

Appendix A

Geotechnical Investigation Report

To:	Chris Boone	From:	Eric Theriault
	St. John's, NL		Saint John, NB
File:	133347566	Date:	December 14, 2016

Reference: Cape Race Access Road

Thirty-two (32) test pits have been put down on the existing granular surfaced road between Cape Race and Portugal Cove South. We understand that the approximate 20 km long access road is to be upgraded but it will keep the existing alignment and profile for much of the route. A portion of the roadway, represented by test pits TP-31 to TP-19 is intended to have an asphalt surface while the remainder, represented by test pits TP-18 to TP-01, will retain a granular surface.

This memo provides the recommended pavement structures for the Cape Race Access Road. As the Test Pit Records and the laboratory gradation testing are still in draft form, the recommendations should be reviewed once these files are finalized.

Traffic loadings for the pavement assessment have not been provided so it has been assumed that the pavement will mostly be used by light vehicles (cars and pick-up trucks) with two heavier vehicles (busses or multi-axle trucks) per day.

Pavement Design - Asphalt Surfaced Section (TP-32 to TP-19)

The thickness of the existing granular surface in this section varies from 0mm (two locations) to 1,000mm and averages 315mm. The subgrade varies but for the pavement design it is classified as silty sand with gravel (SM). Peat/topsoil/rootmat were identified at five (5) of the fourteen (14) locations test pit locations; depths and thicknesses as follows:

TP-20	0.3 – 0.4m, peat
TP-22	0.4 – 0.5m, rootmat
TP-23	0.3 – 0.6, topsoil
TP-27	0.4 – 0.8m, topsoil
TP-28	0.6 – 1.0m, peat

While it is common to leave topsoil/rootmat under roadways, it should be at depths greater than 1.2m below the paved surface. For the locations noted above, the layers are relatively shallow and therefore should be removed and replaced with a suitable fill material prior to placing the new granular base material. Local pit run sand and gravel would be considered as suitable fill.

Because of the variation in the thickness of the existing granular surface throughout this section, it is recommended that it not be considered as part of the new pavement structure. Therefore, the recommended pavement structure on the existing roadway is as follows:

Asphalt	70mm (surface mix, placed in one lift)
Granular A	150mm
Granular B	150mm

Production and placement of the paving materials should be as per the appropriate NLDTW.

Reference: Cape Race Access Road

For widening areas or areas where realignment is requirement, the following pavement structure should be used:

Asphalt	70mm (surface mix, placed in one lift)
Granular A	150mm
Granular B	250mm

Pavement Design - Granular Surfaced Section (TP18 to TP1)

The thickness of the existing granular surface in this section varies from 100mm to 1,000mm and averages 490mm. The subgrade varies but for the pavement design it is classified as silty sand with gravel (SM). Peat/topsoil/rootmat were identified at twelve (12) of the eighteen (18) locations test pit locations. In general, the thickest surface granular layers are directly over the thickest peat deposits such as at the locations of TP-04, TP-07 and TP-14.

For granular surfaced roadways, it is not as critical to remove the shallow (say less than 300mm) peat/rootmat layers as the granular surface can tolerate small deflections. For design purposes, removing these materials is not required; however, they may result in construction related issues, particularly if the construction is undertaken in wet conditions. Therefore it is recommended that in areas where the top of the peat or rootmat is within 300mm of the existing road surface, the construction contract have a provision to place a bi-axial or tri-axial geogrid above the peat/rootmat before placing the pavement structure.

Proofrolling the existing granular surface with a loaded tandem truck prior to placing the new pavement structure is an efficient approach for locating areas of unacceptable subgrade; it is suggested that areas with deflections greater than 20mm should be considered for subgrade improvement with the geogrids.

The required new pavement structure is as follows:

Granular A base	150mm
Granular B subbase	150mm

For widening areas or areas where realignment is requirement, the subgrade should be prepared as per NLDTW requirements and the peat/rootmat should be removed as part of the subgrade preparation. The following pavement structure should be used:

Granular A base	150mm
Granular B subbase	300mm

Construction Sequence

Construction traffic most likely will be the heaviest traffic the pavement is subjected to and it is not included in the pavement design calculations. It is recommended that the construction begins on the Cape Race end of the access road and progresses towards Portugal Cove South. This will very much reduce the impact of the construction traffic on the new pavement structures.

December 14, 2016

Chris Boone

Page 3 of 3

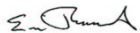
Reference: Cape Race Access Road

Closure

We trust this meets your requirements at this time. If you have any question, please contact the undersigned at your convenience.

Regards,

STANTEC CONSULTING LTD.



Eric Theriault, P.Eng.
Principal, Pavement Engineer
Phone: (506) 636-9632
Fax: (506) 634-8104
Eric.Theriault@stantec.com



Stantec Consulting Ltd.

141 Kelsey Drive, St. John's, NL A1B 0L2

Tel: 709-576-1458 Fax: 709-576-2126

December 20, 2016

File: 133347566

Mr. Chris Boone, P.Eng.
Stantec Consulting Ltd.
141 Kelsey Drive
St. John's, Newfoundland, A1B 0L2

Dear Mr. Boone:

**Re: Geotechnical Investigation, Cape Race Access Road Upgrades
Cape Race, NL**

INTRODUCTION

Acting on the request and authorization of Public Works and Government Services Canada (the Client), Stantec Consulting Ltd. (Stantec) has completed a geotechnical investigation in support of the proposed Cape Race Access road upgrade between Portugal Cove South and Cape Race, Newfoundland and Labrador.

The scope of work completed for this project was in general accordance with Stantec's proposal. In general, the scope of work consisted of completing a geotechnical field investigation limited to excavating test pits every 500 to 1000 meters along the shoulder of the road and preparation of a brief geotechnical letter report.

This report has been prepared specifically and solely for the proposed development described herein and contains all of the findings of this investigation.

SITE AND GEOLOGY

The area of investigation is along the road located between Portugal Cove South and Cape Race, on the southern shore of the Avalon Peninsula in Newfoundland and Labrador. In general, the site is located in a barren landscape consisting of rolling hills, shrubs and bogs with isolated pockets of vegetation in low lying areas.

Based on existing information and previous experience, the natural overburden material consists of surficial organic soils overlying a veneer of glacial till extending to bedrock. Bedrock geology at the site is thought to consist of predominantly tuffaceous to siliceous siltstones and sandstones of the Conception Group and shales and sandstone of the St. John's Group.

FIELD PROCEDURES

The field investigation was completed on November 23 and 24, 2016 and consisted of excavating thirty-two (32) test pits using a rubber tire backhoe (Toromont CAT 420F2 IT) provided by Cox's Construction Ltd. Test pits were excavated to depths ranging from 1.1 m to 2.8 m below the existing ground surface. Upon completion, the test pits were backfilled with the excavated



Reference: Geotechnical Investigation, Cape Race Access Road Upgrade, Cape Race, NL

material and nominally compacted using the backhoe bucket. Test pits were terminated based on backhoe refusal. It is the responsibility of the Client and/or Owner to address any potential hazards due to settlement of backfilled materials.

The field work was conducted under the inspection of Stantec personnel who maintained detailed field records of the various soil strata and groundwater conditions encountered during the investigation. The soils were classified in general accordance with the procedures outlined in the attached explanatory key: Symbol and Terms Used on Borehole and Test Pit Records. Representative soil samples were obtained directly from the test pit walls or from the backhoe bucket during the field investigation. All soil samples were stored in moisture proof containers and would be sent to our laboratory in St. John's for classification and testing if required. Samples remaining after testing will be stored for a period of three (3) months at which time they will be discarded, unless instructions to the contrary are received.

SUMMARIZED SUBSURFACE CONDITIONS

Subsurface conditions observed in the test pits are summarized in the subsections below and described in detail on the attached Field Test Pit Record along with an accompanying explanatory key: Symbols and Terms used on Borehole and Test Pit Records. Representative photographs of the excavated test pits and spoil piles are also attached. Please note that the attached Field Test Pit Records are preliminary field records of our site observations. The use of the Field Test Pit Records for site planning and design should take this into consideration.

