

Query 187- Bidder queried that the payment schedule can be reasonably modified by CEB authority which suits to potential bidders and can come forward for bid submission Bidder request that needful be done by amending the CEB's payment terms towards bidders

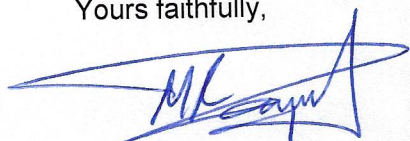
Reply 187-

The original payment schedule of the bid document shall be maintained.

Kindly acknowledge the receipt of this letter addressed to the Mauritius High Commission New Delhi at mhcnewdelhi@gmail.com at latest by the 11th October 2019.

If you have any query please do not hesitate to contact us,

Yours faithfully,



Maheshwur Raj Dayal
CEng MEng(Hons) MIET RPEM
General Manager

cc.
EXIM Bank
Mauritius High Commission in New Delhi
SBMIDCL
SICDC

CEB (GREEN ENERGY) CO LTD

TEL NO: (230) 404 2000
FAX NO: (230) 454 7630 / 7632
E- MAIL: ceb@intnet.mu
WEBSITE: ceb.intnet.mu
VAT Reg No: 27470844
BRN: C16142198

Rue du Savoir | Cyber City, Ebène
MAURITIUS



08 October 2019

Ref: OAB-CGE-005/Clarification10

Attention: All Bidders

Dear Sir/Madam,

OAB-CGE-005 – Design, Supply, Installation, Testing and Commissioned of 8MWac Solar PV Farm at Tamarind Falls, Henrietta (Phase II), Mauritius.

Clarification No.10

Please find below CGE's reply to the queries from bidders in respect of the above mentioned bidding exercise.

Query 188- ITB 3.1-3.3, 4.1(a) to 4.1 (f), ITB 4.2, ITB 4.4, ITB 4.6, ITB 5-6, ITB 7.2-7.4, ITB 8-9, ITB 11.1(a) to 11.1 (j), ITB 12, ITB 13.3, ITB 14-16, ITB 17.2-ITB 17.4, 17.5 (a)- 17.5©, ITB 20.2 --20.3(c), ITB 24-25, ITB 26.2-26.3, ITB 27-30.2, ITB 31-34.4, ITB 35-36, ITB-39-44.

The above enlisted ITBs are missing in the Bid Data Sheet, kindly provide clarification for this query.

Reply 188-

Kindly refer to revised bid documents with correct ITB Nos. issued to High Commission of Mauritius in India on 17 Sept 2019

Query 189- Documentary evidence established with ITB 14.1 that the Plant and installation Services offered by a Bidder in its bid or in any alternative bid, if permitted, are eligible

Since the BDS document does not contain ITB 14.1, kindly provide clarification for the below mentioned point which is requisite for the Bid Documents:

Reply 189-

Kindly refer to revised bid documents with correct ITB Nos. issued to High Commission of Mauritius in India on 17 Sept 2019

MID

Query 190- Documentary evidence in accordance with ITB 15 establishing the Bidder's eligibility and qualifications to perform the contract if its Bid is accepted.

Since the BDS document does not contain ITB 15, kindly provide clarification for the below mentioned point which is requisite for the Bid Documents:

Reply 190-

Kindly refer to revised bid documents with correct ITB Nos. issued to High Commission of Mauritius in India on 17th Sept 2019

Query 191- Documentary evidence established in accordance with ITB 16 that the plant and installation services offered by the Bidder conform to the Bidding Document.

Since the BDS document does not contain ITB 16, kindly provide clarification for the below mentioned point which is requisite for the Bid Documents:

Reply 191-

Kindly refer to revised bid documents with correct ITB Nos. issued to High Commission of Mauritius in India on 17th Sept 2019

Query 192- 4.7 Solar Compact Station: Each Solar Compact Substation shall be designed in such a way that the loss of 30% of the inverter modules in a given Solar Compact Substation shall not affect the guaranteed delivered power at the POD i.e. 8MWac , without overloading any of the healthy inverter modules.

We need the clarification regarding 30% extra AC system size has to be considered on top of 8MW ac output power.

Considering this, the total ac size accounts to the total of 10.4 MWac.

MW ac here refers to the apparent power (MVA) or real/true power(MW)?

Because if its real/true power, the apparent power will further increase.

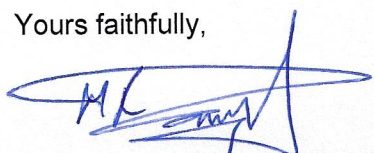
Reply 192-

The inverter shall be designed such that it continues to give 100% output even if 30% of the inverter modules are faulty.

Kindly acknowledge the receipt of this letter addressed to the Mauritius High Commission New Delhi at mhcnewdelhi@gmail.com at latest by the 11th October 2019.

If you have any query please do not hesitate to contact us,

Yours faithfully,



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WEBSITE: ceb.intnet.mu
VAT Reg No: 27470844
BRN: C16142198

Rue du Savoir | Cyber City, Ebène
MAURITIUS



16 October 2019

Ref: OAB-CGE-005/Clarification11

Attention: All Bidders

Dear Sir/Madam,

OAB-CGE-005 – Design, Supply, Installation, Testing and Commissioned of 8MWac Solar PV Farm at Tamarind Falls, Henrietta (Phase II), Mauritius.

Clarification No.11

Please find below CGE's reply to the queries from bidders in respect of the above mentioned bidding exercise.

Query 193- We have already purchase tender document ,we are preparing of this tender, As per tender document Lumsum financial bid/Price bid format is not clear ,

So we are requesting you to kindly confirm the Price bid format which consider the lowest price bidder evaluation.

Cntd'

MRD.

Page 1 of 2

Reply 193-

Bidders are informed with reference to **Bidding Documents, Section IV- Bidding Forms**, the first four schedules provides a cost [in US Dollars] breakdown of the project components;

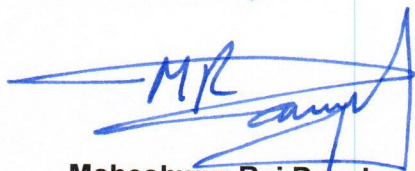
- **Schedule No. 1.** Plant and Mandatory Spare Parts Supplied from Abroad,
- **Schedule No. 2.** Plant and Mandatory Spare Parts Supplied from Within the Employer's Country,
- **Schedule No. 3.** Design Services,
- **Schedule No. 4.** Installation and Other Services.

All the above costs are brought forward in the Grand Summary on **Schedule No. 5** as the **Total Price**. This **Total Price** [in US Dollars] shall be referred to in the **Letter of Bid (Form 1 in Bidding Documents, Section IV - Bidding Forms)** as the fix lump sum price for the project.

Kindly acknowledge the receipt of this letter addressed to the Mauritius High Commission New Delhi at mhcnewdelhi@gmail.com at latest by the 21 October 2019.

If you have any query please do not hesitate to contact us,

Yours faithfully,



Maheshwur Raj Dayal
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E- MAIL: ceb@intnet.mu
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BRN: C16142198

Rue du Savoir | Cyber City, Ebène
MAURITIUS



18 October 2019

Ref: OAB-CGE-005/Addendum No.4

Attention: All Bidders

Dear Sir/Madam,

OAB-CGE-005 – Design, Supply, Installation, Testing and Commissioned of 8MWac Solar PV Farm at Tamarind Falls, Henrietta (Phase II), Mauritius.

Addendum No.4

With regards to the above mentioned bidding exercise, we wish to inform all bidders that as advised by the Government of India through Exim Bank of India; the 'Cells' which are used for manufacturing of **Solar Modules/Panels** should necessarily be manufactured and sourced in **India**.

Kindly acknowledge the receipt of this letter addressed to the Mauritius High Commission New Delhi at mhcnewdelhi@gmail.com at latest by the 21 October 2019.

Yours faithfully,

Maheshwur Raj Dayal
CEng MEng(Hons) MIET RPEM
General Manager

CC.
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TEL NO: (230) 404 2000
FAX NO: (230) 454 7630 / 7632
E- MAIL: ceb@intnet.mu
WEBSITE: ceb.intnet.mu
VAT Reg No: 27470844
BRN: C16142198

Rue du Savoir | Cyber City, Ebène
MAURITIUS

Ref: OAB/CGE/005-Extension No.2

22 October 2019

Attention: All Bidders

Dear Sir/Madam,

OAB-CGE-005 – Design, Supply, Installation, Testing and Commissioned of 8MWac Solar PV Farm at Tamarind Falls, Henrietta (Phase II), Mauritius.

Extension No.2

We refer to the above bidding exercise and wish to inform Bidders that following a number of requests received to extend the deadline to for submission of the bids. We are pleased to inform you that the closing date of the Bids have been extended to the **15th November 2019** with the closing time and venue remaining the same.

Bidders who have already submitted their Bids are kindly requested to submit a "Substituted Offer" as per Instruction to Bidders **ITB 24. Withdrawal, Substitution, and Modification of Bids.**

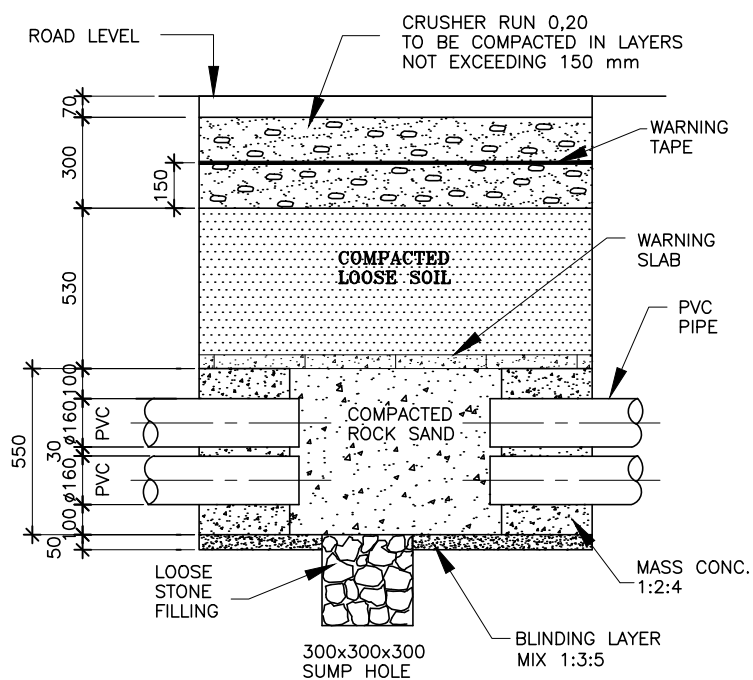
Your attention is hereby drawn that the **Bid Security** shall be effective as from the new closing date and shall be valid 30 days beyond the Bid validity period. The Bid Security shall also be submitted as part of the "Substituted Offer" (Technical Offer)

Kindly acknowledge the receipt of this letter addressed to the Mauritius High Commission in New Delhi at mhcnewdelhi@gmail.com at latest by the **23rd October 2019.**

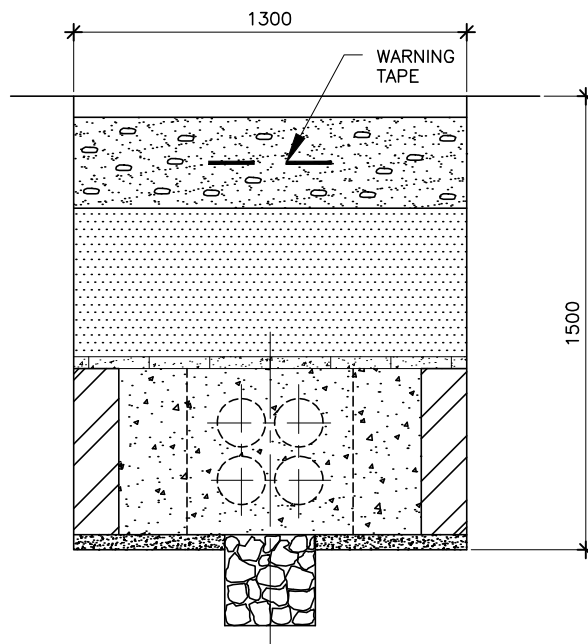
Yours faithfully,

Maheshwur Raj Dayal
CEng MEng(Hons) MIET RPEM
General Manager

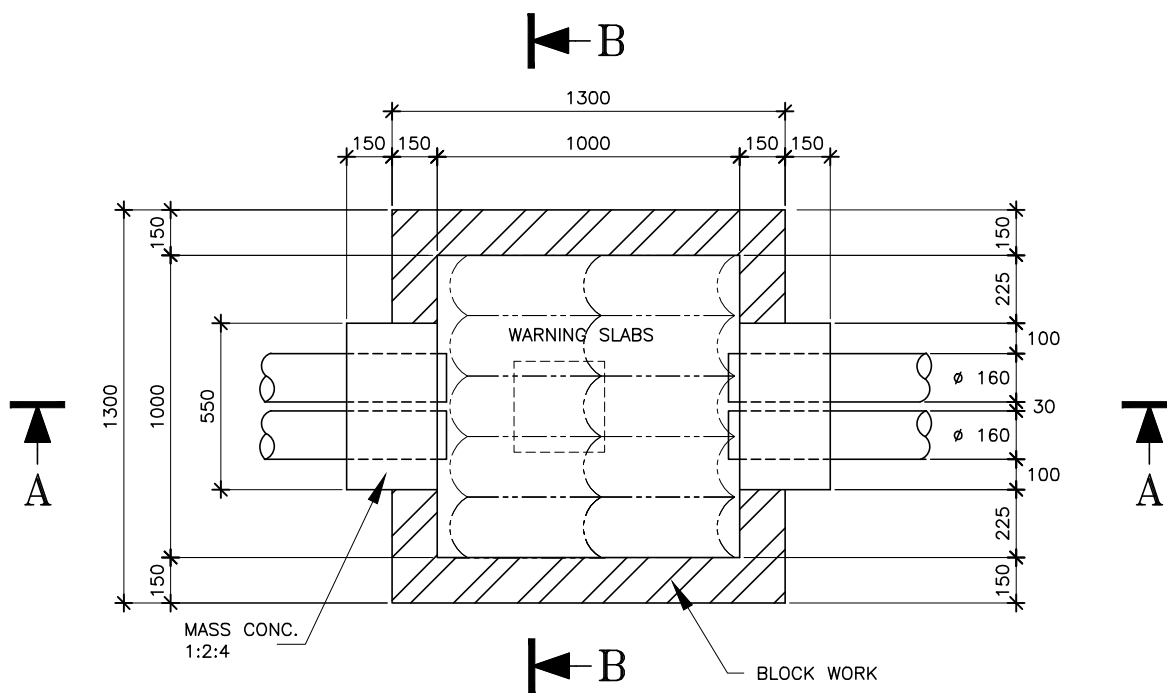
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SECTION A-A



