

October 23, 2015

Lands Management Branch
Energy, Mines and Resources
Government of Yukon
Box 2703
Whitehorse, Yukon Y1A 2C6

ISSUED FOR USE
FILE: W14103670-01
Via Email: kevin.fisher@gov.yk.ca

Attention: Mr. Kevin Fisher, Program Manager

Subject: Geotechnical Suitability Investigation – Lots 1 to 3 Sawmill Road Subdivision
Teslin, Yukon

1.0 INTRODUCTION

As requested Tetra Tech EBA Inc. (Tetra Tech EBA) has completed a geotechnical suitability investigation for Lots 1 to 3 of the Sawmill Road Subdivision of Teslin, Yukon for the Government of Yukon, Energy, Mines and Resources, Land Management Branch (EMR).

The scope of services and cost estimate was presented in Tetra Tech's EBA's, *Proposal to Complete Geotechnical Suitability Investigation, Lots 1 to 3 Sawmill Subdivision*, on July 23, 2015.

1.1 Scope of Services

The proposed scope of services was developed based on email correspondence with EMR personnel and is summarized below:

- Complete one to two testpits on each lot to determine the soil conditions, including:
 - Collect representative soil samples from the testpits to complete index testing; and
 - Complete percolation testing in one testpit on each site to determine septic suitability.
- Prepare a data report summarizing the findings of the investigation and provide geotechnical and septic recommendations for development.

Geotechnical recommendations are based on foundation system specifics including: foundation type, size, shape and burial depth but for this investigation Tetra Tech EBA was to provide general recommendations.

Percolation test results were used to determine appropriate on-site sewage disposal systems.

EMR indicated that they would like to excavate one testpit per lot to confirm the existing soil conditions. If the soil conditions were different from what is expected (approximately 0.5 m of sand over compact sand till) or they change across the lots, they would approve excavation of a second testpit on each site. Confirmation of the second testpit would be approved by EMR prior to proceeding with additional testpits.

1.2 Background Information

The Tetra Tech EBA Report, *Geotechnical Evaluation – Sawmill Road and Morley Bay Residential Expansion Areas – Teslin, Yukon*, (Tetra Tech EBA File W14101162.001) was reviewed prior to initiating the geotechnical suitability investigation for Lots 1 to 3.

2.0 FIELD INVESTIGATION

On August 8, 2015, three testpits (W14103670-01-TP01 to TP03) were excavated on Lots 1 to 3; TP01 on Lot 1, TP02 on Lot 2 and TP03 on Lot 3. All three testpits were excavated in areas considered to be down-gradient of potential areas for building locations. All testpits were excavated with a Komatsu PC 200LC tracked excavator owned and operated by Deadman Creek Enterprises of Teslin, YT. The termination depth of each testpit was about 4.0 m. Percolation tests were performed at depths of 1.0, 1.4 and 2.0 m in Testpits TP01, TP02 and TP03, respectively below existing ground elevations. Each percolation test was performed in accordance with the *Environmental Health Guidelines*, including adequate presoak times and at least two repetitions to confirm the percolation rates.

During testpitting, detailed logs were prepared describing the geotechnical conditions encountered. Samples were collected at regular intervals throughout the depth of each testpit and returned to Tetra Tech EBA's Whitehorse laboratory for natural moisture content determination (on all samples) and particle size analysis testing on select representative samples. Upon completion, UTM coordinates were recorded using a handheld GPS unit and the testpits were backfilled to grade.

Geotechnical conditions are described in the next section of this report. Testpit locations are presented on the attached Figure 1, followed by the testpit logs and associated laboratory test result report forms in Appendix A.

3.0 SITE CONDITIONS

3.1 General Location

Lots 1 to 3 are located along the West Road of the Sawmill Road Subdivision directly north of the original Sawmill Road Subdivision.

3.2 Geotechnical Conditions

Based on the three testpits excavated throughout Lots 1 to 3, geotechnical conditions were found to be very consistent. Conditions encountered are summarized below and detailed testpit logs are attached in Appendix A.

- A thin organic veneer was noted from 0.0 to 0.2 m in all testpits.
- Below the organic veneer, damp SAND and GRAVEL was noted from 0.2 to 0.4 m. The depositional history of this soil unit is likely colluvial.
- Below the surficial SAND and GRAVEL, moist silty SAND (TILL) to SAND and SILT (TILL) soil was noted to the termination depth of all three testpits. The near surface tills were fairly compact but were found to be very compact at depths greater than 2.5 m.
- Percolation tests were performed in Testpits TP01; TP02; and TP03 at depths of 1.0, 1.4 and 2.0 m, respectively. The percolation rates measured ranged from 15 min/25 mm (in TP01) and 17 min/25 mm (in TP02) to 20 min/25 mm (in TP03). All percolation rates are considered acceptable for on-site sewage disposal system design and construction.

- No bedrock, groundwater, or permafrost was encountered in any of the three testpit excavated throughout the lots.

4.0 SITE SUITABILITY AND DEVELOPMENT CONSTRAINTS

The geotechnical conditions noted during the investigation suggest that Lots 1 to 3 are suitable for country residential subdivision development with the following restriction:

- The presence of till soils with significant fines (silt and clay) content means that there is potential for frost heave if cold temperatures and high moisture contents exist. This will affect foundation design construction on the lots and may require the placement of foundation insulation and adequate soil cover over footings.

4.1 On-Site Sewage Disposal System Construction

For an area to be considered acceptable for on-site sewage disposal system construction, there must be at least 600 mm of accepting soil with a percolation rate of greater than 0.1 min/25 mm and less than 60 min/25 mm. As well, there must be at least 1,200 mm of vertical separation between the bottom of the absorption bed and either groundwater or an impervious layer (bedrock, permafrost or fine-grained soils).

Percolation tests performed during this evaluation were done at depths ranging from 1.0 to 2.0 m from existing site elevations and the percolation rates measured were determined to be acceptable for on-site sewage disposal system construction.

System sizing for a typical three-bedroom house would include the installation of a 1,000 imperial gallon (4,550 L) septic tank (two-chamber tank c/w siphon chamber). The chamber absorption system sizing will vary dependent upon the depth from grade (as it affects the percolation rate). For the 15 min/25 mm to 20 min/25 mm percolation rates measured at a depth of 1.0 m in TP01, the installation of 600 mm wide chambers, a total of 55 m of trench and chambers will be required. If the percolation rate increases to 20 min/25 mm as indicated at a depth of 2.0 m in TP03, a minimum of 90 m of trench and chambers will be required.

Lot owners must be aware that on-site sewage disposal system design and construction must be site-specific (separate percolation tests and designs completed for each lot) and is still required to be prepared in compliance with the, *Design Specifications For Sewage Disposal Systems*, document prepared by Government of Yukon, Environmental Health.

5.0 FOUNDATIONS

Based on the geotechnical data collected, concrete strip and spread footings or thickened monolithic slab-on-grade foundations (considered conventional residential housing foundation systems) are considered to be acceptable foundation options for this site. Since the soils found throughout three lots are considered to be frost-susceptible, a minimum of 2.1 m of soil cover is required for frost protection purposes. However, it may not be feasible to construct footings at that depth; therefore, a combination of soil cover and insulation can be used instead. If the following recommendations are adhered to, the insulation should provide sufficient protection to the foundation from frost heave.

5.1 Insulation Recommendations

Tetra Tech EBA recommends insulating foundations of both heated and unheated buildings (garages) to mitigate potential seasonal frost heave damage. These recommendations are based on the building having insulation under the concrete floor slabs. Insulation recommendations are shown in Figure 2 and summarized below. If different

footing burial depths or insulation configurations are desired, Tetra Tech EBA would be pleased to revise their insulation recommendations accordingly. Insulation is to be:

- 100 mm thick given a minimum footing burial depth of 900 mm.
- Doubled (200 mm thick) at building corners and doorways.
- Extended to a minimum of 1.2 m from the building edge.
- Sloped at 12H:1V away from the building.
- Have a 75 mm thick layer of sand bedding above and below.
- Buried at least 300 mm below grade.
- Not required if footing burial depth is greater than 2.1 m.

5.2 Site Grading and Drainage Recommendations.

It is imperative in subdivision construction that the overall grading be considered during the planning phase. Typically, the developer provides a rough grading plan, showing elevations of lot corners, swale directions and general site grading directions. This subdivision is no different. The lot corner elevations must be met by the builders and site runoff must be taken into account for adjacent sites.

The underlying soils consist of low permeability SAND and SILT till. Owing to the lower permeability of this material, rock pits constructed for surface water management will not drain fast enough for efficient use. Surface runoff ditches along lot boundaries should be considered to convey stormwater to areas acceptable for surface water discharge.

5.3 Preserved Wood Foundation Recommendations

If the use of preserved wood foundations (PWF) is desired, a granular drainage layer should be installed beneath all footings and basement slabs, in accordance with CAN-CSA S406, because of the lower permeable till foundation soils and absence of any specific hydrogeological information for the area. If areas of free draining gravel are encountered, it may be possible to remove the requirement for a gravel drainage layer (a geotechnical engineer should be consulted).