- A surficial layer of fill material was encountered at all test pit locations. The thickness of the fill material ranged from 0.1 m to 0.9 m. The fill material generally consisted of well-graded gravel with silt and sand (GW-GM) to silty gravel with sand (GM); with occasional to some cobbles, occasional boulders, organics and debris. In terms of relative density, the fill is classified as loose to compact.
- Below the fill material a layer of organic soils consisting of either peat, rootmat or topsoil was encountered at sixteen (16) test pit locations (TP-02, TP-03, TP-04, TP-07, TP-11, TP-13, TP-14, TP-15, TP-16, TP-17, TP-18, TP-20, TP-22, TP-23, TP-27, TP-28). The organic soils layer was encountered at depth ranging from 0.2 to 1.0 m below the ground surface. The organic soils ranged in thickness from 0.2 m to 1.1 m.
- Native glacial till was encountered at all test pit locations except TP-24. In most test pit locations, the upper zones of the till were noted to be weathered. The till layer was encountered at depths ranging from 0.1 to 2.0 m below the ground surface. The glacial till ranged in thickness from 0.2 to 1.9 m. In general, two types of till were observed along the site.
 - Till type "A" generally consisted of a well-graded to poorly graded gravel with silt and sand (GW-GM) (GP-GM) to a well graded sand with silt and gravel (SW-SM); with occasional to frequent cobbles and occasional to some boulders.
 - Till type "B" general consisted of silty gravel with sand (GM) to silty sand with gravel (SM); with occasional to frequent cobbles and occasional to some boulders.



Reference: Geotechnical Investigation, Cape Race Access Road Upgrade, Cape Race, NL

- Figure 1 below shows the gradation analysis for both types of till. In terms of relative density, the till is classified as compact to dense.

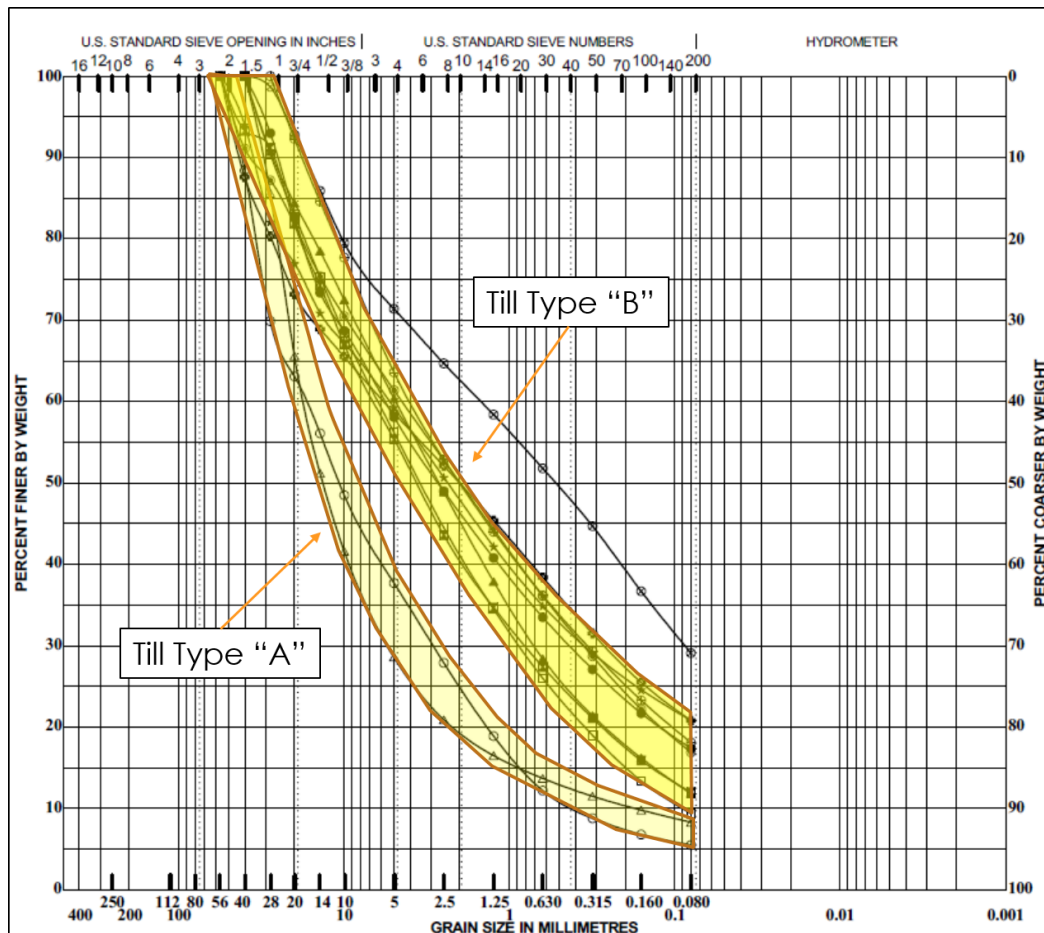


Figure 1 - Gradation Curves for till type "A" and "B"

- At test pit location TP-24 a layer of fluvial soil was encountered below the fill material at a depth of 1.5 m below ground surface. The fluvial material consisted of poorly graded sand (SP). In terms of relative density, the fluvial material is classified as loose to compact.
- Bedrock was inferred based on backhoe refusal at eleven (11) test pit locations (TP-01, TP-02, TP-03, TP-05, TP-06, TP-07, TP-08, TP-09, TP-10, TP-11). The inferred bedrock surface was encountered underlying the till layer at depths ranging from 1.1 m to 1.8 m below the ground surface. Backhoe refusal can also be attributed to large boulders encountered in the base of the test pit.



December 20, 2016
Mr. Chris Boone, P.Eng.
Page 4 of 4

Reference: Geotechnical Investigation, Cape Race Access Road Upgrade, Cape Race, NL

- Groundwater seepage was encountered at nineteen (19) test pit locations (TP-02 to TP-09, TP-10, TP-13, TP-14, TP-16, TP-17, TP-20, TP-23, TP-25 to TP-29, TP-32). Seepage was observed at rates varying from slow to very rapid at depths ranging from 0.2 to 2.2 m below the ground surface. It should be noted that groundwater levels may fluctuate seasonally and in response to precipitation events.

CLOSURE

Use of this letter report is subject to the Statement of General Conditions, attached. It is the responsibility of Public Works and Government Services Canada, who is identified as "the Client" within the Statement of General Conditions, and its agents to review the conditions and to notify Stantec should any of these not be satisfied. The Statement of General Conditions addresses the following: use of the report; basis of the report; standard of care; interpretation of site conditions; varying or unexpected site conditions; and planning, design, or construction.

We trust this brief report meets your present requirements. Should any additional information be required, please do not hesitate to contact our office at your convenience.

Sincerely,

STANTEC CONSULTING LTD

John Nichols, P. Eng.
Geotechnical Engineer

Paul Deering, P.Eng., P.Geo.
Senior Geotechnical Engineer

Attachments:

- Statement of General Conditions
- Symbols and Terms Used on Borehole and Test Pit Records
- Field Test Pit Records
- Test Pit Photographs

STATEMENT OF GENERAL CONDITIONS

USE OF THIS REPORT: This report has been prepared for the sole benefit of the Client or its agent and may not be used by any third party without the express written consent of Stantec Consulting Ltd. and the Client. Any use which a third party makes of this report is the responsibility of such third party.

BASIS OF THE REPORT: The information, opinions, and/or recommendations made in this report are in accordance with Stantec Consulting Ltd.'s present understanding of the site specific project as described by the Client. The applicability of these is restricted to the site conditions encountered at the time of the investigation or study. If the proposed site specific project differs or is modified from what is described in this report or if the site conditions are altered, this report is no longer valid unless Stantec Consulting Ltd. is requested by the Client to review and revise the report to reflect the differing or modified project specifics and/or the altered site conditions.

