| | |
|---|---|
| **Project Name:** | Road Improvement Projects |
| **Addendum Number:** | 1 |
| **Project ID:** | 2026-RFT-008 |

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Addendum 1 is hereby issued to amend the *2026-RFT-008 Road Improvement Projects*. The changes outlined in this addendum shall take precedence over the original document.

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## Question 1.1

The Cost Submission Form includes the following items:

A18 – Supply and install Tensar TriAx TX160 or approved equivalent
B14 – Supply and install Tensar TriAx TX160 or approved equivalent

However, the tender drawings do not appear to identify geogrid placement within the road structure, installation limits, overlap requirements, tie-in requirements, anchoring requirements, or applicable installation details. In addition, the specification package appears to include a Geotextiles section only, and no specific specification section for geogrid or Tensar TX160 could be identified.

Please confirm:

A) Whether geogrid installation is required for this project;
B) The exact roadway limits and placement location within the pavement structure;
C) Applicable installation requirements including overlaps, anchoring, and subgrade preparation; and
D) Whether a separate geogrid specification/detail will be issued by addendum.

## Answer 1.1

A) Geogrid installation is required for this project under Items A18 and B14 of the Cost Submission Form.
B) Geogrid shall consist of Tensar TriAx TX160 or approved equivalent and shall be installed directly on prepared subgrade below the Granular B layer from edge of shoulder to edge of shoulder throughout the roadway reconstruction areas.

C) Adjacent geogrid rolls shall overlap a minimum of 500 mm at all seams. Tie-ins and transitions between geogrid sections shall be continuous and completed in accordance with the manufacturer’s recommendations.

  - Temporary anchoring using pins, staples, sandbags, or other approved methods shall be provided as required to prevent displacement during placement of granular materials.

  - Construction equipment shall not operate directly on exposed geogrid. Initial granular material placement shall be completed by end-dumping and spreading methods to avoid displacement or damage to the geogrid.

  - Subgrade shall be stripped of unsuitable material and graded smooth prior to placement of geogrid. The prepared subgrade surface shall be free of standing water, frozen material, vegetation, debris, and sharp objects prior to installation.

D) A revised specification section for Geogrid has been included as part of this Addendum. No separate installation detail will be issued.

## Question 1.2

Can you tell us if the city is planning on supplying the potential CSP culvert of 600mm for the provisional items?

## Answer 1.2

the City will not be supplying the 600 mm CSP culvert for the provisional item

## Drawing Correction 1.3

a. See sheet C-02 Delete note “install new guardrail” replace with “Existing Guardrail to Remain (±118 m)”.

   The existing guardrail within Area A is to remain in place. No new guardrail installation is required as part of this Contract. References to “Install New Guardrail” on Sheet C02 shall be disregarded.

b. See sheet D-01: Delete detail 4 Guardrail.

## Addition of Part VII – OTHER REFERENCE DOCUMENTS 1.4

a. Geotechnical Report- The attached Geotechnical Report shall be included as a reference document for this tender.

## PART 1 GENERAL

### 1.1 Description

.1 This Section specifies requirements for supply and installation of a geo-synthetic material produced in an open grid configuration, commonly known as Geogrid, which shall be used primarily for reinforcement in slope stabilization and roadway pavement structure reinforcement.

### 1.2 Related Work

.1 Section 31 11 23 – Roadway Grading

.2 Section 31 32 19.16 – Geotextile Soil Stabilization.

### 1.3 Mill Certificates

.1 Minimally one week prior to start of Work the Engineer shall be provided with two copies of mill test data and a certificate that the Geotextile material delivered to job site meets the requirements of this Section.

### 1.4 Approval

.1 Obtain written approval from the Owner's Representative for Geotextile material before installation of the material in the Work.

## PART 2 PRODUCTS

### 2.1 Material

.1 Synthetic Polymer Fabric

- .1 Tensar TriAx TX160 or approved equivalent.
- .2 To be rot-proof.
- .3 Treated to be unaffected by naturally encountered chemicals, alkalis and acids.
- .4 Treated to be unaffected by insects or rodents.
- .5 Free of striations, roughness, pinholes, blisters, undispersed raw materials or any sign of contamination by foreign matter.
- .6 Treated with inhibitors to resist deterioration by ultra-violet light and heat exposure.

.2 Type
  - .1 Triaxial Geogrid to be used for road base reinforcement and other similar load bearing applications.
- .2 Triaxial Geogrid
  - .1 Radial stiffness @ 0.5% strain to be greater than 299 kN/m and meet ASTM D6637.
  - .2 Load transfer junction efficiency expressed as a percentage of ultimate tensile strength to be 92% in accordance with ASTM D6637 and ASTM D7737.
  - .3 Rigid junction strength to be 2 times greater than tensile strength and meet GGI-GG2.
  - .4 Hexagon Pitch =80mm ± 4mm.

## PART 3 EXECUTION

### 3.1 Installation

.1 Place Geogrid by unrolling onto prepared surface, stretch taut and retain in position.

.2 Protect Geogrid from displacement or damage until and during placement of overlaid material layers.

.3 Place Geogrid on sloping surfaces in one continuous length, from toe of slope to upper extent of roll.

.4 Overlap each successive strip of Geogrid minimally 500 mm at seams.

.5 Seams are to be connected as per Manufacturers recommendations.

.6 Protect Geogrid from displacement and damage during placement of granular sub-base and/or granular base material.

.7 After installation, cover with granular material within four hours of placement.

.8 Remove and replace damaged or deteriorated geogrid as directed by Engineer.

### 3.2 Protection

.1 Do not permit passage of any vehicle directly on Geogrid at any time.

## PART 4 BASIS FOR PAYMENT

.1 Unit of Measurement: Square Meter.

.2 Method of Measurement: Based on square meter of installed area measured, from edge of shoulder to edge of shoulder for the roadway surface reconstructed and accepted by Owner’s Representative. Measurement shall be based on the installed surface area of Geogrid, unit rate to include overlaps, tie-ins, anchoring, trimming, and/or replacement of damaged Geogrid.

.3 Item Includes: Supply, delivery, handling, placement, overlaps, tie-ins, anchoring, trimming, protection, and installation of the geogrid throughout the roadway reconstruction areas.

**END OF SECTION**

## Other Documents

1. Geotechnical Report

# GEOTECHNICAL INVESTIGATION
# ROAD & DRAINAGE IMPROVEMENTS
# IQALUIT, NU

## DRAFT REPORT

**PREPARED FOR:**
Dillon Consulting Limited
45 Hebron Way, Suite 202
St. John's, NL  A1A 0P9

**PREPARED BY:**
Canadrill Limited Geotechnical Division
1500 Federal Road
Iqaluit, NU  X0A 0H0
(867) 979-1131

**PROJECT NUMBER:**
IQA-G2109

**SUBMITTED:**
December 2, 2021

# Table of Contents

# List of Attachments

# 1.0 Introduction

Canadrill Limited Geotechnical Division (CGD) has carried out the following geotechnical investigation for road improvements in Iqaluit, NU. The geotechnical investigation presented herein has been carried out in general accordance with the most recent editions of the National Standard of Canada CAN/BNQ 2501-500/2017 *Geotechnical Site Investigations for Building Foundations in Permafrost* and Canada Standards Association (CSA) PLUS 4011:19 *TECHNICAL GUIDE Infrastructure in permafrost: A guide for climate change adaptation*. Drainage improvements for Kangiqsliniq are not covered as part of this report. All third-party information reviewed as part of this investigation has been taken at face value.

# 2.0 Project Background and Understanding

The City of Iqaluit is proposing improvements to several roads in Iqaluit, NU. The roads included in this project are Hanson Drive, Niaqunngusiariaq Road (Apex Road), Joamie Court, Nunavut Drive, Iglulik Drive, and Ikaluktuuiak Drive. The site locations are shown on the attached Figure 1. The purpose of the geotechnical investigation presented herein is to assess the surface and subsurface conditions at the sites via a prescribed number of test pits and provide geotechnical recommendations to support the design and construction of the upgraded roadways and general site grading.

# 3.0 Scope of Services

Based on our understanding of the project requirements, the following scope of services was completed for this portion of the project:

- ***Compilation and Review of Available Information:*** CGD compiled all available information related to climate, site topography, surface drainage features and subsurface conditions throughout the community.
- ***Geotechnical Investigation:*** An engineer from CGD visited the sites and conducted a total of seven test pits (as prescribed within the RFP for this project) using a local backhoe. CGD also carried out dynamic cone penetration tests at each location to compliment our test pit findings.
- ***Laboratory Testing Program:*** A geotechnical laboratory testing program was carried out to properly classify the soils encountered and verify in-situ moisture/ice contents, gradations and salinity.
- ***Geotechnical Report:*** A comprehensive geotechnical report has been prepared summarizing the observations/findings of the investigation including recommendations pertinent to the design and construction of the roadway upgrades and associated site grading.

# 4.0 Available Information

CGD has reviewed the following available information as part of this investigation:

1. (Canadrill, 2020a). Piling Installation Summary Report, Block 200, Iqaluit, NU;
2. (Canadrill, 2020b). Piling Installation Summary Report, Nakasuk School, Iqaluit, NU;
3. (Canadrill, 2020c). Geotechnical Investigation, Wellness Hub, Iqaluit, NU;

4. (Canadrill, 2020d). Geotechnical Investigation, CGS Recovery Centre, Iqaluit, NU;
5. (Canadrill, 2019a). Piling Installation Summary Report, Lot 76, Plan 3677, Iqaluit, NU;
6. (Canadrill, 2019b). Piling Installation Summary Report, Lot 514, Iqaluit, NU;
7. (Canadrill. 2019c). Geotechnical Investigation, Airport Taxiway A, Iqaluit, NU;
8. (Canadrill, 2018). Geotechnical Investigation, First Air Warehouse, Iqaluit, NU;
9. (exp, 2017). Geotechnical Investigation, First Air Hanger, Iqaluit, NU;
10. (exp, 2016). Geotechnical Investigation, Correctional Center, Iqaluit, NU;
11. (exp, 2014). Geotechnical Investigation, Inuit Owned Lands, Iqaluit, NU;
12. (Journeaux, 2015). Geotechnical Investigation, Arctic College Campus Expansion, Iqaluit, NU;
13. Available satellite imagery, Google Earth (2003 to 2020);
14. Aerial photography, National Air Photo Library (1964, 1973, 1983 and 1993);
15. Environment Canada website, historical weather data for the community of Iqaluit, NU;
16. Studies and literature related to the distribution of saline permafrost and ground temperature data throughout Nunavut (i.e. Canadian Geotechnical Journals);
17. AASHTO Guide for Design of Pavement Structures (1993); and
18. City of Iqaluit Municipal Design Guidelines (2005).

# 5.0 Field Program Methodology

CGD carried out the geotechnical field program between September 21 and 23, 2021 when the areas of interest were partially snow covered. The field program consisted of digging seven test pits through the current roadway structures using a local backhoe. Dynamic cone penetration tests were also performed at and/or adjacent to each of the test pits to evaluate the in-situ bearing resistances of the soils present, which can be correlated to California bearing ratio (CBR) values for use in pavement design. The test pit locations are shown on the attached Figures 2 and 3.

The field program was supervised on a full-time basis by a field engineer from CGD experienced with permafrost soils. The test pits were excavated to depths of 0.60 and 2.38 meter below grade (mbg) prior to meeting practical refusal on bedrock or frozen permafrost soils. The sidewall profiles of each test pit was carefully examined and photographed by CGD prior to backfilling. The current pavement structure was as-built as much as possible, including the overall quality of any underlying fill materials and/or native soils present. Soil samples were collected from the layers of interest and at regular intervals through thicker layers, then stored in moisture tight containers and transported to a southern laboratory for further classification and testing. Prior to sample shipment, the initial weights were obtained for all samples to ensure that the moisture contents obtained were representative. Laboratory testing included the determination of natural moisture contents, salinity and grain-size analyses on select samples.

The collected soil samples were visually examined and logged in accordance with ASTM D 2487 (Standard Practice for Classification of Soils for Engineering Purposes, Unified Soil Classification System, ASTM

D 2488 (Standard Practice for Description and Identification of Soils, Visual-Manual Procedure) and ASTM D 4083-8 (Standard Practice for Description of Frozen Soils, Visual-Manual Procedure).

The test pit locations were determined in the field using a commercial grade handheld GPS unit (reported accuracy of ± 3 m) and all depths reported herein are referenced to mbg.

## 6.0 Historical Climate and Permafrost Conditions

Iqaluit is located at 63° 76 N and 68° 54' W on the southeastern coast of Baffin Island, in the Qikiqtaaluk Region of Nunavut. Based on current permafrost mapping, the community is located well within the zone of continuous permafrost.

***Mean Annual Air Temperature (MAAT) and Indices:*** A review of Environment Canada climate records for the community revealed a relatively complete set of historical monthly air temperatures spanning the period from 1981 to 2010. The data indicates the mean annual air temperature (MAAT) over this time period was -9.2℃ and the average thawing and freezing indices were about 660℃-days and 4029℃-days respectively.

***Active Layer Thickness:*** Based on the above-noted climate data and simplified empirical methods, it is estimated that the maximum active layer thickness in Iqaluit currently varies between approximately 1.5 and 2.2 m, depending on site-specific variables such as surficial cover, site drainage, sun exposure and in-situ moisture content. Previous studies have reported active layer thicknesses up to 3.0 m depending on the site and time of year. It is assumed that the more severe active layer thicknesses observed by others (i.e. beyond our 2.2 m estimate) are associated with higher than average surface/ground water flow or some other site-specific considerations not identified.

We also have installed several multi-bead and single-bead thermistors throughout Iqaluit over the past few years. Our stabilized ground temperature readings from these thermistor locations indicate a maximum active layer thicknesses ranging between 1.5 and 1.8 m. The maximum depth that permafrost was encountered during this investigation was 2.38 mbg; therefore, we consider a current maximum active layer thickness of 2.4 m to be an appropriate assumption for these sites.

***Mean Annual Ground Temperature (MAGT):*** Accurate ground temperature measurements via long-term thermistor data collection (2003 to 2004 and 2011 to 2012) is available from others for three boreholes in/around Iqaluit. Based on this data, a MAGT of -5.6 to -7.1℃ has been reported. As noted above, CGD has several multi-bead thermistor installations (extending 10 to 11 mbg) that we routinely obtain readings from throughout the community. Based on our stabilized ground temperature readings over the past few years, the typical MAGT ranges from -3.5 to -4.5℃ at these locations.

## 7.0 Site and Subsurface Conditions

The roads included in this investigation are located from the southern portion of Apex to the central portion of Iqaluit. The sections being investigated have a total length of approximately 3.3 km, with the longest section being Niaqunngusiariaq Road (1.7 km) and the shortest being Hanson Drive (160 m).

Test pits were excavated to depths of 0.60 to 2.38 mbg. Bedrock was encountered at 0.60 mbg in TP03 and all other test pits were terminated after reaching refusal on permafrost. The principal strata encountered at the sites are outlined in the following table and subsections. Further details are provided within the attached test pit logs.

**TABLE 1 - Test Pit Stratigraphy Summary**

| Location | Total Depth (mbg) | Soil Stratigraphy Thickness (m) | | | | | | Depth To (m) | |
|---|---|---|---|---|---|---|---|---|---|
| | | Asphalt | Crushed Granular | | | Original Rootmat | Native Sand or Gravel | Permafrost | Bedrock |
| | | | A | B | C | | | | |
| TP01 | 1.77 | 0.15 | 0.20 | 0.30 | 0.40 | 0.10 | 0.62 | 1.77 | – |
| TP02 | 2.38 | 0.03 | 0.10 | 0.20 | – | – | 2.05 | 2.38 | – |
| TP03 | 0.60 | – | 0.10 | 0.20 | – | 0.10 | 0.20 | – | 0.6 |
| TP04 | 1.80 | – | 0.10 | 0.35 | – | – | 1.35 | 1.80 | – |
| TP05 | 2.10 | – | 0.15 | 0.45 | – | 0.15 | 1.35 | 2.10 | – |
| TP06 | 2.00 | – | 0.20 | 0.45 | – | – | 1.25 | 2.00 | – |
| TP07 | 2.10 | – | 0.20 | | 0.40 | – | 1.50 | 2.10 | – |

The presented information depicts subsurface conditions only at specific locations and that the identified soil boundaries are intended to reflect approximate transition zones for geotechnical design and should not be interpreted as exact planes of geological change for estimation or construction purposes. It is recommended that the subsurface conditions be further evaluated/confirmed at the time of construction by a geotechnical engineer experienced with northern construction and registered with Northwest Territories and Nunavut Association of Professional Engineers and Geoscientists (NAPEG), or their representative.

## 7.1 Asphalt

A layer of asphalt was encountered at surface in TP01 (Hanson Drive) and TP02 (Apex Road, near Apex Bridge) with thicknesses of 0.15 and 0.03 m, respectively.

## 7.2 Fill

Crushed granular fill of the existing roadway structure was encountered directly beneath the asphalt of TP01 and TP02, or at surface in the remaining five test pits. In general, the existing roadway structures appeared to consist of crushed material meeting the criteria of Granular A, underlain by Granular B, which is most test pits was observed to be further underlain by common borrow fill meeting the criteria of Granular C (sometimes crushed and sometimes screened). The approximate extent of each type of fill material encountered is summarized above. The total thickness of crushed granular fill present at the surface of the test pits ranged from 0.3 to 0.9 m.

The moisture content for 15 samples obtained throughout the fill ranged from 2.8 to 9.0%, with an average of 4.2%. Gradation and moisture content test results for the samples tested from the fill at the sites are summarized in the following table and shown in greater detail on the attached laboratory test results.

**TABLE 2 - Fill Gradation and Moisture Content Summary**

| Location | Sample | Depth (mbg) | Soil Fraction | | | Moisture Content (%) | Soil Description |
|---|---|---|---|---|---|---|---|
| | | | Gravel | Sand | Silt | | |
| TP01 | S1 | 0.15 – 0.25 | 47 | 48 | 5 | 3.6 | Well-graded SAND with gravel |
| TP01 | S2 | 0.40 | 64 | 31 | 5 | 2.8 | Well-graded GRAVEL with silt and sand |
| TP01 | S3 | 0.65 – 0.75 | 52 | 41 | 7 | 5.9 | Poorly graded GRAVEL with silt and sand |
| TP02 | S1 | 0.03 – 0.23 | 36 | 60 | 4 | 2.9 | Poorly graded SAND with gravel |
| TP03 | S1 | 0.00 – 0.10 | 49 | 46 | 5 | 3.2 | Well-graded GRAVEL with silt and sand |
| TP03 | S2 | 0.10 – 0.20 | 23 | 71 | 6 | 3.0 | Poorly graded SAND with silt and gravel |
| TP03 | S3 | 0.20 – 0.30 | 21 | 69 | 10 | 5.6 | Poorly graded SAND with silt and gravel |
| TP04 | S1 | 0.00 – 0.10 | 44 | 49 | 7 | 4.5 | Poorly graded SAND with silt and gravel |
| TP04 | S2 | 0.40 – 0.45 | 56 | 37 | 7 | 3.9 | Poorly graded GRAVEL with silt and sand |
| TP05 | S1 | 0.00 – 0.10 | 22 | 73 | 5 | 4.2 | Poorly graded SAND with silt and gravel |
| TP05 | S2 | 0.20 – 0.30 | 32 | 65 | 3 | 3.0 | Poorly graded SAND with gravel |
| TP06 | S1 | 0.00 – 0.10 | 30 | 64 | 6 | 3.6 | Poorly graded SAND with silt and gravel |
| TP07 | S1 | 0.00 – 0.10 | 25 | 69 | 6 | 3.9 | Poorly graded SAND with silt and gravel |
| TP07 | S2 | 0.20 – 0.30 | 17 | 79 | 4 | 9.0 | Poorly graded SAND with gravel |
| TP07 | S3 | 0.50 – 0.60 | 66 | 30 | 4 | 3.3 | Well-graded GRAVEL with sand |

## 7.3 Original Rootmat and Topsoil

The original rootmat and topsoil layer was observed at depth within TP01 (Hansen Drive), TP03 (Apex Road) and TP05 (Nunavut Drive) making it easy to differentiate between fill and native soils at these locations. It is possible that some of the soils classified as native within the remaining four test pits is previously placed common borrow, which was too similar to the native soils present for us to differentiate.

The moisture content for 2 samples obtained throughout the topsoil were 6.6 and 25.5%. Gradation and moisture content test results for the samples tested from the topsoil where encountered are summarized in the following table and shown in greater detail on the attached laboratory test results.

**TABLE 3 – Roomat and Topsoil Gradation and Moisture Content Summary**

| Location | Sample | Depth (mbg) | Soil Fraction | | | Moisture Content (%) | Soil Description |
|---|---|---|---|---|---|---|---|
| | | | Gravel | Sand | Silt | | |
| TP01 | S4 | 1.05 – 1.15 | 3 | 76 | 21 | 25.5 | Silty SAND with organics |
| TP05 | S4 | 0.60 – 0.70 | 18 | 81 | 1 | 6.6 | Poorly graded SAND with gravel and organics |

## 7.4 Native Soils

The native soil throughout the test pits of the sites primarily consisted of light brown to reddish brown silty sand to sand with silt and gravel. The most distinct exception to this was within TP01 (Hansen Drive) where the native soils consisted of mottled (reddish orange to light grey) clayey sand to sandy clay.

