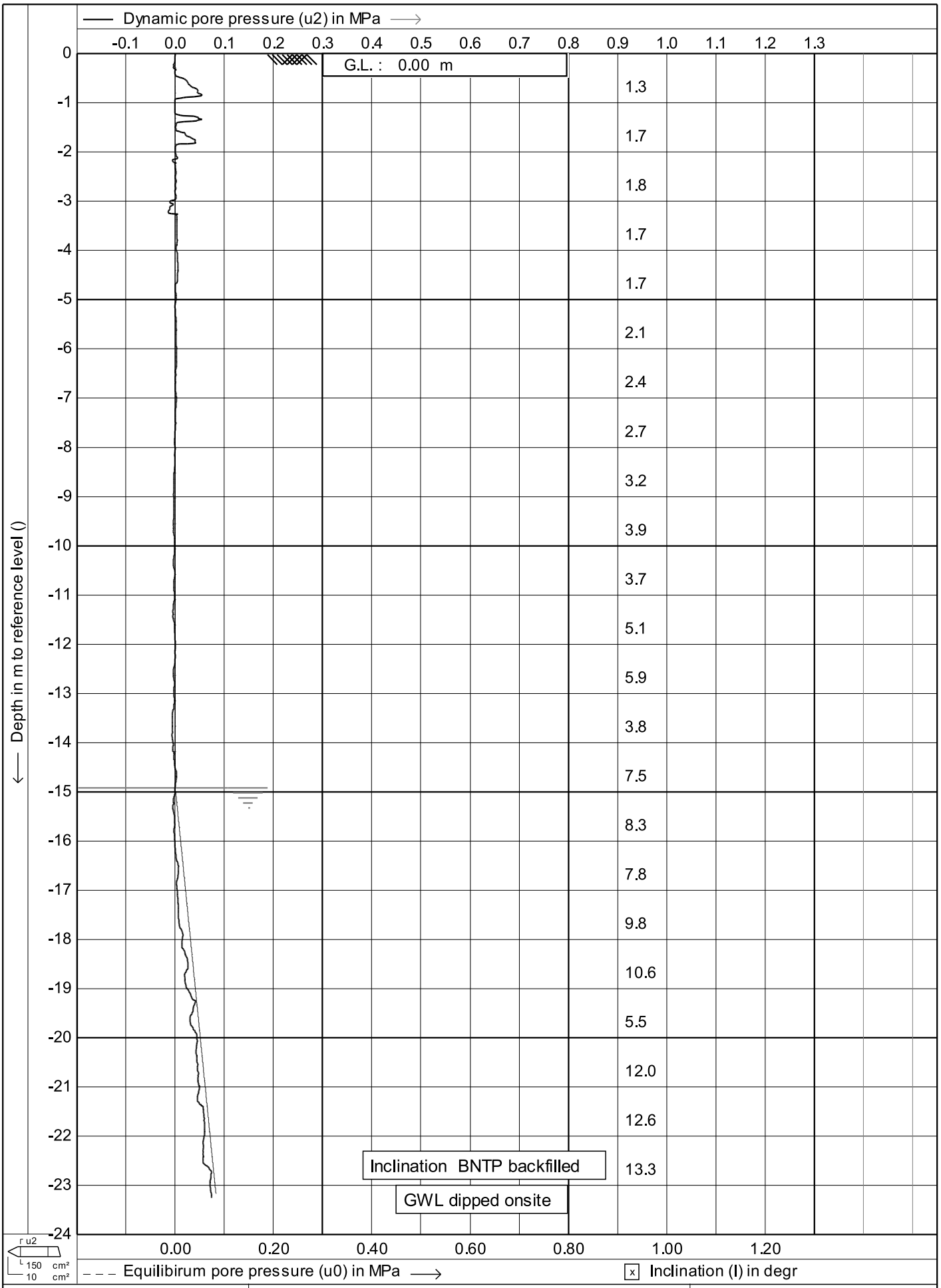
Date : **14/06/2021**

Cone no. : **C10CFIIP.C13068**

Project no. : **CMW055**

CPT no. : **CPT06** 1/14

1.48



PERRY GEOTECH

Test according A.S.T.M Standard D 5778-12

Project : **Site Investigations**

Location: **194 SH24 - Matamata**

Position: **0, 0**

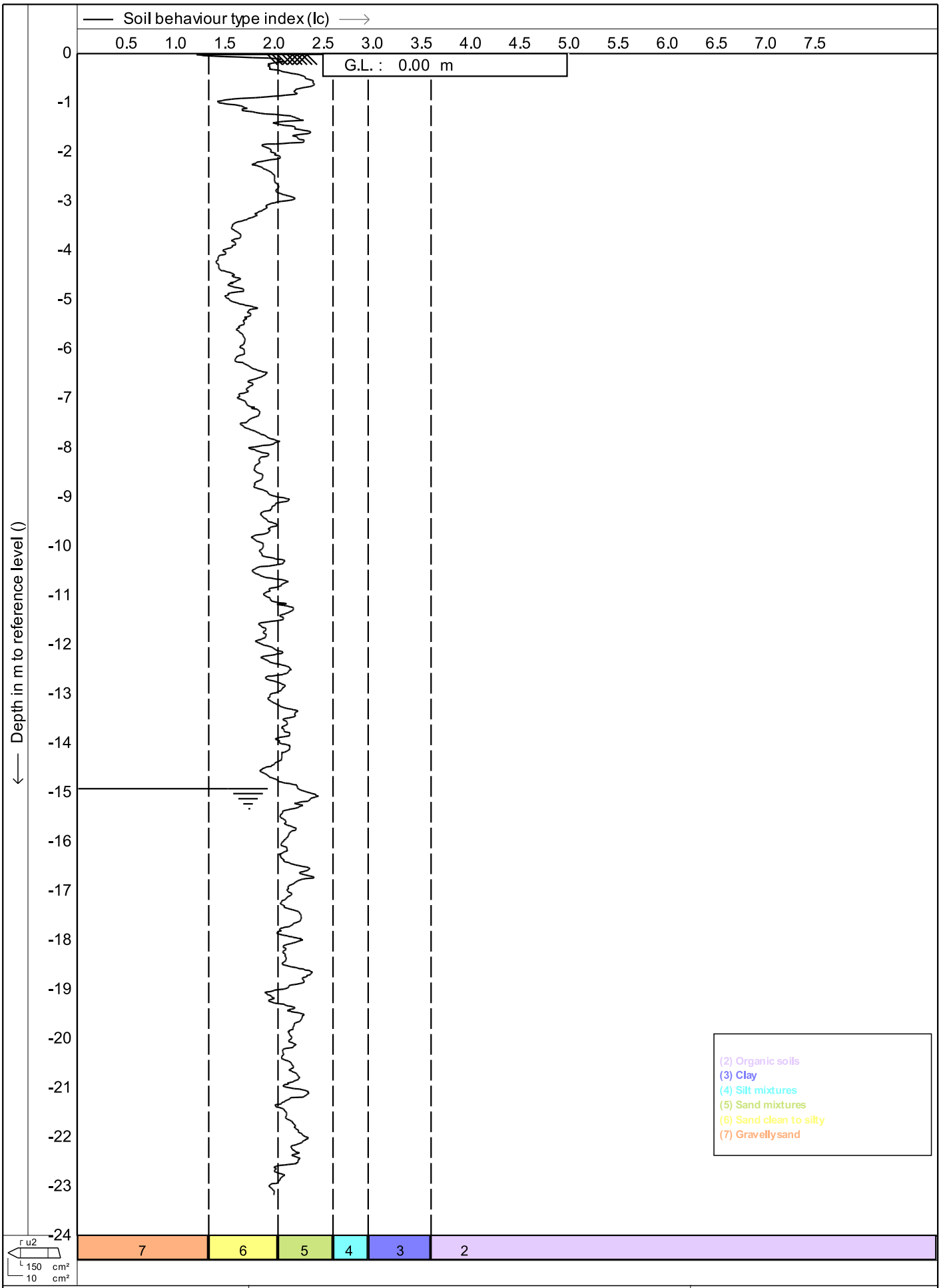
Date : **14/06/2021**

Cone no. : **C10CFIIP.C13068**

Project no. : **CMW055**

CPT no. : **CPT06** **2/14**

1.48



PERRY GEOTECH

Test according A.S.T.M Standard D 5778-12

Project : **Site Investigations**

Location: **194 SH24 - Matamata**

Position: **0, 0**

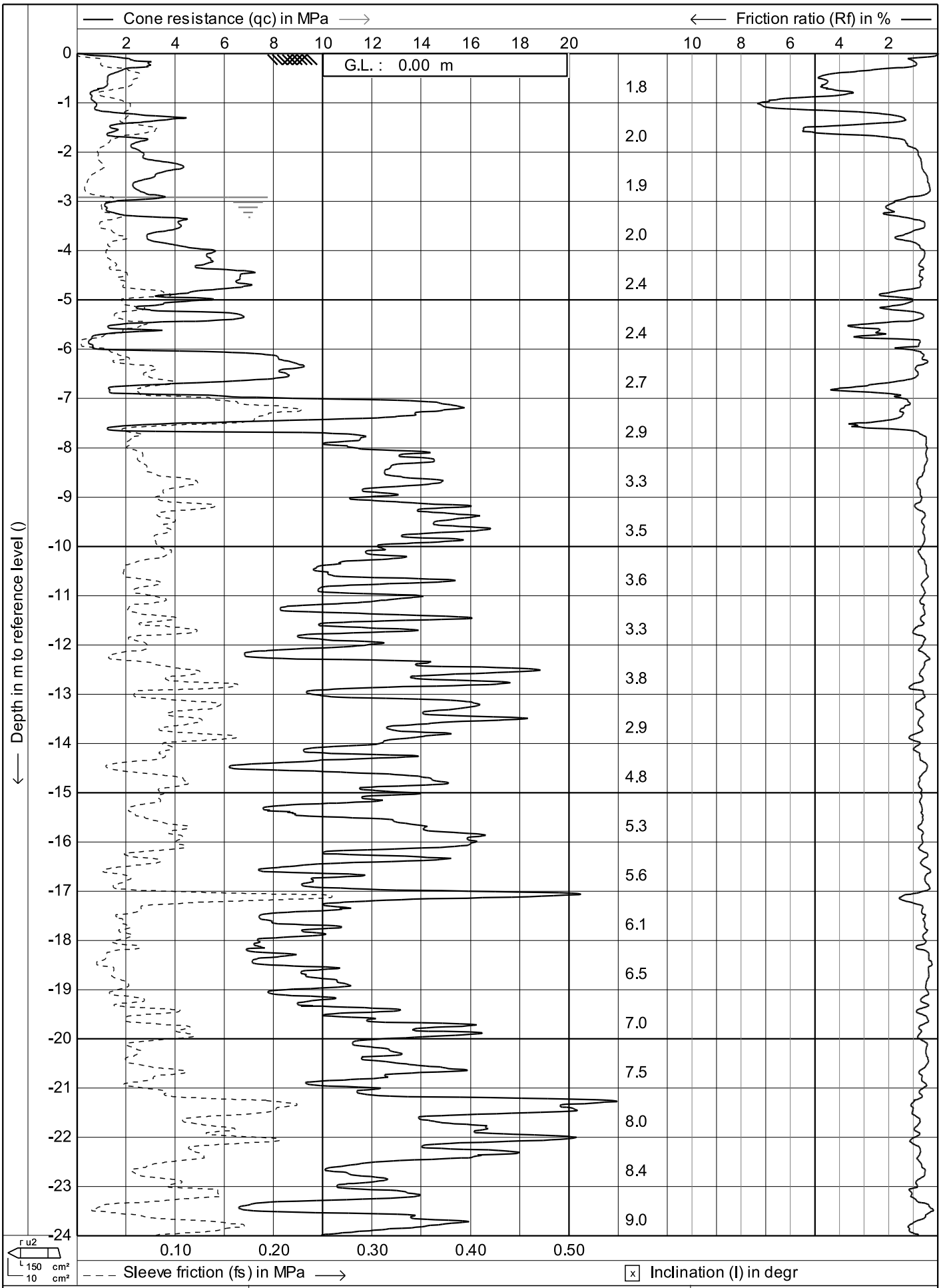
Date : **14/06/2021**

Cone no. : **C10CFIIP.C13068**

Project no. : **CMW055**

CPT no. : **CPT06** **9/14**

1.48



PERRY GEOTECH

Test according A.S.T.M Standard D 5778-12

Project : **Site Investigations**

Location: **194 SH24 - Matamata**

Position: **0, 0**

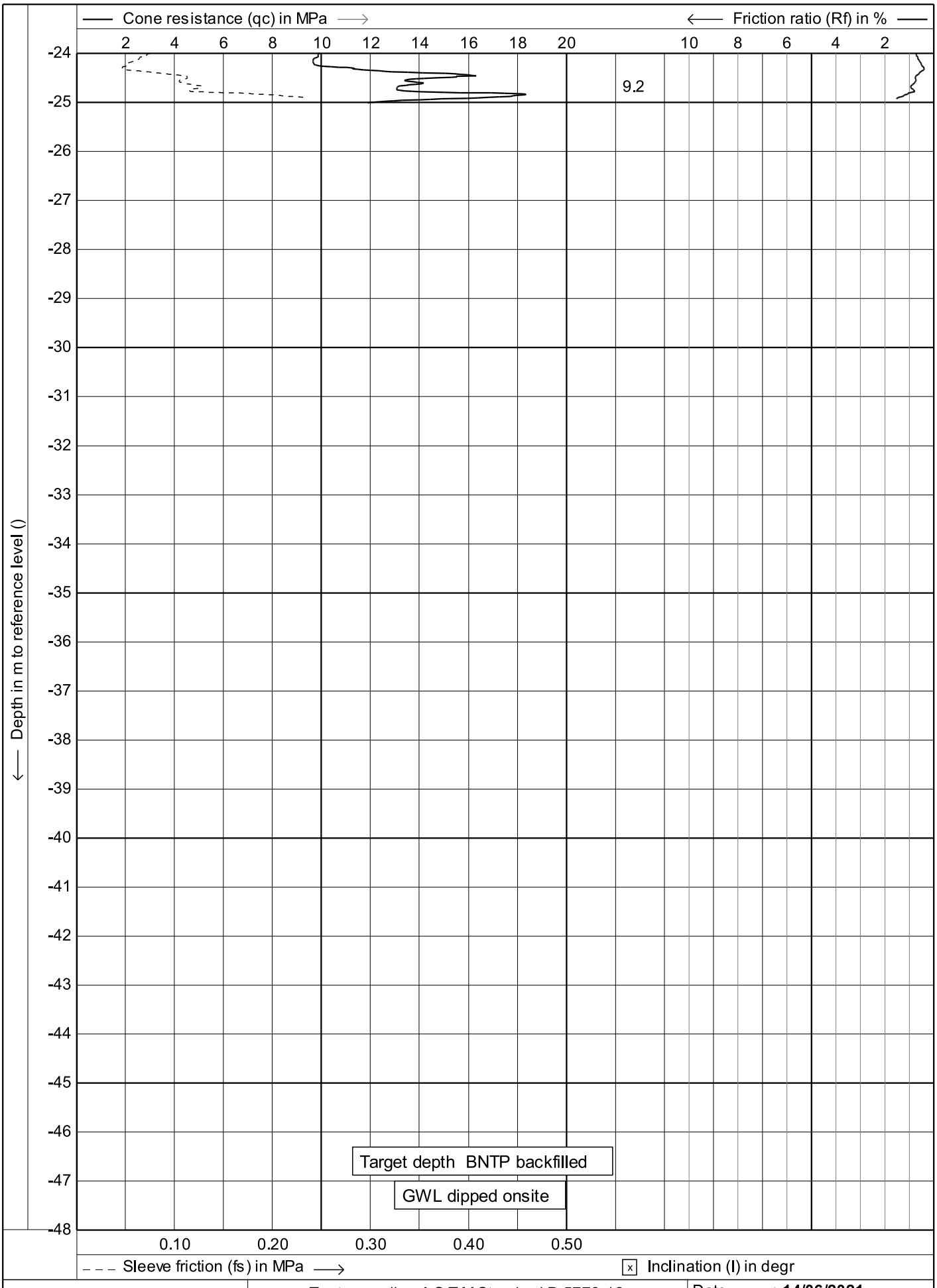
Date : **14/06/2021**

Cone no. : **C10CFIIP.C13068**

Project no. : **CMW055**

CPT no. : **CPT07B** **1/28**

1.48



PERRY GEOTECH

Test according A.S.T.M Standard D 5778-12

Project : **Site Investigations**

Location: **194 SH24 - Matamata**

Position: **0, 0**

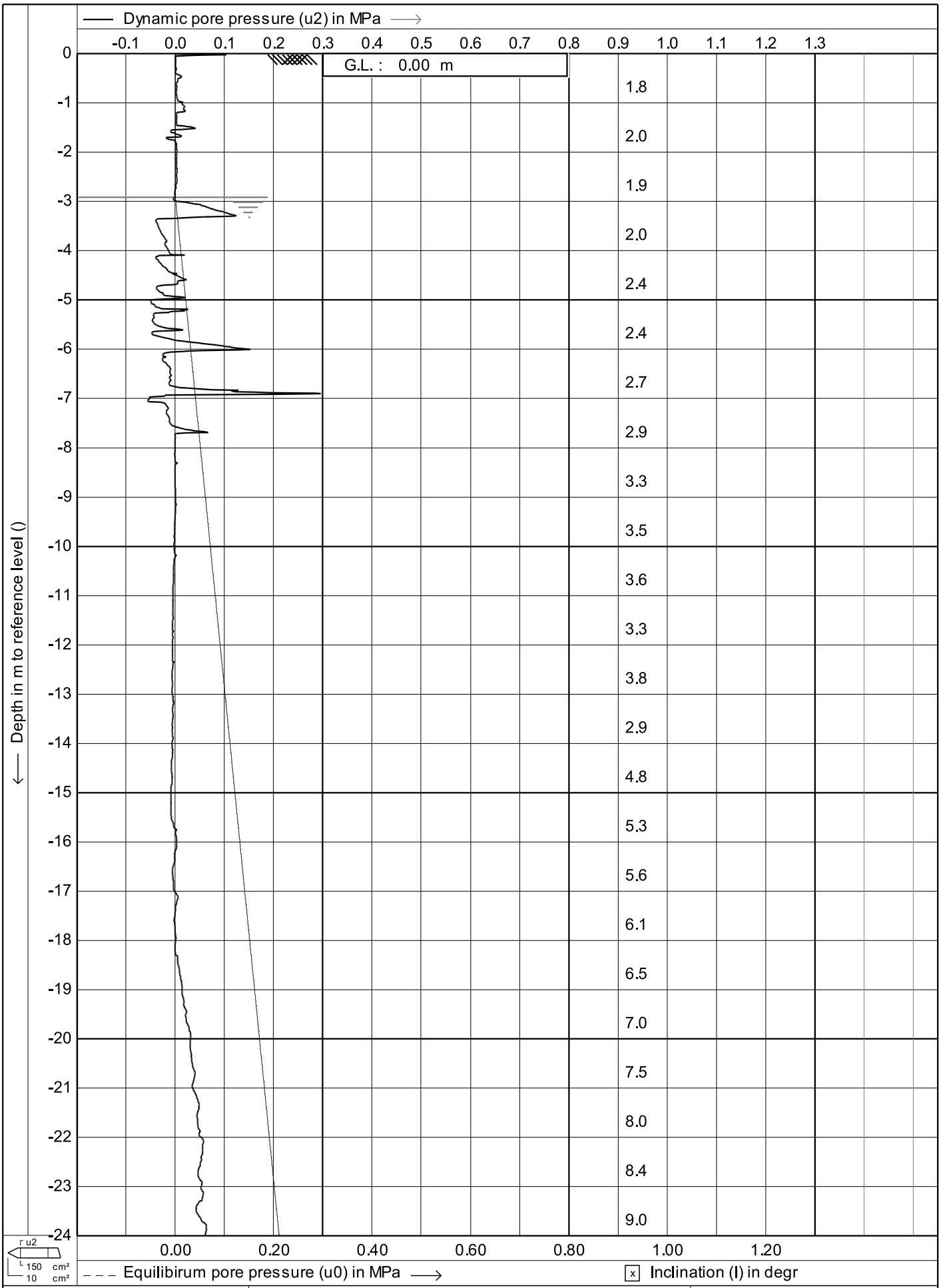
Date : **14/06/2021**

Cone no. : **C10CFIIP.C13068**

Project no. : **CMW055**

CPT no. : **CPT07B** **2/28**

1.48



PERRY GEOTECH

Test according A.S.T.M Standard D 5778-12

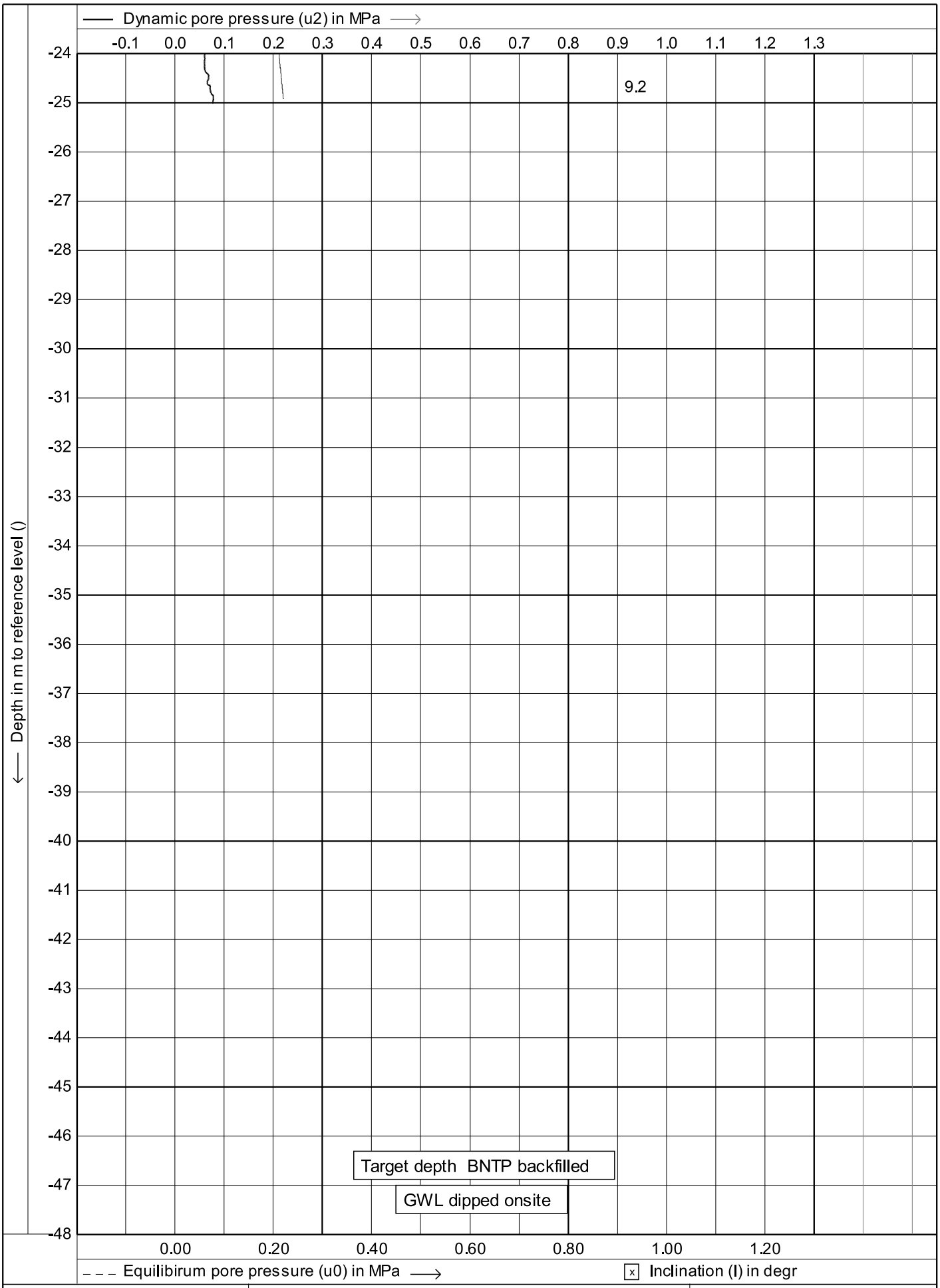
Project : **Site Investigations**

Location: **194 SH24 - Matamata**

Position: **0, 0**

Date	: **14/06/2021**
Cone no.	: **C10CFIIP.C13068**
Project no.	: **CMW055**
CPT no.	: **CPT07B** **3/28**

1,48



PERRY GEOTECH

Test according A.S.T.M Standard D 5778-12

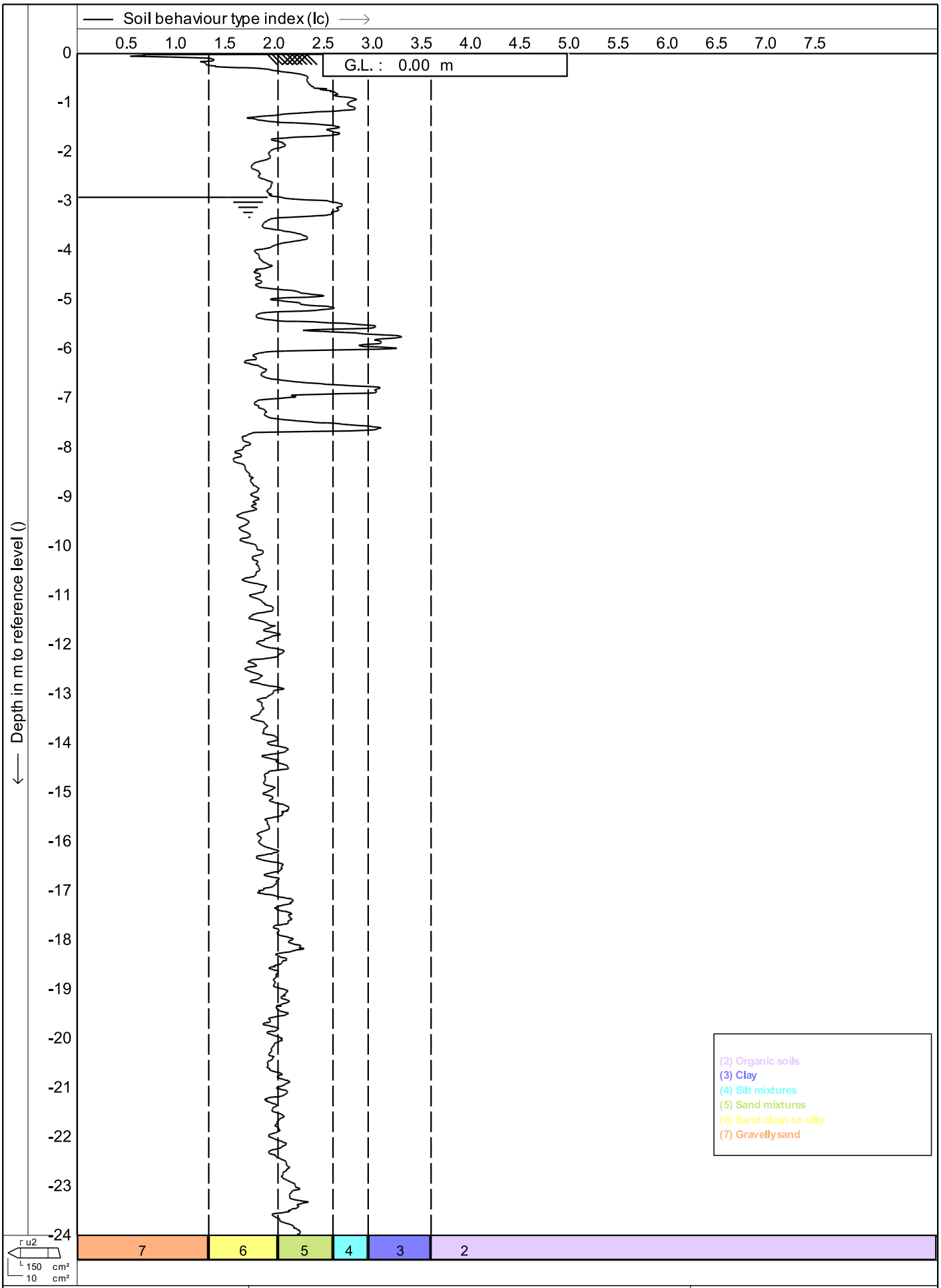
Project : **Site Investigations**

Location: **194 SH24 - Matamata**

Position: **0, 0**

Date	: **14/06/2021**
Cone no.	: **C10CFIIP.C13068**
Project no.	: **CMW055**
CPT no.	: **CPT07B** **4/28**

1.48



PERRY GEOTECH

Test according A.S.T.M Standard D 5778-12

Project : **Site Investigations**

Location: **194 SH24 - Matamata**

Position: **0, 0**

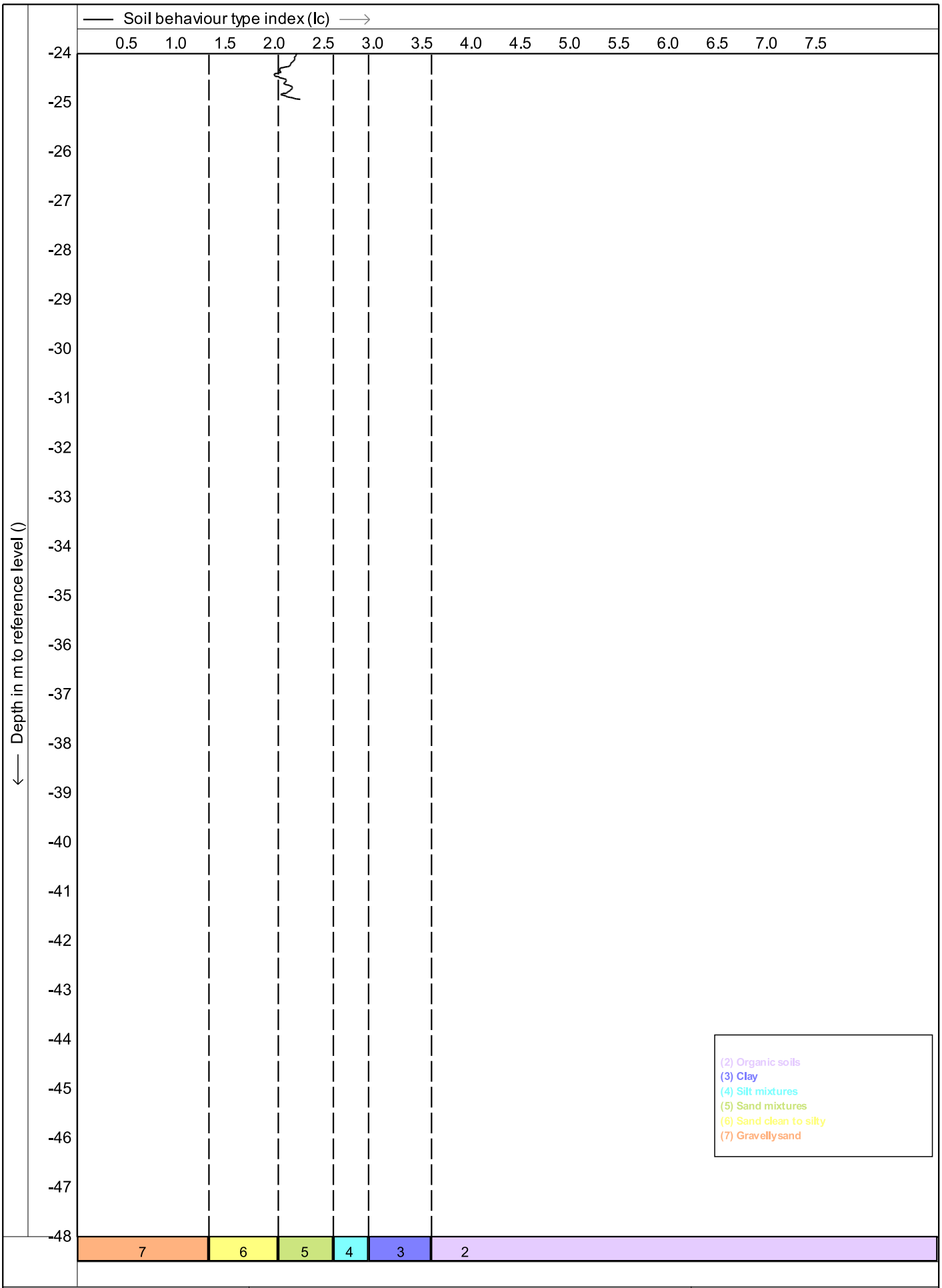
Date : **14/06/2021**

Cone no. : **C10CFIIP.C13068**

Project no. : **CMW055**

CPT no. : **CPT07B** **17/28**

1.48



PERRY GEOTECH

Test according A.S.T.M Standard D 5778-12

Project : **Site Investigations**

Location: **194 SH24 - Matamata**

Position: **0, 0**

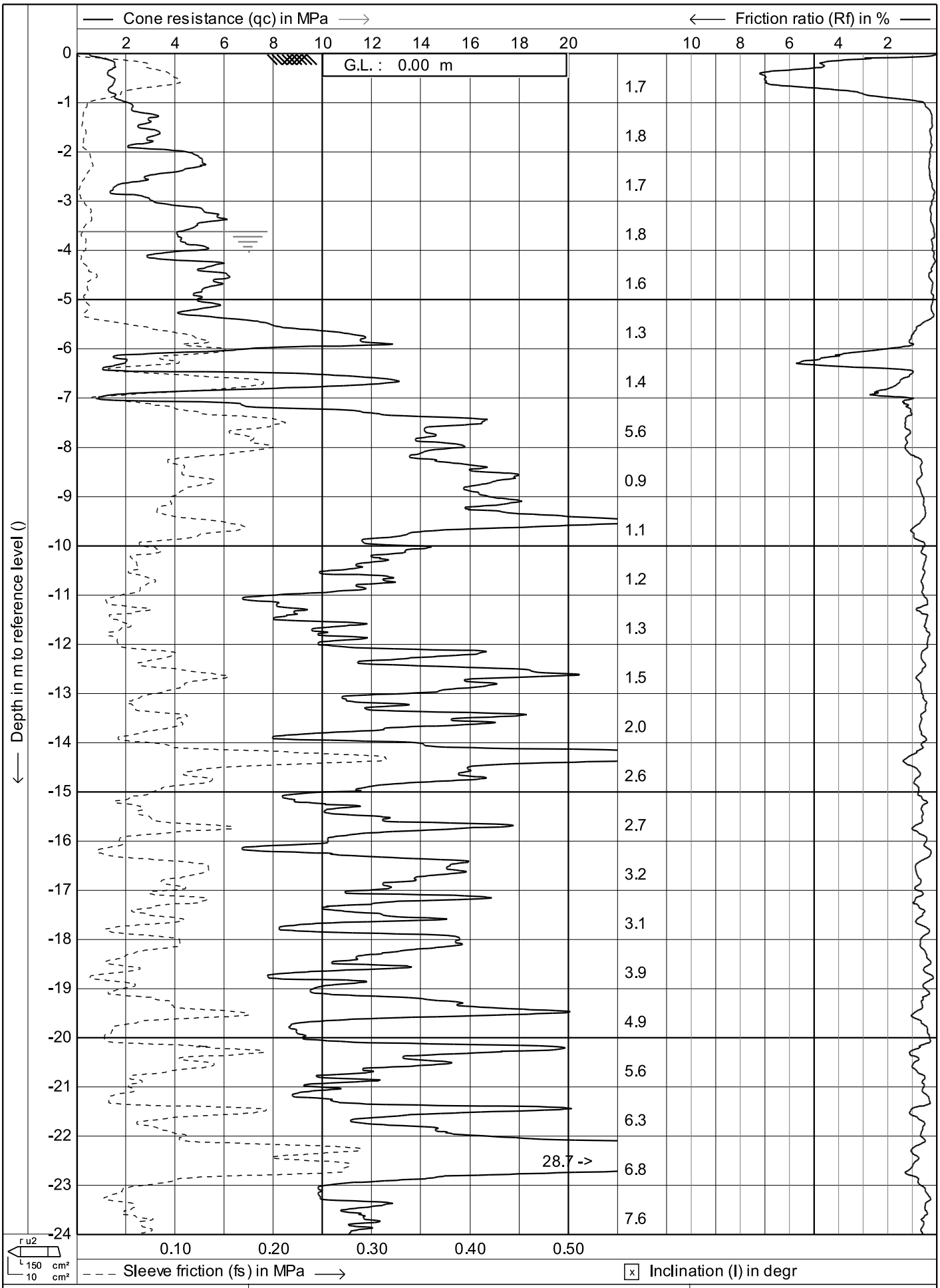
Date : **14/06/2021**

Cone no. : **C10CFIIP.C13068**

Project no. : **CMW055**

CPT no. : **CPT07B** **18/28**

1.48



PERRY GEOTECH

Test according A.S.T.M Standard D 5778-12

Project : **Site Investigations**

Location: **194 SH24 - Matamata**

Position: **0, 0**

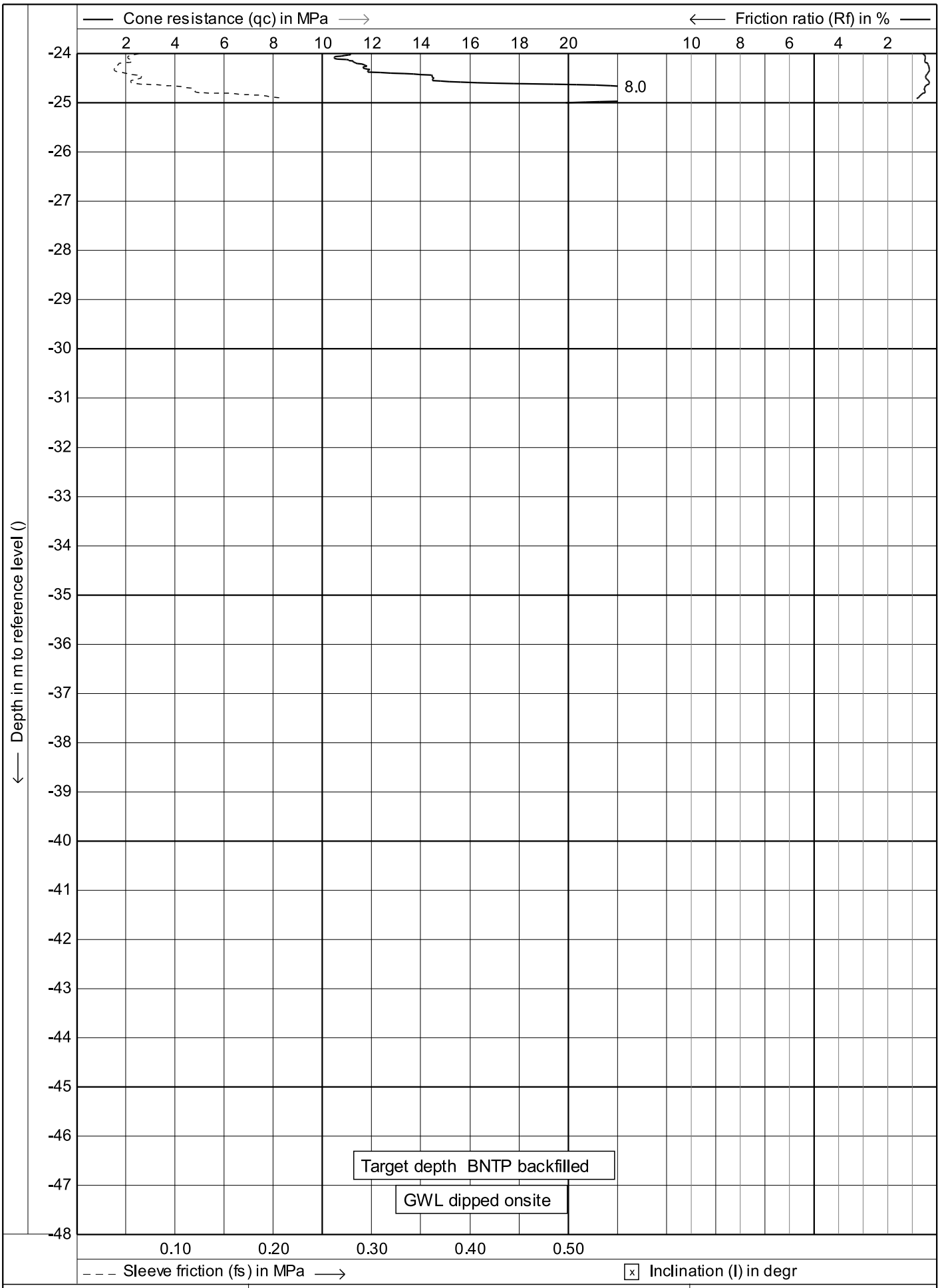
Date : **14/06/2021**

Cone no. : **C10CFIIP.C13068**

Project no. : **CMW055**

CPT no. : **CPT08** 1/28

1.48



PERRY GEOTECH

Test according A.S.T.M Standard D 5778-12

Project : **Site Investigations**

Location: **194 SH24 - Matamata**

Position: **0, 0**

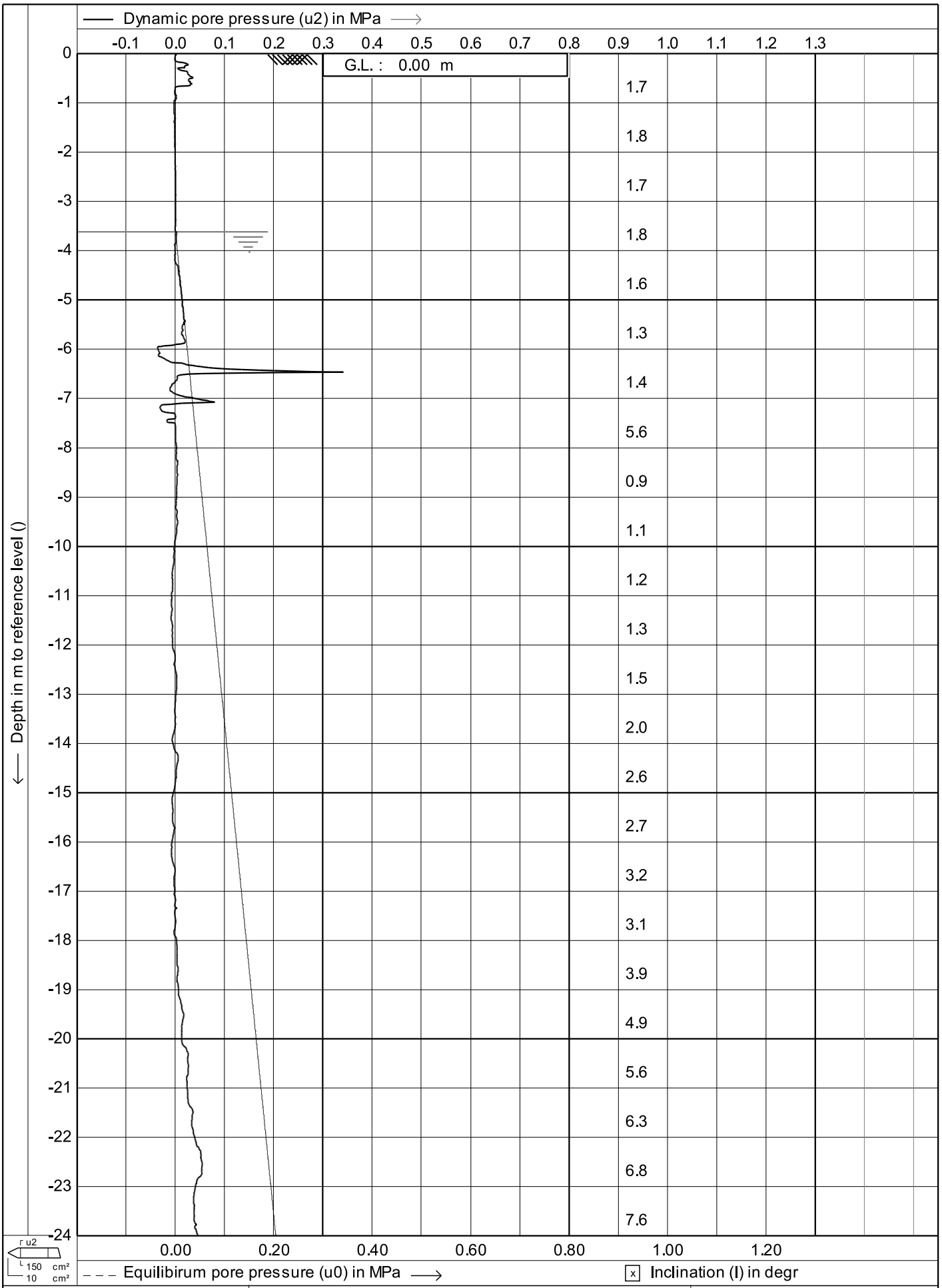
Date : **14/06/2021**

Cone no. : **C10CFIIP.C13068**

Project no. : **CMW055**

CPT no. : **CPT08** **2/28**

1.48



PERRY GEOTECH

Test according A.S.T.M Standard D 5778-12

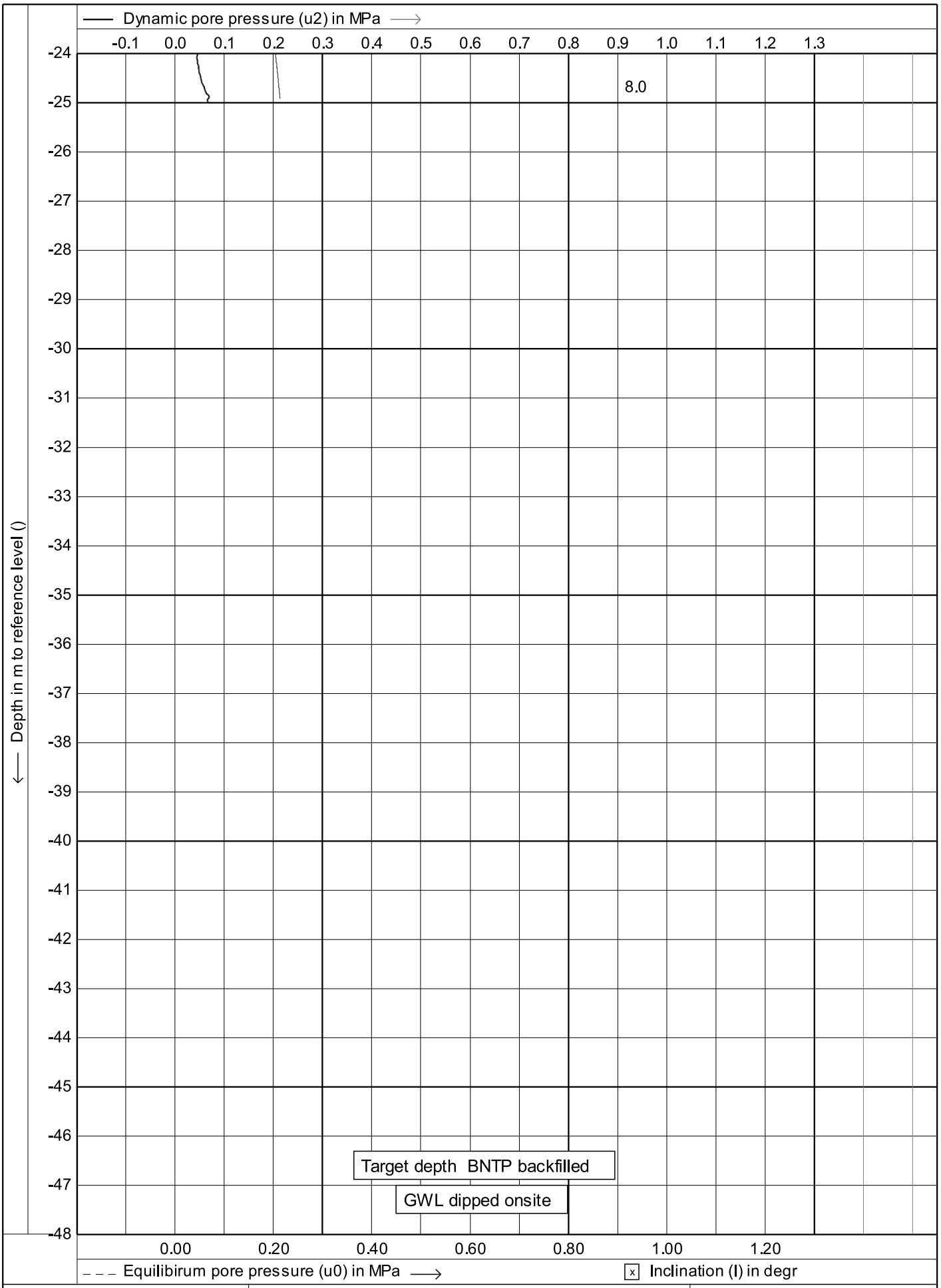
Project : **Site Investigations**

Location: **194 SH24 - Matamata**

Position: **0, 0**

Date	: **14/06/2021**
Cone no.	: **C10CFIIP.C13068**
Project no.	: **CMW055**
CPT no.	: **CPT08**

1.48



PERRY GEOTECH

Test according A.S.T.M Standard D 5778-12

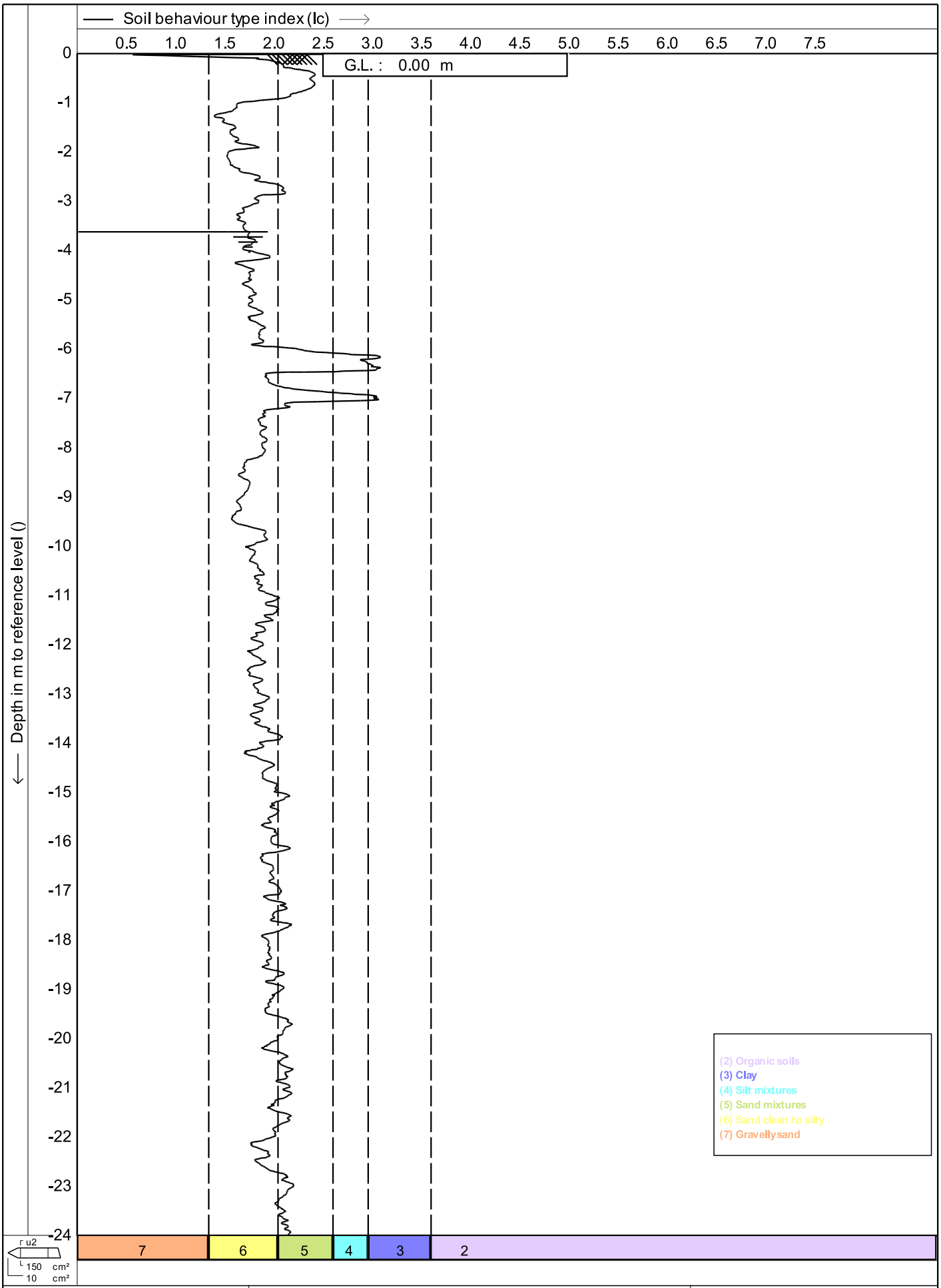
Project : **Site Investigations**

Location: **194 SH24 - Matamata**

Position: **0, 0**

Date	: **14/06/2021**
Cone no.	: **C10CFIIP.C13068**
Project no.	: **CMW055**
CPT no.	: **CPT08**

1.48



PERRY GEOTECH

Test according A.S.T.M Standard D 5778-12

Project : **Site Investigations**

Location: **194 SH24 - Matamata**

Position: **0, 0**

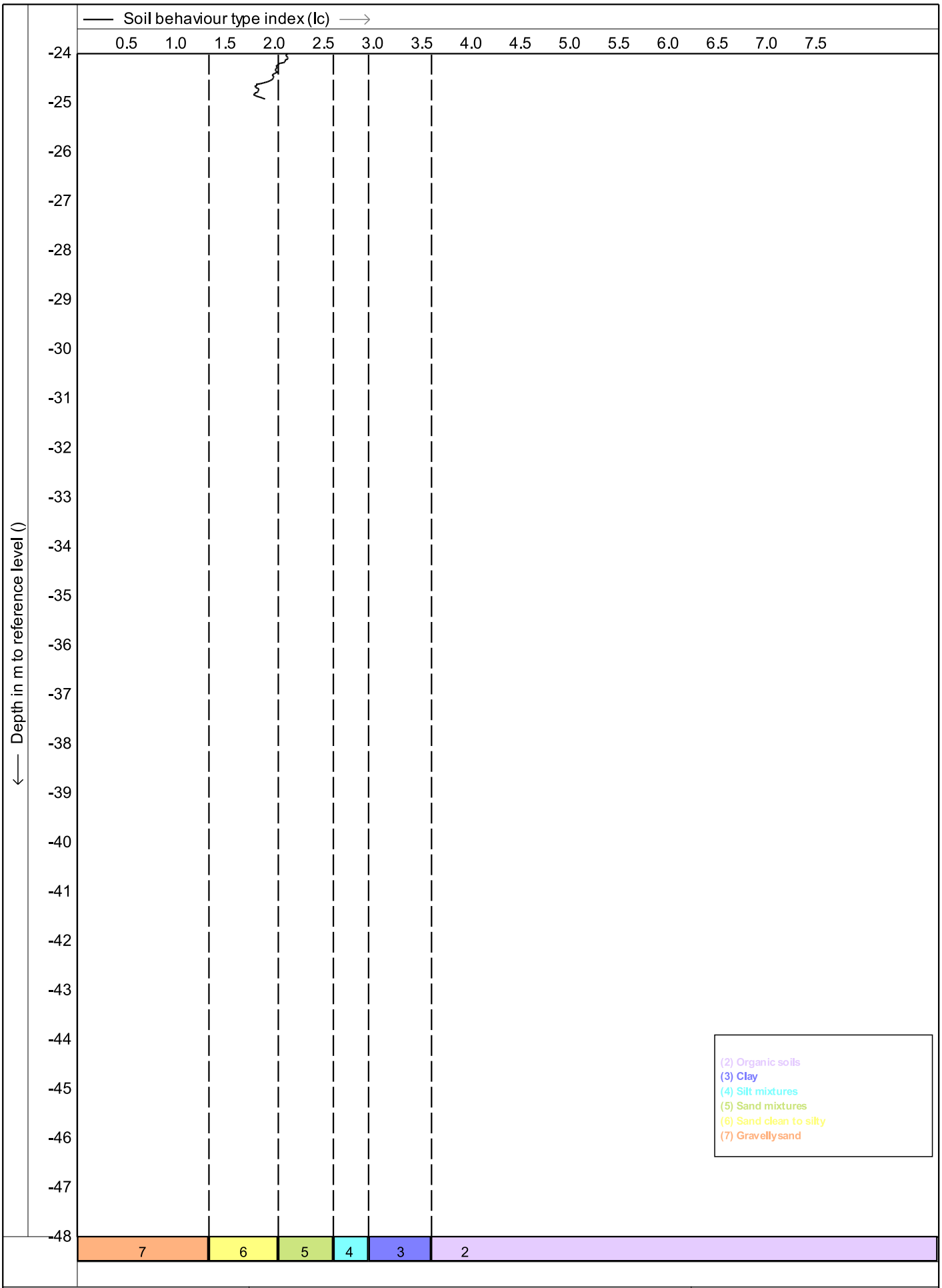
Date : **14/06/2021**

Cone no. : **C10CFIIP.C13068**

Project no. : **CMW055**

CPT no. : **CPT08** **17/28**

1,48



PERRY GEOTECH

Test according A.S.T.M Standard D 5778-12

Project : **Site Investigations**

Location: **194 SH24 - Matamata**

Position: **0, 0**

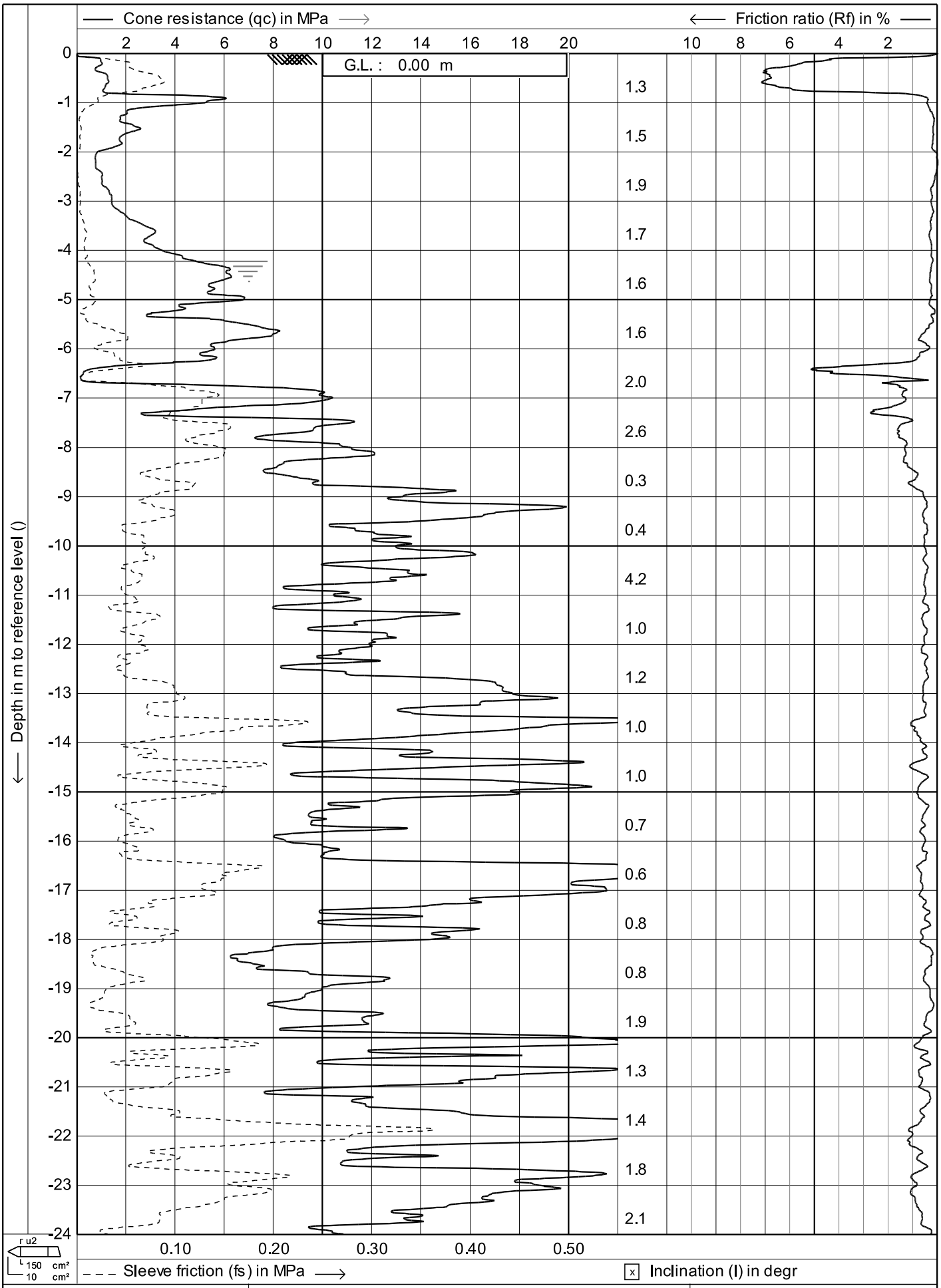
Date : **14/06/2021**

Cone no. : **C10CFIIP.C13068**

Project no. : **CMW055**

CPT no. : **CPT08** **18/28**

1.48



PERRY GEOTECH

Test according A.S.T.M Standard D 5778-12

Project : **Site Investigations**

Location: **194 SH24 - Matamata**

Position: **0, 0**

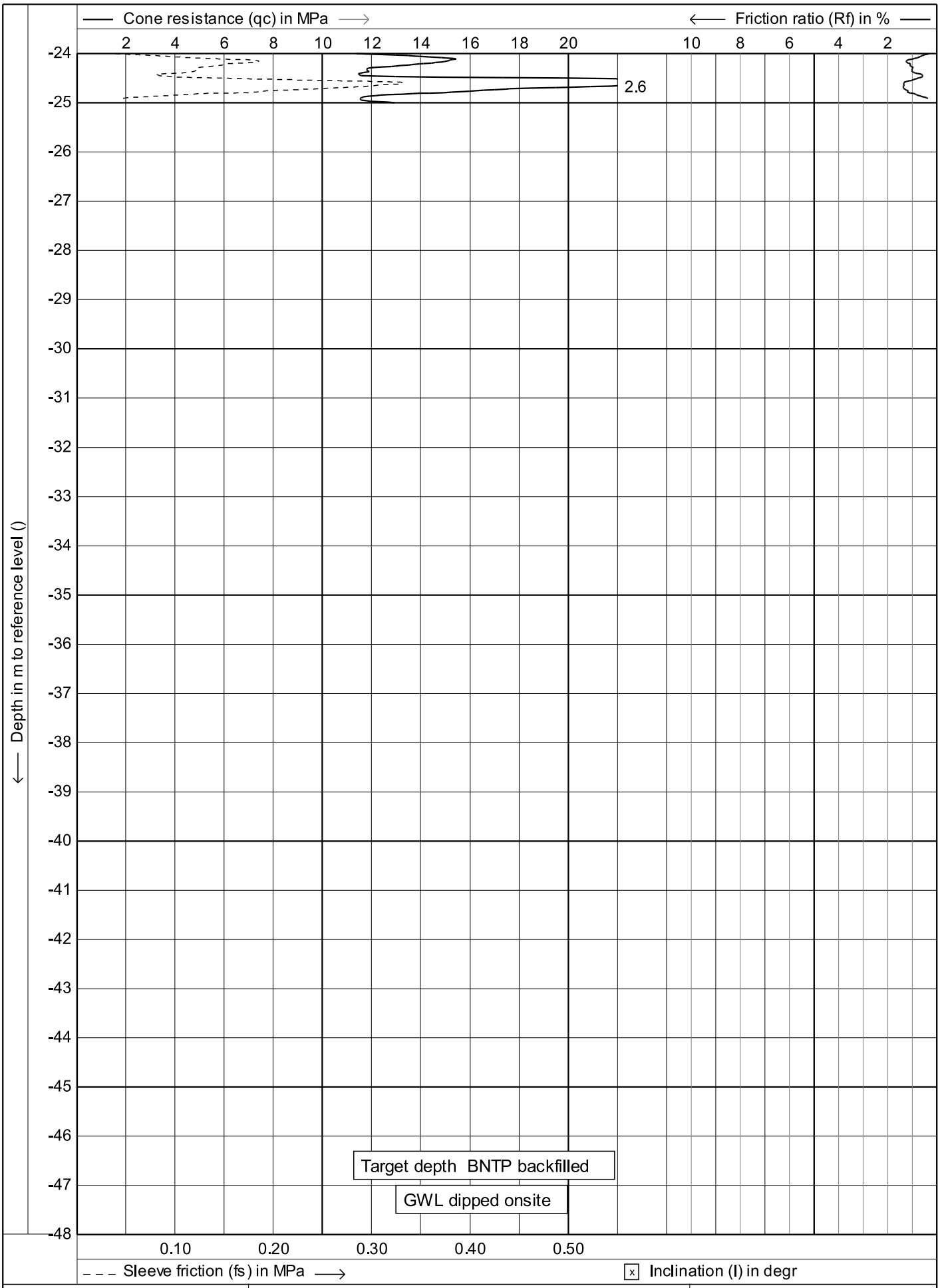
Date : **14/06/2021**

Cone no. : **C10CFIIP.C13068**

Project no. : **CMW055**

CPT no. : **CPT09** 1/28

1.48



PERRY GEOTECH

Test according A.S.T.M Standard D 5778-12

Project : **Site Investigations**

Location: **194 SH24 - Matamata**

Position: **0, 0**

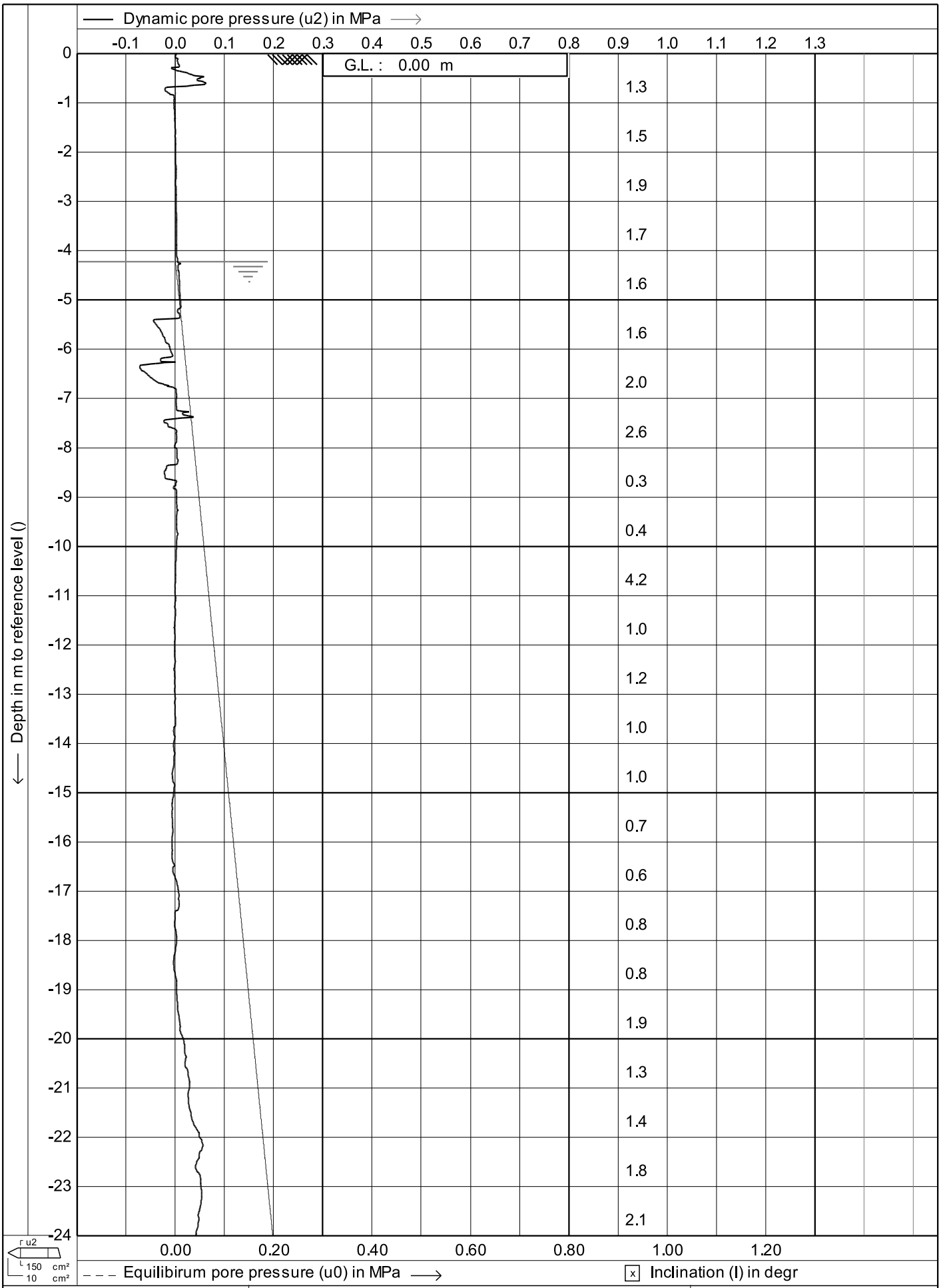
Date : **14/06/2021**

Cone no. : **C10CFIIP.C13068**

Project no. : **CMW055**

CPT no. : **CPT09** **2/28**

1,48



PERRY GEOTECH

Test according A.S.T.M Standard D 5778-12

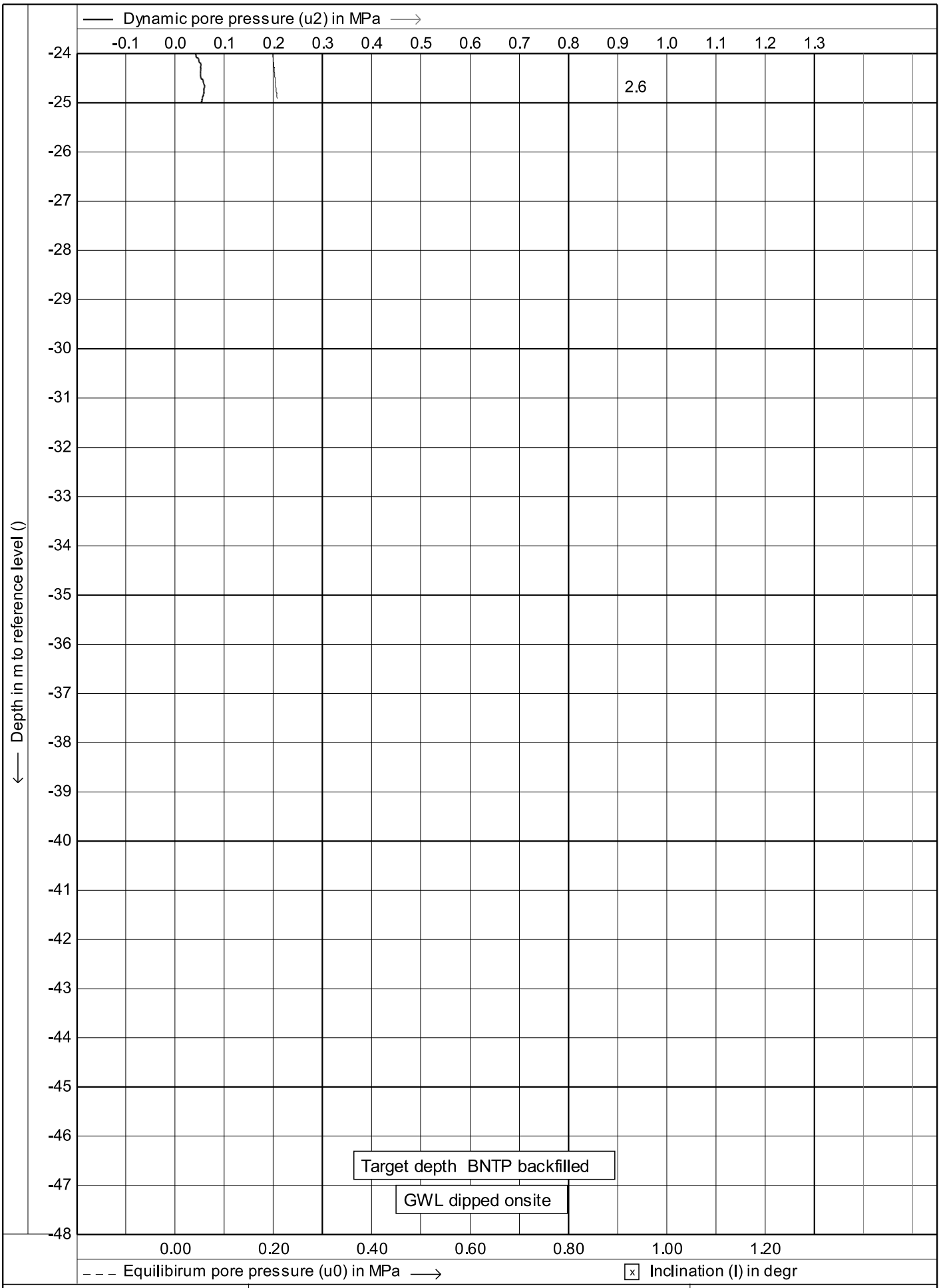
Project : **Site Investigations**

Location: **194 SH24 - Matamata**

Position: **0, 0**

Date	: **14/06/2021**
Cone no.	: **C10CFIIP.C13068**
Project no.	: **CMW055**
CPT no.	: **CPT09**

1.48



PERRY GEOTECH

Test according A.S.T.M Standard D 5778-12

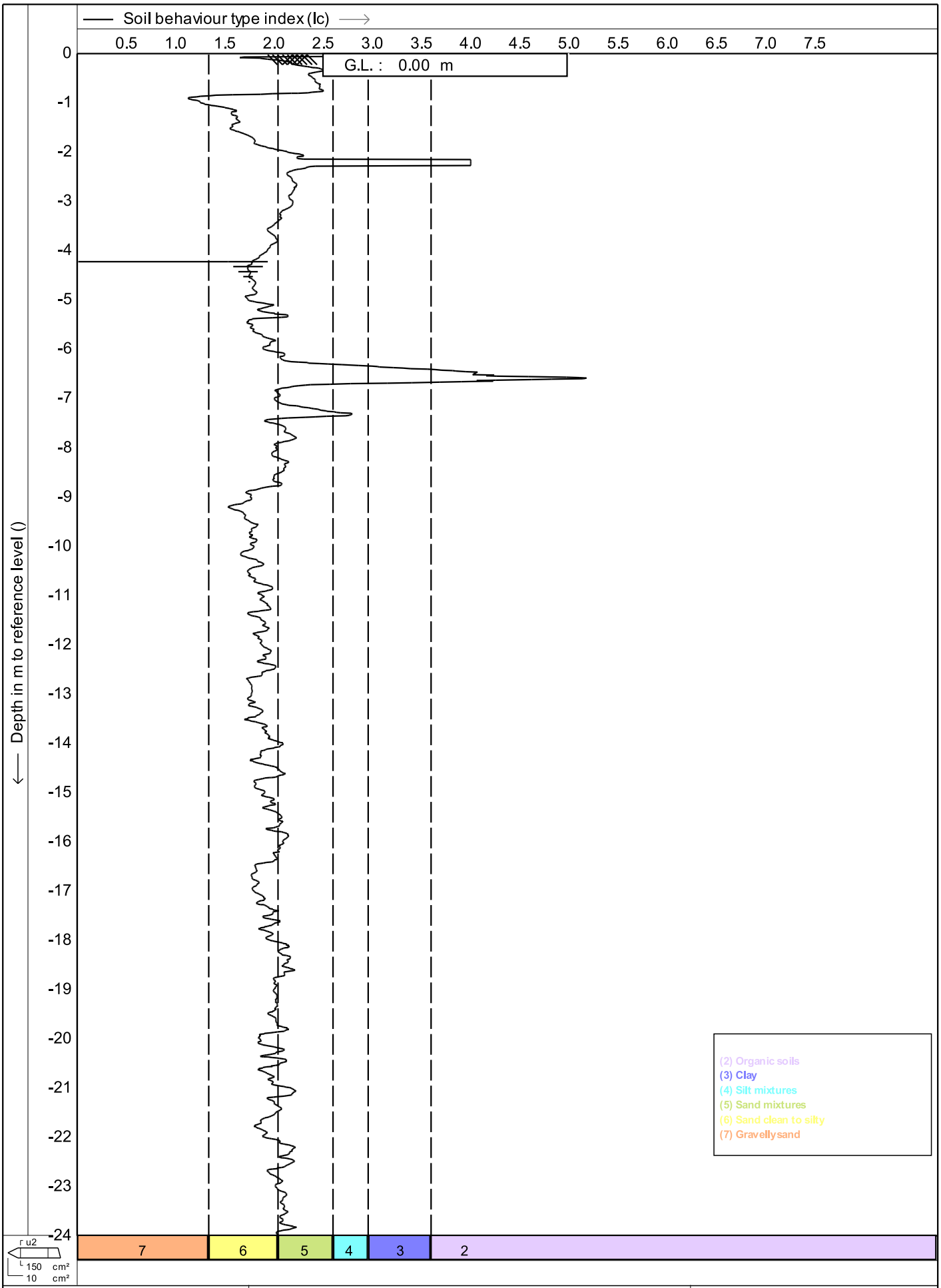
Project : **Site Investigations**

Location: **194 SH24 - Matamata**

Position: **0, 0**

Date	: **14/06/2021**
Cone no.	: **C10CFIIP.C13068**
Project no.	: **CMW055**
CPT no.	: **CPT09**

