GEOTHETA CONSULTING ENGINEERS AND SCIENTISTS

SOLAR PV PROJECT, MPUMALANGA

NEAR-SURFACE GEOTECHNICAL INVESTIGATION REPORT

Cabanga Environmental
Unit 5 & 6 Beyers Office Park
Bosbok Road
Randpark Ridge

2010329/R02 February 2021

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Randpark Ridge

Geotechnical Investigation and Report

Report Reference Number: 2010329/R02

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1. Executive Summary

Cabanga Environmental commissioned Geotheta (Pty) Limited to prepare a geotechnical investigation report for a proposed new solar PV plant near Bethal in Mpumalanga Province.

A near-surface geotechnical investigation was done, and representative soil samples were retrieved.

The typical soil strata of the far eastern side of the site comprises topsoil underlain by soft to stiff sandy clay (transported material) overlying soft to stiff sandy clay (residual material).

The typical soil strata of the western side of the site comprises topsoil underlain by medium dense to dense silty sand (transported material) overlying medium dense to very dense silty sand and clayey sand (residual material) and soft rock sandstone. Hardpan ferricrete was also encountered in some areas.

Groundwater seepage was encountered in one test pit on the eastern side of the site. No groundwater seepage was encountered in any of the other test pits.

The soft rock sandstone and hardpan ferricrete is suitable as a founding horizon where encountered. For areas where soft rock sandstone or hardpan ferricrete are present, reinforced concrete pad footings should be used to support the solar PV panels and other load bearing structures. The pad footings can be founded on the soft rock sandstone or hardpan ferricrete at depths between 0.4m and 2.2m. The soft rock sandstone and hardpan ferricrete will provide a safe bearing capacity of 250kPa.

For areas where deep soil horizons are present, friction piles should be used to support the PV solar panels. Friction piles can be driven into the soil relatively quickly and easily. The piles should be driven into the ground until sufficient pull out resistance is achieved to ensure that the PV panels are adequately anchored to withstand the applied uplift loads. The optimum pile embedment depth will need to be determined by the design engineers.

As an alternative to the above recommendations, cast-iron piles can be driven into the rock or residual material. The cast-iron is non corrosive, and hence will not be affected by the pH and salinity of the soil. The solar panels can be attached direct to the piles, eliminating the need for structural steel supports and hold-down bolts.

Shoring and/or lateral support, or back battering, is required for excavations exceeding 1.5m deep.

Excavatability of the material on site is classed as *soft* to *intermediate* in the soils and *hard* once the soft rock sandstone and hardpan ferricrete is encountered.

Precautions should be taken to protect the foundations from moisture ingress. General precautionary measures, which are intended to prevent the concentrated ingress of water into the ground are also recommended. All external areas are to be free draining away from structures. Adequate storm water control needs to be implemented to direct the water away from excavations and foundations.

The material on site is not suitable for use as structural fill. Suitable material will need to be imported as required.

2. Disclaimer

2.1 Data provided to Geotheta

The opinions expressed in this Report have been based on the information supplied to Geotheta (Pty) Ltd (Geotheta) by Cabanga Environmental (Cabanga). The opinions in this report are provided in response to a specific request from Cabanga to do so. Geotheta has exercised all due care in reviewing the supplied information. Whilst Geotheta has compared key supplied data with expected values, the accuracy of the results and conclusions from the review are entirely reliant on the accuracy and completeness of the supplied data. Geotheta does not accept responsibility for any errors or omissions in the supplied information and does not accept any consequential liability arising from commercial decisions or actions resulting from them.

2.2 Data obtained by Geotheta

Opinions presented in this report apply to the site conditions and features as they existed at the time of Geotheta's investigations, and those reasonably foreseeable. These opinions do not necessarily apply to conditions and features that may arise after the date of this report, about which Geotheta had no prior knowledge nor had the opportunity to evaluate.

3. Statement of Geotheta Independence

Neither Geotheta nor any of the authors of this report have any material present or contingent interest in the outcome of this report, nor do they have any monetary or other interest that could be reasonably regarded as being capable of affecting their independence or that of Geotheta.

Geotheta has no beneficial interest in the outcome of the technical assessment being capable of affecting its independence.

Geotheta's fee for completing this report is based on its normal professional rates and/or fees plus incidental expenses. The payment of that professional fee or expense is not contingent upon the outcome of the report.

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5. List of abbreviations

CBR	:	California Bearing Ratio
Geotheta	:	Geotheta (Pty) Limited
kPa	:	kilo Pascal
Mod	:	Modified
N	:	Weinert N-value
OMC	:	Optimum Moisture Content
SANAS	:	South African National Accreditation System
Soillab	:	Soillab (Pty) Limited
TLB	:	Tractor Loader Backhoe
TP	:	Test Pit

6. Introduction

6.1 Cabanga Environmental commissioned Geotheta (Pty) Limited to prepare a geotechnical investigation report for the proposed solar PV plant near Bethal, in Mpumalanga Province.

6.2 A near-surface geotechnical investigation was done to determine the foundation conditions and appropriate founding depth for the proposed solar PV plant.

6.3 The investigation comprised test pit excavations and retrieval of samples for laboratory testing. The test results were analysed to determine the foundation conditions and the suitability of the in-situ soil for use in the construction works.

6.4 The site investigation work was done from 03 December 2020 to 07 December 2020 and from 15 January 2021 to 20 January 2021. The laboratory test results were received on 04 and 05 February 2021.

7. Terms of reference

7.1 Geotheta submitted proposal reference 2010329 - Cabanga Environmental - Solar PV Project Geotech - P01R on 02 November 2020.

7.2 Cabanga Environmental confirmed the appointment on 19 November 2020.

8. Scope of work

The following work was done:

8.1 Site geotechnical investigation

The following was done to determine the foundation geotechnical characteristics of the area:

8.1.1 Test Pits

8.1.2 A Tractor Loader Backhoe (TLB) excavator was provided and used to excavate test pits.

8.1.3 The test pits were profiled to determine the strata layers and characteristics. Soil samples were retrieved as necessary for laboratory testing.

8.2 Laboratory testing

8.2.1 The soil samples were sent to a SANAS certified geotechnical soils laboratory for testing and analysis. Foundation indicator, pH and Mod CBR tests were undertaken.

8.3 Report

8.3.1 This geotechnical report was written.

9. Site Location and Description

9.1 The site is located approximately 28km north of Bethal in Mpumalanga Province (see Figure 1). The site comprises a large open grassed area with visible rock outcrops in certain areas. Small portions of the site are used for agriculture.

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Figure 1 : Site Location

10. Geology

10.1 The regional geology of the area is shown in Figure 2.

10.2 From the 1:250 000 geological map 2628 East Rand, the site area spans across a geological boundary.

10.3 The western portion of the site is underlain by porphyritic rhyolite with interbedded mudstone and sandstone of the Selons River Formation, Rooiberg Group of the Vaalian Era.

10.4 The eastern portion of the site is underlain by sandstone, shale and coal beds of the Vryheid Formation, Ecca Group of the Permian Era.

10.5 The typical soil strata of the far eastern side of the site comprises topsoil underlain by soft to stiff sandy clay (transported material) overlying soft to stiff sandy clay (residual material).

10.6 The typical soil strata of the western side of the site comprises topsoil underlain by medium dense to dense silty sand (transported material) overlying medium dense to very dense silty sand and clayey sand (residual material) and soft rock sandstone. Hardpan ferricrete was encountered in test pits TP17 and TP46.

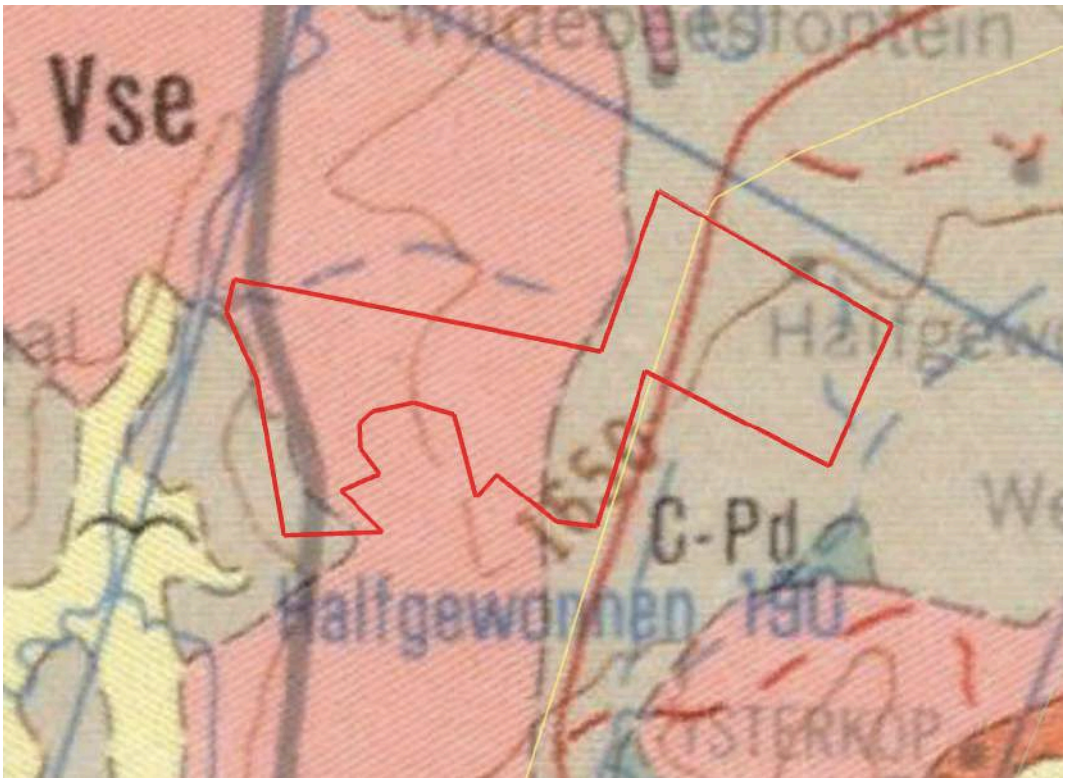

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Figure 2: Regional Geology

11. Engineering Geology

11.1 The influence of climate on weathering is expressed by the N-value (H.H. Weinert 1980). The most important is where N=5. Where N is more than 5, disintegration is dominant, and where N is less than 5, decomposition is dominant.

11.2 The Weinert N-value is about 2.3 for this region, indicating that decomposition is the overriding process.

11.3 Weinert also mentions that where N is between 2 and 5, weathering profiles develop upwards from fresh rock to residual soil.

12. Method of Investigation

12.1 Desk study

12.1.1 The local geology was determined from the geological maps. This is discussed in sections 10 and 11 above.

12.2 Test Pits

12.2.1 No formal grid spacing was used in setting out the test pit positions. Positions were selected to adequately cover the site and to determine any variations in the site geology.

12.2.2 Fifty test pits were excavated. The test pit positions are indicated in Figure 3.

12.2.3 Test pits were not excavated in the agricultural areas so as not to disturb this.

12.2.4 The test pits were excavated with a Tractor Loader Backhoe (TLB) and soil profiles were logged according to the standard method of Jennings, Brink and Williams (1973).

12.2.5 Test pit photographs and profiles are included in Appendix A and Appendix B respectively.

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Figure 3: Test Pit Positions

12.3 Soil Sampling

12.3.1 Disturbed samples were taken from test pits TP3, TP5, TP24, TP37, TP43 and TP48 to determine the material classification and the parameters of the soil types as well as the potential of the excavated material to be used as backfill material.

12.4 Laboratory Testing

12.4.1 The retrieved samples were submitted to Soillab in La Montagne, Pretoria, for testing.

12.4.2 Foundation Indicator, pH and Mod CBR tests were conducted.

12.4.3 The laboratory test results are included as Appendix C.

12.4.4 The results are discussed below.

13. Results

13.1 Site soils

13.1.1 The soil profiles from the test pits encountered on the site are as follows:

Test Pit No	Topsoil	Transported Material	Residual Material	Fill Material	Test pit depth (m)
TP1	0 – 0.4	0.4 – 1.9	1.9 – 2.8		2.8 – Max Reach
TP2	0 – 0.3	0.3 – 2.8	2.8 – 3.4		3.4 – Max Reach
TP3	0 – 0.3	0.3 – 2.0	2.0 – 2.6		2.6 – Max Reach
TP4	0 – 0.4	0.4 – 0.9	0.9 – 3.1		3.1 – Max Reach
TP5	0 – 0.3	0.3 – 2.0	2.0 – 3.0		3.0 – Max Reach
TP6	0 – 0.3	0.3 – 2.5	2.5 – 3.0		3.0 – Max Reach
TP7	0 – 0.3	0.3 – 2.2	2.2 – 3.1		3.1 – Max Reach
TP8	0 – 0.3	0.3 – 0.8	0.8 – 3.0		3.0 – Max Reach
TP9	0 – 0.4	0.4 – 2.1	2.1 – 3.0		3.0 – Max Reach
TP10	0 – 0.4	0.4 – 1.9	1.9 – 3.1		3.1 – Max Reach
TP11	0 – 0.4	0.4 – 0.9	0.9 – 2.7		2.7 – Max Reach
TP12	0 – 0.3	0.3 – 1.1	1.1 – 1.5		1.5 - Refusal
TP13	0 – 0.2	0.2 – 0.6	0.6 – 1.2		1.2 - Refusal
TP14	0 – 0.3	0.3 – 0.6	0.6 – 1.2		1.2 - Refusal
TP15	0 – 0.3	0.3 – 0.6	0.6 – 1.2		1.2 - Refusal
TP16	0 – 0.3	0.3 – 0.8	0.8 – 2.5		2.5 – Max Reach
TP17	0 – 0.3	0.3 – 0.6	-		0.6 - Refusal
TP18	0 – 0.2	0.2 – 0.5	0.5 – 1.1		1.1 - Refusal
TP19	0 – 0.4	-	-		0.4 - Refusal
TP20	0 – 0.2	0.2 – 0.6	0.6 – 1.6		1.6 - Refusal
TP21	0 – 0.3	0.3 – 0.6	0.6 – 2.7		2.7 – Max Reach
TP22	0 – 0.4	0.4 – 0.8	0.8 – 2.6		2.6 – Max Reach
TP23	0 – 0.3	0.3 – 0.5	0.5 – 1.0		1.0 - Refusal
TP24	0 – 0.5	0.5 – 0.7	0.7 – 2.2		2.2 - Refusal
TP25	0 – 0.4	-	0.4 – 1.5		1.5 - Refusal
TP26	0 – 0.4	0.4 – 0.7	0.7 – 1.3		1.3 - Refusal
TP27	0 – 0.5	-	0.5 – 1.0		1.0 - Refusal

TP28	0 – 0.3	0.3 – 0.5	0.5 – 1.1		1.1 - Refusal
TP29	0 – 0.3	0.3 – 0.7	0.7 – 1.8		1.8 - Refusal
TP30	0 – 0.3	-	0.3 – 0.6		0.6 - Refusal
TP31	0 – 0.4	-	0.4 – 0.9		0.9 - Refusal
TP32	0 – 0.5	-	0.5 – 1.1		1.1 - Refusal
TP33	0 – 0.5	-	0.5 – 1.2		1.2 - Refusal
TP34	0 – 0.6	-	0.6 – 1.8		1.8 - Refusal
TP35	0 – 0.3	-	0.3 – 1.5		1.5 - Refusal
TP36	0 – 0.4	-	0.4 – 1.5		1.5 - Refusal
TP37	0 – 0.3	0.3 – 0.5	0.5 – 1.5		1.5 - Refusal
TP38	0 – 0.3	0.3 – 0.5	0.5 – 1.1		1.1 - Refusal
TP39	0 – 0.4	-	-		0.4 - Refusal
TP40	0 – 0.3	-	0.3 – 0.6		0.6 - Refusal
TP41	0 – 0.2	-	0.2 – 0.4		0.4 - Refusal
TP42	0 – 0.3	0.3 – 0.5	0.5 – 1.2		1.2 - Refusal
TP43	0 – 0.8	-	0.8 – 1.3		1.3 - Refusal
TP44	0 – 0.2	-	0.2 – 1.1		1.1 - Refusal
TP45	0 – 0.3	-	0.3 – 0.9		0.9 - Refusal
TP46	0 – 0.4	0.4 – 0.8	-		0.8 - Refusal
TP47	0 – 0.2	0.2 – 0.3	0.3 – 0.5		0.5 – Refusal
TP48	0 – 0.3	-	0.3 – 2.5		2.5 – Max Reach
TP49	0 – 0.1			0.1 – 2.4	2.4 – Max Reach
TP50	0 – 0.1	-	0.1 – 0.4		0.4 - Refusal

13.1.2 Sixteen test pits were excavated until the maximum reach of the TLB at depths between 2.4m to 3.4m below ground level. The remaining thirty-four test pits were excavated until refusal of the TLB at depths between 0.4m to 2.2m.