The moisture content for 17 samples obtained throughout the native soil ranged from 1.5 to 36.7%, with an average of 11.1%. Gradation and moisture content test results for the samples tested from the native soil at the sites are summarized in the following table and shown in greater detail on the attached laboratory test results.

**TABLE 4 - Native Soil Gradation and Moisture Content Summary**

| Location | Sample | Depth (mbg) | Soil Fraction | | | Moisture Content (%) | Soil Description |
|---|---|---|---|---|---|---|---|
| | | | Gravel | Sand | Silt | | |
| TP01 | S6 | 1.65 – 1.70 | 1 | 67 | 32 | 27.4 | Clayey SAND |
| TP02 | S2 | 0.23 – 0.33 | 36 | 59 | 5 | 3.0 | Poorly graded SAND with silt and gravel |
| TP02 | S3 | 0.33 – 0.43 | 13 | 87 | 0 | 1.8 | Poorly graded SAND |
| TP02 | S5 | 1.43 – 1.53 | 9 | 90 | 1 | 3.0 | Poorly graded SAND |
| TP04 | S3 | 0.70 – 0.80 | 63 | 32 | 5 | 3.2 | Poorly graded GRAVEL with sand |
| TP06 | S2 | 0.20 – 0.30 | 24 | 69 | 7 | 3.7 | Well-graded SAND with silt and gravel |
| TP06 | S4 | 0.95 – 1.05 | 32 | 65 | 3 | 3.0 | Poorly graded SAND with gravel |
| TP07 | S4 | 0.85 – 0.95 | 18 | 75 | 7 | 36.7 | Well-graded SAND with silt and gravel |

## 7.5 Bedrock

Based on available geological maps for the area, it is anticipated that bedrock throughout the community would consist of gneiss and granite bedrock. Bedrock was only distinctly encountered in TP03 at 0.6 mbg.

## 7.6 Groundwater

Light to moderate groundwater seepage was observed in four of the seven test pits. Groundwater flow through the sites is anticipated to be moderate to significant during the spring freshet and travel along the bottom of the active layer or top of sound bedrock during thaw. It is anticipated that groundwater levels will fluctuate with seasonal weather trends, during precipitation events, and with significant site disturbance and construction activities.

## 7.7 Porewater Salinity

A total of fifteen samples from this investigation were tested for salinity in general accordance with ASTM D 4542-95 (Standard Test Method for Pore Water Extraction and Determination of the Soluble Salt Content of Soils by Refractometer) and standard methodologies. The salinity test results ranged from 0.0 to 8.0 parts per thousand (ppt), with an average value of 2.9 ppt.

## 7.8 Soil Bearing

Dynamic cone penetration testing was done at 14 locations, at or adjacent to the test pits. The results are summarized in the following table and shown in greater detail on the attached dynamic cone penetration test results.

**TABLE 5 - Dynamic Cone Penetration Test Summary**

| Location | Material Type | Depth Range (mm) | Weighted Average CBR % | Equivalent Resilient Modulus (MPa) |
|---|---|---|---|---|
| TP01 | Fill | 187 – 585 | 50.0 | 196.5 |
| TP01 | Native Soil | 745 – 1593 | 4.4 | 35.9 |
| TP02 | Fill | 33 – 208 | 46.2 | 186.2 |
| TP02 | Native Soil | 236 – 2068 | 29.9 | 135.8 |
| TP02 adjacent | Fill | 75 – 217 | 31.2 | 137.9 |
| TP02 adjacent | Native Soil | 248 – 1128 | 46.2 | 186.2 |
| TP03 | Fill | 60 – 291 | 85.1 | 276.5 |
| TP03 | Native Soil | 314 – 601 | 43.5 | 175.8 |
| TP03 adjacent | Fill | 56 – 276 | 76.5 | 262.0 |
| TP03 adjacent | Native Soil | 303 – 578 | 96.1 | 305.5 |
| TP04 | Fill | 54 – 411 | 51.2 | 199.9 |
| TP04 | Native Soil | 456 – 1220 | 41.2 | 172.4 |
| TP04 downhill | Fill | 69 – 419 | 45.5 | 183.4 |
| TP04 downhill | Native Soil | 499 – 1090 | 28.8 | 134.4 |
| TP04 uphill | Fill | 61 – 447 | 59.7 | 213.7 |
| TP04 uphill | Native Soil | 491 – 594 | 71.3 | 248.2 |
| TP05 | Fill | 68 – 390 | 85.2 | 276.7 |
| TP05 | Native Soil | 724 – 2092 | 36.2 | 155.1 |
| TP05 adjacent | Fill | 70 – 576 | 86.7 | 277.9 |
| TP05 adjacent | Native Soil | 614 – 1066 | 72.2 | 251.7 |
| TP06 | Fill | 65 – 184 | 80.8 | 273.7 |
| TP06 | Native Soil | 204 – 1995 | 30.3 | 136.5 |
| TP06 adjacent | Fill | 71 – 194 | 40.8 | 171.0 |
| TP06 adjacent | Native Soil | 215 – 1065 | 50.8 | 198.6 |
| TP07 | Fill | 50 – 565 | 96.5 | 306.1 |
| TP07 | Native Soil | 620 – 2099 | 21.6 | 117.2 |
| TP07 adjacent 1 | Fill | 50 – 246 | 96.9 | 306.8 |
| TP07 adjacent 2 | Fill | 45 – 345 | 98.1 | 310.3 |

# 8.0 Climate Change in Foundation Design

As mentioned above, CGD anticipates the current maximum active layer thickness throughout the sites to be approximately 2.4 m and the current MAGT to be -3.5℃. Changes to the active layer thickness and MAGT throughout the life of the structure will be dependant on many variables, possibly including but not limited to changes in snow cover, precipitation, surface/groundwater flow, material gradation and in-situ ice content.

CSA PLUS 4011:19 provides that under a high greenhouse gas scenario the MAAT in Iqaluit is estimated to increase by approximately 2.5℃ over the next 30 years (by 2050) compared to the historic temperature trends which were available up to 2015. It is noted however, that recent research infers that greenhouse gas emissions over the next 30 years and beyond may be even higher than previously anticipated and new scenarios continue to be produced by global experts. Therefore, accurately estimating what the active layer thickness and MAGT will be 30 years from now is well beyond the scope of this investigation. To support the current project, we have adjusted the historical temperature data to incorporate the MAAT increase estimated by CSA PLUS 4011:19 and utilized simplified empirical methods to generate an estimated maximum active layer thickness for design. We have also assumed (conservatively) that the MAGT will rise in step with the MAAT.

Based on our assessment, we recommend a design active layer thickness of 3.0 m and design MAGT of -1.0℃ be used for design at the sites.

It is noted that CSA PLUS 4011:19 states *"The requirement for monitoring, reporting, and reacting to any changes that are noted must be recognized early in the project. The responsibilities need to be defined at the project outset and budgets allocated to collect and summarize the data. An annual review by the geotechnical engineer is recommended with more frequent reviews if undesirable trends appear. Monitoring is pointless unless the data collected are evaluated"*. This speaks to the importance of implementing a proper and consistent ground temperature monitoring program that includes review and input from qualified geotechnical personnel as part of responsibly addressing climate change in relation to foundation design and maintenance.

# 9.0 Discussion and Recommendations

## 9.1 Pavement Structure Design

The pavement structure has been evaluated based on the U.S. Department of the Army Technical Manual, Arctic and Subarctic Construction Runway and Road Design procedures, as well as the AASHTO Guide for Design of Pavement Structures procedure. It is noted that U.S. Department of the Army Technical Manual suggest the design of pavement in the arctic region be based on the following two methods:

- Limited Subgrade Frost Penetration Method.
- Reduced Subgrade Strength Method.

The limited subgrade frost penetration method resulted in a very thick (> 1.5 m) roadway structure that is generally uneconomical and would be problematic where these are existing roadways. The reduced subgrade strength method, as well as the AASHTO method, allows for assumptions related to a loss of subgrade bearing strength during thaw or wetter periods over the design life. Although these methods do not limit frost penetration into the underlying native soils, the thickness of the pavement structure is determined such that it will adequately carry traffic loads during the wetter times of year and experience limited differential frost heave due to adequate subgrade preparation techniques and transitions over differing subgrade types. Therefore, a transition zone should be provided where the subgrade changes from overburden to bedrock, such that a 10 Horizontal: 1 Vertical (10H: 1V) slope to the bedrock is provided beneath the pavement structure, even if bedrock breaking is required.

Based on the soil conditions encountered, we have determined the following asphalt and gravel surface pavement structures for use on the project:

**TABLE 6 – Asphalt Pavement Design**

| Layer | Soil Subgrade (mm) | Bedrock Subgrade (mm) |
|---|---|---|
| Asphalt Concrete | 90 | 90 |
| Base gravel, Granular A | 200 | 200 |
| Subbase gravel, Granular B | 300 | 150 |

**TABLE 7 - Gravel Surface Pavement Design (Hansen Drive only)**

| Layer | Minimum Thickness (mm) |
|---|---|
| Base gravel, Granular A | 200 |
| Subbase gravel, Granular B | 300 |
| Select subgrade, Granular C | 300 |

The above pavement structures have been determined using the AASHTO design guidelines, our experience on other projects and the following assumptions:

- Performance life for this pavement design is 15 years.
- Estimated subgrade resilience modulus of 39.5 MPa.
- Estimated traffic loading not exceeding 2.5 x $10^5$ ESAL's.

## 9.2 Site Preparation and Pavement Construction

It is understood that any currently damaged areas along Hansen Drive will be stripped of the existing asphalt, whereas the remaining roadways are all currently gravel surface. Our investigation has confirmed the presence of crushed granular material meeting the criteria of Granular A and/or Granular B along each of the roadways investigated, totalling over 300 mm thick in all the areas of interest.

Given that each test pit represents an entire roadway, it is our opinion that the existing Granular A and B present along the roadways be taken as equivalent to the 300 mm thick Subbase Granular B layer recommended above. On this basis, we would recommend that the existing roadway surfaces be proof rolled as outlined below, prior to receiving the remainder of the recommended pavement structure (200 mm Base Granular A, overlaid by 90 mm of asphalt concrete where desired).

It is anticipated that those areas along Hansen Drive requiring the removal of damaged asphalt, can simply be proof rolled as outlined below and then receive additional Granular A material sufficient to reinstate the existing grades. It is our opinion that the underlying clayey sand to sandy clay of Hansen Drive likely experiences above-average amounts of seasonal heave, resulting in the observed issues.

Prior to the placement of any additional granular materials, the exposed roadway surfaces should be proof rolled / compacted by at least 6 back-and-forth passes from a minimum 10-tonne vibratory drum roller. Any areas with excessive yielding should be excavated and replaced with approved Granular B or C material to the satisfaction of qualified geotechnical personnel onsite.

The Granular A and Granular B gravels should be placed and compacted to a minimum of 100 percent Standard Proctor Maximum Dry Density (SPMDD), and asphalt concrete should be placed and compacted to 92.5 percent of the material maximum theoretical density. In place density tests should be undertaken on each lift to ensure that the specified degree of compaction has been achieved. All granular materials used as part of construction should conform to the most recent specifications of the City of Iqaluit Municipal Design Guidelines.

The satisfactory performance of the pavement is contingent upon provision of a good drainage system. It is recommended that drainage ditches should be provided on both sides of the pavement and should extend at least 0.75 m below the design subgrade level. The ditches should be constructed with side slopes of 2H: 1V or flatter. It may be prudent to line the ditches with at least 100 mm thick layer of coarse gravel to limit erosion of the base and sides.

The finished pavement surface should be free of depressions and should be sloped at a minimum cross fall of 3 percent to provide effective surface drainage towards the ditches. Surface water should not be allowed to pond adjacent to the outside edges of the pavement structure.

## 10.0 Requirement for Qualified Geotechnical Monitoring

As noted above, inspection and monitoring are an important component of the design process. Qualified geotechnical personnel should be onsite throughout the site preparation to assure the native subgrade preparation and material placement/compaction meets the project requirements.

It is noted that CGD can provide a suitably qualified field engineer onsite to work under the direction and guidance of the undersigned as required, upon request.

# 11.0 Closure

The use of this report is subject to the attached statement of general conditions. It is the responsibility of Dillon Consulting Limited, who is identified as "the Client" within the statement of general conditions and its agents to review the conditions and to notify Canadrill Limited Geotechnical Division should any of these not be satisfied. The statement of general conditions addresses; use of the report, basis of the report, standard of care, interpretation of site conditions, varying or unexpected site conditions, planning, design, and construction.

We trust the information contained herein is adequate for your present purposes. Should you have any questions about the contents of this report, or if we can be of any further assistance, please do not hesitate to contact the undersigned at your convenience.

Sincerely,

**Canadrill Limited, Geotechnical Division**

Matthew Shillington, EIT
Junior Engineer – Geotechnical Division
mshillington@canadrill.biz

Jason A. Smith, P.Eng. (NT/NU)
Manager – Geotechnical Division
jsmith@canadrill.biz

# ATTACHMENTS

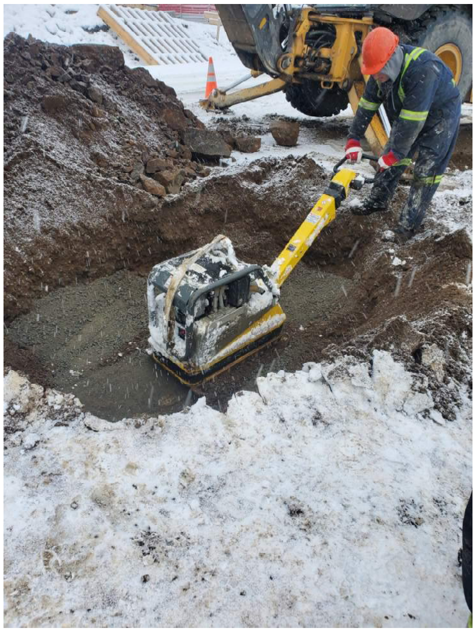
**Photograph 1 – September 21, 2021**
Cutting through asphalt for TP01.

**Photograph 2 – September 21, 2021**
TP01 after excavation.

**Photograph 3 – September 21, 2021**
TP02.

**Photograph 4 – September 21, 2021**
TP03 after reaching bedrock.

**Photograph 5 – September 22, 2021**
Excavating TP04.



**Photograph 6 – September 22, 2021**
Backfilling and compacting TP04.

**Photograph 7 – September 22, 2021**
Groundwater seepage in TP05.

**Photograph 8 – September 22, 2021**
Grading backfill surface of TP05.

**Photograph 9 – September 22, 2021**
Groundwater seepage in TP06.

**Photograph 10 – September 23, 2021**
TP07.

**Photograph 11 – September 23, 2021**
Dynamic cone penetration testing adjacent to TP07.

**Photograph 12 – September 23, 2021**
Location of TP07 after completion of work.

## CANADRILL LIMITED GEOTECHNICAL DIVISION

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CANADRILL

| | | | |
|---|---|---|---|
| Scale: | Not to Scale | Client: | **Dillon Consulting Limited** |
| Project No.: | IQA-G2109 | Project: | Drainage and Road Improvements, Iqaluit, NU |
| | Figure 1 | Title: | Site Location Plan |

Notes: (1) Google Earth image used is understood to be from 2020; therefore, unknown differences may exist between current site conditions and those shown.
(2) This drawing forms part of the report project number as referenced and should be used only in conjunction with this report.

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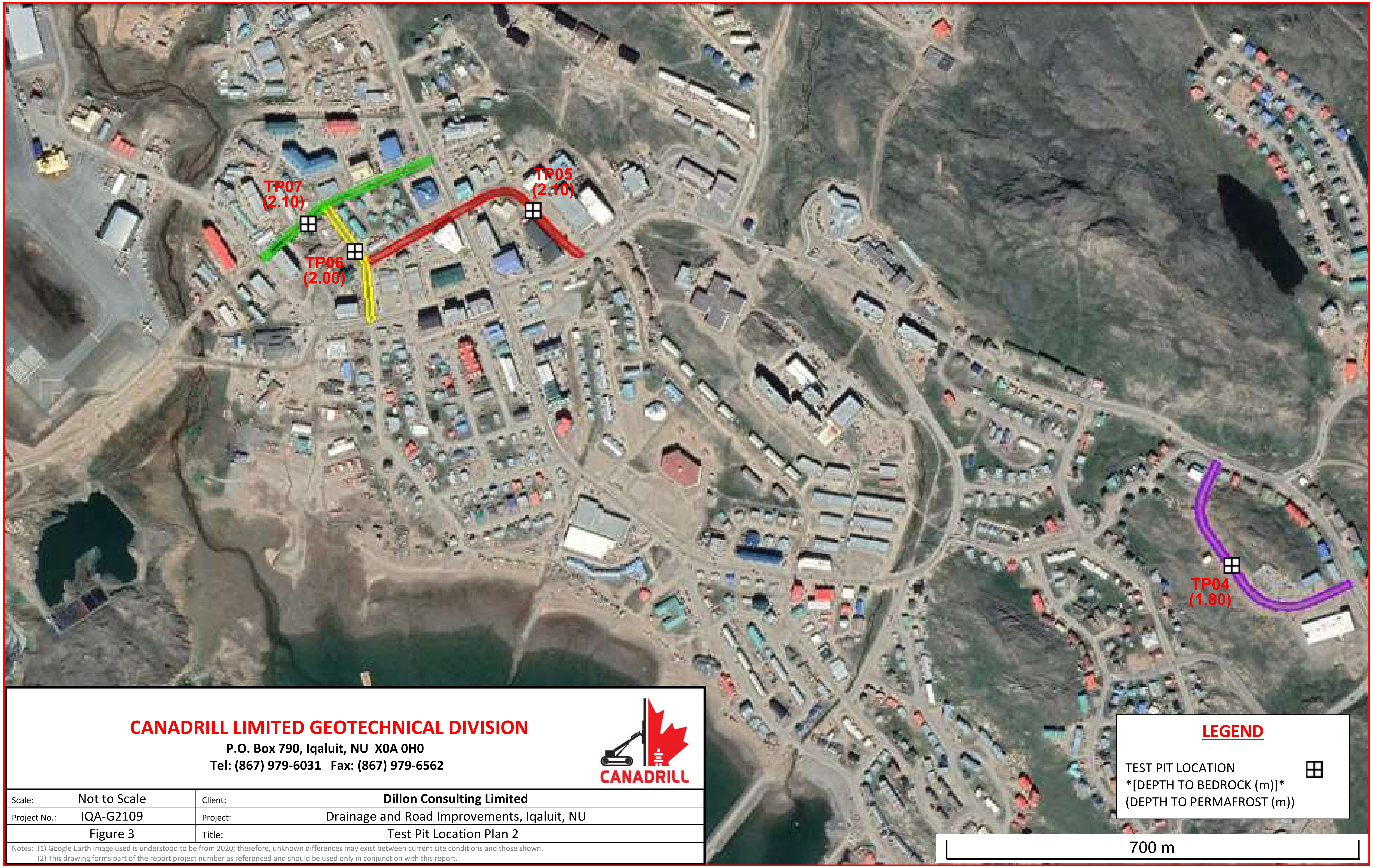
|---|---|---|---|
| Scale: | Not to Scale | Client: | **Dillon Consulting Limited** |
| Project No.: | IQA-G2109 | Project: | Drainage and Road Improvements, Iqaluit, NU |
| | Figure 2 | Title: | Test Pit Location Plan 1 |

Notes: (1) Google Earth image used is understood to be from 2020; therefore, unknown differences may exist between current site conditions and those shown.
(2) This drawing forms part of the report project number as referenced and should be used only in conjunction with this report.



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| | | | |
|---|---|---|---|
| Scale: | Not to Scale | Client: | **Dillon Consulting Limited** |
| Project No.: | IQA-G2109 | Project: | Drainage and Road Improvements, Iqaluit, NU |
| | Figure 3 | Title: | Test Pit Location Plan 2 |

Notes: (1) Google Earth image used is understood to be from 2020; therefore, unknown differences may exist between current site conditions and those shown.
(2) This drawing forms part of the report project number as referenced and should be used only in conjunction with this report.

