GEOTECHNICAL REPORT

GEOTECHNICAL INVESTIGATIONS FOR DOMINICA GEOTHERMAL COMPANY LTD. (DGDC) TRANSMISSION LINE

Submitted to:
SOFRECO

Revision 1

Date: September 5th, 2023

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TABLE OF CONTENTS

1.0 INTRODUCTION

1.1 EXECUTIVE SUMMARY

Introduction: This executive summary provides a concise overview of the findings and recommendations of the geotechnical report conducted for the client, SOFRECO. The focus of this study was to assess the soil conditions at various sites, characterized by variable soil types ranging from sandy to clayey, with predominantly low to medium bearing capacity. The main objective was to determine suitable foundation options for the proposed structures considering the site conditions and access limitations.

Soil Types and Bearing Capacity: Analysis of the soil samples obtained from test pits revealed a variation of soil types, ranging from sandy to clayey. The majority of the soils exhibit low to medium bearing capacity. This implies that careful consideration should be given to foundation design to ensure stability and load-bearing capacity.

Foundation Recommendations: Based on the soil conditions encountered, it is recommended to implement either large mat or raft foundations for the proposed structures. These foundation types distribute the structure's load over a larger area, mitigating the risks associated with low bearing capacity soils. The larger contact area provides stability and minimizes differential settlement issues.

Alternative Option: In addition to mat or raft foundations, micropiles can be considered as an alternative foundation option. Micropiles are deep foundation elements that can transfer loads to load-bearing strata, bypassing weaker soil layers. This option is particularly beneficial in areas with challenging soil conditions or limited access.

Monopoles vs. Steel Structures: Due to difficult site accessibility, it is recommended to use monopoles instead of steel structures for the proposed projects. Monopoles offer advantages such as ease of transportation, reduced installation time, and lower maintenance requirements. These benefits make monopoles a more suitable choice for the project, ensuring efficient construction processes and minimizing logistical challenges.

Further Investigations: It is important to note that in areas where challenging soil conditions or specific project requirements are present, additional investigations and site-specific analysis may be required. These investigations can include more extensive geotechnical testing, soil compaction analysis, or ground improvement methods. There is even more justification for further investigation with regards to deeper soil strata if micropiles are being considered.

Conclusion: In conclusion, the geotechnical investigation has revealed that the site conditions vary from sandy to clayey, with generally low to medium bearing capacity. To ensure the stability and performance of the proposed structures, the use of large mat or raft foundations is recommended as the primary foundation option. Additionally, the consideration of micropiles as an alternative solution may be appropriate in certain areas. These recommendations are based on the understanding of the site's geotechnical parameters and aim to mitigate potential settlement and stability issues.

1.2 BACKGROUND

The Government of the Commonwealth of Dominica (GOCD) is actively working towards transitioning from diesel-generated electricity to geothermal energy. To achieve this goal, GOCD has made significant investments in exploring and harnessing geothermal energy in the Roseau Valley. The aim is to reduce and stabilize the cost of electricity, while also minimizing Dominica's carbon footprint.

The first phase of this project involves the development of a 10 Megawatt (MW) geothermal power plant, along with a new transmission network that will connect to DOMLEC's grid. The World Bank will provide funding for the new transmission network, which will operate at both 69 Kilo Volts (KV) and 33 KV levels. This upgraded transmission network will support the expansion of geothermal energy in Dominica.

Within the transmission network, 69 kV transmission lines will transmit electricity from the Geothermal Power Plant to the Fond Cole Substation, and from Fond Cole to Sugar Loaf, covering a span of 43.5 kilometers (km). Additionally, a 33 kV line will extend 8.4 km from the Geothermal Plant through Trafalgar and Padu Hydro Stations.

As part of the project, five electrical substations will be constructed and interconnected at different locations.

CORISAV Inc. was commissioned by SOFRECO (Owners Engineer) to conduct geotechnical investigations for the proposed DGDC Transmission Line. The geotechnical engineering report has been completed, consisting of 26 test pits dug to a depth of 6' 0". Tests were conducted as specified in the table provided.

The purpose of these services is to provide information and recommendations related to the subsurface soil and rock conditions, groundwater conditions, earthwork, subgrade preparation, and foundation design and construction. These services aim to assist in understanding and addressing geotechnical aspects of a project.

The engagement was based on several assumptions and considered associated risks. It assumed that there would be no delays in the implementation by the client, that the weather conditions would be favorable, and that there would be no major accidents or damage to equipment or works during the implementation. Additionally, it assumed that site access would be maintained and that historical data and approved plans would be available from the client and/or Division of Planning.

While exploratory works may carry some risks to underground services, CORISAV would thoroughly investigate and take necessary precautions to manage and mitigate those risks. It's important to note that the risks associated with the project are directly related to the assumptions presented.

The report is intended for the use and benefit of the client, its affiliates, and any authorized third parties. It can be relied upon to gain valuable insights and guidance regarding the geotechnical aspects of the project.

2.0 SITE LOCATION

2.1 SITE CONDITIONS & ACCESS

ITEM	**GENERAL DESCRIPTION**
Locations	Various
Existing Structures/works	Access Road/ Footpath access
Current Ground Cover	Light Vegetation/Secondary Forest
Existing Topography	Flat/Sloping

LOCATION	**NORTHING**	**EASTING**	**METHOD OF EXCAVATION**	**SITE ACCESS**	**REQUIRED TEST**
33 KV GFI UNDERGROUND LINK					
Point 1	15.331185	-61.328812	Manual	Motorable Access	- Bearing Capacity - Friction Coefficient - Unit Weight - Water Table - Soil Classification - Temperature at 150 cm - Electrical Resistivity - Thermal Resistivity
Point 2B	15.324640	-61.345531	Manual	Motorable Access	
Point 3	15.311559	-61.361953	Manual	Motorable Access	
Point 4	15.305556	-61.38055	Manual	Motorable Access	
69 KV FSI OHTL LINK					
STRUCTURE NO: 3	673759.48	1694020.04	Manual	Non-motorable Access	- Bearing Capacity - Friction Coefficient - Shear - Angle of Repose - Unit Weight - Water Table - Soil Classification - Temperature at 150 cm - Electrical Resistivity - Thermal Resistivity
STRUCTURE NO: 8	674055.86	1696074.05	Manual	Non-motorable Access	
STRUCTURE NO: 15	672981.09	1698921.79	Manual	Non-motorable Access	
STRUCTURE NO: 22	671463.49	1701740.65	Manual	Non-motorable Access	
STRUCTURE NO: 35	669254.1	1706045.84	Manual	Non-motorable Access	
STRUCTURE NO: 42	668168.89	1708402.15	Manual	Non-motorable Access	
STRUCTURE NO: 50	666355.88	1710983.61	Manual	Non-motorable Access	
STRUCTURE NO: 59	665183.13	1715066.28	Manual	Non-motorable Access	
STRUCTURE NO: 72	666548.94	1719481.04	Manual	Non-motorable Access	
STRUCTURE NO: 79	667013.63	1722305.9	Manual	No-motorable Access	
69 KV GFI OHTL					
STRUCTURE NO: 5	674260.03	1694101.19	Manual	Motorable	- Bearing Capacity - Friction Coefficient - Shear - Angle of Repose
STRUCTURE NO: 9	674729.44	1693884.03	Manual	Non-motorable Access	
STRUCTURE NO: 16	675935.63	1694049.72	Manual	Non-motorable Access	
STRUCTURE NO: 21	676681.48	1695469.5	Manual	Non-motorable Access	

STRUCTURE NO: 26	677483.78	1695657.14	Manual	Motorable	- Unit Weight - Water Table - Soil Classification - Temperature at 150 cm - Electrical Resistivity - Thermal Resistivity
STRUCTURE NO: 29	678268.07	1695654.52	Manual	Non-motorable Access	
Substations					
Sugar Loaf	N/A: within property	-	Excavator	Motorable Access	- Bearing Capacity - Friction Coefficient - Shear - Angle of Repose - Unit Weight - Water Table - Soil Classification
Padu	N/A: within property	-	Excavator	Motorable Access	
Trafalgar	N/A: within property	-	Excavator	Motorable Access	
Fond Cole	N/A: within property	-	Excavator	Motorable Access	
West Coast	665897.99	1711400.76	Manual	Non-motorable Access	
Geothermal Power Plant N/A:	Within Property		Excavator	Motorable Access	- Temperature at 150 cm - Electrical Resistivity - Thermal Resistivity

2.2 PROJECT INFORMATION

ITEM	**DESCRIPTION**
Site Layout	Varied
Structures	Likely monopole/guyed tower: Main Wind Force Resisting Systems (Reinforced Concrete and Steel Framed)
Maximum Loads	DEAD LOADS - Reinforced Concrete – 24kN/m^3 - Structural Steel – 77kN/m^3 LIVE LOADS - Sidewalks, vehicular driveways, and yards subjected to trucking subjected to 11.97 kN/m^2 - Walkways and elevated platforms (other than exit ways) subjected to 2.87 kN/m^2 WIND LOADS - qz – 5.93 kN/m^2 SEISMIC LOADS - Ss – See following table

	- S1 – See following table - Risk Category - IV - Seismic Design Category – See following table - Seismic Importance Factor – 1.25 - Site Class – See following table
Grading	A grading plan for the proposed project has not been provided at this time; however, we assume minimal cut/or fill required to develop final grades.

LOCATION	**S_S**	**S_1**	**S_{DS}**	**S_{D1}**	**SITE CLASS**
Point 1	1.494	0.458	0.996	0.305	C
Point 2B	1.494	0.458	0.996	0.305	C
Point 3	1.494	0.458	0.996	0.305	C
Point 4	1.494	0.458	0.996	0.305	C
STRUCTURE NO: 3	1.494	0.458	0.996	0.305	C
STRUCTURE NO: 8	1.494	0.458	0.996	0.305	C
STRUCTURE NO: 15	1.510	0.462	1.007	0.308	C
STRUCTURE NO: 22	1.510	0.462	1.007	0.308	C
STRUCTURE NO: 35	1.510	0.462	1.007	0.308	C
STRUCTURE NO: 42	1.526	0.466	1.017	0.311	C
STRUCTURE NO: 50	1.526	0.466	1.017	0.311	C
STRUCTURE NO: 59	1.526	0.466	1.017	0.311	C
STRUCTURE NO: 72	1.542	0.469	1.028	0.313	D
STRUCTURE NO: 79	1.542	0.469	1.028	0.313	D
STRUCTURE NO: 5	1.494	0.458	0.996	0.305	E
STRUCTURE NO: 9	1.494	0.458	0.996	0.305	D
STRUCTURE NO: 16	1.494	0.458	0.996	0.305	E
STRUCTURE NO: 21	1.494	0.458	0.996	0.305	D
STRUCTURE NO: 26	1.494	0.458	0.996	0.305	E
STRUCTURE NO: 29	1.494	0.458	0.996	0.305	D
Sugar Loaf	1.542	0.469	1.028	0.313	D
Padu	1.494	0.458	0.996	0.305	D
Trafalgar	1.494	0.458	0.996	0.305	D
Fond Cole	1.494	0.458	0.996	0.305	D
West Coast	1.526	0.466	1.017	0.311	C
Geothermal Power Plant	1.494	0.458	0.996	0.305	D

3.0 SUBSURFACE CONDITIONS AND SOIL CHARACHTERISTICS

3.1 TYPICAL PROFILE

Details for soil types at each test pit location are indicated on the individual soil logs found in the Appendix A.