SECTION B-B

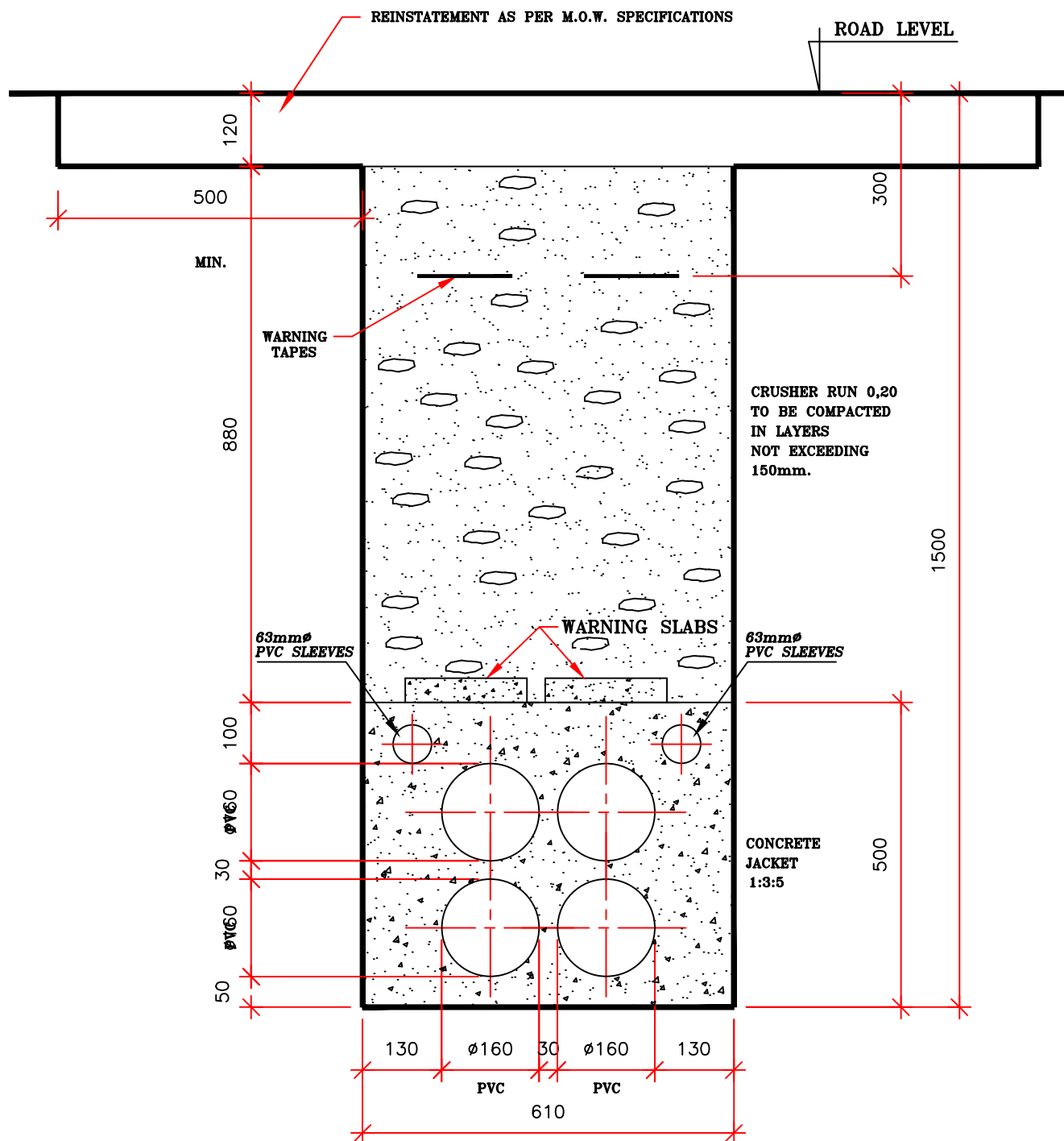


PLAN VIEW

CENTRAL ELECTRICITY BOARD



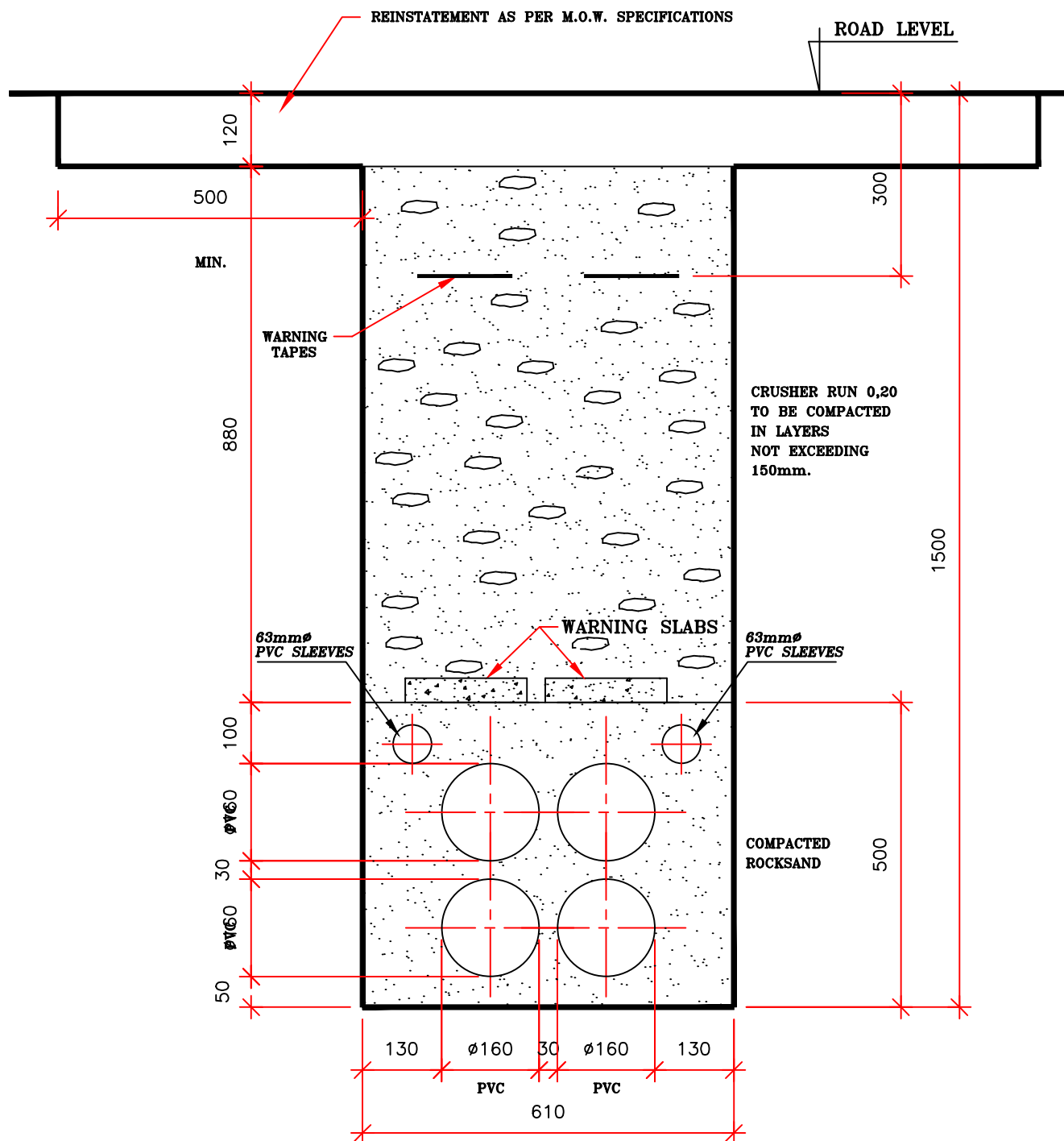
Rev. A	Date: : 20.06.12	TITLE:
Rev. B	Drawn: HM	TYPICAL SECTION THRU' DRAWPIT FOR LV UG CABLES
Rev. C	Chkd: mpm	(4 SLEEVES)
Rev. D	Appd: S.Boothun	Scale: 1:25
Rev. E		DRAWING No. 6118-12.



CENTRAL ELECTRICITY BOARD



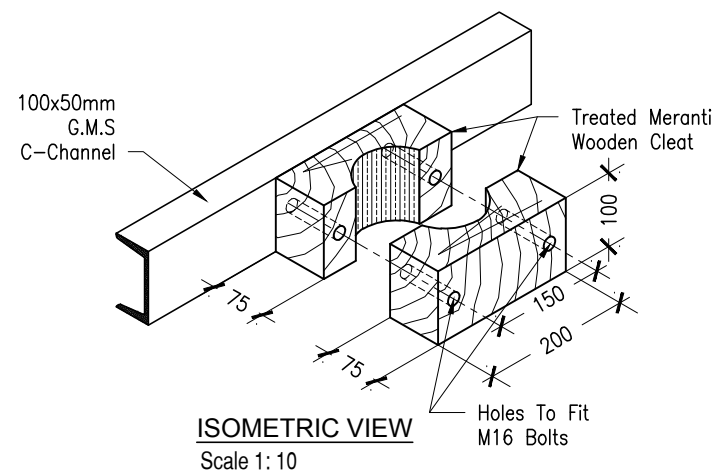
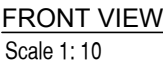
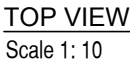
Rev. A	Date: : 24.03.17	TITLE: TYPICAL ROAD CROSSING WITH CONCRETE JACKET 4 PVC SLEEVES 160mm \varnothing + 2 PVC 63mm \varnothing SLEEVES	
Rev. B	Drawn: J.M		
Rev. C	Chkd: J.R	Scale: 1:10	
Rev. D	Appd: N.K		
Rev. E		DRAWING No.	6549-17




CENTRAL ELECTRICITY BOARD



Rev. A	Date: : 24.03.17	TITLE: TRENCH ALONG ROAD 4 PVC SLEEVES 160mm \varnothing + 2 PVC 63mm \varnothing SLEEVES	
Rev. B	Drawn: J.M		
Rev. C	Chkd: J.R	Scale: 1:10 DRAWING No. 6550-17	
Rev. D	Appd: N.K		
Rev. E			



CENTRAL ELECTRICITY BOARD						
 Central Electricity Board	Rev. A	15.05.18 – Angle Bar Support Removed. Req. I.Burkutally	Date:	26.04.2018	TITLE: TYPICAL ARRANGEMENT FOR WOODEN CABLE SUPPORT (HT METERING SWITCHGEAR)	
	Rev. B		Drawn:	J.M		
	Rev. C		Chkd:	m.p.n		
	Rev. D		Appd:	I.B	Scale:	1:7.5
	Rev. E					DRAWING No.

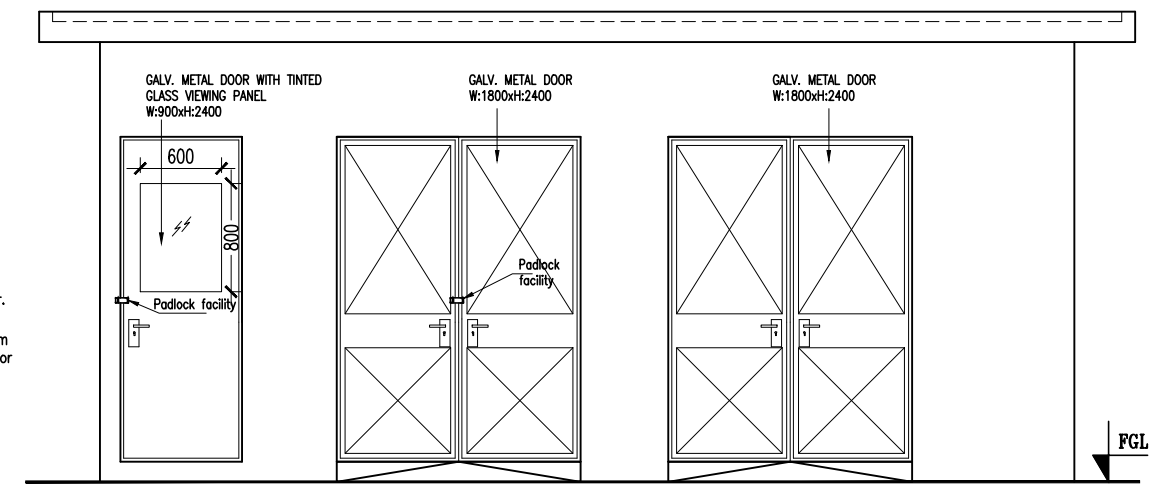


Diagram illustrating a checkered plate structure. The plate is shown as a grid of squares, with a central section labeled "Checked Plate riveted with its support". A note indicates: "Provision should be made for lifting of checkered plates". The plate is supported by a structure labeled "Support for Checkered Plate".

NOTES:

-
- Technical drawing of a CEB (Concrete Embedded) section, showing structural details and dimensions. The drawing includes a cross-section of a wall and floor assembly.
- Dimensions and Labels:**
- Vertical Dimensions:** 450, 300, 400, 2400, 3100, 150, 50, 240, 1635, 700, 1200, 725.
 - Horizontal Dimensions:** 450, 500, 50, 1200, 700, 1200, 725.
 - Labels:** GALV. METAL DOOR, BEAM, REMOVABLE GMS COVER (Depth will depends on client's structural engineer) C/W CHECKERED PLATE (CONSIDERATION SHOULD BE MADE TO WEIGHT OF SWITCHGEAR PANELS & PERSONNEL), FGL, CEB SECTION, 2x50mm \varnothing pipes (Metering Cables), Meranti Wooden Cleat, ANGLED IRON SUPPORT, 4 Nos. PVC SLEEVE \varnothing 160 FOR CEB CABLES, FLOOR DUCT D:1200, SUMP HOLE 300x300x300 FILLED WITH LOOSE STONES.
 - Notes:** For Cable Support Details Refer To Drawing No : 6640-18.