The granular drainage layer should be constructed using a clean crushed stone or clean gravel material of maximum particle size 40 mm and having less than 10% sand (passing the 5 mm sieve). This layer shall be at least 125 mm thick and shall extend beyond the footing base a minimum of 300 mm. The granular drainage layer shall drain to a sump which, in turn, shall drain to a point of final disposal beyond the building's footprint. In accordance with CAN-CSA S406, the use of perimeter drainage tile or pipe is not recommended with PWF foundation systems.

All backfill material placed within 600 mm of the foundation walls shall be free of deleterious debris, frozen materials, and boulders larger than 150 mm in diameter. Existing soils can be used as backfill in service trenches so long as no cobbles are placed within 1 lift of any pipe installation and all backfill materials are moisture conditioned and compacted to at least 95% of the material's maximum dry density (ASTM D698).

6.0 LIMITATIONS OF REPORT

This report and its contents are intended for the sole use of Government of Yukon and their agents. Tetra Tech EBA Inc. (Tetra Tech EBA) does not accept any responsibility for the accuracy of any of the data, the analysis, or

the recommendations contained or referenced in the report when the report is used or relied upon by any Party other than Government of Yukon, or for any Project other than the proposed development at the subject site. Any such unauthorized use of this report is at the sole risk of the user. Use of this report is subject to the terms and conditions stated in Tetra Tech EBA's Services Agreement. Tetra Tech EBA's General Conditions are provided in Appendix A of this report.

7.0 CLOSURE

The information and recommendations presented herein are based on site-specific geotechnical information from the compilation of existing information and conditions noted during site reconnaissance. The conditions presented herein are believed to be representative for the site. However, if conditions differing from those presented in this report are encountered during construction, we request that Tetra Tech EBA be notified so that the geotechnical recommendations can be re-evaluated in light of new findings.

Respectfully submitted,
Tetra Tech EBA Inc.



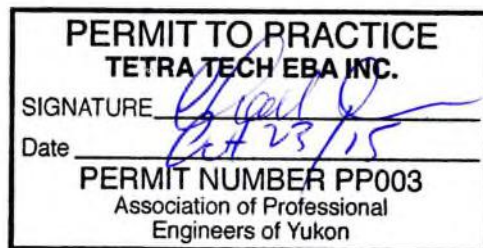
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- Attachments: Figures (2)
Appendix A: Testpit Logs and Laboratory Test Results
Appendix B: Tetra Tech EBA's General Conditions



FIGURES

- Figure 1 Site Plan Showing Testpit Locations
Figure 2 Insulation Detail Heated Structure



LEGEND
 - TESTPIT LOCATION

0 50m
 Scale: 1:1,750 @ 8.5"x11"

CLIENT



**SAWMILL SUBDIVISION GEOTECHNICAL
 SUITABILITY ASSESSMENT - TESLIN, YUKON**

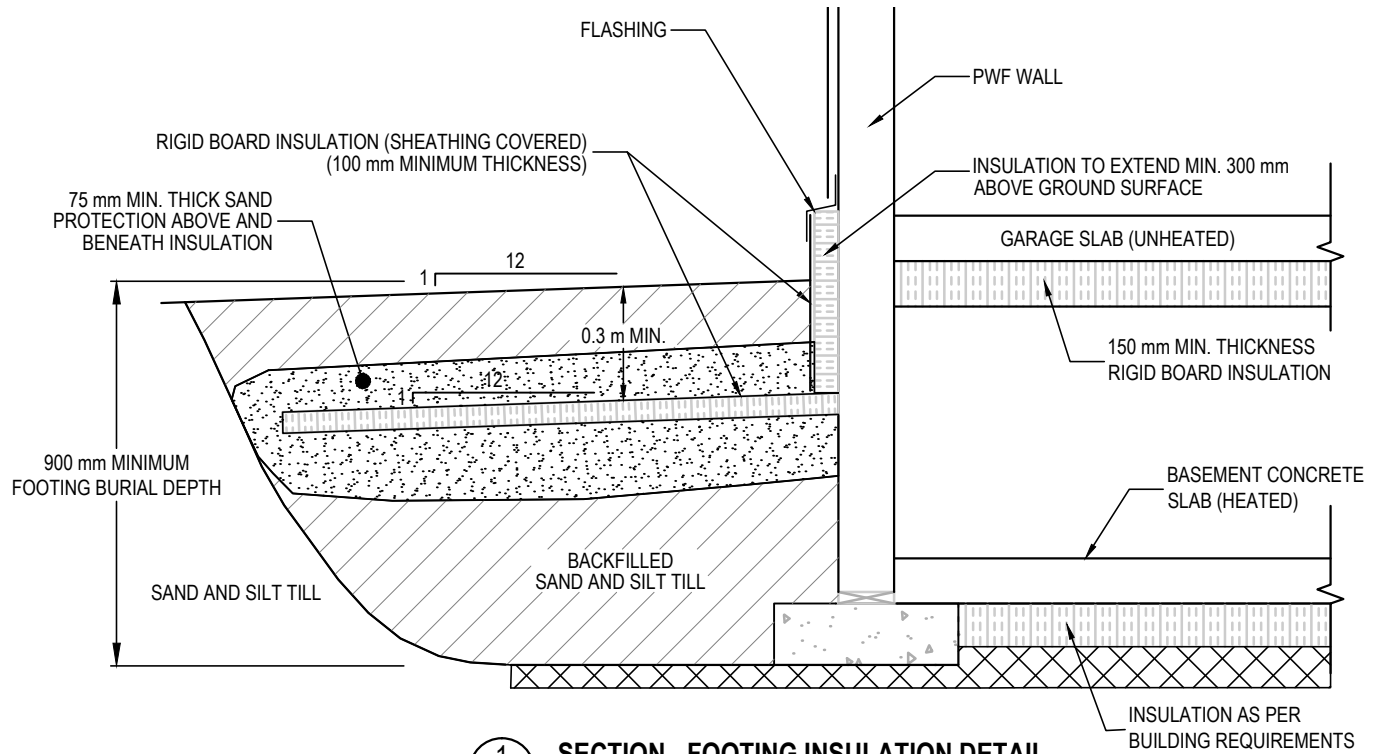
SITE PLAN SHOWING TESTPIT LOCATIONS



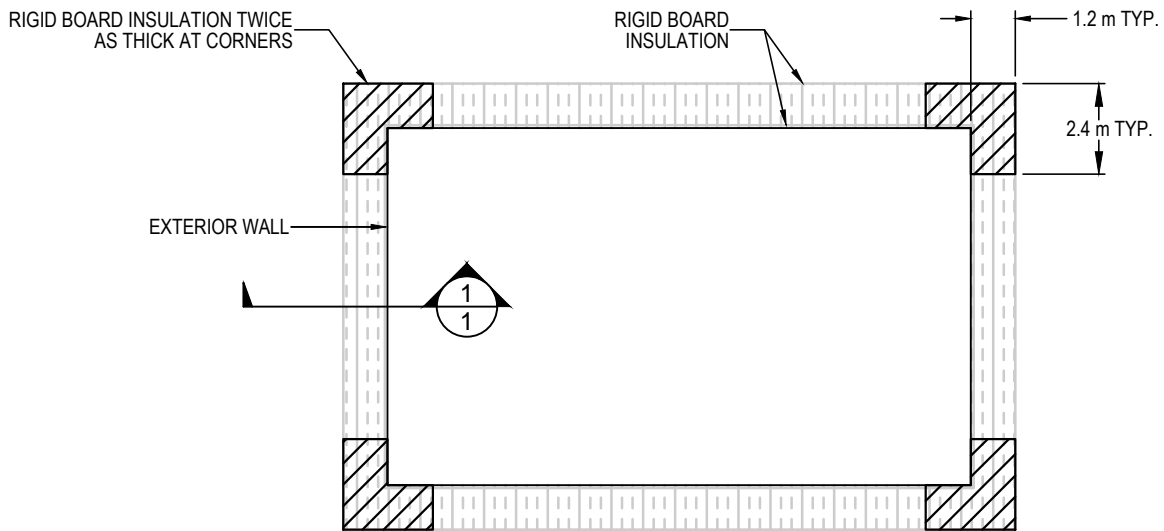
PROJECT NO. W14103670-01	DWN CB	CKD CPC	REV 0
OFFICE EBA-WHSE	DATE August 19, 2015		

Figure 1

Q:\Whitehorse\Data\0201\drawings\Teslin\W14103670-01 Sawmill Subdivision Geotechnical Suitability Assessment\W14103670-01 Fig. 1-R0.dwg [FIGURE 2] September 04, 2015 - 10:24:18 am (BY: BUCHAN, CAMERON)



SECTION - FOOTING INSULATION DETAIL
N.T.S.



PLAN
N.T.S.

NOTES:

1. THE INSULATION (DOW CHEMICAL HI SERIES STYROFOAM OR POLYURETHANE OR APPROVED EQUIVALENT) SHOULD BE MOISTURE RESISTANT AND SUITABLE FOR BURIAL.
2. A MINIMUM BEDDING THICKNESS OF 75 mm OF FINE TO MEDIUM GRAINED SAND SHOULD BE PLACED ABOVE AND BELOW THE INSULATION FOR PROTECTION.
3. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE NOTED.
4. INSULATION THICKNESS CAN BE REDUCED IF FOOTING IS BURIED DEEPER. CONTACT EBA FOR DETAILS.