3.2 GROUNDWATER

The test pits were observed while drilling and directly after completion for the existence and level of groundwater. Groundwater was not observed at any of the test pits. Fluctuations in groundwater levels may be expected throughout the year depending upon variations in rainfall, runoff, evaporation, and other hydrological factors. This may be confirmed by extending the monitoring period.

3.3 SOIL CLASSIFICATION AND ENGINEERING PROPERTIES

For the purpose of this report, the Universal Soil Classification System (USCS) was used to characterize and classify soil. This system uses a combination of letters and numbers to classify soils based on their properties. Here are some of the key features of the USCS:

Particle Size - the USCS considers the particle size distribution of the soil, including the percentages of sand, silt, and clay present. These percentages determine the soil's textural classification, such as sandy, silty, clayey, or a combination of these.

Classification Symbols - the USCS uses symbols to represent the classifications. For example, if a soil has more than 50% of its particles in the sand fraction and less than 12% in the clay fraction, it may be classified as "SP" (silty sand). There are various symbols to represent different soil types based on their particle size and mineral composition.

Plasticity - the USCS also considers the plasticity or the ability of soils to change shape and retain deformation when moistened. It categorizes soils as either "nonplastic" or "plastic" based on their plasticity index (PI).

Other Soil Properties - in addition to particle size and plasticity, the USCS considers other characteristics like organic content, density, compaction, permeability, and shear strength. These properties can further classify the soil into different groups.

Atterberg Limits - are a set of tests used to determine the behaviour of fine-grained soils, such as clay or silt, under various moisture conditions. The three main Atterberg limits are the liquid limit, plastic limit, and shrinkage limit.

Liquid Limit (LL) - is the moisture content at which a soil transitions from a liquid to a plastic state. Knowing the liquid limit of a soil helps in determining its plasticity, consistency, and behaviour under various moisture conditions.

Plastic Limit (PL) - is the moisture content at which a soil transitions from a plastic to a semisolid state. It is the maximum amount of deformation a soil can undergo without cracking.

Shrinkage Limit (SL) - is the lowest moisture content at which a soil no longer shrinks when further drying occurs.

Plasticity Index (PI) - is a measure of the range of moisture content within which a soil's behaviour changes from a plastic to a semisolid state. It is calculated by subtracting the plastic limit (PL) from the liquid limit (LL). PI = LL - PL

The plasticity index provides valuable information about a soil's engineering properties. Soils with a higher plasticity index generally have a larger range of moisture content in which they exhibit plastic behaviour. It indicates the clay or silt fraction and their ability to retain water and change in volume as the moisture content varies.

The plasticity index is often used in soil classification systems, such as the Unified Soil Classification System (USCS), to categorize different types of soils based on their plastic properties. Soils with low plasticity index values are classified as non-plastic or low-plasticity soils, while soils with higher plasticity index values are classified as high-plasticity soils.

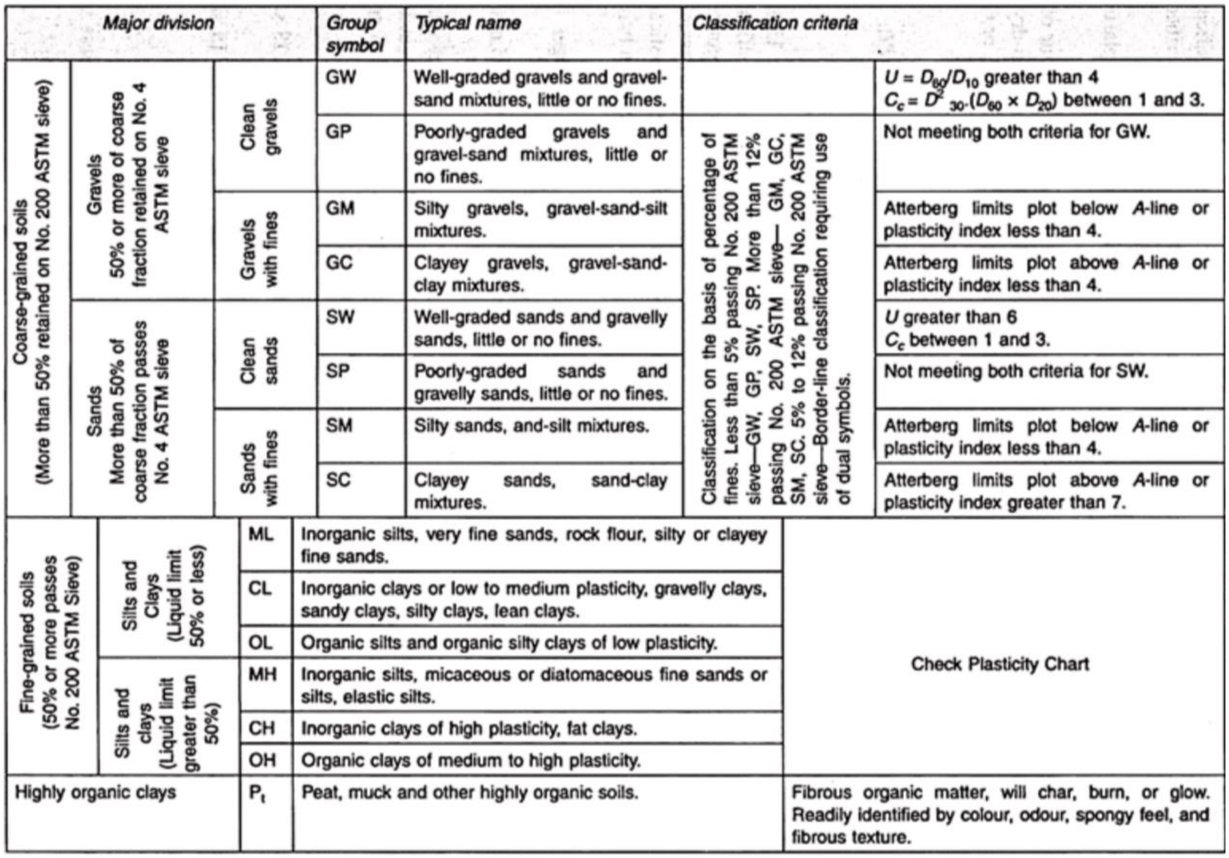
Fines Content – in USCS, fines content refers to the percentage of fine particles, such as silt and clay, present in a soil sample. The fines content is a crucial parameter for classifying soils within the system. It helps determine the overall behavior and engineering properties of the soil.

The fines content is particularly important in distinguishing between different soil types and their classification within the USCS. It helps in determining whether a soil is predominantly coarse-grained or fine-grained, as well as the relative proportions of sand, silt, and clay. Based on the fines content, soils can be categorized into various groups, such as sandy soils, silty soils, clayey soils, or different combinations.

The fines content also influences the plasticity of the soil. In the USCS, soils with higher fines content usually exhibit higher plasticity and cohesive properties. This is evaluated using tests like the Atterberg limits.

Moisture Content – is the amount of water present in a given amount of soil. It is typically expressed as a percentage of the weight of water to the weight of dry soil. The USCS does not specifically address the moisture content of soils as a criterion for classification. Moisture content is typically used to determine other properties of soils, such as their weight, volume, and compaction characteristics.

All the above-mentioned soil characteristics were considered and were used to classify soils based on the context and parameters prescribed by the USCS. The following table presents the major divisions, group symbols, typical names and classification criteria used for classification of soils in this geotechnical report.



Major division			*Group symbol*	*Typical name*	*Classification criteria*	
Coarse-grained soils (More than 50% retained on No. 200 ASTM sieve)	Gravels 50% or more of coarse fraction retained on No. 4 ASTM sieve	Clean gravels	GW	Well-graded gravels and gravel-sand mixtures, little or no fines.		$U = D_{60}/D_{10}$ greater than 4 $C_c = D^2{}_{30} \cdot (D_{60} \times D_{20})$ between 1 and 3.
			GP	Poorly-graded gravels and gravel-sand mixtures, little or no fines.	Classification on the basis of percentage of fines. Less than 5% passing No. 200 ASTM sieve—GW, GP, SW, SP. More than 12% passing No. 200 ASTM sieve— GM, GC, SM, SC. 5% to 12% passing No. 200 ASTM sieve—Border-line classification requiring use of dual symbols.	Not meeting both criteria for GW.
		Gravels with fines	GM	Silty gravels, gravel-sand-silt mixtures.		Atterberg limits plot below *A*-line or plasticity index less than 4.
			GC	Clayey gravels, gravel-sand-clay mixtures.		Atterberg limits plot above *A*-line or plasticity index less than 4.
	Sands More than 50% of coarse fraction passes No. 4 ASTM sieve	Clean sands	SW	Well-graded sands and gravelly sands, little or no fines.		*U* greater than 6 C_c between 1 and 3.
			SP	Poorly-graded sands and gravelly sands, little or no fines.		Not meeting both criteria for SW.
		Sands with fines	SM	Silty sands, and-silt mixtures.		Atterberg limits plot below *A*-line or plasticity index less than 4.
			SC	Clayey sands, sand-clay mixtures.		Atterberg limits plot above *A*-line or plasticity index greater than 7.
Fine-grained soils (50% or more passes No. 200 ASTM Sieve)	Silts and Clays (Liquid limit 50% or less)		ML	Inorganic silts, very fine sands, rock flour, silty or clayey fine sands.	Check Plasticity Chart	
			CL	Inorganic clays or low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.		
			OL	Organic silts and organic silty clays of low plasticity.		
	Silts and clays (Liquid limit greater than 50%)		MH	Inorganic silts, micaceous or diatomaceous fine sands or silts, elastic silts.		
			CH	Inorganic clays of high plasticity, fat clays.		
			OH	Organic clays of medium to high plasticity.		
Highly organic clays			P_t	Peat, muck and other highly organic soils.	Fibrous organic matter, will char, burn, or glow. Readily identified by colour, odour, spongy feel, and fibrous texture.	

Note: Boundary classification: Soils possessing characteristics of two groups are designated by combinations of group symbols — for example, GW-GC, well-graded, gravel-sand mixture with clay binder

Poudel, E. M. (2022, June 23). Unified Soil Classification System (USCS): Civil Engineering & Construction Information. https://dreamcivil.com/unified-soil-classification-system/

Unit Weight - also known as bulk density, is a term used to describe the weight per unit volume of soil. It is commonly expressed in kilogram per cubic meter (kg/m^3) or pounds per cubic foot (lb/ft^3). This measure is very important when making a determination of the stress at any point within a soil mass. It is calculated by multiplying the unit weight of the soil with the thickness of the soil layer. The appropriate unit weight of the soil should be considered based on factors like the position of the water table or the nature of the soil, whether it's dry, partially saturated, fully saturated, or submerged.