1.48



PERRY GEOTECH

Test according A.S.T.M Standard D 5778-12

Project : **Site Investigations**

Location: **194 SH24 - Matamata**

Position: **0, 0**

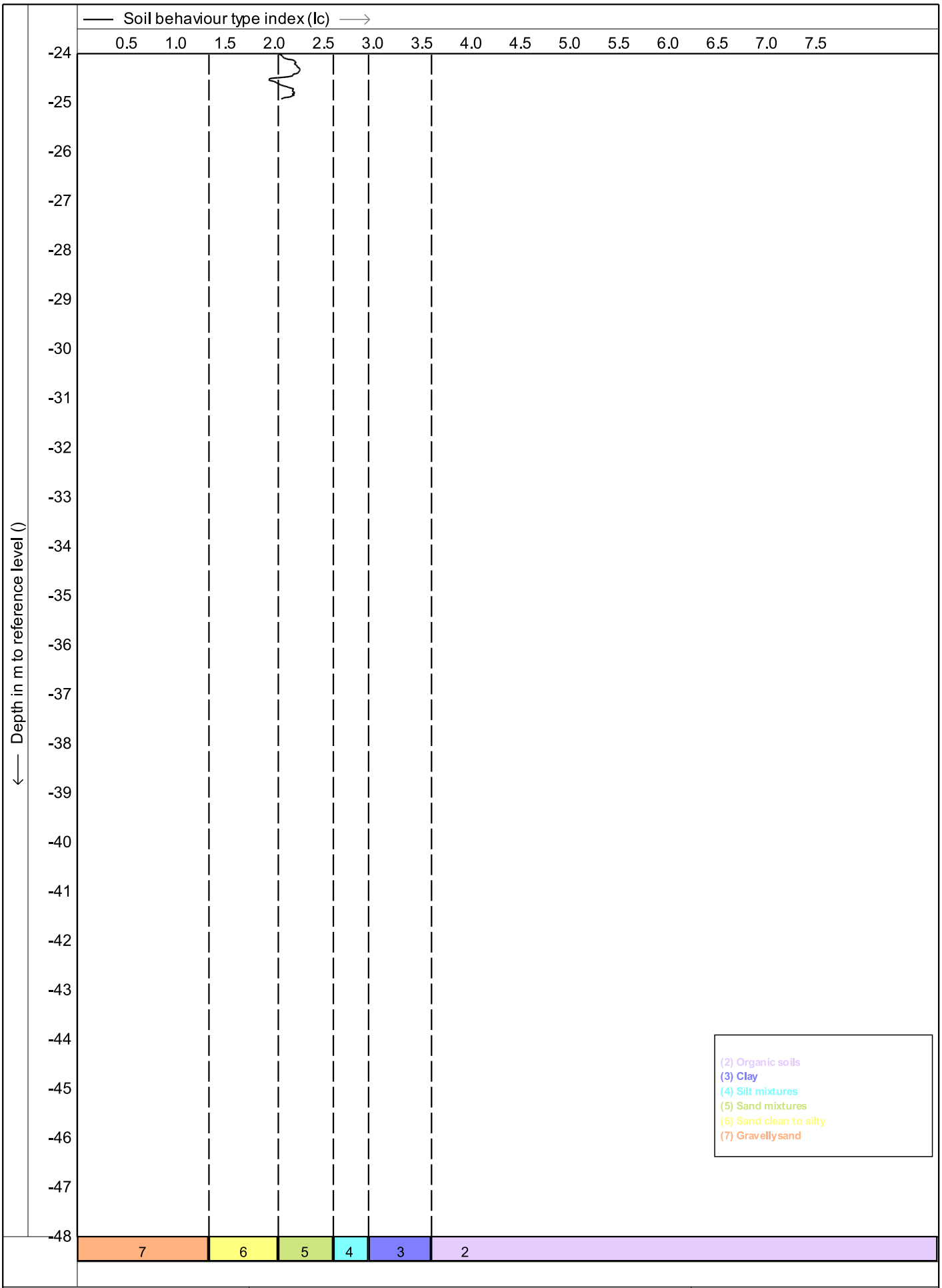
Date : **14/06/2021**

Cone no. : **C10CFIIP.C13068**

Project no. : **CMW055**

CPT no. : **CPT09** **17/28**

1.48



PERRY GEOTECH

Test according A.S.T.M Standard D 5778-12

Project : **Site Investigations**

Location: **194 SH24 - Matamata**

Position: **0, 0**

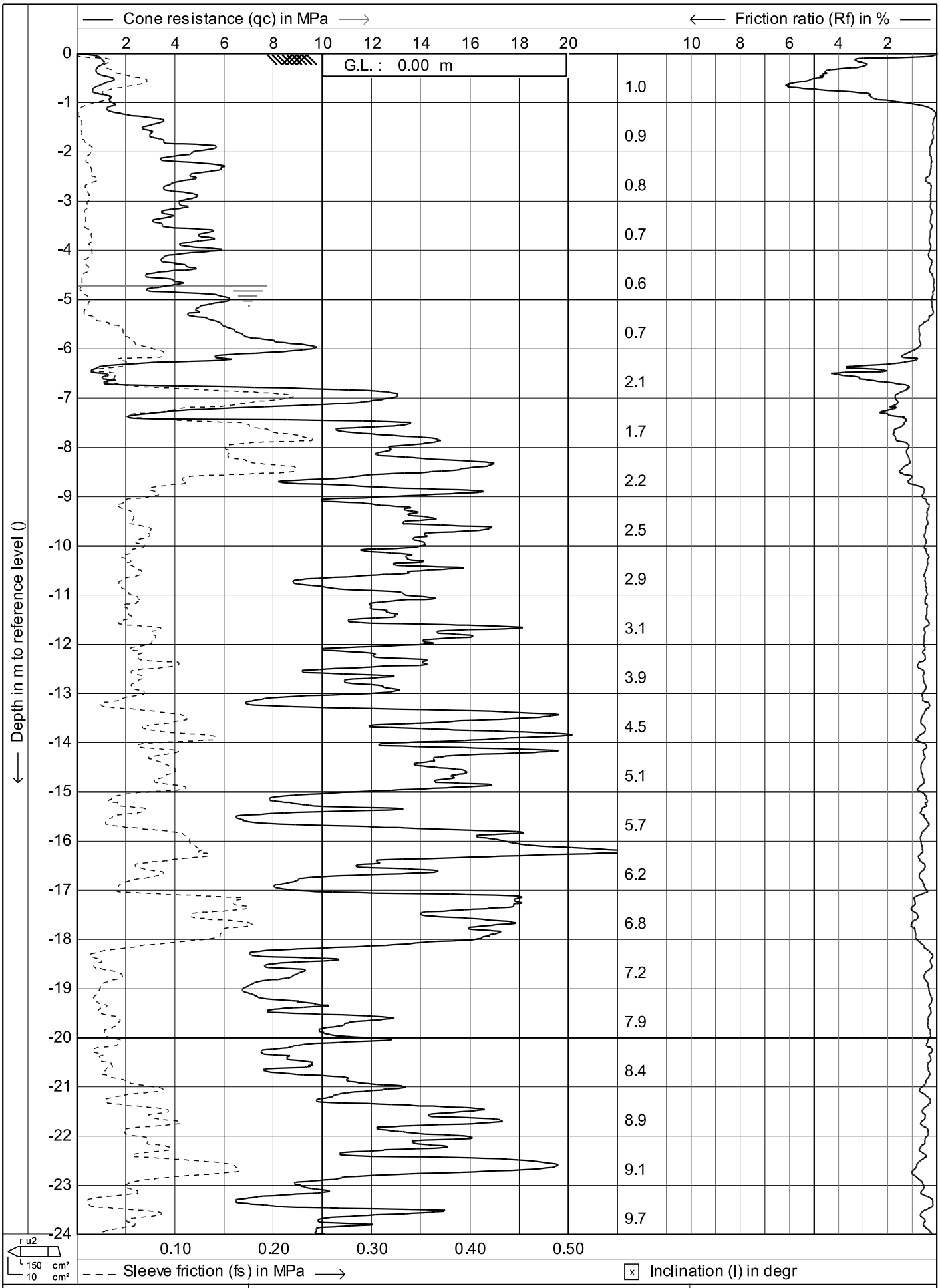
Date : **14/06/2021**

Cone no. : **C10CFIIP.C13068**

Project no. : **CMW055**

CPT no. : **CPT09**

1.48



PERRY GEOTECH

Test according A.S.T.M Standard D 5778-12

Project : **Site Investigations**

Location: **194 SH24 - Matamata**

Position: **0, 0**

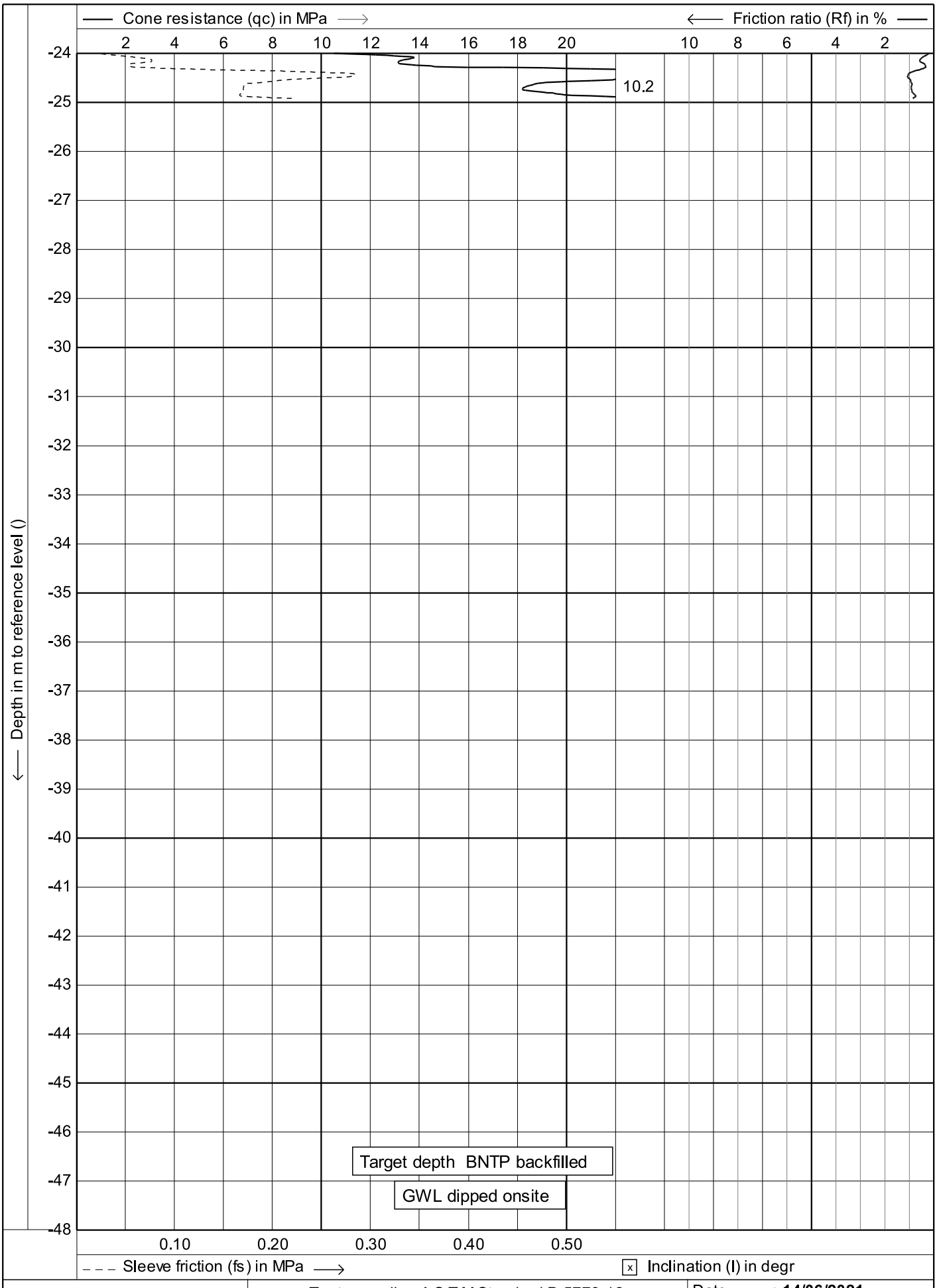
Date : **14/06/2021**

Cone no. : **C10CFIIP.C13068**

Project no. : **CMW055**

CPT no. : **CPT10** **1/28**

1.48



PERRY GEOTECH

Test according A.S.T.M Standard D 5778-12

Project : **Site Investigations**

Location: **194 SH24 - Matamata**

Position: **0, 0**

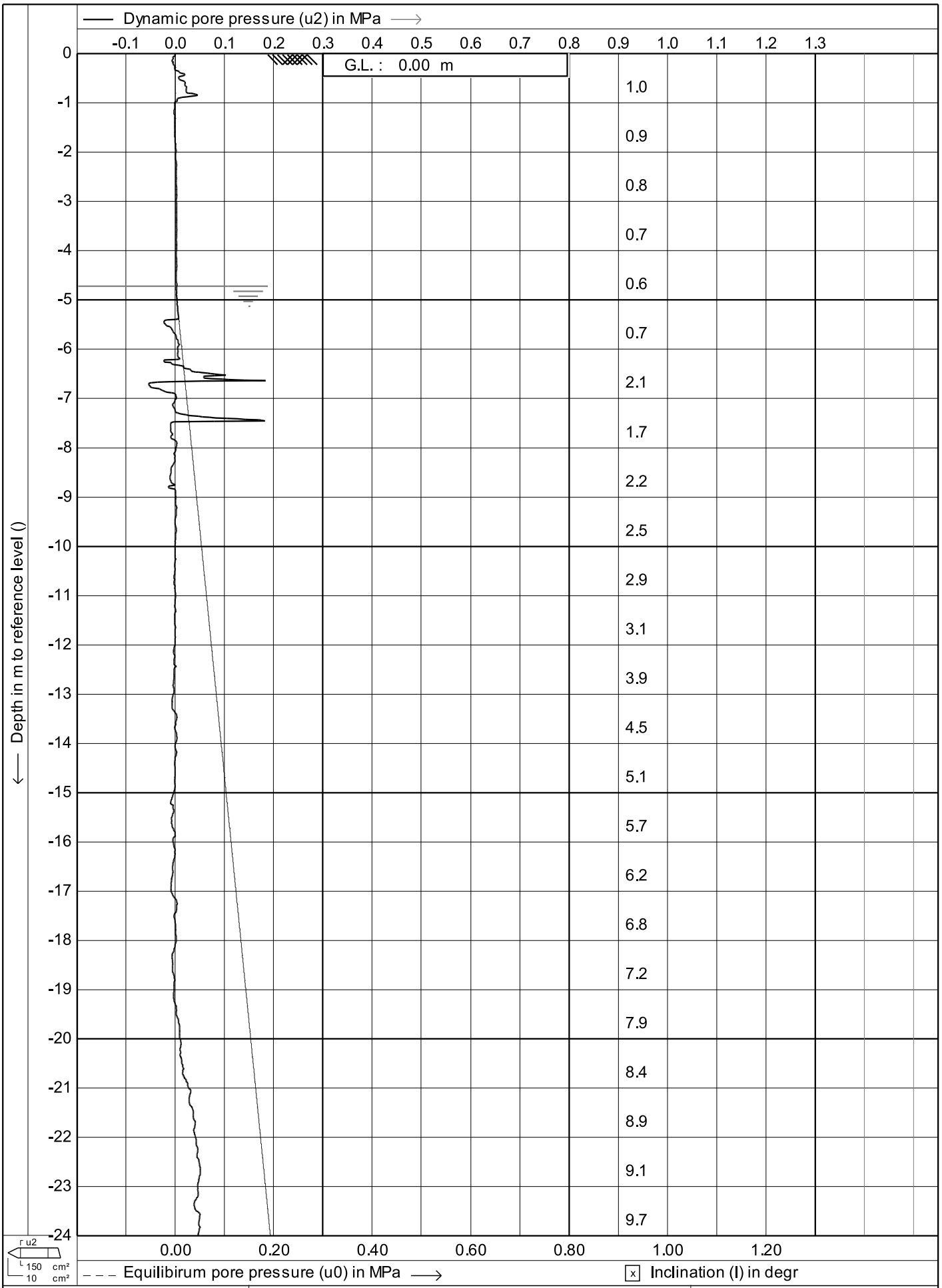
Date : **14/06/2021**

Cone no. : **C10CFIIP.C13068**

Project no. : **CMW055**

CPT no. : **CPT10** **2/28**

1.48



PERRY GEOTECH

Test according A.S.T.M Standard D 5778-12

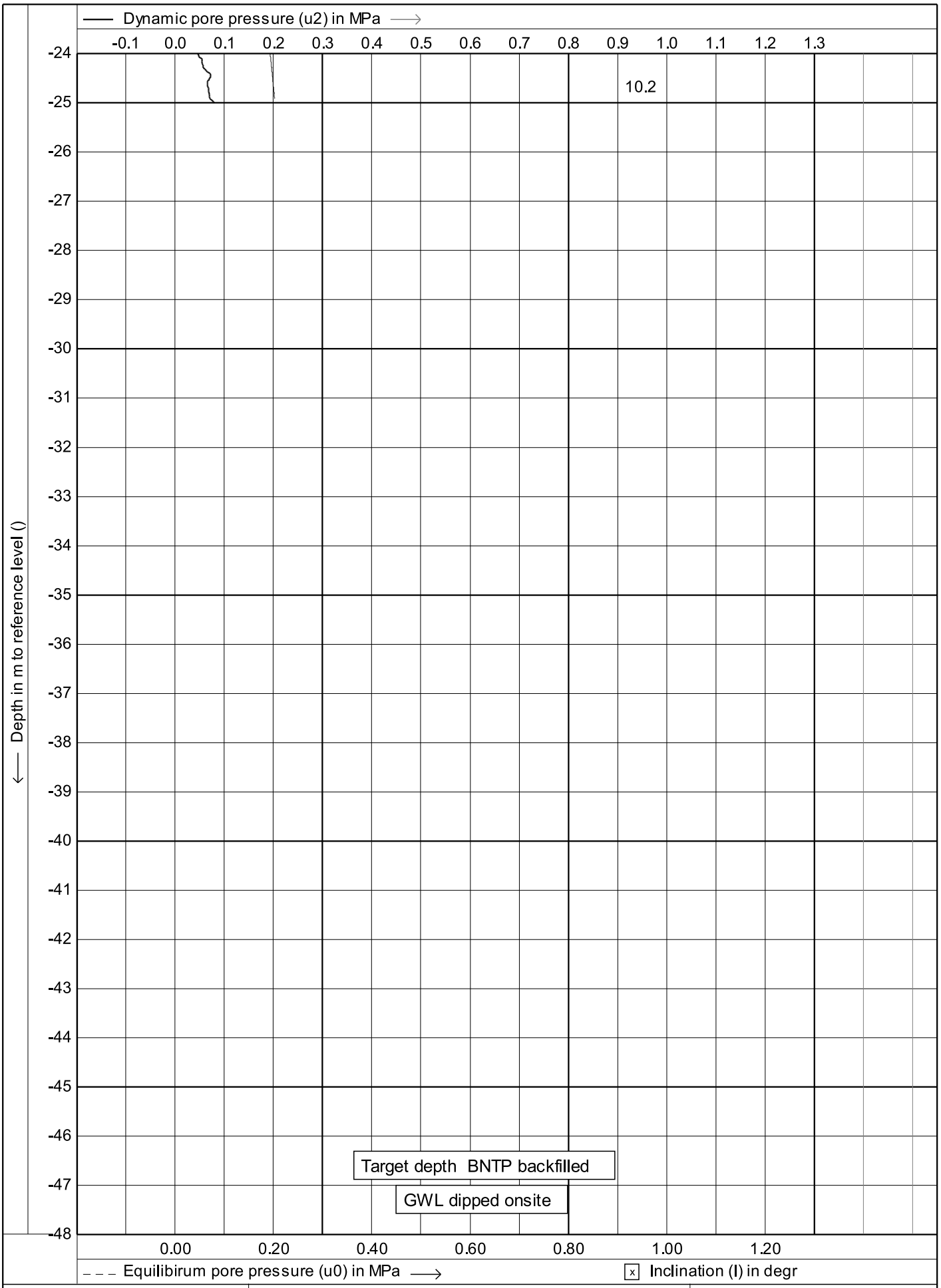
Project : **Site Investigations**

Location: **194 SH24 - Matamata**

Position: **0, 0**

Date	: **14/06/2021**
Cone no.	: **C10CFIIP.C13068**
Project no.	: **CMW055**
CPT no.	: **CPT10**

1.48



PERRY GEOTECH

Test according A.S.T.M Standard D 5778-12

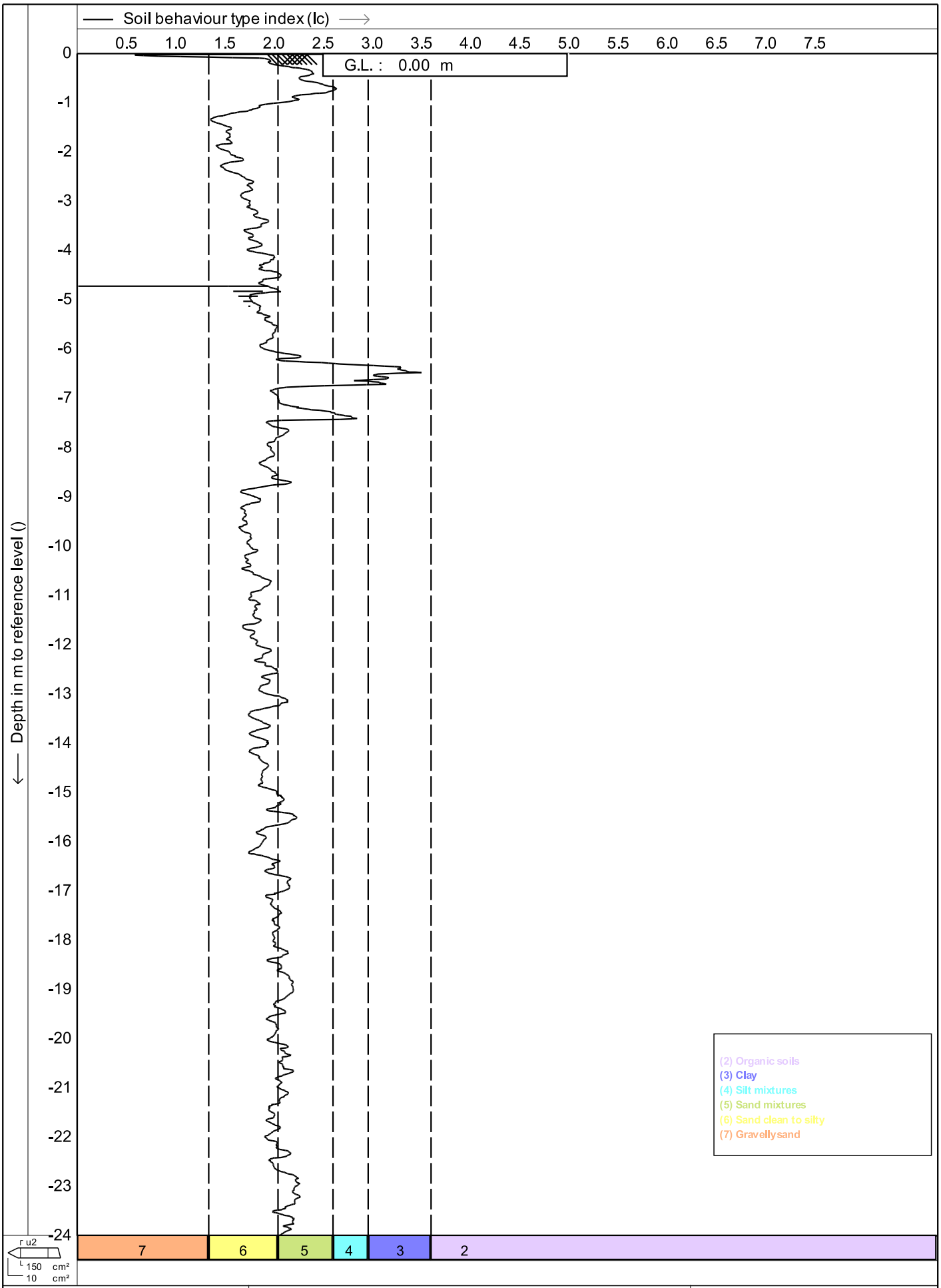
Project : **Site Investigations**

Location: **194 SH24 - Matamata**

Position: **0, 0**

Date	: **14/06/2021**
Cone no.	: **C10CFIIP.C13068**
Project no.	: **CMW055**
CPT no.	: **CPT10** **4/28**

1.48



PERRY GEOTECH

Test according A.S.T.M Standard D 5778-12

Project : **Site Investigations**

Location: **194 SH24 - Matamata**

Position: **0, 0**

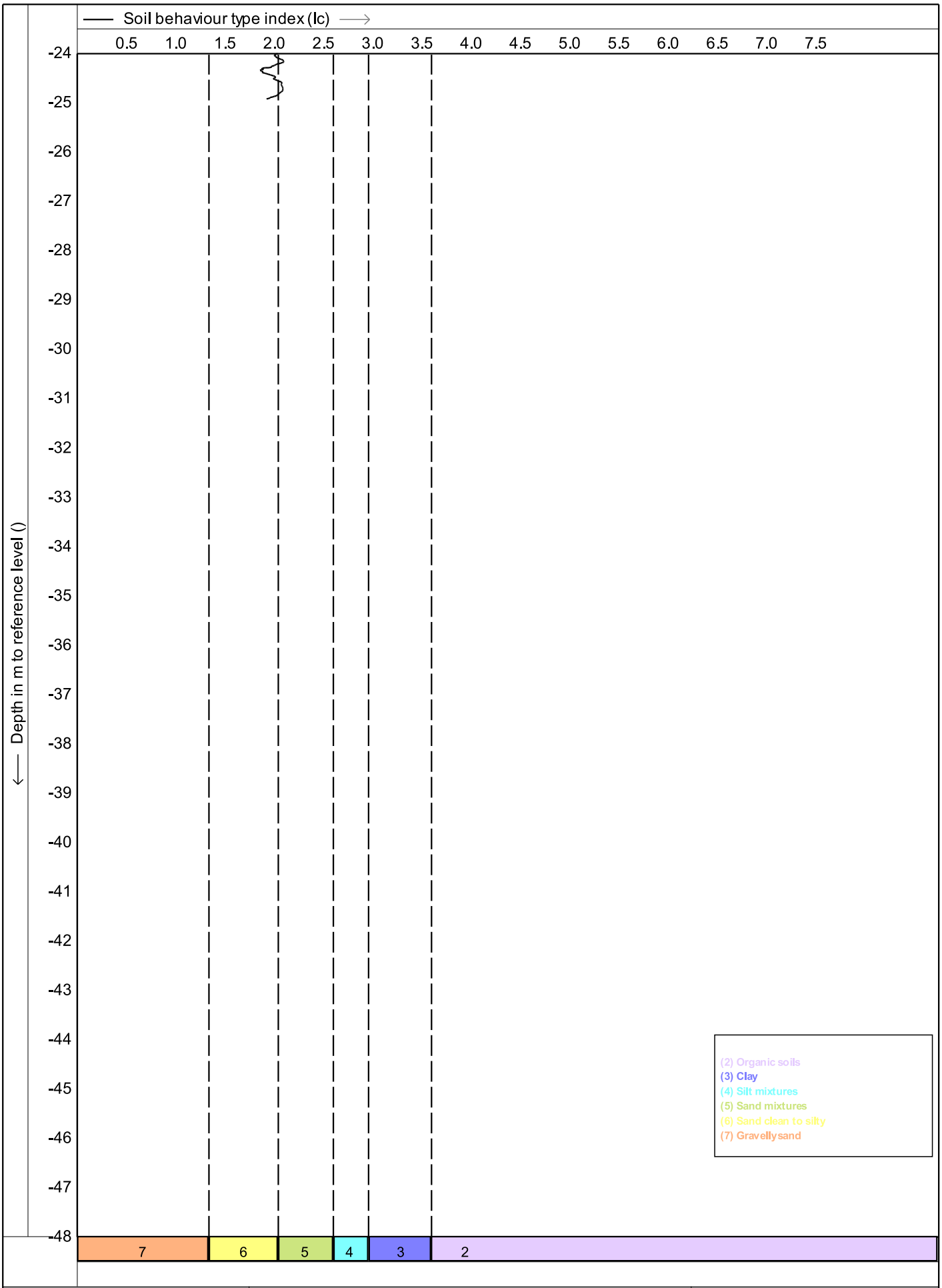
Date : **14/06/2021**

Cone no. : **C10CFIIP.C13068**

Project no. : **CMW055**

CPT no. : **CPT10** **17/28**

1.48



PERRY GEOTECH

Test according A.S.T.M Standard D 5778-12

Project : **Site Investigations**

Location: **194 SH24 - Matamata**

Position: **0, 0**

Date : **14/06/2021**

Cone no. : **C10CFIIP.C13068**

Project no. : **CMW055**

CPT no. : **CPT10** **18/28**

1.48

Appendix D: Static Settlement Analyses

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT01

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		70	kN/m^2
Depth to watertable from ground surface (h_f)		16.2	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 5 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
0.3	20.0	0.4	66.67	**CONTINUOUS**

Footing shape — if L/B = 1: Circular or Square Footing (SQU)

if L/B ≥ 10: Continuous Footings (CON)

Depth of influence = 1.6 metres

Circular or Square Shape = Df + 2B = 1 metres

Continuous Shape = Df + 4B = 1.6 metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 6.40 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 11.20 kN/m^2

Where, for Square or Circular Shaped Footing $\sigma'_{zp(squ)}$ = 8.80 kN/m^2

For $h_f < D_f + B/2$: $\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$

For $h_f > D_f + B/2$: $\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$

Where, for Continuous Shape Footing $\sigma'_{zp(con)}$ = 11.20 kN/m^2

For $h_f < D_f + B$: $\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$

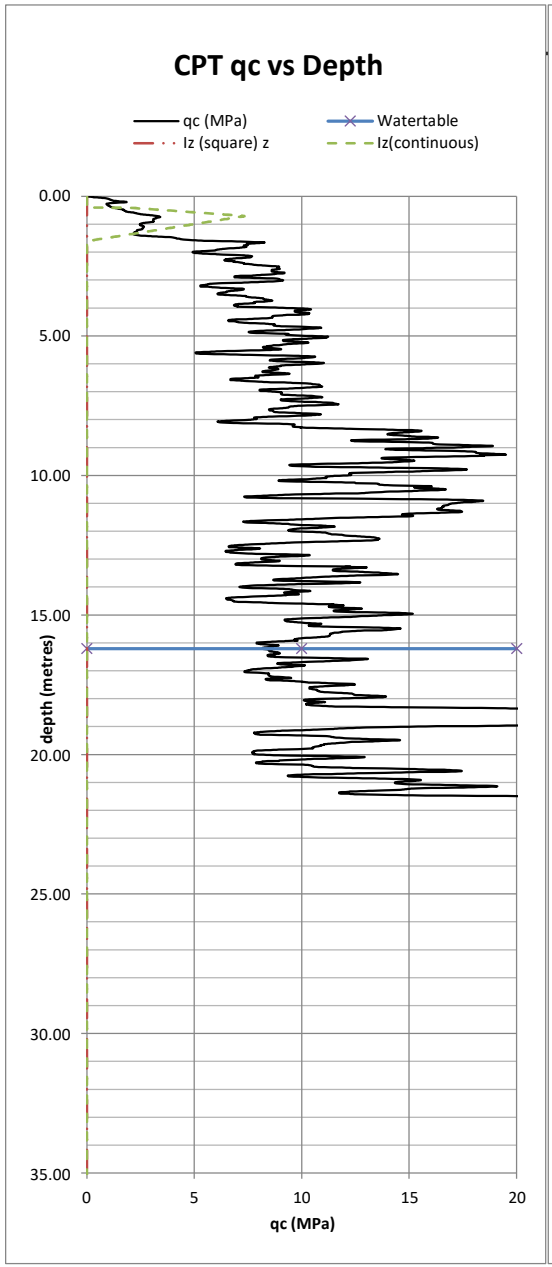
For $h_f > D_f + B$: $\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$

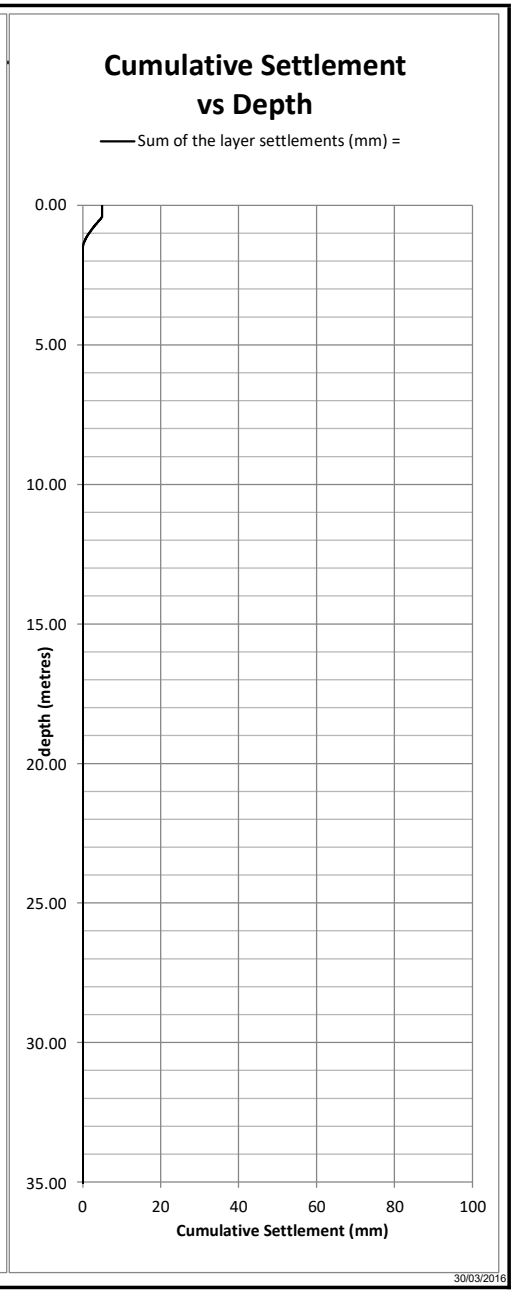
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.7688
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.7383
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	0.9497
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	-	in	-
Total settlement for CONTINUOUS =	**5 mm**	in	**50 years**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT02

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		70	kN/m^2
Depth to watertable from ground surface (h_f)		12.2	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 7 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
0.3	20.0	0.4	66.67	**CONTINUOUS**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 1.6 metres

Circular or Square Shape =	Df + 2B =	1	metres
Continuous Shape =	Df + 4B =	1.6	metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 6.40 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 11.20 kN/m^2

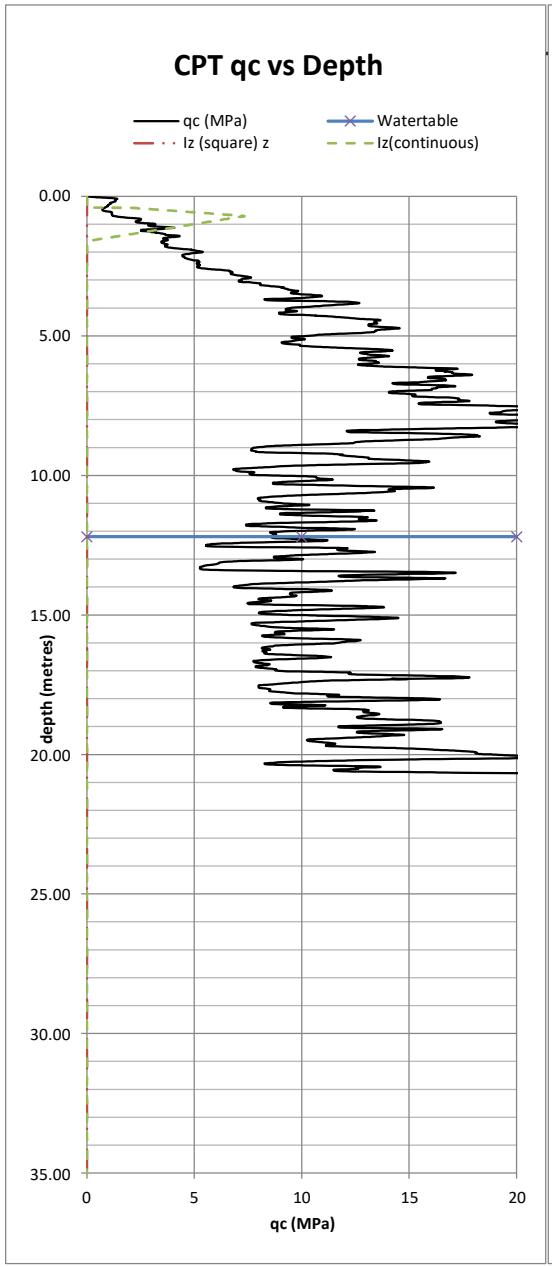
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	8.80 kN/m^2
For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$	
For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$	
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	11.20 kN/m^2
For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$	
For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$	

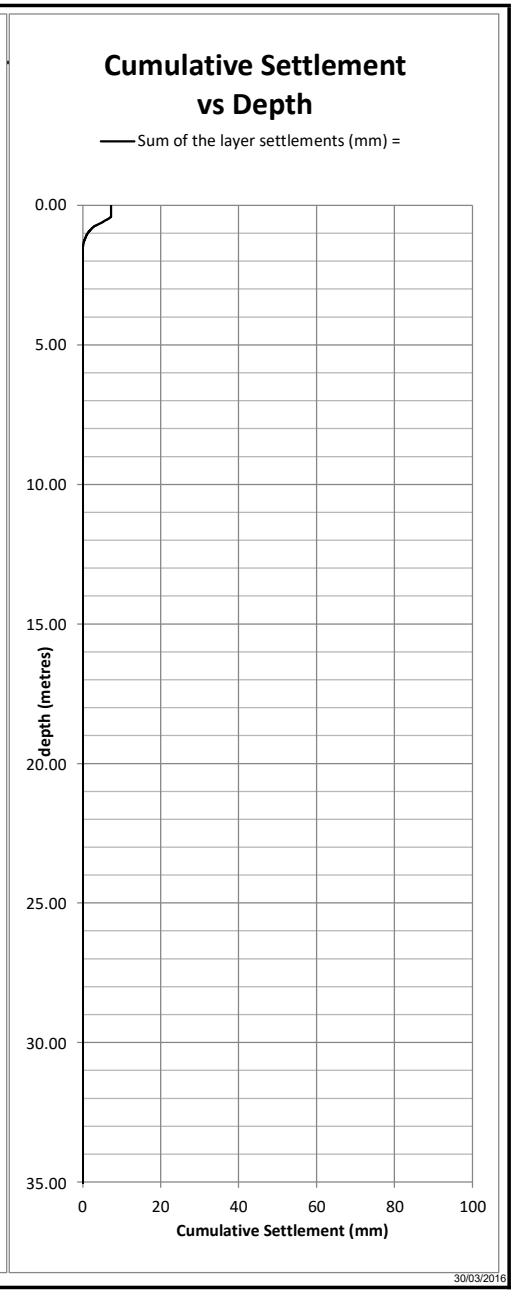
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.7688
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.7383
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	0.9497
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	**-**	**in**	**-**
Total settlement for CONTINUOUS =	**7 mm**	**in**	**50 years**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT03

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		70	kN/m^2
Depth to watertable from ground surface (h_f)		14.8	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 14 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
0.3	20.0	0.4	66.67	**CONTINUOUS**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 1.6 metres

Circular or Square Shape =	Df + 2B =	1	metres
Continuous Shape =	Df + 4B =	1.6	metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 6.40 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 11.20 kN/m^2

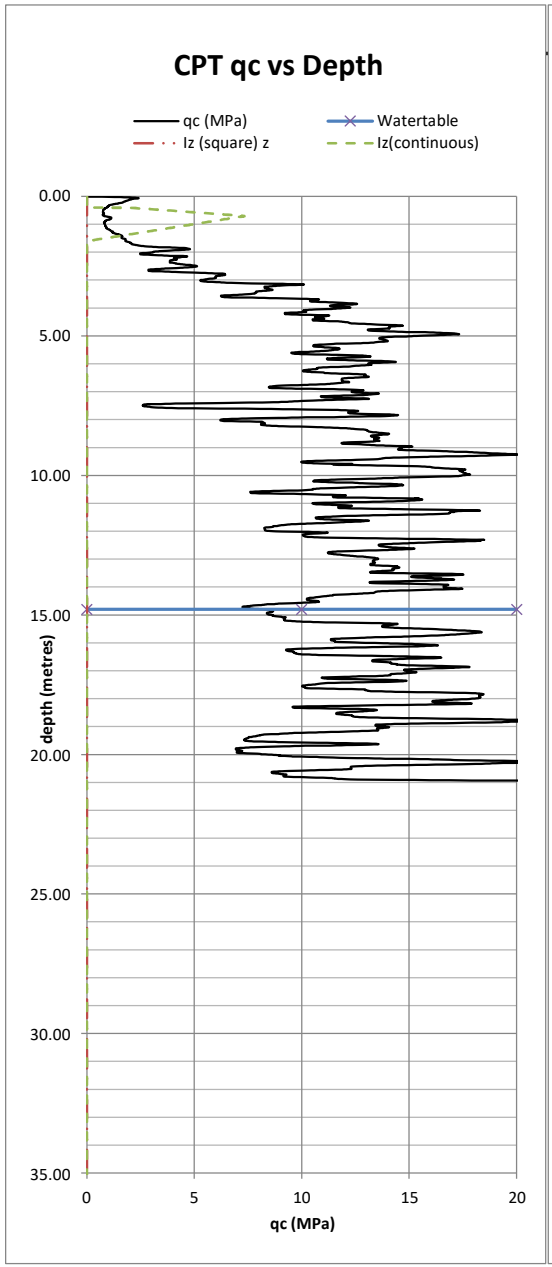
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	8.80 kN/m^2
For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$	
For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$	
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	11.20 kN/m^2
For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$	
For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$	

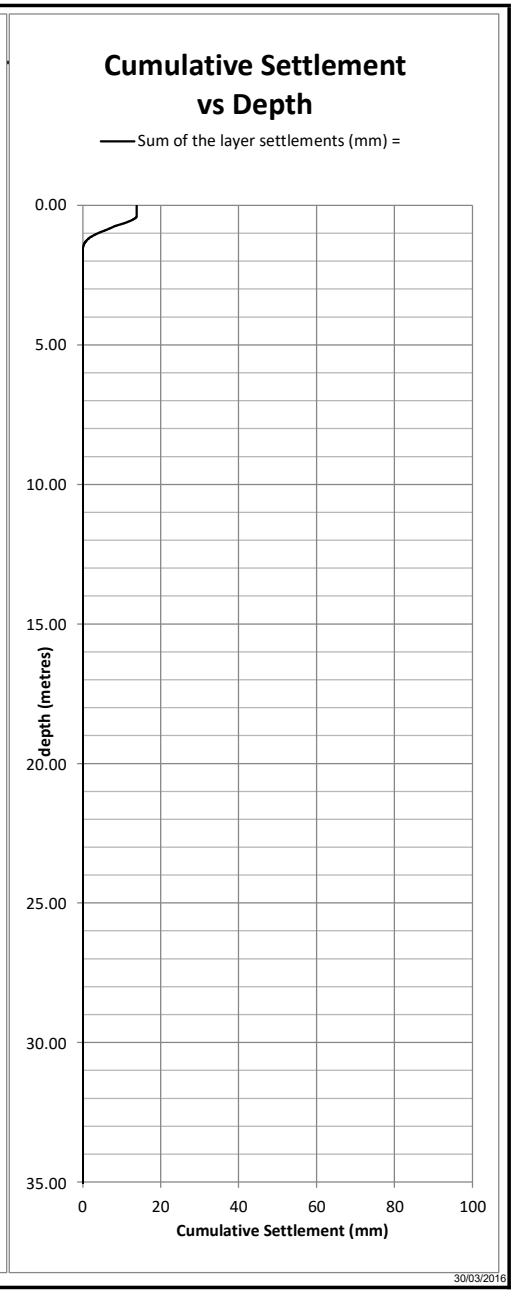
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.7688
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.7383
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	0.9497
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	**-**	**in**	**-**
Total settlement for CONTINUOUS =	**14 mm**	**in**	**50 years**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT04

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		70	kN/m^2
Depth to watertable from ground surface (h_f)		13.5	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 10 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
0.3	20.0	0.4	66.67	**CONTINUOUS**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 1.6 metres

Circular or Square Shape =	Df + 2B =	1	metres
Continuous Shape =	Df + 4B =	1.6	metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 6.40 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 11.20 kN/m^2

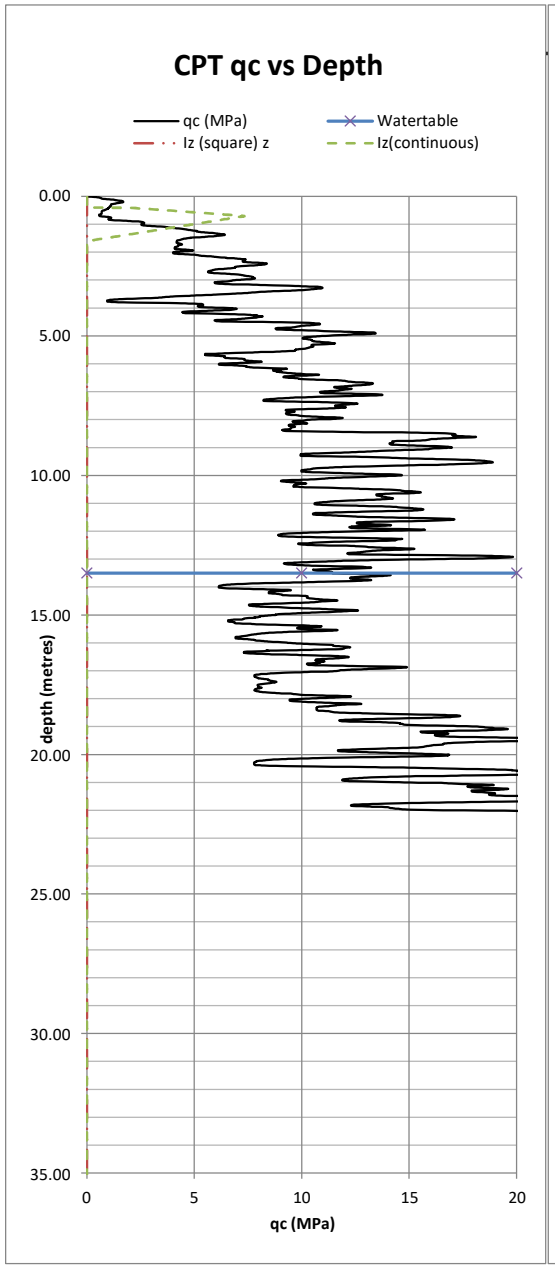
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	8.80 kN/m^2
For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$	
For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$	
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	11.20 kN/m^2
For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$	
For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$	

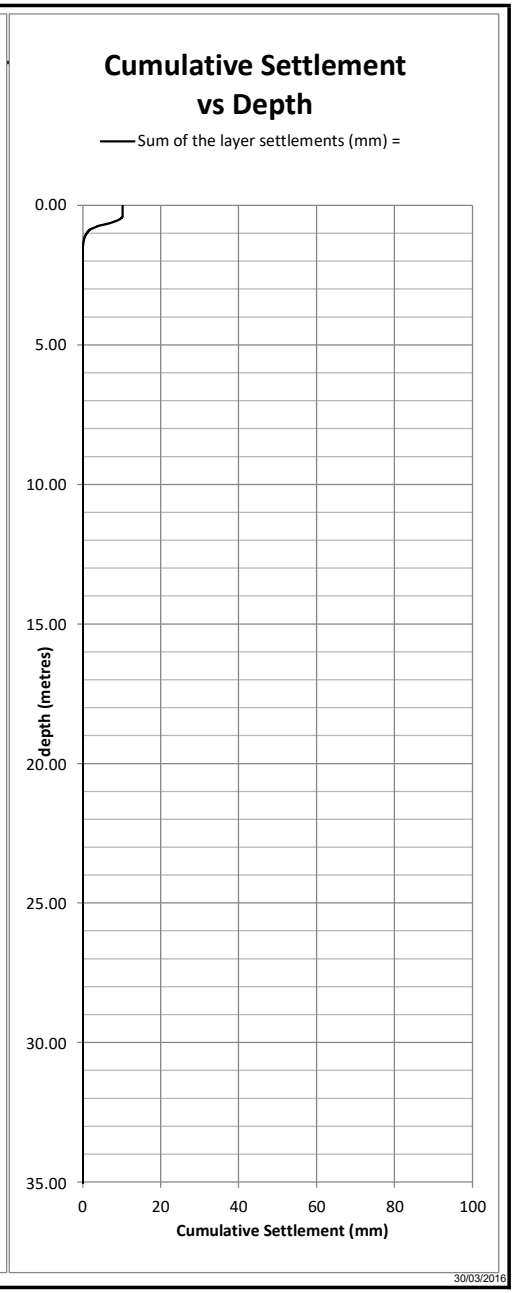
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.7688
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.7383
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	0.9497
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	-	**in**	-
Total settlement for CONTINUOUS =	**10 mm**	**in**	**50 years**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT05

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		70	kN/m^2
Depth to watertable from ground surface (h_f)		13.2	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 9 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
0.3	20.0	0.4	66.67	**CONTINUOUS**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 1.6 metres

Circular or Square Shape =	Df + 2B =	1	metres
Continuous Shape =	Df + 4B =	1.6	metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 6.40 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 11.20 kN/m^2

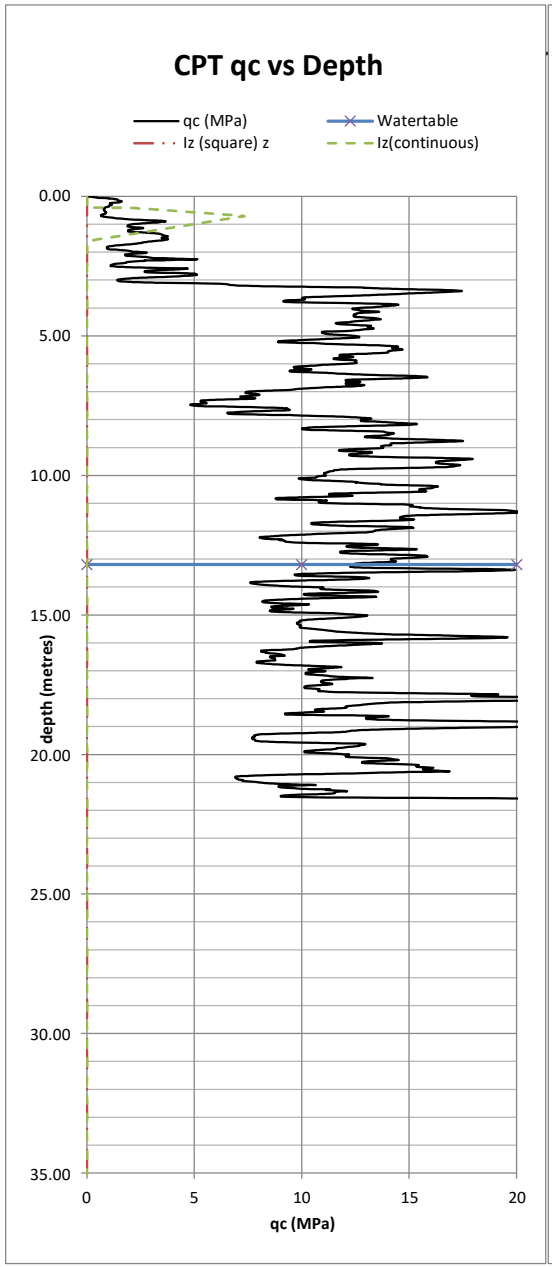
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	8.80 kN/m^2
For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$	
For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$	
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	11.20 kN/m^2
For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$	
For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$	

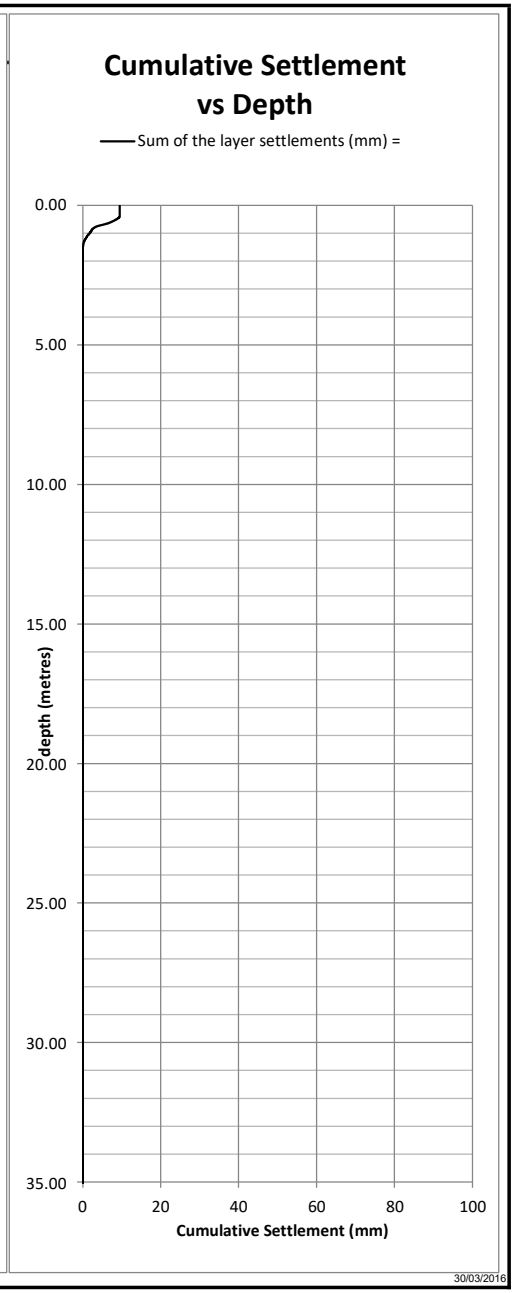
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.7688
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.7383
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	0.9497
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	**-**	**in**	**-**
Total settlement for CONTINUOUS =	**9 mm**	**in**	**50 years**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT06

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		70	kN/m^2
Depth to watertable from ground surface (h_f)		14.9	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 8 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
0.3	20.0	0.4	66.67	**CONTINUOUS**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 1.6 metres

Circular or Square Shape =	Df + 2B =	1	metres
Continuous Shape =	Df + 4B =	1.6	metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 6.40 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 11.20 kN/m^2

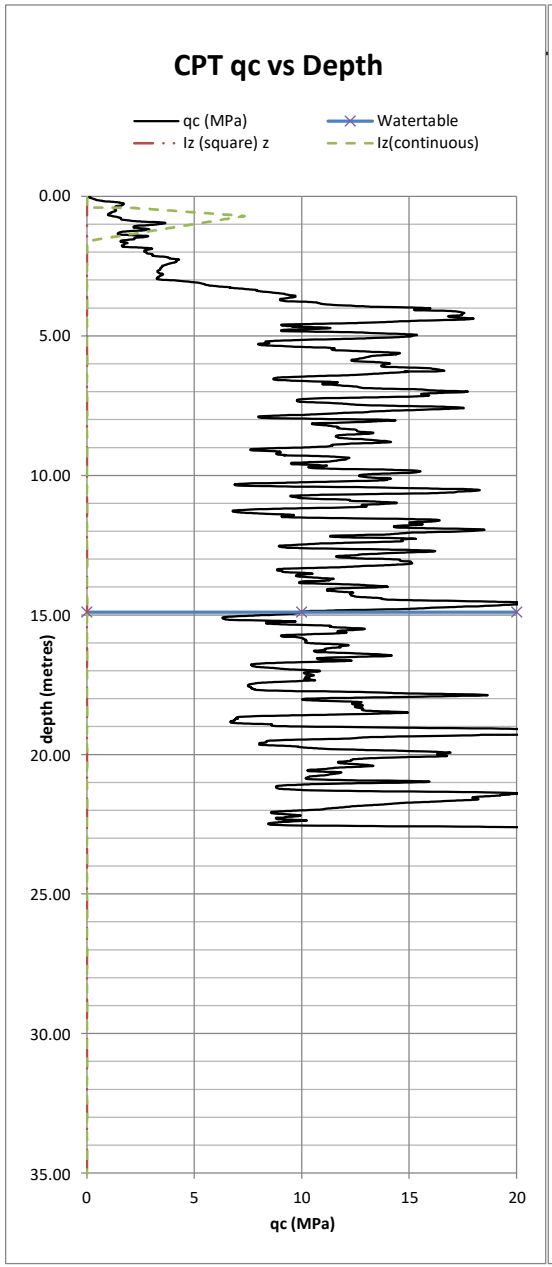
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	8.80 kN/m^2
For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$	
For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$	
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	11.20 kN/m^2
For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$	
For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$	

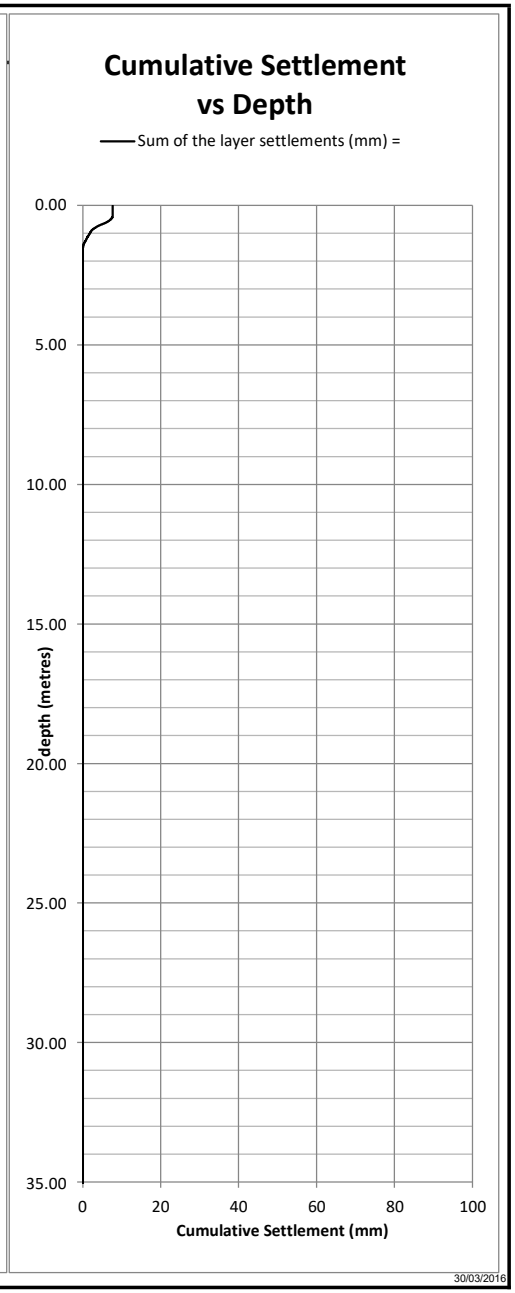
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.7688
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.7383
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	0.9497
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	**-**	**in**	**-**
Total settlement for CONTINUOUS =	**8 mm**	**in**	**50 years**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT07

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		70	kN/m^2
Depth to watertable from ground surface (h_f)		18.2	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 14 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
0.3	20.0	0.4	66.67	**CONTINUOUS**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 1.6 metres

Circular or Square Shape =	Df + 2B =	1	metres
Continuous Shape =	Df + 4B =	1.6	metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 6.40 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 11.20 kN/m^2

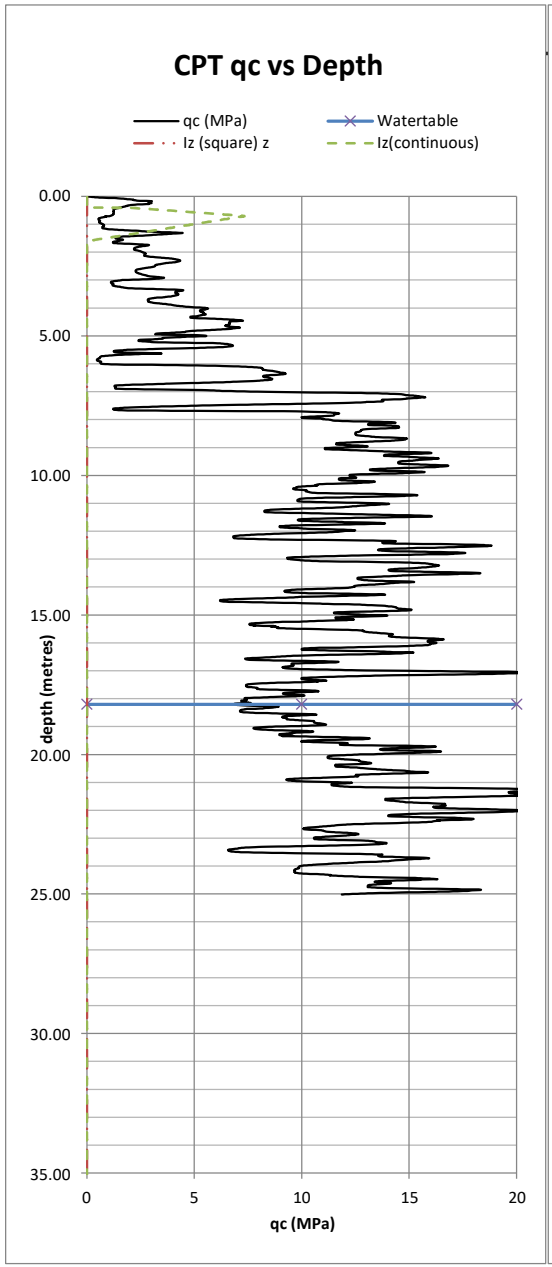
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	8.80 kN/m^2
For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$	
For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$	
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	11.20 kN/m^2
For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$	
For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$	

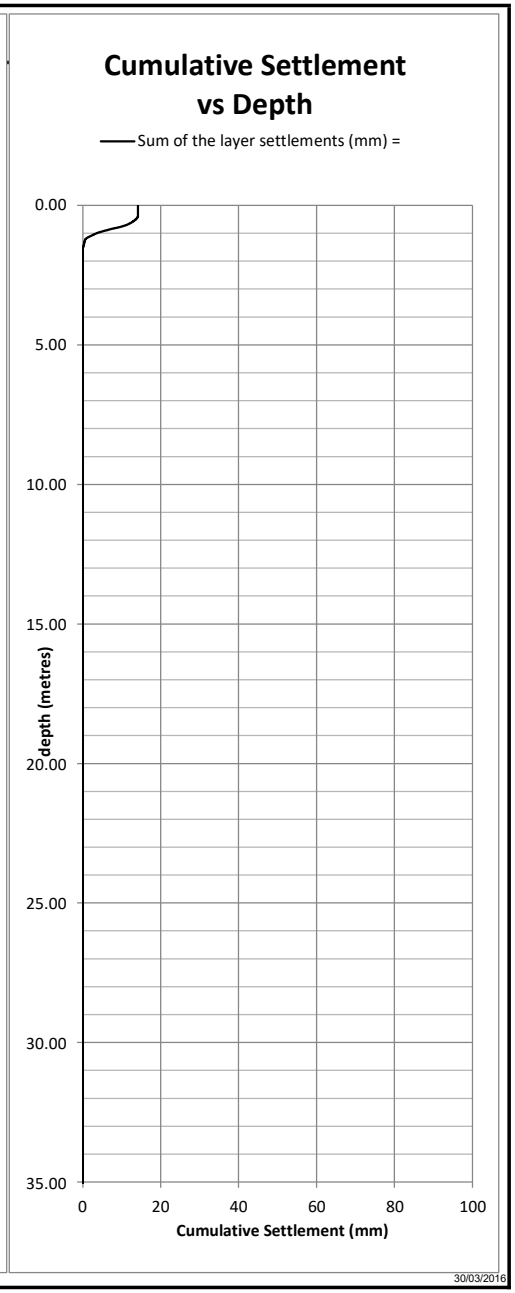
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.7688
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.7383
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	0.9497
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	**-**	**in**	**-**
Total settlement for CONTINUOUS =	**14 mm**	**in**	**50 years**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT08

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		70	kN/m^2
Depth to watertable from ground surface (h_f)		19.0	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 7 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
0.3	20.0	0.4	66.67	**CONTINUOUS**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 1.6 metres

Circular or Square Shape =	Df + 2B =	1	metres
Continuous Shape =	Df + 4B =	1.6	metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 6.40 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 11.20 kN/m^2

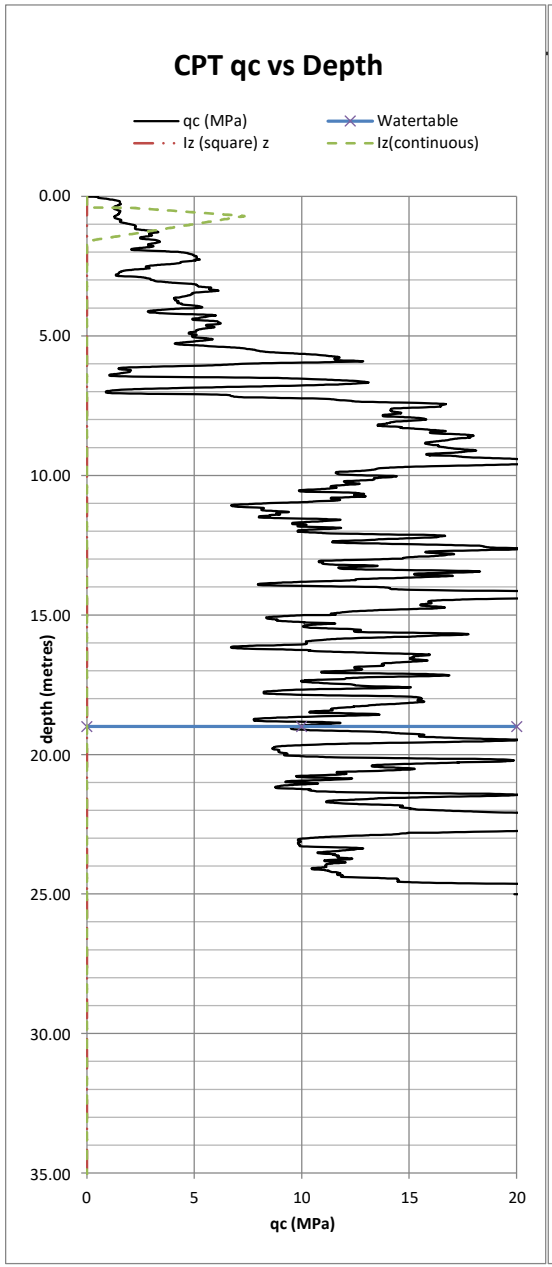
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	8.80 kN/m^2
For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$	
For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$	
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	11.20 kN/m^2
For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$	
For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$	

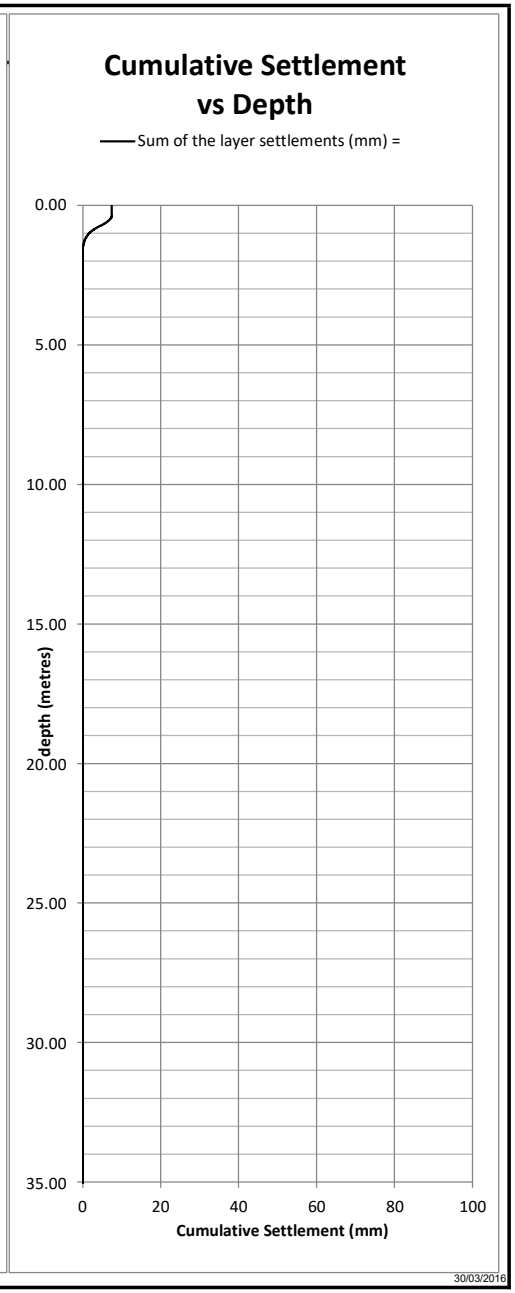
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.7688
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.7383
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	0.9497
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	-	in	-
Total settlement for CONTINUOUS =	**7 mm**	**in**	**50 years**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT09

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		70	kN/m^2
Depth to watertable from ground surface (h_f)		19.2	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 7 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
0.3	20.0	0.4	66.67	**CONTINUOUS**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 1.6 metres

Circular or Square Shape =	Df + 2B =	1	metres
Continuous Shape =	Df + 4B =	1.6	metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 6.40 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 11.20 kN/m^2

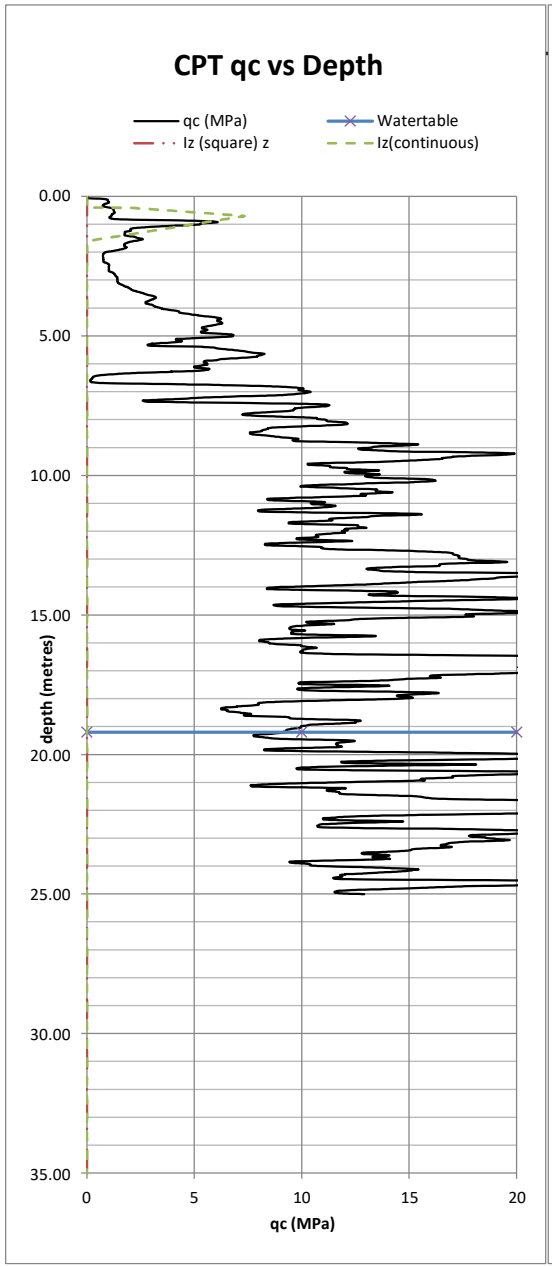
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	8.80 kN/m^2
For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$	
For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$	
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	11.20 kN/m^2
For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$	
For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$	

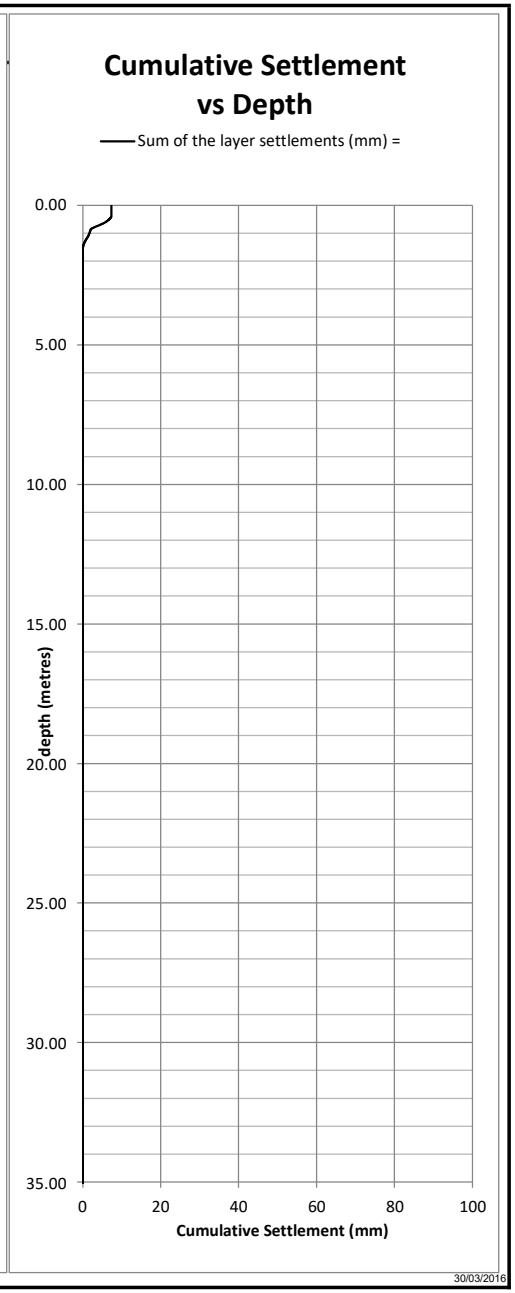
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.7688
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.7383
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	0.9497
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	-	in	-
Total settlement for CONTINUOUS =	**7 mm**	in	**50 years**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT10

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		70	kN/m^2
Depth to watertable from ground surface (h_f)		19.5	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 11 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
0.3	20.0	0.4	66.67	**CONTINUOUS**

Footing shape — if L/B = 1: Circular or Square Footing (SQU)

if L/B ≥ 10: Continuous Footings (CON)

Depth of influence = 1.6 metres

Circular or Square Shape = Df + 2B = 1 metres

Continuous Shape = Df + 4B = 1.6 metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 6.40 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 11.20 kN/m^2

Where, for Square or Circular Shaped Footing $\sigma'_{zp(squ)}$ = 8.80 kN/m^2

For $h_f < D_f + B/2$: $\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$

For $h_f > D_f + B/2$: $\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$

Where, for Continuous Shape Footing $\sigma'_{zp(con)}$ = 11.20 kN/m^2

For $h_f < D_f + B$: $\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$

For $h_f > D_f + B$: $\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$

Peak strain influence factor (I_{zp})

$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ = 0.7688

$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ = 0.7383

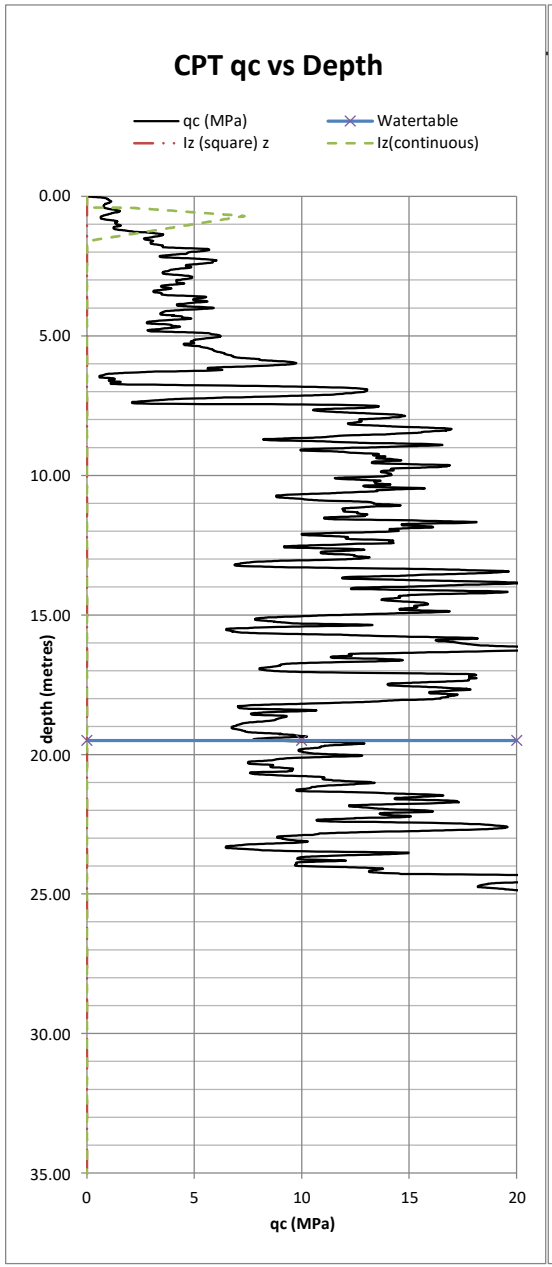
Depth factor (C1) $C1 = 1 - 0.5 (\sigma'_{vo} / q')$ = 0.9497