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# TEST PIT LOG

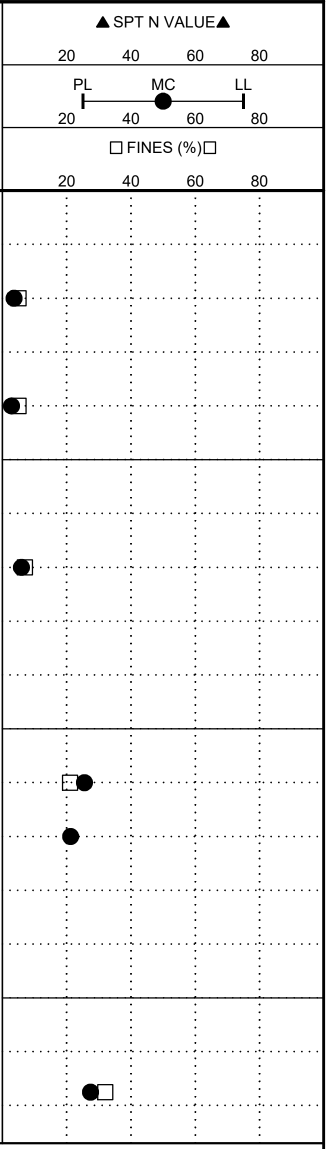
## TP01

PAGE 1 OF 1

**CLIENT** Dillon Consulting Limited
**PROJECT NAME** Road Improvement
**PROJECT NUMBER** IQA-G2109
**PROJECT LOCATION** Iqaluit, NU
**DATE STARTED** 2021.09.21 **COMPLETED** 2021.09.21
**GROUND ELEVATION** n/a
**EXCAVATION CONTRACTOR** Pilitak Enterprises Ltd.
**NOTES**
**EXCAVATION METHOD** Backhoe
Hanson Drive
**LOGGED BY** PM **CHECKED BY** MS

| DEPTH (m) | MATERIAL DESCRIPTION | GRAPHIC LOG | USCS | GROUND ICE DESCRIPTION | SAMPLE NUMBER | SALINITY (ppt) | SOIL FRACTION (%) GRAVEL | SAND | FINES | MOISTURE CONTENT (%) | RQD (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.15 | Asphalt | | | | | | | | | | |
| 0.35 | FILL: GRANULAR A<br>Light brown well-graded SAND with gravel | | GW-GM | | S1 | - | 47 | 48 | 5 | 3.6 | |
| 0.65 | FILL: GRANULAR B<br>Light brown well-graded GRAVEL with silt and sand | | GW-GM | | S2 | 0.0 | 64 | 31 | 5 | 2.8 | |
| 1.05 | FILL: GRANULAR C<br>Light brown poorly graded GRAVEL with silt and sand<br>- frequent cobbles<br>Geotextile fabric at 1.05m | | GP-GM | | S3 | 2.5 | 52 | 41 | 7 | 5.9 | |
| 1.15 | ROOTMAT/TOPSOIL | | | | S4 | - | 3 | 76 | 21 | 25.5 | |
| 1.65 | Orange to brown fine grained clayey SAND | | SC | | S5 | - | - | - | - | 21.2 | |
| 1.77 | Light grey clayey SAND<br>- light seepage at 1.7m | | SC | | S6 | 3.2 | 1 | 67 | 32 | 27.4 | |

Test Pit Terminated at 1.77 m - Refusal on permafrost



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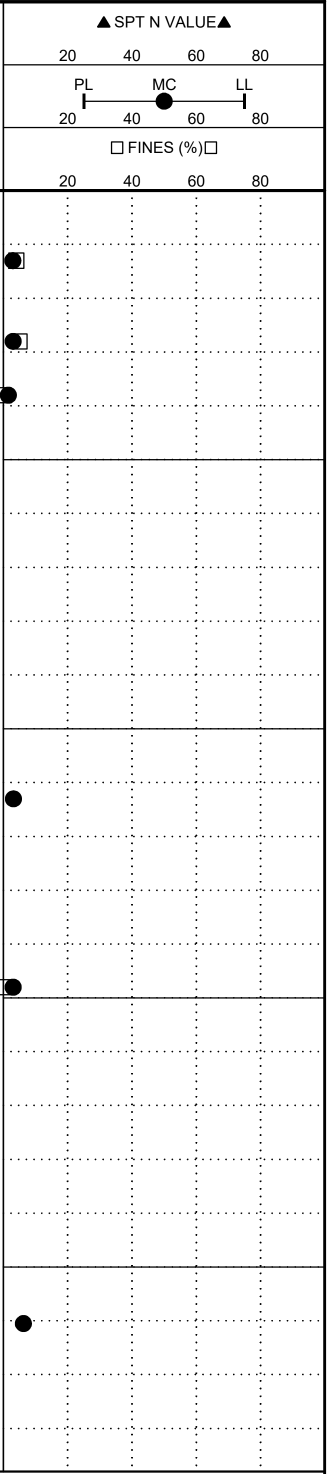
# TEST PIT LOG

## TP02

PAGE 1 OF 1

**CLIENT** Dillon Consulting Limited
**PROJECT NAME** Road Improvement
**PROJECT NUMBER** IQA-G2109
**PROJECT LOCATION** Iqaluit, NU
**DATE STARTED** 2021.09.21 **COMPLETED** 2021.09.21
**GROUND ELEVATION** n/a
**EXCAVATION CONTRACTOR** Pilitak Enterprises Ltd.
**NOTES** Apex Road
**EXCAVATION METHOD** Backhoe
**LOGGED BY** PM **CHECKED BY** MS

| DEPTH (m) | MATERIAL DESCRIPTION | USCS | GROUND ICE DESCRIPTION | SAMPLE NUMBER | SALINITY (ppt) | SOIL FRACTION (%) GRAVEL | SAND | FINES | MOISTURE CONTENT (%) | RQD (%) |
|---|---|---|---|---|---|---|---|---|---|---|
| 0.03 | Asphalt | | | | | | | | | |
| 0.13 | FILL: GRANULAR A<br>Medium brown SAND with silt and gravel | SP-SM | | S1 | - | 36 | 60 | 4 | 2.9 | |
| 0.33 | FILL: GRANULAR B<br>Medium brown GRAVEL with silt and sand | GP-GM | | S2 | 4.0 | 36 | 59 | 5 | 3.0 | |
| 2.38 | Light brown poorly graded SAND with silt and gravel to poorly graded SAND<br>(GRANULAR C) | SP | | S3 | 0.0 | 13 | 87 | 0 | 1.5 | |
| | | | | S4 | - | - | - | - | 3.1 | |
| | | | | S5 | 4.4 | 9 | 90 | 1 | 3.0 | |
| | | | | S6 | - | - | - | - | 6.2 | |
| | Test Pit Terminated at 2.38 m - Refusal on permafrost | | | | | | | | | |



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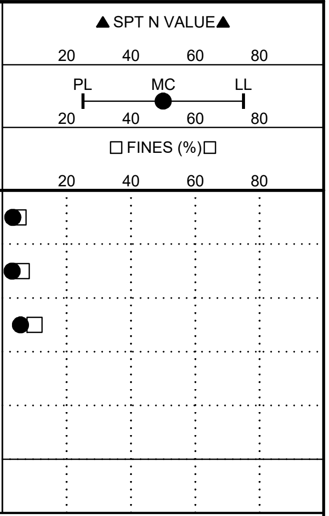
# TEST PIT LOG

## TP03

PAGE 1 OF 1

**CLIENT** Dillon Consulting Limited
**PROJECT NAME** Road Improvement
**PROJECT NUMBER** IQA-G2109
**PROJECT LOCATION** Iqaluit, NU
**DATE STARTED** 2021.09.21    **COMPLETED** 2021.09.21
**GROUND ELEVATION** n/a
**EXCAVATION CONTRACTOR** Pilitak Enterprises Ltd.
**NOTES**
**EXCAVATION METHOD** Backhoe
Apex Road
**LOGGED BY** PM    **CHECKED BY** MS

| DEPTH (m) | MATERIAL DESCRIPTION | GRAPHIC LOG | USCS | GROUND ICE DESCRIPTION | SAMPLE NUMBER | SALINITY (ppt) | SOIL FRACTION (%) | | | MOISTURE CONTENT (%) | RQD (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | GRAVEL | SAND | FINES | | |
| 0.10 | FILL: GRANULAR A<br>Medium brown well-graded GRAVEL with silt and sand | | GW-GM | | S1 | - | 49 | 46 | 5 | 3.2 | |
| 0.30 | FILL: GRANULAR B<br>Medium brown Poorly graded SAND with silt and gravel | | SP-SM | | S2 | 7.6 | 23 | 71 | 6 | 3.0 | |
| | | | | | S3 | - | 21 | 69 | 10 | 5.6 | |
| 0.40 | ROOTMAT/TOPSOIL | | | | | | | | | | |
| 0.60 | Medium brown silty SAND with gravel | | SM | | | | | | | | |
| 1 | Test Pit Terminated at 0.6 m - Refusal on bedrock | | | | | | | | | | |
| 2 | | | | | | | | | | | |



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# TEST PIT LOG

## TP04

PAGE 1 OF 1

**CLIENT** Dillon Consulting Limited

**PROJECT NAME** Road Improvement

**PROJECT NUMBER** IQA-G2109

**PROJECT LOCATION** Iqaluit, NU

**DATE STARTED** 2021.09.21 **COMPLETED** 2021.09.21

**GROUND ELEVATION** n/a

**EXCAVATION CONTRACTOR** Pilitak Enterprises Ltd.

**NOTES** Joamie Court

**EXCAVATION METHOD** Backhoe

**LOGGED BY** PM **CHECKED BY** MS

| DEPTH (m) | MATERIAL DESCRIPTION | GRAPHIC LOG | USCS | GROUND ICE DESCRIPTION | SAMPLE NUMBER | SALINITY (ppt) | SOIL FRACTION (%) |  |  | MOISTURE CONTENT (%) | RQD (%) | ▲SPT N VALUE▲ 20 40 60 80<br>PL MC LL 20 40 60 80<br>☐FINES (%)☐ 20 40 60 80 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  |  |  |  |  |  |  | GRAVEL | SAND | FINES |  |  |  |
| 0.10 | FILL: GRANULAR A<br>Medium brown poorly graded SAND with silt and gravel | ▩ | SP-SM |  | S1 | - | 44 | 49 | 7 | 4.5 |  | ●☐ |
| 0.45 | FILL: GRANULAR B<br>Medium brown poorly graded GRAVEL with silt and sand | ▩ | GP-GM |  | S2 | 3.9 | 56 | 37 | 7 | 3.9 |  | ●☐ |
| 1<br>1.80 | Medium brown poorly graded GRAVEL with sand<br>- frequent cobbles and boulders |  | GP |  | S3 | 3.9 | 63 | 32 | 5 | 3.2 |  | ●☐ |
| 2 | Test Pit Terminated at 1.8 m - Refusal on permafrost |  |  |  |  |  |  |  |  |  |  |  |

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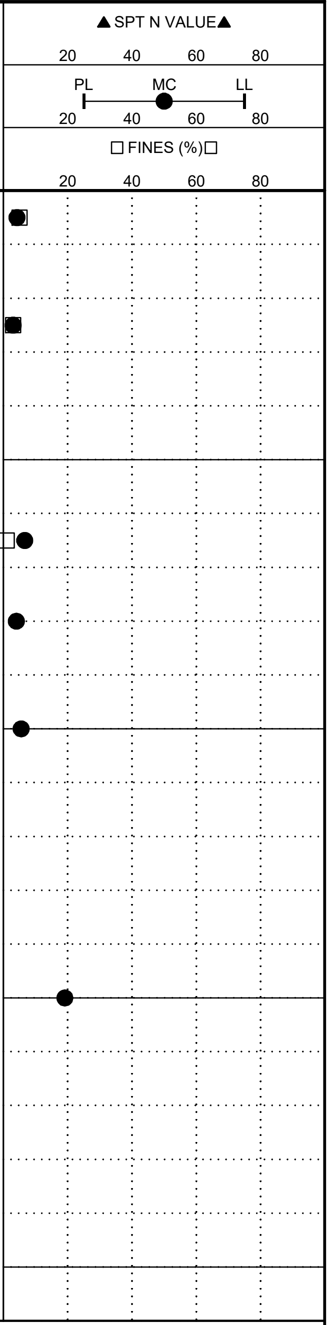
# TEST PIT LOG

## TP05

PAGE 1 OF 1

**CLIENT** Dillon Consulting Limited
**PROJECT NAME** Road Improvement
**PROJECT NUMBER** IQA-G2109
**PROJECT LOCATION** Iqaluit, NU
**DATE STARTED** 2021.09.22 **COMPLETED** 2021.09.22
**GROUND ELEVATION** n/a
**EXCAVATION CONTRACTOR** Pilitak Enterprises Ltd.
**NOTES** Nunavut Drive
**EXCAVATION METHOD** Backhoe
**LOGGED BY** PM **CHECKED BY** MS

| DEPTH (m) | MATERIAL DESCRIPTION | USCS | GROUND ICE DESCRIPTION | SAMPLE NUMBER | SALINITY (ppt) | SOIL FRACTION (%) GRAVEL | SAND | FINES | MOISTURE CONTENT (%) | RQD (%) |
|---|---|---|---|---|---|---|---|---|---|---|
| 0.15 | FILL: GRANULAR A<br>Light brown poorly graded SAND with silt and gravel | SP-SM | | S1 | - | 22 | 73 | 5 | 4.2 | |
| 0.60 | FILL: GRANULAR C<br>Light brown poorly graded SAND with gravel<br>- occasional cobbles | SP | | S2 | 8.0 | 32 | 65 | 3 | 3.0 | |
| 0.75 | ROOTMAT/TOPSOIL | | | S4 | 6.0 | 18 | 81 | 1 | 6.6 | |
| 1.40 | Light brown poorly graded SAND with gravel<br>- moderate seepage at 1.4m | SP | | S5 | - | - | - | - | 4.0 | |
| | | | | S7 | - | - | - | - | 5.5 | |
| 2.10 | Medium SAND with gravel | SP | | S6 | - | - | - | - | 19.1 | |
| | Test Pit Terminated at 2.1 m - Refusal on permafrost | | | | | | | | | |



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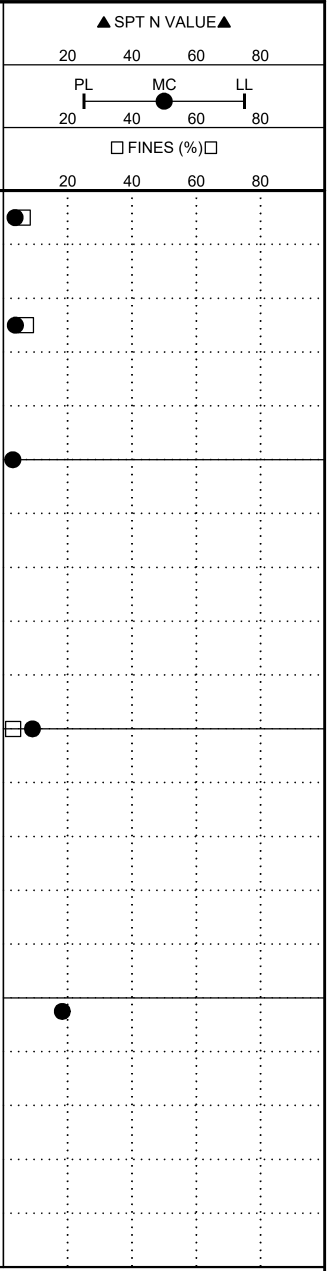
# TEST PIT LOG

## TP06

PAGE 1 OF 1

**CLIENT** Dillon Consulting Limited
**PROJECT NAME** Road Improvement
**PROJECT NUMBER** IQA-G2109
**PROJECT LOCATION** Iqaluit, NU
**DATE STARTED** 2021.09.22  **COMPLETED** 2021.09.22
**GROUND ELEVATION** n/a
**EXCAVATION CONTRACTOR** Pilitak Enterprises Ltd.
**NOTES** Iglulik Drive
**EXCAVATION METHOD** Backhoe
**LOGGED BY** PM  **CHECKED BY** MS

| DEPTH (m) | MATERIAL DESCRIPTION | GRAPHIC LOG | USCS | GROUND ICE DESCRIPTION | SAMPLE NUMBER | SALINITY (ppt) | SOIL FRACTION (%) | | | MOISTURE CONTENT (%) | RQD (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | GRAVEL | SAND | FINES | | |
| 0.20 | FILL: GRANULAR B<br>Medium brown poorly graded SAND with silt and gravel | | SP-SM | | S1 | - | 30 | 64 | 6 | 3.6 | |
| 0.65 | Medium brown well-graded SAND with silt and gravel<br>- possible GRANULAR C<br>- frequent cobbles and boulders | | SW-SM | | S2 | 0.0 | 24 | 69 | 7 | 3.7 | |
| | | | | | S3 | - | - | - | - | 2.9 | |
| 0.90 | Light brown SAND<br>- occasional cobbles | | SP | | | | | | | | |
| 1 | | | | | | | | | | | |
| 2.00 | Reddish poorly graded SAND with gravel<br>- moderate seepage at 1.3m | | SP | | S4 | 0.0 | 32 | 65 | 3 | 9.0 | |
| | | | | | S5 | - | - | - | - | 18.3 | |
| 2 | Test Pit Terminated at 2 m - Refusal on permafrost | | | | | | | | | | |



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# TEST PIT LOG

## TP07

PAGE 1 OF 1

**CLIENT** Dillon Consulting Limited

**PROJECT NAME** Road Improvement

**PROJECT NUMBER** IQA-G2109

**PROJECT LOCATION** Iqaluit, NU

**DATE STARTED** 2021.09.23 **COMPLETED** 2021.09.23

**GROUND ELEVATION** n/a

**EXCAVATION CONTRACTOR** Pilitak Enterprises Ltd.

**NOTES** Ikaluktuuiak

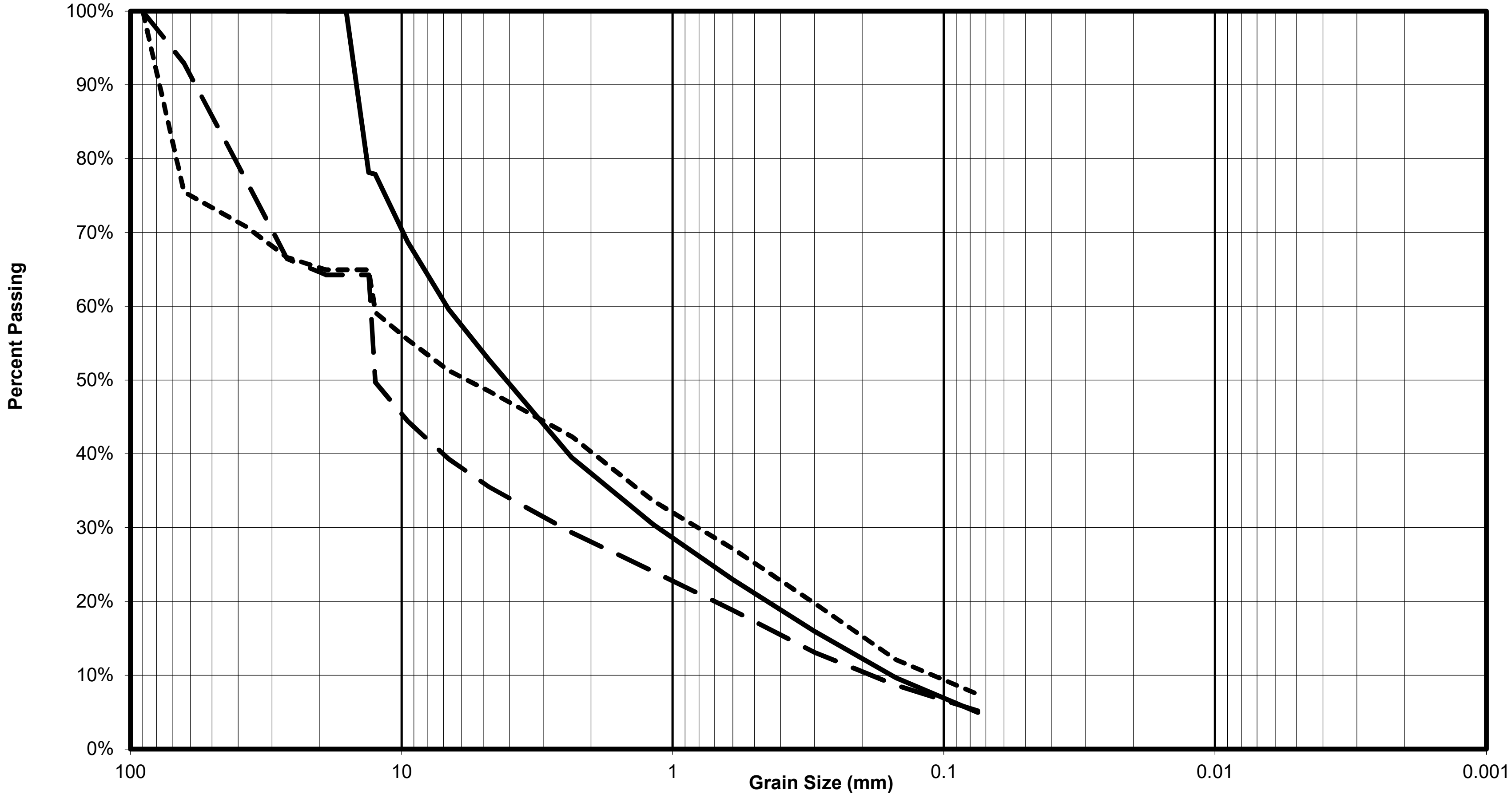
**EXCAVATION METHOD** Backhoe

**LOGGED BY** PM **CHECKED BY** MS

| DEPTH (m) | MATERIAL DESCRIPTION | GRAPHIC LOG | USCS | GROUND ICE DESCRIPTION | SAMPLE NUMBER | SALINITY (ppt) | SOIL FRACTION (%) GRAVEL | SAND | FINES | MOISTURE CONTENT (%) | RQD (%) | ▲ SPT N VALUE ▲ 20 40 60 80 / PL MC LL 20 40 60 80 / ☐ FINES (%) ☐ 20 40 60 80 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  | FILL: GRANULAR A / GRANULAR B<br>Light brown poorly graded SAND with silt and gravel |  | SP-SM |  | S1 | - | 25 | 69 | 6 | 3.9 |  |  |
| 0.20 | FILL: GRANULAR C<br>Light brown poorly graded SAND with gravel to GRAVEL with sand<br>- frequent cobbles |  | SP |  | S2 | 0.0 | 17 | 79 | 4 | 9.0 |  |  |
|  |  |  |  |  | S3 | - | 66 | 30 | 4 | 3.3 |  |  |
| 0.60 | Reddish SAND with gravel |  | SP |  |  |  |  |  |  |  |  |  |
| 0.70 | Brown well-graded SAND with silt and gravel<br>- light seepage at 1.1m |  | SW-SM |  | S4 | 0.0 | 18 | 75 | 7 | 36.7 |  |  |
| 1 |  |  |  |  |  |  |  |  |  |  |  |  |
| 1.10 | Reddish silty SAND with gravel<br>- moderate seepage at 1.4m |  | SM |  | S5 | - | - | - | - | 10.1 |  |  |
| 1.40 | Grey silty SAND with gravel |  | SM |  |  |  |  |  |  |  |  |  |
| 2 |  |  |  |  |  |  |  |  |  |  |  |  |
| 2.10 | Test Pit Terminated at 2.1 m - Refusal on permafrost |  |  |  |  |  |  |  |  |  |  |  |