13.1.3 Groundwater seepage was encountered in test pit TP2 at a depth of 1.6m below ground level. No groundwater seepage was observed in any of the other test pits.

13.2 Laboratory Results

13.2.1 TP03

- The transported material classified as a poorly graded sand to silty sand (SP – SM). The Liquid Limit is 42 and the Linear Shrinkage is 4.0. The value of the Grading Modulus is 2.36.

- The material plotted as a LOW activity on the van der Merwe Activity Diagram.
- With a CBR value of 21 compacted to 95% Mod AASHTO, the transported material classifies as a G7 according to COLTO specifications. The material is therefore not suitable for structural fill.
- The transported material from test pit TP3 has a pH of 6.79 and an electrical conductivity of 0.032 S/m which classifies as a soil with medium corrosion potential.

13.2.2 TP05

- The transported material classified as a low plasticity silt (ML). The Liquid Limit is 46 and the Linear Shrinkage 3.0. The value of the Grading Modulus is 0.55.
- The material plotted as a LOW activity on the van der Merwe Activity Diagram.
- The transported material from test pit TP5 has a pH of 6.54 and an electrical conductivity of 0.036 S/m which classifies as a soil with medium to high corrosion potential.

13.2.3 TP24

- The residual material tested classified as a silty sand (SM). The Liquid Limit is 31 and the Linear Shrinkage is 3.5. The value of the Grading Modulus is 1.35.
- This material plotted as a LOW activity on the van der Merwe Activity Diagram.
- The residual material from test pit TP24 has a pH of 4.81 and an electrical conductivity of 0.052 S/m which classifies as a soil with high corrosion potential.

13.2.4 TP37

- The residual material tested classified as a silty sand (SM). The Liquid Limit is 36 and the Linear Shrinkage is 4.0. The Grading Modulus is 1.25.
- The material plotted as a LOW activity on the van der Merwe Activity Diagram.
- The residual material from test pit TP37 has a pH of 4.84 and an electrical conductivity of 0.052 S/m which classifies as a soil with high corrosion potential.

13.2.5 TP43

- The topsoil material tested classified as non-plastic silty sand (SM). The Grading Modulus is 1.03.
- The material plotted as a LOW activity on the van der Merwe Activity Diagram.
- The topsoil from test pit TP43 has a pH of 4.45 and an electrical conductivity of 0.052 S/m which classifies as a soil with high corrosion potential.

13.2.6 TP48

- The residual material tested classified as a low plasticity clay to low plasticity silt (CL - ML). The Liquid Limit is 25 and the Linear Shrinkage is 2.0. The Grading Modulus is 0.65.
- This material plotted as a LOW activity on the van der Merwe Activity Diagram.
- The residual material from test pit TP48 has a pH of 4.44 and an electrical conductivity of 0.053 S/m which classifies as a soil with high corrosion potential.

14. Discussion of results

14.1 Soil profiles

14.1.1 The typical soil strata of the far eastern side of the site comprises topsoil underlain by soft to stiff sandy clay (transported material) overlying soft to stiff sandy clay (residual material).

14.1.2 The typical soil strata of the western side of the site comprises topsoil underlain by medium dense to dense silty sand (transported material) overlying medium dense to very dense silty sand and clayey sand (residual material) and soft rock sandstone. Hardpan ferricrete was encountered in test pits TP17 and TP46.

14.2 Construction material

14.2.1 The transported material tested classified as G7 according to COLTO specifications. This material is not suitable for use as structural fill.

14.2.2 Suitable material will need to be imported for use as structural fill where required.

14.3 Foundations

14.3.1 The soft rock sandstone and hardpan ferricrete is suitable as a founding horizon where encountered. For areas where soft rock sandstone or hardpan ferricrete are present, reinforced concrete pad footings should be used to support the solar PV panels and other load bearing structures. The pad footings can be founded on the soft rock sandstone or hardpan ferricrete at depths between 0.4m and 2.2m. The soft rock sandstone and hardpan ferricrete will provide a safe bearing capacity of 250kPa.

14.3.2 For areas where deep soil horizons are present, friction piles should be used to support the PV solar panels. Friction piles can be driven into the soil relatively quickly and easily. The piles should be driven into the ground until sufficient pull out resistance is achieved to ensure that the PV panels are adequately anchored to withstand the applied loads. The pull-out strength of the pile can be determined during installation. The optimum pile embedment depth will need to be determined by the design engineers.

14.3.3 As an alternative to the above recommendations, cast-iron piles can be driven into the rock or residual material. The cast-iron is non corrosive, and hence will not be affected by the pH and salinity of the soil. The solar panels can be attached direct to the piles, eliminating the need for structural steel supports and hold-down bolts. This has been successfully done for solar PV plants in the Northern Cape where the piles were driven into calcrete. The deployment and installation was very rapid and cost effective.

14.3.4 Shoring and/or lateral support, or back battering, is required for excavations exceeding 1.5m deep.

14.4 Excavatability

14.4.1 Excavatability of the material on site is classed *soft* to *intermediate* in the soils and *hard* once the soft rock sandstone and hardpan ferricrete is encountered.

15. Summary, conclusions and recommendations

15.1 Fifty test pits were excavated using a TLB to determine the subsoil conditions. Sixteen test pits were excavated until the maximum reach of the TLB at depths between 2.4m to 3.4m below ground level. The remaining thirty-four test pits were excavated until refusal of the TLB at depths between 0.4m to 2.2m below ground level.

15.2 The typical soil strata of the far eastern side of the site comprises topsoil underlain by soft to stiff sandy clay (transported material) overlying soft to stiff sandy clay (residual material).

15.3 The typical soil strata of the western side of the site comprises topsoil underlain by medium dense to dense silty sand (transported material) overlying medium dense to very dense silty sand and clayey sand (residual material) and soft rock sandstone. Hardpan ferricrete was encountered in test pits TP17 and TP46.

15.4 The soft rock sandstone and hardpan ferricrete is suitable as a founding horizon where encountered. For areas where soft rock sandstone or hardpan ferricrete are present, reinforced concrete pad footings should be used to support the solar PV panels and other load bearing structures. The pad footings can be founded on the soft rock sandstone or hardpan ferricrete at depths between 0.4m and 2.2m. The soft rock sandstone and hardpan ferricrete will provide a safe bearing capacity of 250kPa.

15.5 For areas where deep soil horizons are present, friction piles should be used to support the PV solar panels. Friction piles can be driven into the soil relatively quickly and easily. The piles should be driven into the ground until sufficient pull out resistance is achieved to ensure that the PV panels are adequately anchored to withstand the applied loads. The optimum pile embedment depth will need to be determined by the design engineers.

15.6 Driven cast-iron piles can be considered as an alternative.

15.7 Groundwater seepage was encountered in test pit TP2 at a depth of 1.6m below ground level. No groundwater seepage was observed in any of the other test pits.

15.8 Excavatability of the material on site is classed *soft* to *intermediate* in the soils and *hard* once the soft rock sandstone and hardpan ferricrete is encountered.

15.9 Precautions should be taken to protect the foundations from moisture ingress. General precautionary measures, which are intended to prevent the concentrated ingress of water into the ground are also recommended. All external areas are to be free draining away from structures. Adequate storm water control needs to be implemented to direct the water away from excavations and foundations.

15.10 Precautions should be taken to protect sub-surface infrastructure from potential corrosion. Suitable materials should be selected, or the sub-surface infrastructure adequately coated to prevent any potential corrosion to sub-surface infrastructure.

15.11 The material on site is not suitable for use as structural fill. Suitable material will need to be imported where required.

Prepared by

Meisie Kekana – BTech Structural Eng

In terms of Geotheta Quality Policy, this report has been reviewed, product corrected and certified okay for distribution and use.

Reviewed by

Ian Hammond Pr Eng

All data used as source material plus the text, tables, figures, and attachments of this document have been reviewed and prepared in accordance with generally accepted professional engineering and environmental practices.

16. References

16.1 WEINERT, HH. 1980. The natural road construction materials of southern Africa. Pretoria: Academica.

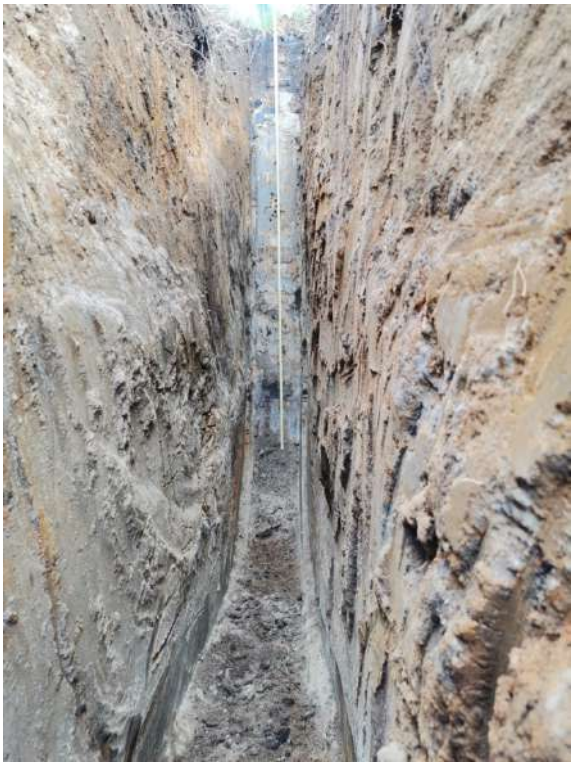
16.2 JENNINGS JE, BRINK ABA, and WILLIAMS AAB. 1973. Revised guide to soil profiling for civil engineering purposes in southern Africa, The Civil Engineer in South Africa, Jan 1973 Trans SAICE, Vol 15 No 1.

16.3 VAN DER MERWE, DH. 1964. The prediction of heave from the plasticity index and the percentage clay fraction of soils. The Civil Engineer in South Africa. June 1964, pp 103-107.

16.4 UNIFIED SOIL CLASSIFICATION SYSTEM. CALTRANS

APPENDICES

APPENDIX A: TEST PIT PHOTOS



TP01

TP02

TP03

TP04

TP05

TP06

TP07

TP08

TP09

TP10

TP11

TP12

TP13

TP14

TP15

TP16

TP17

TP18

TP19

TP20

TP21

TP22

TP23

TP24

TP25

TP26

TP27

TP28

TP29

TP30


S 26°12'31.28848" (LAT)
E 29°31'19.38482" (LONG)
20 January 2021 09:43

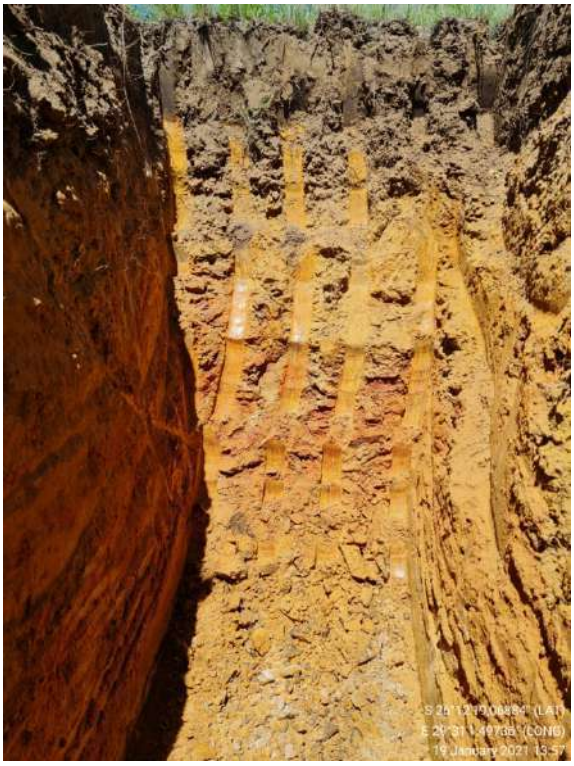
TP31


S 26°12'36.28476" (LAT)
E 29°31'16.93668" (LONG)
20 January 2021 09:56

TP32

TP33

TP34



TP35

TP36


S 26°12'16,59168" (LAT)
E 29°30'35,56692" (LONG)
19 January 2021 14:40

TP37

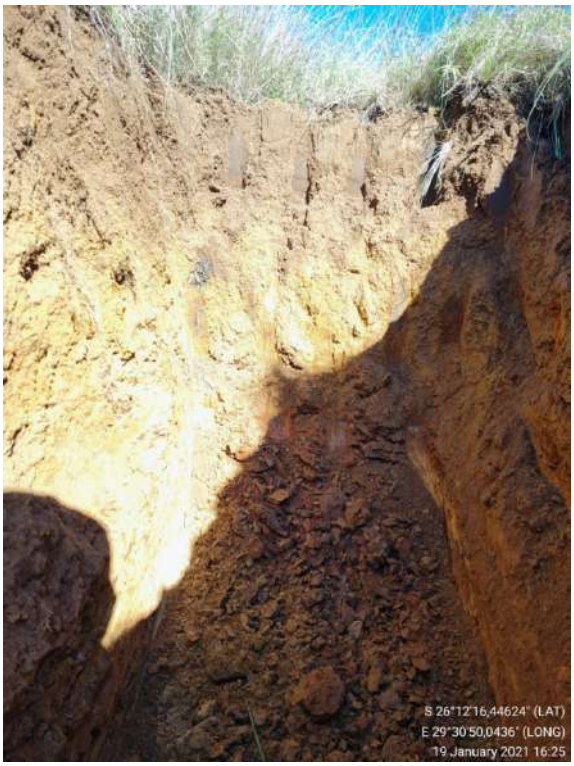

S 26°12'7,15104" (LAT)
E 29°30'30,62304" (LONG)
19 January 2021 15:06

TP38

TP39

TP40

TP41



TP42

TP43

TP44

TP45

TP46

TP47

TP48

TP49

TP50

APPENDIX B: TEST PIT PROFILES

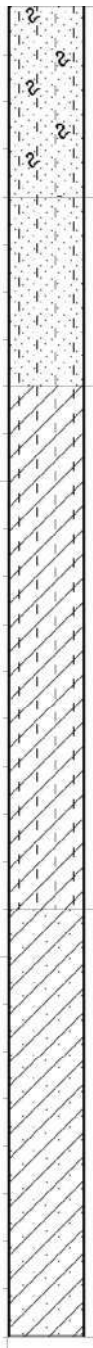
GEOTHETA

Cabanga Environmental
Solar PV Project Geotech

HOLE No: TP1
Sheet 1 of 1

JOB NUMBER: 2010329

Scale 1:15



0.00	Moist, dark brown, very loose, intact, silty SAND with roots. Topsoil.
0.40	Moist, orange and light brown, loose, intact, silty SAND. Transported.
0.80	Slightly moist, orange-grey mottled black, firm, intact, silty CLAY. Transported.
1.90	Slightly moist, grey streaked orange and black, stiff, intact, sandy CLAY. Residual.
2.80	End of TP.

NOTES

1) No groundwater seepage.

2) No refusal.

3) No sample taken.

CONTRACTOR : Plant hire
MACHINE : JCB TLB
DRILLED BY :
PROFILED BY :

TYPE SET BY : Fahad Khan
SETUP FILE : STANDARD.SET

INCLINATION : Vertical
DIAM : 400mm Trench
DATE : 3 December 2020
DATE : 3 December 2020

DATE : 26/01/2021 11:18
TEXT : ..es\2010329TPProfiles.doc

ELEVATION : NGL
X-COORD :
Y-COORD :

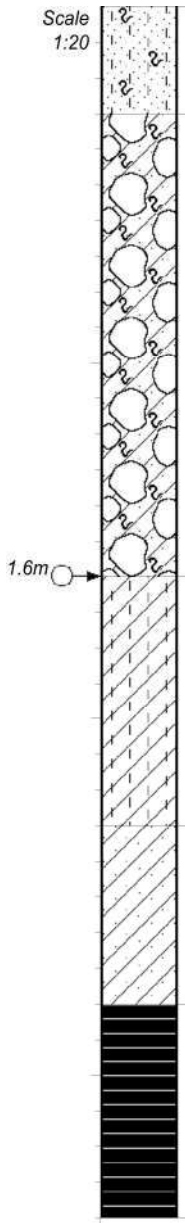
HOLE No: TP1

GEOTHETA

Cabanga Environmental
Solar PV Project Geotech

HOLE No: TP2
Sheet 1 of 1

JOB NUMBER: 2010329



0.00	Slightly moist, dark brown, very loose, intact, silty SAND with roots. Topsoil.
0.30	Moist, black with orange, firm to stiff, intact, sandy CLAY with boulders and some roots. Transported.
1.60	Wet, greyish green mottled orange, soft, intact, silty CLAY. Transported.
2.30	Wet, brown streaked black, soft to firm, intact, sandy CLAY. Transported.
2.80	Wet, black streaked grey, medium dense, intact, Coal beds. Residual
3.40	End of TP.

NOTES

1) Groundwater seepage at 1.6m
2) No refusal.
3) No sample taken.