Technical drawing of a cable trench layout, showing dimensions and labels:

- Dimensions:**
 - Overall width: 450
 - Overall height: 3100
 - CEB SECTION width: 1800
 - CLIENT SECTION width: 875
 - CEB SECTION height: 2800
 - Zone height: 1200
- Labels:**
 - CEB SECTION
 - CLIENT SECTION
 - DEMARCATION FENCING FROM FLOOR TO ROOF LEVEL (INCLUDING IN VOID - BY OTHERS)
 - Removable GMS cover c/w checkered plate
 - ZONE EARMARKED TO INSTALL STEP LADDER IN CABLE TRENCH. STEP LADDER SHALL NOT BE INSTALLED NEAR INCOMER MV PANELS.
 - GAP FOR FENCING
 - SUMP HOLE 300x300x300 FILLED WITH LOOSE STONES
 - 4 Nos. PVC SLEEVE #160 FOR CEB CABLES
 - FGL (Finished Ground Level)

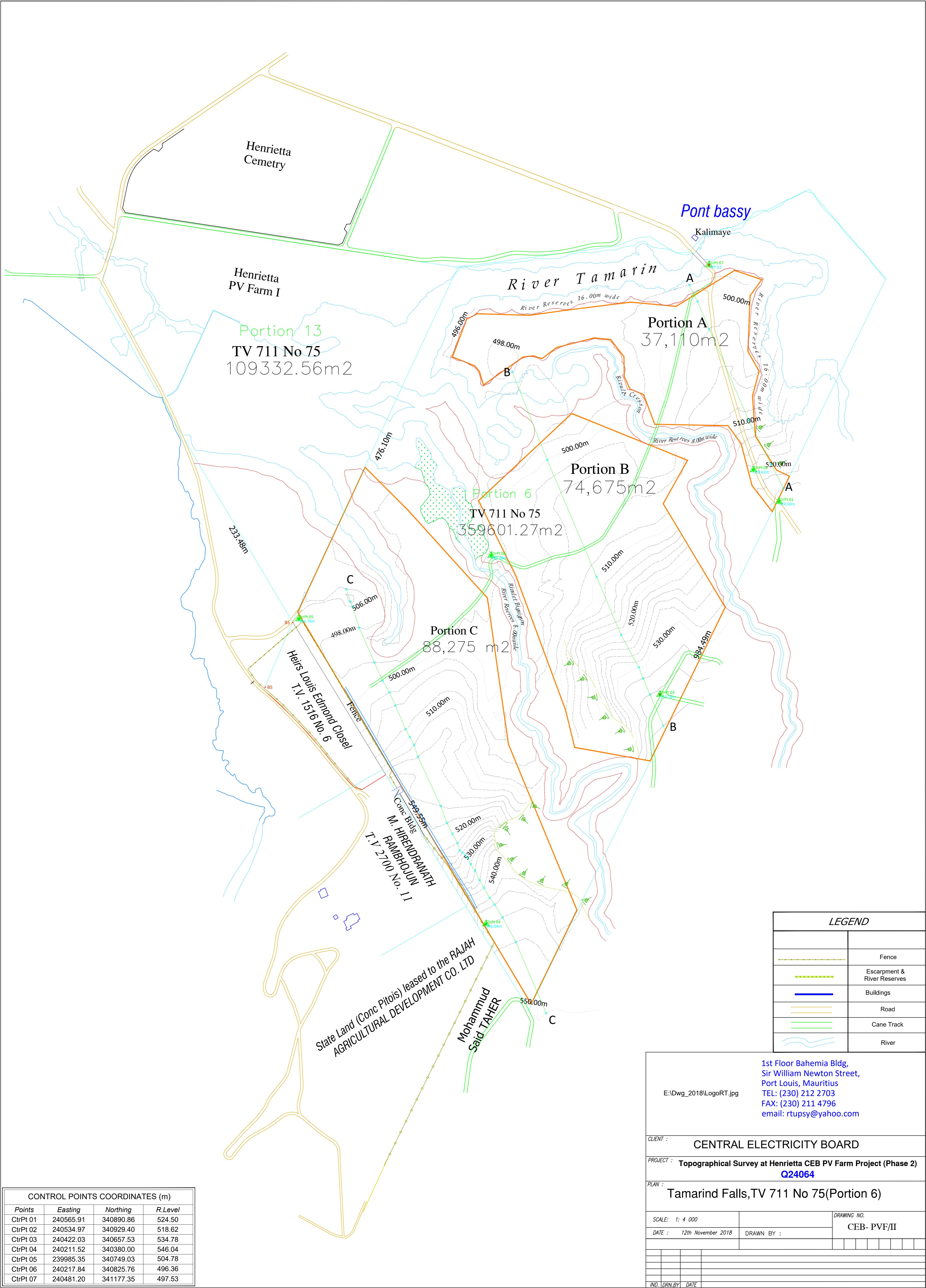
SECTION B-B

CENTRAL ELECTRICITY BOARD

P.O BOX 40 ROYAL ROAD CUREPIPE MAURITIUS



DRAWING No	6645-18



Geotechnical Investigations at Henrietta PV Farm Phase 2

**For : Central Electricity
Board**



Final Report

**Prepared by:
Water Research Co. Ltd.**

Date: 27 June 2019

Report for

Central Electricity Board
Cooperate Office
P.O Box 134
Rue du Savior, Cybercity
Ebene 72201,
Mauritius

Geotechnical Interpretative Report

Water Research Co. Ltd

OPG 19068 CEB

27 June 2019

Main Contributors

Davissen Govindan/Tulasi Vancharla/Emilio Saldivar

Issued by

.....
Davissen Govindan

Checked by

.....
Tulasi Vancharla

Approved by

.....
Emilio Saldivar

Document Revisions

No.	Details	Date
1	Final Report	27 June 2019

Executive Summary

The Central Electricity Board (CEB) intends to further develop the region of Tamarin Falls to accommodate phase 2 of the PV Farm project which comprises the installation of numerous Photovoltaic solar panels and a main building. Water Research Co. Ltd was commissioned by the CEB to carry out a ground investigation and geotechnical assessment of the site to support the design of the development and understand the geotechnical risks that may be present. The ground investigation site works were carried out between 13th February 2019 and 26th March 2019 and included 8Nos. Trial Pits and 9Nos. Coreholes

The ground profile identified consisted mostly of Residual Soil to Completely Weathered Basalts. For the purpose of the analysis, the ground profile was considered as infinite layer of Residual Soil to Completely Weathered Basalts. The proposed development consists of a main building and solar PV panels. On the basis of the soil characteristics and loads expected, conventional pads and strip footings may be considered as options for foundations, which are adequate to sustain 135kPa bearing pressure for the main building and solar PV panels.

Vertical excavations for foundations are likely to be possible with a standard backhoe machine excavator, as proven by the trial pitting during the ground investigation. However, excavations below the groundwater level cause rapid rise and will flood the excavation area. Groundwater control measures will therefore be required at the site prior to initiating any excavation deeper than 1.5m without a cut-off wall.

As the Residual Soil / Completely Weathered Basalt is highly plastic and expansive in nature, it should therefore not be used as structural fill. In addition, NHBC (2014) states that "Fill containing expansive materials is not acceptable for use as support to structural foundations and slabs or as backfill to associated trenches".

For such type of development, wind (uplift) load is significant in the design and operation of the foundation. In this case, it has been found that the two major uplift forces arise due to the wind and water. It is likely that the RS / CWB will not offer adequate capacity for the pullout resistance, therefore the foundations need to be anchored.

With reference to the Highways Agency Interim Advice Note 73/06 (2009), the minimum permitted design California Bearing ratio (CBR) is 2.5%, otherwise some forms of engineering solutions are required. Based on DCPT tests results, it can be prudently assumed that the subgrade has a CBR value less than 2.0% The effect of water is expected to have a significant impact on the Residual Soil / Completely Weathered Basalt, but it is unknown if the subgrade can be improved with compaction.

Contents

Executive Summary	ii
1. Introduction	1
2. Desk Study Information	2
2.1 Site location and topography	2
2.2 Geology	5
2.3 Soil type	6
2.4 Hydrology	7
3. Field and Laboratory work	8
3.1 Rotary Core Drilling	8
3.2 Trial Pits	8
3.3 Standard Penetration Test	11
3.4 Plate Load Test	11
3.5 Dynamic Cone Penetrometer Test	12
3.5.1 Electrical resistivity	13
3.6 Laboratory Testing	13
4. Results and Ground Conditions	14
4.1 Identified Soil Profile	14
4.2 Topsoil	16
4.3 Residual Soil including Residual Soil to Completely Weathered Basalt	16
4.4 Completely Weathered Basalt	16
4.4.1 SPT	16
4.5 Piezometric groundwater level	19
4.6 Dynamic Cone Penetration Test	19
4.7 Classification Laboratory Testing	20
5. Geotechnical Engineering Assessment	21
5.1 Introduction	21
5.2 Stratigraphy and ground water table	21
5.3 Soil parameters	21
5.3.1 Residual Soil / Completely Weathered Basalt	22
5.4 Volume change potential	22
5.5 Shallow Foundations	23
5.5.1 Bearing Capacity	23

5.5.2	Settlement	24
5.6	Excavatability and groundwater control	25
5.7	Uplift resistance	25
5.8	Anchor Foundations	25
5.9	Pavement and hardstandings	26
5.10	Conclusion and recommendations	26
6.	References	27
	Appendices	28
	Appendix A: Corehole Logs	29
	Appendix B: Corehole Photographs	30
	Appendix C: Trial Pit Logs	31
	Appendix D: Trial Pit Photographs	32
	Appendix E: Plate Load Test Results	33
	Appendix F: DCPT Results	34
	Appendix G: SPT Graph	35
	Appendix H: Lab Results	36
	Appendix I: Electrical Resistivity Report	37

LIST OF TABLES

Table 3-1 - Summary of rotary drilled coreholes	8
Table 3-2 - Summary of Trial Pits	9
Table 3-3 - Location and depths of plate load test	12
Table 3-4 - Summary of DCPT tests	12
Table 3-5 - Schedule and Standards for Laboratory Tests	13
Table 4-1 - Summary of the depth of encountered strata in meters	15
Table 4-2 - Summary of SPT	16
Table 4-3 - Summary of groundwater level.	19
Table 4-4 - Summary of DCPT Results	19
Table 4-5 - Summary of Classification Tests Results	20
Table 5-1 - Geological Profile	21
Table 5-2 - Summary of volume change potential	22
Table 5-3 - Summary of plate load test results	23
Table 5-4 - Summary of bearing capacity results	24
Table 5-5 - Summary of predicted settlement	24

LIST OF FIGURES

Figure 2-1: Location Plan	2
Figure 2-2: Site Photos	3
Figure 2-3: Google Earth 10 years span photographs	4
Figure 2-4: Geological Map of Site	5
Figure 2-5: Soil Map of Mauritius	6
Figure 2-6: Hydrological Map	7
Figure 3-1: Location of Coreholes and Trial Pits	10
Figure 4-1: SPT Graph	18

1. Introduction

The Central Electricity Board (CEB) intends to further develop the region of Tamarin Falls to accommodate phase 2 of the PV Farm project which comprises the installation of numerous Photovoltaic solar panels. Water Research Co. Ltd was commissioned by the CEB to carry out a ground investigation and geotechnical assessment of the site to support the design of the development and understand the geotechnical risks that may be present. This Geotechnical Interpretative Report sets out the findings of the ground investigation and assessment.

The geotechnical investigation was performed to assess the soil or rock profile, identify the groundwater level and assess any geotechnical aspect of the proposed site in relation to the development. Water Research's brief comprised the following items:

- Excavate, inspect, sample, log and photographs of Trial Pits;
- Rotary drill, log and photographs of coreholes;
- Geophysical survey – Vertical Electrical Resistivity Sounding tests;
- Field tests comprising Plate Load Tests, Cone penetration tests, Standard Penetration tests at various depths; and
- Geotechnical assessment.

This Report is presented in the following format:

- Desk study information: including geological maps and plans
- Factual information: comprising description of fieldwork; exploratory hole logs and in-situ test results
- Geotechnical assessment: comprising profile definition; general recommendations for selection of foundation solutions, including bearing capacity and settlement assessments.

2. Desk Study Information

2.1 Site location and topography

The site is located approximately 130m to the east of Tamarind Falls reservoir and approximately 450m to the south east of Henrietta Cemetery. A site location plan is presented as Figure 2.1. The site occupies an area of 359,601.27m². The site comprised mainly of agricultural land (sugar cane field and farmers' crops) and dense forest. The sugar cane crops were mostly localised in the south west of the site as shown in Figure 2.2A. The farmers' crops were localised in the east of the site. The south west of the site is partly bounded by the "7 Cascades Restaurant & Lodges" property as shown in Figure 2.2B. River Tamarin crosses the north and north west of the site as shown in Figure 2.2C. The general topography of the land shows that the site is a v shaped valley with elevations varying from 500.0m amsl to 548m amsl according to google earth.



Figure 2-1: Location Plan



Figure 2-2A Sugar cane crops and dense vegetation



Figure 2.2B “7 Cascades Restaurant & Lodges”



Figure 2-2C River Tamarin

According to the 10 years span photographs, the area under investigation has not been used for development other than agricultural use as shown in Figure 2.3.

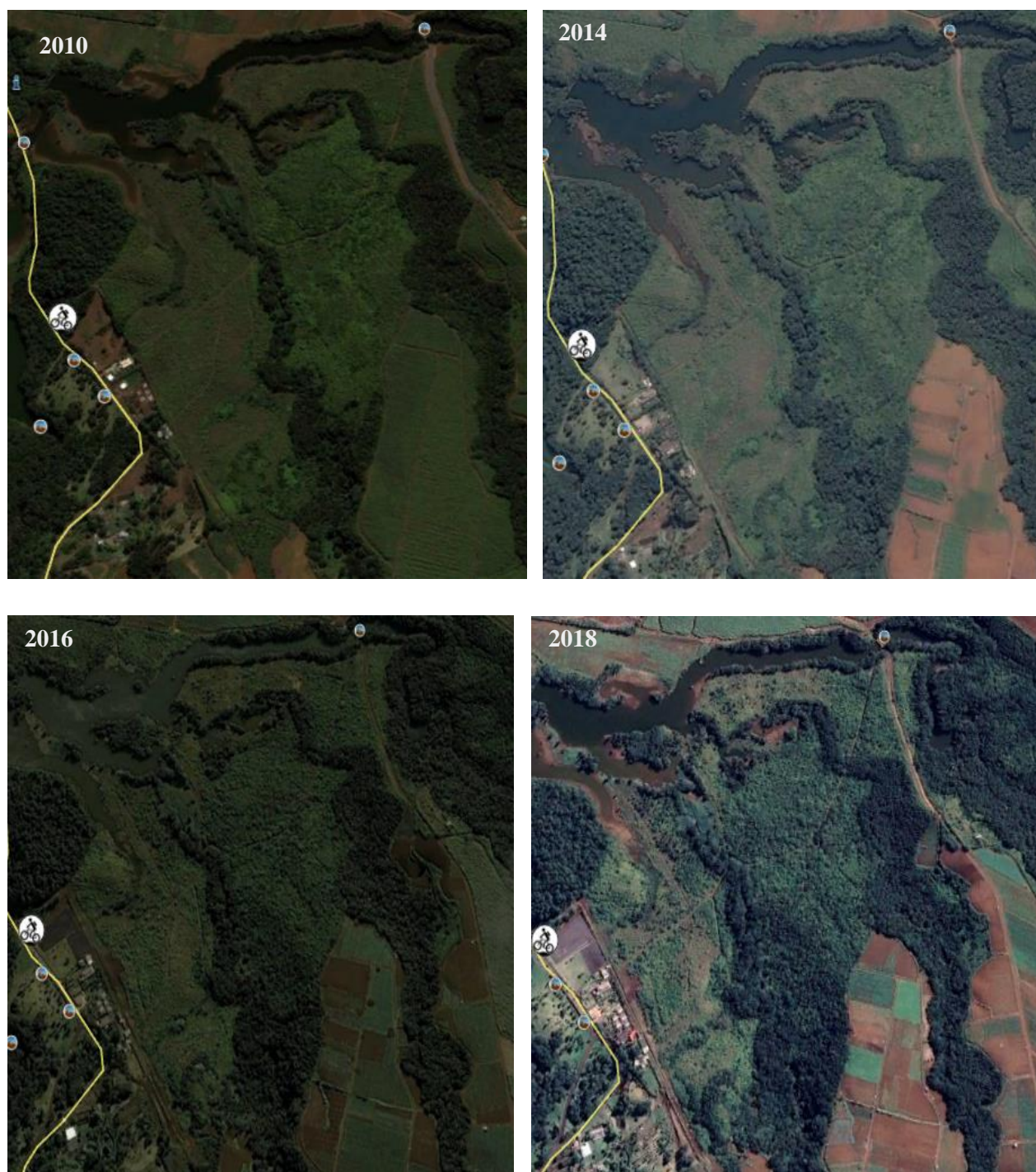


Figure 2-3 Google Earth 10 years span photographs

2.2 Geology

According to Ile Maurice Carte Geologique et Hydrogeologique (1996), presented as Figure 2.4, the area under investigation is located on weathered basalt and pyroclasts of the Intermediate Volcanic Series which are generally composed of basaltic flows overlying basalt agglomerate. The basalts are not very homogeneous in composition and are made up of fine-grained olivine rocks, grey to black in colour. The very compact types are rather rare and are in general porous and often vesicular, the vesicles being sometimes infilled with a powdery bluish material. They are also slightly fissured and in some places the fissures and cavities are filled with light cream coloured clay (Proag, 1995). Boulders within profiles of highly weathered basalt are expected to be widely distributed at this site.