Project: IQA-G2109

# Grain Size Analysis



| Gravel | | Sand | | | Silt and Clay |
|---|---|---|---|---|---|
| Coarse | Fine | Coarse | Medium | Fine | |

Unified Soil Classification System ASTM D 2487/2488

| Curve | Borehole/Testpit | Sample | Depth (m) | Soil Fractions | | | Moisture Content (%) | Soil Description |
|---|---|---|---|---|---|---|---|---|
| | | | | Gravel | Sand | Silt/Clay | | |
| ──── | TP01 | S1 | 0.15 - 0.25 | 47% | 48% | 5% | 3.6% | Well-graded SAND with gravel |
| — — | TP01 | S2 | 0.4 | 64% | 31% | 5% | 2.8% | Well-graded GRAVEL with silt and sand |
| - - - - - | TP01 | S3 | 0.65 - 0.75 | 52% | 41% | 7% | 5.9% | Poorly graded GRAVEL with silt and sand |

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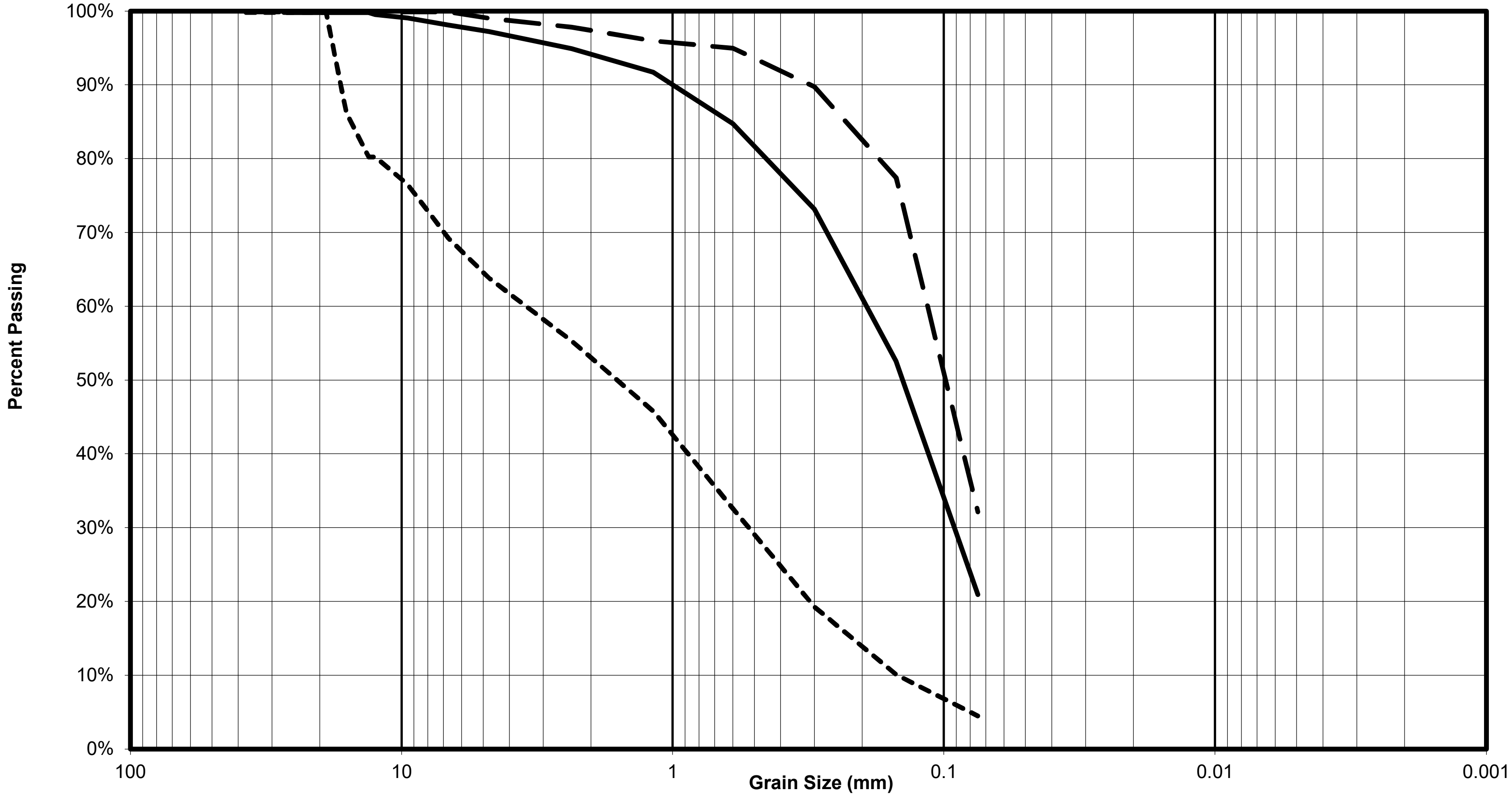
# Grain Size Analysis

Project: IQA-G2109



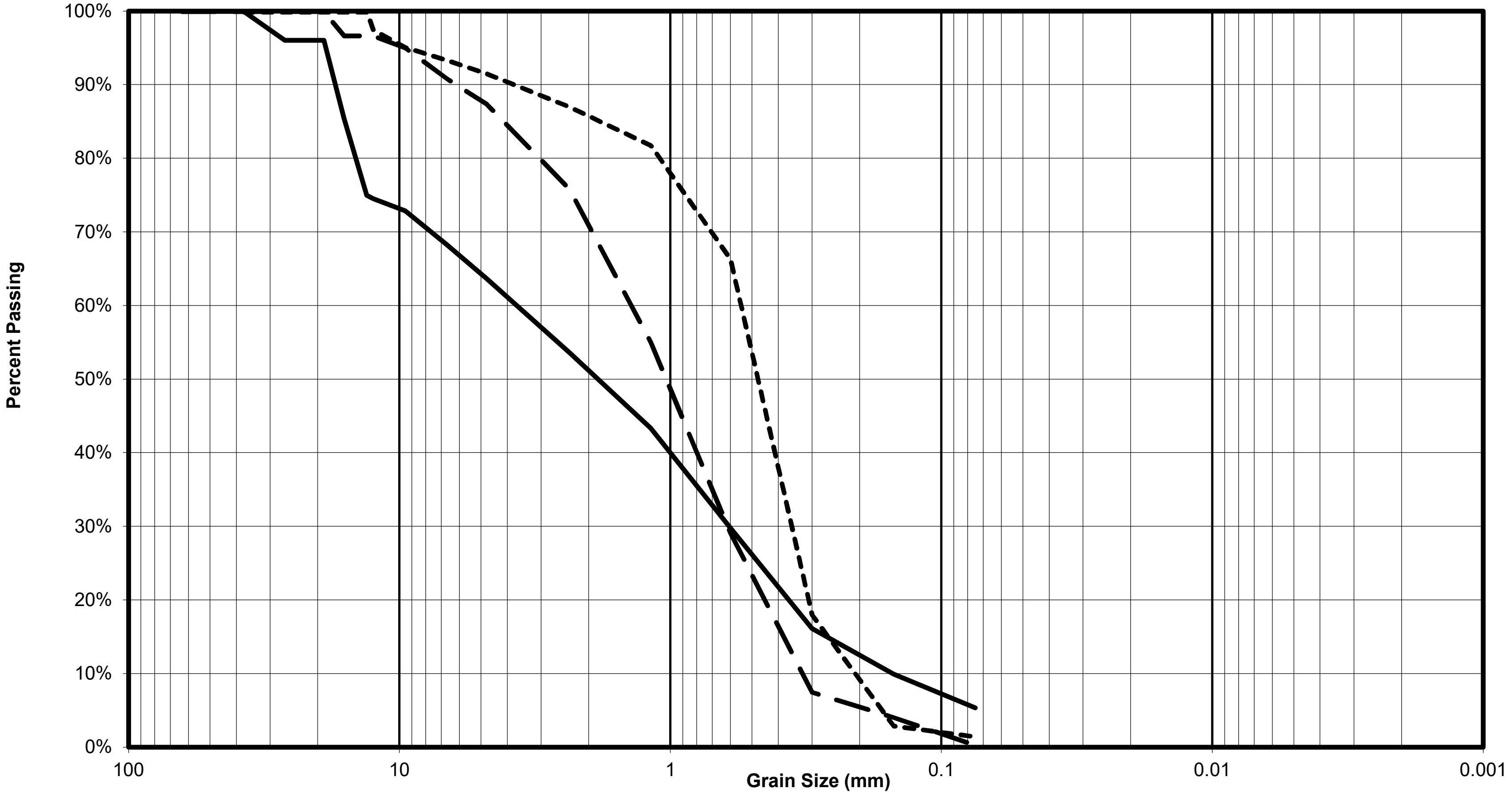
| Gravel | | Sand | | | Silt and Clay |
|---|---|---|---|---|---|
| Coarse | Fine | Coarse | Medium | Fine | |

Unified Soil Classification System ASTM D 2487/2488

| Curve | Borehole/Testpit | Sample | Depth (m) | Soil Fractions | | | Moisture Content (%) | Soil Description |
|---|---|---|---|---|---|---|---|---|
| | | | | Gravel | Sand | Silt/Clay | | |
| —— | TP01 | S4 | 1.05 - 1.15 | 3% | 76% | 21% | 25.5% | Silty SAND |
| — — | TP01 | S6 | 1.65 - 1.7 | 1% | 67% | 32% | 27.4% | Clayey SAND |
| ----- | TP02 | S1 | 0.03 - 0.23 | 36% | 60% | 4% | 2.9% | Poorly graded SAND with gravel |

# Grain Size Analysis

Project: IQA-G2109



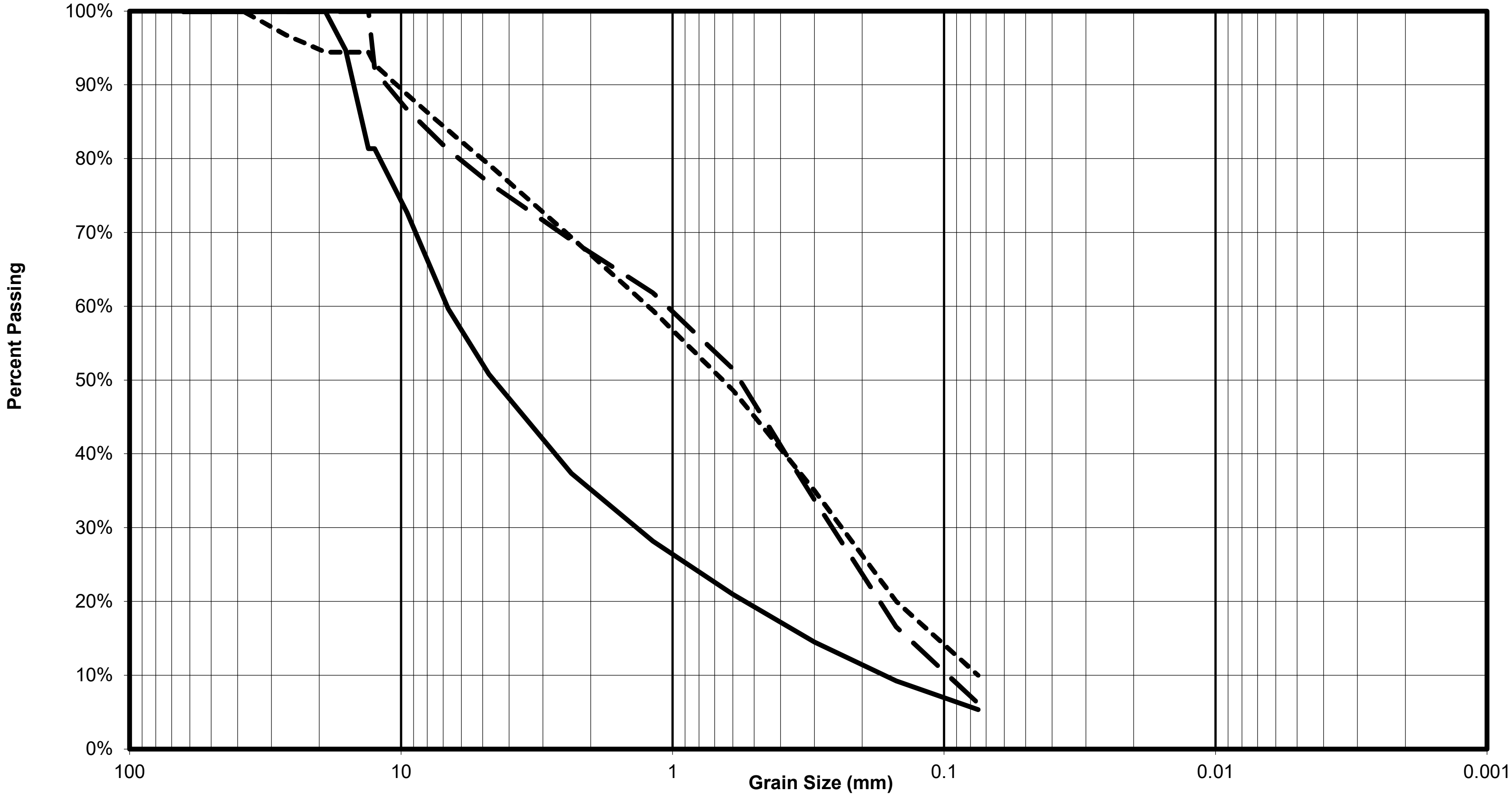
| Gravel | | Sand | | | Silt and Clay |
|---|---|---|---|---|---|
| Coarse | Fine | Coarse | Medium | Fine | |

Unified Soil Classification System ASTM D 2487/2488

| Curve | Borehole/Testpit | Sample | Depth (m) | Soil Fractions | | | Moisture Content (%) | Soil Description |
|---|---|---|---|---|---|---|---|---|
| | | | | Gravel | Sand | Silt/Clay | | |
| ——— | TP02 | S2 | 0.23 - 0.33 | 36% | 59% | 5% | 3.0% | Poorly graded SAND with silt and gravel |
| — — | TP02 | S3 | 0.33 - 0.43 | 13% | 87% | 0% | 1.8% | Poorly graded SAND |
| ----- | TP02 | S5 | 1.43 - 1.53 | 9% | 90% | 1% | 3.0% | Poorly graded SAND |

# Grain Size Analysis

Project: IQA-G2109



| Gravel | | Sand | | | Silt and Clay |
|---|---|---|---|---|---|
| Coarse | Fine | Coarse | Medium | Fine | |

Unified Soil Classification System ASTM D 2487/2488

| Curve | Borehole/Testpit | Sample | Depth (m) | Soil Fractions | | | Moisture Content (%) | Soil Description |
|---|---|---|---|---|---|---|---|---|
| | | | | Gravel | Sand | Silt/Clay | | |
| ——— | TP03 | S1 | 0.0 - 0.1 | 49% | 46% | 5% | 3.2% | Well-graded GRAVEL with silt and sand |
| — — | TP03 | S2 | 0.1 - 0.2 | 23% | 71% | 6% | 3.0% | Poorly graded SAND with silt and gravel |
| ----- | TP03 | S3 | 0.2 - 0.3 | 21% | 69% | 10% | 5.6% | Poorly graded SAND with silt and gravel |

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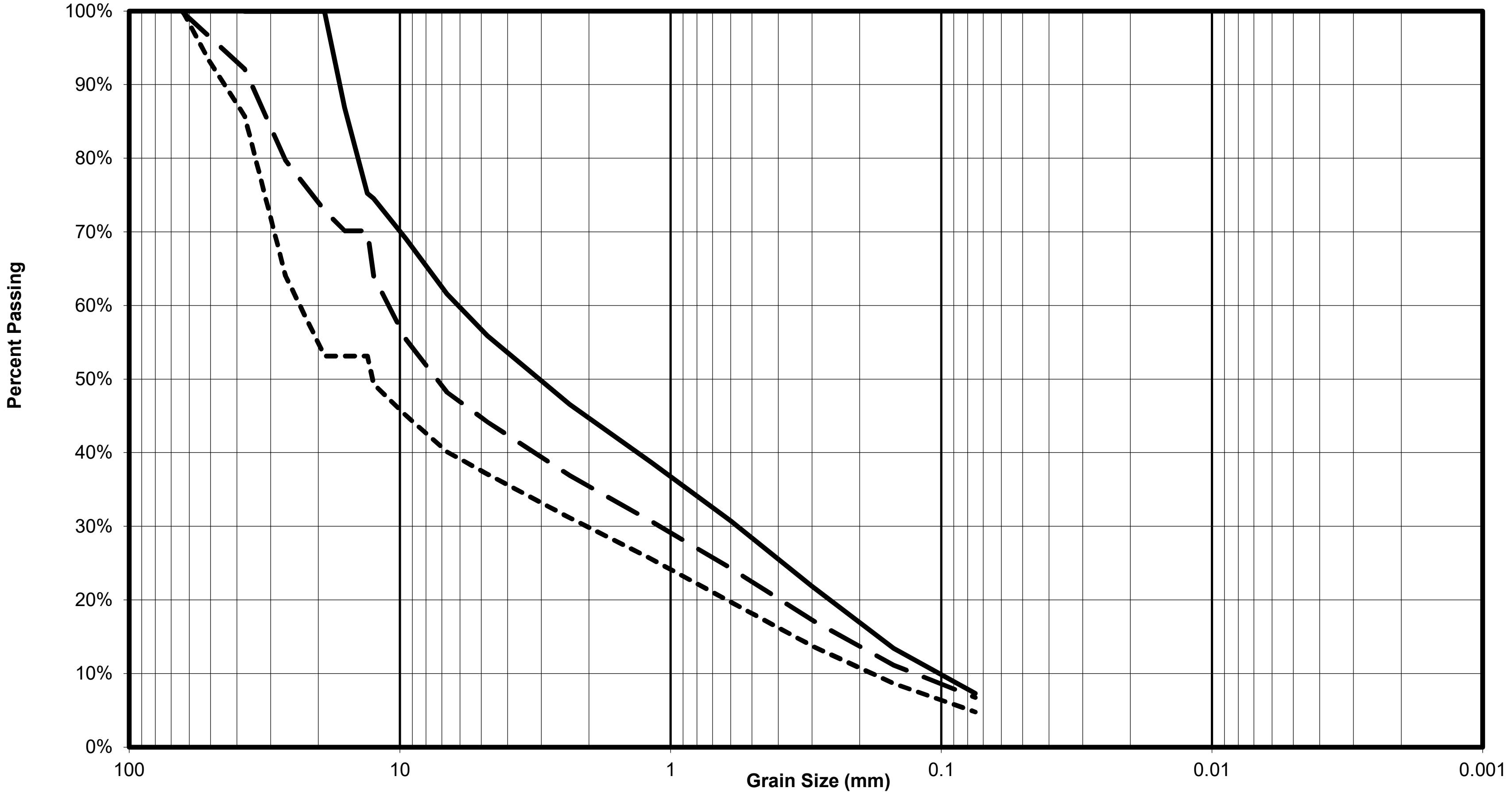
# Grain Size Analysis