STANDARD OF CARE: Preparation of this report, and all associated work, was carried out in accordance with the normally accepted standard of care in the state or province of execution for the specific professional service provided to the Client. No other warranty is made.

INTERPRETATION OF SITE CONDITIONS: Soil, rock, or other material descriptions, and statements regarding their condition, made in this report are based on site conditions encountered by Stantec Consulting Ltd. at the time of the work and at the specific testing and/or sampling locations. Classifications and statements of condition have been made in accordance with normally accepted practices which are judgmental in nature; no specific description should be considered exact, but rather reflective of the anticipated material behavior. Extrapolation of in situ conditions can only be made to some limited extent beyond the sampling or test points. The extent depends on variability of the soil, rock and groundwater conditions as influenced by geological processes, construction activity, and site use.

VARYING OR UNEXPECTED CONDITIONS: Should any site or subsurface conditions be encountered that are different from those described in this report or encountered at the test locations, Stantec Consulting Ltd. must be notified immediately to assess if the varying or unexpected conditions are substantial and if reassessments of the report conclusions or recommendations are required. Stantec Consulting Ltd. will not be responsible to any party for damages incurred as a result of failing to notify Stantec Consulting Ltd. that differing site or sub-surface conditions are present upon becoming aware of such conditions.

PLANNING, DESIGN, OR CONSTRUCTION: Development or design plans and specifications should be reviewed by Stantec Consulting Ltd., sufficiently ahead of initiating the next project stage (property acquisition, tender, construction, etc), to confirm that this report completely addresses the elaborated project specifics and that the contents of this report have been properly interpreted. Specialty quality assurance services (field observations and testing) during construction are a necessary part of the evaluation of sub-subsurface conditions and site preparation works. Site work relating to the recommendations included in this report should only be carried out in the presence of a qualified geotechnical engineer; Stantec Consulting Ltd. cannot be responsible for site work carried out without being present.

SYMBOLS AND TERMS USED ON BOREHOLE AND TEST PIT RECORDS

SOIL DESCRIPTION

Terminology describing common soil genesis:

<i>Rootmat</i>	- vegetation, roots and moss with organic matter and topsoil typically forming a mattress at the ground surface
<i>Topsoil</i>	- mixture of soil and humus capable of supporting vegetative growth
<i>Peat</i>	- mixture of visible and invisible fragments of decayed organic matter
<i>Till</i>	- unstratified glacial deposit which may range from clay to boulders
<i>Fill</i>	- material below the surface identified as placed by humans (excluding buried services)

Terminology describing soil structure:

<i>Desiccated</i>	- having visible signs of weathering by oxidization of clay minerals, shrinkage cracks, etc.
<i>Fissured</i>	- having cracks, and hence a blocky structure
<i>Varved</i>	- composed of regular alternating layers of silt and clay
<i>Stratified</i>	- composed of alternating successions of different soil types, e.g. silt and sand
<i>Layer</i>	- > 75 mm in thickness
<i>Seam</i>	- 2 mm to 75 mm in thickness
<i>Parting</i>	- < 2 mm in thickness

Terminology describing soil types:

The classification of soil types are made on the basis of grain size and plasticity in accordance with the Unified Soil Classification System (USCS) (ASTM D 2487 or D 2488) which excludes particles larger than 75 mm. For particles larger than 75 mm, and for defining percent clay fraction in hydrometer results, definitions proposed by Canadian Foundation Engineering Manual, 4th Edition are used. The USCS provides a group symbol (e.g. SM) and group name (e.g. silty sand) for identification.

Terminology describing cobbles, boulders, and non-matrix materials (organic matter or debris):

Terminology describing materials outside the USCS, (e.g. particles larger than 75 mm, visible organic matter, and construction debris) is based upon the proportion of these materials present:

<i>Trace, or occasional</i>	Less than 10%
<i>Some</i>	10-20%
<i>Frequent</i>	> 20%

Terminology describing compactness of cohesionless soils:

The standard terminology to describe cohesionless soils includes compactness (formerly "relative density"), as determined by the Standard Penetration Test (SPT) N-Value - also known as N-Index. The SPT N-Value is described further on page 3. A relationship between compactness condition and N-Value is shown in the following table.

Compactness Condition	SPT N-Value
<i>Very Loose</i>	<4
<i>Loose</i>	4-10
<i>Compact</i>	10-30
<i>Dense</i>	30-50
<i>Very Dense</i>	>50

Terminology describing consistency of cohesive soils:

The standard terminology to describe cohesive soils includes the consistency, which is based on undrained shear strength as measured by *in situ* vane tests, penetrometer tests, or unconfined compression tests. Consistency may be crudely estimated from SPT N-Value based on the correlation shown in the following table (Terzaghi and Peck, 1967). The correlation to SPT N-Value is used with caution as it is only very approximate.

Consistency	Undrained Shear Strength		Approximate SPT N-Value
	kips/sq.ft.	kPa	
<i>Very Soft</i>	<0.25	<12.5	<2
<i>Soft</i>	0.25 - 0.5	12.5 - 25	2-4
<i>Firm</i>	0.5 - 1.0	25 - 50	4-8
<i>Stiff</i>	1.0 - 2.0	50 - 100	8-15
<i>Very Stiff</i>	2.0 - 4.0	100 - 200	15-30
<i>Hard</i>	>4.0	>200	>30

ROCK DESCRIPTION

Except where specified below, terminology for describing rock is as defined by the International Society for Rock Mechanics (ISRM) 2007 publication "The Complete ISRM Suggested Methods for Rock Characterization, Testing and Monitoring: 1974-2006"

Terminology describing rock quality:

RQD	Rock Mass Quality
0-25	Very Poor Quality
25-50	Poor Quality
50-75	Fair Quality
75-90	Good Quality
90-100	Excellent Quality

Alternate (Colloquial) Rock Mass Quality	
Very Severely Fractured	Crushed
Severely Fractured	Shattered or Very Blocky
Fractured	Blocky
Moderately Jointed	Sound
Intact	Very Sound

RQD (Rock Quality Designation) denotes the percentage of intact and sound rock retrieved from a borehole of any orientation. All pieces of intact and sound rock core equal to or greater than 100 mm (4 in.) long are summed and divided by the total length of the core run. RQD is determined in accordance with ASTM D6032.

SCR (Solid Core Recovery) denotes the percentage of solid core (cylindrical) retrieved from a borehole of any orientation. All pieces of solid (cylindrical) core are summed and divided by the total length of the core run (It excludes all portions of core pieces that are not fully cylindrical as well as crushed or rubble zones).

Fracture Index (FI) is defined as the number of naturally occurring fractures within a given length of core. The Fracture Index is reported as a simple count of natural occurring fractures.