CONTRACTOR : Plant hire
MACHINE : JCB TLB
DRILLED BY :
PROFILED BY :

TYPE SET BY : Fahad Khan
SETUP FILE : STANDARD.SET

INCLINATION : Vertical
DIAM : 600mm Trench
DATE : 4 December 2020
DATE : 4 December 2020

DATE : 26/01/2021 11:18
TEXT : ..es\2010329TPProfiles.doc

ELEVATION : NGL
X-COORD :
Y-COORD :

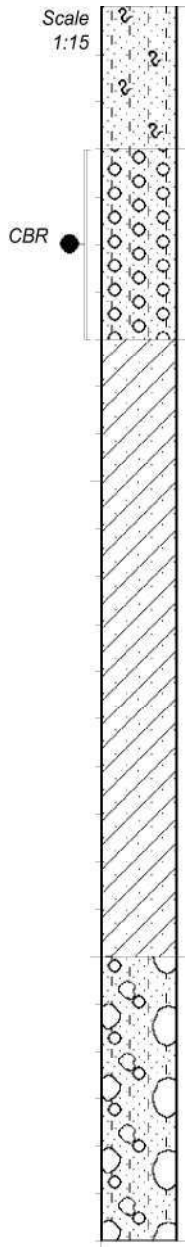
HOLE No: TP2

GEOTHETA

Cabanga Environmental
Solar PV Project Geotech

HOLE No: TP3
Sheet 1 of 1

JOB NUMBER: 2010329



0.00	Moist, dark brown, very loose, intact, silty SAND with roots. Topsoil.
0.30	Slightly moist, brown mottled black and orange, loose to medium dense, intact, gravel in a matrix of silty SAND. Transported.
0.70	Slightly moist, grey streaked orange and black, firm, intact, sandy CLAY. Transported.
2.00	Slightly moist, brown mottled black, medium dense, pinhole voided, gravelly silty SAND with cobbles. Residual.
2.60	End of TP.

NOTES

1) No groundwater seepage.
2) No refusal.
3) Sample taken at 0.3--0.7 for foundation indicator, Mod CBR and pH.

CONTRACTOR : Plant hire
MACHINE : JCB TLB
DRILLED BY :
PROFILED BY :

TYPE SET BY : Fahad Khan
SETUP FILE : STANDARD.SET

INCLINATION : Vertical
DIAM : 600mm Trench
DATE : 4 December 2020
DATE : 4 December 2020

DATE : 26/01/2021 11:18
TEXT : ..es\2010329TPProfiles.doc

ELEVATION : NGL
X-COORD :
Y-COORD :

HOLE No: TP3

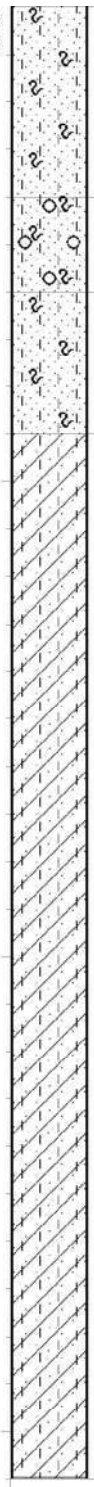
GEOTHETA

Cabanga Environmental
Solar PV Project Geotech

HOLE No: TP4
Sheet 1 of 1

JOB NUMBER: 2010329

Scale 1:15



0.00	Slightly moist, dark brown, very loose, intact, silty SAND with roots. Topsoil.
0.40	Moist, brown speckled orange and black, loose, intact, gravelly silty SAND with roots. Transported.
0.60	Moist, greyish brown, loose, intact, silty SAND with some roots. Transported.
0.90	Slightly moist, grey and orange streaked black and red, medium dense to dense, intact, sandy silty CLAY. Residual.
3.10	End of TP.

NOTES

1) No groundwater seepage.
2) No refusal.
3) No sample taken.

CONTRACTOR : Plant hire
MACHINE : JCB TLB
DRILLED BY :
PROFILED BY :

TYPE SET BY : Fahad Khan
SETUP FILE : STANDARD.SET

INCLINATION : Vertical
DIAM : 600mm Trench
DATE : 4 December 2020
DATE : 4 December 2020

DATE : 26/01/2021 11:18
TEXT : ..es\2010329TPProfiles.doc

ELEVATION : NGL
X-COORD :
Y-COORD :

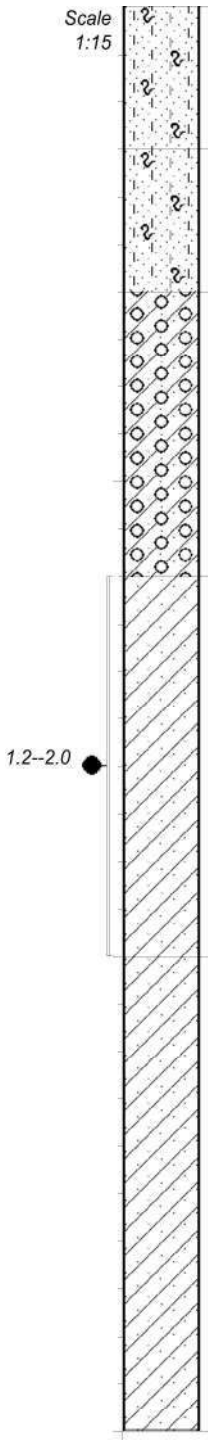
HOLE No: TP4

GEOTHETA

Cabanga Environmental
Solar PV Project Geotech

HOLE No: TP5
Sheet 1 of 1

JOB NUMBER: 2010329



0.00 Moist, dark brown, loose, intact, silty SAND with roots. Topsoil.

0.30 Moist, light brown, loose to medium dense, intact, silty SAND with roots. Transported.

0.60 Slightly moist, grey with orange and black, medium dense to dense, intact, gravel in a matrix of sandy CLAY. Transported.

1.20 Slightly moist, grey with orange and black, firm to stiff, intact, sandy CLAY. Transported.

2.00 Moist, grey, soft to firm, intact, sandy CLAY. Residual.

3.00 End of TP.

NOTES

1) No groundwater seepage.
2) No refusal.
3) Sample taken at 1.2--2.0 for foundation indicator.

CONTRACTOR : Plant hire
MACHINE : JCB TLB
DRILLED BY :
PROFILED BY :

TYPE SET BY : Fahad Khan
SETUP FILE : STANDARD.SET

INCLINATION : Vertical
DIAM : 600mm Trench
DATE : 4 December 2020
DATE : 4 December 2020

DATE : 26/01/2021 11:18
TEXT : ..es\2010329TPProfiles.doc

ELEVATION : NGL
X-COORD :
Y-COORD :

HOLE No: TP5

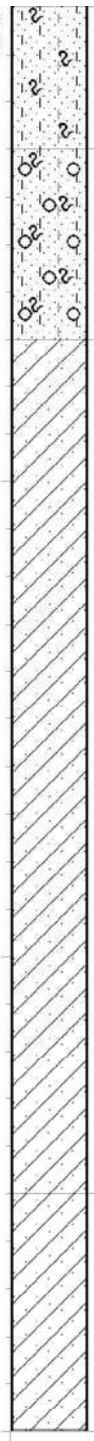
GEOTHETA

Cabanga Environmental
Solar PV Project Geotech

HOLE No: TP6
Sheet 1 of 1

JOB NUMBER: 2010329

Scale 1:15



0.00 Moist, dark brown, loose, intact, silty SAND with roots. Topsoil.

0.30 Moist, brown speckled orange and black, loose, intact, gravelly silty SAND with roots. Transported.

0.70 Slightly moist, grey with orange and black, firm to stiff, intact, sandy CLAY. Transported.

2.50 Moist, grey, soft to firm, intact, sandy CLAY. Residual.

3.00 End of TP.

NOTES

1) No groundwater seepage.
2) No refusal.
3) No sample taken.

CONTRACTOR : Plant hire
MACHINE : JCB TLB
DRILLED BY :
PROFILED BY :

INCLINATION : Vertical
DIAM : 600mm Trench
DATE : 4 December 2020
DATE : 4 December 2020

ELEVATION : NGL
X-COORD :
Y-COORD :

HOLE No: TP6

TYPE SET BY : Fahad Khan
SETUP FILE : STANDARD.SET

DATE : 26/01/2021 11:18
TEXT : ..es\2010329TPProfiles.doc

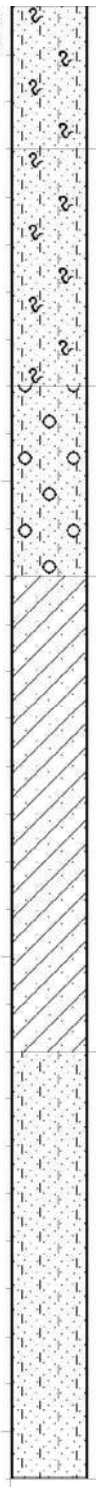
GEOTHETA

Cabanga Environmental
Solar PV Project Geotech

HOLE No: TP7
Sheet 1 of 1

JOB NUMBER: 2010329

Scale 1:15



0.00	Moist, dark brown, loose, intact, silty SAND with roots. Topsoil.
0.30	Moist, light brown, loose to medium dense, intact, silty SAND with roots. Transported.
0.80	Slightly moist, grey streaked orange and black, dense, intact, gravelly silty SAND. Transported.
1.20	Slightly moist, grey with orange and black, firm to stiff, intact, sandy CLAY. Transported.
2.20	Moist, light grey streaked brown and black, medium dense, intact, silty SAND. Residual.
3.10	End of TP.

NOTES

1) No groundwater seepage.
2) No refusal.
3) No sample taken.

CONTRACTOR : Plant hire
MACHINE : JCB TLB
DRILLED BY :
PROFILED BY :

TYPE SET BY : Fahad Khan
SETUP FILE : STANDARD.SET

INCLINATION : Vertical
DIAM : 600mm Trench
DATE : 4 December 2020
DATE : 4 December 2020

DATE : 26/01/2021 11:18
TEXT : ..es\2010329TPProfiles.doc

ELEVATION : NGL
X-COORD :
Y-COORD :

HOLE No: TP7

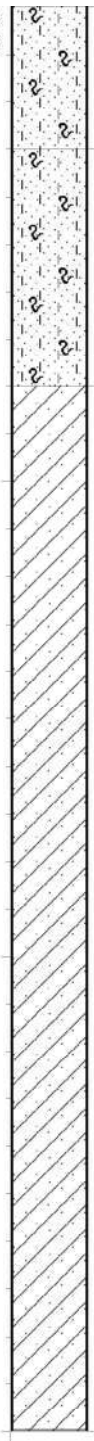
GEOTHETA

Cabanga Environmental
Solar PV Project Geotech

HOLE No: TP08
Sheet 1 of 1

JOB NUMBER: 2010329

Scale 1:15



0.00 Slightly moist, light brown, loose, intact, silty SAND with roots. Topsoil.

0.30 Moist, dark brown, loose, intact, silty SAND with roots. Transported.

0.80 Moist, yellow-orange and grey mottled black, firm, intact, sandy CLAY. Residual.

3.00 End of TP.

NOTES

1) No groundwater seepage.
2) No refusal.
3) No sample taken.

CONTRACTOR : NJP Transport
MACHINE : Case 570T TLB
DRILLED BY :
PROFILED BY :

TYPE SET BY : Massimo Gollino
SETUP FILE : STANDARD.SET

INCLINATION : Vertical
DIAM : 600mm Trench
DATE : 15 January 2021
DATE : 15 January 2021

DATE : 26/01/2021 11:18
TEXT : ..es\2010329TPProfiles.doc

ELEVATION : NGL
X-COORD :
Y-COORD :

HOLE No: TP08

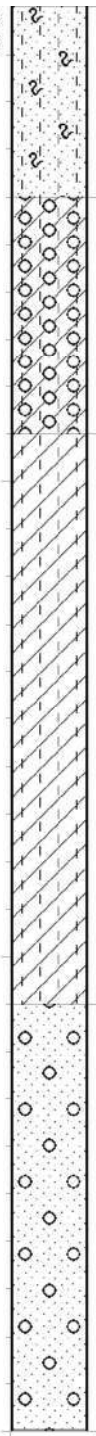
GEOTHETA

Cabanga Environmental
Solar PV Project Geotech

HOLE No: TP9
Sheet 1 of 1

JOB NUMBER: 2010329

Scale 1:15



0.00	Slightly moist, dark brown, loose, intact, silty SAND with roots. Topsoil.
0.40	Slightly moist, reddish brown, soft to firm, intact, gravel in a matrix of silty CLAY. Transported.
0.90	Slightly moist, greenish grey, firm, intact, silty CLAY. Transported.
2.10	Slightly moist, grey and orange mottled black, loose to medium dense, gravelly SAND. Residual.
3.00	End of TP.

NOTES

1) No groundwater seepage.
2) No refusal.
3) No sample taken.

CONTRACTOR : Plant hire
MACHINE : JCB TLB
DRILLED BY :
PROFILED BY :

TYPE SET BY : Fahad Khan
SETUP FILE : STANDARD.SET

INCLINATION : Vertical
DIAM : 600mm Trench
DATE : 7 December 2020
DATE : 7 December 2020

DATE : 26/01/2021 11:18
TEXT : ..es\2010329TPProfiles.doc

ELEVATION : NGL
X-COORD :
Y-COORD :

HOLE No: TP9

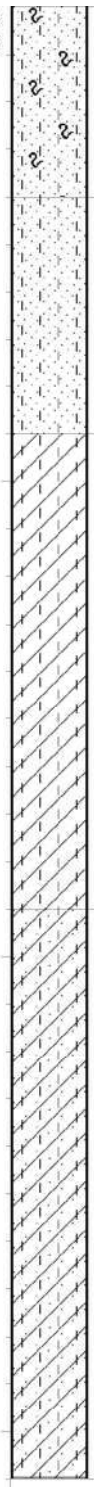
GEOTHETA

Cabanga Environmental
Solar PV Project Geotech

HOLE No: TP10
Sheet 1 of 1

JOB NUMBER: 2010329

Scale 1:15



0.00	Slightly moist, dark brown, loose, intact, silty SAND with roots. Topsoil.
0.40	Slightly moist, light brown, loose, intact, silty SAND. Transported.
0.90	Slightly moist, light brown, firm to stiff, intact, silty CLAY. Transported.
1.90	Slightly moist, grey and orange streaked black and red, medium dense to dense, intact, sandy silty CLAY. Residual.
3.10	End of TP.

NOTES

1) No groundwater seepage.
2) No refusal.
3) No sample taken.

CONTRACTOR : Plant hire
MACHINE : JCB TLB
DRILLED BY :
PROFILED BY :

TYPE SET BY : Fahad Khan
SETUP FILE : STANDARD.SET

INCLINATION : Vertical
DIAM : 600mm Trench
DATE : 7 December 2020
DATE : 7 December 2020

DATE : 26/01/2021 11:18
TEXT : ..es\2010329TPProfiles.doc

ELEVATION : NGL
X-COORD :
Y-COORD :

HOLE No: TP10

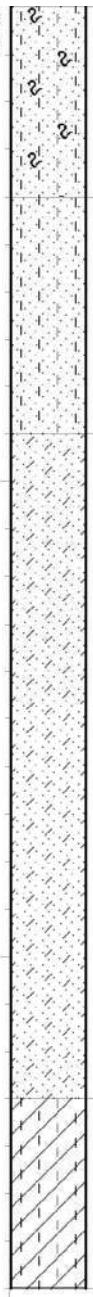
GEOTHETA

Cabanga Environmental
Solar PV Project Geotech

HOLE No: TP11
Sheet 1 of 1

JOB NUMBER: 2010329

Scale 1:15



0.00	Slightly moist, dark brown, loose, intact, silty SAND with roots. Topsoil.
0.40	Slightly moist, light brown, loose, intact, silty SAND. Transported.
0.90	Moist, yellow-orange and grey, medium dense, intact, clayey SAND. Residual.
2.30	Moist, light grey, soft, intact, silty CLAY. Residual.
2.70	End of TP.

NOTES

1) No groundwater seepage.
2) No refusal.
3) No sample taken.

CONTRACTOR : NJP Transport
MACHINE : Case 570T TLB
DRILLED BY :
PROFILED BY :

TYPE SET BY : Massimo Gollino
SETUP FILE : STANDARD.SET

INCLINATION : Vertical
DIAM : 600mm Trench
DATE : 15 January 2021
DATE : 15 January 2021

DATE : 26/01/2021 11:18
TEXT : ..es\2010329TPProfiles.doc

ELEVATION : NGL
X-COORD :
Y-COORD :

HOLE No: TP11

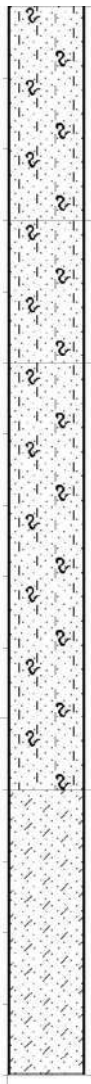
GEOTHETA

Cabanga Environmental
Solar PV Project Geotech

HOLE No: TP12
Sheet 1 of 1

JOB NUMBER: 2010329

Scale 1:10



0.00	Slightly moist, dark brown, loose, intact, silty SAND with roots. Topsoil.
0.30	Dry, light brown, medium dense, intact, silty SAND with roots. Transported.
0.50	Moist, brown, loose to medium dense, intact, silty SAND with occasional roots. Transported.
1.10	Moist, yellow-orange and grey mottled black, dense to very dense, intact, clayey SAND. Residual.
1.50	End of TP.