Project: IQA-G2109



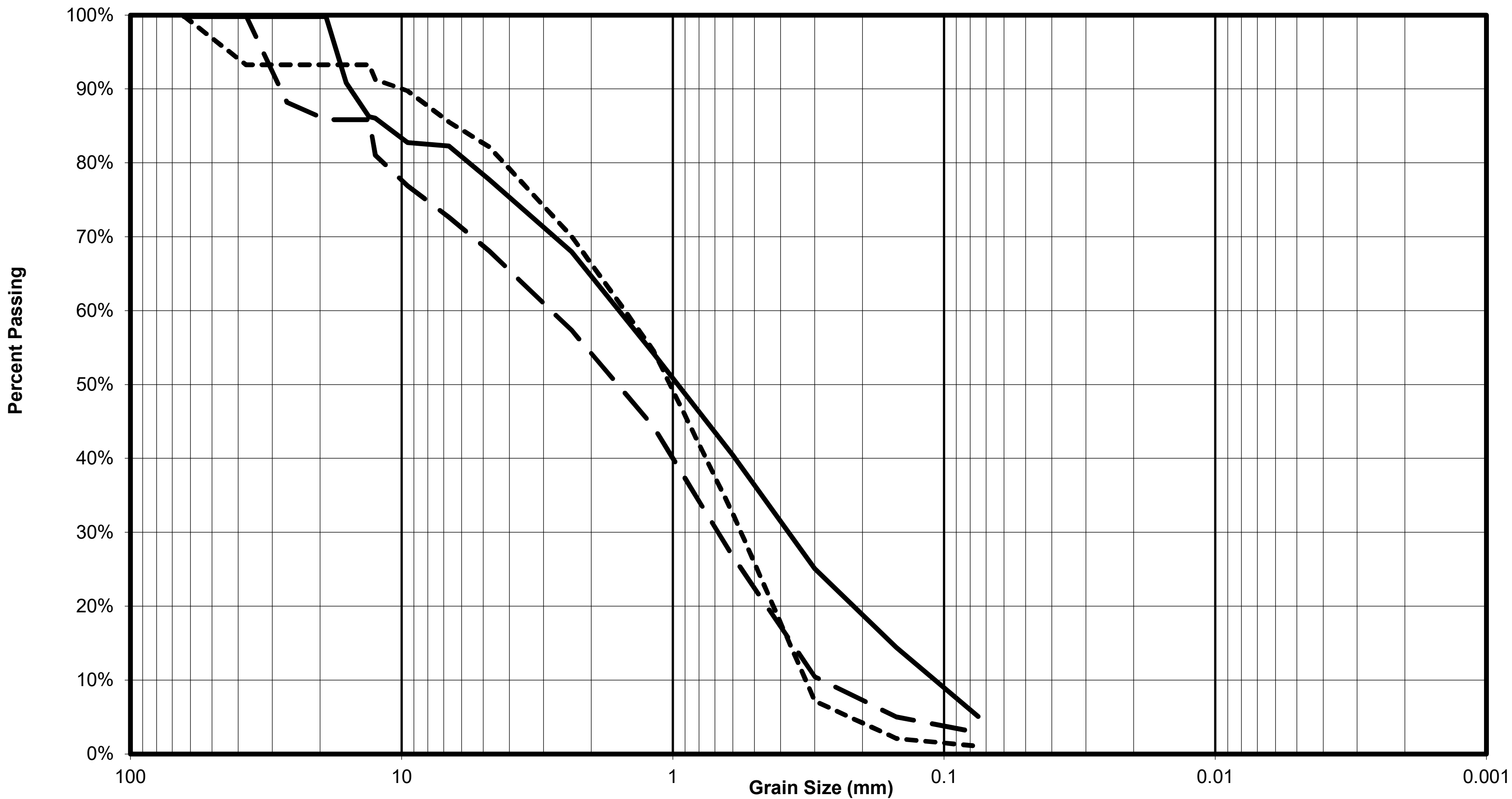
| Gravel | | Sand | | | Silt and Clay |
|---|---|---|---|---|---|
| Coarse | Fine | Coarse | Medium | Fine | |

Unified Soil Classification System ASTM D 2487/2488

| Curve | Borehole/Testpit | Sample | Depth (m) | Soil Fractions | | | Moisture Content (%) | Soil Description |
|---|---|---|---|---|---|---|---|---|
| | | | | Gravel | Sand | Silt/Clay | | |
| ——— | TP04 | S1 | 0.0 - 0.1 | 44% | 49% | 7% | 4.5% | Poorly graded SAND with silt and gravel |
| — — | TP04 | S2 | 0.4 - 0.45 | 56% | 37% | 7% | 3.9% | Poorly graded GRAVEL with silt and sand |
| - - - - - | TP04 | S3 | 0.7 - 0.8 | 63% | 32% | 5% | 3.2% | Poorly graded GRAVEL with sand |

# Grain Size Analysis

Project: IQA-G2109



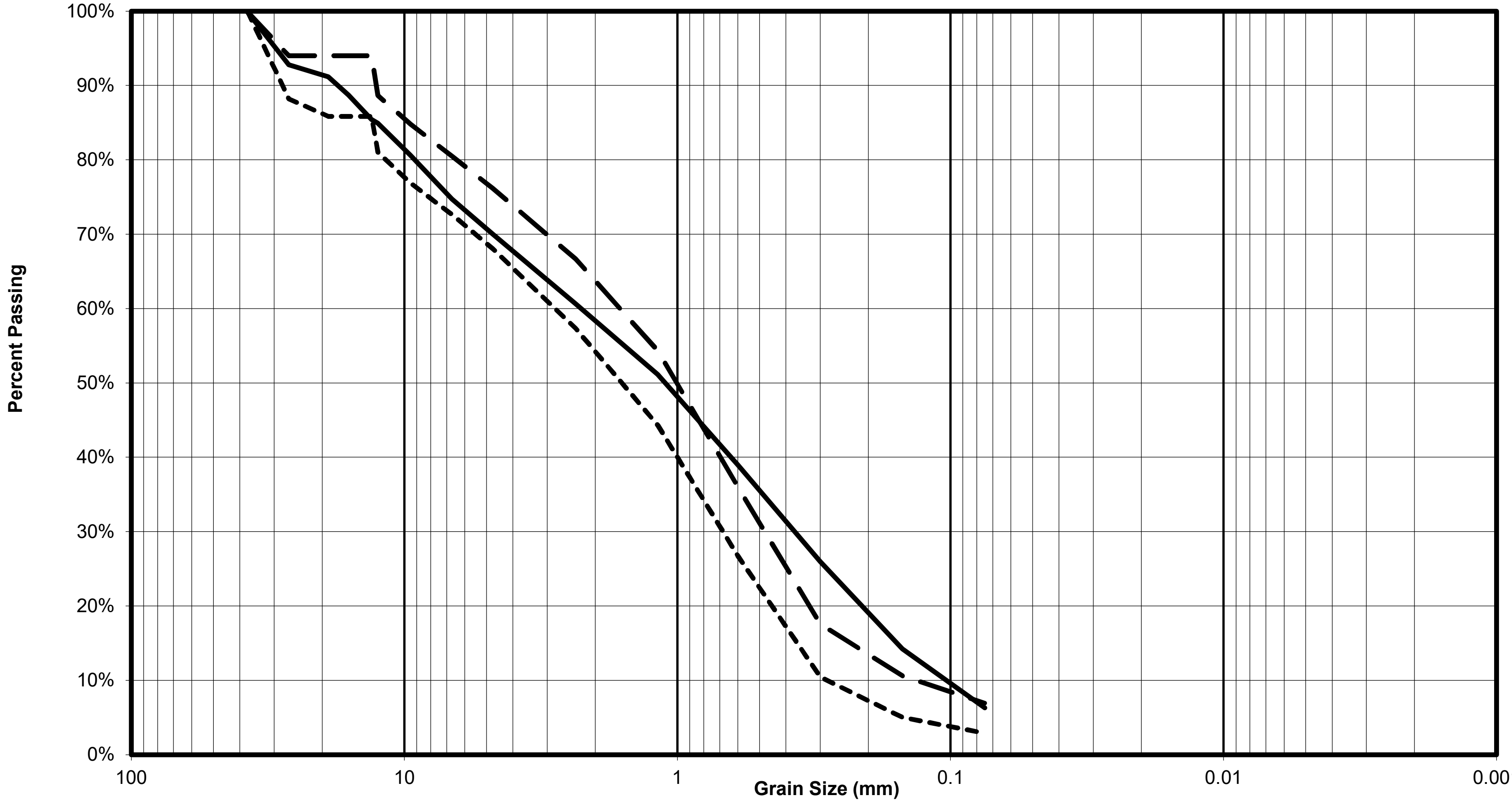
| Gravel | | Sand | | | Silt and Clay |
|---|---|---|---|---|---|
| Coarse | Fine | Coarse | Medium | Fine | |

Unified Soil Classification System ASTM D 2487/2488

| Curve | Borehole/Testpit | Sample | Depth (m) | Soil Fractions | | | Moisture Content (%) | Soil Description |
|---|---|---|---|---|---|---|---|---|
| | | | | Gravel | Sand | Silt/Clay | | |
| ——— | TP05 | S1 | 0.0 - 0.1 | 22% | 73% | 5% | 4.2% | Poorly graded SAND with silt and gravel |
| — — | TP05 | S2 | 0.2 - 0.3 | 32% | 65% | 3% | 3.0% | Poorly graded SAND with gravel |
| ----- | TP05 | S4 | 0.6 - 0.7 | 18% | 81% | 1% | 6.6% | Poorly graded SAND with gravel |

# Grain Size Analysis

Project: IQA-G2109



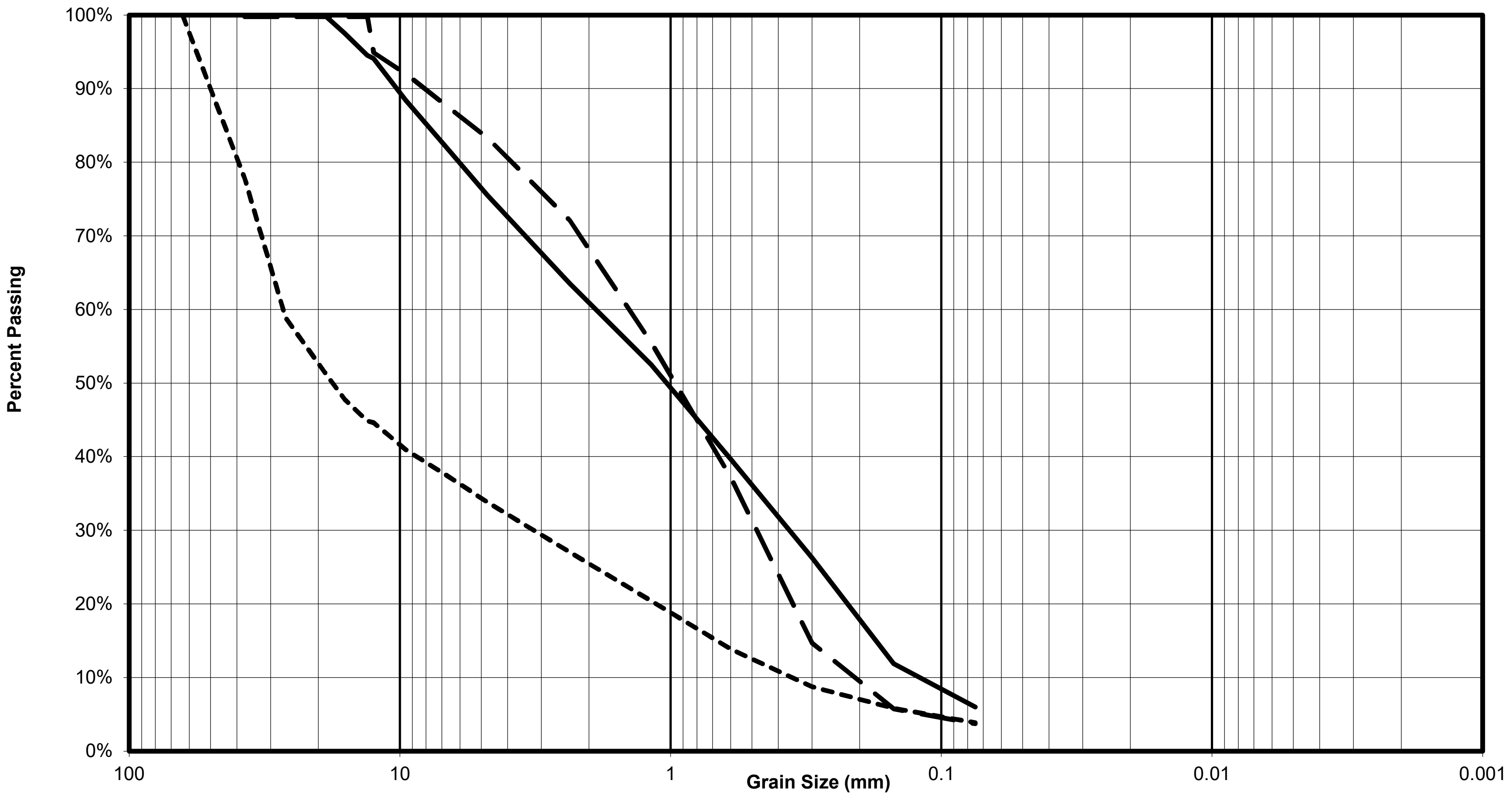
| Gravel | | Sand | | | Silt and Clay |
|---|---|---|---|---|---|
| Coarse | Fine | Coarse | Medium | Fine | |

Unified Soil Classification System ASTM D 2487/2488

| Curve | Borehole/Testpit | Sample | Depth (m) | Soil Fractions | | | Moisture Content (%) | Soil Description |
|---|---|---|---|---|---|---|---|---|
| | | | | Gravel | Sand | Silt/Clay | | |
| ——— | TP06 | S1 | 0.0 - 0.1 | 30% | 64% | 6% | 3.6% | Poorly graded SAND with silt and gravel |
| — — | TP06 | S2 | 0.2 - 0.3 | 24% | 69% | 7% | 3.7% | Well-graded SAND with silt and gravel |
| ----- | TP06 | S4 | 0.95 - 1.05 | 32% | 65% | 3% | 3.0% | Poorly graded SAND with gravel |

# Grain Size Analysis

Project:  IQA-G2109



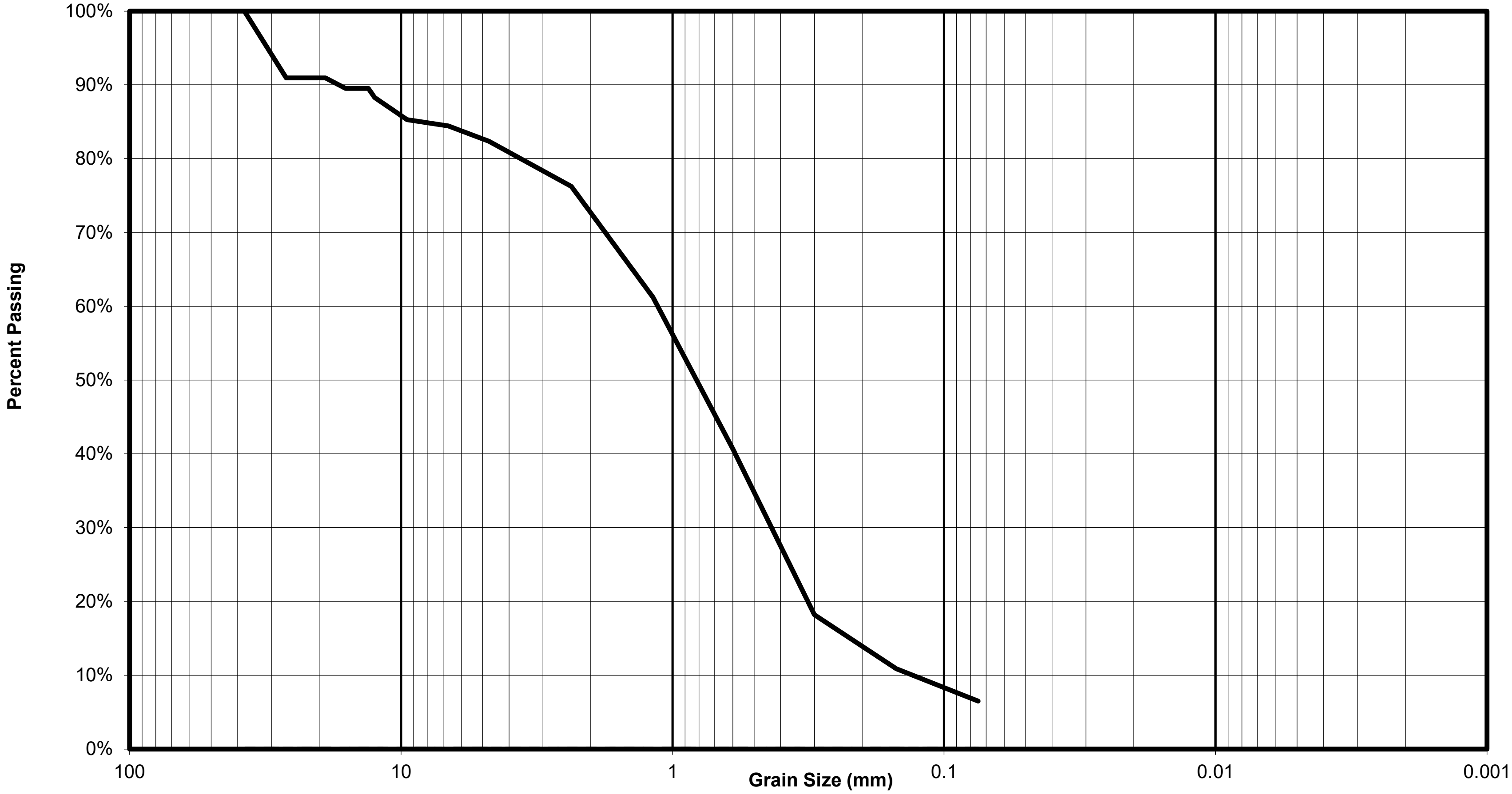
| Gravel | | Sand | | | Silt and Clay |
|---|---|---|---|---|---|
| Coarse | Fine | Coarse | Medium | Fine | |

Unified Soil Classification System ASTM D 2487/2488

| Curve | Borehole/Testpit | Sample | Depth (m) | Soil Fractions | | | Moisture Content (%) | Soil Description |
|---|---|---|---|---|---|---|---|---|
| | | | | Gravel | Sand | Silt/Clay | | |
| —— | TP07 | S1 | 0.0 - 0.1 | 25% | 69% | 6% | 3.9% | Poorly graded SAND with silt and gravel |
| — — | TP07 | S2 | 0.2 - 0.3 | 17% | 79% | 4% | 9.0% | Poorly graded SAND with gravel |
| ----- | TP07 | S3 | 0.5 - 0.6 | 66% | 30% | 4% | 3.3% | Well-graded GRAVEL with sand |

Project: IQA-G2109

# Grain Size Analysis



| Gravel | | Sand | | | Silt and Clay |
|---|---|---|---|---|---|
| Coarse | Fine | Coarse | Medium | Fine | |

Unified Soil Classification System ASTM D 2487/2488

| Curve | Borehole/Testpit | Sample | Depth (m) | Soil Fractions | | | Moisture Content (%) | Soil Description |
|---|---|---|---|---|---|---|---|---|
| | | | | Gravel | Sand | Silt/Clay | | |
| ——— | TP07 | S4 | 0.85 - 0.95 | 18% | 75% | 7% | 36.7% | Well-graded SAND with silt and gravel |
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# Dynamic Cone Penetrometer Test

| | |
|---|---|
| **Date** | 21-Sep |
| **Location** | Hanson Drive, Apex, Iqaluit, NU |
| **Test Pit or Adjacent** | TP01 |
| **Grade Surface** | 150 mm of Asphalt |
| **Test Start Depth (mm)** | 150 |

### Test 1

| Number of blows | Cumulative penetration (mm) | Penetration between readings (mm) | Pentration per blow (mm) | Hammer Factor | DCP Index mm/blow | CBR % |
|---|---|---|---|---|---|---|
| 0 | 37 | - | - | - | - | - |
| 3 | 57 | 20 | 7 | 1 | 7 | 35 |
| 5 | 82 | 25 | 5 | 1 | 5 | 50 |
| 5 | 105 | 23 | 5 | 1 | 5 | 50 |
| 5 | 127 | 22 | 4 | 1 | 4 | 60 |
| 5 | 150 | 23 | 5 | 1 | 5 | 50 |
| 5 | 170 | 20 | 4 | 1 | 4 | 60 |
| 10 | 215 | 45 | 5 | 1 | 5 | 50 |
| 10 | 251 | 36 | 4 | 1 | 4 | 60 |
| 10 | 304 | 53 | 5 | 1 | 5 | 50 |
| 5 | 333 | 29 | 6 | 1 | 6 | 40 |
| 5 | 355 | 22 | 4 | 1 | 4 | 60 |
| 10 | 416 | 61 | 6 | 1 | 6 | 40 |
| 5 | 435 | 19 | 4 | 1 | 4 | 60 |
| 10 | 513 | 78 | 8 | 1 | 8 | 30 |
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# Dynamic Cone Penetrometer Test

| | |
|---|---|
| **Date** | 21-Sep |
| **Location** | Hanson Drive, Apex, Iqaluit, NU |
| **Test Pit or Adjacent** | TP01 |
| **Grade Surface** | 150 mm of Asphalt |
| **Test Start Depth (mm)** | 500 |