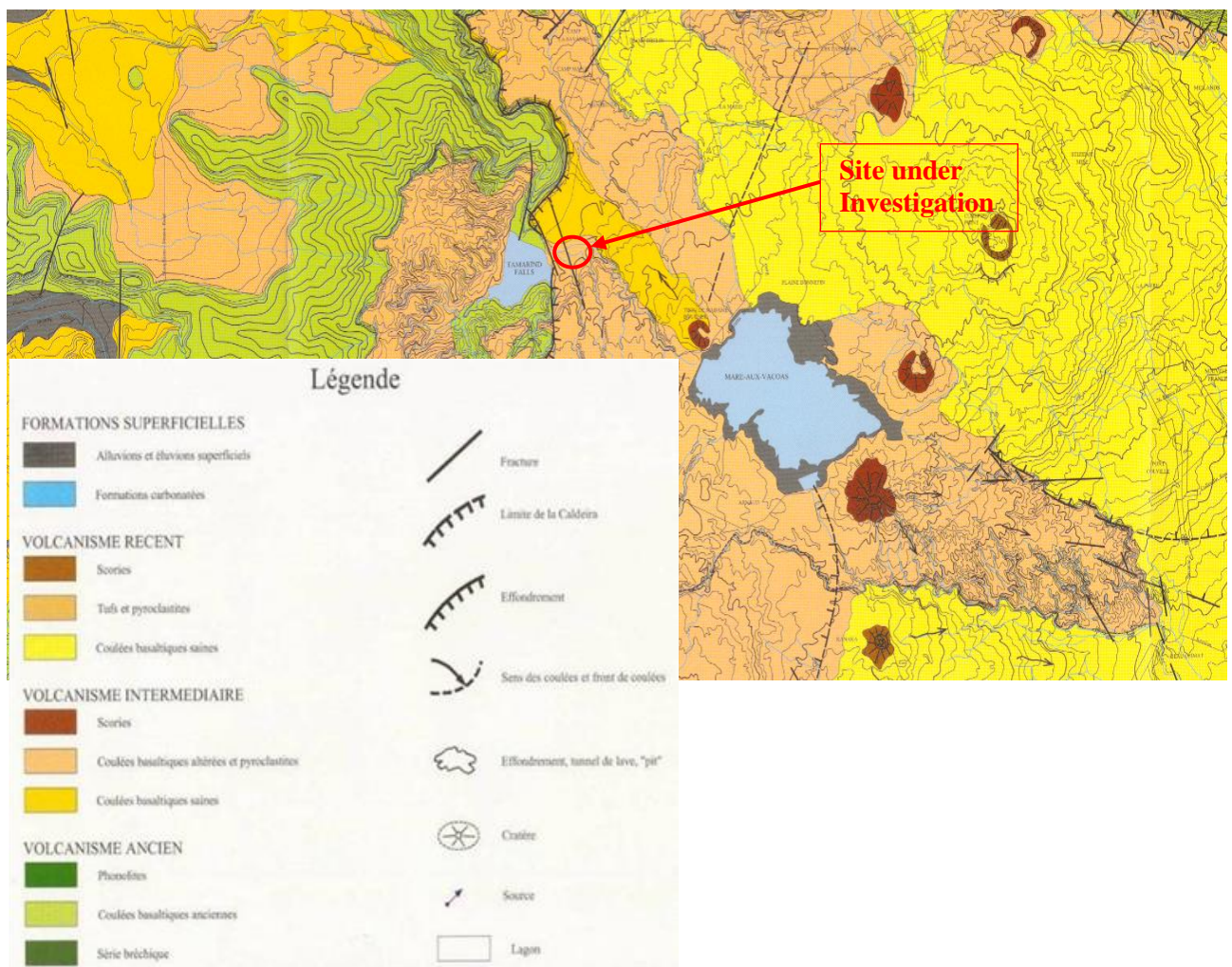


Figure 2-4 Geological map of site.

2.3 Soil type

According to the Soil Map of Mauritius (Figure 2.5), Proag (1995), the surface soil on the site area consists of Humic Ferruginous Latosols. These soils occur within the rainfall zone 2,500mm to over 5,000mm annually on almost flat to sloping land, moderately dissected in parts and have been formed from Early and Intermediate Lavas of the Younger Volcanic Series. The typical profile consists of thin (less than 30cm) A¹ horizon rich in organic matter (7-10%), a crumb structured A² horizon over a compact B horizon. Although the infiltration rate is good, the compact B horizon restricts drainage.

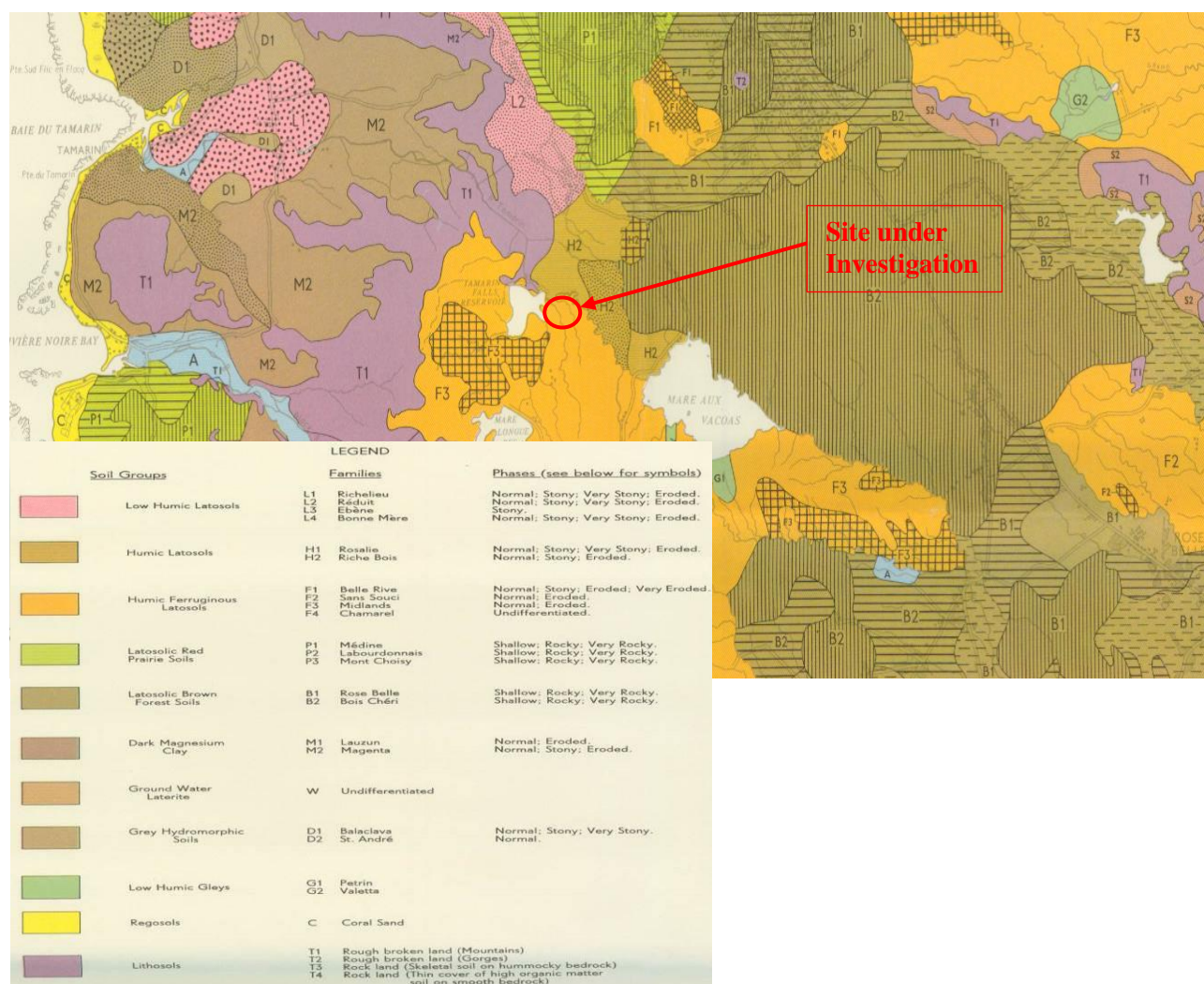


Figure 2-5 Soil map of site

2.4 Hydrology

The River Tamarin and watercourses in the vicinity of the site generally drain towards Tamarin Falls Reservoir.

The map of aquifers of Mauritius (Giorgi et al., 1999), presented as Figure 2.6 shows that the site is underlain by the common recharge zone of the principal aquifers. The Hydrology Data Book (Nov 1999 – Oct 2005), published by the Ministry of Public Utilities indicate that the mean annual rainfall 91971 – 2000) in that particular area is about 2000mm.

High rainfall rates generally result on soft saturated strata.

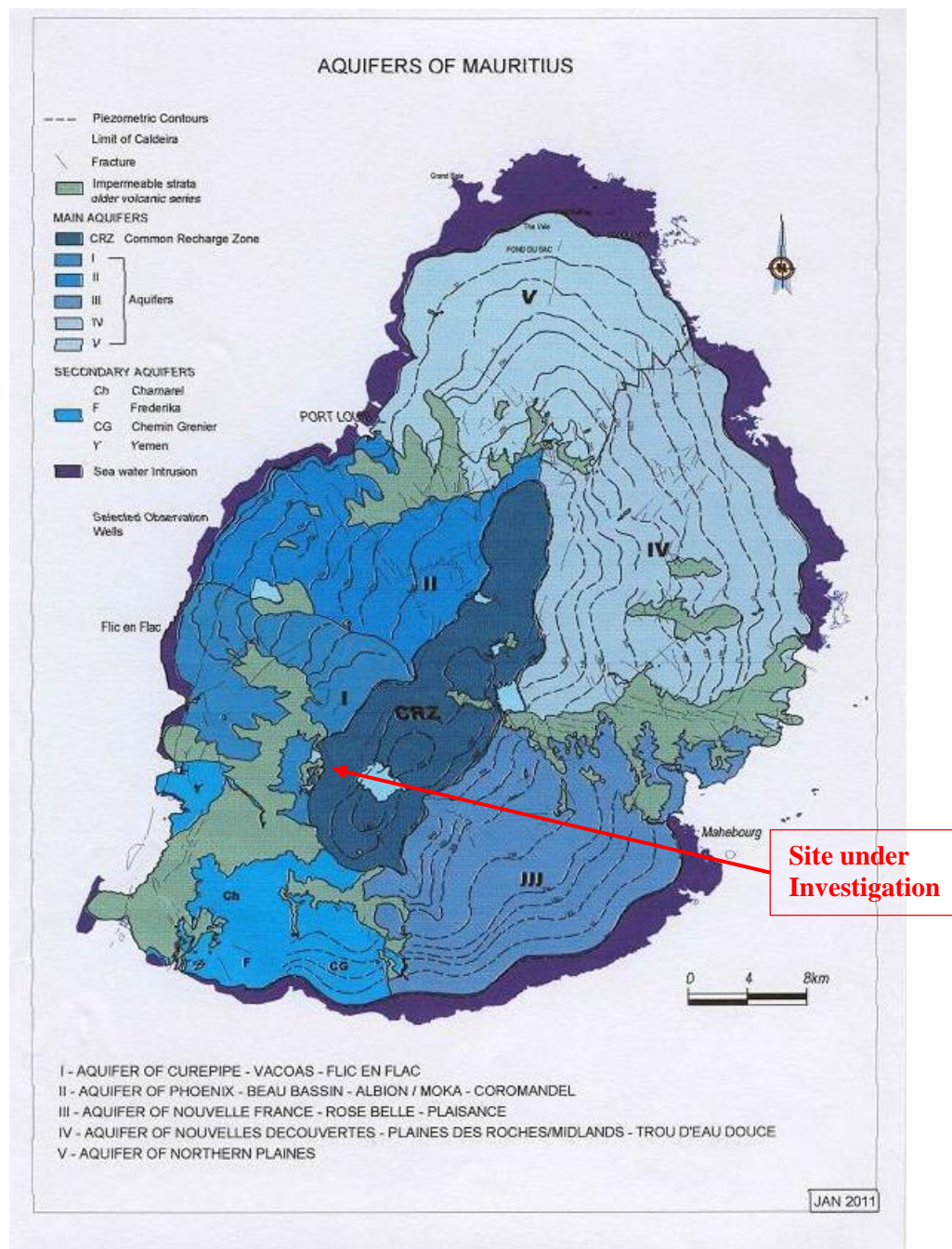


Figure 2-6 Hydrological map of the site

3. Field and Laboratory work

The ground investigation site works were carried out between 13th and 15th February 2019 for the trial pits and between 11th and 26th March 2019 for the coreholes at locations presented in [Figure 3.1](#). The scope of works was defined by the Client in the tender document; the fieldworks and the in-situ and laboratory tests were performed in accordance with relevant BS and ASTM standards. The following sections present the description of the investigation works.

3.1 Rotary Core Drilling

9Nos. coreholes were drilled on the site using rotary drilling techniques to determine and delimit the ground profile – the locations, depth and coordinates of the coreholes are shown in Figure 3.1 and Table 3-1 - **Summary of rotary drilled coreholes**

Core recovery drilling was completed using a single tube core barrel for dry-coring in soils (hole diameter 88.9mm and core diameter 76.2mm) and NX triple tube core barrel for drilling in rock (hole diameter 76mm and core diameter 52mm) followed by P/NW casing (outside diameter of 88.9mm and inside diameter of 76.2mm). Dry coring is drilling without the circulation of water and is done in soft/weak stratum.

Table 3-1 - Summary of rotary drilled coreholes

Corehole No.	Depth (m)	Easting (m)	Northing (m)	Elevation (m)
BH 1	17.00	548934.00	7748740.00	506.0
BH 2	17.00	548991.00	7748740.00	506.0
BH 3	17.00	549084.00	7748574.00	516.0
BH 4	17.28	549067.00	7748506.00	518.0
BH 5	17.00	549178.00	7748315.00	548.0
BH 6	17.00	549329.00	7749066.00	500.0
BH 7	17.00	549253.00	7748872.00	502.0
BH 8	17.00	549296.00	7748780.00	509.0
BH 9	17.18	549312.00	7748620.00	530.0

The core samples recovered from the rotary coreholes were photographed, sampled and logged by an Engineer according to BS5930: 2015. The geological descriptions are presented in the corehole logs along with the assessment of Total Core Recovery (TCR), Solid Core Recovery (SCR) and Rock Quality Designation (RQD), each expressed as a percentage of the individual core runs. Fracture Index (FI) representing the number of clearly identifiable fractures per meter of intact core pieces is also reported. The corehole logs and photos are presented in Appendix A and B respectively.

3.2 Trial Pits

9Nos. Trial Pits were excavated in order to assess the shallow soil profile for foundations of low-rise buildings and earthworks. The Trial Pits were excavated using a mechanical backhoe excavator to the depths shown in Table 3.2. An

Engineer logged the Trial Pits from the surface immediately after excavation. The logs and photos of the Trial Pits are presented in Appendix C and D respectively.