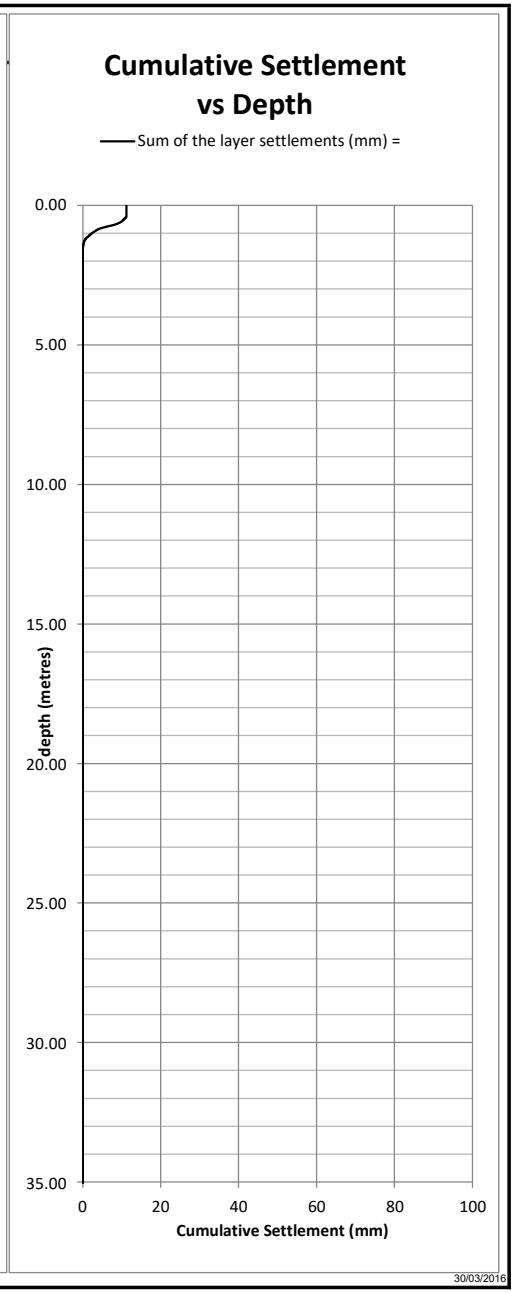
Secondary creep factor (C2) $C2 = 1 + 0.2 \log_{10} (t / 0.1)$ = 1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	-	in	-
Total settlement for CONTINUOUS =	**11 mm**	in	**50 years**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT01

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		100	kN/m^2
Depth to watertable from ground surface (h_f)		16.2	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 8 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
0.3	20.0	0.4	66.67	**CONTINUOUS**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 1.6 metres

Circular or Square Shape =	Df + 2B =	1	metres
Continuous Shape =	Df + 4B =	1.6	metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 6.40 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 11.20 kN/m^2

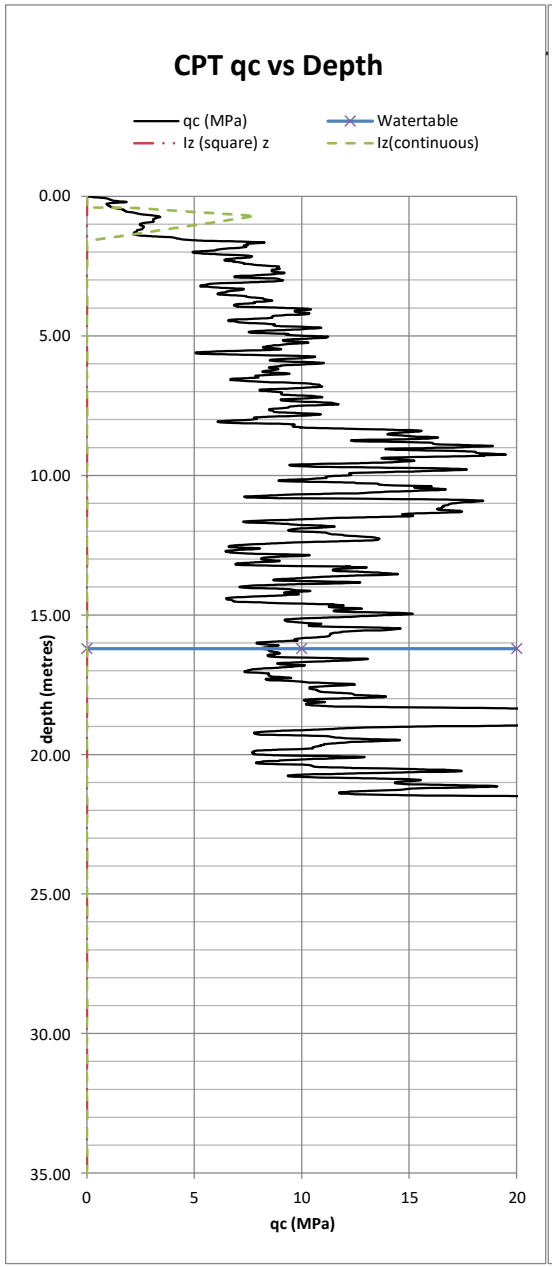
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	8.80 kN/m^2
For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$	
For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$	
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	11.20 kN/m^2
For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$	
For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$	

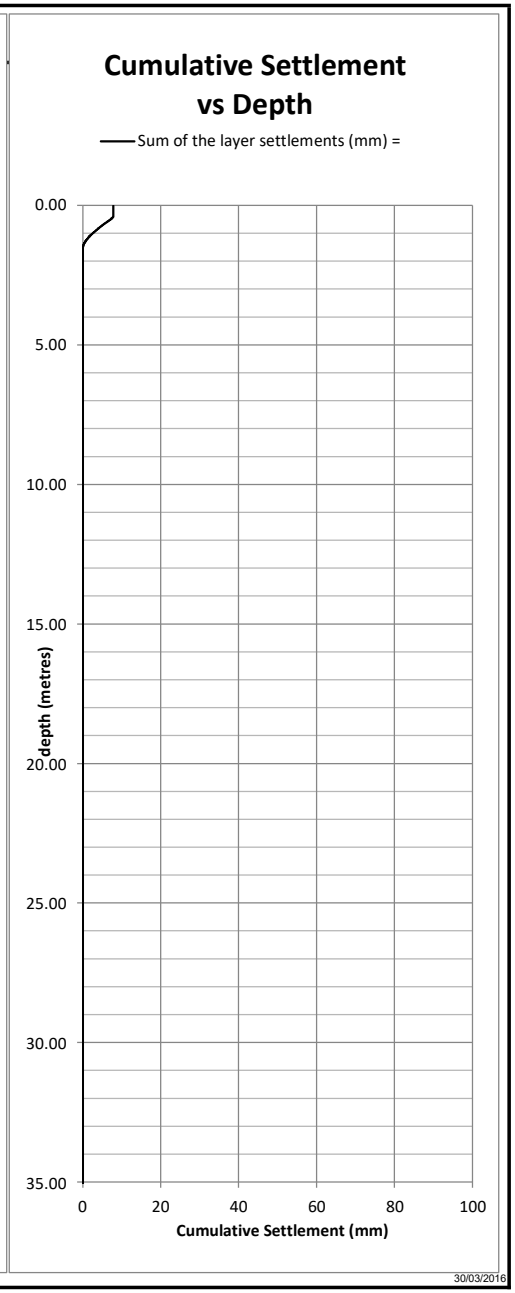
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.8261
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.7891
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	0.9658
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	**-**	**in**	**-**
Total settlement for CONTINUOUS =	**8 mm**	**in**	**50 years**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT02

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		100	kN/m^2
Depth to watertable from ground surface (h_f)		12.2	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 11 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
0.3	20.0	0.4	66.67	**CONTINUOUS**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 1.6 metres

Circular or Square Shape =	Df + 2B =	1	metres
Continuous Shape =	Df + 4B =	1.6	metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 6.40 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 11.20 kN/m^2

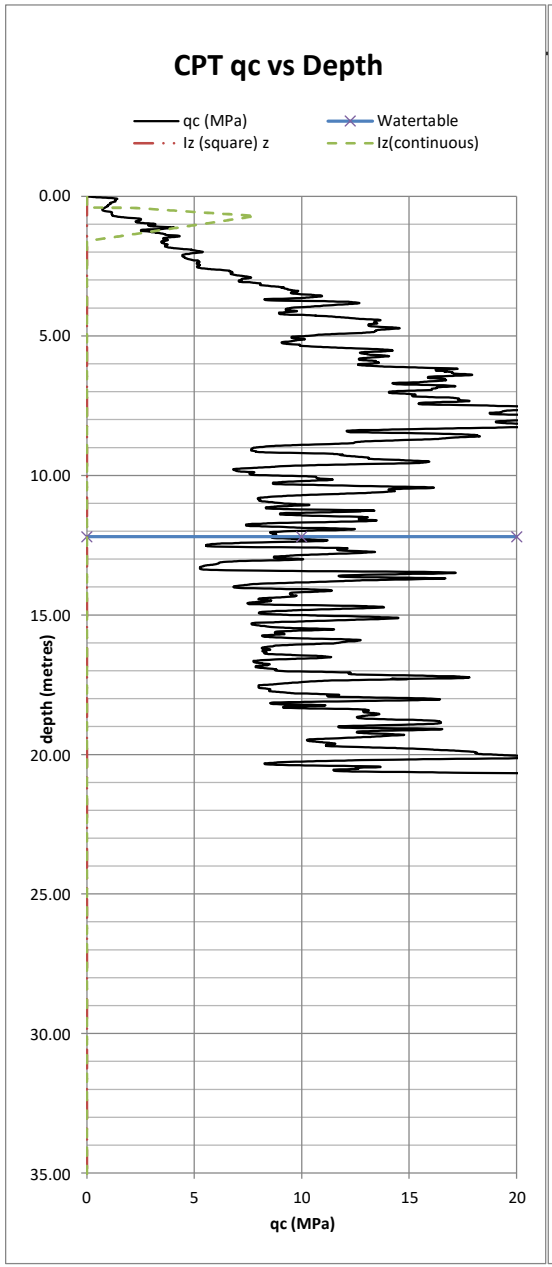
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	8.80 kN/m^2
For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$	
For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$	
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	11.20 kN/m^2
For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$	
For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$	

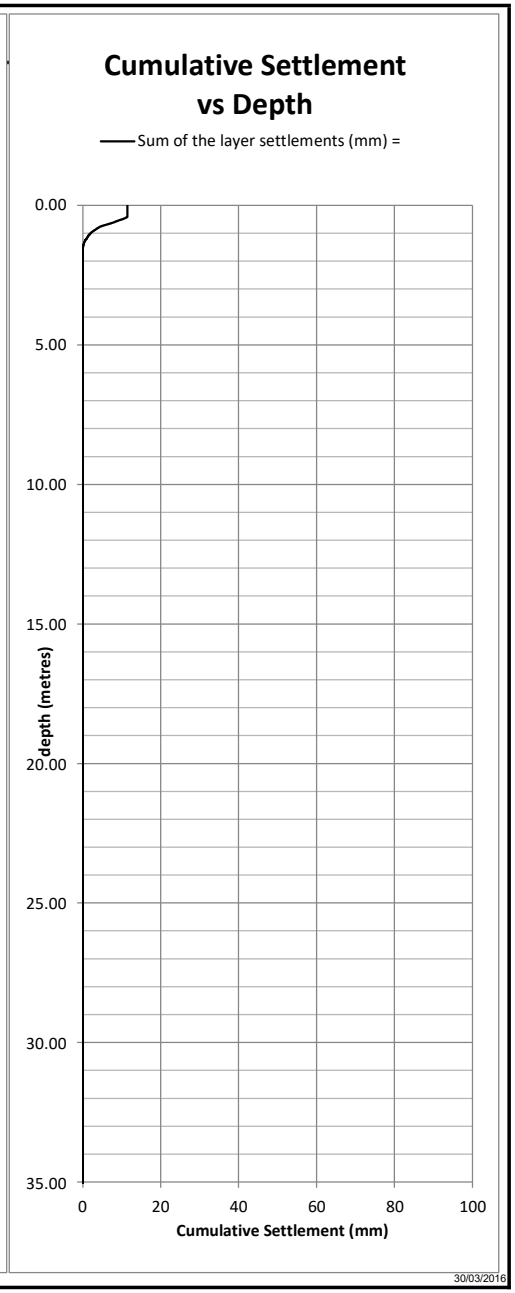
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.8261
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.7891
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	0.9658
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	**-**	**in**	**-**
Total settlement for CONTINUOUS =	**11 mm**	**in**	**50 years**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT03

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		100	kN/m^2
Depth to watertable from ground surface (h_f)		14.8	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 22 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
0.3	20.0	0.4	66.67	**CONTINUOUS**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 1.6 metres

Circular or Square Shape =	Df + 2B =	1	metres
Continuous Shape =	Df + 4B =	1.6	metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 6.40 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 11.20 kN/m^2

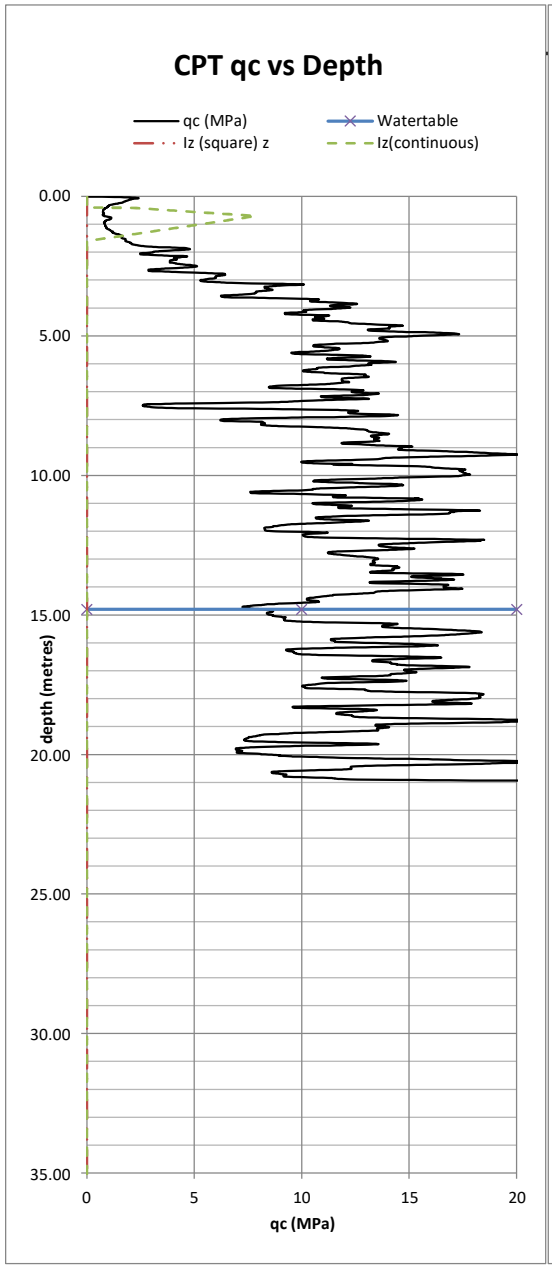
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	8.80 kN/m^2
For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$	
For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$	
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	11.20 kN/m^2
For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$	
For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$	

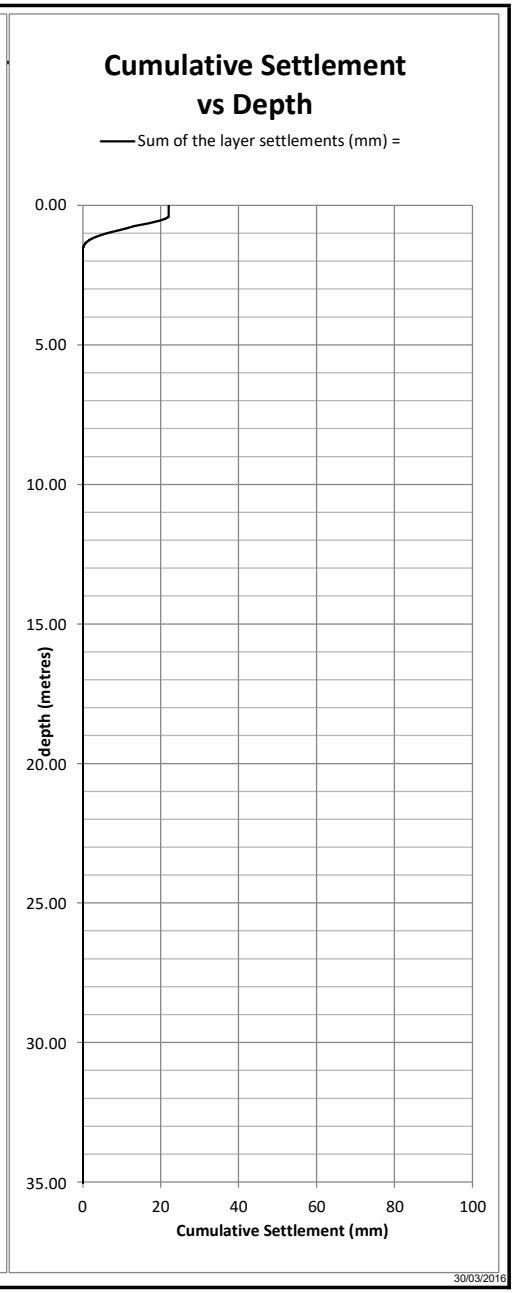
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.8261
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.7891
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	0.9658
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	**-**	**in**	**-**
Total settlement for CONTINUOUS =	**22 mm**	**in**	**50 years**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT04

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		100	kN/m^2
Depth to watertable from ground surface (h_f)		13.5	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 16 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
0.3	20.0	0.4	66.67	**CONTINUOUS**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 1.6 metres

Circular or Square Shape =	Df + 2B =	1	metres
Continuous Shape =	Df + 4B =	1.6	metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 6.40 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 11.20 kN/m^2

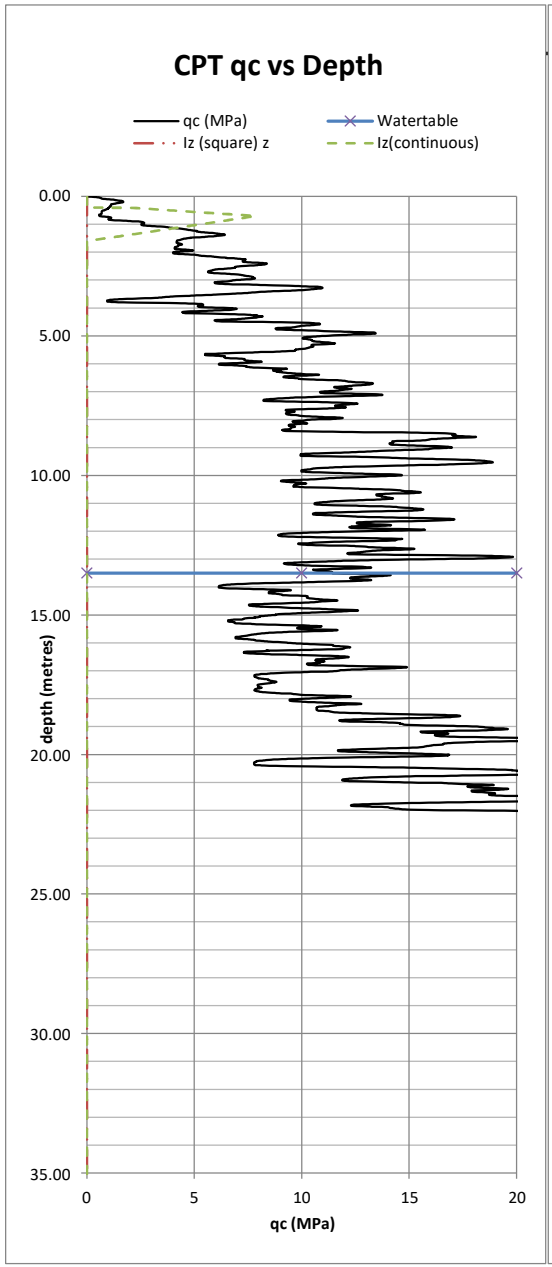
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	8.80 kN/m^2
For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$	
For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$	
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	11.20 kN/m^2
For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$	
For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$	

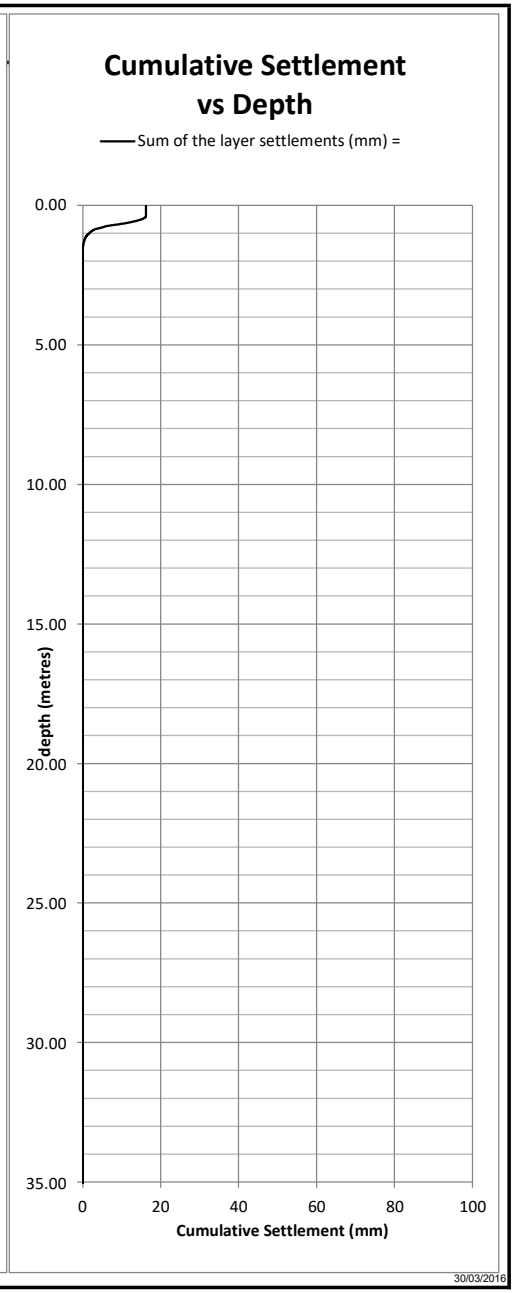
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.8261
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.7891
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	0.9658
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	-	**in**	-
Total settlement for CONTINUOUS =	**16 mm**	**in**	**50 years**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT05

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		100	kN/m^2
Depth to watertable from ground surface (h_f)		13.2	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 15 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
0.3	20.0	0.4	66.67	**CONTINUOUS**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 1.6 metres

Circular or Square Shape =	Df + 2B =	1	metres
Continuous Shape =	Df + 4B =	1.6	metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 6.40 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 11.20 kN/m^2

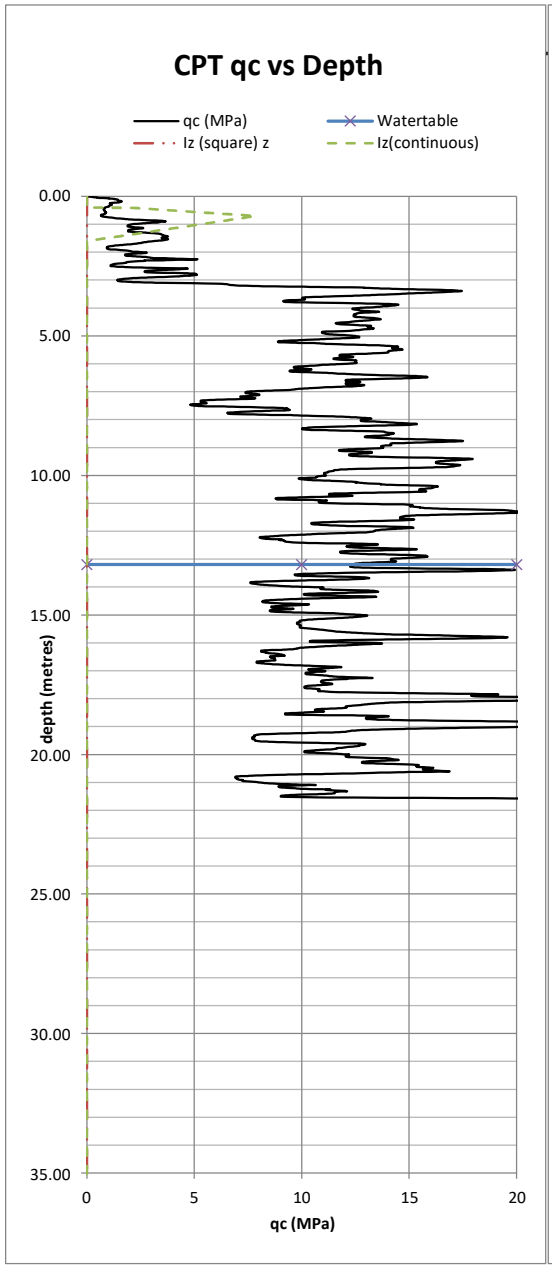
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	8.80 kN/m^2
For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$	
For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$	
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	11.20 kN/m^2
For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$	
For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$	

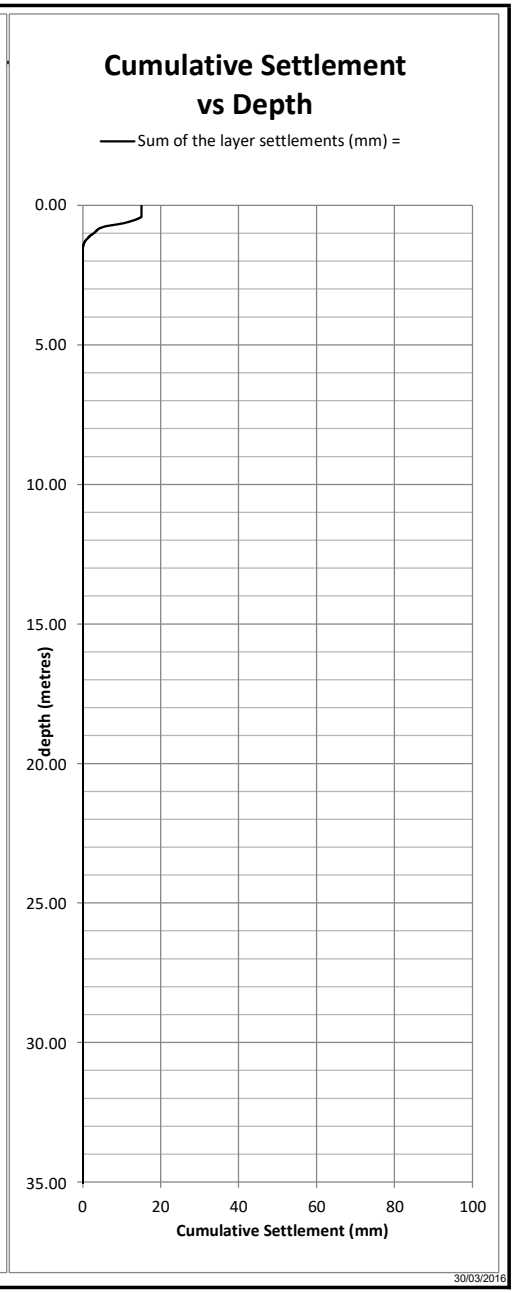
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.8261
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.7891
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	0.9658
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	**-**	**in**	**-**
Total settlement for CONTINUOUS =	**15 mm**	**in**	**50 years**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT06

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		100	kN/m^2
Depth to watertable from ground surface (h_f)		14.9	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 12 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
0.3	20.0	0.4	66.67	**CONTINUOUS**

Footing shape — if L/B = 1: Circular or Square Footing (SQU)

if L/B ≥ 10: Continuous Footings (CON)

Depth of influence = 1.6 metres

Circular or Square Shape = Df + 2B = 1 metres

Continuous Shape = Df + 4B = 1.6 metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 6.40 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 11.20 kN/m^2

Where, for Square or Circular Shaped Footing $\sigma'_{zp(squ)}$ = 8.80 kN/m^2

For $h_f < D_f + B/2$: $\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$

For $h_f > D_f + B/2$: $\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$

Where, for Continuous Shape Footing $\sigma'_{zp(con)}$ = 11.20 kN/m^2

For $h_f < D_f + B$: $\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$

For $h_f > D_f + B$: $\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$

Peak strain influence factor (I_{zp})

$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ = 0.8261

$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ = 0.7891

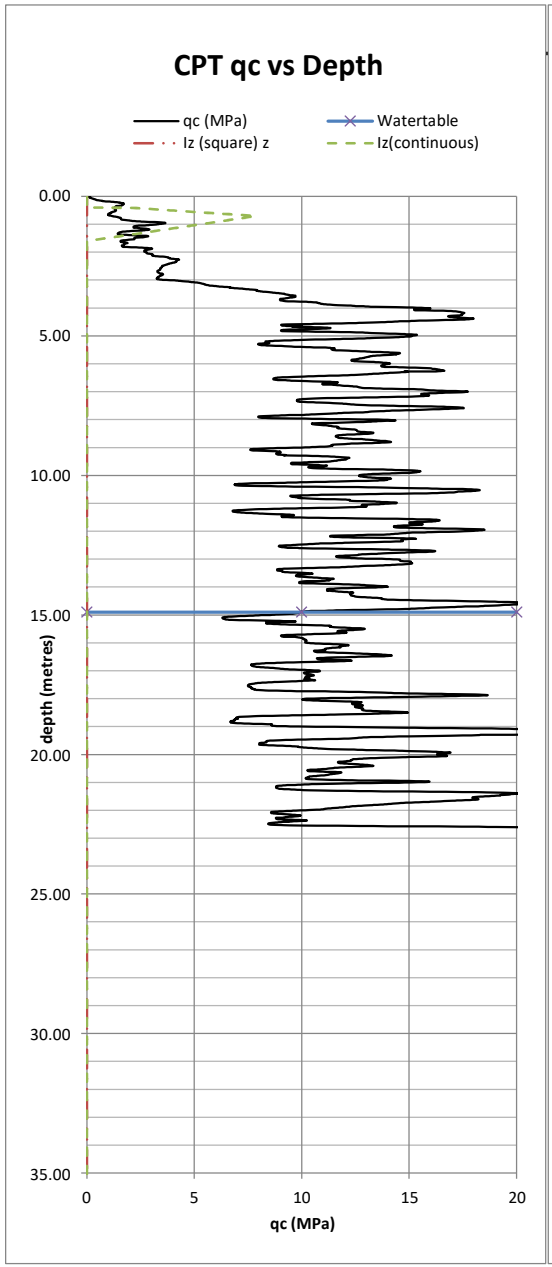
Depth factor (C1) $C1 = 1 - 0.5 (\sigma'_{vo} / q')$ = 0.9658

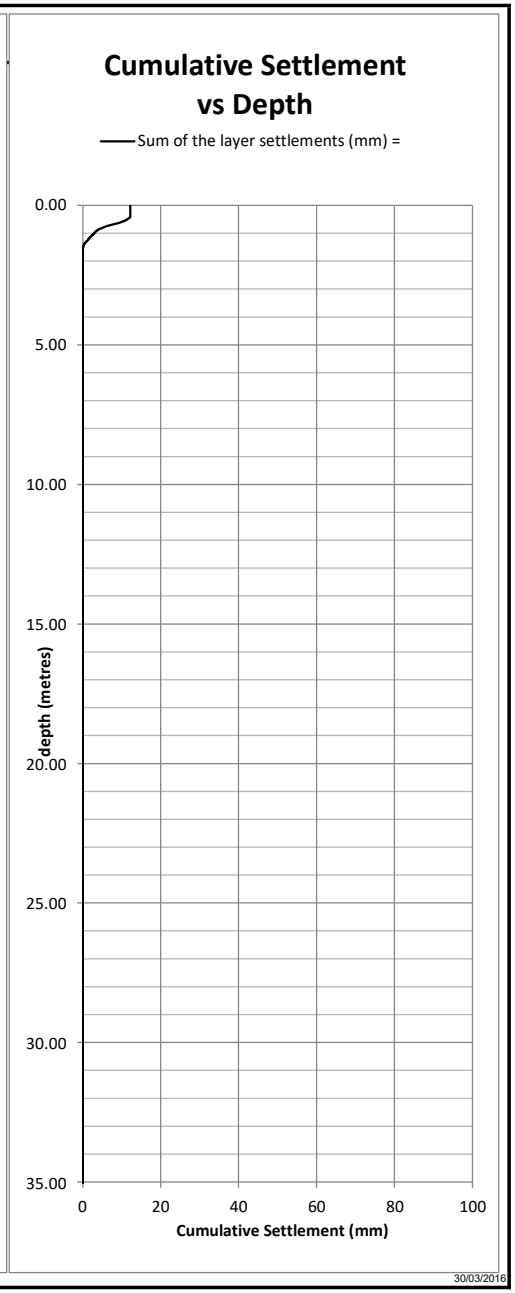
Secondary creep factor (C2) $C2 = 1 + 0.2 \log_{10} (t / 0.1)$ = 1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	-	in	-
Total settlement for CONTINUOUS =	**12 mm**	in	**50 years**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT07

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		100	kN/m^2
Depth to watertable from ground surface (h_f)		18.2	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 23 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
0.3	20.0	0.4	66.67	**CONTINUOUS**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 1.6 metres

Circular or Square Shape =	Df + 2B =	1	metres
Continuous Shape =	Df + 4B =	1.6	metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 6.40 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 11.20 kN/m^2

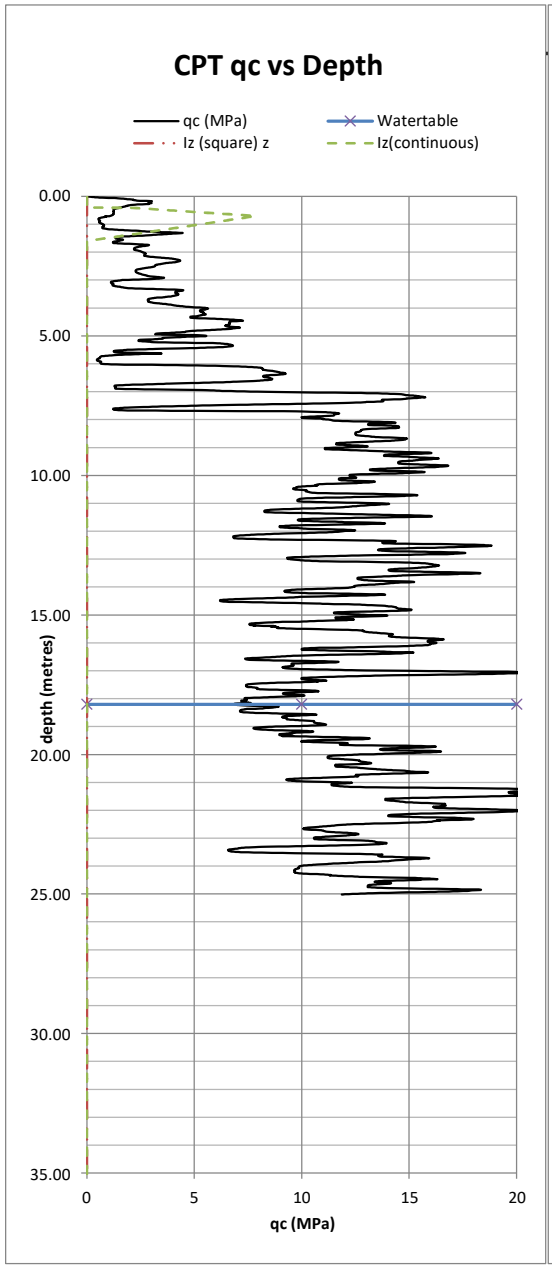
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	8.80 kN/m^2
For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$	
For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$	
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	11.20 kN/m^2
For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$	
For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$	

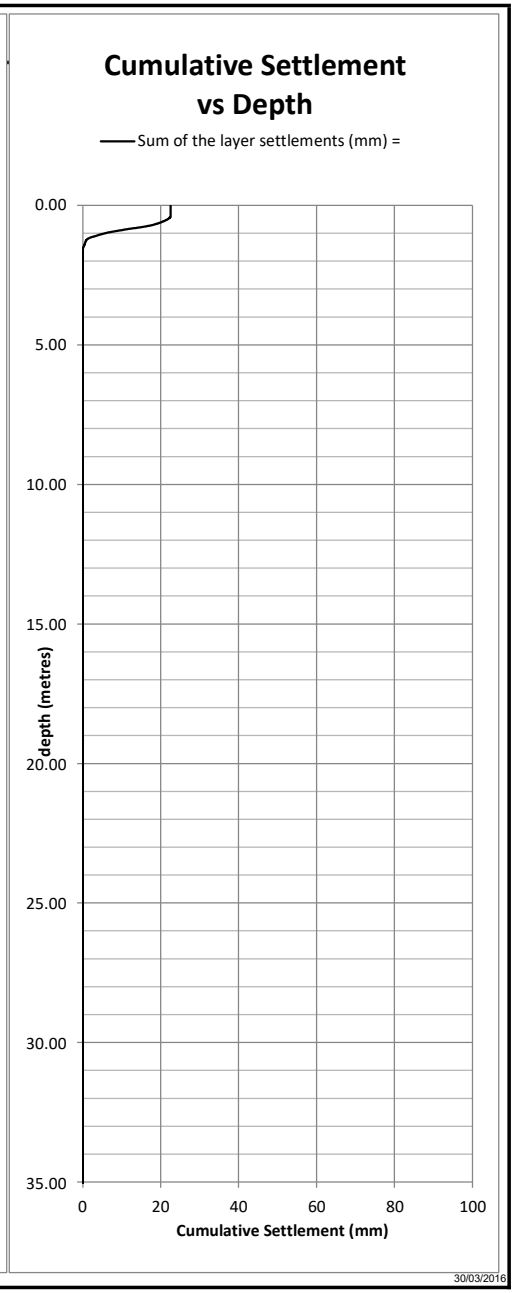
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.8261
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.7891
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	0.9658
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	-	in	-
Total settlement for CONTINUOUS =	**23 mm**	in	**50 years**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT08

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		100	kN/m^2
Depth to watertable from ground surface (h_f)		19.0	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 12 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
0.3	20.0	0.4	66.67	**CONTINUOUS**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 1.6 metres

Circular or Square Shape =	Df + 2B =	1	metres
Continuous Shape =	Df + 4B =	1.6	metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 6.40 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 11.20 kN/m^2

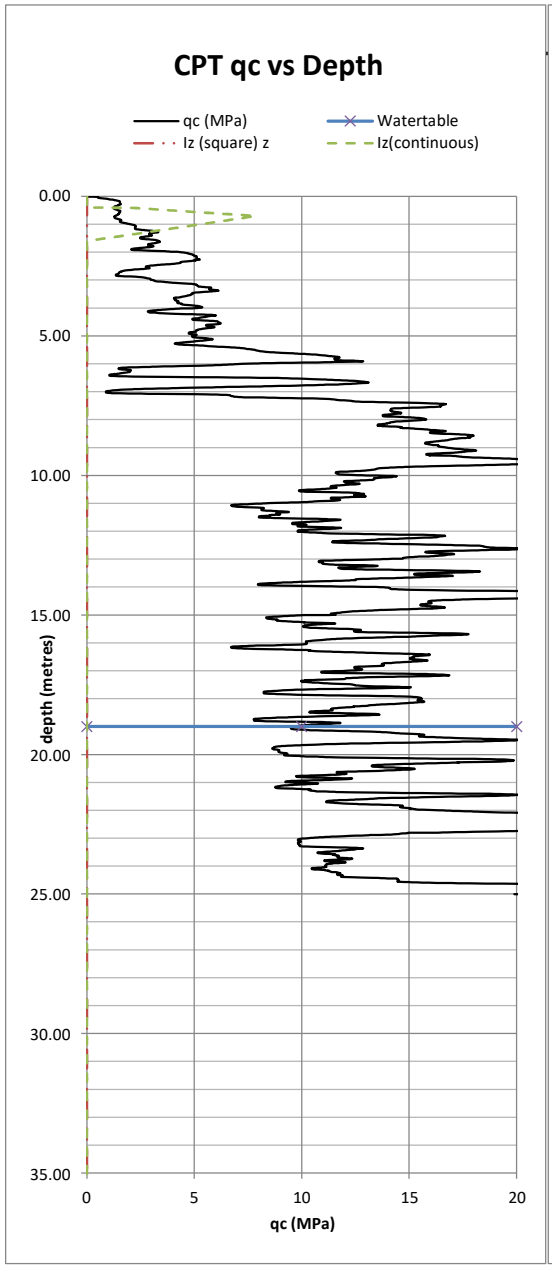
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	8.80 kN/m^2
For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$	
For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$	
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	11.20 kN/m^2
For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$	
For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$	

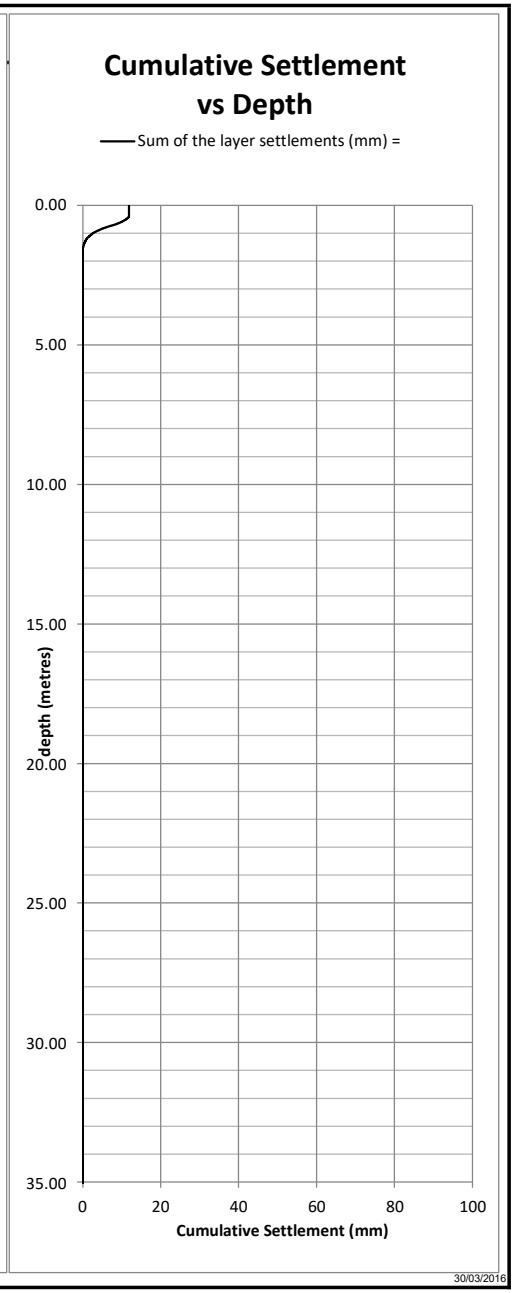
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.8261
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.7891
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	0.9658
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	**-**	**in**	**-**
Total settlement for CONTINUOUS =	**12 mm**	**in**	**50 years**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT09

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		100	kN/m^2
Depth to watertable from ground surface (h_f)		19.2	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 12 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
0.3	20.0	0.4	66.67	**CONTINUOUS**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 1.6 metres

Circular or Square Shape =	Df + 2B =	1	metres
Continuous Shape =	Df + 4B =	1.6	metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 6.40 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 11.20 kN/m^2

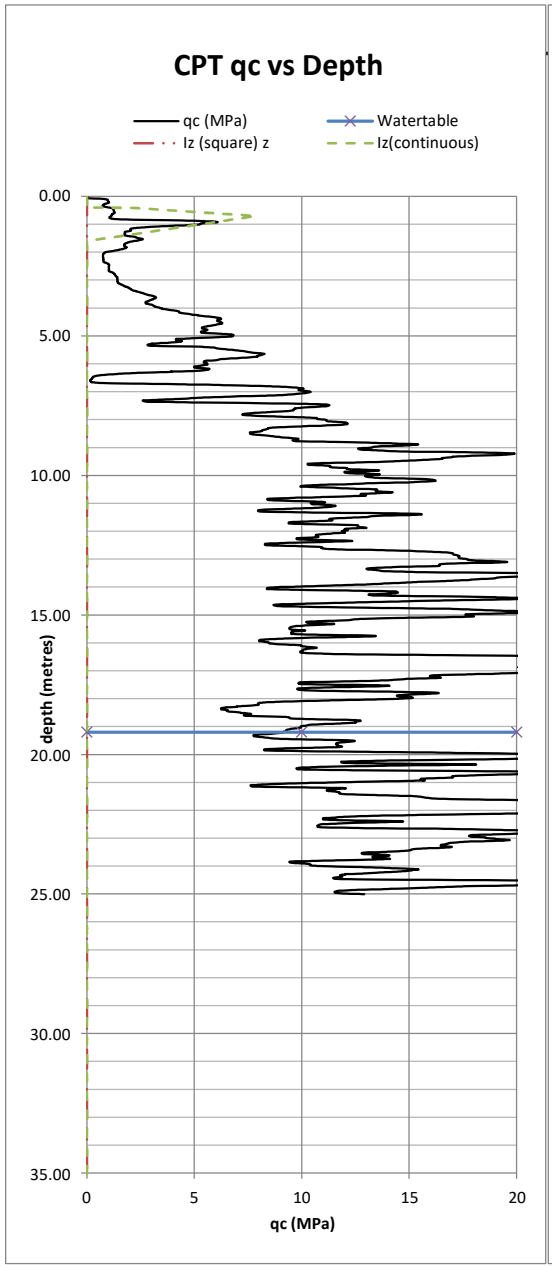
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	8.80 kN/m^2
For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$	
For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$	
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	11.20 kN/m^2
For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$	
For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$	

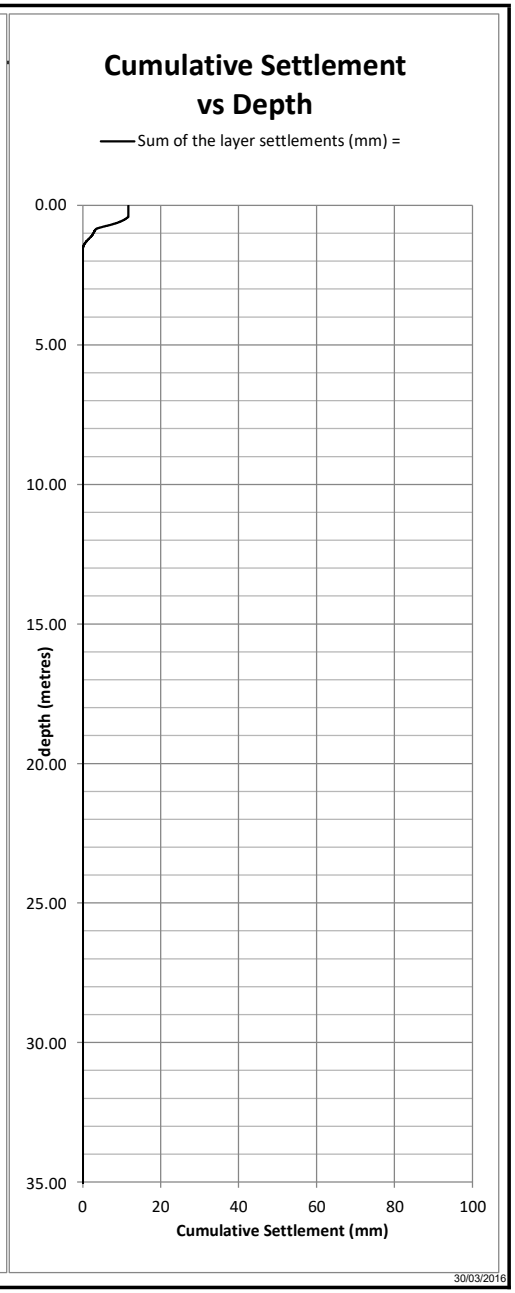
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.8261
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.7891
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	0.9658
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	-	in	-
Total settlement for CONTINUOUS =	**12 mm**	in	**50 years**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT10

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		100	kN/m^2
Depth to watertable from ground surface (h_f)		19.5	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 18 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
0.3	20.0	0.4	66.67	**CONTINUOUS**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 1.6 metres

Circular or Square Shape =	Df + 2B =	1	metres
Continuous Shape =	Df + 4B =	1.6	metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 6.40 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 11.20 kN/m^2

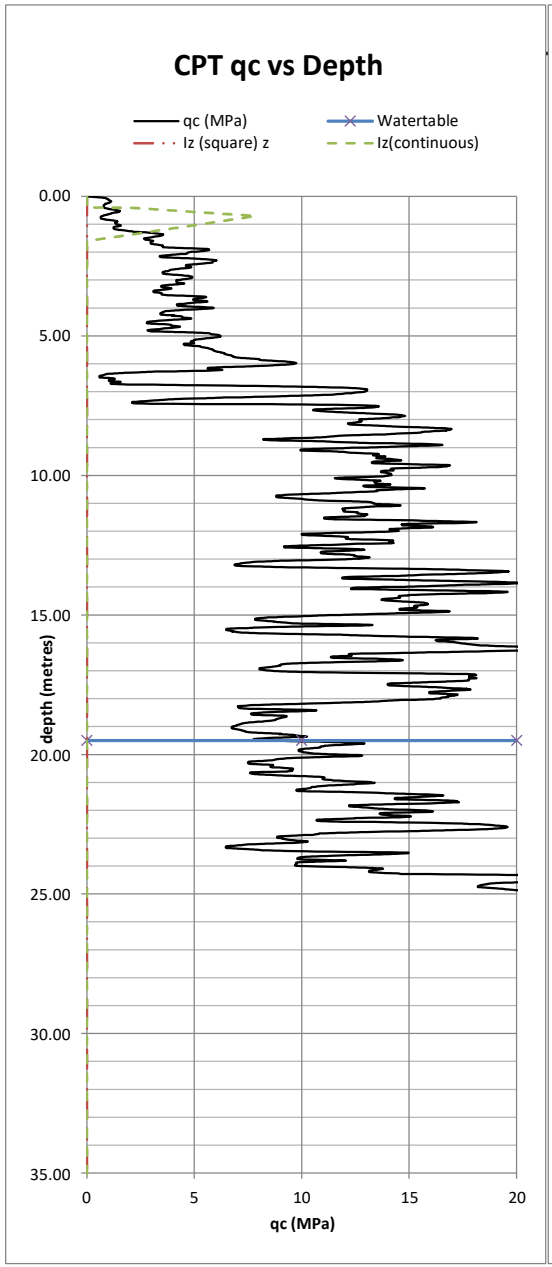
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	8.80 kN/m^2
For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$	
For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$	
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	11.20 kN/m^2
For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$	
For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$	

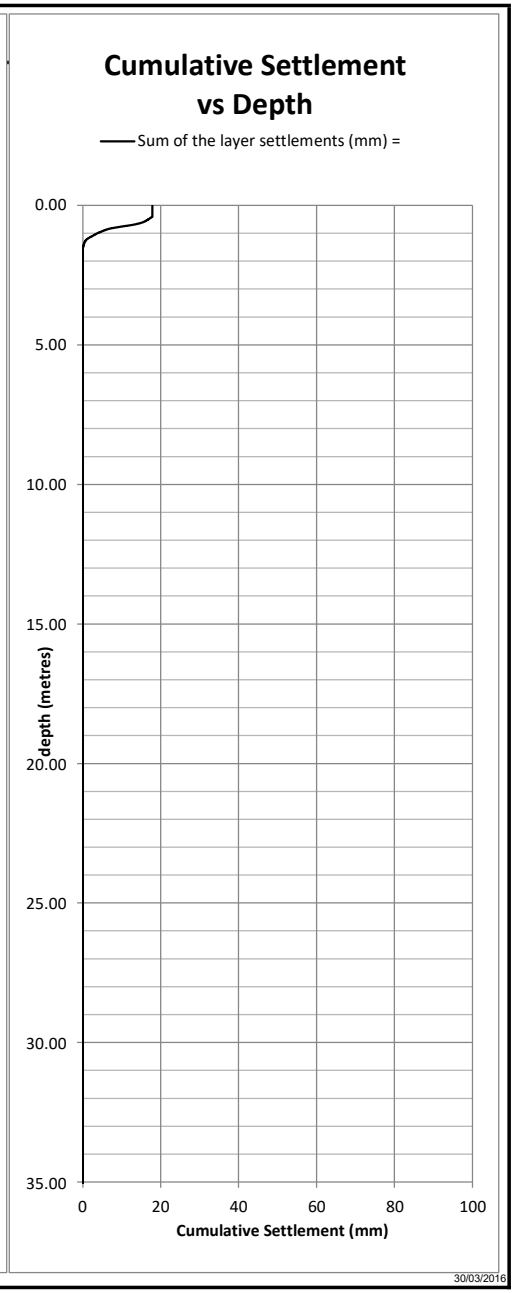
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.8261
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.7891
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	0.9658
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	**-**	**in**	**-**
Total settlement for CONTINUOUS =	**18 mm**	**in**	**50 years**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT01

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		70	kN/m^2
Depth to watertable from ground surface (h_f)		16.2	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 9 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
1.0	20.0	0.4	20.00	**CONTINUOUS**

Footing shape — if L/B = 1: Circular or Square Footing (SQU)

if L/B ≥ 10: Continuous Footings (CON)

Depth of influence = 4.4 metres

Circular or Square Shape = Df + 2B = 2.4 metres

Continuous Shape = Df + 4B = 4.4 metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 6.40 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 22.40 kN/m^2

Where, for Square or Circular Shaped Footing $\sigma'_{zp(squ)}$ = 14.40 kN/m^2

For $h_f < D_f + B/2$: $\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$

For $h_f > D_f + B/2$: $\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$

Where, for Continuous Shape Footing $\sigma'_{zp(con)}$ = 22.40 kN/m^2

For $h_f < D_f + B$: $\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$

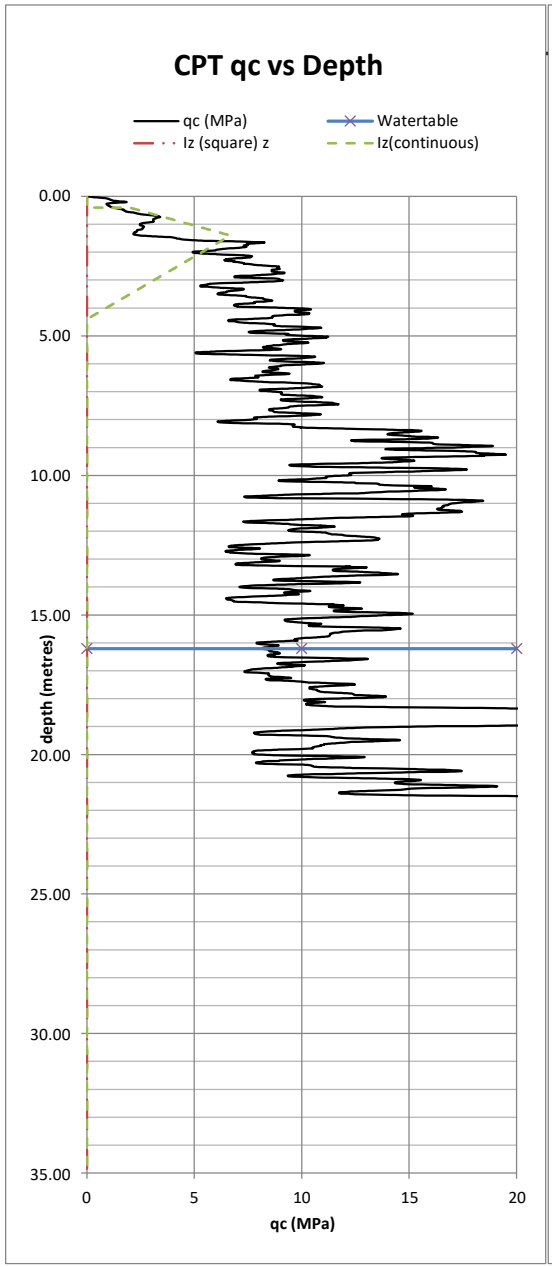
For $h_f > D_f + B$: $\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$

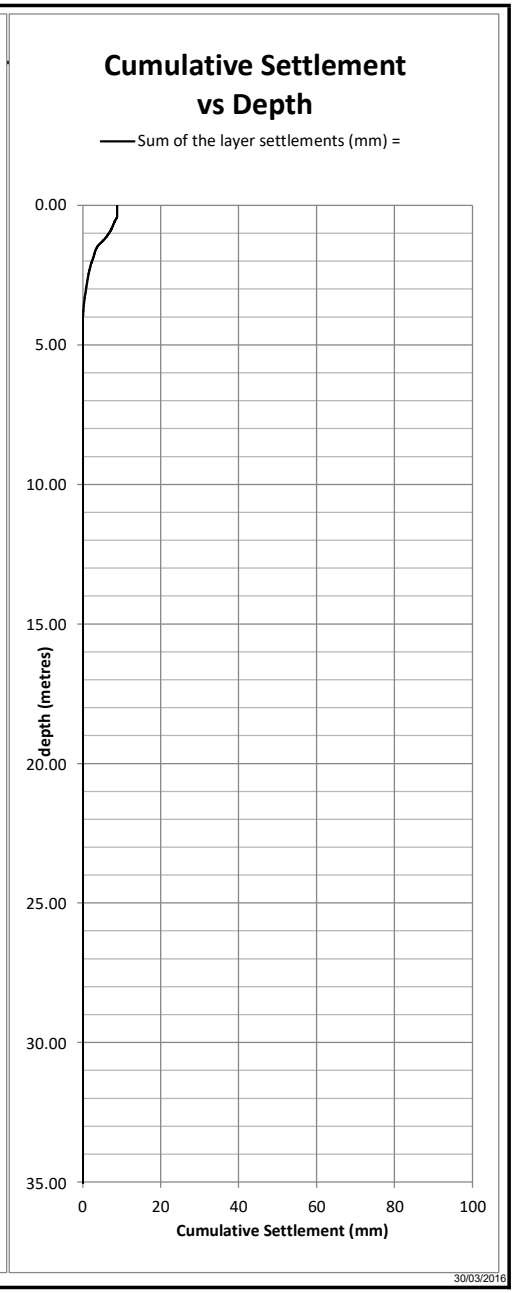
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.7102
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.6685
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	0.9497
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	-	in	-
Total settlement for CONTINUOUS =	**9 mm**	in	**50 years**





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Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT02

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		70	kN/m^2
Depth to watertable from ground surface (h_f)		12.2	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 11 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
1.0	20.0	0.4	20.00	**CONTINUOUS**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 4.4 metres

Circular or Square Shape =	Df + 2B =	2.4	metres
Continuous Shape =	Df + 4B =	4.4	metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 6.40 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 22.40 kN/m^2

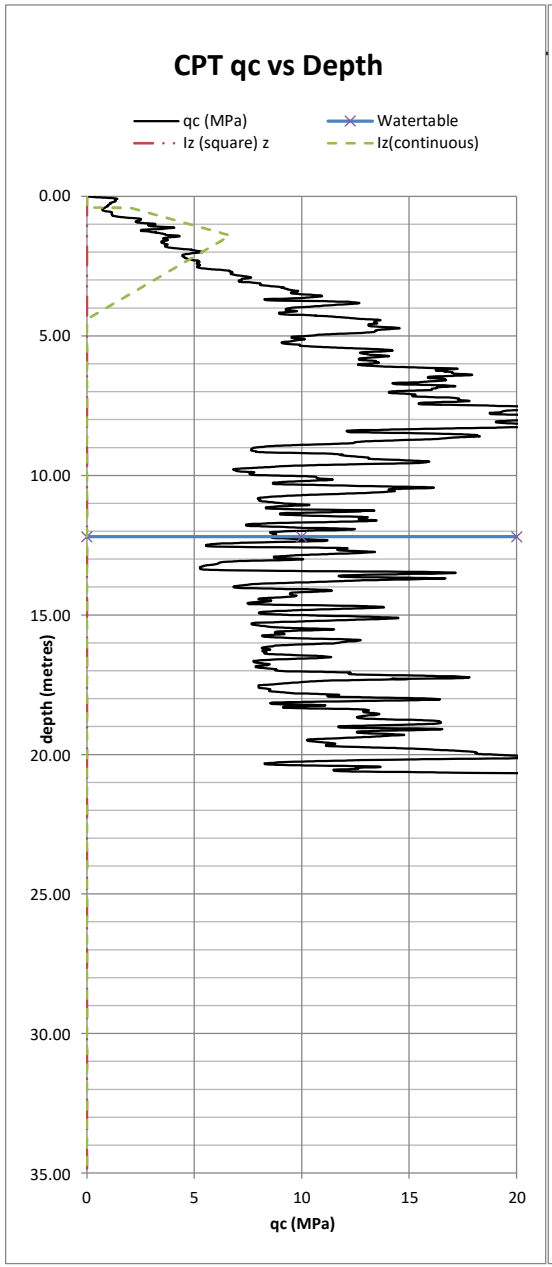
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	14.40 kN/m^2
For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$	
For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$	
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	22.40 kN/m^2
For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$	
For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$	

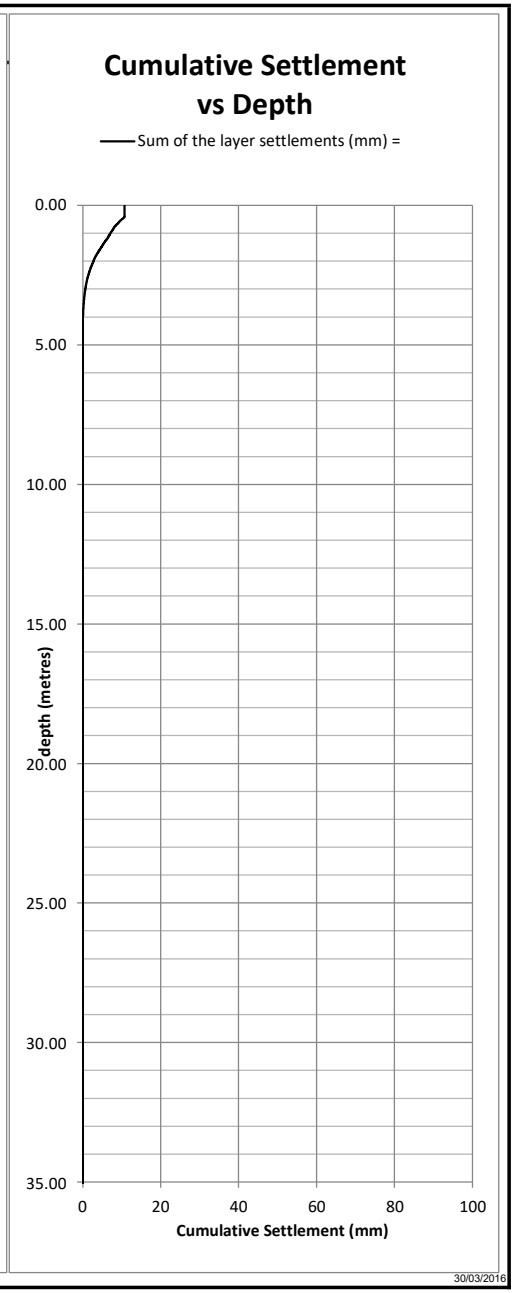
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.7102
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.6685
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	0.9497
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	-	in	-
Total settlement for CONTINUOUS =	**11 mm**	in	**50 years**





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Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT03

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		70	kN/m^2
Depth to watertable from ground surface (h_f)		14.8	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 20 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
1.0	20.0	0.4	20.00	**CONTINUOUS**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 4.4 metres

Circular or Square Shape =	Df + 2B =	2.4	metres
Continuous Shape =	Df + 4B =	4.4	metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 6.40 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 22.40 kN/m^2

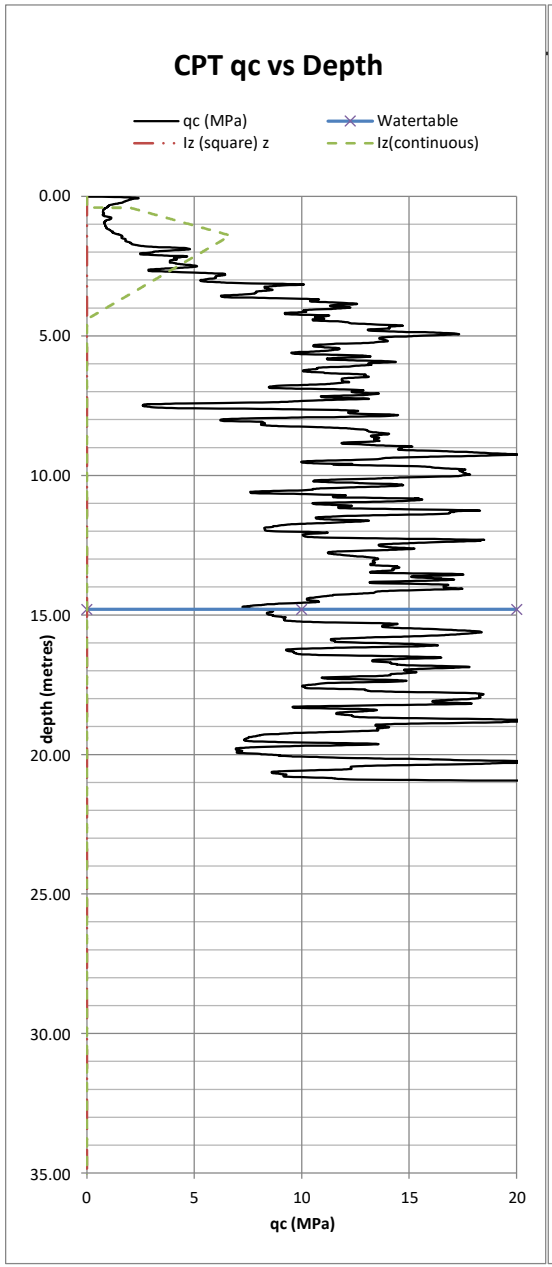
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	14.40 kN/m^2
For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$	
For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$	
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	22.40 kN/m^2
For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$	
For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$	

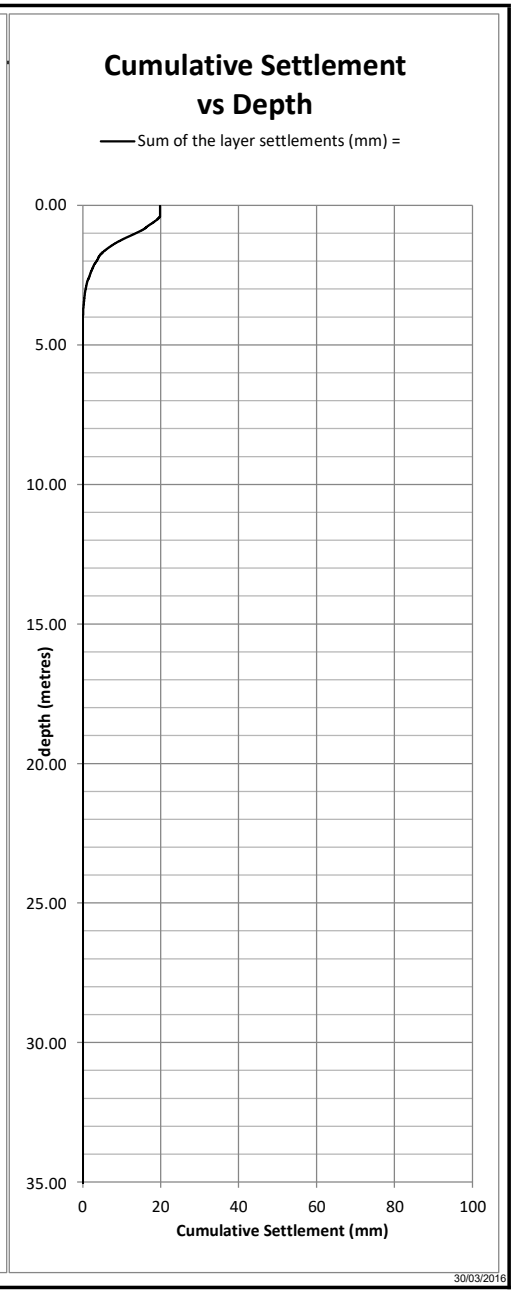
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.7102
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.6685
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	0.9497
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	-	**in**	-
Total settlement for CONTINUOUS =	**20 mm**	**in**	**50 years**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT04

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		70	kN/m^2
Depth to watertable from ground surface (h_f)		13.5	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 12 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
1.0	20.0	0.4	20.00	**CONTINUOUS**

Footing shape — if L/B = 1: Circular or Square Footing (SQU)

if L/B ≥ 10: Continuous Footings (CON)

Depth of influence = 4.4 metres

Circular or Square Shape = Df + 2B = 2.4 metres

Continuous Shape = Df + 4B = 4.4 metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 6.40 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 22.40 kN/m^2

Where, for Square or Circular Shaped Footing $\sigma'_{zp(squ)}$ = 14.40 kN/m^2

For $h_f < D_f + B/2$: $\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$

For $h_f > D_f + B/2$: $\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$

Where, for Continuous Shape Footing $\sigma'_{zp(con)}$ = 22.40 kN/m^2

For $h_f < D_f + B$: $\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$

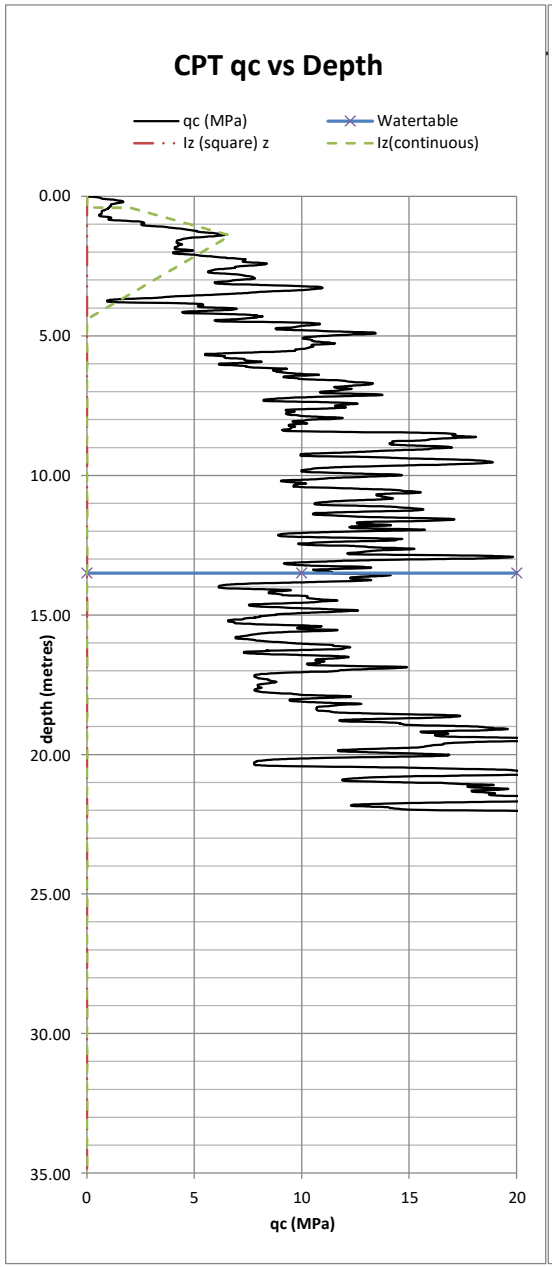
For $h_f > D_f + B$: $\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$

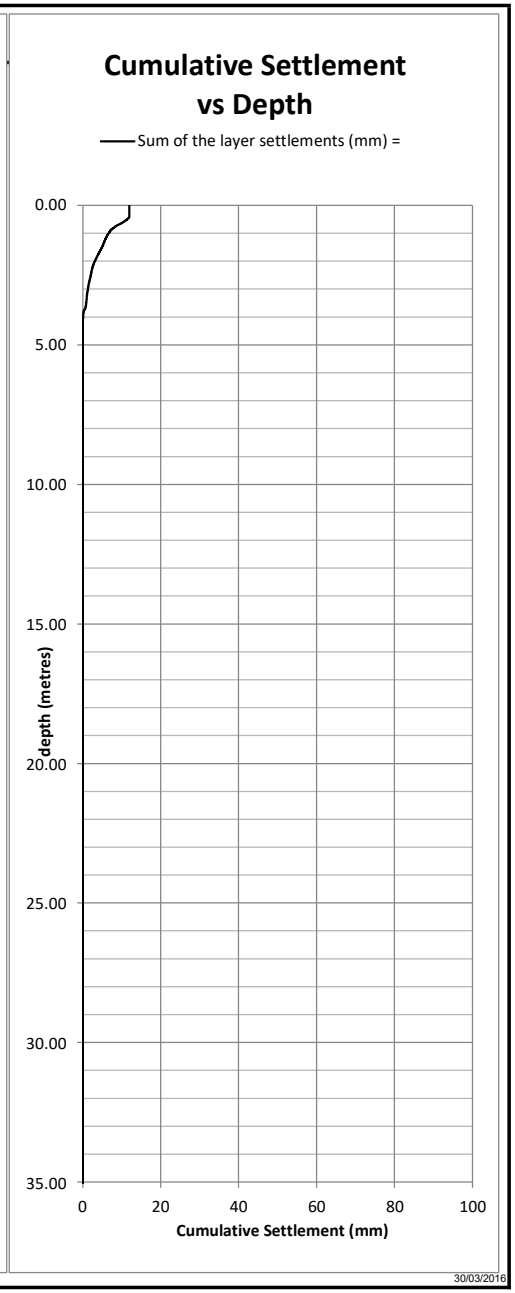
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.7102
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.6685
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	0.9497
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	-	in	-
Total settlement for CONTINUOUS =	**12 mm**	in	**50 years**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT05

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		70	kN/m^2
Depth to watertable from ground surface (h_f)		13.2	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 18 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
1.0	20.0	0.4	20.00	**CONTINUOUS**

Footing shape — if L/B = 1: Circular or Square Footing (SQU)

if L/B ≥ 10: Continuous Footings (CON)

Depth of influence = 4.4 metres

Circular or Square Shape = Df + 2B = 2.4 metres

Continuous Shape = Df + 4B = 4.4 metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 6.40 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 22.40 kN/m^2

Where, for Square or Circular Shaped Footing $\sigma'_{zp(squ)}$ = 14.40 kN/m^2

For $h_f < D_f + B/2$: $\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$

For $h_f > D_f + B/2$: $\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$

Where, for Continuous Shape Footing $\sigma'_{zp(con)}$ = 22.40 kN/m^2

For $h_f < D_f + B$: $\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$

For $h_f > D_f + B$: $\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$

Peak strain influence factor (I_{zp})

$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ = 0.7102

$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ = 0.6685

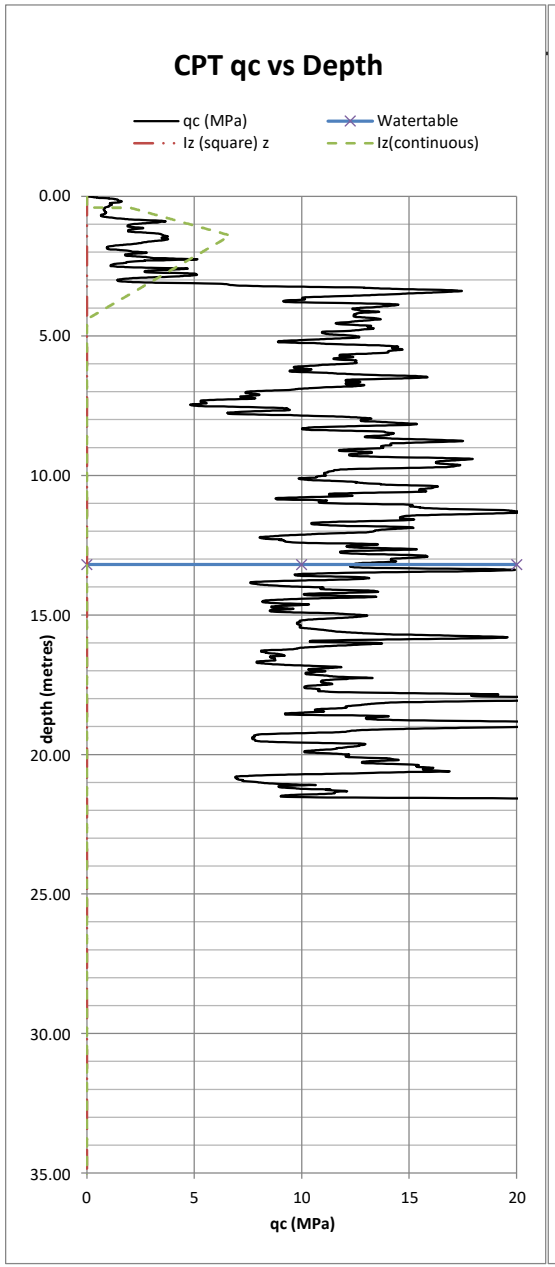
Depth factor (C1) $C1 = 1 - 0.5 (\sigma'_{vo} / q')$ = 0.9497

