APPENDIX A

APPENDIX A GEOTECHNICAL TERMS AND CONDITIONS

GEOTECHNICAL REPORT – GENERAL CONDITIONS

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 EBA's Client. 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 EBA's Client unless otherwise authorized in writing by EBA. Any unauthorized use of the report is at the sole risk of the user.

This report is subject to copyright and shall not be reproduced either wholly or in part without the prior, written permission of EBA. Additional copies of the report, if required, may be obtained upon request.

2.0 ALTERNATE REPORT FORMAT

Where EBA submits both electronic file and hard copy versions of reports, drawings and other project-related documents and deliverables (collectively termed 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 EBA shall be deemed to be the original for the Project.

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

Electronic files submitted by EBA have been prepared and submitted using specific software and hardware systems. 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, 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. 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. 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 SURFACE WATER AND GROUNDWATER CONDITIONS

Surface and groundwater conditions mentioned in this report are those observed at the times recorded in the report. These conditions vary with geological detail between observation sites; annual, seasonal and special meteorologic conditions; and with development activity. Interpretation of water conditions from observations and records is judgemental and constitutes an evaluation of circumstances as influenced by geology, meteorology and development activity. Deviations from these observations may occur during the course of development activities.

8.0 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.

9.0 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.

10.0 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.

11.0 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.

12.0 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.

13.0 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.

14.0 SAMPLES

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.

APPENDIX B

APPENDIX B TESTHOLE LOGS AND LABORATORY DATA – OFF-SITE ENGINEERING

WHISTLE BEND SUBDIVISION

Testhole Logs From Previously Completed Projects

PROJECT PORTER CREEK LAGOON

TESTHOLE No. 1

SURFACE ELEVATION 2216

JOB No. E-1022

Depth ft.	SOIL DESCRIPTION
	PEAT - fibrous
2	SILT - medium brown - tr. to some clay - some oxides - seasonal frost to 3½'
4	
	- non plastic - dry to moist
6	- thinly laminated
8	
10	
12	
14	
	- thinly bedded with layers of silty clay - moist - soft
16	
18	
20	
	- wet - soft - non plastic
22	
24	
26	
	CLAY - medium grey - low to med. plastic - soft - moist to wet - thin sand lenses at 26'
28	
30	
32	END OF HOLE

Water Content % ●

10 20 30 40

Compressive Strength tsf.

1 2 3 4 5

Pocket Pentrometer △

Completion Depth 31½ Date 27-02-75

Depth to Water in Boring

Page 1 of 1

10 20 30 40 50

Penetration Resistance N ▲

Dwg. No.

PROJECT	PORTER CREEK LAGOON	TESTHOLE No.	2
SURFACE ELEVATION	2218	JOB No.	E-1022

Depth ft.	SOIL DESCRIPTION
	PEAT - fibrous
	SAND - medium to light brown
2	- silty
	- fine grained
	- uniform, dry
4	SILT - med. brown
	- trace of clay
	- trace of oxides
6	- seasonal frost to 3½'
	- dry to moist
	- thinly laminated
8	- oxide staining on laminations
	- moist
10	
	- thinly bedded with silty clay
12	
14	
16	
	- soft
18	
20	
	- some oxides
22	
	- med. grey
24	
26	
28	
	CLAY - med. grey
	- low plastic
30	- moist to wet
	- soft
32	
	END OF HOLE

Water Content % ●
10 20 30 40

Compressive Strength tsf.
1 2 3 4 5

Pocket Penetrometer △

10 20 30 40 50

Penetration Resistance N ▲

Completion Depth 31½ Date 27-02-75

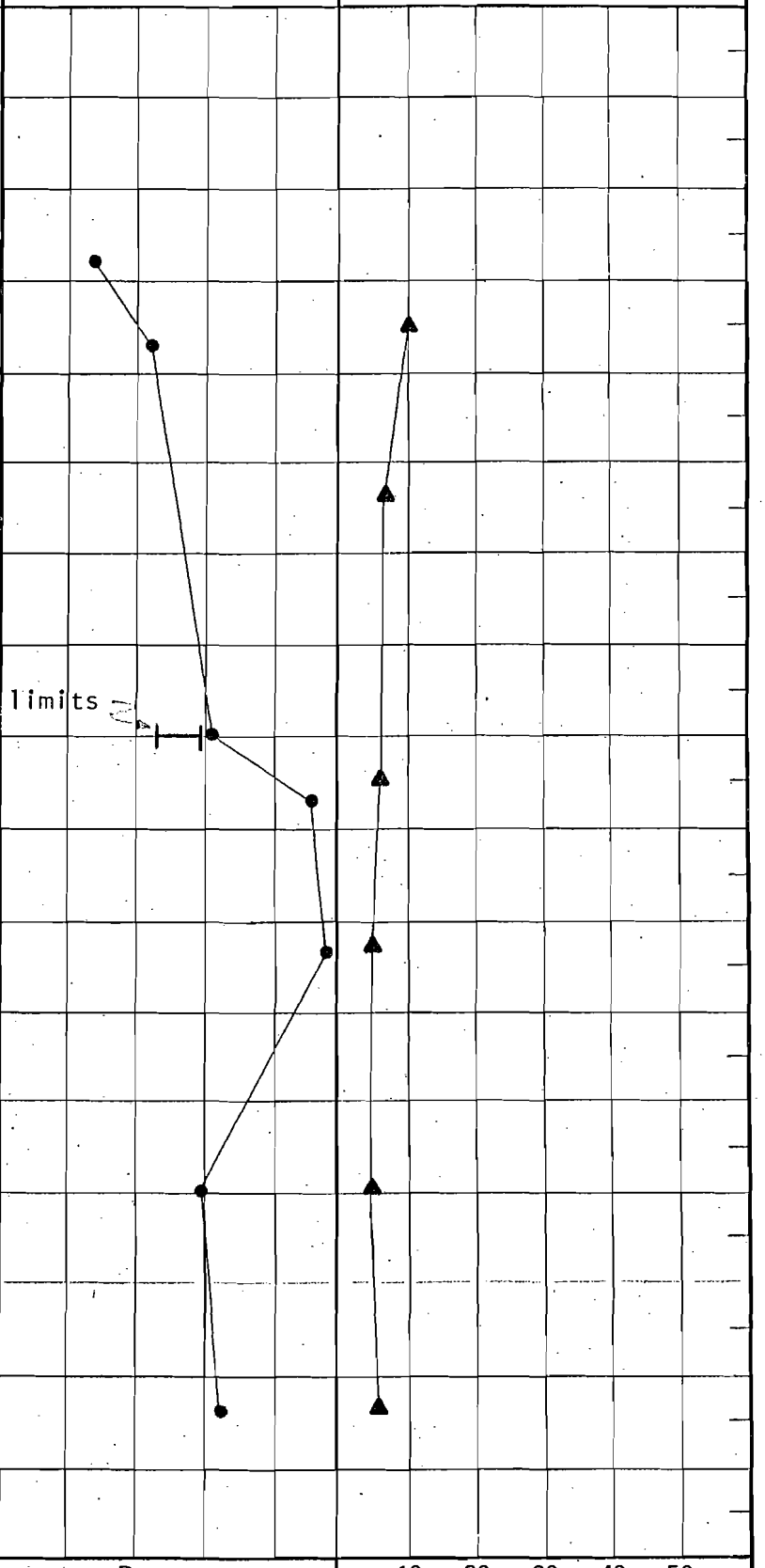
Depth to Water in Boring

Page 1 of 1

Dwg. No.

PROJECT	PORTER CREEK LAGOON	TESTHOLE No.	3
SURFACE ELEVATION	2219	JOB No.	E-1022

Depth ft.	SOIL DESCRIPTION
	PEAT - fibrous
2	SAND - medium brown - silty - fine grained, uniform - dry
4	
	SILT - med. brown - non plastic - thinly laminated - dry to moist - some oxides
6	
8	- seasonal frost to 4'
10	
12	
14	
16	- thinly bedded with layers of silty clay low to med. plastic
18	
20	- soft
22	
24	
26	
28	CLAY - med. grey, silty - low to medium plastic - moist to wet - soft
30	
32	END OF HOLE



Completion Depth 31½ Date 27-02-75

Depth to Water in Boring

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Dwg. No.

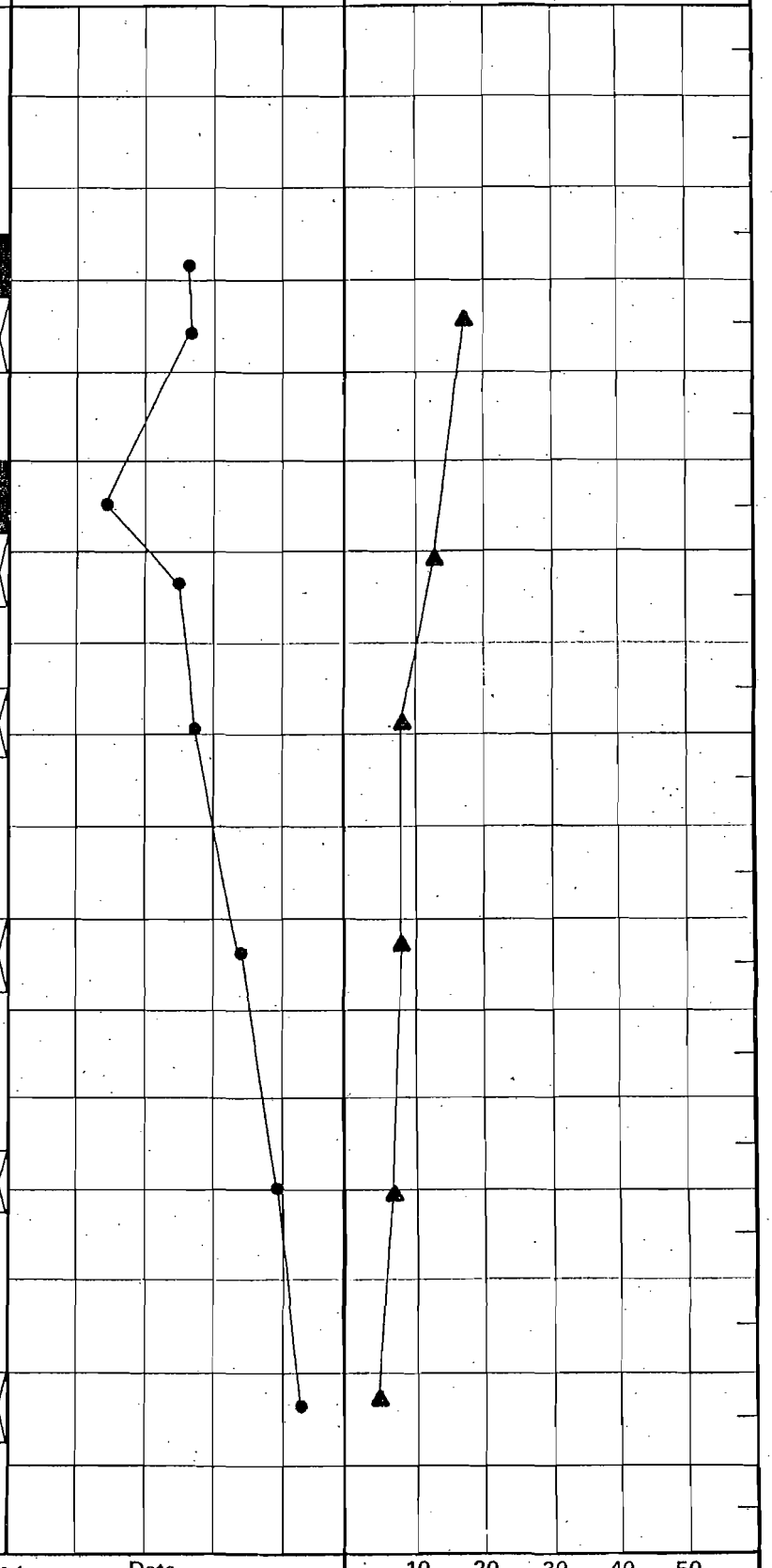
PROJECT PORTER EEK LAGOON

TESTHOLE No. 4

SURFACE ELEVATION 2214

JOB No. E-1022

Depth ft.	SOIL DESCRIPTION
	PEAT - fibrous
2	SILT - med. brown - non plastic - some oxides - dry to moist - seasonal frost to 4½ - some clay - thinly laminated
4	
6	
8	
10	
12	
14	
16	
18	
20	
22	
24	- clayey
26	
28	CLAY - medium grey - silty - low to med. plastic - moist to wet - soft
30	
32	END OF HOLE



Completion Depth 31½

Date 27-02-75

Depth to Water in Boring

Page 1 of 1

Dwg. No.

PORTER CREEK SEWAGE LAGOON	STANLEY ASSOCIATES	TEST PIT NO: 4904-01
PROPOSED SLUDGE LAGOON AREA	CASE 670 RUBBER TIRED BACKHOE	PROJECT NO: 0201-4904
	UTM ZONE: 8 N6738800 E493000	ELEVATION:

SAMPLE TYPE ■ GRAB ⊘ NO RECOVERY ▯▯ SHELBY TUBE

Depth(m)	SAMPLE TYPE	RUN NO	USC	SOIL SYMBOL	SOIL DESCRIPTION
0.0					ORGANICS(OL)–silty, fibrous, black
					SAND(SP)–trace of silt, medium grained, uniform, moist, loose (est.), dark orangey brown
1.0					SILT(ML)–clayey, trace of fine sand, horizontal and parallel laminae, 2 mm thick, moist, dense, medium plastic, light olive
2.0					END OF TEST PIT 2.4 m
3.0					WATER TABLE NOT ENCOUNTERED
4.0					
5.0					
6.0					

PLASTIC M.C. LIQUID (10 20 30 40)

■ PERCENT GRAVEL ■ (20 40 60 80)
● PERCENT SAND ● (20 40 60 80)
▲ PERCENT SILT OR FINES ▲ (20 40 60 80)
◆ PERCENT CLAY ◆ (20 40 60 80)

ELEVATION(m): 0.0, -2.0, -4.0, -6.0

EBA Engineering Consultants Ltd. Whitehorse, Yukon	LOGGED BY: MCP	COMPLETION DEPTH: 2.3 m
	REVIEWED BY: JRT	COMPLETE: 88-09-07
	Fig. No: 4904-01	Page 1 of 1

08/07/15 08:24AM (YUKON-T6)

PORTER CREEK SEWAGE LAGOON	STANLEY ASSOCIATES	TEST PIT NO: 4904-02
PROPOSED SLUDGE LAGOON AREA	CASE 670 RUBBER TIRED BACKHOE	PROJECT NO: 0201-4904
	UTM ZONE: 8 N6738800 E493000	ELEVATION:

SAMPLE TYPE ■ GRAB ⊘ NO RECOVERY ▯▯ SHELBY TUBE

Depth(m)	SAMPLE TYPE	RUN NO	USC	SOIL SYMBOL	SOIL DESCRIPTION
0.0					ORGANICS(OL)–silty, fibrous with rootlets throughout, black
					SAND(SP)–trace of silt, medium grained, uniform, moist, loose (est.), dark orangey brown
1.0					SILT(ML)–clayey, trace of fine sand, horizontal and parallel laminae, 2 mm thick, moist, dense, medium plastic, light olive
2.0					
					END OF TEST PIT 2.5 m
3.0					WATER TABLE NOT ENCOUNTERED
4.0					
5.0					
6.0					

PLASTIC M.C. LIQUID
10 20 30 40

■ PERCENT GRAVEL ■
20 40 60 80

● PERCENT SAND ●
20 40 60 80

▲ PERCENT SILT OR FINES ▲
20 40 60 80

◆ PERCENT CLAY ◆
20 40 60 80

ELEVATION(m)
0.0
-2.0
-4.0
-6.0

EBA Engineering Consultants Ltd. Whitehorse, Yukon	LOGGED BY: MCP	COMPLETION DEPTH: 2.5 m
	REVIEWED BY: JRT	COMPLETE: 88-09-07
	Fig. No: 4904-02	Page 1 of 1

08/07/15 08:24AM (YUKON-T6)

PORTER CREEK SEWAGE LAGOON	STANLEY ASSOCIATES	TEST PIT NO: 4904-03
PROPOSED SLUDGE LAGOON AREA	CASE 670 RUBBER TIRED BACKHOE	PROJECT NO: 0201-4904
	UTM ZONE: 8 N6738800 E493000	ELEVATION:

SAMPLE TYPE ■ GRAB ⊘ NO RECOVERY ▯▯ SHELBY TUBE

Depth(m)	SAMPLE TYPE	RUN NO	USC	SOIL SYMBOL	SOIL DESCRIPTION
0.0					ORGANICS(OL)–silty, fibrous, rootlets throughout, black
					SILT(ML)–trace of fine sand, trace of volcanic ash on top of unit, damp, non plastic, light brown
1.0					SAND(SP)–trace of silt, medium grained, uniform, moist, loose (est.), dark orangey brown
					SILT(ML)–clayey, trace of fine sand, horizontal and parallel laminae, 2 mm thick, moist, dense, medium plastic, light olive
2.0					
					END OF TEST PIT 2.5 m
3.0					WATER TABLE NOT ENCOUNTERED
4.0					
5.0					
6.0					

PLASTIC M.C. LIQUID
10 20 30 40

■ PERCENT GRAVEL ■ 20 40 60 80
● PERCENT SAND ● 20 40 60 80
▲ PERCENT SILT OR FINES ▲ 20 40 60 80
◆ PERCENT CLAY ◆ 20 40 60 80

ELEVATION(m): 0.0, -2.0, -4.0, -6.0

EBA Engineering Consultants Ltd. Whitehorse, Yukon	LOGGED BY: MCP	COMPLETION DEPTH: 2.5 m
	REVIEWED BY: JRT	COMPLETE: 88-09-07
	Fig. No: 4904-03	Page 1 of 1

08/07/15 08:24AM (YUKON-T6)

PORTER CREEK TRANSFER PIPELINE	CLIENT: STANLEY ASSOCIATES ENGINEERING	BOREHOLE NO: 12025-BH01
WHITEHORSE SEWAGE TREATMENT FACILITY	DRILL: CME-75 C/W SOLID SHAFT AUGERS	PROJECT NO: 0201-95-12025
WHITEHORSE, YUKON	UTM ZONE: 8 N6738330 E493070	ELEVATION: 675 m

SAMPLE TYPE: GRAB SAMPLE | NO RECOVERY | STANDARD PEN. | 75 mm SPOON | CRREL BARREL

DCPT (blows/300 mm): 6 12 18 24

PLASTIC M.C. LIQUID: 10 20 30 40

PERCENT GRAVEL: 20 40 60 80

PERCENT SAND: 20 40 60 80

PERCENT SILT OR FINES: 20 40 60 80

PERCENT CLAY: 20 40 60 80

Depth(m)	SAMPLE TYPE	SPT(N)	SOIL DESCRIPTION	ELEVATION(m)
0.0			SILT – some clay, trace of sand; non-plastic; firm; moist; light grey	675.0
1.0			SILT AND CLAY – low plastic; firm; moist; light grey	
2.0			– moisture content increases with depth	673.0
3.0			– below 3.0 m; moist to wet; medium grey	
4.0				671.0
5.0			END OF BOREHOLE @ 4.5 m – no water table encountered – borehole located at approximately Station 10+450 –Elevation is estimated	
6.0				669.0
7.0				
8.0				667.0

EBA Engineering Consultants Ltd.
Whitehorse, Yukon

LOGGED BY: JSB	COMPLETION DEPTH: 4.5 m
REVIEWED BY: CRH	COMPLETE: 19/10/95
	Page 1 of 1

08/07/15 08:37AM (YUKON-7)

PORTER CREEK TRANSFER PIPELINE	CLIENT: STANLEY ASSOCIATES ENGINEERING	BOREHOLE NO: 12025-BH02
WHITEHORSE SEWAGE TREATMENT FACILITY	DRILL: CME-75 C/W SOLID SHAFT AUGERS	PROJECT NO: 0201-95-12025
WHITEHORSE, YUKON	UTM ZONE: 8 N6738610 E493390	ELEVATION: 679 m

SAMPLE TYPE ■ GRAB SAMPLE ⊘ NO RECOVERY ⊠ STANDARD PEN. ▤ 75 mm SPOON ▥ CRREL BARREL

Depth(m)	SAMPLE TYPE	RUN NO	SPT(N)	USC	SOIL SYMBOL	SOIL DESCRIPTION	Depth(ft)
0.0						SAND – trace of silt; fine grained; loose; damp; medium brown	0.0
1.0							2.0
		1				– colour changes to a medium grey below 1.5 m	4.0
2.0							6.0
						– silt content increases to some below 2.5 m	8.0
3.0		2					10.0
4.0						SILT – clayey; low plastic; firm; moist; medium grey	12.0
		3					14.0
5.0							16.0
							18.0
6.0		4				– becomes moist to wet; more clayey with depth	20.0
7.0							22.0
							24.0
		5					26.0
8.0						END OF BOREHOLE @ 7.8 m – no water encountered – sloughing from start of drilling to 4.0 m – Borehole located at approximately Station 10+850 – elevation is estimated	28.0
9.0							30.0
							32.0
10.0							34.0

■ SPT PENETRATION ■ 40 80 120 160

PLASTIC M.C. LIQUID 20 40 60 80

■ PERCENT GRAVEL ■ 20 40 60 80

● PERCENT SAND ● 20 40 60 80

▲ PERCENT SILT OR FINES ▲ 20 40 60 80

◆ PERCENT CLAY ◆ 20 40 60 80

EBA Engineering Consultants Ltd. Whitehorse, Yukon	LOGGED BY: JSB REVIEWED BY: CRH	COMPLETION DEPTH: 7.8 m COMPLETE: 19/10/95
		Page 1 of 1

08/07/15 08:37AM (YUKON10)

PORTER CREEK TRANSFER PIPELINE	CLIENT: STANLEY ASSOCIATES ENGINEERING	BOREHOLE NO: 12025-BH03
WHITEHORSE SEWAGE TREATMENT FACILITY	DRILL: CME-75 C/W SOLID SHAFT AUGERS	PROJECT NO: 0201-95-12025
WHITEHORSE, YUKON	UTM ZONE: 8 N6938720 E493590	ELEVATION: 675 m

SAMPLE TYPE ■ GRAB SAMPLE ⊘ NO RECOVERY ⊠ STANDARD PEN. ▤ 75 mm SPOON ▥ CRREL BARREL

Depth(m)	SAMPLE TYPE	SPT(N)	SOIL DESCRIPTION	ELEVATION(m)
0.0			SAND – trace of silt; medium grained; soft; damp to moist; light reddish brown	675.0
1.0			SILT – trace to some clay, trace of sand; non-plastic; fine grained; soft; damp; light grey	
	■		– clay content increases with depth	
2.0				673.0
			– becomes moist below 2.6 m	
3.0	■		– some clay to clayey by 3.0 m	
4.0			SILT AND CLAY – low plastic; moist to wet; firm; olive grey	671.0
	■		– wet by 4.5 m	
5.0			END OF BOREHOLE @ 4.6 m – no water encountered – little to no sloughing – Borehole located at approximately Station 11+100 – Elevation is estimated	
6.0				669.0
7.0				
8.0				667.0
9.0				

■ STANDARD PENETRATION (N) ■ 20 40 60 80
◆ DCPT ◆ 10 20 30 40
PLASTIC M.C. LIQUID 10 20 30 40

■ PERCENT GRAVEL ■ 20 40 60 80
● PERCENT SAND ● 20 40 60 80
▲ PERCENT SILT OR FINES ▲ 20 40 60 80
◆ PERCENT CLAY ◆ 20 40 60 80

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LOGGED BY: JSB	COMPLETION DEPTH: 4.6 m
REVIEWED BY: CRH	COMPLETE: 19/10/95
	Page 1 of 1

08/07/15 08:38AM (YUKON-8)