NOTES

1) No groundwater seepage.
2) Refusal at 1.5m.
3) No sample taken.

CONTRACTOR : NJP Transport
MACHINE : Case 570T TLB
DRILLED BY :
PROFILED BY :

TYPE SET BY : Massimo Gollino
SETUP FILE : STANDARD.SET

INCLINATION : Vertical
DIAM : 600mm Trench
DATE : 15 January 2021
DATE : 15 January 2021

DATE : 26/01/2021 11:18
TEXT : ..es\2010329TPProfiles.doc

ELEVATION : NGL
X-COORD :
Y-COORD :

HOLE No: TP12

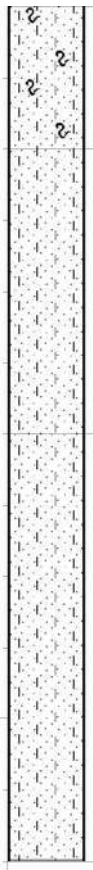
GEOTHETA

Cabanga Environmental
Solar PV Project Geotech

HOLE No: TP13
Sheet 1 of 1

JOB NUMBER: 2010329

Scale 1:10



0.00	Slightly moist, dark brown, loose, intact, silty SAND with roots. Topsoil.
0.20	Slightly moist, brown, loose, intact, silty SAND. Transported.
0.60	Slightly moist, yellow-orange and grey mottled black, dense to very dense, intact, silty SAND. Residual.
1.20	End of TP.

NOTES

1) No groundwater seepage.
2) Refusal at 1.2m.
3) No sample taken.

CONTRACTOR : NJP Transport
MACHINE : Case 570T TLB
DRILLED BY :
PROFILED BY :

TYPE SET BY : Massimo Gollino
SETUP FILE : STANDARD.SET

INCLINATION : Vertical
DIAM : 600mm Trench
DATE : 15 January 2021
DATE : 15 January 2021

DATE : 26/01/2021 11:18
TEXT : ..es\2010329TPProfiles.doc

ELEVATION : NGL
X-COORD :
Y-COORD :

HOLE No: TP13

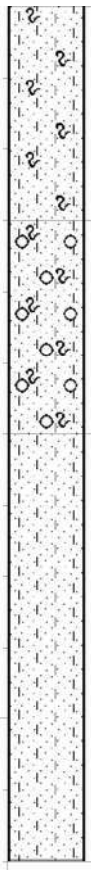
GEOTHETA

Cabanga Environmental
Solar PV Project Geotech

HOLE No: TP14
Sheet 1 of 1

JOB NUMBER: 2010329

Scale 1:10



0.00	Slightly moist, dark brown, loose, intact, silty SAND with roots. Topsoil.
0.30	Slightly moist, dark brown, loose, intact, gravelly silty SAND with roots. Transported.
0.60	Slightly moist, orange-red and grey mottled black, very dense, intact, silty SAND. Residual.
1.20	End of TP.

NOTES

1) No groundwater seepage.
2) Refusal at 1.2m.
3) No sample taken.

CONTRACTOR : NJP Transport
MACHINE : Case 570T TLB
DRILLED BY :
PROFILED BY :

TYPE SET BY : Massimo Gollino
SETUP FILE : STANDARD.SET

INCLINATION : Vertical
DIAM : 600mm Trench
DATE : 15 January 2021
DATE : 15 January 2021

DATE : 26/01/2021 11:18
TEXT : ..es\2010329TPProfiles.doc

ELEVATION : NGL
X-COORD :
Y-COORD :

HOLE No: TP14

GEOTHETA

Cabanga Environmental
Solar PV Project Geotech

HOLE No: TP15
Sheet 1 of 1

JOB NUMBER: 2010329

Scale 1:10

0.00	Slightly moist, dark brown, loose, intact, silty SAND with roots. Topsoil.
0.30	Slightly moist, dark brown, loose, intact, gravelly silty SAND with roots. Transported.
0.60	Slightly moist, orange-red and grey mottled black, dense to very dense, intact, clayey silty SAND. Residual.
1.20	End of TP.

NOTES

1) No groundwater seepage.
2) Refusal at 1.2m.
3) No sample taken.

CONTRACTOR : NJP Transport
MACHINE : Case 570T TLB
DRILLED BY :
PROFILED BY :

TYPE SET BY : Massimo Gollino
SETUP FILE : STANDARD.SET

INCLINATION : Vertical
DIAM : 600mm Trench
DATE : 15 January 2021
DATE : 15 January 2021

DATE : 26/01/2021 11:18
TEXT : ..es\2010329TPProfiles.doc

ELEVATION : NGL
X-COORD :
Y-COORD :

HOLE No: TP15

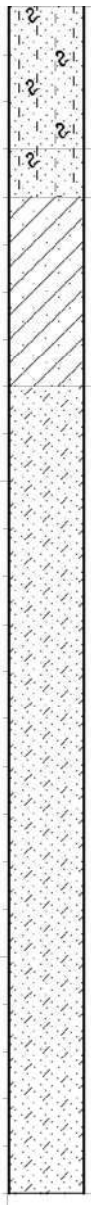
GEOTHETA

Cabanga Environmental
Solar PV Project Geotech

HOLE No: TP16
Sheet 1 of 1

JOB NUMBER: 2010329

Scale 1:15



0.00	Slightly moist, dark brown, loose, intact, silty SAND with roots. Topsoil.
0.30	Dry, light grey, loose, intact, silty SAND with roots. Transported.
0.40	Moist, light grey, firm, intact, sandy CLAY. Transported.
0.80	Moist, yellow-orange and grey, medium dense, intact, clayey SAND. Residual.
2.50	End of TP.

NOTES

1) No groundwater seepage.
2) No Refusal
3) No sample taken.

CONTRACTOR : NJP Transport
MACHINE : Case 570T TLB
DRILLED BY :
PROFILED BY :

TYPE SET BY : Massimo Gollino
SETUP FILE : STANDARD.SET

INCLINATION : Vertical
DIAM : 600mm Trench
DATE : 15 January 2021
DATE : 15 January 2021

DATE : 26/01/2021 11:18
TEXT : ..es\2010329TPProfiles.doc

ELEVATION : NGL
X-COORD :
Y-COORD :

HOLE No: TP16

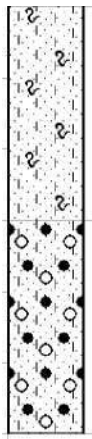
GEOTHETA

Cabanga Environmental
Solar PV Project Geotech

HOLE No: TP17
Sheet 1 of 1

JOB NUMBER: 2010329

Scale 1:10



0.00	Slightly moist, dark brown, loose, intact, silty SAND with roots. Topsoil.
0.30	Slightly moist, light brown and yellow-orange, medium dense to dense, intact, gravelly silty SAND with ferricrete nodules. Transported.
0.60	End of TP.

NOTES

1) No groundwater seepage.
2) Refusal at 0.6m on hardpan ferricrete.
3) No sample taken.

CONTRACTOR : NJP Transport
MACHINE : Case 570T TLB
DRILLED BY :
PROFILED BY :

TYPE SET BY : Massimo Gollino
SETUP FILE : STANDARD.SET

INCLINATION : Vertical
DIAM : 600mm Trench
DATE : 15 January 2021
DATE : 15 January 2021

DATE : 26/01/2021 11:18
TEXT : ..es\2010329TPProfiles.doc

ELEVATION : NGL
X-COORD :
Y-COORD :

HOLE No: TP17

GEOTHETA

Cabanga Environmental
Solar PV Project Geotech

HOLE No: TP18
Sheet 1 of 1

JOB NUMBER: 2010329

Scale 1:10

0.00	Slightly moist, dark grey, loose, intact, silty SAND with roots. Topsoil.
0.20	Slightly moist, light grey and orange mottled black, medium dense, intact, gravelly silty SAND. Transported.
0.50	Moist, yellow-orange and grey mottled black, dense to very dense, intact, clayey silty SAND. Residual.
1.10	End of TP.

NOTES

1) No groundwater seepage.
2) Refusal at 1.1m
3) No sample taken.

CONTRACTOR : NJP Transport
MACHINE : Case 570T TLB
DRILLED BY :
PROFILED BY :

TYPE SET BY : Massimo Gollino
SETUP FILE : STANDARD.SET

INCLINATION : Vertical
DIAM : 600mm Trench
DATE : 15 January 2021
DATE : 15 January 2021

DATE : 26/01/2021 11:18
TEXT : ..es\2010329TPProfiles.doc

ELEVATION : NGL
X-COORD :
Y-COORD :

HOLE No: TP18

GEOTHETA

Cabanga Environmental
Solar PV Project Geotech

HOLE No: TP19
Sheet 1 of 1

JOB NUMBER: 2010329

Scale 1:10

0.00 Moist, dark brown, loose, intact, silty SAND with roots. Topsoil.

0.40 End of TP.

NOTES

1) No groundwater seepage.
2) Refusal at 0.4m
3) No sample taken.

CONTRACTOR : NJP Transport
MACHINE : Case 570T TLB
DRILLED BY :
PROFILED BY :

TYPE SET BY : Massimo Gollino
SETUP FILE : STANDARD.SET

INCLINATION : Vertical
DIAM : 600mm Trench
DATE : 15 January 2021
DATE : 15 January 2021

DATE : 26/01/2021 11:18
TEXT : ..es\2010329TPProfiles.doc

ELEVATION : NGL
X-COORD :
Y-COORD :

HOLE No: TP19

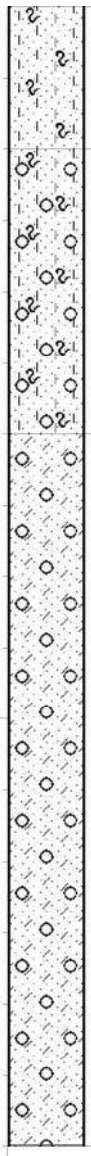
GEOTHETA

Cabanga Environmental
Solar PV Project Geotech

HOLE No: TP20
Sheet 1 of 1

JOB NUMBER: 2010329

Scale 1:10



0.00	Slightly moist, dark brown, loose, intact, silty SAND with roots. Topsoil.
0.20	Slightly moist, light brown, loose to medium dense, intact, gravelly silty SAND with roots. Transported.
0.60	Slightly moist, dark red and yellow mottled black, dense to very dense, intact, gravelly clayey SAND. Residual.
1.60	End of TP.

NOTES

1) No groundwater seepage.
2) Refusal at 1.6m
3) No sample taken.

CONTRACTOR : NJP Transport
MACHINE : Case 570T TLB
DRILLED BY :
PROFILED BY :

TYPE SET BY : Massimo Gollino
SETUP FILE : STANDARD.SET

INCLINATION : Vertical
DIAM : 600mm Trench
DATE : 15 January 2021
DATE : 15 January 2021

DATE : 26/01/2021 11:18
TEXT : ..es\2010329TPProfiles.doc

ELEVATION : NGL
X-COORD :
Y-COORD :

HOLE No: TP20

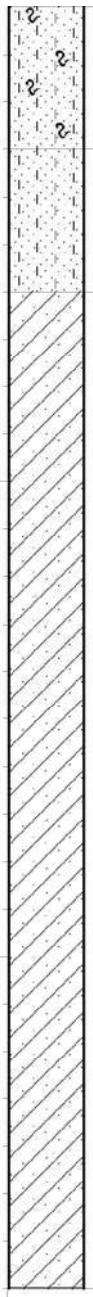
GEOTHETA

Cabanga Environmental
Solar PV Project Geotech

HOLE No: TP21
Sheet 1 of 1

JOB NUMBER: 2010329

Scale 1:15



0.00	Slightly moist, dark brown, loose, intact, silty SAND with roots. Topsoil.
0.30	Slightly moist, light brown, loose, intact, silty SAND. Transported.
0.60	Moist, yellow-orange and grey, firm, intact, sandy CLAY. Residual.
2.70	End of TP.

NOTES

1) No groundwater seepage.
2) No refusal.
3) No sample taken.

CONTRACTOR : NJP Transport
MACHINE : Case 570T TLB
DRILLED BY :
PROFILED BY :

TYPE SET BY : Massimo Gollino
SETUP FILE : STANDARD.SET

INCLINATION : Vertical
DIAM : 600mm Trench
DATE : 15 January 2021
DATE : 15 January 2021

DATE : 26/01/2021 11:18
TEXT : ..es\2010329TPProfiles.doc

ELEVATION : NGL
X-COORD :
Y-COORD :

HOLE No: TP21

GEOTHETA

Cabanga Environmental
Solar PV Project Geotech

HOLE No: TP22
Sheet 1 of 1

JOB NUMBER: 2010329

Scale 1:15

0.00	Slightly moist, dark brown, loose, intact, silty SAND with roots. Topsoil.
0.40	Slightly moist, light brown, loose, intact, silty SAND with occasional roots. Transported.
0.80	Moist, yellow-red and grey, loose, intact, clayey SAND. Residual.
1.70	Moist, yellow-red and grey, dense, intact, clayey SAND. Residual.
2.60	End of TP.

NOTES

1) No groundwater seepage.
2) No refusal.
3) No sample taken.

CONTRACTOR : NJP Transport
MACHINE : Case 570T TLB
DRILLED BY :
PROFILED BY :

TYPE SET BY : Massimo Gollino
SETUP FILE : STANDARD.SET

INCLINATION : Vertical
DIAM : 600mm Trench
DATE : 19 January 2021
DATE : 19 January 2021

DATE : 26/01/2021 11:18
TEXT : ..es\2010329TPProfiles.doc

ELEVATION : NGL
X-COORD :
Y-COORD :

HOLE No: TP22

GEOTHETA

Cabanga Environmental
Solar PV Project Geotech

HOLE No: TP23
Sheet 1 of 1

JOB NUMBER: 2010329

Scale 1:10

0.00 Slightly moist, brown, loose, intact, silty SAND with roots. Topsoil.

0.30 Slightly moist, brown, loose, intact, gravelly silty SAND with roots Transported.

0.50 Moist, yellow-orange mottled black, medium dense to dense, intact, silty SAND. Residual.

1.00 End of TP.

NOTES

1) No groundwater seepage.
2) Refusal at 1.0m.
3) No sample taken.

CONTRACTOR : NJP Transport
MACHINE : Case 570T TLB
DRILLED BY :
PROFILED BY :

TYPE SET BY : Massimo Gollino
SETUP FILE : STANDARD.SET

INCLINATION : Vertical
DIAM : 600mm Trench
DATE : 19 January 2021
DATE : 19 January 2021

DATE : 26/01/2021 11:18
TEXT : ..es\2010329TPProfiles.doc

ELEVATION : NGL
X-COORD :
Y-COORD :

HOLE No: TP23

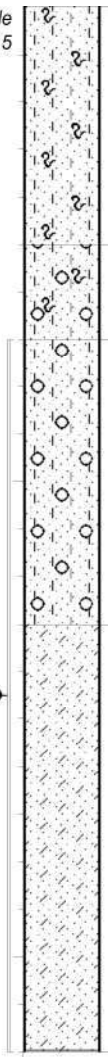
GEOTHETA

Cabanga Environmental
Solar PV Project Geotech

HOLE No: TP24
Sheet 1 of 1

JOB NUMBER: 2010329

Scale 1:15



0.7--2.2m

0.00	Slightly moist, brown, loose, intact, silty SAND with roots. Topsoil.
0.50	Slightly moist, brown, loose, intact, gravelly silty SAND with roots Transported.
0.70	Moist, orange-red mottled black, medium dense, intact, gravelly silty SAND. Residual.
1.30	Moist, orange-red and grey mottled black, dense, intact, clayey SAND. Residual.
2.20	End of TP.

NOTES

1) No groundwater seepage.
2) Refusal at 2.2m.
3) Sample taken at 0.7--2.2m for foundation indicator and pH.