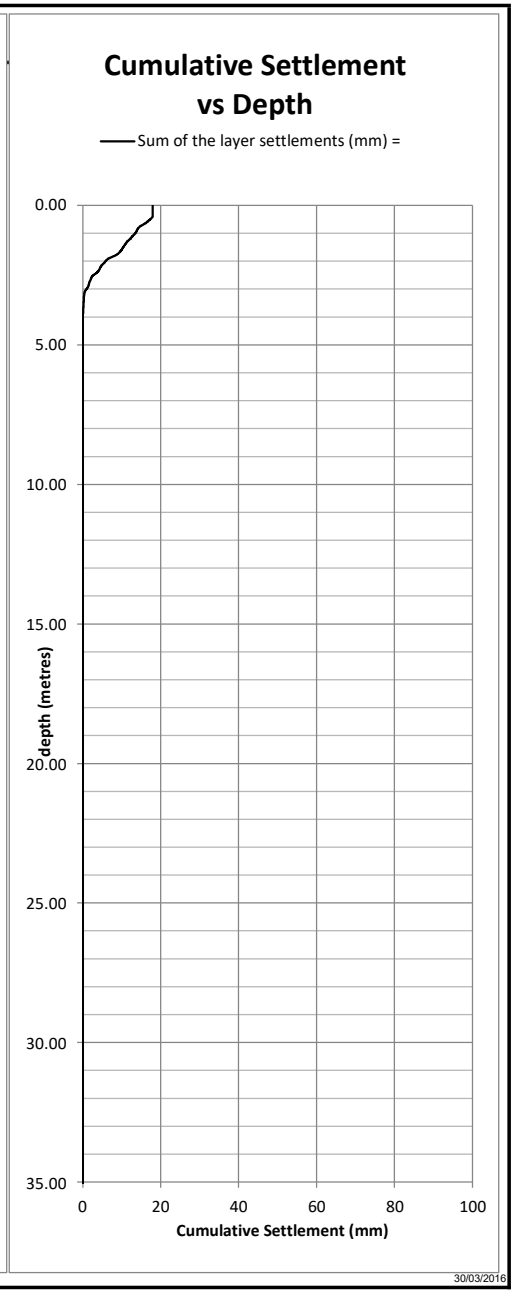
Secondary creep factor (C2) $C2 = 1 + 0.2 \log_{10} (t / 0.1)$ = 1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	**-**	**in**	**-**
Total settlement for CONTINUOUS =	**18 mm**	**in**	**50 years**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT06

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		70	kN/m^2
Depth to watertable from ground surface (h_f)		14.9	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 15 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
1.0	20.0	0.4	20.00	**CONTINUOUS**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 4.4 metres

Circular or Square Shape =	Df + 2B =	2.4 metres
Continuous Shape =	Df + 4B =	4.4 metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 6.40 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 22.40 kN/m^2

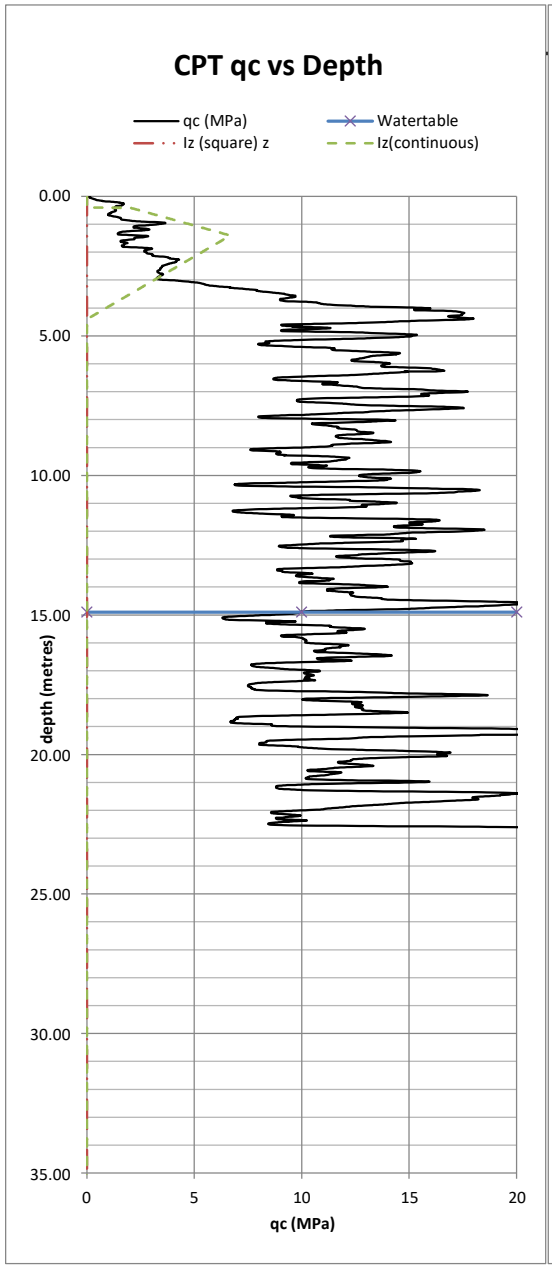
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	14.40 kN/m^2
For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$	
For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$	
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	22.40 kN/m^2
For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$	
For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$	

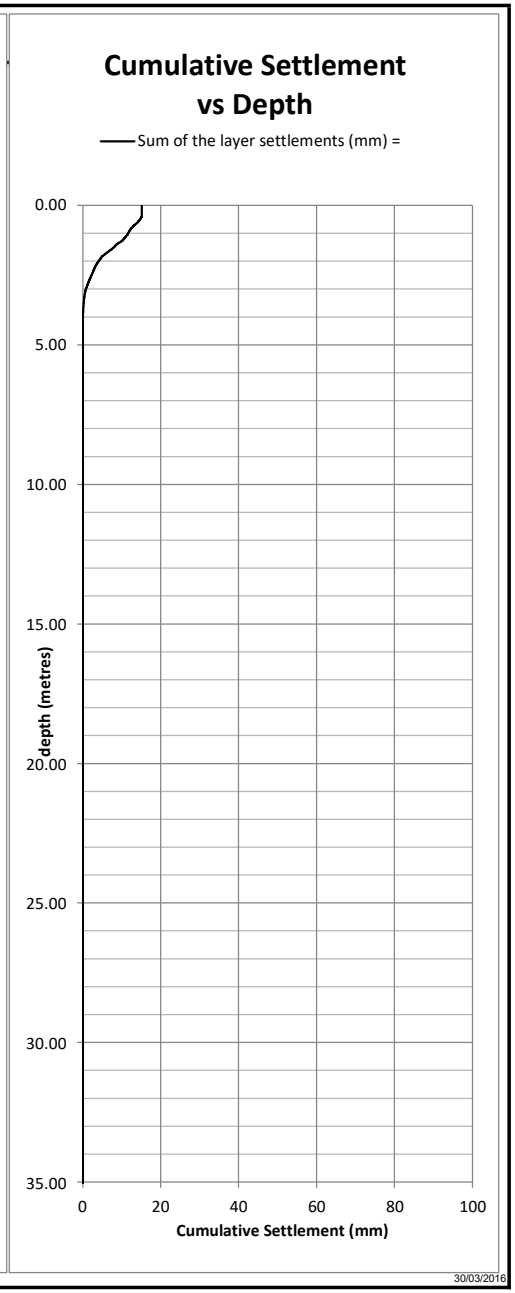
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.7102
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.6685
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	0.9497
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	-	in	-
Total settlement for CONTINUOUS =	**15 mm**	in	**50 years**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT07

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		70	kN/m^2
Depth to watertable from ground surface (h_f)		18.2	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 23 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
1.0	20.0	0.4	20.00	**CONTINUOUS**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 4.4 metres

Circular or Square Shape =	Df + 2B =	2.4	metres
Continuous Shape =	Df + 4B =	4.4	metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 6.40 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 22.40 kN/m^2

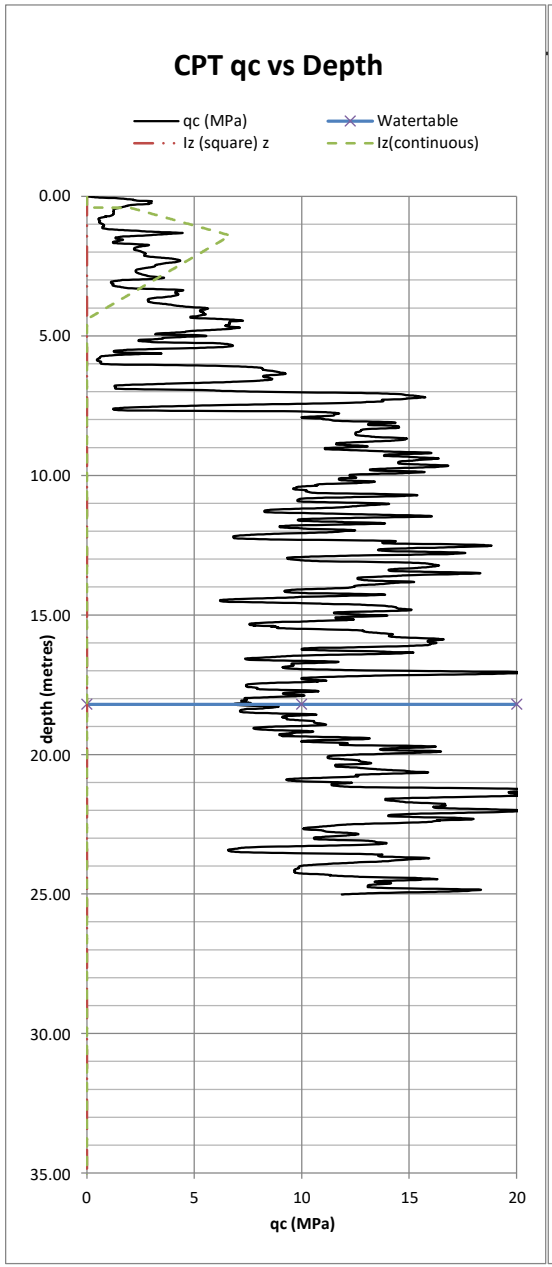
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	14.40	kN/m^2
For h_f < D_f + B/2	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$		
For h_f > D_f + B/2	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$		
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	22.40	kN/m^2
For h_f < D_f + B	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$		
For h_f > D_f + B	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$		

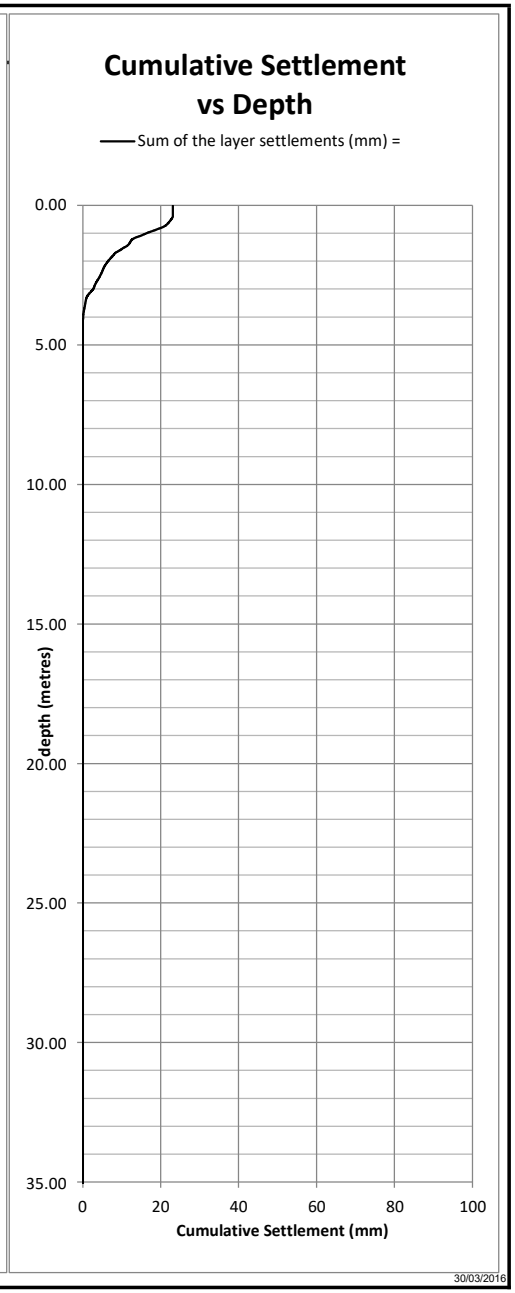
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.7102
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.6685
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	0.9497
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	-	in	-
Total settlement for CONTINUOUS =	**23 mm**	in	**50 years**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT08

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		70	kN/m^2
Depth to watertable from ground surface (h_f)		19.0	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 15 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
1.0	20.0	0.4	20.00	**CONTINUOUS**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 4.4 metres

Circular or Square Shape =	Df + 2B =	2.4	metres
Continuous Shape =	Df + 4B =	4.4	metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 6.40 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 22.40 kN/m^2

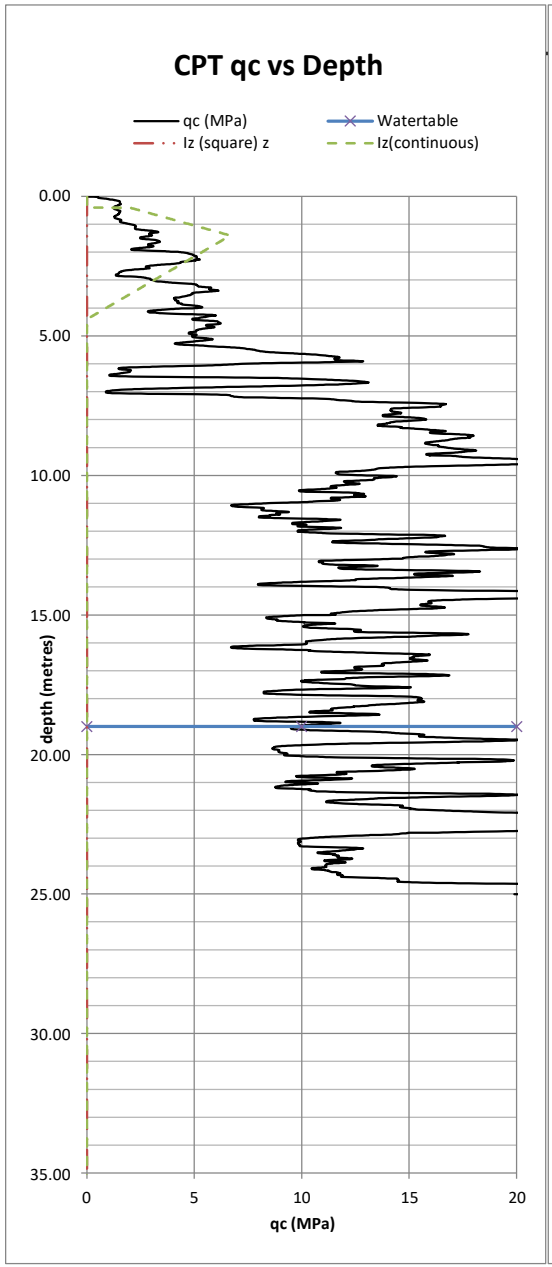
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	14.40	kN/m^2
For h_f < D_f + B/2	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$		
For h_f > D_f + B/2	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$		
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	22.40	kN/m^2
For h_f < D_f + B	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$		
For h_f > D_f + B	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$		

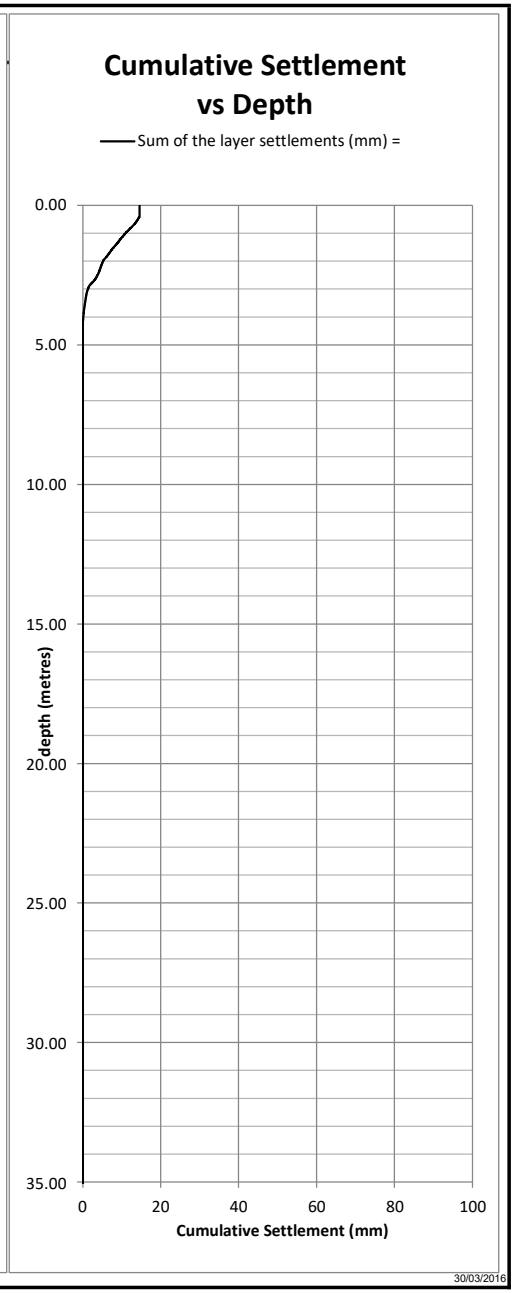
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.7102
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.6685
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	0.9497
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	**-**	**in**	**-**
Total settlement for CONTINUOUS =	**15 mm**	**in**	**50 years**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT09

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		70	kN/m^2
Depth to watertable from ground surface (h_f)		19.2	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 26 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
1.0	20.0	0.4	20.00	**CONTINUOUS**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 4.4 metres

Circular or Square Shape =	Df + 2B =	2.4	metres
Continuous Shape =	Df + 4B =	4.4	metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 6.40 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 22.40 kN/m^2

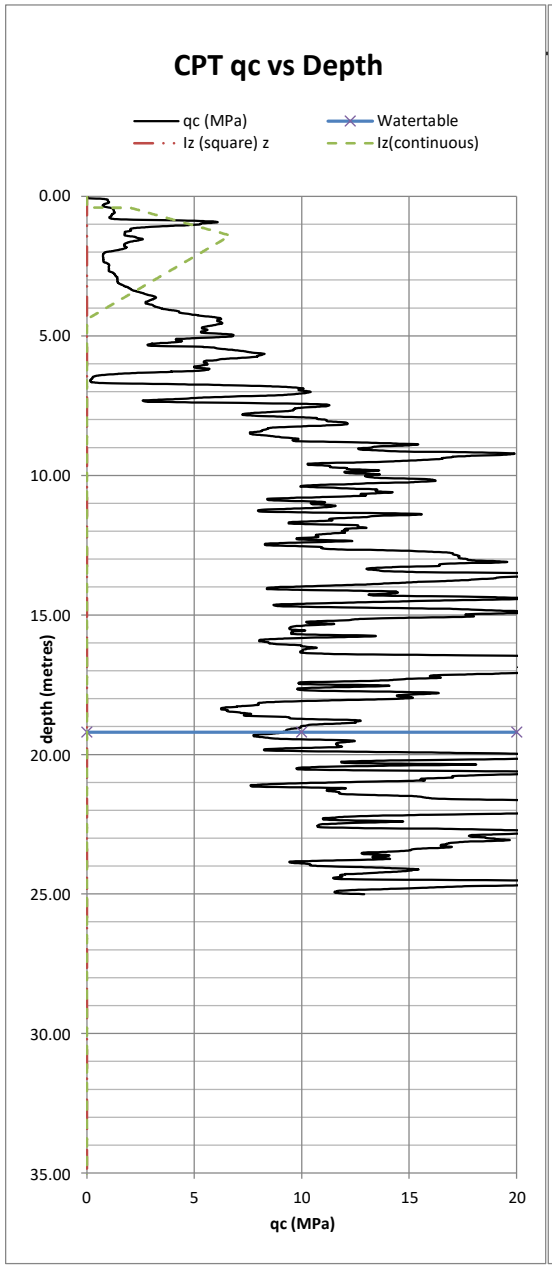
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	14.40	kN/m^2
For h_f < D_f + B/2	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$		
For h_f > D_f + B/2	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$		
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	22.40	kN/m^2
For h_f < D_f + B	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$		
For h_f > D_f + B	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$		

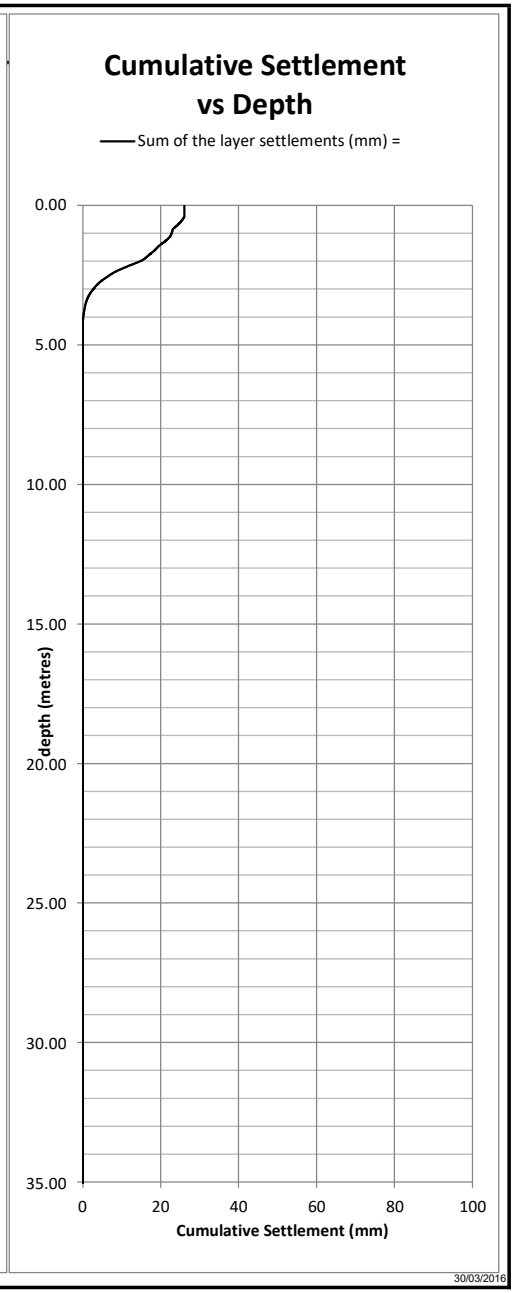
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.7102
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.6685
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	0.9497
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	**-**	**in**	**-**
Total settlement for CONTINUOUS =	**26 mm**	**in**	**50 years**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT10

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		70	kN/m^2
Depth to watertable from ground surface (h_f)		19.5	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 15 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
1.0	20.0	0.4	20.00	**CONTINUOUS**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 4.4 metres

Circular or Square Shape = Df + 2B = 2.4 metres

Continuous Shape = Df + 4B = 4.4 metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 6.40 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 22.40 kN/m^2

Where, for Square or Circular Shaped Footing $\sigma'_{zp(squ)}$ = 14.40 kN/m^2

For $h_f < D_f + B/2$: $\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$

For $h_f > D_f + B/2$: $\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$

Where, for Continuous Shape Footing $\sigma'_{zp(con)}$ = 22.40 kN/m^2

For $h_f < D_f + B$: $\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$

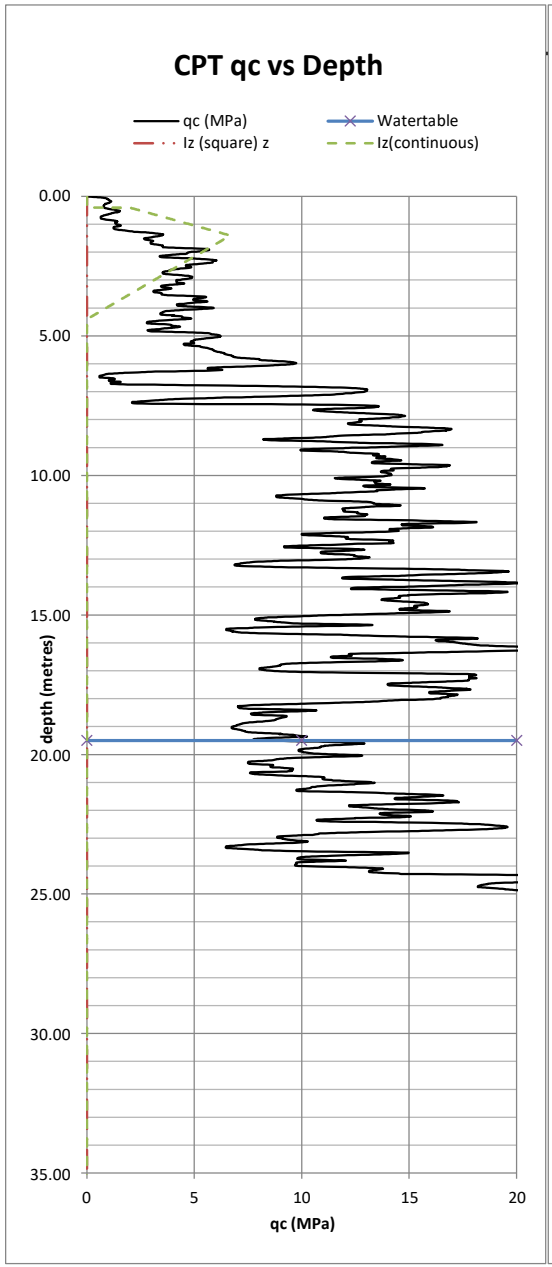
For $h_f > D_f + B$: $\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$

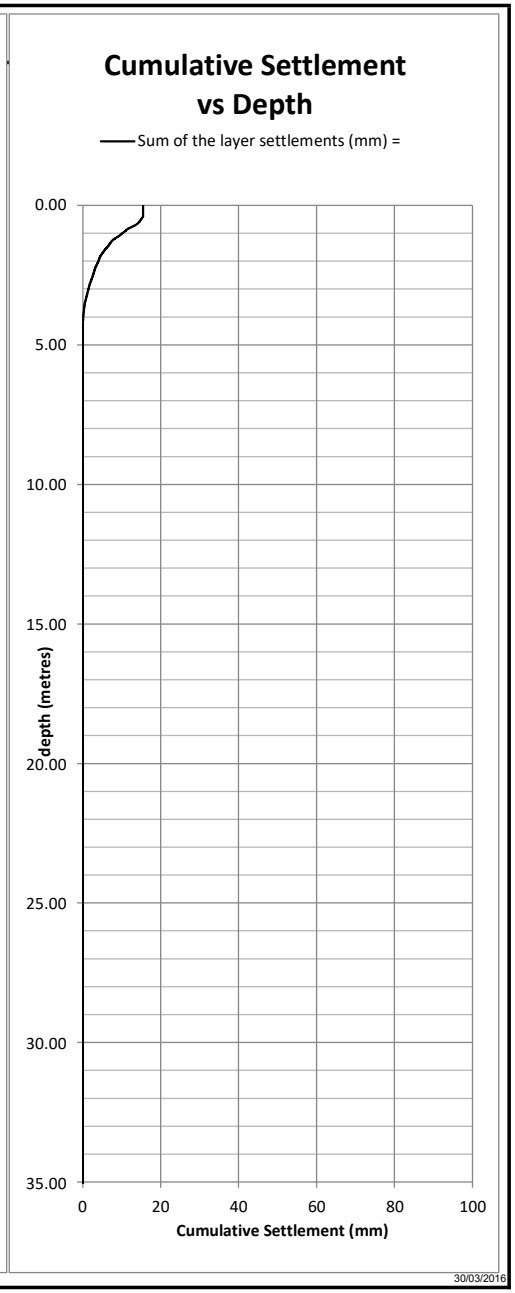
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.7102
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.6685
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	0.9497
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	-	in	-
Total settlement for CONTINUOUS =	**15 mm**	in	**50 years**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT01

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		100	kN/m^2
Depth to watertable from ground surface (h_f)		16.2	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 14 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
1.0	20.0	0.4	20.00	**CONTINUOUS**

Footing shape — if L/B = 1: Circular or Square Footing (SQU); if L/B ≥ 10: Continuous Footings (CON)

Depth of influence = 4.4 metres

Circular or Square Shape = Df + 2B = 2.4 metres

Continuous Shape = Df + 4B = 4.4 metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 6.40 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 22.40 kN/m^2

Where, for Square or Circular Shaped Footing $\sigma'_{zp(squ)}$ = 14.40 kN/m^2

For $h_f < D_f + B/2$: $\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$

For $h_f > D_f + B/2$: $\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$

Where, for Continuous Shape Footing $\sigma'_{zp(con)}$ = 22.40 kN/m^2

For $h_f < D_f + B$: $\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$

For $h_f > D_f + B$: $\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$

Peak strain influence factor (I_{zp})

$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ = 0.7550

$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ = 0.7044

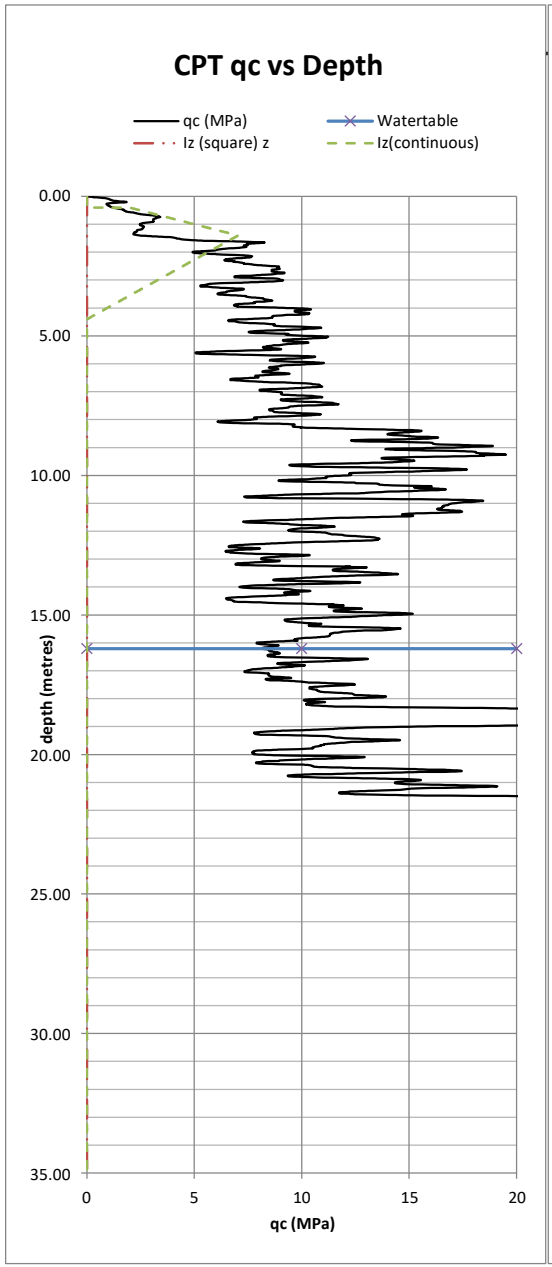
Depth factor (C1) $C1 = 1 - 0.5 (\sigma'_{vo} / q')$ = 0.9658

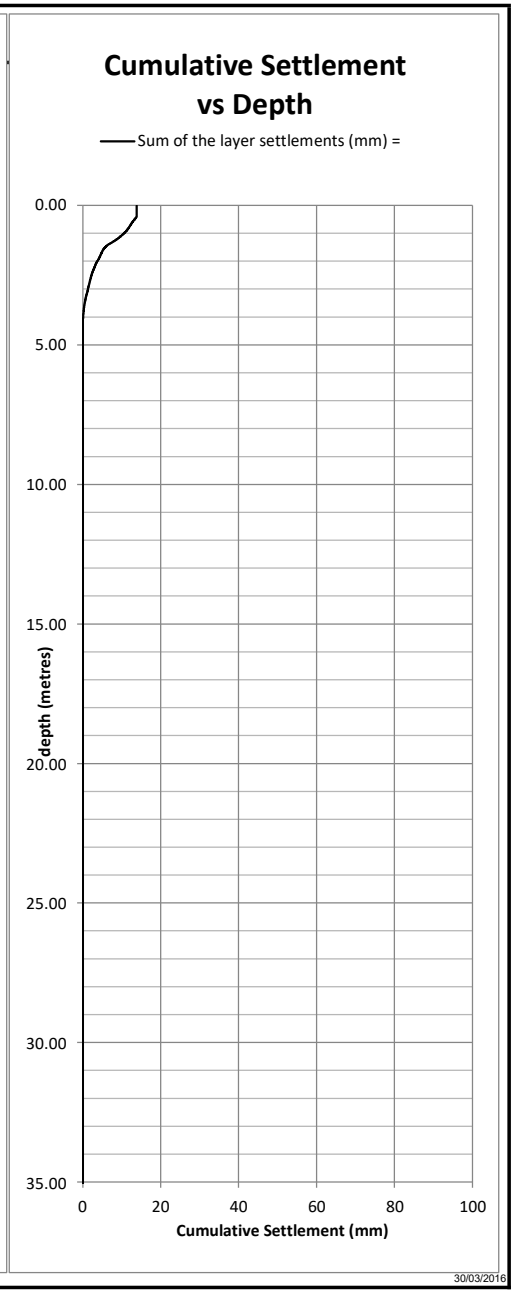
Secondary creep factor (C2) $C2 = 1 + 0.2 \log_{10} (t / 0.1)$ = 1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	-	in	-
Total settlement for CONTINUOUS =	**14 mm**	in	**50 years**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT02

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		100	kN/m^2
Depth to watertable from ground surface (h_f)		12.2	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 17 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
1.0	20.0	0.4	20.00	**CONTINUOUS**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 4.4 metres

Circular or Square Shape =	Df + 2B =	2.4	metres
Continuous Shape =	Df + 4B =	4.4	metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 6.40 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 22.40 kN/m^2

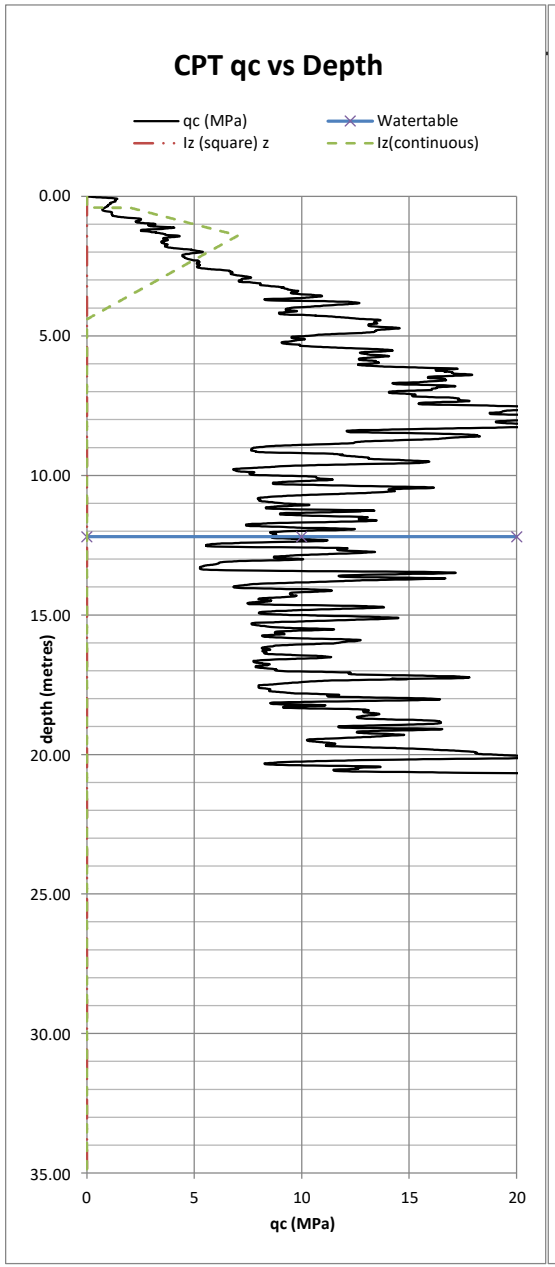
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	14.40	kN/m^2
For h_f < D_f + B/2	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$		
For h_f > D_f + B/2	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$		
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	22.40	kN/m^2
For h_f < D_f + B	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$		
For h_f > D_f + B	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$		

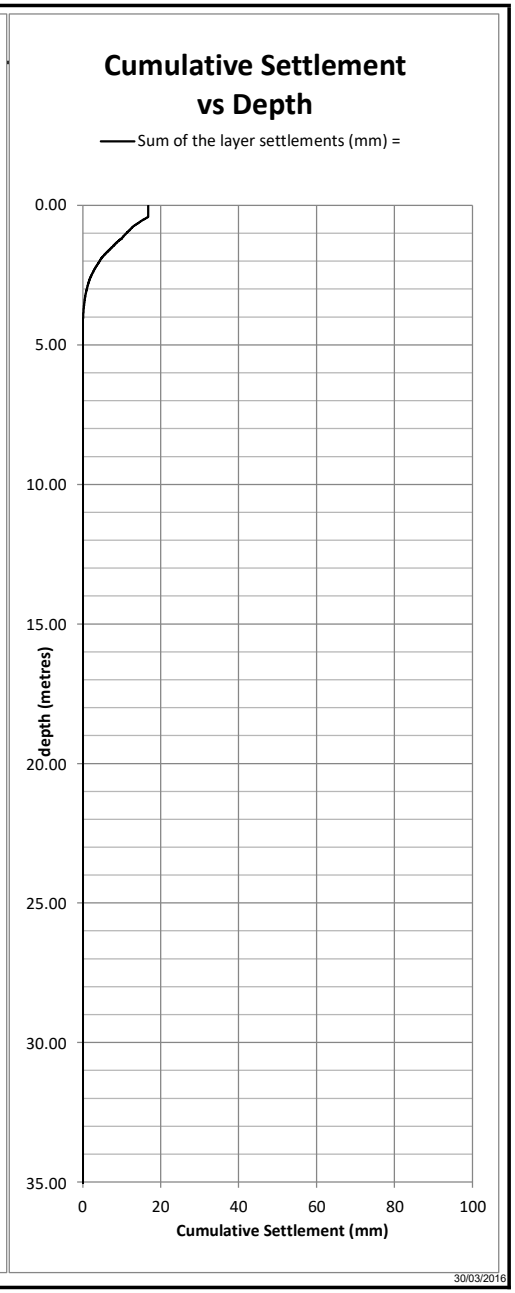
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.7550
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.7044
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	0.9658
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	**-**	**in**	**-**
Total settlement for CONTINUOUS =	**17 mm**	**in**	**50 years**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT03

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		100	kN/m^2
Depth to watertable from ground surface (h_f)		14.8	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 31 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
1.0	20.0	0.4	20.00	**CONTINUOUS**

Footing shape: if L/B = 1 — Circular or Square Footing (SQU)

if L/B ≥ 10 — Continuous Footings (CON)

Depth of influence = 4.4 metres

Circular or Square Shape = Df + 2B = 2.4 metres

Continuous Shape = Df + 4B = 4.4 metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 6.40 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 22.40 kN/m^2

Where, for Square or Circular Shaped Footing $\sigma'_{zp(squ)}$ = 14.40 kN/m^2

For $h_f < D_f + B/2$: $\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$

For $h_f > D_f + B/2$: $\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$

Where, for Continuous Shape Footing $\sigma'_{zp(con)}$ = 22.40 kN/m^2

For $h_f < D_f + B$: $\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$

For $h_f > D_f + B$: $\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$

Peak strain influence factor (I_{zp})

$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ = 0.7550

$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ = 0.7044

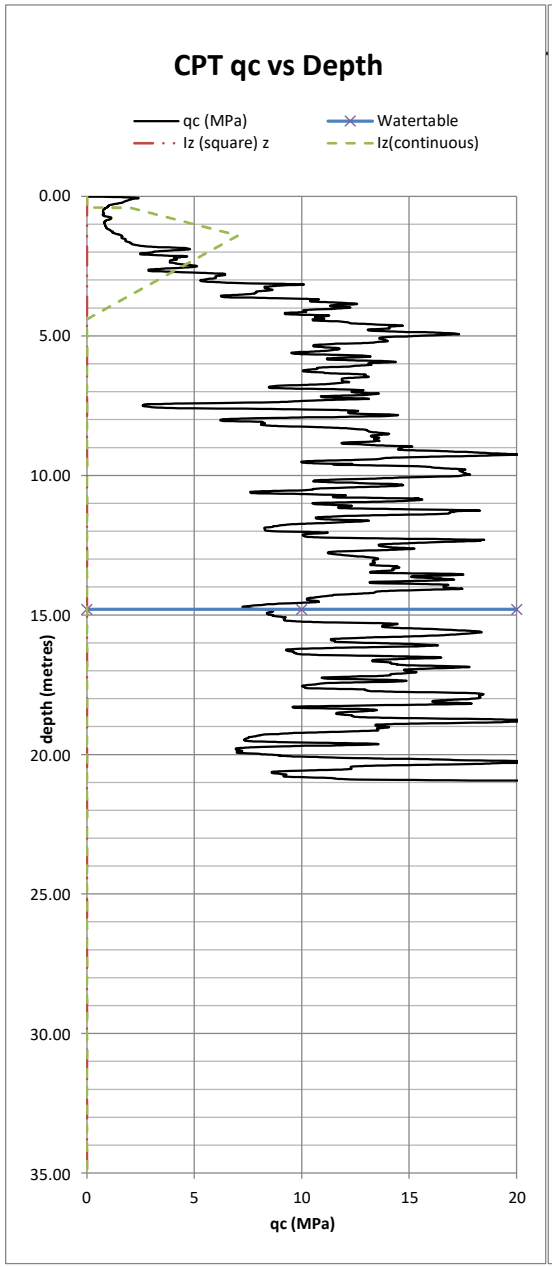
Depth factor (C1) $C1 = 1 - 0.5 (\sigma'_{vo} / q')$ = 0.9658

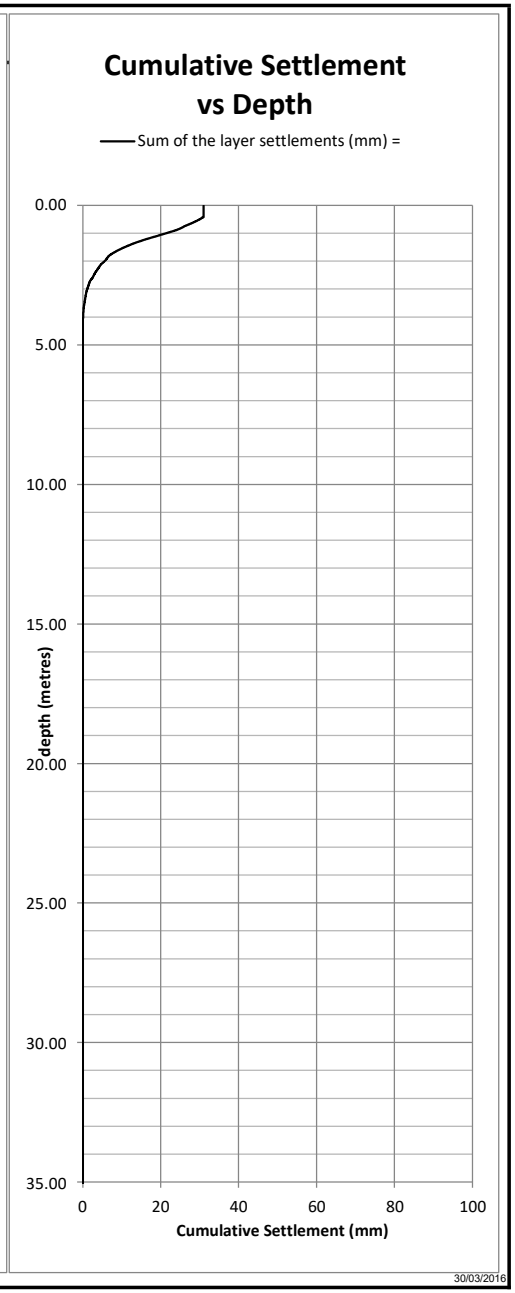
Secondary creep factor (C2) $C2 = 1 + 0.2 \log_{10} (t / 0.1)$ = 1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	-	in	-
Total settlement for CONTINUOUS =	**31 mm**	in	**50 years**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT04

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		100	kN/m^2
Depth to watertable from ground surface (h_f)		13.5	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 19 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
1.0	20.0	0.4	20.00	**CONTINUOUS**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 4.4 metres

Circular or Square Shape =	Df + 2B =	2.4	metres
Continuous Shape =	Df + 4B =	4.4	metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 6.40 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 22.40 kN/m^2

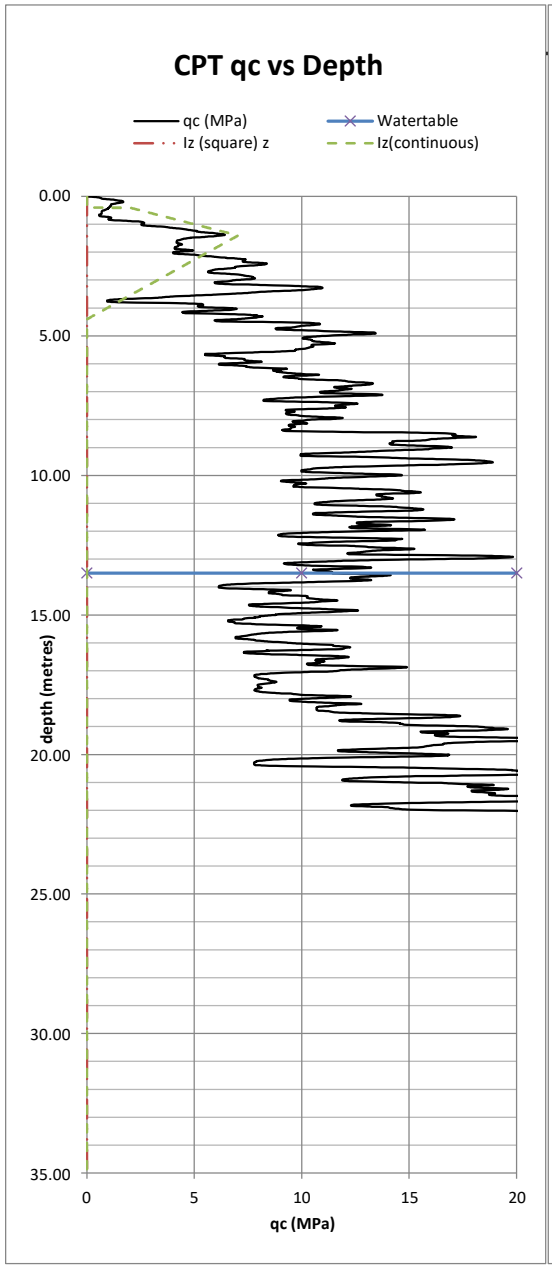
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	14.40	kN/m^2
For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$		
For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$		
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	22.40	kN/m^2
For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$		
For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$		

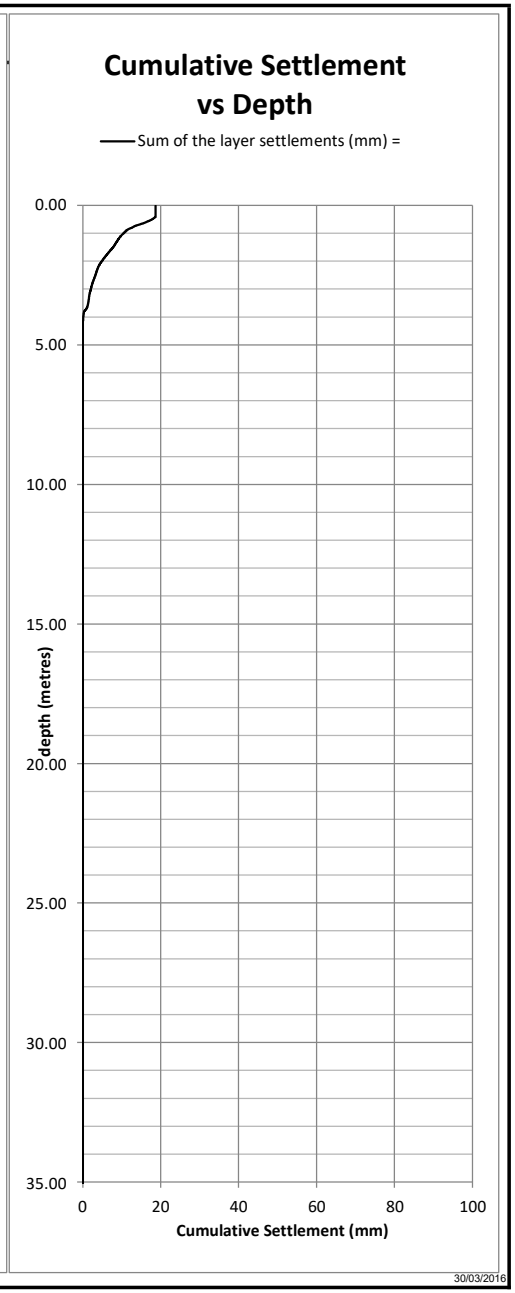
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.7550
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.7044
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	0.9658
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	-	**in**	-
Total settlement for CONTINUOUS =	**19 mm**	**in**	**50 years**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT05

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		100	kN/m^2
Depth to watertable from ground surface (h_f)		13.2	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 28 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
1.0	20.0	0.4	20.00	**CONTINUOUS**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 4.4 metres

Circular or Square Shape =	Df + 2B =	2.4	metres
Continuous Shape =	Df + 4B =	4.4	metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 6.40 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 22.40 kN/m^2

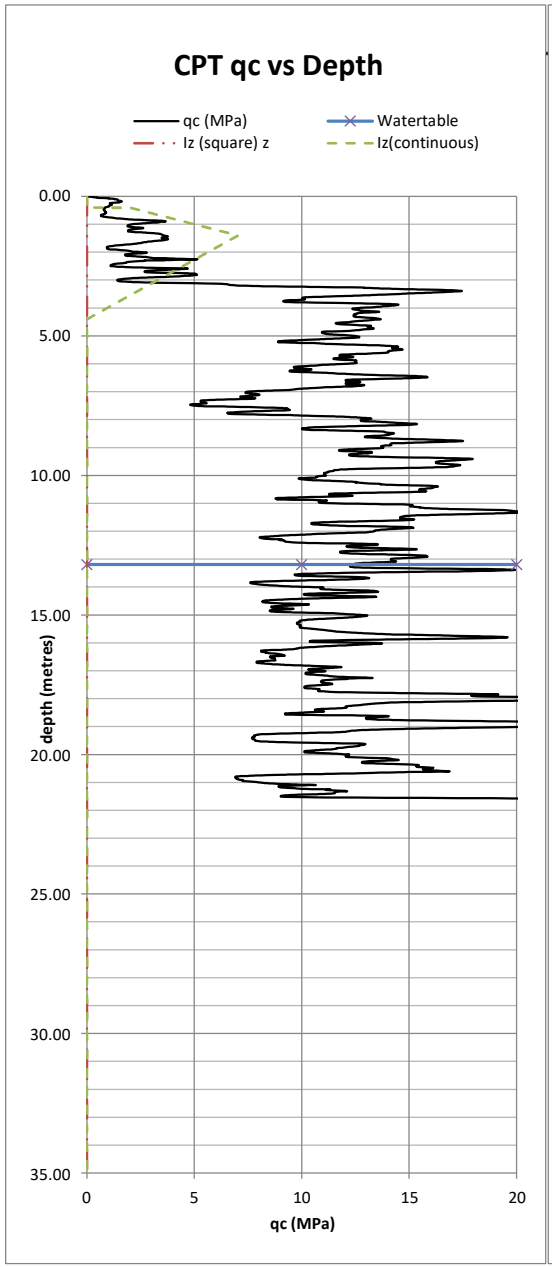
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	14.40	kN/m^2
For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$		
For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$		
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	22.40	kN/m^2
For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$		
For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$		

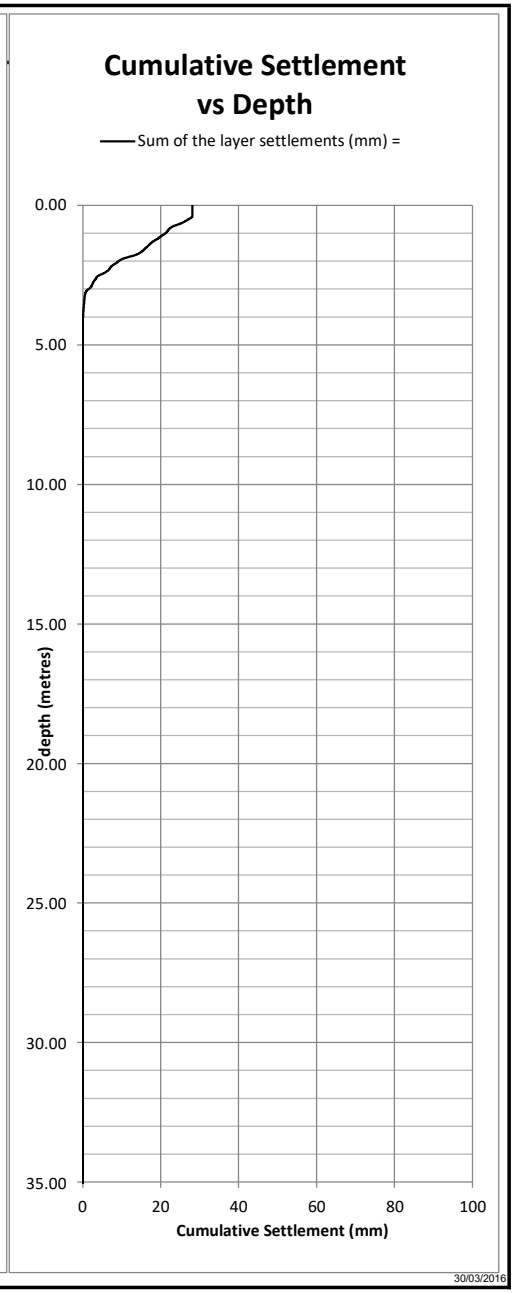
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.7550
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.7044
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	0.9658
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	**-**	**in**	**-**
Total settlement for CONTINUOUS =	**28 mm**	**in**	**50 years**





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Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT06

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		100	kN/m^2
Depth to watertable from ground surface (h_f)		14.9	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 24 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
1.0	20.0	0.4	20.00	**CONTINUOUS**

Footing shape — if L/B = 1: Circular or Square Footing (SQU)

if L/B ≥ 10: Continuous Footings (CON)

Depth of influence = 4.4 metres

Circular or Square Shape = Df + 2B = 2.4 metres

Continuous Shape = Df + 4B = 4.4 metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 6.40 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 22.40 kN/m^2

Where, for Square or Circular Shaped Footing $\sigma'_{zp(squ)}$ = 14.40 kN/m^2

For $h_f < D_f + B/2$: $\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$

For $h_f > D_f + B/2$: $\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$

Where, for Continuous Shape Footing $\sigma'_{zp(con)}$ = 22.40 kN/m^2

For $h_f < D_f + B$: $\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$

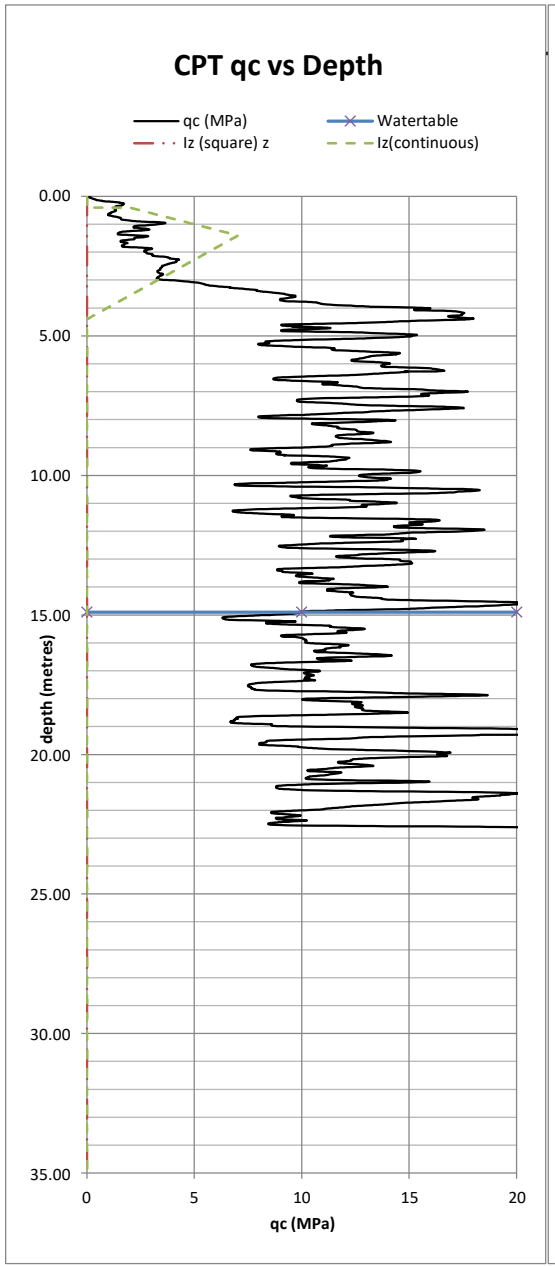
For $h_f > D_f + B$: $\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$

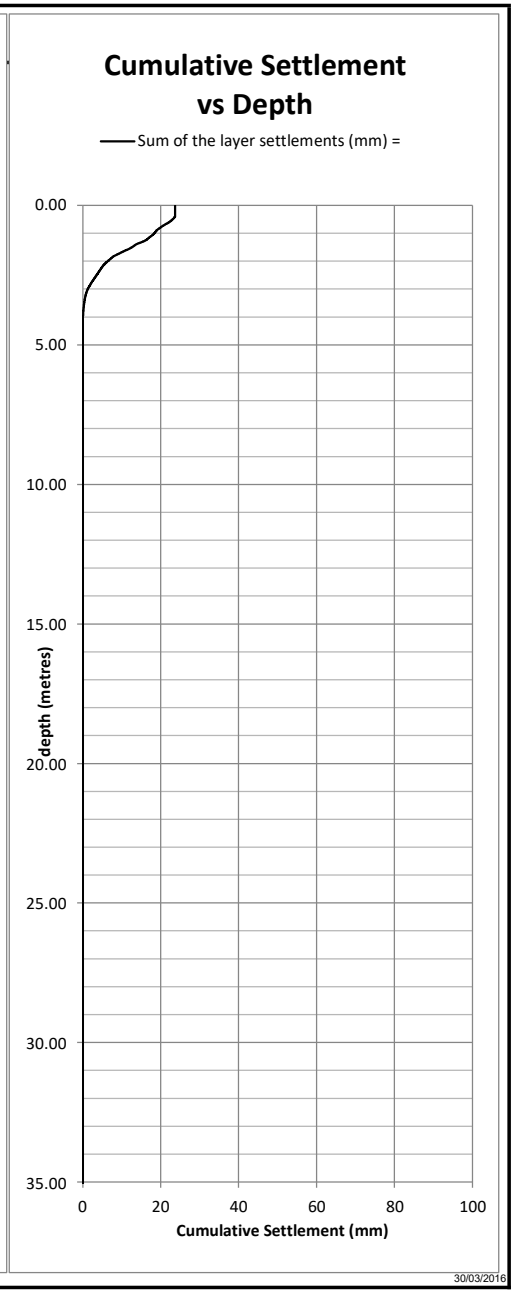
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.7550
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.7044
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	0.9658
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	**-**	**in**	**-**
Total settlement for CONTINUOUS =	**24 mm**	**in**	**50 years**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT07

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		100	kN/m^2
Depth to watertable from ground surface (h_f)		18.2	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 36 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
1.0	20.0	0.4	20.00	**CONTINUOUS**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 4.4 metres

Circular or Square Shape =	Df + 2B =	2.4	metres
Continuous Shape =	Df + 4B =	4.4	metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 6.40 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 22.40 kN/m^2

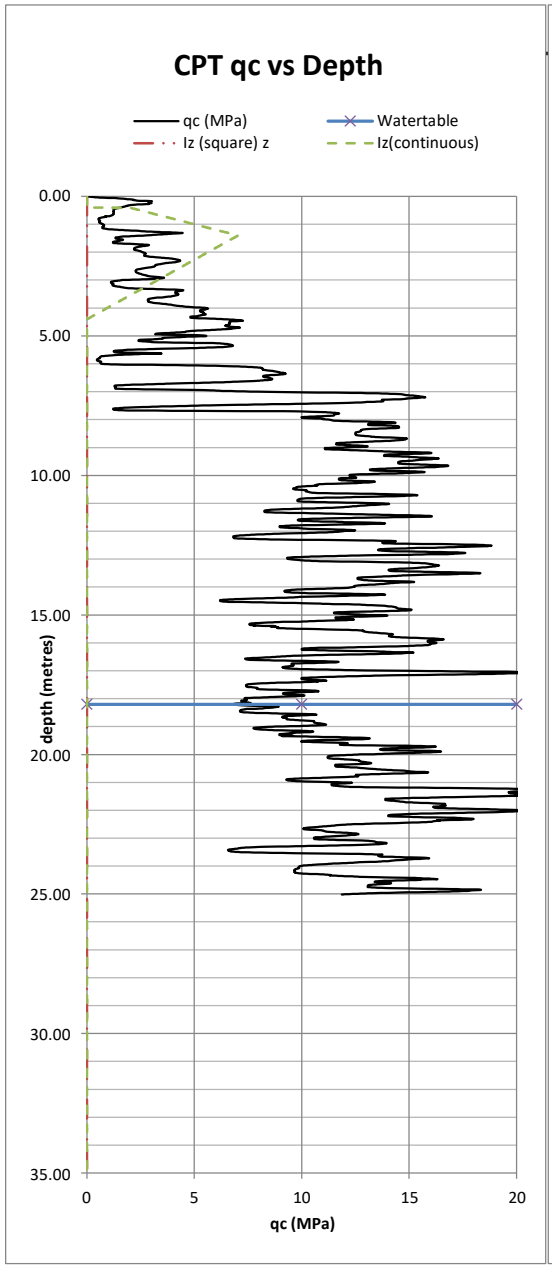
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	14.40	kN/m^2
For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$		
For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$		
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	22.40	kN/m^2
For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$		
For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$		

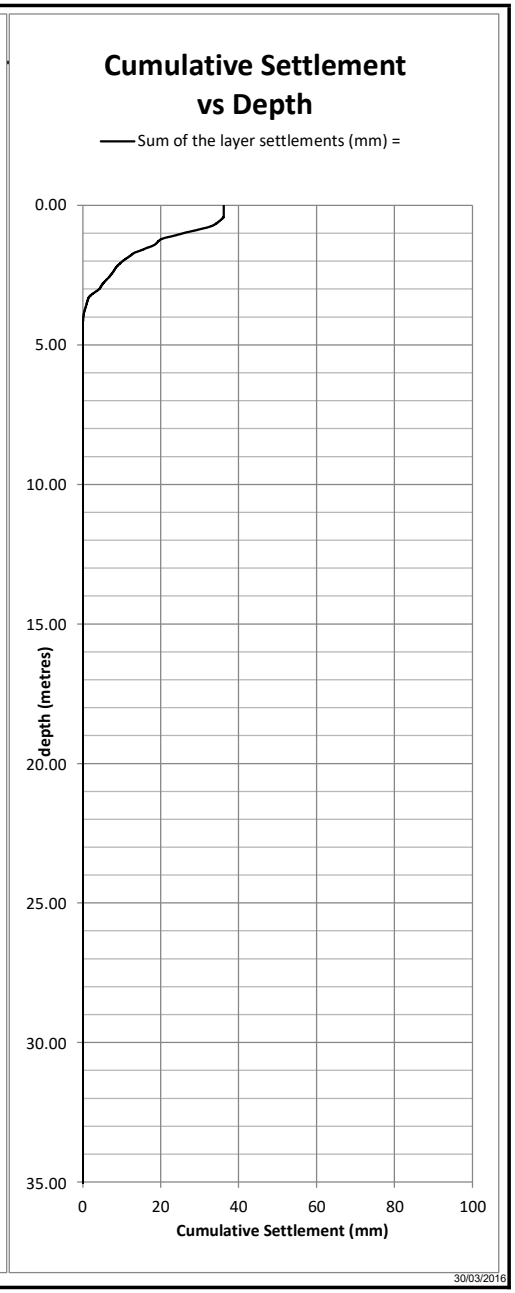
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.7550
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.7044
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	0.9658
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	-	in	-
Total settlement for CONTINUOUS =	**36 mm**	in	**50 years**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT08

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		100	kN/m^2
Depth to watertable from ground surface (h_f)		19.0	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 23 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
1.0	20.0	0.4	20.00	**CONTINUOUS**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 4.4 metres

Circular or Square Shape =	Df + 2B =	2.4	metres
Continuous Shape =	Df + 4B =	4.4	metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 6.40 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 22.40 kN/m^2

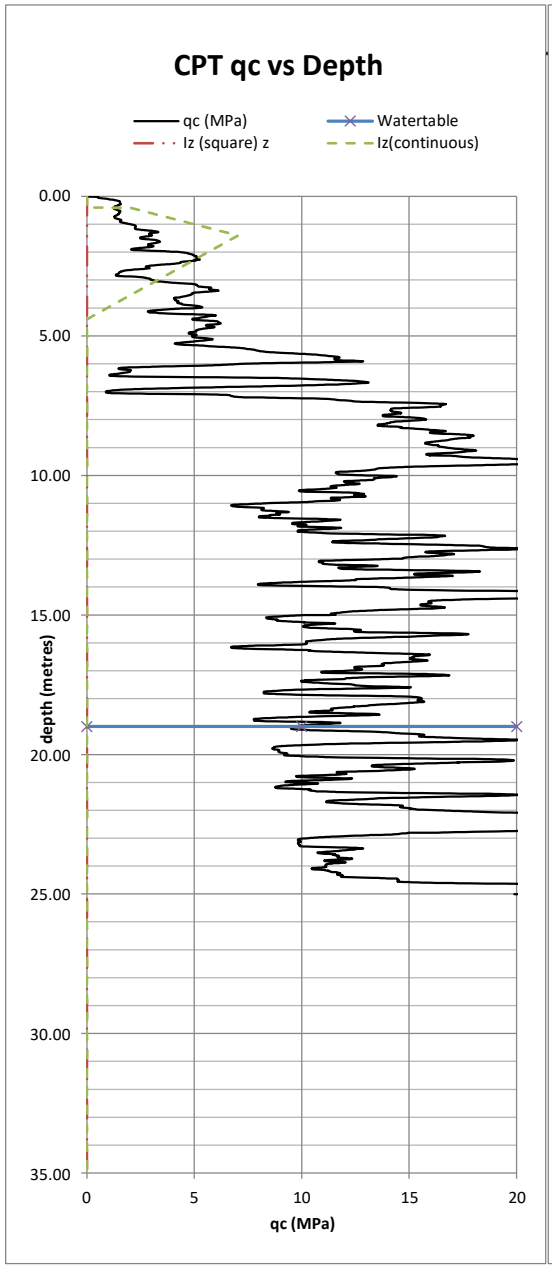
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	14.40	kN/m^2
For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$		
For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$		
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	22.40	kN/m^2
For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$		
For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$		

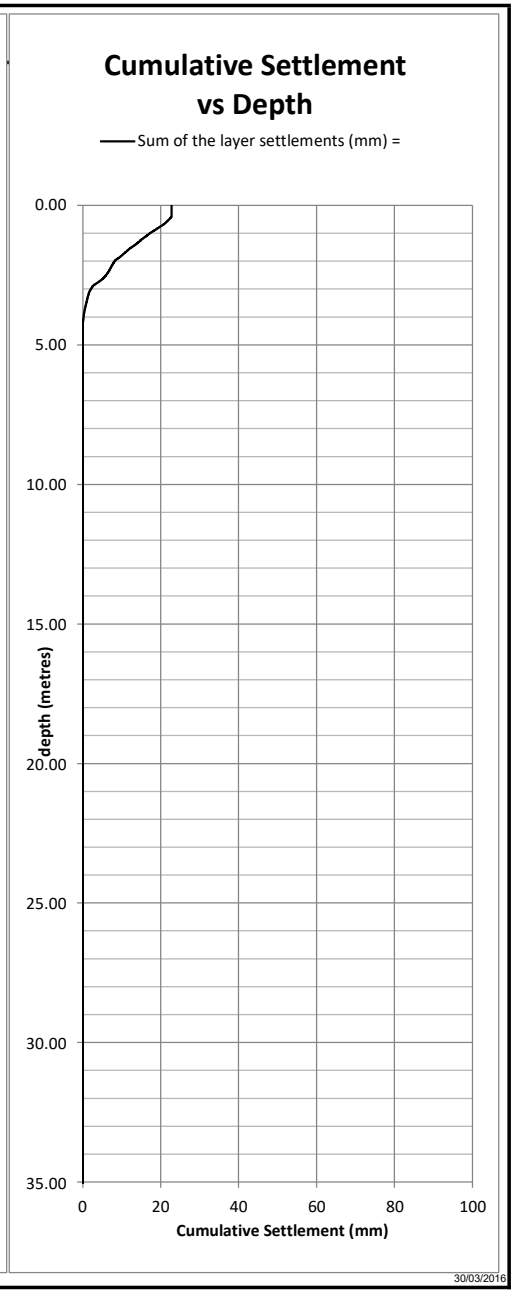
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.7550
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.7044
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	0.9658
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	-	in	-
Total settlement for CONTINUOUS =	**23 mm**	in	**50 years**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT09

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		100	kN/m^2
Depth to watertable from ground surface (h_f)		19.2	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 41 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
1.0	20.0	0.4	20.00	**CONTINUOUS**

Footing shape — if L/B = 1: Circular or Square Footing (SQU)

if L/B ≥ 10: Continuous Footings (CON)

Depth of influence = 4.4 metres

Circular or Square Shape = Df + 2B = 2.4 metres

Continuous Shape = Df + 4B = 4.4 metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 6.40 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 22.40 kN/m^2

Where, for Square or Circular Shaped Footing $\sigma'_{zp(squ)}$ = 14.40 kN/m^2

For $h_f < D_f + B/2$: $\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$

For $h_f > D_f + B/2$: $\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$

Where, for Continuous Shape Footing $\sigma'_{zp(con)}$ = 22.40 kN/m^2

For $h_f < D_f + B$: $\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$

For $h_f > D_f + B$: $\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$

Peak strain influence factor (I_{zp})

$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ = 0.7550

$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ = 0.7044

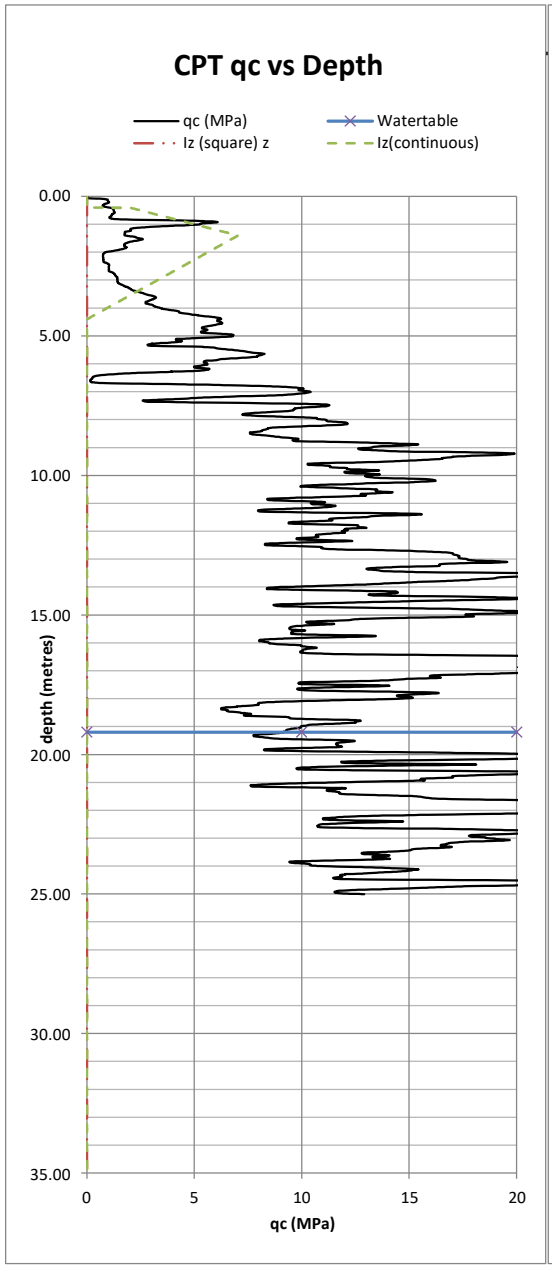
Depth factor (C1) $C1 = 1 - 0.5 (\sigma'_{vo} / q')$ = 0.9658

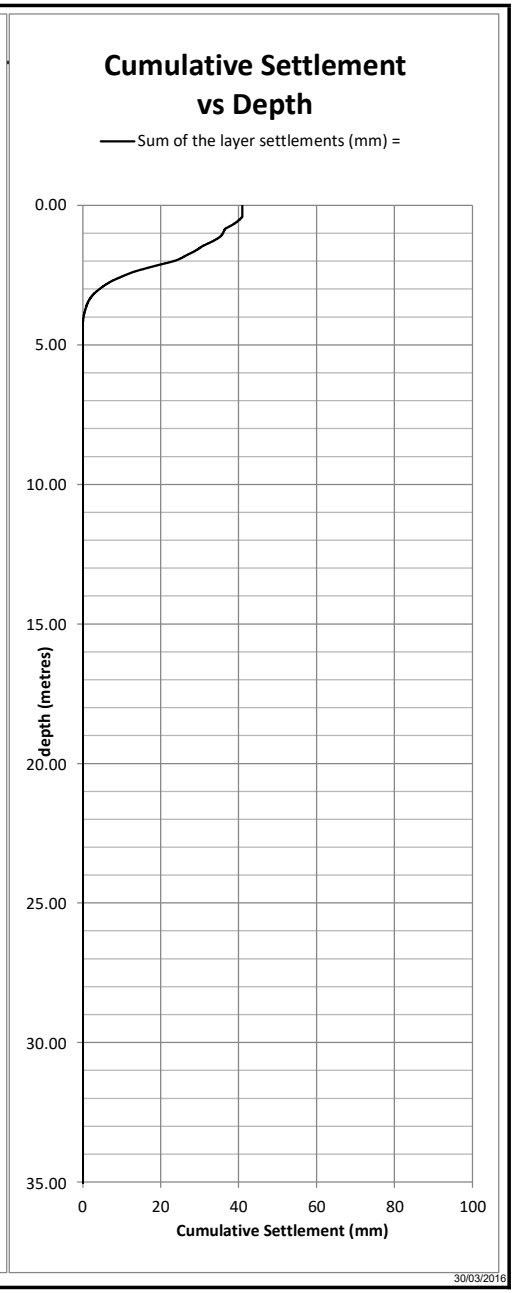
Secondary creep factor (C2) $C2 = 1 + 0.2 \log_{10} (t / 0.1)$ = 1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	-	in	-
Total settlement for CONTINUOUS =	**41 mm**	in	**50 years**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT10

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		100	kN/m^2
Depth to watertable from ground surface (h_f)		19.5	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 24 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
1.0	20.0	0.4	20.00	**CONTINUOUS**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 4.4 metres

Circular or Square Shape =	Df + 2B =	2.4	metres
Continuous Shape =	Df + 4B =	4.4	metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 6.40 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 22.40 kN/m^2