Table 3-2 - Summary of Trial Pits

TP No.	Depth (m)	Easting	Northing	Location
TP 1	3.40	548944.00	7748761.00	506.0
TP 2	3.60	549034.00	7748783.00	506.0
TP 3	3.70	549093.00	7748676.00	516.0
TP 4	3.50	548992.00	7748649.00	518.0
TP 5	3.00	549151.00	7748421.00	548.0
TP 6	3.20	549307.00	7749067.00	500.0
TP 7	3.30	549231.00	7748859.00	502.0
TP 8	3.20	549232.00	7748742.00	509.0
TP 9	3.00	549357.00	7748672.00	530.0

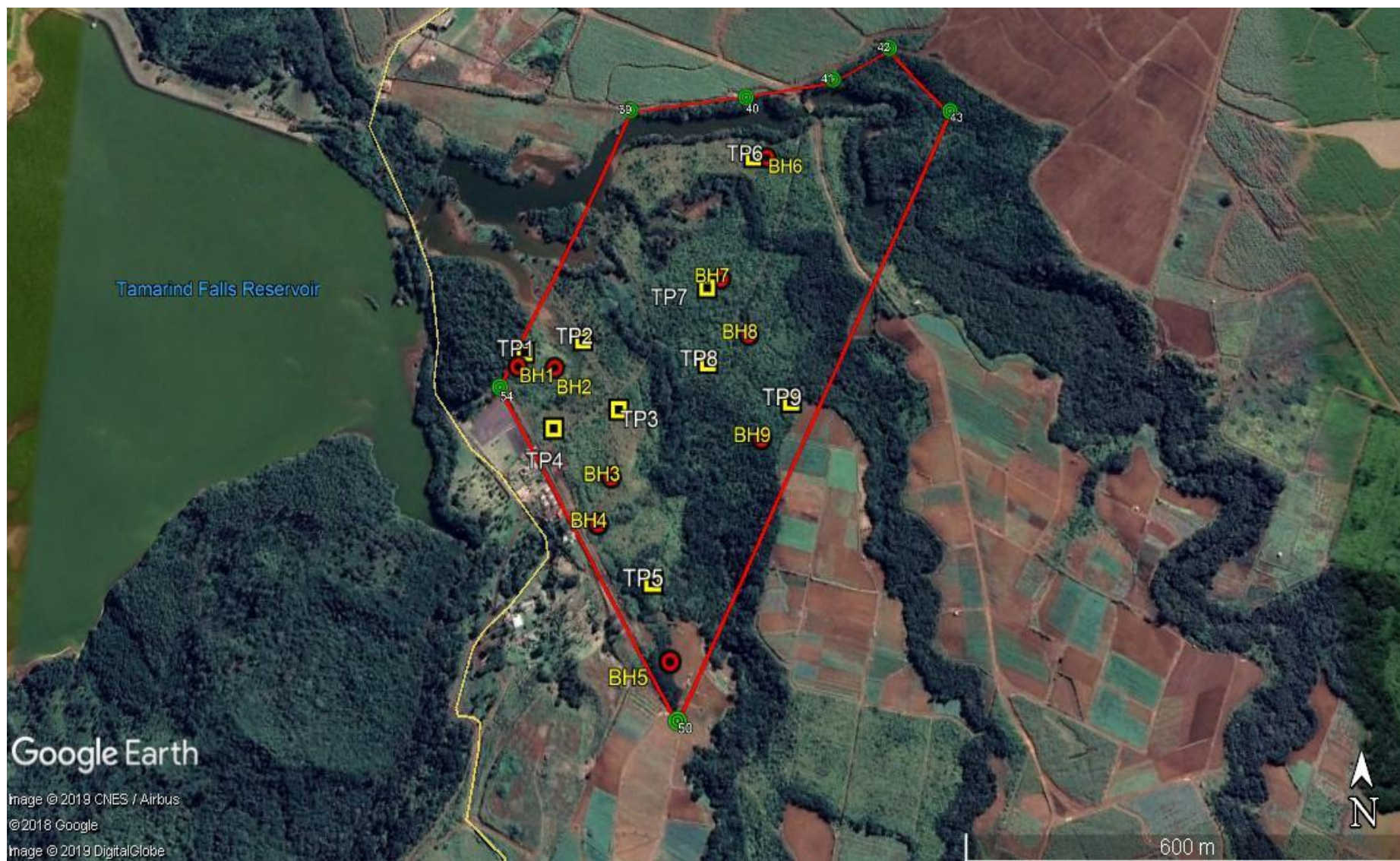


Figure 3.1 - Location of core holes and Trial Pits

3.3 Standard Penetration Test

68Nos. Standard Penetration Tests (SPT) were carried out in accordance with BS 1377 (1990). The test consists of driving a 50mm split spoon by means of a 63.5kg hammer falling a height of 760mm. The SPT blow count N is the number of blows required to drive the spoon by 300mm after initially seating the spoon by 150mm. Tests for which the full penetration of 450mm could not be achieved after 50 blows are termed as "Refusals".

3.4 Plate Load Test

8Nos Plate Load Tests were scheduled to be carried out with a Geotechnical Testing Equipment's hydraulically jacked system. Only 6 Nos Plate Load Tests were carried out. The remaining 2 Nos were cancelled out due to difficulties in accessing the tests positions. The tests were carried out in accordance with BS1377: Part 9:1990 using diameter plate of 300mm on a maintained load basis and following the procedure:

1. Apply seating load to produce deflection between 0.25 mm and 0.51 mm.
2. Record and release load.
3. Apply $\frac{1}{2}$ seating load.
4. Allow dial needles to come to rest.
5. Set dial needles to zero.
6. Apply load above $\frac{1}{2}$ seating load.
7. Allow action of load to continue until rate of deflection of not more than 0.03 mm/min has been maintained for at least two consecutive minutes.
8. Record load and deflection readings for applied load increment.
9. Apply next loads increments up to maximum or failure, each time repeating (7)
10. For final load increment maintain load until deflection of not more than 0.03 mm/min for at least two consecutive minutes.
11. Unload in steps and release the load to load at which dial gages were set to zero.

The location and depths are shown in Table 3.3 and the complete set of results and the load displacement curves are presented in Appendix E.

Table 3-3 - Location and depths of plate load test

TP No.	PLT No.	Depth (m bgl)	Stratum
TP 1	PLT 6	1.8	CWB to RS
TP 2	PLT 5	1.2	CWB to RS
TP 3	PLT 4	2.0	CWB to RS
TP 6	PLT 1	1.5	CWB
TP 7	PLT 2	1.5	CWB to RS
TP 8	PLT 3	2.0	CWB to RS

3.5 Dynamic Cone Penetrometer Test

8 Nos TRRL type (Ref. 6) dynamic probing tests were carried out at locations adjacent to the trial pits from the surface and up to depths shown in **Table 3-4**.

Table 3-4 - Summary of DCPT tests

TP No.	Depth (m)	Stratum
TP 1	1.8	CWB to RS
TP 2	1.2	CWB to RS
TP 3	2.0	CWB to RS
TP 5	1.5	CWB to RS
TP 6	1.5	CWB
TP 7	1.5	CWB to RS
TP 8	2.0	CWB to RS
TP 9	1.3	CWB to RS

Dynamic probing involves driving a 20mm diameter solid cone (60° angles) into the ground using repeated blows of a hammer with a mass of 8kg, falling a distance of 575mm. Typically, the rate of driving is between 15 to 30 blows per minute. As the cone is driven into the ground, the number of blows for each 100mm penetration is recorded. The penetration resistance provides a measure from which the California Bearing Ratio (CBR) can be calculated using the following formula:

$$\text{Log}_{10}(\text{CBR}) = 2.48 - 1.057 \log_{10}(\text{mm/blow})$$

The details of the tests, the penetration vs blows and CBR results are presented in Appendix F. The concrete surfaces at the location of the tests were removed prior to the execution of the tests.

3.5.1 Electrical resistivity

Stratagem 974 carried out the Vertical Electrical Resistivity Soundings in 8 locations using the Wenner 4-point method, in accordance with the ASTM International Standard G57-06 and IEEE Standard 81-2012. The report is enclosed in Appendix I.

3.6 Laboratory Testing

The schedule of laboratory testing is presented in Table 3-5.

Table 3-5 - Schedule and Standards for Laboratory Tests

Test	Number of Tests	Standard
Moisture Content	15	BS 1377: Part 2, Section 1
Liquid Limit (LL) and Plastic Limit (PL)	15	BS 1377: Part 2, Section 4 & 5
Particle Size analysis (wet sieving only)	15	BS 1377: Part 2
Bulk Density	15	BS 1377: Part 8
Soil pH Test	8	BS 1377: Part 7
Unconsolidated undrained Tri-axial	5	BS 1377: Part 8
Consolidated drained Tri-axial	5	BS 1377: Part 8

4. Results and Ground Conditions

This Chapter summarises the data obtained during the investigation works.

4.1 Identified Soil Profile

The depth and thickness of the various strata as observed in the exploratory holes are shown in the corehole logs and trial pit logs presented in Appendix A and Appendix C and summarised in Table 4-1. The following definitions were considered for weathered basalts:

- Fresh - No visible sign of rock material weathering; perhaps slight discoloration on major discontinuity surfaces. No visible sign of rock material weathering; only slight discoloration on major discontinuity surfaces.
- Slightly weathered (SWB) - Discoloration indicates weathering of rock material and discontinuity surfaces. Distinctly weathered through much of the rock fabric with slight limonite staining. Strength approaches that of the fresh rock. Requires explosive for excavation. Highly permeable open joints.
- Moderately weathered (MWB) - Less than half of the rock material is decomposed or disintegrated. Fresh or discoloured rock is present either as a continuous framework or as core stones. Considerably weathered throughout. Possessing some strength – large pieces cannot be broken by hand, reasonable core recovery. Often limonite stained. Difficult to rip.
- Highly weathered (HWB) - More than half of the rock material is decomposed or disintegrated. Fresh or discoloured rock is present either as a discontinuous framework or as core stones. Rock so weakened by weathering that fairly large pieces can be broken and crumbled in the hands. Sometimes recovered as core in careful rotary drilling.
- Completely weathered (CWB) - All rock material is decomposed and/or disintegrated to soil. The original mass structure is still largely intact. Rock completely decomposed by weathering in place but texture still recognisable. Can be excavated by hand.
- Residual soil - All rock material is converted to soil. The mass structure and material fabric are destroyed. There is a large change in volume, but the soil has not been significantly transported. No recognisable rock textures. Surface layer contains humus and plant roots.

The general ground profile identified consisted of Top Soil overlying Residual Soils to Completely Weathered Basalt. The summary of the strata encountered is presented in Table 4.1. The following sections present the information gathered for each of the encountered strata.

Table 4-1 - Summary of the depth of encountered strata in meters

Exploratory Hole No.	Topsoil		RS and RS to CWB		CWB	
	Depth (m bgl)	Thick (m)	Depth (m bgl)	Thick (m)	Depth (m bgl)	Thick (m)
TP 1	0.00 – 0.20	0.20	0.20 – 3.40	3.20		
TP 2	0.00 – 0.40	0.40	0.40 – 3.60	3.20		
TP 3	0.00 – 0.40	0.40	0.40 – 3.70	3.30		
TP 4	0.00 – 0.40	0.40	0.40 – 3.50	3.10		
TP 5	0.00 – 0.50	0.50	0.50 – 3.00	2.50		
TP 6	0.00 – 0.30	0.30	0.30 – 3.20	2.90		
TP 7	0.00 – 0.40	0.40	0.40 – 3.30	2.90		
TP 8	0.00 – 0.30	0.30	0.00 – 3.20	3.20		
TP 9	0.00 – 0.20	0.20	0.20 – 3.00	2.80		
BH 1			0.00 – 9.00	9.00	9.00 – 17.00	8.00
BH 2	0.00 – 0.20	0.20			0.20 – 17.00	16.80
BH 3			0.00 – 17.00	17.00		
BH 4			0.00 – 17.28	17.28		
BH 5			0.00 – 17.00	17.00		
BH 6	0.00 – 0.48	0.48			0.48 – 17.00	16.52
BH 7			0.00 – 17.00	17.00		
BH 8	0.00 – 0.35	0.35	0.35 – 17.00	16.65		
BH 9			0.00 – 17.18	17.18		

4.2 Topsoil

Topsoil was encountered in all exploratory holes except for BH1, BH3, BH4, BH5, BH 7 and BH 9 from the surface up to a maximum depth of 0.5m with an average of 0.34m. Topsoil was described as dark brown very gravelly high plasticity clay with frequent rootlets.

4.3 Residual Soil including Residual Soil to Completely Weathered Basalt

Residual Soil including Residual Soil to Completely Weathered Basalt were encountered in all exploratory holes except for BH 2 and BH 6. This stratum was encountered up to a maximum depth 17.28m in BH 4 with an average of 15.9m. This stratum was generally described as:

- Soft to firm dark brown to reddish brown very high plasticity silty clay.
- Stiff reddish brown slightly gravelly high plasticity silty clay.

4.4 Completely Weathered Basalt

Completely Weathered Basalts were encountered in BH 1, BH 2 and BH 6 only with maximum thickness encountered in BH 2. The average thickness of this stratum is 13.8m and was generally described as stiff brown high plasticity silty clay with rare cobbles.

4.4.1 SPT

The list of the SPTs carried out is shown in Appendix G. The variation of the SPT N value with depth for all the coreholes is presented in Table 4.2 and Figure 4-1.