**Test 2**

| Number of blows | Cumulative penetration (mm) | Penetration between readings (mm) | Pentration per blow (mm) | Hammer Factor | DCP Index mm/blow | CBR % |
|---|---|---|---|---|---|---|
| 0 | 107 | - | - | - | - | - |
| 1 | 127 | 20 | 20 | 1 | 20 | 10 |
| 1 | 152 | 25 | 25 | 1 | 25 | 8 |
| 2 | 167 | 15 | 8 | 1 | 8 | 30 |
| 10 | 180 | 13 | 1 | 1 | 1 | 100 |
| 10 | 200 | 20 | 2 | 1 | 2 | 100 |
| 10 | 245 | 45 | 5 | 1 | 5 | 50 |
| 4 | 340 | 95 | 24 | 1 | 24 | 8 |
| 1 | 410 | 70 | 70 | 1 | 70 | 2.5 |
| 1 | 473 | 63 | 63 | 1 | 63 | 2.8 |
| 1 | 510 | 37 | 37 | 1 | 37 | 5 |
| 1 | 548 | 38 | 38 | 1 | 38 | 5 |
| 1 | 587 | 39 | 39 | 1 | 39 | 4.8 |
| 1 | 610 | 23 | 23 | 1 | 23 | 9 |
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# Dynamic Cone Penetrometer Test

| | |
|---|---|
| **Date** | 21-Sep |
| **Location** | Hanson Drive, Apex, Iqaluit, NU |
| **Test Pit or Adjacent** | TP01 |
| **Grade Surface** | 150 mm of Asphalt |
| **Test Start Depth (mm)** | 900 |

| **Test 3** | | | | | | |
|---|---|---|---|---|---|---|
| Number of blows | Cumulative penetration (mm) | Penetration between readings (mm) | Pentration per blow (mm) | Hammer Factor | DCP Index mm/blow | CBR % |
| 0 | 121 | - | - | - | - | - |
| 1 | 136 | 15 | 15 | 1 | 15 | 14 |
| 1 | 170 | 34 | 34 | 1 | 34 | 6 |
| 1 | 207 | 37 | 37 | 1 | 37 | 5 |
| 1 | 252 | 45 | 45 | 1 | 45 | 4.1 |
| 1 | 296 | 44 | 44 | 1 | 44 | 4.2 |
| 1 | 344 | 48 | 48 | 1 | 48 | 3.8 |
| 1 | 386 | 42 | 42 | 1 | 42 | 4.4 |
| 1 | 437 | 51 | 51 | 1 | 51 | 3.6 |
| 1 | 515 | 78 | 78 | 1 | 78 | 2.2 |
| 1 | 567 | 52 | 52 | 1 | 52 | 3.5 |
| 1 | 621 | 54 | 54 | 1 | 54 | 3.4 |
| 1 | 675 | 54 | 54 | 1 | 54 | 3.4 |
| 1 | 693 | 18 | 18 | 1 | 18 | 11 |
| 2 | 705 | 12 | 6 | 1 | 6 | 40 |
| 5 | 724 | 19 | 4 | 1 | 4 | 60 |
| 10 | 749 | 25 | 3 | 1 | 3 | 80 |
| 10 | 772 | 23 | 2 | 1 | 2 | 100 |
| 10 | 794 | 22 | 2 | 1 | 2 | 100 |
| 10 | 817 | 23 | 2 | 1 | 2 | 100 |
| 10 | 839 | 22 | 2 | 1 | 2 | 100 |
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# Dynamic Cone Penetrometer Test

| | |
|---|---|
| **Date** | 21-Sep |
| **Location** | Apex Road (Low Site), Iqaluit, NU |
| **Test Pit or Adjacent** | TP02 |
| **Grade Surface** | 25 mm Asphalt |
| **Test Start Depth (mm)** | 0 |

**Test 1**

| Number of blows | Cumulative penetration (mm) | Penetration between readings (mm) | Pentration per blow (mm) | Hammer Factor | DCP Index mm/blow | CBR % |
|---|---|---|---|---|---|---|
| 0 | 33 | - | - | - | - | - |
| 2 | 56 | 23 | 12 | 1 | 12 | 18 |
| 2 | 79 | 23 | 12 | 1 | 12 | 18 |
| 2 | 94 | 15 | 8 | 1 | 8 | 30 |
| 2 | 109 | 15 | 8 | 1 | 8 | 30 |
| 2 | 122 | 13 | 7 | 1 | 7 | 35 |
| 5 | 148 | 26 | 5 | 1 | 5 | 50 |
| 5 | 169 | 21 | 4 | 1 | 4 | 60 |
| 10 | 197 | 28 | 3 | 1 | 3 | 80 |
| 5 | 208 | 11 | 2 | 1 | 2 | 100 |
| 10 | 236 | 28 | 3 | 1 | 3 | 80 |
| 10 | 265 | 29 | 3 | 1 | 3 | 80 |
| 10 | 295 | 30 | 3 | 1 | 3 | 80 |
| 10 | 326 | 31 | 3 | 1 | 3 | 80 |
| 10 | 362 | 36 | 4 | 1 | 4 | 60 |
| 10 | 398 | 36 | 4 | 1 | 4 | 60 |
| 10 | 430 | 32 | 3 | 1 | 3 | 80 |
| 10 | 470 | 40 | 4 | 1 | 4 | 60 |
| 10 | 509 | 39 | 4 | 1 | 4 | 60 |
| 10 | 546 | 37 | 4 | 1 | 4 | 60 |
| 10 | 585 | 39 | 4 | 1 | 4 | 60 |
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# Dynamic Cone Penetrometer Test

| | |
|---|---|
| **Date** | 21-Sep |
| **Location** | Apex Road (Low Site), Iqaluit, NU |
| **Test Pit or Adjacent** | TP02 |
| **Grade Surface** | 25 mm Asphalt |
| **Test Start Depth (mm)** | 700 |

**Test 2**

| Number of blows | Cumulative penetration (mm) | Penetration between readings (mm) | Pentration per blow (mm) | Hammer Factor | DCP Index mm/blow | CBR % |
|---|---|---|---|---|---|---|
| 0 | 119 | - | - | - | - | - |
| 1 | 203 | 84 | 84 | 1 | 84 | 2 |
| 1 | 246 | 43 | 43 | 1 | 43 | 4.3 |
| 1 | 260 | 14 | 14 | 1 | 14 | 15 |
| 1 | 287 | 27 | 27 | 1 | 27 | 7 |
| 1 | 309 | 22 | 22 | 1 | 22 | 9 |
| 1 | 329 | 20 | 20 | 1 | 20 | 10 |
| 2 | 361 | 32 | 16 | 1 | 16 | 13 |
| 2 | 387 | 26 | 13 | 1 | 13 | 16 |
| 2 | 414 | 27 | 14 | 1 | 14 | 15 |
| 2 | 438 | 24 | 12 | 1 | 12 | 18 |
| 2 | 461 | 23 | 12 | 1 | 12 | 18 |
| 2 | 481 | 20 | 10 | 1 | 10 | 20 |
| 2 | 497 | 16 | 8 | 1 | 8 | 30 |
| 2 | 512 | 15 | 8 | 1 | 8 | 30 |
| 5 | 553 | 41 | 8 | 1 | 8 | 30 |
| 5 | 588 | 35 | 7 | 1 | 7 | 35 |
| 6 | 635 | 47 | 8 | 1 | 8 | 30 |
| 5 | 673 | 38 | 8 | 1 | 8 | 30 |
| 5 | 714 | 41 | 8 | 1 | 8 | 30 |
| 5 | 754 | 40 | 8 | 1 | 8 | 30 |
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# Dynamic Cone Penetrometer Test

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|---|---|
| **Date** | 21-Sep |
| **Location** | Apex Road (Low Site), Iqaluit, NU |
| **Test Pit or Adjacent** | TP02 |
| **Grade Surface** | 25 mm Asphalt |
| **Test Start Depth (mm)** | 1100 |

**Test 3**

| Number of blows | Cumulative penetration (mm) | Penetration between readings (mm) | Pentration per blow (mm) | Hammer Factor | DCP Index mm/blow | CBR % |
|---|---|---|---|---|---|---|
| 0 | 114 | - | - | - | - | - |
| 1 | 154 | 40 | 40 | 1 | 40 | 4.7 |
| 1 | 183 | 29 | 29 | 1 | 29 | 7 |
| 1 | 209 | 26 | 26 | 1 | 26 | 8 |
| 1 | 232 | 23 | 23 | 1 | 23 | 9 |
| 1 | 252 | 20 | 20 | 1 | 20 | 10 |
| 1 | 272 | 20 | 20 | 1 | 20 | 10 |
| 1 | 290 | 18 | 18 | 1 | 18 | 11 |
| 5 | 360 | 70 | 14 | 1 | 14 | 15 |
| 2 | 381 | 21 | 11 | 1 | 11 | 20 |
| 2 | 398 | 17 | 9 | 1 | 9 | 25 |
| 5 | 451 | 53 | 11 | 1 | 11 | 20 |
| 2 | 473 | 22 | 11 | 1 | 11 | 20 |
| 2 | 493 | 20 | 10 | 1 | 10 | 20 |
| 2 | 509 | 16 | 8 | 1 | 8 | 30 |
| 5 | 555 | 46 | 9 | 1 | 9 | 25 |
| 5 | 600 | 45 | 9 | 1 | 9 | 25 |
| 5 | 645 | 45 | 9 | 1 | 9 | 25 |
| 5 | 696 | 51 | 10 | 1 | 10 | 20 |
| 2 | 717 | 21 | 11 | 1 | 11 | 20 |
| 2 | 739 | 22 | 11 | 1 | 11 | 20 |
| 2 | 765 | 26 | 13 | 1 | 13 | 16 |
| 2 | 787 | 22 | 11 | 1 | 11 | 20 |
| 2 | 810 | 23 | 12 | 1 | 12 | 18 |
| 2 | 836 | 26 | 13 | 1 | 13 | 16 |
| 2 | 865 | 29 | 15 | 1 | 15 | 14 |
| 2 | 890 | 25 | 13 | 1 | 13 | 16 |
| 2 | 916 | 26 | 13 | 1 | 13 | 16 |
| 2 | 941 | 25 | 13 | 1 | 13 | 16 |
| 2 | 968 | 27 | 14 | 1 | 14 | 15 |
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# Dynamic Cone Penetrometer Test

| | |
|---|---|
| **Date** | 21-Sep |
| **Location** | Apex Road (Low Site), Iqaluit, NU |
| **Test Pit or Adjacent** | Adjacent to TP02 |
| **Grade Surface** | 25 mm Asphalt |
| **Test Start Depth (mm)** | 0 |

**Test 1**

| Number of blows | Cumulative penetration (mm) | Penetration between readings (mm) | Pentration per blow (mm) | Hammer Factor | DCP Index mm/blow | CBR % |
|---|---|---|---|---|---|---|
| 0 | 75 | - | - | - | - | - |
| 2 | 96 | 21 | 11 | 1 | 11 | 20 |
| 2 | 114 | 18 | 9 | 1 | 9 | 25 |
| 5 | 153 | 39 | 8 | 1 | 8 | 30 |
| 5 | 188 | 35 | 7 | 1 | 7 | 35 |
| 5 | 217 | 29 | 6 | 1 | 6 | 40 |
| 5 | 248 | 31 | 6 | 1 | 6 | 40 |
| 5 | 279 | 31 | 6 | 1 | 6 | 40 |
| 5 | 308 | 29 | 6 | 1 | 6 | 40 |
| 5 | 324 | 16 | 3 | 1 | 3 | 80 |
| 10 | 376 | 52 | 5 | 1 | 5 | 50 |
| 5 | 404 | 28 | 6 | 1 | 6 | 40 |
| 5 | 432 | 28 | 6 | 1 | 6 | 40 |
| 5 | 457 | 25 | 5 | 1 | 5 | 50 |
| 5 | 476 | 19 | 4 | 1 | 4 | 60 |
| 10 | 516 | 40 | 4 | 1 | 4 | 60 |
| 10 | 552 | 36 | 4 | 1 | 4 | 60 |
| 10 | 589 | 37 | 4 | 1 | 4 | 60 |
| 10 | 634 | 45 | 5 | 1 | 5 | 50 |
| 10 | 675 | 41 | 4 | 1 | 4 | 60 |
| 10 | 719 | 44 | 4 | 1 | 4 | 60 |
| 10 | 767 | 48 | 5 | 1 | 5 | 50 |
| 5 | 795 | 28 | 6 | 1 | 6 | 40 |
| 5 | 825 | 30 | 6 | 1 | 6 | 40 |
| 5 | 859 | 34 | 7 | 1 | 7 | 35 |
| 5 | 890 | 31 | 6 | 1 | 6 | 40 |
| 5 | 920 | 30 | 6 | 1 | 6 | 40 |
| 5 | 949 | 29 | 6 | 1 | 6 | 40 |
| 5 | 982 | 33 | 7 | 1 | 7 | 35 |
| 5 | 1018 | 36 | 7 | 1 | 7 | 35 |
| 5 | 1055 | 37 | 7 | 1 | 7 | 35 |
| 5 | 1090 | 35 | 7 | 1 | 7 | 35 |
| 5 | 1128 | 38 | 8 | 1 | 8 | 30 |
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# Dynamic Cone Penetrometer Test

| | |
|---|---|
| **Date** | 21-Sep |
| **Location** | Apex Road (High Site), Iqaluit, NU |
| **Test Pit or Adjacent** | TP03 |
| **Grade Surface** | Packed Gravel |
| **Test Start Depth (mm)** | 0 |

**Test 1**

| Number of blows | Cumulative penetration (mm) | Penetration between readings (mm) | Pentration per blow (mm) | Hammer Factor | DCP Index mm/blow | CBR % |
|---|---|---|---|---|---|---|
| 0 | 60 | - | - | - | - | - |
| 5 | 80 | 20 | 4 | 1 | 4 | 60 |
| 10 | 116 | 36 | 4 | 1 | 4 | 60 |
| 10 | 148 | 32 | 3 | 1 | 3 | 80 |
| 10 | 176 | 28 | 3 | 1 | 3 | 80 |
| 10 | 199 | 23 | 2 | 1 | 2 | 100 |
| 10 | 219 | 20 | 2 | 1 | 2 | 100 |
| 10 | 234 | 15 | 2 | 1 | 2 | 100 |
| 10 | 248 | 14 | 1 | 1 | 1 | 100 |
| 10 | 260 | 12 | 1 | 1 | 1 | 100 |
| 10 | 273 | 13 | 1 | 1 | 1 | 100 |
| 10 | 291 | 18 | 2 | 1 | 2 | 100 |
| 10 | 314 | 23 | 2 | 1 | 2 | 100 |
| 10 | 348 | 34 | 3 | 1 | 3 | 80 |
| 10 | 426 | 78 | 8 | 1 | 8 | 30 |
| 5 | 460 | 34 | 7 | 1 | 7 | 35 |
| 5 | 493 | 33 | 7 | 1 | 7 | 35 |
| 5 | 525 | 32 | 6 | 1 | 6 | 40 |
| 5 | 550 | 25 | 5 | 1 | 5 | 50 |
| 5 | 577 | 27 | 5 | 1 | 5 | 50 |
| 5 | 601 | 24 | 5 | 1 | 5 | 50 |
| 10 | 649 | 48 | 5 | 1 | 5 | 50 |
| 10 | 688 | 39 | 4 | 1 | 4 | 60 |
| 10 | 715 | 27 | 3 | 1 | 3 | 80 |
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# Dynamic Cone Penetrometer Test

| | |
|---|---|
| **Date** | 21-Sep |
| **Location** | Apex Road (High Site), Iqaluit, NU |
| **Test Pit or Adjacent** | TP03 |
| **Grade Surface** | Packed Gravel |
| **Test Start Depth (mm)** | 570 |

**Test 2**

| Number of blows | Cumulative penetration (mm) | Penetration between readings (mm) | Pentration per blow (mm) | Hammer Factor | DCP Index mm/blow | CBR % |
|---|---|---|---|---|---|---|
| 0 | 102 | - | - | - | - | - |
| 5 | 136 | 34 | 7 | 1 | 7 | 35 |
| 5 | 155 | 19 | 4 | 1 | 4 | 60 |
| 10 | 191 | 36 | 4 | 1 | 4 | 60 |
| 10 | 214 | 23 | 2 | 1 | 2 | 100 |
| 10 | 235 | 21 | 2 | 1 | 2 | 100 |
| 10 | 247 | 12 | 1 | 1 | 1 | 100 |
| 10 | 255 | 8 | 1 | 1 | 1 | 100 |
| 10 | 268 | 13 | 1 | 1 | 1 | 100 |
| 10 | 285 | 17 | 2 | 1 | 2 | 100 |
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CANADRILL

# Dynamic Cone Penetrometer Test

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|---|---|
| **Date** | 21-Sep |
| **Location** | Apex Road (High Site), Iqaluit, NU |
| **Test Pit or Adjacent** | Adjacent to TP03 |
| **Grade Surface** | Packed Gravel |
| **Test Start Depth (mm)** | 0 |

## Test 1

| Number of blows | Cumulative penetration (mm) | Penetration between readings (mm) | Pentration per blow (mm) | Hammer Factor | DCP Index mm/blow | CBR % |
|---|---|---|---|---|---|---|
| 0 | 56 | - | - | - | - | - |
| 5 | 82 | 26 | 5 | 1 | 5 | 50 |
| 5 | 104 | 22 | 4 | 1 | 4 | 60 |
| 10 | 136 | 32 | 3 | 1 | 3 | 80 |
| 10 | 167 | 31 | 3 | 1 | 3 | 80 |
| 10 | 197 | 30 | 3 | 1 | 3 | 80 |
| 10 | 227 | 30 | 3 | 1 | 3 | 80 |
| 10 | 250 | 23 | 2 | 1 | 2 | 100 |
| 10 | 276 | 26 | 3 | 1 | 3 | 80 |
| 10 | 303 | 27 | 3 | 1 | 3 | 80 |
| 10 | 330 | 27 | 3 | 1 | 3 | 80 |
| 10 | 356 | 26 | 3 | 1 | 3 | 80 |
| 10 | 375 | 19 | 2 | 1 | 2 | 100 |
| 10 | 396 | 21 | 2 | 1 | 2 | 100 |
| 10 | 414 | 18 | 2 | 1 | 2 | 100 |
| 10 | 435 | 21 | 2 | 1 | 2 | 100 |
| 10 | 452 | 17 | 2 | 1 | 2 | 100 |
| 10 | 472 | 20 | 2 | 1 | 2 | 100 |
| 10 | 486 | 14 | 1 | 1 | 1 | 100 |
| 10 | 501 | 15 | 2 | 1 | 2 | 100 |
| 10 | 515 | 14 | 1 | 1 | 1 | 100 |
| 10 | 529 | 14 | 1 | 1 | 1 | 100 |
| 10 | 541 | 12 | 1 | 1 | 1 | 100 |
| 10 | 552 | 11 | 1 | 1 | 1 | 100 |
| 10 | 566 | 14 | 1 | 1 | 1 | 100 |
| 10 | 578 | 12 | 1 | 1 | 1 | 100 |
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CANADRILL

# Dynamic Cone Penetrometer Test

| | |
|---|---|
| **Date** | 22-Sep |
| **Location** | Joamie Court, Iqaluit, NU |
| **Test Pit or Adjacent** | TP04 |
| **Grade Surface** | Packed Gravel |
| **Test Start Depth (mm)** | 0 |

| **Test 1** | | | | | | |
|---|---|---|---|---|---|---|
| Number of blows | Cumulative penetration (mm) | Penetration between readings (mm) | Pentration per blow (mm) | Hammer Factor | DCP Index mm/blow | CBR % |
| 0 | 54 | - | - | - | - | - |
| 5 | 79 | 25 | 5 | 1 | 5 | 50 |
| 5 | 108 | 29 | 6 | 1 | 6 | 40 |
| 5 | 135 | 27 | 5 | 1 | 5 | 50 |
| 5 | 164 | 29 | 6 | 1 | 6 | 40 |
| 5 | 187 | 23 | 5 | 1 | 5 | 50 |
| 5 | 214 | 27 | 5 | 1 | 5 | 50 |
| 5 | 235 | 21 | 4 | 1 | 4 | 60 |
| 10 | 284 | 49 | 5 | 1 | 5 | 50 |
| 10 | 327 | 43 | 4 | 1 | 4 | 60 |
| 10 | 365 | 38 | 4 | 1 | 4 | 60 |
| 10 | 411 | 46 | 5 | 1 | 5 | 50 |
| 10 | 456 | 45 | 5 | 1 | 5 | 50 |
| 10 | 529 | 73 | 7 | 1 | 7 | 35 |
| 5 | 558 | 29 | 6 | 1 | 6 | 40 |
| 5 | 592 | 34 | 7 | 1 | 7 | 35 |
| 5 | 646 | 54 | 11 | 1 | 11 | 20 |
| 2 | 673 | 27 | 14 | 1 | 14 | 15 |
| 2 | 687 | 14 | 7 | 1 | 7 | 35 |
| 5 | 724 | 37 | 7 | 1 | 7 | 35 |
| 2 | 734 | 10 | 5 | 1 | 5 | 50 |
| 2 | 768 | 34 | 17 | 1 | 17 | 12 |
| 1 | 812 | 44 | 44 | 1 | 44 | 4.2 |
| 1 | 831 | 19 | 19 | 1 | 19 | 11 |
| 1 | 845 | 14 | 14 | 1 | 14 | 15 |
| 2 | 891 | 46 | 23 | 1 | 23 | 9 |
| 1 | 908 | 17 | 17 | 1 | 17 | 12 |
| 2 | 940 | 32 | 16 | 1 | 16 | 13 |
| 2 | 957 | 17 | 9 | 1 | 9 | 25 |
| 5 | 977 | 20 | 4 | 1 | 4 | 60 |
| 10 | 1003 | 26 | 3 | 1 | 3 | 80 |
| 10 | 1030 | 27 | 3 | 1 | 3 | 80 |
| 10 | 1063 | 33 | 3 | 1 | 3 | 80 |
| 10 | 1090 | 27 | 3 | 1 | 3 | 80 |
| | | | | | | |