Cohesion - the internal molecular attraction between soil particles that enables them to stick together. Cohesion is primarily associated with fine-grained cohesive soils, such as clay. Unlike cohesionless soils, which rely mainly on frictional forces between particles, cohesive soils possess cohesive strength due to the attractive forces between their particles.

Cohesion contributes to the overall shear strength and stability of cohesive soils. It resists shearing and allows the soil mass to retain its shape, even when subjected to external forces.

Angle of Resistance - also known as the angle of internal friction, is a measure of the shear strength of soil. It represents the angle at which soil particles can resist shear forces before the soil starts to deform. The angle of internal friction is a property of granular materials and represents their resistance to shearing or sliding when subjected to an external force. It determines the stability and strength of the material under different conditions.

A high angle of internal friction indicates that the particles of the material have a strong interlocking mechanism, which results in a higher resistance to sliding. On the other hand, a low angle of internal friction suggests that the particles have less interlocking and are more prone to sliding.

Materials with a high angle of internal friction, such as dry sand or gravel, have a greater ability to withstand shear stresses without significant deformation. This makes them suitable for constructing stable slopes or foundations.

On the contrary, materials with a low angle of internal friction, such as loose soils or fine-grained sands, are more susceptible to shearing and sliding. They tend to exhibit significant deformation and instability under applied forces.

Angle of Repose - the maximum angle at which a pile of granular material, such as sand or rocks, can remain stable without collapsing or sliding. It is a fundamental concept in geotechnical engineering and plays a crucial role in determining the stability of slopes, landslides, and other natural phenomena. The angle of repose varies depending on factors such as the size and shape of the grains, moisture content, and the internal friction between the particles.

Friction Coefficient - is a measure of the shear resistance or frictional forces between soil particles. It quantifies the interparticle friction or resistance to sliding or shearing within a soil mass. The friction coefficient is an important parameter used in geotechnical engineering to analyze the stability of soil slopes, retaining walls, and foundations.

The friction coefficient of soil depends on various factors, including the type, size, and shape of soil particles, as well as the moisture content and compaction level. Cohesive soils, such as clays, have generally higher friction coefficients compared to cohesionless soils, such as sands.

Electric Resistivity - the measure of how well a particular type of soil can resist the flow of electrical current. It is an important property when studying the behavior of soils for various applications, such as in geotechnical engineering and environmental science.

Soil resistivity is typically measured in ohm-meters (Ω·m) and is influenced by several factors, including moisture content, mineral composition, compaction, temperature, and the presence of contaminants. Generally, soils with higher resistivity values have lower electrical conductivity and vice versa.

Electric resistivity helps engineers determine the suitability of soil for grounding systems. Lower resistivity generally indicates better conductivity, which is important for proper dissipation of fault currents and protection against electric shock hazards. By measuring resistivity, engineers can design grounding systems that meet safety standards.

Soil resistivity affects the corrosion potential of buried metal structures, such as pipelines or underground cables. High resistivity soil can lead to increased corrosion risk, as it may retain moisture, promoting electrochemical reactions. Engineers assess soil resistivity to evaluate the need for protective measures, such as cathodic protection systems, to mitigate corrosion.

The soil corrosiveness is classified based on soil electrical resistivity by the British Standard BS-1377 as follows:

$\rho E > 100$ Ωm: slightly corrosive
$50 < \rho E < 100$ Ωm: moderately corrosive
$10 < \rho E < 50$ Ωm: corrosive
$\rho E < 10$ Ωm: severe

where ρE is measured apparent soil resistivity.

Thermal Resistivity – is the soil's ability to resist the flow of heat. It is a property that determines how well or poorly heat can be transferred through the soil. Thermal resistivity is typically measured in units of in SI units as °K-m/W (degrees Kelvin-meter per watt). In the United States it is more commonly reported as °C-cm/W (degrees Celsius-centimeter per watt).

Understanding thermal resistivity is important in designing systems that involve heat transfer through the ground, such as underground cables. By studying the thermal resistivity of soil, engineers and scientists can determine how efficiently heat will be conducted and provide appropriate insulation if necessary.

The table hereunder shows the thermal properties of the elements in a typical soil. These elements normally occur as mixtures in soil.

Typical Elements in Soil	**Thermal Resistivity °C-cm/W**
Quart	11
Soil Minerals	40
Granite	33
Organic Matter	400
Water	172
Air	3846

Thermal Properties of Common Soil Constituents. Adapted from Campbell & Norman (1998)

The thermal resistivity of the soil or backfill material affects how efficiently heat is transferred from the cable to the surrounding environment. Materials with higher resistivity impede heat dissipation, potentially causing the cable to operate at higher temperatures. This may require additional insulation or other cooling measures to maintain the cable's integrity within safe limits.

The value of thermal resistivity can vary greatly depending on the specific soil conditions. Highly compacted soils, soils with high moisture content, and those with a high clay or silt content generally have higher thermal resistivity. On the other hand, sandy soils, which have larger air spaces, tend to have lower thermal resistivity. It is therefore recommended that underground cables be embedded within sand beds.

While these soil characteristics and parameters were tested and presented in the soil logs, it is not typical to discuss each parameter in isolation when analyzing soil characteristics and its response to loading.

3.4 SEISMIC HAZARDS

Potential seismic hazards resulting from a nearby moderate to major earthquake can generally be classified as primary and secondary. The primary effect is ground rupture, also called surface faulting. The common secondary seismic hazards include ground shaking, and ground lurching.
Based on topographic and lithologic data, the risk of regional subsidence or uplift, soil liquefaction, lateral spreading, landslides, tsunamis, flooding or seiches is considered low to negligible at the sites.

Soil liquefaction results from loss of strength during cyclic loading, such as imposed by earthquakes. Soils most susceptible to liquefaction are clean, loose, saturated, uniformly graded and fine-grained sands. The clays encountered in the pits were generally soft to stiff. For these reasons and based upon engineering judgment, it is our opinion that the potential for liquefaction at the sites are low during seismic shaking.

3.5 EXCAVATABILITY AND ACCESS

Based on our exploration and the geologic setting of the areas, conventional grading and backhoe/excavation equipment will be able to excavate the soil deposits barring site accessibility. In some cases, manual excavation will need to be considered.

3.6 ON-SITE AGGREGATE SOURCES

While intrusions of cobbles were encountered in some clay strata, we do not consider the cobbles encountered on site to be suitable as aggregate sources are in trace amounts, and separation would not be economical.

4.0 RECOMMENDATIONS FOR DESIGN AND CONSTRUCTION

4.1 GEOTECHNICAL CONSIDERATIONS

Based on conditions found in the test pits, the structures can generally be placed on large mats/raft foundations. For sites with classification of C and D, individual mats may be considered under each monopole.

For sites with classification of E, stress overlap may need to be considered if mats are being proposed as they would be required to be larger to counteract the lower soil bearing capacity. As an alternative, soil improvement may also be considered for site classification E, to improve the bearing capacity. The logistics of major soil improvement may require significant excavation and soil replacement which are limited by site access, working space and availability of suitable materials. A single raft for all three monopoles may prove to be the most economical solution.

As an alternative to rafts and piles, utilization of micropiles
in combination with minimal soil replacement in pile cap/footing zones may be considered.

Due to the presence of high plasticity clay soils in some areas, we recommend that a low plasticity engineered fill be constructed beneath slab-on-grade floors, roadways and sidewalks where required.

4.2 EARTHWORK RECOMMENDATIONS

Earthwork recommendations are intended for use in structural areas that will support improvements such as the buildings and other heavily loaded structures.

We define "structural areas" as any area sensitive to settlement of compacted soil. These areas include, but are not limited to buildings, towers, heavily loaded areas and pavement areas.

Clear structural areas, of surface and subsurface deleterious materials including existing building foundations, slabs, buried utility and irrigation lines, pavements, debris, and designated trees, shrubs, and associated roots. Clean and backfill excavations extending below the planned finished site grades with suitable material compacted to the recommendations presented.

Following clearing, strip structural areas to remove surface organic materials. Strip organics from the ground surface to a depth of at least 25 to 50mm below the surface. Remove stripping from the site or, if considered suitable by the developer, landscape architect and owner, use them in landscape fill.

4.2.1 OVEREXCAVATION

In order to avoid expansive clay and mitigate possibly disturbed surface soil, we recommend overexcavation of structural areas. Pavements areas should be overexcavated at minimum of 600m below footing depths. The excavation should be backfilled in accordance with section 4.2.3. Overexcavation for compacted backfill placement below footings should extend laterally beyond all edges of the footings at least 750mm per meter of overexcavation depth below elevation with approved fill.

4.2.2 MATERIAL TYPES

Engineered fill shall be well draining and compactable in nature. Controlled, compacted fill should consist of approved materials that are free of organic matter and debris and contain maximum rock size of 3 inches. A sample of each material type should be submitted to the geotechnical engineer for evaluation prior to its use. Low plasticity cohesive soil or granular soil having at least 15% low plasticity fines.

Soil stabilization (chemical or mechanical) may be needed to improve bearing capacity based on the foundation type selected. Chemical stabilization may be done with fly ash or cement. The percentage required should be determined in the field.

4.2.3 COMPACTION REQUIREMENTS

ITEM	**DESCRIPTION**
Subgrade Scarification Depth	400mm (min)
Overexcavation Depth	600mm (min)

Fill Lift Thickness	200mm or less in loose thickness
Compaction Requirements[1]	At least 95% of the material maximum standard Proctor dry density (ASTM D-698)
Moisture Content	0 to 3% above the material's optimum moisture content, determined in accordance with ASTM D-698, the standard Proctor procedure

1. We recommend that engineered fill (including scarified compacted subgrade) be tested for moisture content and compaction during placement. Should the results of the in-place density tests indicate the specified moisture or compaction limits have not been met, the area represented by the test should be reworked and retested as required until the specified moisture and compaction requirements are achieved.

4.2.4 UTILITY TRENCH BACKFILL

Infiltration and migration are probable in utility trenches therefore they should be sealed properly to prevent water from perfusing the trenches or migrating below the structures. Constructing an effective clay "trench plug" that extends at least 1.5m out from the face of the structure's exterior is recommended. The material for this plug should consist of clay compacted at a water content at or above the soils optimum water content. The clay fill should totally surround the utility line and be compacted in accordance with recommendations in this report.

4.2.5 SITE DRAINAGE

Grading must give effective drainage away from the structural areas during and after construction. Water permitted to pond close to the structures can result in greater soil movements than those discussed in this report. Greater movements can result in unacceptable differential floor slab movements, cracked slabs and walls, and roof leaks. Estimated movements described in this report are based on effective drainage for the life of the structure and cannot be relied upon if effective drainage is not maintained.