CLIENT



**SAWMILL SUBDIVISION GEOTECHNICAL
SUITABILITY ASSESSMENT - TESLIN, YUKON**

**INSULATION DETAIL
HEATED STRUCTURE**



PROJECT NO. W14103670-01	DWN CB	CKD CPC	REV 0
OFFICE EBA-WHSE	DATE September 1, 2015		

Figure 2

APPENDIX A

TESTPIT LOGS AND LABORATORY TEST RESULTS

GENERAL CONDITIONS

GEOTECHNICAL REPORT

This report incorporates and is subject to these “General Conditions”.

1.0 USE OF REPORT AND OWNERSHIP

This geotechnical report pertains to a specific site, a specific development and a specific scope of work. It is not applicable to any other sites nor should it be relied upon for types of development other than that to which it refers. Any variation from the site or development would necessitate a supplementary geotechnical assessment.

This report and the recommendations contained in it are intended for the sole use of Tetra Tech EBA's Client. Tetra Tech EBA does not accept any responsibility for the accuracy of any of the data, the analyses or the recommendations contained or referenced in the report when the report is used or relied upon by any party other than Tetra Tech EBA's Client unless otherwise authorized in writing by Tetra Tech EBA. Any unauthorized use of the report is at the sole risk of the user.

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2.0 ALTERNATE REPORT FORMAT

Where Tetra Tech EBA submits both electronic file and hard copy versions of reports, drawings and other project-related documents and deliverables (collectively termed Tetra Tech EBA's instruments of professional service), only the signed and/or sealed versions shall be considered final and legally binding. The original signed and/or sealed version archived by Tetra Tech EBA shall be deemed to be the original for the Project.

Both electronic file and hard copy versions of Tetra Tech EBA's instruments of professional service shall not, under any circumstances, no matter who owns or uses them, be altered by any party except Tetra Tech EBA. Tetra Tech EBA's instruments of professional service will be used only and exactly as submitted by Tetra Tech EBA.

Electronic files submitted by Tetra Tech EBA have been prepared and submitted using specific software and hardware systems. Tetra Tech EBA makes no representation about the compatibility of these files with the Client's current or future software and hardware systems.

3.0 ENVIRONMENTAL AND REGULATORY ISSUES

Unless stipulated in the report, Tetra Tech EBA has not been retained to investigate, address or consider and has not investigated, addressed or considered any environmental or regulatory issues associated with development on the subject site.

4.0 NATURE AND EXACTNESS OF SOIL AND ROCK DESCRIPTIONS

Classification and identification of soils and rocks are based upon commonly accepted systems and methods employed in professional geotechnical practice. This report contains descriptions of the systems and methods used. Where deviations from the system or method prevail, they are specifically mentioned.

Classification and identification of geological units are judgmental in nature as to both type and condition. Tetra Tech EBA does not warrant conditions represented herein as exact, but infers accuracy only to the extent that is common in practice.

Where subsurface conditions encountered during development are different from those described in this report, qualified geotechnical personnel should revisit the site and review recommendations in light of the actual conditions encountered.

5.0 LOGS OF TESTHOLES

The testhole logs are a compilation of conditions and classification of soils and rocks as obtained from field observations and laboratory testing of selected samples. Soil and rock zones have been interpreted. Change from one geological zone to the other, indicated on the logs as a distinct line, can be, in fact, transitional. The extent of transition is interpretive. Any circumstance which requires precise definition of soil or rock zone transition elevations may require further investigation and review.

6.0 STRATIGRAPHIC AND GEOLOGICAL INFORMATION

The stratigraphic and geological information indicated on drawings contained in this report are inferred from logs of test holes and/or soil/rock exposures. Stratigraphy is known only at the locations of the test hole or exposure. Actual geology and stratigraphy between test holes and/or exposures may vary from that shown on these drawings. Natural variations in geological conditions are inherent and are a function of the historic environment. Tetra Tech EBA does not represent the conditions illustrated as exact but recognizes that variations will exist. Where knowledge of more precise locations of geological units is necessary, additional investigation and review may be necessary.

7.0 PROTECTION OF EXPOSED GROUND

Excavation and construction operations expose geological materials to climatic elements (freeze/thaw, wet/dry) and/or mechanical disturbance which can cause severe deterioration. Unless otherwise specifically indicated in this report, the walls and floors of excavations must be protected from the elements, particularly moisture, desiccation, frost action and construction traffic.

8.0 SUPPORT OF ADJACENT GROUND AND STRUCTURES

Unless otherwise specifically advised, support of ground and structures adjacent to the anticipated construction and preservation of adjacent ground and structures from the adverse impact of construction activity is required.

9.0 INFLUENCE OF CONSTRUCTION ACTIVITY

There is a direct correlation between construction activity and structural performance of adjacent buildings and other installations. The influence of all anticipated construction activities should be considered by the contractor, owner, architect and prime engineer in consultation with a geotechnical engineer when the final design and construction techniques are known.

10.0 OBSERVATIONS DURING CONSTRUCTION

Because of the nature of geological deposits, the judgmental nature of geotechnical engineering, as well as the potential of adverse circumstances arising from construction activity, observations during site preparation, excavation and construction should be carried out by a geotechnical engineer. These observations may then serve as the basis for confirmation and/or alteration of geotechnical recommendations or design guidelines presented herein.

11.0 DRAINAGE SYSTEMS

Where temporary or permanent drainage systems are installed within or around a structure, the systems which will be installed must protect the structure from loss of ground due to internal erosion and must be designed so as to assure continued performance of the drains. Specific design detail of such systems should be developed or reviewed by the geotechnical engineer. Unless otherwise specified, it is a condition of this report that effective temporary and permanent drainage systems are required and that they must be considered in relation to project purpose and function.

12.0 BEARING CAPACITY

Design bearing capacities, loads and allowable stresses quoted in this report relate to a specific soil or rock type and condition. Construction activity and environmental circumstances can materially change the condition of soil or rock. The elevation at which a soil or rock type occurs is variable. It is a requirement of this report that structural elements be founded in and/or upon geological materials of the type and in the condition assumed. Sufficient observations should be made by qualified geotechnical personnel during construction to assure that the soil and/or rock conditions assumed in this report in fact exist at the site.

13.0 SAMPLES

Tetra Tech EBA will retain all soil and rock samples for 30 days after this report is issued. Further storage or transfer of samples can be made at the Client's expense upon written request, otherwise samples will be discarded.

14.0 INFORMATION PROVIDED TO TETRA TECH EBA BY OTHERS

During the performance of the work and the preparation of the report, Tetra Tech EBA may rely on information provided by persons other than the Client. While Tetra Tech EBA endeavours to verify the accuracy of such information when instructed to do so by the Client, Tetra Tech EBA accepts no responsibility for the accuracy or the reliability of such information which may affect the report.

APPENDIX B

TETRA TECH EBA'S GENERAL CONDITIONS

TERMS USED ON BOREHOLE LOGS

TERMS DESCRIBING CONSISTENCY OR CONDITION

COARSE GRAINED SOILS (major portion retained on 0.075mm sieve): Includes (1) clean gravels and sands, and (2) silty or clayey gravels and sands. Condition is rated according to relative density, as inferred from laboratory or in situ tests.

DESCRIPTIVE TERM	RELATIVE DENSITY	N (blows per 0.3m)
Very Loose	0 TO 20%	0 to 4
Loose	20 TO 40%	4 to 10
Compact	40 TO 75%	10 to 30
Dense	75 TO 90%	30 to 50
Very Dense	90 TO 100%	greater than 50

The number of blows, N, on a 51mm O.D. split spoon sampler of a 63.5kg weight falling 0.76m, required to drive the sampler a distance of 0.3m from 0.15m to 0.45m.

FINE GRAINED SOILS (major portion passing 0.075mm sieve): Includes (1) inorganic and organic silts and clays, (2) gravelly, sandy, or silty clays, and (3) clayey silts. Consistency is rated according to shearing strength, as estimated from laboratory or in situ tests.

DESCRIPTIVE TERM	UNCONFINED COMPRESSIVE STRENGTH (KPA)
Very Soft	Less than 25
Soft	25 to 50
Firm	50 to 100
Stiff	100 to 200
Very Stiff	200 to 400
Hard	Greater than 400

NOTE: Slickensided and fissured clays may have lower unconfined compressive strengths than shown above, because of planes of weakness or cracks in the soil.

GENERAL DESCRIPTIVE TERMS

Slickensided - having inclined planes of weakness that are slick and glossy in appearance.

Fissured - containing shrinkage cracks, frequently filled with fine sand or silt; usually more or less vertical.

Laminated - composed of thin layers of varying colour and texture.

Interbedded - composed of alternate layers of different soil types.

Calcareous - containing appreciable quantities of calcium carbonate.;

Well graded - having wide range in grain sizes and substantial amounts of intermediate particle sizes.

Poorly graded - predominantly of one grain size, or having a range of sizes with some intermediate size missing.