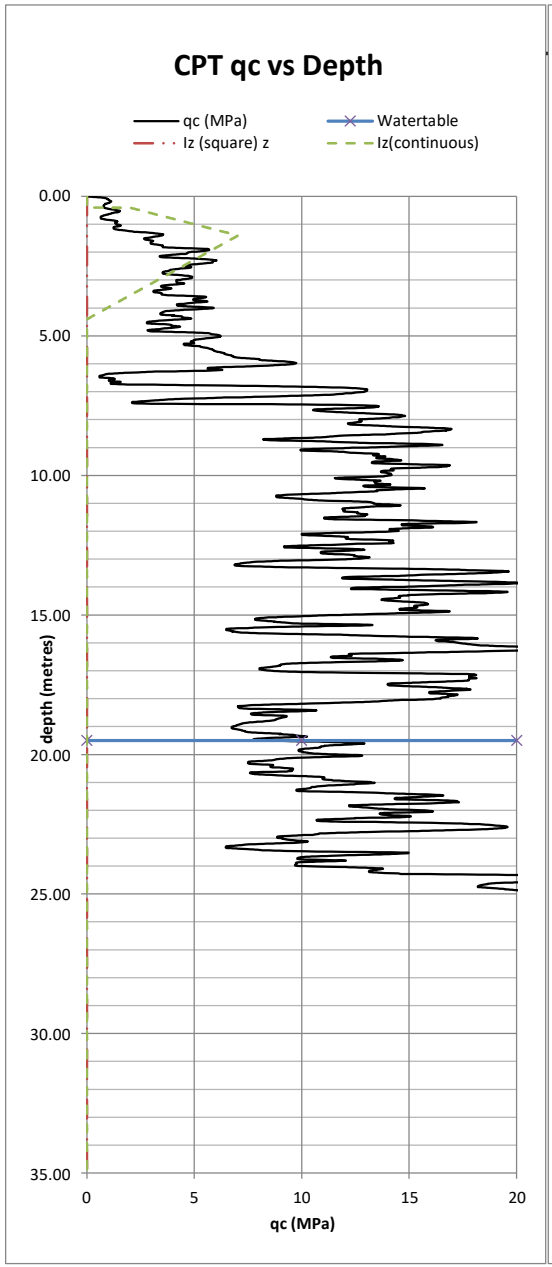
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	14.40	kN/m^2
For h_f < D_f + B/2	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$		
For h_f > D_f + B/2	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$		
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	22.40	kN/m^2
For h_f < D_f + B	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$		
For h_f > D_f + B	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$		

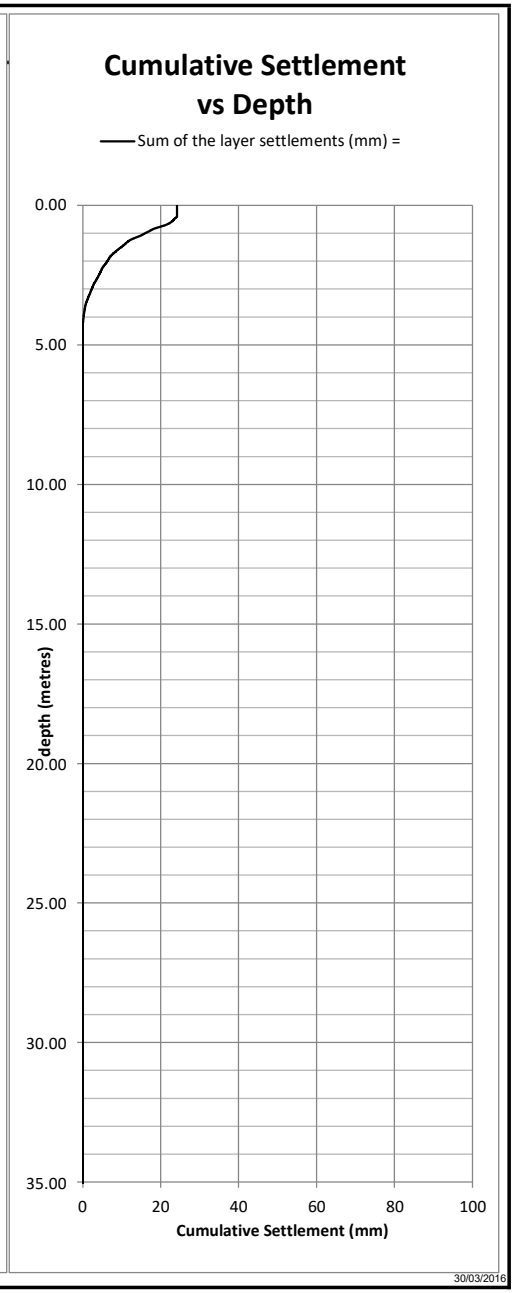
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.7550
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.7044
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	0.9658
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	-	in	-
Total settlement for CONTINUOUS =	**24 mm**	in	**50 years**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT01

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		16	kN/m^2
Depth to watertable from ground surface (h_f)		16.2	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 9 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
17.0	17.0	0.0	1.00	**SQUARE / CIRCULAR**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 34 metres

Circular or Square Shape =	Df + 2B =	34	metres
Continuous Shape =	Df + 4B =	68	metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 0.00 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 136.00 kN/m^2

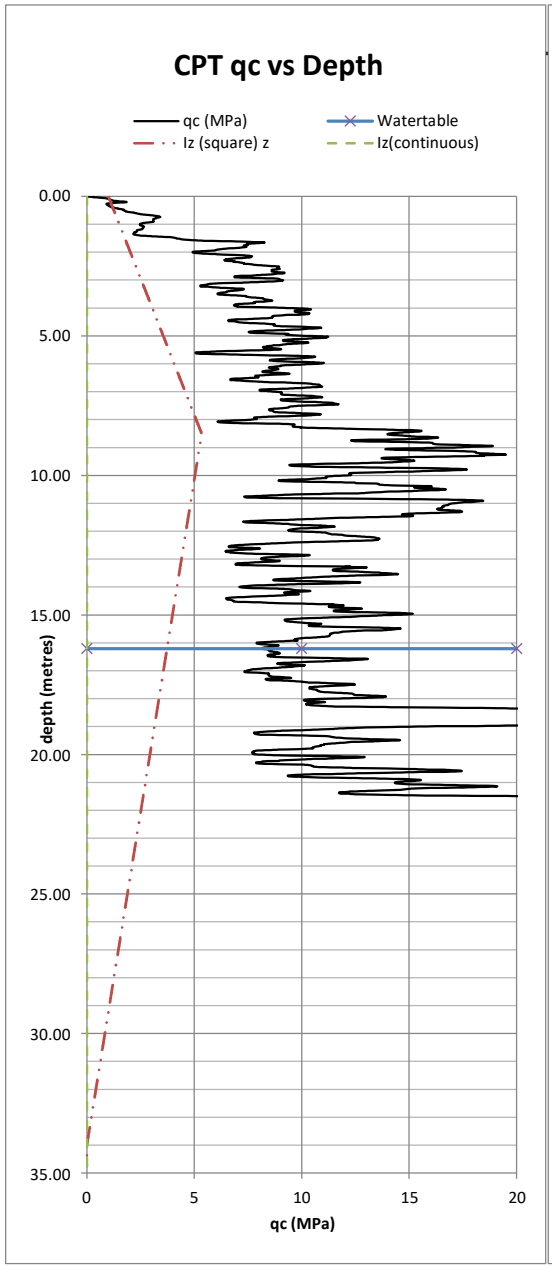
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	136.00	kN/m^2
For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$		
For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$		
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	264.15	kN/m^2
For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$		
For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$		

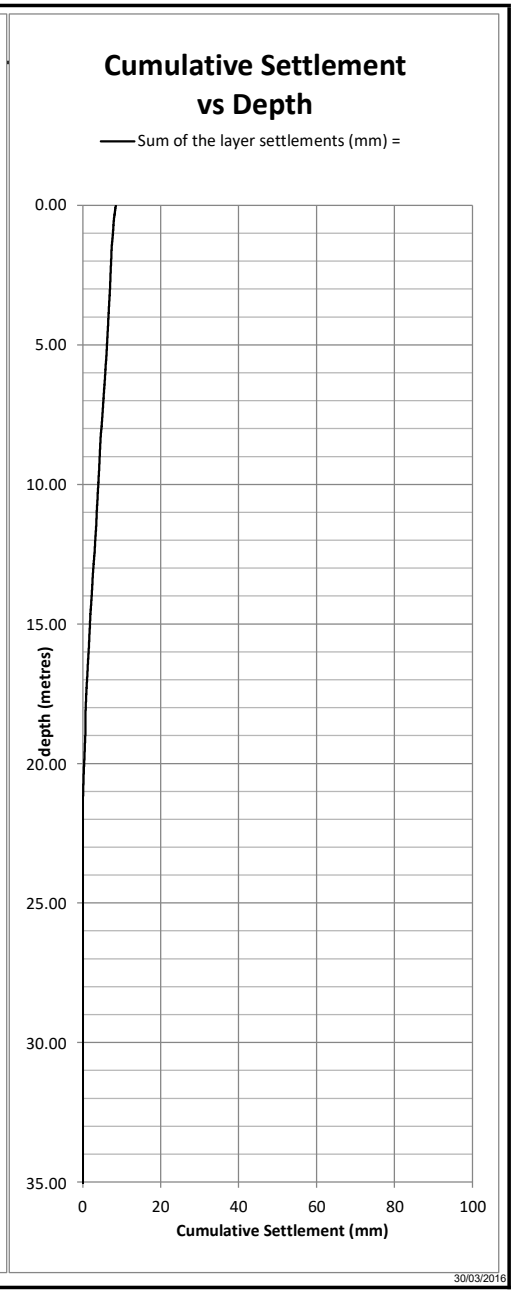
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.5343
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.5246
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	1.0000
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	**9 mm**	**in**	**50 years**
Total settlement for CONTINUOUS =	**-**	**in**	**-**





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Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT02

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		16	kN/m^2
Depth to watertable from ground surface (h_f)		12.2	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 8 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
13.0	13.0	0.0	1.00	**SQUARE / CIRCULAR**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 26 metres

Circular or Square Shape =	Df + 2B =	26	metres
Continuous Shape =	Df + 4B =	52	metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 0.00 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 104.00 kN/m^2

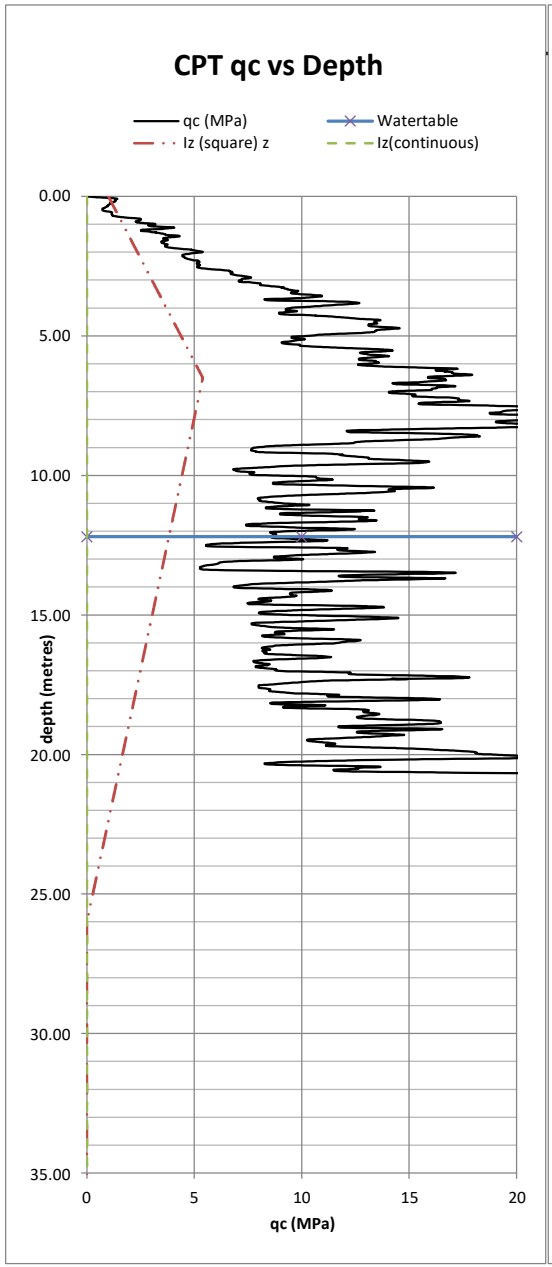
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	104.00	kN/m^2
For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$		
For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$		
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	200.15	kN/m^2
For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$		
For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$		

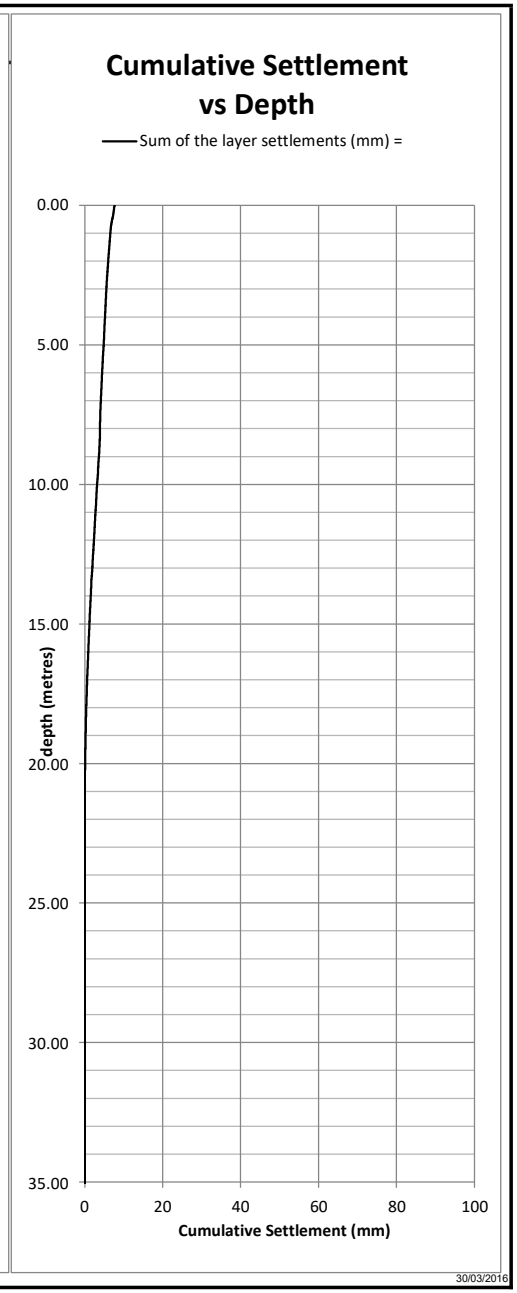
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.5392
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.5283
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	1.0000
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	**8 mm**	**in**	**50 years**
Total settlement for CONTINUOUS =	**-**	**in**	**-**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT03

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		16	kN/m^2
Depth to watertable from ground surface (h_f)		14.8	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 9 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
29.0	29.0	0.0	1.00	**SQUARE / CIRCULAR**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 58 metres

Circular or Square Shape =	Df + 2B =	58	metres
Continuous Shape =	Df + 4B =	116	metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 0.00 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 232.00 kN/m^2

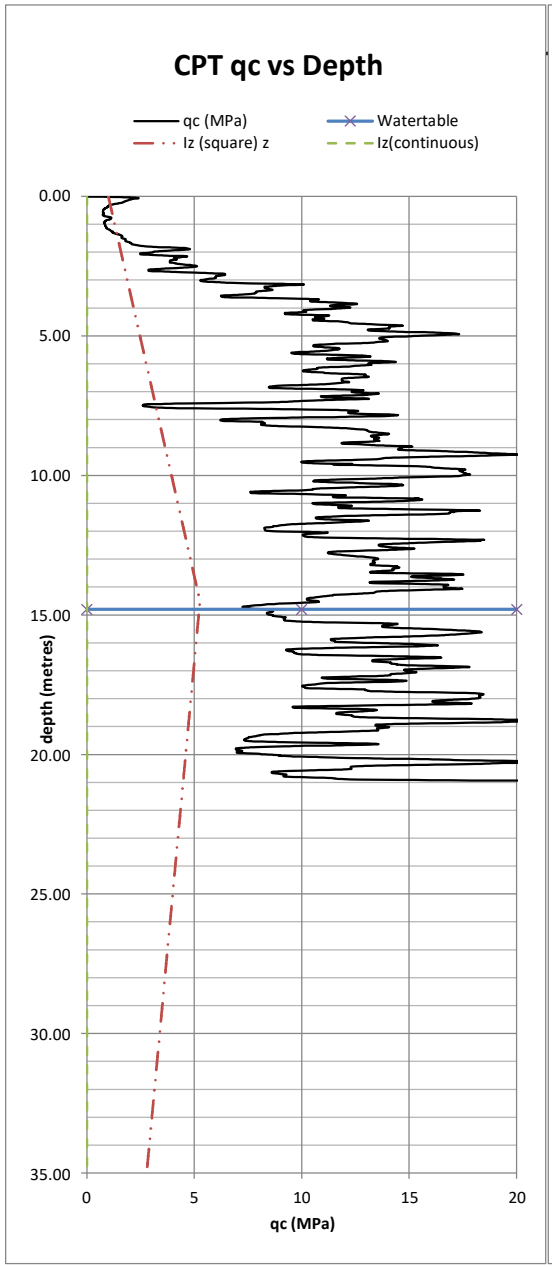
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	232.00	kN/m^2
For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$		
For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$		
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	324.70	kN/m^2
For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$		
For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$		

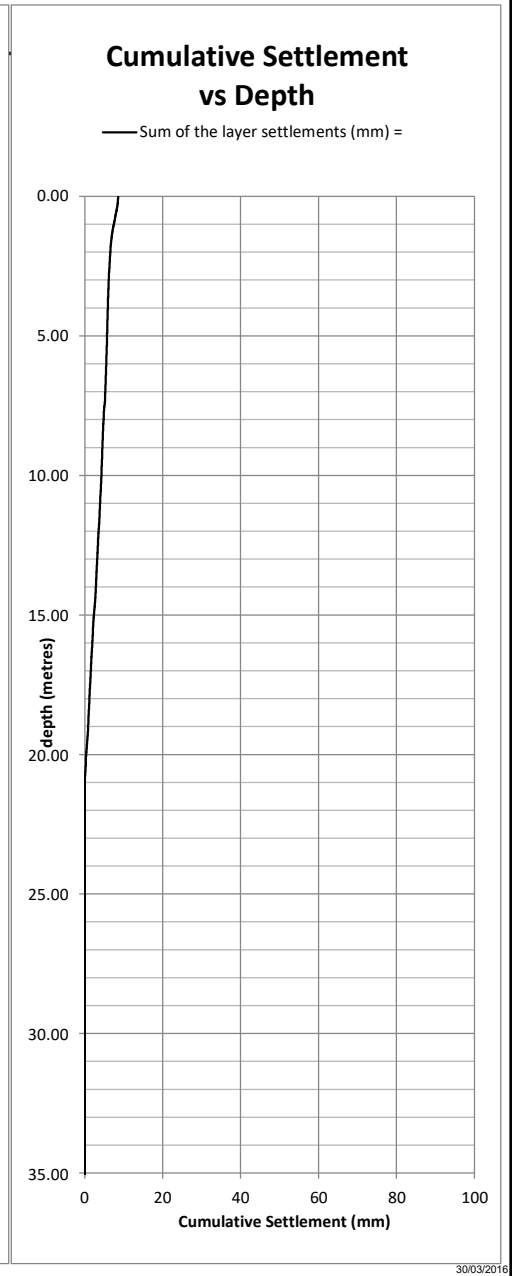
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.5263
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.5222
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	1.0000
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	**9 mm**	**in**	**50 years**
Total settlement for CONTINUOUS =	**-**	**in**	**-**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT04

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		16	kN/m^2
Depth to watertable from ground surface (h_f)		13.5	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 9 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
12.0	12.0	0.0	1.00	**SQUARE / CIRCULAR**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 24 metres

Circular or Square Shape =	Df + 2B =	24 metres
Continuous Shape =	Df + 4B =	48 metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 0.00 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 96.00 kN/m^2

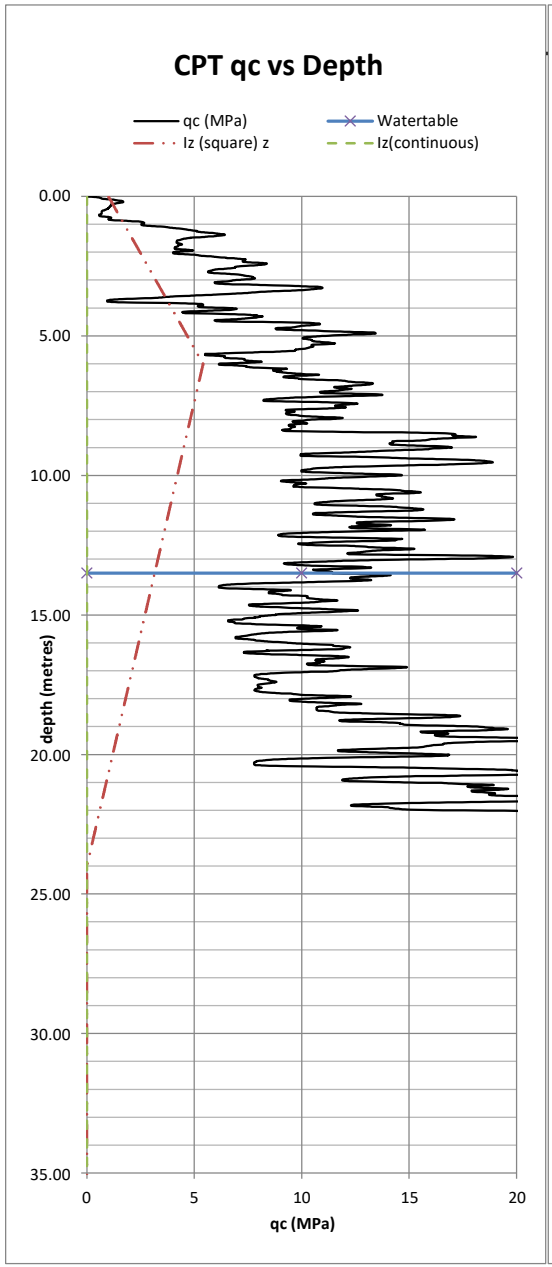
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	96.00 kN/m^2
For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$	
For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$	
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	192.00 kN/m^2
For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$	
For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$	

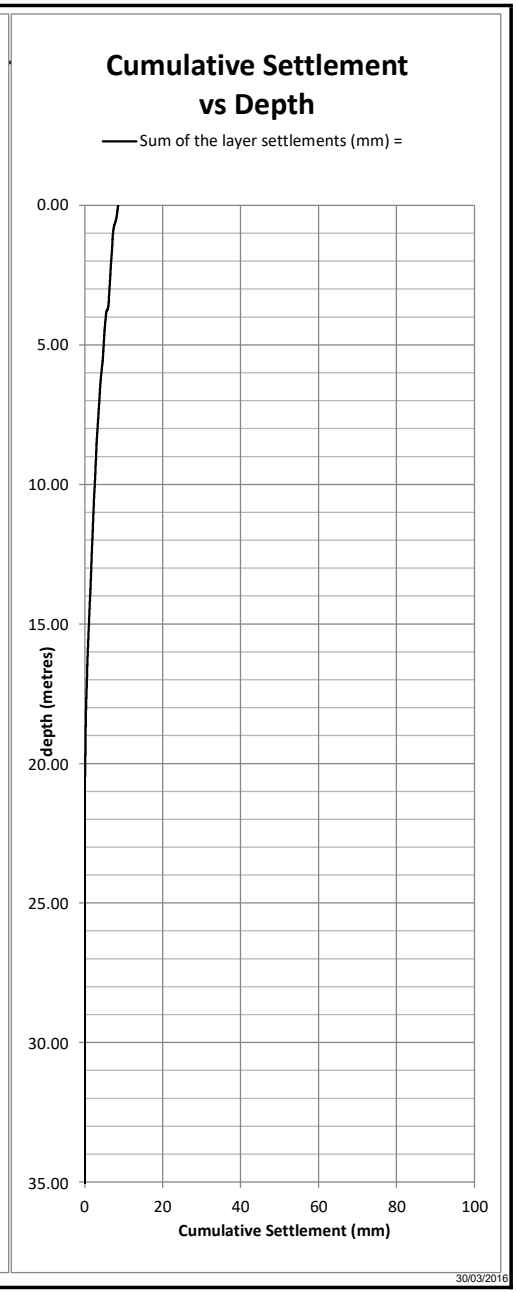
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.5408
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.5289
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	1.0000
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	**9 mm**	**in**	**50 years**
Total settlement for CONTINUOUS =	**-**	**in**	**-**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT05

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		16	kN/m^2
Depth to watertable from ground surface (h_f)		13.2	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 9 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
11.0	11.0	0.0	1.00	**SQUARE / CIRCULAR**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 22 metres

Circular or Square Shape =	Df + 2B =	22	metres
Continuous Shape =	Df + 4B =	44	metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 0.00 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 88.00 kN/m^2

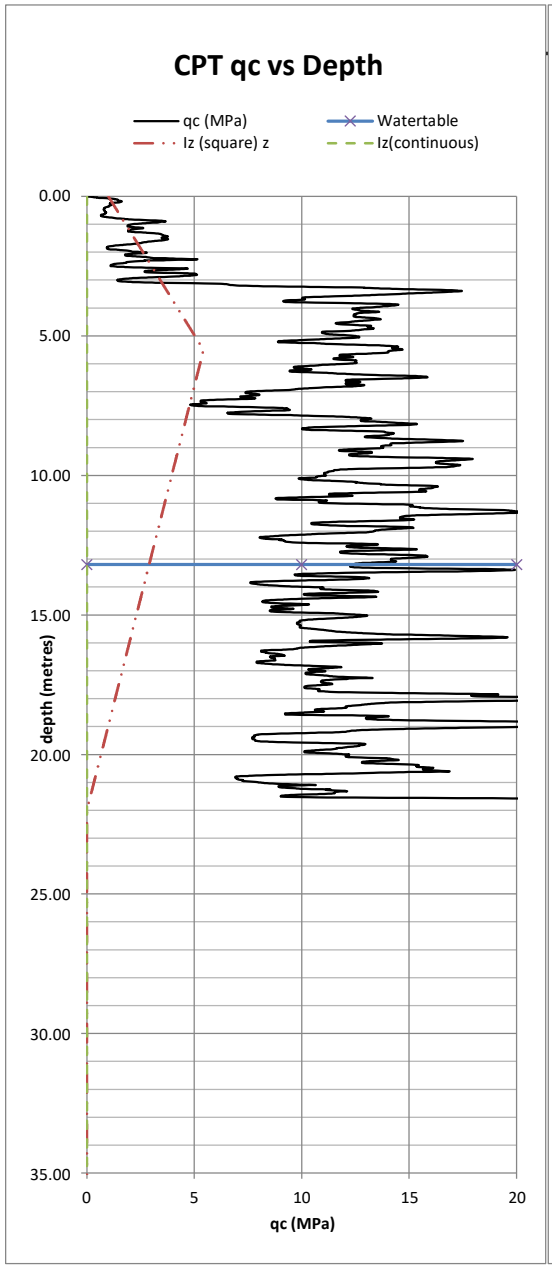
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	88.00	kN/m^2
For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$		
For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$		
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	176.00	kN/m^2
For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$		
For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$		

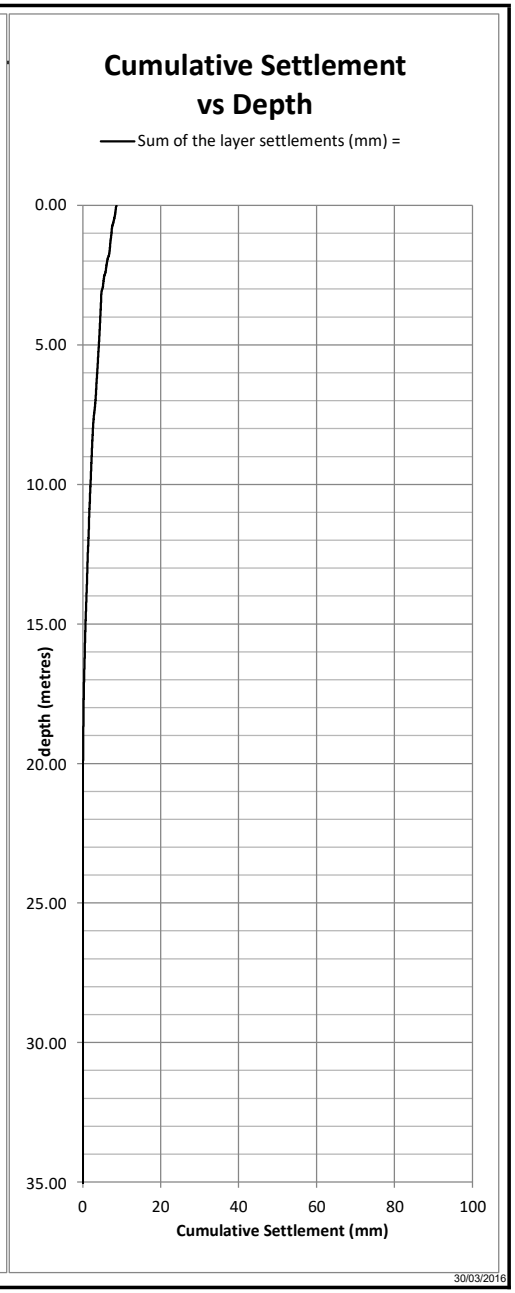
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.5426
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.5302
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	1.0000
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	**9 mm**	**in**	**50 years**
Total settlement for CONTINUOUS =	**-**	**in**	**-**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT06

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		16	kN/m^2
Depth to watertable from ground surface (h_f)		14.9	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 18 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
16.0	16.0	0.0	1.00	**SQUARE / CIRCULAR**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 32 metres

Circular or Square Shape =	Df + 2B =	32	metres
Continuous Shape =	Df + 4B =	64	metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 0.00 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 128.00 kN/m^2

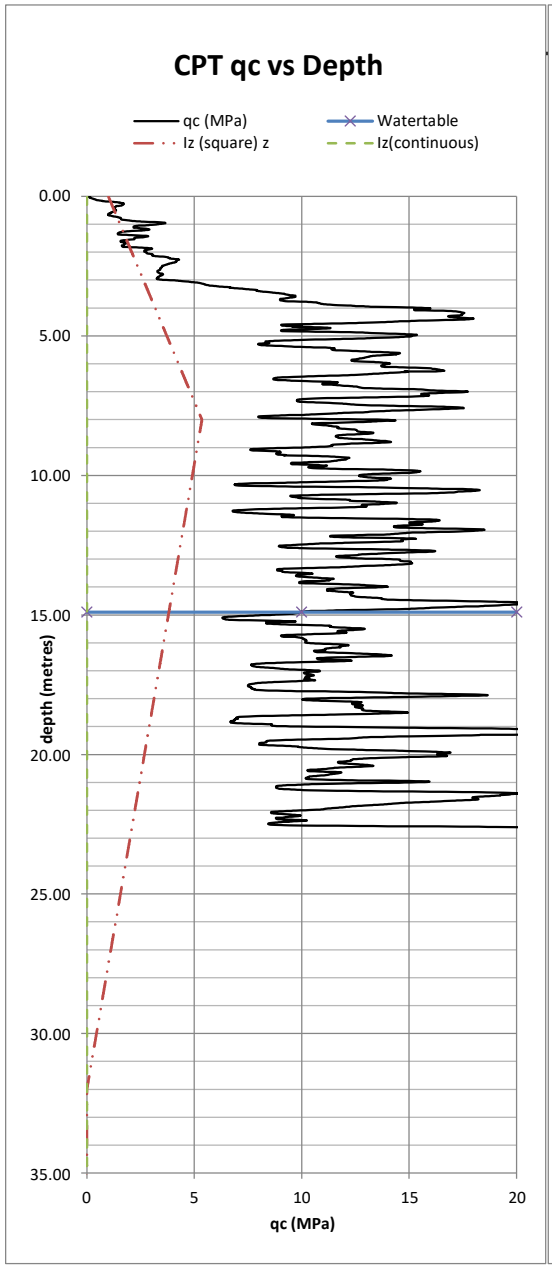
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	128.00	kN/m^2
For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$		
For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$		
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	245.21	kN/m^2
For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$		
For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$		

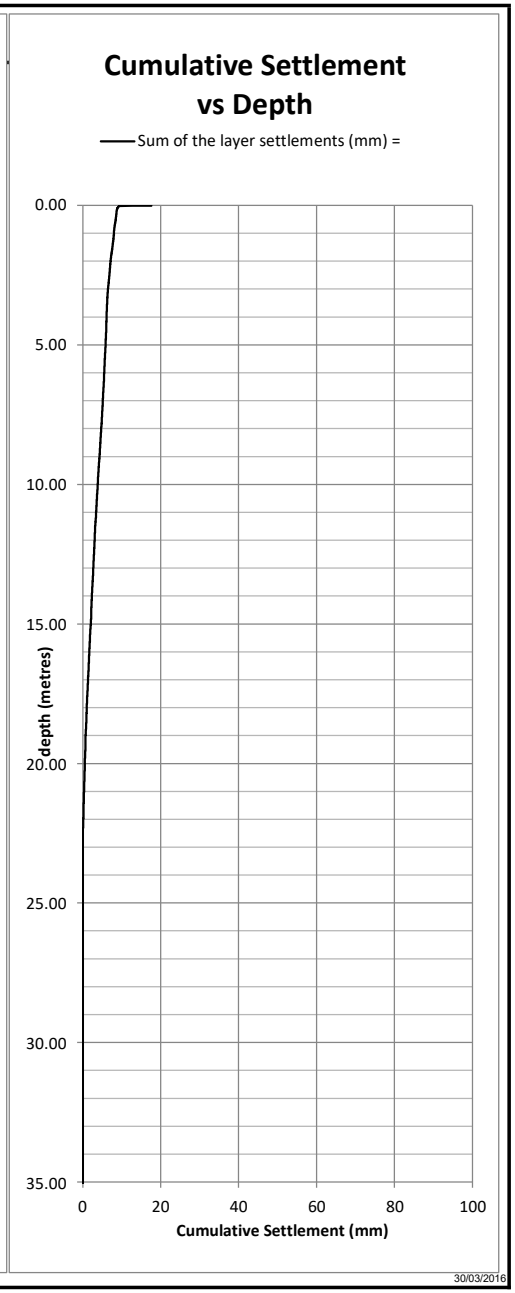
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.5354
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.5255
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	1.0000
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	**18 mm**	**in**	**50 years**
Total settlement for CONTINUOUS =	**-**	**in**	**-**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT07

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		16	kN/m^2
Depth to watertable from ground surface (h_f)		18.2	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 15 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
10.0	10.0	0.0	1.00	**SQUARE / CIRCULAR**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 20 metres

Circular or Square Shape =	Df + 2B =	20	metres
Continuous Shape =	Df + 4B =	40	metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 0.00 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 80.00 kN/m^2

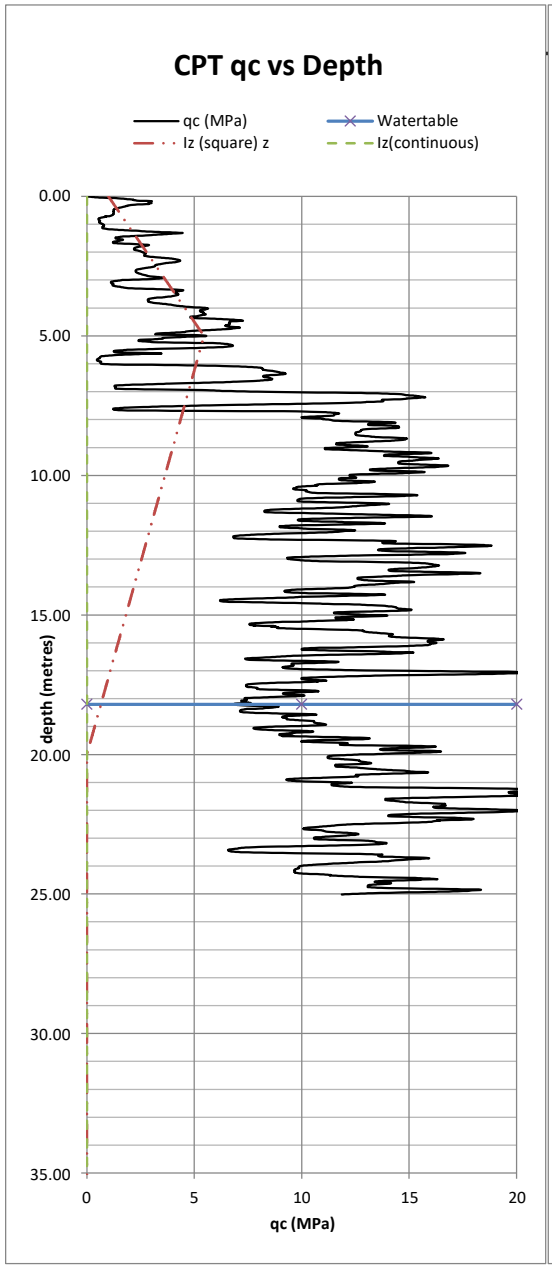
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	80.00	kN/m^2
For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$		
For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$		
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	160.00	kN/m^2
For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$		
For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$		

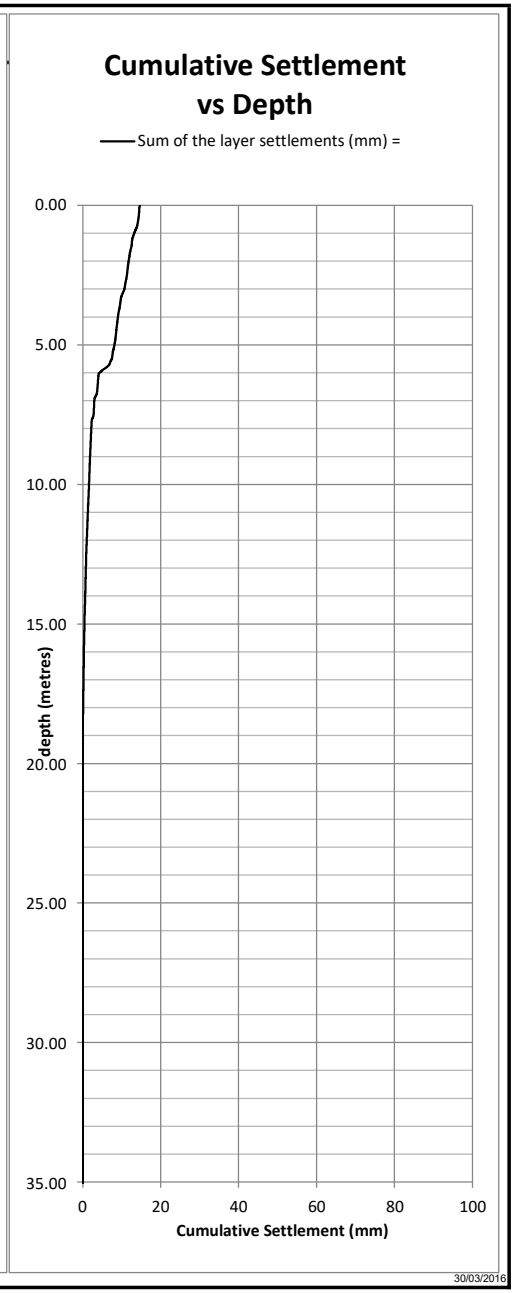
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.5447
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.5316
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	1.0000
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	**15 mm**	**in**	**50 years**
Total settlement for CONTINUOUS =	**-**	**in**	**-**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT08

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		16	kN/m^2
Depth to watertable from ground surface (h_f)		19.0	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions Settlement = 11 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
12.0	12.0	0.0	1.00	**SQUARE / CIRCULAR**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 24 metres

Circular or Square Shape =	Df + 2B =	24	metres
Continuous Shape =	Df + 4B =	48	metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 0.00 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 96.00 kN/m^2

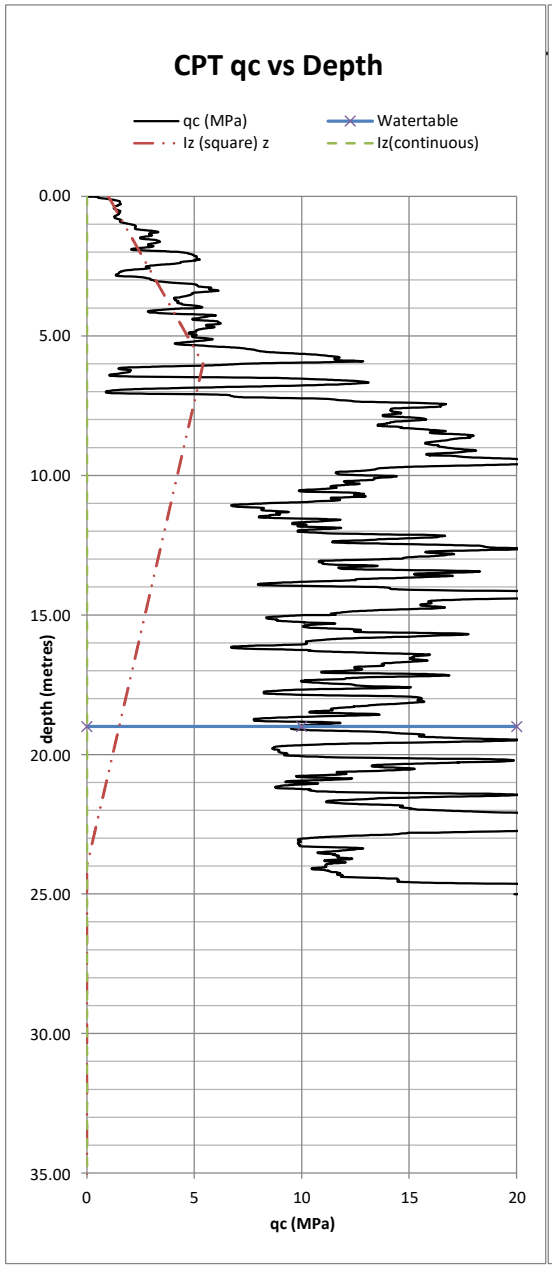
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	96.00	kN/m^2
For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$		
For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$		
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	192.00	kN/m^2
For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$		
For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$		

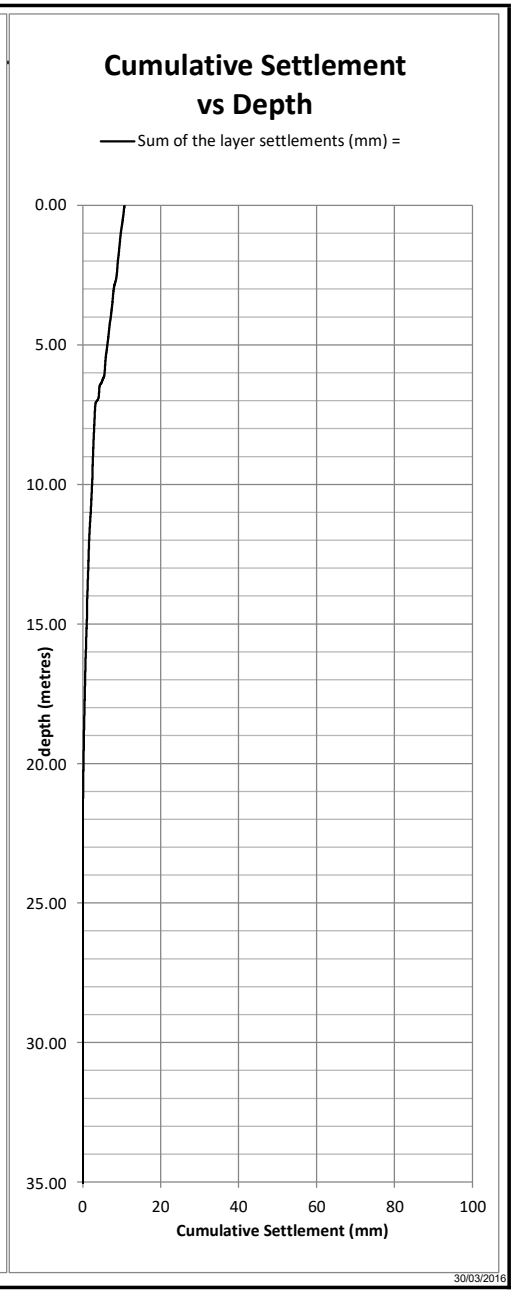
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.5408
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.5289
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	1.0000
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	**11 mm**	**in**	**50 years**
Total settlement for CONTINUOUS =	**-**	**in**	**-**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT09

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		16	kN/m^2
Depth to watertable from ground surface (h_f)		19.2	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions Settlement = 48 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
12.0	12.0	0.0	1.00	**SQUARE / CIRCULAR**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 24 metres

Circular or Square Shape =	Df + 2B =	24 metres
Continuous Shape =	Df + 4B =	48 metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 0.00 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 96.00 kN/m^2

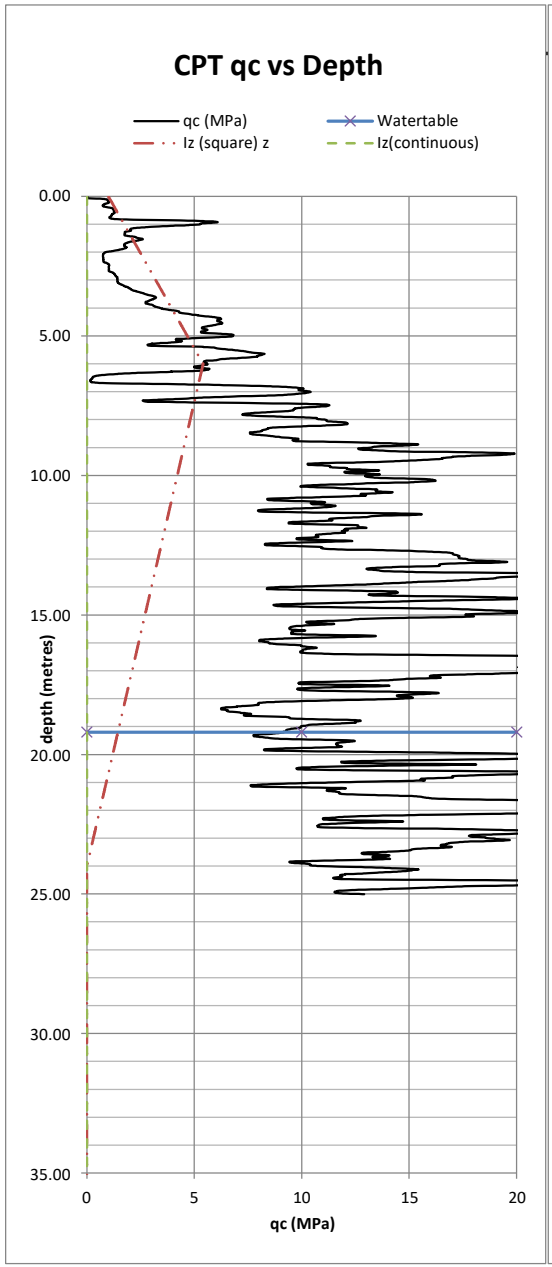
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	96.00 kN/m^2
For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$	
For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$	
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	192.00 kN/m^2
For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$	
For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$	

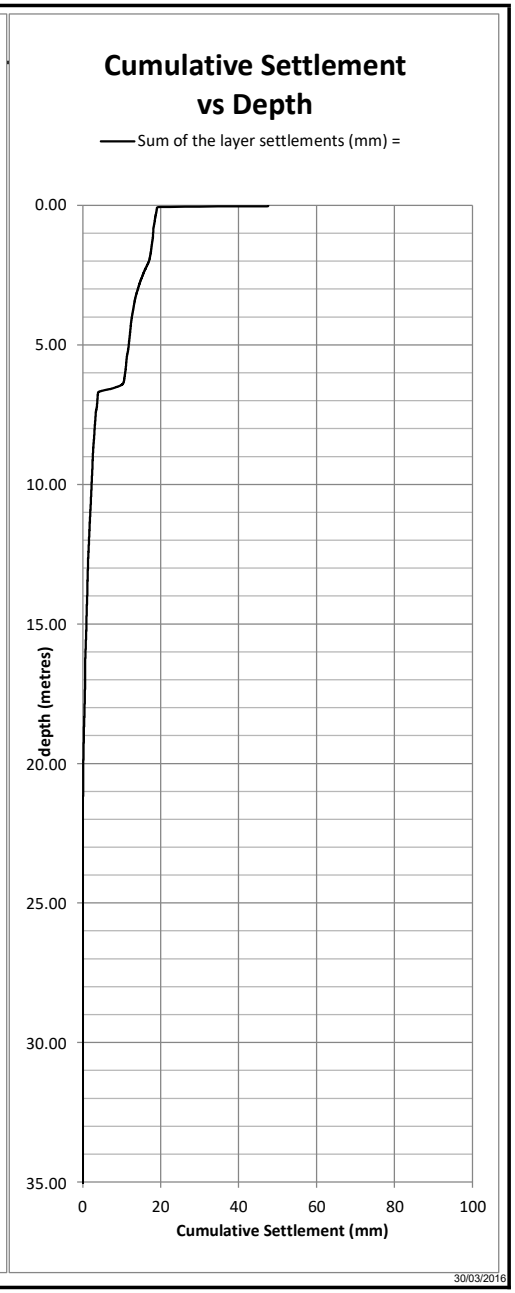
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.5408
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.5289
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	1.0000
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	**48 mm**	**in**	**50 years**
Total settlement for CONTINUOUS =	**-**	**in**	**-**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT10

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		16	kN/m^2
Depth to watertable from ground surface (h_f)		19.5	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 13 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
14.0	14.0	0.0	1.00	**SQUARE / CIRCULAR**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 28 metres

Circular or Square Shape =	Df + 2B =	28	metres
Continuous Shape =	Df + 4B =	56	metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 0.00 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 112.00 kN/m^2

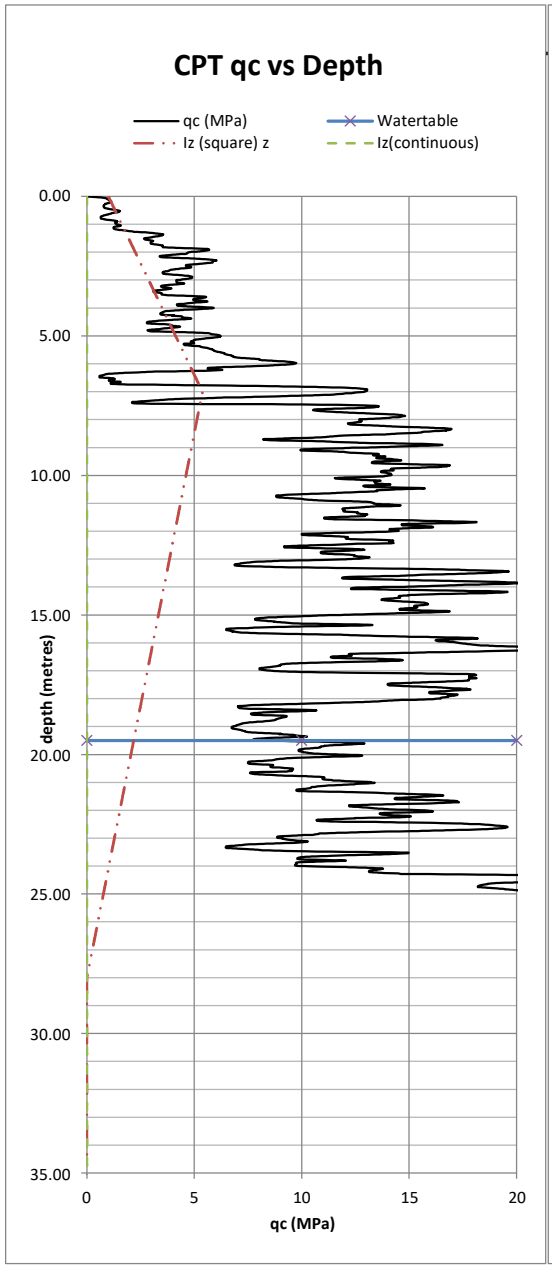
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	112.00	kN/m^2
For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$		
For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$		
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	224.00	kN/m^2
For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$		
For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$		

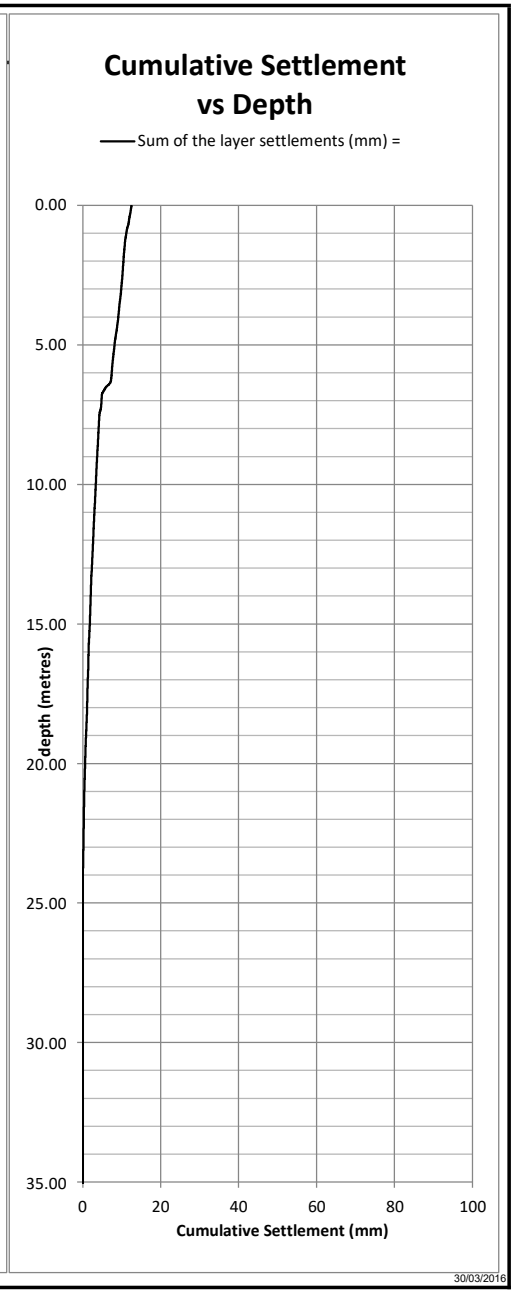
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.5378
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.5267
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	1.0000
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	**13 mm**	**in**	**50 years**
Total settlement for CONTINUOUS =	**-**	**in**	**-**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT01

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		10	kN/m^2
Depth to watertable from ground surface (h_f)		16.2	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 5 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
11.0	11.0	0.0	1.00	**SQUARE / CIRCULAR**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 22 metres

Circular or Square Shape =	Df + 2B =	22 metres
Continuous Shape =	Df + 4B =	44 metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 0.00 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 88.00 kN/m^2

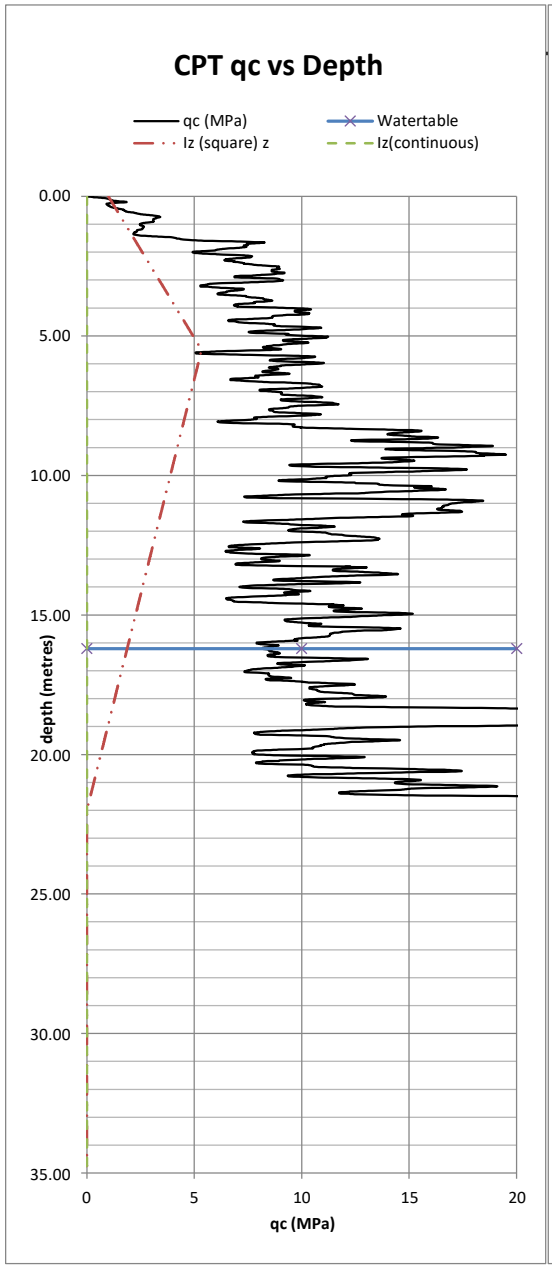
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	88.00 kN/m^2
For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$	
For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$	
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	176.00 kN/m^2
For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$	
For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$	

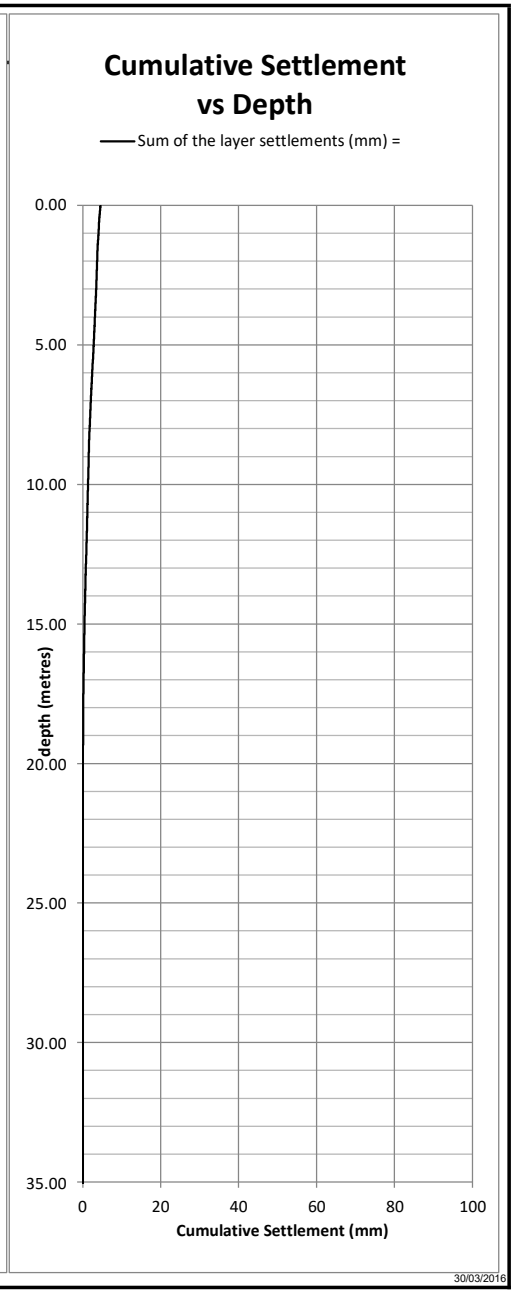
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.5337
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.5238
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	1.0000
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	**5 mm**	**in**	**50 years**
Total settlement for CONTINUOUS =	**-**	**in**	**-**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT02

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		10	kN/m^2
Depth to watertable from ground surface (h_f)		12.2	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 5 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
12.0	12.0	0.0	1.00	**SQUARE / CIRCULAR**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 24 metres

Circular or Square Shape =	Df + 2B =	24	metres
Continuous Shape =	Df + 4B =	48	metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 0.00 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 96.00 kN/m^2

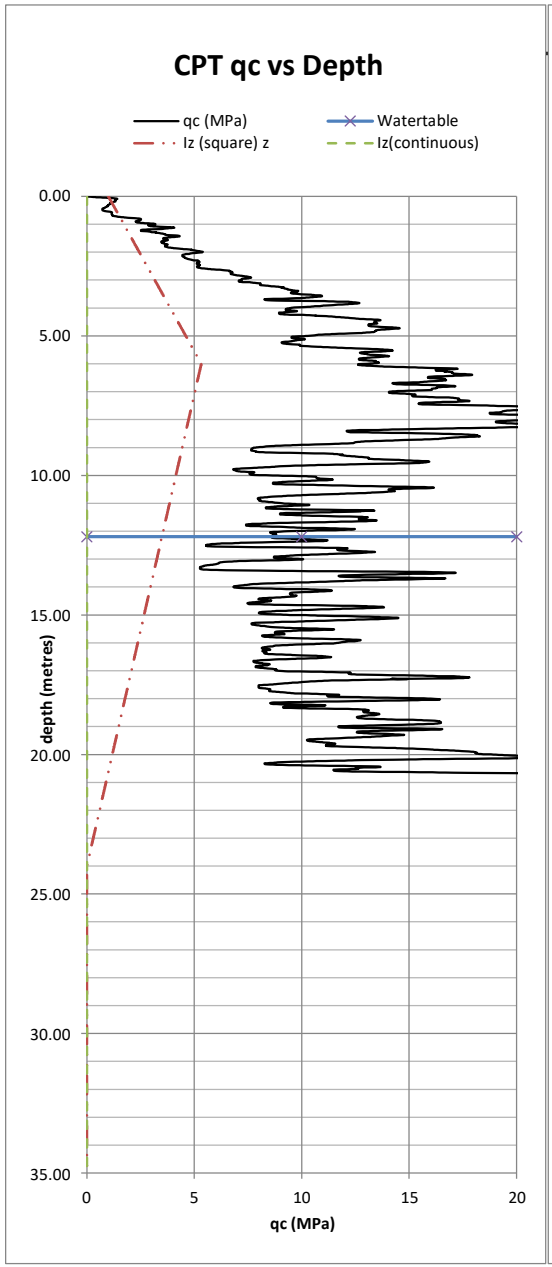
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	96.00	kN/m^2
For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$		
For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$		
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	192.00	kN/m^2
For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$		
For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$		

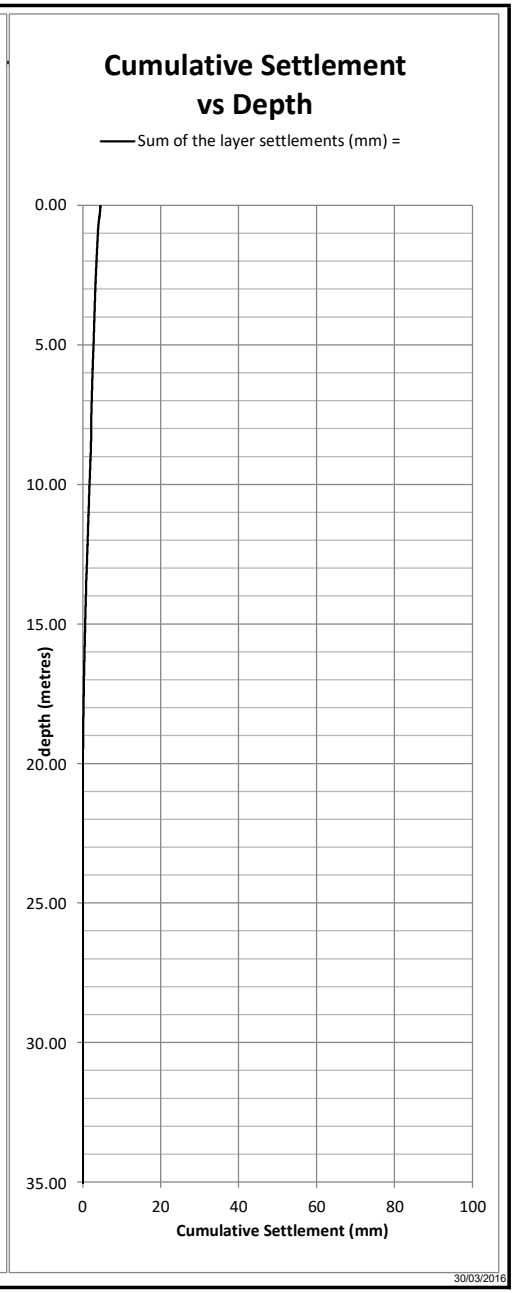
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.5323
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.5228
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	1.0000
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	**5 mm**	**in**	**50 years**
Total settlement for CONTINUOUS =	**-**	**in**	**-**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT03

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		10	kN/m^2
Depth to watertable from ground surface (h_f)		14.8	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 5 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
7.0	7.0	0.0	1.00	**SQUARE / CIRCULAR**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 14 metres

Circular or Square Shape =	Df + 2B =	14 metres
Continuous Shape =	Df + 4B =	28 metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 0.00 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 56.00 kN/m^2

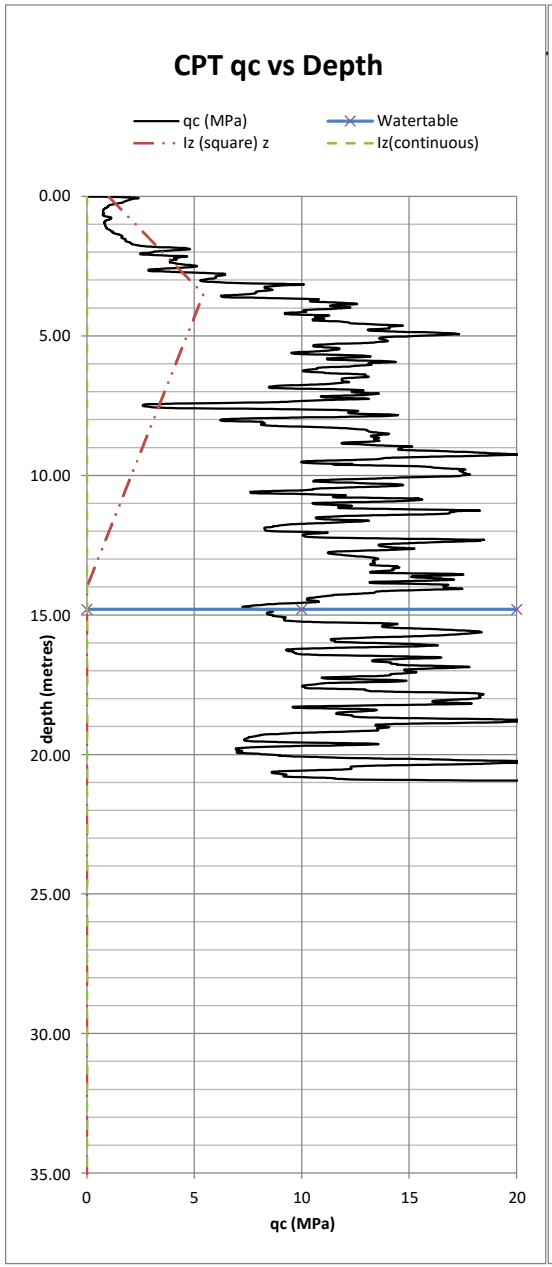
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	56.00 kN/m^2
For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$	
For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$	
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	112.00 kN/m^2
For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$	
For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$	

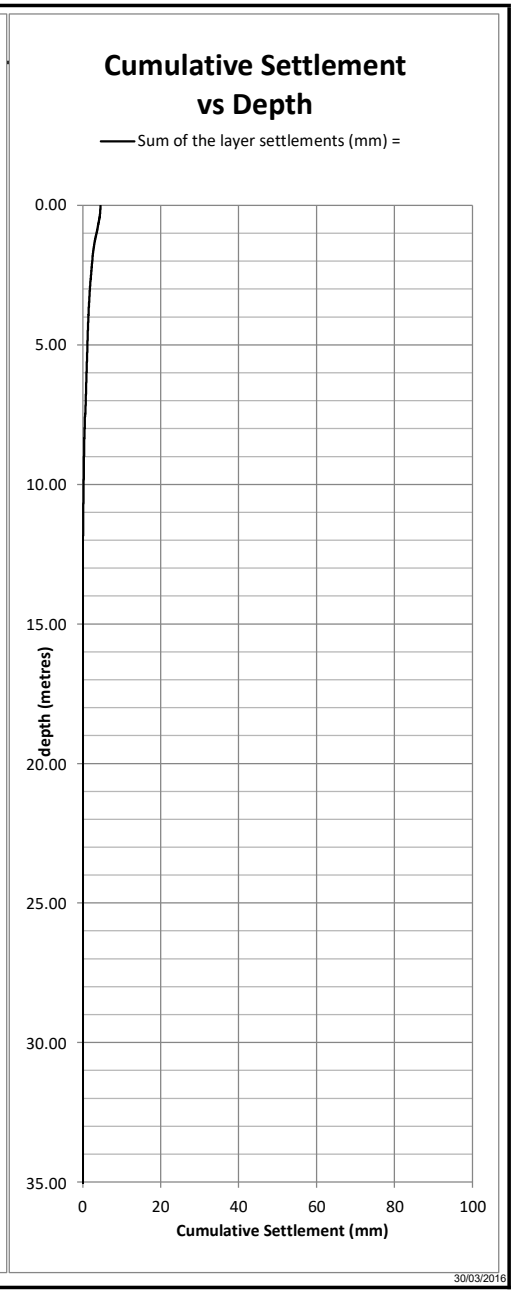
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.5423
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.5299
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	1.0000
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	**5 mm**	**in**	**50 years**
Total settlement for CONTINUOUS =	**-**	**in**	**-**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT04

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		10	kN/m^2
Depth to watertable from ground surface (h_f)		13.5	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 6 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
14.0	14.0	0.0	1.00	**SQUARE / CIRCULAR**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 28 metres

Circular or Square Shape =	Df + 2B =	28	metres
Continuous Shape =	Df + 4B =	56	metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 0.00 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 112.00 kN/m^2

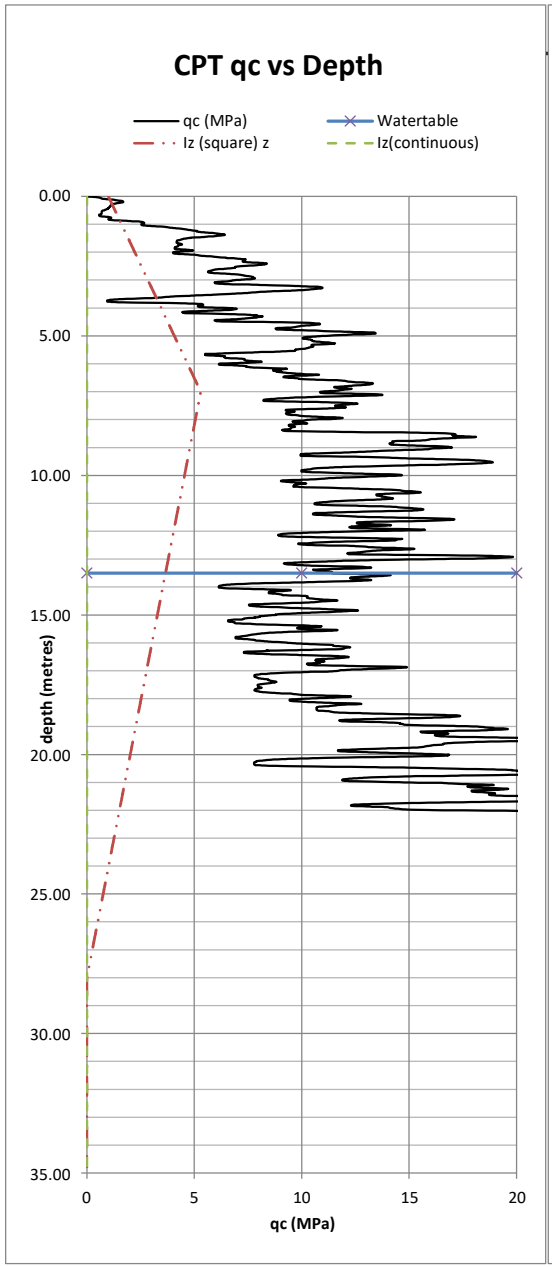
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	112.00	kN/m^2
For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$		
For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$		
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	219.10	kN/m^2
For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$		
For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$		

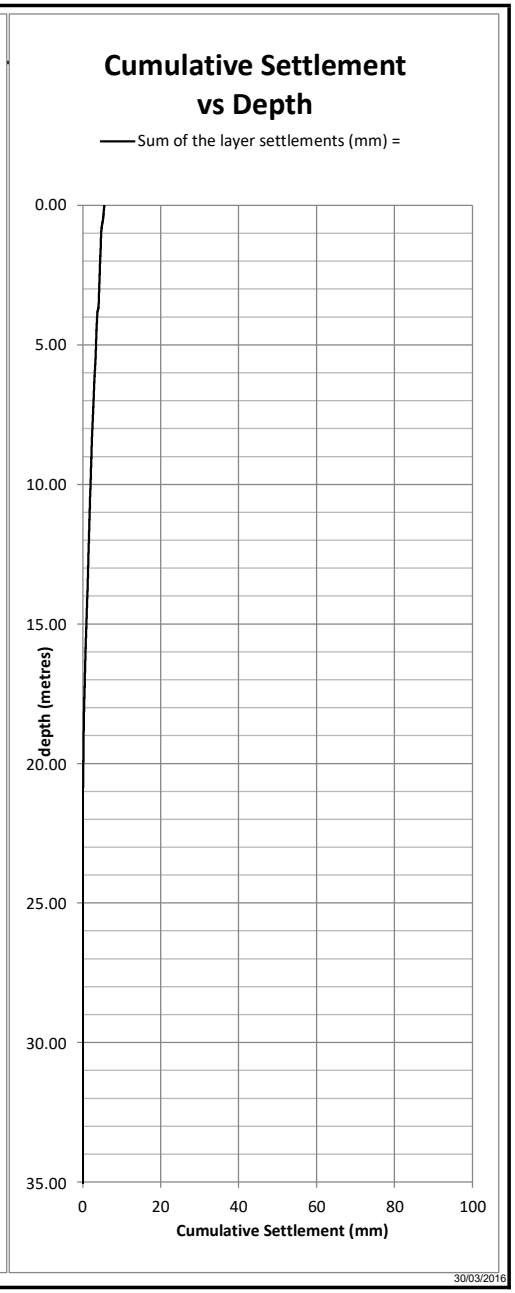
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.5299
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.5214
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	1.0000
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	**6 mm**	**in**	**50 years**
Total settlement for CONTINUOUS =	**-**	**in**	**-**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT05

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		10	kN/m^2
Depth to watertable from ground surface (h_f)		13.2	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 6 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
13.0	13.0	0.0	1.00	**SQUARE / CIRCULAR**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 26 metres

Circular or Square Shape =	Df + 2B =	26	metres
Continuous Shape =	Df + 4B =	52	metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 0.00 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 104.00 kN/m^2

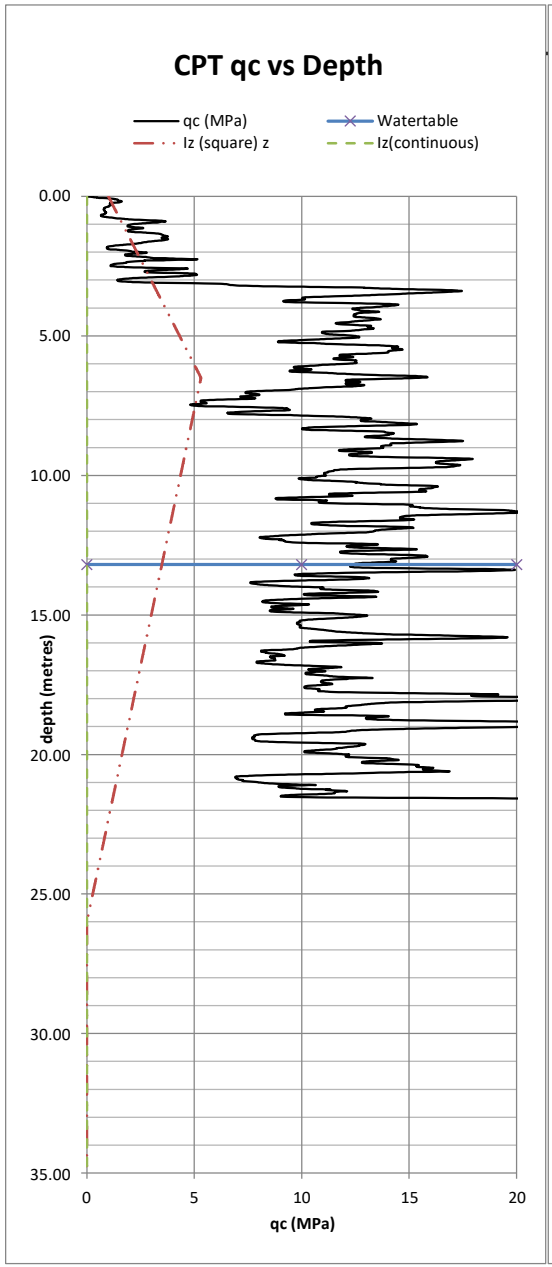
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	104.00	kN/m^2
For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$		
For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$		
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	208.00	kN/m^2
For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$		
For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$		