PORTER CREEK TRANSFER PIPELINE	CLIENT: STANLEY ASSOCIATES ENGINEERING	BOREHOLE NO: 12025-BH04
WHITEHORSE SEWAGE TREATMENT FACILITY	DRILL: CME-75 C/W HOLLOW STEM AUGERS	PROJECT NO: 0201-95-12025
WHITEHORSE, YUKON	UTM ZONE: 8 N6738960 E493630	ELEVATION: 670 m

SAMPLE TYPE ■ GRAB SAMPLE ⊘ NO RECOVERY ⊠ STANDARD PEN. ▤ 75 mm SPOON ▥ CRREL BARREL ◧ CORE

Depth(m)	SAMPLE TYPE	RUN NO	SPT(N)	USC	SOIL SYMBOL	SOIL DESCRIPTION	ELEVATION(m)
0.0						SAND – trace of silt	670.0
1.0						SILT – trace to some clay, low plastic; fine grained; very stiff; moist; grey	
2.0	⊠	1	18			– occasional zones of non-plastic silt – clay content increases with depth – colour becomes a darker grey below 2.5 m	668.0
3.0	⊠	2	19			– less sand below 2.5 m	
4.0						SILT AND CLAY – medium plastic; moist to wet; stiff; grey	666.0
5.0	⊠	3	10				
6.0	⊠	4	9				664.0
7.0							
8.0	⊠	5	13			– becomes highly plastic below 8.2 m	662.0
9.0	⊠	6	14				
10.0						– becomes blueish grey and firm below 10.0 m	660.0
11.0	⊠	7	7				
12.0	⊠	8	7				658.0
13.0						END OF BOREHOLE @ 12.5 m – no water table encountered – Borehole is located approximately at Station 11+325 – Elevation is estimated	
14.0							656.0
15.0							

■ STANDARD PENETRATION ■ 20 40 60 80
▲ DCPT ▲ 20 40 60 80
PLASTIC M.C. LIQUID 10 20 30 40

■ PERCENT GRAVEL ■ 20 40 60 80
● PERCENT SAND ● 20 40 60 80
▲ PERCENT SILT OR FINES ▲ 20 40 60 80
◆ PERCENT CLAY ◆ 20 40 60 80

EBA Engineering Consultants Ltd.
Whitehorse, Yukon

LOGGED BY: JSB
REVIEWED BY: CRH

COMPLETION DEPTH: 12.5 m
COMPLETE: 19/10/95

08/07/15 08:38AM (YUKON15)

PORTER CREEK TRANSFER PIPELINE	CLIENT: STANLEY ASSOCIATES ENGINEERING	BOREHOLE NO: 12025-BH05
WHITEHORSE SEWAGE TREATMENT FACILITY	DRILL: CME-75 C/W HOLLOW STEM AUGERS	PROJECT NO: 0201-95-12025
WHITEHORSE, YUKON	UTM ZONE: 8 N6739120 E493660	ELEVATION: 645 m

SAMPLE TYPE ■ GRAB ⊘ NO RECOVERY ⊠ STANDARD PEN. ☰ 75 mm SPOON ▯▯ CRREL BARREL ▮ HQ CORE

Depth(m)	SAMPLE TYPE	RUN NO	SPT(N)	USC	SOIL SYMBOL	SOIL DESCRIPTION
0.0	■	1				SAND – silty; fine grained, uniform sand; soft; dry; yellowish brown
1.0						
2.0	⊠	2	11			SAND – gravelly, trace to some silt; fine to medium sand; fine to medium grained subrounded gravel; loose; dry; medium to dark brown
3.0	■	3				
4.0						– becomes compact below 4.0 m
5.0	⊠	4	17			
6.0	⊠	5	17			
7.0						
8.0	⊠	6	38			– becomes dense below 7.5 m
9.0	⊠	7	40			SAND AND GRAVEL – trace of silt; well graded sand; well graded sub-rounded gravels; dense; dry; light grey
10.0						
11.0	▯▯	8	76			– drilling becomes easier below 8.8 m
12.0		9				– grinding and fairly hard drilling below 12.3 m
13.0						
14.0	▯▯	10	41			– drilling becomes easier below 12.5 m
15.0 ▼	▯▯	11	30			– less gravel, becomes fine to medium grained
16.0						– water table at 15.0 m
17.0						
18.0	▯▯	12	69			SAND – some silt, trace of gravel; medium to coarse grained sand; fine to medium grained sub-rounded gravel; dense; saturated; medium greyish brown
19.0						
20.0	⊠	13				
21.0	⊠	14	33			
22.0						
23.0	⊠	15				
24.0						– little to no gravel below 24.0 m
25.0	⊠	16	42			– becomes siltier below 24.0 m
26.0	⊠	17	11			– sand becomes finer grained below 24.0 m
27.0						
28.0	⊠	18	18			– sand becomed medium to coarse grained below 27.0 m
29.0	⊠	19	13			END OF BOREHOLE @ 29.2 m
30.0						– water table at 15.0 m
31.0						– Borehole located at approximately Station 11+480
32.0						– Elevation is estimated
33.0						
34.0						
35.0						

■ STANDARD PENETRATION ■ 20 40 60 80

PLASTIC M.C. LIQUID 10 20 30 40

■ PERCENT GRAVEL ■ 20 40 60 80

● PERCENT SAND ● 20 40 60 80

▲ PERCENT SILT OR FINES ▲ 20 40 60 80

◆ PERCENT CLAY ◆ 20 40 60 80

Depth(ft): 0.0 2.0 4.0 6.0 8.0 10.0 12.0 14.0 16.0 18.0 20.0 22.0 24.0 26.0 28.0 30.0 32.0 34.0 36.0 38.0 40.0 42.0 44.0 46.0 48.0 50.0 52.0 54.0 56.0 58.0 60.0 62.0 64.0 66.0 68.0 70.0 72.0 74.0 76.0 78.0 80.0 82.0 84.0 86.0 88.0 90.0 92.0 94.0 96.0 98.0 100.0 102.0 104.0 106.0 108.0 110.0 112.0 114.0

EBA Engineering Consultants Ltd.
Whitehorse, Yukon

LOGGED BY: JSB	COMPLETION DEPTH: 29.2 m
REVIEWED BY: CRH	COMPLETE: 19/10/95
	Page 1 of 1

08/07/15 08:38AM (YUKON34)

PORTER CREEK TRANSFER PIPELINE	CLIENT: STANLEY ASSOCIATES ENGINEERING	BOREHOLE NO: 12025-BH06
WHITEHORSE SEWAGE TREATMENT FACILITY	DRILL: CME-75 C/W SOLID SHAFT AUGERS	PROJECT NO: 0201-95-12025
WHITEHORSE, YUKON	UTM ZONE: 8 N6739020 E493600	ELEVATION: 655 m

SAMPLE TYPE ■ GRAB SAMPLE ⊘ NO RECOVERY ⊠ STANDARD PEN. ▤ 75 mm SPOON ▥ CRREL BARREL

Depth(m)	SAMPLE TYPE	SPT(N)	USC	SOIL SYMBOL	SOIL DESCRIPTION	ELEVATION(m)
0.0					SILT – some sand; fine grained; uniform sand; soft; dry; light yellowish brown	655.0
1.0	■					
2.0					– drilling becomes a little harder below 1.8 m	653.0
					SILT – clayey; low plastic; damp; stiff; grey	
3.0	■				– clay content increases with depth	
4.0						651.0
5.0	■					
6.0	■					649.0
					– drilling becomes easy below 6.5 m	
7.0	■					
8.0					END OF BOREHOLE @ 7.6 m – no water table encountered – Borehole located at approximately Station 11+400 – Elevation is estimated	647.0
9.0						
10.0						645.0

PLASTIC M.C. LIQUID (10 20 30 40)

■ PERCENT GRAVEL ■ (20 40 60 80)

● PERCENT SAND ● (20 40 60 80)

▲ PERCENT SILT OR FINES ▲ (20 40 60 80)

◆ PERCENT CLAY ◆ (20 40 60 80)

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Whitehorse, Yukon

LOGGED BY: JSB
REVIEWED BY: CRH

COMPLETION DEPTH: 7.6 m
COMPLETE: 24/10/95

08/07/15 08:38AM (YUKON-9)

RANGEWAY ROAD CONSTRUCTION	CLIENT: DAVID NAIRNE & ASSOCIATES	BOREHOLE NO: 11731-01
GEOTECHNICAL EVALUATION	DRILL: TRUCK MOUNTED CME-75	PROJECT NO: 0201-11731
WHITEHORSE, YUKON	UTM ZONE: 8 N6737500 E493700	ELEVATION: 696.6 m

SAMPLE TYPE: GRAB | NO RECOVERY | STANDARD PEN. | 75 mm SPOON | CRREL BARREL | DISTURBED

Depth(m)	SAMPLE TYPE	RUN NO	SOIL DESCRIPTION	PLASTIC / M.C. / LIQUID	PERCENT GRAVEL / SAND / SILT OR FINES / CLAY	ELEVATION(m)
0.0				10 20 30 40	20 40 60 80	
		1	(SURFACING GRAVEL) SAND – silty, some gravel, fine grained, seasonally frozen, olive brown			
		2	GRAVEL – sandy, some silt, gravel up to 40 mm diameter, seasonally frozen, medium brown			696.0
1.0			– sandier, cleaner and easier to drill from 1.2 m to 1.8 m			
		3				
2.0			– seasonal frost ends at 2.2 m			694.0
3.0		4				
			END OF BOREHOLE @ 3.5 m – drilled at STA 2+990			692.0
4.0						
5.0						

EBA Engineering Consultants Ltd. Whitehorse, Yukon	LOGGED BY: MCP REVIEWED BY: MCP	COMPLETION DEPTH: 3.5 m COMPLETE: 95/01/31
		Page 1 of 1

08/07/15 08:28AM (YUKON-5)

RANGEWAY ROAD CONSTRUCTION	CLIENT: DAVID NAIRNE & ASSOCIATES	BOREHOLE NO: 11731-02
GEOTECHNICAL EVALUATION	DRILL: TRUCK MOUNTED CME-75	PROJECT NO: 0201-11731
WHITEHORSE, YUKON	UTM ZONE: 8 N6737170 E494115	ELEVATION: 681.5 m

SAMPLE TYPE: GRAB | NO RECOVERY | STANDARD PEN. | 75 mm SPOON | CRREL BARREL | DISTURBED

Depth(m)	SAMPLE TYPE	RUN NO	SOIL DESCRIPTION	ELEVATION(m)
0.0				681.5
	GRAB	1	(SURFACING GRAVEL) SAND – silty, some gravel, fine grained, seasonally frozen, light brown	
			SAND – some silt, trace of fine gravel, brown	
	GRAB	2	seasonally frozen, medium brown	
1.0			medium grained, damp, loose, medium	
			SILT – some clay, seasonally frozen to approximately 2.2 m, moist becoming wet below frost, firm	
	GRAB	3	where moist and soft where wet, olive brown	
2.0			– easy drilling	679.0
3.0	GRAB	4		
			END OF BOREHOLE @ 3.5 m – drilled at STA 2+440	
4.0				677.0
5.0				

PLASTIC M.C. LIQUID
10 20 30 40

■ PERCENT GRAVEL ■ 20 40 60 80
● PERCENT SAND ● 20 40 60 80
▲ PERCENT SILT OR FINES ▲ 20 40 60 80
◆ PERCENT CLAY ◆ 20 40 60 80

EBA Engineering Consultants Ltd.
Whitehorse, Yukon

LOGGED BY: MCP	COMPLETION DEPTH: 3.5 m
REVIEWED BY: MCP	COMPLETE: 95/01/31
	Page 1 of 1

08/07/15 08:28AM (YUKON-5)

RANGEWAY ROAD CONSTRUCTION	CLIENT: DAVID NAIRNE & ASSOCIATES	BOREHOLE NO: 11731-03
GEOTECHNICAL EVALUATION	DRILL: TRUCK MOUNTED CME-75	PROJECT NO: 0201-11731
WHITEHORSE, YUKON	UTM ZONE: 8 N6736770 E494380	ELEVATION: 665 m

SAMPLE TYPE ■ GRAB SAMPLE ⊘ NO RECOVERY ⊠ STANDARD PEN. ☰ 75 mm SPOON ⫼ CRREL BARREL

SOIL DESCRIPTION

■ STANDARD PENETRATION (N) ■ 20 40 60 80

◆ DCPT ◆ 10 20 30 40

PLASTIC M.C. LIQUID 10 20 30 40

■ PERCENT GRAVEL ■ 20 40 60 80

● PERCENT SAND ● 20 40 60 80

▲ PERCENT SILT OR FINES ▲ 20 40 60 80

◆ PERCENT CLAY ◆ 20 40 60 80

Depth(m)	SAMPLE TYPE	SPT(N)	SOIL DESCRIPTION	ELEVATION(m)
0.0	■		(SURFACING GRAVEL) SAND – silty, some gravel, fine grained, seasonally frozen, medium brown	665.0
			SILT – some clay, trace of fine sand, seasonally frozen, olive brown	
1.0				
	■			
2.0			– seasonal frost ends at 2.0m – wet below frost line	663.0
3.0	■		– slightly drier from 3.2 m to 3.4 m	
4.0				661.0
	■		– interbedded wet and very wet silts	
5.0				
			– moist below 5.5 m	
6.0	■			659.0
			END OF BOREHOLE @ 6.2 m – drilled at STA 1+490	
7.0				
8.0				657.0
9.0				

EBA Engineering Consultants Ltd. Whitehorse, Yukon	LOGGED BY: MCP REVIEWED BY: MCP	COMPLETION DEPTH: 6.2 m COMPLETE: 95/01/31
		Page 1 of 1

08/07/15 08:29AM (YUKON-8)

RANGEWAY ROAD CONSTRUCTION	CLIENT: DAVID NAIRNE & ASSOCIATES	BOREHOLE NO: 11731-07
GEOTECHNICAL EVALUATION	DRILL: SHOP BUILT AUGER RIG	PROJECT NO: 0201-11731
WHITEHORSE, YUKON	UTM ZONE: 8 N6736980 E494310	ELEVATION: 681.5 m

SAMPLE TYPE: GRAB SAMPLE | NO RECOVERY | STANDARD PEN. | 75 mm SPOON | CRREL BARREL

Depth(m)	SAMPLE TYPE	RUN NO	SPT(N)	USC	SOIL SYMBOL	SOIL DESCRIPTION	ELEVATION(ft)
0.0						ORGANIC ROOT MAT OVER SILT – moist, black	2236.0
		1				SAND – trace of silt, medium grained, seasonally frozen, damp when thawed, medium brown	
1.0							2234.0
							2232.0
						SILT – trace of fine sand, trace of clay, damp, firm (est.), medium brown	2230.0
2.0		2					2228.0
						END OF BOREHOLE @ 2.5 m – drilled at STA 0+050 along Golf Course Access Road	
3.0							2226.0
							2224.0
4.0							2222.0

■ STANDARD PENETRATION ■ 10 20 30 40
◆ DCPT ◆ 10 20 30 40
PLASTIC M.C. LIQUID 10 20 30 40

■ PERCENT GRAVEL ■ 20 40 60 80
● PERCENT SAND ● 20 40 60 80
▲ PERCENT SILT OR FINES ▲ 20 40 60 80
◆ PERCENT CLAY ◆ 20 40 60 80

EBA Engineering Consultants Ltd.
Whitehorse, Yukon

LOGGED BY: MCP
REVIEWED BY: MCP
COMPLETION DEPTH: 2.5 m
COMPLETE: 95/04/20

08/07/15 08:29AM (YUKON-4)

RANGEWAY ROAD CONSTRUCTION	CLIENT: DAVID NAIRNE & ASSOCIATES	BOREHOLE NO: 11731-08
GEOTECHNICAL EVALUATION	DRILL: SHOP BUILT AUGER RIG	PROJECT NO: 0201-11731
WHITEHORSE, YUKON	UTM ZONE: 8 N6737190 E494620	ELEVATION: 681 m

SAMPLE TYPE ■ GRAB SAMPLE ⊘ NO RECOVERY ⊠ STANDARD PEN. ▤ 75 mm SPOON ▥ CRREL BARREL

SOIL DESCRIPTION

■ STANDARD PENETRATION ■ 10 20 30 40

PLASTIC M.C. LIQUID 10 20 30 40

◆ PERCENT GRAVEL ◆ 20 40 60 80

▲ PERCENT SAND ▲ 20 40 60 80

■ PERCENT SILT OR FINES ■ 20 40 60 80

● PERCENT CLAY ● 20 40 60 80

Depth(m)	SAMPLE TYPE	RUN NO	SPT(N)	USC	SOIL SYMBOL	SOIL DESCRIPTION	ELEVATION(m)
0.0						ORGANIC ROOT MAT OVER SILT – seasonally frozen, black over dark brown	681.0
	■	1				SAND – trace of silt, medium grained, seasonally frozen, damp when thawed, medium brown	
1.0						– trace of fine gravel at interface with silt	
						SILT – trace of fine sand, trace of clay, damp to moist with depth, olive brown	
2.0	■	2					679.0
3.0						– wet below 3.0 m	
	■	3					
4.0						END OF BOREHOLE @ 3.8 m – drilled at STA 0+450 along Golf Course Access Road	677.0
5.0							
6.0							675.0
7.0							

EBA Engineering Consultants Ltd. Whitehorse, Yukon	LOGGED BY: MCP	COMPLETION DEPTH: 3.8 m
	REVIEWED BY: MCP	COMPLETE: 95/04/20
		Page 1 of 1

08/07/15 08:29AM (YUKON-6)

RANGEWAY ROAD CONSTRUCTION	CLIENT: DAVID NAIRNE & ASSOCIATES	BOREHOLE NO: 11731-09
GEOTECHNICAL EVALUATION	DRILL: SHOP BUILT AUGER RIG	PROJECT NO: 0201-11731
WHITEHORSE, YUKON	UTM ZONE: 8 N6737330 E494760	ELEVATION: 673.1 m

SAMPLE TYPE: GRAB SAMPLE | NO RECOVERY | STANDARD PEN. | 75 mm SPOON | CRREL BARREL

Depth(m)	SAMPLE TYPE	RUN NO	SPT(N)	USC	SOIL SYMBOL	SOIL DESCRIPTION	STANDARD PENETRATION 10 20 30 40 / DCPT 10 20 30 40 / PLASTIC M.C. LIQUID 10 20 30 40	PERCENT GRAVEL 20 40 60 80 / PERCENT SAND 20 40 60 80 / PERCENT SILT OR FINES 20 40 60 80 / PERCENT CLAY 20 40 60 80	ELEVATION(ft)
0.0						ORGANIC ROOT MAT OVER SILT – moist, black and brown			2208.0
						SAND – trace of silt, medium grained, seasonally frozen, moist to wet when thawed, medium brown becoming grey below 1.0 m			
		1							2206.0
1.0						– easy to drill			
									2204.0
2.0						SILT – some clay, trace of fine sand, wet, soft, olive grey			2202.0
		2							
						END OF BOREHOLE @ 2.5 m – drilled at STA 0+650 along Golf Course Access Road			2200.0
3.0									2198.0
									2196.0
4.0									2194.0

EBA Engineering Consultants Ltd. Whitehorse, Yukon	LOGGED BY: MCP	COMPLETION DEPTH: 2.5 m
	REVIEWED BY: MCP	COMPLETE: 95/04/20
		Page 1 of 1

08/07/15 08:29AM (YUKON-4)

RANGEWAY ROAD CONSTRUCTION	CLIENT: DAVID NAIRNE & ASSOCIATES	BOREHOLE NO: 11731-10
GEOTECHNICAL EVALUATION	DRILL: SHOP BUILT AUGER RIG	PROJECT NO: 0201-11731
WHITEHORSE, YUKON	UTM ZONE: 8 N6737330 E494760	ELEVATION: 673.1 m

SAMPLE TYPE ■ GRAB SAMPLE ⊘ NO RECOVERY ⊠ STANDARD PEN. ▤ 75 mm SPOON ▥ CRREL BARREL

Depth(m)	SAMPLE TYPE	RUN NO	SPT(N)	USC	SOIL SYMBOL	SOIL DESCRIPTION	ELEVATION(ft)
0.0						ORGANIC ROOT MAT OVER SILT – moist, black and brown	2208.0
	■	1				SAND – trace of silt, medium to fine grained, dry to damp, medium to light brown	2206.0
1.0							2204.0
2.0							2202.0
	■	2					2200.0
						END OF BOREHOLE @ 2.5 m – drilled at STA 0+920 along Golf Access Road	
3.0							2198.0
							2196.0
4.0							2194.0

■ STANDARD PENETRATION ■ 10 20 30 40
◆ DCPT ◆ 10 20 30 40
PLASTIC M.C. LIQUID 10 20 30 40

■ PERCENT GRAVEL ■ 20 40 60 80
● PERCENT SAND ● 20 40 60 80
▲ PERCENT SILT OR FINES ▲ 20 40 60 80
◆ PERCENT CLAY ◆ 20 40 60 80

EBA Engineering Consultants Ltd. Whitehorse, Yukon	LOGGED BY: MCP	COMPLETION DEPTH: 2.5 m
	REVIEWED BY: MCP	COMPLETE: 95/04/20
		Page 1 of 1

08/07/15 08:29AM (YUKON-4)

RANGEWAY ROAD CONSTRUCTION	CLIENT: DAVID NAIRNE & ASSOCIATES	BOREHOLE NO: 11731-11
GEOTECHNICAL EVALUATION	DRILL: SHOP BUILT AUGER RIG	PROJECT NO: 0201-11731
WHITEHORSE, YUKON	UTM ZONE: 8 N6737640 E495130	ELEVATION: 682 m

SAMPLE TYPE ■ GRAB SAMPLE ⊘ NO RECOVERY ⊠ STANDARD PEN. ▤ 75 mm SPOON ▥ CRREL BARREL

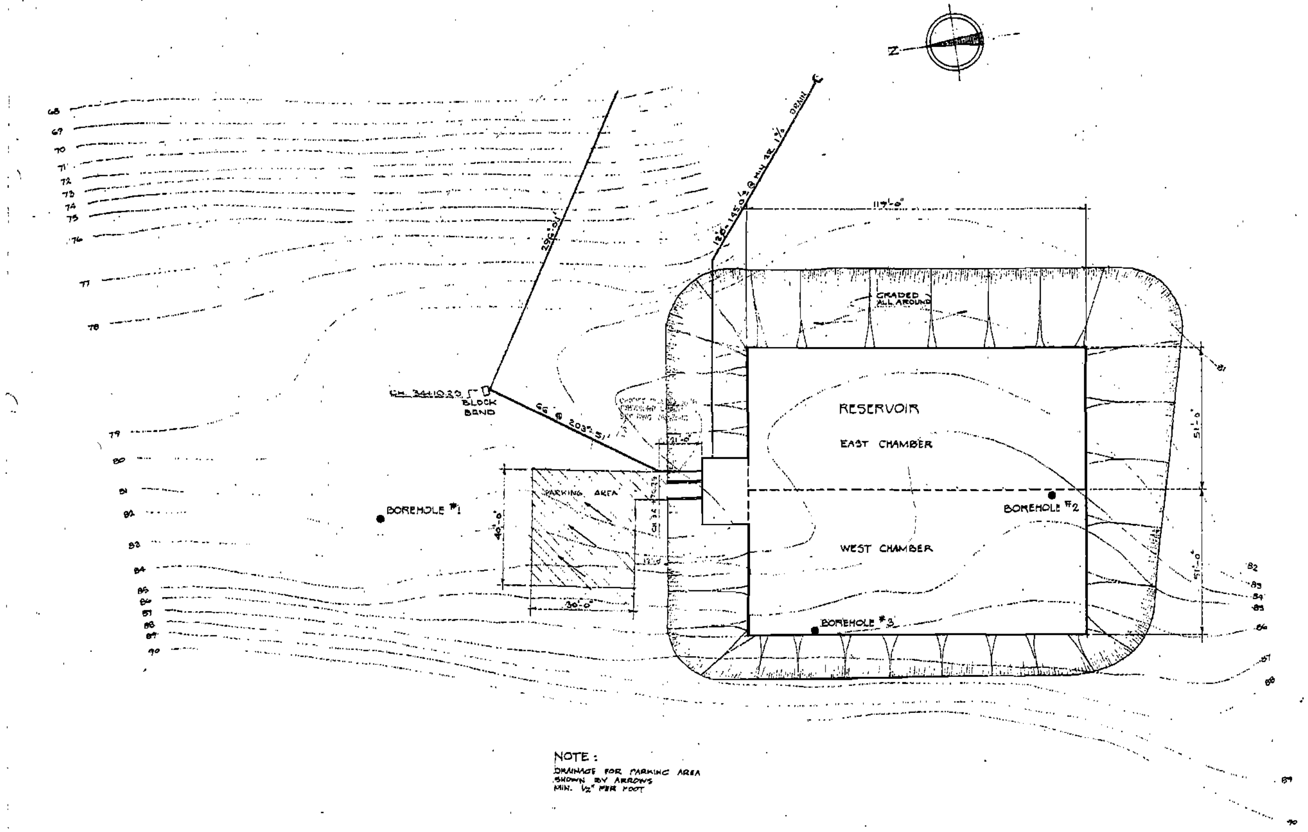
Depth(m)	SAMPLE TYPE	RUN NO	SPT(N)	USC	SOIL SYMBOL	SOIL DESCRIPTION	■ STANDARD PENETRATION ■ 10 20 30 40 / ◆ DCPT ◆ 10 20 30 40 / PLASTIC M.C. LIQUID 10 20 30 40	■ PERCENT GRAVEL ■ 20 40 60 80 / ● PERCENT SAND ● 20 40 60 80 / ▲ PERCENT SILT OR FINES ▲ 20 40 60 80 / ◆ PERCENT CLAY ◆ 20 40 60 80	ELEVATION(ft)
0.0						ORGANIC ROOT MAT OVER SILT – moist, black over brown			2237.0
	■	1				SAND – trace to some silt, fine grained, occasional fragments of coarse grained sand throughout, damp, very loose, light brown	●	▲ ●	2235.0
1.0									2233.0
2.0									2231.0
	■	2					●		2229.0
						END OF BOREHOLE @ 2.5 m – drilled at STA 1+120 along Golf Course Access Road			2227.0
3.0									2225.0
4.0									2223.0