Table 4-2 - Summary of SPT

TP/CH No.	Depth (m)	Stratum	SPT	Corrected SPT
BH 1	1.50	CWB-RS	18	21
	3.50	CWB-RS	8	51
	6.00	CWB-RS	15	18
	8.00	CWB-RS	10	12
	10.00	CWB	25	30
	12.00	CWB	27	32
	14.50	CWB	29	34
	16.50	CWB	34	40
BH 2	1.50	CWB	18	21
	3.50	CWB	21	25

	5.50	CWB	18	21
	8.00	CWB	24	28
	10.00	CWB	20	24
	12.50	CWB	23	27
	15.00	CWB	26	31
BH 3	1.50	RS	12	14
	3.50	RS	10	12
	4.50	RS	12	14
	6.50	RS	10	12
	8.50	RS	25	30
	11.00	CWB-RS	26	31
	13.50	CWB-RS	26	31
	15.50	CWB-RS	27	32
BH 4	1.50	RS	15	18
	3.50	RS	18	21
	5.50	RS	16	19
	7.50	RS	11	13
	10.00	RS	10	12
	12.50	RS	10	12
	15.00	RS	10	12
BH 5	1.50	RS	12	14
	3.50	RS	11	13
	5.50	RS	13	15
	7.50	RS	9	11
	9.50	RS	9	11
	11.50	RS	10	12
	13.50	RS	9	11
	15.00	RS	10	12
BH 6	1.50	CWB	20	24
	4.00	CWB	22	26
	6.50	CWB	21	25
	11.50	CWB	32	38
	14.50	CWB	42	50
	16.50	CWB	32	38
BH 7	4.00	RS	18	21
	6.00	RS	32	38
	8.50	RS	9	11
	10.50	CWB-RS	45	53
	13.00	CWB-RS	47	56
	15.00	CWB-RS	47	56
BH 8	1.50	RS	19	22
	3.50	RS	22	26
	6.00	RS	15	18
	8.00	RS	17	20
	10.00	RS	19	22
	12.00	RS	14	17

BH 9	14.00	CWB-RS	32	38
	16.00	CWB-RS	34	40
	1.50	RS	16	19
	4.00	RS	13	15
	6.00	RS	13	15
	8.00	RS	19	22
	10.00	RS	8	9
	12.00	RS	18	21
	14.00	RS	15	18
	16.00	RS	13	15

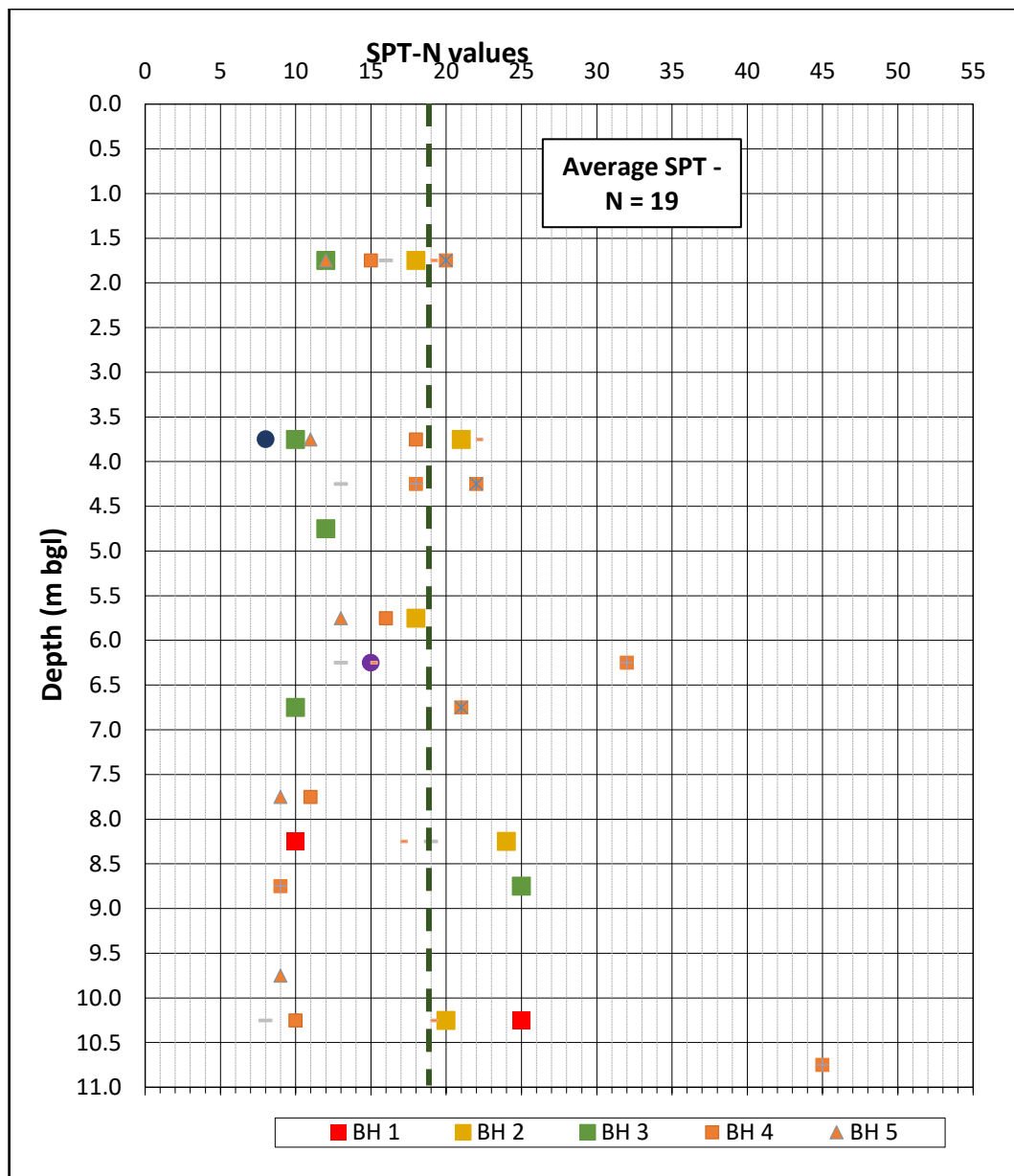


Figure 4-1: SPT values variation with depth

4.5 Piezometric groundwater level

The piezometric ground water level was recorded at the time of drilling for coreholes and during excavation for the trial pits. Groundwater measured from coreholes may be associated with water used during drilling. The summary of the recorded ground water level is shown in **Table 4-3 - Summary of groundwater level.**

Table 4-3 - Summary of groundwater level.

Exploratory hole	GW Strike depth (m bgl)	GW Strike elevation (m amsl)
TP 2	1.90	504.1
TP 4	3.50	514.5
TP 6	3.20	496.8
BH 2	1.50	504.1
BH 6	3.00	497.0

4.6 Dynamic Cone Penetration Test

The DCP tests were carried out at the following depths as shown in **Table 4-4.**

Table 4-4 - Summary of DCPT Results

Trial Pit	Sample Description	Depth (m bgl)	Displacement (mm)	Blows	Disp/Blows (mm/blow)	Estimated CBR Value (%)
TP 1		1.8	915	16	57.19	3.45
TP 2		1.2	914	15	60.93	3.07
TP 3		2.0	886	25	35.44	5.69
TP 5		1.5	907	12	75.58	1.49
TP 6		1.5	909	24	37.88	5.28
TP 7		1.5	868	34	25.53	4.82
TP 8		2.0	885	24	36.88	5.34
TP 9		1.3	909	72	12.63	10.38

4.7 Classification Laboratory Testing

Results of Atterberg Limits and Particle Size Distribution (PSD) laboratory tests on RS-CWB stratum are shown in Table 4.5. **Error! Reference source not found.**4 shows the particle size distribution of the collected samples. The laboratory certificates are enclosed in Appendix E: .

Table 4-5 - Summary of Classification Tests Results

TP/BH No.	Depth (m)	Stratum	Natural Moisture Content (%)	Atterberg Limits (LL, PL, PI)			PSD (%)		
				PL	LL	PI	Clay Silt	Sand	Gravel
TP 1	0.20 – 1.50	clayey SILT	60	52	85	34	53	14.7	31.4
TP 1	1.50 – 3.40	clayey SILT	64	55	95	39	58.1	15.9	26.0
TP 2	0.40 – 1.50	very gravelly SAND	64	60	116	57	22.3	49.1	28.6
TP 2	1.50 – 3.50	very gravelly SAND	64	54	115	61	19.8	46.4	33.8
TP 3	0.40 – 1.70	silty CLAY	56	50	78	28	58.9	29.0	12.1
TP 3	1.70 – 3.70	silty CLAY	58	50	84	34	93.9	0.0	6.1
TP 5	0.50 – 3.00	gravelly SILT	49	42	57	15	43.5	9.1	47.4
TP 6	0.30 – 2.10	gravelly SAND	56	49	77	29	17.1	62.3	20.6
TP 6	2.10 – 3.20	gravelly SAND	56	44	79	35	4.9	71.2	23.9
TP 7	0.40 – 2.20	very silty GRAVEL	43	36	56	20	34.8	21.1	44.1
TP 7	2.20 – 3.30	very silty GRAVEL	50	35	52	17	29.2	26.9	43.9
TP 8	0.30 – 1.10	clayey SILT	60	64	133	69	63.6	11.4	25.0
TP 8	1.10 – 3.20	clayey SILT	54	64	143	79	62.2	13.1	24.7
TP 9	0.20 – 1.20	very silty GRAVEL	33	30	40	10	34.4	25.8	39.8
TP 9	1.20 – 3.00	very silty GRAVEL	31	36	44	8	26.5	28.8	44.7

5. Geotechnical Engineering Assessment

5.1 Introduction

The proposed development comprises a PV farm and a main building. While the vertical downward loads of the PV structures on the foundation may be small, the structures required uplift resistance to sustain wind load. Shallow (strip, pad) foundations or anchors are the usual solution for such development. The following sections discussed the foundation alternatives and other geotechnical issues including:

- Volume change potential;
- Bearing capacities and settlement analyses;
- Excavatability and groundwater control;
- Uplift resistance (including alternative solutions)
- Strength of pavement and hardstandings.

5.2 Stratigraphy and ground water table

Based on the observed strata sequence, the strength characteristics and the expected type of foundation solution and stresses that would be produced on the ground, an idealised stratigraphic sequence for the site has been determined as presented in Table 5.1. The thickness of the Residual Soil / Completely Weathered Basalt varies between 2.50m and 17.18m. For the purpose of the analysis, the Completely Weathered Basalts and the Residual Soils were grouped as one single stratum since they were found to share the same properties.

For the following discussion, a 7m thick layer is considered that overlies alternate layers of rock weathered basalt.

Table 5-1 - Geological Profile

Stratum	Depth to base of stratum (m bgl)
Topsoil	0.35
Residual Soil to Completely Weathered Basalt	0.35 – 17.28

The groundwater table is taken to be at 1.5m below ground level. However, it should be noted that water levels could vary significantly, being dependent on the seasons, the intensity of rainfalls, and the amount of run-off from surrounding areas.

5.3 Soil parameters

The Topsoil which is at a depth of 0.35 m bgl, is assumed to be removed and not forming a bearing stratum. Hence no parameters are provided for this stratum. The following abbreviations are used:

- γ_b = Bulk density
- S_u = Undrained shear strength

- c' = cohesion
- ϕ' = Angle of shearing resistance
- m_v = coefficient of volume compressibility

5.3.1 Residual Soil / Completely Weathered Basalt

Undrained shear strength

The undrained shear strength (S_u) of this stratum has been estimated from the available SPT test results using the expression $S_u = f_1 N$ (Stroud and Butler, 1975); f_1 is taken as 4.5. The correlated undrained shear strength indicates a range between 36 kPa and 190 kPa (mean 85kPa), indicating medium strength, according to BS 5930: 2015 – Table 9 Terms for classification of strength. For the purpose of the analysis, an SPT N-value of 15 was considered representing an Undrained Shear Strength of 67kPa.

Compressibility

The coefficient of compressibility, m_v has been calculated based on Stroud (1975) as $m_v = 1 / f_2 N$. As the Residual Soil / Completely Weathered Basalt is of high plasticity, f_2 is determined as 0.40. The compressibility value, based on SPT N-value of 15 was calculated as 0.16m²/MN indicating medium to high compressibility strata (Carter, 1983).

Unit weight

The laboratory density results show that the bulk density lies between 1.60 and 1.80 Mg/cm³. An average value of 1.70 Mg/cm³ was considered for the analysis.

5.4 Volume change potential

National Housing Building Standards (NHBC, 2014) states that shrinkable soils are those containing more than 35% fine particles and having a modified Plasticity Index of 10% or greater. The Modified Plasticity Index is defined as the Plasticity Index of the soil multiplied by the percentage of particles less than 425µm. The calculated Modified Plasticity Index results and the resulting volume change potential is presented in Table 5.2.

Table 5-2 - Summary of volume change potential

TP No.	Sample depth (m bgl)	Plasticity Index (%)	% of particles < 425 µm	Modified Plasticity Index (%)	Volume change potential
TP 1	0.20 – 1.50	34	62.1	21.11	Medium
TP 1	1.50 – 3.40	39	67.9	26.48	Medium
TP 2	0.40 – 1.50	57	38.1	21.72	Medium
TP 2	1.50 – 3.50	61	34.6	21.11	Medium
TP 3	0.40 – 1.70	28	60.5	16.94	Low

TP 3	1.70 – 3.70	34	93.9	31.93	Medium
TP 5	0.50 – 3.00	15	47.0	7.05	Low
TP 6	0.30 – 2.10	29	36.9	10.70	Low
TP 6	2.10 – 3.20	35	28.0	9.80	Low
TP 7	0.40 – 2.20	20	46.7	9.34	Low
TP 7	2.20 – 3.30	17	43.8	7.45	Low
TP 8	0.30 – 1.10	69	67.9	46.85	High
TP 8	1.10 – 3.20	79	68.6	54.19	High
TP 9	0.20 – 1.20	10	51.8	5.18	Low
TP 9	1.20 – 3.00	8	43.2	3.46	Low

The results indicate that the Residual Soil / Completely Weathered Basalt has low to high volume change potential. Considering, the minimum foundation depth should be 1.0m (NHBC, 2014). Strip, pads, raft, and pile and beam will be acceptable in shrinkable soils, provided that they are capable of supporting the applied loads without undue settlement and heave precautions.

5.5 Shallow Foundations

The foundation for the new structure has been assessed considering strip, pad and raft in the Residual Soil / Completely Weathered Basal assuming a maximum thickness of 17.0m.

5.5.1 Bearing Capacity

Plate load test

Table 5.3 presents the plate load test results that include the mean bearing pressure for 305mm plate and the average settlement.

Table 5-3 - Summary of plate load test results

TP No.	PTL No.	Depth (m)	Weather Conditions	Maximum mean Bearing Pressure (kPa)	Average settlement (mm)
TP 1	PLT 6	1.8	Heavy rainfall	499	19.83
TP 2	PLT 5	1.2	Cloudy	485	16.64
TP 3	PLT 4	2.0	Sunny	485	9.38
TP 6	PLT 1	1.5	Sunny	485	7.70
TP 7	PLT 2	1.5	Sunny	485	9.13
TP 8	PLT 3	2.0	Sunny	485	4.56

The settlement achieved during the tests are generally larger than those commonly obtained for plate load tests on typical Mauritian clayey weathered basalts. The average bearing pressure for 305mm plate is 490kPa, thus assuming a factor of safety of 2, the presumed bearing capacity is 245kPa. In order to interpret these results it should be noted that: i) this value is lower than could have been estimated if failure had been achieved, ii) the PLT tests assess a thickness of material approximately twice the diameter of the plate and iii) there is a scale effect that should be considered to assess the allowable bearing pressure.

Undrained condition

The bearing capacity calculations consider individual pad foundations on an infinite layer of Residual Soil / Completely Weathered Basalt, with Brinch Hansen coefficients and a factor of safety of 3. The analysis considers the founding depth at 1.5m because the site investigation, carried out during the rainy season, revealed that any excavation below the water strike will be subject to high rates of groundwater seepage.

The results are presented in Table 5.4. The results indicate presumed bearing capacity between 217kPa and 284kPa for individual pads and strip footings.

Table 5-4 - Summary of bearing capacity results

Foundation type & size	Foundation depth (m bgl) / Thickness of foundation (m)	Presumed bearing capacity (kPa)
Pad 1.0m W x 1.0m L	1.5	284
Pad 2.0m W x 2.0m L	1.5	265
Strip 1.0m x 3.0m W	1.5	233
Raft 10 m W by 10 m L	1.5	217

5.5.2 Settlement

The estimates of consolidation settlement, which has been computed using the one-dimensional consolidation method, is shown in Table 5.5.

Table 5-5 - Summary of predicted settlement

Foundation type and size	Bearing Pressure (kPa)	Consolidation Settlement (mm)
Pad 1.0m W x 1.0m L	135	14
Pad 2.0m W x 2.0m L	135	28
Strip 1.0m x 3.0W	135	26
Raft 10 m W by 10 m L	70	62

Skempton and McDonald (1956) proposed maximum settlement of 65mm for isolated pads on clay. The settlement values for isolated footings appear to be low compared to the maximum proposed value, the group effect or interaction between pads could result in an increase in total settlements.

For raft foundation, Tomlinson (1980) specified that the allowable maximum settlement in clay is 65mm and the analysis for 10m by 10m raft show that the settlement is above the permissible levels. For larger raft dimensions, the settlement will be greater.