CONTRACTOR : NJP Transport
MACHINE : Case 570T TLB
DRILLED BY :
PROFILED BY :

TYPE SET BY : Massimo Gollino
SETUP FILE : STANDARD.SET

INCLINATION : Vertical
DIAM : 600mm Trench
DATE : 19 January 2021
DATE : 19 January 2021

DATE : 26/01/2021 11:18
TEXT : ..es\2010329TPProfiles.doc

ELEVATION : NGL
X-COORD :
Y-COORD :

HOLE No: TP24

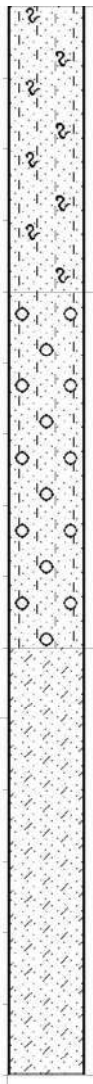
GEOTHETA

Cabanga Environmental
Solar PV Project Geotech

HOLE No: TP25
Sheet 1 of 1

JOB NUMBER: 2010329

Scale 1:10



0.00 Slightly moist, brown, loose, intact, silty SAND with roots. Topsoil.

0.40 Moist, brown and yellow-orange mottled black, loose to medium dense, intact, gravelly silty SAND. Residual.

0.90 Moist, orange-red and grey mottled black, dense, intact, clayey SAND. Residual.

1.50 End of TP.

NOTES

1) No groundwater seepage.
2) Refusal at 1.5m.
3) No sample taken.

CONTRACTOR : NJP Transport
MACHINE : Case 570T TLB
DRILLED BY :
PROFILED BY :

TYPE SET BY : Massimo Gollino
SETUP FILE : STANDARD.SET

INCLINATION : Vertical
DIAM : 600mm Trench
DATE : 19 January 2021
DATE : 19 January 2021

DATE : 26/01/2021 11:18
TEXT : ..es\2010329TPProfiles.doc

ELEVATION : NGL
X-COORD :
Y-COORD :

HOLE No: TP25

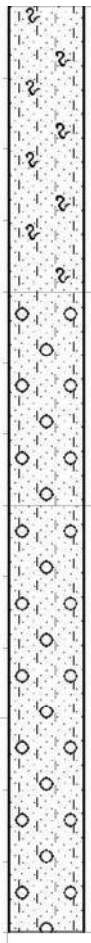
GEOTHETA

Cabanga Environmental
Solar PV Project Geotech

HOLE No: TP26
Sheet 1 of 1

JOB NUMBER: 2010329

Scale 1:10



0.00	Slightly moist, brown, loose, intact, silty SAND with roots. Topsoil.
0.40	Moist, brown mottled black, medium dense, intact, gravelly silty SAND. Transported.
0.70	Moist, orange-red and grey, dense to very dense, intact, gravelly silty SAND. Residual.
1.30	End of TP.

NOTES

1) No groundwater seepage.
2) Refusal at 1.3m.
3) No sample taken.

CONTRACTOR : NJP Transport
MACHINE : Case 570T TLB
DRILLED BY :
PROFILED BY :

TYPE SET BY : Massimo Gollino
SETUP FILE : STANDARD.SET

INCLINATION : Vertical
DIAM : 600mm Trench
DATE : 19 January 2021
DATE : 19 January 2021

DATE : 26/01/2021 11:18
TEXT : ..es\2010329TPProfiles.doc

ELEVATION : NGL
X-COORD :
Y-COORD :

HOLE No: TP26

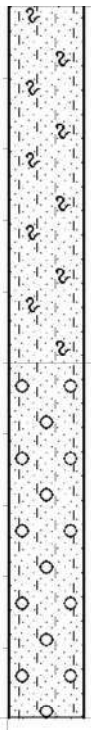
GEOTHETA

Cabanga Environmental
Solar PV Project Geotech

HOLE No: TP27
Sheet 1 of 1

JOB NUMBER: 2010329

Scale 1:10



0.00 Slightly moist, brown, loose, intact, silty SAND with roots. Topsoil.

0.50 Slightly moist, orange-brown mottled black, dense, intact, gravelly silty SAND. Residual.

1.00 End of TP.

NOTES

1) No groundwater seepage.
2) Refusal at 1.0m.
3) No sample taken.

CONTRACTOR : NJP Transport
MACHINE : Case 570T TLB
DRILLED BY :
PROFILED BY :

TYPE SET BY : Massimo Gollino
SETUP FILE : STANDARD.SET

INCLINATION : Vertical
DIAM : 600mm Trench
DATE : 19 January 2021
DATE : 19 January 2021

DATE : 26/01/2021 11:18
TEXT : ..es\2010329TPProfiles.doc

ELEVATION : NGL
X-COORD :
Y-COORD :

HOLE No: TP27

GEOTHETA

Cabanga Environmental
Solar PV Project Geotech

HOLE No: TP28
Sheet 1 of 1

JOB NUMBER: 2010329

Scale 1:10

0.00	Slightly moist, brown, loose, intact, silty SAND with roots. Topsoil.
0.30	Slightly moist, brown, loose, intact, gravelly silty SAND with roots. Transported.
0.50	Slightly moist, orange-red and grey mottled black, very dense, intact, silty SAND. Residual.
1.10	End of TP.

NOTES

1) No groundwater seepage.
2) Refusal at 1.1m.
3) No sample taken.

CONTRACTOR : NJP Transport
MACHINE : Case 570T TLB
DRILLED BY :
PROFILED BY :

TYPE SET BY : Massimo Gollino
SETUP FILE : STANDARD.SET

INCLINATION : Vertical
DIAM : 600mm Trench
DATE : 19 January 2021
DATE : 19 January 2021

DATE : 26/01/2021 11:18
TEXT : ..es\2010329TPProfiles.doc

ELEVATION : NGL
X-COORD :
Y-COORD :

HOLE No: TP28

GEOTHETA

Cabanga Environmental
Solar PV Project Geotech

HOLE No: TP29
Sheet 1 of 1

JOB NUMBER: 2010329

Scale 1:10

0.00	Slightly moist, brown, loose, intact, silty SAND with roots. Topsoil.
0.30	Slightly moist, yellow-orange mottled black, dense to very dense, intact, silty SAND with ferricrete nodules and roots. Transported.
0.70	Moist, orange-red mottled black, medium dense, intact, silty SAND. Residual.
1.30	Moist, orange-red mottled black, dense to very dense, intact, silty SAND. Residual.
1.80	End of TP.

NOTES

1) No groundwater seepage.
2) Refusal at 1.8m.
3) No sample taken.

CONTRACTOR : NJP Transport
MACHINE : Case 570T TLB
DRILLED BY :
PROFILED BY :

TYPE SET BY : Massimo Gollino
SETUP FILE : STANDARD.SET

INCLINATION : Vertical
DIAM : 600mm Trench
DATE : 19 January 2021
DATE : 19 January 2021

DATE : 26/01/2021 11:18
TEXT : ..es\2010329TPProfiles.doc

ELEVATION : NGL
X-COORD :
Y-COORD :

HOLE No: TP29

GEOTHETA

Cabanga Environmental
Solar PV Project Geotech

HOLE No: TP30
Sheet 1 of 1

JOB NUMBER: 2010329

Scale 1:10

0.00 Slightly moist, brown, loose, intact, silty SAND with roots. Topsoil.

0.30 Slightly moist, greyish-orange mottled black, dense, intact, silty SAND with cobbles. Residual.

0.60 End of TP.

NOTES

1) No groundwater seepage.
2) Refusal at 0.6m.
3) No sample taken.

CONTRACTOR : NJP Transport
MACHINE : Case 570T TLB
DRILLED BY :
PROFILED BY :

TYPE SET BY : Massimo Gollino
SETUP FILE : STANDARD.SET

INCLINATION : Vertical
DIAM : 600mm Trench
DATE : 19 January 2021
DATE : 19 January 2021

DATE : 26/01/2021 11:18
TEXT : ..es\2010329TPProfiles.doc

ELEVATION : NGL
X-COORD :
Y-COORD :

HOLE No: TP30

GEOTHETA

Cabanga Environmental
Solar PV Project Geotech

HOLE No: TP31
Sheet 1 of 1

JOB NUMBER: 2010329

Scale 1:10

0.00 Slightly moist, brown, loose, intact, silty SAND with roots. Topsoil.

0.40 Slightly moist, yellow-orange and grey mottled black, dense to very dense, intact, silty SAND. Residual.

0.90 End of TP.

NOTES

1) No groundwater seepage.
2) Refusal at 0.9m.
3) No sample taken.

CONTRACTOR : NJP Transport
MACHINE : Case 570T TLB
DRILLED BY :
PROFILED BY :

TYPE SET BY : Massimo Gollino
SETUP FILE : STANDARD.SET

INCLINATION : Vertical
DIAM : 600mm Trench
DATE : 20 January 2021
DATE : 20 January 2021

DATE : 26/01/2021 11:18
TEXT : ..es\2010329TPProfiles.doc

ELEVATION : NGL
X-COORD :
Y-COORD :

HOLE No: TP31

GEOTHETA

Cabanga Environmental
Solar PV Project Geotech

HOLE No: TP32
Sheet 1 of 1

JOB NUMBER: 2010329

Scale 1:10

0.00	Slightly moist, brown, loose, intact, silty SAND with roots. Topsoil.
0.30	Slightly moist, brown, loose, intact, gravelly silty SAND with roots. Topsoil.
0.50	Slightly moist, yellow-orange and grey mottled black, dense, intact, silty SAND. Residual.
1.10	End of TP.

NOTES

1) No groundwater seepage.
2) Refusal at 1.1m.
3) No sample taken.

CONTRACTOR : NJP Transport
MACHINE : Case 570T TLB
DRILLED BY :
PROFILED BY :

TYPE SET BY : Massimo Gollino
SETUP FILE : STANDARD.SET

INCLINATION : Vertical
DIAM : 600mm Trench
DATE : 20 January 2021
DATE : 20 January 2021

DATE : 26/01/2021 11:18
TEXT : ..es\2010329TPProfiles.doc

ELEVATION : NGL
X-COORD :
Y-COORD :

HOLE No: TP32

GEOTHETA

Cabanga Environmental
Solar PV Project Geotech

HOLE No: TP33
Sheet 1 of 1

JOB NUMBER: 2010329

Scale 1:10

0.00	Slightly moist, brown, loose, intact, silty SAND with roots. Topsoil.
0.30	Slightly moist, brown, loose, intact, gravelly silty SAND with roots. Topsoil.
0.50	Slightly moist, orange-red and grey mottled black, dense, intact, silty SAND. Residual.
1.20	End of TP.

NOTES

1) No groundwater seepage.
2) Refusal at 1.2m.
3) No sample taken.

CONTRACTOR : NJP Transport
MACHINE : Case 570T TLB
DRILLED BY :
PROFILED BY :

TYPE SET BY : Massimo Gollino
SETUP FILE : STANDARD.SET

INCLINATION : Vertical
DIAM : 600mm Trench
DATE : 19 January 2021
DATE : 19 January 2021

DATE : 26/01/2021 11:18
TEXT : ..es\2010329TPProfiles.doc

ELEVATION : NGL
X-COORD :
Y-COORD :

HOLE No: TP33

GEOTHETA

Cabanga Environmental
Solar PV Project Geotech

HOLE No: TP34
Sheet 1 of 1

JOB NUMBER: 2010329

Scale 1:10

0.00	Slightly moist, brown, loose, intact, silty SAND with roots. Topsoil.
0.30	Slightly moist, brown, dense, intact, gravelly silty SAND with roots. Topsoil.
0.60	Slightly moist, yellow-orange and grey mottled black, dense, intact, silty SAND. Residual.
1.80	End of TP.

NOTES

1) No groundwater seepage.
2) Refusal at 1.8m.
3) No sample taken.

CONTRACTOR : NJP Transport
MACHINE : Case 570T TLB
DRILLED BY :
PROFILED BY :

TYPE SET BY : Massimo Gollino
SETUP FILE : STANDARD.SET

INCLINATION : Vertical
DIAM : 600mm Trench
DATE : 19 January 2021
DATE : 19 January 2021

DATE : 26/01/2021 11:18
TEXT : ..es\2010329TPProfiles.doc

ELEVATION : NGL
X-COORD :
Y-COORD :

HOLE No: TP34

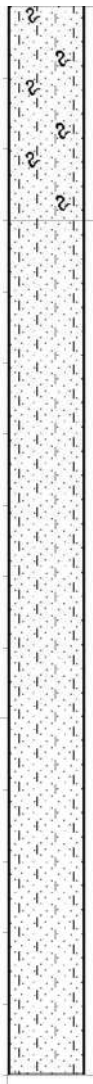
GEOTHETA

Cabanga Environmental
Solar PV Project Geotech

HOLE No: TP35
Sheet 1 of 1

JOB NUMBER: 2010329

Scale 1:10



0.00 Slightly moist, brown, loose, intact, silty SAND with roots. Topsoil.

0.30 Slightly moist, yellow-orange and grey mottled black, dense, intact, silty SAND. Residual.

1.50 End of TP.

NOTES

1) No groundwater seepage.
2) Refusal at 1.5m.
3) No sample taken.

CONTRACTOR : NJP Transport
MACHINE : Case 570T TLB
DRILLED BY :
PROFILED BY :

TYPE SET BY : Massimo Gollino
SETUP FILE : STANDARD.SET

INCLINATION : Vertical
DIAM : 600mm Trench
DATE : 19 January 2021
DATE : 19 January 2021

DATE : 26/01/2021 11:18
TEXT : ..es\2010329TPProfiles.doc

ELEVATION : NGL
X-COORD :
Y-COORD :

HOLE No: TP35

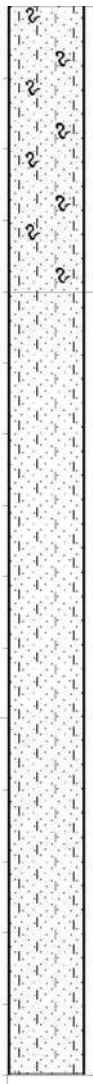
GEOTHETA

Cabanga Environmental
Solar PV Project Geotech

HOLE No: TP36
Sheet 1 of 1

JOB NUMBER: 2010329

Scale 1:10



0.00 Slightly moist, brown, loose, intact, silty SAND with roots. Topsoil.

0.40 Slightly moist, yellow-orange and grey mottled black, dense to very dense, intact, silty SAND. Residual.

1.50 End of TP.

NOTES

1) No groundwater seepage.
2) Refusal at 1.5m.
3) No sample taken.

CONTRACTOR : NJP Transport
MACHINE : Case 570T TLB
DRILLED BY :
PROFILED BY :

TYPE SET BY : Massimo Gollino
SETUP FILE : STANDARD.SET

INCLINATION : Vertical
DIAM : 600mm Trench
DATE : 19 January 2021
DATE : 19 January 2021

DATE : 26/01/2021 11:18
TEXT : ..es\2010329TPProfiles.doc

ELEVATION : NGL
X-COORD :
Y-COORD :

HOLE No: TP36

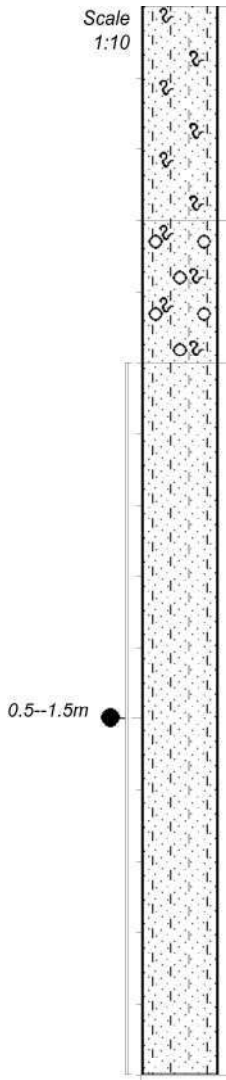
GEOTHETA

Cabanga Environmental
Solar PV Project Geotech

HOLE No: TP37
Sheet 1 of 1

JOB NUMBER: 2010329

Scale 1:10



0.00	Slightly moist, brown, loose, intact, silty SAND with roots. Topsoil.
0.30	Slightly moist, brown, loose, intact, gravelly silty SAND with roots. Transported.
0.50	Moist, yellow-orange and light grey, dense to very dense, intact, silty SAND. Residual.
1.50	End of TP.

NOTES

1) No groundwater seepage.
2) Refusal at 1.5m.
3) Sample taken at 0.5--1.5m for foundation indicator and pH.

CONTRACTOR : NJP Transport
MACHINE : Case 570T TLB
DRILLED BY :
PROFILED BY :

TYPE SET BY : Massimo Gollino
SETUP FILE : STANDARD.SET

INCLINATION : Vertical
DIAM : 600mm Trench
DATE : 19 January 2021
DATE : 19 January 2021

DATE : 26/01/2021 11:18
TEXT : ..es\2010329TPProfiles.doc

ELEVATION : NGL
X-COORD :
Y-COORD :

HOLE No: TP37

GEOTHETA

Cabanga Environmental
Solar PV Project Geotech

HOLE No: TP38
Sheet 1 of 1

JOB NUMBER: 2010329

Scale 1:10

0.00	Slightly moist, brown, loose, intact, silty SAND with roots. Topsoil.
0.30	Slightly moist, light brown, loose, intact, gravelly silty SAND with roots. Transported.
0.50	Moist, yellow-orange and light grey, dense to very dense, intact, silty SAND. Residual.
1.10	End of TP.

NOTES

1) No groundwater seepage.
2) Refusal at 1.1m.
3) No sample taken.