EBA Engineering Consultants Ltd. Whitehorse, Yukon	LOGGED BY: MCP	COMPLETION DEPTH: 2.5 m
	REVIEWED BY: MCP	COMPLETE: 95/04/20
		Page 1 of 1

08/07/15 08:29AM (YUKON-4)

APPENDIX C

APPENDIX C TESTHOLE LOGS AND LABORATORY DATA – WHISTLE BEND



BOREHOLE LOG

DEPTH IN FEET	SAMPLE Nº	SAMPLE TYPE	BOREHOLE #1
5	8		SILTY, SANDY GRAVEL, NON PLASTIC MAXIMUM SIZE 9" 35% PASS Nº 200 SIEVE
10, 15	18		BEDROCK - GEOLOGICAL DISCRIPTION: HORNBLENDE - BIOTITE GRANODIORITE
			BOTTOM OF HOLE
20			
			BOREHOLE #2
5, 10, 15, 20	22		SILTY, SANDY GRAVEL - NON PLASTIC MAXIMUM SIZE 12" 35% PASS Nº 200 SIEVE
25	28		BEDROCK - SHEARED & ALTERED GRANODIORITE
30, 35	35		BEDROCK - HORNBLENDE BIOTITE GRANODIORITE
			BOTTOM OF HOLE
			BOREHOLE #3
5, 10, 15, 20, 25			SILTY, SANDY GRAVEL - NON PLASTIC MAXIMUM SIZE 12" 35% PASS Nº 200 SIEVE
30			BEDROCK - SHEARED & ALTERED GRANODIORITE
35			BEDROCK - HORNBLENDE BIOTITE - GRANODIORITE

REV Nº	DESCRIPTION	DATE	BY
1	GENERAL REVISION	8/JULY/[illegible]	B.S.

Consulting Engineers
T.H. NEWTON ENGINEERING LTD
8712 - 150 th St
Edmonton Alta

DEPARTMENT OF PUBLIC WORKS

CANADA

DWG. No. W 65-2-17

WHITE HORSE WATER SYSTEM 1965

DATE: SEP. 15 1965

RESERVOIR LOCATION PLAN

REV 1

SCALE: 1" = 20'-0"

VALLEYVIEW PUMPHOUSE

KULAN RESERVOIR SITE

SILTY TILL WITH ROCKS & PEBBLES THROUGHOUT.

SILTY TILL WITH LARGE AMOUNTS of SILT.

ROCK

LAYER of FRACTURED ROCK OR TILL. N COUNT @ 10' - 18'

ROCK

HOLE STOPPED AT 18' SUSPECT BEDROCK.

BOREHOLE # 1

SILTY GRAVEL OR TILL.

ROCK

SILTY GRAVEL OR TILL

CLAY & SILTY GRAVEL

SILT & SAND WITH GRAVEL. N COUNT

SAND & GRAVEL

SILTY SAND & GRAVEL.

SILTY GRAVEL

N COUNT @ 20' - 79

GREY SILT & GRAVEL WITH CLAY

ROCK.

HOLE STOPPED @ 34' SUSPECT

BOREHOLE # 2

Geotech.Eval-Porter Creek Watermain Phll	CLIENT: City of Whitehorse	TEST PIT NO: 1200125-TP01
Kulan Subdivision	EXCAVATOR: Komatsu PC 150LC	PROJECT NO: 1200125
Whitehorse, YT	UTM ZONE: 8 N6736914 E490922	ELEVATION: 769.4 m

SAMPLE TYPE ■ GRAB ▨ NO RECOVERY ▥ SHELBY TUBE

Depth(m)	SAMPLE TYPE	RUN NO	USC	SOIL SYMBOL	SOIL DESCRIPTION	PLASTIC / M.C. / LIQUID (10 20 30 40)	■ PERCENT GRAVEL ■ / ● PERCENT SAND ● / ▲ PERCENT SILT OR FINES ▲ / ◆ PERCENT CLAY ◆ (20 40 60 80)	ELEVATION(m)
0.0					SAND AND SILT (TILL) – some gravel, cobbles and boulders throughout, moist, compact (est.), olive brown			769.0
1.0								
2.0								767.0
3.0					– moisture content increasing below 3.0 m			
4.0								765.0
5.0 ▼					– water seeping into testpit at approximately 5.0 m			▼
6.0					– possibly bedrock at 5.8 m END OF TESTPIT 5.8 m			763.0

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Whitehorse, Yukon

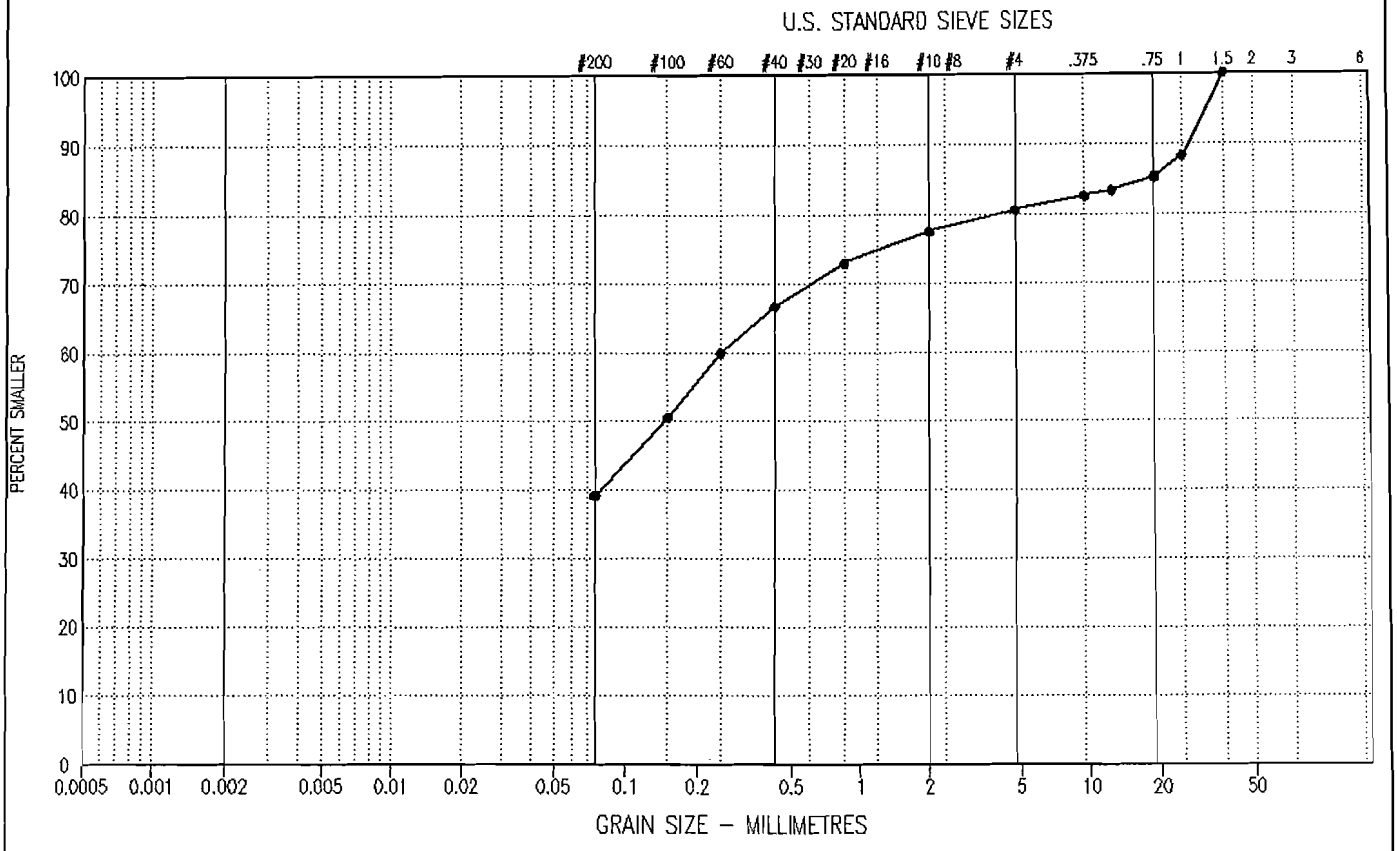
LOGGED BY: MCP	COMPLETION DEPTH: 5.8 m
REVIEWED BY: JRT	COMPLETE: 04/10/28
	Page 1 of 1

04/11/09 01:32PM (YUKON-TB)

EBA Engineering

PARTICLE SIZE – ANALYSIS OF SOILS

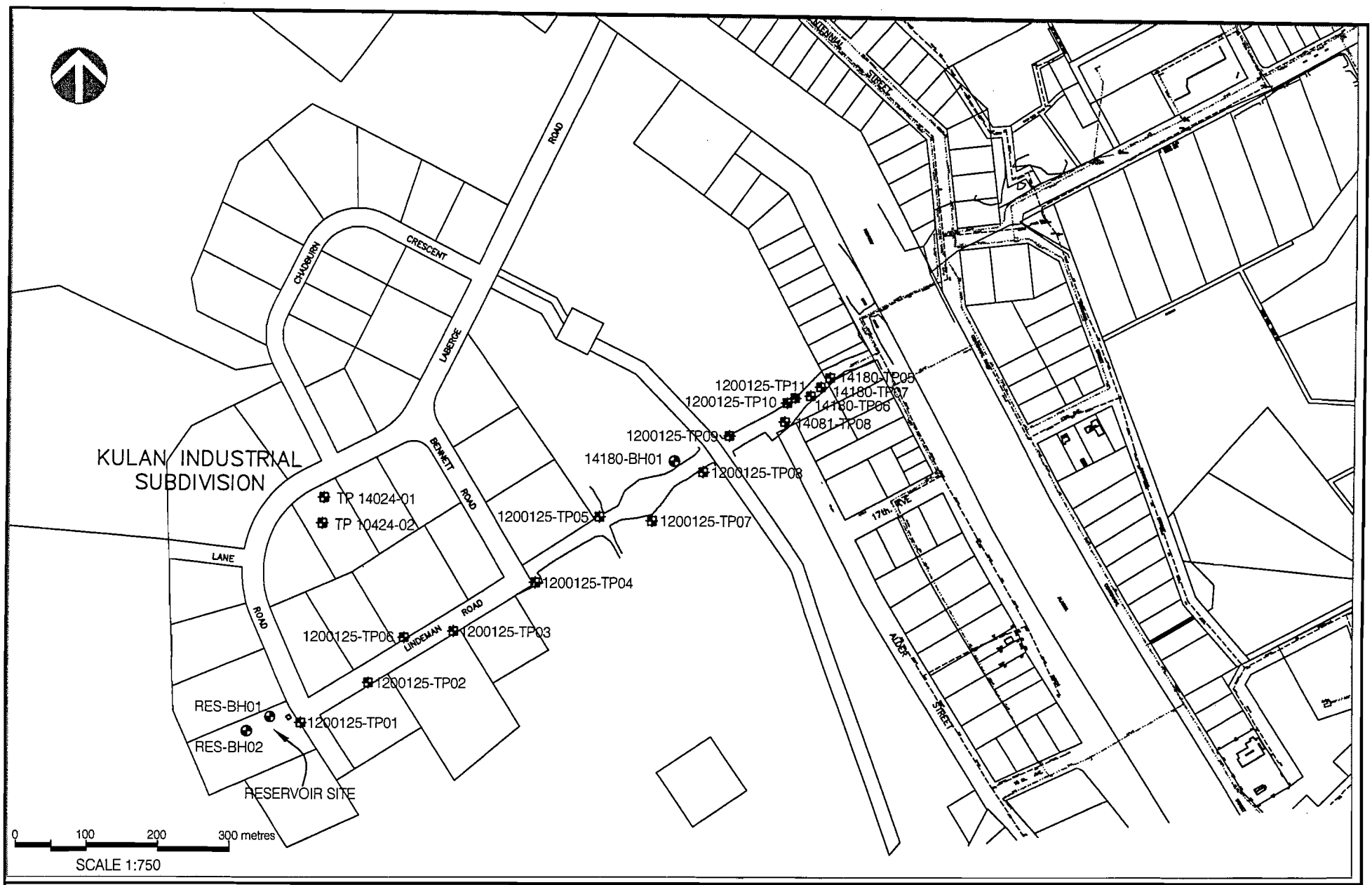
CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



SYMBOL	BOREHOLE NUMBER	DEPTH (m)	DESCRIPTION			Cu	Cc	U.S.C
			CLAY & SILT %	SAND %	GRAVEL %			
●——●	1200125–TP01	2.00	39	42	20	–	–	

Project: 0201–1200125 Date Tested: 04/11/04 BY: PO

Tested in accordance with ASTM D422 unless otherwise noted.



EBA Engineering Consultants Ltd.		PROJECT	GEOTECHNICAL EVALUATION PORTER CREEK WATERMAIN PH III - WHITEHORSE, YUKON
CLIENT	ENGINEERING DEPARTMENT Quest Engineering Group	TITLE	SITE PLAN SHOWING TESTHOLE LOCATIONS
DATE NOV. 2004	DWN. JSB	CHKD. MCP	FILE NO. 1200125 DRWG. FIGURE 1

WHISTLE BEND SUBDIVISION

Current Borehole Logs and Associated Laboratory Test Result Report Forms

Geotechnical Evaluation	AECOM	BOREHOLE NO: W14101171-BH01
Whistle Bend Subdivision	Drilling Method: NODWELL Mounted CME 75	PROJECT NO: W14101171
Whitehorse, YT	6736721N; 493953E; Zone 8	

SAMPLE TYPE: GRAB SAMPLE | NO RECOVERY | BULK | CRREL CORE | SHELBY TUBE | GRAB CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m^3) 500 1000 1500 2000; PLASTIC M.C. LIQUID 20 40 60 80	CLAY (%) 20 40 60 80; SILT (%) 20 40 60 80; SAND (%) 20 40 60 80; GRAVEL (%) 20 40 60 80	Depth (ft)
0	Grass and Labrador Tea ground cover over organic root material						0
	SAND - silty, trace organics, seasonally frozen, damp below frost, medium brown		1				
1	- sand becomes some silt, fine grained, uniform, damp, greyish brown below 0.5 m						
			2				5
2	- some gravel below 2.0 m						
			3				10
3							
4	- very easy drilling to 4.0 m						
	GRAVEL AND SAND - trace silt, likely cobbles, very compact, dark brown		4				15
5							
			5				
6							20
7			6				
							25
8							
			7				30
9	END OF BOREHOLE @ 9.0 m						
10							33

EBA Engineering Consultants Ltd.

LOGGED BY: MCP	COMPLETION DEPTH: 9m
REVIEWED BY:	COMPLETE: 12/8/2008
DRAWING NO:	Page 1 of 1

PARTICLE SIZE DISTRIBUTION

ASTM C136 & D422

Project: **Whistle Bend Subdivision, Whitehorse, YT**

Project Number: W14101171

Date Tested: September 17, 2008

Tespit Number: BH01-6

Depth: 7.5 m

Soil Description: GRAVEL AND SAND - trace silt

Cu: 40.1

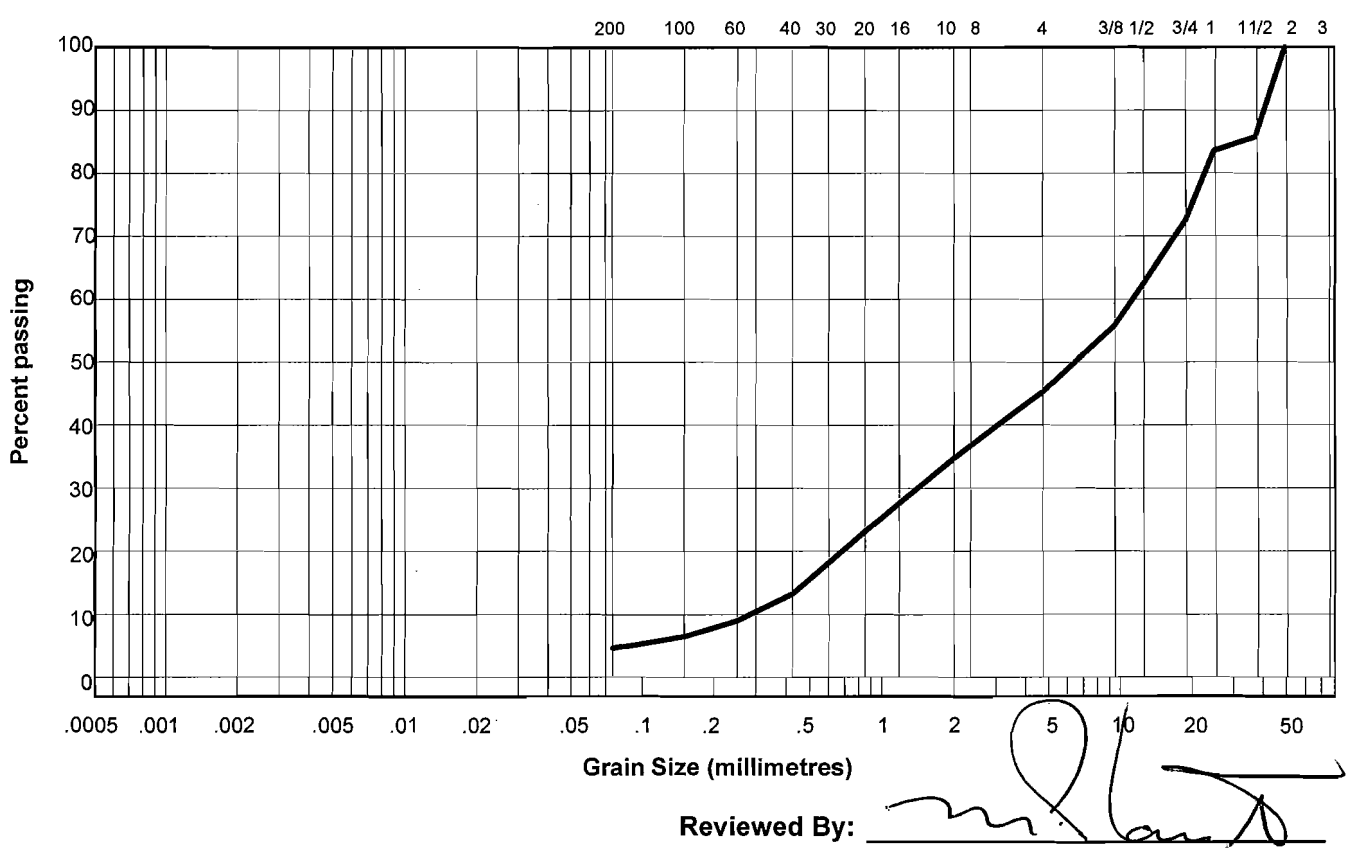
Cc: 0.6

Natural Moisture Content: 1.2%

Remarks:

Sieve Size	Percent Passing
50.000	100
37.500	86
25.000	84
19.000	73
12.500	62
9.500	56
4.750	45
2.000	35
0.850	23
0.425	13
0.250	9
0.150	7
0.075	4.6

Clay	Silt	Sand			Gravel	
		Fine	Medium	Coarse	Fine	Coarse



Reviewed By:

EBA Engineering Consultants Ltd.

Geotechnical Evaluation	AECOM	BOREHOLE NO: W14101171-BH02
Whistle Bend Subdivision	Drilling Method: NODWELL Mounted CME 75	PROJECT NO: W14101171
Whitehorse, YT	6736796N; 494022E; Zone 8	

SAMPLE TYPE: GRAB SAMPLE | NO RECOVERY | BULK | CRREL CORE | SHELBY TUBE | GRAB CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS
0	SAND - silty, trace organics, fine grained, uniform, damp to dry below seasonal frost, dark brown		1	
1				
			2	
2	- cleaner and coarser below 2.0 m, gravel fragments below 2.8 m			
			3	
3	SAND AND GRAVEL - trace silt, occassional cobble below 3.5 m, damp, very compact, hard drilling, dark brown			
4			4	
5	- refusal at 5.0 m on first attempt, backed up 1.0 m, refusal on second attempt			
	END OF BOREHOLE @ 5.0 m			
6				
7				
8				
9				
10				

Bulk Density(kg/m^3) 500 1000 1500 2000

PLASTIC M.C. LIQUID 20 40 60 80

◆ CLAY (%) ◆ 20 40 60 80

● SILT (%) ● 20 40 60 80

▲ SAND (%) ▲ 20 40 60 80

■ GRAVEL (%) ■ 20 40 60 80

Depth (ft): 0, 5, 10, 15, 20, 25, 30, 33

EBA Engineering Consultants Ltd.

LOGGED BY: MCP	COMPLETION DEPTH: 5m
REVIEWED BY:	COMPLETE: 12/8/2008
DRAWING NO:	Page 1 of 1

PARTICLE SIZE DISTRIBUTION

ASTM C136 & D422

Project: **Whistle Bend Subdivision, Whitehorse, YT**

Project Number: W14101171

Date Tested: December 9, 2008

Tespit Number: BH02-4

Depth: 4.5 m

Soil Description: SAND AND GRAVEL - trace silt

Cu: 9.2

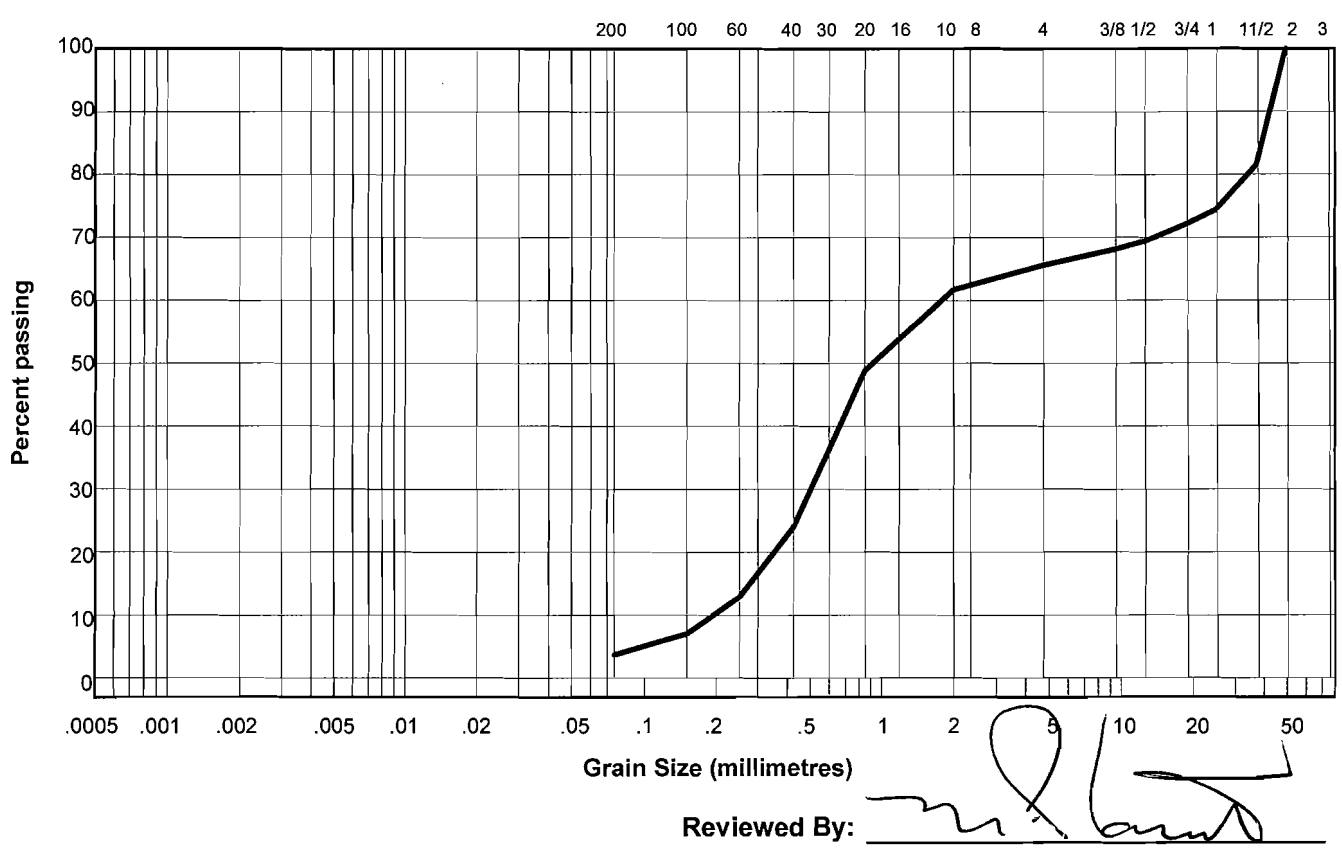
Cc: 0.7

Natural Moisture Content: 2.6%

Remarks:

Sieve Size	Percent Passing
50.000	100
37.500	82
25.000	74
19.000	72
12.500	69
9.500	68
4.750	66
2.000	62
0.850	49
0.425	24
0.250	13
0.150	7
0.075	3.6

Clay	Silt	Sand			Gravel	
		Fine	Medium	Coarse	Fine	Coarse



Reviewed By:

EBA Engineering Consultants Ltd.

Geotechnical Evaluation	AECOM	BOREHOLE NO: W14101171-BH03
Whistle Bend Subdivision	Drilling Method: NODWELL Mounted CME 75	PROJECT NO: W14101171
Whitehorse, YT	6736852N; 494158E; Zone 8	

SAMPLE TYPE: GRAB SAMPLE | NO RECOVERY | BULK | CRREL CORE | SHELBY TUBE | GRAB CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m³) 500 1000 1500 2000; PLASTIC M.C. LIQUID 20 40 60 80	CLAY (%) 20 40 60 80; SILT (%) 20 40 60 80; SAND (%) 20 40 60 80; GRAVEL (%) 20 40 60 80	Depth (ft)
0	SAND AND SILT (FILL) - trace gravel (along ditch)		1				0
	ORGANIC FILL LINE						
1	SAND - some silt becoming trace silt by 1.0 m, trace gravel, medium to fine grained, damp, dark brown		2				5
2	SILT - some clay, trace of fine grained sand, wet, soft, olive brown - very easy to drill		3				10
4			4				15
	END OF BOREHOLE @ 4.5 m						
5							
6							20
7							
8							25
9							30
10							33

EBA Engineering Consultants Ltd.

LOGGED BY: MCP	COMPLETION DEPTH: 4.5m
REVIEWED BY:	COMPLETE: 12/8/2008
DRAWING NO:	Page 1 of 1

PARTICLE SIZE DISTRIBUTION

ASTM C136 & D422

Project: **Whistle Bend Subdivision, Whitehorse, YT**

Project Number: W14101171

Date Tested: December 9, 2008

Tespit Number: BH03-2

Depth: 1.5 m

Soil Description: SAND - trace gravel, trace silt

Cu: 1.8

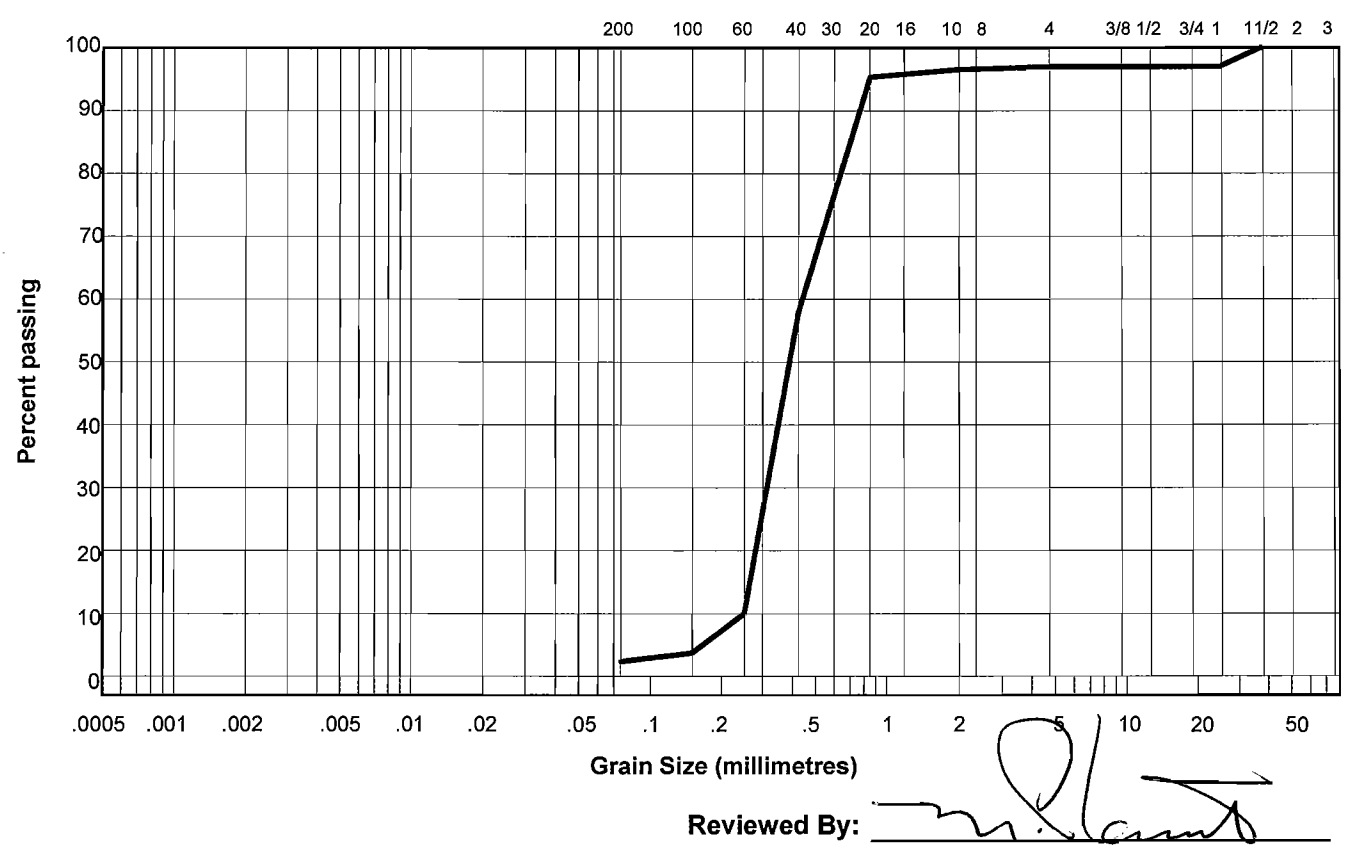
Cc: 0.9

Natural Moisture Content: 2.9%

Remarks:

Sieve Size	Percent Passing
50.000	#N/A
37.500	100
25.000	97
19.000	97
12.500	97
9.500	97
4.750	97
2.000	97
0.850	95
0.425	58
0.250	10
0.150	4
0.075	2.4

Clay	Silt	Sand			Gravel	
		Fine	Medium	Coarse	Fine	Coarse



Reviewed By:

EBA Engineering Consultants Ltd.

Geotechnical Evaluation	AECOM	BOREHOLE NO: W14101171-BH04
Whistle Bend Subdivision	Drilling Method: NODWELL Mounted CME 75	PROJECT NO: W14101171
Whitehorse, YT	6736277N; 494550E; Zone 8	

SAMPLE TYPE: GRAB SAMPLE | NO RECOVERY | BULK | CRREL CORE | SHELBY TUBE | GRAB CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m³) 500 1000 1500 2000 / PLASTIC M.C. LIQUID 20 40 60 80	CLAY (%) / SILT (%) / SAND (%) / GRAVEL (%) 20 40 60 80	Depth (ft)
0	SILT WITH SAND AND ORGANICS (FILL) - seasonally frozen, moist below seasonal frost, brown with organic black		1				0
1			2				5
2	- sandy from 1.5 m to 2.5 m						
	Fill line at 2.5 m. organics, moist, black		3				10
3	SILT - some clay, some fine sand, wet to saturated by 4.5 m, very soft, dark grey						
4			4				15
5	- not as saturated and firmer between 4.5 and 5.5 m						
6			5				20
7			6				25
	END OF BOREHOLE @ 7.5 m						
8							
9							30
10							33

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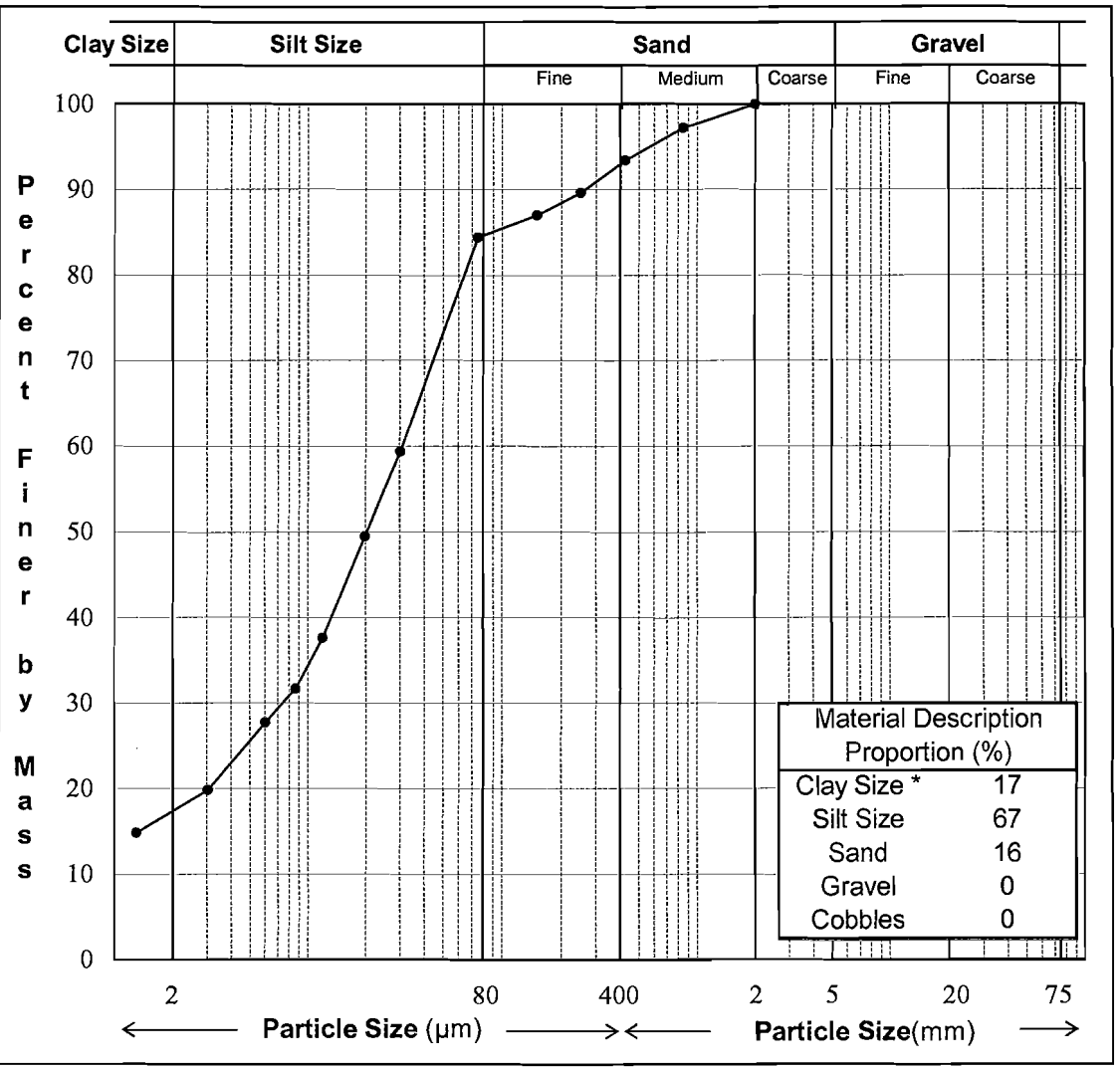
LOGGED BY: MCP	COMPLETION DEPTH: 7.5m
REVIEWED BY:	COMPLETE: 12/9/2008
DRAWING NO:	Page 1 of 1

PARTICLE SIZE ANALYSIS (Hydrometer) TEST REPORT

ASTM D422

Project: **Whistle Bend Subdivision, Whitehorse, YT** Date Tested: 2008/12/09
Client: AECOM
Project No.: W14101171
Location:
Sample No.: BH04-4
Depth: 5.4 m
Description**: SILT - some clay, some sand

Particle Size	Percent Passing
100 mm	
75 mm	
50 mm	
38 mm	
25 mm	
19 mm	
13 mm	
10 mm	
5 mm	
2 mm	100
850 µm	97
425 µm	93
250 µm	90
150 µm	87
75 µm	84
30 µm	59
20 µm	50
12 µm	38
9 µm	32
6 µm	28
3 µm	20
1 µm	15



Remarks: * The upper clay size of 2 µm, per the Canadian Foundation Engineering Manual.
** The description is visually based & subject to EBA description protocols.

Reviewed By: _____

EBA Engineering Consultants Ltd.

Geotechnical Evaluation	AECOM	BOREHOLE NO: W14101171-BH05
Whistle Bend Subdivision	Drilling Method: NODWELL Mounted CME 75	PROJECT NO: W14101171
Whitehorse, YT	6736224N; 494478E; Zone 8	

SAMPLE TYPE: GRAB SAMPLE | NO RECOVERY | BULK | CRREL CORE | SHELBY TUBE | GRAB CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS
0	ORGANICS AND WOOD FRAGMENTS		1	
	SILT - some fine sand, some clay, trace organics, saturated, very soft, dark grey			
1			2	
	- groundwater at 1.5 m - same elevation as McIntyre Creek			
2				
3	- less sand and slightly lower moisture content by 3.0 m		3	
4	- trace to some sand and well rounded up to 2.5 mm diameter from 4.0 m to 5.0 m (lens), brownish, cast to silt matrix		4	
5				
	- silt is slightly drier and firmer from 5.5 to 6.0 m, dark grey		5	
6				
7			6	
8				
9			7	
	SAND - some gravel, trace silt, trace clay, saturated, brown			
10				

Bulk Density(kg/m^3) 500 1000 1500 2000

PLASTIC M.C. LIQUID 20 40 60 80

CLAY (%) 20 40 60 80

SILT (%) 20 40 60 80

SAND (%) 20 40 60 80

GRAVEL (%) 20 40 60 80

Depth (ft): 0, 5, 10, 15, 20, 25, 30, 33

EBA Engineering Consultants Ltd.

LOGGED BY: MCP	COMPLETION DEPTH: 10.5m
REVIEWED BY:	COMPLETE: 12/9/2008
DRAWING NO:	Page 1 of 2

Geotechnical Evaluation	AECOM	BOREHOLE NO: W14101171-BH05
Whistle Bend Subdivision	Drilling Method: NODWELL Mounted CME 75	PROJECT NO: W14101171
Whitehorse, YT	6736224N; 494478E; Zone 8	

SAMPLE TYPE: GRAB SAMPLE | NO RECOVERY | BULK | CRREL CORE | SHELBY TUBE | GRAB CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m³) 500 1000 1500 2000; PLASTIC M.C. LIQUID 20 40 60 80	CLAY (%) 20 40 60 80; SILT (%) 20 40 60 80; SAND (%) 20 40 60 80; GRAVEL (%) 20 40 60 80	Depth (ft)
10	- poor sample recovery at 10 m		8				35
	END OF BOREHOLE @ 10.5 m						
11							
12							40
13							
14							45
15							
16							50
17							
18							55
19							
20							60
							65
							66

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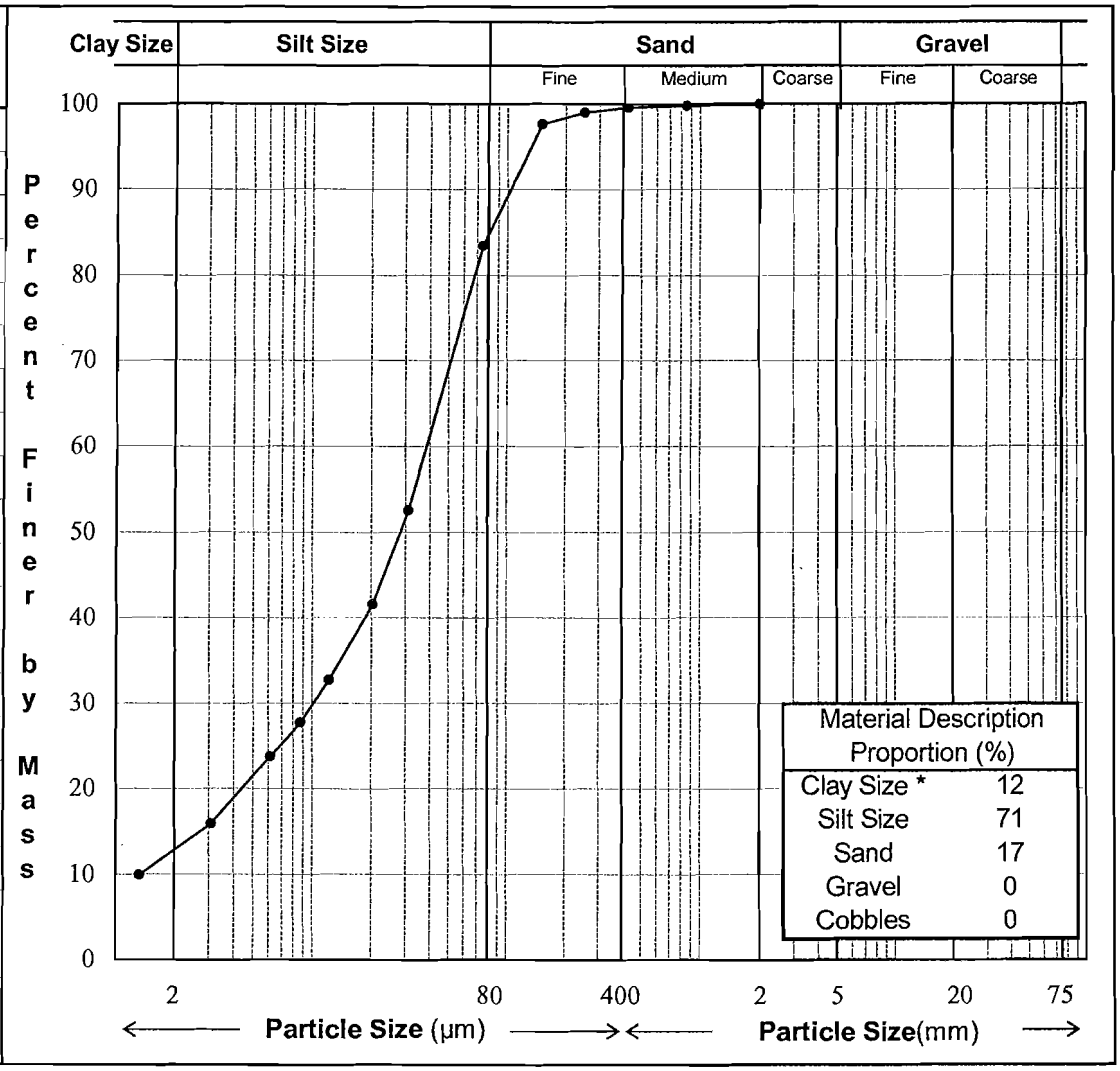
LOGGED BY: MCP	COMPLETION DEPTH: 10.5m
REVIEWED BY:	COMPLETE: 12/9/2008
DRAWING NO:	Page 2 of 2

PARTICLE SIZE ANALYSIS (Hydrometer) TEST REPORT

ASTM D422

Project: **Whistle Bend Subdivision, Whitehorse, YT** Date Tested: 2008/12/09
Client: EACOM
Project No.: W14101171
Location:
Sample No.: BH05-5
Depth: 6.0 m
Description**: SILT - some sand, some clay

Particle Size	Percent Passing
100 mm	
75 mm	
50 mm	
38 mm	
25 mm	
19 mm	
13 mm	
10 mm	
5 mm	
2 mm	100
850 µm	100
425 µm	100
250 µm	99
150 µm	98
75 µm	83
31 µm	52
20 µm	42
12 µm	33
9 µm	28
6 µm	24
3 µm	16
1 µm	10



Remarks: * The upper clay size of 2 µm, per the Canadian Foundation Engineering Manual.
** The description is visually based & subject to EBA description protocols.

Reviewed By: _____

EBA Engineering Consultants Ltd.

PARTICLE SIZE DISTRIBUTION

ASTM C136 & D422

Project: **Whistle Bend Subdivision, Whitehorse, YT**

Project Number: W14101171

Date Tested: December 9, 2008

Tespit Number: BH05-8

Depth: 10.5 m

Soil Description: SAND - some gravel, trace silt

Cu: 5.7

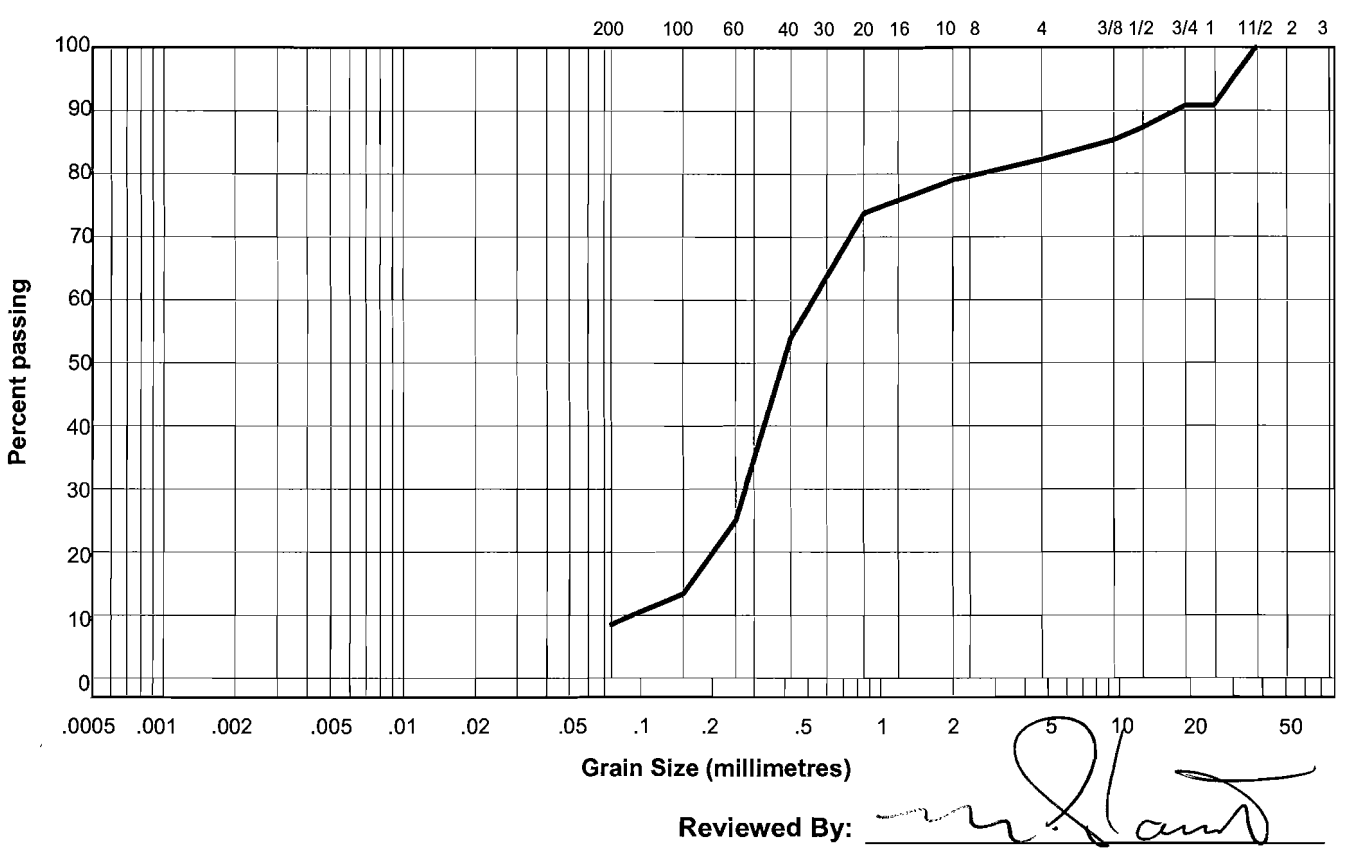
Cc: 1.6

Natural Moisture Content: 17.7%

Remarks:

Sieve Size	Percent Passing
50.000	#N/A
37.500	100
25.000	91
19.000	91
12.500	87
9.500	85
4.750	82
2.000	79
0.850	74
0.425	54
0.250	25
0.150	13
0.075	8.6

Clay	Silt	Sand			Gravel	
		Fine	Medium	Coarse	Fine	Coarse



Reviewed By:

EBA Engineering Consultants Ltd.

Geotechnical Evaluation	AECOM	BOREHOLE NO: W14101171-BH06
Whistle Bend Subdivision	Drilling Method: NODWELL Mounted CME 75	PROJECT NO: W14101171
Whitehorse, YT	6736288N; 494380E; Zone 8	

SAMPLE TYPE: GRAB SAMPLE | NO RECOVERY | BULK | CRREL CORE | SHELBY TUBE | GRAB CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS
0	SILT AND ORGANICS (FILL) - some gravel, some to trace sand, moist, brown/black		1	
2	SILT - some sand, trace clay, wet, soft, grey		2	
3	SAND AND SILT - some gravel, saturated, loose, dark brown		3	
	- groundwater at 3.0 m, sample recovery below 3.0 m is poor due to groundwater			
4	GRAVEL AND SAND - trace to some silt, saturated, loose, dark brown		4	
6			5	
7			6	
	END OF BOREHOLE @ 7.5 m			
10				

Bulk Density(kg/m^3): 500 1000 1500 2000

PLASTIC M.C. LIQUID: 20 40 60 80

CLAY (%): 20 40 60 80

SILT (%): 20 40 60 80

SAND (%): 20 40 60 80

GRAVEL (%): 20 40 60 80

Depth (ft): 0 5 10 15 20 25 30 33

EBA Engineering Consultants Ltd.

LOGGED BY: MCP	COMPLETION DEPTH: 7.5m
REVIEWED BY:	COMPLETE: 12/9/2008
DRAWING NO:	Page 1 of 1

PARTICLE SIZE DISTRIBUTION

ASTM C136 & D422

Project: **Whistle Bend Subdivision, Whitehorse, YT**

Project Number: W14101171

Date Tested: December 10, 2008

Tespit Number: BH06-3

Depth: 3.0 m

Soil Description: SAND AND SILT - some gravel

Cu:

Cc:

Natural Moisture Content: 18.3%

Remarks:

Sieve Size	Percent Passing
50.000	#N/A
37.500	#N/A
25.000	100
19.000	92
12.500	88
9.500	85
4.750	82
2.000	79
0.850	76
0.425	69
0.250	53
0.150	38
0.075	25.4

Clay	Silt	Sand			Gravel	
		Fine	Medium	Coarse	Fine	Coarse

Reviewed By:

EBA Engineering Consultants Ltd.

PARTICLE SIZE DISTRIBUTION

ASTM C136 & D422

Project: **Whistle Bend Subdivision, Whitehorse, YT**

Project Number: W14101171

Date Tested: December 10, 2008

Tespit Number: BH06-5

Depth: 6.0 m

Soil Description: GRAVEL AND SAND - trace silt

Cu: 130.5

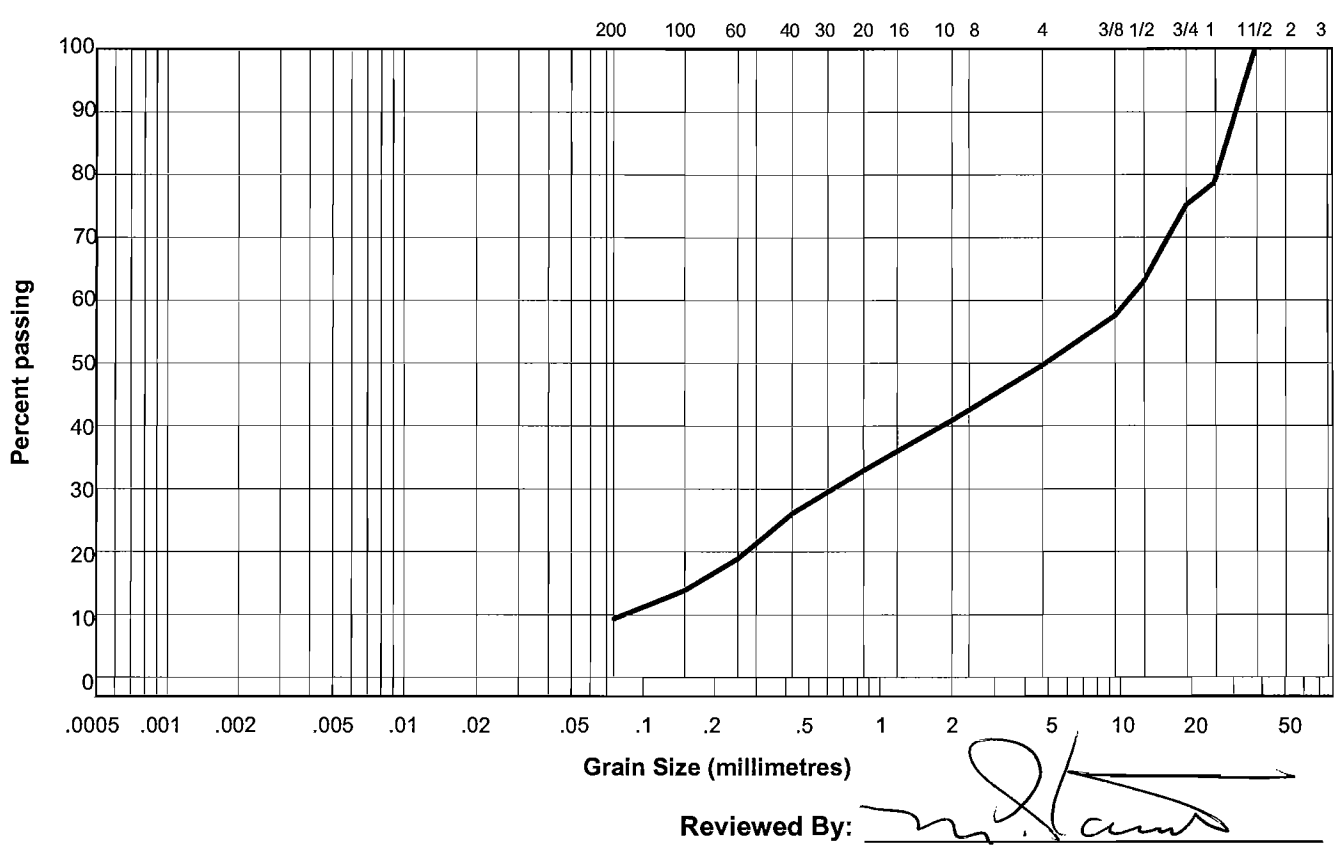
Cc: 0.4

Natural Moisture Content: 12.7%

Remarks:

Sieve Size	Percent Passing
50.000	#N/A
37.500	100
25.000	79
19.000	75
12.500	63
9.500	58
4.750	50
2.000	41
0.850	33
0.425	26
0.250	19
0.150	14
0.075	9.4

Clay	Silt	Sand			Gravel	
		Fine	Medium	Coarse	Fine	Coarse



Reviewed By:

EBA Engineering Consultants Ltd.

Geotechnical Evaluation	AECOM	BOREHOLE NO: W14101171-BH07
Whistle Bend Subdivision	Drilling Method: NODWELL Mounted CME 75	PROJECT NO: W14101171
Whitehorse, YT	6737137N; 494178E; Zone 8	

SAMPLE TYPE: GRAB SAMPLE | NO RECOVERY | BULK | CRREL CORE | SHELBY TUBE | GRAB CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m³) 500 1000 1500 2000 / PLASTIC M.C. LIQUID 20 40 60 80	CLAY (%) / SILT (%) / SAND (%) / GRAVEL (%) 20 40 60 80	Depth (ft)
0	SILT - some sand, some gravel, damp below seasonal frost, firm, olive brown						0
1			1				5
2							
3	SILT - some clay, moist to wet, soft, olive brown		2				10
4	- plasticity increased by 4.0 m		3				15
5	- trace of sand (thin lenses), medium from 4.8 to 6.0 m						
6	END OF BOREHOLE @ 6.0 m		4				20
7							25
8							
9							30
10							33

EBA Engineering Consultants Ltd.

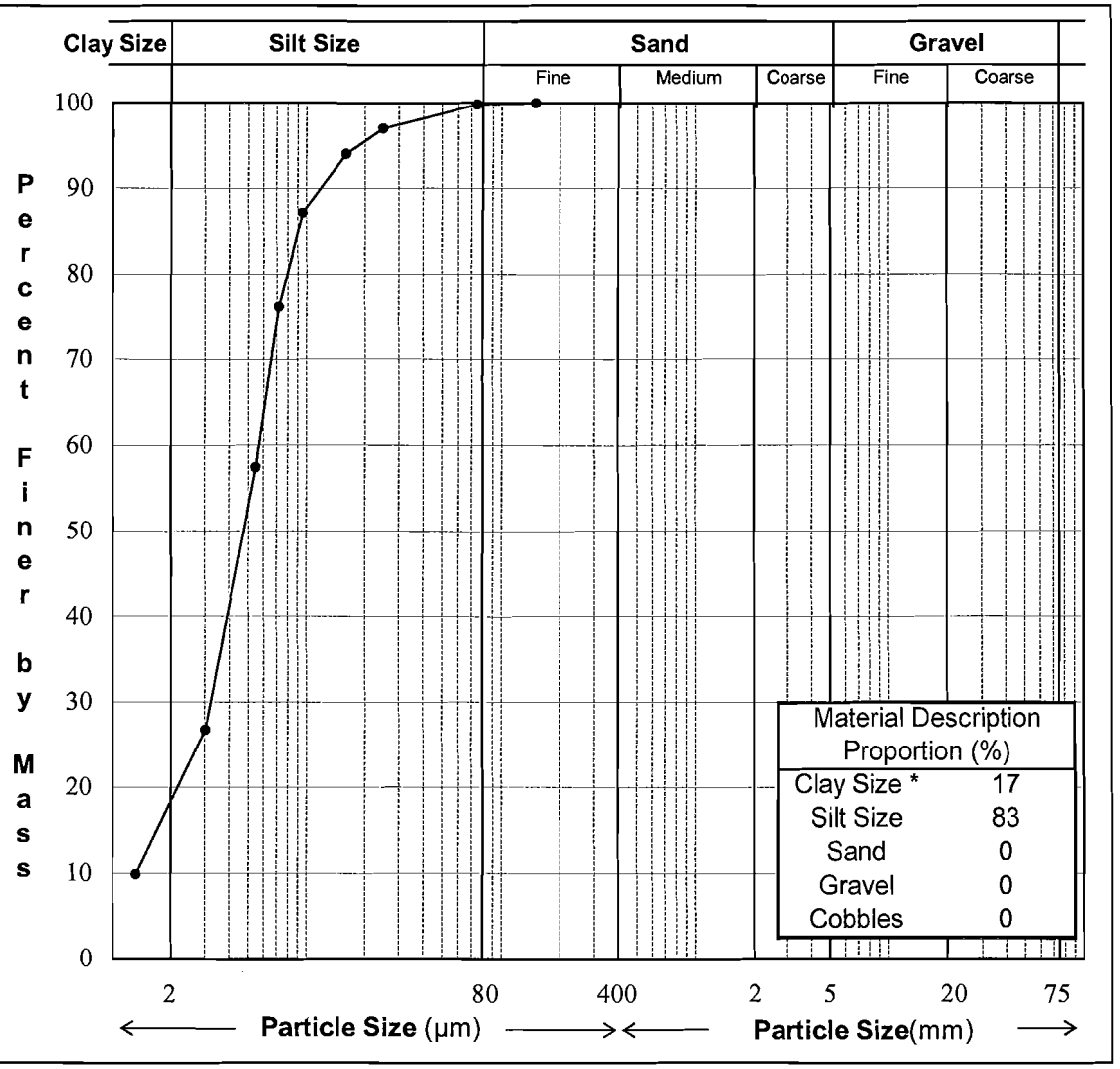
LOGGED BY: MCP	COMPLETION DEPTH: 6m
REVIEWED BY:	COMPLETE: 12/9/2008
DRAWING NO:	Page 1 of 1

PARTICLE SIZE ANALYSIS (Hydrometer) TEST REPORT

ASTM D422

Project: **Whistle Bend Subdivision, Whitehorse, YT** Date Tested: 2008/12/09
Client: AECOM
Project No.: W14101171
Location:
Sample No.: BH07-3
Depth: 4.5 m
Description**: SILT - some clay

Particle Size	Percent Passing
100 mm	
75 mm	
50 mm	
38 mm	
25 mm	
19 mm	
13 mm	
10 mm	
5 mm	
2 mm	
850 µm	
425 µm	
250 µm	
150 µm	100
75 µm	100
25 µm	97
16 µm	94
10 µm	87
7 µm	76
5 µm	57
3 µm	27
1 µm	10



Remarks: * The upper clay size of 2 µm, per the Canadian Foundation Engineering Manual.
** The description is visually based & subject to EBA description protocols.

Reviewed By:

EBA Engineering Consultants Ltd.

Geotechnical Evaluation	AECOM	BOREHOLE NO: W14101171-BH08
Whistle Bend Subdivision	Drilling Method: NODWELL Mounted CME 75	PROJECT NO: W14101171
Whitehorse, YT	6737347N; 494293E; Zone 8	

SAMPLE TYPE: GRAB SAMPLE | NO RECOVERY | BULK | CRREL CORE | SHELBY TUBE | GRAB CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m³) 500 1000 1500 2000; PLASTIC M.C. LIQUID 20 40 60 80	CLAY (%) SILT (%) SAND (%) GRAVEL (%) 20 40 60 80	Depth (ft)
0	SAND - some silt, fine grained, uniform, dry to damp below seasonal frost, loose, medium brown		1				0
1							
2	SILT AND SAND - trace organics, damp, firm, brown - interbedded with sandier material		2				5
3			3				10
4	SILT - trace fine sand, trace to some clay, wet and softer with depth, olive grey with some brown mottling		4				15
5	- soft and dark grey below 5 m		5				
6	END OF BOREHOLE @ 6.0 m						20
7							25
8							
9							30
10							33

EBA Engineering Consultants Ltd.

LOGGED BY: MCP	COMPLETION DEPTH: 6m
REVIEWED BY:	COMPLETE: 12/9/2008
DRAWING NO:	Page 1 of 1

PARTICLE SIZE DISTRIBUTION

ASTM C136 & D422

Project: **Whistle Bend Subdivision, Whitehorse, YT**

Project Number: W14101171

Date Tested: December 10, 2008

Tespit Number: BH08-2

Depth: 1.5 m

Soil Description: SILT AND SAND

Cu:

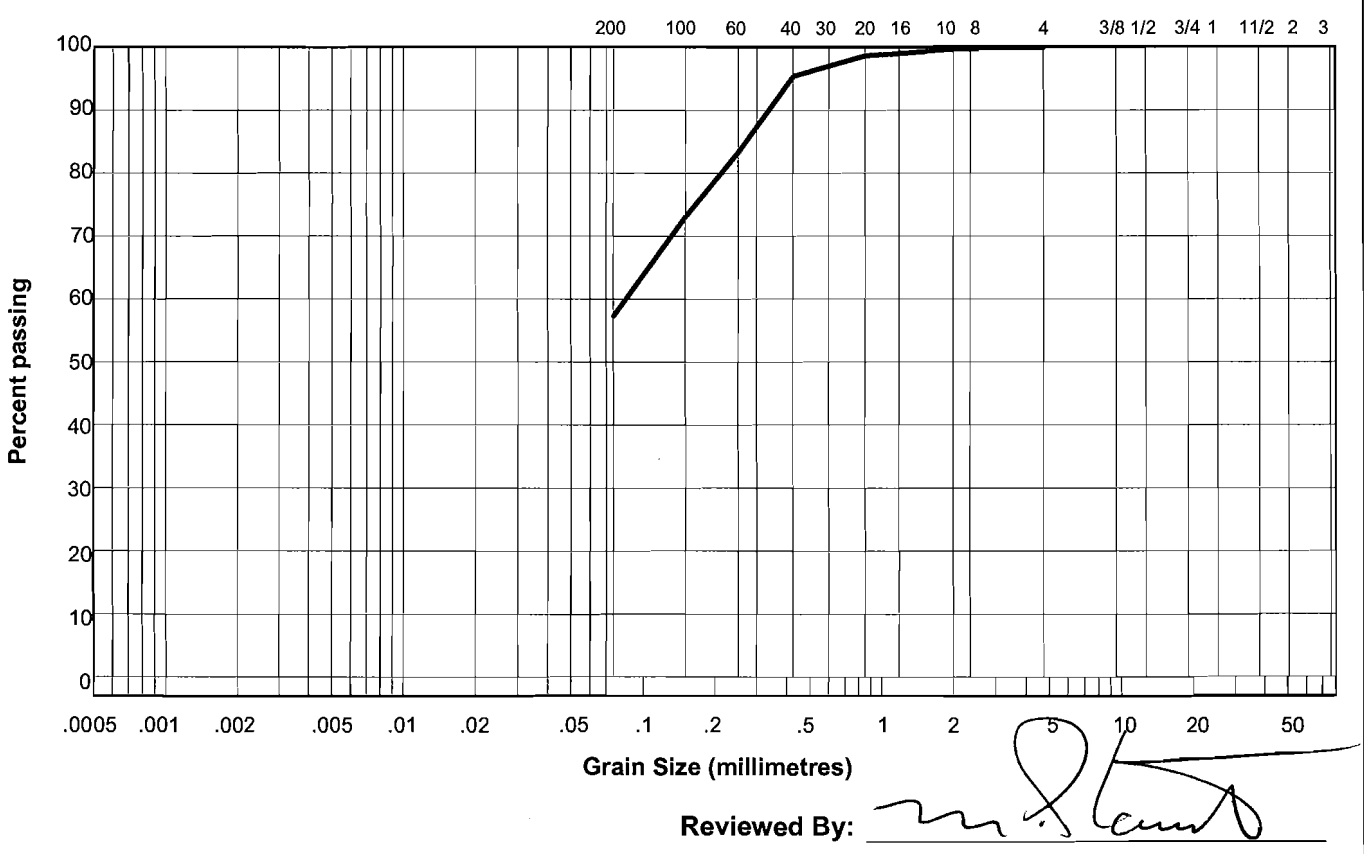
Cc:

Natural Moisture Content: 17.0%

Remarks:

Sieve Size	Percent Passing
50.000	#N/A
37.500	#N/A
25.000	#N/A
19.000	#N/A
12.500	#N/A
9.500	#N/A
4.750	100
2.000	100
0.850	99
0.425	95
0.250	83
0.150	73
0.075	57.3

Clay	Silt	Sand			Gravel	
		Fine	Medium	Coarse	Fine	Coarse



Reviewed By:

EBA Engineering Consultants Ltd.

Geotechnical Evaluation	AECOM	BOREHOLE NO: W14101171-BH09
Whistle Bend Subdivision	Drilling Method: NODWELL Mounted CME 75	PROJECT NO: W14101171
Whitehorse, YT	6737534N; 494167E; Zone 8	

SAMPLE TYPE: GRAB SAMPLE | NO RECOVERY | BULK | CRREL CORE | SHELBY TUBE | GRAB CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS
0	SAND - trace to some silt, trace organics, fine grained, uniform, damp to dry below frost, loose, dark brown		1	
1				
			2	
2	- slightly coarser and grey below 2.0 m			
			3	
3	- becomes siltier and firm, moisture increasing below 3.0 m			
4			4	
	SILT - some clay, trace fine sand, wet, soft, dark grey			
5				
			5	
6	END OF BOREHOLE @ 6.0 m			
7				
8				
9				
10				

Bulk Density(kg/m^3): 500 1000 1500 2000

PLASTIC M.C. LIQUID: 20 40 60 80

CLAY (%): 20 40 60 80

SILT (%): 20 40 60 80

SAND (%): 20 40 60 80

GRAVEL (%): 20 40 60 80

Depth (ft): 0 5 10 15 20 25 30 33

EBA Engineering Consultants Ltd.

LOGGED BY: MCP	COMPLETION DEPTH: 6m
REVIEWED BY:	COMPLETE: 12/9/2008
DRAWING NO:	Page 1 of 1

PARTICLE SIZE DISTRIBUTION

ASTM C136 & D422

Project: **Whistle Bend Subdivision, Whitehorse, YT**

Project Number: W14101171

Date Tested: December 10, 2008

Tespit Number: BH09-1

Depth: 0.3 m

Soil Description: SAND - silty, trace gravel

Cu:

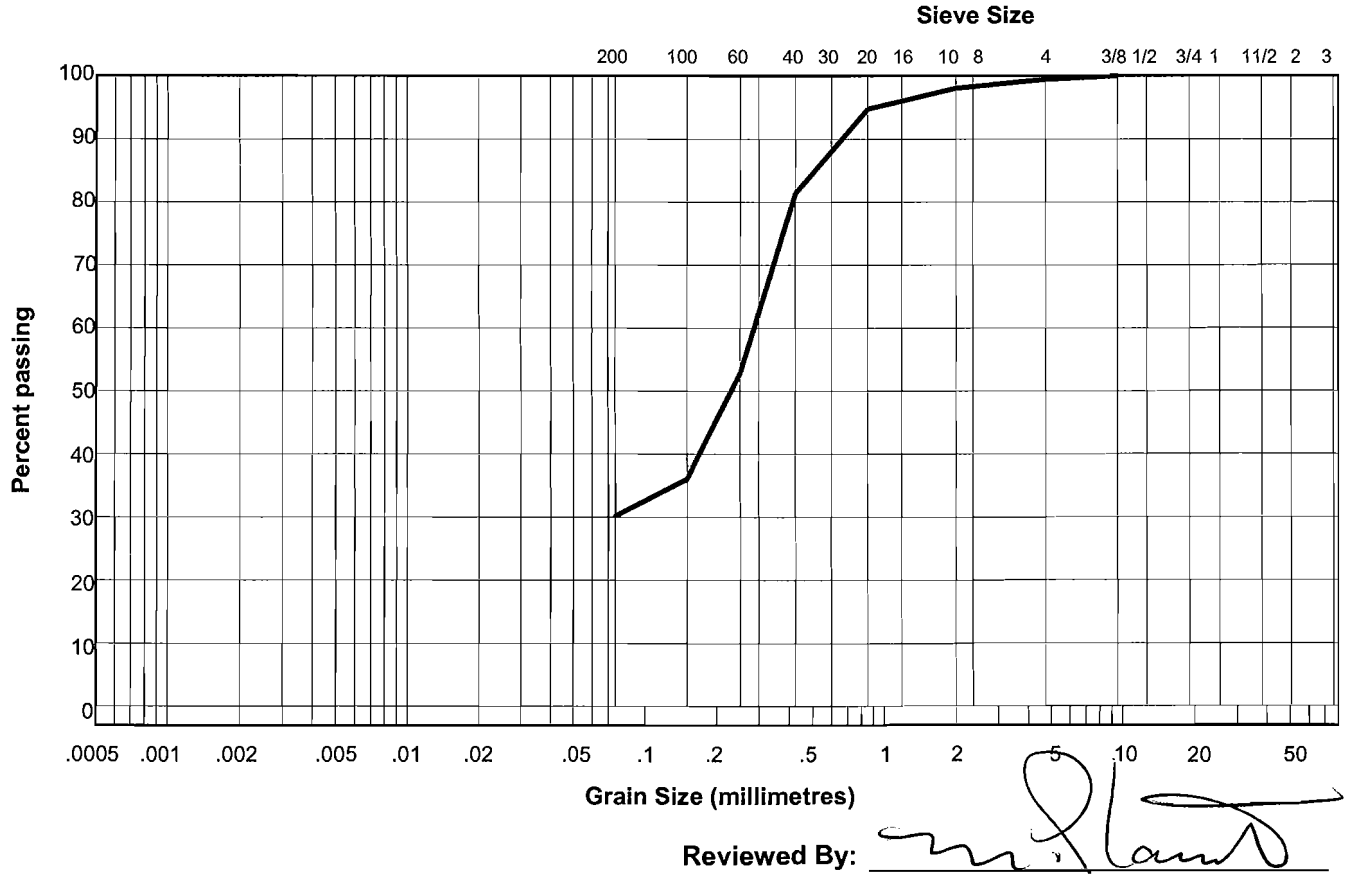
Cc:

Natural Moisture Content: 9.2%

Remarks:

Sieve Size	Percent Passing
50.000	#N/A
37.500	#N/A
25.000	#N/A
19.000	#N/A
12.500	#N/A
9.500	100
4.750	99
2.000	98
0.850	95
0.425	81
0.250	53
0.150	36
0.075	30.2

Clay	Silt	Sand			Gravel	
		Fine	Medium	Coarse	Fine	Coarse



Reviewed By:

EBA Engineering Consultants Ltd.

Geotechnical Evaluation	AECOM	BOREHOLE NO: W14101171-BH10
Whistle Bend Subdivision	Drilling Method: NODWELL Mounted CME 75	PROJECT NO: W14101171
Whitehorse, YT	6737740N; 494593E; Zone 8	

SAMPLE TYPE: GRAB SAMPLE | NO RECOVERY | BULK | CRREL CORE | SHELBY TUBE | GRAB CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m³) 500 1000 1500 2000; PLASTIC M.C. LIQUID 20 40 60 80	CLAY (%) 20 40 60 80; SILT (%) 20 40 60 80; SAND (%) 20 40 60 80; GRAVEL (%) 20 40 60 80	Depth (ft)
0	SILT - some clay, trace of fine sand, seasonally frozen to 0.6 m, moist, below frost firm, medium olive brown, some mottling		1				0
1							
			2				5
2							
			3				10
3	- moisture content increasing with depth, firm, dark olive						
4			4				15
	- consistently smooth drilling throughout depth of borehole, wet with higher plasticity from 4.5 to 6.0 m						
5			5				
6	END OF BOREHOLE @ 6.0 m						20
7							
							25
8							
9							30
10							33

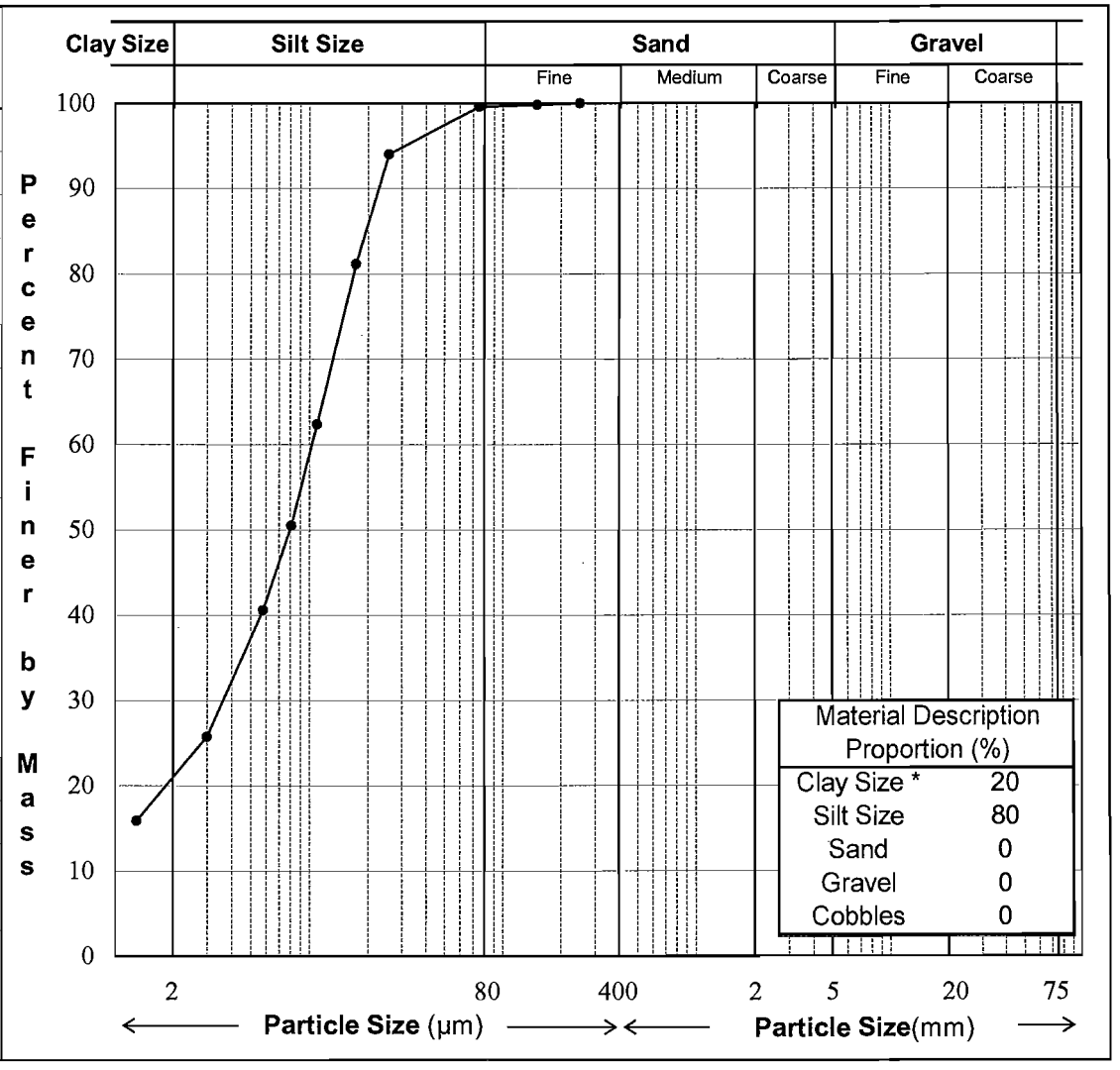
EBA Engineering Consultants Ltd.	LOGGED BY: MCP	COMPLETION DEPTH: 6m
	REVIEWED BY:	COMPLETE: 12/10/2008
	DRAWING NO:	Page 1 of 1

PARTICLE SIZE ANALYSIS (Hydrometer) TEST REPORT

ASTM D422

Project: **Whistle Bend Subdivision, Whitehorse, YT** Date Tested: 2008/12/11
Client: AECOM
Project No.: W14101171
Location:
Sample No.: BH10-2
Depth: 1.5 m
Description**: SILT - some clay

Particle Size	Percent Passing
100 mm	
75 mm	
50 mm	
38 mm	
25 mm	
19 mm	
13 mm	
10 mm	
5 mm	
2 mm	
850 µm	
425 µm	
250 µm	100
150 µm	100
75 µm	100
26 µm	94
17 µm	81
11 µm	62
8 µm	50
6 µm	41
3 µm	26
1 µm	16



Remarks: * The upper clay size of 2 µm, per the Canadian Foundation Engineering Manual.
** The description is visually based & subject to EBA description protocols.

Reviewed By: _____

EBA Engineering Consultants Ltd. eba

Geotechnical Evaluation	AECOM	BOREHOLE NO: W14101171-BH11
Whistle Bend Subdivision	Drilling Method: NODWELL Mounted CME 75	PROJECT NO: W14101171
Whitehorse, YT	6737995N; 494583E; Zone 8	

SAMPLE TYPE: GRAB SAMPLE | NO RECOVERY | BULK | CRREL CORE | SHELBY TUBE | GRAB CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS
0	GRAVEL (FILL) - sandy, trace to some silt, seasonally frozen, dark brown		1	
1	SAND - some silt to silty, fine grained, dry to damp, fairly compact, medium brown		2	
2	- sand is medium to coarse grained from 1.5 to 2.0 m			
3	SILT - some clay, trace fine sand, damp, becoming moist with depth, firm, medium to dark olive with some brown mottling		3	
4			4	
5				
6	END OF BOREHOLE @ 6.0 m		5	
7				
8				
9				
10				

Bulk Density(kg/m^3) 500 1000 1500 2000

PLASTIC M.C. LIQUID 20 40 60 80

◆ CLAY (%) ◆ 20 40 60 80

● SILT (%) ● 20 40 60 80

▲ SAND (%) ▲ 20 40 60 80

■ GRAVEL (%) ■ 20 40 60 80

Depth (ft): 0, 5, 10, 15, 20, 25, 30, 33

EBA Engineering Consultants Ltd.

LOGGED BY: MCP	COMPLETION DEPTH: 6m
REVIEWED BY:	COMPLETE: 12/10/2008
DRAWING NO:	Page 1 of 1

PARTICLE SIZE DISTRIBUTION

ASTM C136 & D422

Project: **Whistle Bend Subdivision, Whitehorse, YT**

Project Number: W14101171

Date Tested: December 11, 2008

Tespit Number: BH11-2

Depth: 1.5 m

Soil Description: SAND - silty

Cu:

Cc:

Natural Moisture Content: 6.5%

Remarks:

Sieve Size	Percent Passing
50.000	#N/A
37.500	#N/A
25.000	#N/A
19.000	#N/A
12.500	#N/A
9.500	#N/A
4.750	100
2.000	100
0.850	100
0.425	98
0.250	79
0.150	49
0.075	21.8

Clay	Silt	Sand			Gravel	
		Fine	Medium	Coarse	Fine	Coarse

Reviewed By:

EBA Engineering Consultants Ltd.

Geotechnical Evaluation	AECOM	BOREHOLE NO: W14101171-BH12
Whistle Bend Subdivision	Drilling Method: NODWELL Mounted CME 75	PROJECT NO: W14101171
Whitehorse, YT	6738445N; 494880E; Zone 8	

SAMPLE TYPE: GRAB SAMPLE | NO RECOVERY | BULK | CRREL CORE | SHELBY TUBE | GRAB CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS
0	ORGANIC ROOT MATERIAL - frozen, black			
	SAND AND SILT - some silt to silty, fine grained, uniform, dry to damp, medium brown		1	
1	- becomes coarser, trace silt, dry, loose, greyish brown below 0.3 m			
	SILT -some fine sand, trace to some clay, damp, firm, light olive		2	
2				
3	- moisture content increases with depth, still firm, dark olive		3	
4	- finer below 4.0 m		4	
5				
6	END OF BOREHOLE @ 6.0 m		5	
7				
8				
9				
10				

Bulk Density(kg/m^3) 500 1000 1500 2000

PLASTIC M.C. LIQUID 20 40 60 80

◆ CLAY (%) ◆ 20 40 60 80

● SILT (%) ● 20 40 60 80

▲ SAND (%) ▲ 20 40 60 80

■ GRAVEL (%) ■ 20 40 60 80

Depth (ft): 0, 5, 10, 15, 20, 25, 30, 33

EBA Engineering Consultants Ltd.

LOGGED BY: MCP	COMPLETION DEPTH: 6m
REVIEWED BY:	COMPLETE: 12/10/2008
DRAWING NO:	Page 1 of 1

MGP W14101171.GPJ EBA.GDT 09/1/30

PARTICLE SIZE DISTRIBUTION

ASTM C136 & D422

Project: **Whistle Bend Subdivision, Whitehorse, YT**

Project Number: W14101171

Date Tested: December 10, 2008

Tespit Number: BH12-1

Depth: 0.3 m

Soil Description: SAND AND SILT

Cu:

Cc:

Natural Moisture Content: 4.5%

Remarks:

Sieve Size	Percent Passing
50.000	#N/A
37.500	#N/A
25.000	#N/A
19.000	#N/A
12.500	#N/A
9.500	#N/A
4.750	100
2.000	100
0.850	100
0.425	95
0.250	77
0.150	61
0.075	47.7

Clay	Silt	Sand			Gravel	
		Fine	Medium	Coarse	Fine	Coarse

Reviewed By:

EBA Engineering Consultants Ltd.

Geotechnical Evaluation	AECOM	BOREHOLE NO: W14101171-BH13
Whistle Bend Subdivision	Drilling Method: NODWELL Mounted CME 75	PROJECT NO: W14101171
Whitehorse, YT	6738509N; 494430E; Zone 8	

SAMPLE TYPE: GRAB SAMPLE | NO RECOVERY | BULK | CRREL CORE | SHELBY TUBE | GRAB CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS
0	ORGANIC ROOT MATERIAL - seasonally frozen, brown and black			
	SAND - silty, trace organics at upper interface, fine grained, uniform, damp below seasonal frost, medium brown		1	
	- sand becomes slightly coarser, trace silt, dry to damp, medium greyish brown			
1				
			2	
	- trace to some gravel from 1.5 to 2.5 m			
2				
	SILT - some clay, trace fine sand, damp, firm, light olive		3	
3	- moisture content increases with depth, firm, becomes dark olive			
4			4	
5	- easy drilling throughout depth of borehole			
			5	
6	END OF BOREHOLE @ 6.0 m			
7				
8				
9				
10				

Bulk Density(kg/m^3): 500 1000 1500 2000

PLASTIC M.C. LIQUID: 20 40 60 80

◆ CLAY (%) ◆: 20 40 60 80

● SILT (%) ●: 20 40 60 80

▲ SAND (%) ▲: 20 40 60 80

■ GRAVEL (%) ■: 20 40 60 80

Depth (ft): 0 5 10 15 20 25 30 33

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LOGGED BY: MCP	COMPLETION DEPTH: 6m
REVIEWED BY:	COMPLETE: 12/10/2008
DRAWING NO:	Page 1 of 1

PARTICLE SIZE DISTRIBUTION

ASTM C136 & D422

Project: **Whistle Bend Subdivision, Whitehorse, YT**

Project Number: W14101171

Date Tested: December 11, 2008

Tespit Number: BH13-2

Depth: 1.5 m

Soil Description: SAND - silty

Cu:

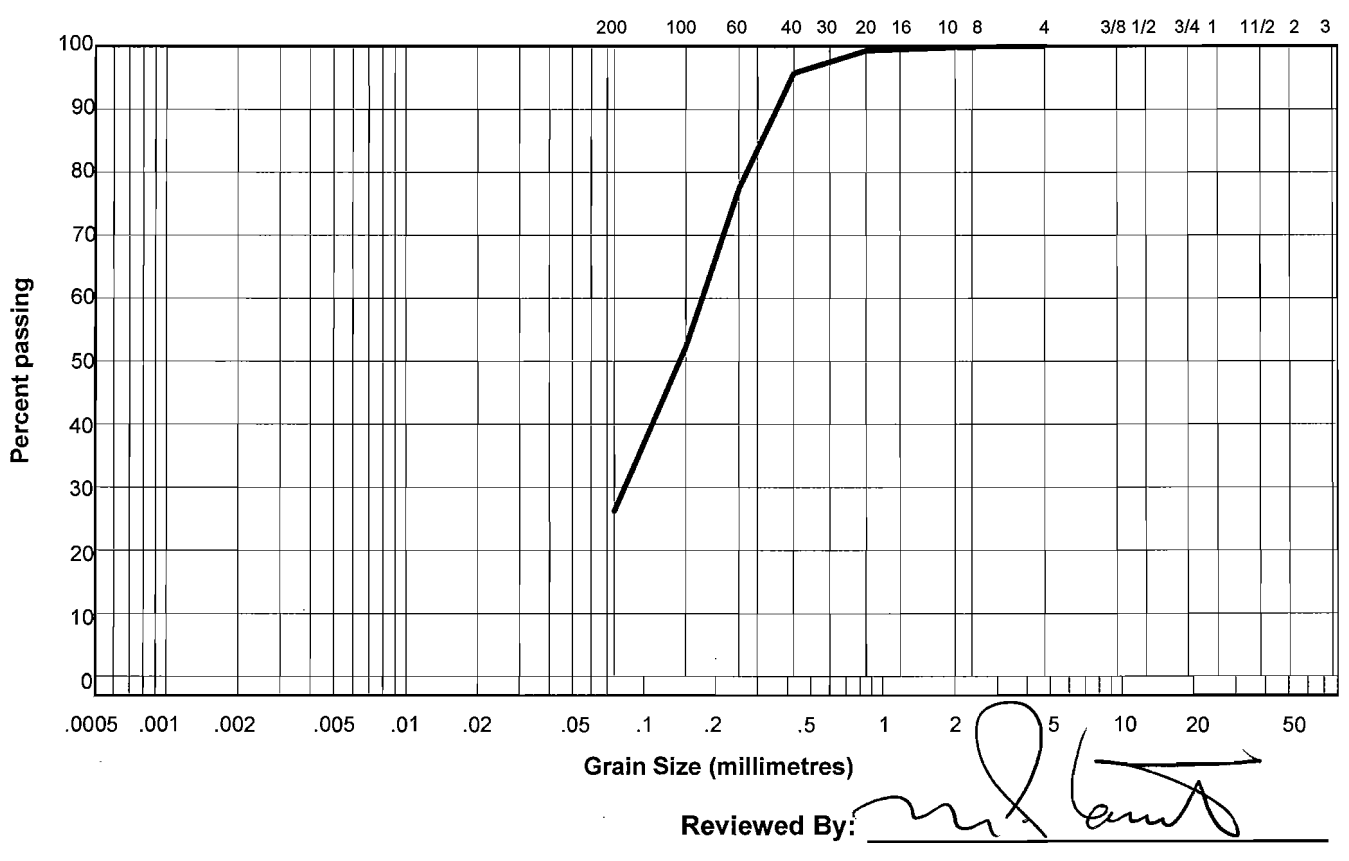
Cc:

Natural Moisture Content: 3.2%

Remarks:

Sieve Size	Percent Passing
50.000	#N/A
37.500	#N/A
25.000	#N/A
19.000	#N/A
12.500	#N/A
9.500	#N/A
4.750	100
2.000	100
0.850	99
0.425	96
0.250	77
0.150	52
0.075	26.2

Clay	Silt	Sand			Gravel	
		Fine	Medium	Coarse	Fine	Coarse



Reviewed By:

EBA Engineering Consultants Ltd.

Geotechnical Evaluation	AECOM	BOREHOLE NO: W14101171-BH14
Whistle Bend Subdivision	Drilling Method: NODWELL Mounted CME 75	PROJECT NO: W14101171
Whitehorse, YT	6738205N; 494192E; Zone 8	

SAMPLE TYPE: GRAB SAMPLE | NO RECOVERY | BULK | CRREL CORE | SHELBY TUBE | GRAB CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS
0	ORGANIC ROOT MATERIAL - seasonally frozen, black			
	SILT - some clay, trace fine sand, seasonally frozen to 0.8 m, damp below seasonal frost, firm, medium olive brown		1	
1				
			2	
2				
	- moisture content increases with depth, firm, dark olive brown		3	
3				
4			4	
	- soft by 4.5 m, turning dark grey as moisture content increases between 4.5 and 6.0 m			
5				
			5	
6	END OF BOREHOLE @ 6.0 m			
7				
8				
9				
10				

Bulk Density(kg/m^3): 500 1000 1500 2000

PLASTIC M.C. LIQUID: 20 40 60 80

◆ CLAY (%) ◆: 20 40 60 80

● SILT (%) ●: 20 40 60 80

▲ SAMPLE (%) ▲: 20 40 60 80

■ GRAVEL (%) ■: 20 40 60 80

Depth (ft): 0, 5, 10, 15, 20, 25, 30, 33

EBA Engineering Consultants Ltd.	LOGGED BY: MCP	COMPLETION DEPTH: 6m
	REVIEWED BY:	COMPLETE: 12/10/2008
	DRAWING NO:	Page 1 of 1

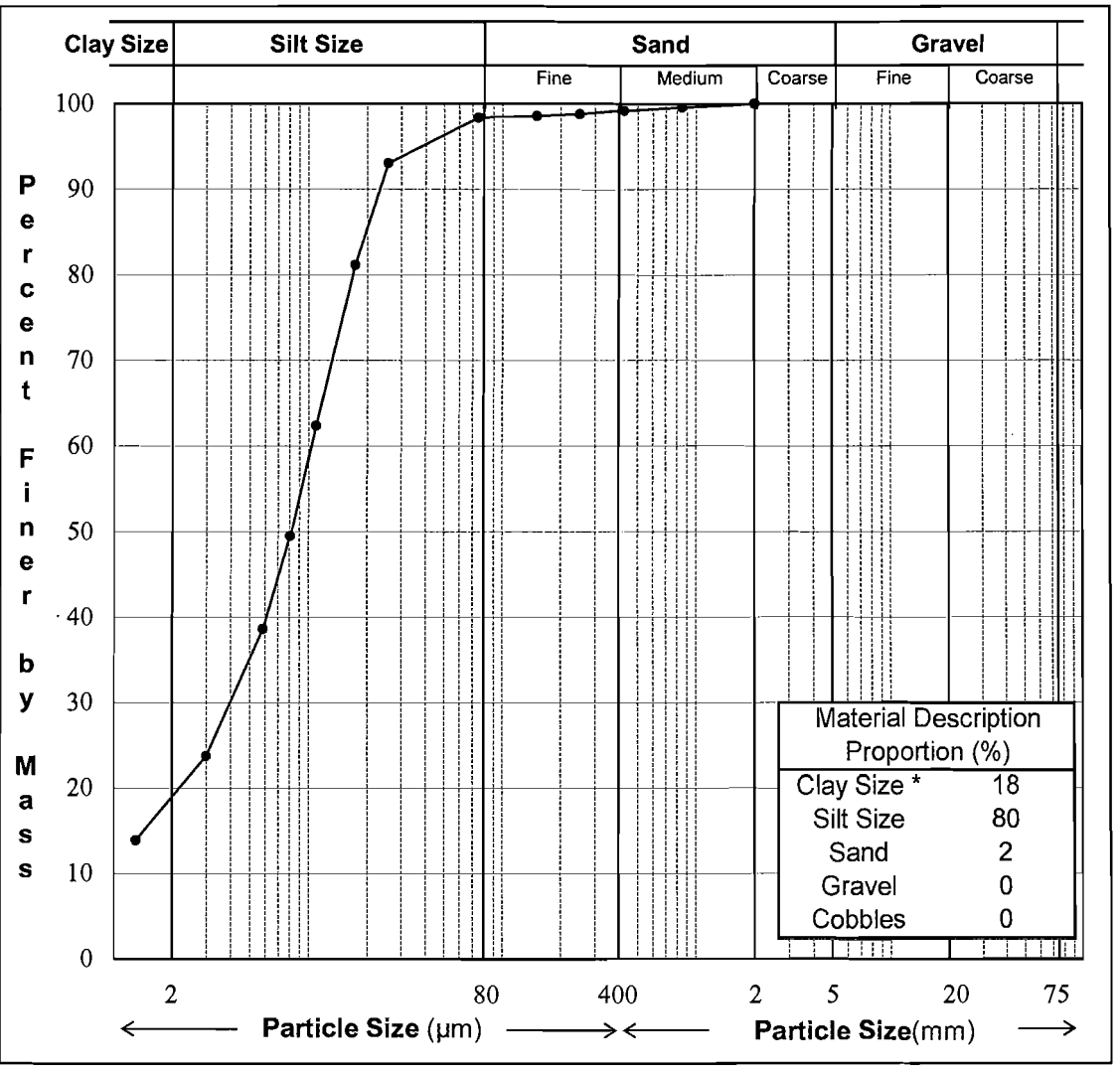
MGP W14101171.GPJ EBA.GDT 09/01/30

PARTICLE SIZE ANALYSIS (Hydrometer) TEST REPORT

ASTM D422

Project: **Whistle Bend Subdivision, Whitehorse, YT** Date Tested: 2008/12/11
Client: AECOM
Project No.: W14101171
Location:
Sample No.: BH14-1
Depth: 0.3 m
Description**: SILT - some clay, trace sand

Particle Size	Percent Passing
100 mm	
75 mm	
50 mm	
38 mm	
25 mm	
19 mm	
13 mm	
10 mm	
5 mm	
2 mm	100
850 µm	100
425 µm	99
250 µm	99
150 µm	99
75 µm	98
26 µm	93
17 µm	81
11 µm	62
8 µm	50
6 µm	39
3 µm	24
1 µm	14



Remarks: * The upper clay size of 2 µm, per the Canadian Foundation Engineering Manual.
** The description is visually based & subject to EBA description protocols.

Reviewed By: _____

EBA Engineering Consultants Ltd. eba

Geotechnical Evaluation	AECOM	BOREHOLE NO: W14101171-BH15
Whistle Bend Subdivision	Drilling Method: NODWELL Mounted CME 75	PROJECT NO: W14101171
Whitehorse, YT	6738162N; 494003E; Zone 8	

SAMPLE TYPE: GRAB SAMPLE | NO RECOVERY | BULK | CRREL CORE | SHELBY TUBE | GRAB CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m³) 500 1000 1500 2000 / PLASTIC M.C. LIQUID 20 40 60 80	CLAY (%) / SILT (%) / SAND (%) / GRAVEL (%) 20 40 60 80	Depth (ft)
0	SAND - some to trace silt, fine grained, uniform, dry to damp below seasonal frost, medium brown		1				0
1	- becomes cleaner and greyish brown at 0.3 m						
			2				5
2							
			3				10
3	- smooth, easy drilling throughout depth of borehole						
4			4				15
5							
			5				20
6							
7			6				25
8							
	SILT - some clay, trace fine sand, wet, soft, dark olive		7				30
9	END OF BOREHOLE @ 9.0 m						
10							33

EBA Engineering Consultants Ltd.	LOGGED BY: MCP	COMPLETION DEPTH: 9m
	REVIEWED BY:	COMPLETE: 12/10/2008
	DRAWING NO:	Page 1 of 1

PARTICLE SIZE DISTRIBUTION

ASTM C136 & D422

Project: **Whistle Bend Subdivision, Whitehorse, YT**

Project Number: W14101171

Date Tested: December 11, 2008

Tespit Number: BH15-5

Depth: 6.0 m

Soil Description: SAND - trace silt

Cu: 2.4

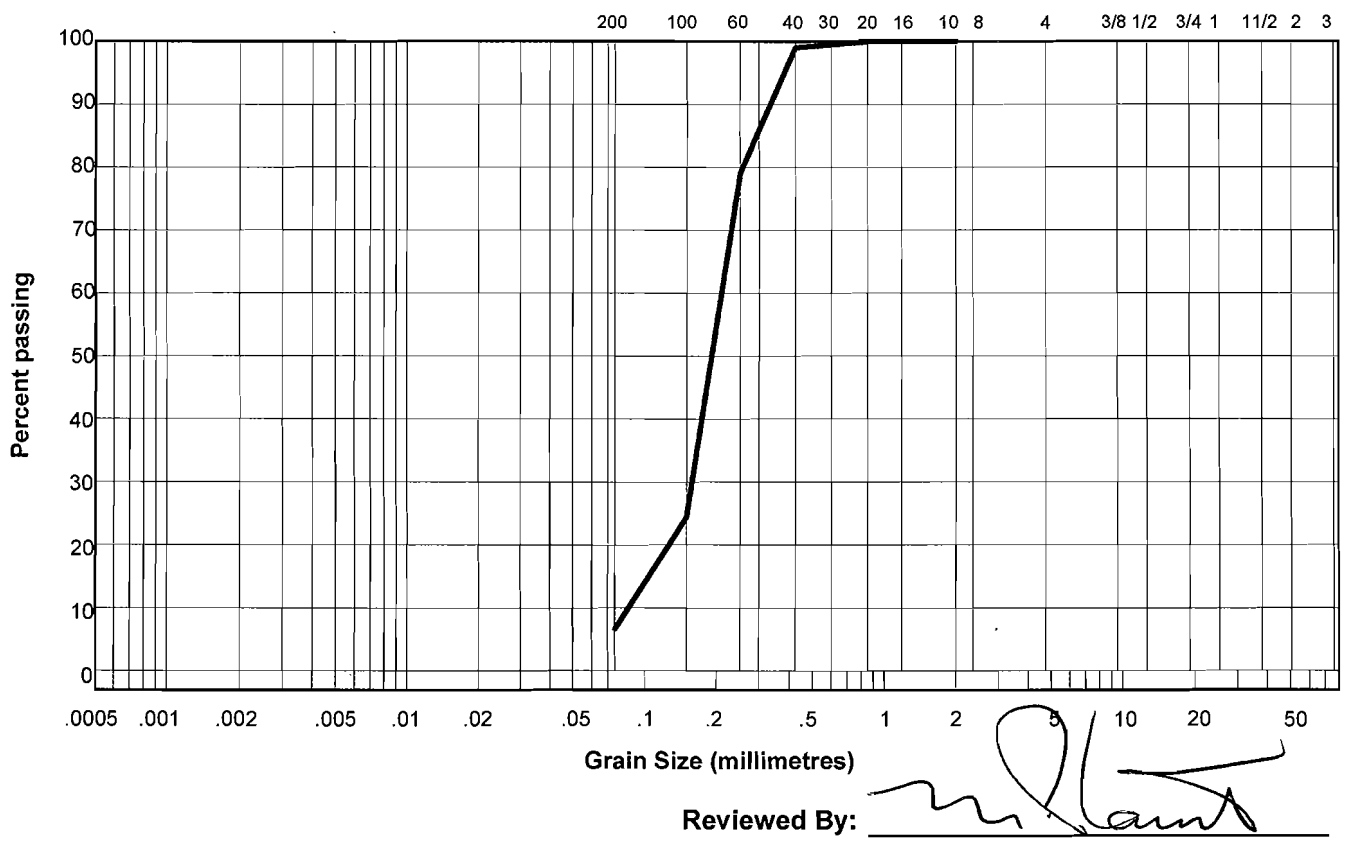
Cc: 1.4

Natural Moisture Content: 2.9%

Remarks:

Sieve Size	Percent Passing
50.000	#N/A
37.500	#N/A
25.000	#N/A
19.000	#N/A
12.500	#N/A
9.500	#N/A
4.750	#N/A
2.000	100
0.850	100
0.425	99
0.250	79
0.150	24
0.075	6.6

Clay	Silt	Sand			Gravel	
		Fine	Medium	Coarse	Fine	Coarse



Reviewed By:

EBA Engineering Consultants Ltd.

Geotechnical Evaluation	AECOM	BOREHOLE NO: W14101171-BH16
Whistle Bend Subdivision	Drilling Method: NODWELL Mounted CME 75	PROJECT NO: W14101171
Whitehorse, YT	6738800N; 493653E; Zone 8	

SAMPLE TYPE: GRAB SAMPLE | NO RECOVERY | BULK | CRREL CORE | SHELBY TUBE | GRAB CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS
0	ORGANIC ROOT MATERIAL - seasonally frozen, organic brown			
	SAND - some silt to silty, damp below seasonal frost, dark brown		1	
1	- becomes clean and medium to fine grained, dry to damp, medium greyish brown			
	SILT - some clay, trace fine sand, damp, firm, light olive		2	
2				
3	- moisture content increases with depth, still firm		3	
4			4	
	- some mottling in soil at 4.5 m			
5				
6			5	
	END OF BOREHOLE @ 6.0 m			
7				
8				
9				
10				

Bulk Density(kg/m^3): 500 1000 1500 2000

PLASTIC M.C. LIQUID: 20 40 60 80

CLAY (%): 20 40 60 80

SILT (%): 20 40 60 80

SAND (%): 20 40 60 80

GRAVEL (%): 20 40 60 80

Depth (ft): 0 5 10 15 20 25 30 33

EBA Engineering Consultants Ltd.	LOGGED BY: MCP	COMPLETION DEPTH: 6m
	REVIEWED BY:	COMPLETE: 12/11/2008
	DRAWING NO:	Page 1 of 1

MGP W14101171.GPJ EBA.GDT 09/01/30

PARTICLE SIZE DISTRIBUTION

ASTM C136 & D422

Project: **Whistle Bend Subdivision, Whitehorse, YT**

Project Number: W14101171

Date Tested: December 11, 2008

Tespit Number: BH16-1

Depth: 0.3 m

Soil Description: SAND - trace silt

Cu:

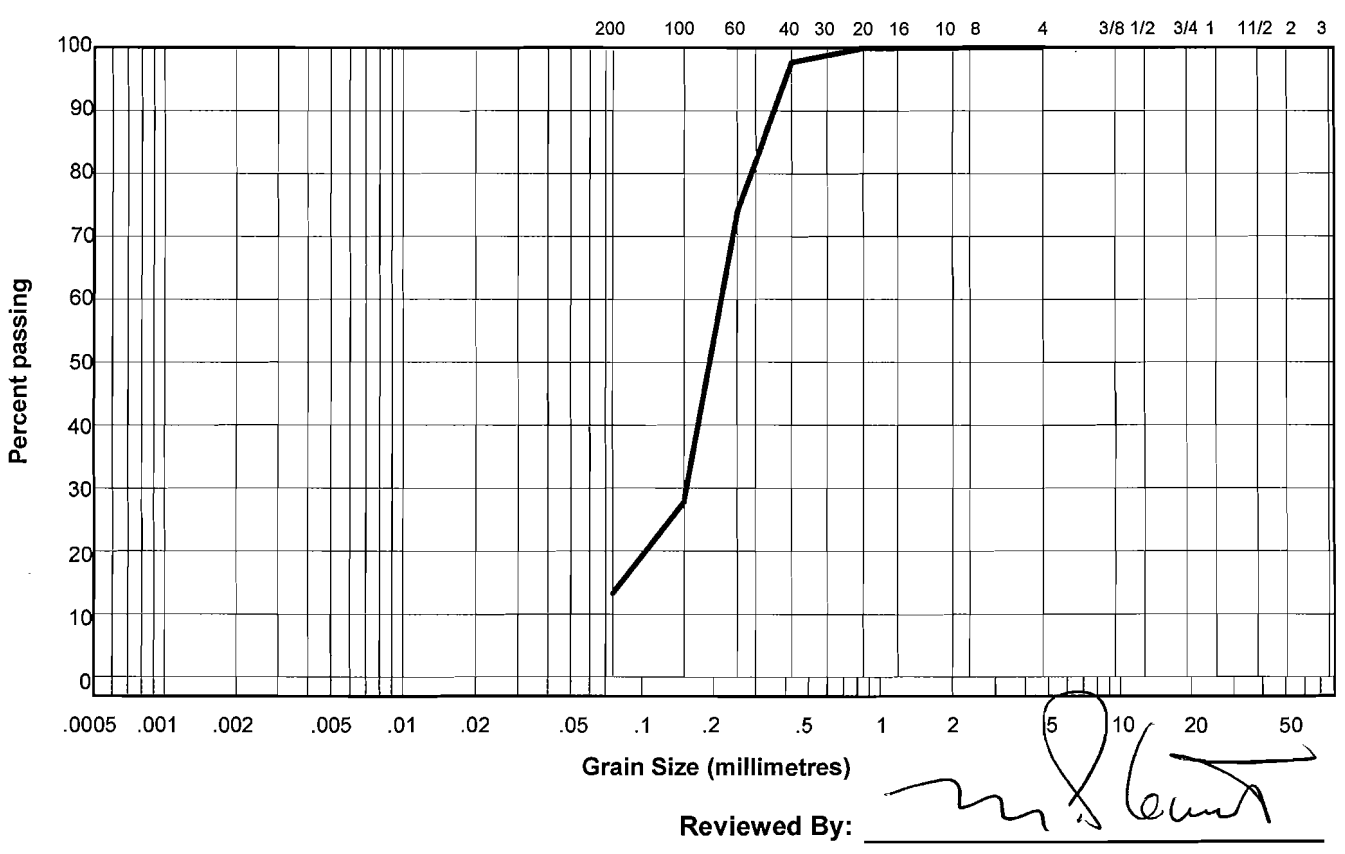
Cc:

Natural Moisture Content: 5.2%

Remarks:

Sieve Size	Percent Passing
50.000	#N/A
37.500	#N/A
25.000	#N/A
19.000	#N/A
12.500	#N/A
9.500	#N/A
4.750	100
2.000	100
0.850	100
0.425	98
0.250	74
0.150	28
0.075	13.3

Clay	Silt	Sand			Gravel	
		Fine	Medium	Coarse	Fine	Coarse



Reviewed By:

EBA Engineering Consultants Ltd.

Geotechnical Evaluation	AECOM	BOREHOLE NO: W14101171-BH17
Whistle Bend Subdivision	Drilling Method: NODWELL Mounted CME 75	PROJECT NO: W14101171
Whitehorse, YT	6738516N; 493694E; Zone 8	

SAMPLE TYPE: GRAB SAMPLE | NO RECOVERY | BULK | CRREL CORE | SHELBY TUBE | GRAB CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS
0	ORGANIC ROOT MATERIAL - seasonally frozen, black and brown			
	SAND - some silt, trace organics, damp below seasonal frost, brown		1	
	- becomes SAND - trace silt, medium to fine grained, damp, greyish brown			
	SILT - some clay, trace fine sand, damp, firm, medium olive brown			
1			2	
2	- moisture content increasing with depth, becoming softer			
3			3	
4	- sandy, silt lens from 4.1 to 4.3 m		4	
5				
6			5	
	END OF BOREHOLE @ 6.0 m			
7				
8				
9				
10				

Bulk Density(kg/m^3): 500 1000 1500 2000

PLASTIC M.C. LIQUID: 20 40 60 80

CLAY (%): 20 40 60 80

SILT (%): 20 40 60 80

SAND (%): 20 40 60 80

GRAVEL (%): 20 40 60 80

Depth (ft): 0 5 10 15 20 25 30 33

EBA Engineering Consultants Ltd.

LOGGED BY: MCP	COMPLETION DEPTH: 6m
REVIEWED BY:	COMPLETE: 12/11/2008
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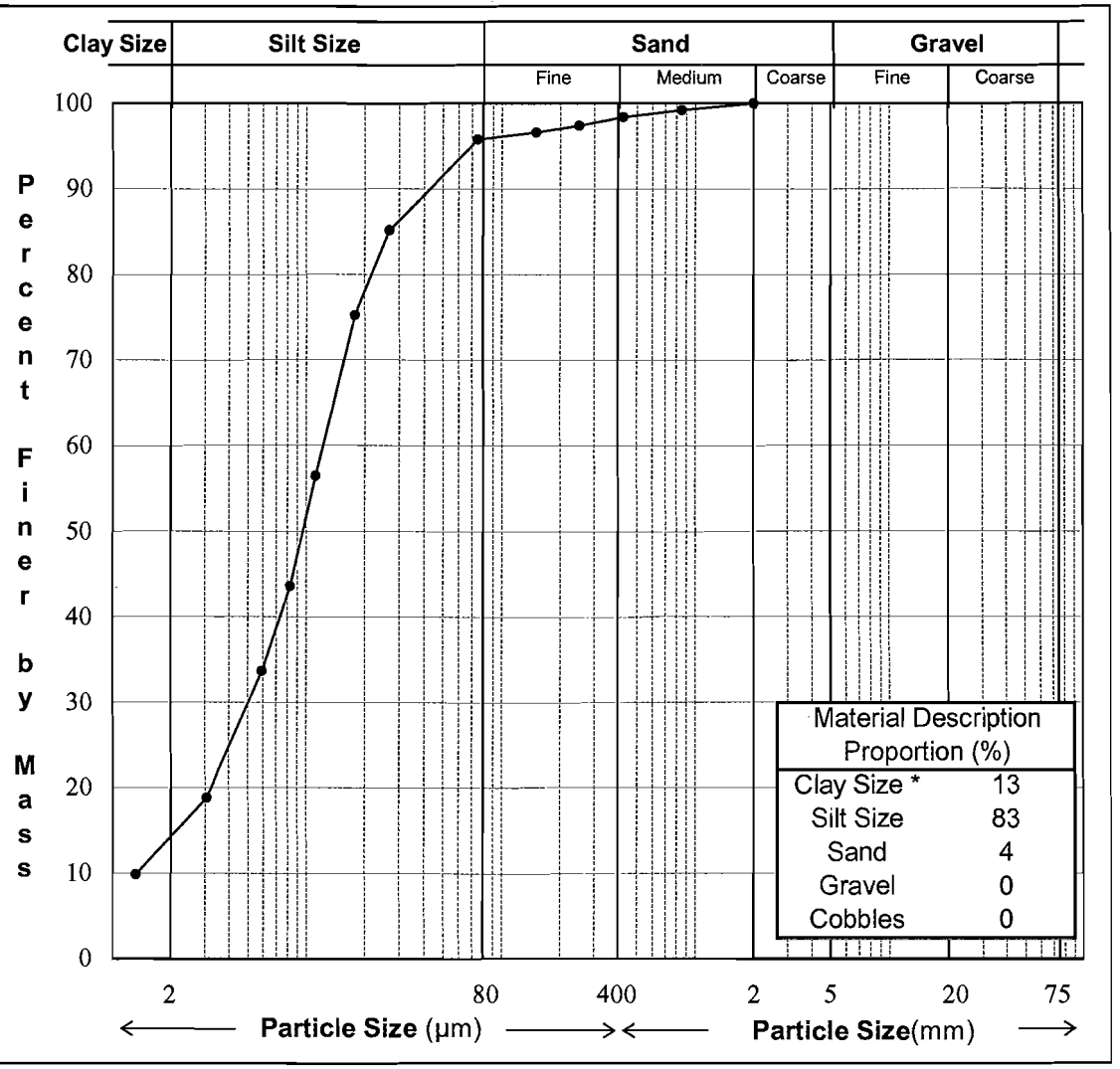
PARTICLE SIZE ANALYSIS (Hydrometer) TEST REPORT

ASTM D422

Project: **Whistle Bend Subdivision, Whitehorse, YT** Date Tested: 2008/12/11
Client: AECOM
Project No.: W14101171
Location:
Sample No.: BH17-3
Depth: 3.0 m
Description**: SILT - some clay, trace sand

Particle Size	Percent Passing
100 mm	
75 mm	
50 mm	
38 mm	
25 mm	
19 mm	
13 mm	
10 mm	
5 mm	
2 mm	100
850 µm	99
425 µm	98
250 µm	97
150 µm	97
75 µm	96
27 µm	85
18 µm	75
11 µm	56
8 µm	44
6 µm	34
3 µm	19
1 µm	10



Remarks: * The upper clay size of 2 µm, per the Canadian Foundation Engineering Manual.
** The description is visually based & subject to EBA description protocols.

Reviewed By: _____

EBA Engineering Consultants Ltd.

Geotechnical Evaluation	AECOM	BOREHOLE NO: W14101171-BH18
Whistle Bend Subdivision	Drilling Method: NODWELL Mounted CME 75	PROJECT NO: W14101171
Whitehorse, YT	6738121N; 493750E; Zone 8	

SAMPLE TYPE: GRAB SAMPLE | NO RECOVERY | BULK | CRREL CORE | SHELBY TUBE | GRAB CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m³) 500 1000 1500 2000 / PLASTIC M.C. LIQUID 20 40 60 80	CLAY (%) / SILT (%) / SAND (%) / GRAVEL (%) 20 40 60 80	Depth (ft)
0	ORGANIC ROOT MATERIAL		1				0
	SAND AND SILT - rootlets throughout, seasonally frozen, organic brown						
	SAND - some to trace silt, medium to fine grained, damp below frost, greyish brown						
1	SILT - some clay, trace sand, damp, firm, light olive brown		2				5
2							
3	- moisture content increases with depth		3				10
4			4				15
5	- becomes softer by 4.5 m color turns dark grey below 5.0 m						
6			5				20
	END OF BOREHOLE @ 6.0 m						
7							25
8							
9							30
10							33

EBA Engineering Consultants Ltd.