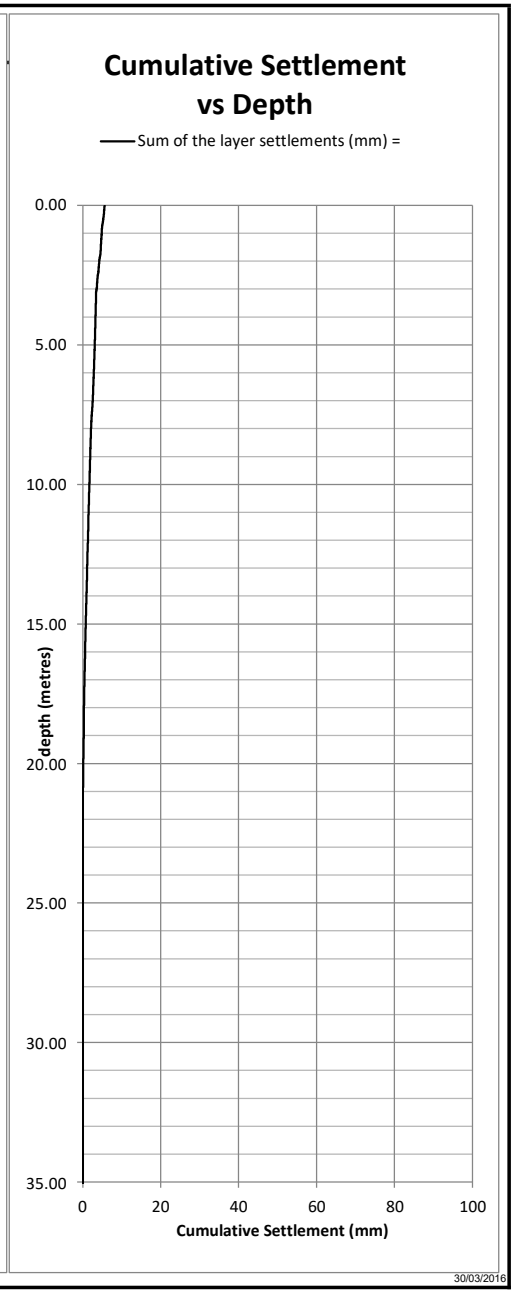
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.5310
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.5219
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	1.0000
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	**6 mm**	**in**	**50 years**
Total settlement for CONTINUOUS =	**-**	**in**	**-**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT06

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		10	kN/m^2
Depth to watertable from ground surface (h_f)		14.9	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 11 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
13.0	13.0	0.0	1.00	**SQUARE / CIRCULAR**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 26 metres

	Circular or Square Shape =	Df + 2B =	26 metres
	Continuous Shape =	Df + 4B =	52 metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 0.00 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 104.00 kN/m^2

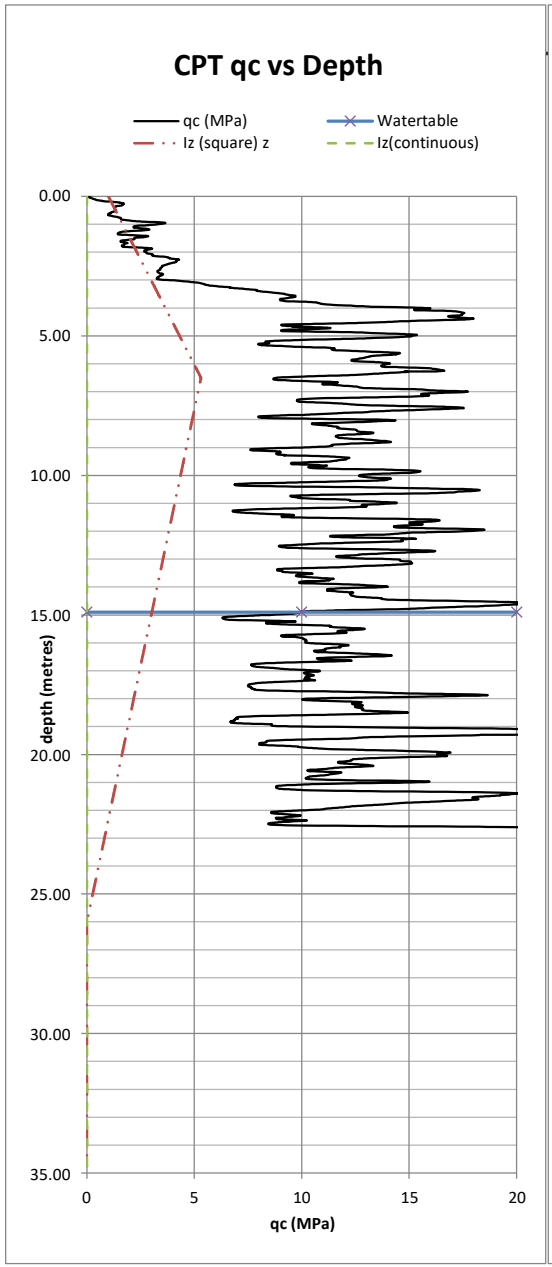
Where, for Square or Circular Shaped Footing		$\sigma'_{zp(squ)}$ = 104.00	kN/m^2
	For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$	
	For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$	
Where, for Continuous Shape Footing		$\sigma'_{zp(con)}$ = 208.00	kN/m^2
	For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$	
	For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$	

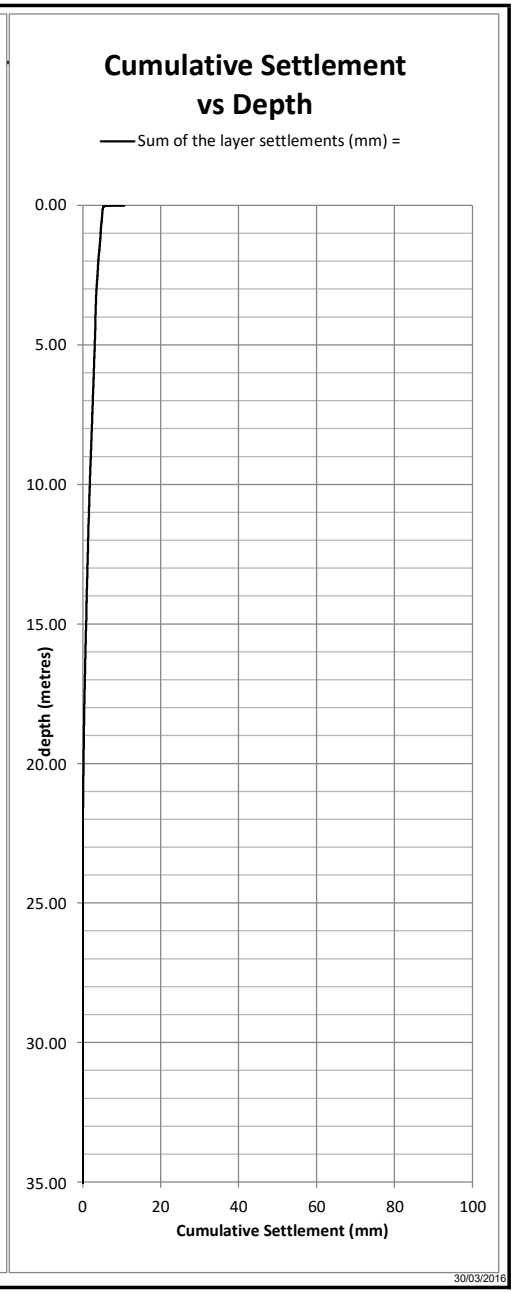
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.5310
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.5219
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	1.0000
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	**11 mm**	**in**	**50 years**
Total settlement for CONTINUOUS =	**-**	**in**	**-**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT07

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		10	kN/m^2
Depth to watertable from ground surface (h_f)		18.2	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 9 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
8.0	8.0	0.0	1.00	**SQUARE / CIRCULAR**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 16 metres

Circular or Square Shape =	Df + 2B =	16	metres
Continuous Shape =	Df + 4B =	32	metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 0.00 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 64.00 kN/m^2

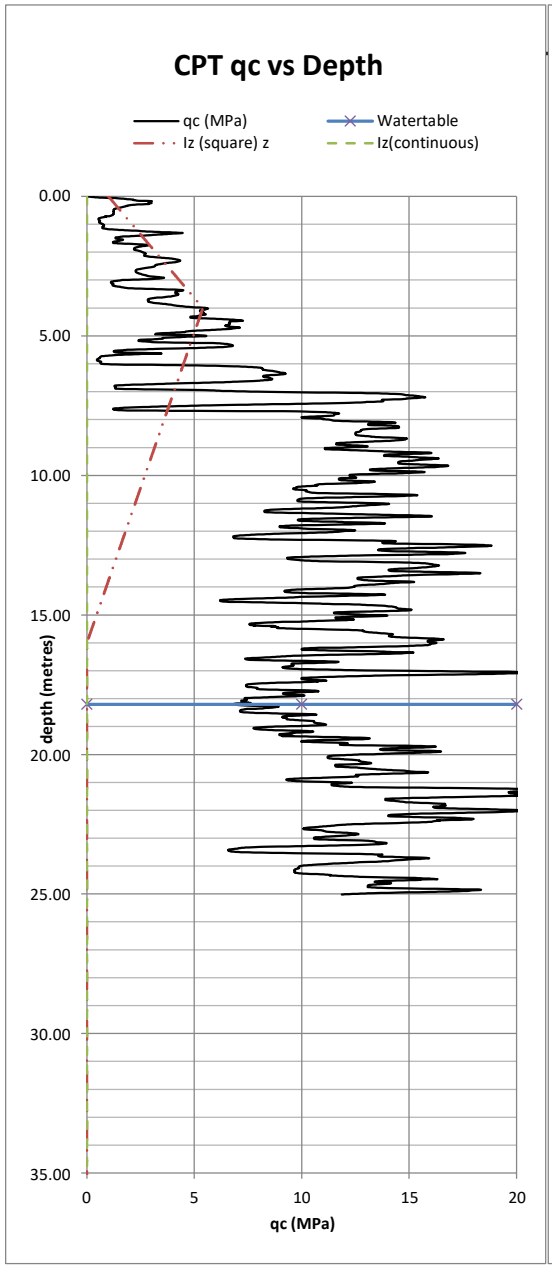
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	64.00	kN/m^2
For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$		
For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$		
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	128.00	kN/m^2
For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$		
For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$		

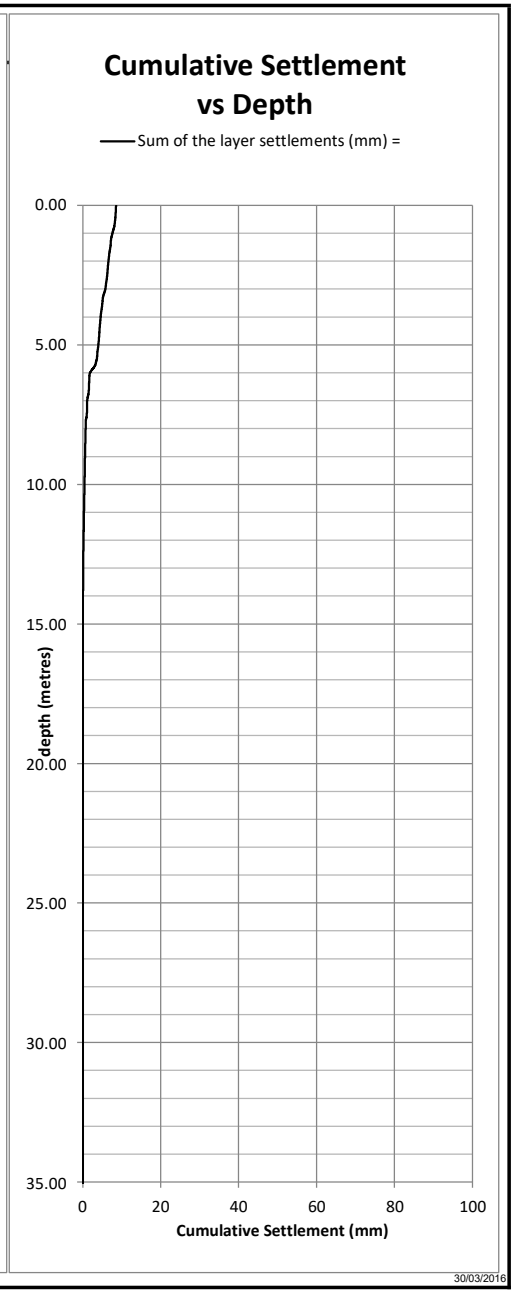
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.5395
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.5280
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	1.0000
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	**9 mm**	**in**	**50 years**
Total settlement for CONTINUOUS =	**-**	**in**	**-**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT08

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		10	kN/m^2
Depth to watertable from ground surface (h_f)		19.0	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 7 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
12.0	12.0	0.0	1.00	**SQUARE / CIRCULAR**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 24 metres

Circular or Square Shape =	Df + 2B =	24	metres
Continuous Shape =	Df + 4B =	48	metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 0.00 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 96.00 kN/m^2

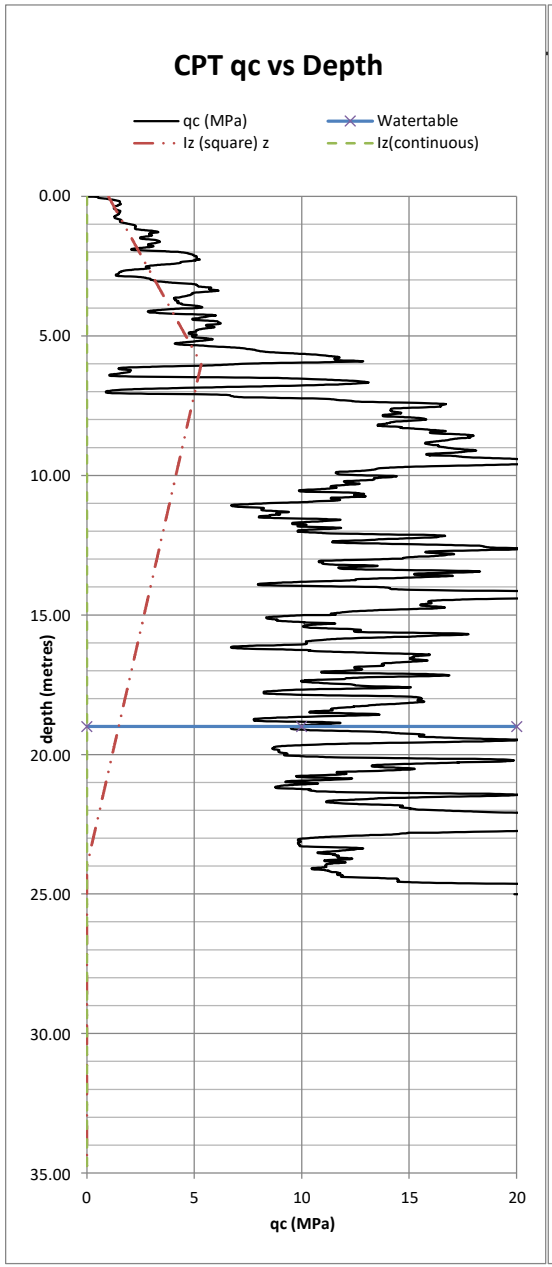
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	96.00 kN/m^2
For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$	
For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$	
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	192.00 kN/m^2
For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$	
For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$	

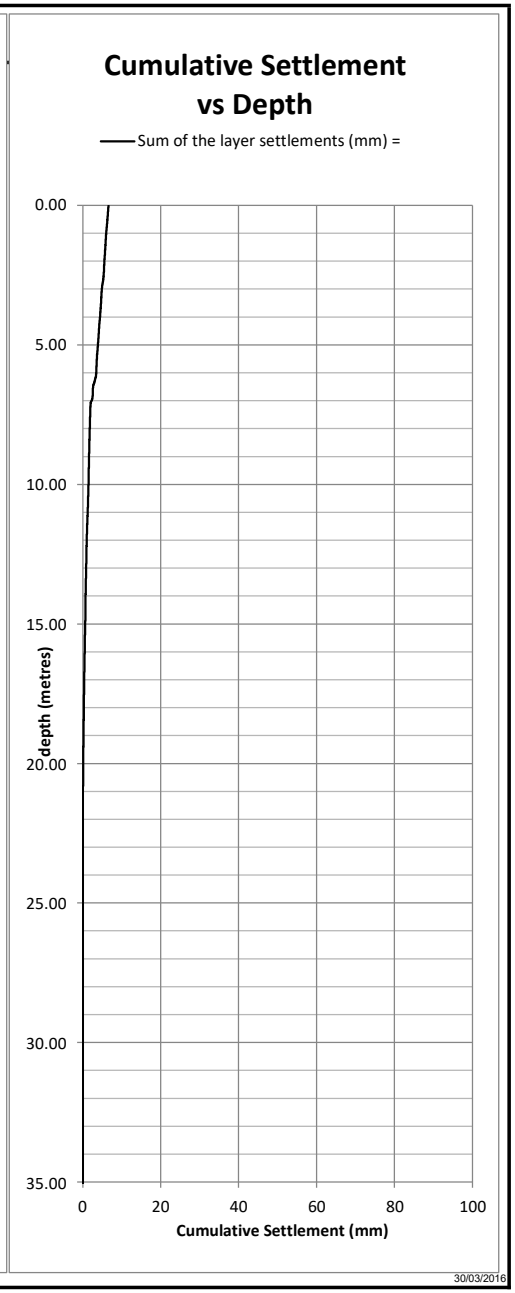
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.5323
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.5228
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	1.0000
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	**7 mm**	**in**	**50 years**
Total settlement for CONTINUOUS =	**-**	**in**	**-**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT09

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		10	kN/m^2
Depth to watertable from ground surface (h_f)		19.2	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 30 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
12.0	12.0	0.0	1.00	**SQUARE / CIRCULAR**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 24 metres

Circular or Square Shape =	Df + 2B =	24 metres
Continuous Shape =	Df + 4B =	48 metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 0.00 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 96.00 kN/m^2

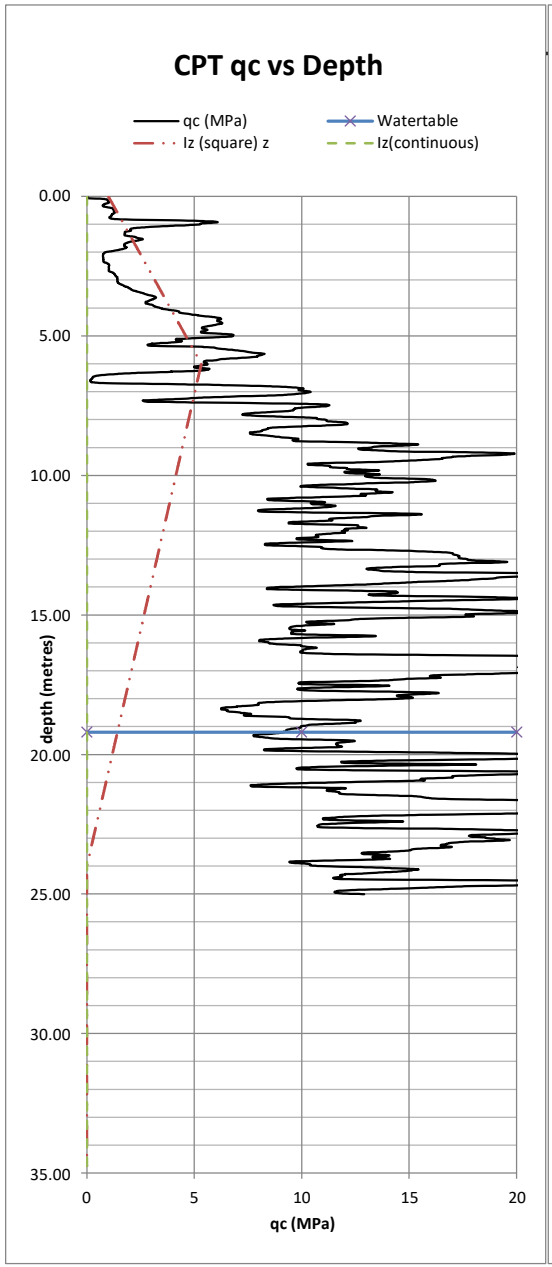
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	96.00 kN/m^2
For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$	
For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$	
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	192.00 kN/m^2
For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$	
For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$	

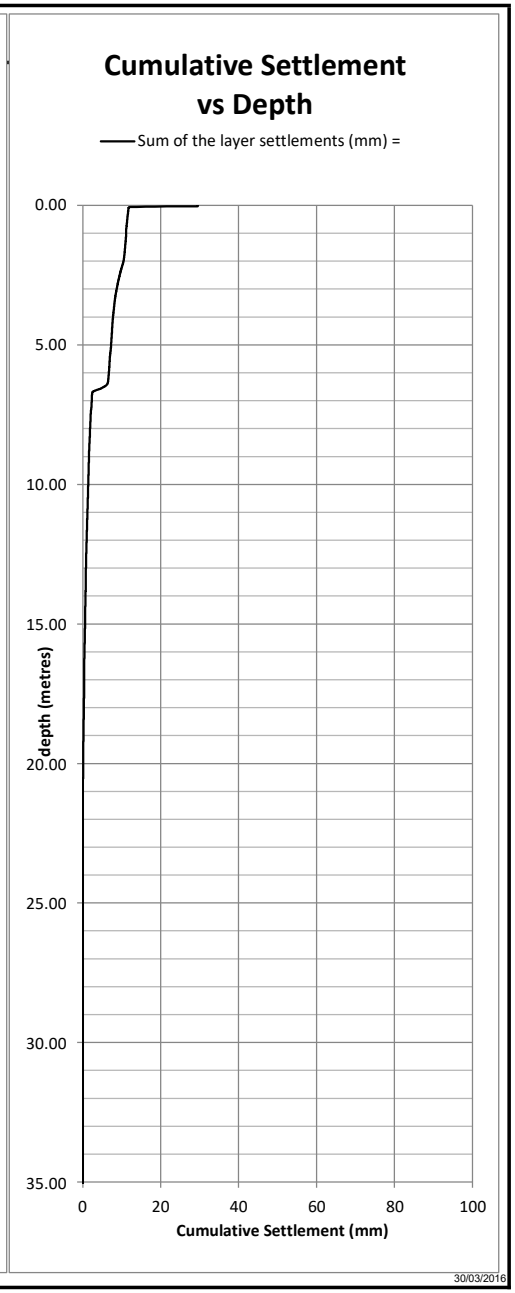
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.5323
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.5228
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	1.0000
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	**30 mm**	**in**	**50 years**
Total settlement for CONTINUOUS =	**-**	**in**	**-**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT10

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		10	kN/m^2
Depth to watertable from ground surface (h_f)		19.5	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 8 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
13.0	13.0	0.0	1.00	**SQUARE / CIRCULAR**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 26 metres

Circular or Square Shape =	Df + 2B =	26	metres
Continuous Shape =	Df + 4B =	52	metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 0.00 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 104.00 kN/m^2

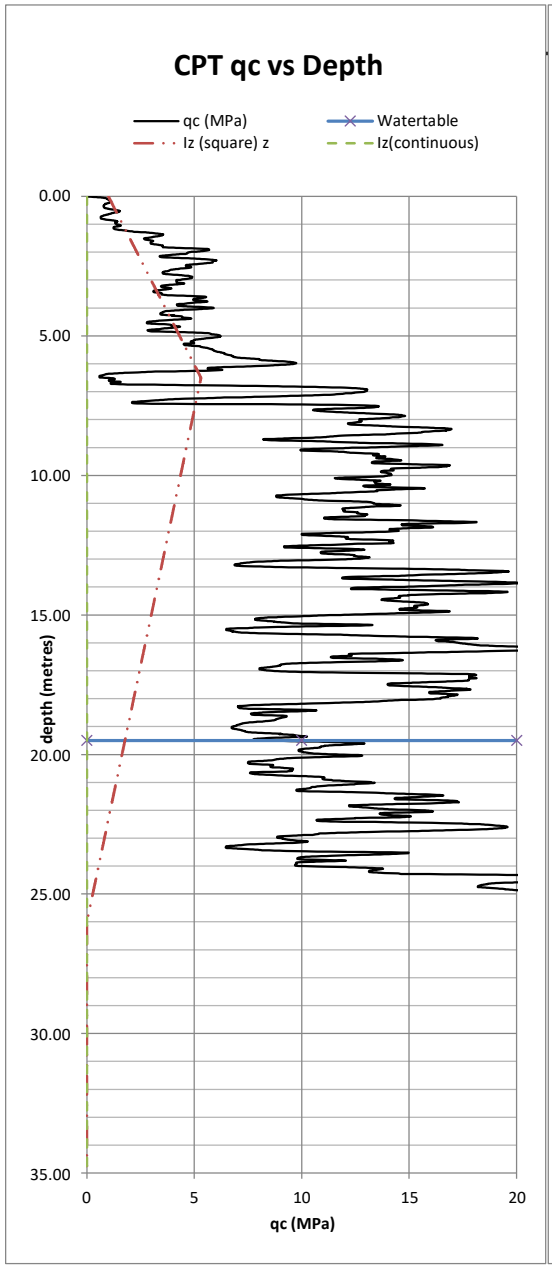
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	104.00	kN/m^2
For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$		
For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$		
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	208.00	kN/m^2
For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$		
For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$		

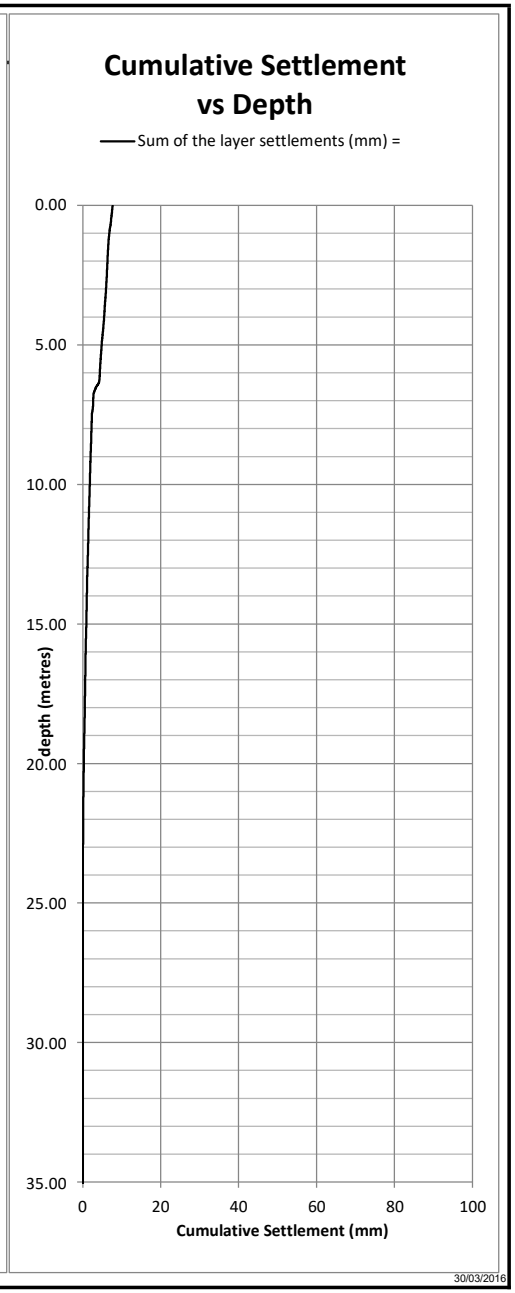
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.5310
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.5219
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	1.0000
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	**8 mm**	**in**	**50 years**
Total settlement for CONTINUOUS =	**-**	**in**	**-**





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Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT01

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		20	kN/m^2
Depth to watertable from ground surface (h_f)		16.2	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 11 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
16.0	16.0	0.0	1.00	**SQUARE / CIRCULAR**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 32 metres

Circular or Square Shape =	Df + 2B =	32	metres
Continuous Shape =	Df + 4B =	64	metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 0.00 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 128.00 kN/m^2

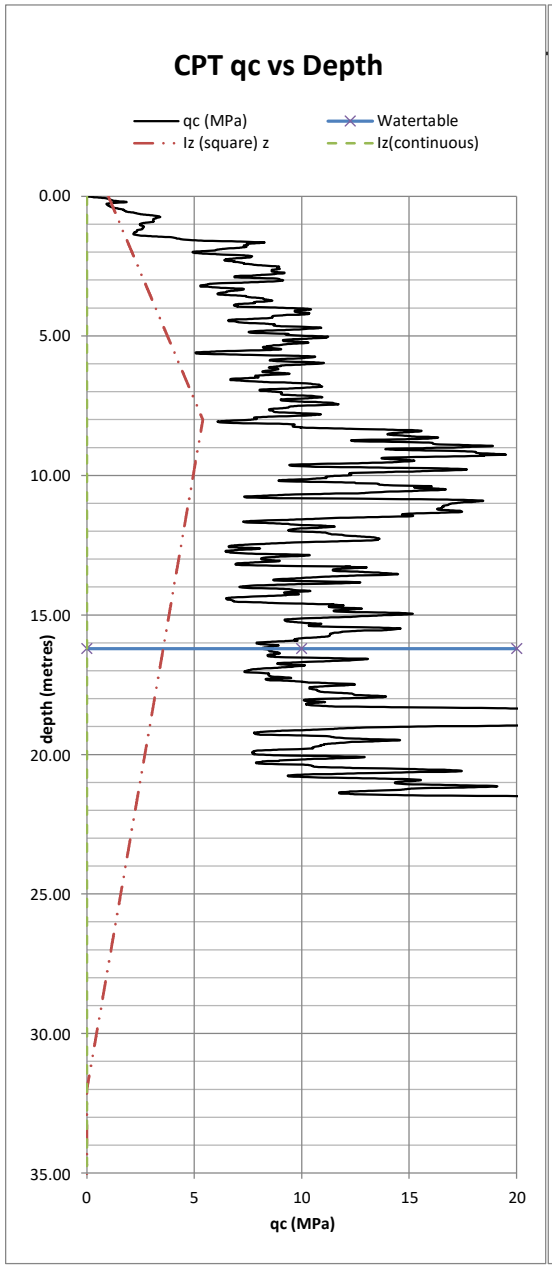
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	128.00	kN/m^2
For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$		
For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$		
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	256.00	kN/m^2
For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$		
For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$		

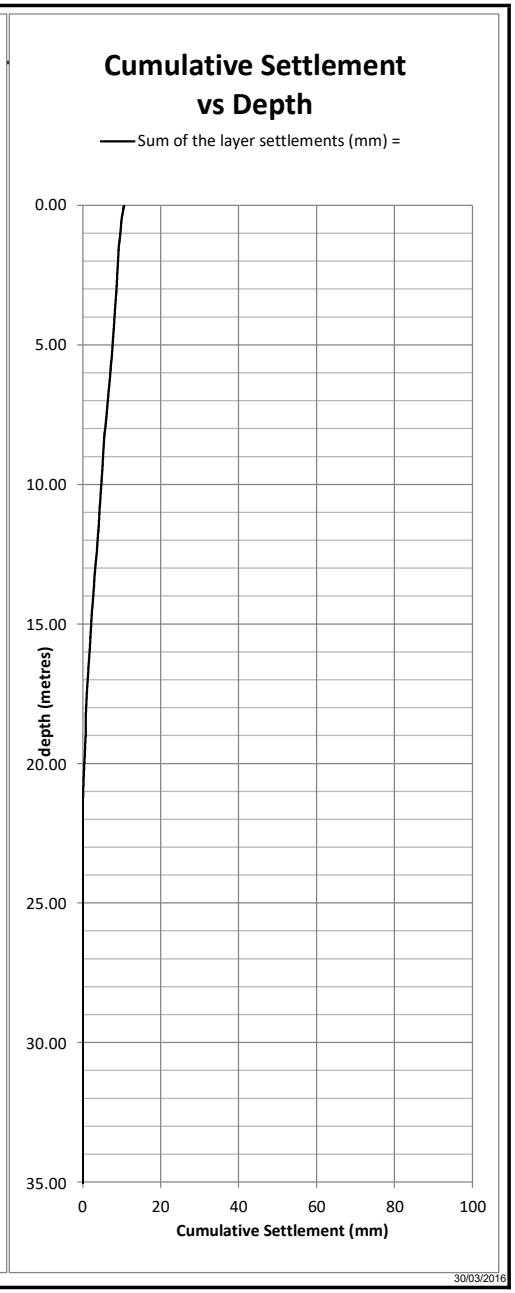
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.5395
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.5280
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	1.0000
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	**11 mm**	**in**	**50 years**
Total settlement for CONTINUOUS =	**-**	**in**	**-**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT02

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		20	kN/m^2
Depth to watertable from ground surface (h_f)		12.2	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 11 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
19.0	19.0	0.0	1.00	**SQUARE / CIRCULAR**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 38 metres

Circular or Square Shape =	Df + 2B =	38	metres
Continuous Shape =	Df + 4B =	76	metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 0.00 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 152.00 kN/m^2

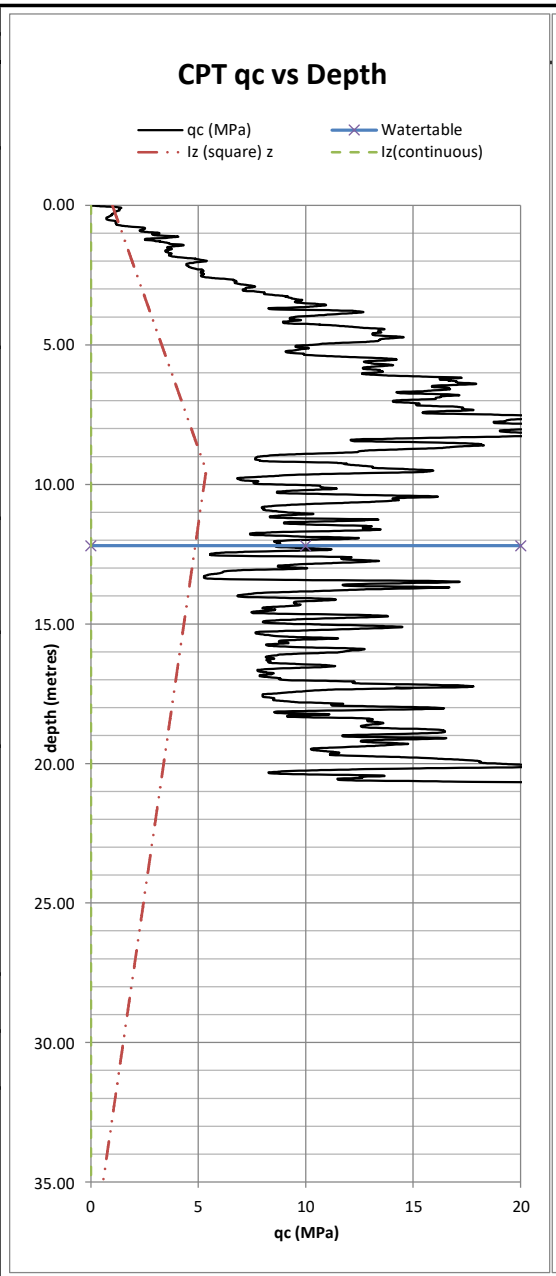
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	152.00	kN/m^2
For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$		
For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$		
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	237.29	kN/m^2
For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$		
For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$		

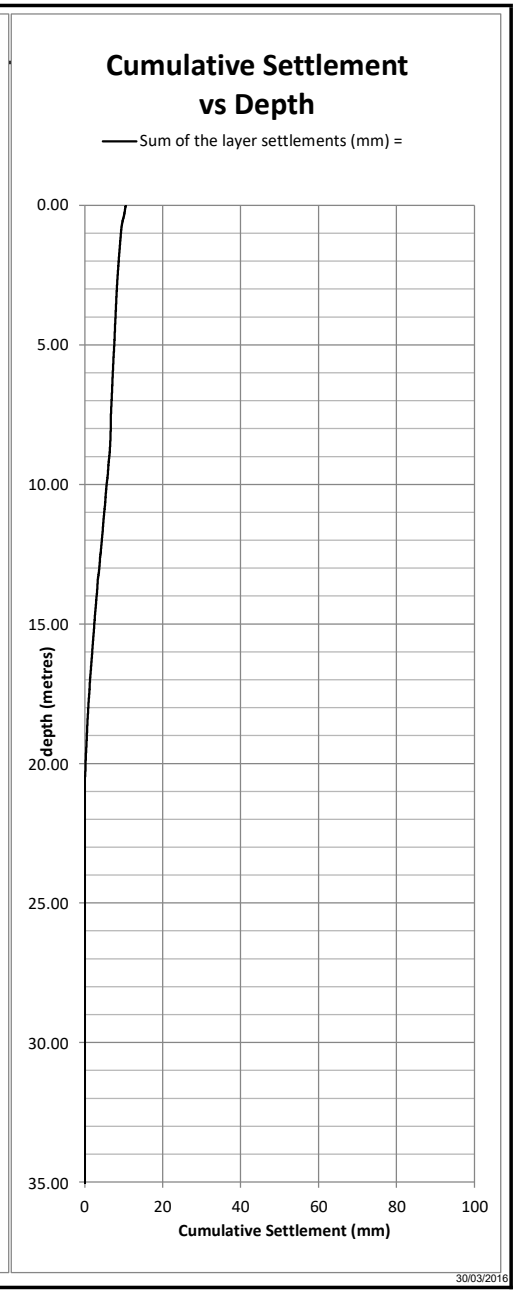
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.5363
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.5290
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	1.0000
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	**11 mm**	**in**	**50 years**
Total settlement for CONTINUOUS =	**-**	**in**	**-**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT03

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		20	kN/m^2
Depth to watertable from ground surface (h_f)		14.8	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 11 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
11.0	11.0	0.0	1.00	**SQUARE / CIRCULAR**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 22 metres

Circular or Square Shape =	Df + 2B =	22	metres
Continuous Shape =	Df + 4B =	44	metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 0.00 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 88.00 kN/m^2

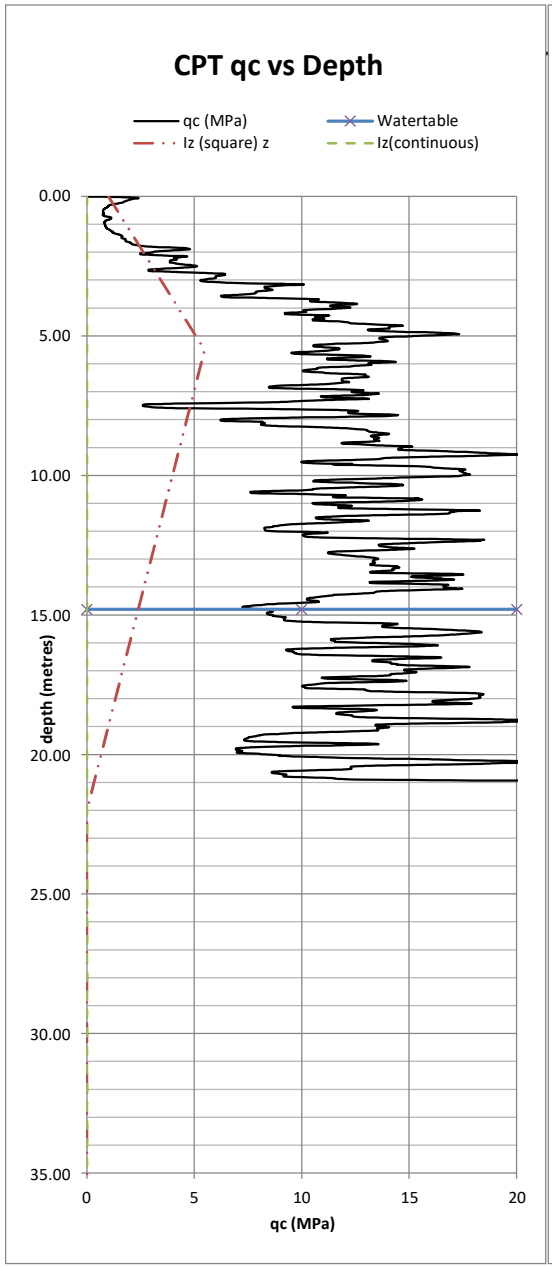
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	88.00	kN/m^2
For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$		
For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$		
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	176.00	kN/m^2
For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$		
For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$		

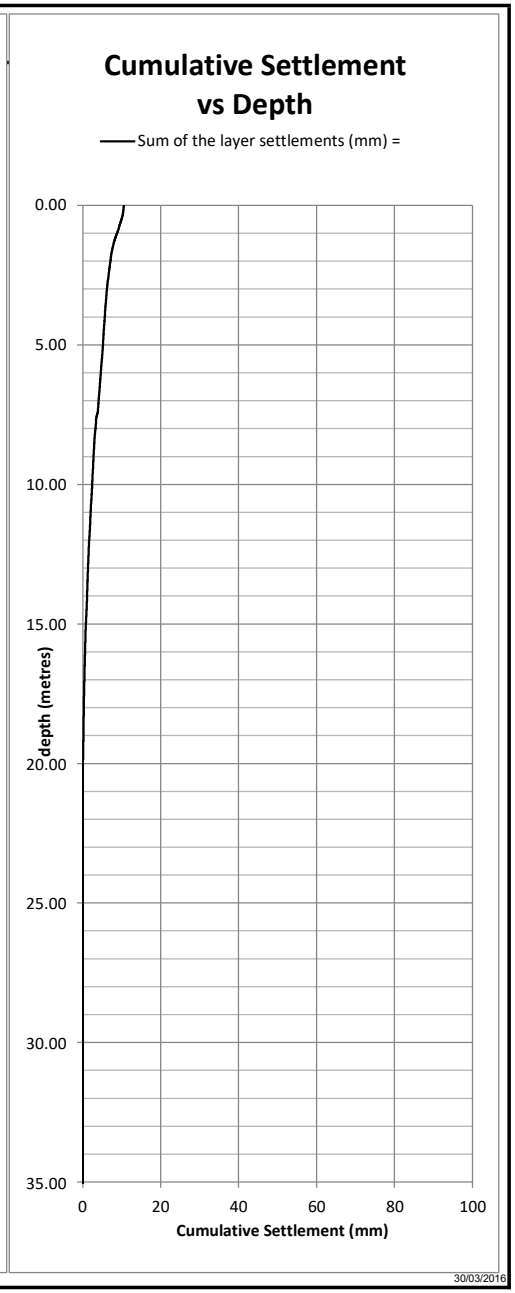
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.5477
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.5337
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	1.0000
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	**11 mm**	**in**	**50 years**
Total settlement for CONTINUOUS =	**-**	**in**	**-**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT04

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		20	kN/m^2
Depth to watertable from ground surface (h_f)		13.5	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 12 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
16.0	16.0	0.0	1.00	**SQUARE / CIRCULAR**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 32 metres

Circular or Square Shape =	Df + 2B =	32	metres
Continuous Shape =	Df + 4B =	64	metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 0.00 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 128.00 kN/m^2

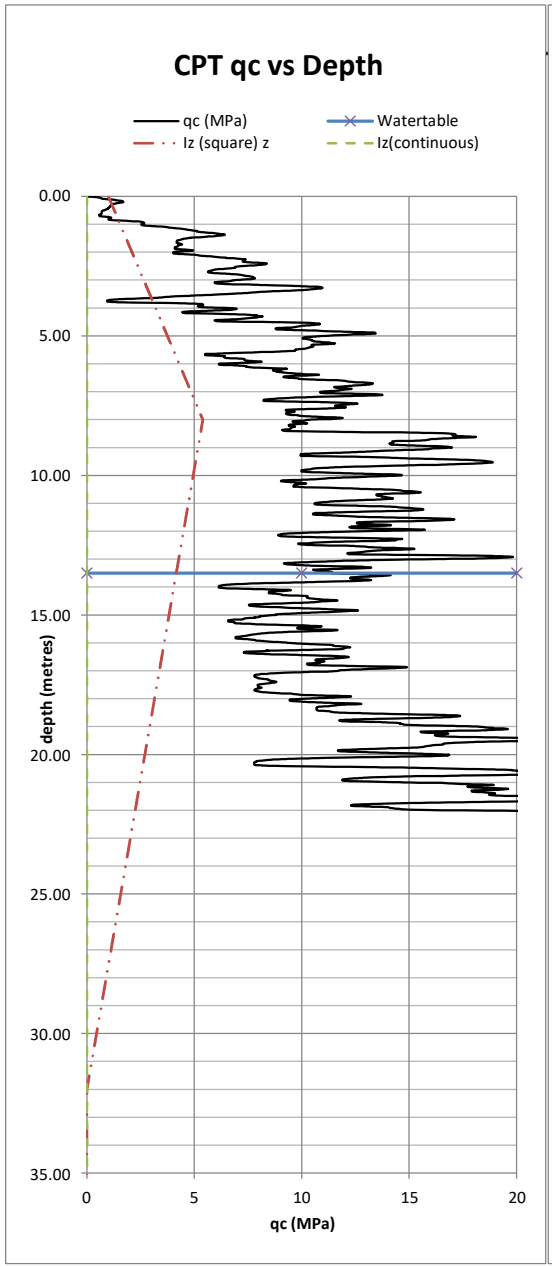
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	128.00	kN/m^2
For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$		
For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$		
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	231.48	kN/m^2
For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$		
For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$		

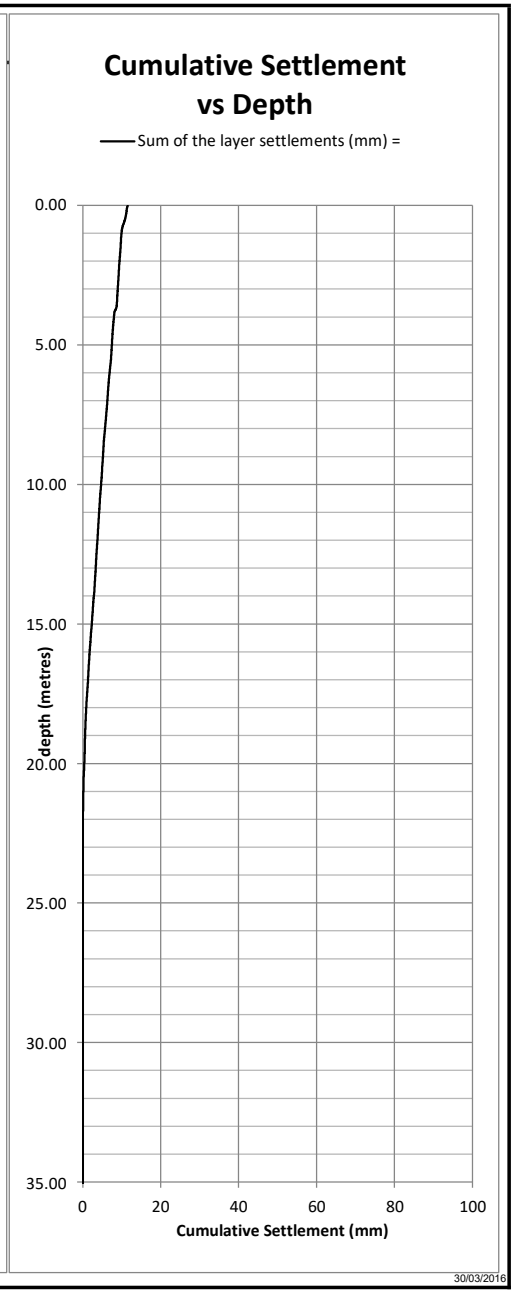
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.5395
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.5294
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	1.0000
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	**12 mm**	**in**	**50 years**
Total settlement for CONTINUOUS =	**-**	**in**	**-**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT05

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		20	kN/m^2
Depth to watertable from ground surface (h_f)		13.2	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 12 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
14.0	14.0	0.0	1.00	**SQUARE / CIRCULAR**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 28 metres

Circular or Square Shape =	Df + 2B =	28	metres
Continuous Shape =	Df + 4B =	56	metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 0.00 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 112.00 kN/m^2

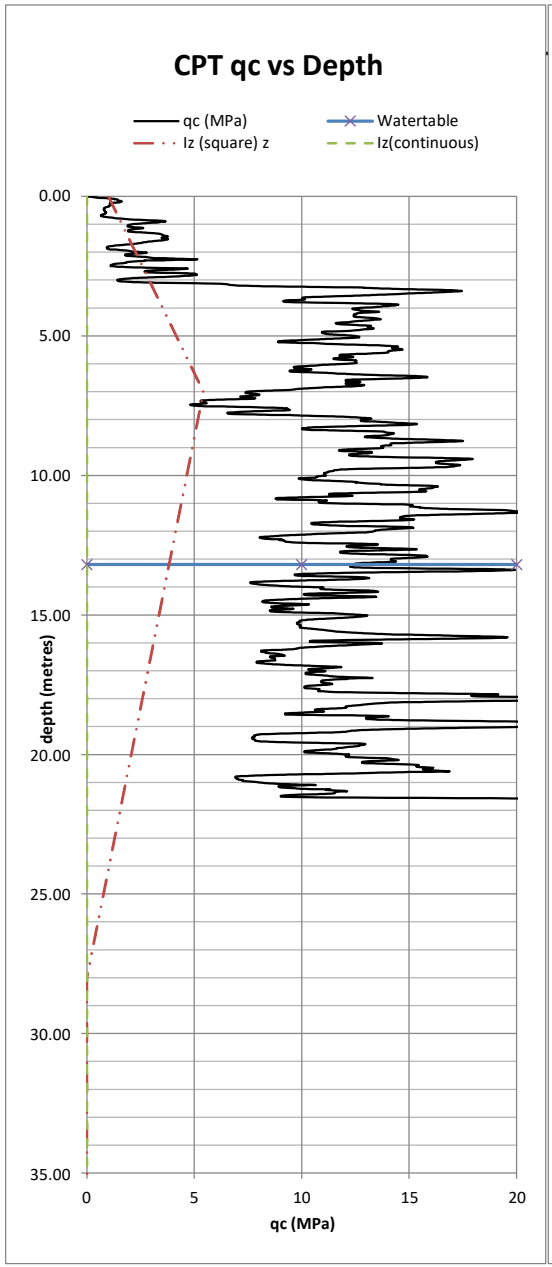
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	112.00	kN/m^2
For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$		
For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$		
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	216.15	kN/m^2
For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$		
For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$		

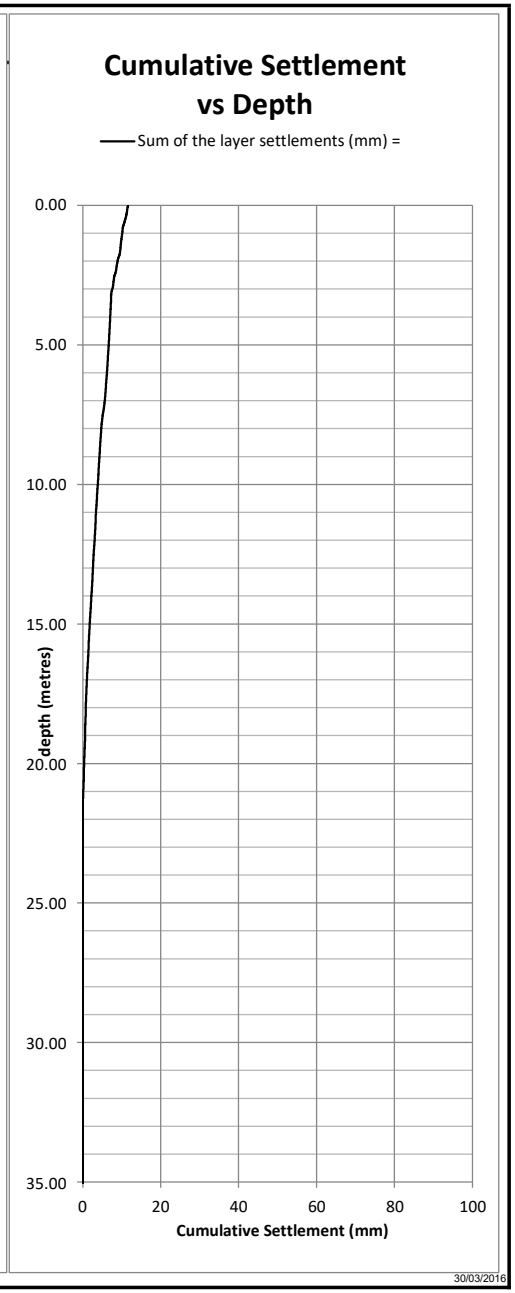
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.5423
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.5304
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	1.0000
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	**12 mm**	**in**	**50 years**
Total settlement for CONTINUOUS =	**-**	**in**	**-**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT06

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		20	kN/m^2
Depth to watertable from ground surface (h_f)		14.9	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 22 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
14.0	14.0	0.0	1.00	**SQUARE / CIRCULAR**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 28 metres

Circular or Square Shape =	Df + 2B =	28	metres
Continuous Shape =	Df + 4B =	56	metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 0.00 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 112.00 kN/m^2

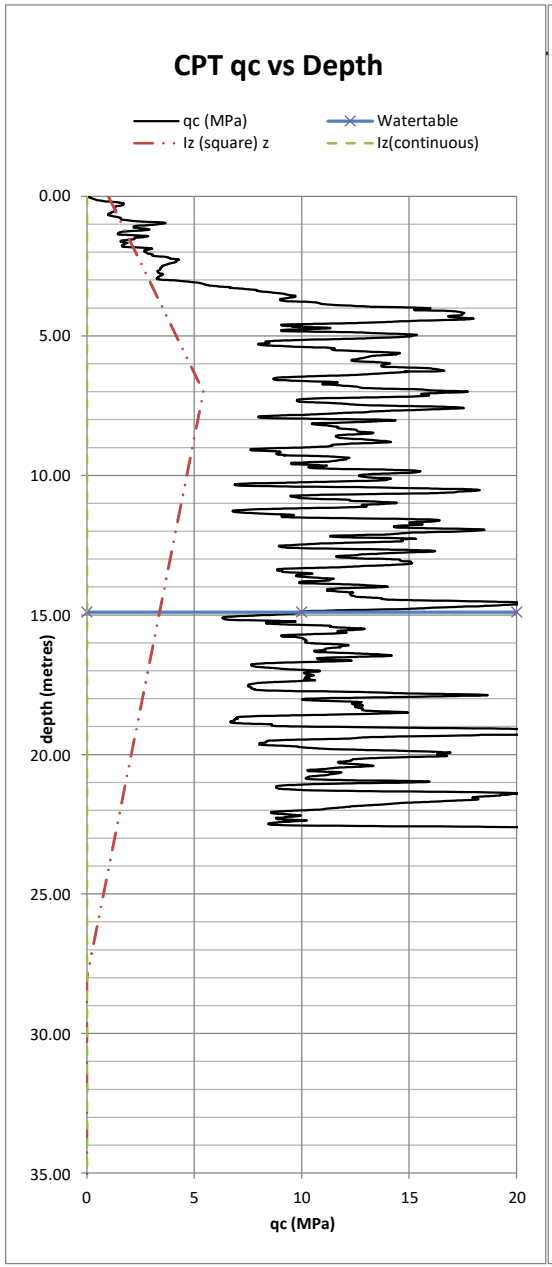
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	112.00	kN/m^2
For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$		
For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$		
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	224.00	kN/m^2
For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$		
For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$		

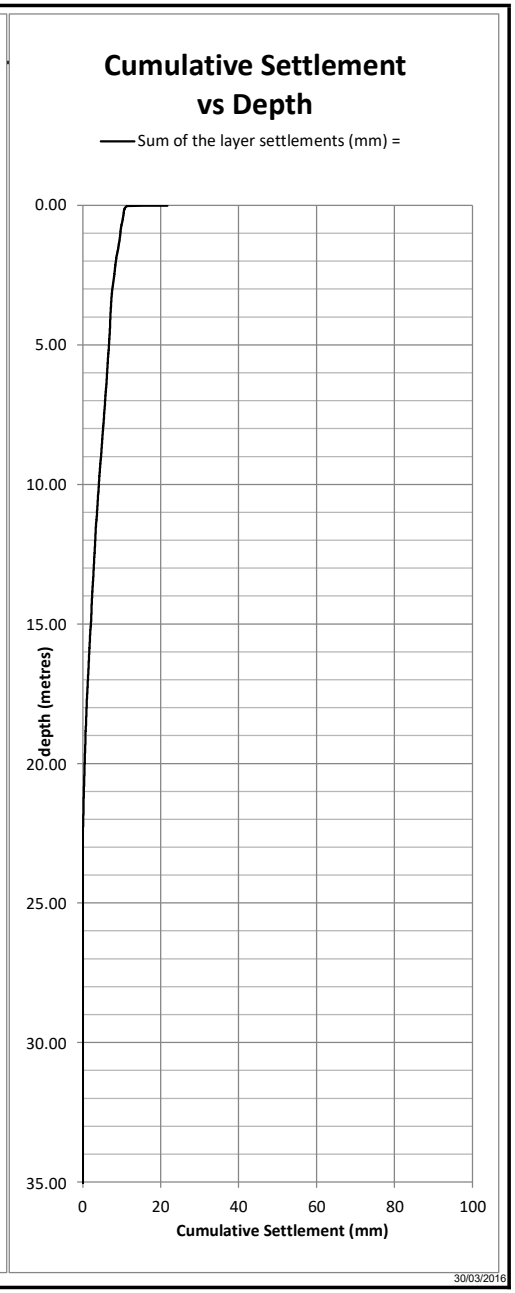
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.5423
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.5299
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	1.0000
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	**22 mm**	**in**	**50 years**
Total settlement for CONTINUOUS =	**-**	**in**	**-**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT07

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		20	kN/m^2
Depth to watertable from ground surface (h_f)		18.2	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions Settlement = 19 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
11.0	11.0	0.0	1.00	**SQUARE / CIRCULAR**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 22 metres

Circular or Square Shape =	Df + 2B =	22	metres
Continuous Shape =	Df + 4B =	44	metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 0.00 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 88.00 kN/m^2

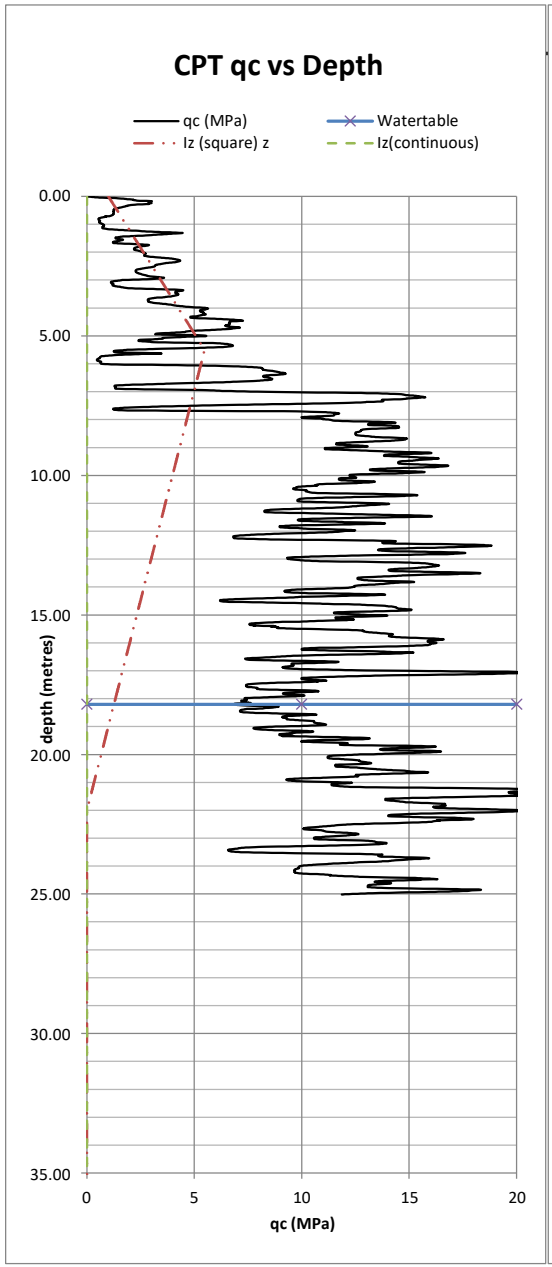
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	88.00	kN/m^2
For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$		
For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$		
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	176.00	kN/m^2
For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$		
For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$		

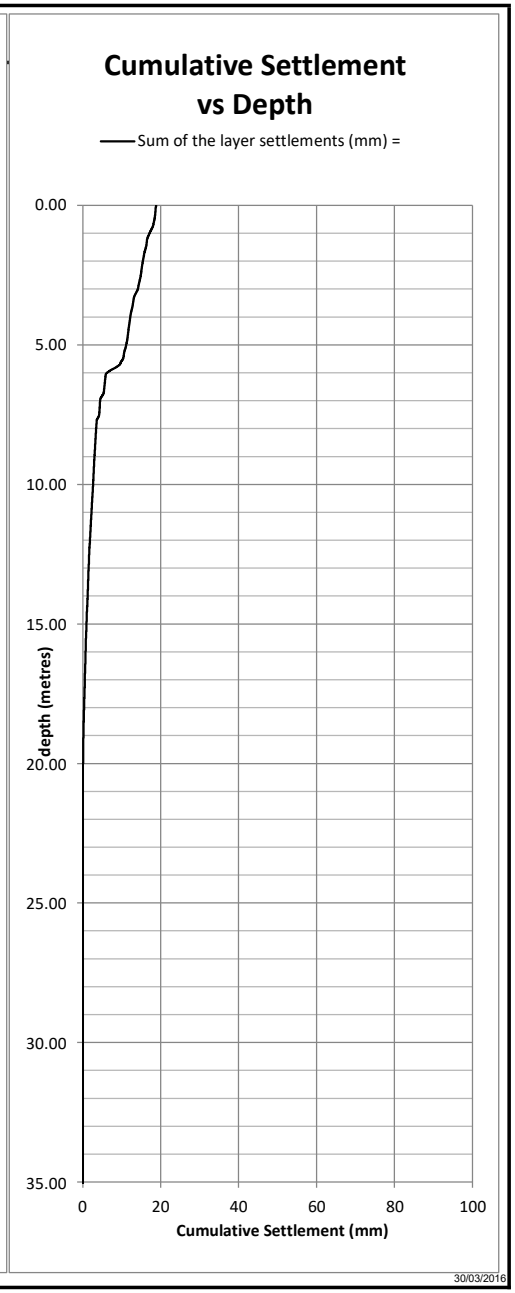
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.5477
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.5337
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	1.0000
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	**19 mm**	**in**	**50 years**
Total settlement for CONTINUOUS =	**-**	**in**	**-**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT08

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		20	kN/m^2
Depth to watertable from ground surface (h_f)		19.0	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 14 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
12.0	12.0	0.0	1.00	**SQUARE / CIRCULAR**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 24 metres

Circular or Square Shape =	Df + 2B =	24	metres
Continuous Shape =	Df + 4B =	48	metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 0.00 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 96.00 kN/m^2

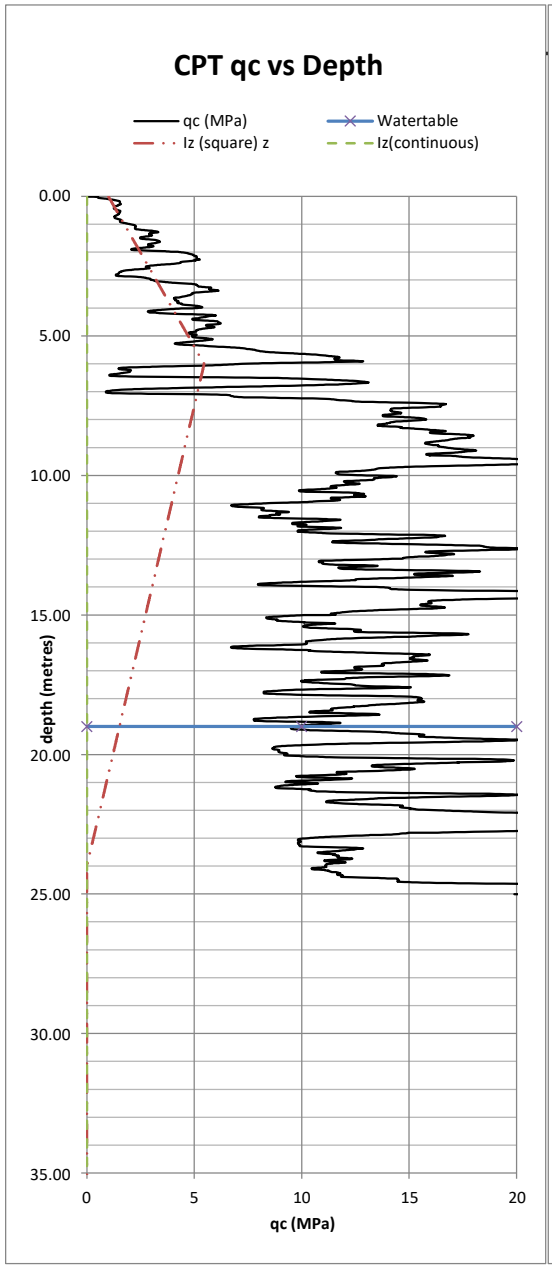
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	96.00	kN/m^2
For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$		
For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$		
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	192.00	kN/m^2
For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$		
For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$		

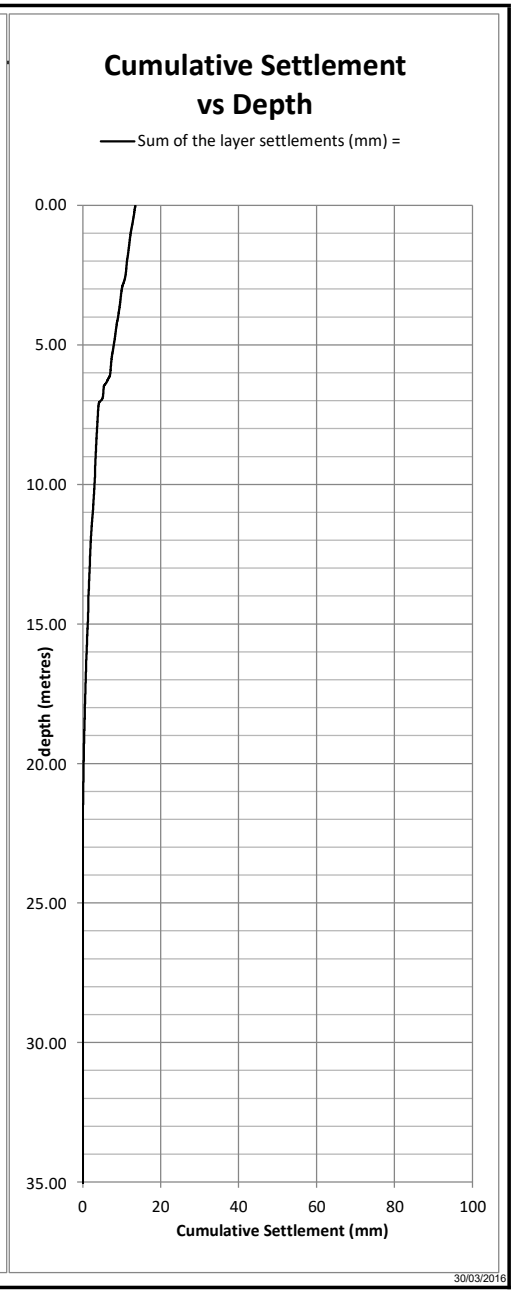
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.5456
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.5323
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	1.0000
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	**14 mm**	**in**	**50 years**
Total settlement for CONTINUOUS =	**-**	**in**	**-**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT09

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		20	kN/m^2
Depth to watertable from ground surface (h_f)		19.2	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 60 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
12.0	12.0	0.0	1.00	**SQUARE / CIRCULAR**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 24 metres

Circular or Square Shape =	Df + 2B =	24	metres
Continuous Shape =	Df + 4B =	48	metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 0.00 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 96.00 kN/m^2

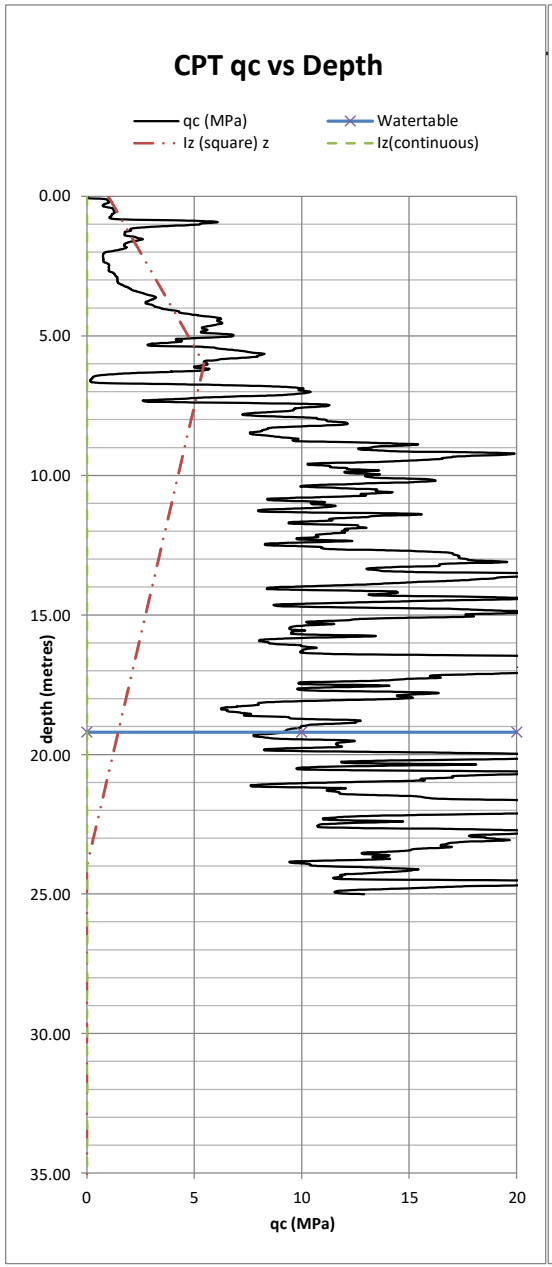
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	96.00	kN/m^2
For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$		
For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$		
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	192.00	kN/m^2
For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$		
For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$		

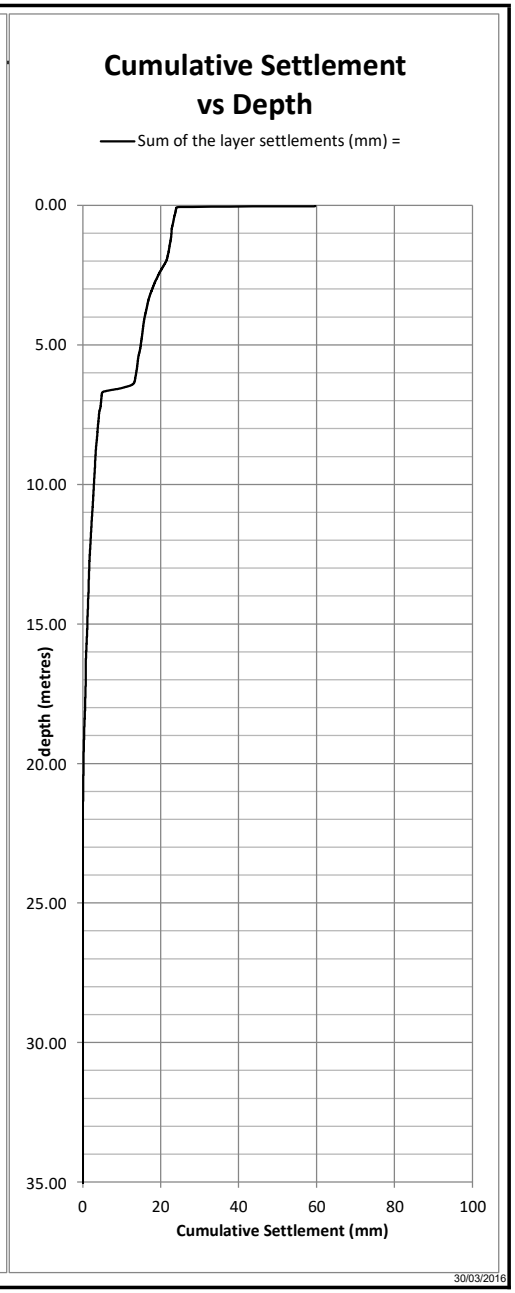
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.5456
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.5323
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	1.0000
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	**60 mm**	**in**	**50 years**
Total settlement for CONTINUOUS =	**-**	**in**	**-**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT10

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		20	kN/m^2
Depth to watertable from ground surface (h_f)		19.5	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 16 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
22.0	22.0	0.0	1.00	**SQUARE / CIRCULAR**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 44 metres

Circular or Square Shape =	Df + 2B =	44	metres
Continuous Shape =	Df + 4B =	88	metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 0.00 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 176.00 kN/m^2

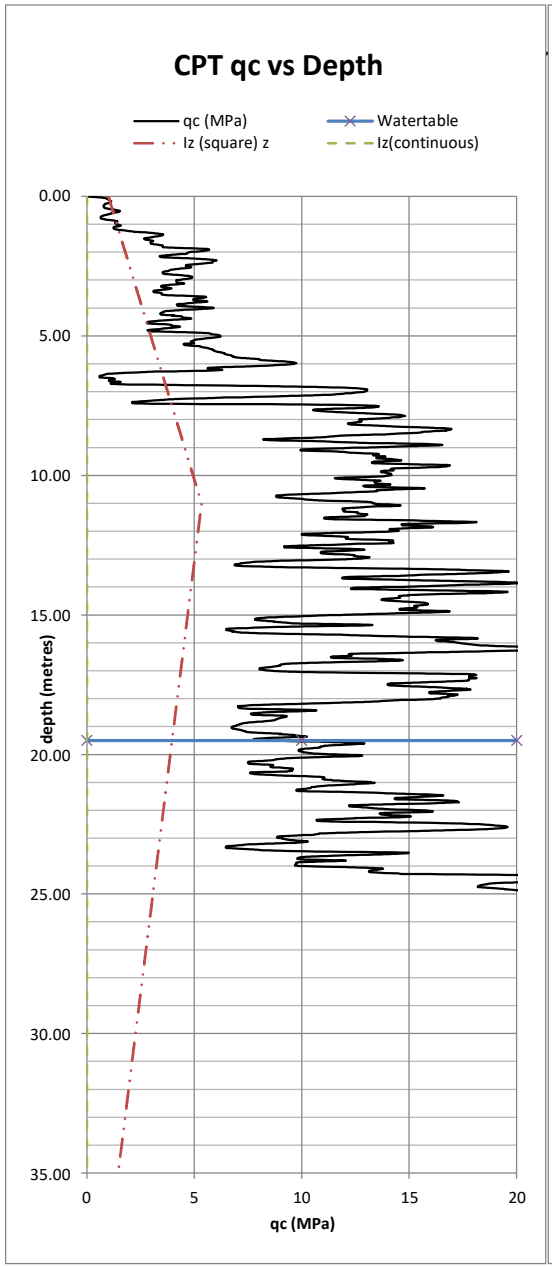
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	176.00	kN/m^2
For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$		
For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$		
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	327.48	kN/m^2
For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$		
For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$		

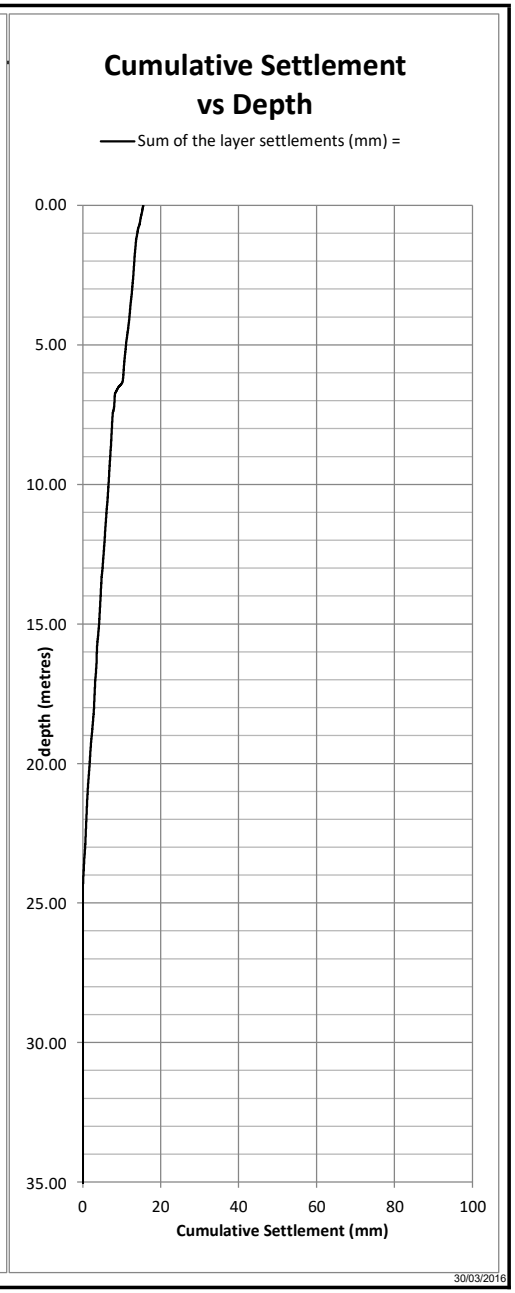
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.5337
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.5247
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	1.0000
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	**16 mm**	**in**	**50 years**
Total settlement for CONTINUOUS =	**-**	**in**	**-**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT01

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		70	kN/m^2
Depth to watertable from ground surface (h_f)		16.2	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 12 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
2.5	2.5	0.4	1.00	**SQUARE / CIRCULAR**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 5.4 metres

Circular or Square Shape =	Df + 2B =	5.4 metres
Continuous Shape =	Df + 4B =	10.4 metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 6.40 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 26.40 kN/m^2