CANADRILL

# Dynamic Cone Penetrometer Test

| | |
|---|---|
| **Date** | 22-Sep |
| **Location** | Joamie Court, Iqaluit, NU |
| **Test Pit or Adjacent** | TP04 |
| **Grade Surface** | Packed Gravel |
| **Test Start Depth (mm)** | 480 |

## Test 2

| Number of blows | Cumulative penetration (mm) | Penetration between readings (mm) | Pentration per blow (mm) | Hammer Factor | DCP Index mm/blow | CBR % |
|---|---|---|---|---|---|---|
| 0 | 94 | - | - | - | - | - |
| 1 | 130 | 36 | 36 | 1 | 36 | 5 |
| 1 | 158 | 28 | 28 | 1 | 28 | 7 |
| 1 | 180 | 22 | 22 | 1 | 22 | 9 |
| 1 | 206 | 26 | 26 | 1 | 26 | 8 |
| 1 | 230 | 24 | 24 | 1 | 24 | 8 |
| 2 | 267 | 37 | 19 | 1 | 19 | 11 |
| 2 | 292 | 25 | 13 | 1 | 13 | 16 |
| 1 | 310 | 18 | 18 | 1 | 18 | 11 |
| 2 | 334 | 24 | 12 | 1 | 12 | 18 |
| 2 | 347 | 13 | 7 | 1 | 7 | 35 |
| 5 | 396 | 49 | 10 | 1 | 10 | 20 |
| 5 | 422 | 26 | 5 | 1 | 5 | 50 |
| 5 | 476 | 54 | 11 | 1 | 11 | 20 |
| 2 | 492 | 16 | 8 | 1 | 8 | 30 |
| 5 | 510 | 18 | 4 | 1 | 4 | 60 |
| 10 | 529 | 19 | 2 | 1 | 2 | 100 |
| 10 | 581 | 52 | 5 | 1 | 5 | 50 |
| 5 | 615 | 34 | 7 | 1 | 7 | 35 |
| 5 | 632 | 17 | 3 | 1 | 3 | 80 |
| 5 | 641 | 9 | 2 | 1 | 2 | 100 |
| 10 | 655 | 14 | 1 | 1 | 1 | 100 |
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CANADRILL

# Dynamic Cone Penetrometer Test

| | |
|---|---|
| **Date** | 22-Sep |
| **Location** | Joamie Court, Iqaluit, NU |
| **Test Pit or Adjacent** | TP04 |
| **Grade Surface** | Packed Gravel |
| **Test Start Depth (mm)** | 1000 |

## Test 3

| Number of blows | Cumulative penetration (mm) | Penetration between readings (mm) | Pentration per blow (mm) | Hammer Factor | DCP Index mm/blow | CBR % |
|---|---|---|---|---|---|---|
| 0 | 94 | - | - | - | - | - |
| 5 | 144 | 50 | 10 | 1 | 10 | 20 |
| 5 | 159 | 15 | 3 | 1 | 3 | 80 |
| 10 | 177 | 18 | 2 | 1 | 2 | 100 |
| 10 | 214 | 37 | 4 | 1 | 4 | 60 |
| 10 | 217 | 3 | 0 | 1 | 0 | 100 |
| 10 | 220 | 3 | 0 | 1 | 0 | 100 |

CANADRILL

# Dynamic Cone Penetrometer Test

| | |
|---|---|
| **Date** | 22-Sep |
| **Location** | Joamie Court, Iqaluit, NU |
| **Test Pit or Adjacent** | Adjacent to TP04 (downhill) |
| **Grade Surface** | Packed Gravel |
| **Test Start Depth (mm)** | 0 |

## Test 1

| Number of blows | Cumulative penetration (mm) | Penetration between readings (mm) | Pentration per blow (mm) | Hammer Factor | DCP Index mm/blow | CBR % |
|---|---|---|---|---|---|---|
| 0 | 69 | - | - | - | - | - |
| 5 | 95 | 26 | 5 | 1 | 5 | 50 |
| 5 | 127 | 32 | 6 | 1 | 6 | 40 |
| 5 | 166 | 39 | 8 | 1 | 8 | 30 |
| 5 | 198 | 32 | 6 | 1 | 6 | 40 |
| 5 | 227 | 29 | 6 | 1 | 6 | 40 |
| 5 | 253 | 26 | 5 | 1 | 5 | 50 |
| 5 | 279 | 26 | 5 | 1 | 5 | 50 |
| 5 | 307 | 28 | 6 | 1 | 6 | 40 |
| 5 | 329 | 22 | 4 | 1 | 4 | 60 |
| 5 | 354 | 25 | 5 | 1 | 5 | 50 |
| 5 | 372 | 18 | 4 | 1 | 4 | 60 |
| 10 | 419 | 47 | 5 | 1 | 5 | 50 |
| 10 | 499 | 80 | 8 | 1 | 8 | 30 |
| 5 | 545 | 46 | 9 | 1 | 9 | 25 |
| 5 | 607 | 62 | 12 | 1 | 12 | 18 |
| 2 | 636 | 29 | 15 | 1 | 15 | 14 |
| 2 | 664 | 28 | 14 | 1 | 14 | 15 |
| 2 | 689 | 25 | 13 | 1 | 13 | 16 |
| 2 | 709 | 20 | 10 | 1 | 10 | 20 |
| 2 | 734 | 25 | 13 | 1 | 13 | 16 |
| 2 | 768 | 34 | 17 | 1 | 17 | 12 |
| 1 | 812 | 44 | 44 | 1 | 44 | 4.2 |
| 1 | 831 | 19 | 19 | 1 | 19 | 11 |
| 1 | 845 | 14 | 14 | 1 | 14 | 15 |
| 2 | 891 | 46 | 23 | 1 | 23 | 9 |
| 1 | 908 | 17 | 17 | 1 | 17 | 12 |
| 2 | 940 | 32 | 16 | 1 | 16 | 13 |
| 2 | 957 | 17 | 9 | 1 | 9 | 25 |
| 5 | 977 | 20 | 4 | 1 | 4 | 60 |
| 10 | 1003 | 26 | 3 | 1 | 3 | 80 |
| 10 | 1030 | 27 | 3 | 1 | 3 | 80 |
| 10 | 1063 | 33 | 3 | 1 | 3 | 80 |
| 10 | 1090 | 27 | 3 | 1 | 3 | 80 |
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CANADRILL

# Dynamic Cone Penetrometer Test

| | |
|---|---|
| **Date** | 22-Sep |
| **Location** | Joamie Court, Iqaluit, NU |
| **Test Pit or Adjacent** | Adjacent to TP04 (uphill) |
| **Grade Surface** | Packed Gravel |
| **Test Start Depth (mm)** | 0 |

## Test 1

| Number of blows | Cumulative penetration (mm) | Penetration between readings (mm) | Pentration per blow (mm) | Hammer Factor | DCP Index mm/blow | CBR % |
|---|---|---|---|---|---|---|
| 0 | 61 | - | - | - | - | - |
| 10 | 95 | 34 | 3 | 1 | 3 | 80 |
| 10 | 118 | 23 | 2 | 1 | 2 | 100 |
| 10 | 152 | 34 | 3 | 1 | 3 | 80 |
| 10 | 187 | 35 | 4 | 1 | 4 | 60 |
| 10 | 222 | 35 | 4 | 1 | 4 | 60 |
| 10 | 272 | 50 | 5 | 1 | 5 | 50 |
| 5 | 300 | 28 | 6 | 1 | 6 | 40 |
| 5 | 329 | 29 | 6 | 1 | 6 | 40 |
| 5 | 350 | 21 | 4 | 1 | 4 | 60 |
| 10 | 400 | 50 | 5 | 1 | 5 | 50 |
| 5 | 422 | 22 | 4 | 1 | 4 | 60 |
| 5 | 447 | 25 | 5 | 1 | 5 | 50 |
| 10 | 491 | 44 | 4 | 1 | 4 | 60 |
| 10 | 545 | 54 | 5 | 1 | 5 | 50 |
| 5 | 558 | 13 | 3 | 1 | 3 | 80 |
| 5 | 566 | 8 | 2 | 1 | 2 | 100 |
| 10 | 580 | 14 | 1 | 1 | 1 | 100 |
| 10 | 590 | 10 | 1 | 1 | 1 | 100 |
| 10 | 594 | 4 | 0 | 1 | 0 | 100 |
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CANADRILL

# Dynamic Cone Penetrometer Test

| | |
|---|---|
| **Date** | 22-Sep |
| **Location** | Nunavut Drive, Iqaluit, NU |
| **Test Pit or Adjacent** | TP05 |
| **Grade Surface** | Packed Gravel |
| **Test Start Depth (mm)** | 0 |

## Test 1

| Number of blows | Cumulative penetration (mm) | Penetration between readings (mm) | Pentration per blow (mm) | Hammer Factor | DCP Index mm/blow | CBR % |
|---|---|---|---|---|---|---|
| 0 | 68 | - | - | - | - | - |
| 5 | 94 | 26 | 5 | 1 | 5 | 50 |
| 5 | 115 | 21 | 4 | 1 | 4 | 60 |
| 10 | 152 | 37 | 4 | 1 | 4 | 60 |
| 10 | 183 | 31 | 3 | 1 | 3 | 80 |
| 10 | 210 | 27 | 3 | 1 | 3 | 80 |
| 10 | 228 | 18 | 2 | 1 | 2 | 100 |
| 10 | 250 | 22 | 2 | 1 | 2 | 100 |
| 10 | 267 | 17 | 2 | 1 | 2 | 100 |
| 10 | 290 | 23 | 2 | 1 | 2 | 100 |
| 10 | 310 | 20 | 2 | 1 | 2 | 100 |
| 10 | 332 | 22 | 2 | 1 | 2 | 100 |
| 10 | 345 | 13 | 1 | 1 | 1 | 100 |
| 10 | 364 | 19 | 2 | 1 | 2 | 100 |
| 10 | 377 | 13 | 1 | 1 | 1 | 100 |
| 10 | 384 | 7 | 1 | 1 | 1 | 100 |
| 10 | 390 | 6 | 1 | 1 | 1 | 100 |
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CANADRILL

# Dynamic Cone Penetrometer Test

| | |
|---|---|
| **Date** | 22-Sep |
| **Location** | Nunavut Drive, Iqaluit, NU |
| **Test Pit or Adjacent** | TP05 |
| **Grade Surface** | Packed Gravel |
| **Test Start Depth (mm)** | 600 |

**Test 2**

| Number of blows | Cumulative penetration (mm) | Penetration between readings (mm) | Pentration per blow (mm) | Hammer Factor | DCP Index mm/blow | CBR % |
|---|---|---|---|---|---|---|
| 0 | 124 | - | - | - | - | - |
| 2 | 154 | 30 | 15 | 1 | 15 | 14 |
| 2 | 186 | 32 | 16 | 1 | 16 | 13 |
| 2 | 215 | 29 | 15 | 1 | 15 | 14 |
| 2 | 236 | 21 | 11 | 1 | 11 | 20 |
| 2 | 258 | 22 | 11 | 1 | 11 | 20 |
| 2 | 279 | 21 | 11 | 1 | 11 | 20 |
| 5 | 312 | 33 | 7 | 1 | 7 | 35 |
| 5 | 342 | 30 | 6 | 1 | 6 | 40 |
| 5 | 358 | 16 | 3 | 1 | 3 | 80 |
| 10 | 414 | 56 | 6 | 1 | 6 | 40 |
| 5 | 445 | 31 | 6 | 1 | 6 | 40 |
| 5 | 472 | 27 | 5 | 1 | 5 | 50 |
| 5 | 498 | 26 | 5 | 1 | 5 | 50 |
| 5 | 522 | 24 | 5 | 1 | 5 | 50 |
| 10 | 558 | 36 | 4 | 1 | 4 | 60 |
| 10 | 590 | 32 | 3 | 1 | 3 | 80 |
| 10 | 622 | 32 | 3 | 1 | 3 | 80 |
| 10 | 647 | 25 | 3 | 1 | 3 | 80 |
| 10 | 675 | 28 | 3 | 1 | 3 | 80 |
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CANADRILL

# Dynamic Cone Penetrometer Test

| | |
|---|---|
| **Date** | 22-Sep |
| **Location** | Nunavut Drive, Iqaluit, NU |
| **Test Pit or Adjacent** | TP05 |
| **Grade Surface** | Packed Gravel |
| **Test Start Depth (mm)** | 950 |

| **Test 3** | | | | | | |
|---|---|---|---|---|---|---|
| Number of blows | Cumulative penetration (mm) | Penetration between readings (mm) | Pentration per blow (mm) | Hammer Factor | DCP Index mm/blow | CBR % |
| 0 | 172 | - | - | - | - | - |
| 1 | 195 | 23 | 23 | 1 | 23 | 9 |
| 1 | 214 | 19 | 19 | 1 | 19 | 11 |
| 5 | 247 | 33 | 7 | 1 | 7 | 35 |
| 5 | 285 | 38 | 8 | 1 | 8 | 30 |
| 5 | 307 | 22 | 4 | 1 | 4 | 60 |
| 5 | 338 | 31 | 6 | 1 | 6 | 40 |
| 5 | 367 | 29 | 6 | 1 | 6 | 40 |
| 5 | 398 | 31 | 6 | 1 | 6 | 40 |
| 5 | 432 | 34 | 7 | 1 | 7 | 35 |
| 5 | 460 | 28 | 6 | 1 | 6 | 40 |
| 5 | 493 | 33 | 7 | 1 | 7 | 35 |
| 5 | 528 | 35 | 7 | 1 | 7 | 35 |
| 5 | 565 | 37 | 7 | 1 | 7 | 35 |
| 5 | 604 | 39 | 8 | 1 | 8 | 30 |
| 5 | 648 | 44 | 9 | 1 | 9 | 25 |
| 5 | 695 | 47 | 9 | 1 | 9 | 25 |
| 5 | 744 | 49 | 10 | 1 | 10 | 20 |
| 5 | 796 | 52 | 10 | 1 | 10 | 20 |
| 2 | 818 | 22 | 11 | 1 | 11 | 20 |
| 2 | 839 | 21 | 11 | 1 | 11 | 20 |
| 2 | 857 | 18 | 9 | 1 | 9 | 25 |
| 5 | 906 | 49 | 10 | 1 | 10 | 20 |
| 5 | 960 | 54 | 11 | 1 | 11 | 20 |
| 2 | 979 | 19 | 10 | 1 | 10 | 20 |
| 5 | 1033 | 54 | 11 | 1 | 11 | 20 |
| 2 | 1056 | 23 | 12 | 1 | 12 | 18 |
| 2 | 1077 | 21 | 11 | 1 | 11 | 20 |
| 2 | 1095 | 18 | 9 | 1 | 9 | 25 |
| 5 | 1117 | 22 | 4 | 1 | 4 | 60 |
| 2 | 1122 | 5 | 3 | 1 | 3 | 80 |
| 10 | 1142 | 20 | 2 | 1 | 2 | 100 |
| 10 | 1157 | 15 | 2 | 1 | 2 | 100 |
| 10 | 1169 | 12 | 1 | 1 | 1 | 100 |
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CANADRILL

# Dynamic Cone Penetrometer Test

| | |
|---|---|
| **Date** | 22-Sep |
| **Location** | Nunavut Drive, Iqaluit, NU |
| **Test Pit or Adjacent** | Adjacent to TP05 |
| **Grade Surface** | Packed Gravel |
| **Test Start Depth (mm)** | 0 |

## Test 1 (1 of 2)

| Number of blows | Cumulative penetration (mm) | Penetration between readings (mm) | Pentration per blow (mm) | Hammer Factor | DCP Index mm/blow | CBR % |
|---|---|---|---|---|---|---|
| 0 | 70 | - | - | - | - | - |
| 10 | 108 | 38 | 4 | 1 | 4 | 60 |
| 10 | 138 | 30 | 3 | 1 | 3 | 80 |
| 10 | 159 | 21 | 2 | 1 | 2 | 100 |
| 10 | 181 | 22 | 2 | 1 | 2 | 100 |
| 10 | 196 | 15 | 2 | 1 | 2 | 100 |
| 10 | 214 | 18 | 2 | 1 | 2 | 100 |
| 10 | 230 | 16 | 2 | 1 | 2 | 100 |
| 10 | 238 | 8 | 1 | 1 | 1 | 100 |
| 10 | 249 | 11 | 1 | 1 | 1 | 100 |
| 10 | 263 | 14 | 1 | 1 | 1 | 100 |
| 10 | 282 | 19 | 2 | 1 | 2 | 100 |
| 10 | 296 | 14 | 1 | 1 | 1 | 100 |
| 10 | 310 | 14 | 1 | 1 | 1 | 100 |
| 10 | 328 | 18 | 2 | 1 | 2 | 100 |
| 10 | 347 | 19 | 2 | 1 | 2 | 100 |
| 10 | 363 | 16 | 2 | 1 | 2 | 100 |
| 10 | 375 | 12 | 1 | 1 | 1 | 100 |
| 10 | 397 | 22 | 2 | 1 | 2 | 100 |
| 10 | 417 | 20 | 2 | 1 | 2 | 100 |
| 10 | 442 | 25 | 3 | 1 | 3 | 80 |
| 10 | 470 | 28 | 3 | 1 | 3 | 80 |
| 10 | 504 | 34 | 3 | 1 | 3 | 80 |
| 10 | 541 | 37 | 4 | 1 | 4 | 60 |
| 10 | 576 | 35 | 4 | 1 | 4 | 60 |
| 10 | 614 | 38 | 4 | 1 | 4 | 60 |
| 10 | 648 | 34 | 3 | 1 | 3 | 80 |
| 10 | 682 | 34 | 3 | 1 | 3 | 80 |
| 10 | 716 | 34 | 3 | 1 | 3 | 80 |
| 10 | 750 | 34 | 3 | 1 | 3 | 80 |
| 10 | 785 | 35 | 4 | 1 | 4 | 60 |
| 10 | 820 | 35 | 4 | 1 | 4 | 60 |
| 10 | 858 | 38 | 4 | 1 | 4 | 60 |
| 10 | 897 | 39 | 4 | 1 | 4 | 60 |
| 10 | 921 | 24 | 2 | 1 | 2 | 100 |

CANADRILL

# Dynamic Cone Penetrometer Test

| | |
|---|---|
| **10** | 22-Sep |
| **10** | Nunavut Drive, Iqaluit, NU |
| **target depth reached** | Adjacent to TP05 |
| **0** | Packed Gravel |
| **Test Start Depth (mm)** | 0 |

## Test 1 (2 of 2)

| Number of blows | Cumulative penetration (mm) | Penetration between readings (mm) | Pentration per blow (mm) | Hammer Factor | DCP Index mm/blow | CBR % |
|---|---|---|---|---|---|---|
| 10 | 938 | 17 | 2 | 1 | 2 | 100 |
| 10 | 964 | 26 | 3 | 1 | 3 | 80 |
| 10 | 995 | 31 | 3 | 1 | 3 | 80 |
| 10 | 1030 | 35 | 4 | 1 | 4 | 60 |
| 10 | 1066 | 36 | 4 | 1 | 4 | 60 |
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CANADRILL

# Dynamic Cone Penetrometer Test

| | |
|---|---|
| **Date** | 23-Sep |
| **Location** | Iglulik Drive, Iqaluit, NU |
| **Test Pit or Adjacent** | TP06 |
| **Grade Surface** | Packed Gravel |
| **Test Start Depth (mm)** | 0 |

**Test 1**

| Number of blows | Cumulative penetration (mm) | Penetration between readings (mm) | Pentration per blow (mm) | Hammer Factor | DCP Index mm/blow | CBR % |
|---|---|---|---|---|---|---|
| 0 | 65 | - | - | - | - | - |
| 5 | 90 | 25 | 5 | 1 | 5 | 50 |
| 5 | 108 | 18 | 4 | 1 | 4 | 60 |
| 5 | 124 | 16 | 3 | 1 | 3 | 80 |
| 10 | 141 | 17 | 2 | 1 | 2 | 100 |
| 10 | 165 | 24 | 2 | 1 | 2 | 100 |
| 10 | 184 | 19 | 2 | 1 | 2 | 100 |
| 10 | 204 | 20 | 2 | 1 | 2 | 100 |
| 10 | 217 | 13 | 1 | 1 | 1 | 100 |
| 10 | 237 | 20 | 2 | 1 | 2 | 100 |
| 10 | 250 | 13 | 1 | 1 | 1 | 100 |
| 10 | 263 | 13 | 1 | 1 | 1 | 100 |
| 10 | 263 | 0 | 0 | 1 | 0 | 100 |
| 10 | 268 | 5 | 1 | 1 | 1 | 100 |
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# Dynamic Cone Penetrometer Test

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|---|---|
| **Date** | 23-Sep |
| **Location** | Iglulik Drive, Iqaluit, NU |
| **Test Pit or Adjacent** | TP06 |
| **Grade Surface** | Packed Gravel |
| **Test Start Depth (mm)** | 530 |

**Test 2**

| Number of blows | Cumulative penetration (mm) | Penetration between readings (mm) | Pentration per blow (mm) | Hammer Factor | DCP Index mm/blow | CBR % |
|---|---|---|---|---|---|---|
| 0 | 107 | - | - | - | - | - |
| 1 | 154 | 47 | 47 | 1 | 47 | 3.9 |
| 5 | 199 | 45 | 9 | 1 | 9 | 25 |
| 2 | 218 | 19 | 10 | 1 | 10 | 20 |
| 5 | 266 | 48 | 10 | 1 | 10 | 20 |
| 2 | 287 | 21 | 11 | 1 | 11 | 20 |
| 5 | 338 | 51 | 10 | 1 | 10 | 20 |
| 2 | 361 | 23 | 12 | 1 | 12 | 18 |
| 2 | 382 | 21 | 11 | 1 | 11 | 20 |
| 2 | 402 | 20 | 10 | 1 | 10 | 20 |
| 2 | 422 | 20 | 10 | 1 | 10 | 20 |
| 2 | 442 | 20 | 10 | 1 | 10 | 20 |
| 2 | 462 | 20 | 10 | 1 | 10 | 20 |
| 2 | 482 | 20 | 10 | 1 | 10 | 20 |
| 2 | 502 | 20 | 10 | 1 | 10 | 20 |
| 5 | 544 | 42 | 8 | 1 | 8 | 30 |
| 5 | 590 | 46 | 9 | 1 | 9 | 25 |
| 5 | 638 | 48 | 10 | 1 | 10 | 20 |
| 2 | 657 | 19 | 10 | 1 | 10 | 20 |
| 2 | 677 | 20 | 10 | 1 | 10 | 20 |
| 5 | 725 | 48 | 10 | 1 | 10 | 20 |
| 5 | 777 | 52 | 10 | 1 | 10 | 20 |

CANADRILL

# Dynamic Cone Penetrometer Test

| | |
|---|---|
| **Date** | 23-Sep |
| **Location** | Iglulik Drive, Iqaluit, NU |
| **Test Pit or Adjacent** | TP06 |
| **Grade Surface** | Packed Gravel |
| **Test Start Depth (mm)** | 1000 |

**Test 3 (1 of 2)**

| Number of blows | Cumulative penetration (mm) | Penetration between readings (mm) | Pentration per blow (mm) | Hammer Factor | DCP Index mm/blow | CBR % |
|---|---|---|---|---|---|---|
| 0 | 104 | - | - | - | - | - |
| 2 | 144 | 40 | 20 | 1 | 20 | 10 |
| 2 | 181 | 37 | 19 | 1 | 19 | 11 |
| 1 | 201 | 20 | 20 | 1 | 20 | 10 |
| 1 | 225 | 24 | 24 | 1 | 24 | 8 |
| 1 | 247 | 22 | 22 | 1 | 22 | 9 |
| 1 | 267 | 20 | 20 | 1 | 20 | 10 |
| 1 | 286 | 19 | 19 | 1 | 19 | 11 |
| 2 | 325 | 39 | 20 | 1 | 20 | 10 |
| 2 | 365 | 40 | 20 | 1 | 20 | 10 |
| 1 | 386 | 21 | 21 | 1 | 21 | 10 |
| 1 | 404 | 18 | 18 | 1 | 18 | 11 |
| 2 | 437 | 33 | 17 | 1 | 17 | 12 |
| 2 | 472 | 35 | 18 | 1 | 18 | 11 |
| 2 | 505 | 33 | 17 | 1 | 17 | 12 |
| 2 | 531 | 26 | 13 | 1 | 13 | 16 |
| 2 | 550 | 19 | 10 | 1 | 10 | 20 |
| 5 | 594 | 44 | 9 | 1 | 9 | 25 |
| 5 | 651 | 57 | 11 | 1 | 11 | 20 |
| 2 | 674 | 23 | 12 | 1 | 12 | 18 |
| 2 | 707 | 33 | 17 | 1 | 17 | 12 |
| 2 | 734 | 27 | 14 | 1 | 14 | 15 |
| 2 | 748 | 14 | 7 | 1 | 7 | 35 |
| 5 | 793 | 45 | 9 | 1 | 9 | 25 |
| 5 | 837 | 44 | 9 | 1 | 9 | 25 |
| 3 | 889 | 52 | 17 | 1 | 17 | 12 |
| 2 | 915 | 26 | 13 | 1 | 13 | 16 |
| 2 | 930 | 15 | 8 | 1 | 8 | 30 |
| 5 | 955 | 25 | 5 | 1 | 5 | 50 |
| 10 | 995 | 40 | 4 | 1 | 4 | 60 |
| 10 | 1016 | 21 | 2 | 1 | 2 | 100 |
| 10 | 1040 | 24 | 2 | 1 | 2 | 100 |
| 10 | 1059 | 19 | 2 | 1 | 2 | 100 |
| 10 | 1076 | 17 | 2 | 1 | 2 | 100 |
| 10 | 1097 | 21 | 2 | 1 | 2 | 100 |

CANADRILL

# Dynamic Cone Penetrometer Test

| | |
|---|---|
| **Date** | 23-Sep |
| **Location** | Iglulik Drive, Iqaluit, NU |
| **Test Pit or Adjacent** | TP06 |
| **Grade Surface** | Packed Gravel |
| **Test Start Depth (mm)** | 1000 |

**Test 3 (2 of 2)**

| Number of blows | Cumulative penetration (mm) | Penetration between readings (mm) | Pentration per blow (mm) | Hammer Factor | DCP Index mm/blow | CBR % |
|---|---|---|---|---|---|---|
| 10 | 1117 | 20 | 2 | 1 | 2 | 100 |
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CANADRILL

# Dynamic Cone Penetrometer Test

| | |
|---|---|
| **Date** | 23-Sep |
| **Location** | Iglulik Drive, Iqaluit, NU |
| **Test Pit or Adjacent** | Adjacent to TP06 |
| **Grade Surface** | Packed Gravel |
| **Test Start Depth (mm)** | 0 |

### Test 1

| Number of blows | Cumulative penetration (mm) | Penetration between readings (mm) | Pentration per blow (mm) | Hammer Factor | DCP Index mm/blow | CBR % |
|---|---|---|---|---|---|---|
| 0 | 71 | - | - | - | - | - |
| 5 | 103 | 32 | 6 | 1 | 6 | 40 |
| 5 | 130 | 27 | 5 | 1 | 5 | 50 |
| 5 | 160 | 30 | 6 | 1 | 6 | 40 |
| 5 | 194 | 34 | 7 | 1 | 7 | 35 |
| 5 | 215 | 21 | 4 | 1 | 4 | 60 |
| 5 | 239 | 24 | 5 | 1 | 5 | 50 |
| 5 | 257 | 18 | 4 | 1 | 4 | 60 |
| 5 | 280 | 23 | 5 | 1 | 5 | 50 |
| 5 | 301 | 21 | 4 | 1 | 4 | 60 |
| 10 | 338 | 37 | 4 | 1 | 4 | 60 |
| 10 | 377 | 39 | 4 | 1 | 4 | 60 |
| 10 | 424 | 47 | 5 | 1 | 5 | 50 |
| 10 | 470 | 46 | 5 | 1 | 5 | 50 |
| 5 | 481 | 11 | 2 | 1 | 2 | 100 |
| 10 | 522 | 41 | 4 | 1 | 4 | 60 |
| 10 | 566 | 44 | 4 | 1 | 4 | 60 |
| 10 | 617 | 51 | 5 | 1 | 5 | 50 |
| 10 | 656 | 39 | 4 | 1 | 4 | 60 |
| 10 | 671 | 15 | 2 | 1 | 2 | 100 |
| 10 | 692 | 21 | 2 | 1 | 2 | 100 |
| 1 | 801 | 109 | 109 | 1 | 109 | 1.5 |
| 1 | 833 | 32 | 32 | 1 | 32 | 6 |
| 1 | 852 | 19 | 19 | 1 | 19 | 11 |
| 2 | 870 | 18 | 9 | 1 | 9 | 25 |
| 2 | 883 | 13 | 7 | 1 | 7 | 35 |
| 5 | 907 | 24 | 5 | 1 | 5 | 50 |
| 5 | 926 | 19 | 4 | 1 | 4 | 60 |
| 10 | 952 | 26 | 3 | 1 | 3 | 80 |
| 10 | 971 | 19 | 2 | 1 | 2 | 100 |
| 10 | 996 | 25 | 3 | 1 | 3 | 80 |
| 10 | 1029 | 33 | 3 | 1 | 3 | 80 |
| 10 | 1065 | 36 | 4 | 1 | 4 | 60 |
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# Dynamic Cone Penetrometer Test

| | |
|---|---|
| **Date** | 23-Sep |
| **Location** | Ikaluktuutiak Drive, Iqaluit, NU |
| **Test Pit or Adjacent** | TP07 |
| **Grade Surface** | Packed Gravel |
| **Test Start Depth (mm)** | 0 |

**Test 1**

| Number of blows | Cumulative penetration (mm) | Penetration between readings (mm) | Pentration per blow (mm) | Hammer Factor | DCP Index mm/blow | CBR % |
|---|---|---|---|---|---|---|
| 0 | 50 | - | - | - | - | - |
| 5 | 63 | 13 | 3 | 1 | 3 | 80 |
| 10 | 87 | 24 | 2 | 1 | 2 | 100 |
| 10 | 109 | 22 | 2 | 1 | 2 | 100 |
| 10 | 131 | 22 | 2 | 1 | 2 | 100 |
| 10 | 155 | 24 | 2 | 1 | 2 | 100 |
| 10 | 178 | 23 | 2 | 1 | 2 | 100 |
| 10 | 204 | 26 | 3 | 1 | 3 | 80 |
| 10 | 229 | 25 | 3 | 1 | 3 | 80 |
| 10 | 253 | 24 | 2 | 1 | 2 | 100 |
| 10 | 273 | 20 | 2 | 1 | 2 | 100 |
| 10 | 294 | 21 | 2 | 1 | 2 | 100 |
| 10 | 317 | 23 | 2 | 1 | 2 | 100 |
| 10 | 341 | 24 | 2 | 1 | 2 | 100 |
| 10 | 366 | 25 | 3 | 1 | 3 | 80 |
| 10 | 386 | 20 | 2 | 1 | 2 | 100 |
| 10 | 408 | 22 | 2 | 1 | 2 | 100 |
| 10 | 425 | 17 | 2 | 1 | 2 | 100 |
| 10 | 443 | 18 | 2 | 1 | 2 | 100 |
| 10 | 467 | 24 | 2 | 1 | 2 | 100 |
| 10 | 490 | 23 | 2 | 1 | 2 | 100 |
| 10 | 509 | 19 | 2 | 1 | 2 | 100 |
| 10 | 528 | 19 | 2 | 1 | 2 | 100 |
| 10 | 545 | 17 | 2 | 1 | 2 | 100 |
| 10 | 556 | 11 | 1 | 1 | 1 | 100 |
| 10 | 565 | 9 | 1 | 1 | 1 | 100 |
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CANADRILL

# Dynamic Cone Penetrometer Test

| | |
|---|---|
| **Date** | 23-Sep |
| **Location** | Ikaluktuutiak Drive, Iqaluit, NU |
| **Test Pit or Adjacent** | TP07 |
| **Grade Surface** | Packed Gravel |
| **Test Start Depth (mm)** | 470 |

**Test 2**

| Number of blows | Cumulative penetration (mm) | Penetration between readings (mm) | Pentration per blow (mm) | Hammer Factor | DCP Index mm/blow | CBR % |
|---|---|---|---|---|---|---|
| 0 | 75 | - | - | - | - | - |
| 2 | 94 | 19 | 10 | 1 | 10 | 20 |
| 5 | 125 | 31 | 6 | 1 | 6 | 40 |
| 5 | 150 | 25 | 5 | 1 | 5 | 50 |
| 5 | 168 | 18 | 4 | 1 | 4 | 60 |
| 10 | 202 | 34 | 3 | 1 | 3 | 80 |
| 5 | 233 | 31 | 6 | 1 | 6 | 40 |
| 5 | 267 | 34 | 7 | 1 | 7 | 35 |
| 2 | 291 | 24 | 12 | 1 | 12 | 18 |
| 2 | 352 | 61 | 31 | 1 | 31 | 6 |
| 1 | 439 | 87 | 87 | 1 | 87 | 2 |
| 1 | 490 | 51 | 51 | 1 | 51 | 3.6 |
| 1 | 526 | 36 | 36 | 1 | 36 | 5 |
| 1 | 555 | 29 | 29 | 1 | 29 | 7 |
| 1 | 580 | 25 | 25 | 1 | 25 | 8 |
| 1 | 601 | 21 | 21 | 1 | 21 | 10 |
| 1 | 620 | 19 | 19 | 1 | 19 | 11 |
| 2 | 650 | 30 | 15 | 1 | 15 | 14 |
| 2 | 668 | 18 | 9 | 1 | 9 | 25 |

# Dynamic Cone Penetrometer Test

| | |
|---|---|
| **Date** | 23-Sep |
| **Location** | Ikaluktuutiak Drive, Iqaluit, NU |
| **Test Pit or Adjacent** | TP07 |
| **Grade Surface** | Packed Gravel |
| **Test Start Depth (mm)** | 1000 |

## Test 3 (1 of 2)

| Number of blows | Cumulative penetration (mm) | Penetration between readings (mm) | Pentration per blow (mm) | Hammer Factor | DCP Index mm/blow | CBR % |
|---|---|---|---|---|---|---|
| 0 | 99 | - | - | - | - | - |
| 2 | 135 | 36 | 18 | 1 | 18 | 11 |
| 2 | 152 | 17 | 9 | 1 | 9 | 25 |
| 5 | 230 | 78 | 16 | 1 | 16 | 13 |
| 2 | 252 | 22 | 11 | 1 | 11 | 20 |
| 2 | 278 | 26 | 13 | 1 | 13 | 16 |
| 2 | 299 | 21 | 11 | 1 | 11 | 20 |
| 5 | 342 | 43 | 9 | 1 | 9 | 25 |
| 5 | 372 | 30 | 6 | 1 | 6 | 40 |
| 5 | 411 | 39 | 8 | 1 | 8 | 30 |
| 5 | 453 | 42 | 8 | 1 | 8 | 30 |
| 5 | 494 | 41 | 8 | 1 | 8 | 30 |
| 5 | 550 | 56 | 11 | 1 | 11 | 20 |
| 2 | 573 | 23 | 12 | 1 | 12 | 18 |
| 2 | 598 | 25 | 13 | 1 | 13 | 16 |
| 2 | 620 | 22 | 11 | 1 | 11 | 20 |
| 2 | 640 | 20 | 10 | 1 | 10 | 20 |
| 2 | 659 | 19 | 10 | 1 | 10 | 20 |
| 5 | 711 | 52 | 10 | 1 | 10 | 20 |
| 2 | 732 | 21 | 11 | 1 | 11 | 20 |
| 2 | 755 | 23 | 12 | 1 | 12 | 18 |
| 2 | 777 | 22 | 11 | 1 | 11 | 20 |
| 2 | 798 | 21 | 11 | 1 | 11 | 20 |
| 2 | 818 | 20 | 10 | 1 | 10 | 20 |
| 2 | 838 | 20 | 10 | 1 | 10 | 20 |
| 2 | 859 | 21 | 11 | 1 | 11 | 20 |
| 2 | 879 | 20 | 10 | 1 | 10 | 20 |
| 2 | 899 | 20 | 10 | 1 | 10 | 20 |
| 2 | 920 | 21 | 11 | 1 | 11 | 20 |
| 2 | 939 | 19 | 10 | 1 | 10 | 20 |
| 2 | 958 | 19 | 10 | 1 | 10 | 20 |
| 2 | 978 | 20 | 10 | 1 | 10 | 20 |
| 2 | 996 | 18 | 9 | 1 | 9 | 25 |
| 2 | 1016 | 20 | 10 | 1 | 10 | 20 |
| 2 | 1035 | 19 | 10 | 1 | 10 | 20 |

# Dynamic Cone Penetrometer Test

| | |
|---|---|
| **Date** | 23-Sep |
| **Location** | Ikaluktuutiak Drive, Iqaluit, NU |
| **Test Pit or Adjacent** | TP07 |
| **Grade Surface** | Packed Gravel |
| **Test Start Depth (mm)** | 1000 |

**Test 3 (2 of 2)**

| Number of blows | Cumulative penetration (mm) | Penetration between readings (mm) | Pentration per blow (mm) | Hammer Factor | DCP Index mm/blow | CBR % |
|---|---|---|---|---|---|---|
| 2 | 1052 | 17 | 9 | 1 | 9 | 25 |
| 2 | 1066 | 14 | 7 | 1 | 7 | 35 |
| 5 | 1084 | 18 | 4 | 1 | 4 | 60 |
| 10 | 1099 | 15 | 2 | 1 | 2 | 100 |
| 10 | 1112 | 13 | 1 | 1 | 1 | 100 |
| 10 | 1121 | 9 | 1 | 1 | 1 | 100 |
| 10 | 1128 | 7 | 1 | 1 | 1 | 100 |

CANADRILL

# Dynamic Cone Penetrometer Test

| | |
|---|---|
| **Date** | 23-Sep |
| **Location** | Ikaluktuutiak Drive, Iqaluit, NU |
| **Test Pit or Adjacent** | Adjacent to TP07 |
| **Grade Surface** | Packed Gravel |
| **Test Start Depth (mm)** | 0 |

## Test 1

| Number of blows | Cumulative penetration (mm) | Penetration between readings (mm) | Pentration per blow (mm) | Hammer Factor | DCP Index mm/blow | CBR % |
|---|---|---|---|---|---|---|
| 0 | 50 | - | - | - | - | - |
| 10 | 80 | 30 | 3 | 1 | 3 | 80 |
| 10 | 104 | 24 | 2 | 1 | 2 | 100 |
| 10 | 124 | 20 | 2 | 1 | 2 | 100 |
| 10 | 145 | 21 | 2 | 1 | 2 | 100 |
| 10 | 162 | 17 | 2 | 1 | 2 | 100 |
| 10 | 172 | 10 | 1 | 1 | 1 | 100 |
| 10 | 186 | 14 | 1 | 1 | 1 | 100 |
| 10 | 203 | 17 | 2 | 1 | 2 | 100 |
| 10 | 221 | 18 | 2 | 1 | 2 | 100 |
| 10 | 235 | 14 | 1 | 1 | 1 | 100 |
| 10 | 242 | 7 | 1 | 1 | 1 | 100 |
| 10 | 246 | 4 | 0 | 1 | 0 | 100 |
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# Dynamic Cone Penetrometer Test

| | |
|---|---|
| **Date** | 23-Sep |
| **Location** | Ikaluktuutiak Drive, Iqaluit, NU |
| **Test Pit or Adjacent** | Adjacent to TP07 |
| **Grade Surface** | Packed Gravel |
| **Test Start Depth (mm)** | 0 |

**Test 2**

| Number of blows | Cumulative penetration (mm) | Penetration between readings (mm) | Pentration per blow (mm) | Hammer Factor | DCP Index mm/blow | CBR % |
|---|---|---|---|---|---|---|
| 0 | 45 | - | - | - | - | - |
| 10 | 74 | 29 | 3 | 1 | 3 | 80 |
| 10 | 95 | 21 | 2 | 1 | 2 | 100 |
| 10 | 112 | 17 | 2 | 1 | 2 | 100 |
| 10 | 132 | 20 | 2 | 1 | 2 | 100 |
| 10 | 154 | 22 | 2 | 1 | 2 | 100 |
| 10 | 174 | 20 | 2 | 1 | 2 | 100 |
| 10 | 193 | 19 | 2 | 1 | 2 | 100 |
| 10 | 213 | 20 | 2 | 1 | 2 | 100 |
| 10 | 235 | 22 | 2 | 1 | 2 | 100 |
| 10 | 251 | 16 | 2 | 1 | 2 | 100 |
| 10 | 271 | 20 | 2 | 1 | 2 | 100 |
| 10 | 290 | 19 | 2 | 1 | 2 | 100 |
| 10 | 304 | 14 | 1 | 1 | 1 | 100 |
| 10 | 319 | 15 | 2 | 1 | 2 | 100 |
| 10 | 335 | 16 | 2 | 1 | 2 | 100 |
| 10 | 344 | 9 | 1 | 1 | 1 | 100 |
| 10 | 345 | 1 | 0 | 1 | 0 | 100 |
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## 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 Canadrill Limited Geotechnical Division 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 Canadrill 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 Canadrill 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 province or territory of execution for the specific professional service provided to the Client. No other warranty is made.

**Interpretation of Site Conditions:** Where Canadrill Ltd. has carried out a test pit or borehole field program, the soil, rock or other material descriptions and statements regarding their condition made in this report are based on site conditions encountered by Canadrill Ltd. at the time of the work and at the specified testing and/or sampling locations. Classifications and statements of condition have been made in accordance with normally accepted practices which are judgement 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. In the case of a desktop assessment the previous reports and information prepared by other parties has been taken at face value.

**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, Canadrill 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. Canadrill Ltd. will not be responsible to any party for damages incurred as a result of failing to notify Canadrill 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 Canadrill 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-surface 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; Canadrill Ltd. cannot be responsible for site work carried out without.