Exposed ground should be sloped at a minimum 4.5 percent away from the building for at least 4 meters beyond the perimeter of the structural areas. After construction and landscaping, verify final grades to ensure that effective drainage has been achieved. Grades around the structures should also be periodically inspected and adjusted as necessary, as part of the structure's maintenance program.

Roof runoff from any adjacent structures should be collected in drains or gutters. Roof drains and downpipes should discharge onto pavements which slope away from the building or down spouts should extend a minimum of 3 meters away from structures.

4.2.6 CONSTRUCTION CONSIDERATIONS FOR EARTHWORK

Upon completion of filling and grading, the subgrade moisture content should be maintained prior to construction of floor slabs and footings. Construction traffic over the completed subgrade should be avoided to the extent practical. The site should also be graded to prevent ponding of surface water on the prepared subgrades or in excavations. If the subgrade should become desiccated, saturated, or loose, the affected material should be removed or these materials should be scarified, moisture treated, and recompacted prior to floor slab construction.

The geotechnical engineer should be retained during the construction phase of the project to observe earthwork and to perform any necessary tests and observations during subgrade preparation; proofrolling; placement and compaction of controlled compacted fills; backfilling of excavations into the completed subgrade, and just prior to construction of building floor slabs.

4.3 FOUNDATIONS

4.3.1 FOOTING FOUNDATION DESIGN REQUIREMENTS

Structures that are expected to transmit heavy soil loadings should be supported by raft/mat foundations or micropiles.

Here are some key design considerations for mat foundations:

1. Load distribution: The mat foundation's design should ensure that the entire building load is adequately distributed across the foundation. This includes both dead loads (the weight of the building itself) and live loads (loads from occupants, furniture, and equipment).
2. Bearing capacity: The foundation must be designed to have an adequate bearing capacity to support the combined loads from the building and prevent excessive settlement or bearing failure.
3. Settlement control: Mat foundations are prone to differential settlement due to variations in soil properties. To minimize differential settlement, the engineer may use techniques like soil improvement, controlled fill placement, or adding stiffening elements.
4. Structural design: The mat foundation's structural design should be robust enough to distribute the loads uniformly and efficiently to the soil below. Reinforcement detailing and concrete strength are critical factors in ensuring the foundation's integrity.
5. Proximity to property lines and adjacent structures: The distance to property lines and adjacent structures is important to prevent any adverse effects on neighboring properties during construction or later settlement.
6. Groundwater considerations: The presence of groundwater affects the soil's bearing capacity and can lead to buoyancy concerns during construction. Adequate drainage and waterproofing measures may be necessary.
7. Earthquake and lateral loads: In seismically active areas or where lateral loads are significant, the foundation must be designed to withstand these forces, considering the interaction between the superstructure and the foundation.
8. Temperature and environmental effects: Extreme temperature variations or aggressive environmental conditions may impact the durability and performance of the foundation. Adequate measures like proper concrete mix design and insulation can address these issues.
9. Construction process: Mat foundations require careful planning during the construction process. The engineer must consider factors like excavation, dewatering, concreting, and curing procedures to ensure the foundation is constructed as intended.
10. Serviceability requirements: Besides considering the structural capacity, the mat foundation should also meet serviceability requirements like avoiding excessive deflection that could lead to damage or discomfort to occupants.
11. Local building codes and regulations: The design of mat foundations must comply with local building codes, which may have specific requirements related to foundation design, soil conditions, seismicity, and other relevant factors.
12. Professional geotechnical and structural engineers work together to address these considerations and design a safe and efficient mat foundation for a given building project.
13. Calculation methods for mat foundation design shall be based on the latest version of applicable codes.
14. It shall not be placed on the topsoil.
15. A minimum depth of 50 cm shall be used for mat foundation. This is required to ensure that the soil has a safe bearing capacity which is assumed in the design.
16. The depth of mat foundation must satisfy shear requirements.
17. A uniform thickness can be used for raft foundation if axial/point loads are equally spaced and the loads are not very heavy.
18. According to ACI 318-14, British standard; Eurocode 7; and IS 456; a minimum cover of 50 mm is required for mat foundation.
19. The above reinforcement cover may be increased based on harmful chemicals and minerals in the soil and fluctuations of water table when it is very near to the foundation.
20. Mat foundation should be placed below the level which would not be influenced by the seasonal change of weather to cause swelling and shrinking of the soil.

21. When mat foundation is constructed on sand, the minimum depth of foundation is around 2.5 m below the surrounding ground surface. if a smaller depth is considered, the edges of the raft settle appreciably more than the interior due to lack of confinement of the sand.
22. However, British standards specify a minimum depth of 0.6m below the surrounding ground surface.
23. When raft foundation is founded on sand, differential settlement governs the design but this is determined by the strength and stiffness of the raft structure and is very difficult to assess.
24. Accurate estimations of all types of loads, moments, and forces are needed for the present as well as for future expansion. This is crucial because once the construction of the foundation is completed and settles well into the soil, it would be difficult to strengthen it in future.
25. Foundation structures should be able to sustain the applied loads, moments, forces, and induced reactions without exceeding the safe bearing capacity of the soil.
26. The settlement of the structure should be as uniform as possible and should be within the tolerable limits.
27. Mat foundation should provide adequate safety for maintaining the stability of structure due to either overturning and/or sliding.
28. Foundation structures undergo soil-structure interaction. Therefore, the behaviour of foundation structures depends on the properties of structural materials and soil. That is why soil investigation is needed to specify the properties of soil, strata-wise and its settlement criteria.
29. Rafts constructed on saturated clay should be examined for both bearing capacity and settlement because either may control the design.
30. The weight of the raft is not considered in the structural design because it is assumed to be carried directly by the subsoil.
31. Alternatively, rafts may be thickened at the column/point load locations for economy and depth should be made sufficient to resist shear.

Here are some key design considerations for micropiles:

1. Structures that are expected to transmit heavy soil loadings should be supported by composite reinforced micropiles in accordance with FHWA NHI-05-039. These will be primarily designed as Category A to transmit axial loads primarily however inclined micropiles should also be constructed as part of micropile grouping to counteract shear and lateral loading. It is very likely that in accordance with AASHTO LRFD BDS the method of installation/grouting will be prescribed as Type A or Type B.
2. A verification test pile is recommended to determine both compression and tensile strength/resistance. The equipment, staging and requirements are presented in chapter 7 of FHWA NHI-05-039. The equipment used will be as follows:
   2.1 Compression loading – ASTM D 1143
   2.2 Tension loading – ASTM D 3689
   2.3 Lateral loading – ASTM D 3966.
3. Based on the depths/limits of the test pits and ultimately subsurface exploration conducted, the depth to an incompressible stratum could not be determined. Pile lengths/minimum depth of investigations should be guided by and/or influenced by the following FHWA NHI-05-039:
4. Micropiles in soils – depth of investigation should extend below the anticipated micropile tip elevation a minimum of 6 m (20 ft), or a minimum of two times the maximum micropile group dimension, whichever is deeper. All borings should extend through unsuitable strata such as unconsolidated fill, peat, highly organic materials, soft fine-grained soils, and loose coarse-grained soils to reach hard or dense materials.
5. Micropiles bearing on rock – a minimum of 3 m (10 ft) of rock core shall be obtained at each investigation point location to verify that the boring has not terminated on a boulder.

6. Micropiles supported on or extending into rock – a minimum of 3 m (10 ft) of rock core, or a length of rock core equal to at least three times the micropile diameter for isolated micropiles or two times the maximum micropile group dimension, whichever is greater, shall be extended below the anticipated micropile tip elevation to determine the physical characteristics of rock within the zone of foundation influence.

Ancillary structures, including lightly loaded buildings, maintenance structures and offices can be supported on conventional shallow footings with slabs on-grade with reduced soil improvements as directed by the geotechnical engineer.

Ancillary structures, including lightly loaded buildings, maintenance structures and offices can be supported on conventional shallow footings with slabs on-grade with reduced soil improvements as directed by the geotechnical engineer.

4.4 SEISMIC CONSIDERATIONS

Design in accordance with applicable codes: ACI, ASCE 7-11, BS or similar.

SEISMIC LOADS

- Ss – See table in section 2.2
- S1 – See table in section 2.2
- Seismic Design Category – D
- Seismic Importance Factor – 1.25
- Site Class – See table in section 2.2
- Risk Category - IV

4.5 FLOOR SLABS

Where required, the use of a vapor retarder should be considered beneath concrete slabs on grade that will be covered with wood, tile, carpet or other moisture sensitive or impervious coverings, or when the slab will support equipment sensitive to moisture.

4.6 PAVEMENTS

4.6.1 TYPICAL PAVEMENT SECTIONS

PAVEMENT SECTION	**DRIVE LANES**	**PARKING**
4,000 psi / 27,500kN/m2 Portland Cement Concrete	150mm Concrete	125mm Concrete
Subgrade	250mm Treated Subgrade	200mm Treated Subgrade

4.6.2 PAVEMENT DRAINAGE AND MAINTENANCE

Pavements should be sloped to provide rapid drainage of surface water. Water allowed to pond on or adjacent to the pavements could saturate the subgrade and contribute to premature pavement deterioration. The natural slope of the land can be beneficial for avoiding pooling of water on pavements. Drains should be constructed to take water away from site as much as possible due to avoid the risk of waterlogged soil and foundation settlement.

5.0 GENERAL COMMENTS

CORISAV INC should be retained to review the final design plans and specifications so comments can be made regarding interpretation and implementation of our geotechnical recommendations in the design and specifications. CORISAV also should be retained to provide observation and testing services during testing, grading, excavation, foundation construction and other earth-related construction phases of the project.

The analysis and recommendations presented in this report are based upon the data obtained from the test pits performed at the indicated locations. This report does not reflect variations that may occur across the site, or due to the modifying effects of construction or weather. The nature and extent of such variations may not become evident until during or after construction. If variations appear, we should be immediately notified so that further evaluation and supplemental recommendations can be provided.

The scope of services for this project does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential for such contamination or pollution, and environmental assessment can be considered.

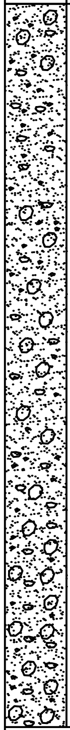
This report has been prepared for the exclusive use of our client, for specific application to the project discussed and has been prepared in accordance with generally accepted geotechnical engineering practices. No warranties, either expressed or implied, are intended or made. Site safety, excavation support, and dewatering requirements are the responsibility of others. In the event that changes in the nature, design, or location of the project as outlined in this report are planned, the conclusions and recommendations contained in this report shall not be considered valid unless CORISAV reviews the changes and either verifies or modifies the conclusions of this report in writing.

Prepared by,

…………………………………………
Cassanni Laville MSc.| Geotechnical & Structural Engineer
CORISAV INC.

Appendix A

LOG OF TEST PIT - 33 KV G.F.I POINT 1 underground link.

GRAPHIC LOGO	DESCRIPTION	DEPTH IN METERS	WATER LEVEL	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	FINES CONTENT (% passing #200 sieve)	MOISTURE CONTENT (%)	UNIT WEIGHT (g/cm³)	ALL. BEARING CAPACITY (psf) [kN/m^2] *field value	COHESION INTERCEPT (C')	ANGLE of SHARE RESISTANCE (Ø')	ANGLE of REPOSE	FRICTION COEFFICIENT (μ)	SOIL TEMPERATURE at 150cm depth	ELECTRIC RESISTIVITY	THERMAL RESISTIVITY
	SP light Brown, poorly graded sands with cobbles.	0.5 1.0 1.5															
	BOTTOM OF TEST PIT	2.0 2.5 3.0	-	-	-	-	9.2	6%	1.67	(2600) [124]	0 Kpa	39°	35°	0.51	21°c	120 ohms	R: 113 °c. cm / w

The stratification lines represent the approximate boundary lines between soil and rock types; in-situ, the transition may be gradual.

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Roseau, Commonwealth of Dominica
Tel:(767) 440-1200
info@corisav.com www.corisav.com

Soil Investigations

Client: SOFRECO
Site: Laudat
Commonwealth of Dominica

Digging Started: 27th February
Digging Completed: 27th February
Hole depth: 6 feet
Hole Size, length x ..4'.: x ..4'...
Surface Elevation (msl): NA

Supervision of Pits by: Chendi Laville
Approved by: Marsha Hamilton
Digging Contractor: CORISAV INC.
Digging Method: Manual

LOG OF TEST PIT - 33 KV G.F.I POINT 2B underground link.

GRAPHIC LOGO	DESCRIPTION	DEPTH IN METERS	WATER LEVEL	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	FINES CONTENT (% passing #200 sieve)	MOISTURE CONTENT (%)	UNIT WEIGHT (g/cm³)	ALL. BEARING CAPACITY (psf) [kN/m^2] *field value	COHESION INTERCEPT (C')	ANGLE of SHARE RESISTANCE (Ø')	ANGLE of REPOSE	FRICTION COEFFICIENT (µ)	SOIL TEMPERATURE at 150cm depth	ELECTRIC RESISTIVITY	THERMAL RESISTIVITY
	SP lBrown, poorly graded sands with cobbles.	0.5 1.0 1.5	–	–	–	–	10.3%	15.27%	1.47	(2500) [119]	0 Kpa	40°	0.53	36°	27°c	112 ohms	R: 560 °c. cm / w
	BOTTOM OF TEST PIT	2.0 2.5 3.0															

The stratification lines represent the approximate boundary lines between soil and rock types; in-situ, the transition may be gradual.

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Soil Investigations

Client: SOFRECO

Site: Trafalgar

Commonwealth of Dominica

Digging Started: 27th February

Digging Completed: 27th February

Hole depth: 6 feet

Hole Size, length x ..4'..: x ..4'..

Surface Elevation (msl): NA

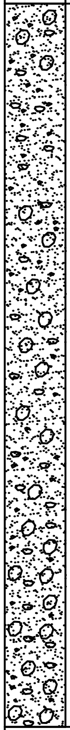
Supervision of Pits by: Chendi Laville

Approved by: Marsha Hamilton

Digging Contractor: CORISAV INC.

Digging Method: Manual

LOG OF TEST PIT - 33 KV G.F.I POINT 3 underground link.

GRAPHIC LOGO	DESCRIPTION	DEPTH IN METERS	WATER LEVEL	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	FINES CONTENT (% passing #200 sieve)	MOISTURE CONTENT (%)	UNIT WEIGHT (g/cm^3)	ALL. BEARING CAPACITY (psf) [kN/m^2] *field value	COHESION INTERCEPT (C')	ANGLE of SHARE RESISTANCE (Ø')	ANGLE of REPOSE	FRICTION COEFFICIENT (µ)	SOIL TEMPERATURE at 150cm depth	ELECTRIC RESISTIVITY	THERMAL RESISTIVITY
	SP Brown, poorly graded sands with cobbles.	0.5 1.0 1.5															
	BOTTOM OF TEST PIT		-	-	-	-	6.3%	8%	1.69	(4000) [191]	0 Kpa	31°	32°	0.39	21°c	164 ohms	R: 546 °c. cm / w
		2.0 2.5 3.0															

The stratification lines represent the approximate boundary lines between soil and rock types; in-situ, the transition may be gradual.

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Soil Investigations

Client: SOFRECO
Site: Roseau valley
Commonwealth of Dominica

Digging Started: 27th February
Digging Completed: 27th February
Hole depth: 6 feet
Hole Size, length x ...4'...: x ...4'...
Surface Elevation (msl): NA

Supervision of Pits by: Chendi Laville
Approved by: Marsha Hamilton
Digging Contractor: CORISAV INC.
Digging Method: Manual

LOG OF TEST PIT - 33 KV G.F.I POINT 4 underground link.

GRAPHIC LOGO	DESCRIPTION	DEPTH IN METERS	WATER LEVEL	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	FINES CONTENT (% passing #200 sieve)	MOISTURE CONTENT (%)	UNIT WEIGHT (g/cm^3)	ALL. BEARING CAPACITY (psf) [kN/m^2] *field value	COHESION INTERCEPT (C')	ANGLE of SHARE RESISTANCE (Ø')	ANGLE of REPOSE	FRICTION COEFFICIENT (μ)	SOIL TEMPERATURE at 150cm depth	ELECTRIC RESISTIVITY	THERMAL RESISTIVITY
▨	CL Brown Silty Clay	0.5 1.0 1.5	-	45%	22%	23%	99%	42%	1.61	(2000) [95]	14 Kpa	34°	33°	0.39	21°c	144 ohms	R: 118 °c. cm / w
	BOTTOM OF TEST PIT	2.0 2.5 3.0															

The stratification lines represent the approximate boundary lines between soil and rock types; in-situ, the transition may be gradual.

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Soil Investigations

Client: SOFRECO

Site: Goodwill - Federation drive

Commonwealth of Dominica

Digging Started: 27th February

Digging Completed: 27th February

Hole depth: 6 feet

Hole Size, length x ..4'..: x ..4'...

Surface Elevation (msl): NA

Supervision of Pits by: Chendi Laville

Approved by: Marsha Hamilton

Digging Contractor: CORISAV INC.

Digging Method: Manual

LOG OF TEST PIT - 69 KV F.S.I Structure no. 3 OHTL link.

GRAPHIC LOGO	DESCRIPTION	DEPTH IN METERS	WATER LEVEL	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	FINES CONTENT (% passing #200 sieve)	MOISTURE CONTENT (%)	UNIT WEIGHT (g/cm^3)	ALL. BEARING CAPACITY (psf) [kN/m^2] *field value	COHESION INTERCEPT (C')	ANGLE of SHARE RESISTANCE (Ø')	ANGLE of REPOSE	FRICTION COEFFICIENT (μ)	SOIL TEMPERATURE at 150cm depth	ELECTRIC RESISTIVITY	THERMAL RESISTIVITY
▨	CL Brown Silty Clay	0.5 1.0 1.5	-	47%	24%	23%	45.6%	23.98%	1.87	(2050) [98]	16 Kpa	32°	33°	0.41	27.2°c	161 ohms	R: 113 °c. cm / w
	BOTTOM OF TEST PIT	2.0 2.5 3.0															

The stratification lines represent the approximate boundary lines between soil and rock types; in-situ, the transition may be gradual.

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Soil Investigations

Client: SOFRECO

Site: Fond cole - glas gow estate
Commonwealth of Dominica

Digging Started: 28th February
Digging Completed: 28th February
Hole depth: 6 feet
Hole Size, length x ...4'.: x ...4'..
Surface Elevation (msl): NA

Supervision of Pits by: Chendi Laville
Approved by: Marsha Hamilton
Digging Contractor: CORISAV INC.
Digging Method: Manual

LOG OF TEST PIT - 69 KV F.S.I Structure no. 8 OHTL link.

GRAPHIC LOGO	DESCRIPTION	DEPTH IN METERS	WATER LEVEL	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	FINES CONTENT (% passing #200 sieve)	MOISTURE CONTENT (%)	UNIT WEIGHT (g/cm³)	ALL. BEARING CAPACITY (psf) [kN/m^2] *field value	COHESION INTERCEPT (C')	ANGLE of SHARE RESISTANCE (Ø')	ANGLE of REPOSE	FRICTION COEFFICIENT (μ)	SOIL TEMPERATURE at 150cm depth	ELECTRIC RESISTIVITY	THERMAL RESISTIVITY
	ML light brown, silty of clayey fine sands	0.5 1.0 1.5	-	40%	10%	30%	82%	12%	1.74	(2050) [98]	16 Kpa	32°	32°	0.41	24°c	168 ohms	R: 220 °c. cm / w
	BOTTOM OF TEST PIT	2.0 2.5 3.0															

The stratification lines represent the approximate boundary lines between soil and rock types; in-situ, the transition may be gradual.

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Soil Investigations

Client: SOFRECO
Site: Canefield east
Commonwealth of Dominica

Digging Started: 28th February
Digging Completed: 28th February
Hole depth: 6 feet
Hole Size, length x ...4'.: x ..4'...
Surface Elevation (msl): NA

Supervision of Pits by: Chendi Laville
Approved by: Marsha Hamilton
Digging Contractor: CORISAV INC.
Digging Method: Manual

LOG OF TEST PIT - 69 KV F.S.I Structure no. 15 OHTL link.

GRAPHIC LOGO	DESCRIPTION	DEPTH IN METERS	WATER LEVEL	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	FINES CONTENT (% passing #200 sieve)	MOISTURE CONTENT (%)	UNIT WEIGHT (g/cm^3)	ALL. BEARING CAPACITY (psf) $[kN/m^2]$ *field value	COHESION INTERCEPT (C')	ANGLE of SHARE RESISTANCE (Ø')	ANGLE of REPOSE	FRICTION COEFFICIENT (μ)	SOIL TEMPERATURE at 150cm depth	ELECTRIC RESISTIVITY	THERMAL RESISTIVITY
▨	SC light brown,clayey sand	0.5 1.0 1.5	-	52%	27%	25%	14.4%	23.37%	1.70	(4500) [215]	15 Kpa	29°	31°	0.36	26°c	36 ohms	R: 258 °c. cm / w
	BOTTOM OF TEST PIT	2.0 2.5 3.0															

The stratification lines represent the approximate boundary lines between soil and rock types; in-situ, the transition may be gradual.

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Soil Investigations

Client: SOFRECO
Site: Mahaut
Commonwealth of Dominica

Digging Started: 28th February
Digging Completed: 28th February
Hole depth: 6 feet
Hole Size, length x ..4'..: x ..4'...
Surface Elevation (msl): NA

Supervision of Pits by: Chendi Laville
Approved by: Marsha Hamilton
Digging Contractor: CORISAV INC.
Digging Method: Manual

LOG OF TEST PIT - 69 KV F.S.I Structure no. 22 OHTL link.