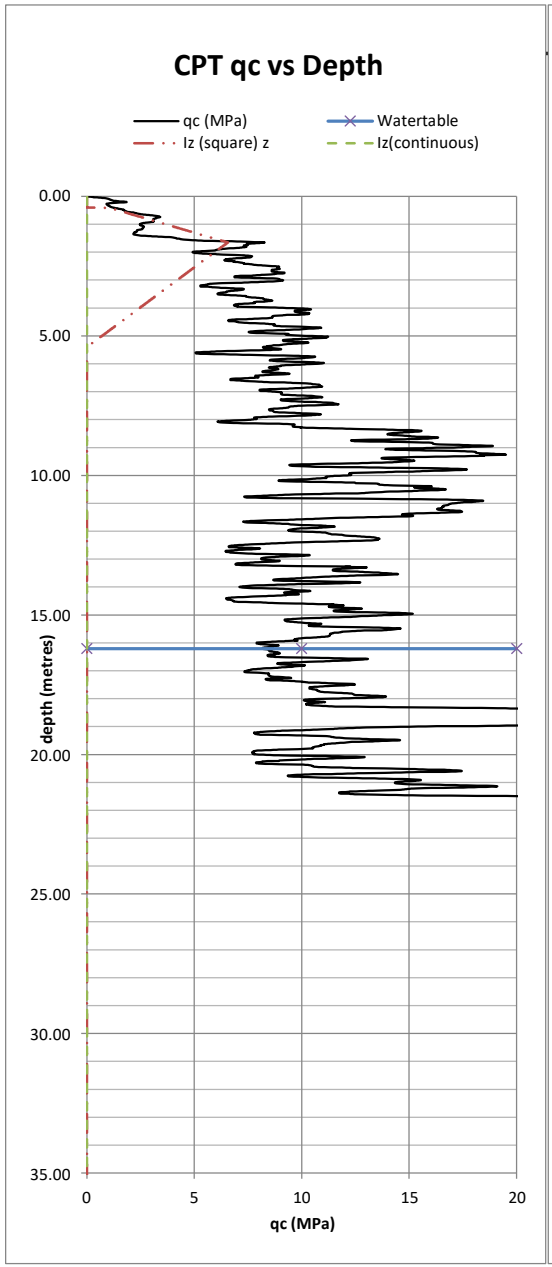
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	26.40 kN/m^2
For h_f < D_f + B/2	$\sigma'_{zp(squ)}$ =	$(\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$
For h_f > D_f + B/2	$\sigma'_{zp(squ)}$ =	$\gamma_s \times (D_f + B/2)$
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	46.40 kN/m^2
For h_f < D_f + B	$\sigma'_{zp(con)}$ =	$(\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$
For h_f > D_f + B	$\sigma'_{zp(con)}$ =	$\gamma_s \times (D_f + B)$

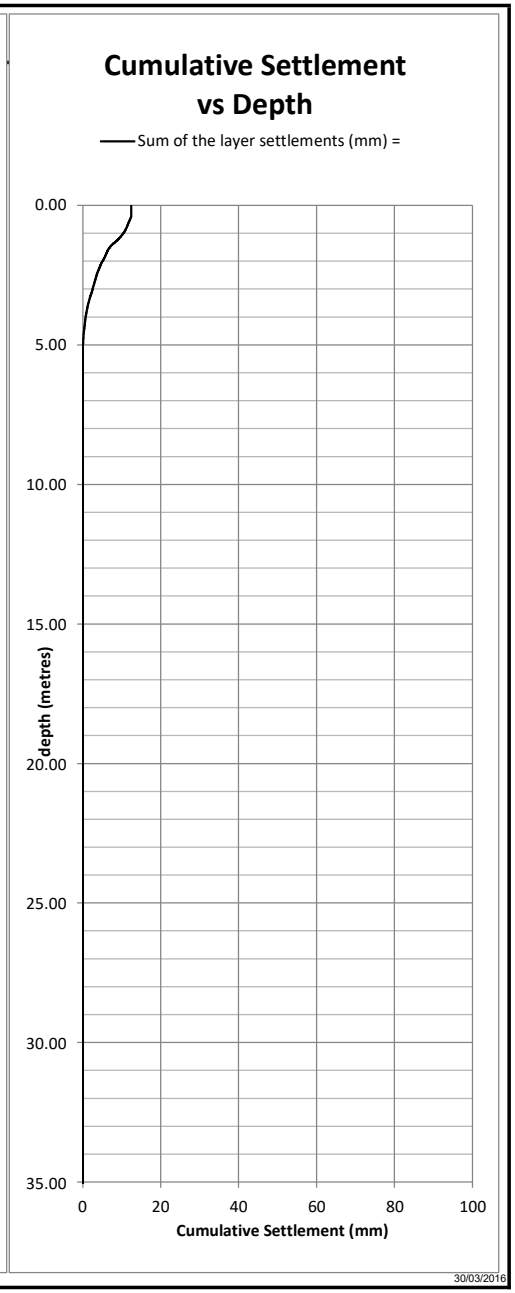
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.6552
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.6171
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	0.9497
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	**12 mm**	**in**	**50 years**
Total settlement for CONTINUOUS =	**-**	**in**	**-**





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Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT02

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		70	kN/m^2
Depth to watertable from ground surface (h_f)		12.2	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 14 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
2.5	2.5	0.4	1.00	**SQUARE / CIRCULAR**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 5.4 metres

	Circular or Square Shape =	Df + 2B =	5.4 metres
	Continuous Shape =	Df + 4B =	10.4 metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 6.40 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 26.40 kN/m^2

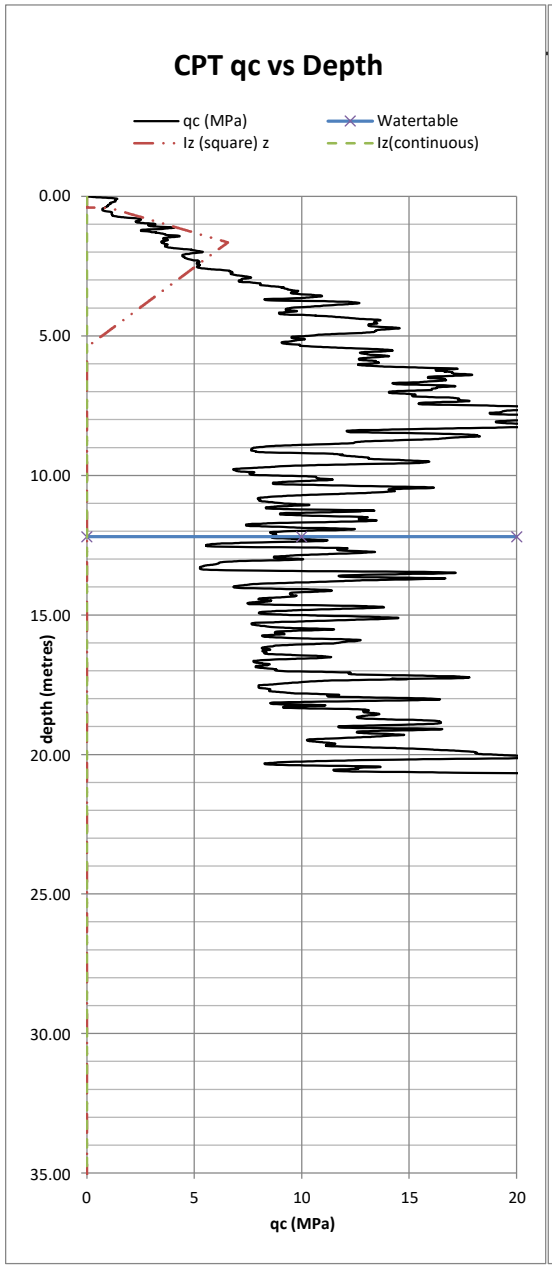
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	26.40 kN/m^2
For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$	
For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$	
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	46.40 kN/m^2
For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$	
For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$	

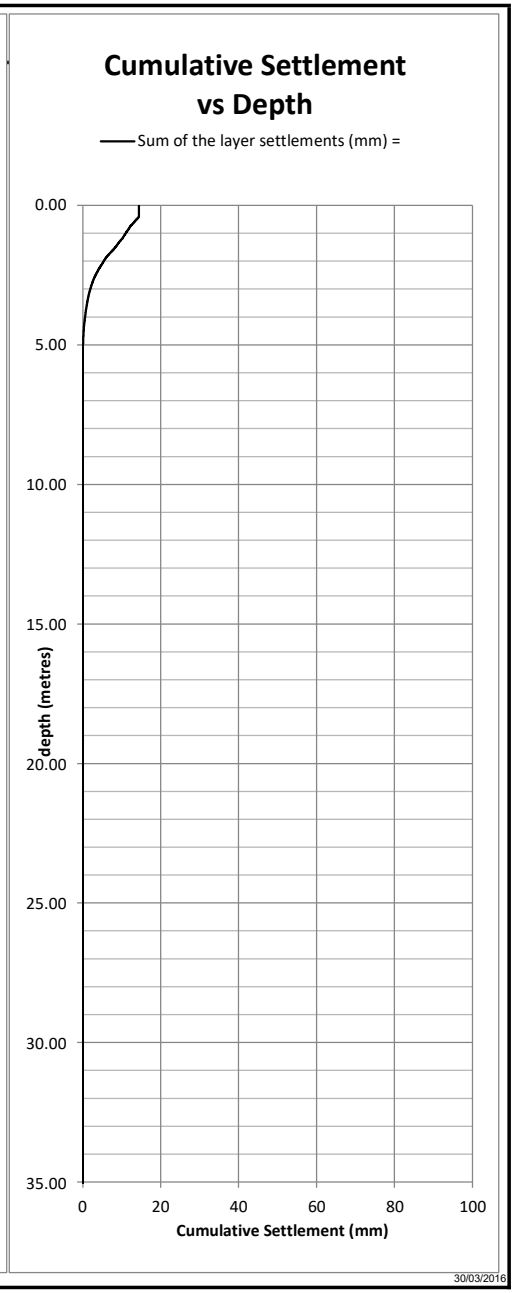
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.6552
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.6171
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	0.9497
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	**14 mm**	**in**	**50 years**
Total settlement for CONTINUOUS =	**-**	**in**	**-**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT03

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		70	kN/m^2
Depth to watertable from ground surface (h_f)		14.8	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 25 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
2.5	2.5	0.4	1.00	**SQUARE / CIRCULAR**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 5.4 metres

	Circular or Square Shape =	Df + 2B =	5.4 metres
	Continuous Shape =	Df + 4B =	10.4 metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 6.40 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 26.40 kN/m^2

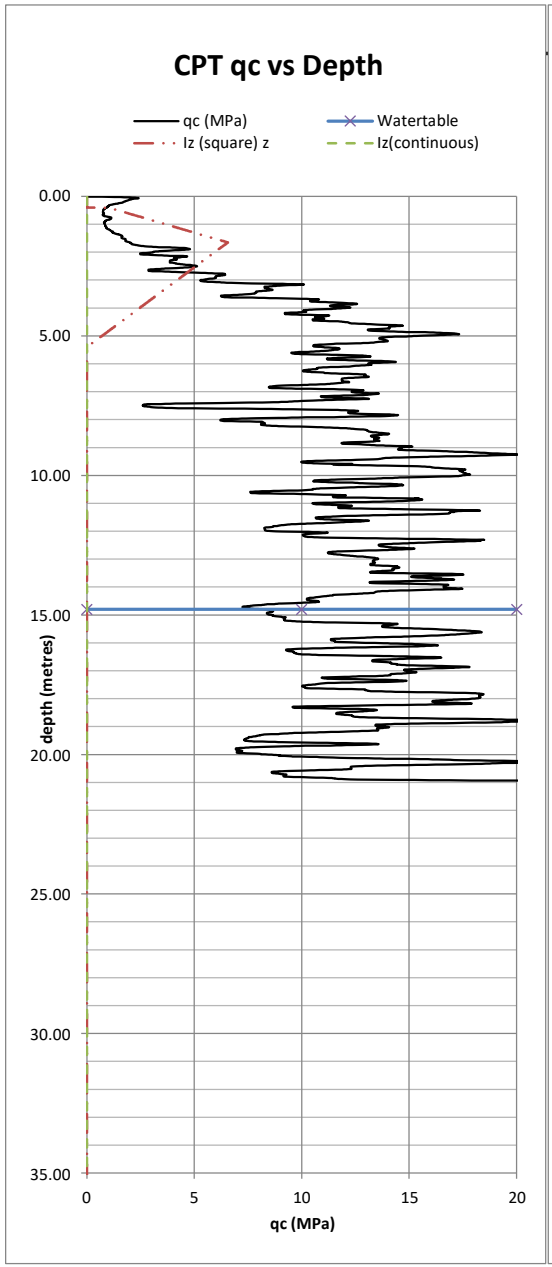
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	26.40 kN/m^2
For h_f < D_f + B/2	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$	
For h_f > D_f + B/2	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$	
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	46.40 kN/m^2
For h_f < D_f + B	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$	
For h_f > D_f + B	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$	

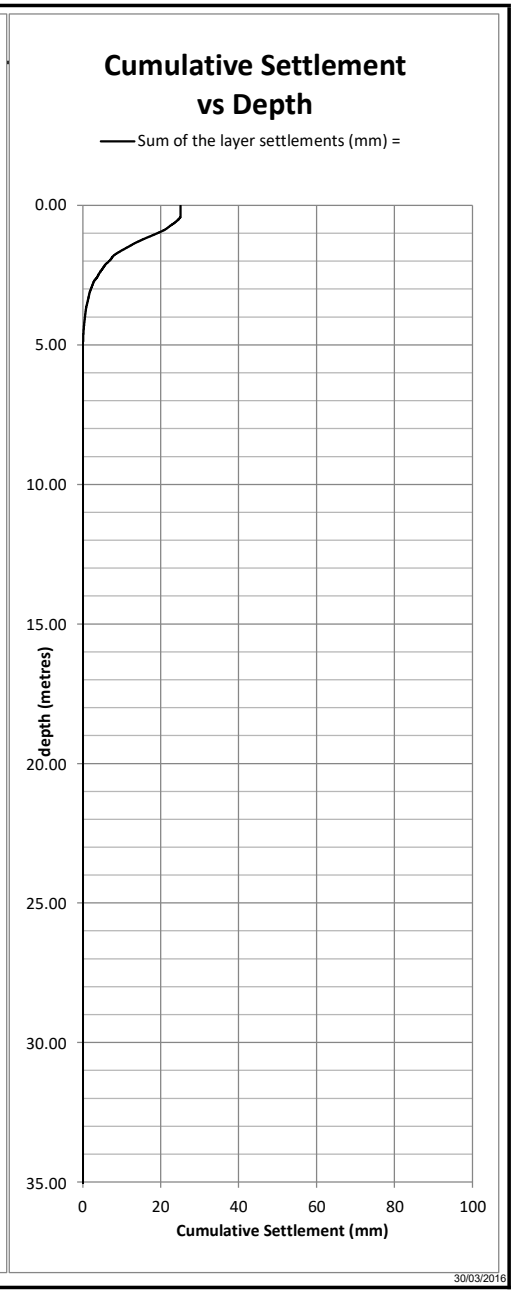
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.6552
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.6171
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	0.9497
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	**25 mm**	**in**	**50 years**
Total settlement for CONTINUOUS =	**-**	**in**	**-**





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Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT04

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		70	kN/m^2
Depth to watertable from ground surface (h_f)		13.5	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 17 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
2.5	2.5	0.4	1.00	**SQUARE / CIRCULAR**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 5.4 metres

Circular or Square Shape =	Df + 2B =	5.4 metres
Continuous Shape =	Df + 4B =	10.4 metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 6.40 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 26.40 kN/m^2

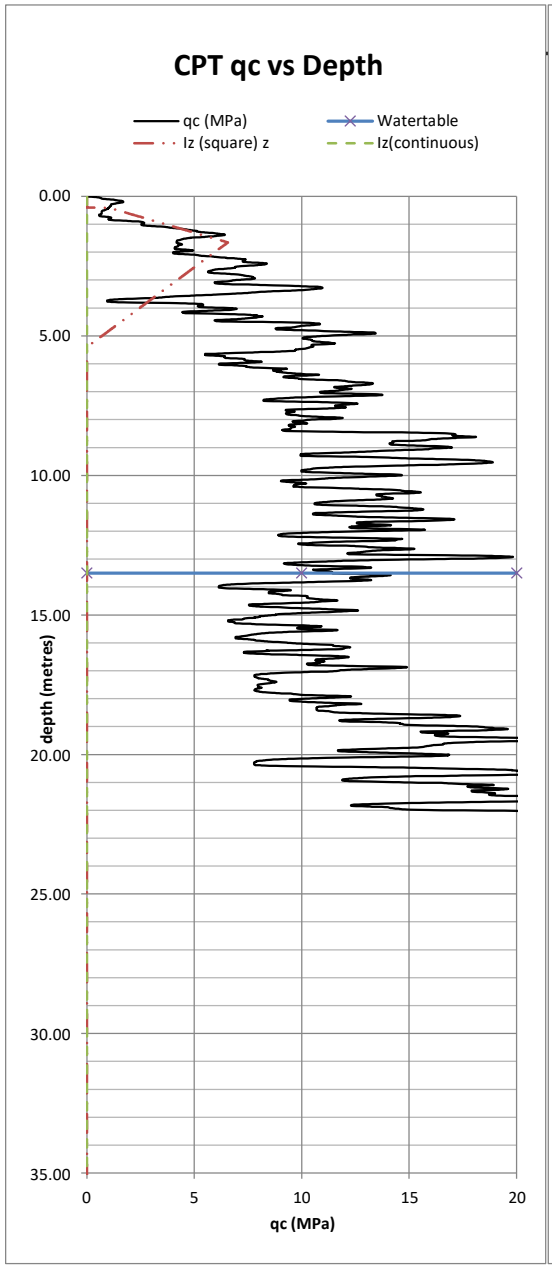
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	26.40 kN/m^2
For h_f < D_f + B/2	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$	
For h_f > D_f + B/2	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$	
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	46.40 kN/m^2
For h_f < D_f + B	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$	
For h_f > D_f + B	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$	

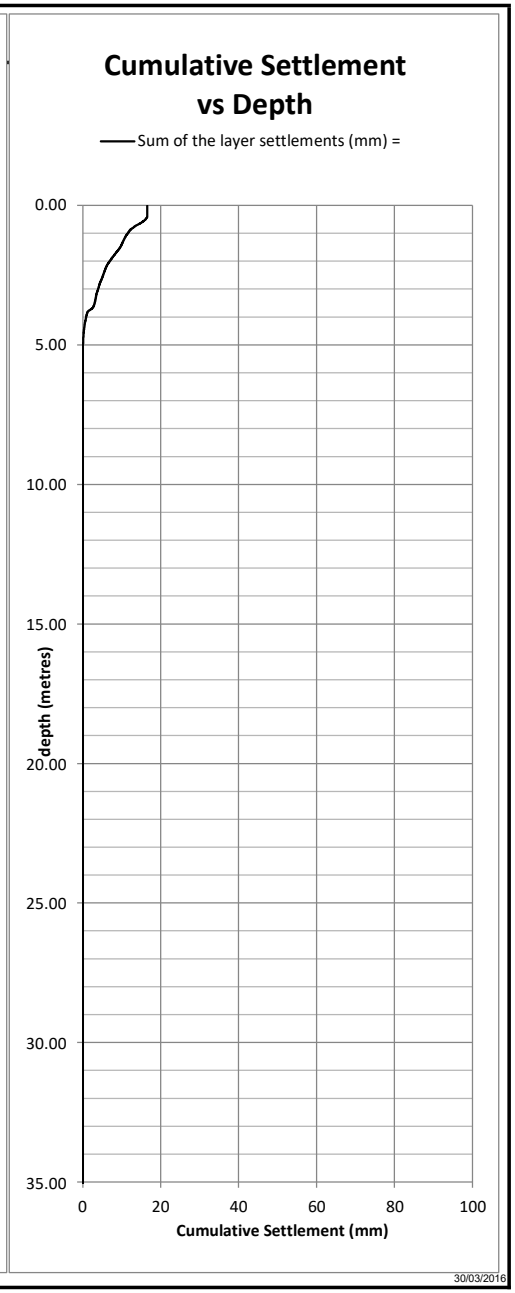
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.6552
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.6171
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	0.9497
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	**17 mm**	**in**	**50 years**
Total settlement for CONTINUOUS =	**-**	**in**	**-**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT05

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		70	kN/m^2
Depth to watertable from ground surface (h_f)		13.2	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 25 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
2.5	2.5	0.4	1.00	**SQUARE / CIRCULAR**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 5.4 metres

Circular or Square Shape =	Df + 2B =	5.4 metres
Continuous Shape =	Df + 4B =	10.4 metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 6.40 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 26.40 kN/m^2

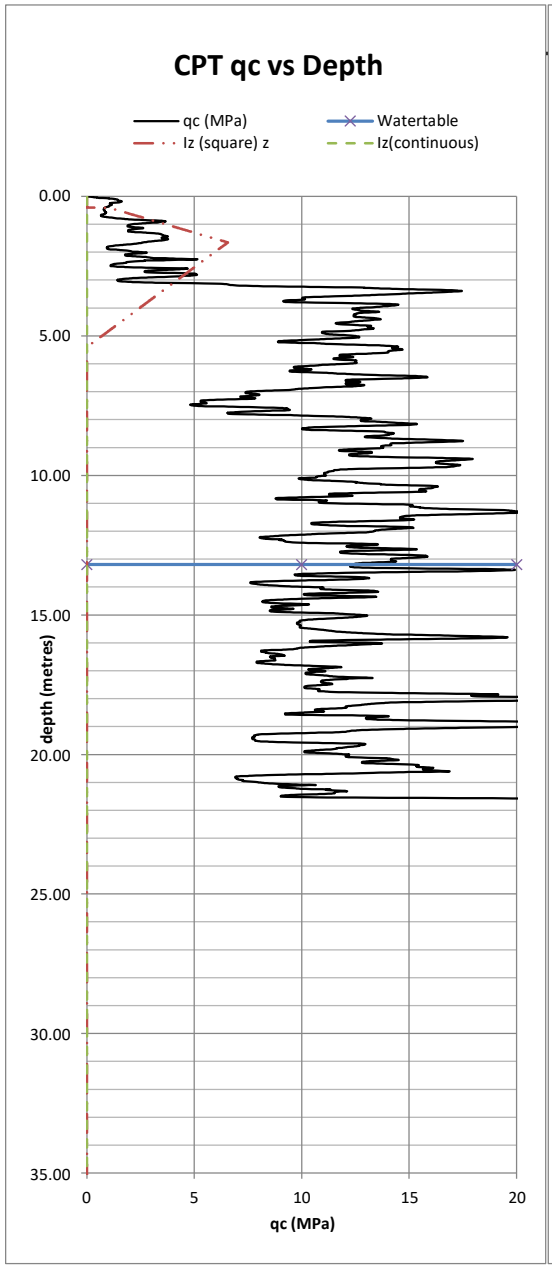
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	26.40 kN/m^2
For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$	
For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$	
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	46.40 kN/m^2
For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$	
For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$	

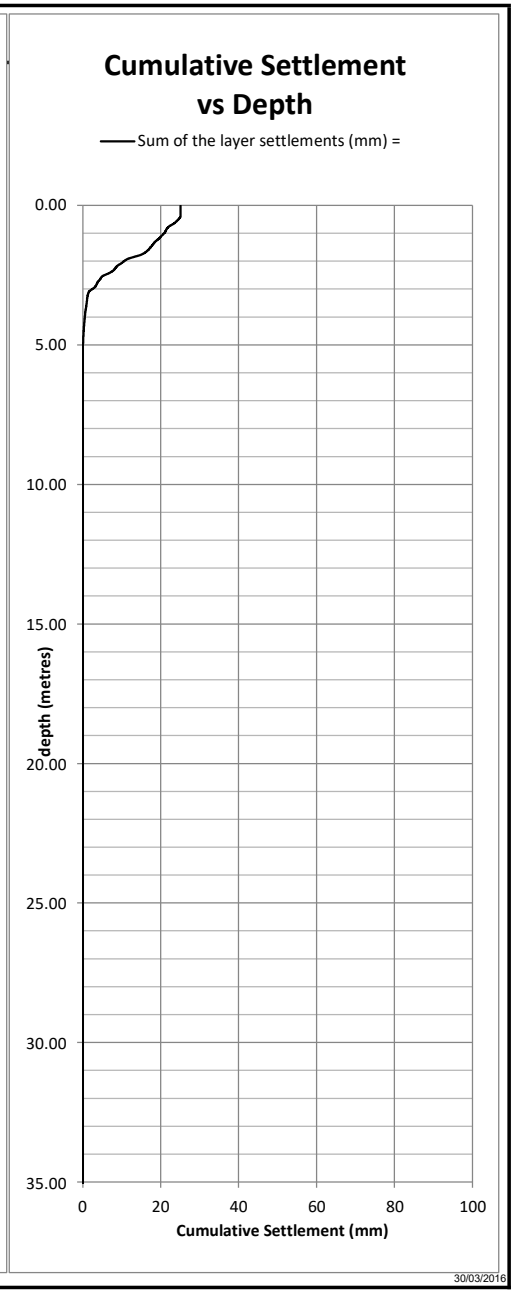
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.6552
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.6171
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	0.9497
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	**25 mm**	**in**	**50 years**
Total settlement for CONTINUOUS =	**-**	**in**	**-**





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Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT06

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		70	kN/m^2
Depth to watertable from ground surface (h_f)		14.9	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 21 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
2.5	2.5	0.4	1.00	**SQUARE / CIRCULAR**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 5.4 metres

Circular or Square Shape =	Df + 2B =	5.4 metres
Continuous Shape =	Df + 4B =	10.4 metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 6.40 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 26.40 kN/m^2

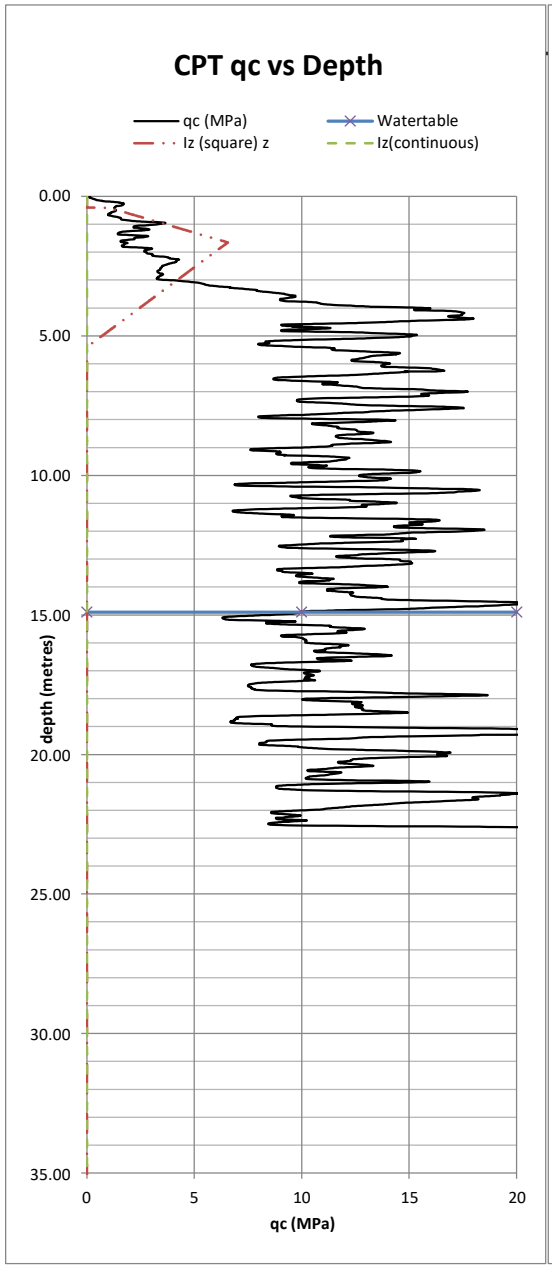
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	26.40 kN/m^2
For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$	
For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$	
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	46.40 kN/m^2
For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$	
For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$	

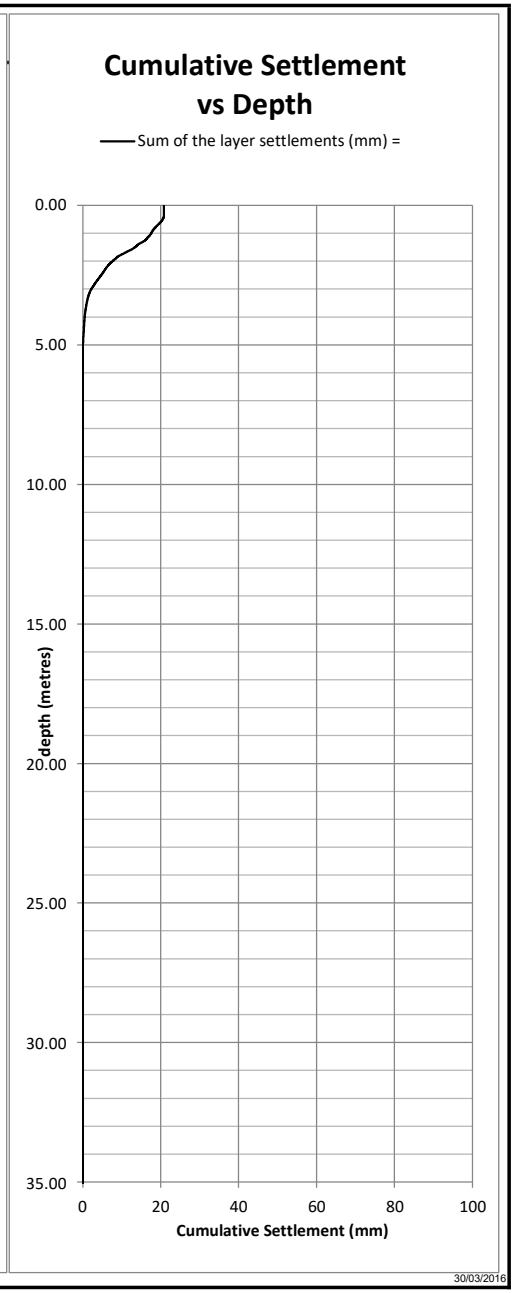
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.6552
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.6171
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	0.9497
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	**21 mm**	**in**	**50 years**
Total settlement for CONTINUOUS =	**-**	**in**	**-**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT07

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		70	kN/m^2
Depth to watertable from ground surface (h_f)		18.2	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 32 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
2.5	2.5	0.4	1.00	**SQUARE / CIRCULAR**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 5.4 metres

Circular or Square Shape =	Df + 2B =	5.4 metres
Continuous Shape =	Df + 4B =	10.4 metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 6.40 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 26.40 kN/m^2

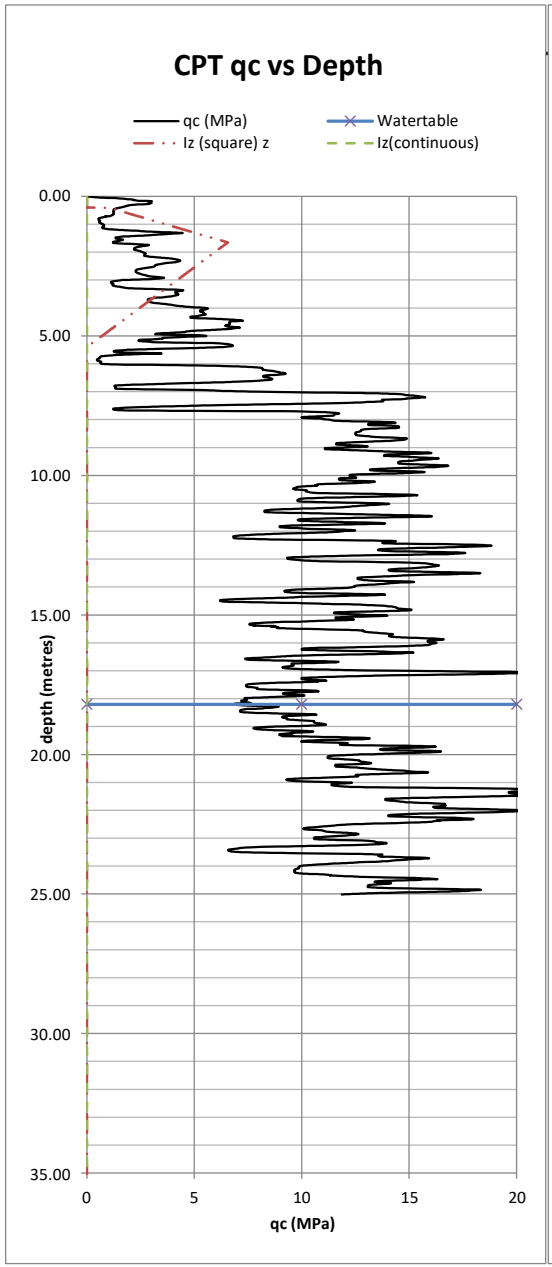
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	26.40 kN/m^2
For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$	
For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$	
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	46.40 kN/m^2
For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$	
For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$	

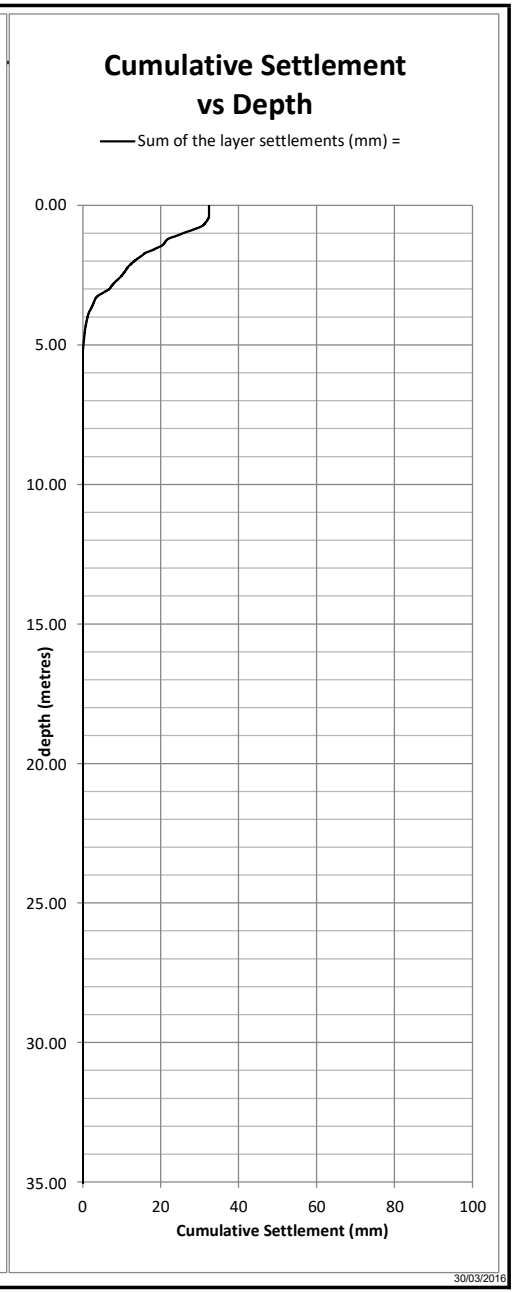
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.6552
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.6171
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	0.9497
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	**32 mm**	**in**	**50 years**
Total settlement for CONTINUOUS =	**-**	**in**	**-**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT08

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		70	kN/m^2
Depth to watertable from ground surface (h_f)		19.0	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 22 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
2.5	2.5	0.4	1.00	**SQUARE / CIRCULAR**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 5.4 metres

Circular or Square Shape =	Df + 2B =	5.4 metres
Continuous Shape =	Df + 4B =	10.4 metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 6.40 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 26.40 kN/m^2

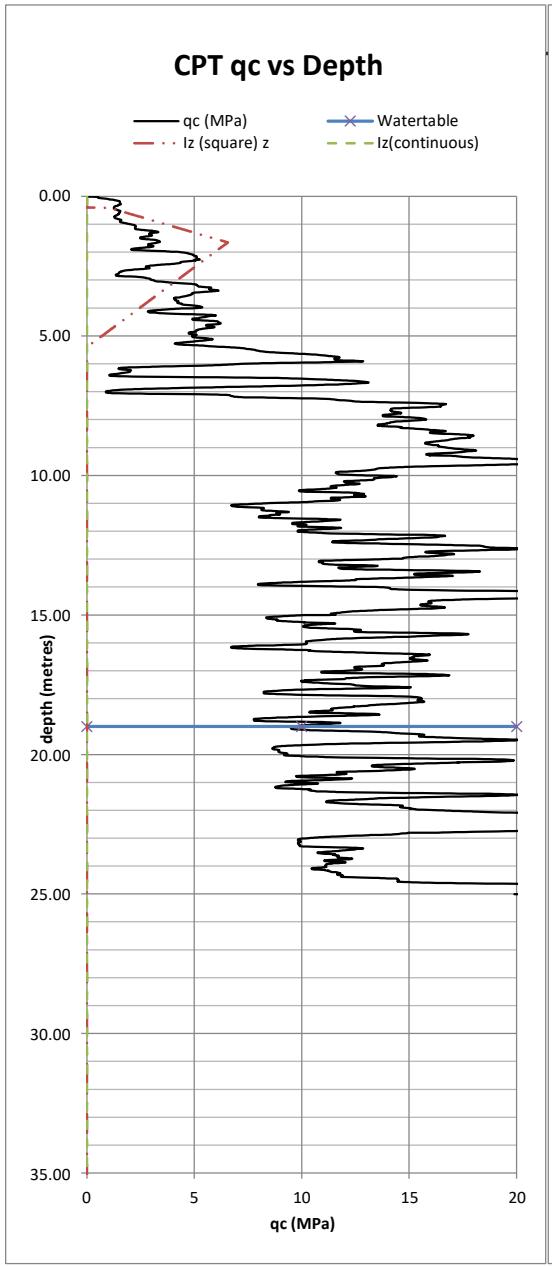
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	26.40 kN/m^2
For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$	
For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$	
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	46.40 kN/m^2
For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$	
For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$	

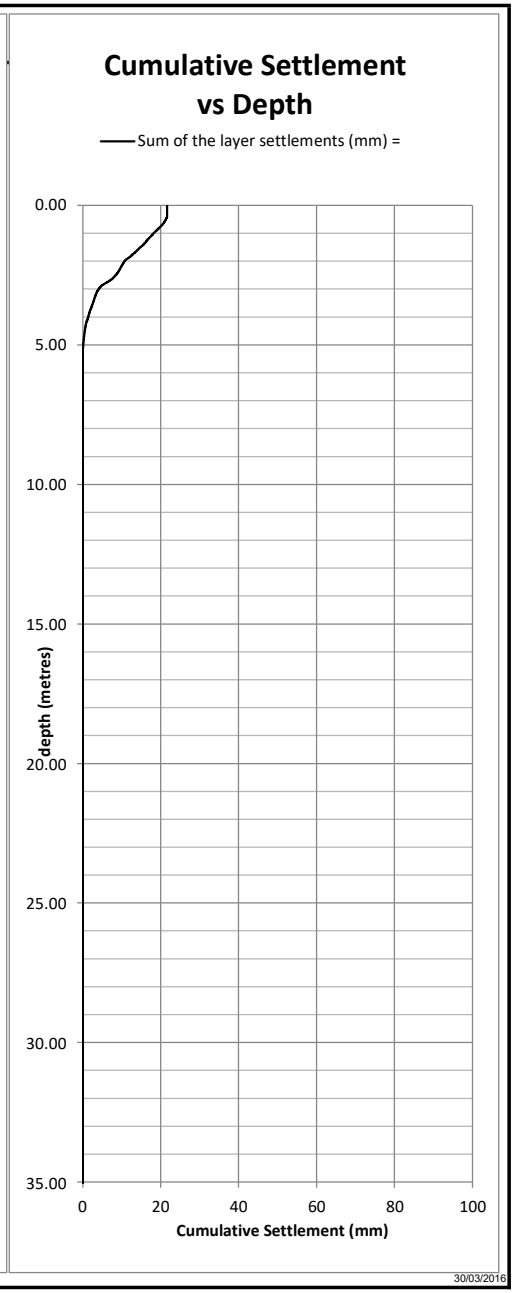
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.6552
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.6171
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	0.9497
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	**22 mm**	**in**	**50 years**
Total settlement for CONTINUOUS =	**-**	**in**	**-**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT09

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		70	kN/m^2
Depth to watertable from ground surface (h_f)		19.2	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 41 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
2.5	2.5	0.4	1.00	**SQUARE / CIRCULAR**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 5.4 metres

Circular or Square Shape =	Df + 2B =	5.4	metres
Continuous Shape =	Df + 4B =	10.4	metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 6.40 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 26.40 kN/m^2

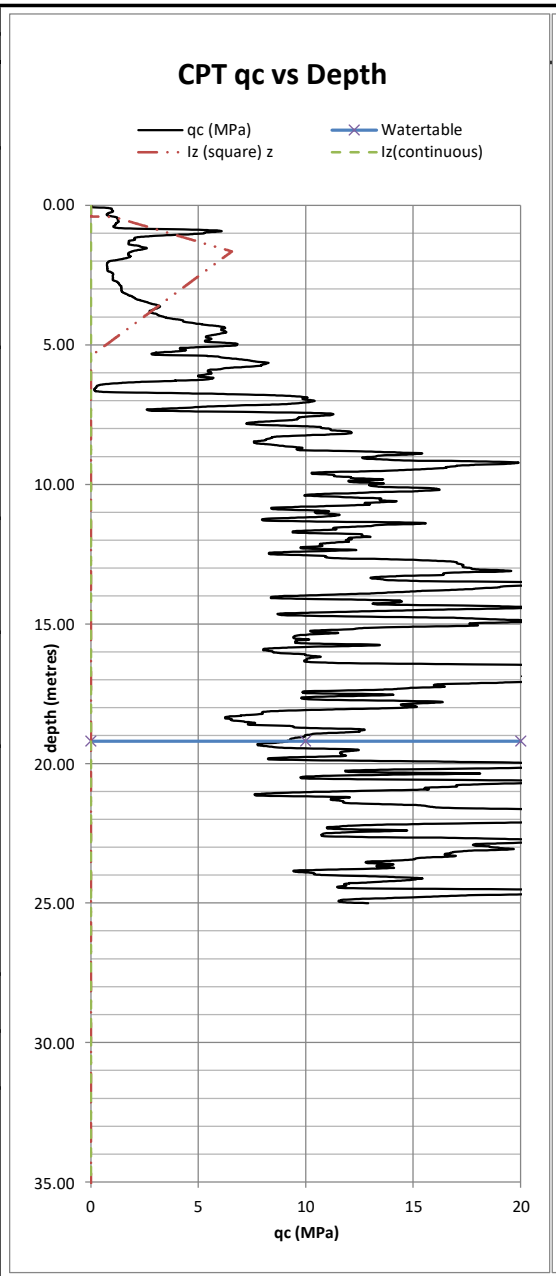
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	26.40 kN/m^2
For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$	
For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$	
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	46.40 kN/m^2
For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$	
For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$	

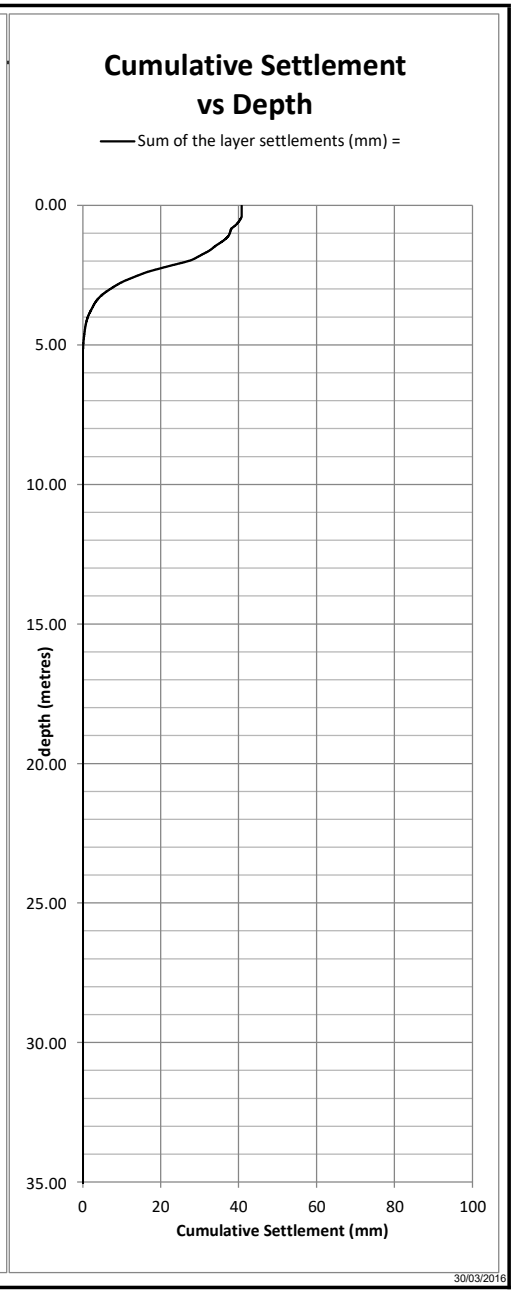
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.6552
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.6171
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	0.9497
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	**41 mm**	**in**	**50 years**
Total settlement for CONTINUOUS =	**-**	**in**	**-**





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Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT10

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		70	kN/m^2
Depth to watertable from ground surface (h_f)		19.5	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 22 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
2.5	2.5	0.4	1.00	**SQUARE / CIRCULAR**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 5.4 metres

Circular or Square Shape =	Df + 2B =	5.4 metres
Continuous Shape =	Df + 4B =	10.4 metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 6.40 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 26.40 kN/m^2

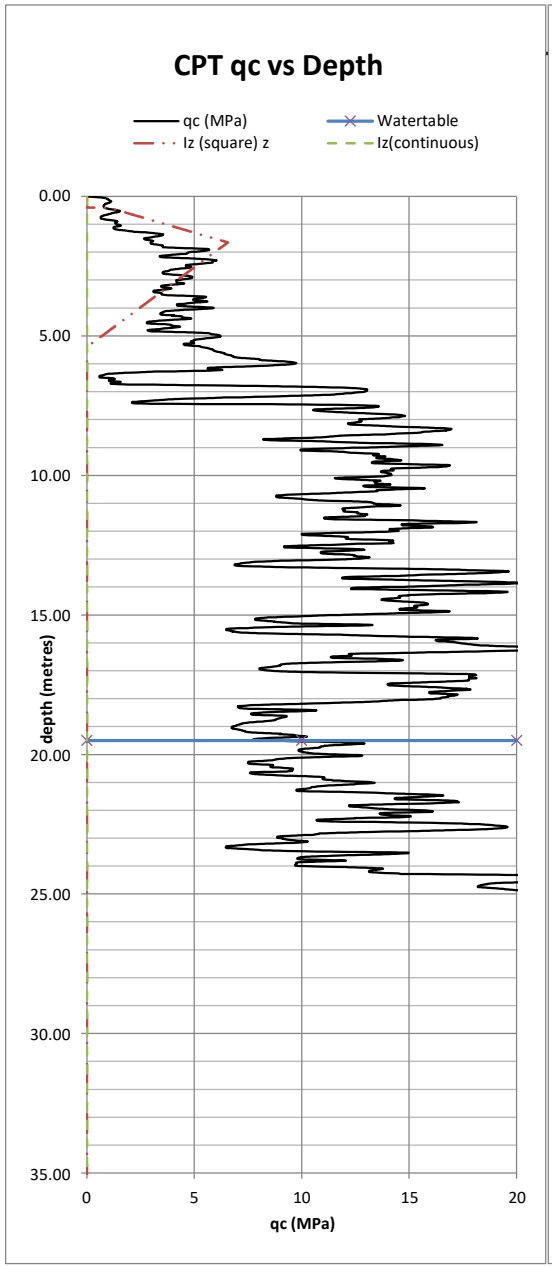
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	26.40 kN/m^2
For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$	
For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$	
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	46.40 kN/m^2
For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$	
For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$	

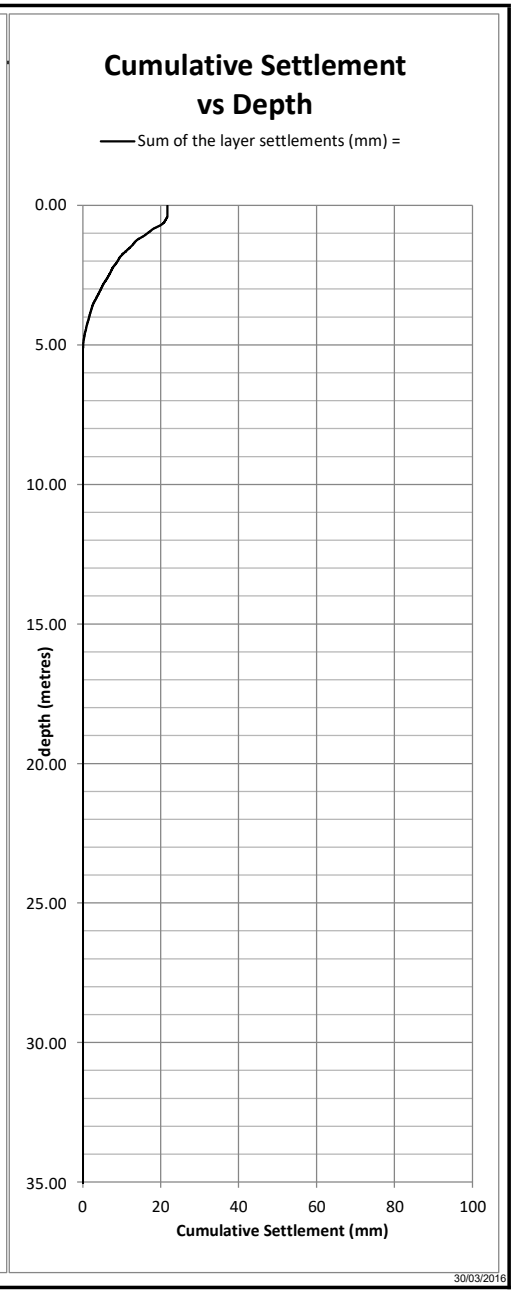
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.6552
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.6171
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	0.9497
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	**22 mm**	**in**	**50 years**
Total settlement for CONTINUOUS =	**-**	**in**	**-**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT01

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		100	kN/m^2
Depth to watertable from ground surface (h_f)		16.2	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 19 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
2.5	2.5	0.4	1.00	**SQUARE / CIRCULAR**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 5.4 metres

Circular or Square Shape =	Df + 2B =	5.4 metres
Continuous Shape =	Df + 4B =	10.4 metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 6.40 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 26.40 kN/m^2

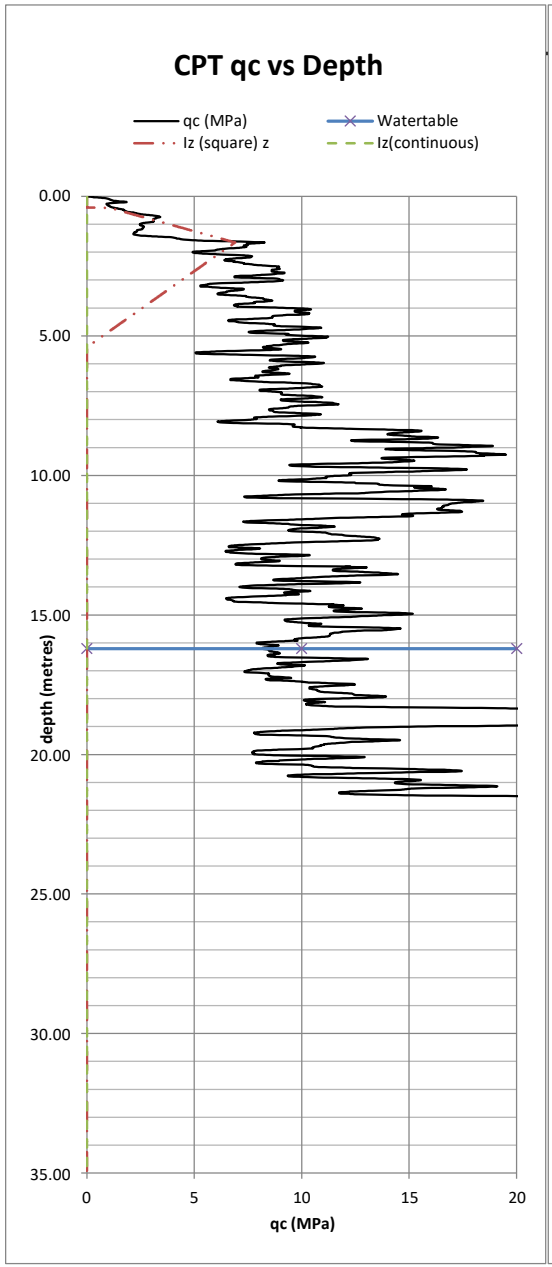
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	26.40 kN/m^2
For h_f < D_f + B/2	$\sigma'_{zp(squ)}$ =	$(\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$
For h_f > D_f + B/2	$\sigma'_{zp(squ)}$ =	$\gamma_s \times (D_f + B/2)$
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	46.40 kN/m^2
For h_f < D_f + B	$\sigma'_{zp(con)}$ =	$(\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$
For h_f > D_f + B	$\sigma'_{zp(con)}$ =	$\gamma_s \times (D_f + B)$

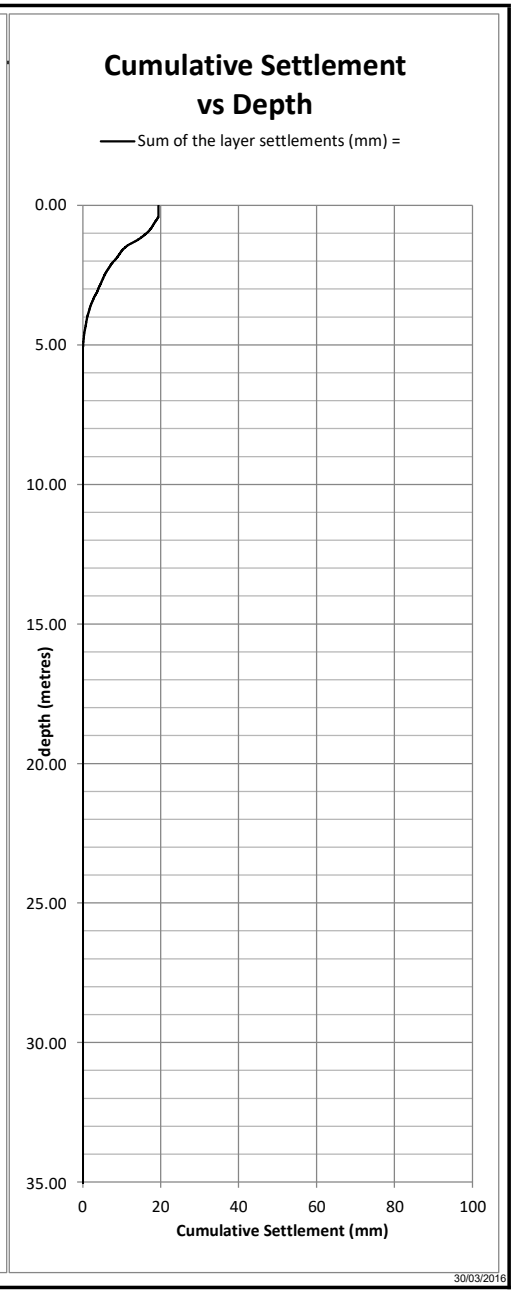
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.6883
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.6420
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	0.9658
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	**19 mm**	**in**	**50 years**
Total settlement for CONTINUOUS =	**-**	**in**	**-**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT02

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		100	kN/m^2
Depth to watertable from ground surface (h_f)		12.2	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 22 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
2.5	2.5	0.4	1.00	**SQUARE / CIRCULAR**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 5.4 metres

	Circular or Square Shape =	Df + 2B =	5.4 metres
	Continuous Shape =	Df + 4B =	10.4 metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 6.40 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 26.40 kN/m^2

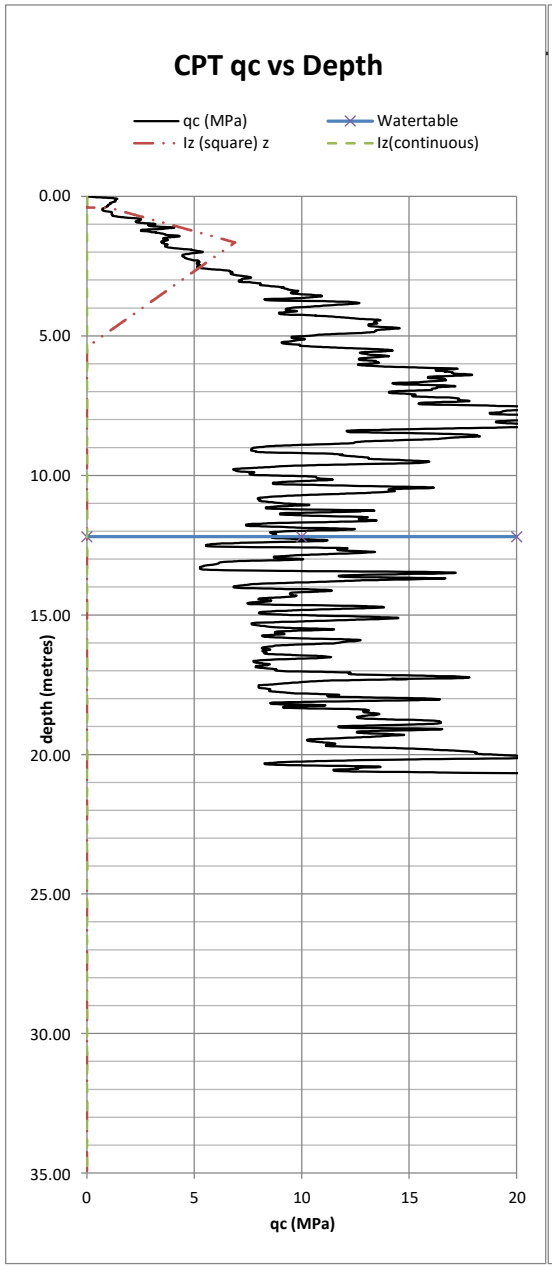
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	26.40 kN/m^2
For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$	
For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$	
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	46.40 kN/m^2
For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$	
For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$	

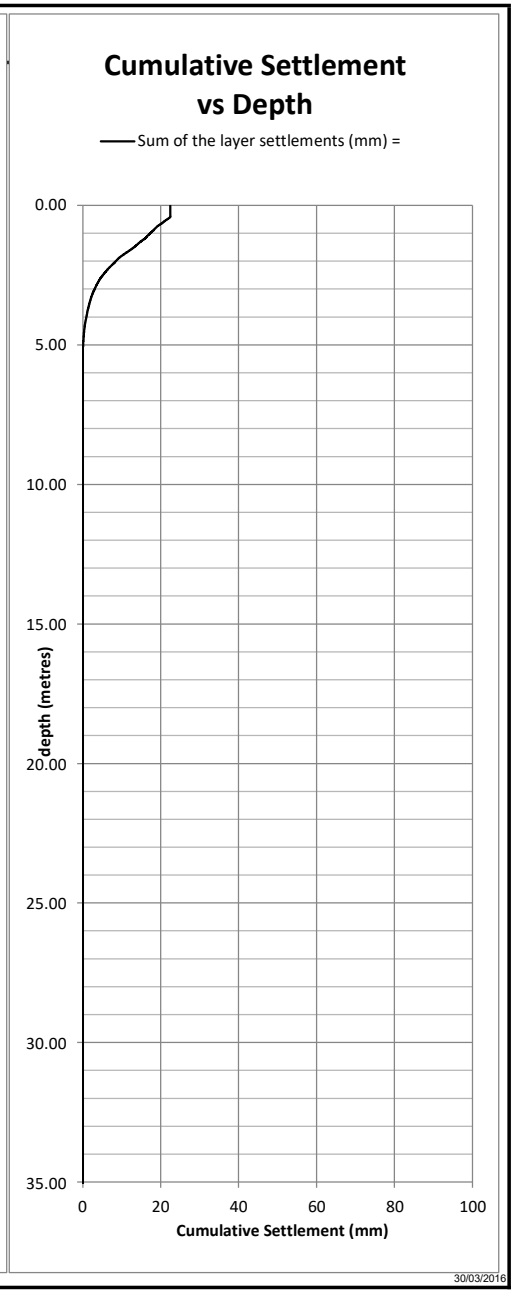
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.6883
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.6420
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	0.9658
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	**22 mm**	**in**	**50 years**
Total settlement for CONTINUOUS =	**-**	**in**	**-**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT03

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		100	kN/m^2
Depth to watertable from ground surface (h_f)		14.8	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 39 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
2.5	2.5	0.4	1.00	**SQUARE / CIRCULAR**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 5.4 metres

Circular or Square Shape =	Df + 2B =	5.4	metres
Continuous Shape =	Df + 4B =	10.4	metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 6.40 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 26.40 kN/m^2

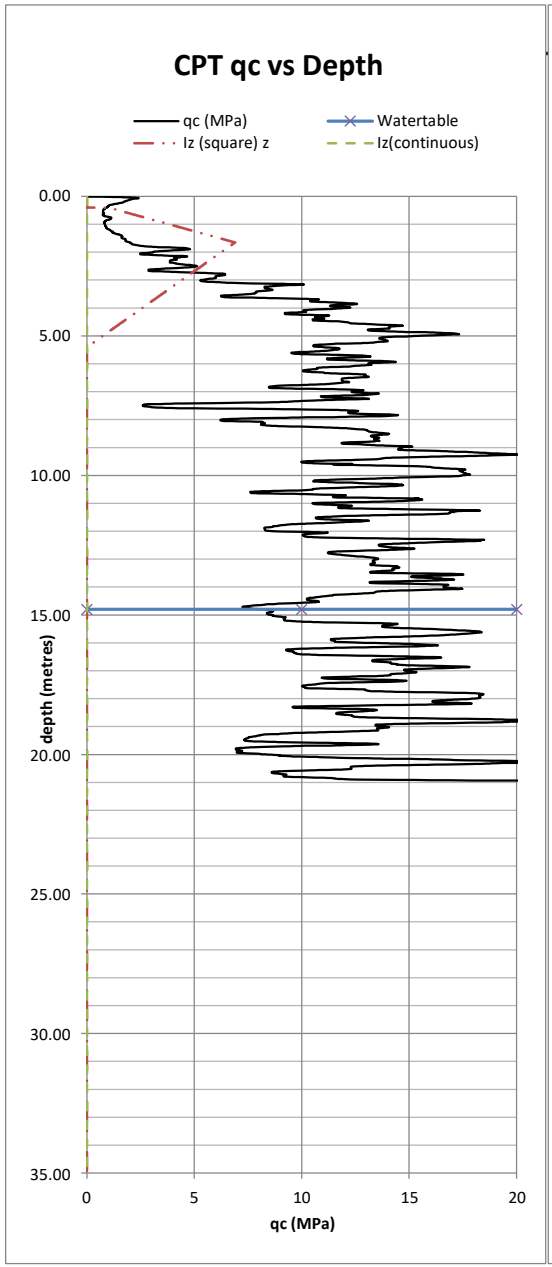
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	26.40	kN/m^2
For h_f < D_f + B/2	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$		
For h_f > D_f + B/2	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$		
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	46.40	kN/m^2
For h_f < D_f + B	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$		
For h_f > D_f + B	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$		

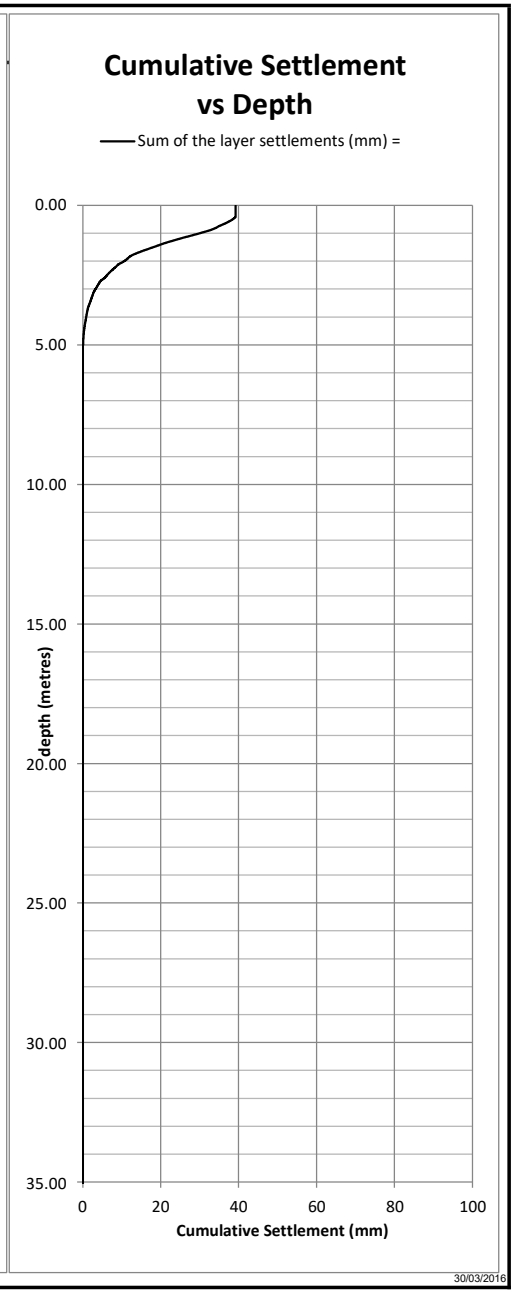
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.6883
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.6420
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	0.9658
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	**39 mm**	**in**	**50 years**
Total settlement for CONTINUOUS =	**-**	**in**	**-**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT04

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		100	kN/m^2
Depth to watertable from ground surface (h_f)		13.5	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 26 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
2.5	2.5	0.4	1.00	**SQUARE / CIRCULAR**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 5.4 metres

Circular or Square Shape =	Df + 2B =	5.4 metres
Continuous Shape =	Df + 4B =	10.4 metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 6.40 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 26.40 kN/m^2

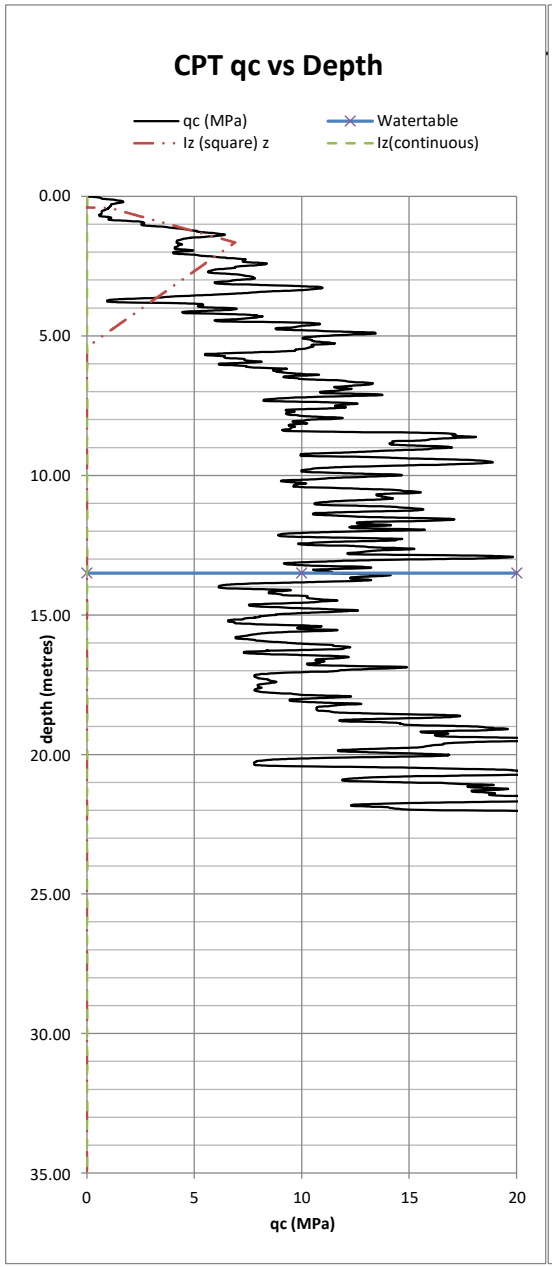
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	26.40 kN/m^2
For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$	
For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$	
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	46.40 kN/m^2
For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$	
For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$	

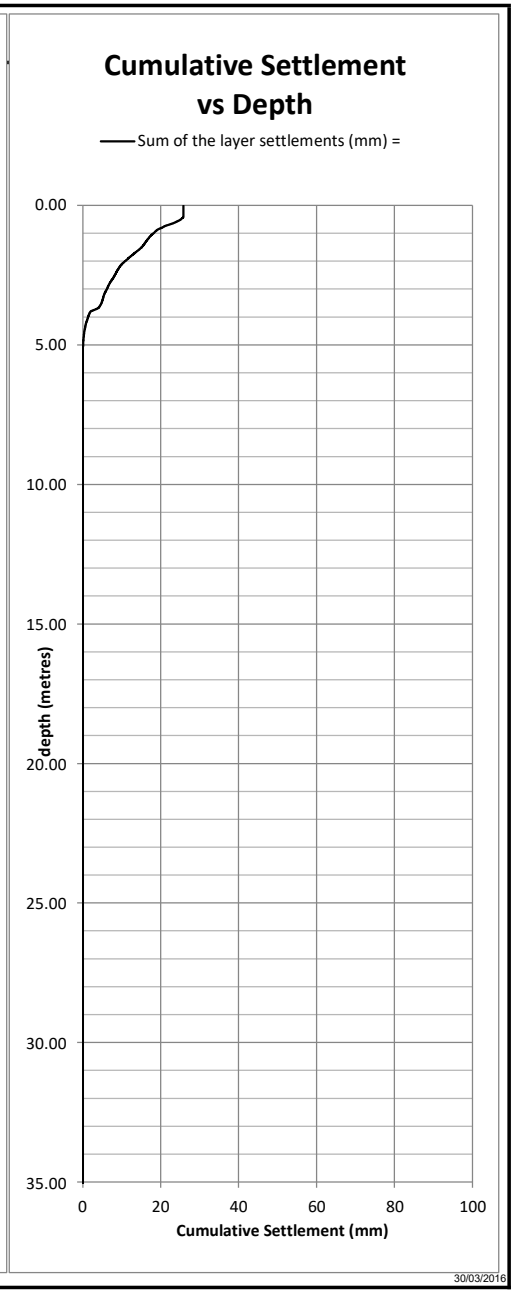
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.6883
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.6420
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	0.9658
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	**26 mm**	**in**	**50 years**
Total settlement for CONTINUOUS =	**-**	**in**	**-**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT05

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		100	kN/m^2
Depth to watertable from ground surface (h_f)		13.2	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 39 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
2.5	2.5	0.4	1.00	**SQUARE / CIRCULAR**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 5.4 metres

	Circular or Square Shape =	Df + 2B =	5.4 metres
	Continuous Shape =	Df + 4B =	10.4 metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 6.40 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 26.40 kN/m^2

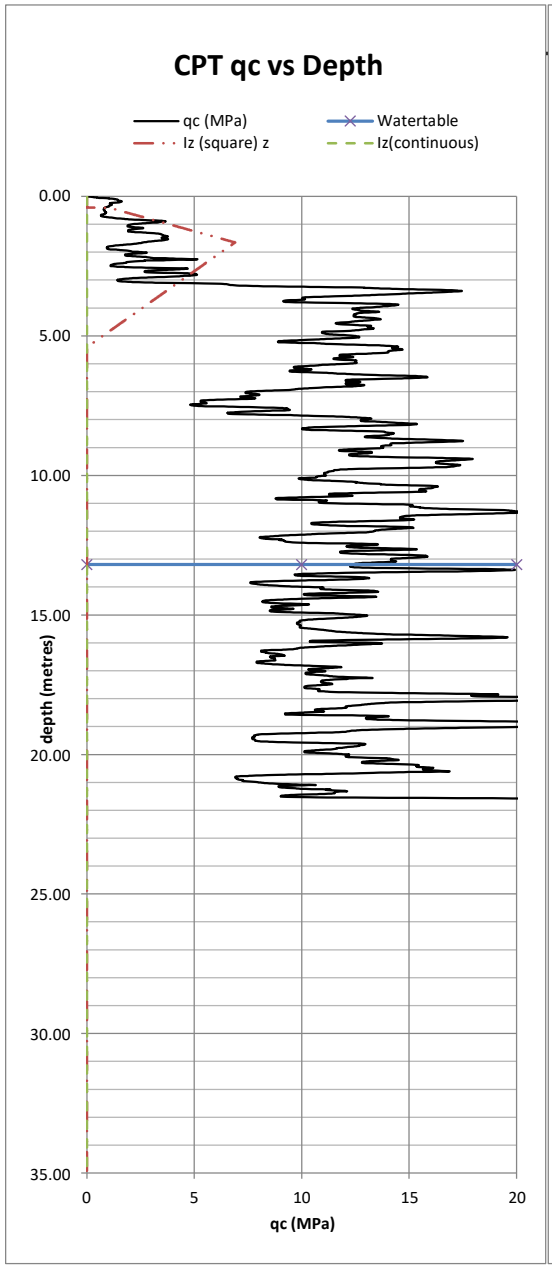
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	26.40 kN/m^2
For h_f < D_f + B/2	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$	
For h_f > D_f + B/2	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$	
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	46.40 kN/m^2
For h_f < D_f + B	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$	
For h_f > D_f + B	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$	

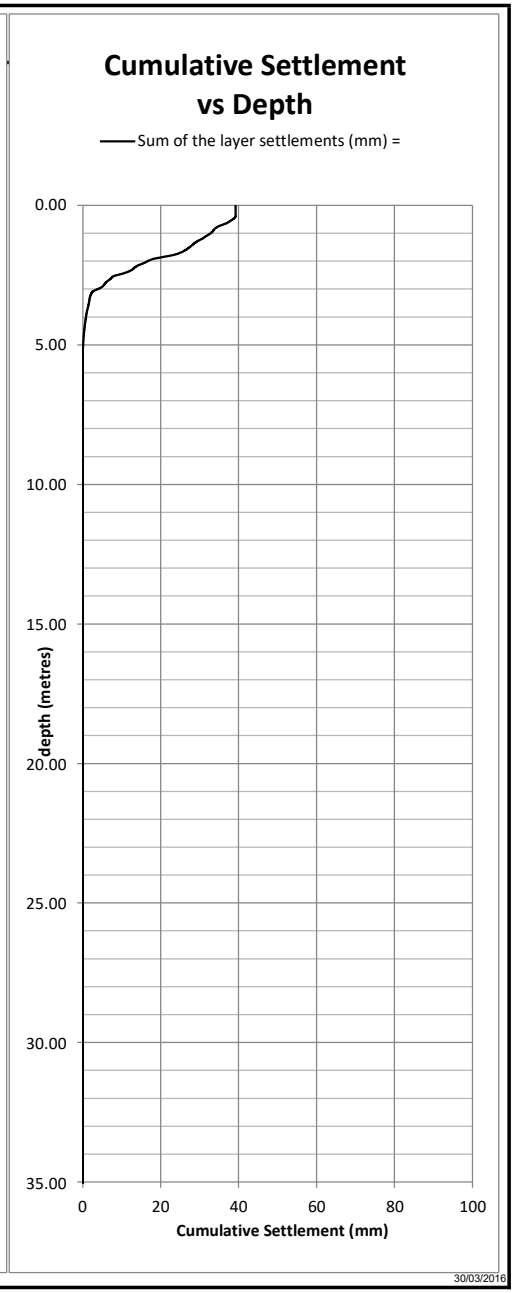
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.6883
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.6420
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	0.9658
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	**39 mm**	**in**	**50 years**
Total settlement for CONTINUOUS =	**-**	**in**	**-**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT06

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		100	kN/m^2
Depth to watertable from ground surface (h_f)		14.9	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 33 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
2.5	2.5	0.4	1.00	**SQUARE / CIRCULAR**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 5.4 metres

Circular or Square Shape =	Df + 2B =	5.4 metres
Continuous Shape =	Df + 4B =	10.4 metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 6.40 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 26.40 kN/m^2