Terminology describing rock with respect to discontinuity and bedding spacing:

Spacing (mm)	Discontinuities	Bedding
>6000	Extremely Wide	-
2000-6000	Very Wide	Very Thick
600-2000	Wide	Thick
200-600	Moderate	Medium
60-200	Close	Thin
20-60	Very Close	Very Thin
<20	Extremely Close	Laminated
<6	-	Thinly Laminated

Terminology describing rock strength:

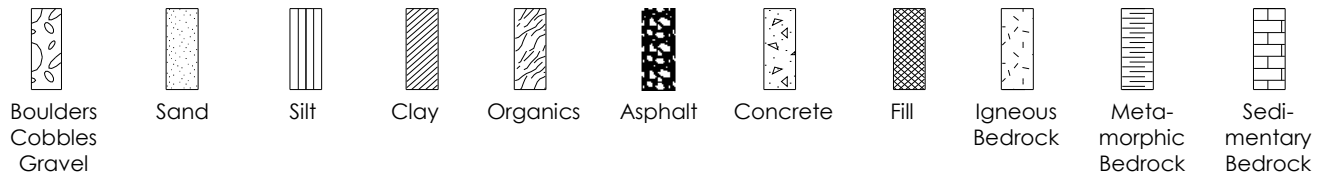
Strength Classification	Grade	Unconfined Compressive Strength (MPa)
Extremely Weak	R0	<1
Very Weak	R1	1 – 5
Weak	R2	5 – 25
Medium Strong	R3	25 – 50
Strong	R4	50 – 100
Very Strong	R5	100 – 250
Extremely Strong	R6	>250

Terminology describing rock weathering:

Term	Symbol	Description
Fresh	W1	No visible signs of rock weathering. Slight discoloration along major discontinuities
Slightly	W2	Discoloration indicates weathering of rock on discontinuity surfaces. All the rock material may be discolored.
Moderately	W3	Less than half the rock is decomposed and/or disintegrated into soil.
Highly	W4	More than half the rock is decomposed and/or disintegrated into soil.
Completely	W5	All the rock material is decomposed and/or disintegrated into soil. The original mass structure is still largely intact.
Residual Soil	W6	All the rock converted to soil. Structure and fabric destroyed.

STRATA PLOT

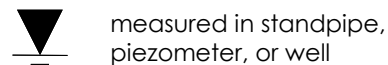
Strata plots symbolize the soil or bedrock description. They are combinations of the following basic symbols. The dimensions within the strata symbols are not indicative of the particle size, layer thickness, etc.



SAMPLE TYPE

SS	Split spoon sample (obtained by performing the Standard Penetration Test)
ST	Shelby tube or thin wall tube
DP	Direct-Push sample (small diameter tube sampler hydraulically advanced)
PS	Piston sample
BS	Bulk sample
HQ, NQ, BQ, etc.	Rock core samples obtained with the use of standard size diamond coring bits.

WATER LEVEL MEASUREMENT



RECOVERY

For soil samples, the recovery is recorded as the length of the soil sample recovered. For rock core, recovery is defined as the total cumulative length of all core recovered in the core barrel divided by the length drilled and is recorded as a percentage on a per run basis.

N-VALUE

Numbers in this column are the field results of the Standard Penetration Test: the number of blows of a 140 pound (63.5 kg) hammer falling 30 inches (760 mm), required to drive a 2 inch (50.8 mm) O.D. split spoon sampler one foot (300 mm) into the soil. In accordance with ASTM D1586, the N-Value equals the sum of the number of blows (N) required to drive the sampler over the interval of 6 to 18 in. (150 to 450 mm). However, when a 24 in. (610 mm) sampler is used, the number of blows (N) required to drive the sampler over the interval of 12 to 24 in. (300 to 610 mm) may be reported if this value is lower. For split spoon samples where insufficient penetration was achieved and N-Values cannot be presented, the number of blows are reported over sampler penetration in millimetres (e.g. 50/75). Some design methods make use of N-values corrected for various factors such as overburden pressure, energy ratio, borehole diameter, etc. No corrections have been applied to the N-values presented on the log.

DYNAMIC CONE PENETRATION TEST (DCPT)

Dynamic cone penetration tests are performed using a standard 60 degree apex cone connected to 'A' size drill rods with the same standard fall height and weight as the Standard Penetration Test. The DCPT value is the number of blows of the hammer required to drive the cone one foot (300 mm) into the soil. The DCPT is used as a probe to assess soil variability.

OTHER TESTS

S	Sieve analysis
H	Hydrometer analysis
k	Laboratory permeability
y	Unit weight
G _s	Specific gravity of soil particles
CD	Consolidated drained triaxial
CU	Consolidated undrained triaxial with pore pressure measurements
UU	Unconsolidated undrained triaxial
DS	Direct Shear
C	Consolidation
Q _u	Unconfined compression
I _p	Point Load Index (I _p on Borehole Record equals I _p (50) in which the index is corrected to a reference diameter of 50 mm)

	Single packer permeability test; test interval from depth shown to bottom of borehole
	Double packer permeability test; test interval as indicated
	Falling head permeability test using casing
	Falling head permeability test using well point or piezometer

**Stantec****TEST PIT RECORD**CLIENT Public Works & Government Services CanadaPROJECT Cape Race Access RoadLOCATION Cape Race, NLDATES (mm-dd-yy): DUG 11-23-16WATER LEVEL N/ATEST PIT No. TP-01PROJECT No. 133347566DATUM N/A

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES			UNDRAINED SHEAR STRENGTH - kPa ★		WATER CONTENT & ATTERBERG LIMITS	
					TYPE	NUMBER	OTHER TESTS	20	40	60	80
0		Compact, grey, well-graded GRAVEL with silt and sand (GW-GM) to silty GRAVEL with sand (GM): FILL									
		Compact to dense, brown, silty GRAVEL with sand (GM) to silty SAND with gravel (SM); some cobbles: TILL									
1					BS	1	S				
		End of Test Pit									
		- Refusal on probably bedrock.									
		- No water observed.									
2											
3											



Stantec

TEST PIT RECORD

CLIENT Public Works & Government Services Canada

PROJECT Cape Race Access Road

LOCATION Cape Race, NL

DATES (mm-dd-yy): DUG 11-23-16

WATER LEVEL 0.9m

11-23-16

TEST PIT No. TP-02

PROJECT No. 133347566

DATUM N/A

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES			UNDRAINED SHEAR STRENGTH - kPa ★		WATER CONTENT & ATTERBERG LIMITS									
					TYPE	NUMBER	OTHER TESTS	20	40	60	80	10	20	30	40	50	60	70	80
0		Compact, brown to grey, well-graded GRAVEL with silt and sand (GW-GM) to silty GRAVEL with sand (GM); occasional debris (wooden pole): FILL																	
		Soft, brown: PEAT																	
1		Compact to dense, brown to grey, silty GRAVEL with sand (GM) to silty SAND with gravel (SM); some cobbles: TILL																	
		End of Test Pit																	
		- Refusal on probably bedrock.																	
2		- Slow water seepage observed at 0.9 m depth.																	
3																			



Stantec

TEST PIT RECORD

CLIENT Public Works & Government Services Canada

PROJECT Cape Race Access Road

LOCATION Cape Race, NL

DATES (mm-dd-yy): DUG 11-23-16



WATER LEVEL 1.2m

11-23-16

TEST PIT No. TP-03

PROJECT No. 133347566

DATUM N/A

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES			UNDRAINED SHEAR STRENGTH - kPa ★		WATER CONTENT & ATTERBERG LIMITS									
					TYPE	NUMBER	OTHER TESTS	20	40	60	80	10	20	30	40	50	60	70	80
0		Compact, brown to grey, well-graded GRAVEL with silt and sand (GW-GM) to silty GRAVEL with sand (GM): FILL Soft, brown: PEAT																	
		Compact to dense, brown to grey, silty GRAVEL with sand (GM) to silty SAND with gravel (SM); some cobbles, occasional boulders: TILL																	
1					BS	1	S												
		End of Test Pit - Refusal on probably bedrock. - Slow water seepage observed at 1.2 m depth.																	
2																			
3																			

TEST PIT RECORD

CLIENT **Public Works & Government Services Canada**

PROJECT Cape Race Access Road

LOCATION	<u>Cape Race, NL</u>
----------	----------------------

LOCATIONS: 1

DATES (mm-dd-yy): DUG 11-23-16

TEST PIT No. TP-04

PROJECT No. 133347566

DATUM N/A

[illegible]