GRAPHIC LOGO	DESCRIPTION	DEPTH IN METERS	WATER LEVEL	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	FINES CONTENT (% passing #200 sieve)	MOISTURE CONTENT (%)	UNIT WEIGHT (g/cm³)	ALL. BEARING CAPACITY (psf) [kN/m²] *field value	COHESION INTERCEPT (C')	ANGLE of SHARE RESISTANCE (Ø')	ANGLE of REPOSE	FRICTION COEFFICIENT (μ)	SOIL TEMPERATURE at 150cm depth	ELECTRIC RESISTIVITY	THERMAL RESISTIVITY
▨	CL brown Clay with pebbles	0.5 1.0 1.5	-	48%	23%	25%	96.6%	35.62%	1.30	(3600) [172]	15 Kpa	36°	34°	0.39	23°c	36.8 ohms	R: 118 °c. cm / w
	BOTTOM OF TEST PIT	2.0 2.5 3.0															

The stratification lines represent the approximate boundary lines between soil and rock types; in-situ, the transition may be gradual.

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Soil Investigations

Client: SOFRECO
Site: Warner
Commonwealth of Dominica

Digging Started: 28th February
Digging Completed: 28th February
Hole depth: 6 feet
Hole Size, length x ..4'..: x ..4'..
Surface Elevation (msl): NA

Supervision of Pits by: Chendi Laville
Approved by: Marsha Hamilton
Digging Contractor: CORISAV INC.
Digging Method: Manual

LOG OF TEST PIT - 69 KV F.S.I Structure no. 35 OHTL link.

GRAPHIC LOGO	DESCRIPTION	DEPTH IN METERS	WATER LEVEL	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	FINES CONTENT (% passing #200 sieve)	MOISTURE CONTENT (%)	UNIT WEIGHT (g/cm³)	ALL. BEARING CAPACITY (psf) [kN/m^2] *field value	COHESION INTERCEPT (C')	ANGLE of SHARE RESISTANCE (Ø')	ANGLE of REPOSE	FRICTION COEFFICIENT (μ)	SOIL TEMPERATURE at 150cm depth	ELECTRIC RESISTIVITY	THERMAL RESISTIVITY
	SP Brown Silty Clay with pebbles	0.5 1.0 1.5	-	52%	32%	20%	64%	18.04%	1.60	(3500) [167]	78 Kpa	29°	31°	0.32	29.8°c	36.7 ohms	R: 1.8e + 03 °c. cm / w
	BOTTOM OF TEST PIT	2.0 2.5 3.0															

The stratification lines represent the approximate boundary lines between soil and rock types; in-situ, the transition may be gradual.

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info@corisav.com www.corisav.com

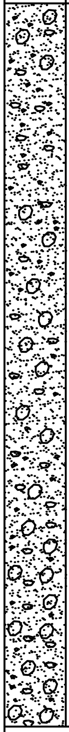
Soil Investigations

Client: SOFRECO
Site: Mero
Commonwealth of Dominica

Digging Started: 28th February
Digging Completed: 28th February
Hole depth: 6 feet
Hole Size, length x ..4'..: x ..4'...
Surface Elevation (msl): NA

Supervision of Pits by: Chendi Laville
Approved by: Marsha Hamilton
Digging Contractor: CORISAV INC.
Digging Method: Manual

LOG OF TEST PIT - 69 KV F.S.I Structure no. 42 OHTL link.

GRAPHIC LOGO	DESCRIPTION	DEPTH IN METERS	WATER LEVEL	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	FINES CONTENT (% passing #200 sieve)	MOISTURE CONTENT (%)	UNIT WEIGHT (g/cm^3)	ALL. BEARING CAPACITY (psf) [kN/m^2] *field value	COHESION INTERCEPT (C')	ANGLE of SHARE RESISTANCE (Ø')	ANGLE of REPOSE	FRICTION COEFFICIENT (μ)	SOIL TEMPERATURE at 150cm depth	ELECTRIC RESISTIVITY	THERMAL RESISTIVITY
	SP Brown Silty Clay with pebbles	0.5 1.0 1.5	-	-	-	-	13.8%	9.30%	1.60	(3500) [167]	0 Kpa	30°	33°	0.38	26.3°c	116 ohms	R: 513 °c. cm / w
	BOTTOM OF TEST PIT	2.0 2.5 3.0															

The stratification lines represent the approximate boundary lines between soil and rock types; in-situ, the transition may be gradual.

CORISAV® INC

P.O Box 2229, Roseau,Dominica
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Tel:(767) 440-1200
info@corisav.com www.corisav.com

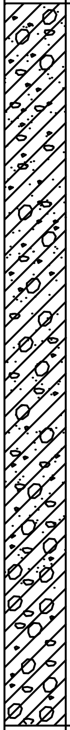
Soil Investigations

Client: SOFRECO
Site: Salisbury
Commonwealth of Dominica

Digging Started: 1st March
Digging Completed: 1st March
Hole depth: 6 feet
Hole Size, length x ..4'..: x ..4'..
Surface Elevation (msl): NA

Supervision of Pits by: Chendi Laville
Approved by: Marsha Hamilton
Digging Contractor: CORISAV INC.
Digging Method: Manual

LOG OF TEST PIT - 69 KV F.S.I Structure no. 50 OHTL link.

GRAPHIC LOGO	DESCRIPTION	DEPTH IN METERS	WATER LEVEL	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	FINES CONTENT (% passing #200 sieve)	MOISTURE CONTENT (%)	UNIT WEIGHT (g/cm^3)	ALL. BEARING CAPACITY (psf) [kN/m^2] *field value	COHESION INTERCEPT (C')	ANGLE of SHARE RESISTANCE (Ø')	ANGLE of REPOSE	FRICTION COEFFICIENT (μ)	SOIL TEMPERATURE at 150cm depth	ELECTRIC RESISTIVITY	THERMAL RESISTIVITY
	SP light grey coarse to medium sandy sand with an abundance of pebbles	0.5 1.0 1.5	-	-	-	-	18.3%	3.91%	1.56	(2500) [119]	6 Kpa	20°	28°	0.24	32.1°c	129 ohm / m	R: 485 °c. cm / w
	BOTTOM OF TEST PIT	2.0 2.5 3.0															

The stratification lines represent the approximate boundary lines between soil and rock types; in-situ, the transition may be gradual.

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Roseau, Commonwealth of Dominica
Tel:(767) 440-1200
info@corisav.com www.corisav.com

Soil Investigations

Client: SOFRECO
Site: Colihaut
Commonwealth of Dominica

Digging Started: 1st March
Digging Completed: 1st March
Hole depth: 6 feet
Hole Size, length x ..4'..: x ..4'...
Surface Elevation (msl): NA

Supervision of Pits by: Chendi Laville
Approved by: Marsha Hamilton
Digging Contractor: CORISAV INC.
Digging Method: Manual

LOG OF TEST PIT - 69 KV F.S.I Structure no. 59 OHTL link.

GRAPHIC LOGO	DESCRIPTION	DEPTH IN METERS	WATER LEVEL	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	FINES CONTENT (% passing #200 sieve)	MOISTURE CONTENT (%)	UNIT WEIGHT (g/cm³)	ALL. BEARING CAPACITY (psf) [kN/m^2] *field value	COHESION INTERCEPT (C')	ANGLE of SHARE RESISTANCE (Ø')	ANGLE of REPOSE	FRICTION COEFFICIENT (µ)	SOIL TEMPERATURE at 150cm depth	ELECTRIC RESISTIVITY	THERMAL RESISTIVITY
	SP Brown Silty Clay with pebbles	0.5 1.0 1.5	-	-	-	-	74.2%	8.9%	1.51	(2800) [134]	6 Kpa	44°	36°	0.59	32°c	137 ohm / m	R: 123 °c. cm / w
	BOTTOM OF TEST PIT	2.0 2.5 3.0															

The stratification lines represent the approximate boundary lines between soil and rock types; in-situ, the transition may be gradual.

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Soil Investigations

Client: SOFRECO
Site: Colihaut
Commonwealth of Dominica

Digging Started: 1st March
Digging Completed: 1st March
Hole depth: 6 feet
Hole Size, length x ..4'.. x ..4'..
Surface Elevation (msl): NA

Supervision of Pits by: Chendi Laville
Approved by: Marsha Hamilton
Digging Contractor: CORISAV INC.
Digging Method: Manual

LOG OF TEST PIT - 69 KV F.S.I Structure no .72 OHTL link.

GRAPHIC LOGO	DESCRIPTION	DEPTH IN METERS	WATER LEVEL	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	FINES CONTENT (% passing #200 sieve)	MOISTURE CONTENT (%)	UNIT WEIGHT (g/cm^3)	ALL. BEARING CAPACITY (psf) $[kN/m^2]$ *field value	COHESION INTERCEPT (C')	ANGLE of SHARE RESISTANCE (Ø')	ANGLE of REPOSE	FRICTION COEFFICIENT (μ)	SOIL TEMPERATURE at 150cm depth	ELECTRIC RESISTIVITY	THERMAL RESISTIVITY
▨	CL brown Silty Clay																
▨		0.5															
▨		1.0															
▨		1.5															
	BOTTOM OF TEST PIT		-	53%	24%	29%	41.5%	22%	1.63	(1300) [62]	14 Kpa	34°	33°	0.45	24.5°c	168 ohms	R: 127 °c. cm / w
		2.0															
		2.5															
		3.0															

The stratification lines represent the approximate boundary lines between soil and rock types; in-situ, the transition may be gradual.

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Soil Investigations

Client: SOFRECO
Site: Portsmouth - picard
Commonwealth of Dominica

Digging Started: 2nd March
Digging Completed: 2nd March
Hole depth: 6 feet
Hole Size, length x ...4'..: x ...4'..
Surface Elevation (msl): NA

Supervision of Pits by: Chendi Laville
Approved by: Marsha Hamilton
Digging Contractor: CORISAV INC.
Digging Method: Manual

LOG OF TEST PIT - 69 KV F.S.I Structure no. 79 OHTL link.

GRAPHIC LOGO	DESCRIPTION	DEPTH IN METERS	WATER LEVEL	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	FINES CONTENT (% passing #200 sieve)	MOISTURE CONTENT (%)	UNIT WEIGHT (g/cm³)	ALL. BEARING CAPACITY (psf) [kN/m^2] *field value	COHESION INTERCEPT (C')	ANGLE of SHARE RESISTANCE (Ø')	ANGLE of REPOSE	FRICTION COEFFICIENT (μ)	SOIL TEMPERATURE at 150cm depth	ELECTRIC RESISTIVITY	THERMAL RESISTIVITY
▨	CH brown inorganic clay of high plasticity	0.5 1.0 1.5	–	100%	44%	59%	83%	36.69%	1.24	(1400) [67]	27 Kpa	19°	30°	0.39	21°c	12.8 ohm / m	R: 249 °c. cm / w
	BOTTOM OF TEST PIT	2.0 2.5 3.0															

The stratification lines represent the approximate boundary lines between soil and rock types; in-situ, the transition may be gradual.