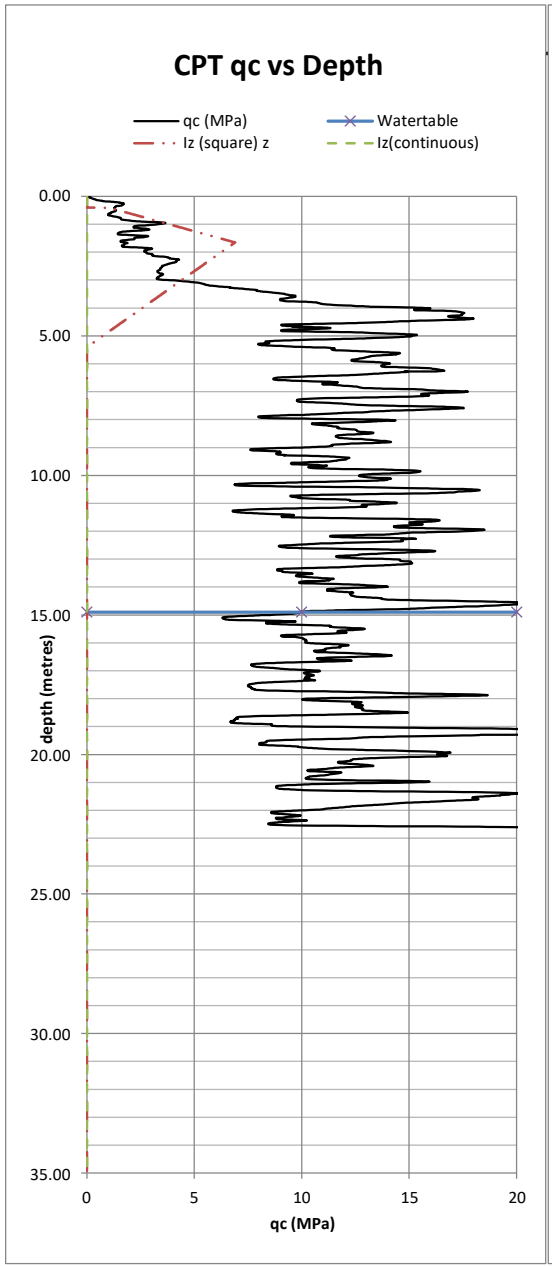
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	26.40 kN/m^2
For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$	
For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$	
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	46.40 kN/m^2
For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$	
For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$	

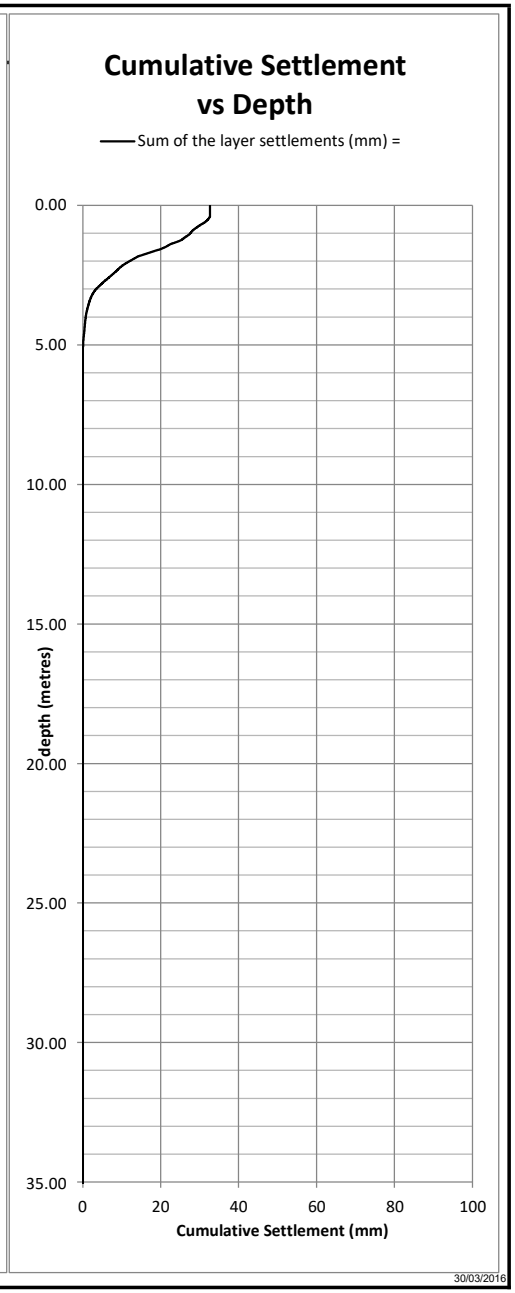
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.6883
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.6420
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	0.9658
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	**33 mm**	**in**	**50 years**
Total settlement for CONTINUOUS =	**-**	**in**	**-**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT07

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		100	kN/m^2
Depth to watertable from ground surface (h_f)		18.2	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 51 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
2.5	2.5	0.4	1.00	**SQUARE / CIRCULAR**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 5.4 metres

	Circular or Square Shape =	Df + 2B =	5.4 metres
	Continuous Shape =	Df + 4B =	10.4 metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 6.40 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 26.40 kN/m^2

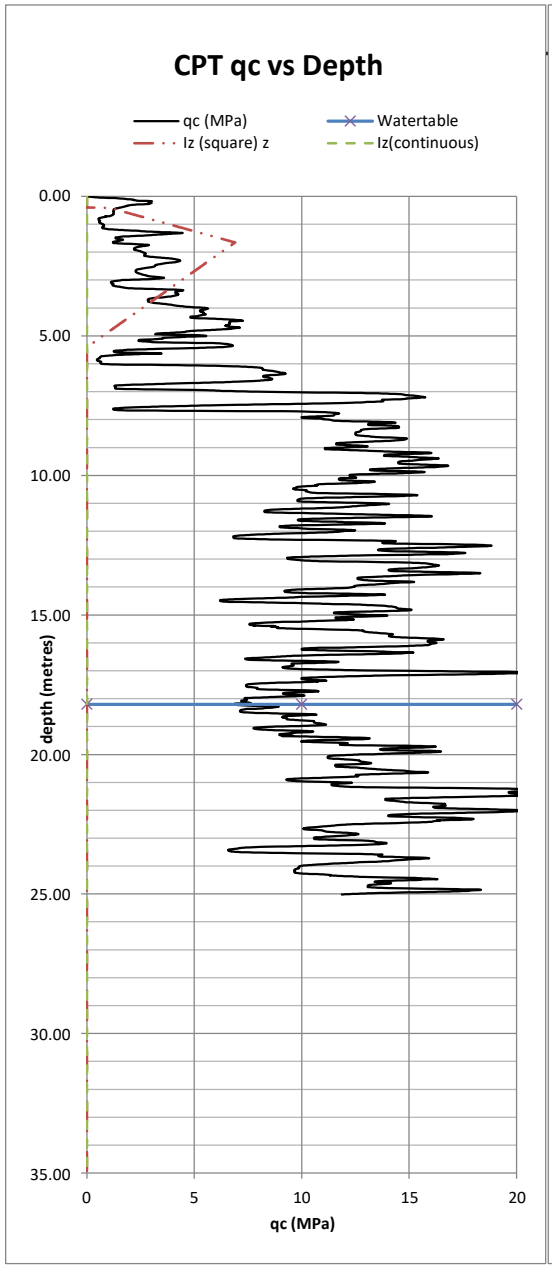
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	26.40 kN/m^2
For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$	
For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$	
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	46.40 kN/m^2
For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$	
For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$	

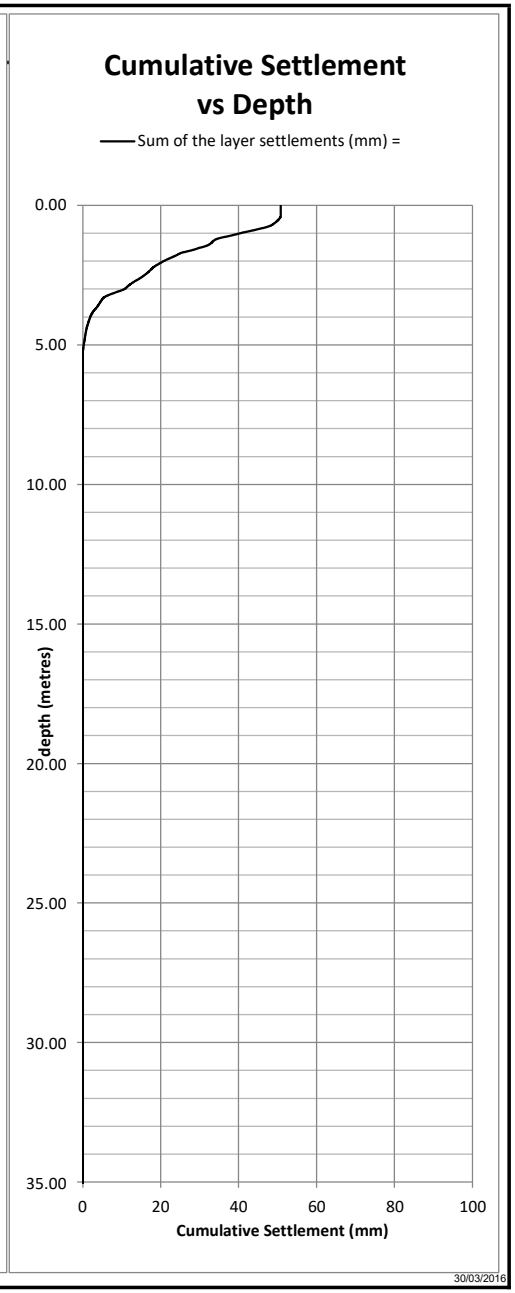
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.6883
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.6420
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	0.9658
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	**51 mm**	**in**	**50 years**
Total settlement for CONTINUOUS =	**-**	**in**	**-**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT08

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		70	kN/m^2
Depth to watertable from ground surface (h_f)		19.0	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 22 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
2.5	2.5	0.4	1.00	**SQUARE / CIRCULAR**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 5.4 metres

Circular or Square Shape =	Df + 2B =	5.4 metres
Continuous Shape =	Df + 4B =	10.4 metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 6.40 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 26.40 kN/m^2

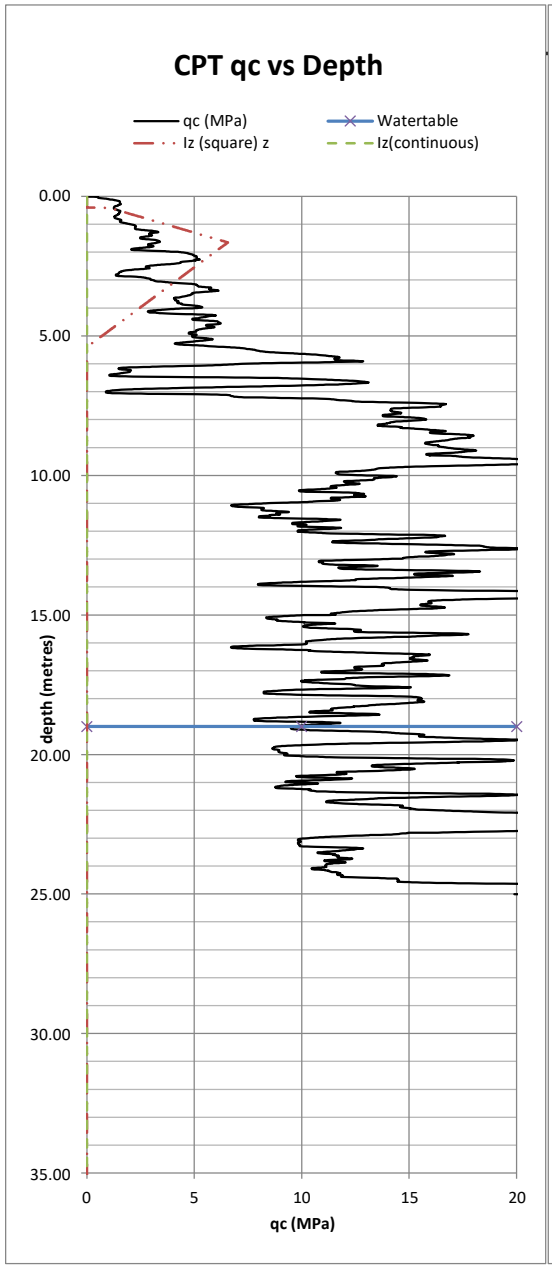
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	26.40 kN/m^2
For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$	
For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$	
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	46.40 kN/m^2
For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$	
For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$	

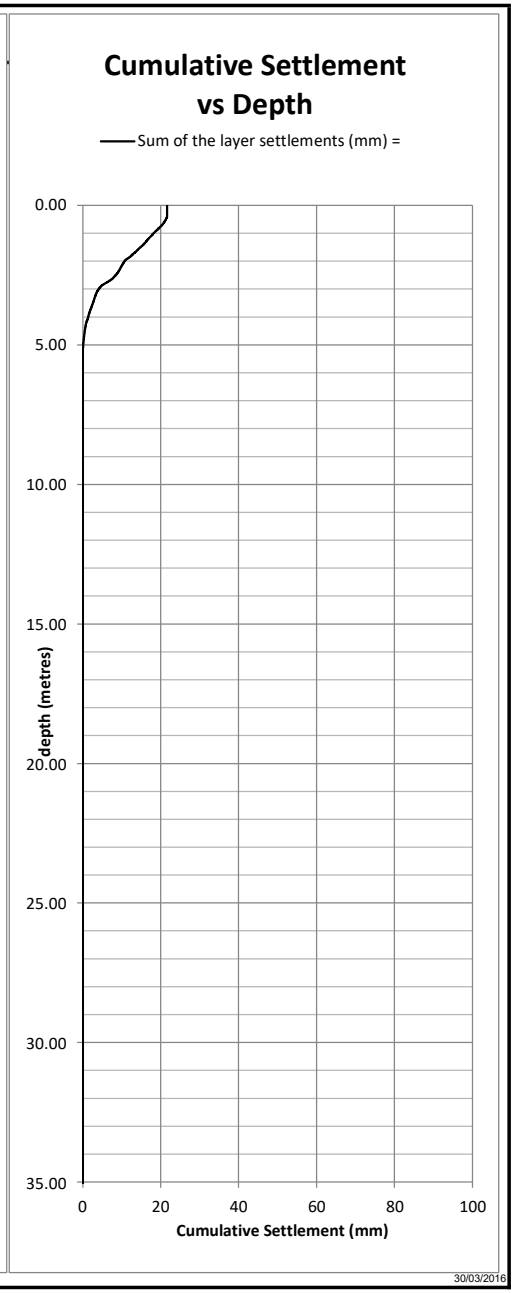
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.6552
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.6171
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	0.9497
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	**22 mm**	**in**	**50 years**
Total settlement for CONTINUOUS =	**-**	**in**	**-**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT09

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		100	kN/m^2
Depth to watertable from ground surface (h_f)		19.2	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 64 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
2.5	2.5	0.4	1.00	**SQUARE / CIRCULAR**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 5.4 metres

	Circular or Square Shape =	Df + 2B =	5.4 metres
	Continuous Shape =	Df + 4B =	10.4 metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 6.40 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 26.40 kN/m^2

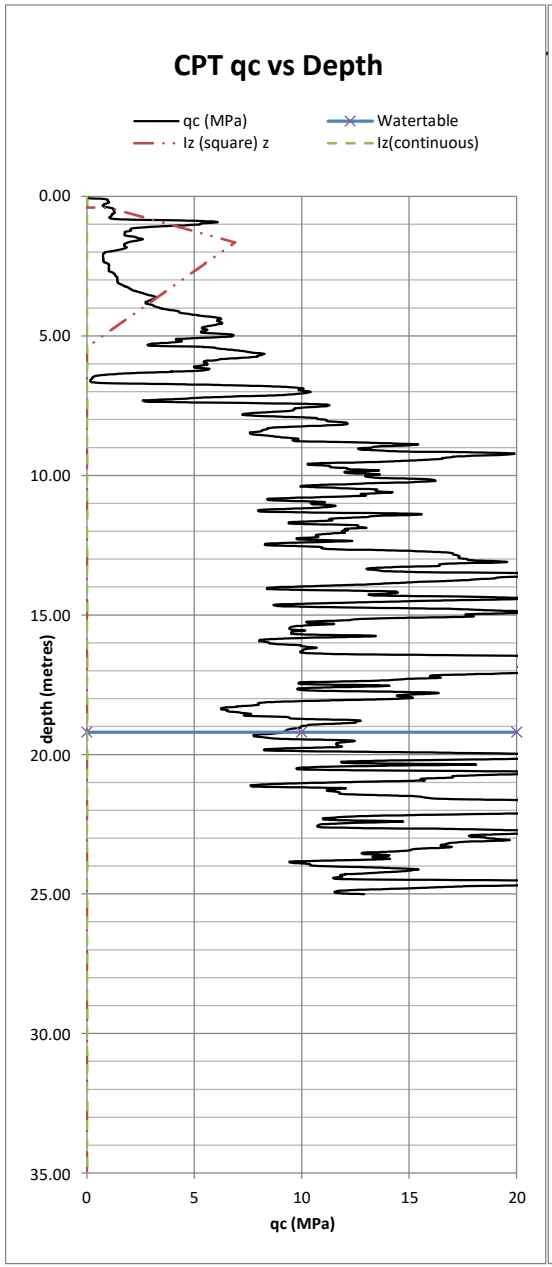
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	26.40 kN/m^2
For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$	
For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$	
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	46.40 kN/m^2
For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$	
For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$	

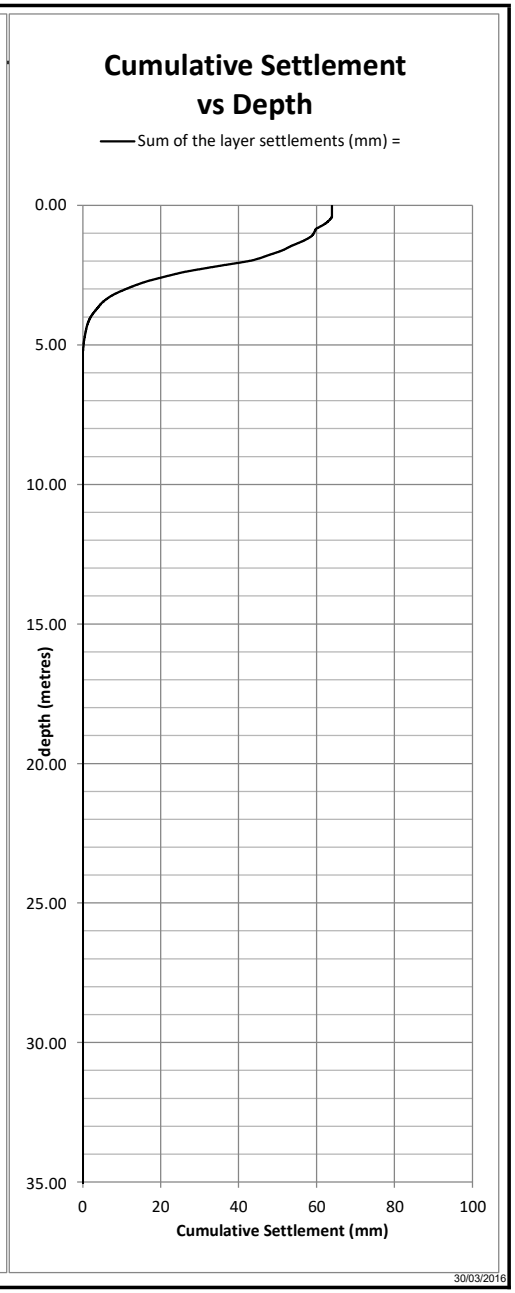
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.6883
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.6420
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	0.9658
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	**64 mm**	**in**	**50 years**
Total settlement for CONTINUOUS =	**-**	**in**	**-**





30/03/2016

Settlement Calculation for Cohesionless Soil - Schmertmann's Method

CPT10

Client:	Calcutta Farms Limited	Job number:	TGA2020-0304
Location:	194 State Highway 24, Matamata	Date:	23/08/2021

Input parameters

Soil unit weight (kN/m^3)		16.0	kN/m^3
Bearing pressure at base of footing (q)		100	kN/m^2
Depth to watertable from ground surface (h_f)		19.5	metres
Time since application of load (t)	(t ≥ 0.1 yr)	50	years
Filter out layer settlement where qc is greater than		20.0	MPa

Footing dimensions — Settlement = 34 mm

Width (B) (metres)	Length (L) (metres)	Depth (D_f) (metres)	L/B	Footing Shape
2.5	2.5	0.4	1.00	**SQUARE / CIRCULAR**

Footing shape	if L/B = 1	Circular or Square Footing (SQU)
	if L/B ≥ 10	Continuous Footings (CON)

Depth of influence = 5.4 metres

Circular or Square Shape =	Df + 2B =	5.4 metres
Continuous Shape =	Df + 4B =	10.4 metres

Eff. stress at a depth D_f below the ground surface (σ'_{vo}) = 6.40 kN/m^2

Where watertable is below base of footing (Df < hf) : $\sigma'_{vo} = (\gamma_s \times D_f)$

Where watertable is above base of footing (Df > hf) : $\sigma'_{vo} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f - h_f)$

Initial vert eff. stress at a depth of I_{zp} (σ'_{zp}) σ'_{zp} = 26.40 kN/m^2

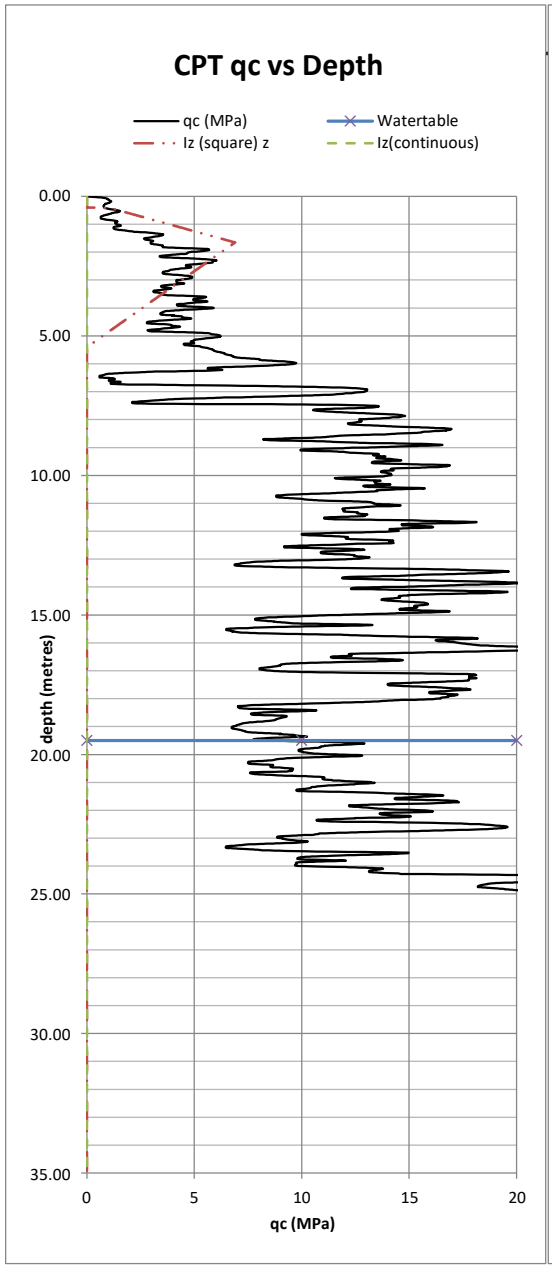
Where, for Square or Circular Shaped Footing	$\sigma'_{zp(squ)}$ =	26.40 kN/m^2
For $h_f < D_f + B/2$	$\sigma'_{zp(squ)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B/2 - h_f)$	
For $h_f > D_f + B/2$	$\sigma'_{zp(squ)} = \gamma_s \times (D_f + B/2)$	
Where, for Continuous Shape Footing	$\sigma'_{zp(con)}$ =	46.40 kN/m^2
For $h_f < D_f + B$	$\sigma'_{zp(con)} = (\gamma_s \times h_f) + (\gamma_s - \gamma_w) \times (D_f + B - h_f)$	
For $h_f > D_f + B$	$\sigma'_{zp(con)} = \gamma_s \times (D_f + B)$	

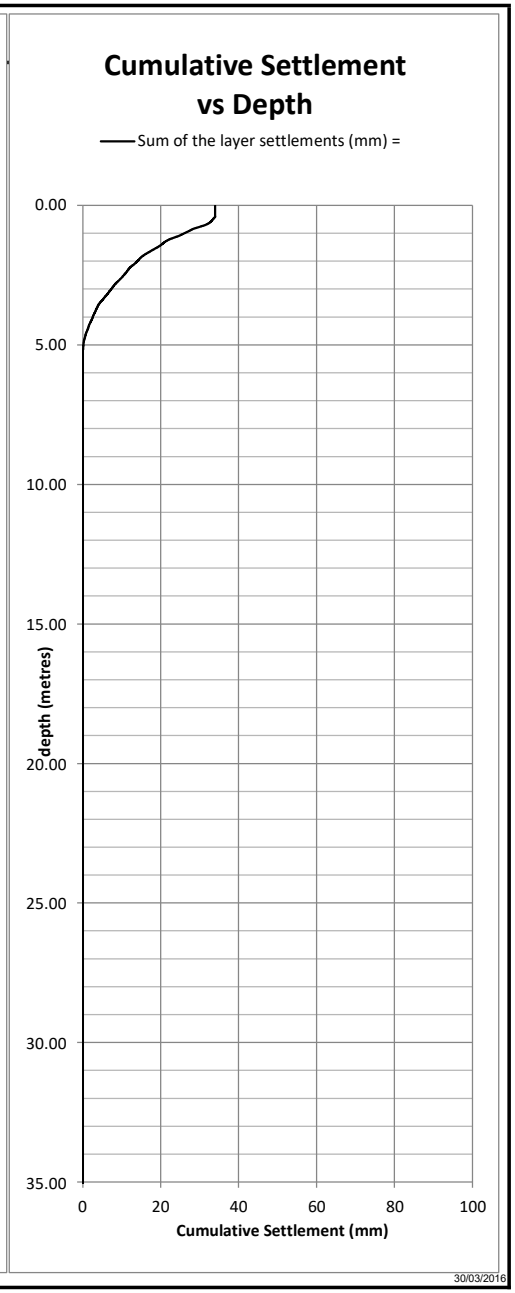
Peak strain influence factor (I_{zp})	$I_{zp(squ)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(squ)})}$ =	0.6883
	$I_{zp(con)} = 0.5 + 0.1 \sqrt{(q' / \sigma'_{zp(con)})}$ =	0.6420
Depth factor (C1)	$C1 = 1 - 0.5 (\sigma'_{vo} / q')$ =	0.9658
Secondary creep factor (C2)	$C2 = 1 + 0.2 \log_{10} (t / 0.1)$ =	1.5398

Summary of settlement calculation

Total settlement = $C1.C2.\sigma'_{vo}.\Sigma(I_z/xq_c).\Delta z$

Total settlement for SQUARE / CIRCULAR =	**34 mm**	**in**	**50 years**
Total settlement for CONTINUOUS =	**-**	**in**	**-**





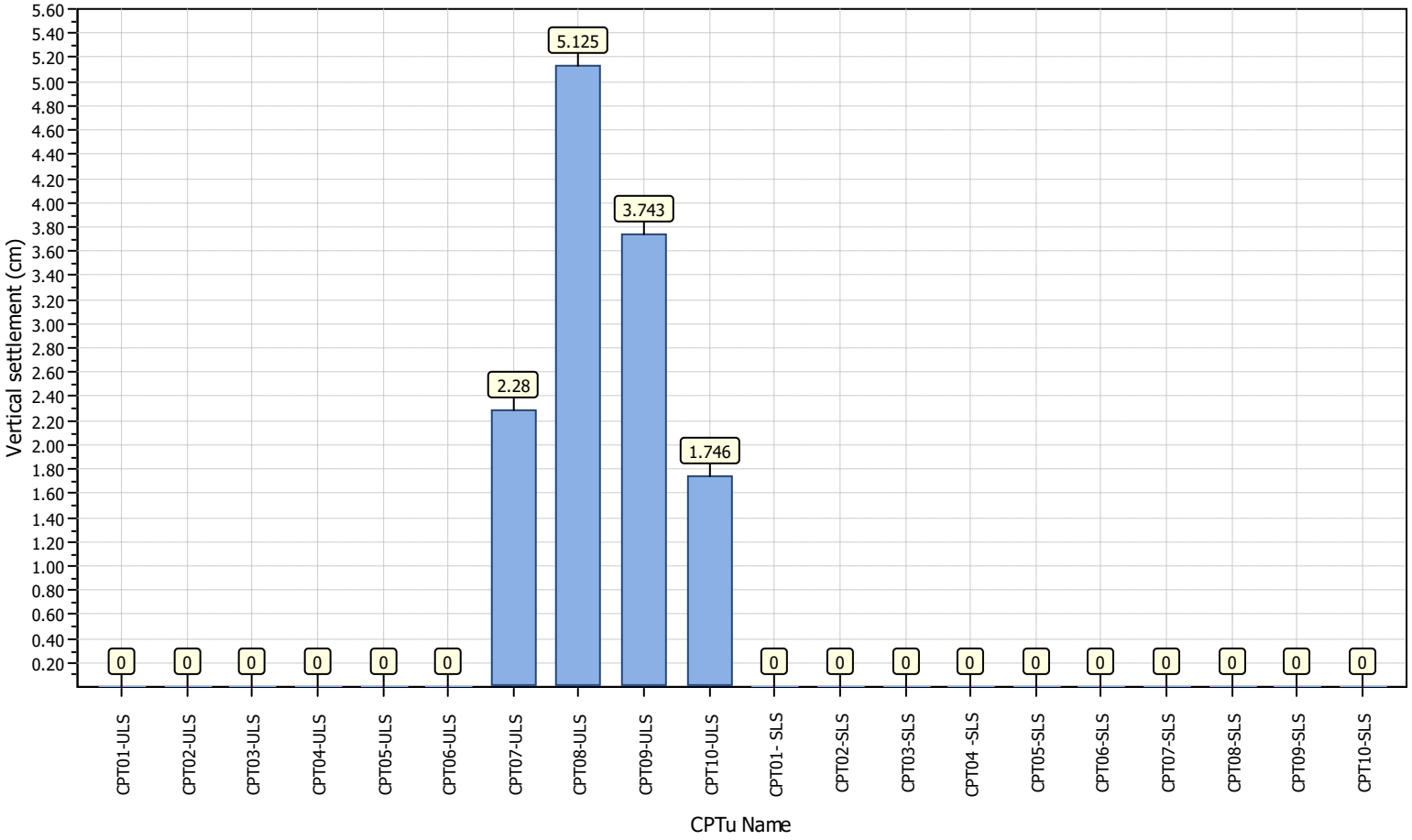
30/03/2016

Appendix E: Liquefaction Analyses

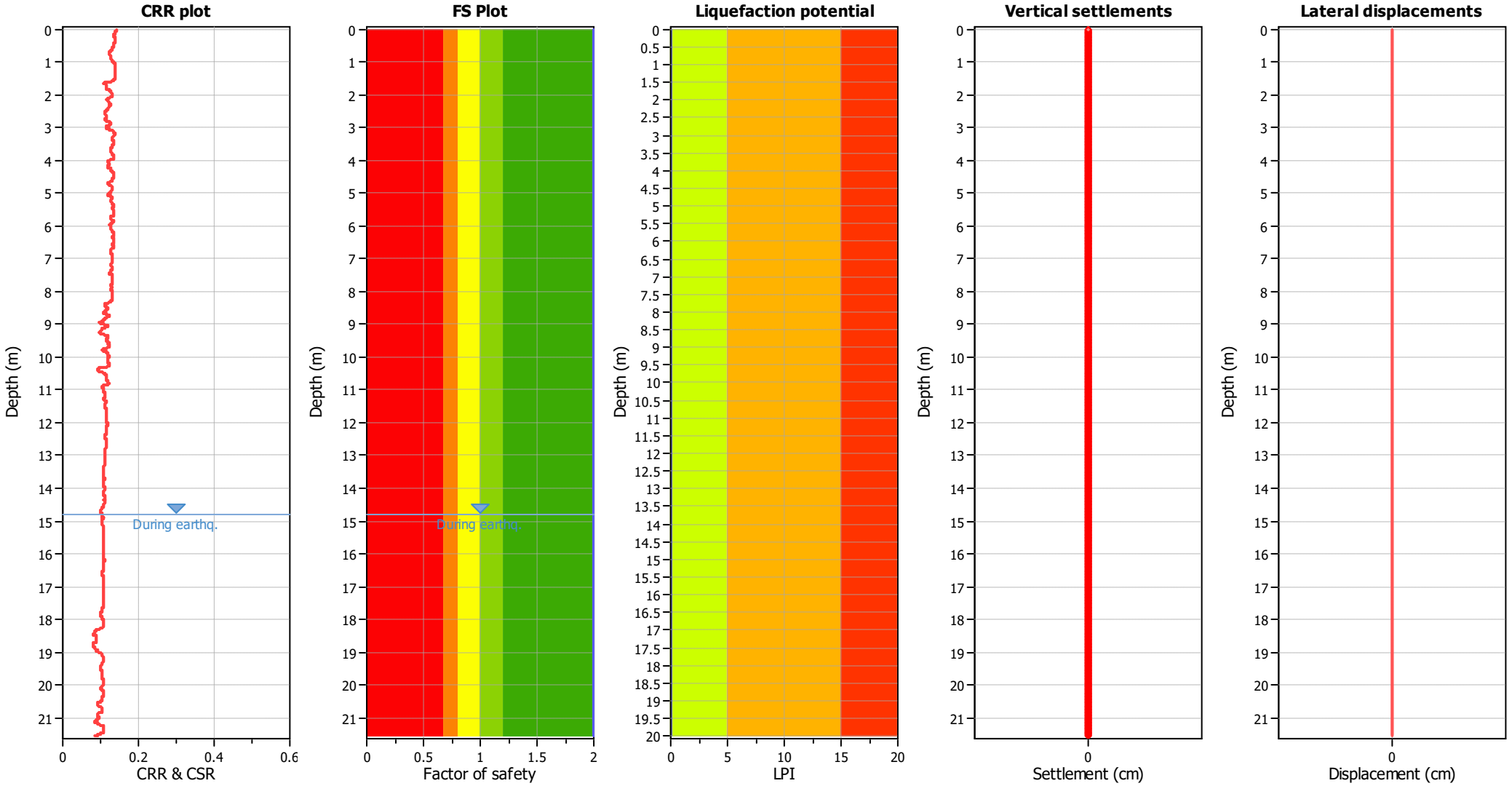
Project title : Tauranga Road Industrial Subdivision

Location : 194 State Highway 24, Matamata

Overall vertical settlements report



Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	14.80 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	5.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.26	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	14.80 m	Fill height:	N/A	Limit depth:	10.00 m

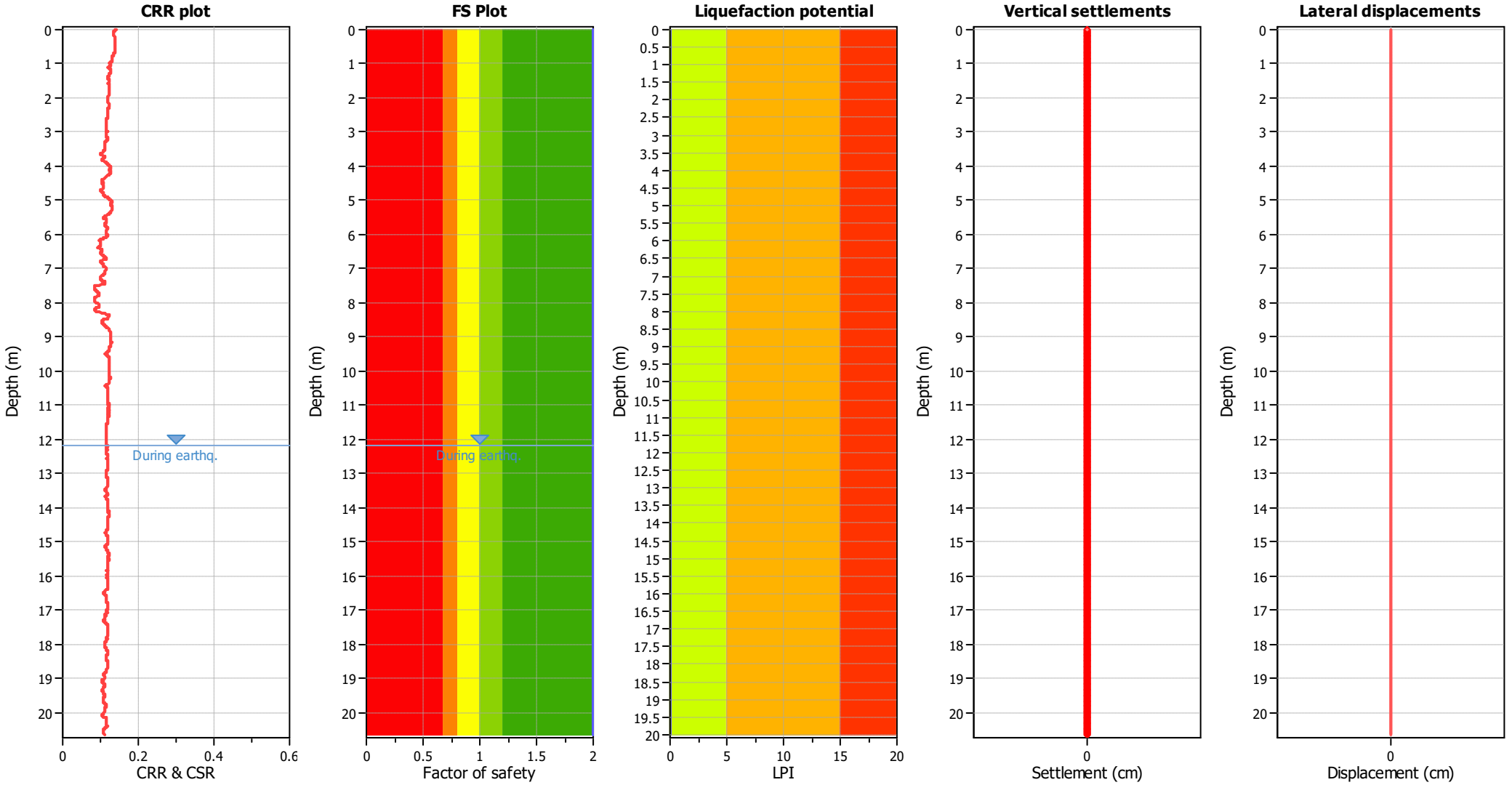
F.S. color scheme

- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

LPI color scheme

- Very high risk
- High risk
- Low risk

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	12.20 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	5.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.26	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	12.20 m	Fill height:	N/A	Limit depth:	10.00 m

F.S. color scheme

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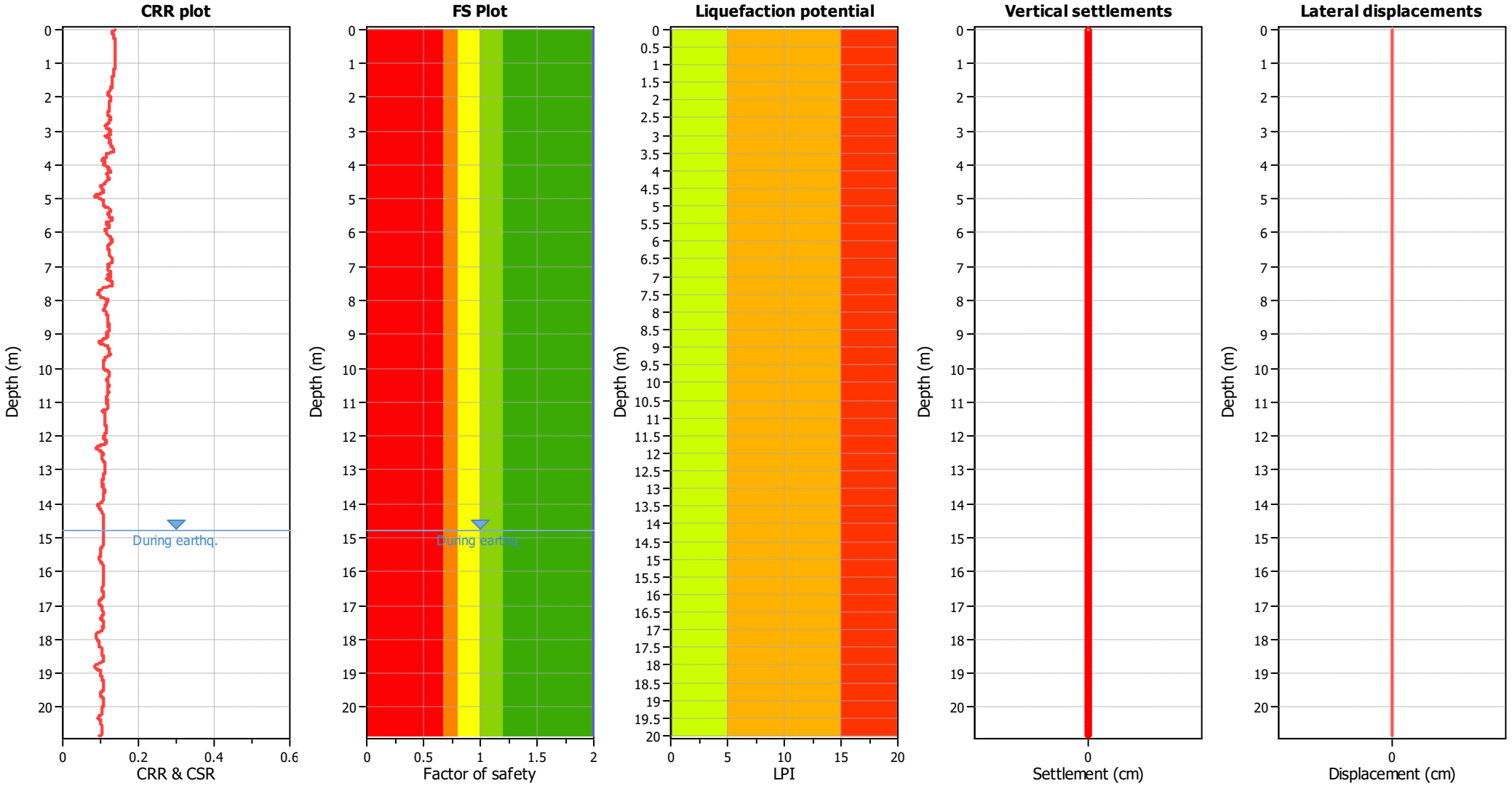
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

LPI color scheme

- Very high risk
- High risk
- Low risk

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	14.80 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	5.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.26	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	14.80 m	Fill height:	N/A	Limit depth:	10.00 m

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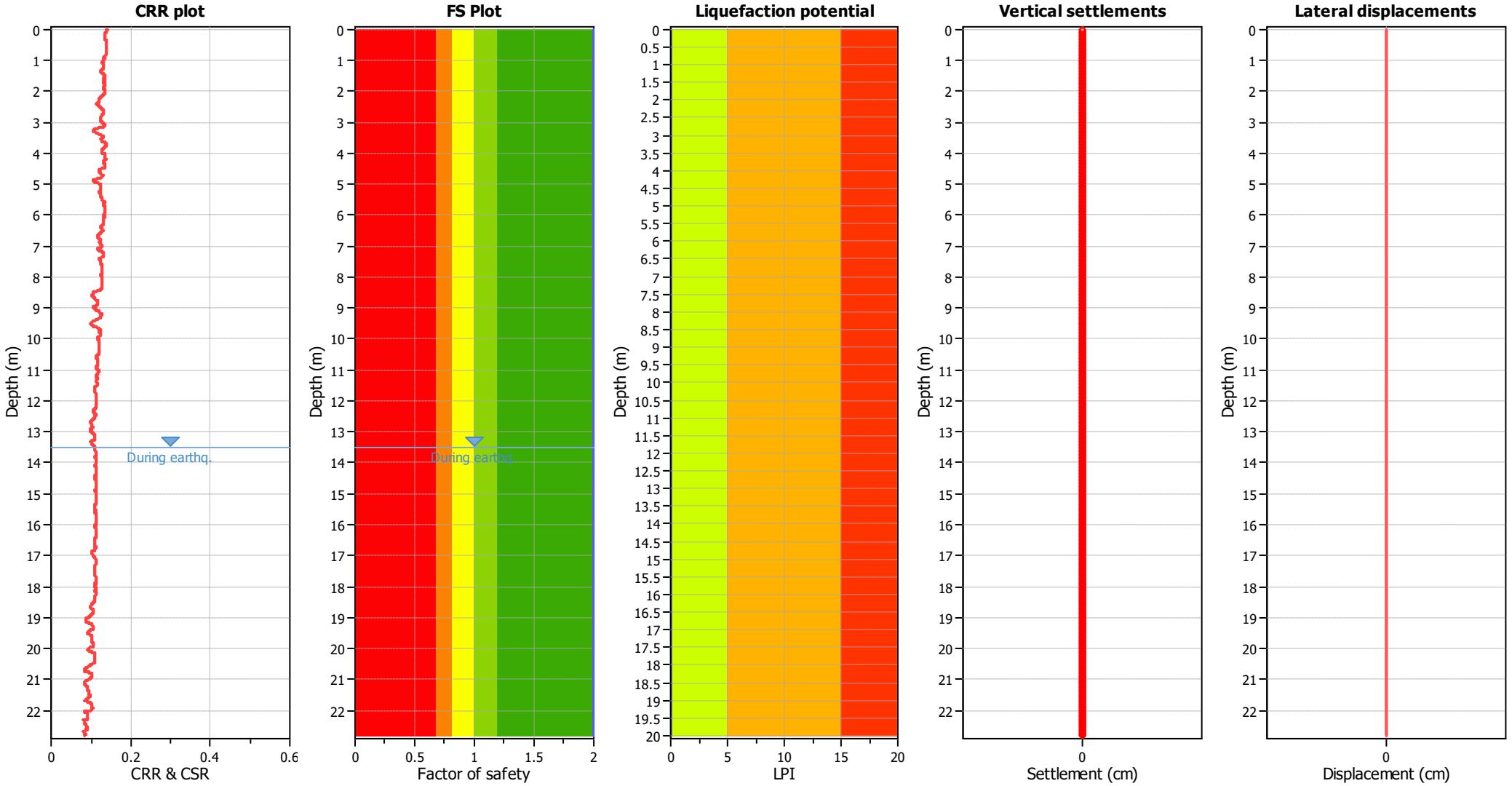
Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	13.50 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	5.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.26	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	13.50 m	Fill height:	N/A	Limit depth:	10.00 m

F.S. color scheme

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LPI color scheme

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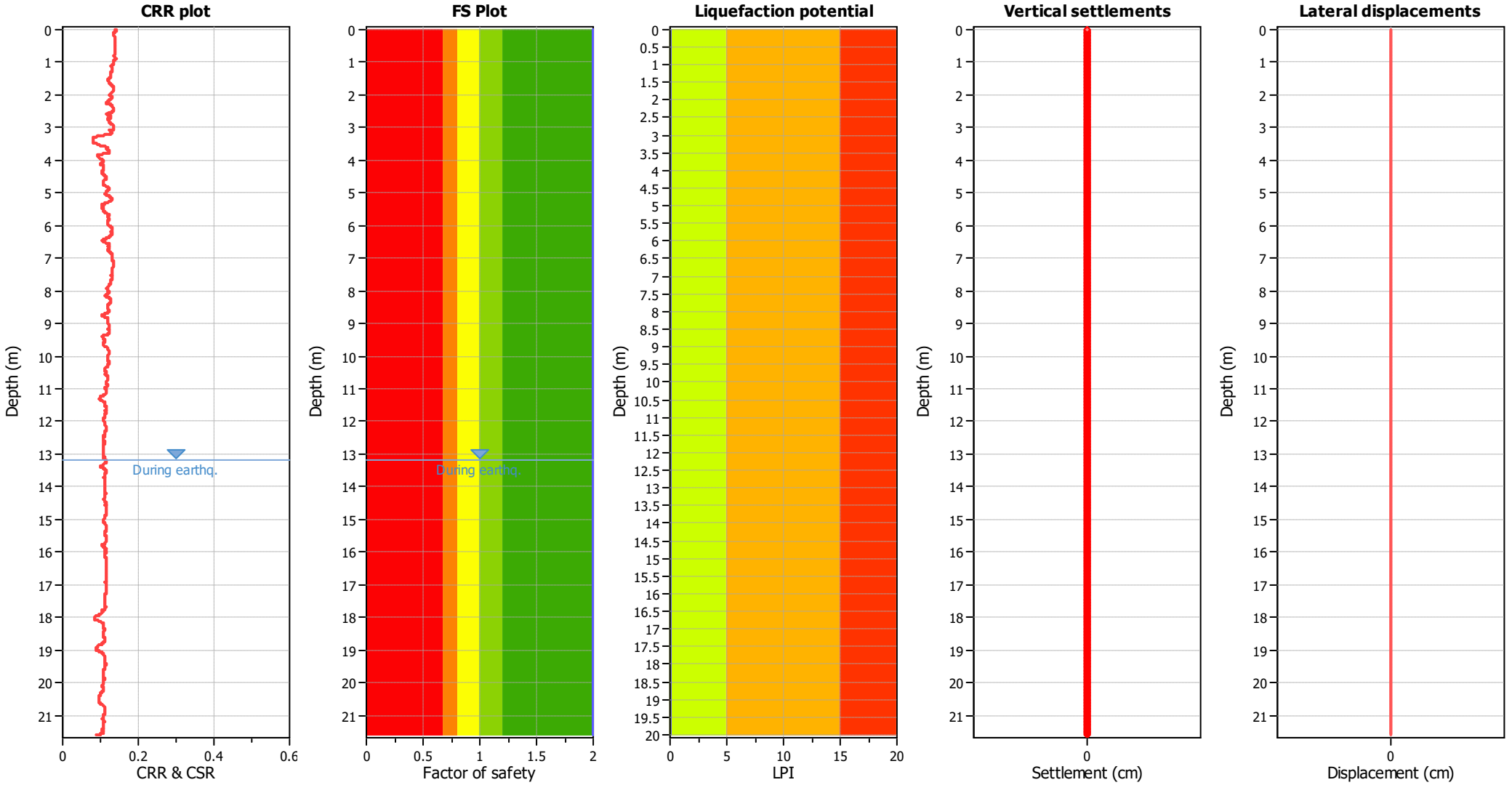
Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	13.20 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	5.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.26	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	13.20 m	Fill height:	N/A	Limit depth:	10.00 m

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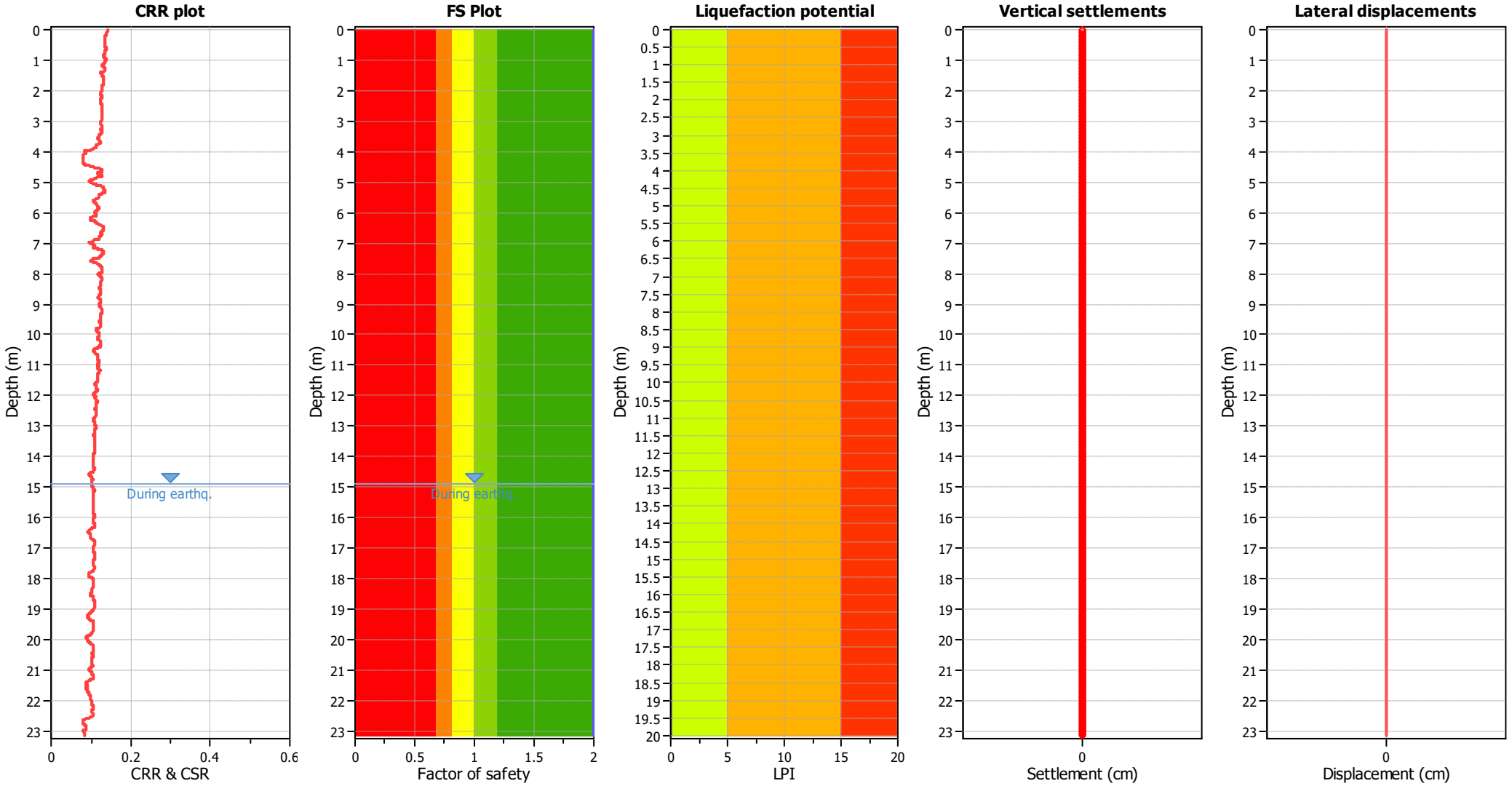
Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	14.90 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	5.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.26	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	14.90 m	Fill height:	N/A	Limit depth:	10.00 m

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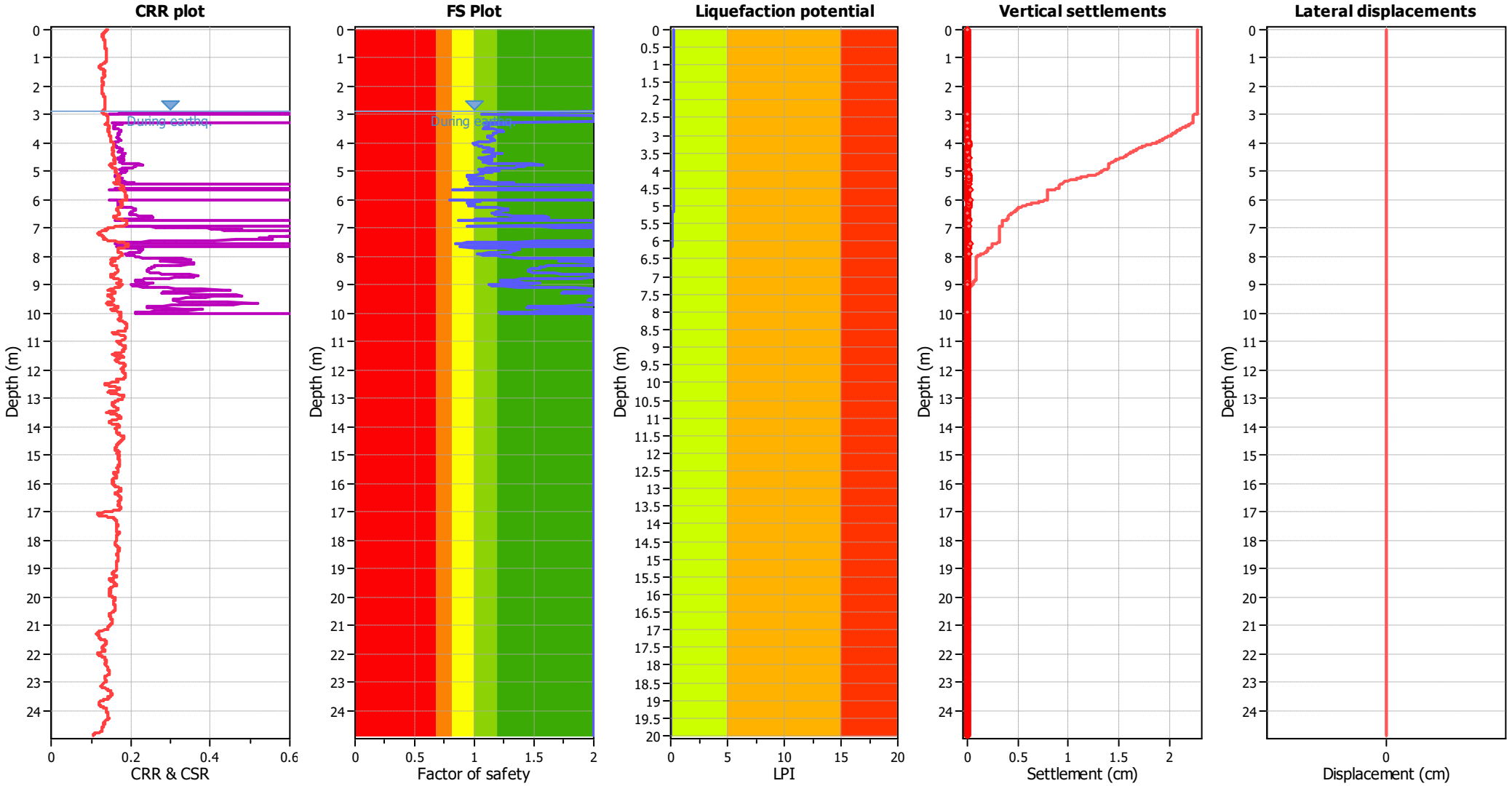
Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	2.90 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	5.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.26	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	2.90 m	Fill height:	N/A	Limit depth:	10.00 m

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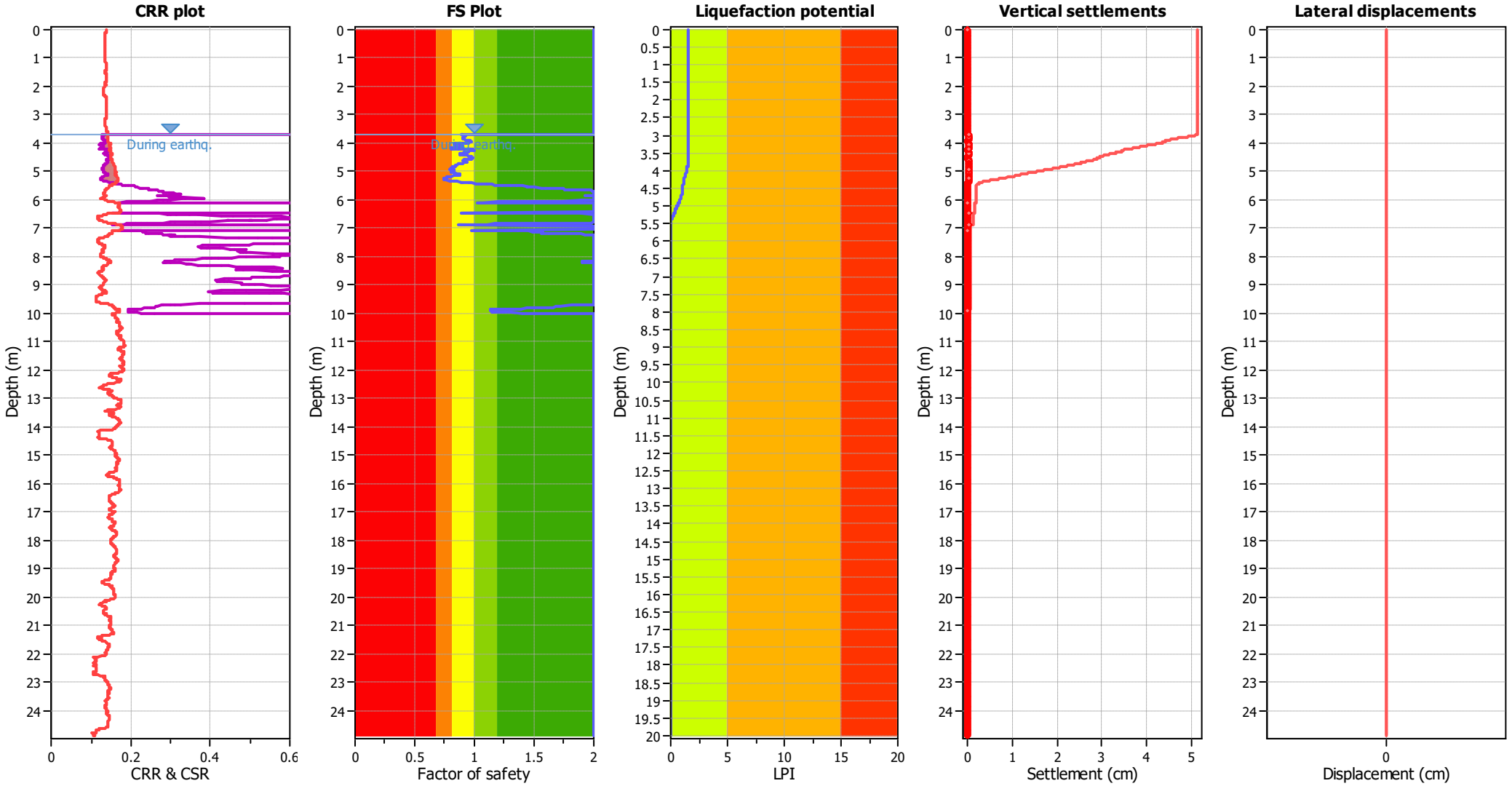
Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	3.70 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	5.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.26	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	3.70 m	Fill height:	N/A	Limit depth:	10.00 m

F.S. color scheme

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- Liquefaction and no liq. are equally likely
- Unlike to liquefy
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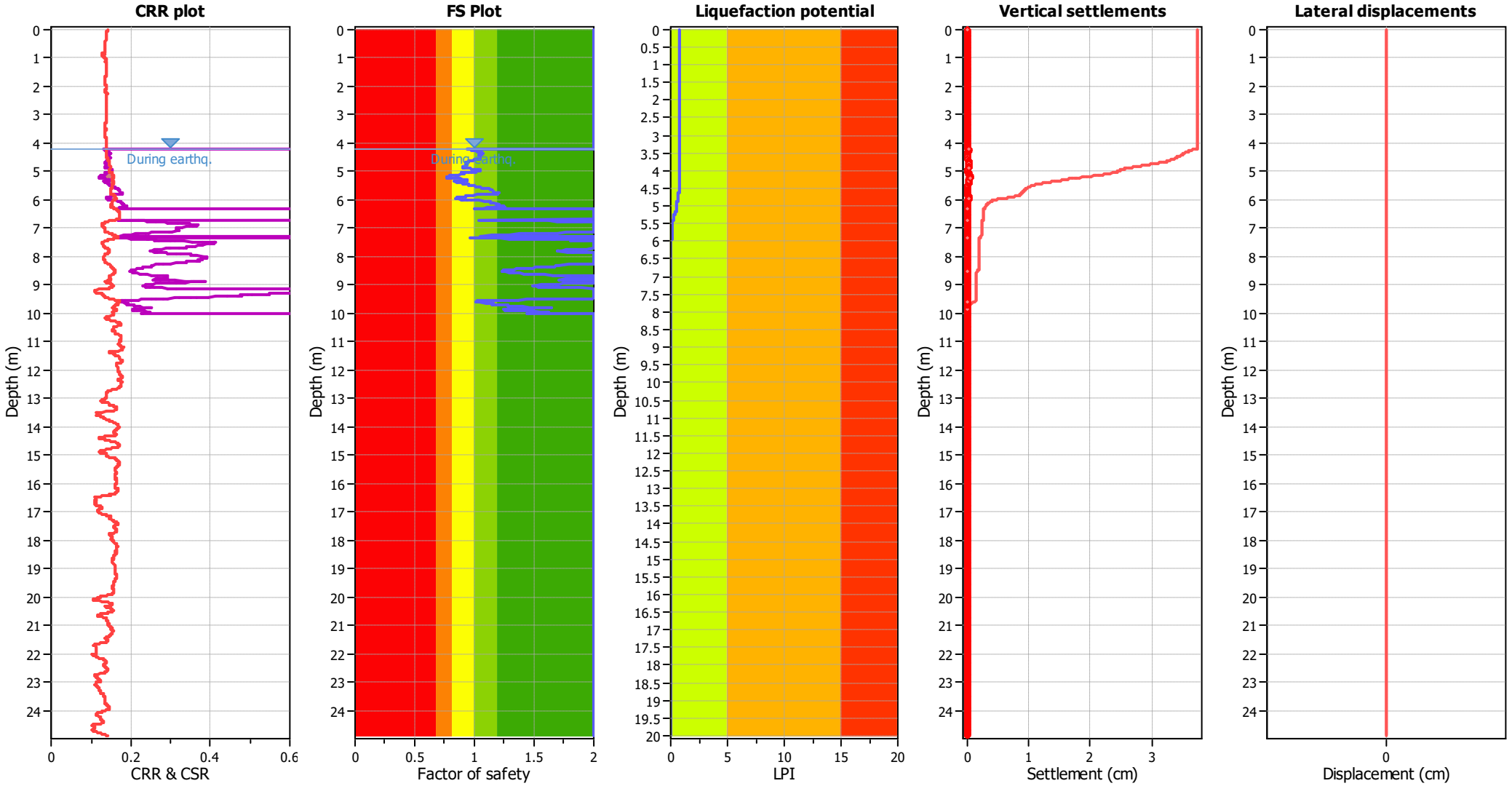
LPI color scheme

- Very high risk
- High risk
- Low risk

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	4.20 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	5.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.26	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	4.20 m	Fill height:	N/A	Limit depth:	10.00 m

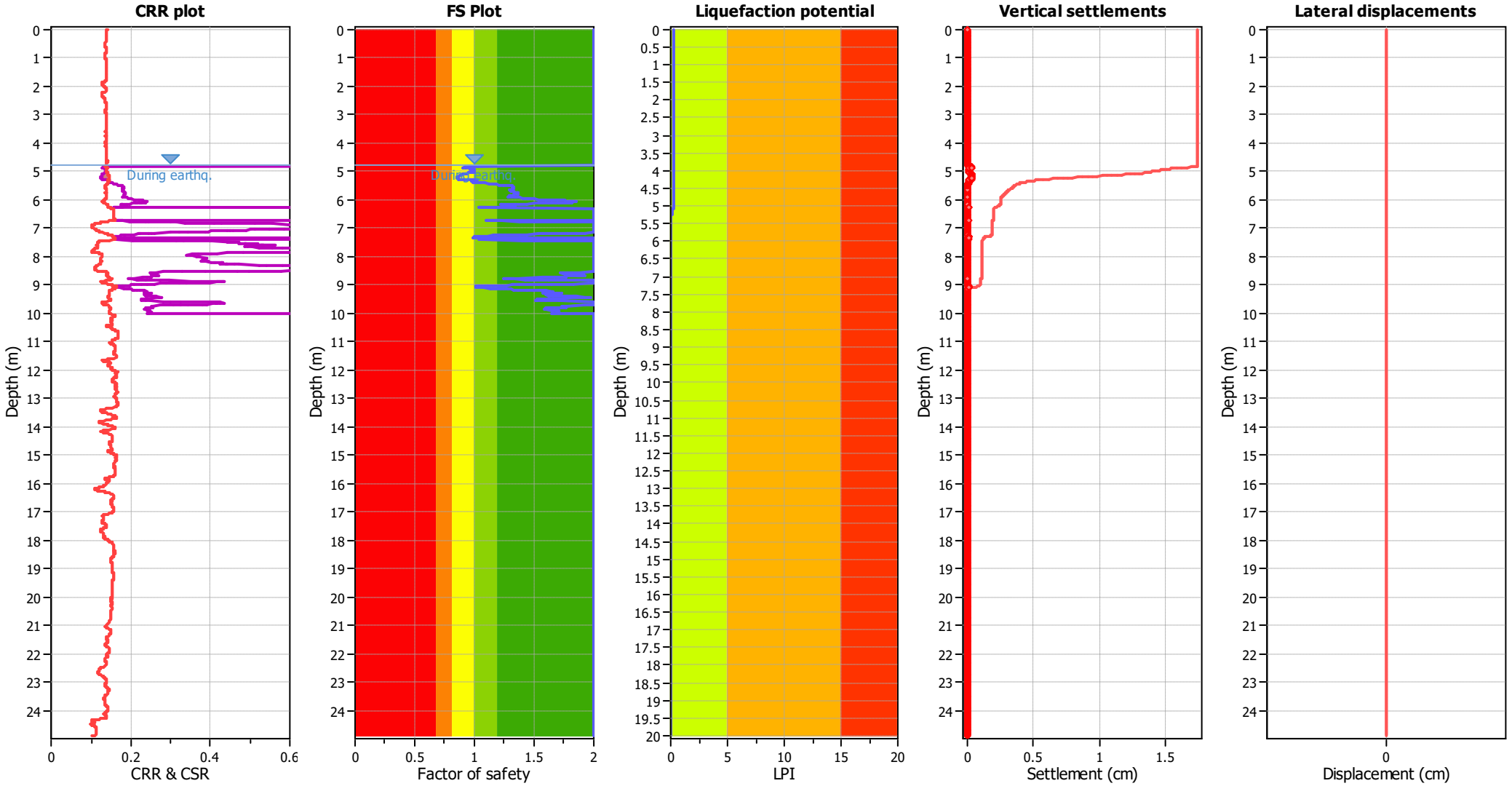
F.S. color scheme

- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

LPI color scheme

- Very high risk
- High risk
- Low risk

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	4.80 m	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	5.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.26	Use fill:	No	Limit depth applied:	Yes
Depth to water table (insitu):	4.80 m	Fill height:	N/A	Limit depth:	10.00 m

F.S. color scheme

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LPI color scheme

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Appendix F: Natural Hazards Risk Assessment

NATURAL HAZARDS RISK ASSESSMENT FOR LAND SUBDIVISION TAURANGA ROAD, MATAMATA

A. CONTEXT

Section 106 of the Resource Management Act (RMA) requires an assessment of the risk from natural hazards to be carried out when considering the granting of a subdivision consent. S106 RMA specifically states that the assessment must consider the combined effect of the natural hazard likelihood and material damage to land, other land or structures (consequence).

Section 2 of the RMA defines natural hazards as any atmospheric or earth or water related occurrence (including earthquake, tsunami, erosion, volcanic and geothermal activity, landslip, subsidence, sedimentation, wind, drought, fire or flooding) the action of which adversely affects or may adversely affect human life, property, or other aspects of the environment.

This appendix to CMW report reference TGA2020-0304AC Rev3 sets out the criteria for and presents the results of an assessment of the geotechnical-related natural hazards associated with this proposed subdivision development. The remaining hazards, i.e. tsunami, wind, drought, fire and flooding hazards are not covered by this assessment.

B. BASIS OF ASSESSMENT

B1. Risk Classification

The occurrence of natural hazards and their potential impacts on the proposed subdivision development is assessed in terms of risk significance, which is based on likelihood and consequence factors. A risk table is used to help assess the likelihood and consequence factors, the form of which used by CMW for this project is presented in Table B1.

Table B1: Natural Hazard Risk Classification

		Consequence				
		Insignificant 1	Minor 2	Moderate 3	Major 4	Catastrophic 5
Likelihood	Almost Certain 5	Medium 5	High 10	Very high 15	Extreme 20	Extreme 25
	Likely 4	Low 4	Medium 8	High 12	Very high 16	Extreme 20
	Moderate 3	Low 3	Medium 6	Medium 9	High 12	Very high 15
	Unlikely 2	Very low 2	Low 4	Medium 6	Medium 8	High 10
	Rare 1	Very low 1	Very low 2	Low 3	Low 4	Medium 5

B2. Likelihood

With respect to assessing the likelihood or chance of the risk occurring, the qualitative definitions used by CMW for this project are provided in Table B2 for each likelihood classification.

Table B2: Qualitative Natural Hazard Likelihood Definitions		
1	Rare	The natural hazard is not expected to occur during the design life of the project
2	Unlikely	The natural hazard is unlikely, but may occur during the design life
3	Moderate	The natural hazard will probably occur at some time during the life of the project
4	Likely	The natural hazard is expected to occur during the design life of the project
5	Almost Certain	The natural hazard will almost definitely occur during the design life of the project

B3. Consequence

In terms of determining the consequence or severity of the natural hazard occurring, the qualitative definitions used by CMW for this project are provided in Table B3 for each consequence classification.

Table B3: Qualitative Natural Hazard Consequence Definitions		
1	Insignificant	Very minor to no damage, not requiring any repair, no people at risk, no economic effect to landowners.
2	Minor	Minor damage to land only, any repairs can be considered normal property maintenance no people at risk, very minor economic effect.
3	Moderate	Some damage to land requiring repair to reinstate within few months, minor cosmetic damage to buildings being within relevant code tolerances, does not require immediate repair, no people at risk, minor economic effect.
4	Major	Significant damage to land requiring immediate repair, damage to buildings beyond serviceable limits requiring repair, no collapse of structures, perceptible effect to people, no risk to life, considerable economic effect.
5	Catastrophic	Major damage to land and buildings, possible structure collapse requiring replacement, risk to life, major economic effect or possible site abandonment.

B4. Risk Acceptance

It is recognised that the natural hazard risk assessment provided herein is qualitative and, due to the wide range of possible geohazards that could occur, is somewhat subjective. Other methods are available to quantitatively assess an acceptable level of geotechnical related natural hazard risk, such as defining an acceptable factor of safety with respect to slope stability or acceptable differential ground settlements with respect to recommended building code limits.

Therefore, to give this qualitative natural hazard risk assessment some relevance to more commonly adopted numerical or quantitative geotechnical assessment techniques, a residual risk rating of very low to medium (risk value = 1 to 9 inclusive) is considered an acceptable result for the proposed subdivision development.

A risk rating of high to extreme (risk value ≥ 10) is considered an unacceptable result for the proposed subdivision development.

C. RISK ASSESSMENT

The natural hazards relevant to this proposed subdivision development and adjacent, potentially affected land have been assessed with respect to the criteria outlined above.

Assessment is based on proposed post development ground conditions with and without any geotechnical controls. The latent risk was first assessed with the site in its proposed developed state to consider the risks to the development and surrounding land, including assessment of land modifications from the pre-existing natural state, without any implemented geotechnical controls. The specific geotechnical mitigation measures and engineering design solutions outlined in the table below and CMW report, where relevant, were then considered to determine the natural hazard residual risk remaining after the proposed controls have been implemented.

Results of this assessment are presented in Table C1 below.

Table C1: Natural Hazard Risk Assessment Results

RMA S2 Hazard	Description	Proposed Site Latent Risk of Damage to Land / Structures			Comments and Geotechnical Control	Proposed Site Residual Risk of Damage to Land / Structures OR Acceleration/ Worsening of Hazard with Geotechnical Controls Implemented		
		Likelihood	Consequence	Risk Rating		Likelihood	Consequence	Risk Rating
Earthquake	Fault Rupture	1	4	Low 4	Approximately 3km from the Kerepehi Fault. Recurrence interval of 2,000 to 3,500 years, no control required.	1	4	Low 4
	Liquefaction Induced Subsidence	2	2	Low 4	Deep groundwater table, low risk of surface manifestation. Specific foundation design where	1	2	Very Low 2

					applicable. Shallow foundations.			
	Lateral Spread	1	1	Very Low 1	Site is near level and upper soils are above water table. No geotechnical controls warranted.	1	1	Very Low 1
Volcanic Activity	Ash & Pyroclastic Falls	1	4	Low 4	No geotechnical controls warranted	1	4	Low 4
	Lava flows & Lahars	1	4	Low 4	No geotechnical controls warranted	1	4	Low 4
Geothermal Activity	Formation of geysers, hot springs, fumaroles, mud pools	1	3	Low 3	No geotechnical controls warranted.	1	3	Low 3
Erosion	Cut Batters	4	2	Medium 8	Max 1:2.5 gradient	2	2	Low 4
	Fill Batters	4	2	Medium 8	Max 1:2.5 gradient	2	2	Low 4
Landslip	Global Slope Instability	2	3	Medium 6	No development directly above existing retaining wall in the northwest.	1	3	Low 3
	Soil Creep	1	1	Very Low 1	No geotechnical controls warranted.	1	1	Very Low 1
	Bearing Capacity Failure	3	3	Medium 9	Reduced bearing capacity where required. Undercut and replace if required.	1	3	Low 3
	Cut & Fill Batter Instability	3	2	Medium 6	Where required, cut and fill batters to be graded to 1(V):2.5(H)	1	2	Very Low 2
Subsidence	Expansive Soils	1	2	Very Low 2	Expansive soils not an issue for the site	1	2	Very Low 2

	Sinkholes	1	3	Low 3	Expansive soils not an issue for the site	1	3	Low 3
	Soft Soils	2	3	Medium 6	Undercut and remove if encountered	1	3	Low 3
	Effects of Dewatering	1	2	Very Low 2	Dewatering unlikely to be required due to low groundwater table	1	2	Very Low 2
Sedimentation	Rockfall, Debris Inundation	1	1	Very Low 1	Site near level	1	1	Very Low 1

Notes:

- Assessments include the impact of the proposed subdivision works on adjacent properties.
- The following reference(s) contain information on the hazards contained in this assessment and the non-geotechnical hazards that have not been included:
    - **Waikato** https://waikatoregion.maps.arcgis.com/apps/MapSeries/index.html?appid=f2b48398f93146e8a5cf0aa3fddce92c