DATUM N/A

STANTEC GEOTECHNICAL TEST PIT 12/20/16 5:59:58 PM



Stantec

TEST PIT RECORD

CLIENT Public Works & Government Services Canada

PROJECT Cape Race Access Road

LOCATION Cape Race, NL

DATES (mm-dd-yy): DUG 11-23-16

WATER LEVEL 0.2m

11-23-16

TEST PIT No. TP-06

PROJECT No. 133347566

DATUM N/A

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES			UNDRAINED SHEAR STRENGTH - kPa ★		WATER CONTENT & ATTERBERG LIMITS									
					TYPE	NUMBER	OTHER TESTS	20	40	60	80	10	20	30	40	50	60	70	80
0		Compact, grey, well-graded GRAVEL with silt and sand (GW-GM) to silty GRAVEL with sand (GM): FILL Dense, dark brown, well-graded to poorly graded GRAVEL with silt and sand (GW-GM)(GP-GM) to well-graded SAND with silt and gravel (SW-SM); occasional cobbles: TILL																	
1					BS	1													
		Highly fractured, moderately weathered: BEDROCK																	
2		End of Test Pit - Practical backhoe refusal. - Slow water seepage observed at 0.2 m depth.																	
3																			

**Stantec****TEST PIT RECORD**CLIENT Public Works & Government Services CanadaPROJECT Cape Race Access RoadLOCATION Cape Race, NLDATES (mm-dd-yy): DUG 11-23-16WATER LEVEL 0.9m11-23-16TEST PIT No. TP-07PROJECT No. 133347566DATUM N/A

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES			UNDRAINED SHEAR STRENGTH - kPa ★		WATER CONTENT & ATTERBERG LIMITS									
					TYPE	NUMBER	OTHER TESTS	20	40	60	80	10	20	30	40	50	60	70	80
0		Compact, grey, well-graded GRAVEL with silt and sand (GW-GM) to silty GRAVEL with sand (GM); occasional cobbles: FILL																	
1		Soft, brown: PEAT																	
2		Compact to dense, silty GRAVEL with sand (GM) to silty SAND with gravel (SM); occasional cobbles: TILL			BS	1	S												
3		End of Test Pit - Practical backhoe refusal. - Slow to moderate water seepage observed at 0.9 m depth.																	

TEST PIT RECORD

CLIENT **Public Works & Government Services Canada**

PROJECT Cape Race Access Road

LOCATION Cape Race, NL

LOCATIONS: _____
 DATES (mm-dd-yy): DUG 11-23-16

TEST PIT No. TP-08PROJECT No. 133347566

DATUM N/A

[illegible]



Stantec

TEST PIT RECORD

CLIENT Public Works & Government Services Canada

PROJECT Cape Race Access Road

LOCATION Cape Race, NL

DATES (mm-dd-yy): DUG 11-23-16

WATER LEVEL N/A

TEST PIT No. TP-09

PROJECT No. 133347566

DATUM N/A

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES			UNDRAINED SHEAR STRENGTH - kPa ★		WATER CONTENT & ATTERBERG LIMITS									
					TYPE	NUMBER	OTHER TESTS	20	40	60	80	10	20	30	40	50	60	70	80
0		Compact, grey, well-graded GRAVEL with silt and sand (GW-GM) to silty GRAVEL with sand (GM); occasional cobbles: FILL																	
1		Dense, dark to reddish brown, silty GRAVEL with sand (GM) to silty SAND with gravel (SM); some to frequent cobbles, occasional to some boulders: TILL																	
2		End of Test Pit - Refusal on probable bedrock. - No water seepage observed.																	
3																			



Stantec

TEST PIT RECORD

CLIENT Public Works & Government Services Canada

PROJECT Cape Race Access Road

LOCATION Cape Race, NL

DATES (mm-dd-yy): DUG 11-23-16

WATER LEVEL 0.6m

11-23-16

TEST PIT No. TP-10

PROJECT No. 133347566

DATUM N/A

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES			UNDRAINED SHEAR STRENGTH - kPa ★		WATER CONTENT & ATTERBERG LIMITS									
					TYPE	NUMBER	OTHER TESTS	20	40	60	80	10	20	30	40	50	60	70	80
0		Compact, grey, well-graded GRAVEL with silt and sand (GW-GM) to silty GRAVEL with sand (GM): FILL																	
		Dense, dark brown, silty GRAVEL with sand (GM) to silty SAND with gravel (SM); some to frequent cobbles, some boulders: TILL																	
1																			
		End of Test Pit																	
		- Practical backhoe refusal.																	
		- Very fast water seepage observed at 0.6 m depth.																	
2																			
3																			

**Stantec****TEST PIT RECORD**CLIENT Public Works & Government Services CanadaPROJECT Cape Race Access RoadLOCATION Cape Race, NLDATES (mm-dd-yy): DUG 11-23-16WATER LEVEL N/ATEST PIT No. TP-11PROJECT No. 133347566DATUM N/A

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES			UNDRAINED SHEAR STRENGTH - kPa ★		WATER CONTENT & ATTERBERG LIMITS									
					TYPE	NUMBER	OTHER TESTS	20	40	60	80	10	20	30	40	50	60	70	80
0		Compact, brown to grey, well-graded GRAVEL with silt and sand (GW-GM) to silty GRAVEL with sand (GM): FILL																	
		Loose, dark brown: TOPSOIL																	
1		Compact to dense, light brown to grey, silty GRAVEL with sand (GM) to silty SAND with gravel (SM); some cobbles, occasional boulders: TILL																	
					BS	1													
2		End of Test Pit - Practical backhoe refusal. - No water seepage observed.																	
3																			



Stantec

TEST PIT RECORD

CLIENT Public Works & Government Services Canada

PROJECT Cape Race Access Road

LOCATION Cape Race, NL

DATES (mm-dd-yy): DUG 11-23-16

WATER LEVEL N/A

TEST PIT No. TP-12

PROJECT No. 133347566

DATUM N/A

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES			UNDRAINED SHEAR STRENGTH - kPa ★		WATER CONTENT & ATTERBERG LIMITS									
					TYPE	NUMBER	OTHER TESTS	20	40	60	80	10	20	30	40	50	60	70	80
0		Compact, grey, well-graded GRAVEL with silt and sand (GW-GM) to silty GRAVEL with sand (GM): FILL																	
		Dense, dark brown, silty GRAVEL with sand (GM) to silty SAND with gravel (SM); some to frequent cobbles, some boulders: TILL																	
1					BS	1													
		End of Test Pit																	
		- Practical backhoe refusal.																	
		- No water seepage observed.																	
2																			
3																			



Stantec

TEST PIT RECORD

CLIENT Public Works & Government Services Canada

PROJECT Cape Race Access Road

LOCATION Cape Race, NL

DATES (mm-dd-yy): DUG 11-23-16

WATER LEVEL 1.4m

11-23-16

TEST PIT No. TP-13

PROJECT No. 133347566

DATUM N/A

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES			UNDRAINED SHEAR STRENGTH - kPa ★		WATER CONTENT & ATTERBERG LIMITS										
					TYPE	NUMBER	OTHER TESTS	20	40	60	80	10	20	30	40	50	60	70	80	
0		Compact, grey, well-graded GRAVEL with silt and sand (GW-GM) to silty GRAVEL with sand (GM): FILL																		
		Loose to compact, brown: TOPSOIL																		
1		Compact to dense, light brown to grey, silty GRAVEL with sand (GM) to silty SAND with gravel (SM); some cobbles, occasional boulders: TILL																		
					BS	1	S													
		End of Test Pit																		
2		- Refusal on probably bedrock.																		
		- Slow water seepage observed at 1.4 m depth.																		
3																				



DATUM N/A

STANTEC GEOTECHNICAL TEST PIT 12/20/16 6:00:02 PM



Stantec

TEST PIT RECORD

CLIENT Public Works & Government Services Canada

PROJECT Cape Race Access Road

LOCATION Cape Race, NL

DATES (mm-dd-yy): DUG 11-24-16

WATER LEVEL N/A

TEST PIT No. TP-15

PROJECT No. 133347566

DATUM N/A

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES			UNDRAINED SHEAR STRENGTH - kPa ★		WATER CONTENT & ATTERBERG LIMITS									
					TYPE	NUMBER	OTHER TESTS	20	40	60	80	10	20	30	40	50	60	70	80
0		Compact, grey, well-graded GRAVEL with silt and sand (GW-GM) to silty GRAVEL with sand (GM): FILL																	
		Compact, dark to light brown: TOPSOIL																	
1		Dense, grey, silty GRAVEL with sand (GM) to silty SAND with gravel (SM); occasional to some cobbles, occasional boulders: TILL																	
2		End of Test Pit - Practical backhoe refusal. - No water seepage observed.																	
3																			