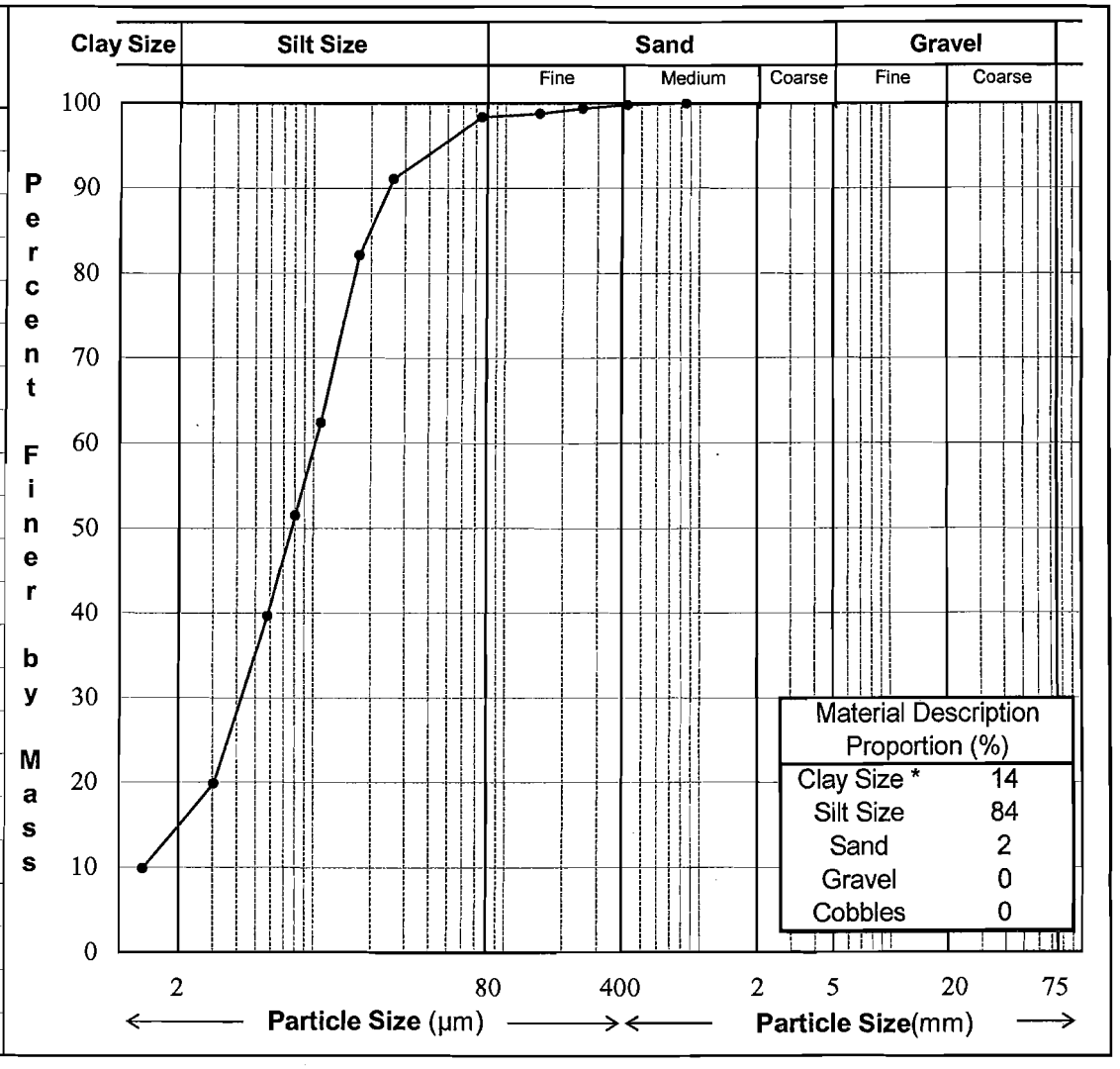
LOGGED BY: MCP	COMPLETION DEPTH: 6m
REVIEWED BY:	COMPLETE: 12/11/2008
DRAWING NO:	Page 1 of 1

PARTICLE SIZE ANALYSIS (Hydrometer) TEST REPORT

ASTM D422

Project: **Whistle Bend Subdivision, Whitehorse, YT** Date Tested: 2008/12/11
Client: AECOM
Project No.: W14101171
Location:
Sample No.: BH18-2
Depth: 1.5 m
Description**: SILT - some clay, trace sand

Particle Size	Percent Passing
100 mm	
75 mm	
50 mm	
38 mm	
25 mm	
19 mm	
13 mm	
10 mm	
5 mm	
2 mm	
850 µm	100
425 µm	100
250 µm	99
150 µm	99
75 µm	98
26 µm	91
17 µm	82
11 µm	62
8 µm	51
6 µm	40
3 µm	20
1 µm	10



Remarks: * The upper clay size of 2 µm, per the Canadian Foundation Engineering Manual.
** The description is visually based & subject to EBA description protocols.

Reviewed By:

EBA Engineering Consultants Ltd. eba

Geotechnical Evaluation	AECOM	BOREHOLE NO: W14101171-BH19
Whistle Bend Subdivision	Drilling Method: NODWELL Mounted CME 75	PROJECT NO: W14101171
Whitehorse, YT	6737854N; 493739E; Zone 8	

SAMPLE TYPE: GRAB SAMPLE | NO RECOVERY | BULK | CRREL CORE | SHELBY TUBE | GRAB CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m^3) 500 1000 1500 2000; PLASTIC M.C. LIQUID 20 40 60 80	CLAY (%) 20 40 60 80; SILT (%) 20 40 60 80; SAND (%) 20 40 60 80; GRAVEL (%) 20 40 60 80	Depth (ft)
0	SAND - some to trace silt, medium to fine grained, damp below seasonal frost, medium brown to greyish brown		1				0
1							
	SILT - some clay, trace fine sand, damp, firm, light olive brown		2				5
2							
			3				
3	- moisture increasing with depth, darker olive brown						10
4			4				
	- softer by 4.5 m, becoming dark olive to grey in colour						15
5							
			5				
6	END OF BOREHOLE @ 6.0 m						20
7							
							25
8							
9							30
10							33

EBA Engineering Consultants Ltd.	LOGGED BY: MCP	COMPLETION DEPTH: 6m
	REVIEWED BY:	COMPLETE: 12/11/2008
	DRAWING NO:	Page 1 of 1

PARTICLE SIZE DISTRIBUTION

ASTM C136 & D422

Project: **Whistle Bend Subdivision, Whitehorse, YT**

Project Number: W14101171

Date Tested: December 11, 2008

Tespit Number: BH19-1

Depth: 0.3 m

Soil Description: SAND - some silt

Cu:

Cc:

Natural Moisture Content: 6.0%

Remarks:

Sieve Size	Percent Passing
50.000	#N/A
37.500	#N/A
25.000	#N/A
19.000	#N/A
12.500	#N/A
9.500	#N/A
4.750	100
2.000	100
0.850	100
0.425	90
0.250	60
0.150	37
0.075	18.1

Clay	Silt	Sand			Gravel	
		Fine	Medium	Coarse	Fine	Coarse

Reviewed By:

EBA Engineering Consultants Ltd.

Geotechnical Evaluation	AECOM	BOREHOLE NO: W14101171-BH20
Whistle Bend Subdivision	Drilling Method: NODWELL Mounted CME 75	PROJECT NO: W14101171
Whitehorse, YT	6739080N; 493450E; Zone 8	

SAMPLE TYPE: GRAB SAMPLE | NO RECOVERY | BULK | CRREL CORE | SHELBY TUBE | GRAB CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS	Bulk Density(kg/m^3) 500 1000 1500 2000; PLASTIC M.C. LIQUID 20 40 60 80	CLAY (%) 20 40 60 80; SILT (%) 20 40 60 80; SAND (%) 20 40 60 80; GRAVEL (%) 20 40 60 80	Depth (ft)
0	SILT (FILL) on top of cleared area						0
	SAND - some to trace silt, medium to fine grained, damp below seasonal frost, fairly compact, medium brown to greyish brown		1				
1							
			2				5
2							
	SILT - some clay, trace fine sand, moist to wet, firm, becoming softer by 3.0 m, dark olive brown, trace mottling						
			3				10
3							
4			4				15
5							
			5				20
6							
7			6				25
	END OF BOREHOLE @ 7.5 m						
8							
9							30
10							33

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LOGGED BY: MCP	COMPLETION DEPTH: 7.5m
REVIEWED BY:	COMPLETE: 12/11/2008
DRAWING NO:	Page 1 of 1

PARTICLE SIZE DISTRIBUTION

ASTM C136 & D422

Project: **Whistle Bend Subdivision, Whitehorse, YT**

Project Number: W14101171

Date Tested: December 11, 2008

Tespit Number: BH20-2

Depth: 1.5 m

Soil Description: SAND - trace silt

Cu: 2.8

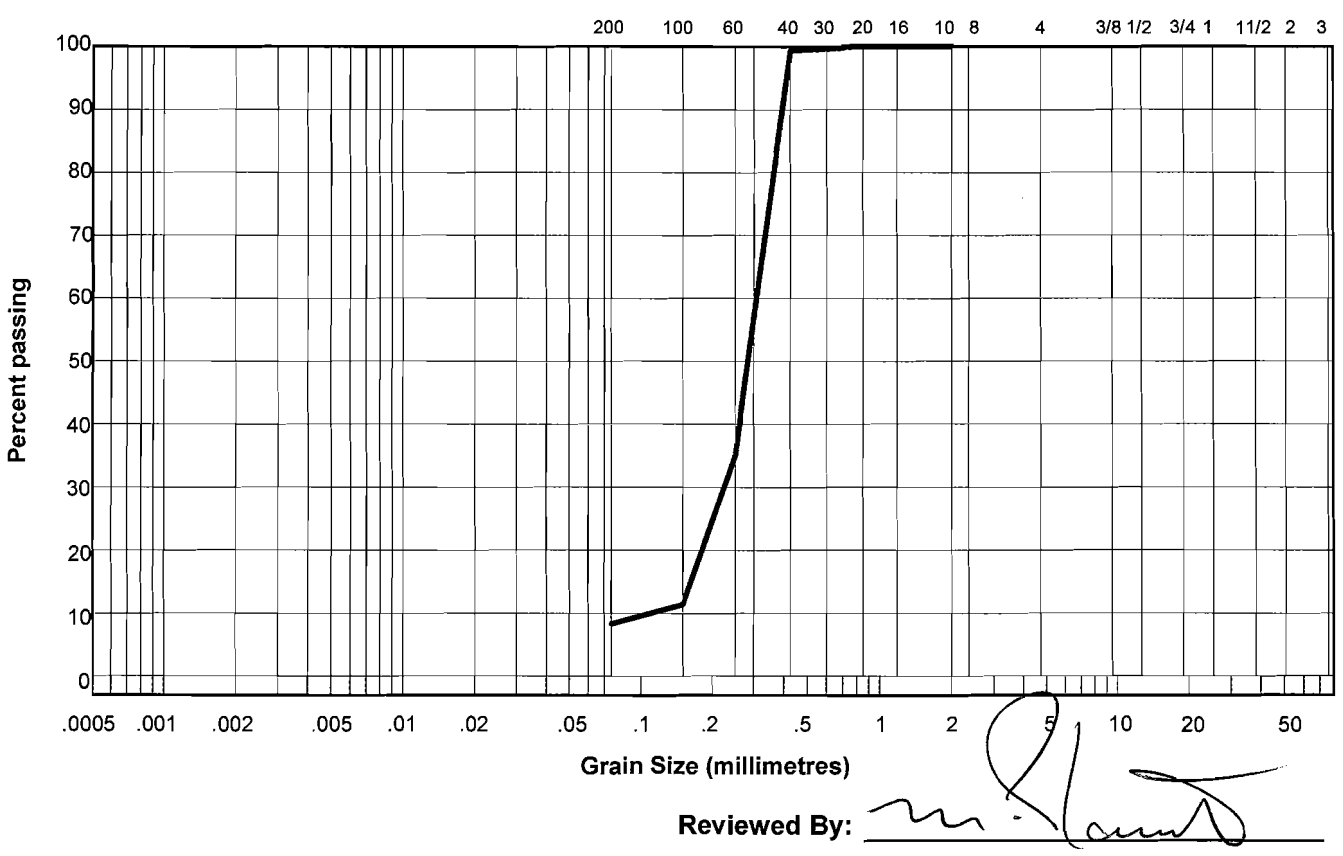
Cc: 1.5

Natural Moisture Content: 3.3%

Remarks:

Sieve Size	Percent Passing
50.000	#N/A
37.500	#N/A
25.000	#N/A
19.000	#N/A
12.500	#N/A
9.500	#N/A
4.750	#N/A
2.000	100
0.850	100
0.425	99
0.250	35
0.150	11
0.075	8.3

Clay	Silt	Sand			Gravel	
		Fine	Medium	Coarse	Fine	Coarse



Reviewed By:

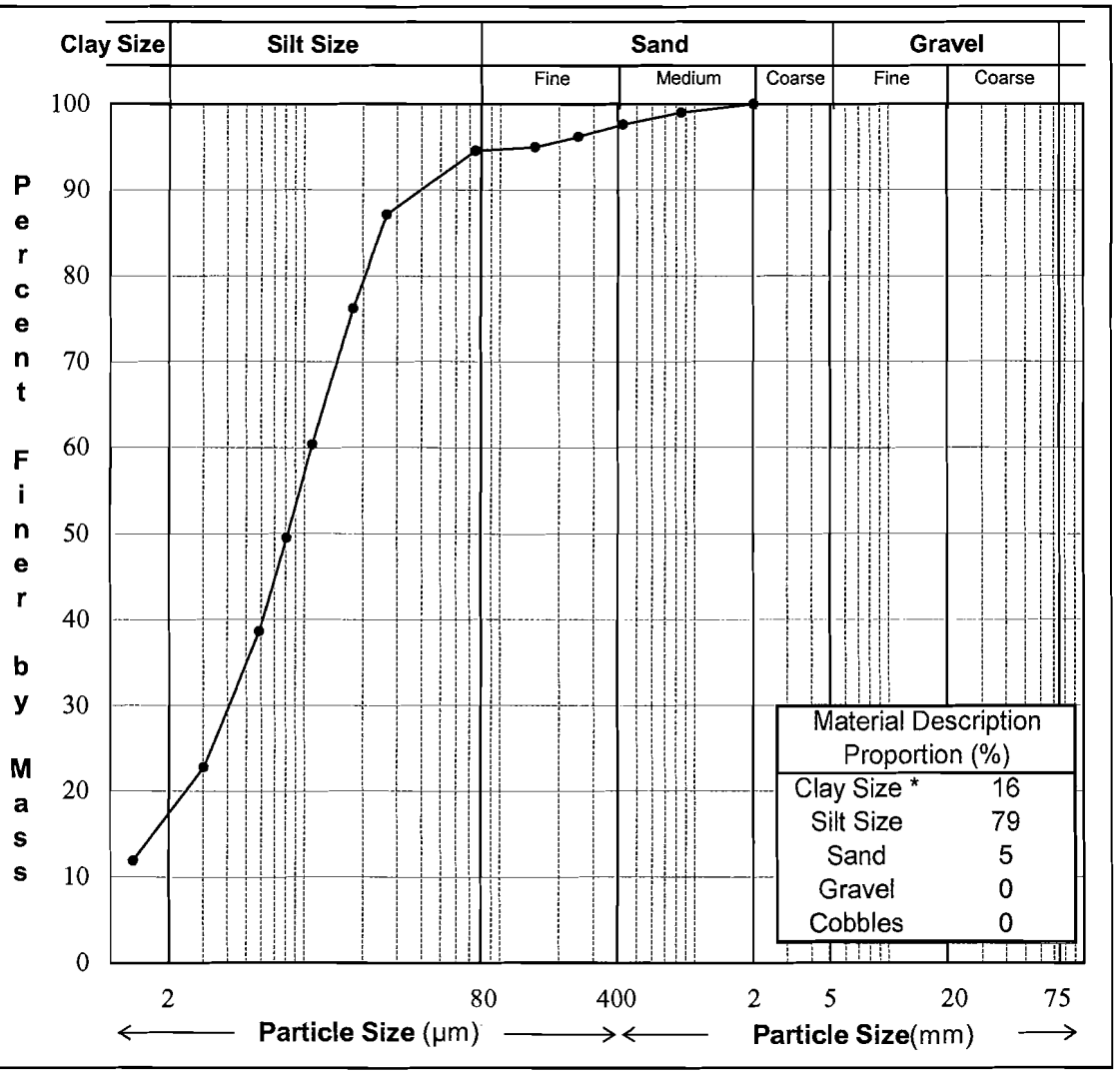
EBA Engineering Consultants Ltd.

PARTICLE SIZE ANALYSIS (Hydrometer) TEST REPORT

ASTM D422

Project: **Whistle Bend Subdivision, Whitehorse, YT** Date Tested: 2008/12/09
Client: AECOM
Project No.: W14101171
Location:
Sample No.: BH20-4
Depth: 4.5 m
Description**: SILT - some clay, trace sand

Particle Size	Percent Passing
100 mm	
75 mm	
50 mm	
38 mm	
25 mm	
19 mm	
13 mm	
10 mm	
5 mm	
2 mm	100
850 µm	99
425 µm	98
250 µm	96
150 µm	95
75 µm	95
27 µm	87
18 µm	76
11 µm	60
8 µm	50
6 µm	39
3 µm	23
1 µm	12



Remarks: * The upper clay size of 2 µm, per the Canadian Foundation Engineering Manual.
** The description is visually based & subject to EBA description protocols.

Reviewed By:

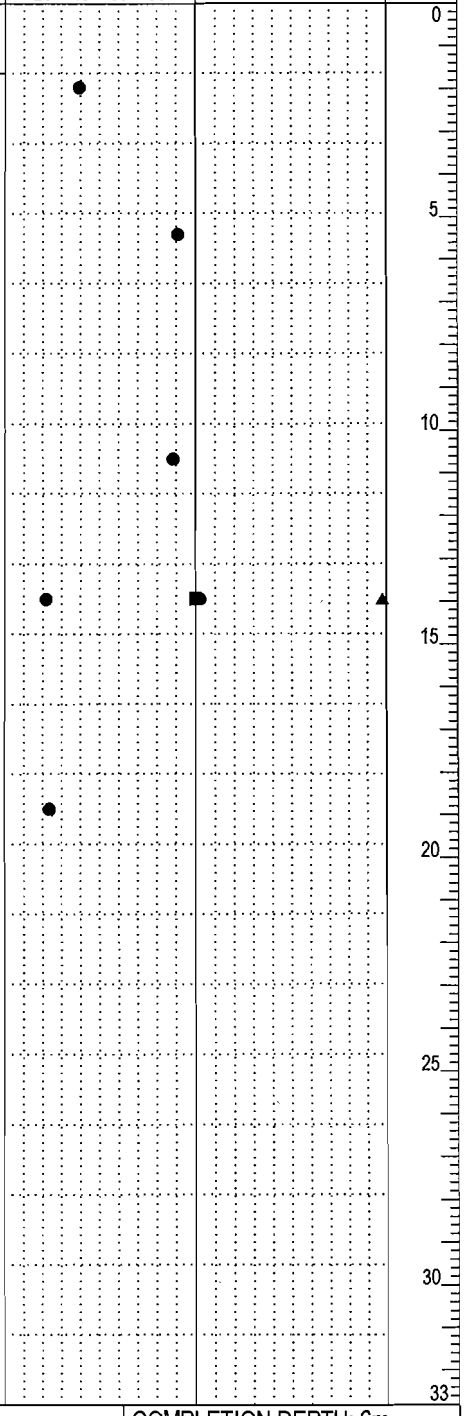
EBA Engineering Consultants Ltd. eba

Geotechnical Evaluation	Client: AECOM	TESTPIT NO: W14101171-TP21
Whistle Bend Subdivision	Excavator: Hitachi Tracked	PROJECT NO: W14101171
Whitehorse, YT	6739182N; 494917E; Zone 8	

SAMPLE TYPE: GRAB SAMPLE | NO RECOVERY | BULK | CRREL CORE | SHELBY TUBE | GRAB CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	LITHOLOGICAL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	GROUND ICE DESCRIPTION AND COMMENTS
0	GRASS GROUND COVER AND ORGANICS - rootlets throughout, seasonally frozen to 0.5 m, black			Seasonal Frost to 0.5 m
1	SAND - silty, interbedded with organics, medium to fine grained, moist to wet, dark grey		1	Unfrozen below 0.5 m
2			2	
3	SILT - trace clay, trace fine sand, deposited in even, parallel laminae (glaciolacustrine), wet, soft, dark brown - becomes dark grey in colour (unoxidized) below 3.0 m		3	
4	SAND - trace to some silt, medium to fine grained and siltier below 5.0 m, wet to saturated with water entering testpit around 5.0 m, very loose, testpit sloughing badly, dark grey		4	
5			5	
6	END OF TESTPIT @ 6.0 m NOTE: testpit excavated in large kettle depression located west of golf course			
7				
8				
9				
10				



Depth (ft): 0, 5, 10, 15, 20, 25, 30, 33

EBA Engineering Consultants Ltd.

LOGGED BY: MCP	COMPLETION DEPTH: 6m
REVIEWED BY:	COMPLETE: 3/24/2009
DRAWING NO:	Page 1 of 1

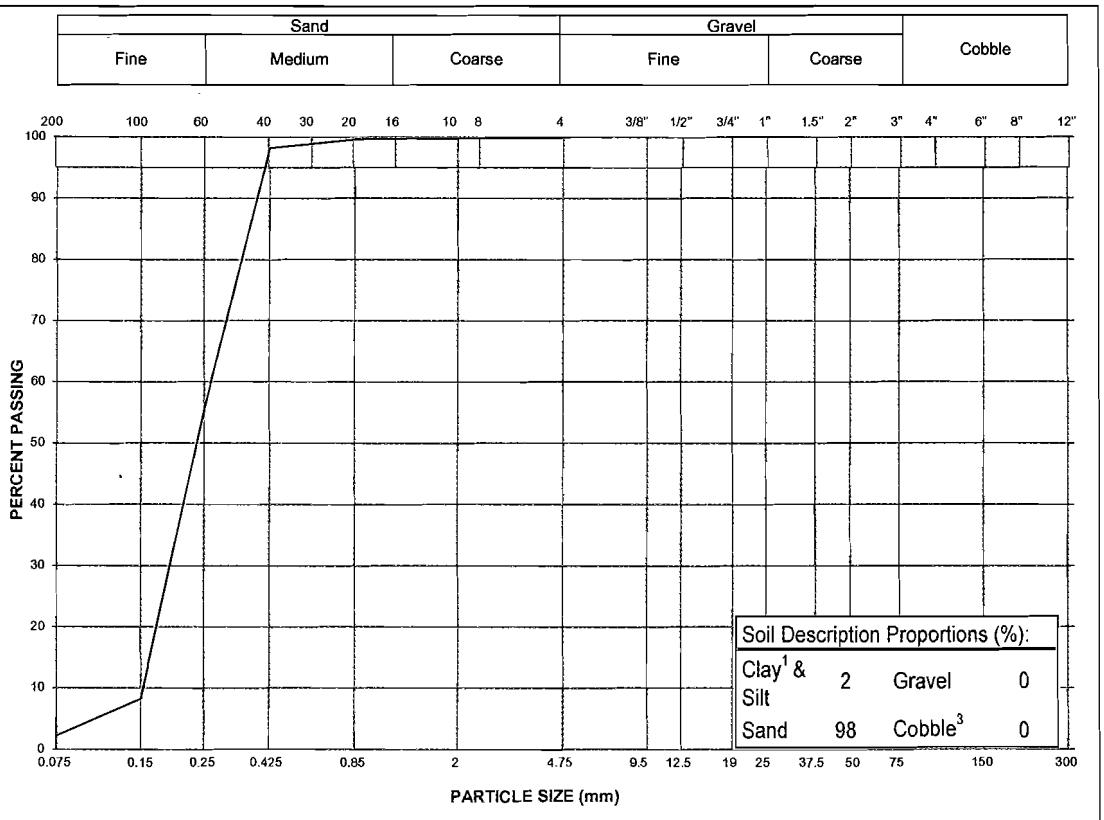
MGP W14101171.GPJ EBA.GDT 09/8/13

PARTICLE SIZE ANALYSIS TEST REPORT

ASTM D422 & C136

Project:	Whistlebend Subdivision	Client:	AECOM
Project No.:	W14101171	Client Rep.:	
Site:	Kettle Depression		
Material Type:		Date Tested:	27-Mar-2009 By: MCP
Sample No.:		Soil Description[2]:	SAND - trace silt
Sample Loc.:	W14101171-TP21		
Sample Depth:	4.0 m	USC Classification:	SM Cu: 1.7
Sampling Method:	Grab		Cc: 0.9
Date sampled:	24-Mar-2009 By: MCP	Moisture Content:	21.7

Particle Size (mm)	Percent Passing
300	
200	
150	
100	
75	
50	
38	
25	
19	
12.5	
10	
5	100.0
2	99.8
0.85	99.7
0.425	98.2
0.25	55.6
0.15	8.3
0.075	2.2



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

[3] If cobbles are present, sampling procedure may not meet ASTM C702 & D75

Specification: _____

Remarks: _____

Reviewed By: _____

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