CONTRACTOR : NJP Transport
MACHINE : Case 570T TLB
DRILLED BY :
PROFILED BY :

TYPE SET BY : Massimo Gollino
SETUP FILE : STANDARD.SET

INCLINATION : Vertical
DIAM : 600mm Trench
DATE : 19 January 2021
DATE : 19 January 2021

DATE : 26/01/2021 11:18
TEXT : ..es\2010329TPProfiles.doc

ELEVATION : NGL
X-COORD :
Y-COORD :

HOLE No: TP38

GEOTHETA

Cabanga Environmental
Solar PV Project Geotech

HOLE No: TP39
Sheet 1 of 1

JOB NUMBER: 2010329

Scale 1:10

0.00 Slightly moist, brown, loose, intact, silty SAND with roots. Topsoil.

0.40 End of TP.

NOTES

1) No groundwater seepage.
2) Refusal at 0.4m.
3) No sample taken.

CONTRACTOR : NJP Transport
MACHINE : Case 570T TLB
DRILLED BY :
PROFILED BY :

TYPE SET BY : Massimo Gollino
SETUP FILE : STANDARD.SET

INCLINATION : Vertical
DIAM : 600mm Trench
DATE : 19 January 2021
DATE : 19 January 2021

DATE : 26/01/2021 11:18
TEXT : ..es\2010329TPProfiles.doc

ELEVATION : NGL
X-COORD :
Y-COORD :

HOLE No: TP39

GEOTHETA

Cabanga Environmental
Solar PV Project Geotech

HOLE No: TP40
Sheet 1 of 1

JOB NUMBER: 2010329

Scale 1:10

0.00 Slightly moist, brown, loose, intact, gravelly silty SAND with roots. Topsoil.

0.30 Slightly moist, yellow-orange and grey mottled black, dense, intact, silty SAND. Residual.

0.60 End of TP.

NOTES

1) No groundwater seepage.
2) Refusal at 0.6m.
3) No sample taken.

CONTRACTOR : NJP Transport
MACHINE : Case 570T TLB
DRILLED BY :
PROFILED BY :

TYPE SET BY : Massimo Gollino
SETUP FILE : STANDARD.SET

INCLINATION : Vertical
DIAM : 600mm Trench
DATE : 19 January 2021
DATE : 19 January 2021

DATE : 26/01/2021 11:18
TEXT : ..es\2010329TPProfiles.doc

ELEVATION : NGL
X-COORD :
Y-COORD :

HOLE No: TP40

GEOTHETA

Cabanga Environmental
Solar PV Project Geotech

HOLE No: TP41
Sheet 1 of 1

JOB NUMBER: 2010329

Scale 1:10

0.00 Slightly moist, brown, loose, intact, silty SAND with roots. Topsoil.

0.20 Moist, yellow-orange and light grey, dense, intact, silty SAND. Residual.

0.40 End of TP.

NOTES

1) No groundwater seepage.
2) Refusal at 0.4m.
3) No sample taken.

CONTRACTOR : NJP Transport
MACHINE : Case 570T TLB
DRILLED BY :
PROFILED BY :

TYPE SET BY : Massimo Gollino
SETUP FILE : STANDARD.SET

INCLINATION : Vertical
DIAM : 600mm Trench
DATE : 19 January 2021
DATE : 19 January 2021

DATE : 26/01/2021 11:18
TEXT : ..es\2010329TPProfiles.doc

ELEVATION : NGL
X-COORD :
Y-COORD :

HOLE No: TP41

GEOTHETA

Cabanga Environmental
Solar PV Project Geotech

HOLE No: TP42
Sheet 1 of 1

JOB NUMBER: 2010329

Scale 1:10

0.00	Slightly moist, brown, loose, intact, silty SAND with roots. Topsoil.
0.30	Slightly moist, brown, loose, intact, gravelly silty SAND with roots. Transported.
0.50	Slightly moist, yellow-orange and grey mottled black, medium dense, intact, silty SAND. Residual.
0.80	Slightly moist, yellow-orange and grey mottled black, dense to very dense, intact, silty SAND. Residual.
1.20	End of TP.

NOTES

1) No groundwater seepage.
2) Refusal at 1.2m.
3) No sample taken.

CONTRACTOR : NJP Transport
MACHINE : Case 570T TLB
DRILLED BY :
PROFILED BY :

TYPE SET BY : Massimo Gollino
SETUP FILE : STANDARD.SET

INCLINATION : Vertical
DIAM : 600mm Trench
DATE : 19 January 2021
DATE : 19 January 2021

DATE : 26/01/2021 11:18
TEXT : ..es\2010329TPProfiles.doc

ELEVATION : NGL
X-COORD :
Y-COORD :

HOLE No: TP42

GEOTHETA

Cabanga Environmental
Solar PV Project Geotech

HOLE No: TP43
Sheet 1 of 1

JOB NUMBER: 2010329

Scale 1:10

0.00 Moist, brown, loose, intact, silty SAND with roots. Topsoil.

0.80 Slightly moist, yellow-orange and grey mottled black, dense, intact, silty SAND. Residual.

1.30 End of TP.

NOTES

1) No groundwater seepage.
2) Refusal at 1.3m.
3) Sample taken at 0--0.8 for foundation indicator and pH.

CONTRACTOR : NJP Transport
MACHINE : Case 570T TLB
DRILLED BY :
PROFILED BY :

TYPE SET BY : Massimo Gollino
SETUP FILE : STANDARD.SET

INCLINATION : Vertical
DIAM : 600mm Trench
DATE : 19 January 2021
DATE : 19 January 2021

DATE : 26/01/2021 11:18
TEXT : ..es\2010329TPProfiles.doc

ELEVATION : NGL
X-COORD :
Y-COORD :

HOLE No: TP43

GEOTHETA

Cabanga Environmental
Solar PV Project Geotech

HOLE No: TP44
Sheet 1 of 1

JOB NUMBER: 2010329

Scale 1:10

0.00 Moist, brown, loose, intact, silty SAND with roots. Topsoil.

0.20 Moist, yellow-orange and light grey, dense, intact, silty SAND. Residual.

1.10 End of TP.

NOTES

1) No groundwater seepage.
2) Refusal at 1.1m.
3) No sample taken.

CONTRACTOR : NJP Transport
MACHINE : Case 570T TLB
DRILLED BY :
PROFILED BY :

TYPE SET BY : Massimo Gollino
SETUP FILE : STANDARD.SET

INCLINATION : Vertical
DIAM : 600mm Trench
DATE : 20 January 2021
DATE : 20 January 2021

DATE : 26/01/2021 11:18
TEXT : ..es\2010329TPProfiles.doc

ELEVATION : NGL
X-COORD :
Y-COORD :

HOLE No: TP44

GEOTHETA

Cabanga Environmental
Solar PV Project Geotech

HOLE No: TP45
Sheet 1 of 1

JOB NUMBER: 2010329

Scale 1:10

0.00 Moist, brown, loose, intact, silty SAND with roots. Topsoil.

0.30 Dry, yellow-orange and light grey, dense, intact, silty SAND. Residual.

0.90 End of TP.

NOTES

1) No groundwater seepage.
2) Refusal at 0.9m.
3) No sample taken.

CONTRACTOR : NJP Transport
MACHINE : Case 570T TLB
DRILLED BY :
PROFILED BY :

TYPE SET BY : Massimo Gollino
SETUP FILE : STANDARD.SET

INCLINATION : Vertical
DIAM : 600mm Trench
DATE : 20 January 2021
DATE : 20 January 2021

DATE : 26/01/2021 11:18
TEXT : ..es\2010329TPProfiles.doc

ELEVATION : NGL
X-COORD :
Y-COORD :

HOLE No: TP45

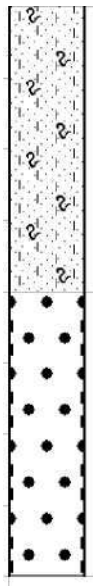
GEOTHETA

Cabanga Environmental
Solar PV Project Geotech

HOLE No: TP46
Sheet 1 of 1

JOB NUMBER: 2010329

Scale 1:10



0.00 Moist, brown, loose, intact, silty SAND with roots. Topsoil.

0.40 Slightly moist, light brown and yellow-orange blotched black, dense to very dense, intact, partially cemented ferricrete. Pedogenic.

0.80 End of TP.

NOTES

1) No groundwater seepage.
2) Refusal at 0.8m on hardpan ferricrete.
3) No sample taken.

CONTRACTOR : NJP Transport
MACHINE : Case 570T TLB
DRILLED BY :
PROFILED BY :

TYPE SET BY : Massimo Gollino
SETUP FILE : STANDARD.SET

INCLINATION : Vertical
DIAM : 600mm Trench
DATE : 20 January 2021
DATE : 20 January 2021

DATE : 26/01/2021 11:18
TEXT : ..es\2010329TPProfiles.doc

ELEVATION : NGL
X-COORD :
Y-COORD :

HOLE No: TP46

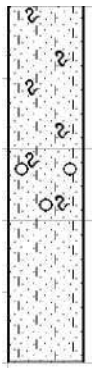
GEOTHETA

Cabanga Environmental
Solar PV Project Geotech

HOLE No: TP47
Sheet 1 of 1

JOB NUMBER: 2010329

Scale 1:10



0.00	Moist, brown, loose, intact, silty SAND with roots. Topsoil.
0.20	Moist, light brown, loose, intact, gravelly silty SAND with roots. Transported.
0.30	Slightly moist, light grey and yellow-orange, dense to very dense, intact, silty SAND. Residual.
0.50	End of TP.

NOTES

1) No groundwater seepage.
2) Refusal at 0.5m.
3) No sample taken.

CONTRACTOR : NJP Transport
MACHINE : Case 570T TLB
DRILLED BY :
PROFILED BY :

TYPE SET BY : Massimo Gollino
SETUP FILE : STANDARD.SET

INCLINATION : Vertical
DIAM : 600mm Trench
DATE : 20 January 2021
DATE : 20 January 2021

DATE : 26/01/2021 11:18
TEXT : ..es\2010329TPProfiles.doc

ELEVATION : NGL
X-COORD :
Y-COORD :

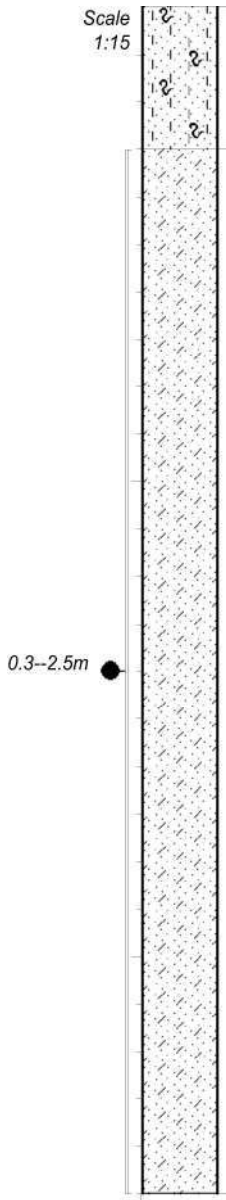
HOLE No: TP47

GEOTHETA

Cabanga Environmental
Solar PV Project Geotech

HOLE No: TP48
Sheet 1 of 1

JOB NUMBER: 2010329



0.00 Moist, light brown, loose, intact, silty SAND with roots. Topsoil.

0.30 Moist, dark red and grey mottled black in places, dense, intact, clayey SAND. Residual.

2.50 End of TP.

NOTES

1) No groundwater seepage.
2) No refusal.
3) Sample taken at 0.3--2.5m for foundation indicator and pH.

CONTRACTOR : NJP Transport
MACHINE : Case 570T TLB
DRILLED BY :
PROFILED BY :

TYPE SET BY : Massimo Gollino
SETUP FILE : STANDARD.SET

INCLINATION : Vertical
DIAM : 600mm Trench
DATE : 20 January 2021
DATE : 20 January 2021

DATE : 26/01/2021 11:18
TEXT : ..es\2010329TPProfiles.doc

ELEVATION : NGL
X-COORD :
Y-COORD :

HOLE No: TP48

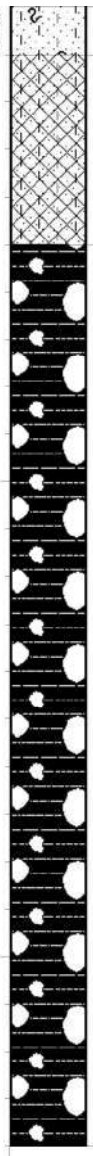
GEOTHETA

Cabanga Environmental
Solar PV Project Geotech

HOLE No: TP49
Sheet 1 of 1

JOB NUMBER: 2010329

Scale 1:15



0.00	Dry, light brown, loose, intact, silty SAND with roots. Topsoil.
0.10	Slightly moist, yellow-orange, dense, intact, silty SAND. Fill.
0.50	Slightly moist, dark grey, dense to medium dense with depth, intact, coal fragments and cobbles in a matrix of silty SAND. Fill.
2.40	End of TP.

NOTES

1) No groundwater seepage.
2) No refusal.
3) No sample taken.

CONTRACTOR : NJP Transport
MACHINE : Case 570T TLB
DRILLED BY :
PROFILED BY :

TYPE SET BY : Massimo Gollino
SETUP FILE : STANDARD.SET

INCLINATION : Vertical
DIAM : 600mm Trench
DATE : 20 January 2021
DATE : 20 January 2021

DATE : 26/01/2021 11:18
TEXT : ..es\2010329TPProfiles.doc

ELEVATION : NGL
X-COORD :
Y-COORD :

HOLE No: TP49

GEOTHETA

Cabanga Environmental
Solar PV Project Geotech

HOLE No: TP50
Sheet 1 of 1

JOB NUMBER: 2010329

Scale 1:10

0.00	Slightly moist, brown, loose, intact, gravelly silty SAND with roots. Topsoil.
0.10	Dry, light grey and yellow-brown, dense, intact, silty SAND. Residual.
0.40	End of TP.

NOTES

1) No groundwater seepage.
2) Refusal at 0.4m.
3) No sample taken.

CONTRACTOR : NJP Transport
MACHINE : Case 570T TLB
DRILLED BY :
PROFILED BY :

TYPE SET BY : Massimo Gollino
SETUP FILE : STANDARD.SET

INCLINATION : Vertical
DIAM : 600mm Trench
DATE : 20 January 2021
DATE : 20 January 2021

DATE : 26/01/2021 11:18
TEXT : ..es\2010329TPProfiles.doc

ELEVATION : NGL
X-COORD :
Y-COORD :

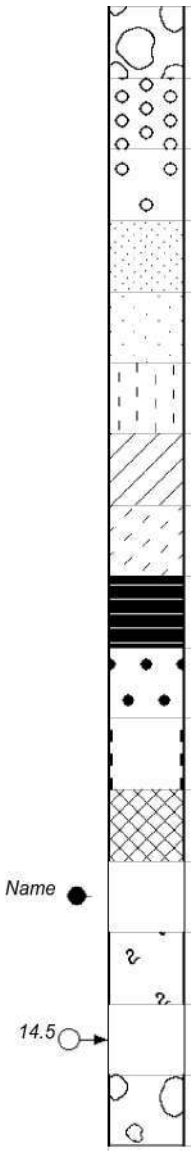
HOLE No: TP50

GEOTHETA

Cabanga Environmental
Solar PV Project Geotech

LEGEND
Sheet 1 of 1

JOB NUMBER: 2010329



BOULDERS	{SA01}
GRAVEL	{SA02}
GRAVELLY	{SA03}
SAND	{SA04}
SANDY	{SA05}
SILTY	{SA07}
CLAY	{SA08}
CLAYEY	{SA09}
COAL	{SA52}
FERRICRETE NODULES	{SA24}
PARTIALLY CEMENTED	{SA30}
FILL	{SA32}
DISTURBED SAMPLE	{SA38}
ROOTS	{SA40}
WATER SEEPAGE/water strike	{CH50}
COBBLES	{SA58}

CONTRACTOR :
MACHINE :
DRILLED BY :
PROFILED BY :

TYPE SET BY : Fahad Khan
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE :

DATE : 26/01/2021 11:18
TEXT : ..es\2010329TPProfiles.doc

ELEVATION :
X-COORD :
Y-COORD :