Stantec

TEST PIT RECORD

CLIENT Public Works & Government Services Canada

PROJECT Cape Race Access Road

LOCATION Cape Race, NL

DATES (mm-dd-yy): DUG 11-24-16

WATER LEVEL 0.6m

11-24-16

TEST PIT No. TP-16

PROJECT No. 133347566

DATUM N/A

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES			UNDRAINED SHEAR STRENGTH - kPa ★		WATER CONTENT & ATTERBERG LIMITS									
					TYPE	NUMBER	OTHER TESTS	20	40	60	80	10	20	30	40	50	60	70	80
0		Compact, grey, well-graded GRAVEL with silt and sand (GW-GM) to silty GRAVEL with sand (GM): FILL Compact, grey to brown: TOPSOIL																	
1		Dense, well-graded to poorly graded GRAVEL with silt and sand (GW-GM)(GP-GM) to well-graded SAND with silt and gravel (SW-SM); frequent cobbles, occasional boulders: TILL																	
2		End of Test Pit - Practical backhoe refusal. - Very rapid water seepage observed at 0.6 m depth.																	
3																			

**Stantec****TEST PIT RECORD**CLIENT **Public Works & Government Services Canada**PROJECT **Cape Race Access Road**LOCATION **Cape Race, NL**DATES (mm-dd-yy): DUG **11-24-16**WATER LEVEL **0.8m****11-24-16**TEST PIT No. **TP-17**PROJECT No. **133347566**DATUM **N/A**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES			UNDRAINED SHEAR STRENGTH - kPa ★		WATER CONTENT & ATTERBERG LIMITS									
					TYPE	NUMBER	OTHER TESTS	20	40	60	80	10	20	30	40	50	60	70	80
0		Compact, grey, well-graded GRAVEL with silt and sand (GW-GM) to silty GRAVEL with sand (GM): FILL																	
		Compact to dense, brown to dark brown: TOPSOIL																	
1		Dense, light brown to grey, well-graded to poorly graded GRAVEL with silt and sand (GW-GM)(GP-GM) to well-graded SAND with silt and gravel (SW-SM); some cobbles, occasional boulders: TILL																	
					BS	1	S												
2		End of Test Pit - Practical backhoe refusal. - Moderate to rapid water seepage observed at 0.8 m depth.																	
3																			

**Stantec****TEST PIT RECORD**CLIENT **Public Works & Government Services Canada**PROJECT **Cape Race Access Road**LOCATION **Cape Race, NL**DATES (mm-dd-yy): DUG **11-24-16**WATER LEVEL **N/A**TEST PIT No. **TP-18**PROJECT No. **133347566**DATUM **N/A**

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES			UNDRAINED SHEAR STRENGTH - kPa ★		WATER CONTENT & ATTERBERG LIMITS	
					TYPE	NUMBER	OTHER TESTS	20	40	60	80
0		Compact, grey to light brown, well-graded GRAVEL with silt and sand (GW-GM) to silty GRAVEL with sand (GM); occasional cobbles: FILL									
		Compact, dark brown to brown: TOPSOIL									
1		Dense, brown to light grey, well-graded to poorly graded GRAVEL with silt and sand (GW-GM)(GP-GM) to well-graded SAND with silt and gravel (SW-SM); occasional to frequent cobbles, occasional boulders: TILL			BS	1					
2		End of Test Pit - Practical backhoe refusal. - No water seepage observed.									
3											



Stantec

TEST PIT RECORD

CLIENT Public Works & Government Services Canada

PROJECT Cape Race Access Road

LOCATION Cape Race, NL

DATES (mm-dd-yy): DUG 11-24-16

WATER LEVEL N/A

TEST PIT No. TP-19

PROJECT No. 133347566

DATUM N/A

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES			UNDRAINED SHEAR STRENGTH - kPa ★		WATER CONTENT & ATTERBERG LIMITS									
					TYPE	NUMBER	OTHER TESTS	20	40	60	80	10	20	30	40	50	60	70	80
0		Compact, grey, well-graded GRAVEL with silt and sand (GW-GM) to silty GRAVEL with sand (GM): FILL																	
		Compact to dense, dark brown to grey, well-graded to poorly graded GRAVEL with silt and sand (GW-GM)(GP-GM) to well-graded SAND with silt and gravel (SW-SM); occasional boulders: TILL			BS	1													
1																			
2		End of Test Pit																	
		- Practical backhoe refusal.																	
		- No water seepage observed.																	
3																			

**Stantec****TEST PIT RECORD**CLIENT Public Works & Government Services CanadaPROJECT Cape Race Access RoadLOCATION Cape Race, NLDATES (mm-dd-yy): DUG 11-24-16WATER LEVEL 0.8m11-24-16TEST PIT No. TP-20PROJECT No. 133347566DATUM N/A

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES			UNDRAINED SHEAR STRENGTH - kPa ★		WATER CONTENT & ATTERBERG LIMITS									
					TYPE	NUMBER	OTHER TESTS	20	40	60	80	10	20	30	40	50	60	70	80
0		Compact, grey to light brown, well-graded GRAVEL with silt and sand (GW-GM) to silty GRAVEL with sand (GM): FILL																	
		Soft, black, organic rich: PEAT																	
		Compact to dense, reddish brown to brown to grey, well-graded to poorly graded GRAVEL with silt and sand (GW-GM)(GP-GM) to well-graded SAND with silt and gravel (SW-SM); occasional to some cobbles, occasional boulders: TILL																	
1																			
					BS	1	S												
		End of Test Pit																	
2		- Practical backhoe refusal. - Moderate water seepage observed at 0.8 m depth.																	
3																			



Stantec

TEST PIT RECORD

CLIENT Public Works & Government Services Canada

PROJECT Cape Race Access Road

LOCATION Cape Race, NL

DATES (mm-dd-yy): DUG 11-24-16

WATER LEVEL N/A

TEST PIT No. TP-21

PROJECT No. 133347566

DATUM N/A

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES			UNDRAINED SHEAR STRENGTH - kPa ★		WATER CONTENT & ATTERBERG LIMITS									
					TYPE	NUMBER	OTHER TESTS	20	40	60	80	10	20	30	40	50	60	70	80
0		Compact, grey, well-graded GRAVEL with silt and sand (GW-GM) to silty GRAVEL with sand (GM): FILL																	
		Compact to dense, brown, silty GRAVEL with sand (GM) to silty SAND with gravel (SM); some cobbles, occasional boulders: TILL																	
1					BS	1													
		End of Test Pit																	
2		- Refusal on probable bedrock.																	
		- No water seepage observed.																	
3																			



Stantec

TEST PIT RECORD

CLIENT Public Works & Government Services Canada

PROJECT Cape Race Access Road

LOCATION Cape Race, NL

DATES (mm-dd-yy): DUG 11-24-16

WATER LEVEL N/A

TEST PIT No. TP-22

PROJECT No. 133347566

DATUM N/A

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES			UNDRAINED SHEAR STRENGTH - kPa ★		WATER CONTENT & ATTERBERG LIMITS									
					TYPE	NUMBER	OTHER TESTS	20	40	60	80	10	20	30	40	50	60	70	80
0		Compact, brown to grey, well-graded GRAVEL with silt and sand (GW-GM) to silty GRAVEL with sand (GM): FILL																	
		Soft, brown: ROOTMAT																	
1		Dense, grey, silty GRAVEL with sand (GM) to silty SAND with gravel (SM); some cobbles, occasional boulders: TILL																	
					BS	1	S	○											
2		End of Test Pit - Practical backhoe refusal. - No water seepage observed.																	
3																			