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Soil Investigations

Client: SOFRECO
Site: Portsmouth - sugarloaf estate
Commonwealth of Dominica

Digging Started: 2nd March
Digging Completed: 2nd March
Hole depth: 6 feet
Hole Size, length x ..4'..: x ..4'...
Surface Elevation (msl): NA

Supervision of Pits by: Chendi Laville
Approved by: Marsha Hamilton
Digging Contractor: CORISAV INC.
Digging Method: Manual

LOG OF TEST PIT - 69 KV G.F.I Structure no. 5 OHTL link.

GRAPHIC LOGO	DESCRIPTION	DEPTH IN METERS	WATER LEVEL	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	FINES CONTENT (% passing #200 sieve)	MOISTURE CONTENT (%)	UNIT WEIGHT (g/cm^3)	ALL. BEARING CAPACITY (psf) $[kN/m^2]$ *field value	COHESION INTERCEPT (C')	ANGLE of SHARE RESISTANCE (Ø')	ANGLE of REPOSE	FRICTION COEFFICIENT (μ)	SOIL TEMPERATURE at 150cm depth	ELECTRIC RESISTIVITY	THERMAL RESISTIVITY
▨	CL Brown Silty Clay	0.5 1.0 1.5	-	49%	21%	28%	37.4%	32.04%	1.89	(700) [33]	13 Kpa	18°	27°	0.39	25.1°c	16.8 ohm / m	R: 148 °c. cm / w
	BOTTOM OF TEST PIT	2.0 2.5 3.0															

The stratification lines represent the approximate boundary lines between soil and rock types; in-situ, the transition may be gradual.

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Soil Investigations

Client: SOFRECO
Site: Fond cole - glas gow estate
Commonwealth of Dominica

Digging Started: 3rd March
Digging Completed: 3rd March
Hole depth: 6 feet
Hole Size, length x ......4'..: x ...4'...
Surface Elevation (msl): NA

Supervision of Pits by: Chendi Laville
Approved by: Marsha Hamilton
Digging Contractor: CORISAV INC.
Digging Method: Manual

LOG OF TEST PIT - 69 KV G.F.I Structure no. 9 OHTL link.

GRAPHIC LOGO	DESCRIPTION	DEPTH IN METERS	WATER LEVEL	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	FINES CONTENT (% passing #200 sieve)	MOISTURE CONTENT (%)	UNIT WEIGHT (g/cm^3)	ALL. BEARING CAPACITY (psf) [kN/m^2] *field value	COHESION INTERCEPT (C')	ANGLE of SHARE RESISTANCE (Ø')	ANGLE of REPOSE	FRICTION COEFFICIENT (μ)	SOIL TEMPERATURE at 150cm depth	ELECTRIC RESISTIVITY	THERMAL RESISTIVITY
▨	CL Brown Silty Clay	0.5															
▨		1.0															
▨		1.5															
▨			-	35%	24%	11%	35.1%	25.01%	1.91	(2000) [95]	16 Kpa	32°	32°	0.41	22.8°c	24 ohm / m	R: 131 °c. cm / w
	BOTTOM OF TEST PIT	2.0															
		2.5															
		3.0															

The stratification lines represent the approximate boundary lines between soil and rock types; in-situ, the transition may be gradual.

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Soil Investigations

Client: SOFRECO
Site: Fond cole - glas gow estate
Commonwealth of Dominica

Digging Started: 3rd March
Digging Completed: 3rd March
Hole depth: 6 feet
Hole Size, length x ...4'..: x ..4'...
Surface Elevation (msl): NA

Supervision of Pits by: Chendi Laville
Approved by: Marsha Hamilton
Digging Contractor: CORISAV INC.
Digging Method: Manual

LOG OF TEST PIT - 69 KV G.F.I Structure no. 16 OHTL link.

GRAPHIC LOGO	DESCRIPTION	DEPTH IN METERS	WATER LEVEL	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	FINES CONTENT (% passing #200 sieve)	MOISTURE CONTENT (%)	UNIT WEIGHT (g/cm³)	ALL. BEARING CAPACITY (psf) [kN/m²] *field value	COHESION INTERCEPT (C')	ANGLE of SHARE RESISTANCE (Ø')	ANGLE of REPOSE	FRICTION COEFFICIENT (μ)	SOIL TEMPERATURE at 150cm depth	ELECTRIC RESISTIVITY	THERMAL RESISTIVITY
▨	SC light grey,clayey sands																
▨		0.5															
▨		1.0															
▨		1.5															
▨			-	47%	33%	14%	37.1%	25.22%	1.82	(1000) [47]	20 Kpa	34°	33°	0.44	22.8°c	87.2 ohm / m	R: 119 °c. cm / w
	BOTTOM OF TEST PIT																
		2.0															
		2.5															
		3.0															

The stratification lines represent the approximate boundary lines between soil and rock types; in-situ, the transition may be gradual.

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Soil Investigations

Client: SOFRECO
Site: Fond cole - glas gow estate
Commonwealth of Dominica

Digging Started: 3rd March
Digging Completed: 3rd March
Hole depth: 6 feet
Hole Size, length x ..4'..: x ..4'...
Surface Elevation (msl): NA

Supervision of Pits by: Chendi Laville
Approved by: Marsha Hamilton
Digging Contractor: CORISAV INC.
Digging Method: Manual

LOG OF TEST PIT - 69 KV G.F.I Structure no. 21 OHTL link.

GRAPHIC LOGO	DESCRIPTION	DEPTH IN METERS	WATER LEVEL	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	FINES CONTENT (% passing #200 sieve)	MOISTURE CONTENT (%)	UNIT WEIGHT (g/cm³)	ALL. BEARING CAPACITY (psf) [kN/m²] *field value	COHESION INTERCEPT (C')	ANGLE of SHARE RESISTANCE (Ø')	ANGLE of REPOSE	FRICTION COEFFICIENT (μ)	SOIL TEMPERATURE at 150cm depth	ELECTRIC RESISTIVITY	THERMAL RESISTIVITY
▨	SC brown clayey sands	0.5 1.0 1.5	-	107%	80%	27%	16.2%	35.62%	1.61	(2000) [95]	15 Kpa	36°	34°	0.47	27.6°c	35.8 ohm / m	R: 197 °c. cm / w
	BOTTOM OF TEST PIT	2.0 2.5 3.0															

The stratification lines represent the approximate boundary lines between soil and rock types; in-situ, the transition may be gradual.

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Soil Investigations

Client: SOFRECO
Site: Laudat
Commonwealth of Dominica

Digging Started: 3rd March
Digging Completed: 3rd March
Hole depth: 6 feet
Hole Size, length x ...4'..: x ...4'...
Surface Elevation (msl): NA

Supervision of Pits by: Chendi Laville
Approved by: Marsha Hamilton
Digging Contractor: CORISAV INC.
Digging Method: Manual

LOG OF TEST PIT - 69 KV G.F.I Structure no. 26 OHTL link.

GRAPHIC LOGO	DESCRIPTION	DEPTH IN METERS	WATER LEVEL	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	FINES CONTENT (% passing #200 sieve)	MOISTURE CONTENT (%)	UNIT WEIGHT (g/cm³)	ALL. BEARING CAPACITY (psf) [kN/m^2] *field value	COHESION INTERCEPT (C')	ANGLE of SHARE RESISTANCE (Ø')	ANGLE of REPOSE	FRICTION COEFFICIENT (μ)	SOIL TEMPERATURE at 150cm depth	ELECTRIC RESISTIVITY	THERMAL RESISTIVITY
▨	CH brown Silty clay																
		0.5															
		1.0															
		1.5															
			–	95%	36%	69%	15%	22.40%	1.54	(650) [31]	16 Kpa	32°	32°	–	21.9°c	24.8 ohm / m	R: 152 °c. cm / w
	BOTTOM OF TEST PIT																
		2.0															
		2.5															
		3.0															

The stratification lines represent the approximate boundary lines between soil and rock types; in-situ, the transition may be gradual.

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Soil Investigations

Client: SOFRECO
Site: Laudat
Commonwealth of Dominica

Digging Started: 3rd March
Digging Completed: 3rd March
Hole depth: 6 feet
Hole Size, length x ..4'..: x ..4'...
Surface Elevation (msl): NA

Supervision of Pits by: Chendi Laville
Approved by: Marsha Hamilton
Digging Contractor: CORISAV INC.
Digging Method: Manual

LOG OF TEST PIT - 69 KV G.F.I Structure no. 29 OHTL link.

GRAPHIC LOGO	DESCRIPTION	DEPTH IN METERS	WATER LEVEL	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	FINES CONTENT (% passing #200 sieve)	MOISTURE CONTENT (%)	UNIT WEIGHT (g/cm³)	ALL. BEARING CAPACITY (psf) [kN/m^2] *field value	COHESION INTERCEPT (C')	ANGLE of SHARE RESISTANCE (Ø')	ANGLE of REPOSE	FRICTION COEFFICIENT (μ)	SOIL TEMPERATURE at 150cm depth	ELECTRIC RESISTIVITY	THERMAL RESISTIVITY
▨	SC brown sand - clay mixture	0.5 1.0 1.5	-	78%	53%	25%	10.5%	37.88%	1.41	(1300) [62]	16 Kpa	32°	33°	-	21°c	13.7 ohm / m	R: 152 °c. cm / w
	BOTTOM OF TEST PIT	2.0 2.5 3.0															

The stratification lines represent the approximate boundary lines between soil and rock types; in-situ, the transition may be gradual.

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Soil Investigations

Client: SOFRECO

Site: Laudat

Commonwealth of Dominica

Digging Started: 3rd March

Digging Completed: 3rd March

Hole depth: 6 feet

Hole Size, length x ...4'.: x ...4'...

Surface Elevation (msl): NA

Supervision of Pits by: Chendi Laville

Approved by: Marsha Hamilton

Digging Contractor: CORISAV INC.

Digging Method: Manual

LOG OF TEST PIT - SUBSTATION - SUGAR LOAF POWER STATION

GRAPHIC LOGO	DESCRIPTION	DEPTH IN METERS	WATER LEVEL	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	FINES CONTENT (% passing #200 sieve)	MOISTURE CONTENT (%)	UNIT WEIGHT (g/cm^3)	ALL. BEARING CAPACITY (psf) [kN/m^2] *field value	COHESION INTERCEPT (C')	ANGLE of SHARE RESISTANCE (Ø')	ANGLE of REPOSE	FRICTION COEFFICIENT (μ)	SOIL TEMPERATURE at 150cm depth	ELECTRIC RESISTIVITY	THERMAL RESISTIVITY
▨	CH brown Silty clay	0.5 1.0 1.5	-	80%	28%	52%%	43.2%	45.42%	1.55	(2000) [95]	28 Kpa	11°	25°	0.4	24.2°c	142 ohm / m	R: 333 °c. cm / w
	BOTTOM OF TEST PIT	2.0 2.5 3.0															

The stratification lines represent the approximate boundary lines between soil and rock types; in-situ, the transition may be gradual.