LEGEND
SUMMARY OF SYMBOLS

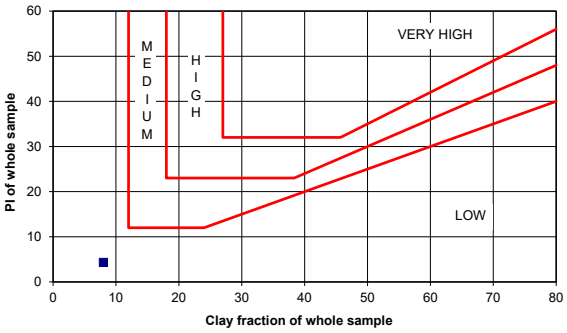
APPENDIX C: LABORATORY RESULTS

PARTICLE SIZE ANALYSIS

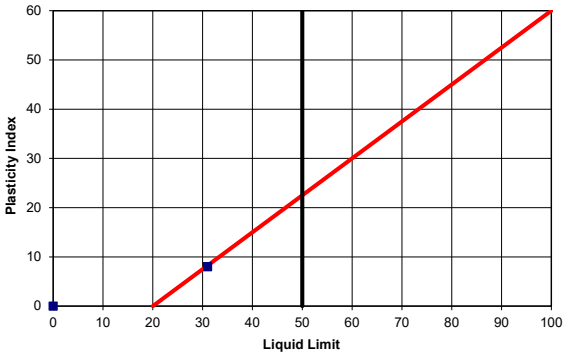
Sample No.	1
Soillab Sample No.	S20-032-01
Depth (m)	0.7 - 2.2
Position	TP 24
Material Description	LIGHT REDDISH ORANGE FERRICRETE GRAVELLY SAND
Relative density on < 2 mm **(SANS 5844)**	2.647
Organic Material	
Moisture (%) / Dispersion (%)	
SCREEN ANALYSIS (% PASSING) **(SANS 3001:GR1)**	
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	98
5.0 mm	85
2.00 mm	72
0.425 mm	54
0.075 mm	39
HYDROMETER ANALYSIS (% PASSING) **(SANS 3001:GR3)**	
57 µm	22
34 µm	18
14 µm	11
6 µm	8
2 µm	6
% Clay	8
% Silt	14
% Sand	50
% Gravel	28
ATTERBERG LIMITS **(SANS 3001:GR10)**	
Liquid Limit	31
Plasticity Index	8
Linear Shrinkage (%)	3.5
Grading Modulus	1.35
Classification	A-4 (0)
Unified Classification	SM
Chart Reference	

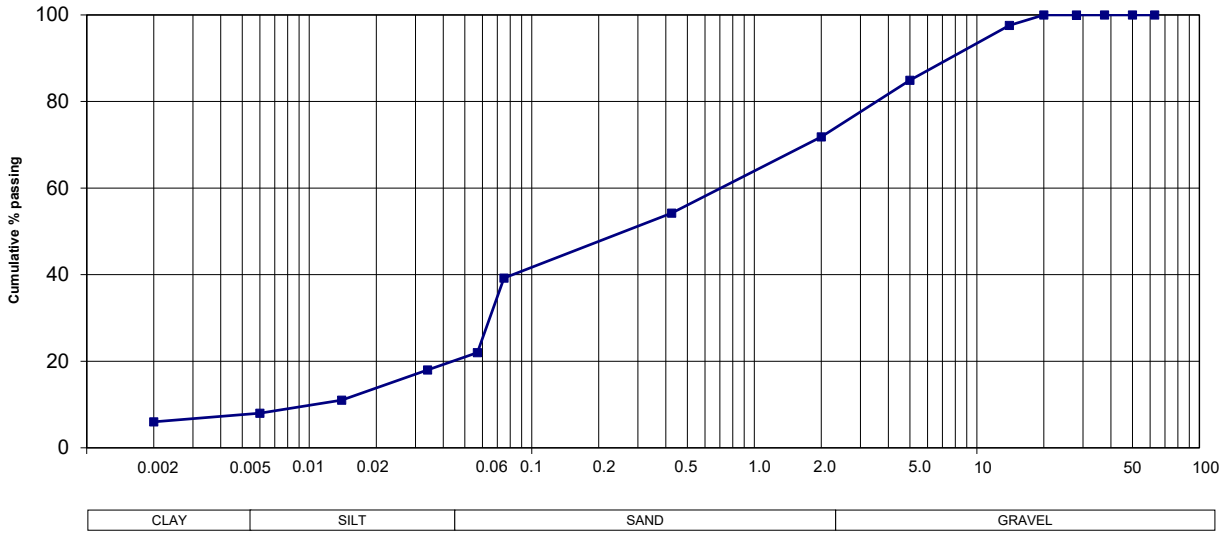
PROJECT : 2010329-CABANGA
JOB No. : S20-032
DATE : 2020/02/01

POTENTIAL EXPANSIVENESS



PLASTICITY CHART





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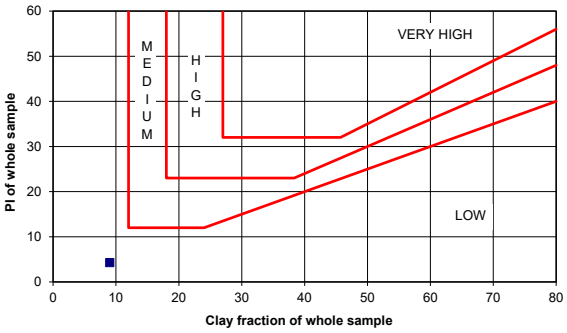
PARTICLE SIZE ANALYSIS

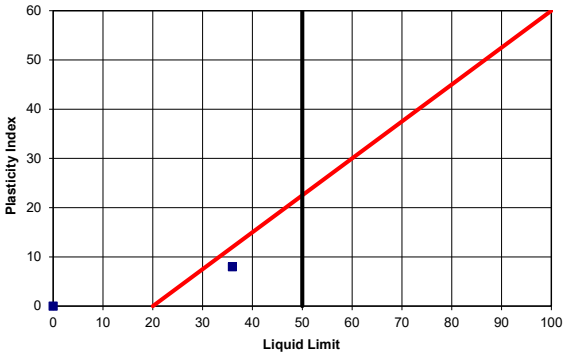
Sample No.	02
Soillab Sample No.	S20-032-02
Depth (m)	0.5 - 1.5
Position	TP 37
Material Description	DARK YELLOW GRAVELLY SAND
Relative density on < 2 mm **(SANS 5844)**	2.66
Organic Material	
Moisture (%) / Dispersion (%)	
SCREEN ANALYSIS (% PASSING) **(SANS 3001:GR1)**	
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
5.0 mm	94
2.00 mm	78
0.425 mm	53
0.075 mm	44
HYDROMETER ANALYSIS (% PASSING) **(SANS 3001:GR3)**	
56 µm	22
33 µm	18
14 µm	12
6 µm	9
2 µm	6
% Clay	9
% Silt	13
% Sand	56
% Gravel	22
ATTERBERG LIMITS **(SANS 3001:GR10)**	
Liquid Limit	36
Plasticity Index	8
Linear Shrinkage (%)	4.0
Grading Modulus	1.25
Classification	A-4 (1)
Unified Classification	SM
Chart Reference	

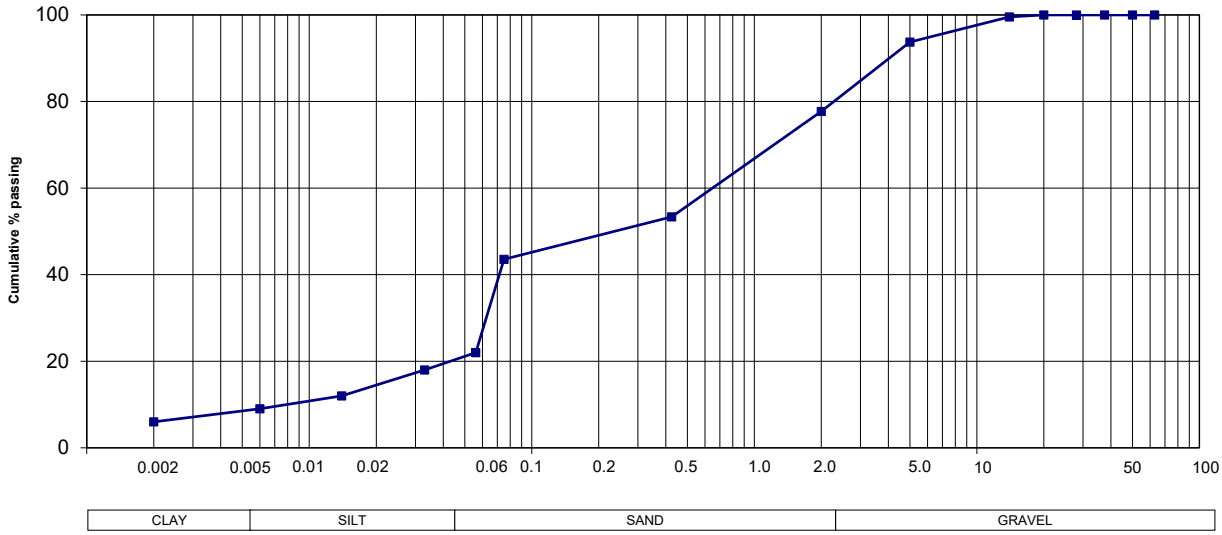
PROJECT : 2010329 -CABANGA
JOB No. : S20-032
DATE : 2020/02/01

POTENTIAL EXPANSIVENESS



PLASTICITY CHART





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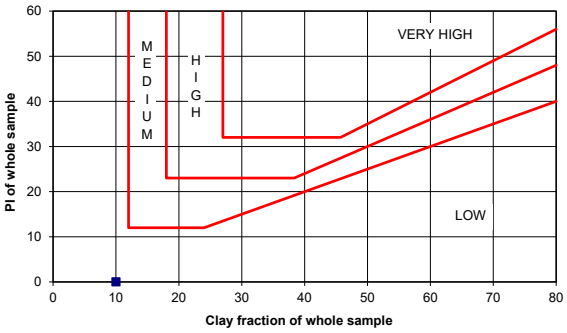
PARTICLE SIZE ANALYSIS

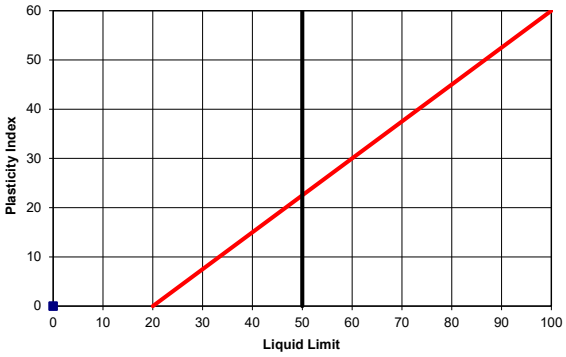
Sample No.	03
Soillab Sample No.	S20-032-03
Depth (m)	0.0 - 0.8
Position	TP 43
Material Description	LIGHT GREY FERRICRETE SILTY SAND
Relative density on < 2 mm **(SANS 5844)**	2.681
Organic Material	
Moisture (%) / Dispersion (%)	
SCREEN ANALYSIS (% PASSING) **(SANS 3001:GR1)**	
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
5.0 mm	94
2.00 mm	89
0.425 mm	77
0.075 mm	31
HYDROMETER ANALYSIS (% PASSING) **(SANS 3001:GR3)**	
58 µm	22
34 µm	18
14 µm	12
6 µm	10
2 µm	6
% Clay	10
% Silt	12
% Sand	67
% Gravel	11
ATTERBERG LIMITS **(SANS 3001:GR10)**	
Liquid Limit	
Plasticity Index	NP
Linear Shrinkage (%)	0.0
Grading Modulus	1.03
Classification	A-2-4 (0)
Unified Classification	SM
Chart Reference	

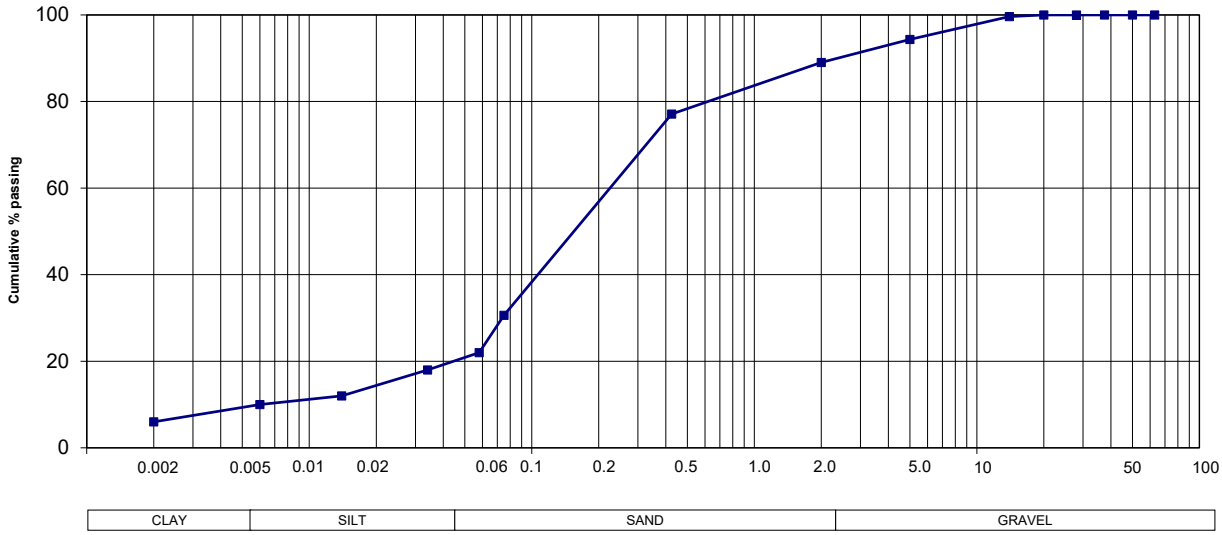
PROJECT : 2010329 - CABANGA
JOB No. : S20-032
DATE : 2020/02/01

POTENTIAL EXPANSIVENESS



PLASTICITY CHART





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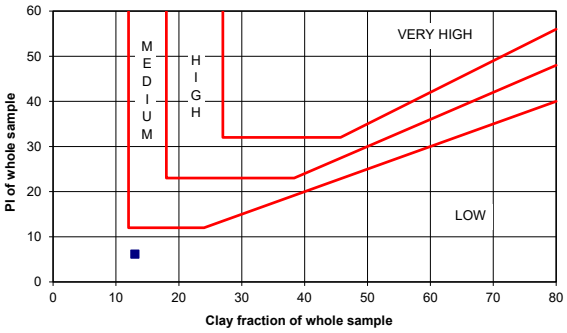
PARTICLE SIZE ANALYSIS

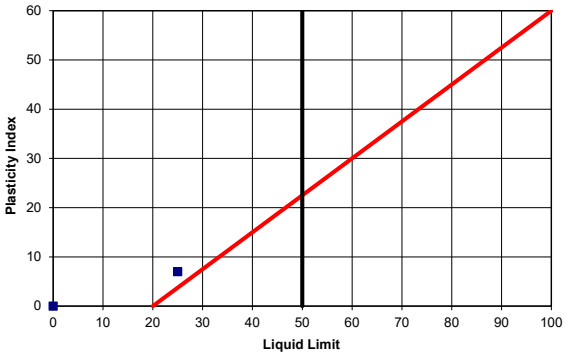
Sample No.	04
Soillab Sample No.	S20-032-04
Depth (m)	0.3 - 2.5
Position	TP 48
Material Description	LIGHT RED FERRICRETE SILTY SAND
Relative density on < 2 mm **(SANS 5844)**	2.694
Organic Material	
Moisture (%) / Dispersion (%)	
SCREEN ANALYSIS (% PASSING) **(SANS 3001:GR1)**	
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
5.0 mm	99
2.00 mm	97
0.425 mm	88
0.075 mm	51
HYDROMETER ANALYSIS (% PASSING) **(SANS 3001:GR3)**	
56 µm	32
33 µm	27
14 µm	17
6 µm	13
2 µm	12
% Clay	13
% Silt	19
% Sand	65
% Gravel	3
ATTERBERG LIMITS **(SANS 3001:GR10)**	
Liquid Limit	25
Plasticity Index	7
Linear Shrinkage (%)	2.0
Grading Modulus	0.65
Classification	A-4 (1)
Unified Classification	CL & ML
Chart Reference	

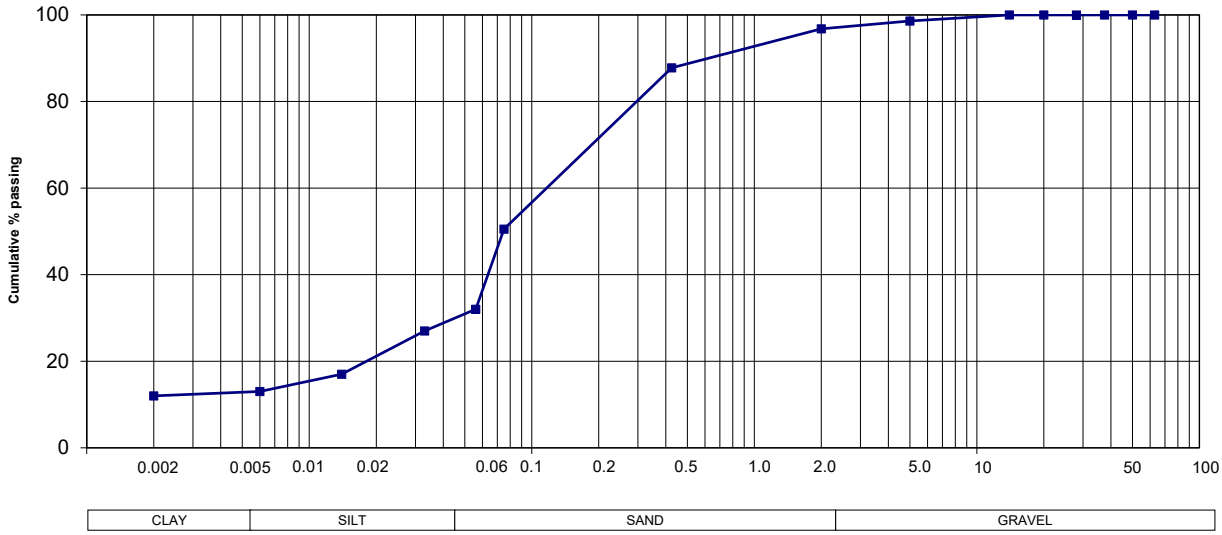
PROJECT : 2010329 - CABANGA
JOB No. : S20-032
DATE : 2020/02/01