Stantec

TEST PIT RECORD

CLIENT Public Works & Government Services Canada

PROJECT Cape Race Access Road

LOCATION Cape Race, NL

DATES (mm-dd-yy): DUG 11-24-16

WATER LEVEL 0.7m

11-24-16

TEST PIT No. TP-23

PROJECT No. 133347566

DATUM N/A

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES			UNDRAINED SHEAR STRENGTH - kPa ★		WATER CONTENT & ATTERBERG LIMITS									
					TYPE	NUMBER	OTHER TESTS	20	40	60	80	10	20	30	40	50	60	70	80
0		Compact, grey, well-graded GRAVEL with silt and sand (GW-GM) to silty GRAVEL with sand (GM): FILL																	
		Compact, brown to light brown: TOPSOIL																	
		Dense, grey, silty GRAVEL with sand (GM) to silty SAND with gravel (SM); some cobbles, occasional boulders: TILL		▽															
1					BS	1													
		End of Test Pit																	
2		- Practical backhoe refusal. - Moderate to slow water seepage observed at 0.7 m depth.																	
3																			

**Stantec****TEST PIT RECORD**CLIENT Public Works & Government Services CanadaPROJECT Cape Race Access RoadLOCATION Cape Race, NLDATES (mm-dd-yy): DUG 11-24-16WATER LEVEL N/ATEST PIT No. TP-24PROJECT No. 133347566DATUM N/A

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES			UNDRAINED SHEAR STRENGTH - kPa ★		WATER CONTENT & ATTERBERG LIMITS	
					TYPE	NUMBER	OTHER TESTS	20	40	60	80
0		Compact, brown, well-graded GRAVEL with silt and sand (GW-GM) to silty GRAVEL with sand (GM); some cobbles, occasional boulders, occasional organics: FILL									
1											
2		Loose to compact, poorly graded SAND (SP): FLUVIAL SAND									
					BS	1	S				
3		End of Test Pit									
		- Practical backhoe refusal.									
		- No water seepage observed.									



Stantec

TEST PIT RECORD

CLIENT Public Works & Government Services Canada

PROJECT Cape Race Access Road

LOCATION Cape Race, NL

DATES (mm-dd-yy): DUG 11-24-16

WATER LEVEL 0.7m

11-24-16

TEST PIT No. TP-25

PROJECT No. 133347566

DATUM N/A

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES			UNDRAINED SHEAR STRENGTH - kPa ★		WATER CONTENT & ATTERBERG LIMITS									
					TYPE	NUMBER	OTHER TESTS	20	40	60	80	10	20	30	40	50	60	70	80
0		Compact, light brown to grey, well-graded GRAVEL with silt and sand (GW-GM) to silty GRAVEL with sand (GM): FILL																	
1		Dense, grey, silty GRAVEL with sand (GM) to silty SAND with gravel (SM); some cobbles, occasional boulders: TILL																	
2		End of Test Pit - Refusal of probable bedrock. - Moderate water seepage observed at 0.7 m depth.																	
3																			



Stantec

TEST PIT RECORD

CLIENT Public Works & Government Services Canada

PROJECT Cape Race Access Road

LOCATION Cape Race, NL

DATES (mm-dd-yy): DUG 11-24-16

WATER LEVEL 1.2m

11-24-16

TEST PIT No. TP-26

PROJECT No. 133347566

DATUM N/A

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES			UNDRAINED SHEAR STRENGTH - kPa ★		WATER CONTENT & ATTERBERG LIMITS									
					TYPE	NUMBER	OTHER TESTS	20	40	60	80	10	20	30	40	50	60	70	80
0		Compact, grey, well-graded GRAVEL with silt and sand (GW-GM) to silty GRAVEL with sand (GM); occasional cobbles and boulders: FILL																	
		Compact to dense, brown to grey, silty GRAVEL with sand (GM) to silty SAND with gravel (SM); occasional to some cobbles, occasional boulders: TILL																	
1																			
		End of Test Pit																	
2		- Refusal on probable bedrock.																	
		- Moderate to slow water seepage observed at 1.7 m depth.																	
3																			





Stantec

TEST PIT RECORD

CLIENT Public Works & Government Services Canada

PROJECT Cape Race Access Road

LOCATION Cape Race, NL

DATES (mm-dd-yy): DUG 11-24-16

WATER LEVEL 1m

11-24-16

TEST PIT No. TP-28

PROJECT No. 133347566

DATUM N/A

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES			UNDRAINED SHEAR STRENGTH - kPa ★		WATER CONTENT & ATTERBERG LIMITS									
					TYPE	NUMBER	OTHER TESTS	20	40	60	80	10	20	30	40	50	60	70	80
0		Compact, grey, well-graded GRAVEL with silt and sand (GW-GM) to silty GRAVEL with sand (GM); occasional boulders: FILL																	
		Soft, black, occasional cobbles: PEAT																	
1		Dense to compact, grey to brown, silty GRAVEL with sand (GM) to silty SAND with gravel (SM); some cobbles and occasional boulders: TILL																	
2		End of Test Pit																	
		- Practical backhoe refusal.																	
		- Moderate water seepage observed at 1.0 m depth.																	
3																			



Stantec

TEST PIT RECORD

CLIENT Public Works & Government Services Canada

PROJECT Cape Race Access Road

LOCATION Cape Race, NL

DATES (mm-dd-yy): DUG 11-24-16

WATER LEVEL N/A


TEST PIT No. TP-29

PROJECT No. 133347566

DATUM N/A

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES			UNDRAINED SHEAR STRENGTH - kPa ★		WATER CONTENT & ATTERBERG LIMITS									
					TYPE	NUMBER	OTHER TESTS	20	40	60	80	10	20	30	40	50	60	70	80
0		Compact, brown to grey, well-graded GRAVEL with silt and sand (GW-GM) to silty GRAVEL with sand (GM): FILL Compact to dense, grey, well-graded to poorly graded GRAVEL with silt and sand (GW-GM)(GP-GM) to well-graded SAND with silt and gravel (SW-SM); some cobbles, occasional boulders: TILL																	
1																			
2		End of Test Pit - Practical backhoe refusal. - No water seepage observed.																	
3																			

**Stantec****TEST PIT RECORD**CLIENT Public Works & Government Services CanadaPROJECT Cape Race Access RoadLOCATION Cape Race, NLDATES (mm-dd-yy): DUG 11-24-16WATER LEVEL N/ATEST PIT No. TP-30PROJECT No. 133347566DATUM N/A

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES			UNDRAINED SHEAR STRENGTH - kPa ★									
					TYPE	NUMBER	OTHER TESTS	20	40	60	80	WATER CONTENT & ATTERBERG LIMITS					
0		Loose to compact, brown, well-graded GRAVEL with silt and sand (GW-GM) to silty GRAVEL with sand (GM); frequent cobbles, occasional boulders: FILL															
1																	
2		End of Test Pit - Major sidewall sloughing, terminated test pit in fill. - No water seepage observed.															
3																	

**Stantec****TEST PIT RECORD**CLIENT Public Works & Government Services CanadaPROJECT Cape Race Access RoadLOCATION Cape Race, NLDATES (mm-dd-yy): DUG 11-24-16WATER LEVEL N/ATEST PIT No. TP-31PROJECT No. 133347566DATUM N/A

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES			UNDRAINED SHEAR STRENGTH - kPa ★		WATER CONTENT & ATTERBERG LIMITS									
					TYPE	NUMBER	OTHER TESTS	20	40	60	80	10	20	30	40	50	60	70	80
0		Compact to dense, grey to brown, well-graded GRAVEL with silt and sand (GW-GM) to silty GRAVEL with sand (GM); frequent cobbles, occasional boulders: FILL																	
1		Dense, grey, well-graded to poorly graded GRAVEL with silt and sand (GW-GM)(GP-GM) to well-graded SAND with silt and gravel (SW-SM); frequent cobbles, occasional boulders: TILL																	
					BS	1	S	○											
2		End of Test Pit																	
		- Practical backhoe refusal.																	
		- No water seepage observed.																	
3																			



Stantec

TEST PIT RECORD

CLIENT Public Works & Government Services Canada

PROJECT Cape Race Access Road

LOCATION Cape Race, NL

DATES (mm-dd-yy): DUG 11-24-16

WATER LEVEL 1.6m

11-24-16

TEST PIT No. TP-32

PROJECT No. 133347566

DATUM N/A

DEPTH (m)	ELEVATION (m)	DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES			UNDRAINED SHEAR STRENGTH - kPa ★		WATER CONTENT & ATTERBERG LIMITS									
					TYPE	NUMBER	OTHER TESTS	20	40	60	80	10	20	30	40	50	60	70	80
0		Compact, grey to brown, well-graded GRAVEL with silt and sand (GW-GM) to silty GRAVEL with sand (GM): FILL																	
1		Dense, grey to light brown, well-graded to poorly graded GRAVEL with silt and sand (GW-GM)(GP-GM) to well-graded SAND with silt and gravel (SW-SM); some cobbles, occasional boulders: TILL																	
					BS	1													
2		End of Test Pit - Practical backhoe refusal. - Rapid water seepage observed at 1.6 m depth.																	
3																			

GEOTECHNICAL INVESTIGATION, CAPE RACE ACCESS ROAD UPGRADES,
CAPE RACE, NL



Test Pit TP-01



Test Pit TP-01 Spoil Pile

GEOTECHNICAL INVESTIGATION, CAPE RACE ACCESS ROAD UPGRADES,
CAPE RACE, NL



Test Pit TP-02



Test Pit TP-02 Spoil pile

GEOTECHNICAL INVESTIGATION, CAPE RACE ACCESS ROAD UPGRADES,
CAPE RACE, NL



Test Pit TP-03



Test Pit TP-03 Spoil Pile

GEOTECHNICAL INVESTIGATION, CAPE RACE ACCESS ROAD UPGRADES,
CAPE RACE, NL



Test Pit TP-04



Test Pit TP-04 Spoil Pile

GEOTECHNICAL INVESTIGATION, CAPE RACE ACCESS ROAD UPGRADES,
CAPE RACE, NL



Test Pit TP-05



Test Pit TP-05 Spoil Pile

GEOTECHNICAL INVESTIGATION, CAPE RACE ACCESS ROAD UPGRADES,
CAPE RACE, NL



Test Pit TP-06



Test Pit TP-06 Spoil Pile

GEOTECHNICAL INVESTIGATION, CAPE RACE ACCESS ROAD UPGRADES,
CAPE RACE, NL



Test Pit TP-07



Test Pit TP-07 Spoil Pile

GEOTECHNICAL INVESTIGATION, CAPE RACE ACCESS ROAD UPGRADES,
CAPE RACE, NL



Test Pit TP-08



Test Pit TP-08 Spoil Pile

GEOTECHNICAL INVESTIGATION, CAPE RACE ACCESS ROAD UPGRADES,
CAPE RACE, NL



Test Pit TP-09



Test Pit TP-09 Spoil Pile

GEOTECHNICAL INVESTIGATION, CAPE RACE ACCESS ROAD UPGRADES,
CAPE RACE, NL



Test Pit TP-10



Test Pit TP-10 Spoil Pile

GEOTECHNICAL INVESTIGATION, CAPE RACE ACCESS ROAD UPGRADES,
CAPE RACE, NL



Test Pit TP-11



Test Pit TP-11 Spoil Pile

GEOTECHNICAL INVESTIGATION, CAPE RACE ACCESS ROAD UPGRADES,
CAPE RACE, NL



Test Pit TP-12



Test Pit TP-12 Spoil Pile

GEOTECHNICAL INVESTIGATION, CAPE RACE ACCESS ROAD UPGRADES,
CAPE RACE, NL



Test Pit TP-13



Test Pit TP-13 Spoil Pile

GEOTECHNICAL INVESTIGATION, CAPE RACE ACCESS ROAD UPGRADES,
CAPE RACE, NL



Test Pit TP-14



Test Pit TP-14 Spoil Pile

GEOTECHNICAL INVESTIGATION, CAPE RACE ACCESS ROAD UPGRADES,
CAPE RACE, NL



Test Pit TP-15



Test Pit TP-15 Spoil Pile

GEOTECHNICAL INVESTIGATION, CAPE RACE ACCESS ROAD UPGRADES,
CAPE RACE, NL



Test Pit TP-16



Test Pit TP-16 Spoil Pile

GEOTECHNICAL INVESTIGATION, CAPE RACE ACCESS ROAD UPGRADES,
CAPE RACE, NL



Test Pit TP-17



Test Pit TP-17 Spoil Pile

GEOTECHNICAL INVESTIGATION, CAPE RACE ACCESS ROAD UPGRADES,
CAPE RACE, NL



Test Pit TP-18



Test Pit TP-18 Spoil Pile

GEOTECHNICAL INVESTIGATION, CAPE RACE ACCESS ROAD UPGRADES,
CAPE RACE, NL



Test Pit TP-19



Test Pit TP-19 Spoil Pile

GEOTECHNICAL INVESTIGATION, CAPE RACE ACCESS ROAD UPGRADES,
CAPE RACE, NL



Test Pit TP-20



Test Pit TP-20 Spoil Pile

GEOTECHNICAL INVESTIGATION, CAPE RACE ACCESS ROAD UPGRADES,
CAPE RACE, NL



Test Pit TP-21



Test Pit TP-21 Spoil Pile

GEOTECHNICAL INVESTIGATION, CAPE RACE ACCESS ROAD UPGRADES,
CAPE RACE, NL



Test Pit TP-22



Test Pit TP-22 Spoil Pile

GEOTECHNICAL INVESTIGATION, CAPE RACE ACCESS ROAD UPGRADES,
CAPE RACE, NL



Test Pit TP-23



Test Pit TP-23 Spoil Pile

GEOTECHNICAL INVESTIGATION, CAPE RACE ACCESS ROAD UPGRADES,
CAPE RACE, NL



Test Pit TP-24



Test Pit TP-24 Spoil Pile

GEOTECHNICAL INVESTIGATION, CAPE RACE ACCESS ROAD UPGRADES,
CAPE RACE, NL



Test Pit TP-25



Test Pit TP-25 Spoil Pile

GEOTECHNICAL INVESTIGATION, CAPE RACE ACCESS ROAD UPGRADES,
CAPE RACE, NL



Test Pit TP-26



Test Pit TP-26 Spoil Pile

GEOTECHNICAL INVESTIGATION, CAPE RACE ACCESS ROAD UPGRADES,
CAPE RACE, NL



Test Pit TP-27



Test Pit TP-27 Spoil Pile

GEOTECHNICAL INVESTIGATION, CAPE RACE ACCESS ROAD UPGRADES,
CAPE RACE, NL



Test Pit TP-28



Test Pit TP-28 Spoil Pile

GEOTECHNICAL INVESTIGATION, CAPE RACE ACCESS ROAD UPGRADES,
CAPE RACE, NL



Test Pit TP-29



Test Pit TP-29 Spoil Pile

GEOTECHNICAL INVESTIGATION, CAPE RACE ACCESS ROAD UPGRADES,
CAPE RACE, NL



Test Pit TP-30



Test Pit TP-30 Spoil Pile

GEOTECHNICAL INVESTIGATION, CAPE RACE ACCESS ROAD UPGRADES,
CAPE RACE, NL



Test Pit TP-31



Test Pit TP-31 Spoil Pile

GEOTECHNICAL INVESTIGATION, CAPE RACE ACCESS ROAD UPGRADES,
CAPE RACE, NL



Test Pit TP-32



Test Pit TP-32 Spoil Pile