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Soil Investigations

Client: SOFRECO

Site: Portsmouth - sugarloaf estate

Commonwealth of Dominica

Digging Started: 3rd March

Digging Completed: 3rd March

Hole depth: 6 feet

Hole Size, length x ..4'..: x ..4'..

Surface Elevation (msl): NA

Supervision of Pits by: Chendi Laville

Approved by: Marsha Hamilton

Digging Contractor: CORISAV INC.

Digging Method: Excavator

LOG OF TEST PIT - SUBSTATION - PADU POWER STATION

GRAPHIC LOGO	DESCRIPTION	DEPTH IN METERS	WATER LEVEL	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	FINES CONTENT (% passing #200 sieve)	MOISTURE CONTENT (%)	UNIT WEIGHT (g/cm³)	ALL. BEARING CAPACITY (psf) [kN/m^2] *field value	COHESION INTERCEPT (C')	ANGLE of SHARE RESISTANCE (Ø')	ANGLE of REPOSE	FRICTION COEFFICIENT (μ)	SOIL TEMPERATURE at 150cm depth	ELECTRIC RESISTIVITY	THERMAL RESISTIVITY
▨	SP light grey, poorly graded sands	0.5															
▨		1.0															
▨		1.5															
			-	-	-	-	18.5%	8.58%	1.72	(2000) [96]	13 Kpa	36°	34°	0.47	27.8°c	133.6 ohm / m	R: 197 °c. cm / w
	BOTTOM OF TEST PIT	2.0															
		2.5															
		3.0															

The stratification lines represent the approximate boundary lines between soil and rock types; in-situ, the transition may be gradual.

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Soil Investigations

Client: SOFRECO
Site: Trafalgar
Commonwealth of Dominica

Digging Started: 4th March
Digging Completed: 4th March
Hole depth: 6 feet
Hole Size, length x ......4'..: x ......4'...
Surface Elevation (msl): NA

Supervision of Pits by: Chendi Laville
Approved by: Marsha Hamilton
Digging Contractor: CORISAV INC.
Digging Method: Excavator

LOG OF TEST PIT - SUBSTATION - TRAFALGAR

GRAPHIC LOGO	DESCRIPTION	DEPTH IN METERS	WATER LEVEL	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	FINES CONTENT (% passing #200 sieve)	MOISTURE CONTENT (%)	UNIT WEIGHT (g/cm^3)	ALL. BEARING CAPACITY (psf) [kN/m^2] *field value	COHESION INTERCEPT (C')	ANGLE of SHARE RESISTANCE (Ø')	ANGLE of REPOSE	FRICTION COEFFICIENT (μ)	SOIL TEMPERATURE at 150cm depth	ELECTRIC RESISTIVITY	THERMAL RESISTIVITY
▨	SC grey clayey sands	0.5 1.0 1.5	-	-	-	-	14.1%	13.69%	1.67	(1400) [67]	7 Kpa	36°	34°	0.39	22.8°c	126 ohm / m	R: 125 °c. cm / w
	BOTTOM OF TEST PIT	2.0 2.5 3.0															

The stratification lines represent the approximate boundary lines between soil and rock types; in-situ, the transition may be gradual.

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Tel:(767) 440-1200
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Soil Investigations

Client: SOFRECO
Site: Trafalgar
Commonwealth of Dominica

Digging Started: 4th March
Digging Completed: 4th March
Hole depth: 6 feet
Hole Size, length x ..4'..: x ..4'...
Surface Elevation (msl): NA

Supervision of Pits by: Chendi Laville
Approved by: Marsha Hamilton
Digging Contractor: CORISAV INC.
Digging Method: Excavator

LOG OF TEST PIT - SUBSTATION - FOND COLE

GRAPHIC LOGO	DESCRIPTION	DEPTH IN METERS	WATER LEVEL	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	FINES CONTENT (% passing #200 sieve)	MOISTURE CONTENT (%)	UNIT WEIGHT (g/cm³)	ALL. BEARING CAPACITY (psf) [kN/m^2] *field value	COHESION INTERCEPT (C')	ANGLE of SHARE RESISTANCE (Ø')	ANGLE of REPOSE	FRICTION COEFFICIENT (μ)	SOIL TEMPERATURE at 150cm depth	ELECTRIC RESISTIVITY	THERMAL RESISTIVITY
	ML brown silty of clayey fine sands																
		0.5															
		1.0															
		1.5															
			-	36%	24%	12%	52%	26%	1.60	(1400) [67]	4 Kpa	38°	34°	0.50	26.5°c	11 ohm / m	R: 263 °c. cm / w
	BOTTOM OF TEST PIT																
		2.0															
		2.5															
		3.0															

The stratification lines represent the approximate boundary lines between soil and rock types; in-situ, the transition may be gradual.

CORISAV INC ®

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Tel:(767) 440-1200
info@corisav.com www.corisav.com

Soil Investigations

Client: SOFRECO
Site: Fond Cole
Commonwealth of Dominica

Digging Started: 4th March
Digging Completed: 4th March
Hole depth: 6 feet
Hole Size, length x ..4'.: x ..4'...
Surface Elevation (msl): NA

Supervision of Pits by: Chendi Laville
Approved by: Marsha Hamilton
Digging Contractor: CORISAV INC.
Digging Method: Excavator

LOG OF TEST PIT - SUBSTATION - WEST COAST (structure no. 51)

GRAPHIC LOGO	DESCRIPTION	DEPTH IN METERS	WATER LEVEL	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	FINES CONTENT (% passing #200 sieve)	MOISTURE CONTENT (%)	UNIT WEIGHT (g/cm^3)	ALL. BEARING CAPACITY (psf) $[kN/m^2]$ *field value	COHESION INTERCEPT (C')	ANGLE of SHARE RESISTANCE (Ø')	ANGLE of REPOSE	FRICTION COEFFICIENT (µ)	SOIL TEMPERATURE at 150cm depth	ELECTRIC RESISTIVITY	THERMAL RESISTIVITY
	ML light brown silty of clayey fine sands																
		0.5															
		1.0															
		1.5															
			–	42%	10%	32%	58.6%	38.45%	1.52	(2500) [119]	5 Kpa	32°	32°	0.35	30.8°c	37.6 ohm / m	R: 123 °c. cm / w
	BOTTOM OF TEST PIT																
		2.0															
		2.5															
		3.0															

The stratification lines represent the approximate boundary lines between soil and rock types; in-situ, the transition may be gradual.

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Soil Investigations

Client: SOFRECO

Site: Colihaut
Commonwealth of Dominica

Digging Started: 4th March
Digging Completed: 4th March
Hole depth: 6 feet
Hole Size, length x ..4'..: x ..4'....
Surface Elevation (msl): NA

Supervision of Pits by: Chendi Laville
Approved by: Marsha Hamilton
Digging Contractor: CORISAV INC.
Digging Method: Excavator

LOG OF TEST PIT - SUBSTATION - GEOTHERMAL POWER PLANT

GRAPHIC LOGO	DESCRIPTION	DEPTH IN METERS	WATER LEVEL	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	FINES CONTENT (% passing #200 sieve)	MOISTURE CONTENT (%)	UNIT WEIGHT (g/cm^3)	ALL. BEARING CAPACITY (psf) [kN/m^2] *field value	COHESION INTERCEPT (C')	ANGLE of SHARE RESISTANCE (Ø')	ANGLE of REPOSE	FRICTION COEFFICIENT (μ)	SOIL TEMPERATURE at 150cm depth	ELECTRIC RESISTIVITY	THERMAL RESISTIVITY
▨	SP Brown with gravels	0.5 1.0 1.5															
	BOTTOM OF TEST PIT	2.0 2.5 3.0	-	-	-	-	65%	9.61%	1.49	(1800) [86]	8 Kpa	46°	37°	0.62	22.1°c	115.2 ohms	R: 352 °c. cm / w

The stratification lines represent the approximate boundary lines between soil and rock types; in-situ, the transition may be gradual.

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Soil Investigations

Client: SOFRECO
Site: Laudat
Commonwealth of Dominica

Digging Started: 4th March
Digging Completed: 4th March
Hole depth: 6 feet
Hole Size, length x ..4'..: x ..4'..
Surface Elevation (msl): NA

Supervision of Pits by: Chendi Laville
Approved by: Marsha Hamilton
Digging Contractor: CORISAV INC.
Digging Method: Excavator

Photographs

Figure 1. Geo point 1

Figure 2. Geo Point 1

Figure 3. Geo Point 2b

Figure 4. Geo Point 3

Figure 5. Geo Point 3

Figure 6. Geo Point 4

Figure 7. Geo Point 4

Figure 8. Structure 3 FSI

Figure 9. Structure 3 FSI

Figure 100. Structure 8 FSI

Figure 11. Structure 8 FSI

Figure 12. Structure 15 FSI

Figure 13. Structure 15 FSI

Figure 14. Structure 22 FSI

Figure 15. Structure 22 FSI

Figure 12. Structure 35 FSI

Figure 13. Structure 35 FSI

Figure 14. Structure 42 FSI

Figure 15. Structure 42 FSI

Figure 17. Structure 50 FSI

Figure 16. Structure 50 FSI

Figure 22. Structure 59 FSI

Figure 183. Structure 59 FSI

Figure 19. Structure 72 FSI

Figure 20. Structure 72 FSI

Figure 21. Structure 79 FSI

Figure 27. Structure 5 GFI

Figure 28. Structure 5 GFI

Figure 29. Structure 9 GFI

Figure 30. Structure 9 GFI

Figure 31. Structure 16 GFI

Figure 32. Structure 16 GFI

Figure 33. Structure 21 GFI

Figure 34. Structure 21 GFI

Figure 35. Structure 26 GFI

Figure 22. Structure 26 GFI

Figure 37. Structure 29 GFI

Figure 38. Structure 29 GFI

Figure 39. Padu Power Station

Figure 40. Padu Power Station

Figure 24. Geothermal Plant

Figure 23. Geothermal Plant

Figure 43. Trafalgar Power Station

Figure 25. Trafalgar Power Station

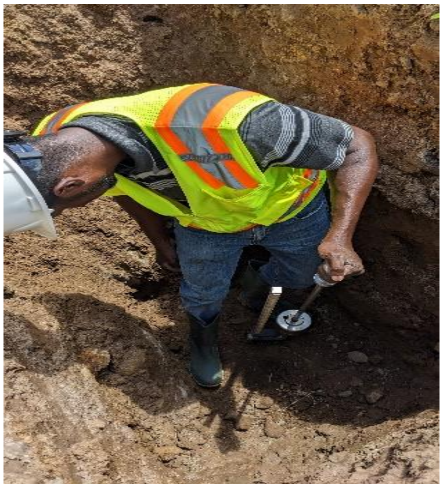

Figure 45. Fond Cole Power Station

Figure 46. Fond Cole Power Station

Figure 47. West Coast Power Station

Figure 48. West Coast Power Station

Figure 49. Sugar Loaf Power Station

Figure 50. Sugar Loaf Power Station.