POTENTIAL EXPANSIVENESS



PLASTICITY CHART





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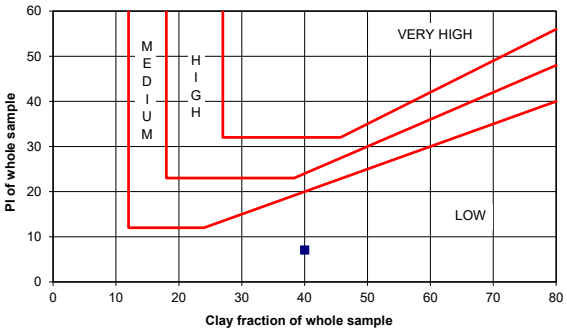
PARTICLE SIZE ANALYSIS

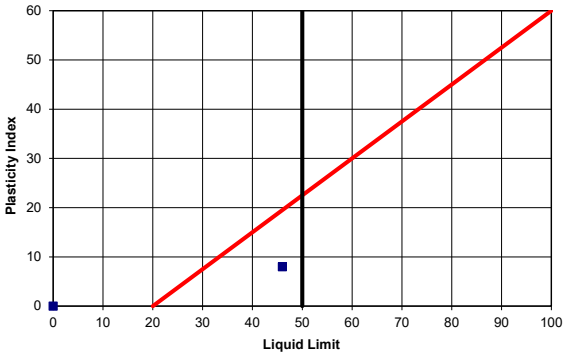
Sample No.	05
Soillab Sample No.	S20-032-05
Depth (m)	1.2 - 2.0
Position	TP 05
Material Description	LIGHT OLIVE FERRICRETE CLAYEY SAND
Relative density on < 2 mm **(SANS 5844)**	2.667
Organic Material	
Moisture (%) / Dispersion (%)	
SCREEN ANALYSIS (% PASSING) **(SANS 3001:GR1)**	
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
5.0 mm	98
2.00 mm	95
0.425 mm	88
0.075 mm	62
HYDROMETER ANALYSIS (% PASSING) **(SANS 3001:GR3)**	
53 µm	50
31 µm	47
12 µm	42
5 µm	40
2 µm	38
% Clay	40
% Silt	10
% Sand	45
% Gravel	5
ATTERBERG LIMITS **(SANS 3001:GR10)**	
Liquid Limit	46
Plasticity Index	8
Linear Shrinkage (%)	3.0
Grading Modulus	0.55
Classification	A-5 (5)
Unified Classification	ML
Chart Reference	

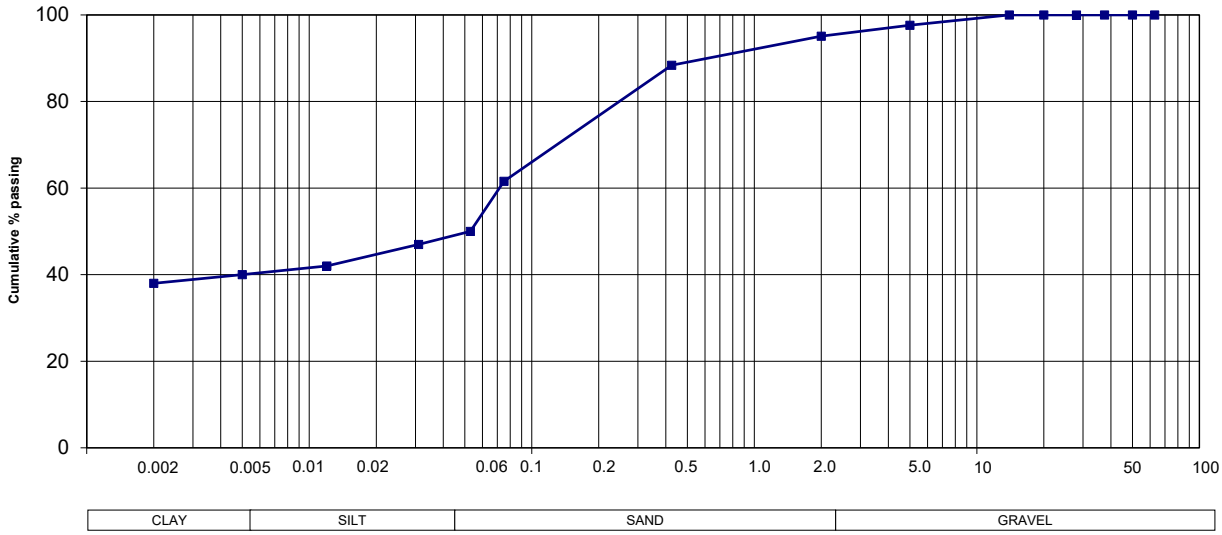
PROJECT : 2010329 - CABANGA
JOB No. : S20-032
DATE : 2020/02/01

POTENTIAL EXPANSIVENESS



PLASTICITY CHART



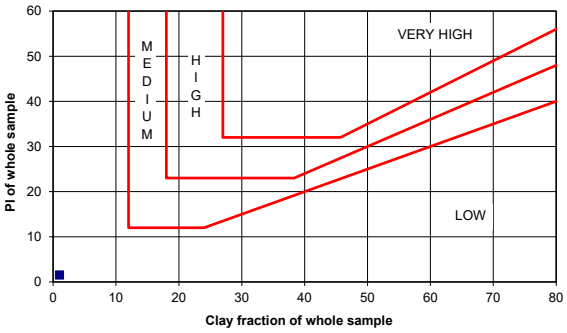


PARTICLE SIZE ANALYSIS

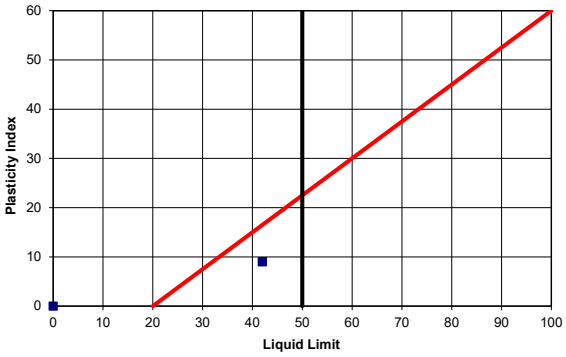
Sample No.	06
Soillab Sample No.	S20-032-06
Depth (m)	0.3 - 0.7
Position	TP 03
Material Description	DARK OLIVE DOLERITE SANDY GRAVEL
Relative density on < 2 mm **(SANS 5844)**	2.471
Organic Material	
Moisture (%) / Dispersion (%)	
SCREEN ANALYSIS (% PASSING) **(SANS 3001:GR1)**	
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	98
20.0 mm	91
14.0 mm	90
5.0 mm	67
2.00 mm	36
0.425 mm	17
0.075 mm	11
HYDROMETER ANALYSIS (% PASSING) **(SANS 3001:GR3)**	
61 µm	6
36 µm	4
15 µm	2
7 µm	1
2 µm	0
% Clay	1
% Silt	5
% Sand	30
% Gravel	64
ATTERBERG LIMITS **(SANS 3001:GR10)**	
Liquid Limit	42
Plasticity Index	9
Linear Shrinkage (%)	4.0
Grading Modulus	2.36
Classification	A-2-5 (0)
Unified Classification	SP - SM
Chart Reference	

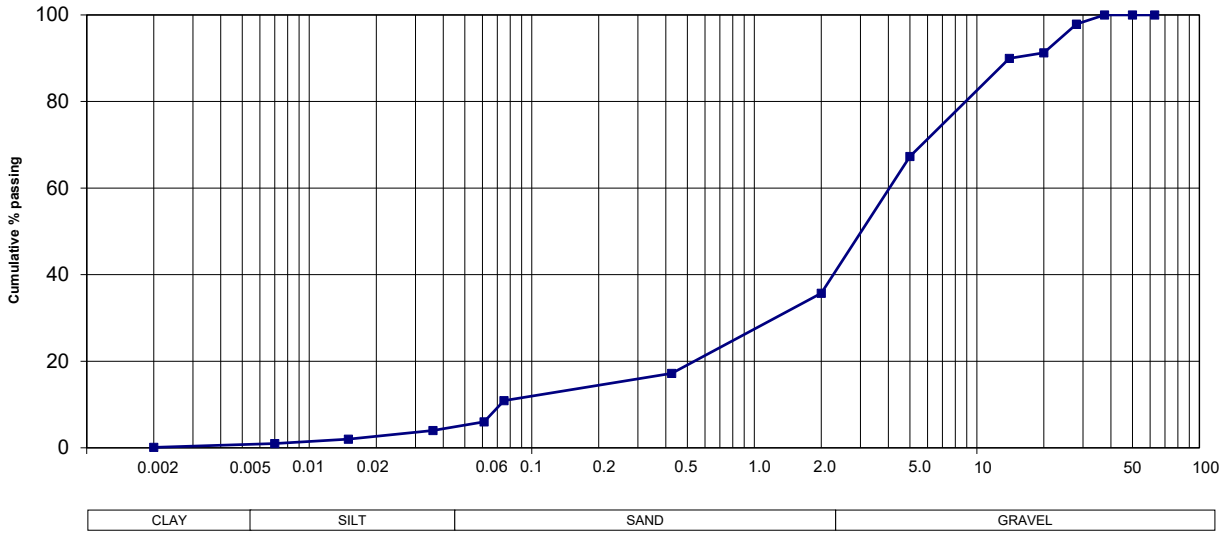
PROJECT : 2010329- CABANGA
JOB No. : S20-032
DATE : 2020/02/01

POTENTIAL EXPANSIVENESS



PLASTICITY CHART





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Soillab is a SANAS accredited Testing Laboratory.

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South Africa, 0040

Project Description

Client:	GEOTHETA CONSULTING ENGINEERS &SCIENTISTS	Soillab Job No.:	S21-0032
Job Description:	2010329-CABANGA	Contract Number:	
Date:	2021/02/02	Reference Number:	

Sample Description

Soillab Sample No.:	S21-0032-01
Sample Description:	TP03
Sample Depth:	0.3 - 0.7
Material Description:	DARK OLIVE

Screen Analysis (% Passing) - SANS 3001-GR1

75,00 mm	100
63,00 mm	100
50,00 mm	100
37,50 mm	100
28,00 mm	98
20,00 mm	91
14,00 mm	90
5,00 mm	67
2,000 mm	36
0,425 mm	17
0,075 mm	11

Soil-mortar percentages - SANS 3001-PR5

Coarse Sand	2.000-0.425mm	52
Coarse Fine Sand	0.425-0.250mm	8
Medium Fine Sand	0.250-0.150mm	5
Fine Fine Sand	0.150-0.075mm	5
Silt and clay	<0.075mm	30

Constants

Grading Modulus	SANS 3001-PR5	2.36
Liquid Limit	SANS 3001-GR10	42
Plasticity Index		9
Linear Shrinkage		4.0

MOD AASHTO - SANS 3001-GR30

Max Dry Density (kg/m³)	2083
Optimum Moisture Content (%)	12.2

CBR - SANS 3001-GR40

MOD AASHTO	
Moulding Moisture Content (%)	12.3
Dry Density (kg/m³)	2089
% of Max Dry Density	100.3
100% MOD CBR (%)	46
% Swell	0.6
NRB	
Dry Density (kg/m³)	1980
% of Max Dry Density	95.0
100% NRB CBR (%)	21
% Swell	0.4
PROCTOR	
Dry Density (kg/m³)	1875
% of Max Dry Density	90.0
100% PROCTOR CBR (%)	10
% Swell	0.8
CBR (%)	
100% Mod AASHTO	44
98% Mod AASHTO	33
97% Mod AASHTO	28
95% Mod AASHTO	21
93% Mod AASHTO	16
90% Mod AASHTO	10
COLTO Classification:	**G7**

W.I. 7.8.1 (a)i

SNALAB CIVIL ENGINEERING LABORATORY

sanas T0345

SNA CIVIL AND STRUCTURAL ENGINEERS (PTY) LTD
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Tel :(012) 751-9388
E-MAIL : snalab@sna.co.za
REG. NO. 2005/006128/07

SANAS accredited facility since 2007

TEST REPORT

REPORT NUMBER 25903

Client :	SOILLAB
Address:	P.O BOX 72928 LYNNWOOD RIDGE 0040
Cell :	073 489 2321 / 012 813 4900
E-Mail:	choeum@soillab.co.za
ATTENTION:	MANTSHA CHOEU
Project/Order:	2010329 - CABANGA / S21-0032
Brief :	PH & COND

Date requested	27/01/2021			
Date sampled	SAMPLED BY CLIENT			
Date received	27/01/2021			
Date Tested	Start date :	05/02/2021	End date :	05/02/2021
Location of sampling	SAMPLED BY CLIENT			
Sampling method/methods	SAMPLED BY CLIENT			
Sampling plan	SAMPLED BY CLIENT			
Sampled by	SAMPLED BY CLIENT			
Sample number	REFER TO TEST REPORT			
Sample Condition/Description	REFER TO TEST REPORT			
Sample classification	N/A			
Sampling Environmental condition	SAMPLED BY CLIENT			
Test Method/Methods used	REFER TO TEST REPORT			
Test done at	SNALAB (PTA)			

Deviation to test methods : Deviations, exclusions or additions will be noted on test result sheets

Test/Tests marked # Not SANAS Accredited in this report are not included in the SANAS Schedule of Accreditation for this laboratory.

The results relate only to the items tested. Any opinions ,classifications , comments and interpretations do not fall within the scope of our SANAS accreditation.

This certificate is issued without any corrections what so ever.

Test report/reports shall not be reproduced except in full, without written approval of the Laboratory.

This test report relates only to samples received.

If the report is referred to as an INTERIM REPORT it is not fit for publication.

Information above noted as" **Supplied by Client/Sampled by Client**" may effect the validity of the test results.

Hendrik Diederiks. Pr Tech Eng
Laboratory Manager
Technical Signatory

05/02/2021
DATE ISSUED:

SNALAB CIVIL ENGINEERING LABORATORY

Project: 2010329-CABANGA / S21-0032
Rd/Sect/Bp:
Layer/ Test pit:

Lab No : 25903
Client No : 2300
Date : 05/02/2021

INDICATORS

W.I.7.8.1(e)

Methods:	SANS 3001-GR 1 + GR2 + GR5	SANS 3001 GR 10	TMH 1: A20	TMH 1: A21T

HOLE & / SAMPLE No. MATERIALS DESCRIPTION	DEPTH (m)	% PASSING 100.0	90.0	75.0	63.0	50.0	37.5	28.0	20.0	14.0	5.0	2.0	0.425	0.075	SOIL MORTAR ANAL (% vs # mm) 2.0 - 0.425	0.425-0.250	0.250 - 0.150	0.150 - 0.075	<0.075	GM	ATTERBERG LIMITS (%) LL	LS	PI	pH	ELEC-TRIC CONDUC. (S/m)	AASTHO Classification #
TP03	0.3-2.7																							6.79	0.032	A-1-a (0) (1)
FERRICRETE IN LIGHT BROWN GRAVEL																										
TP05	1.2-2.0																							6.54	0.036	A-1-a (0) (2)
FERRICRETE IN LIGHT BROWN GRAVEL																										
TP24	0.7-2.2																							4.81	0.052	A-1-a (0) (3)
FERRICRETE IN LIGHT BROWN GRAVEL																										
TP37	0.5-1.5																							4.84	0.052	A-1-a (0) (4)
LIGHT BROWN GRAVEL																										
TP43	0.0-0.8																							4.45	0.052	A-1-a (0) (5)
DARK BROWN GRAVEL																										
TP48	0.3-2.5																							4.44	0.053	A-1-a (0) (6)
REDDISH BROWN GRAVEL																										
																										( ) (7)
																										( ) (8)
																										( ) (9)
																										( ) (10)

REMARKS:

Tech:
Date: 05/02/2021

Geotheta Report Distribution Record

Report No.	2010329/R02
Copy No.	Electronic

Name/Title	Company	Copy	Date	Authorised by
Ms. Lelani Claasen	Cabanga Environmental	Electronic	February 2021	Ian Hammond

Approval Signature: