EBA Engineering Consultants Ltd.

Civil, Geotechnical and Materials Engineers

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YEARS OF EXCELLENCE
EBA ENGINEERING

FINAL REPORT
GRANULAR SOURCE INVESTIGATION
km 1647
NORTH ALASKA HIGHWAY, YUKON

0201-10923

April, 1992

eba

TRANSPORTATION
ORIGINAL
REPORT
Yukon
PLEASE
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GEOTECHNICAL

FINAL REPORT
GRANULAR SOURCE INVESTIGATION
km 1647
NORTH ALASKA HIGHWAY, YUKON

0201-10923

April, 1992

eba

EBA Engineering Consultants Ltd.

Civil, Geotechnical and Materials Engineers

May 1, 1992

Government of Yukon
Department of Community and
Transportation Services
Box 2703
Whitehorse, Yukon
Y1A 2C6

EBA File: 0201-10923

Attention: Mr. Iain Blown, P.Eng.
Geotechnical Projects Manager
Transportation Engineering Branch

Dear Sir:

Subject: Final Report
Granular Source Evaluation
km 1647 RHS McIntosh Lodge Pit
North Alaska Highway

We are pleased to submit our final report for the above captioned site. Included herein are the following:

- an airphoto laser copy Site Plan showing recent testhole locations (both EBA and PWC), as well as reserve and existing pit boundaries;
- testpit logs in ESEbase format from the EBA and PWC investigations;
- grain size distribution report forms for all sieves completed on samples collected during the EBA and PWC field investigations;
- photographs of spoil piles and/or testpits as well as some general photos of the existing pit.

1.0 FIELD INVESTIGATIONS

Two investigations have recently been completed at the subject site. Based on initial airphoto interpretation, PWC completed an investigation in

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November, 1991 to delineate the source boundaries. The investigation consisted of fourteen testpits excavated throughout the site and a limited laboratory testing program to verify aggregate quality.

On April 15 and 16, 1992, EBA completed a subsequent geotechnical investigation consisting of 12 testpits excavated to a maximum depth of 5.0 m. Testpits were excavated utilizing a CAT 225 tracked backhoe contracted from Arctic Backhoe Services of Whitehorse, Yukon.

To avoid duplication of effort, the locations of the PWC testpits were noted and a rough grid was established to obtain maximum coverage of the subject site. During the investigation, all testpits were logged and photographs of all spoil piles and/or testpits were taken by a Senior EBA Technician. Detailed testpit logs for both the EBA and PWC investigations are presented in Appendix A following the site plan, and colour laser copies of all photographs are presented in Appendix B. It should be noted that the EBA and PWC plot formats and presentation of test results differ slightly, but basically the same information is presented. To be consistent, EBA has adopted the ASTM soil classification system for this project.

All testpit locations were recorded utilizing a Trimble Transpak global positioning system (GPS) locator. The latitude:longitude readout was converted into UTM coordinates with in-house software.

On Drawing 10923-A-01, in Appendix A, the locations of all testholes excavated by EBA and PWC are presented along with other pertinent information such as approximate reserve boundaries and existing pit limits.

2.0 SAMPLING AND LABORATORY TESTING PROGRAM

During the field investigation, disturbed grab samples were collected at regular intervals or at major interfaces of differing soils. Sample size was sufficient to facilitate moisture and grain size testing with additional sample for trial crushing or L.A. Abrasion testing, if deemed necessary in the near future. All EBA test results are found on the testpit logs in Appendix A

with report forms following the appropriate log. The PWC test results are also included following the logs.

3.0 GRANULAR SOURCE DESCRIPTION

The following describes the km 1647 granular source:

Location:	Alaska Highway, km 1647 - Right Hand Side
Surface Area:	Surveyed reserve encompasses 65 ha
Access Road:	Existing 600 m access road parallels Alaska Highway for 400 m and runs 200 m up into the existing pit.
Geologic Unit:	Alluvial terrace along the west side of Bear Creek
Land Status:	Crown Land - reserve established by PWC in 1991 - A woodcutting permit was noted north of the existing pit and evidence of tree harvesting was observed. - The existing pit is currently being utilized as a storage area for pipe being removed and straightened from the old Shakwak pipeline. This may complicate the setup of a large crushing operation and the placement of stockpiles.
Existing Borrow Pit Exposures:	Pit Exposures of up to 6.0 m in height surround the existing pit. Many small indentations exist where specific contractors were allowed to remove material in accordance to past land use permits.

<u>Surficial Features:</u>

Vegetation:	Vegetation patterns vary throughout the site with sparse to moderately dense stands of poplar along the deposit edges; moderately dense stands of white spruce (up to 20 m high with 250 mm butt diameters) throughout the central section of the site; small dense lodgepole pines in areas which

were previously destroyed by forest fire; and the areas to the northwest and northeast of the existing pit are currently cleared of trees.

Topography: The area is relatively flat with significant elevation increases at the northeast corner of the reserve.

Drainage: The area appears well drained due to the granular nature of the deposit and the positive drainage patterns along the edges of the deposit.

Other: A few surface boulders were observed throughout the existing pit during the field investigation. No permafrost or groundwater was encountered during the field investigation.

Materials Description

Based on 14 testpits by PWC and 12 by EBA, a generalized description of the granular materials found at the km 1647 pit is as follows:

Depth Below Ground Surface		Soil Description
OVERBURDEN THICKNESS	(0.7 m avg.) (0.4 m min.) (1.8 m max.)	ORGANICS, SANDY SILT AND CLAYEY SILT OVERBURDEN
GRANULAR MATERIALS	average of 3.5 m proven thickness of gravel	WELL GRADED AND/OR POORLY GRADED GRAVEL WITH SAND

Overburden Materials: Thicknesses listed above are based on thicknesses of the organics, silty, and clayey soils overlying the actual gravels and sand which comprise the alluvial terrace

Granular Materials:	The gravels found throughout the site are variable (GW to GP) and occasional silt lenses should be anticipated. Testpits excavated in the pit floor indicate that underlying the gravel is poorly graded sand to an undetermined depth.
Oversize Materials:	The gravel throughout much of the site was noted as being up to 100 mm maximum size with isolated areas containing up to 10% with material larger than 100 mm.

Estimated Volumes:	Remaining Area Undeveloped	-	approx. 55 ha
	Volume of Overburden	-	385,000 m^3
	Volume of Gravel	-	2,000,000 m^3

4.0 SITE DEVELOPMENT RECOMMENDATIONS

Requirements for the 1992 Crushing Program are for 5,000 m^3 of Granular "A" and 4,000 m^3 of BST aggregate. It is also understood that a 100 m x 100 m area will be cleared for this program. Based on the above, the following recommendations are made:

- It is recommended that the area to be cleared begin along the west edge of the deposit and proceed north from the current pit. The area is clear of trees, and stump removal and grubbing would be minimized. Overburden thicknesses of less than 1.0 m are anticipated in this area. Starting development in this area will allow future development to proceed radially around the existing pit. Overburden from subsequent extraction contracts can then be placed in areas previously mined and retained for use during reclamation.

- With minimal amounts of material larger than 100 mm in size, the fracture count specified may be difficult to obtain. It is therefore recommended that the gravel be crushed to 12.5 mm nominal size.

- General observations of the existing pit faces and the testpit sidewalls suggest that slightly cleaner gravels are found lower down so it may be appropriate to produce the Granular "A" material from the upper section of the granular unit and extract the underlying material for BST aggregate production. Siltier lenses of gravel within the top 2.0 m of the gravel unit may be encountered so adjustments may be necessary during crushing if the fines contents begin to exceed the percentages allowed.

5.0 CLOSURE

Information presented in this report are based on the results of the 1992 EBA and 1991 PWC geotechnical investigations of the subject site; results of previous crushing contracts and general observations of the area. Results presented in this report and recommendations made are considered to be representative and pertinent but if discrepancies are noted during development, EBA requests that we be notified so that the area assessment can be modified.

If questions arise upon review, please contact this office at your convenience.

Respectfully submitted,
EBA Engineering Consultants Ltd.

M.C. Plaunt, C.E.T.
Engineering Technologist

J.R. Trimble, P.Eng.
Project Director
Office Manager

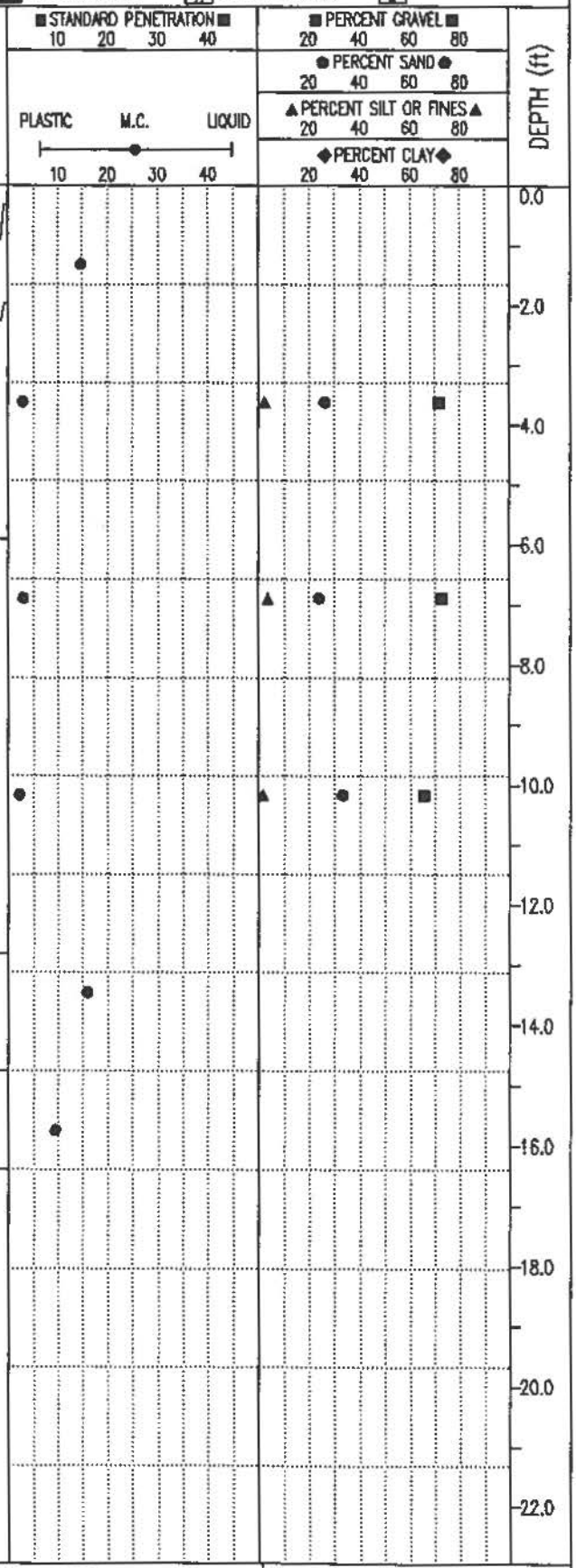
MCP/JRT/rsz

APPENDIX A

GRANULAR SOURCE EVALUATION km 1647	CLIENT: YTG - TRANSPORTATION ENG.	BOREHOLE No: 92-001E
McINTOSH LODGE PIT	HOE: CAT 225 TRACKED BACKHOE	Project No: 0201-10923
NORTH ALASKA HIGHWAY	UTM ZONE: 8 N6743932.00 E353477.00	ELEVATION: 0.00 (m)

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

DEPTH (m)	SAMPLE TYPE	SAMPLE NO	SPT(N)	USC	SOIL SYMBOL	SOIL DESCRIPTION
0.0						TEA GROUND COVER AND ORGANICS to 0.1 m, frozen, black
						SANDY SILT-seasonally frozen, rusty brown becoming medium olive by 0.4 m
						POORLY GRADED GRAVEL WITH SAND-trace of clay to 2.3 m, gravel up to 150 mm in size with 10% over 100 mm, subangular, seasonally frozen, medium greyish brown
1.0		1				
		2		GP		
2.0						WELL GRADED GRAVEL WITH SAND-trace of silt, seasonally frozen to 2.0 m, dark grey
		3		GW		
3.0		4		GW		
4.0						SANDY SILT(TILL)-trace of fine, angular gravel, moist, dark olive -lens of GRAVEL with SILT AND SAND from 4.2 to 4.5 m
		5				
						SILTY SAND-fine grained, uniform, damp, medium brown
		6				
5.0						END OF TESTPIT 5.0 m NOTE: very little sloughing in testpit
6.0						
7.0						



EBA Engineering Consultants Ltd. Whitehorse, Yukon	LOGGED BY: MCP	COMPLETION DEPTH: 5.0 m
	REVIEWED BY:	COMPLETE: 92/04/15
	Fig. No:	Page 1 of 1

EBA Engineering Consultants Ltd.

PARTICLE - SIZE ANALYSIS OF SOILS

Project: Granular Source Evaluation
km 1647, North Alaska Highway

Project Number: 0201-10923

Date Tested: 92-04-21

Borehole Number: 92-001E

Depth: 1.0 m

Soil Description: POORLY GRADED GRAVEL WITH SAND (GP)

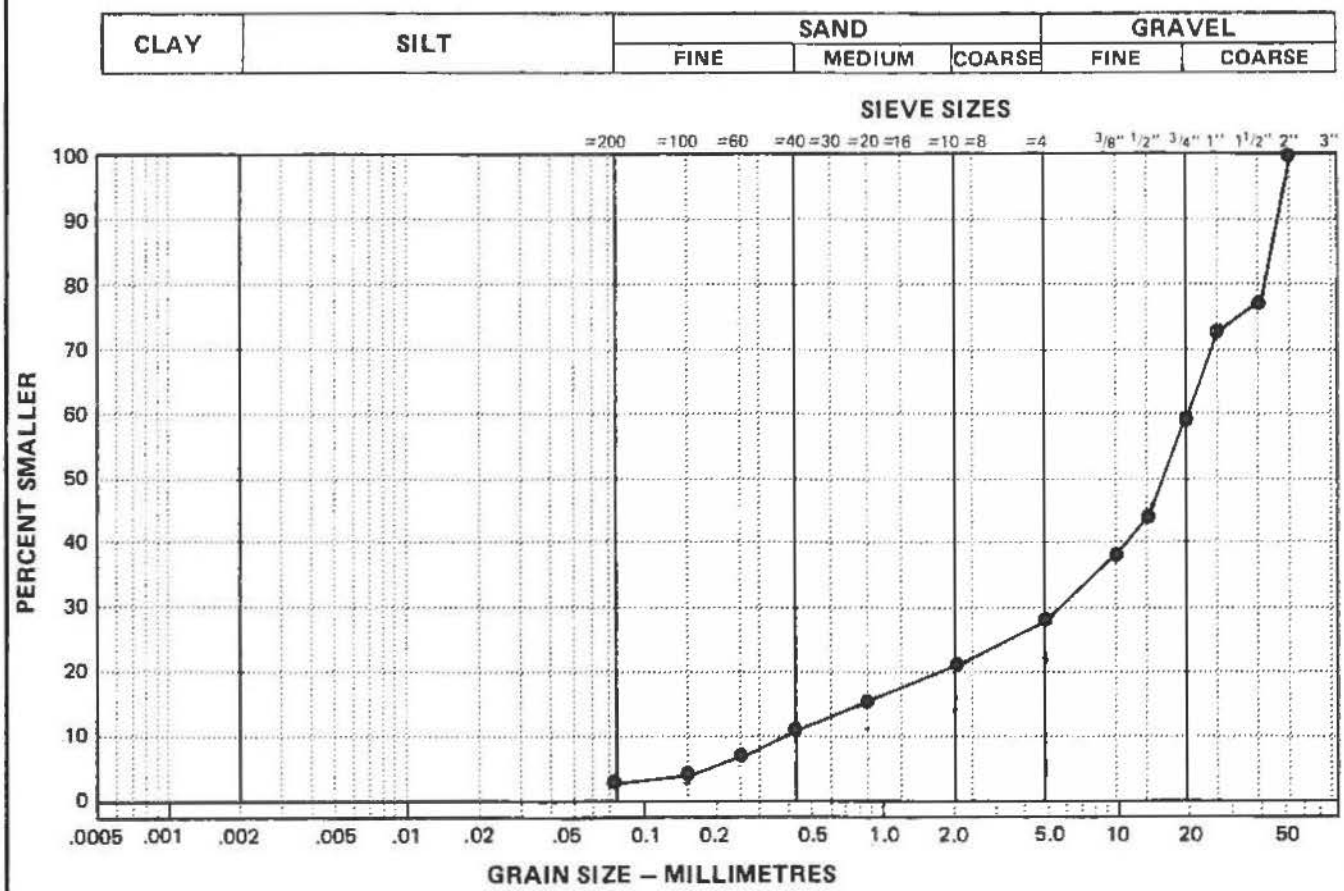
Cu: 50

Cc: 4.5

Natural Moisture Content: _____ %

Remarks: Gravel 71.6%
Sand 26.0%
Silt 2.4%
1/2" sieve - 43.6% passing

SIEVE	PERCENTAGE PASSING
3"	
2"	100.0
1 1/2"	77.2
1"	72.8
3/4"	59.3
3/8"	38.8
No. 4	28.4
No. 10	21.2
No. 20	15.9
No. 40	11.0
No. 60	7.3
No. 100	4.8
No. 200	2.4



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EBA Engineering Consultants Ltd.

PARTICLE - SIZE ANALYSIS OF SOILS

Project: Granular Source Evaluation
km 1647 , North Alaska Highway

Project Number: 0201-10923

Date Tested: 92-04-21

Borehole Number: 92-001E

Depth: 2.0 m

Soil Description: WELL GRADED GRAVEL WITH SAND (GW) .

Cu: 33.3

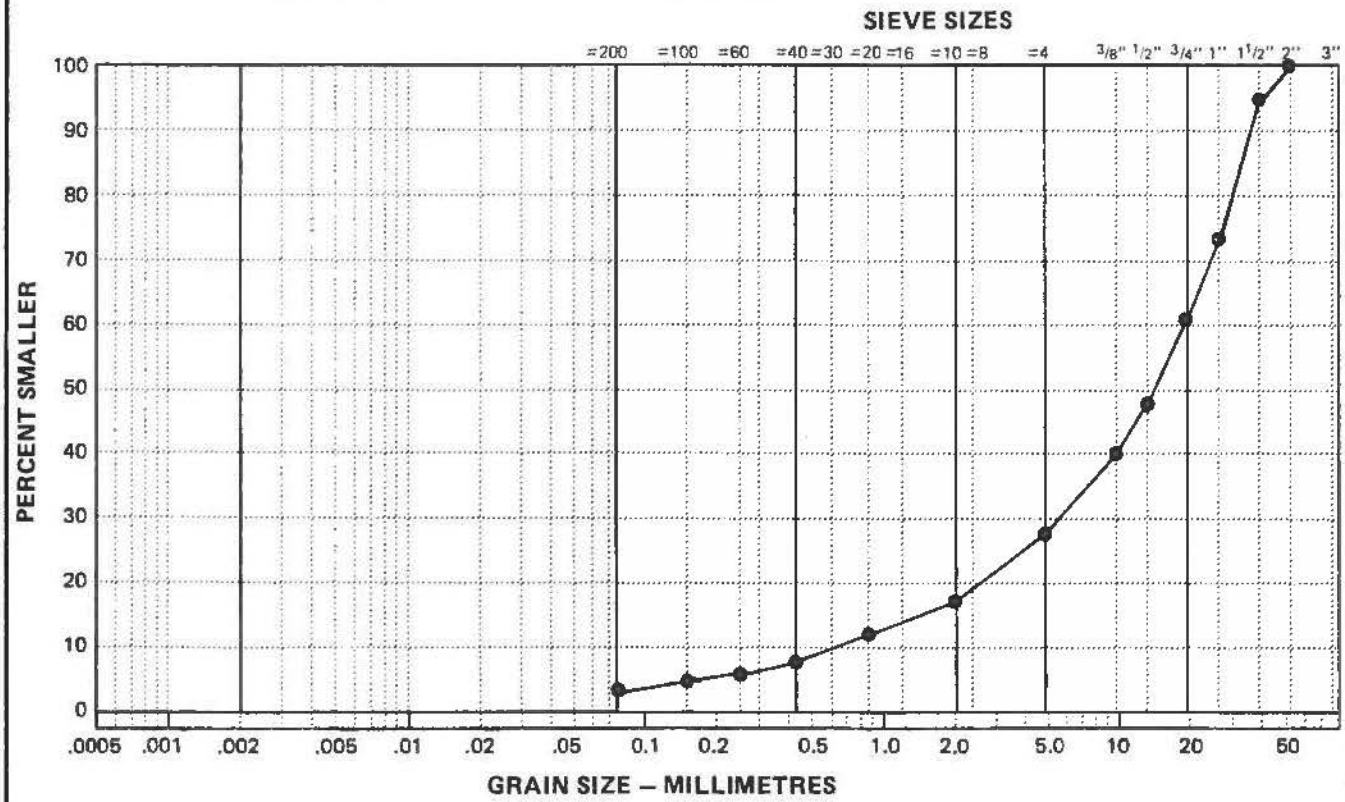
Cc: 2.8

Natural Moisture Content: _____ %

Remarks: Gravel 72.7%
Sand 23.7%
Silt 3.6%
1/2" sieve - 48.1% passing

SIEVE	PERCENTAGE PASSING
3"	
2"	100.0
1 1/2"	95.8
1"	72.7
3/4"	60.9
3/8"	40.0
No. 4	27.3
No. 10	17.6
No. 20	11.6
No. 40	7.9
No. 60	6.1
No. 100	4.7
No. 200	3.6

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



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PARTICLE - SIZE ANALYSIS OF SOILS

Project: Granular Source Evaluation
km 1647, North Alaska Highway

Project Number: 0201-10923

Date Tested: 92-04-21

Borehole Number: 92-001E

Depth: 3.0 m

Soil Description: WELL GRADED GRAVEL WITH SAND (GW)

Cu: 52.6

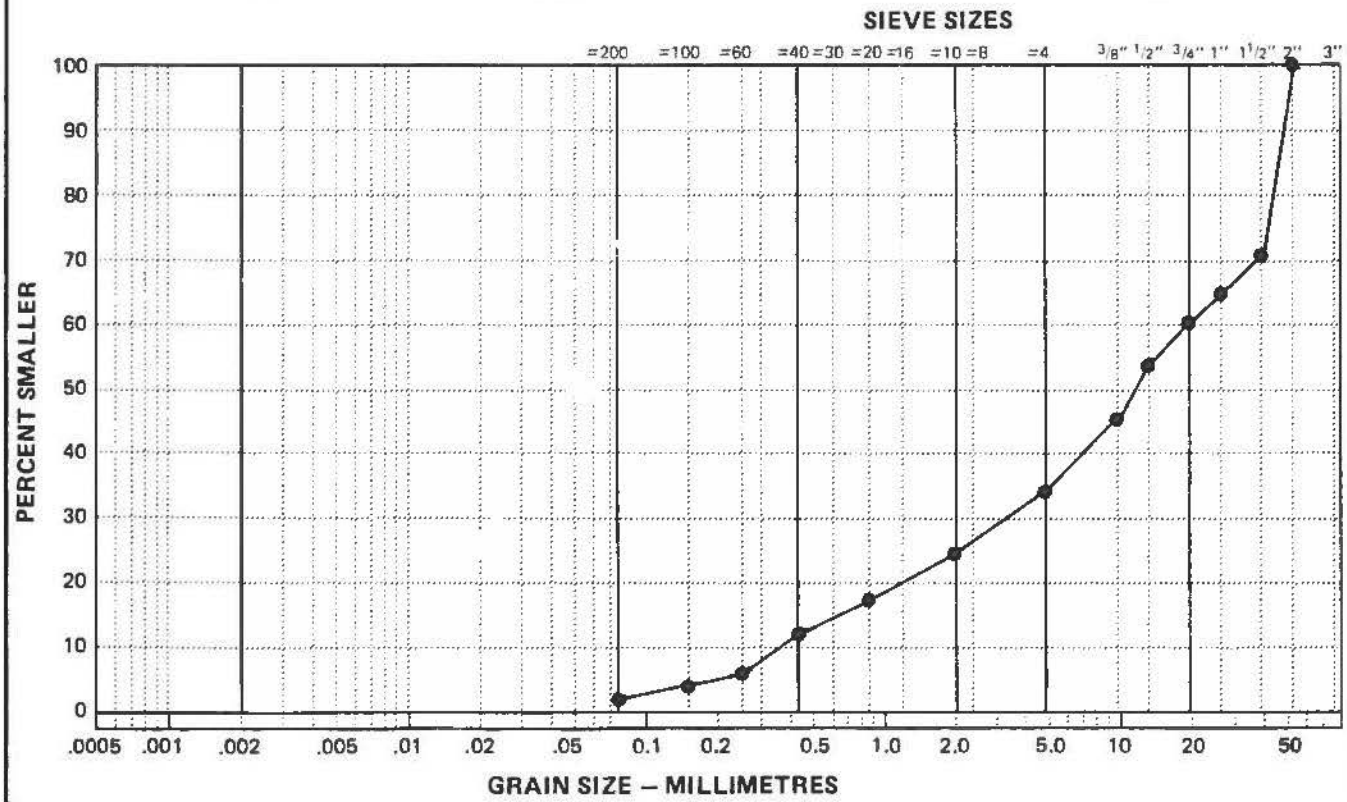
Cc: 1.6

Natural Moisture Content: _____ %

Remarks: Gravel 65.4%
Sand 33.0%
Silt 1.6%
1/2" sieve - 53.6% passing

SIEVE	PERCENTAGE PASSING
3"	
2"	100.0
1 1/2"	70.8
1"	65.3
3/4"	60.9
3/8"	46.4
No. 4	34.6
No. 10	24.8
No. 20	17.9
No. 40	11.4
No. 60	6.7
No. 100	3.7
No. 200	1.6

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



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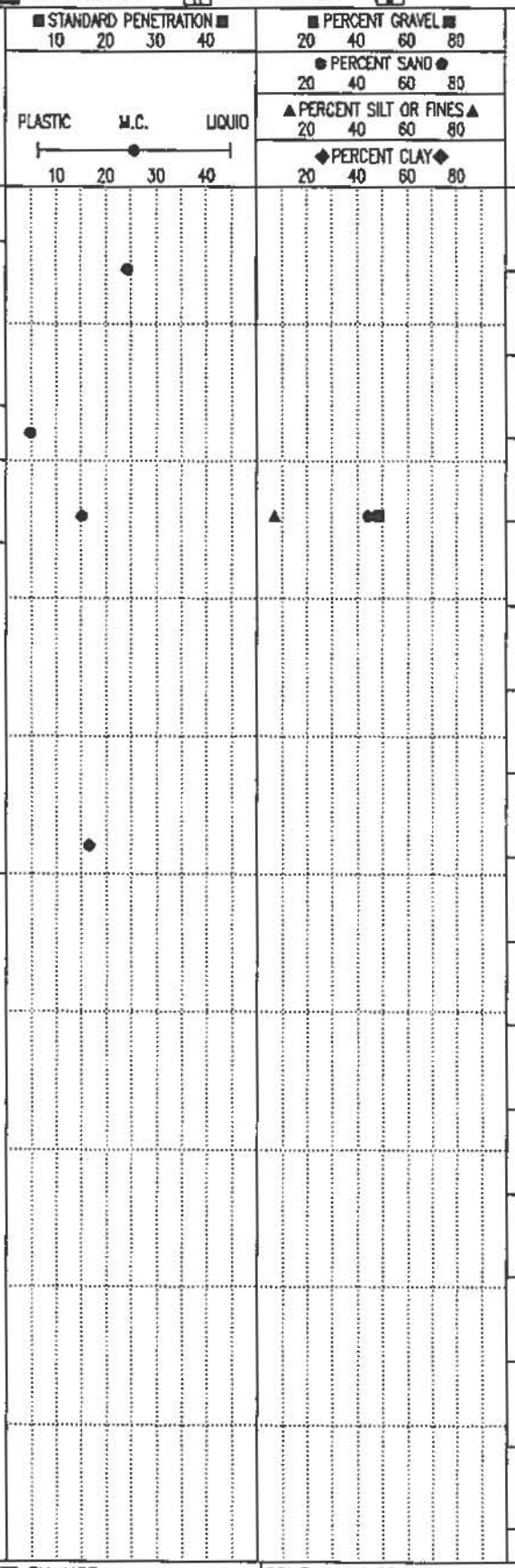
GRANULAR SOURCE EVALUATION km 1647	CLIENT: YTG - TRANSPORTATION ENG.	BOREHOLE No: 92-002E
McINTOSH LODGE PIT	HOE: CAT 225 TRACKED BACKHOE	Project No: 0201-10923
NORTH ALASKA HIGHWAY	UTM ZONE: 8 N6743755.00 E353769.00	ELEVATION: 0.00 (m)

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

DEPTH (m)	SAMPLE TYPE	SAMPLE NO	SPT(N)	USC	SOIL SYMBOL	SOIL DESCRIPTION
0.0						ORGANIC GROUND COVER-seasonally frozen, black
		1				SILT-little fine sand, trace of fibrous organics, wet, rusty brown to medium olive
		2				SAND AND SILT-fine grained, uniform, olive brown
1.0		3		GP/GM		POORLY GRADED GRAVEL WITH SILT AND SAND-gravel up to 40 mm in size, moist, compact(est.), olive grey
						SILT WITH GRAVEL(TILL)-trace of fine sand, trace of clay, occasional cobble, wet, soft, olive brown to medium olive
2.0		4				
						END OF TESTPIT 2.5 m
3.0						
4.0						
5.0						



EBA Engineering Consultants Ltd. Whitehorse, Yukon	LOGGED BY: MCP	COMPLETION DEPTH: 2.5 m
	REVIEWED BY:	COMPLETE: 92/04/16
	Fig. No:	Page 1 of 1

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PARTICLE - SIZE ANALYSIS OF SOILS

Project: Granular Source Evaluation
km 1647, North Alaska Highway

Project Number: 0201-10923

Date Tested: 92-04-21

Borehole Number: 92-002E

Depth: 1.1 - 1.3 m

Soil Description: POORLY GRADED GRAVEL WITH SILT AND SAND (GP/GM)

Cu: 6.1

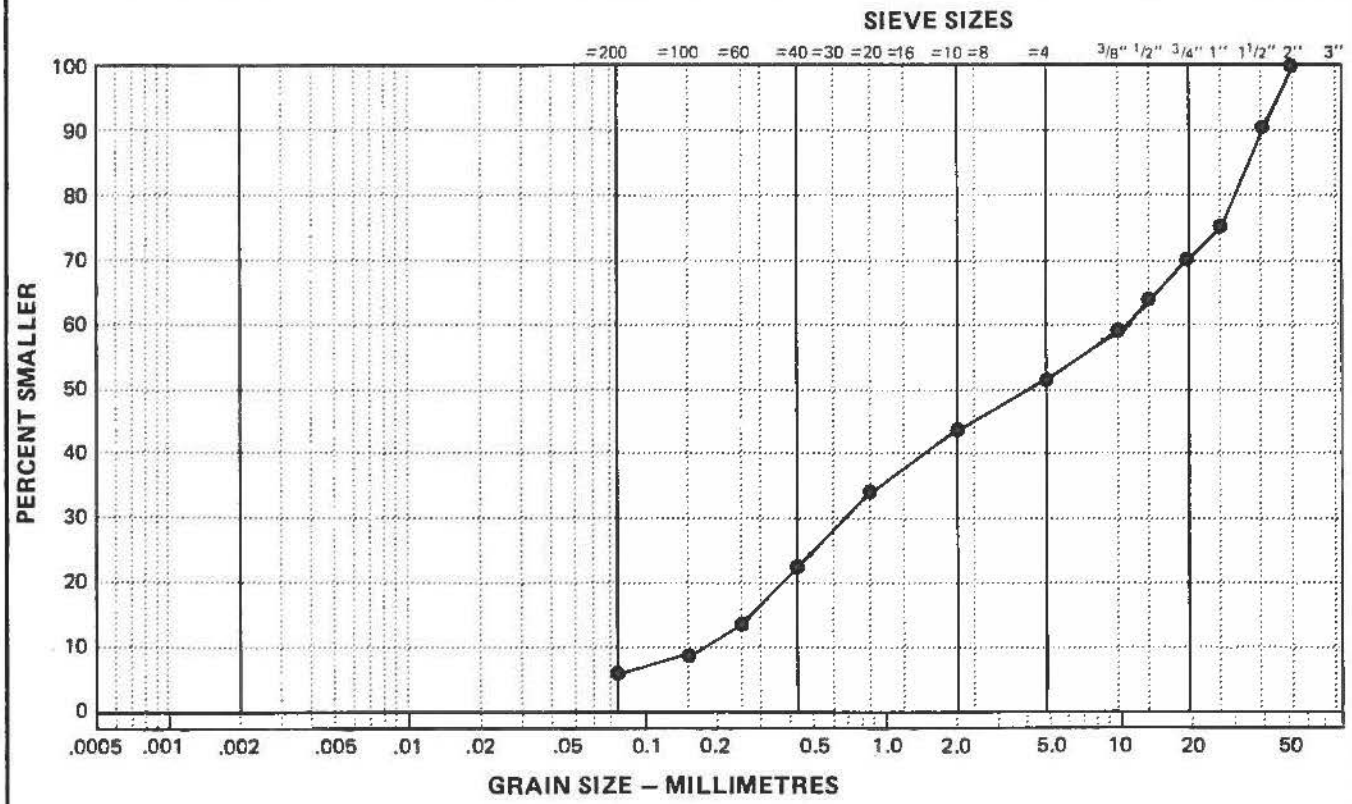
Cc: .02

Natural Moisture Content: _____ %

Remarks: Gravel 48.5%
Sand 44.4%
Silt 7.1%
1/2" sieve - 63.5% passing

SIEVE	PERCENTAGE PASSING
3"	
2"	100.0
1 1/2"	90.1
1"	75.5
3/4"	70.3
3/8"	59.8
No. 4	51.5
No. 10	42.9
No. 20	33.7
No. 40	21.3
No. 60	13.0
No. 100	9.7
No. 200	7.1

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



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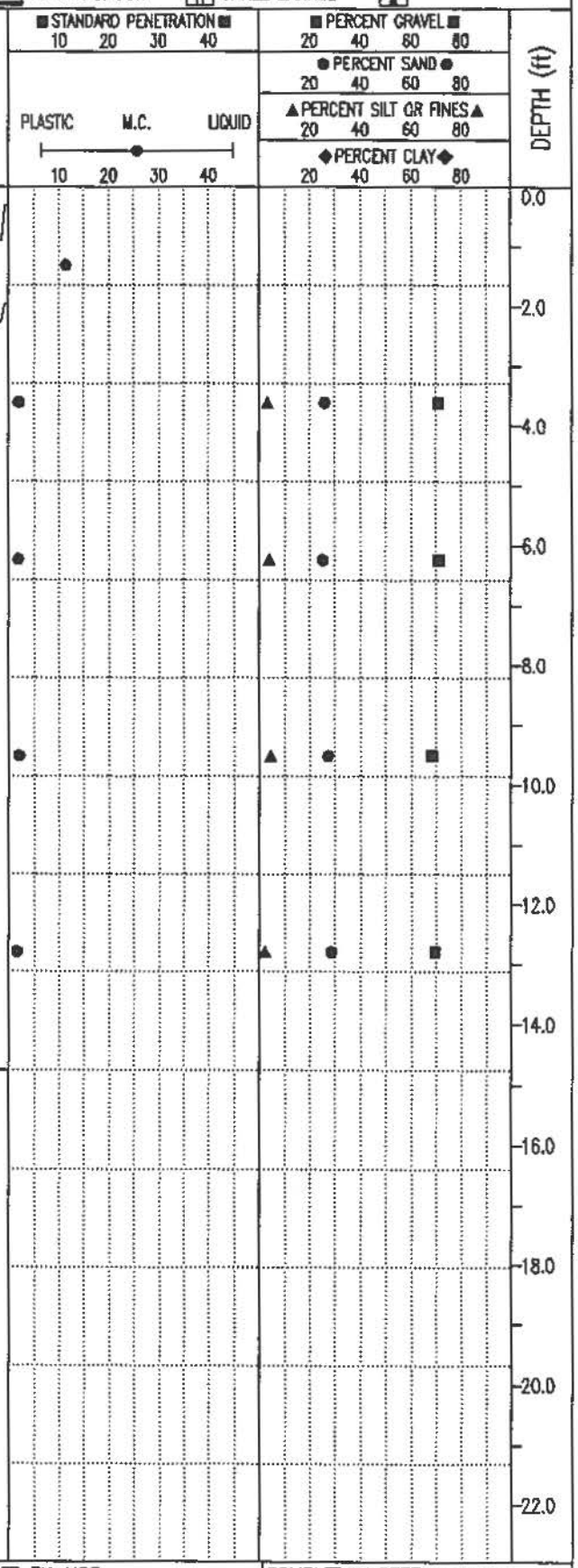
GRANULAR SOURCE EVALUATION km 1647	CLIENT: YTG - TRANSPORTATION ENG.	BOREHOLE No: 92-003E
McINTOSH LODGE PIT	HOE: CAT 225 TRACKED BACKHOE	Project No: 0201-10923
NORTH ALASKA HIGHWAY	UTM ZONE: 8 N6743752.00 E353857.00	ELEVATION: 0.00 (m)

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

DEPTH (m)	SAMPLE TYPE	SAMPLE NO	SPT(N)	USC	SOIL SYMBOL	SOIL DESCRIPTION
0.0						ORGANIC GROUND COVER-seasonally frozen, black
	Grab	1				SILT-little fine sand, rootlets to 0.6 m, seasonally frozen, rusty brown to olive at 0.5 m
1.0	Grab	2		GW		WELL GRADED GRAVEL WITH SAND-trace of silt, gravel is subangular up to 200 mm in size, less than 10% over 100 mm in size, seasonally frozen to 2.0 m, greyish brown
						-calcitic coating on some gravel particles
2.0	Grab	3		GW		
						-olive brown and slightly siltier from 2.5 m to 3.5 m
3.0	Grab	4		GW		
4.0	Grab	5		GW		
						END OF TESTPIT 4.5 m
						NOTE: Very little sloughing in testpit
5.0						
6.0						
7.0						



EBA Engineering Consultants Ltd. Whitehorse, Yukon	LOGGED BY: MCP	COMPLETION DEPTH: 4.5 m
	REVIEWED BY:	COMPLETE: 92/04/15
	Fig. No:	Page 1 of 1

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PARTICLE - SIZE ANALYSIS OF SOILS

Project: Granular Source Evaluation
km 1647, North Alaska Highway

Project Number: 0201-10923

Date Tested: 92-04-21

Borehole Number: 92-003E

Depth: 1.0 m

Soil Description: WELL GRADED GRAVEL WITH SAND (GW)

Cu: 40

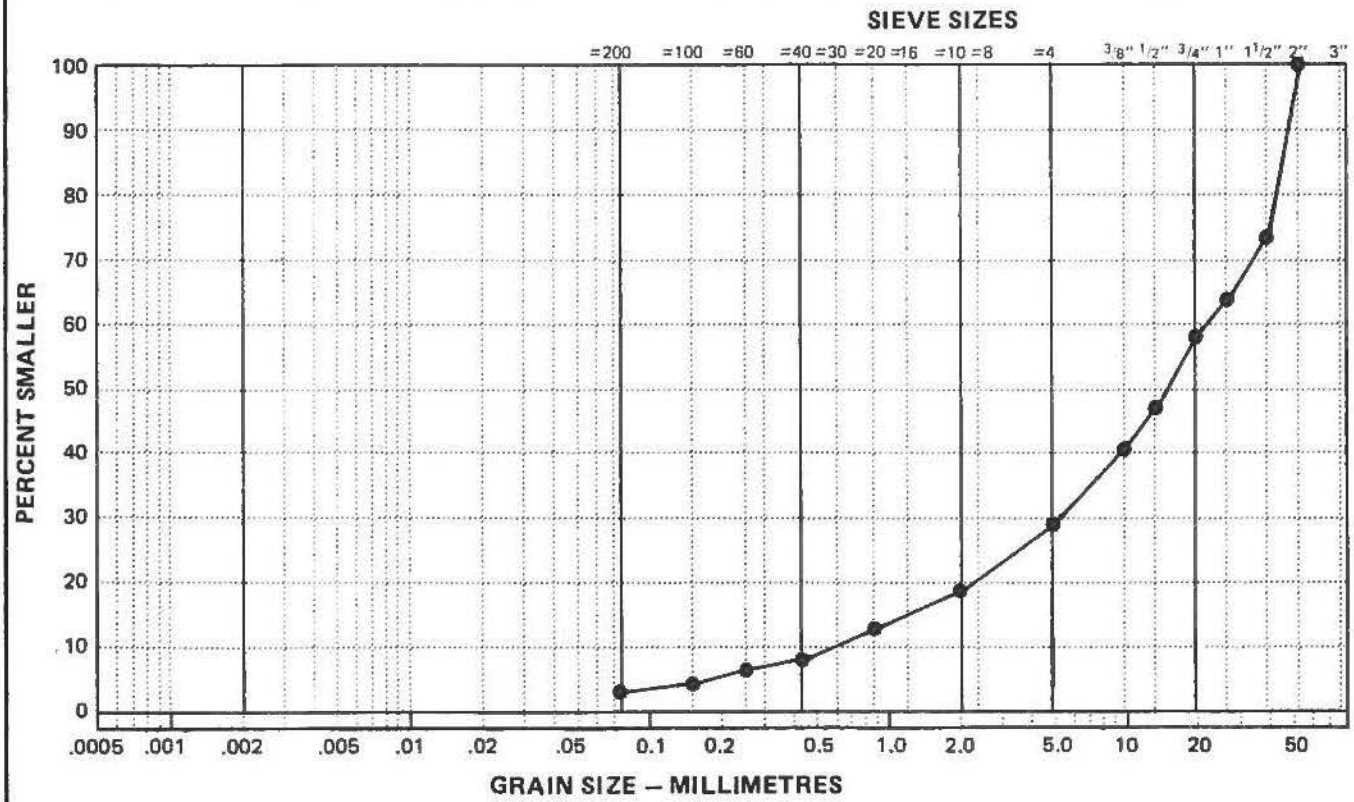
Cc: 2.1

Natural Moisture Content: _____ %

Remarks: Gravel 70.9%
Sand 25.8%
Silt 3.3%
1/2" sieve - 47.5% passing

SIEVE	PERCENTAGE PASSING
3"	--
2"	100.0
1 1/2"	72.8
1"	63.4
3/4"	58.3
3/8"	40.2
No. 4	29.1
No. 10	19.0
No. 20	12.4
No. 40	8.2
No. 60	5.9
No. 100	4.4
No. 200	3.3

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



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PARTICLE - SIZE ANALYSIS OF SOILS

Project: Granular Source Evaluation
km 1647, North Alaska Highway

Project Number: 0201-10923

Date Tested: 92-04-21

Borehole Number: 92-003E

Depth: 2.0 m

Soil Description: WELL GRADED GRAVEL WITH SAND (GW)

Cu: 35.3

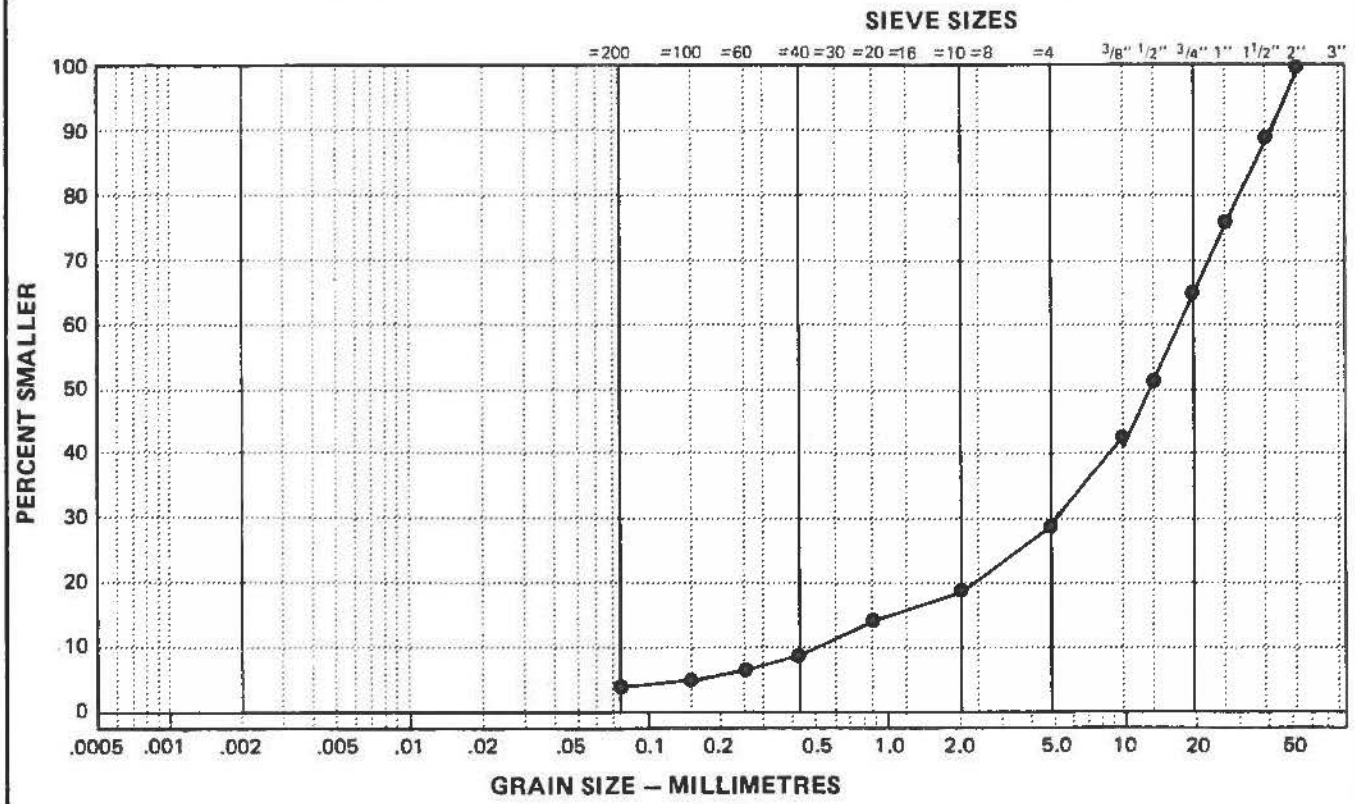
Cc: 2.7

Natural Moisture Content: %

Remarks: Gravel 71.0%
Sand 25.1%
Silt 3.9%
1/2" seive - 51.1% passing

SIEVE	PERCENTAGE PASSING
3"	
2"	100.0
1 1/2"	89.1
1"	76.9
3/4"	64.6
3/8"	42.3
No. 4	29.0
No. 10	19.6
No. 20	13.7
No. 40	9.6
No. 60	7.1
No. 100	5.3
No. 200	3.9

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



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EBA Engineering Consultants Ltd.

PARTICLE - SIZE ANALYSIS OF SOILS

Project: Granular Source Evaluation
km 1647, North Alaska Highway

Project Number: 0201-10923

Date Tested: 92-04-22

Borehole Number: 92-003E

Depth: 3.0 m

Soil Description: WELL GRADED GRAVEL WITH SAND (GW)

Cu: 17.62

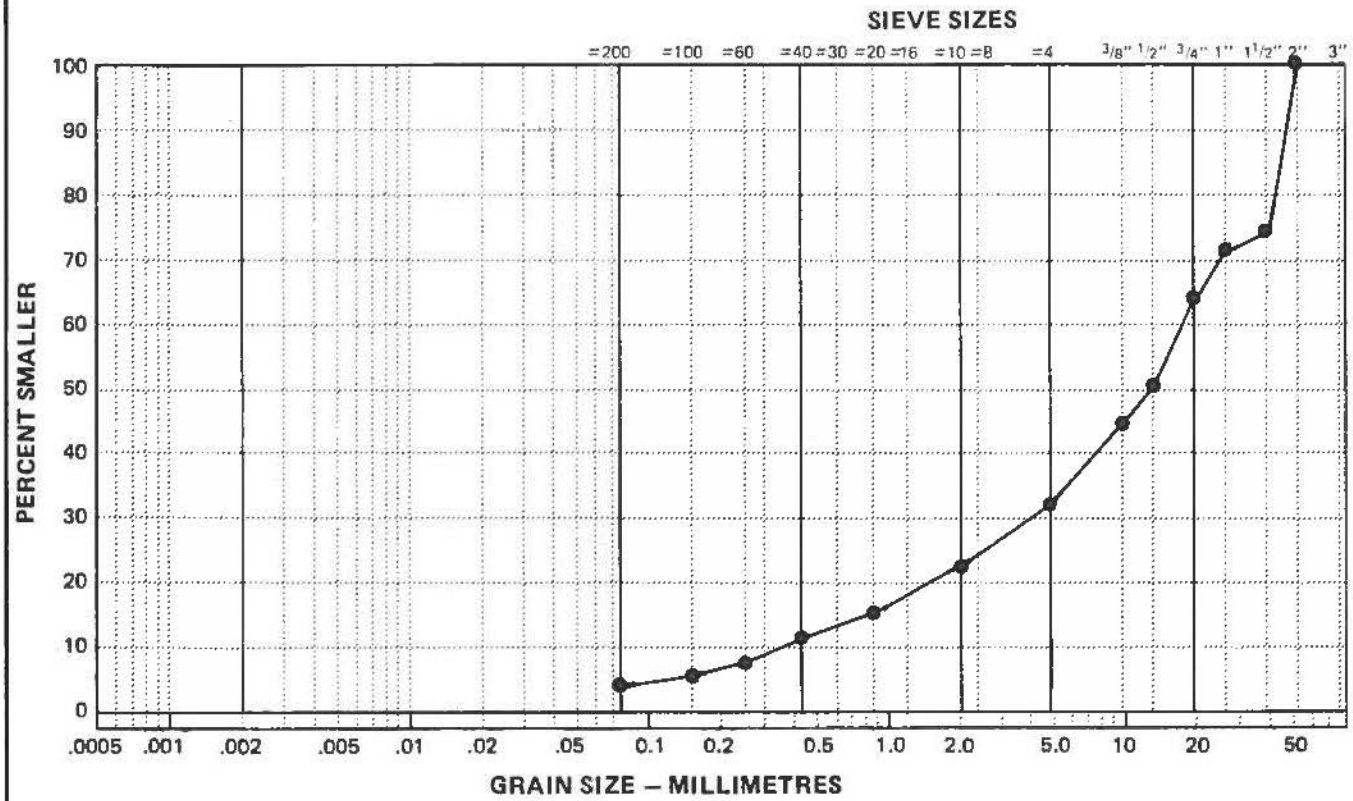
Cc: 2.3

Natural Moisture Content: _____ %

Remarks: Gravel 68.2%
Sand 27.3%
Silt 4.5%
1/2" sieve - 50.5% passing

SIEVE	PERCENTAGE PASSING
3"	
2"	100.0
1 1/2"	74.7
1"	71.1
3/4"	64.3
3/8"	44.4
No. 4	31.8
No. 10	22.0
No. 20	15.8
No. 40	11.2
No. 60	8.0
No. 100	5.9
No. 200	4.5

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



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EBA Engineering Consultants Ltd.

PARTICLE - SIZE ANALYSIS OF SOILS

Project: Granular Source Evaluation
km 1647, North Alaska Highway

Project Number: 0201-10923

Date Tested: 92-04-21

Borehole Number: 92-003E

Depth: 4.0 m

Soil Description: WELL GRADED GRAVEL WITH SAND (GW)

Cu: 44.4

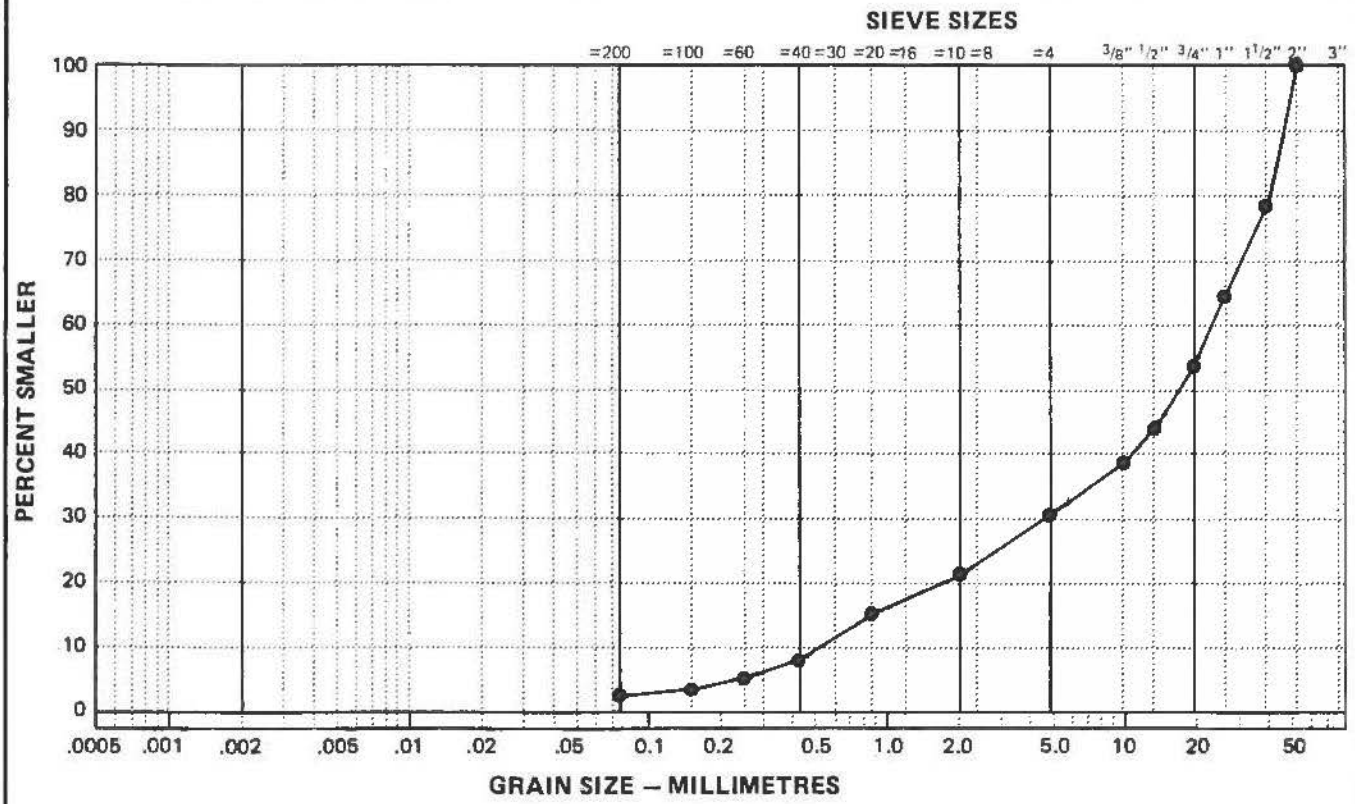
Cc: 1.8

Natural Moisture Content: _____ %

Remarks: Gravel 69.5%
Sand 28.4%
Silt 2.1%
1/2" sieve - 43.4% passing

SIEVE	PERCENTAGE PASSING
3"	
2"	100.0
1 1/2"	78.1
1"	64.4
3/4"	53.4
3/8"	39.1
No. 4	30.5
No. 10	21.2
No. 20	14.4
No. 40	8.8
No. 60	5.4
No. 100	3.3
No. 200	2.1

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



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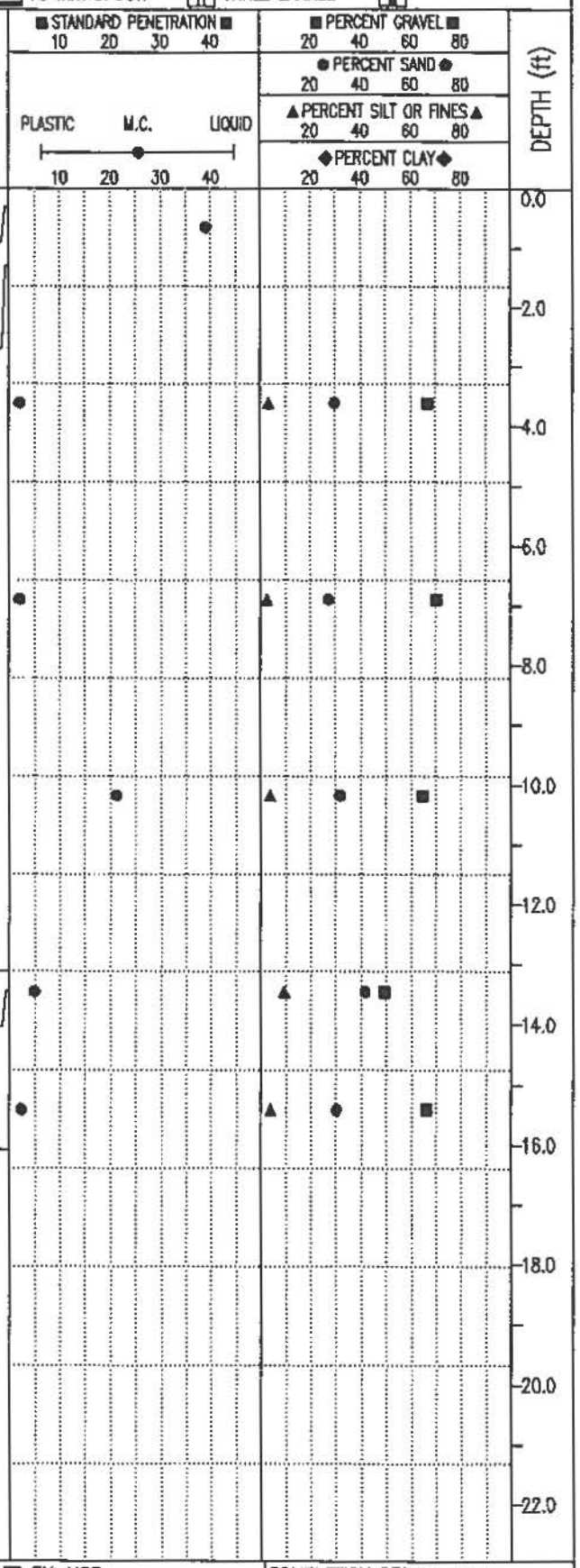
GRANULAR SOURCE EVALUATION km 1647	CLIENT: YTG – TRANSPORTATION ENG.	BOREHOLE No: 92–004E
McINTOSH LODGE PIT	HOE: CAT 225 TRACKED BACKHOE	Project No: 0201–10923
NORTH ALASKA HIGHWAY	UTM ZONE: 8 N6743602.00 E353743.00	ELEVATION: 0.00 (m)

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

DEPTH (m)	SAMPLE TYPE	SAMPLE NO	SPT(N)	USC	SOIL SYMBOL	SOIL DESCRIPTION
0.0						ORGANIC GROUND COVER–seasonally frozen, black
		1				SILT WITH SAND–trace of clay, rootlets throughout, sand is fine grained, uniform, seasonally frozen, rusty brown becoming light olive by 0.4 m
1.0		2		GW		WELL GRADED GRAVEL WITH SAND–trace of silt, gravel is subangular, up to 150 mm maximum size, with less than 5% over 100 mm, moist, olive brown –100 mm thick lens of SILT with trace of clay, moist, olive brown at 0.9 m
2.0		3		GW		
3.0		4		GW		
4.0		5		SP/SM		SILTY SAND lens from 4.0 to 4.1 m, moist, dark olive
						WELL GRADED GRAVEL WITH SILT AND SAND–damp to moist, olive brown
		6		GW/GM		
5.0						END OF TESTPIT 4.9 m
						NOTE: Very little sloughing in testpit
6.0						
7.0						



EBA Engineering Consultants Ltd. Whitehorse, Yukon	LOGGED BY: MCP	COMPLETION DEPTH: 4.9 m
	REVIEWED BY:	COMPLETE: 92/04/15
	Fig. No:	Page 1 of 1

EBA Engineering Consultants Ltd.

PARTICLE - SIZE ANALYSIS OF SOILS

Project: Granular Source Evaluation
km 1647, North Alaska Highway

Project Number: 0201-10923

Date Tested: 92-04-22

Borehole Number: 92-004E

Depth: 1.0 m

Soil Description: WELL GRADED GRAVEL WITH SAND (GW)

Cu: 12.3

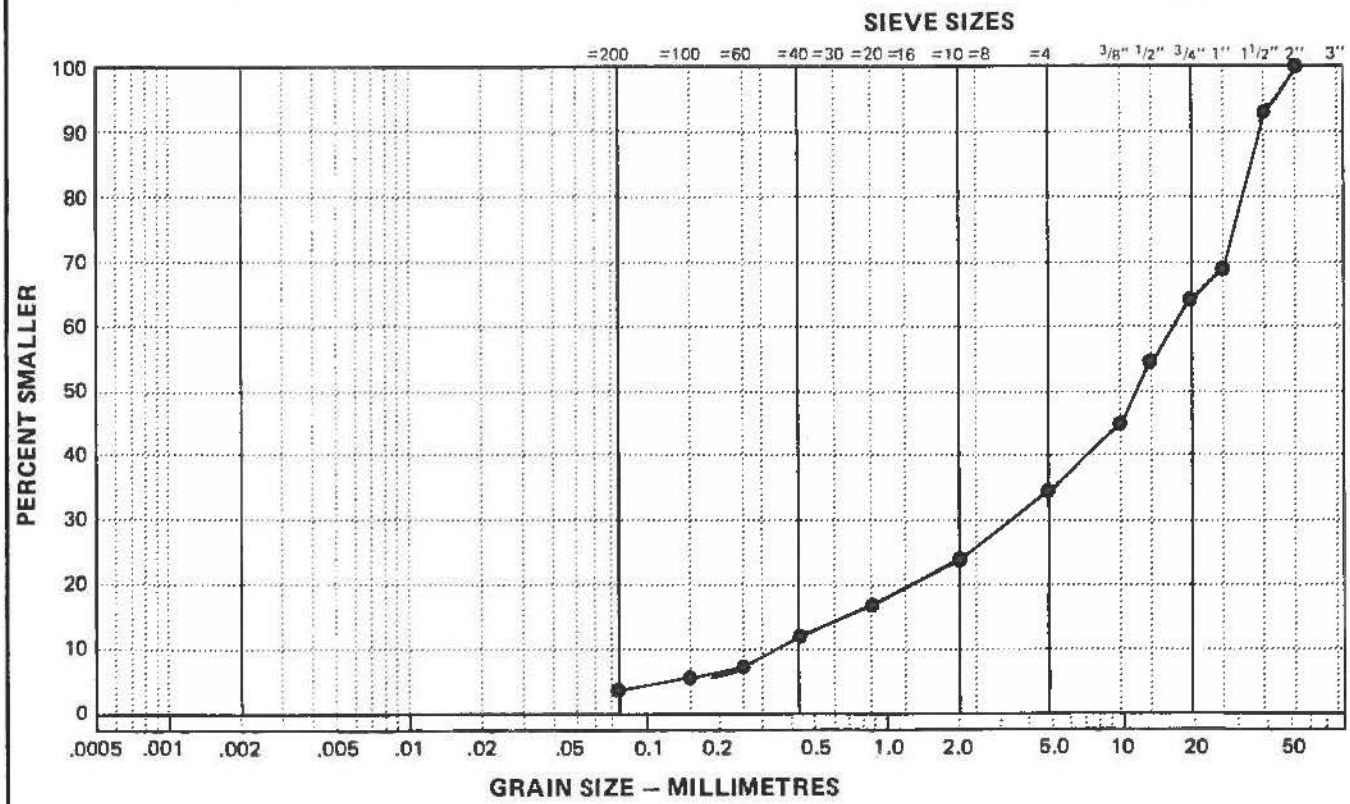
Cc: 1.9

Natural Moisture Content: %

Remarks: Gravel 67.1%
Sand 29.5%
Silt 3.4%
1/2" sieve - 54.0% passing

SIEVE	PERCENTAGE PASSING
3"	
2"	100.0
1 1/2"	92.9
1"	69.4
3/4"	64.2
3/8"	45.1
No. 4	32.9
No. 10	23.3
No. 20	17.0
No. 40	11.4
No. 60	7.6
No. 100	5.3
No. 200	3.4

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



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EBA Engineering Consultants Ltd.

PARTICLE - SIZE ANALYSIS OF SOILS

Project: Granular Source Evaluation
km 1647, North Alaska Highway

Project Number: 0201-10923

Date Tested: 92-04-22

Borehole Number: 92-004E

Depth: 2.0 m

Soil Description: WELL GRADED GRAVEL WITH SAND (GW)

Cu: 26.01

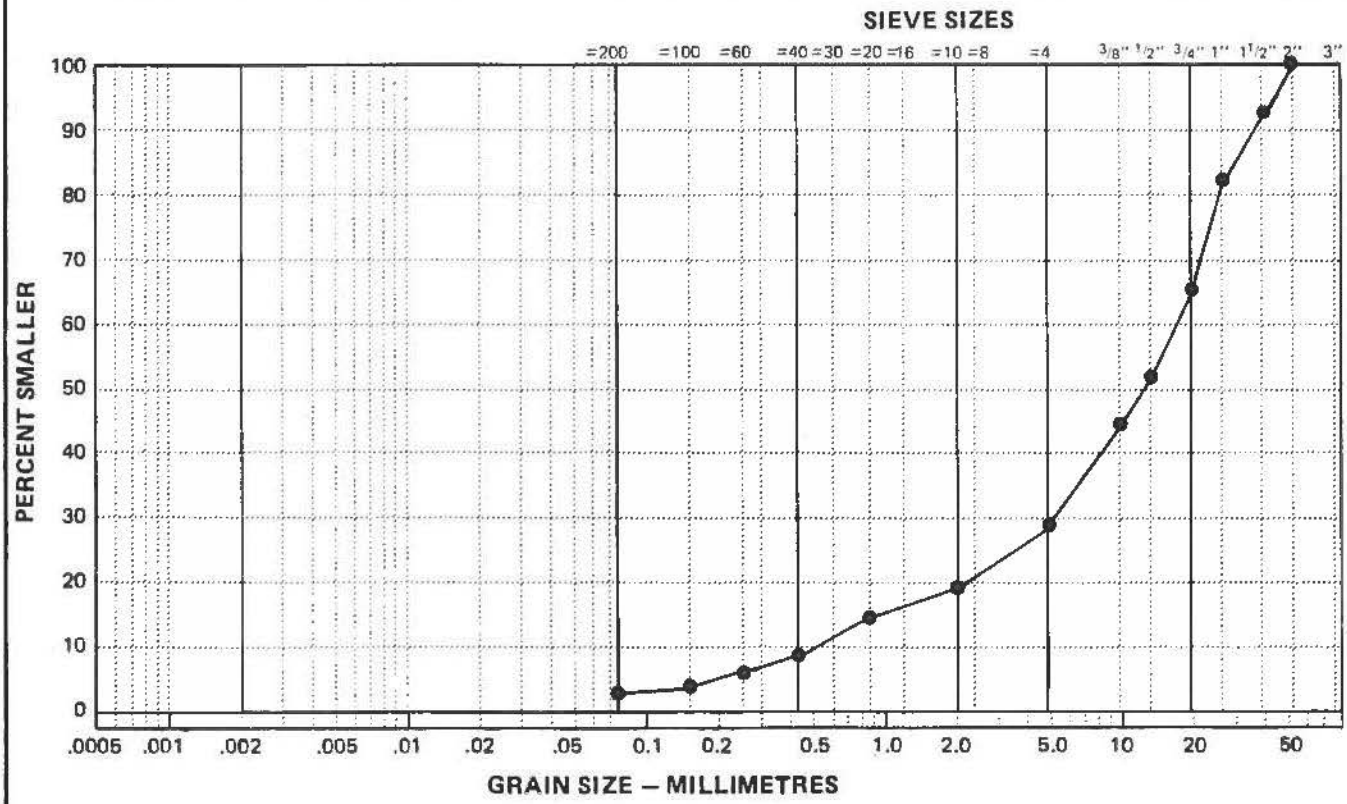
Cc: 2.8

Natural Moisture Content: _____ %

Remarks: Gravel 70.3%
Sand 27.1%
Silt 2.6%
1/2" sieve - 51.6% passing

SIEVE	PERCENTAGE PASSING
3"	
2"	100.0
1 1/2"	92.7
1"	81.4
3/4"	66.7
3/8"	44.5
No. 4	29.7
No. 10	19.8
No. 20	13.9
No. 40	9.4
No. 60	6.4
No. 100	4.2
No. 200	2.6

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



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EBA Engineering Consultants Ltd.

PARTICLE - SIZE ANALYSIS OF SOILS

Project: Granular Source Evaluation
km 1647, North Alaska Highway

Project Number: 0201-10923

Date Tested: 92-04-22

Borehole Number: 92-004E

Depth: 3.0 m

Soil Description: WELL GRADED GRAVEL WITH SAND (GW)

Cu: 12.3

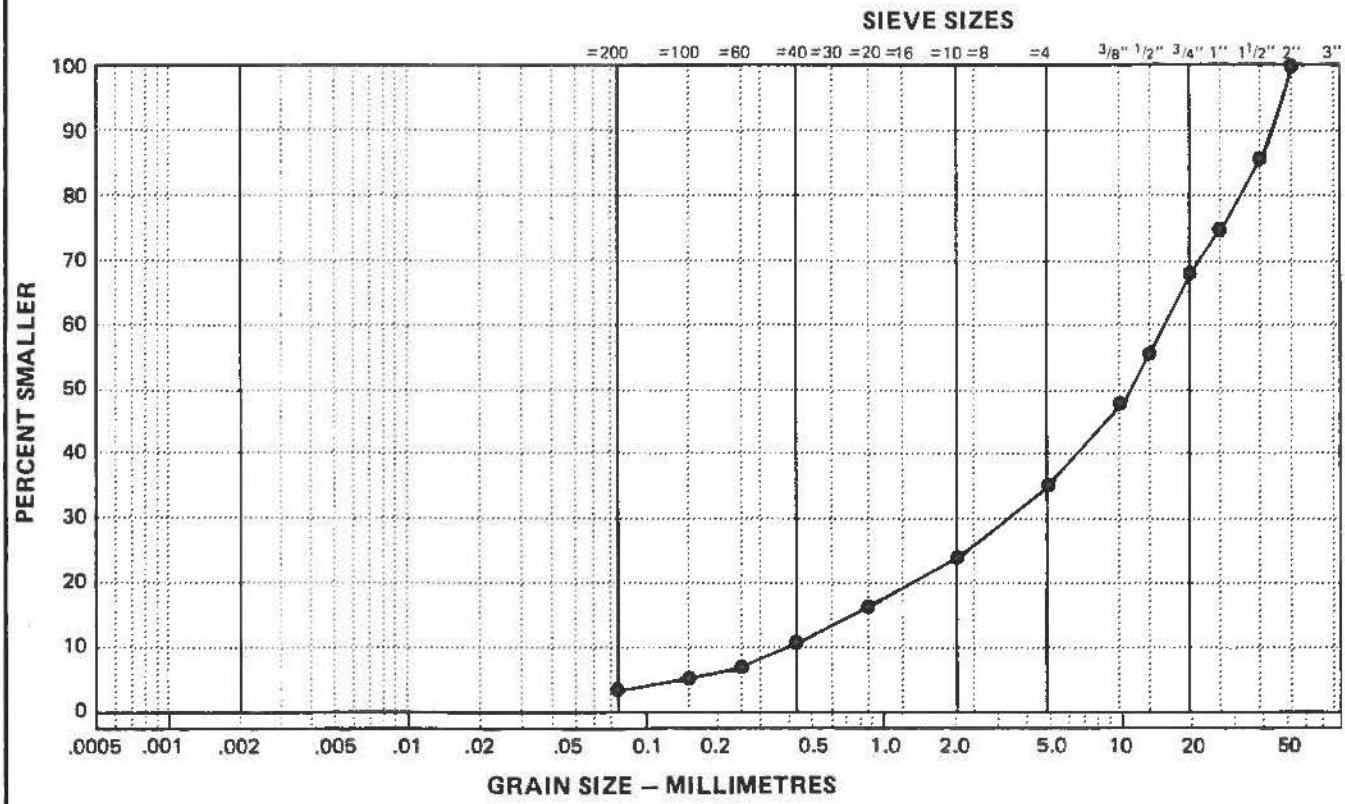
Cc: 1.8

Natural Moisture Content: _____ %

Remarks: Gravel 64.7%
Sand 31.6%
Silt 3.7%
1/2" sieve - 55.4% passing

SIEVE	PERCENTAGE PASSING
3"	
2"	100.0
1 1/2"	85.7
1"	74.8
3/4"	68.8
3/8"	48.6
No. 4	35.3
No. 10	23.7
No. 20	15.9
No. 40	10.6
No. 60	7.4
No. 100	5.3
No. 200	3.7

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



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EBA Engineering Consultants Ltd.

PARTICLE - SIZE ANALYSIS OF SOILS

Project: Granular Source Evaluation
km 1647, North Alaska Highway

Project Number: 0201-10923

Date Tested: 92-04-22

Borehole Number: 92-004E

Depth: 4.0 m

Soil Description: WELL GRADED GRAVEL WITH SILT AND SAND

Cu: 100 (GW/GM)

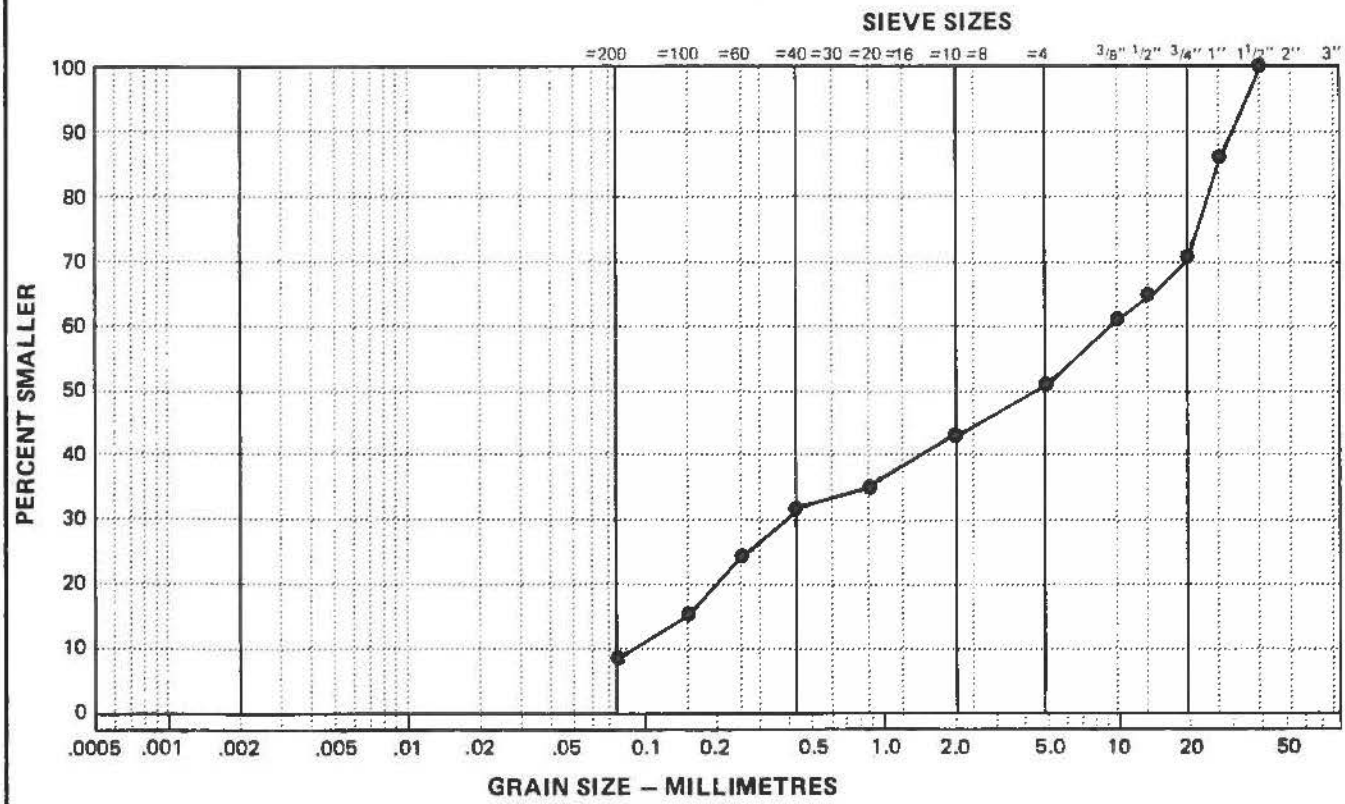
Cc: 2.0

Natural Moisture Content: _____ %

Remarks: Gravel 49.2%
Sand 41.5%
Silt 9.3%
1/2" sieve - 64.9% passing

SIEVE	PERCENTAGE PASSING
3"	
2"	
1 1/2"	100.0
1"	86.5
3/4"	80.7
3/8"	60.9
No. 4	50.8
No. 10	42.4
No. 20	36.4
No. 40	31.0
No. 60	23.8
No. 100	16.2
No. 200	9.3

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



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EBA Engineering Consultants Ltd.

PARTICLE - SIZE ANALYSIS OF SOILS

Project: Granular Source Evaluation
km 1647, North Alaska Highway

Project Number: 0201-10923

Date Tested: 92-04-22

Borehole Number: 92-004E

Depth: 4.8 m

Soil Description: WELL GRADED GRAVEL WITH SILT AND SAND

Cu: 64.3 (GW/GM)

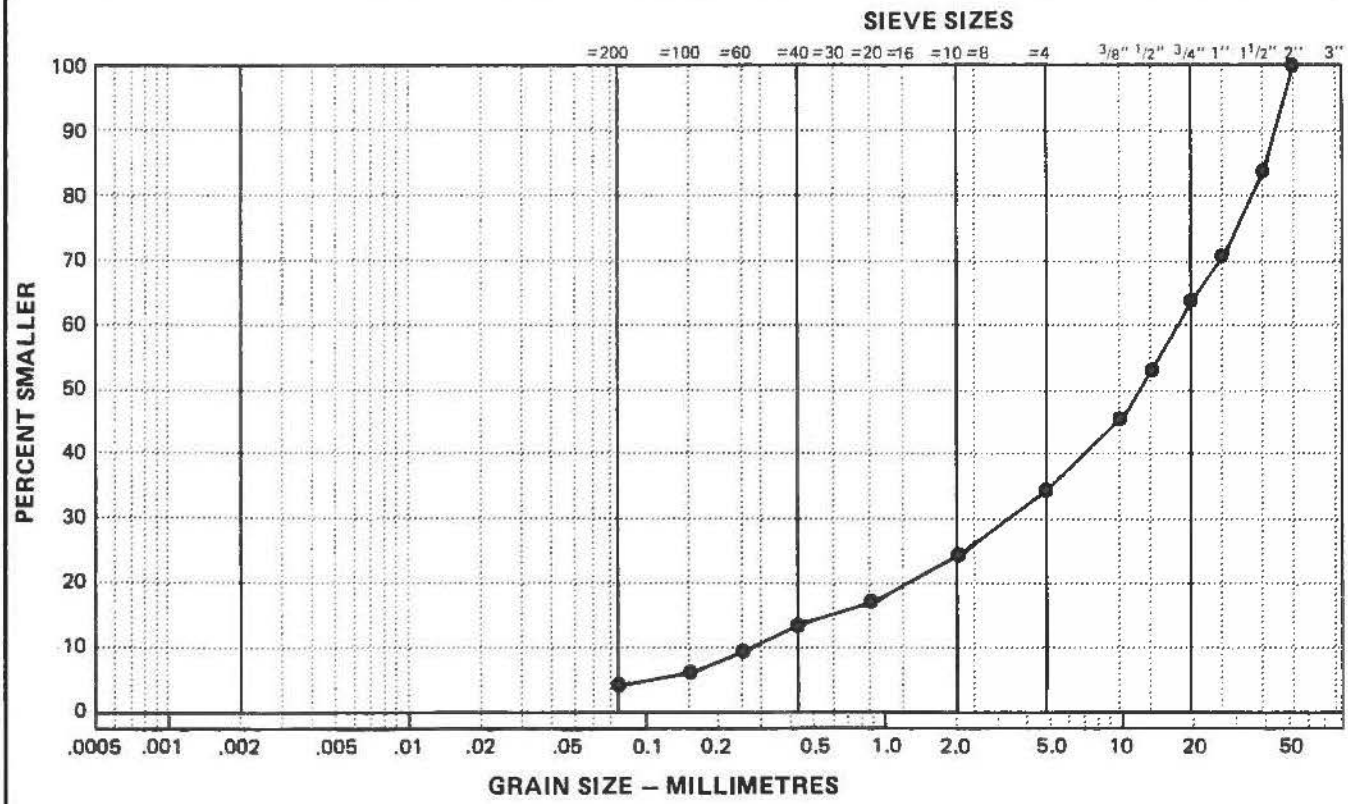
Cc: 24

Natural Moisture Content: %

Remarks: Gravel 66.1%
Sand 30.1%
Silt 3.8%
1/2" sieve - 52.5% passing

SIEVE	PERCENTAGE PASSING
3"	
2"	100.0
1 1/2"	83.4
1"	70.5
3/4"	62.9
3/8"	45.8
No. 4	33.9
No. 10	24.2
No. 20	17.5
No. 40	12.6
No. 60	9.2
No. 100	6.4
No. 200	3.8

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



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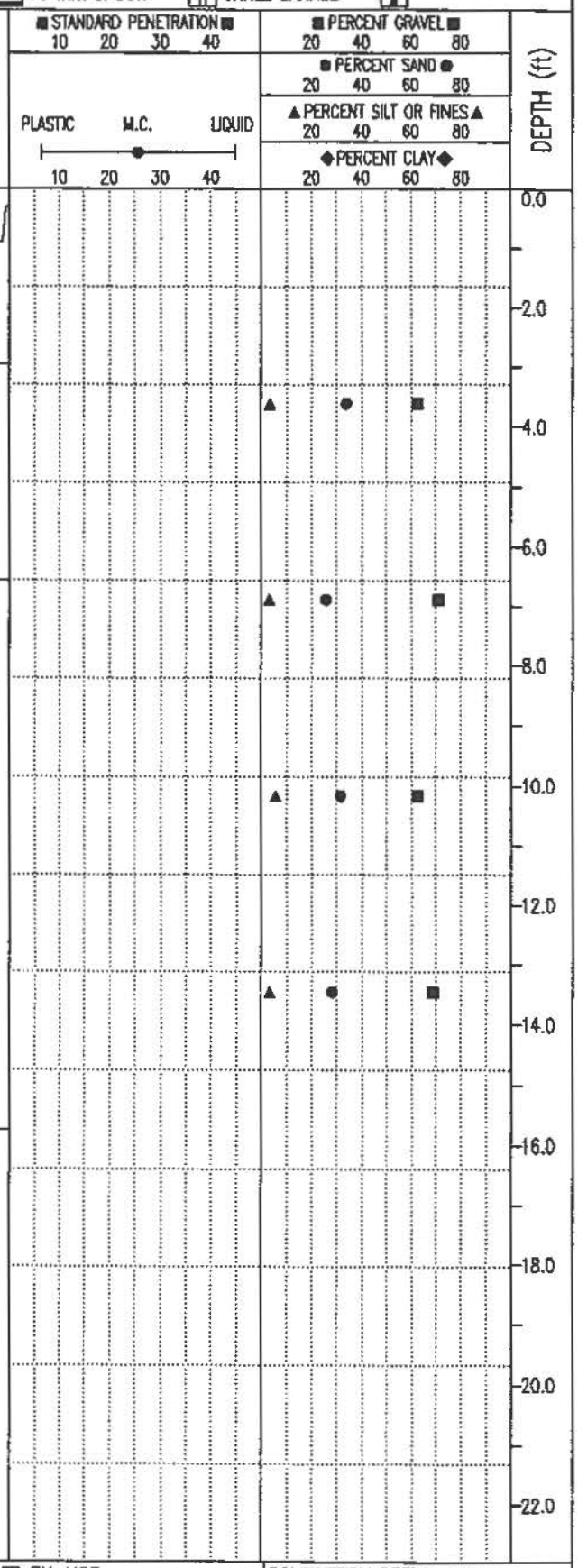
GRANULAR SOURCE EVALUATION km 1647	CLIENT: YTG - TRANSPORTATION ENG.	BOREHOLE No: 92-005E
McINTOSH LODGE PIT	HOE: CAT 225 TRACKED BACKHOE	Project No: 0201-10923
NORTH ALASKA HIGHWAY	UTM ZONE: 8 N6743453.00 E353666.00	ELEVATION: 0.00 (m)

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

DEPTH (m)	SAMPLE TYPE	SAMPLE NO	SPT(N)	USC	SOIL SYMBOL	SOIL DESCRIPTION
0.0	Grab	1				ORGANIC GROUND COVER-seasonally frozen, black
						SILTY SAND-rootlets and fibrous organics to 0.8 m, fine grained, uniform, seasonally frozen, olive brown
1.0	Grab	2		GP		POORLY GRADED GRAVEL WITH SAND-trace of silt, gravel is subangular, up to 100 mm maximum size, moist, compact, brownish grey
						-150 mm thick lenses of siltier gravel at approximately 1.6, 2.4 and 3.0 m
2.0	Grab	3		GW		WELL GRADED GRAVEL WITH SAND-trace of silt, sand is medium to fine grained, gravel is subangular, up to 100 mm maximum size, damp grey
3.0	Grab	4		GW/GM		
4.0	Grab	5		GW		
5.0						END OF TESTPIT 4.8 m NOTE: Very little sloughing in testpit
6.0						
7.0						



EBA Engineering Consultants Ltd. Whitehorse, Yukon	LOGGED BY: MCP	COMPLETION DEPTH: 4.8 m
	REVIEWED BY:	COMPLETE: 92/04/15
	Fig. No:	Page 1 of 1

EBA Engineering Consultants Ltd.

PARTICLE - SIZE ANALYSIS OF SOILS

Project: Granular Source Evaluation
km 1647, North Alaska Highway

Project Number: 0201-10923

Date Tested: 92-04-22

Borehole Number: 92-005E

Depth: 1.0 m

Soil Description: POORLY GRADED GRAVEL WITH SAND (GP)

Cu: 36.4

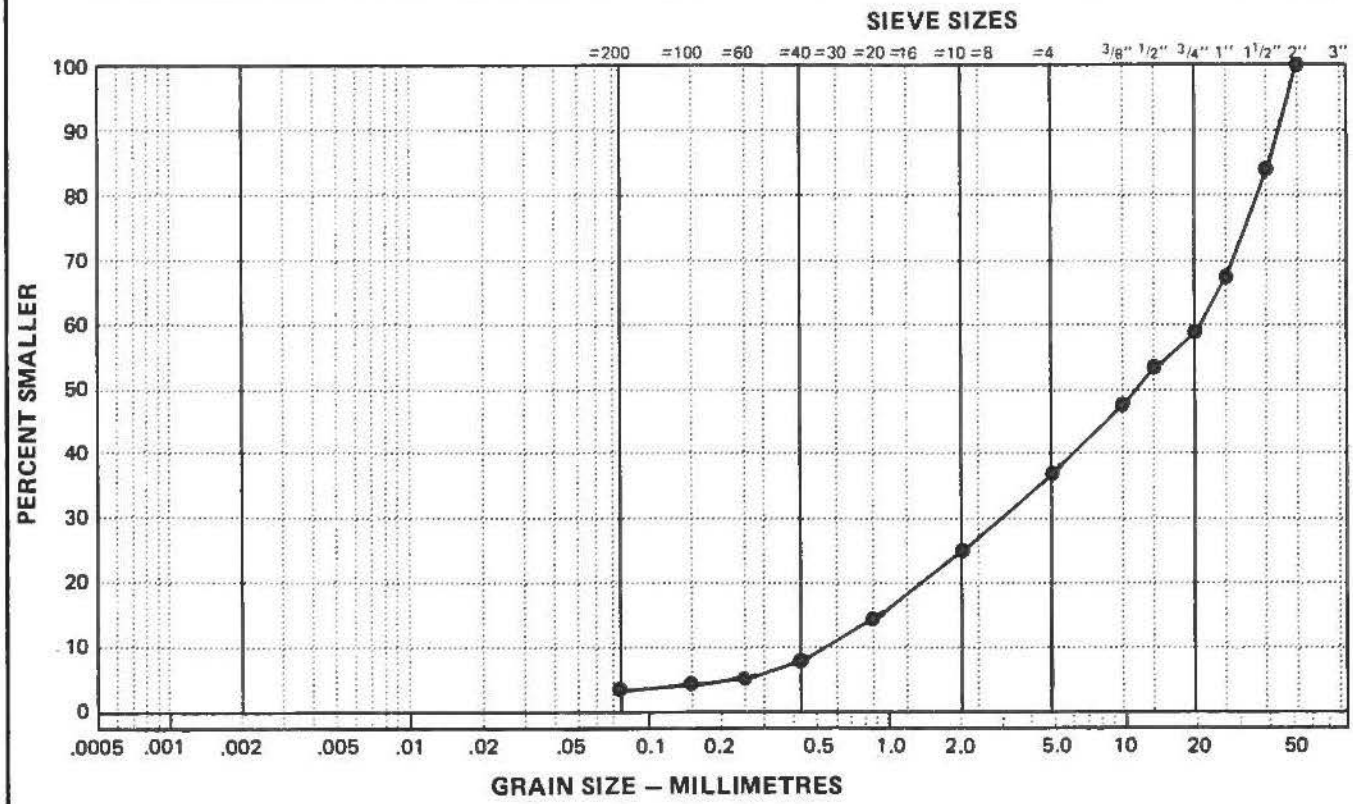
Cc: 0.8

Natural Moisture Content: _____ %

Remarks: Gravel 62.8%
Sand 33.7%
Silt 3.5%
1/2" sieve - 53.2% passing

SIEVE	PERCENTAGE PASSING
3"	
2"	100.0
1 1/2"	83.9
1"	67.7
3/4"	59.0
3/8"	47.7
No. 4	37.2
No. 10	24.9
No. 20	14.5
No. 40	8.1
No. 60	5.5
No. 100	4.2
No. 200	3.5

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



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EBA Engineering Consultants Ltd.

PARTICLE - SIZE ANALYSIS OF SOILS

Project: Granular Source Evaluation
km 1647 North Alaska Highway

Project Number: 0201-10923

Date Tested: 92-04-22

Borehole Number: 92-005E

Depth: 2.0 m

Soil Description: WELL GRADED GRAVEL WITH SAND (GW)

Cu: 26.0

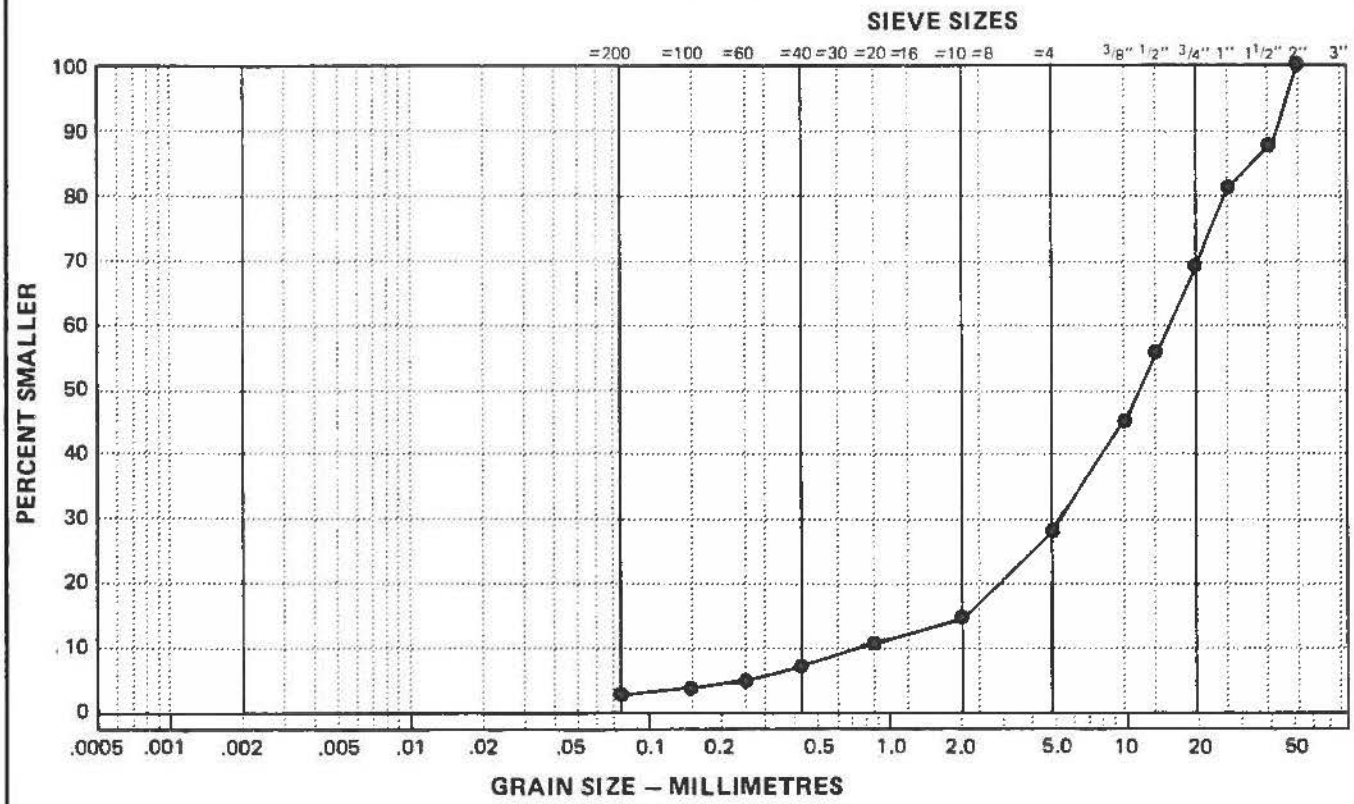
Cc: 2.2

Natural Moisture Content: _____ %

Remarks: Gravel 71.1%
Sand 25.6%
Silt 3.3%
1/2" sieve - 56.5% passing

SIEVE	PERCENTAGE PASSING
3"	
2"	100.0
1 1/2"	88.7
1"	80.9
3/4"	69.6
3/8"	46.9
No. 4	28.9
No. 10	15.6
No. 20	10.1
No. 40	7.0
No. 60	5.3
No. 100	4.2
No. 200	3.3

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



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EBA Engineering Consultants Ltd.

PARTICLE - SIZE ANALYSIS OF SOILS

Project: Granular Source Evaluation
km 1647, North Alaska Highway

Project Number: 0201-10923

Date Tested: 92-04-22

Borehole Number: 92-005E

Depth: 3.0 m

Soil Description: WELL GRADED GRAVEL WITH SILT AND SAND (GW/GM)

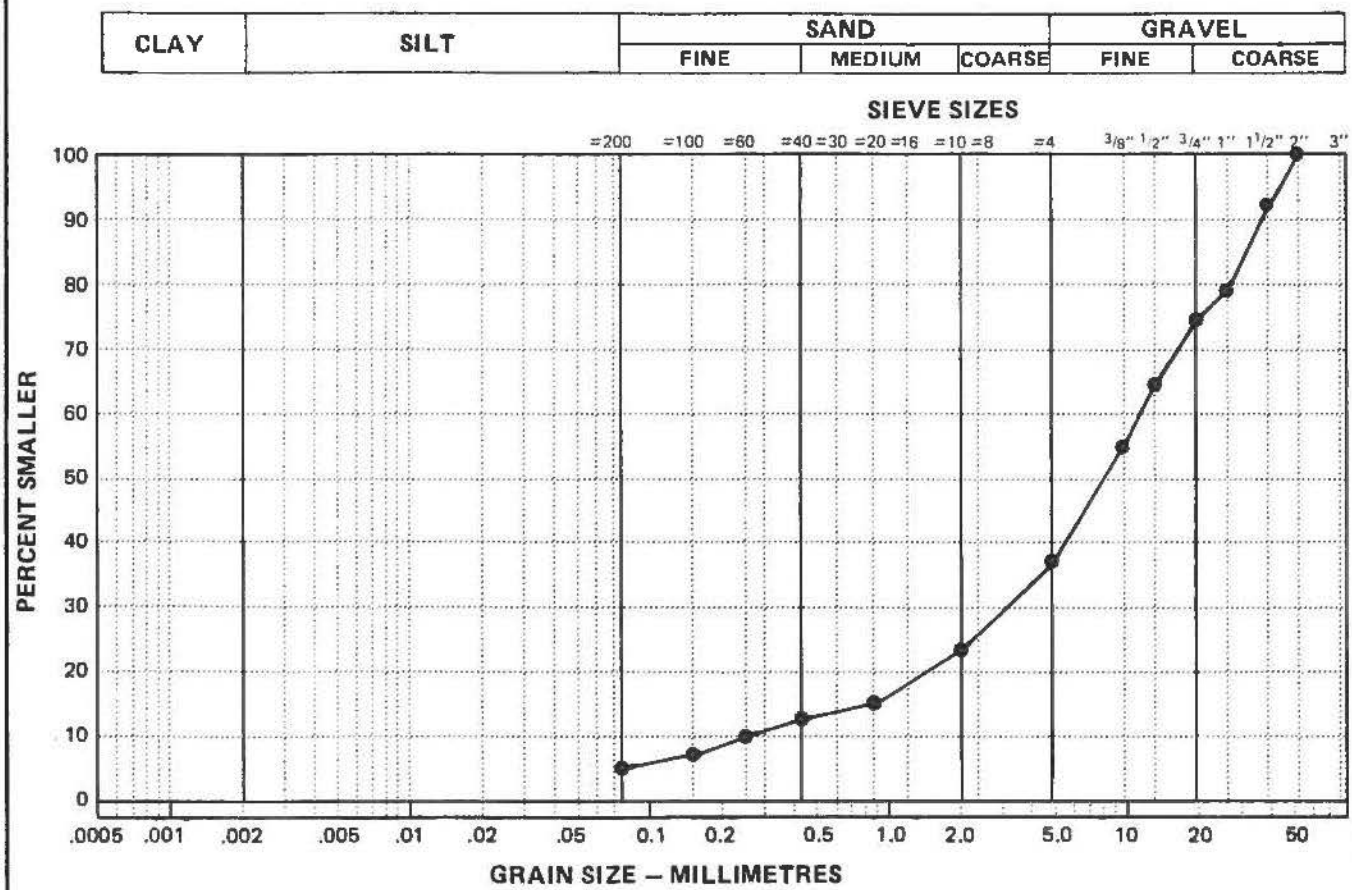
Cu: 50

Cc: 3.1

Natural Moisture Content: _____ %

Remarks: Gravel 62.6%
Sand 31.5%
Silt 5.9%
1/2" sieve - 64.2% passing

SIEVE	PERCENTAGE PASSING
3"	
2"	100.0
1 1/2"	91.6
1"	79.1
3/4"	75.4
3/8"	55.5
No. 4	37.4
No. 10	23.4
No. 20	16.5
No. 40	12.5
No. 60	10.0
No. 100	7.8
No. 200	5.9



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EBA Engineering Consultants Ltd.

PARTICLE - SIZE ANALYSIS OF SOILS

Project: Granular Source Evaluation
km 1647, North Alaska Highway

Project Number: 0201-10923

Date Tested: 92-04-22

Borehole Number: 92-005E

Depth: 4.0 m

Soil Description: WELL GRADED GRAVEL WITH SAND (GW)

Cu: 15.2

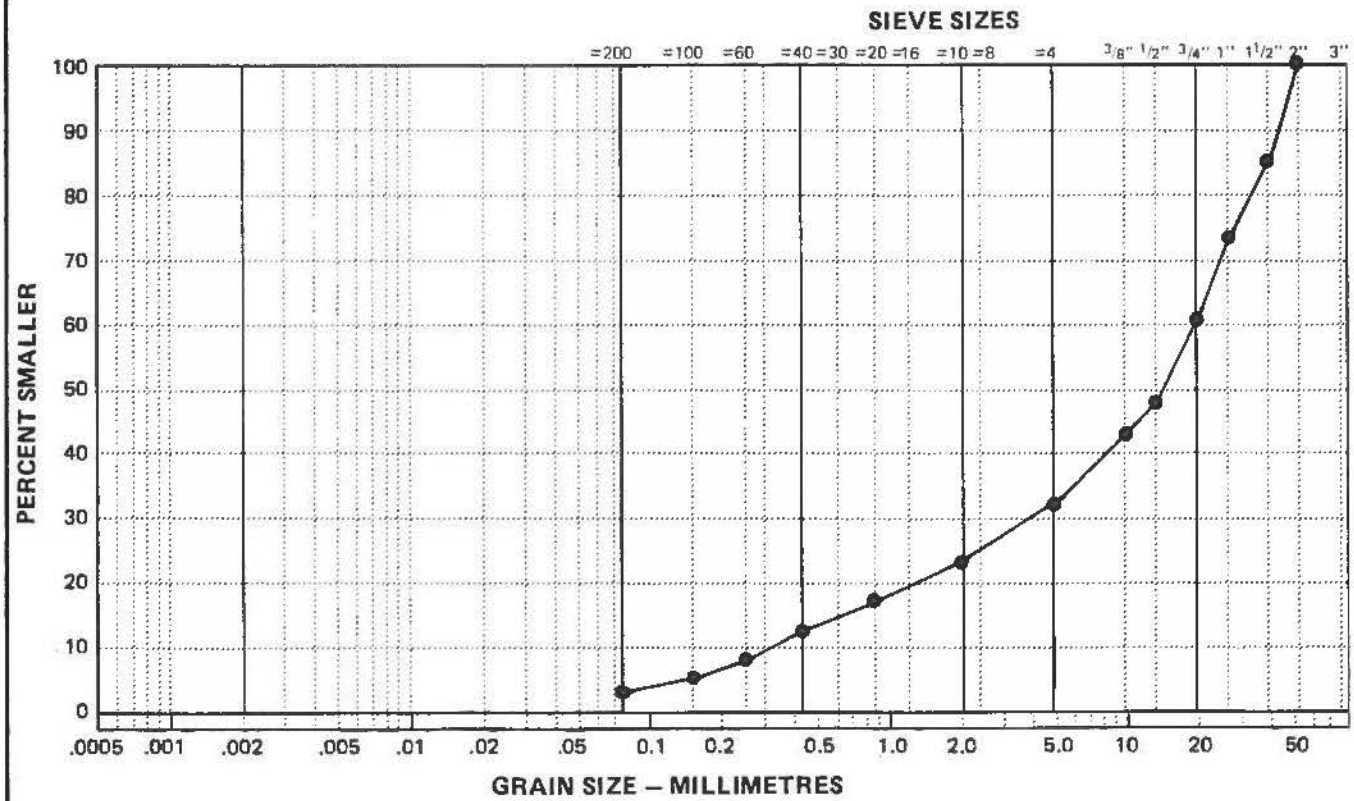
Cc: 2.5

Natural Moisture Content: _____ %

Remarks: Gravel 68.7%
Sand 27.9%
Silt 3.4%
1/2" sieve - 47.9% passing

SIEVE	PERCENTAGE PASSING
3"	
2"	100.0
1 1/2"	85.8
1"	72.9
3/4"	60.4
3/8"	47.9
No. 4	42.6
No. 10	31.3
No. 20	22.9
No. 40	17.3
No. 60	12.3
No. 100	8.3
No. 200	5.5

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



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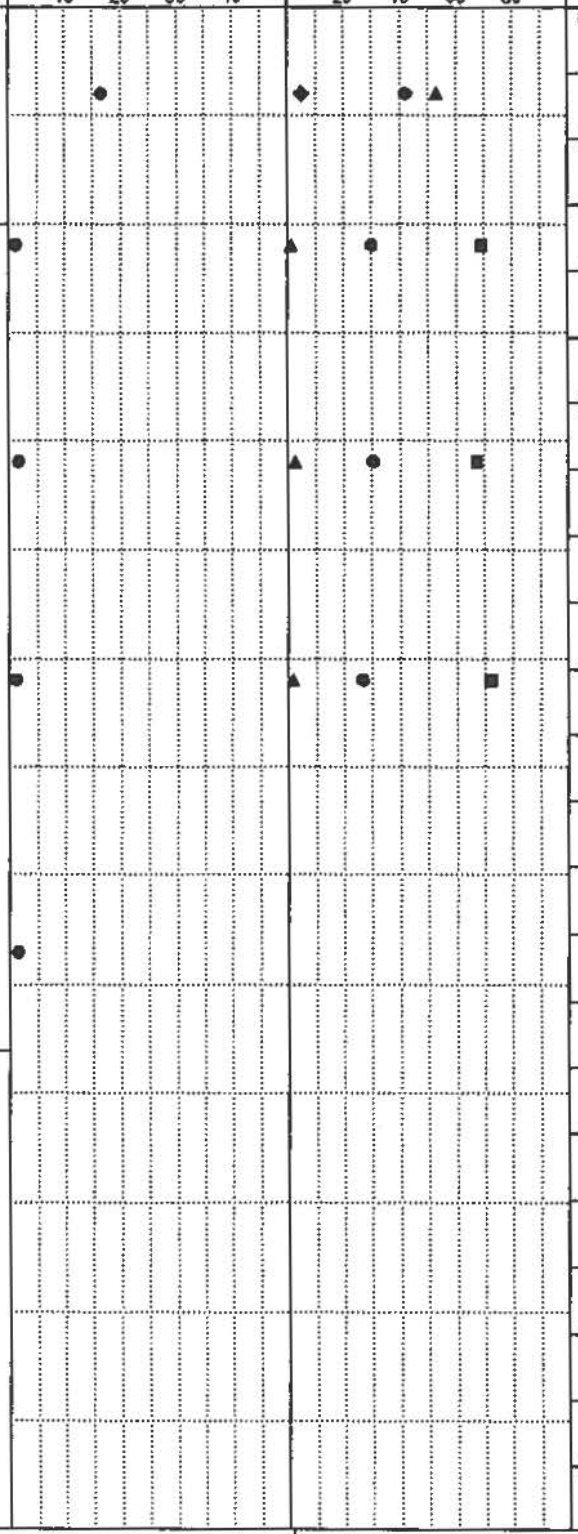
GRANULAR SOURCE EVALUATION km 1647	CLIENT: YTG – TRANSPORTATION ENG.	BOREHOLE No: 92–006E
McINTOSH LODGE PIT	HOE: CAT 225 TRACKED BACKHOE	Project No: 0201–10923
NORTH ALASKA HIGHWAY	UTM ZONE: B N6743439.00 E353779.00	ELEVATION: 0.00 (m)

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

DEPTH (m)	SAMPLE TYPE	SAMPLE NO	SPT(N)	USC	SOIL SYMBOL	SOIL DESCRIPTION
0.0						SANDY SILT–trace of clay, rootlets to 0.2 m, seasonally frozen to 1.0 m, rusty brown over olive brown
	GRAB	1		ML		
1.0	GRAB	2		GW		WELL GRADED GRAVEL WITH SAND–trace of silt, gravel is subangular, up to 100 mm in size, moist, compact(est.), greyish brown –75 mm thick lenses of siltier gravel at 1.3 and 1.6 m
2.0	GRAB	3		GW		
3.0	GRAB	4		GW		
4.0	GRAB	5				
5.0						END OF TESTPIT 4.8 m NOTE: Very little sloughing in testpit
6.0						
7.0						



EBA Engineering Consultants Ltd. Whitehorse, Yukon	LOGGED BY: MCP	COMPLETION DEPTH: 4.8 m
	REVIEWED BY:	COMPLETE: 92/04/15
	Fig. No:	Page 1 of 1

EBA Engineering Consultants Ltd.

PARTICLE - SIZE ANALYSIS OF SOILS

Project: km 1647 Granular Source Evaluation
North Alaska Highway, Yukon

Project Number: 0201-10923

Date Tested: 92-04-24

Borehole Number: 92-006E

Depth: 0.5 m

Soil Description: SANDY SILT-trace of clay (ML)

Cu:

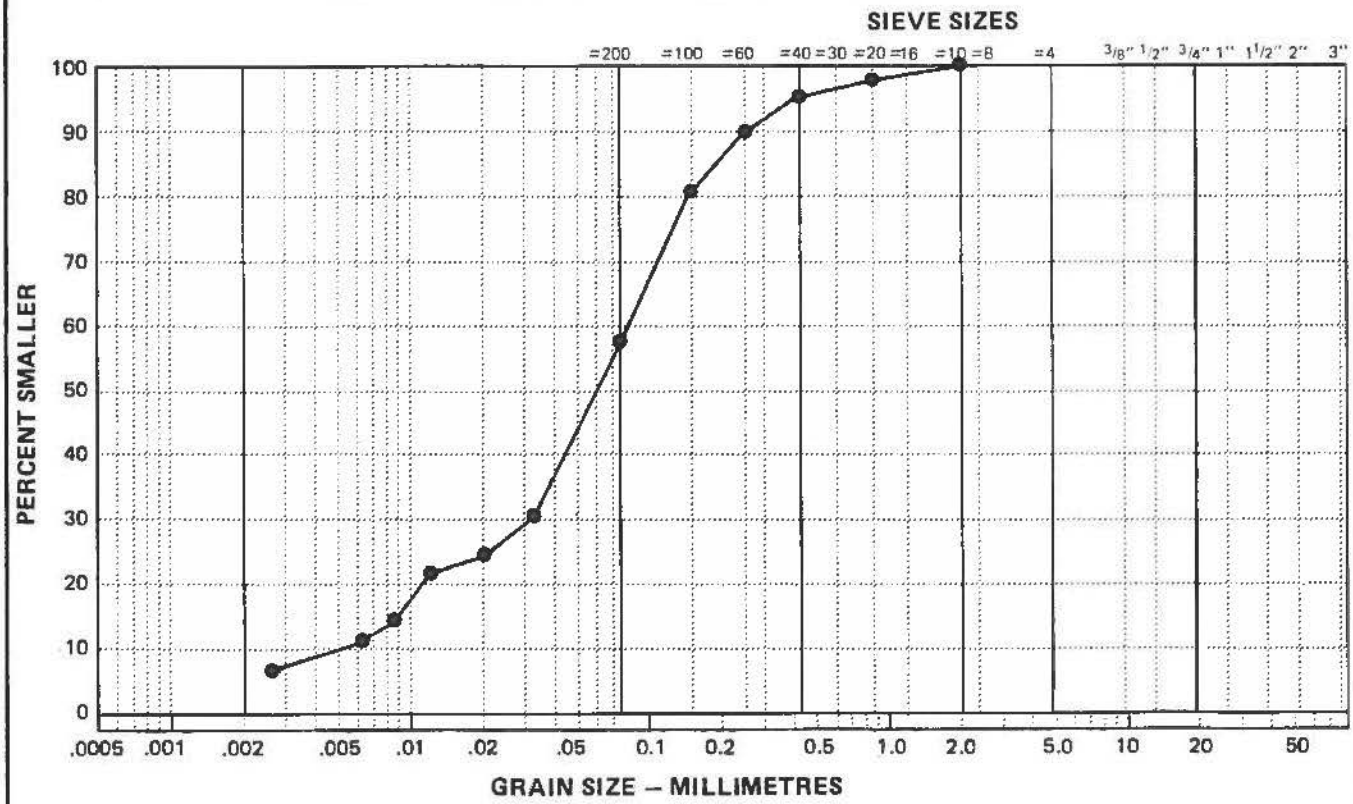
Cc:

Natural Moisture Content: %

Remarks:

SIEVE	PERCENTAGE PASSING
3"	
2"	
1 1/2"	
1"	
3/4"	
3/8"	
No. 4	
No. 10	100.0
No. 20	98.4
No. 40	95.8
No. 60	90.0
No. 100	80.8
No. 200	58.4

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



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EBA Engineering Consultants Ltd.

PARTICLE - SIZE ANALYSIS OF SOILS

Project: Granular Source Evaluation
km 1647, North Alaska Highway

Project Number: 0201-10923

Date Tested: 92-04-22

Borehole Number: 92-006E

Depth: 1.0 m

Soil Description: WELL GRADED GRAVEL WITH SAND (GW)

Cu: 16.8

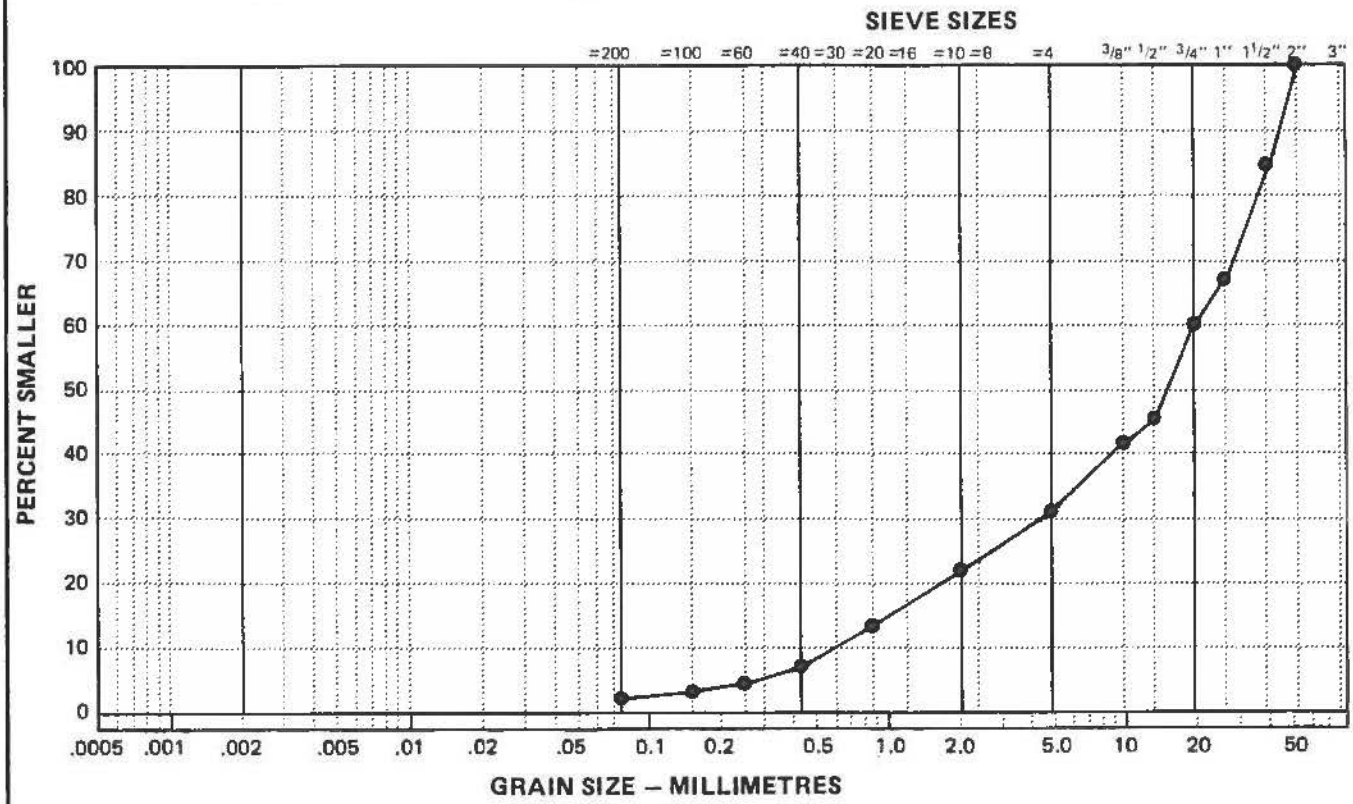
Cc: 1.4

Natural Moisture Content: _____ %

Remarks: Gravel 69.0%
Sand 29.8%
Silt 1.2%
1/2" sieve - 46.8% passing

SIEVE	PERCENTAGE PASSING
3"	
2"	100.0
1 1/2"	84.9
1"	67.3
3/4"	60.0
3/8"	41.0
No. 4	31.0
No. 10	21.2
No. 20	13.2
No. 40	7.6
No. 60	4.3
No. 100	2.3
No. 200	1.2

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



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EBA Engineering Consultants Ltd.

PARTICLE - SIZE ANALYSIS OF SOILS

Project: Granular Source Evaluation
km 1647, North Alaska Highway

Project Number: 0201-10923

Date Tested: 92-04-22

Borehole Number: 92-006E

Depth: 2.0 m

Soil Description: well graded gravel with sand (GW)

Cu: 12.3

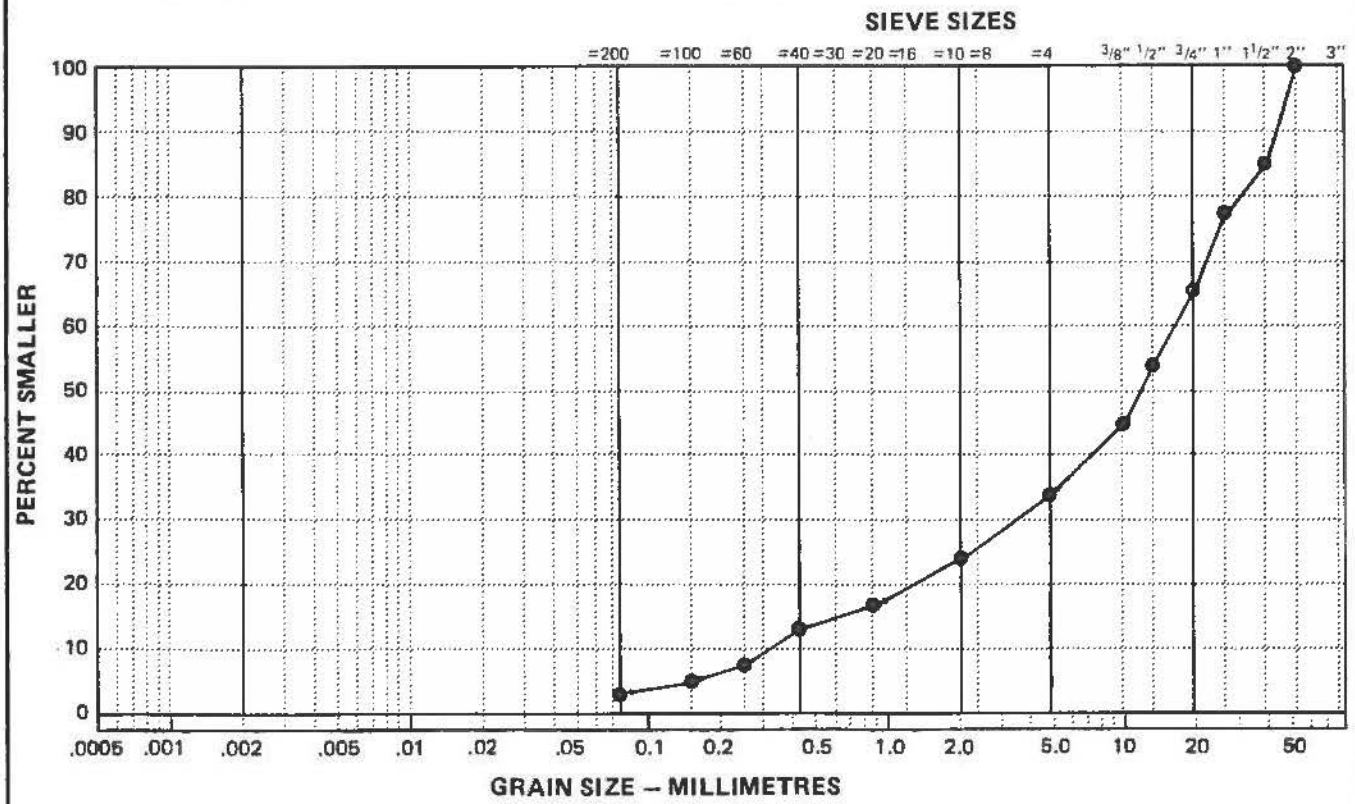
Cc: 2.3

Natural Moisture Content: _____ %

Remarks: Gravel 67.2%
Sand 30.2%
Silt 2.6%
1/2" sieve - 52.5% passing

SIEVE	PERCENTAGE PASSING
3"	
2"	100.0
1 1/2"	85.4
1"	77.8
3/4"	65.9
3/8"	44.6
No. 4	32.8
No. 10	23.5
No. 20	17.4
No. 40	12.3
No. 60	8.4
No. 100	5.2
No. 200	2.6

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



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2033

EBA Engineering Consultants Ltd.

PARTICLE - SIZE ANALYSIS OF SOILS

Project: Granular Source Evaluation
km 1647, North Alaska Highway

Project Number: 0201-10923

Date Tested: 92-04-22

Borehole Number: 92-006E

Depth: 3.0 m

Soil Description: WELL GRADED GRAVEL WITH SAND (GW)

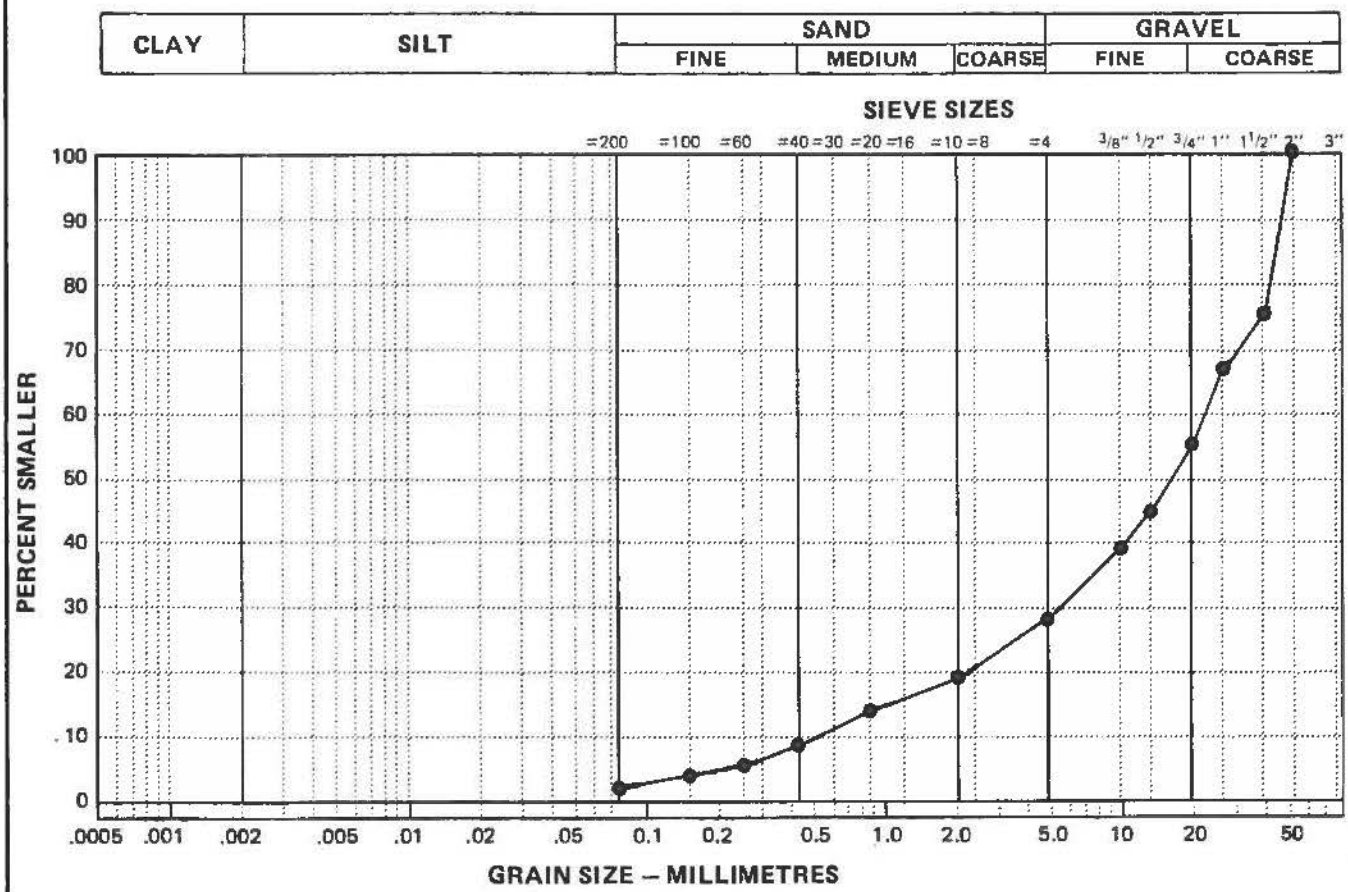
Cu: 26.0

Cc: 2.0

Natural Moisture Content: _____ %

Remarks: Gravel 71.9%
Sand 26.5%
Silt 1.6%
1/2" sieve - 44.3% passing

SIEVE	PERCENTAGE PASSING
3"	
2"	100.0
1 1/2"	75.6
1"	67.7
3/4"	55.6
3/8"	39.0
No. 4	28.1
No. 10	19.7
No. 20	13.8
No. 40	9.0
No. 60	5.5
No. 100	3.1
No. 200	1.6



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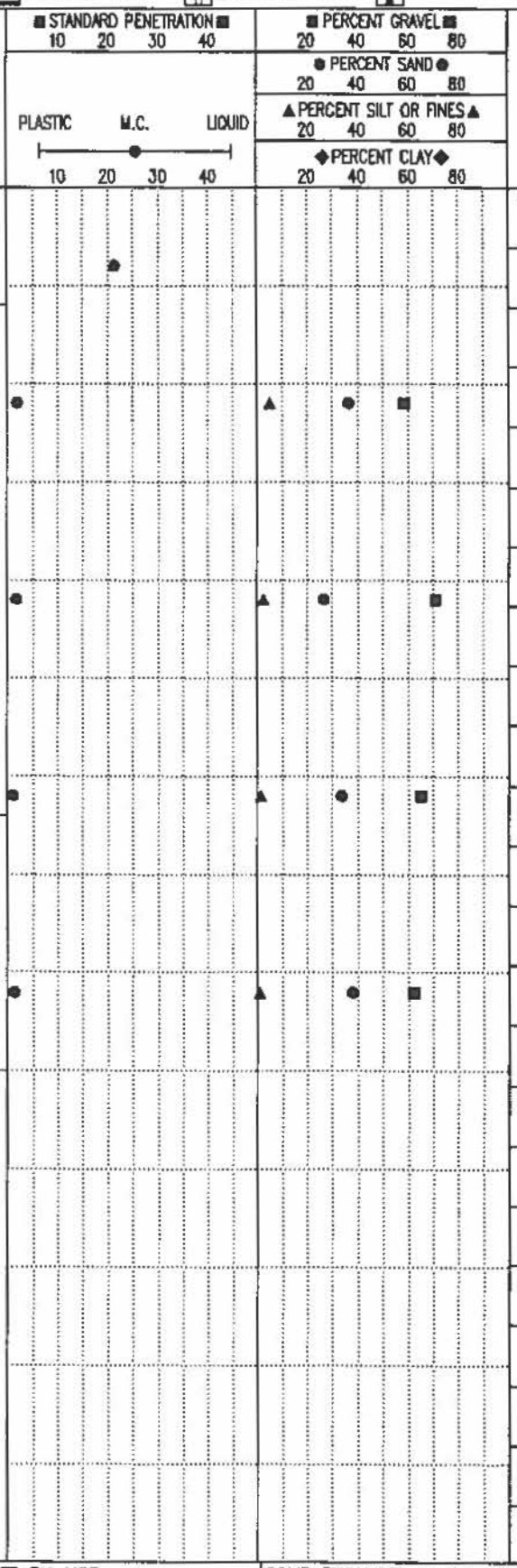
GRANULAR SOURCE EVALUATION km 1647	CLIENT: YTG – TRANSPORTATION ENG.	BOREHOLE No: 92-007E
McINTOSH LODGE PIT	HOE: CAT 225 TRACKED BACKHOE	Project No: 0201-10923
NORTH ALASKA HIGHWAY	UTM ZONE: 8 N6744738.00 E354218.00	ELEVATION: 0.00 (m)

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

DEPTH (m)	SAMPLE TYPE	SAMPLE NO	SPT(N)	USC	SOIL SYMBOL	SOIL DESCRIPTION
0.0						SPARSE GRASS GROUND COVER (CLEARED AREA)
	GRAB	1				CLAYEY SILT–thin laminae, even, parellel, seasonally frozen, olive brown
						WELL GRADED GRAVEL WITH SAND–trace of silt, gravel is medium grained, up to 50 mm maximum size, clast supported, seasonally frozen to 2.0 m, greyish brown
1.0	GRAB	2		GW/GM		–lenses of siltier gravel at approximately 1.0, 1.8 and 2.5 m
2.0	GRAB	3		GW		
3.0	GRAB	4		GW		
						POORLY GRADED GRAVEL WITH SAND–trace of silt, gravel is subangular, up to 75 mm, sand is medium to fine grained, damp, dark grey
4.0	GRAB	5		GP		
						END OF TESTPIT 4.5 m
5.0						NOTE: Very little sloughing in testpit
6.0						
7.0						



EBA Engineering Consultants Ltd. Whitehorse, Yukon	LOGGED BY: MCP	COMPLETION DEPTH: 4.5 m
	REVIEWED BY:	COMPLETE: 92/04/16
	Fig. No:	Page 1 of 1

EBA Engineering Consultants Ltd.

PARTICLE - SIZE ANALYSIS OF SOILS

Project: Granular Source Evaluation
km 1647, North Alaska Highway

Project Number: 0201-10923

Date Tested: 92-04-22

Borehole Number: 92-007E

Depth: 1.0 m

Soil Description: WELL GRADED GRAVEL WITH SILT AND SAND (GW/GM)

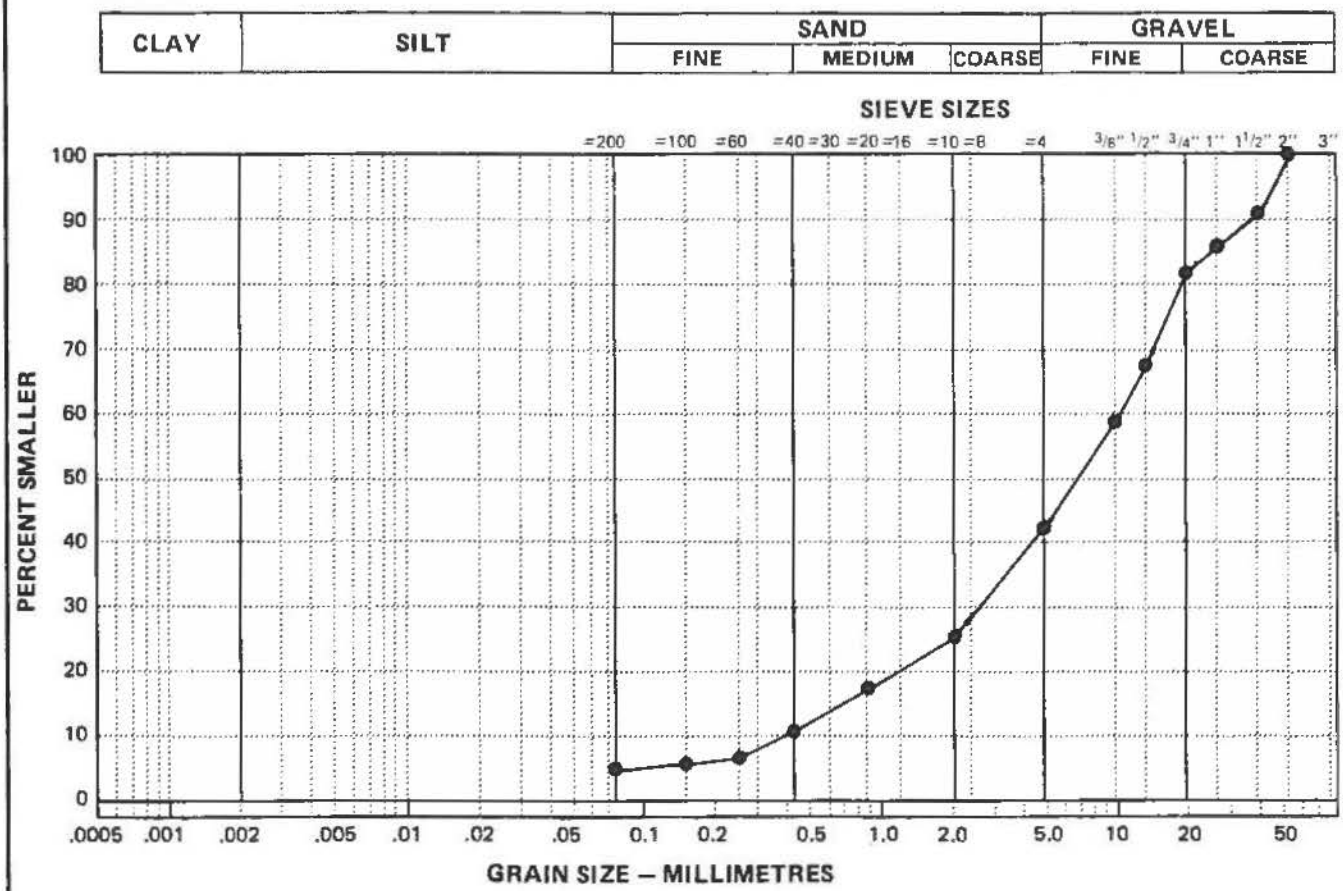
Cu: 27.5

Cc: 1.7

Natural Moisture Content: ____ %

Remarks: Gravel 58.4%
Sand 36.4%
Silt 5.2%
1/2" sieve - 67.4% passing

SIEVE	PERCENTAGE PASSING
3"	
2"	100.0
1 1/2"	90.8
1"	86.7
3/4"	81.1
3/8"	59.0
No. 4	41.6
No. 10	25.2
No. 20	17.1
No. 40	10.2
No. 60	6.9
No. 100	6.0
No. 200	5.2



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EBA Engineering Consultants Ltd.

PARTICLE - SIZE ANALYSIS OF SOILS

Project: Granular Source Evaluation
km 1647, North Alaska Highway

Project Number: 0201-10923

Date Tested: 92-04-22

Borehole Number: 92-007E

Depth: 2.0 m

Soil Description: WELL GRADED GRAVEL WITH SAND (GW)

Cu: 7.5

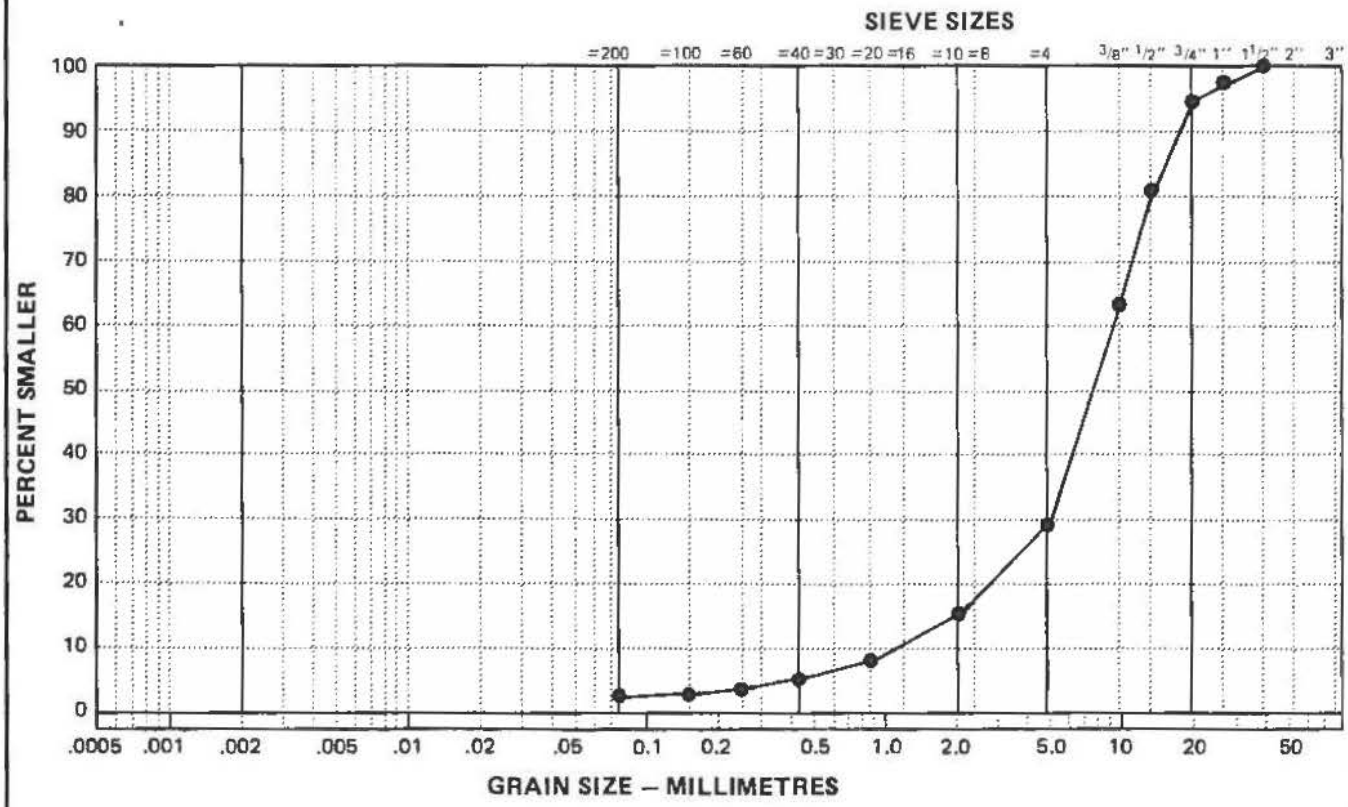
Cc: 2.3

Natural Moisture Content: _____ %

Remarks: Gravel 70.9%
Sand 26.5%
Silt 2.6%

SIEVE	PERCENTAGE PASSING
3"	
2"	
1 1/2"	100.0
1"	97.9
3/4"	95.7
3/8"	62.6
No. 4	29.1
No. 10	15.9
No. 20	8.7
No. 40	4.9
No. 60	3.5
No. 100	2.6
No. 200	

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



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EBA Engineering Consultants Ltd.

PARTICLE - SIZE ANALYSIS OF SOILS

Project: Granular Source Evaluation
km 1647, North Alaska Highway

Project Number: 0201-10923

Date Tested: 92-04-22

Borehole Number: 92-007E

Depth: 3.0 m

Soil Description: WELL GRADED GRAVEL WITH SAND (GW)

Cu: 12.3

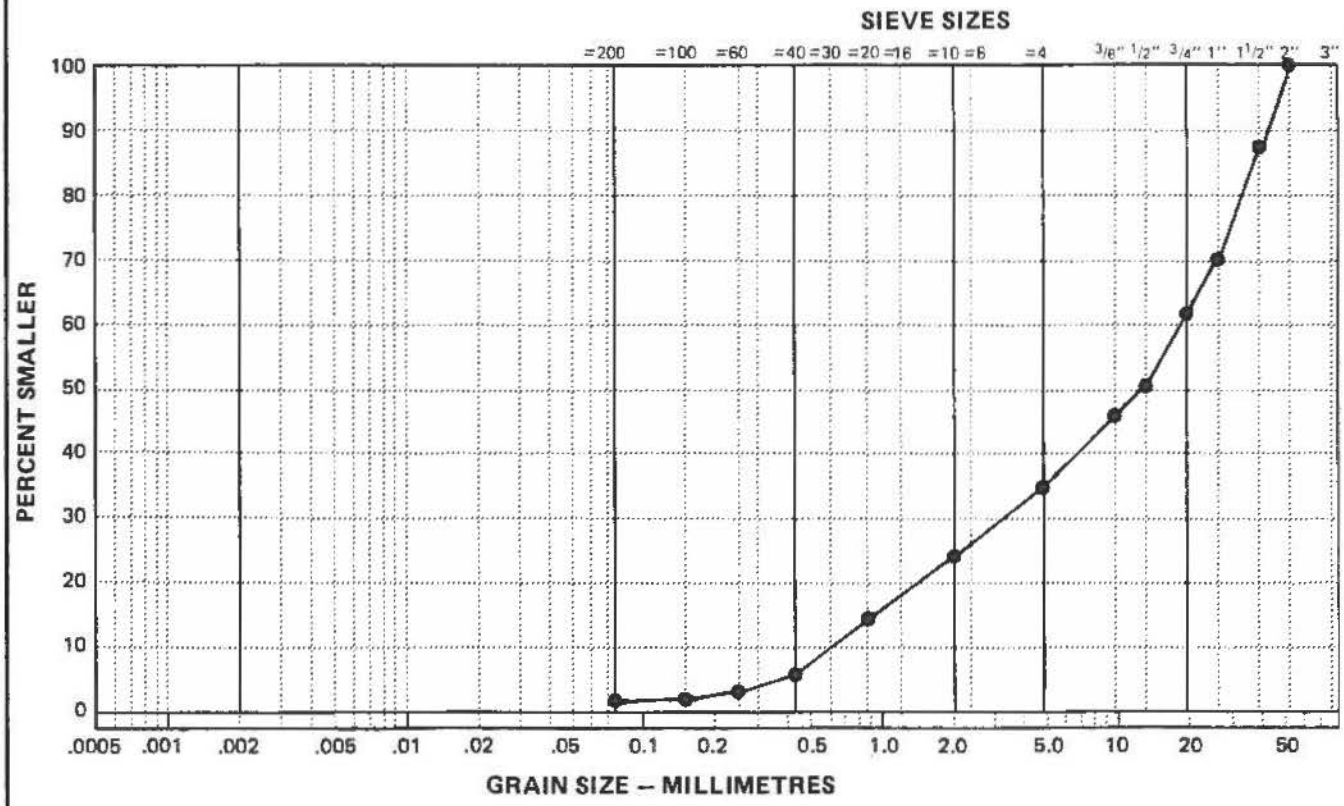
Cc: 1.1

Natural Moisture Content: _____ %

Remarks: Gravel 65.2%
Sand 33.4%
Silt 1.4%
1/2" sieve - 50.5% passing

SIEVE	PERCENTAGE PASSING
3"	
2"	100.0
1 1/2"	87.1
1"	70.1
3/4"	61.2
3/8"	46.7
No. 4	34.8
No. 10	23.6
No. 20	14.3
No. 40	5.8
No. 60	2.5
No. 100	1.7
No. 200	1.4

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



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EBA Engineering Consultants Ltd.

PARTICLE - SIZE ANALYSIS OF SOILS

Project: Granular Source Evaluation
km 1647, North Alaska Highway

Project Number: 0201-10923

Date Tested: 92-04-22

Borehole Number: 92-007E

Depth: 4.0 m

Soil Description: POORLY GRADED GRAVEL WITH SAND (GP)

Cu: 6.8

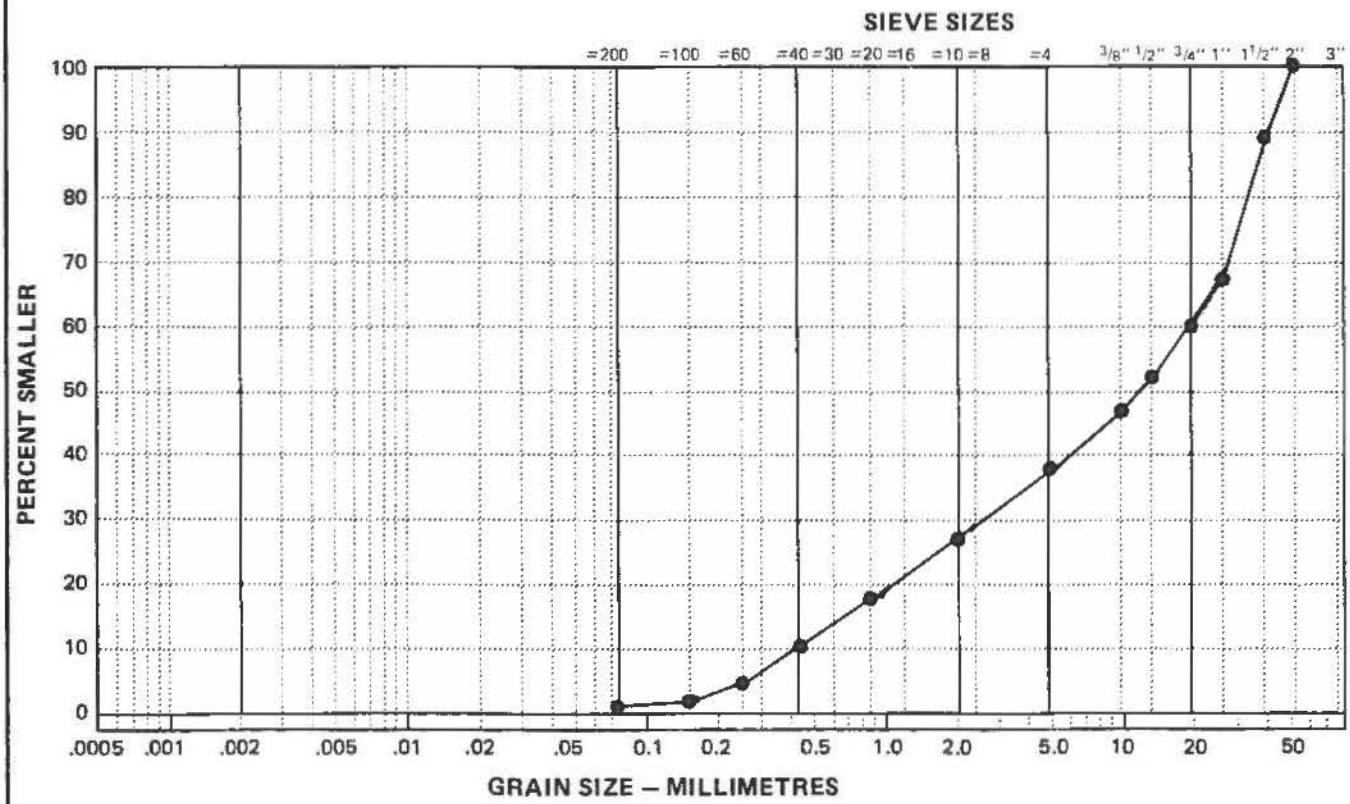
Cc: 0.8

Natural Moisture Content: _____ %

Remarks: Gravel 62.2%
Sand 37.8%
Silt 1.0%
1/2" sieve - 51.7% passing

SIEVE	PERCENTAGE PASSING
3"	
2"	100.0
1 1/2"	79.6
1"	67.3
3/4"	60.0
3/8"	47.4
No. 4	37.8
No. 10	27.2
No. 20	18.6
No. 40	10.5
No. 60	4.5
No. 100	1.9
No. 200	1.0

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



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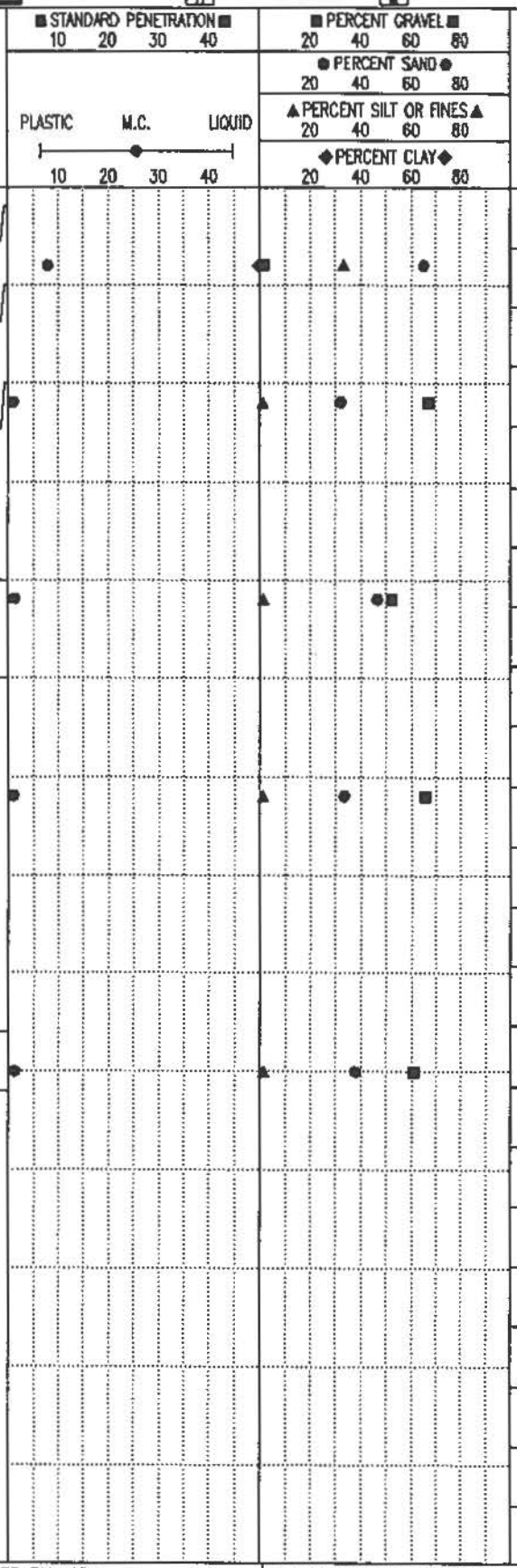
GRANULAR SOURCE EVALUATION km 1647	CLIENT: YTG – TRANSPORTATION ENG.	BOREHOLE No: 92–008E
McINTOSH LODGE PIT	HOE: CAT 225 TRACKED BACKHOE	Project No: 0201–10923
NORTH ALASKA HIGHWAY	UTM ZONE: B N6743458.00 E354073.00	ELEVATION: 0.00 (m)

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

DEPTH (m)	SAMPLE TYPE	SAMPLE NO	SPT(N)	USC	SOIL SYMBOL	SOIL DESCRIPTION
0.0						SPARSE GRASS GROUND COVER AND ORGANIC ROOTMAT
	GRAB SAMPLE	1		SM		SILTY SAND–trace of fibrous organics, seasonally frozen, medium brown to olive
						POORLY GRADED GRAVEL WITH SILT AND SAND–gravel is medium to fine, up to 40 mm, seasonally frozen, light brown
1.0	GRAB SAMPLE	2		GW		WELL GRADED GRAVEL WITH SAND–trace of silt, gravel is subangular, up to 75 mm in size, seasonally frozen to 1.8 m, damp when thawed, dark grey
2.0	GRAB SAMPLE	3		GP		POORLY GRADED GRAVEL WITH SAND–trace of silt, very sandy to 2.5 m, damp, dark grey
						WELL GRADED GRAVEL WITH SAND–trace of silt, gravel is subangular, up to 75 mm in size, damp, dark grey
3.0	GRAB SAMPLE	4		GW		–150 mm thick silty sand lens at 3.4 m
4.0						–300 mm thick silty sand lens from 4.0 to 4.3 m
	GRAB SAMPLE	5		GP		POORLY GRADED GRAVEL WITH SAND–trace of silt, damp, dark grey
						END OF TESTPIT 4.6 m
5.0						
6.0						
7.0						



EBA Engineering Consultants Ltd. Whitehorse, Yukon	LOGGED BY: MCP	COMPLETION DEPTH: 4.6 m
	REVIEWED BY:	COMPLETE: 92/04/16
	Fig. No:	Page 1 of 1

EBA Engineering Consultants Ltd.

PARTICLE - SIZE ANALYSIS OF SOILS

Project: Granular Source Evaluation
km 1647, North Alaska Highway

Project Number: 0201-10923

Date Tested: 92-04-22

Borehole Number: 92-008E

Depth: 0.5 m

Soil Description: SILTY SAND (SM)

Cu:

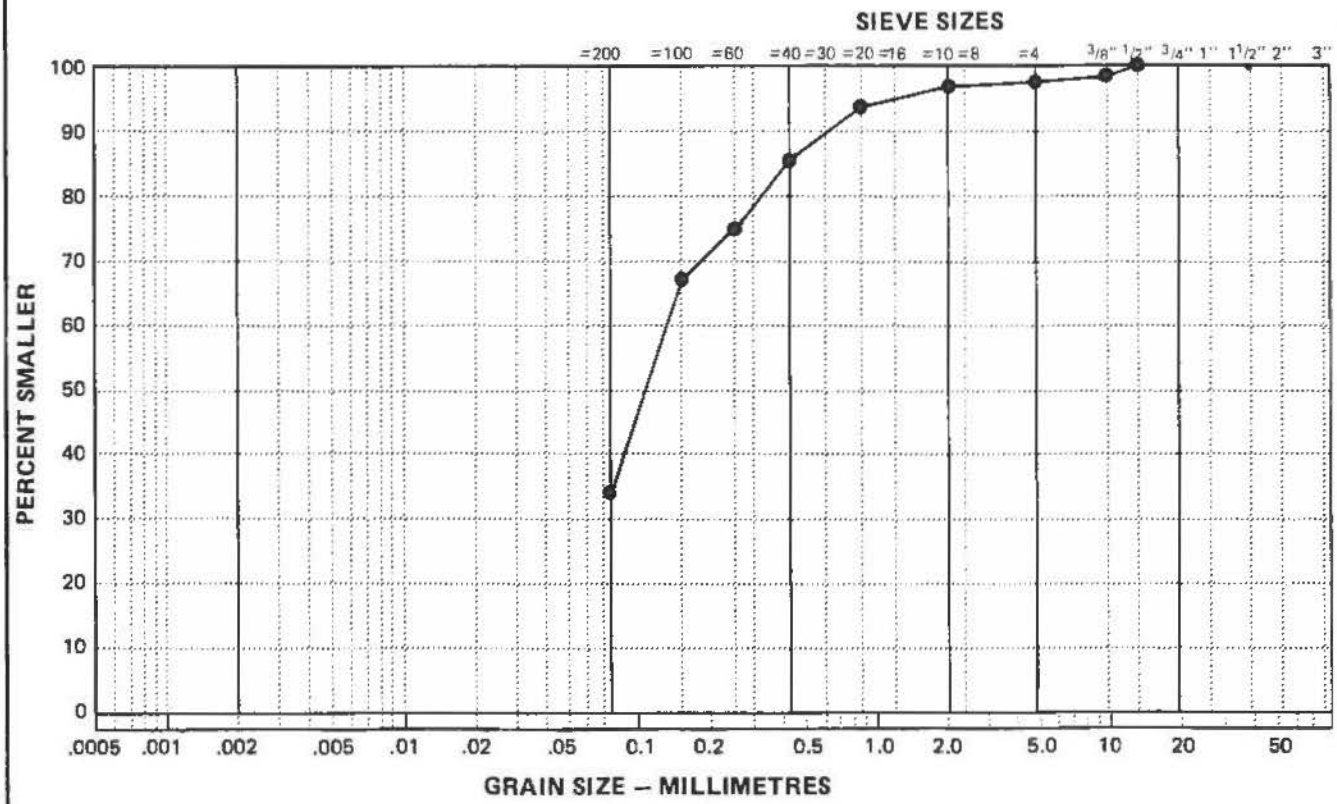
Cc:

Natural Moisture Content: %

Remarks: Gravel 1.8%
Sand 65.0%
Silt 33.2%
1/2" sieve - 100.0% passing

SIEVE	PERCENTAGE PASSING
3"	
2"	
1 1/2"	
1"	
3/4"	
3/8"	99.0
No. 4	98.2
No. 10	97.2
No. 20	93.8
No. 40	85.6
No. 60	74.5
No. 100	57.9
No. 200	33.2

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



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EBA Engineering Consultants Ltd.

PARTICLE - SIZE ANALYSIS OF SOILS

Project: km 1647 Granular Source Evaluation
North Alaska Highway, Yukon

Project Number: 0201-10923

Date Tested: 92-04-23

Borehole Number: 92-008E

Depth: 1.0 m

Soil Description: WELL GRADED GRAVEL WITH SAND (GW)

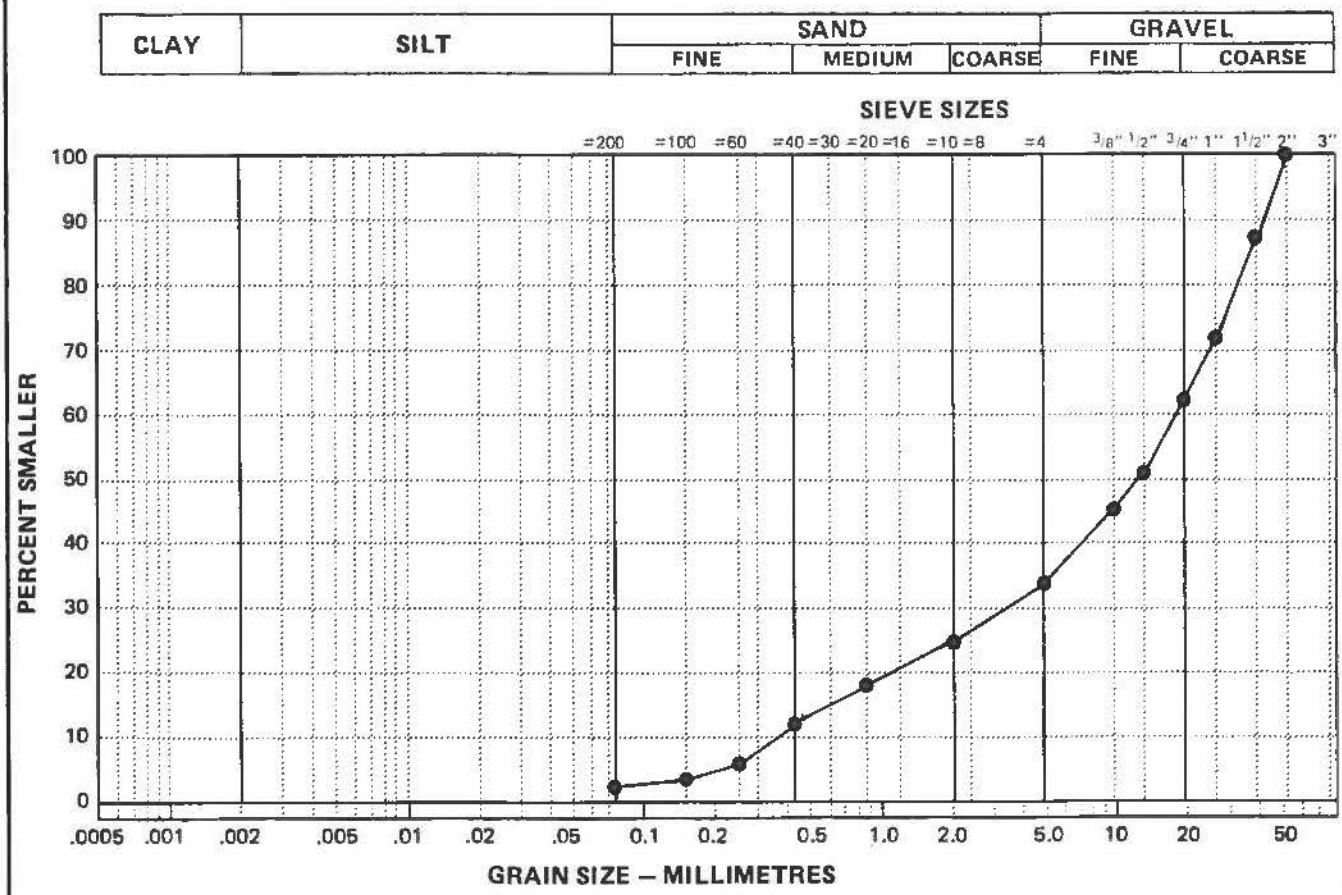
Cu: 5.1

Cc: 1.4

Natural Moisture Content: _____ %

Remarks: Gravel 66.9
Sand 31.9
Silt 1.2
1/2" sieve - 51.2% passing

SIEVE	PERCENTAGE PASSING
3"	
2"	100.0
1 1/2"	87.4
1"	71.1
3/4"	61.1
3/8"	45.5
No. 4	33.1
No. 10	24.9
No. 20	18.4
No. 40	11.3
No. 60	5.4
No. 100	2.4
No. 200	1.2



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EBA Engineering Consultants Ltd.

PARTICLE - SIZE ANALYSIS OF SOILS

Project: km 1647 Granular Source Evaluation
North Alaska Highway, Yukon

Project Number: 0201-10923

Date Tested: 92-04-23

Borehole Number: 92-008E

Depth: 2.0 m

Soil Description: POORLY GRADED GRAVEL WITH SAND (GP)

Cu: 28.1

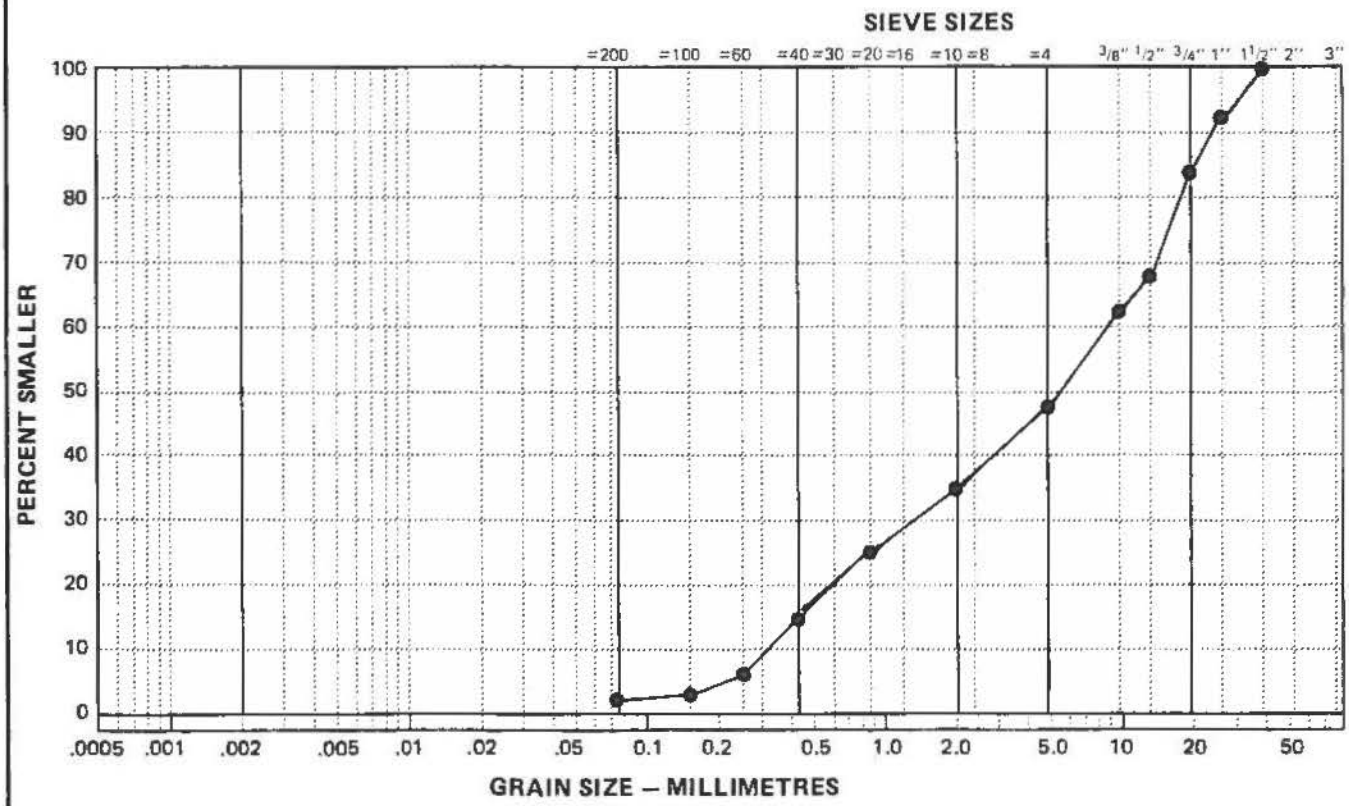
Cc: 0.7

Natural Moisture Content: _____ %

Remarks: Gravel 52.2%
Sand 46.4%
Silt 1.4%
1/2" sieve - 68.9% passing

SIEVE	PERCENTAGE PASSING
3"	
2"	
1 1/2"	100.0
1"	91.8
3/4"	82.9
3/8"	61.2
No. 4	47.8
No. 10	35.5
No. 20	25.5
No. 40	15.4
No. 60	6.8
No. 100	2.4
No. 200	1.4

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



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EBA Engineering Consultants Ltd.