MODIFIED UNIFIED SOIL CLASSIFICATION

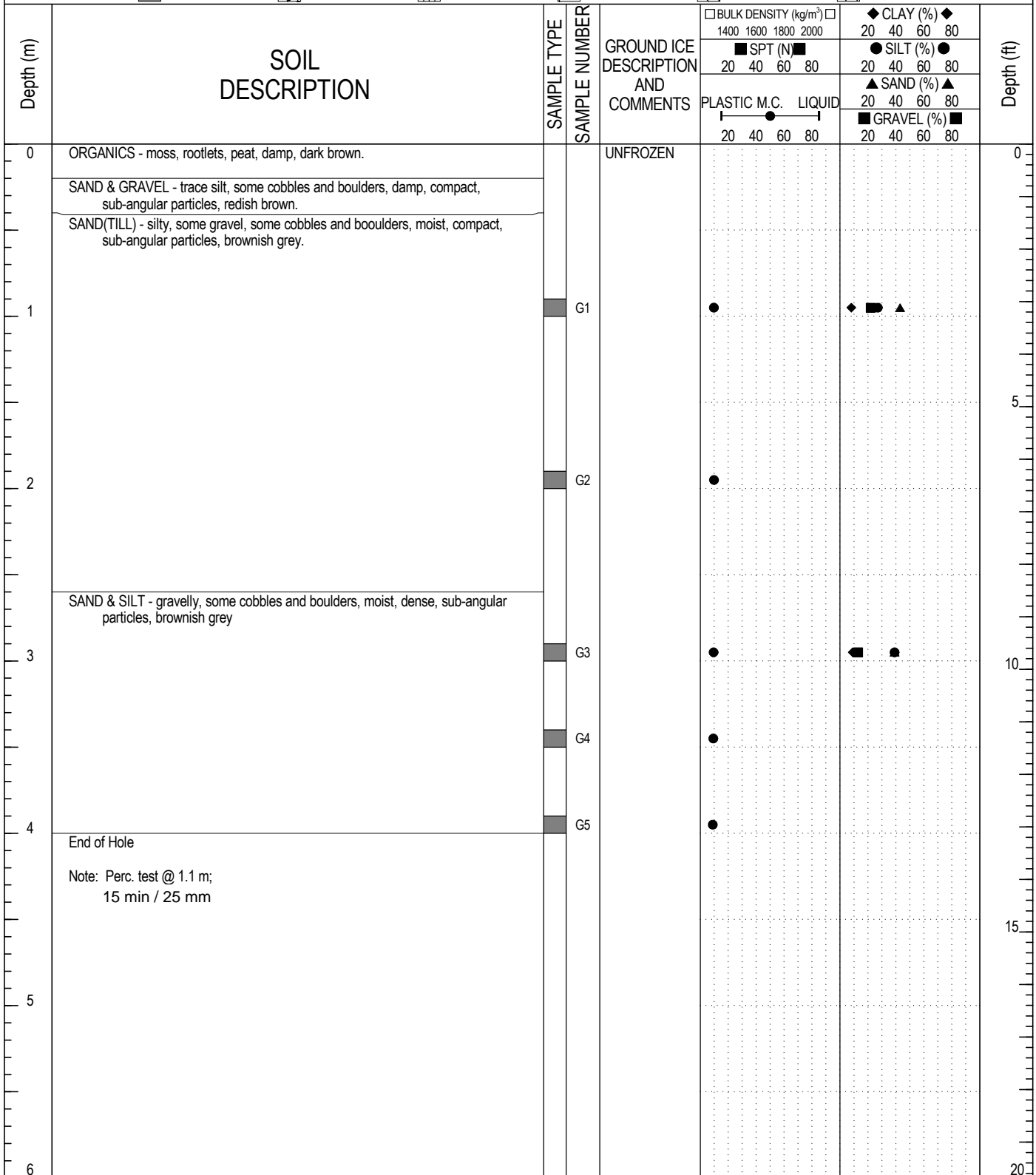
MAJOR DIVISION	GROUP SYMBOL	TYPICAL DESCRIPTION	LABORATORY CLASSIFICATION CRITERIA	
COARSE-GRAINED SOILS More than 50% retained on 75 µm sieve*	GRAVELS 50% or more of coarse fraction retained on 4.75 mm sieve	CLEAN GRAVELS	GW Well-graded gravels and gravel-sand mixtures, little or no fines	
		GRAVELS WITH FINES	GP Poorly graded gravels and gravel-sand mixtures, little or no fines	
		CLEAN SANDS	GM Silty gravels, gravel-sand-silt mixtures	
		SANDS WITH FINES	GC Clayey gravels, gravel-sand-clay mixtures	
	SANDS More than 50% of coarse fraction passes 4.75 mm sieve	CLEAN SANDS	SW Well-graded sands and gravelly sands, little or no fines	Classification on basis of percentage of fines GW, GP, SW, SP GM, GC, SM, SC Borderline Classification requiring use of dual symbols Less than 5% Pass 75 µm sieve More than 12% Pass 75 µm sieve 5% to 12% Pass 75 µm sieve
		SANDS WITH FINES	SM Silty sands, sand-silt mixtures	
		CLEAN SANDS	SP Poorly graded sands and gravelly sands, little or no fines	
		SANDS WITH FINES	SC Clayey sands, sand-clay mixtures	
		CLEAN SANDS	SW Well-graded sands and gravelly sands, little or no fines	
		SANDS WITH FINES	SM Silty sands, sand-silt mixtures	
FINE-GRAINED SOILS (by behavior) 50% or more passes 75 µm sieve*	SILTS	Liquid limit < 50 ML Inorganic silts, very fine sands, rock flour, silty or clayey fine sands of slight plasticity	For classification of fine-grained soils and fine fraction of coarse-grained soils. <div style="text-align: center;"> PLASTICITY CHART </div>	
		Liquid limit > 50 MH Inorganic silts, micaceous or diatomaceous fine sands or silts, elastic silts		
	CLAYS Above "A" line on plasticity chart negligible organic content	Liquid limit < 30 CL Inorganic clays of low plasticity, gravelly clays, sandy clays, silty clays, lean clays		
		Liquid limit 30-50 CI Inorganic clays of medium plasticity, silty clays		
		Liquid limit > 50 CH Inorganic clays of high plasticity, fat clays		
	ORGANIC SILTS AND CLAYS	Liquid limit < 50 OL Organic silts and organic silty clays of low plasticity		
		Liquid limit > 50 OH Organic clays of medium to high plasticity		
	HIGHLY ORGANIC SOILS	PT Peat and other highly organic soils		*Based on the material passing the 75 mm sieve Reference: ASTM Designation D2487, for identification procedure see D2488. USC as modified by PFRA


SOIL COMPONENTS					OVERSIZE MATERIAL	
FRACTION	SIEVE SIZE		DEFINING RANGES OF PERCENTAGE BY MASS OF MINOR COMPONENTS		Rounded or subrounded COBBLES 75 mm to 300 mm BOULDERS > 300 mm	
	PASSING	RETAINED	PERCENTAGE	DESCRIPTOR		
GRAVEL	coarse	75 mm	19 mm	>35 %	"and"	Not rounded ROCK FRAGMENTS >75 mm ROCKS > 0.76 cubic metre in volume
	fine	19 mm	4.75 mm	21 to 35 %	"y-adjective"	
SAND	coarse	4.75 mm	2.00 mm	10 to 20 %	"some"	
	medium	2.00 mm	425 µm	>0 to 10 %	"trace"	
	fine	425 µm	75 µm			
SILT (non plastic) or CLAY (plastic)	75 µm		as above but by behavior			



GEOTECH SUITABILITY ASSESSMENT	GOVERNMENT OF YUKON	TESTPIT NO: TP01
SAW MILL RD. SUB.	EXCAVATOR: KOMATSU PC200	PROJECT: W14103670-01
TESLIN, YUKON		

SAMPLE TYPE	<input type="checkbox"/> DISTURBED	<input type="checkbox"/> NO RECOVERY	<input type="checkbox"/> SPT	<input type="checkbox"/> A-CASING	<input type="checkbox"/> SHELBY TUBE	<input type="checkbox"/> CORE
BACKFILL TYPE	<input type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND

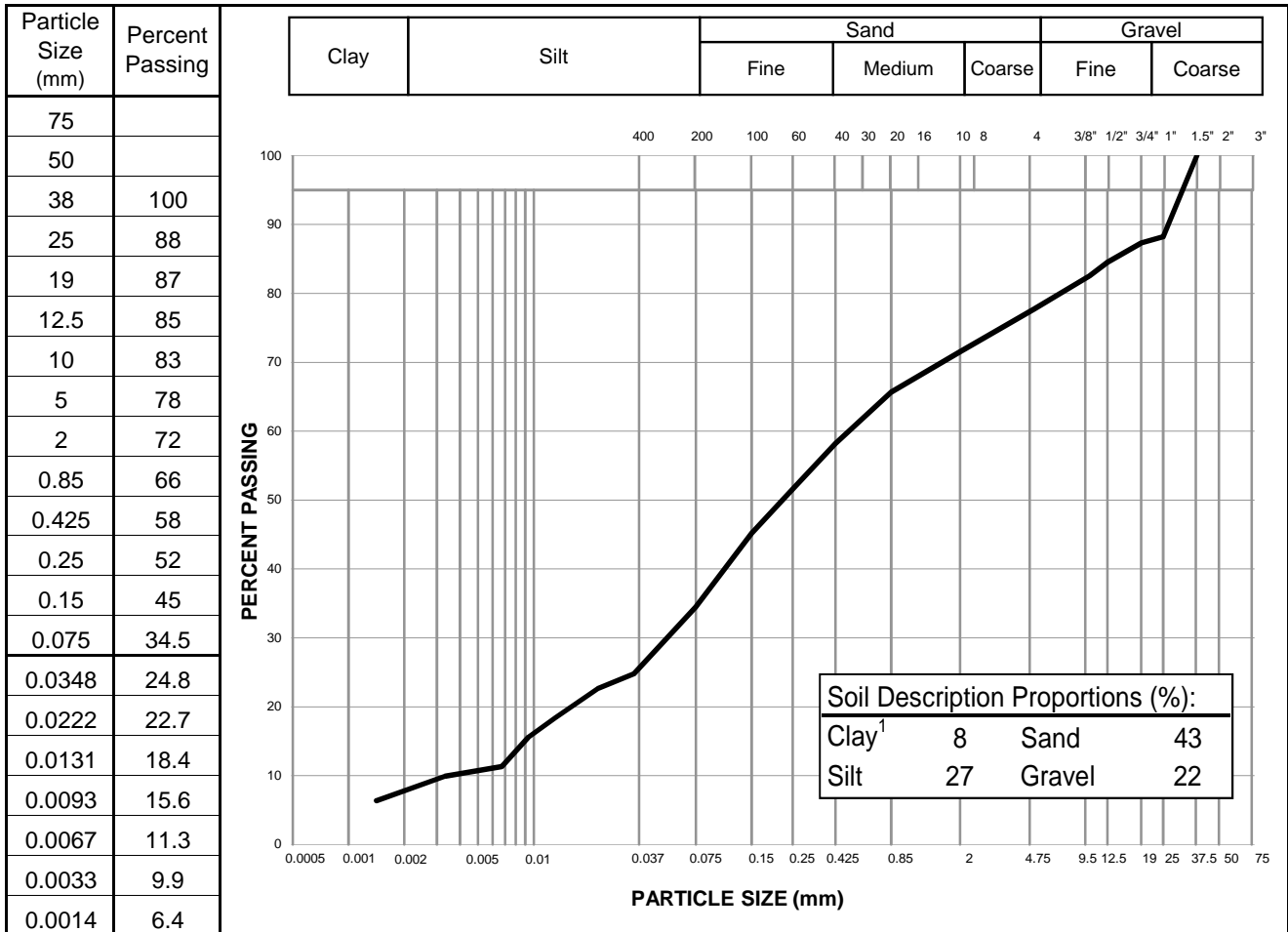


 TETRA TECH EBA	LOGGED BY: CPC	COMPLETION DEPTH: 4m
	REVIEWED BY:	COMPLETE: 15/08/06
	DRAWING NO:	Page 1 of 1

PARTICLE SIZE ANALYSIS REPORT

ASTM D422, C136 & C117

Project:	Geotechnical Suitability Investigation	Sample No.:	G01
Project No.:	W14103670-01	Material Type:	
Site:	Sawmill Subdivision, Teslin, YT	Sample Loc.:	TP01
Client:	YG - EMR Lands Management Branch	Sample Depth:	0.9 - 1.2 m
Client Rep.:	Kevin Fisher	Sampling Method:	Grab
Date Tested:	August 16, 2015	By:	AMT
		Date sampled:	August 6, 2015
Soil Description ² :	SAND - silty, gravelly, trace clay	Sampled By:	CPC
		USC Classification:	Cu: 149.5 Cc: 1.7
Moisture Content:	9.7%		



Notes: ¹ The upper clay size of 2 um, per the Canadian Foundation Engineering Manual
² The description is visually based & subject to EBA description protocols

Specification: _____

Remarks: _____

Reviewed By: P.Eng.

Data presented herein is for the sole use of the stipulated client. Tetra Tech EBA is not responsible, nor can be held liable, for use made of this report by any other party, with or without the knowledge of Tetra Tech EBA. The testing services reported herein have been performed to recognized industry standards, unless noted. No other warranty is made. These data do not include or represent any interpretation or opinion of specification compliance or material suitability. Should engineering interpretation be required, Tetra Tech EBA will provide it upon written request.

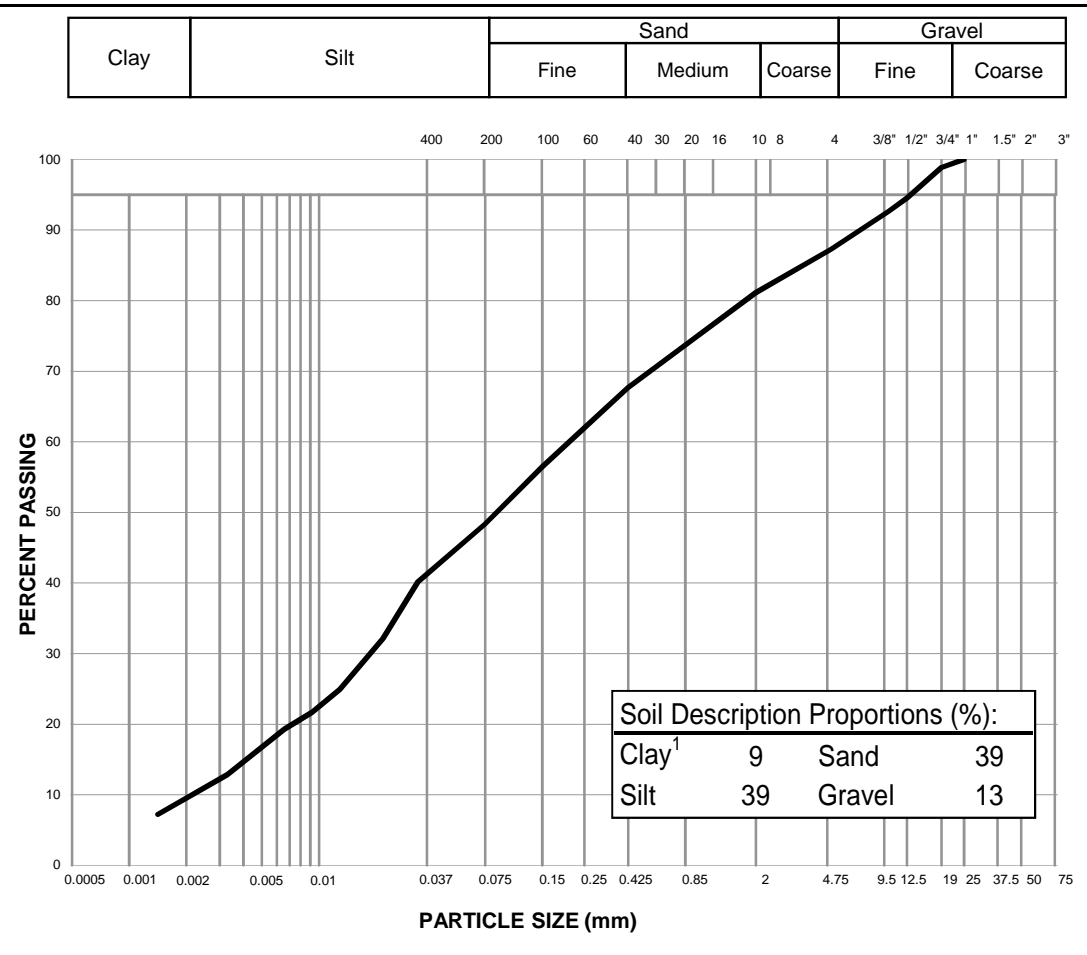


PARTICLE SIZE ANALYSIS REPORT

ASTM D422, C136 & C117

Project:	Geotechnical Suitability Investigation	Sample No.:	G03
Project No.:	W14103670-01	Material Type:	
Site:	Sawmill Subdivision, Teslin, YT	Sample Loc.:	TP01
Client:	YG - EMR Lands Management Branch	Sample Depth:	2.9 - 3.0 m
Client Rep.:	Kevin Fisher	Sampling Method:	Grab
Date Tested:	August 16, 2015	By:	AMT
		Date sampled:	August 6, 2015
Soil Description ² :	SAND and SILT - some gravel, trace clay	Sampled By:	CPC
Moisture Content:	9.5%	USC Classification:	Cu: 91.4 Cc: 0.7

Particle Size (mm)	Percent Passing
75	
50	
38	
25	100
19	99
12.5	95
10	93
5	87
2	81
0.85	74
0.425	68
0.25	62
0.15	56
0.075	48.4
0.0332	40.2
0.0217	32.1
0.0129	24.9
0.0092	21.7
0.0066	19.3
0.0033	12.9
0.0014	7.2



Notes: ¹ The upper clay size of 2 um, per the Canadian Foundation Engineering Manual
² The description is visually based & subject to EBA description protocols

Specification: _____

Remarks: _____

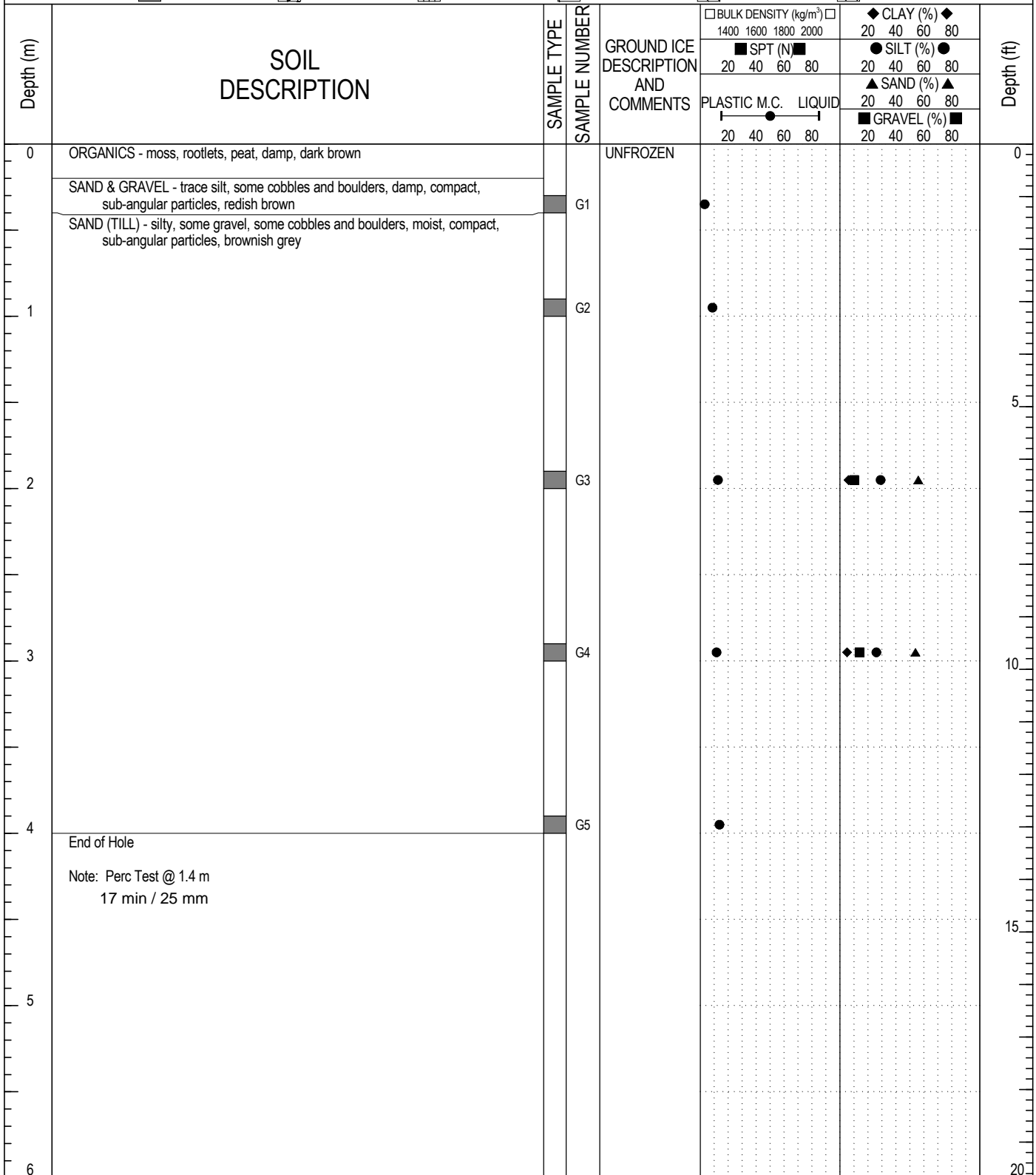
Reviewed By: Chad Caon P.Eng.

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GEOTECH SUITABILITY ASSESSMENT	GOVERNMENT OF YUKON	TESTPIT NO: TP02
SAW MILL RD. SUB.	EXCAVATOR: KOMATSU PC200	PROJECT: W14103670-01
TESLIN, YUKON		

SAMPLE TYPE	<input type="checkbox"/> DISTURBED	<input type="checkbox"/> NO RECOVERY	<input type="checkbox"/> SPT	<input type="checkbox"/> A-CASING	<input type="checkbox"/> SHELBY TUBE	<input type="checkbox"/> CORE
BACKFILL TYPE	<input type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND



LOGGED BY: CPC

COMPLETION DEPTH: 4m

REVIEWED BY:

COMPLETE: 15/08/06

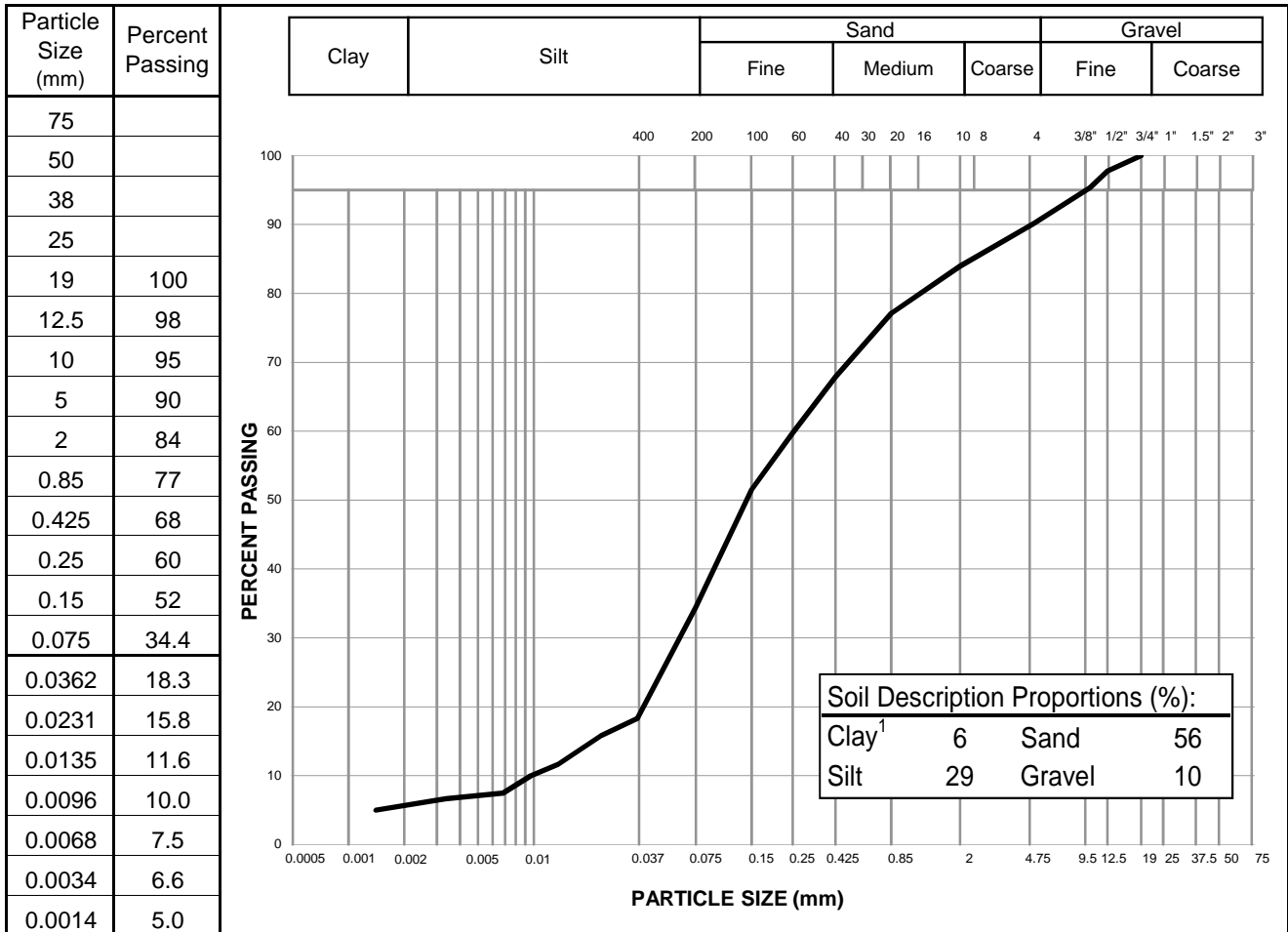
DRAWING NO:

Page 1 of 1

PARTICLE SIZE ANALYSIS REPORT

ASTM D422, C136 & C117

Project:	Geotechnical Suitability Investigation	Sample No.:	G03
Project No.:	W14103670-01	Material Type:	
Site:	Sawmill Subdivision, Teslin, YT	Sample Loc.:	TP02
Client:	YG - EMR Lands Management Branch	Sample Depth:	1.9 - 2.0 m
Client Rep.:	Kevin Fisher	Sampling Method:	Grab
Date Tested:	August 16, 2015	By:	AMT
		Date sampled:	August 6, 2015
Soil Description ² :	SAND - silty, trace gravel, trace clay	Sampled By:	CPC
		USC Classification:	Cu: 26.4 Cc: 1.7
Moisture Content:	12.6%		



Notes: ¹ The upper clay size of 2 um, per the Canadian Foundation Engineering Manual
² The description is visually based & subject to EBA description protocols

Specification: _____

Remarks: _____

Reviewed By: P.Eng.

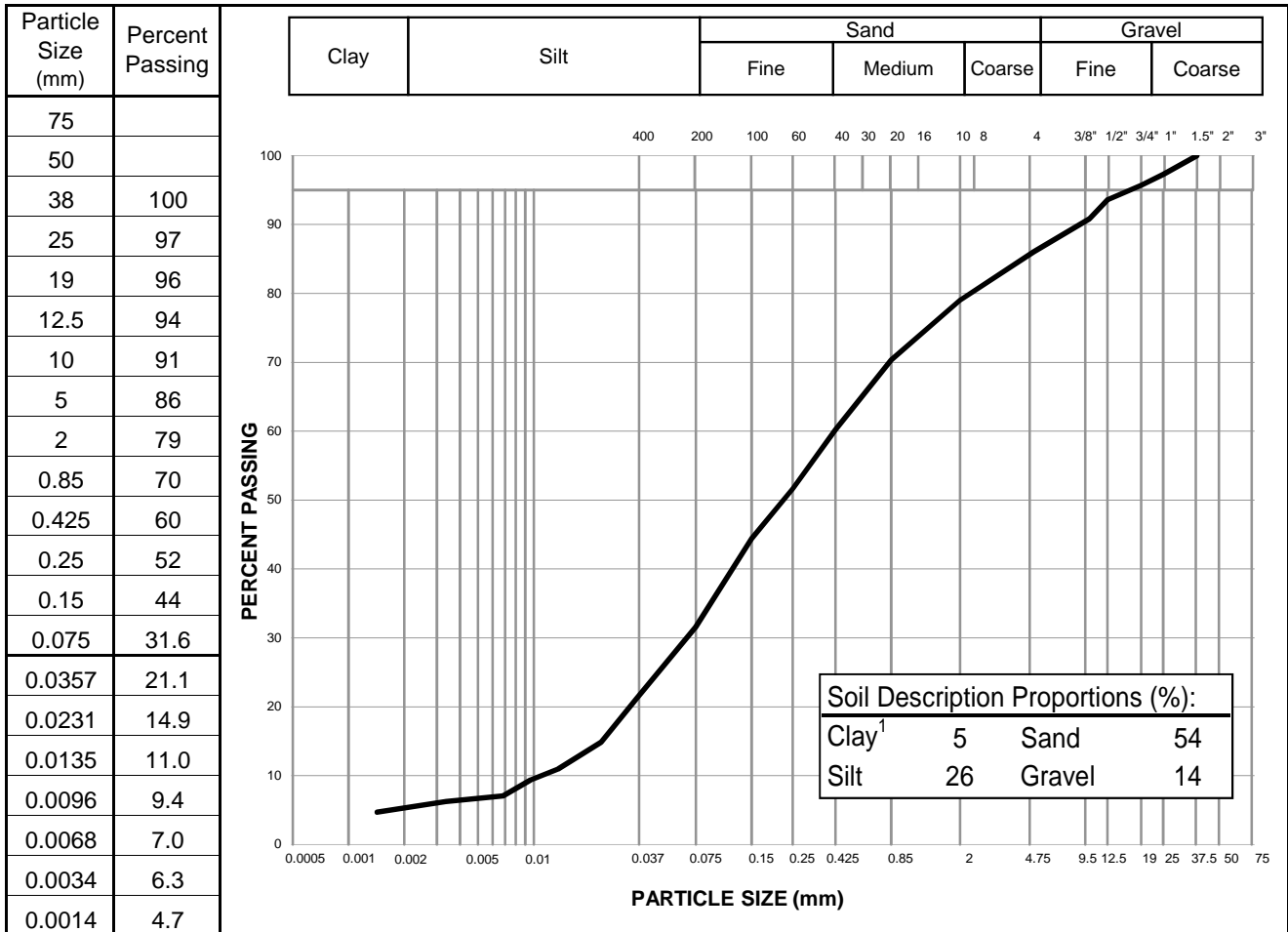
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PARTICLE SIZE ANALYSIS REPORT

ASTM D422, C136 & C117

Project:	Geotechnical Suitability Investigation	Sample No.:	G04
Project No.:	W14103670-01	Material Type:	
Site:	Sawmill Subdivision, Teslin, YT	Sample Loc.:	TP02
Client:	YG - EMR Lands Management Branch	Sample Depth:	2.9 - 3.0 m
Client Rep.:	Kevin Fisher	Sampling Method:	Grab
Date Tested:	August 16, 2015	By:	AMT
		Date sampled:	August 6, 2015
Soil Description ² :	SAND - silty, some gravel, trace clay	Sampled By:	CPC
		USC Classification:	Cu: 37.8 Cc: 1.0
Moisture Content:	11.6%		



Notes: ¹ The upper clay size of 2 um, per the Canadian Foundation Engineering Manual

² The description is visually based & subject to EBA description protocols

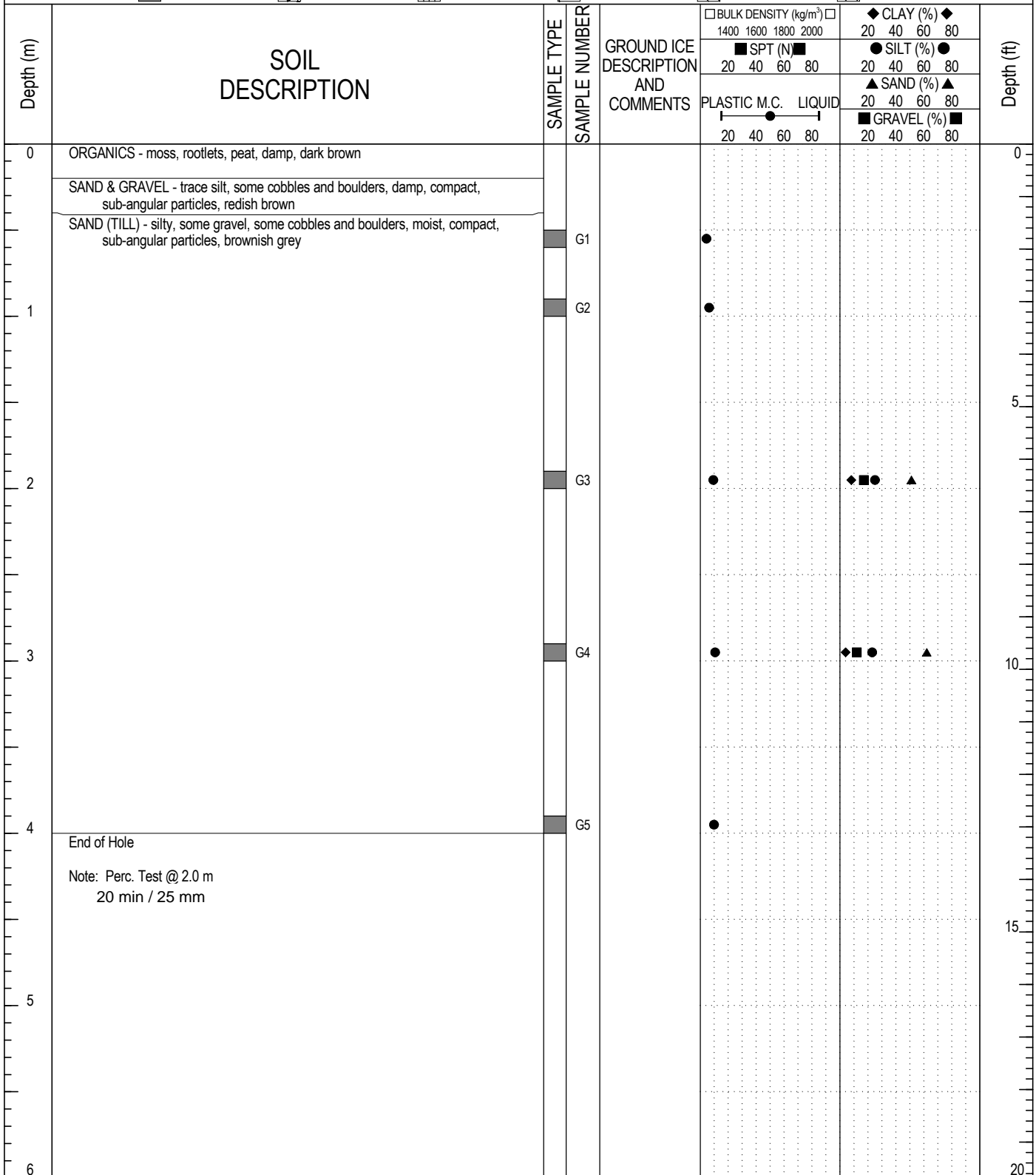
Specification: _____


Remarks: _____

Reviewed By: P.Eng.

GEOTECH SUITABILITY ASSESSMENT	GOVERNMENT OF YUKON	TESTPIT NO: TP03
SAW MILL RD. SUB.	EXCAVATOR: KOMATSU PC200	PROJECT: W14103670-01
TESLIN, YUKON		

SAMPLE TYPE	<input type="checkbox"/> DISTURBED	<input type="checkbox"/> NO RECOVERY	<input type="checkbox"/> SPT	<input type="checkbox"/> A-CASING	<input type="checkbox"/> SHELBY TUBE	<input type="checkbox"/> CORE
BACKFILL TYPE	<input type="checkbox"/> BENTONITE	<input type="checkbox"/> PEA GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> DRILL CUTTINGS	<input type="checkbox"/> SAND

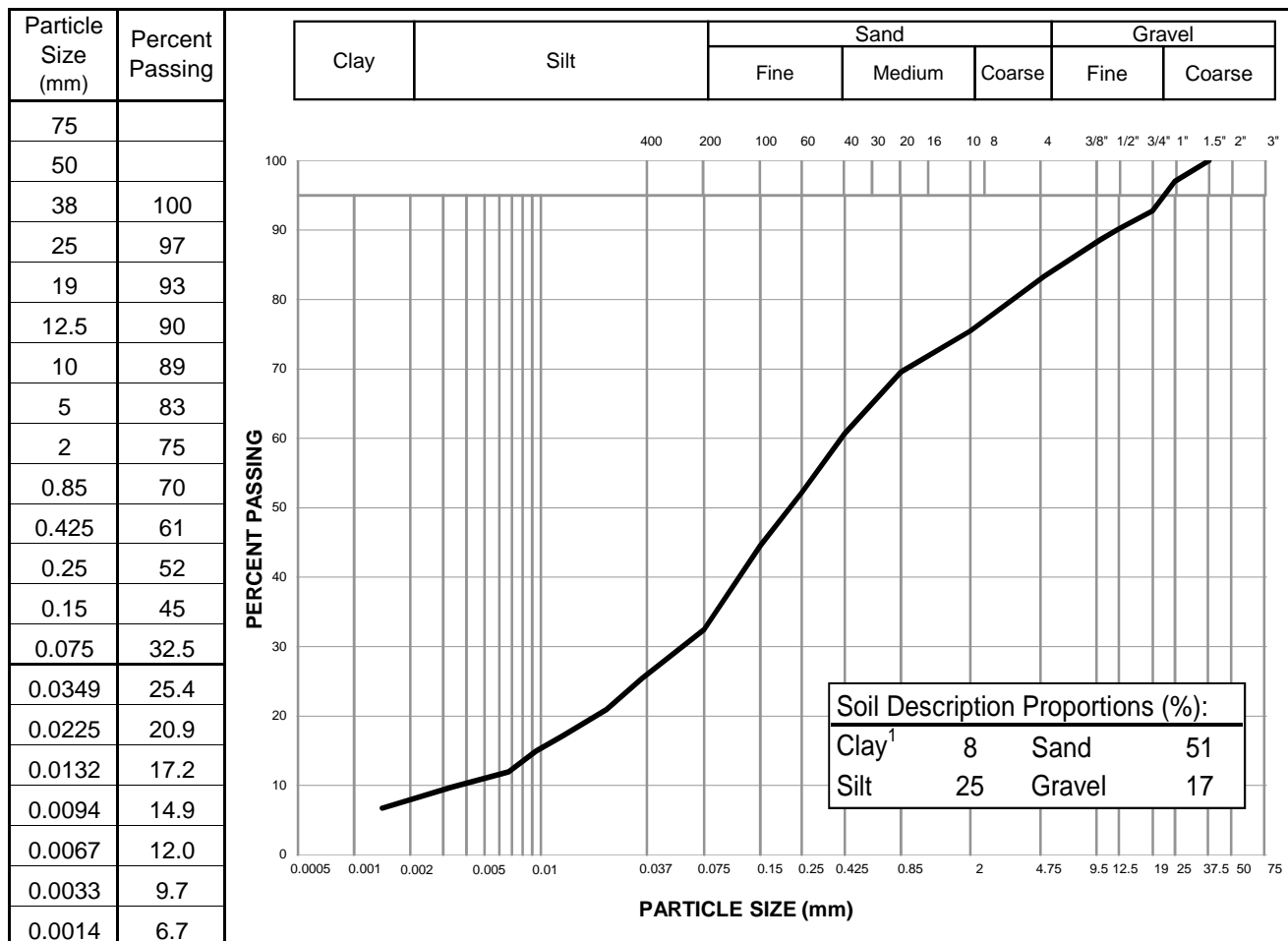


 TETRA TECH EBA	LOGGED BY: CPC	COMPLETION DEPTH: 4m
	REVIEWED BY:	COMPLETE: 15/08/06
	DRAWING NO:	Page 1 of 1

PARTICLE SIZE ANALYSIS REPORT

ASTM D422, C136 & C117

Project:	Geotechnical Suitability Investigation	Sample No.:	G02
Project No.:	W14103670-01	Material Type:	
Site:	Sawmill Subdivision, Teslin, YT	Sample Loc.:	TP03
Client:	YG - EMR Lands Management Branch	Sample Depth:	0.9 - 1.0 m
Client Rep.:	Kevin Fisher	Sampling Method:	Grab
Date Tested:	August 16, 2015	By:	AMT
Date Tested:		Date sampled:	August 6, 2015
Soil Description ² :	SAND - silty, some gravel, trace clay	Sampled By:	CPC
		USC Classification:	Cu: 109.5 Cc: 2.4
Moisture Content:	6.3%		



Notes: ¹ The upper clay size of 2 um, per the Canadian Foundation Engineering Manual

² The description is visually based & subject to EBA description protocols

Specification: _____

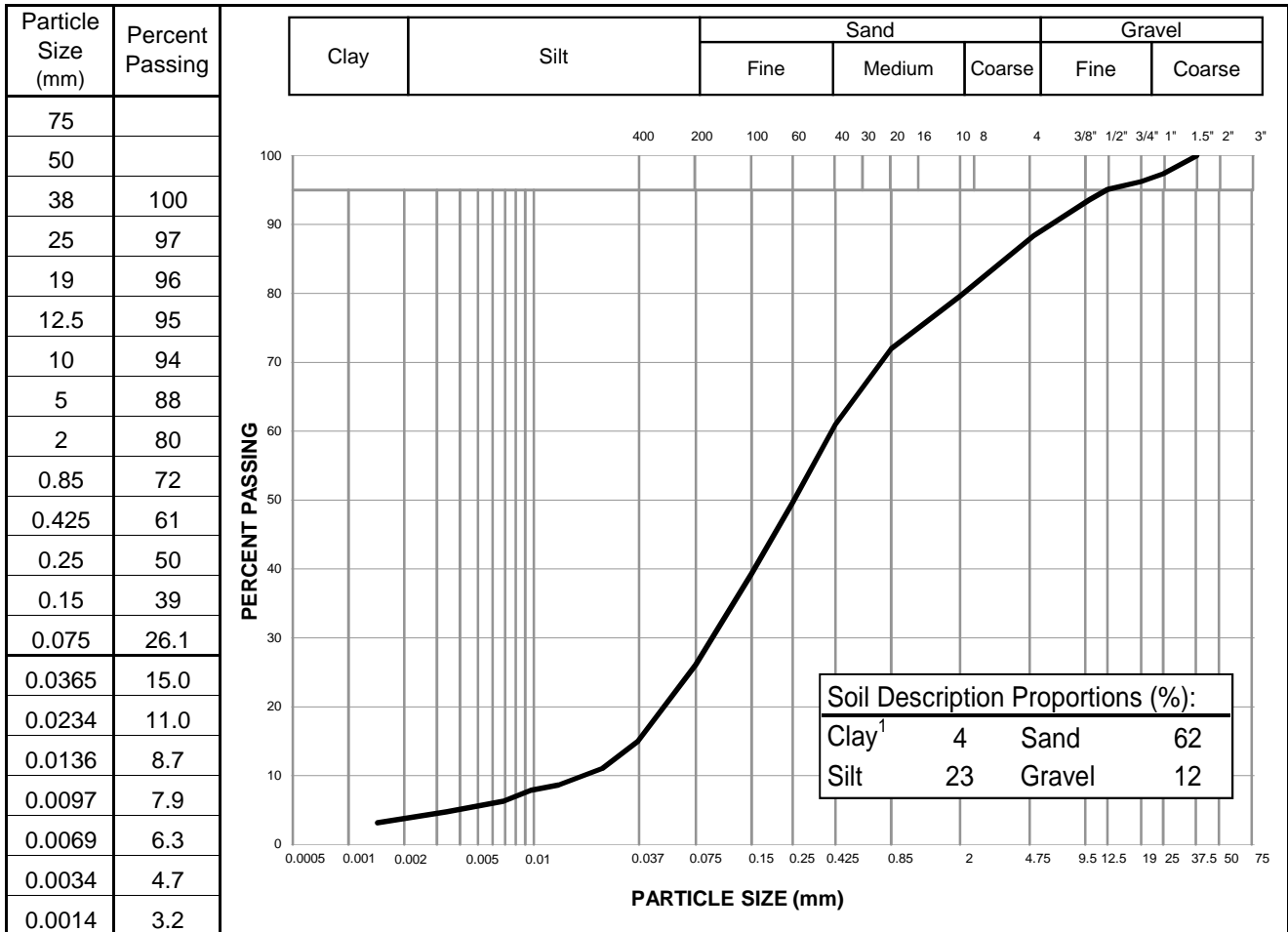
Remarks: _____

Reviewed By: Chad Coon P.Eng.

PARTICLE SIZE ANALYSIS REPORT

ASTM D422, C136 & C117

Project:	Geotechnical Suitability Investigation	Sample No.:	G03
Project No.:	W14103670-01	Material Type:	
Site:	Sawmill Subdivision, Teslin, YT	Sample Loc.:	TP03
Client:	YG - EMR Lands Management Branch	Sample Depth:	1.9 - 2.0 m
Client Rep.:	Kevin Fisher	Sampling Method:	Grab
Date Tested:	August 16, 2015	By:	AMT
		Date sampled:	August 6, 2015
Soil Description ² :	SAND - silty, some gravel, trace clay	Sampled By:	CPC
		USC Classification:	Cu: 21.4 Cc: 1.2
Moisture Content:	9.3%		



Notes: ¹ The upper clay size of 2 um, per the Canadian Foundation Engineering Manual
² The description is visually based & subject to EBA description protocols

Specification: _____

Remarks: _____

Reviewed By: P.Eng.

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