5.6 Excavatability and groundwater control

Vertical excavations for foundations are likely to be possible with a standard backhoe machine excavator, as proven by the trial pitting during the ground investigation. However, excavations below the groundwater level cause rapid rise and will flood the excavation area. Groundwater control measures will therefore be required at the site prior to initiating any excavation deeper than 1.5m without a cut-off wall.

As the Residual Soil / Completely Weathered Basalt is highly plastic and expansive in nature, it should therefore not be used as structural fill. In addition, NHBC (2014) states that "Fill containing expansive materials is not acceptable for use as support to structural foundations and slabs or as backfill to associated trenches".

5.7 Uplift resistance

The lower bound value of uplift resistance can be determined based on the self-weight of the foundation. Friction between the soil and the sides of the foundation can also be assumed to contribute to the total uplift resistance. For such type of development, wind (uplift) load is significant in the design and operation of the foundation. In this case, it has been found that the two major uplift forces arise due to the wind and water. To determine the latter, the pressure head acting at the base of the foundation must be known. It is likely that the RS / CWB will not offer adequate capacity for the pullout resistance, therefore the foundations need to be anchored.

5.8 Anchor Foundations

Anchor foundations may be of two types:

- (1) where shallow bedrock is encountered, the anchor could be a threaded rod placed in drilled holes and filled with either grout; and
- (2) where the soft soil is thick, the use of I steel beams can be implemented.

The length and size of the anchors are subject to a pullout test.

Another measure to avoid the uplift is to increase the base thickness of the foundations. But this is subject to further analysis based on the exact pressure heads acting at the base of the foundation, data, which unfortunately we do not have at the time of writing this Report.

5.9 Pavement and hardstandings

With reference to the Highways Agency Interim Advice Note 73/06 (2009), the minimum permitted design California Bearing ratio (CBR) is 2.5%, otherwise some forms of engineering solutions are required. Based on DCPT tests results, it can be prudently assumed that the subgrade has a CBR value less than 2.0%. The effect of water is expected to have a significant impact on the Residual Soil / Completely Weathered Basalt, but it is unknown if the subgrade can be improved with compaction.

5.10 Conclusion and recommendations

From the factual information in section 4 and the assessment in this section, the founding stratum (the Residual Soil / Completely Weathered Basalt) was found to be soft / very soft and the high value of liquid limit indicate that it has very low strength and is prone to softening. Similarly, the results of the moisture content indicate that water logging and further loss of strength is possible in this stratum. It can also be inferred to be of poor drainage characteristics. The recommended bearing capacity for individual pads and strip footings is taken as 135kPa. Although the settlement values for isolated footings appear to be low compared to the maximum proposed value, the group effect or interaction between pads could result in an increase in settlements. It is likely that the RS / CWB will not offer adequate capacity for the pullout resistance, therefore the foundations need to be anchored. The length and size of the anchors are subject to a pullout test.


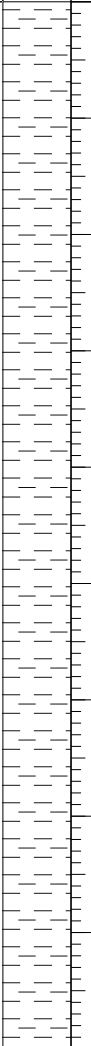
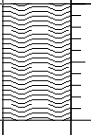


Regarding the pavement and hardstanding, it is recommended to remove at least 600mm of the soil and replace with a capping layer of compacted hardcore. A 350mm thick subbase is recommended on the capping layer. Note that water must be kept out of the subbase, capping and subgrade both during construction and service life of the pavement and hardstandings.


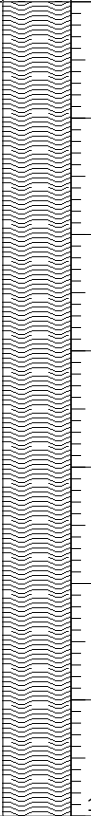
6. References


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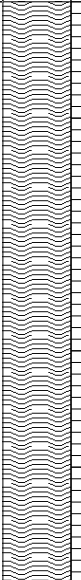
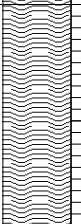
Appendices




Appendix A: Corehole Logs



<div>WATER RESEARCH CO. LTD</div>										BOREHOLE No. : BH 1										
										SITE : Henrietta										
Drilling Rig : Apafor 38				National Grid Coordinates				Start Date : 23/03/2019												
Casing Diameter : 114,89mm				N : 7748740.00				End Date : 25/03/2019												
Borehole Diameter : 89,76mm				E : 548934.000				Final Depth : 17.00m												
Core Diameter : 76,52mm				Ground Level : 506.000m amsl				Water Depth : No Ground Water Encountered												
Scale (m)	Description of Strata	Legend	Depth (m)	Elevation (m amsl)	Depth of Water Strikes	Sample / In Situ Test	N Value	Recovery (cm)	Coring				FI	Installation	Casing Depth	Drilling				
									Core Run	TCR (%)	SCR (%)	RQD (%)								
0.5	Soft to firm dark brown very high plasticity silty CLAY. COMPLETELY WEATHERED BASALT TO RESIDUAL SOIL.					SPTLS	(18)	28	0.40	100										
1.0									1.00	100										
1.5									1.50	100										
2.0									2.00	100										
2.5									3.00	100										
3.0									3.50	100										
3.5						SPTLS	(8)	30	4.00	100							4.0m			
4.0									4.48	100										
4.5									5.50	100										
5.0						U2		38	6.00	100										
5.5									SPTLS	(15)	28	7.39								
6.0						8.00	100													
6.5						8.50	100													
7.0						9.50	100													
7.5						SPTLS	(10)	30	10.00	100										
8.0																				
8.5																				
9.0						Firm to stiff yellowish brown very gravelly high plasticity CLAY. COMPLETELY WEATHERED BASALT.		9.00	497.00											
9.5																				
10.0																				
Continued on Next Page																				
Legend : U : Undisturbed Tube Sample C : (SPT) Solid Cone DC : Dry Coring														Logged by : DG						
D : Disturbed Sample S : (SPT) Split Spoon WD : Water Drilling														Drillers : RM						
RU : Refusal at Jacking of U Sampler NI : Non Intact M : Mazier Sample														Checked by : ES						
R : (SPT) Refusal  : Water Strike  : Water Rose To																				
Contract No. : OPG 19068 CEB				Project : Geotechnical Investigation at Proposed Henrietta PV Farm Phase 2								Sheet : 1 of 2								


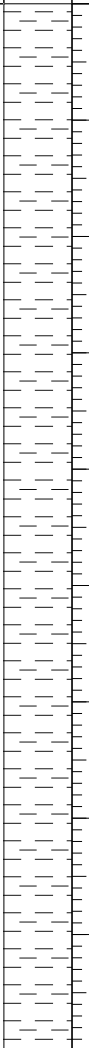
<div>WATER RESEARCH CO. LTD</div>										BOREHOLE No. : BH 1							
										SITE : Henrietta							
Drilling Rig : Apafor 38					National Grid Coordinates					Start Date : 23/03/2019							
Casing Diameter : 114,89mm					N : 7748740.00					End Date : 25/03/2019							
Borehole Diameter : 89,76mm					E : 548934.000					Final Depth : 17.00m							
Core Diameter : 76,52mm					Ground Level : 506.000m amsl					Water Depth : No Ground Water Encountered							
Scale (m)	Description of Strata	Legend	Depth (m)	Elevation (m amsl)	Depth of Water Strikes	Sample / In Situ Test	N Value	Recovery (cm)	Coring				FI	Installation	Casing Depth	Drilling	
									Core Run	TCR (%)	SCR (%)	RQD (%)					
10.5	Firm to stiff yellowish brown very gravelly high plasticity CLAY. COMPLETELY WEATHERED BASALT.					SPTLS	(25)	24	10.50	100							
11.0																	
11.5																	
12.0						SPTLS	(27)	32	12.00	100							
12.5									12.50	100							
13.0																	
13.5																	
14.0						U2		28	14.00	100							
14.5									14.50	100							
15.0						SPTLS	(29)	24	15.00	100							
15.5																	
16.0																	
16.5							16.50	100									
17.0	End of Borehole at 17.00m		17.00	489.00		SPTLS	(34)	27	17.00	100				17.0 m			
17.5																	
18.0																	
18.5																	
19.0																	
19.5																	
20.0																	
Legend : U : Undisturbed Tube Sample C : (SPT) Solid Cone DC : Dry Coring D : Disturbed Sample S : (SPT) Split Spoon WD : Water Drilling RU : Refusal at Jacking of U Sampler NI : Non Intact M : Mazier Sample R : (SPT) Refusal ▼ : Water Strike ∇ : Water Rose To													Logged by : DG Drillers : RM Checked by : ES				
Contract No. : OPG 19068 CEB				Project : Geotechnical Investigation at Proposed Henrietta PV Farm Phase 2								Sheet : 2 of 2					





<div>WATER RESEARCH CO. LTD</div>										BOREHOLE No. : BH 2															
										SITE : Henrietta															
Drilling Rig : Apafor 38				National Grid Coordinates				Start Date : 21/03/2019																	
Casing Diameter : 114,89mm				N : 7748740.00				End Date : 21/03/2019																	
Borehole Diameter : 76,89mm				E : 548991.000				Final Depth : 17.00m																	
Core Diameter : 76,52mm				Ground Level : 506.000m amsl				Water Depth : No Ground Water Encountered																	
Scale (m)	Description of Strata	Legend	Depth (m)	Elevation (m amsl)	Depth of Water Strikes	Sample / In Situ Test	N Value	Recovery (cm)	Coring				FI	Installation	Casing Depth	Drilling									
									Core Run	TCR (%)	SCR (%)	RQD (%)													
0.5	Dark brown very gravelly high plasticity CLAY with frequent rootlets. TOPSOIL. Firm to stiff dark brown high plasticity silty CLAY. COMPLETELY WEATHERED BASALT.		0.20	505.80					0.20	100															
1.0																									
1.5																									
2.0											SPTLS	(18)					20	2.00	100						
2.5																		2.63	100						
3.0																		3.00	100						
3.5																		3.50	100						
4.0											SPTLS	(21)					23	4.00	100					4.0m	
4.5																									
5.0																									
5.5																		5.50	100						
6.0											SPTLS	(18)					21	6.00	100						
6.5											U2						46	6.50	100						
7.0																									
7.5																		7.39	100						
8.0																		8.00	100						
8.5																		8.50	100						
9.0											SPTLS	(24)					28	9.00	100						
9.5																		9.43	100						
10.0								10.00	100																
Continued on Next Page				10.00	496.00																				
Legend : U : Undisturbed Tube Sample C : (SPT) Solid Cone DC : Dry Coring D : Disturbed Sample S : (SPT) Split Spoon WD : Water Drilling RU : Refusal at Jacking of U Sampler NI : Non Intact M : Mazier Sample R : (SPT) Refusal ▼ : Water Strike ∇ : Water Rose To													Logged by : DG Drillers : RM Checked by : ES												
Contract No. : OPG 19068 CEB				Project : Geotechnical Investigation at Proposed Henrietta PV Farm Phase 2								Sheet : 1 of 2													


<div>WATER RESEARCH CO. LTD</div>										BOREHOLE No. : BH 2							
										SITE : Henrietta							
Drilling Rig : Apafor 38					National Grid Coordinates					Start Date : 21/03/2019							
Casing Diameter : 114,89mm					N : 7748740.00					End Date : 21/03/2019							
Borehole Diameter : 76,89mm					E : 548991.000					Final Depth : 17.00m							
Core Diameter : 76,52mm					Ground Level : 506.000m amsl					Water Depth : No Ground Water Encountered							
Scale (m)	Description of Strata	Legend	Depth (m)	Elevation (m amsl)	Depth of Water Strikes	Sample / In Situ Test	N Value	Recovery (cm)	Coring				FI	Installation	Casing Depth	Drilling	
									Core Run	TCR (%)	SCR (%)	RQD (%)					
10.5	Stiff yellowish brown slightly gravelly high plasticity CLAY. COMPLETELY WEATHERED BASALT.					SPTLS	(26)	28	10.50	100							
11.0						U2		25	11.00	100							
11.5																	
12.0																	
12.5						SPTLS	(23)	26	12.50	100							
13.0									13.00	100							
13.5	Stiff reddish brown slightly gravelly high plasticity CLAY. COMPLETELY WEATHERED BASALT.																
14.0									14.00	100							
14.5							14.50	100									
15.0	U2			25	15.00	100											
15.5	SPTLS		(22)	24	15.50	100											
16.0																	
16.5																	
17.0	End of Borehole at 17.00m													17.0 m			
17.5																	
18.0																	
18.5																	
19.0																	
19.5																	
20.0																	
Legend : U : Undisturbed Tube Sample C : (SPT) Solid Cone DC : Dry Coring D : Disturbed Sample S : (SPT) Split Spoon WD : Water Drilling RU : Refusal at Jacking of U Sampler NI : Non Intact M : Mazier Sample R : (SPT) Refusal ▼ : Water Strike ∇ : Water Rose To													Logged by : DG Drillers : RM Checked by : ES				
Contract No. : OPG 19068 CEB					Project : Geotechnical Investigation at Proposed Henrietta PV Farm Phase 2								Sheet : 2 of 2				

<div>WATER RESEARCH CO. LTD</div>										BOREHOLE No. : BH 3						
										SITE : Henrietta						
Drilling Rig : Apafor 38				National Grid Coordinates						Start Date : 25/03/2019						
Casing Diameter : 114,89mm				N : 7748574.00						End Date : 26/03/2019						
Borehole Diameter : 76,89mm				E : 549084.000						Final Depth : 17.00m						
Core Diameter : 76,52mm				Ground Level : 516.000m amsl						Water Depth : No Ground Water Encountered						
Scale (m)	Description of Strata	Legend	Depth (m)	Elevation (m amsl)	Depth of Water Strikes	Sample / In Situ Test	N Value	Recovery (cm)	Coring				FI	Installation	Casing Depth	Drilling
									Core Run	TCR (%)	SCR (%)	RQD (%)				
0.5	Soft to firm dark brown very high plasticity silty CLAY. RESIDUAL SOIL.					SPTLS	(12)	40	0.70	100						
1.0																
1.5									1.50	100						
2.0									2.00	100						
2.5									2.56	100						
3.0									3.00	100						
3.5									3.50	100						
4.0						SPTLS	(10)	40	4.00	100					4.0m	
4.5						U2		36	4.50	100						
5.0						SPTLS	(12)	46	5.00	100						
5.5									5.50	100						
6.0									6.00	100						
6.5									6.50	100						
7.0						SPTLS	(10)	40	7.00	100						
7.5									7.53	100						
8.0									8.00	100						
8.5									8.50	100						
9.0	COBBLES of strong grey fine grained slightly vesicular of Moderately Weathered Basalt		9.00	507.00		SPTLS	(25)	42	9.00	100						
9.5									9.15	100						
10.0									9.64	100						
Continued on Next Page																
Legend : U : Undisturbed Tube Sample C : (SPT) Solid Cone DC : Dry Coring D : Disturbed Sample S : (SPT) Split Spoon WD : Water Drilling RU : Refusal at Jacking of U Sampler NI : Non Intact M : Mazier Sample R : (SPT) Refusal ▼ : Water Strike ∇ : Water Rose To													Logged by : DG Drillers : RM R Checked by : ES			
Contract No. : OPG 19068 CEB				Project : Geotechnical Investigation at Proposed Henrietta PV Farm Phase 2											Sheet : 1 of 2	

<div>WATER RESEARCH CO. LTD</div>										BOREHOLE No. : BH 3						
										SITE : Henrietta						
Drilling Rig : Apafor 38				National Grid Coordinates						Start Date : 25/03/2019						
Casing Diameter : 114,89mm				N : 7748574.00						End Date : 26/03/2019						
Borehole Diameter : 76,89mm				E : 549084.000						Final Depth : 17.00m						
Core Diameter : 76,52mm				Ground Level : 516.000m amsl						Water Depth : No Ground Water Encountered						
Scale (m)	Description of Strata	Legend	Depth (m)	Elevation (m amsl)	Depth of Water Strikes	Sample / In Situ Test	N Value	Recovery (cm)	Coring				FI	Installation	Casing Depth	Drilling
									Core Run	TCR (%)	SCR (%)	RQD (%)				
10.5	COBBLES of strong grey fine grained slightly vesicular of Moderately Weathered Basalt		10.50	505.50		SPTLS	(26)	24	10.43	100						
11.0	Stiff dark brown to reddish brown high plasticity silty CLAY. COMPLETELY WEATHERED BASALT TO RESIDUAL SOIL.		11.00	100												
11.5			11.50	100												
12.0			12.00	100												
12.5			12.52	100												
13.0			13.00	100												
13.5			U2			34	13.50	100								
14.0			SPTLS	(26)		24	14.00	100								
14.5							14.47	100								
15.0							15.00	100								
15.5							15.50	100								
16.0							16.00	100								
16.5			SPTLS	(27)		25	16.44	100								
17.0							17.00	100			17.0 m					
17.5																
18.0																
18.5																
19.0																
19.5																
20.0																
	End of Borehole at 17.00m		17.00	499.00												
Legend : U : Undisturbed Tube Sample C : (SPT) Solid Cone DC : Dry Coring D : Disturbed Sample S : (SPT) Split Spoon WD : Water Drilling RU : Refusal at Jacking of U Sampler NI : Non Intact M : Mazier Sample R : (SPT) Refusal ▼ : Water Strike ∇ : Water Rose To													Logged by : DG Drillers : RM R Checked by : ES			
Contract No. : OPG 19068 CEB				Project : Geotechnical Investigation at Proposed Henrietta PV Farm Phase 2										Sheet : 2 of 2		

<div>WATER RESEARCH CO. LTD</div>										BOREHOLE No. : BH 4													
										SITE : Henrietta													
Drilling Rig : Apafor 38					National Grid Coordinates					Start Date : 22/03/2019													
Casing Diameter : 114,89mm					N : 7748506.00					End Date : 23/03/2019													
Borehole Diameter : 76,89mm					E : 549067.000					Final Depth : 17.28m													
Core Diameter : 76,52mm					Ground Level : 518.000m amsl					Water Depth : No Ground Water Encountered													
Scale (m)	Description of Strata	Legend	Depth (m)	Elevation (m amsl)	Depth of Water Strikes	Sample / In Situ Test	N Value	Recovery (cm)	Coring				FI	Installation	Casing Depth	Drilling							
									Core Run	TCR (%)	SCR (%)	RQD (%)											
0.5	Soft to firm yellowish brown very high plasticity silty CLAY. RESIDUAL SOIL.								0.47	100													
1.0									1.00	100													
1.5									1.50	100													
2.0									SPTLS	(15)	40	2.00					100						
2.5												2.40					100						
3.0												3.00					100						
3.5												3.50					100						
4.0									SPTLS	(18)	25	4.00					100			4.0m			
4.5												4.35					100						
5.0												5.00					100						
5.5									U2		33	5.50					100						
6.0												6.00					100						
6.5									SPTLS	(16)	40	6.50					100						
7.0												7.00					100						
7.5												7.50					100						
8.0												8.00					100						
8.5	SPTLS	(11)	40	8.47	100																		
9.0				9.00	100																		
9.5				9.50	100																		
10.0	U2		37	10.00	100																		
Continued on Next Page																							
Legend : U : Undisturbed Tube Sample C : (SPT) Solid Cone DC : Dry Coring D : Disturbed Sample S : (SPT) Split Spoon WD : Water Drilling RU : Refusal at Jacking of U Sampler NI : Non Intact M : Mazier Sample R : (SPT) Refusal ▼ : Water Strike ∇ : Water Rose To													Logged by : DG Drillers : R Checked by : ES										
Contract No. : OPG 19068 CEB					Project : Geotechnical Investigation at Proposed Henrietta PV Farm Phase 2					Sheet : 1 of 2													

<div>WATER RESEARCH CO. LTD</div>										BOREHOLE No. : BH 4						
										SITE : Henrietta						
Drilling Rig : Apafor 38				National Grid Coordinates						Start Date : 22/03/2019						
Casing Diameter : 114,89mm				N : 7748506.00						End Date : 23/03/2019						
Borehole Diameter : 76,89mm				E : 549067.000						Final Depth : 17.28m						
Core Diameter : 76,52mm				Ground Level : 518.000m amsl						Water Depth : No Ground Water Encountered						
Scale (m)	Description of Strata	Legend	Depth (m)	Elevation (m amsl)	Depth of Water Strikes	Sample / In Situ Test	N Value	Recovery (cm)	Coring				FI	Installation	Casing Depth	Drilling
									Core Run	TCR (%)	SCR (%)	RQD (%)				
10.5	Soft to firm yellowish brown very high plasticity silty CLAY. RESIDUAL SOIL.					SPTLS	(10)	40	10.50	100						
11.0									11.00	100						
11.5									11.15	100						
12.0									12.00	100						
12.5									12.50	100						
13.0						SPTLS	(10)	40	13.00	100						
13.5									13.47	100						
14.0									14.00	100						
14.5									14.50	100						
15.0						U2		45	15.00	100						
15.5	SPTLS	(10)	40	15.50	100											
16.0				16.00	100											
16.5				16.66	100											
17.0				17.28	100			17.3 m								
17.5																
18.0	End of Borehole at 17.28m		17.28	500.72												
18.5																
19.0																
19.5																
20.0																
Legend : U : Undisturbed Tube Sample C : (SPT) Solid Cone DC : Dry Coring												Logged by : DG				
D : Disturbed Sample S : (SPT) Split Spoon WD : Water Drilling												Drillers : R				
RU : Refusal at Jacking of U Sampler NI : Non Intact M : Mazier Sample												Checked by : ES				
R : (SPT) Refusal  : Water Strike  : Water Rose To																
Contract No. : OPG 19068 CEB				Project : Geotechnical Investigation at Proposed Henrietta PV Farm Phase 2								Sheet : 2 of 2				



BOREHOLE No. : BH 5

SITE : Henrietta

Drilling Rig : Apafor 38

Casing Diameter : 114,89mm

Borehole Diameter : 76,89mm

Core Diameter : 52mm

National Grid Coordinates

N : 7748315.00

E : 549178.000

Ground Level : 548.000m amsl

Start Date : 20/03/2019

End Date : 21/03/2019

Final Depth : 17.00m

Water Depth : No Ground Water Encountered

Scale (m)	Description of Strata	Legend	Depth (m)	Elevation (m amsl)	Depth of Water Strikes	Sample / In Situ Test	N Value	Recovery (cm)	Coring				FI	Installation	Casing Depth	Drilling
									Core Run	TCR (%)	SCR (%)	RQD (%)				
0.5	Soft to firm yellowish brown very high plasticity silty CLAY. RESIDUAL SOIL.								0.55	100						
1.00									100							
1.50									100							
2.00									100							
2.55									100							
3.00									100							
3.50									100							
4.00									100							
4.52									100							
5.00									100							
5.50									100							
6.00									100							
6.25									100							
6.59									100							
7.00									100							
7.50									100							
8.00									100							
8.48									100							
9.00									100							
9.50									100							
10.00	100															
Continued on Next Page																

Legend :

U : Undisturbed Tube Sample

D : Disturbed Sample

RU : Refusal at Jacking of U Sampler

R : (SPT) Refusal

C : (SPT) Solid Cone

S : (SPT) Split Spoon

NI : Non Intact

▼ : Water Strike

DC : Dry Coring

WD : Water Drilling

M : Mazier Sample

⚡ : Water Rose To

Logged by : DG



Drillers : R RM



Checked by : ES


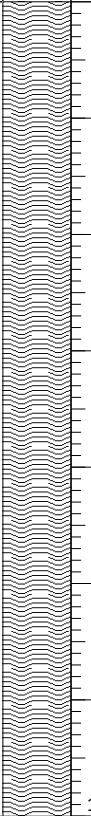
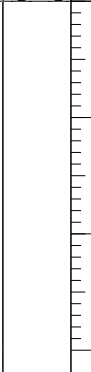
Contract No. : OPG 19068 CEB

Project : Geotechnical Investigation at Proposed Henrietta PV Farm Phase 2

Sheet : 1 of 2

<div>WATER RESEARCH CO. LTD</div>										BOREHOLE No. : BH 5						
										SITE : Henrietta						
Drilling Rig : Apafor 38				National Grid Coordinates						Start Date : 20/03/2019						
Casing Diameter : 114,89mm				N : 7748315.00						End Date : 21/03/2019						
Borehole Diameter : 76,89mm				E : 549178.000						Final Depth : 17.00m						
Core Diameter : 52mm				Ground Level : 548.000m amsl						Water Depth : No Ground Water Encountered						
Scale (m)	Description of Strata	Legend	Depth (m)	Elevation (m amsl)	Depth of Water Strikes	Sample / In Situ Test	N Value	Recovery (cm)	Coring				FI	Installation	Casing Depth	Drilling
									Core Run	TCR (%)	SCR (%)	RQD (%)				
10.5	Soft to firm yellowish brown very high plasticity silty CLAY. RESIDUAL SOIL.								10.28	100						
									10.70	100						
11.0									11.00	100						
11.5									11.50	100						
12.0						SPTLS	(10)	42	12.00	100						
12.5									12.37	100						
13.0									13.00	100						
13.5									13.50	100						
14.0						SPTLS	(9)	40	14.00	100						
14.5									14.49	100						
15.0									15.00	100						
15.5						SPTLS	(10)	41								
16.0									16.00	100						
16.5									16.58	100						
17.0									17.00	100					17.0 m	
	End of Borehole at 17.00m															
17.5																
18.0																
18.5																
19.0																
19.5																
20.0																
Legend : U : Undisturbed Tube Sample C : (SPT) Solid Cone DC : Dry Coring												Logged by : DG				
D : Disturbed Sample S : (SPT) Split Spoon WD : Water Drilling												Drillers : R RM				
RU : Refusal at Jacking of U Sampler NI : Non Intact M : Mazier Sample												Checked by : ES				
R : (SPT) Refusal ▼ : Water Strike ∇ : Water Rose To																
Contract No. : OPG 19068 CEB				Project : Geotechnical Investigation at Proposed Henrietta PV Farm Phase 2								Sheet : 2 of 2				

<div>WATER RESEARCH CO. LTD</div>										BOREHOLE No. : BH 6																	
										SITE : Henrietta																	
Drilling Rig : Apafor 38				National Grid Coordinates						Start Date : 11/03/2019																	
Casing Diameter : 89mm				N : 7749066.00						End Date : 20/03/2019																	
Borehole Diameter : 76,89mm				E : 549329.000						Final Depth : 17.00m																	
Core Diameter : 76,52mm				Ground Level : 500.000m amsl						Water Depth : No Ground Water Encountered																	
Scale (m)	Description of Strata	Legend	Depth (m)	Elevation (m amsl)	Depth of Water Strikes	Sample / In Situ Test	N Value	Recovery (cm)	Coring				FI	Installation	Casing Depth	Drilling											
									Core Run	TCR (%)	SCR (%)	RQD (%)															
0.5	Dark brown very gravelly high plasticity CLAY with frequent rootlets. TOPSOIL.		0.48	499.52					0.22	100																	
			0.48	100																							
1.0	Stiff brown high plasticity silty CLAY with rare cobbles at 5.19m & 8.60m. Cobbles are of strong grey Moderately Weathered Basalt. COMPLETELY WEATHERED BASALT.								SPTLS	(20)	18	1.00					100										
1.5												1.50					100										
2.0												2.00					100										
2.5												2.70					100										
3.0												3.50					100										
3.5												4.00					100										
4.0												4.50					100	SPTLS	(22)	18	5.19	100					
4.5												5.76					100										
5.0												6.50					100										
5.5												7.00					100										
6.0												8.00					100	SPTLS	(21)	30	8.50	100					
6.5												9.00					100										
7.0																											
7.5																											
8.0																		SPTLS (R)			8.00	100					
8.5																											
9.0																											
9.5																											
10.0	Continued on Next Page			10.00					490.00									10.00	100								
Legend : U : Undisturbed Tube Sample C : (SPT) Solid Cone DC : Dry Coring D : Disturbed Sample S : (SPT) Split Spoon WD : Water Drilling RU : Refusal at Jacking of U Sampler NI : Non Intact M : Mazier Sample R : (SPT) Refusal ▼ : Water Strike ∇ : Water Rose To																	Logged by : DG Drillers : R RM Checked by : ES										
Contract No. : OPG 19068 CEB				Project : Geotechnical Investigation at Proposed Henrietta PV Farm Phase 2													Sheet : 1 of 2										

<div>WATER RESEARCH CO. LTD</div>										BOREHOLE No. : BH 6											
										SITE : Henrietta											
Drilling Rig : Apafor 38					National Grid Coordinates					Start Date : 11/03/2019											
Casing Diameter : 89mm					N : 7749066.00					End Date : 20/03/2019											
Borehole Diameter : 76,89mm					E : 549329.000					Final Depth : 17.00m											
Core Diameter : 76,52mm					Ground Level : 500.000m amsl					Water Depth : No Ground Water Encountered											
Scale (m)	Description of Strata	Legend	Depth (m)	Elevation (m amsl)	Depth of Water Strikes	Sample / In Situ Test	N Value	Recovery (cm)	Coring				FI	Installation	Casing Depth	Drilling					
									Core Run	TCR (%)	SCR (%)	RQD (%)									
10.5	Stiff to very stiff yellowish brown high plasticity silty CLAY with rare cobbles at 13.50m. Cobbles are of strong grey Moderately Weathered Basalt. COMPLETELY WEATHERED BASALT.						(32)	27	10.80	100											
11.0																					
11.5									11.50	100											
12.0									12.00	100											
12.5																					
13.0									12.70	100											
13.5																					
14.0						SPTLS (R)			13.50	100											
14.5									14.00	100											
15.0						SPTLS	(42)	21	14.50	100											
15.5									15.00	100											
16.0																					
16.5						U2		32	16.00	100											
17.0	End of Borehole at 17.00m		17.00	483.00	SPTLS	(32)	28	16.50	100			17.0 m									
17.5								17.00	100												
18.0																					
18.5																					
19.0																					
19.5																					
20.0																					
Legend : U : Undisturbed Tube Sample C : (SPT) Solid Cone DC : Dry Coring													Logged by : DG								
D : Disturbed Sample S : (SPT) Split Spoon WD : Water Drilling													Drillers : R RM								
RU : Refusal at Jacking of U Sampler NI : Non Intact M : Mazier Sample													Checked by : ES								
R : (SPT) Refusal ▼ : Water Strike ∇ : Water Rose To																					
Contract No. : OPG 19068 CEB					Project : Geotechnical Investigation at Proposed Henrietta PV Farm Phase 2							Sheet : 2 of 2									