PARTICLE - SIZE ANALYSIS OF SOILS

Project: km 1647 Granular Source Evaluation
North Alaska Highway, Yukon

Project Number: 0201-10923

Date Tested: 92-04-23

Borehole Number: 92-008E

Depth: 3.0 m

Soil Description: WELL GRADED GRAVEL WITH SAND (GW)

Cu: 15.2

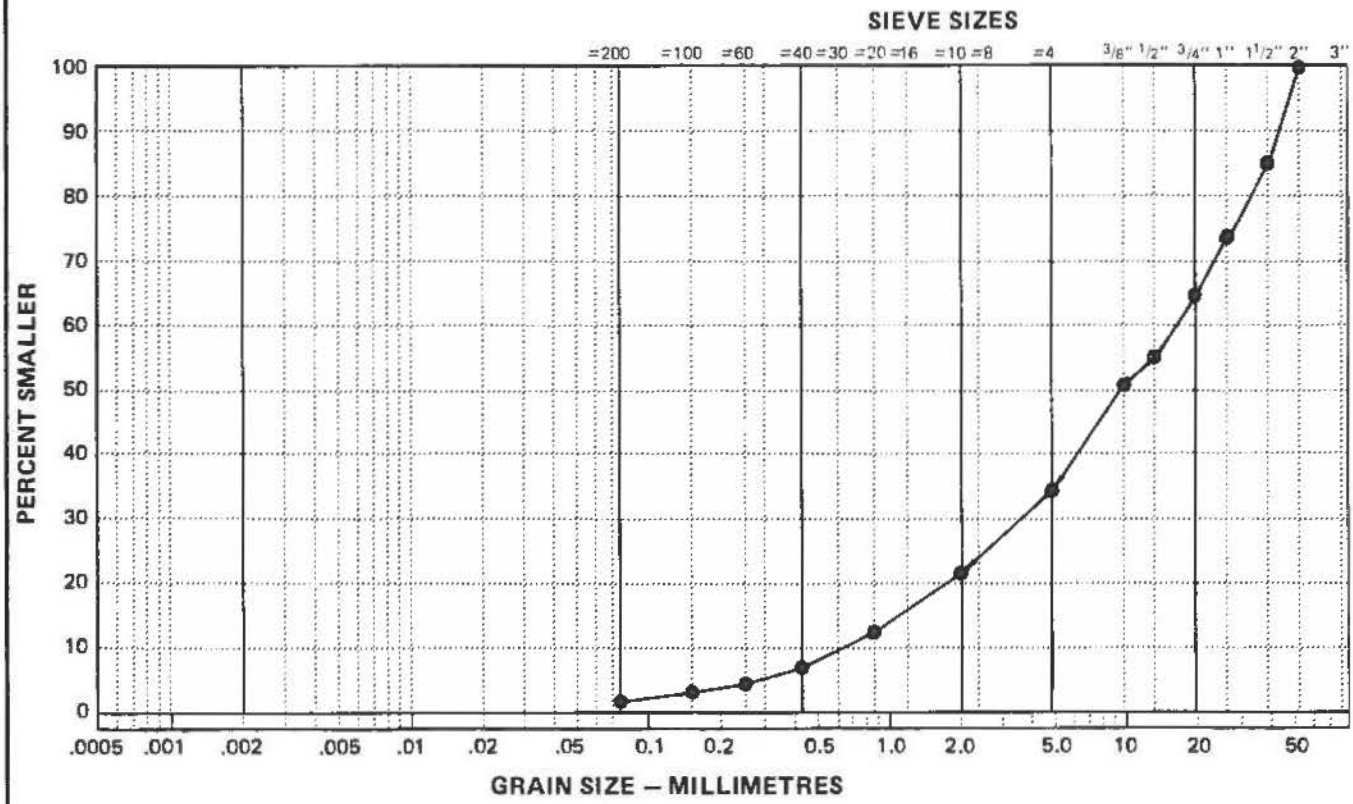
Cc: 1.5

Natural Moisture Content: _____ %

Remarks: Gravel 65.5%
Sand 33.3%
Silt 1.2%
1/2" sieve - 55.8% passing

SIEVE	PERCENTAGE PASSING
3"	
2"	100.0
1 1/2"	84.2
1"	73.3
3/4"	64.3
3/8"	50.5
No. 4	34.5
No. 10	21.0
No. 20	12.5
No. 40	7.2
No. 60	3.6
No. 100	2.0
No. 200	1.2

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



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EBA Engineering Consultants Ltd.

PARTICLE - SIZE ANALYSIS OF SOILS

Project: km 1647 Granular Source Evaluation
North Alaska Highway, Yukon

Project Number: 0201-10923

Date Tested: 92-04-23

Borehole Number: 92-008E

Depth: 4.0 m

Soil Description: POORLY GRADED GRAVEL WITH SAND (GP)

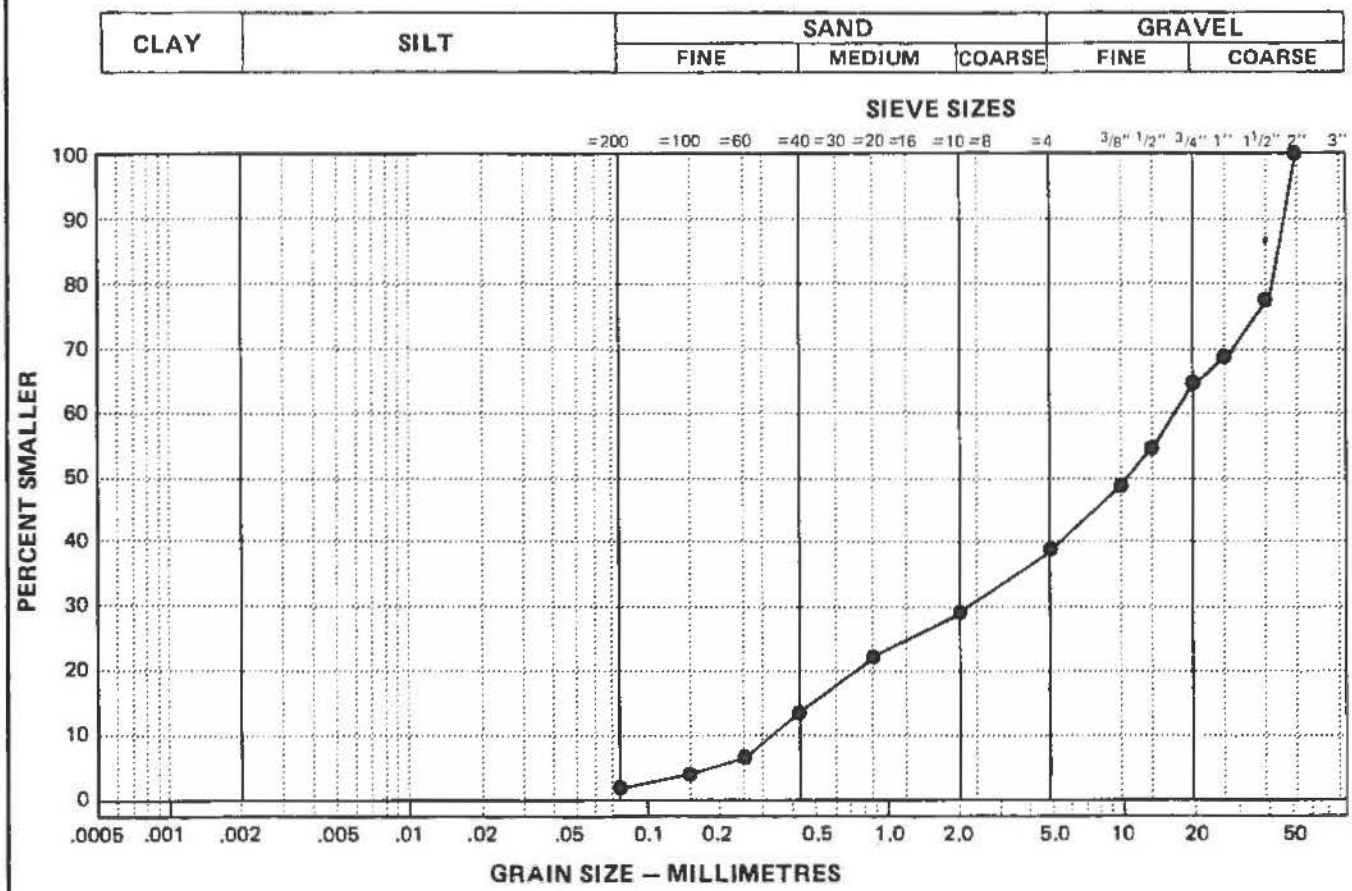
Cu: 56.3

Cc: 0.8

Natural Moisture Content: ____ %

Remarks: Gravel 60.9%
Sand 37.7%
Silt 1.4%
1/2" sieve - 54.5% passing

SIEVE	PERCENTAGE PASSING
3"	
2"	100.0
1 1/2"	77.4
1"	69.7
3/4"	65.8
3/8"	49.6
No. 4	39.1
No. 10	29.7
No. 20	21.8
No. 40	13.4
No. 60	6.8
No. 100	3.1
No. 200	1.4



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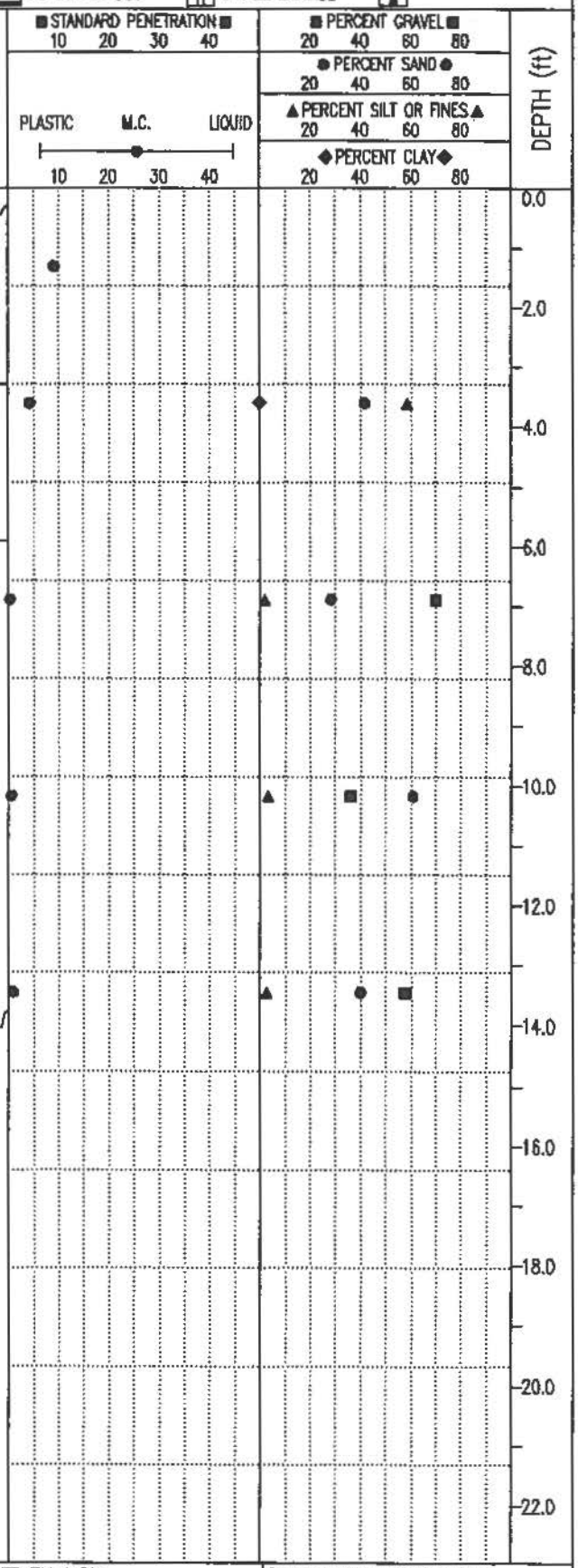
GRANULAR SOURCE EVALUATION km 1647	CLIENT: YTG – TRANSPORTATION ENG.	BOREHOLE No: 92–009E
McINTOSH LODGE PIT	HOE: CAT 225 TRACKED BACKHOE	Project No: 0201–10923
NORTH ALASKA HIGHWAY	UTM ZONE: 8 N6743582.00 E354006.00	ELEVATION: 0.00 (m)

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

DEPTH (m)	SAMPLE TYPE	SAMPLE NO	SPT(N)	USC	SOIL SYMBOL	SOIL DESCRIPTION
0.0						ORGANIC ROOT MAT–seasonally frozen, black
						SILT WITH SAND–rootlets and fibrous organics to 0.3 m, seasonally frozen to 1.0 m, brown to olive brown
		1				
1.0		2		ML		SANDY SILT–fine grained, uniform, damp, olive brown
						WELL GRADED GRAVEL WITH SAND–trace of silt, gravel is uniform in size, gap graded, up to 75 mm, damp, dark grey
2.0		3		GW		
3.0		4		SW		WELL GRADED SAND WITH GRAVEL LENS at 3.0 m
4.0		5		GP		POORLY GRADED GRAVEL WITH SAND LENS at 4.0 m
						END OF TESTPIT 4.2 m
						NOTE: Very little slouging in testpit
5.0						
6.0						
7.0						



EBA Engineering Consultants Ltd. Whitehorse, Yukon	LOGGED BY: MCP	COMPLETION DEPTH: 4.2 m
	REVIEWED BY:	COMPLETE: 92/04/16
	Fig. No:	Page 1 of 1

EBA Engineering Consultants Ltd.

PARTICLE - SIZE ANALYSIS OF SOILS

Project: km 1647 Granular Source Evaluation
North Alaska Highway, Yukon

Project Number: 0201-10923

Date Tested: 92-04-23

Borehole Number: 92-009E

Depth: 1.0 m

Soil Description: SANDY SILT (ML)

Cu:

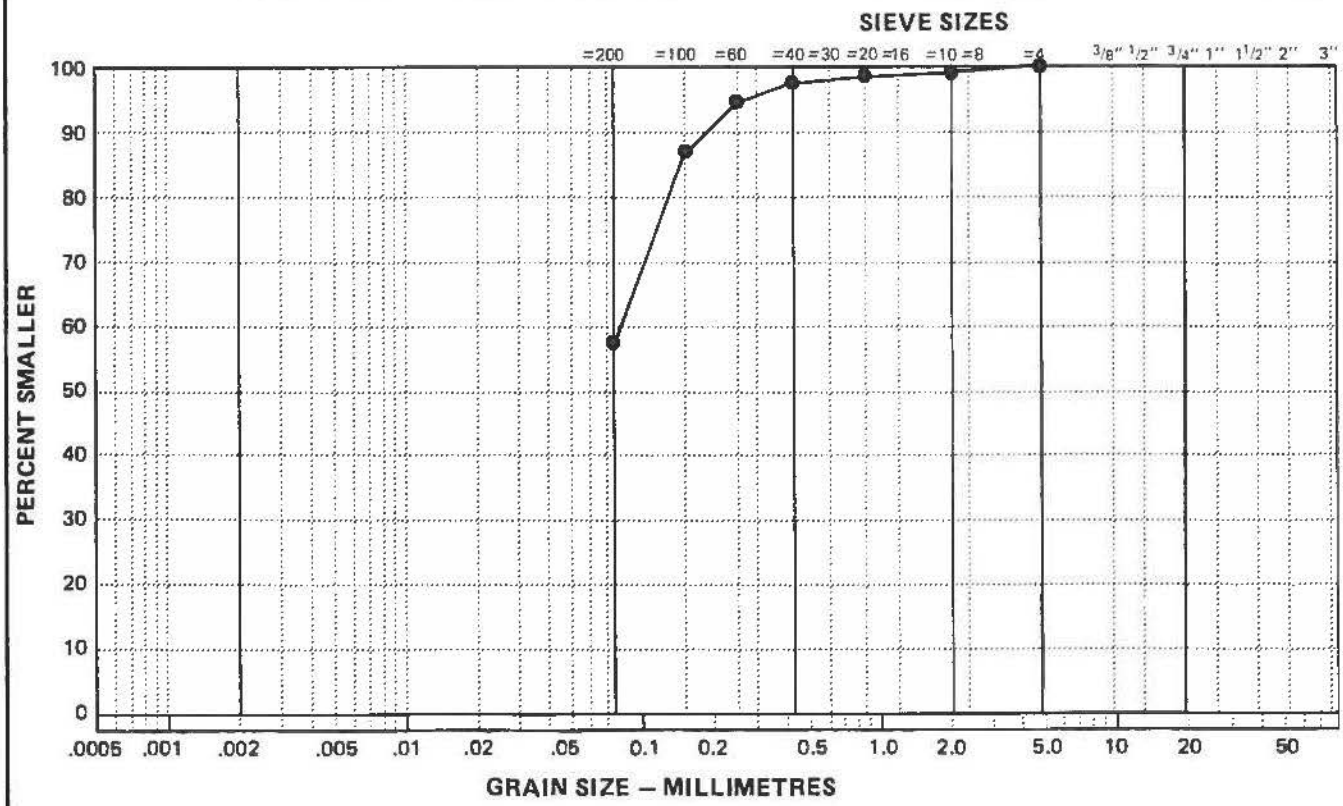
Cc:

Natural Moisture Content: %

Remarks: Gravel 0.0%
Sand 41.5%
Silt 58.5%

SIEVE	PERCENTAGE PASSING
3"	
2"	
1 1/2"	
1"	
3/4"	
3/8"	
No. 4	100.0
No. 10	99.8
No. 20	99.4
No. 40	98.4
No. 60	95.3
No. 100	87.0
No. 200	58.5

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



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EBA Engineering Consultants Ltd.

PARTICLE - SIZE ANALYSIS OF SOILS

Project: km 1647 Granular Source Evaluation
North Alaska Highway, Yukon

Project Number: 0201-10923

Date Tested: 92-04-23

Borehole Number: 92-009E

Depth: 2.0 m

Soil Description: WELL GRADED GRAVEL WITH SAND (GW)

Cu: 24.0

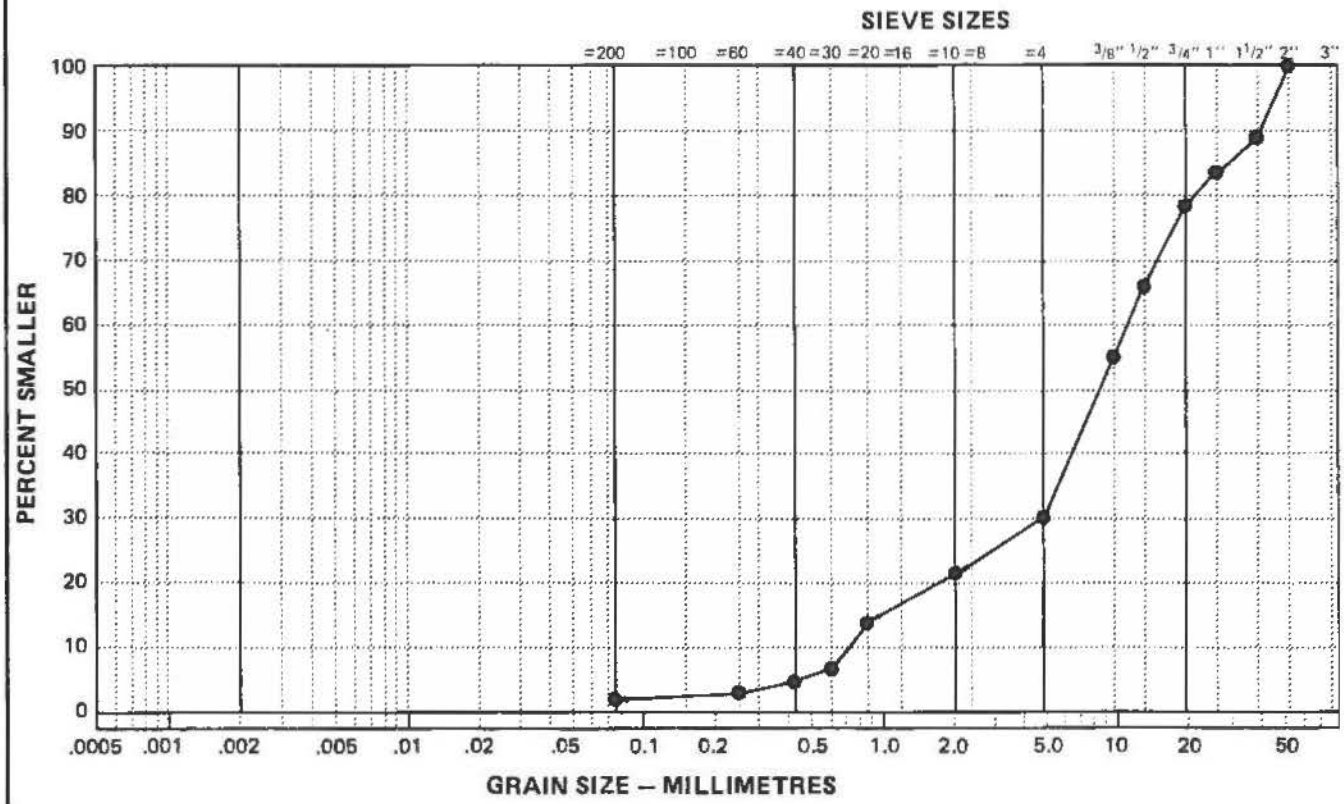
Cc: 2.7

Natural Moisture Content: _____ %

Remarks: Gravel 70.0%
Sand 28.1%
Silt 1.9%
1/2" sieve - 66.6% passing

SIEVE	PERCENTAGE PASSING
3"	
2"	100.0
1 1/2"	89.1
1"	83.9
3/4"	78.9
3/8"	55.1
No. 4	30.0
No. 10	21.0
No. 20	14.2
No. 40	6.8
No. 60	3.6
No. 100	2.3
No. 200	1.9

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



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EBA Engineering Consultants Ltd.

PARTICLE - SIZE ANALYSIS OF SOILS

Project: km 1647 Granular Source Evaluation
North Alaska Highway, Yukon

Project Number: 0201-10923

Date Tested: 92-04-23

Borehole Number: 92-009E

Depth: 3.0 m

Soil Description: WELL GRADED SAND WITH GRAVEL (SW)

Cu: 6.5

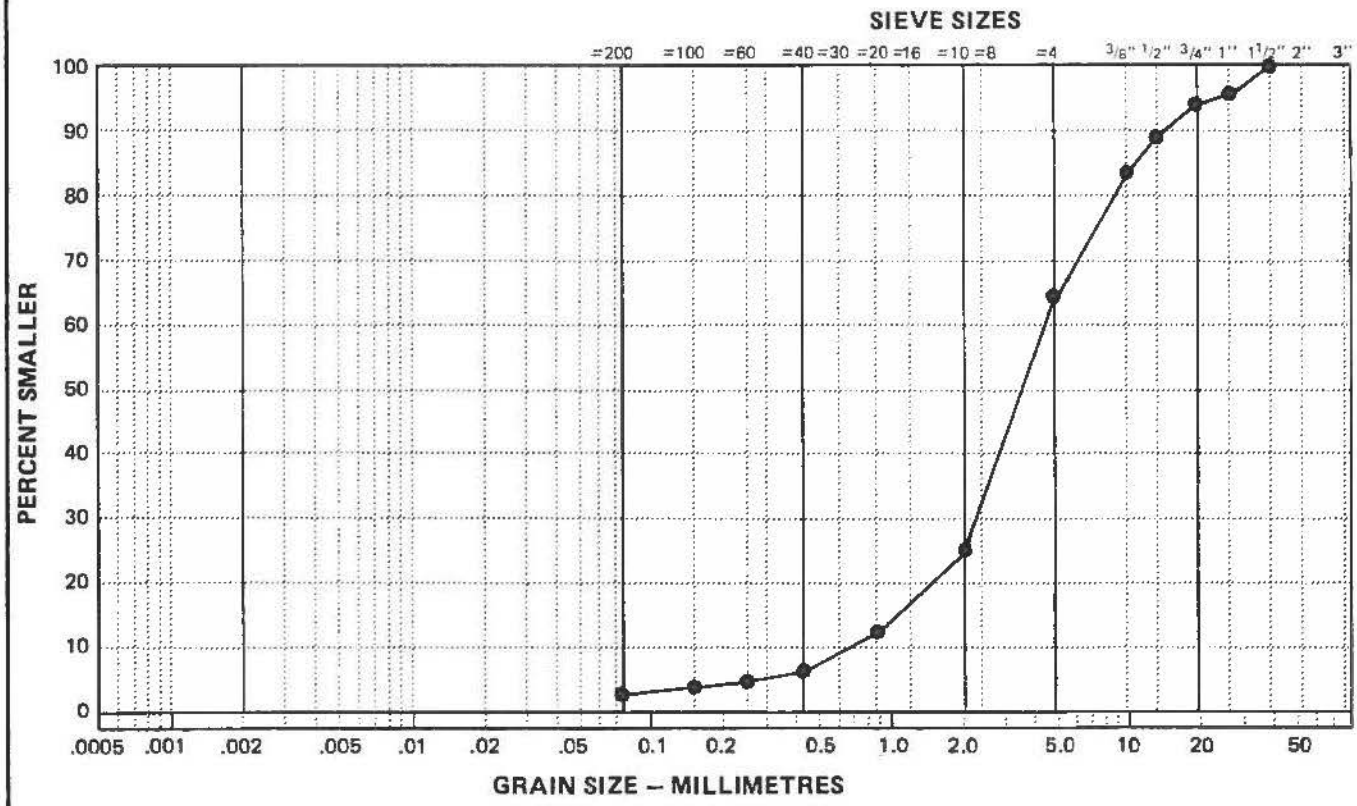
Cc: 1.8

Natural Moisture Content: _____ %

Remarks: Gravel 36.1%
Sand 60.6%
Silt 3.3%
1/2" sieve - 89.6% passing

SIEVE	PERCENTAGE PASSING
3"	
2"	
1 1/2"	100.0
1"	96.7
3/4"	94.7
3/8"	82.9
No. 4	63.9
No. 10	25.3
No. 20	11.5
No. 40	5.9
No. 60	4.3
No. 100	3.7
No. 200	3.3

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



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PARTICLE - SIZE ANALYSIS OF SOILS

Project: km 1647 Granular Source Evaluation
North Alaska Highway, Yukon

Project Number: 0201-10923

Date Tested: 92-04-23

Borehole Number: 92-009E

Depth: 4.0 m

Soil Description: POORLY GRADED GRAVEL WITH SAND (GP)

Cu: 4.41

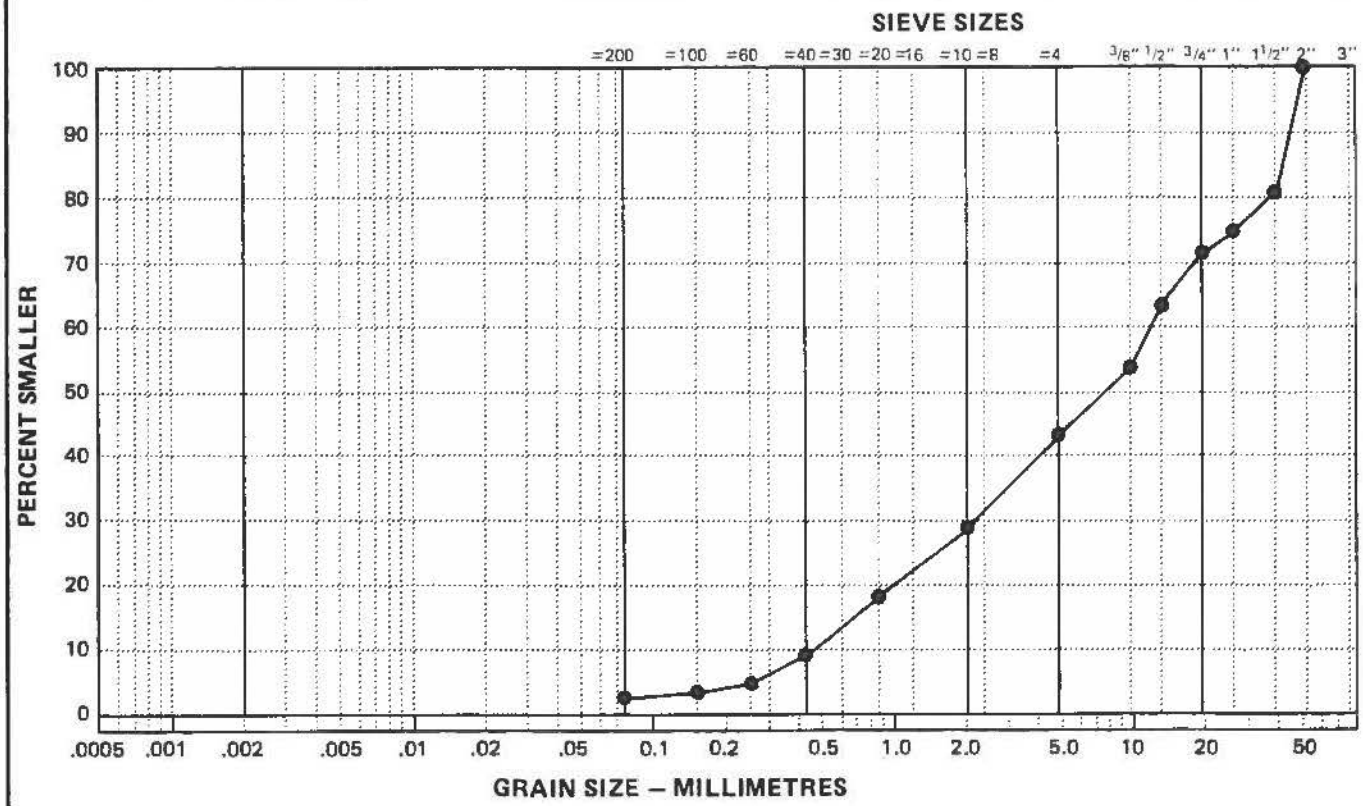
Cc: 0.8

Natural Moisture Content: _____ %

Remarks: Gravel 57.7%
Sand 39.8%
Silt 2.5%
1/2" sieve - 62.4% passing

SIEVE	PERCENTAGE PASSING
3"	
2"	100.0
1 1/2"	80.5
1"	75.4
3/4"	71.2
3/8"	53.9
No. 4	42.3
No. 10	29.3
No. 20	18.6
No. 40	9.4
No. 60	4.9
No. 100	3.4
No. 200	2.5

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



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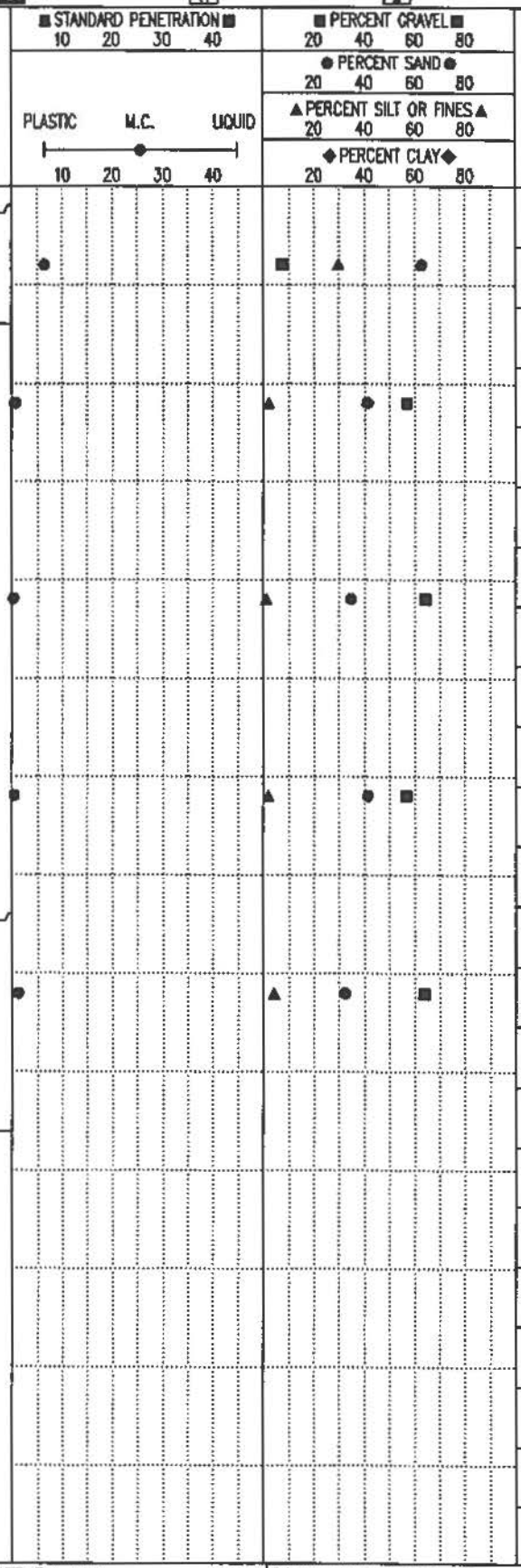
GRANULAR SOURCE EVALUATION km 1647	CLIENT: YTG – TRANSPORTATION ENG.	BOREHOLE No: 92–010E
McINTOSH LODGE PIT	HOE: CAT 225 TRACKED BACKHOE	Project No: 0201–10923
NORTH ALASKA HIGHWAY	UTM ZONE: 8 N6743505.00 E353927.00	ELEVATION: 0.00 (m)

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

DEPTH (m)	SAMPLE TYPE	SAMPLE NO	SPT(N)	USC	SOIL SYMBOL	SOIL DESCRIPTION
0.0						ORGANIC ROOT MAT–seasonally frozen, black
	GRAB	1				SILTY SAND–rootlets and fibrous organics to 0.4 m, seasonally frozen, brown to olive brown by 0.3 m
1.0	GRAB	2		GW		WELL GRADED GRAVEL WITH SAND–trace of silt, fibrous organics to 1.0 m, gravel is subangular, up to 150 mm maximum size, less than 10% over 100 mm, seasonally frozen to 1.5 m, damp when thawed, dark grey
2.0	GRAB	3		GW		–occasional lens of siltier gravel throughout testpit depth
3.0	GRAB	4		GW		–cobbles to 200 mm from 3.2 to 3.6 m –50 mm thick wet silt lens at 3.6 m
4.0	GRAB	5		GP		POORLY GRADED GRAVEL WITH SAND–slightly siltier than overlying gravel, damp, dark grey
5.0						END OF TESTPIT 4.8 m NOTE: Very little sloughing in testpit
7.0						



EBA Engineering Consultants Ltd. Whitehorse, Yukon	LOGGED BY: MCP	COMPLETION DEPTH: 4.8 m
	REVIEWED BY:	COMPLETE: 92/04/16
	Fig. No:	Page 1 of 1

EBA Engineering Consultants Ltd.

PARTICLE - SIZE ANALYSIS OF SOILS

Project: km 1647 Granular Source EValuation
North Alaska Highway, Yukon

Project Number: 0201-10923

Date Tested: 92-04-23

Borehole Number: 92-010E

Depth: 0.5 m

Soil Description: SILTY SAND (SM)

Cu:

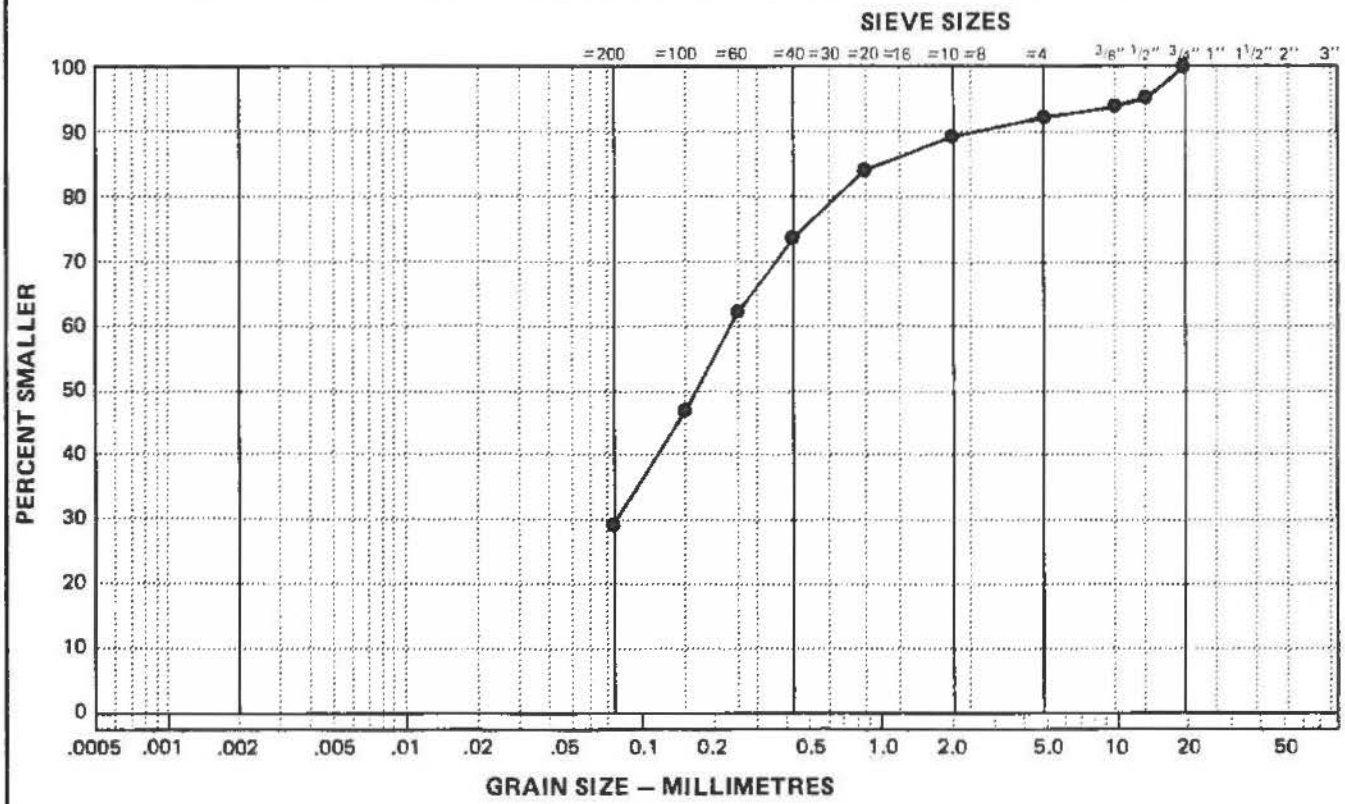
Cc:

Natural Moisture Content: %

Remarks: Gravel 7.6%
Sand 62.8%
Silt 29.6%

SIEVE	PERCENTAGE PASSING
3"	
2"	
1 1/2"	
1"	
3/4"	100.0
3/8"	94.4
No. 4	92.4
No. 10	89.3
No. 20	84.4
No. 40	73.1
No. 60	61.8
No. 100	47.5
No. 200	29.6

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



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EBA Engineering Consultants Ltd.

PARTICLE - SIZE ANALYSIS OF SOILS

Project: km 1647 Granular Source Evaluation
North Alaska Highway, Yukon

Project Number: 0201-10923

Date Tested: 92-04-23

Borehole Number: 92-010E

Depth: 1.0 m

Soil Description: WELL GRADED GRAVEL WITH SAND (GW)

Cu: 28.2

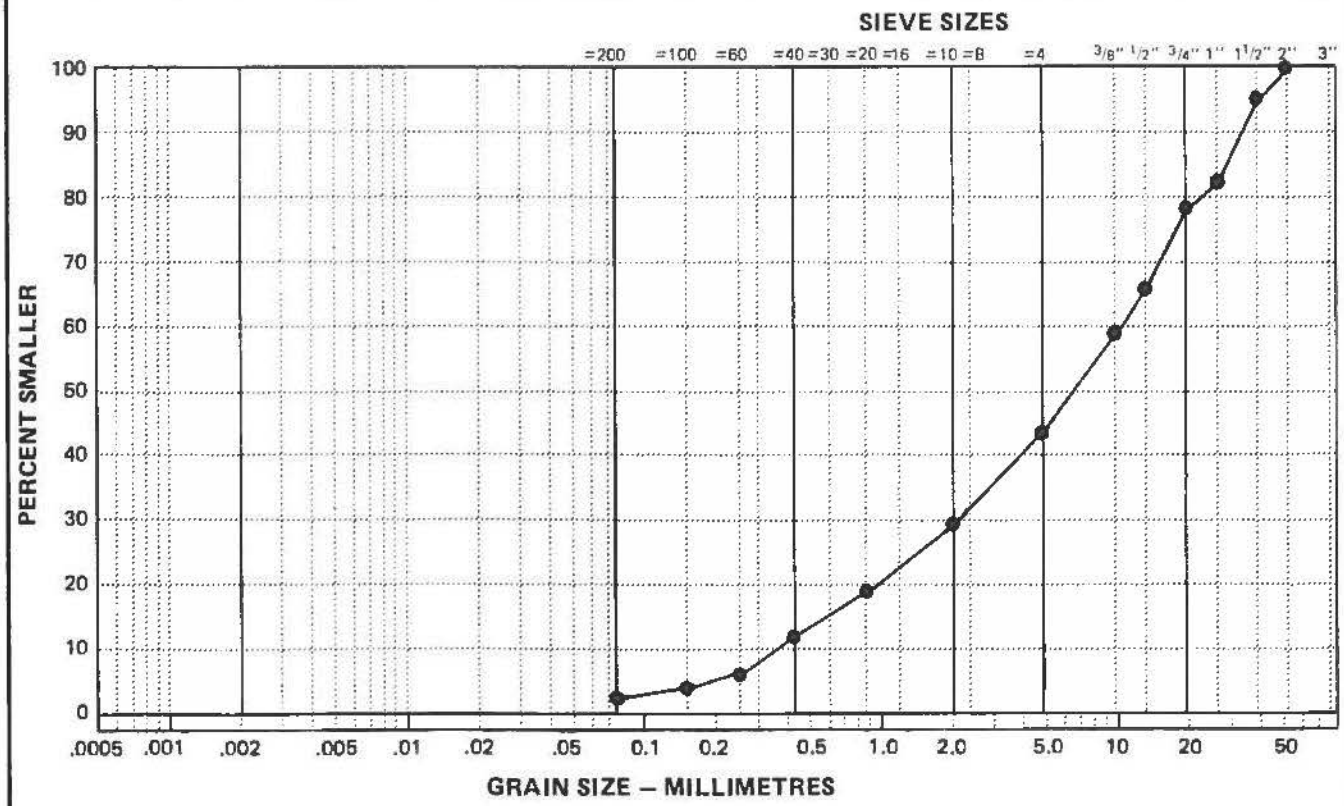
Cc: 1.0

Natural Moisture Content: _____ %

Remarks: Gravel 56.9%
Sand 41.1%
Silt 2.0%
1/2" sieve - 66.3% passing

SIEVE	PERCENTAGE PASSING
3"	
2"	100.0
1 1/2"	96.1
1"	81.6
3/4"	78.9
3/8"	59.4
No. 4	43.1
No. 10	29.1
No. 20	19.0
No. 40	11.3
No. 60	6.2
No. 100	3.4
No. 200	2.0

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



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PARTICLE - SIZE ANALYSIS OF SOILS

Project: km 1647 Granular Source Evaluation
North Alaska Highway, Yukon

Project Number: 0201-10923

Date Tested: 92-04-23

Borehole Number: 92-010E

Depth: 2.0 m

Soil Description: WELL GRADED GRAVEL WITH SAND (GW)

Cu: 42.5

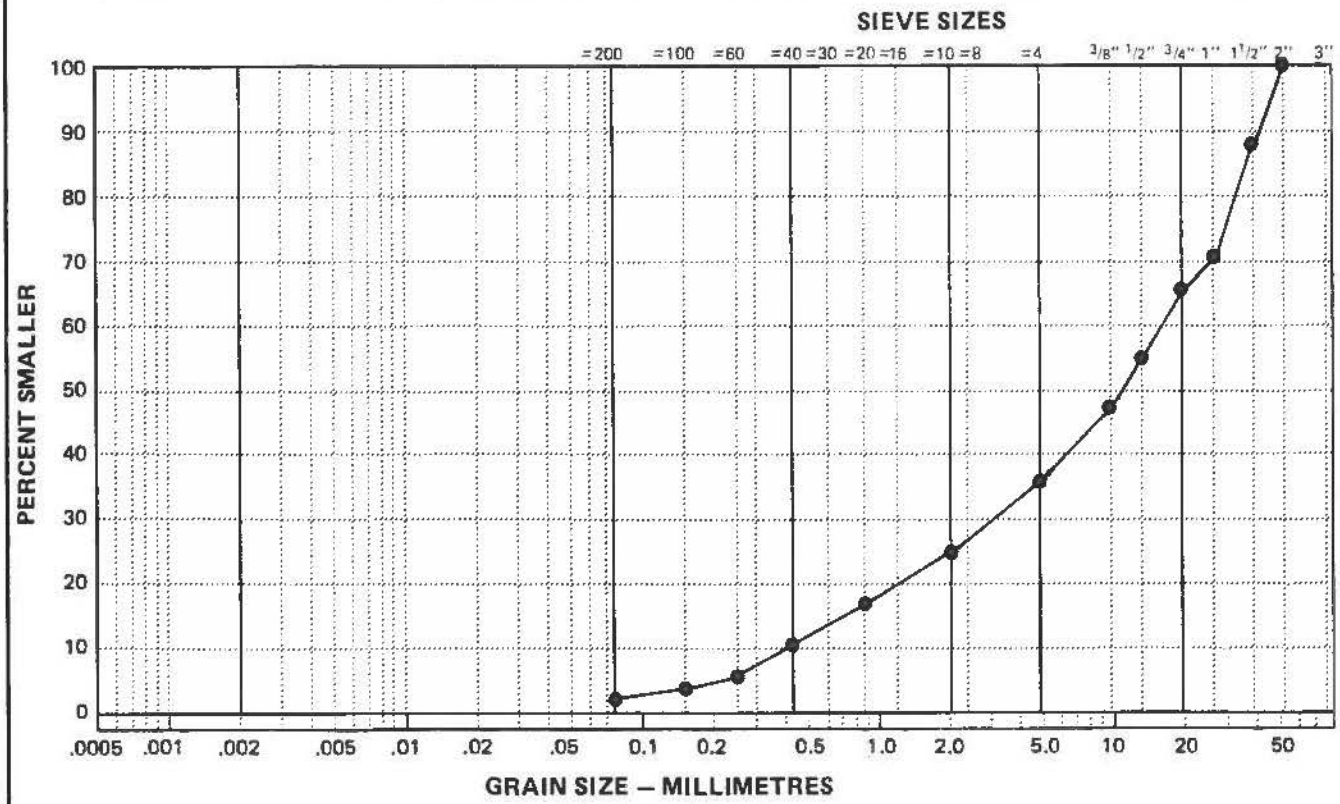
Cc: 1.4

Natural Moisture Content: _____ %

Remarks: Gravel 64.3%
Sand 34.5%
Silt 1.2%
1/2" sieve - 56.9% passing

SIEVE	PERCENTAGE PASSING
3"	
2"	100.0
1 1/2"	88.1
1"	70.6
3/4"	66.5
3/8"	48.8
No. 4	35.7
No. 10	25.4
No. 20	17.6
No. 40	10.4
No. 60	5.6
No. 100	3.4
No. 200	1.2

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



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EBA Engineering Consultants Ltd.

PARTICLE - SIZE ANALYSIS OF SOILS

Project: km 1647 Granular Source Evaluation
North Alaska Highway, Yukon

Project Number: 0201-10923

Date Tested: 92-04-23

Borehole Number: 92-010E

Depth: 3.0 m

Soil Description: WELL GRADED GRAVEL WITH SAND (GW)

Cu: 28.1

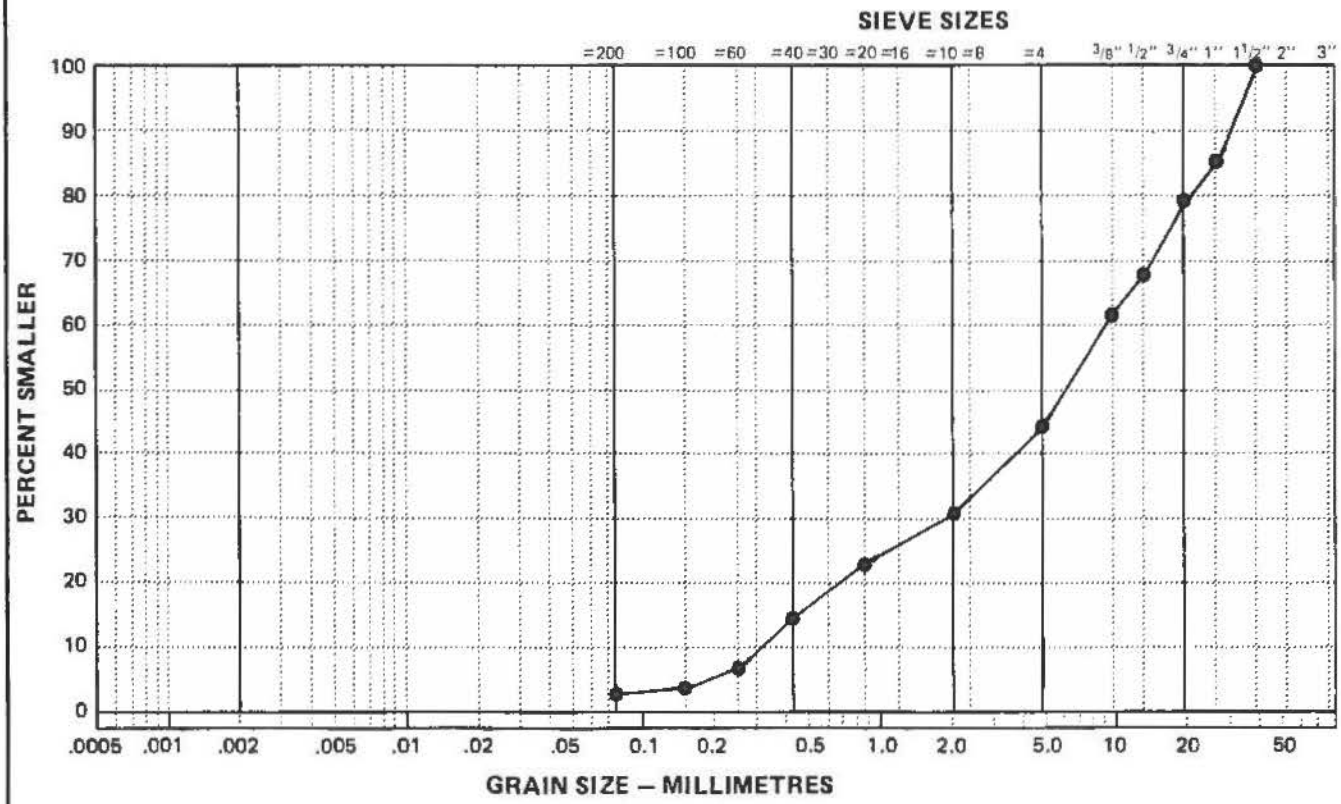
Cc: 1.4

Natural Moisture Content: %

Remarks: Gravel 56.8%
Sand 41.3%
Silt 1.9%
1/2" sieve - 68.2%

SIEVE	PERCENTAGE PASSING
3"	
2"	
1 1/2"	100.0
1"	85.8
3/4"	79.1
3/8"	61.0
No. 4	43.2
No. 10	30.8
No. 20	22.2
No. 40	13.2
No. 60	7.0
No. 100	3.5
No. 200	1.9

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



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EBA Engineering Consultants Ltd.

PARTICLE - SIZE ANALYSIS OF SOILS

Project: km 1647 Granular Source Evaluation
North Alaska Highway, Yukon

Project Number: 0201-10923

Date Tested: 92-04-23

Borehole Number: 92-010E

Depth: 4.0 m

Soil Description: POORLY GRADED GRAVEL WITH SAND (GP)

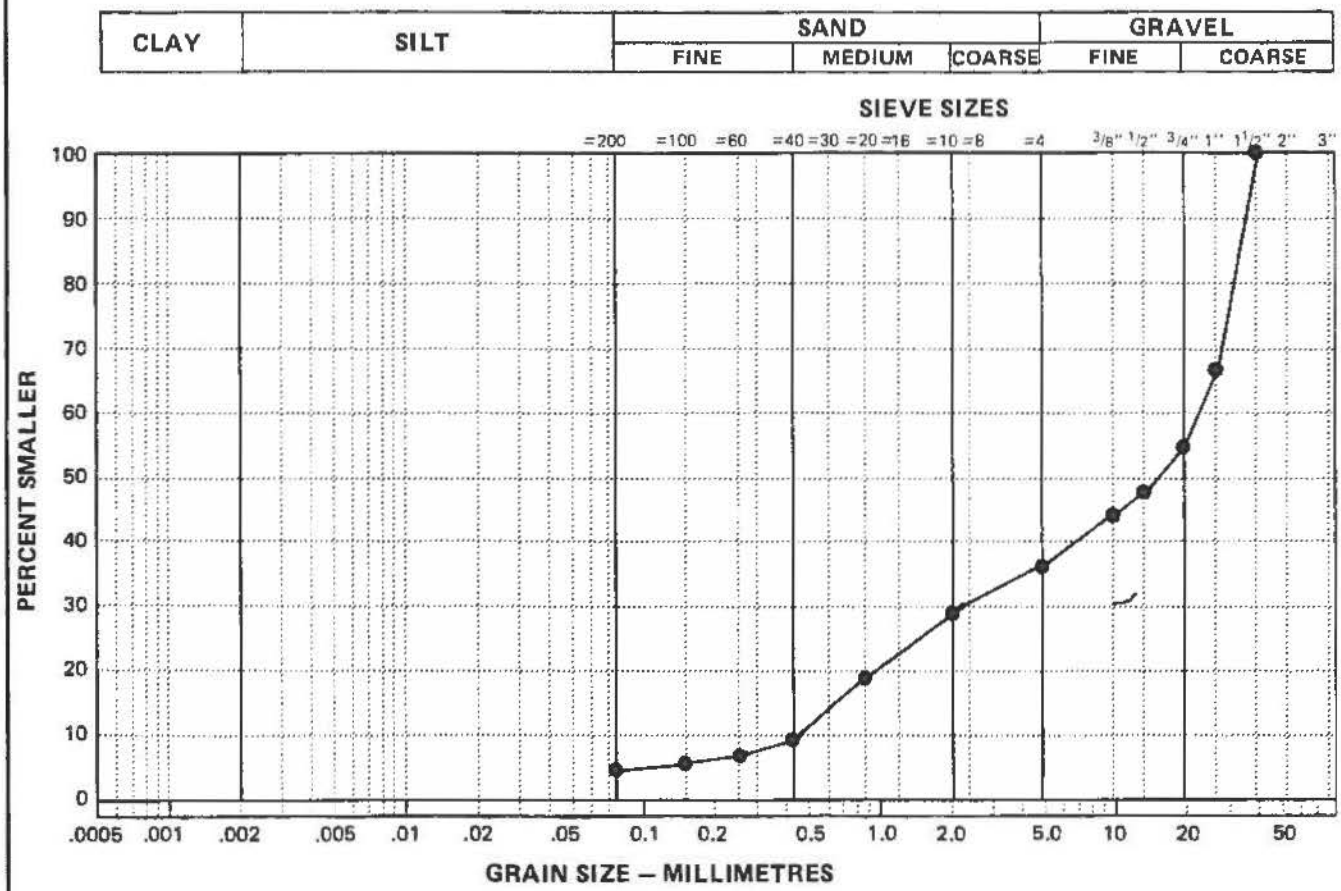
Cu: 50

Cc: 0.4

Natural Moisture Content: %

Remarks: Gravel 63.7%
Sand 32.1%
Silt 4.2%
1/2" sieve - 48.1% passing

SIEVE	PERCENTAGE PASSING
3"	
2"	
1 1/2"	100.0
1"	67.4
3/4"	53.6
3/8"	43.8
No. 4	36.3
No. 10	29.3
No. 20	19.9
No. 40	9.9
No. 60	6.5
No. 100	5.3
No. 200	4.2



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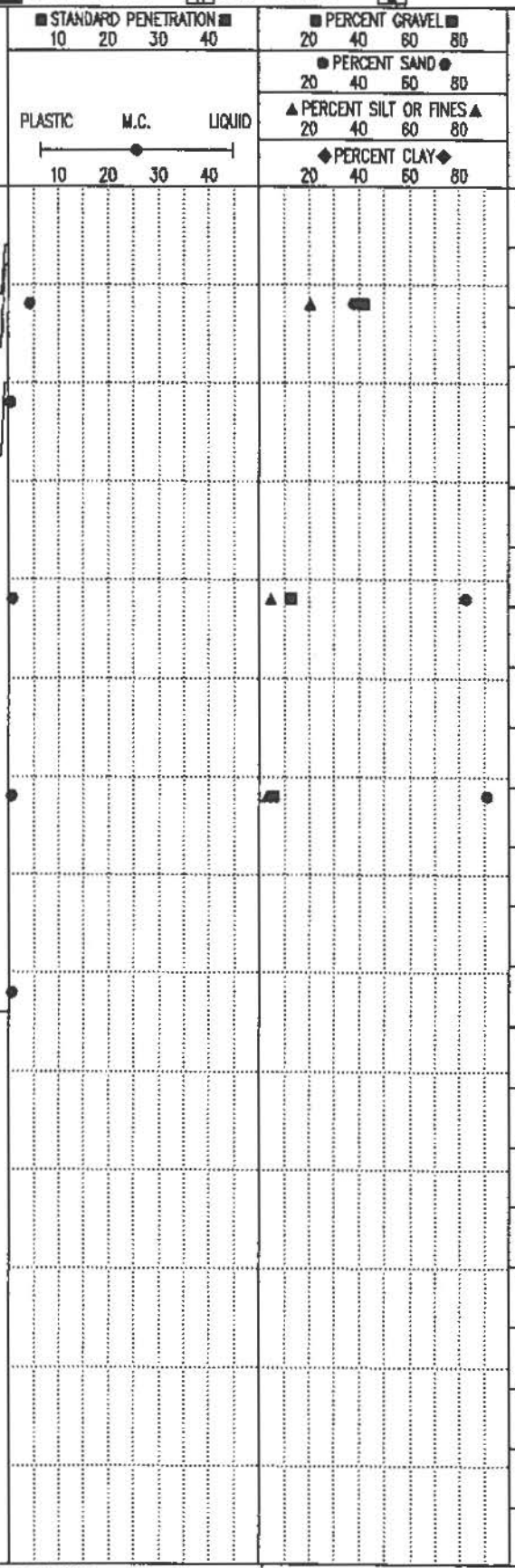
GRANULAR SOURCE EVALUATION km 1647	CLIENT: YTG – TRANSPORTATION ENG.	BOREHOLE No: 92–011E
McINTOSH LODGE PIT	HOE: CAT 225 TRACKED BACKHOE	Project No: 0201–10923
NORTH ALASKA HIGHWAY	UTM ZONE: 8 N6743322.00 E354069.00	ELEVATION: 0.00 (m)

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

DEPTH (m)	SAMPLE TYPE	SAMPLE NO	SPT(N)	USC	SOIL SYMBOL	SOIL DESCRIPTION
0.0						EXCAVATED IN PIT FLOOR POORLY GRADED GRAVEL WITH SILT AND SAND–gravel is subangular, up to 75 mm size, seasonally frozen, dark brown
		1		GM		SILTY SAND WITH GRAVEL–seasonally frozen, dark brown
1.0		2				SILTY GRAVEL WITH SAND–gravel is subangular, up to 75 mm maximum size, seasonally frozen, olive grey
						POORLY GRADED SAND–trace of silt, occasional lens of fine gravel below 1.0 m, sand is medium to fine grained, damp, brownish grey
2.0		3		SP		
3.0		4		SP		
4.0		5				
						END OF TESTPIT 4.2 m NOTE: Very little sloughing in testpit
5.0						
6.0						
7.0						



EBA Engineering Consultants Ltd. Whitehorse, Yukon	LOGGED BY: MCP	COMPLETION DEPTH: 4.2 m
	REVIEWED BY:	COMPLETE: 92/04/16
	Fig. No:	Page 1 of 1

EBA Engineering Consultants Ltd.

PARTICLE - SIZE ANALYSIS OF SOILS

Project: km 1647 Granular Source Evaluation
North Alaska Highway, Yukon

Project Number: 0201-10923

Date Tested: 92-04-23

Borehole Number: 92-011E

Depth: 0.5 m

Soil Description: SILTY GRAVEL WITH SAND (GM)

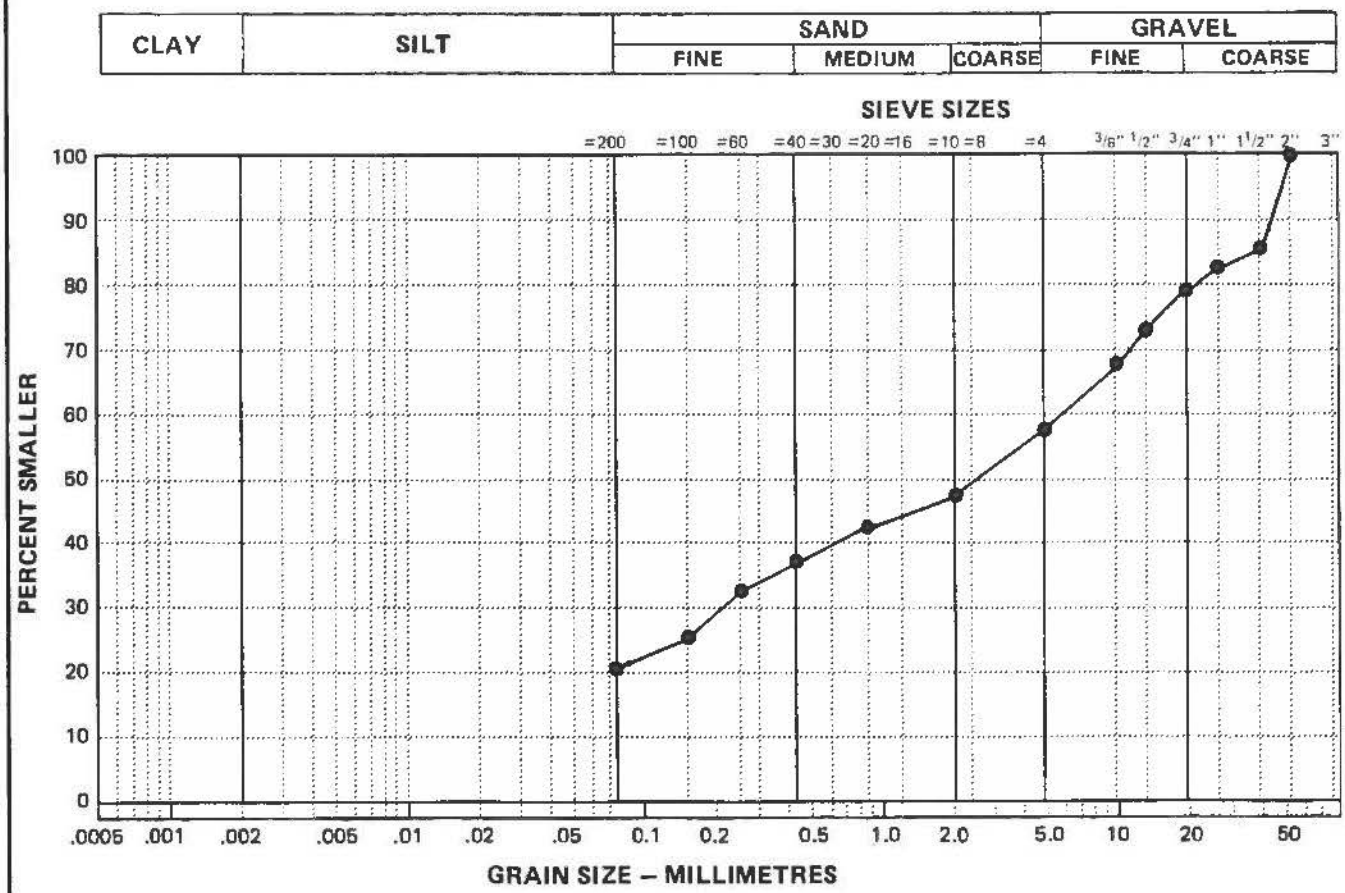
Cu:

Cc:

Natural Moisture Content: %

Remarks: Gravel 41.7%
Sand 37.9%
Silt 20.4%
1/2" sieve - 73.1% passing

SIEVE	PERCENTAGE PASSING
3"	
2"	100.0
1 1/2"	85.6
1"	82.1
3/4"	79.6
3/8"	68.3
No. 4	58.3
No. 10	48.7
No. 20	42.7
No. 40	37.1
No. 60	32.0
No. 100	26.7
No. 200	20.4



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EBA Engineering Consultants Ltd.

PARTICLE - SIZE ANALYSIS OF SOILS

Project: km 1647 Granular Source Evaluation
North Alaska Highway, Yukon

Project Number: 0201-10923

Date Tested: 92-04-23

Borehole Number: 92-011E

Depth: 2.0 m

Soil Description: POORLY GRADED SAND (SP)

Cu: 3.9

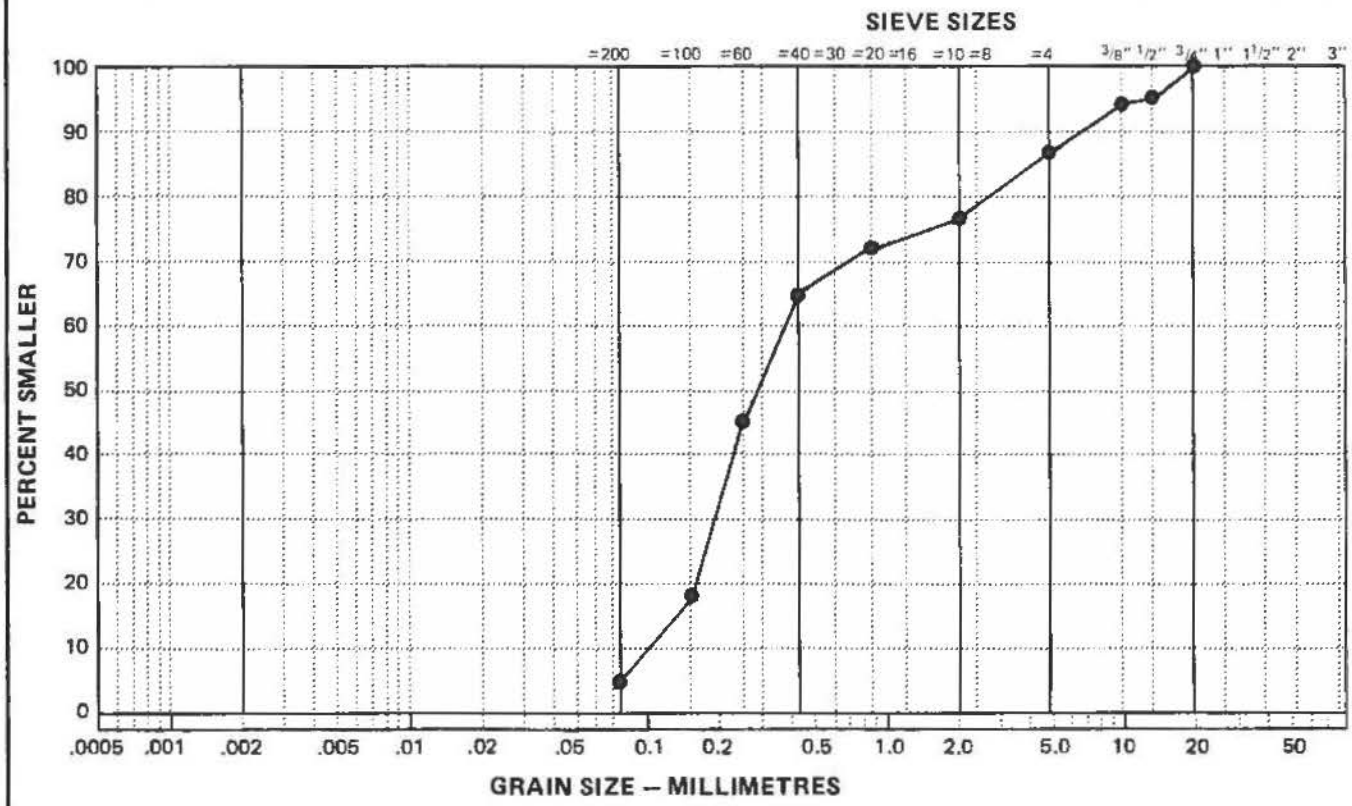
Cc: 1.0

Natural Moisture Content: _____ %

Remarks: Gravel 12.9%
Sand 82.5%
Silt 4.6%
1/2" sieve - 96.3% passing

SIEVE	PERCENTAGE PASSING
3"	
2"	
1 1/2"	
1"	
3/4"	100.0
3/8"	94.7
No. 4	87.1
No. 10	77.0
No. 20	71.6
No. 40	64.4
No. 60	44.8
No. 100	18.4
No. 200	4.6

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



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EBA Engineering Consultants Ltd.

PARTICLE - SIZE ANALYSIS OF SOILS

Project: km 1647 Granular Source Evaluation
North Alaska Highway, Yukon

Project Number: 0201-10923

Date Tested: 92-04-23

Borehole Number: 92-011E

Depth: 3.0 m

Soil Description: POORLY GRADED SAND (SP)

Cu: 4.6

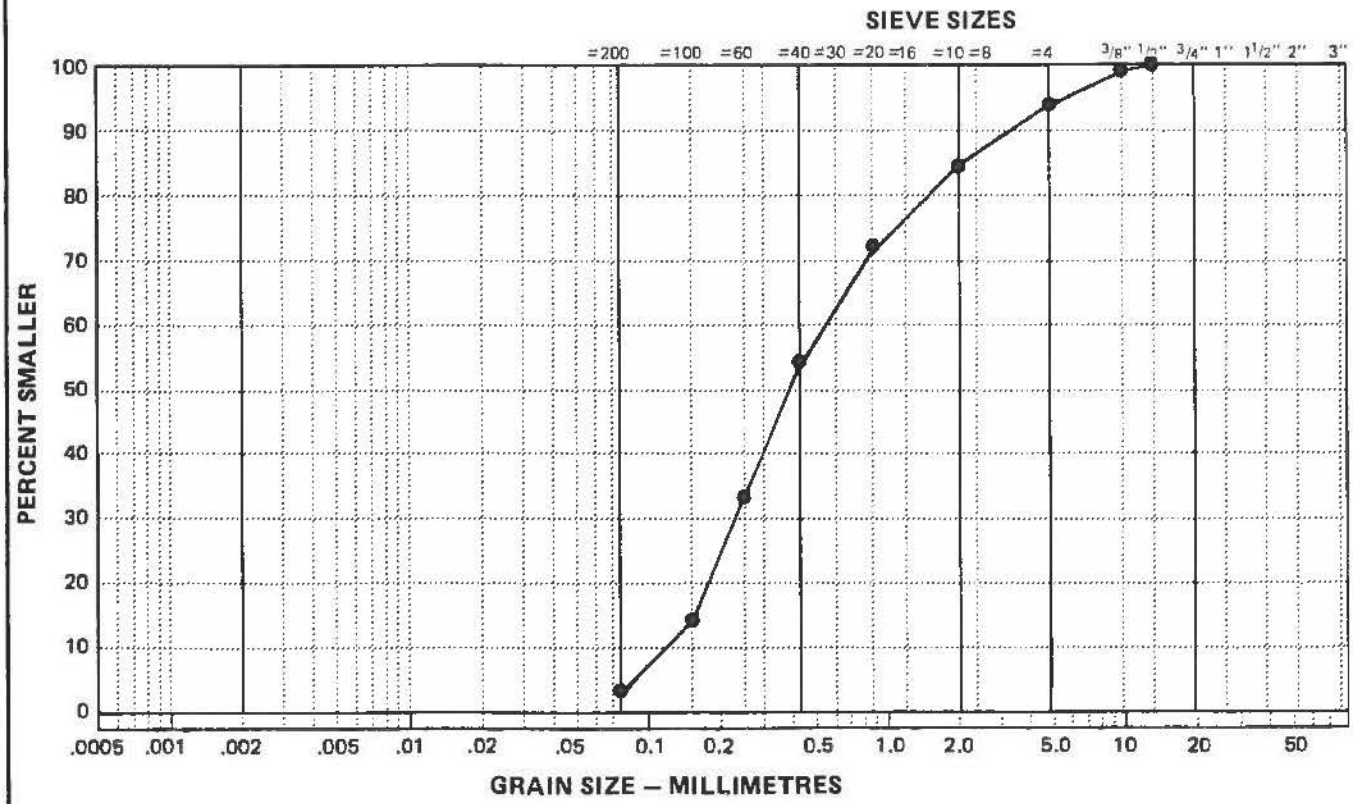
Cc: 0.7

Natural Moisture Content: _____ %

Remarks: Gravel 5.9%
Sand 91.0%
Silt 3.1%
1/2" sieve - 100.0% passing

SIEVE	PERCENTAGE PASSING
3"	
2"	
1 1/2"	
1"	
3/4"	
3/8"	99.1
No. 4	94.1
No. 10	84.6
No. 20	72.1
No. 40	54.1
No. 60	32.2
No. 100	13.3
No. 200	3.1

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



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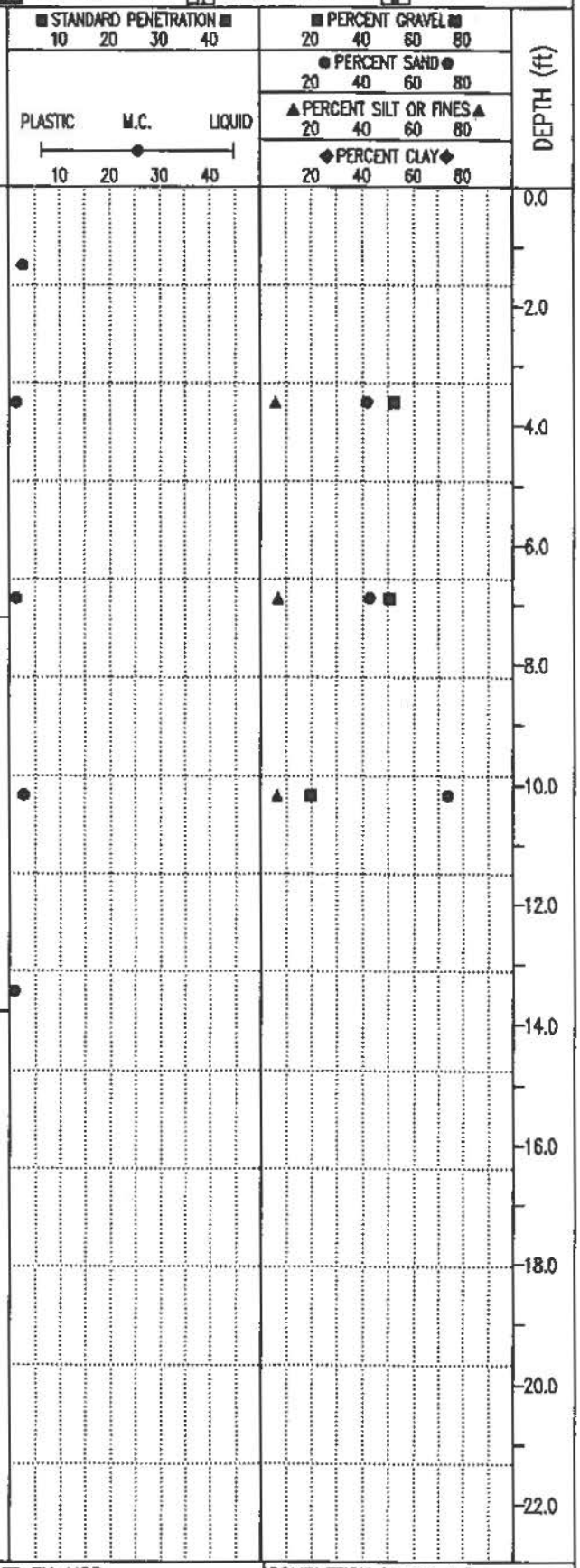
GRANULAR SOURCE EVALUATION km 1647	CLIENT: YTG – TRANSPORTATION ENG.	BOREHOLE No: 92–012E
McINTOSH LODGE PIT	HOE: CAT 225 TRACKED BACKHOE	Project No: 0201–10923
NORTH ALASKA HIGHWAY	UTM ZONE: 8 N6743238.00 E354014.00	ELEVATION: 0.00 (m)

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

DEPTH (m)	SAMPLE TYPE	SAMPLE NO	SPT(N)	USC	SOIL SYMBOL	SOIL DESCRIPTION
0.0						EXCAVATED IN PIT FLOOR WELL GRADED GRAVEL WITH SILT AND SAND–seasonally frozen to 1.8 m, brown
	GRAB	1				
1.0	GRAB	2		GW/GM		
						–300 mm thick lens of SILTY SAND at 1.5 m
2.0	GRAB	3		GP/GM		
						POORLY GRADED SAND WITH SILT–occasional lenses of fine gravel throughout depth of testpit, sand is medium to fine grained, gravel is medium to fine grained, damp, dark grey
3.0	GRAB	4		SP/SM		
4.0	GRAB	5				
						END OF TESTPIT 4.2 m NOTE: Very little sloughing in testpit
7.0						



EBA Engineering Consultants Ltd. Whitehorse, Yukon	LOGGED BY: MCP	COMPLETION DEPTH: 4.2 m
	REVIEWED BY:	COMPLETE: 92/04/16
	Fig. No:	Page 1 of 1

EBA Engineering Consultants Ltd.

PARTICLE - SIZE ANALYSIS OF SOILS

Project: km 1647 Granular Source Evaluation
North Alaska Highway, Yukon

Project Number: 0201-10923

Date Tested: 92-04-23

Borehole Number: 92-012E

Depth: 1.0 m

Soil Description: WELL GRADED GRAVEL WITH SILT AND SAND (GW/GM)

Cu: 44.7

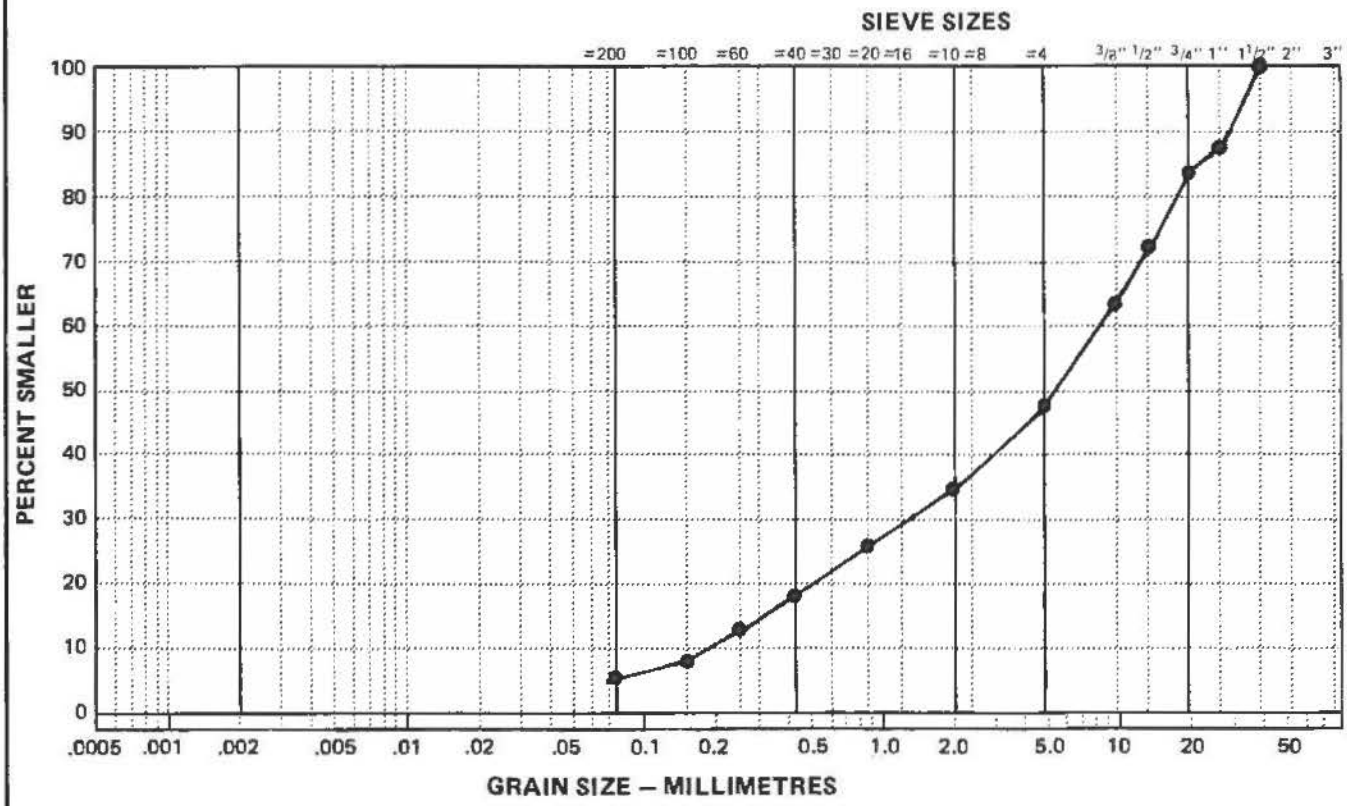
Cc: 1.2

Natural Moisture Content: _____ %

Remarks: Gravel 52.4%
Sand 41.6%
Silt 6.0%
1/2" sieve - 71.5% passing

SIEVE	PERCENTAGE PASSING
3"	
2"	
1 1/2"	100.0
1"	87.7
3/4"	82.8
3/8"	63.0
No. 4	47.6
No. 10	35.3
No. 20	26.2
No. 40	18.3
No. 60	12.5
No. 100	8.8
No. 200	6.0

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



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EBA Engineering Consultants Ltd.

PARTICLE - SIZE ANALYSIS OF SOILS

Project: km 1647 Granular Source Evaluation
North Alaska Highway, Yukon

Project Number: 0201-10923

Date Tested: 92-04-23

Borehole Number: 92-012E

Depth: 2.0 m

Soil Description: POORLY GRADED GRAVEL WITH SILT AND SAND (GP/GM)

Cu: 66.7

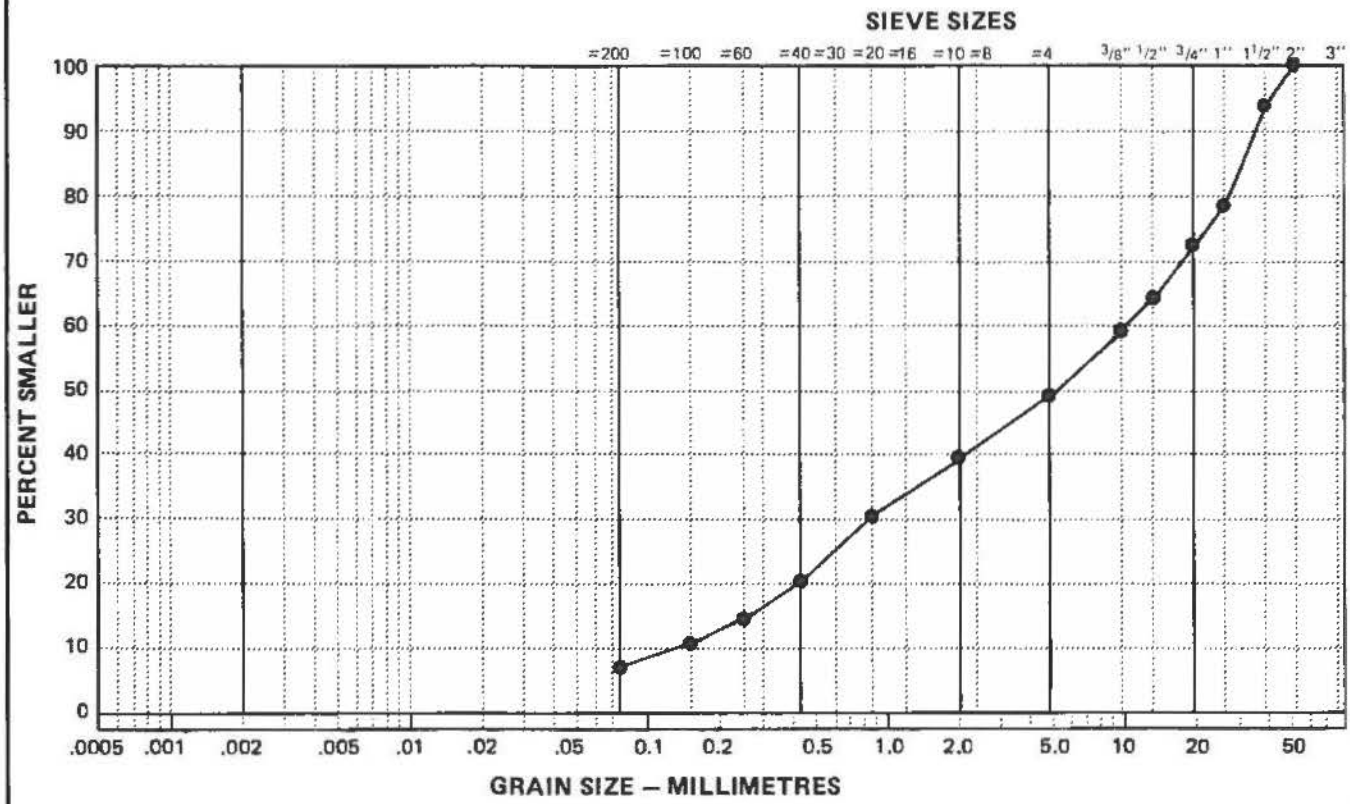
Cc: 0.5

Natural Moisture Content: _____ %

Remarks: Gravel 50.4%
Sand 42.7%
Silt 6.9%
1/2" sieve - 64.4% passing

SIEVE	PERCENTAGE PASSING
3"	
2"	100.0
1 1/2"	93.7
1"	78.9
3/4"	71.8
3/8"	59.8
No. 4	49.6
No. 10	39.1
No. 20	30.1
No. 40	20.5
No. 60	14.7
No. 100	10.7
No. 200	6.9

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



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EBA Engineering Consultants Ltd.

PARTICLE - SIZE ANALYSIS OF SOILS

Project: km 1647 Granular Source Evaluation
North Alaska Highway, Yukon

Project Number: 0201-10923

Date Tested: 92-04-23

Borehole Number: 92-012E

Depth: 3.0 m

Soil Description: POORLY GRADED SAND WITH SILT (SP/SM)

Cu: 11

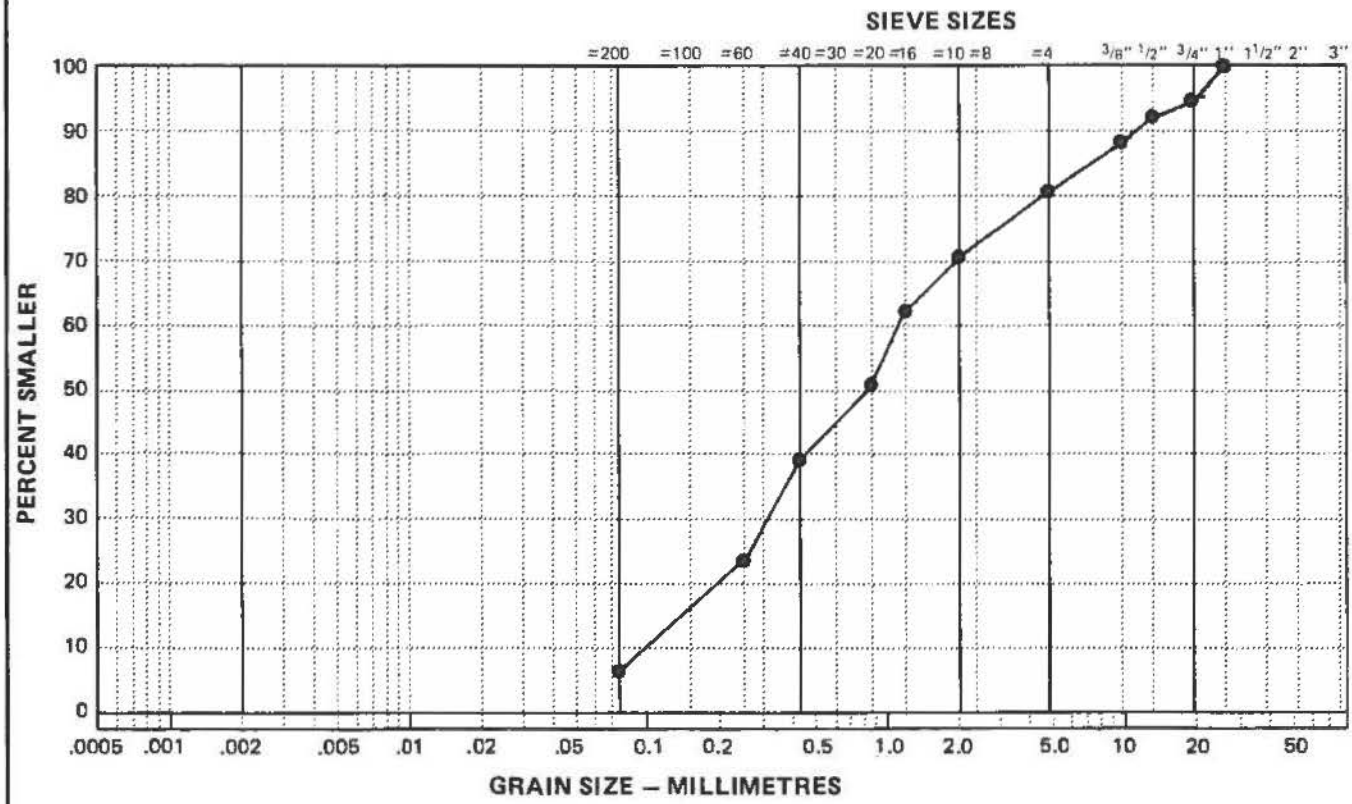
Cc: 0.9

Natural Moisture Content: _____ %

Remarks: Gravel 19.9%
Sand 73.7%
Silt 6.4%
1/2" sieve - 91.6% passing

SIEVE	PERCENTAGE PASSING
3"	
2"	
1 1/2"	
1"	100.0
3/4"	95.4
3/8"	88.5
No. 4	80.1
No. 10	70.5
No. 20	61.8
No. 40	50.9
No. 60	39.6
No. 100	23.4
No. 200	6.4

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



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GRANULAR INVESTIGATION
KM 1647, R.H.S.
ALASKA HIGHWAY, Y.T.

PIT IDENT: 115 A-13w

BEAR CREEK AREA

1991 BACKHOE TESTING
HOLES 01 - 14, LOG BOOK 156
SAMPLE # 1 - 19 (LAB # 5413 - 5431)

COMBINED LOS ANGELES ABRASION RESULT
(GRADATION B) - 17.3% LOSS
(Does not include lab numbers 5413,5423,and 5430)

SUBSURFACE EXPLORATION AND TEST REPORT	ALASKA HIGHWAY GRANULAR INVESTIGATION	BOREHOLE No. 156-01
PWC/O&M YUKON	A/H KM 1647 RHS	Project No: 859167
BACKHOE: CASE 688	LOCATION: See Plan	ELEVATION 0.000 (m)

SAMPLE TYPE: RETURN, S.P.T., AUGER, BULK, TUBE, CORE

DEPTH (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	▲ PERCENT FINES ▲ 20 40 60 80 / PLASTIC M.C. LIQUID 20 40 60 80	USC	◆ PERCENT SAND ◆ 20 40 60 80 / ■ PERCENT GRAVEL ■ 20 40 60 80	DEPTH (m)
0.0	STOCKPILE BASE --19mm crush						0.0
	SANDY GRAVEL -brown -frozen Nb (seasonal) -some silt -maximum 100mm material						
1.0	POORLY GRADED SAND WITH GRAVEL (SP) -brown -frozen to 1.2m Nb (seasonal) -damp						1.0
			1	▲	SP	■◆	
2.0							2.0
3.0							3.0
	END HOLE at 3.5m -in existing pit						
4.0							4.0
5.0							5.0
6.0							6.0

Public Works Canada Whitehorse, Yukon Territory.	COMPLETION DEPTH 3.5 m	COMPLETE 91/11/12
	LOGGED BY DT	DWG NO. / Page 1 of 1

SUBSURFACE EXPLORATION AND TEST REPORT	ALASKA HIGHWAY GRANULAR INVESTIGATION	BOREHOLE No. 156-02
PWC/O&M YUKON	A/H KM 1647 RHS	Project No: 859167
BACKHOE: CASE 688	LOCATION: See Plan	ELEVATION 0.000 (m)

SAMPLE TYPE: RETURN, S.P.T., AUGER, BULK, TUBE, CORE

DEPTH (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	▲ PERCENT FINES ▲ (20 40 60 80) / PLASTIC M.C. LIQUID (20 40 60 80)	USC	◆ PERCENT SAND ◆ (20 40 60 80) / ■ PERCENT GRAVEL ■ (20 40 60 80)	DEPTH (m)
0.0	ORGANIC MATERIAL						0.0
	SANDY SILT -brown -frozen Nb (seasonal) -some organics						
	SANDY GRAVEL -brown -frozen to 0.5m Nb (seasonal) -some silt and organics -maximum 100mm material						
1.0							1.0
	POORLY GRADED GRAVEL WITH SILT AND SAND (GP-GM) -brown -damp -some silt -maximum 75mm material -small sand layers from 1.1m to 5.0m						
2.0							2.0
			2	▲	GP-GM	◆ ■	
3.0							3.0
4.0							4.0
5.0	END HOLE at 5.0m						5.0
6.0							6.0

Public Works Canada Whitehorse, Yukon Territory.	COMPLETION DEPTH 5.0 m	COMPLETE 91/11/13
	LOGGED BY DT	DWG NO. / Page 1 of 1

SUBSURFACE EXPLORATION AND TEST REPORT	ALASKA HIGHWAY GRANULAR INVESTIGATION	BOREHOLE No. 156-03
PWC/O&M YUKON	A/H KM 1647 RHS	Project No: 859167
BACKHOE: CASE 688	LOCATION: See Plan	ELEVATION 0.000 (m)

SAMPLE TYPE: RETURN | S.P.T. | AUGER | BULK | TUBE | CORE

DEPTH (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	USC
0.0	ORGANIC MATERIAL			
	GRAVELLY SILT –some sand, cobbles and boulders			
	POORLY GRADED GRAVEL WITH SILT AND SAND (GP&GM) –light brown –damp –maximum 300mm material –estimate 2% +100mm		3	GP–GM
1.0				
2.0				
3.0	POORLY GRADED GRAVEL WITH SAND (GP) –light brown –damp –maximum 100mm material			
4.0			4	GP
5.0	END HOLE at 5.0m			
6.0				

▲ PERCENT FINES ▲ (20, 40, 60, 80)

PLASTIC — M.C. — LIQUID (20, 40, 60, 80)

◆ PERCENT SAND ◆ (20, 40, 60, 80)

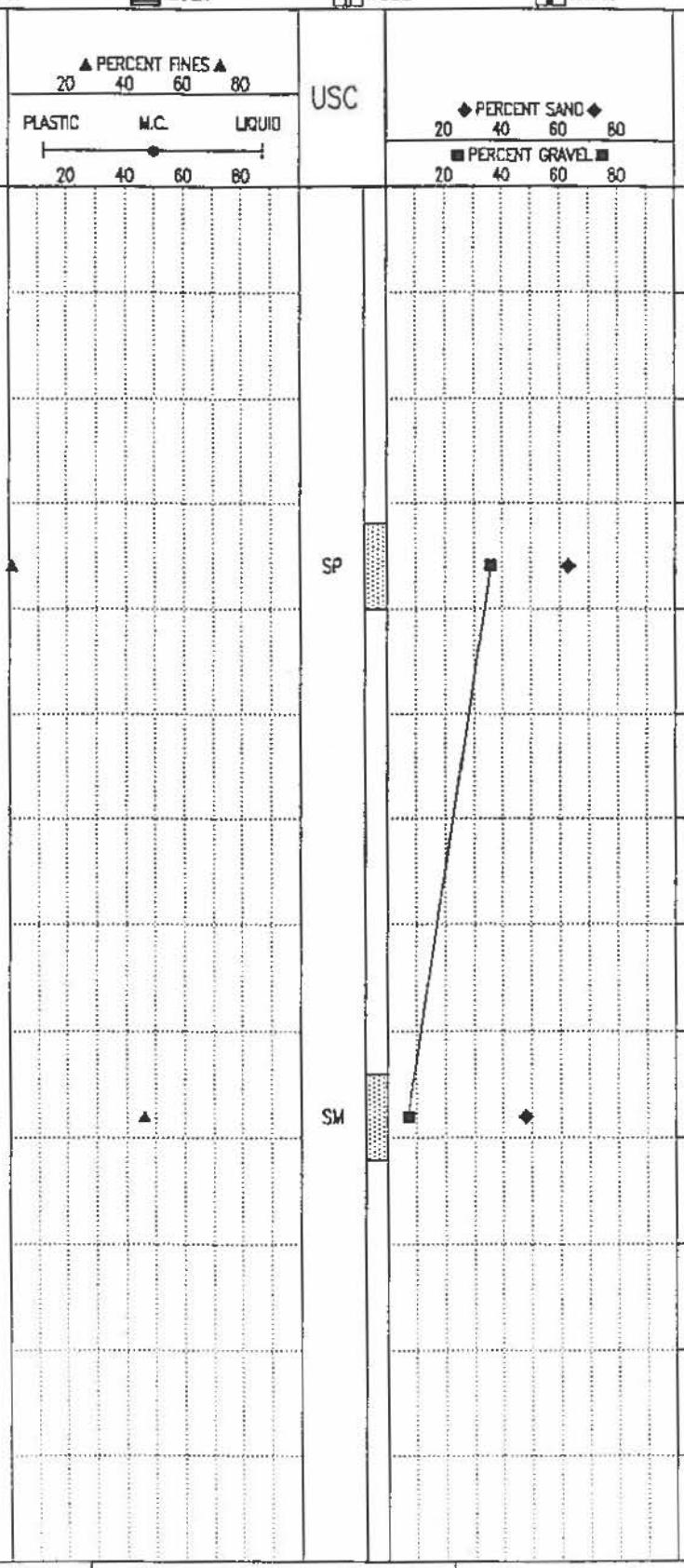
■ PERCENT GRAVEL ■ (20, 40, 60, 80)

Public Works Canada Whitehorse, Yukon Territory.	COMPLETION DEPTH 5.0 m	COMPLETE 91/11/13
	LOGGED BY DT	DWG NO.

SUBSURFACE EXPLORATION AND TEST REPORT	ALASKA HIGHWAY GRANULAR INVESTIGATION	BOREHOLE No. 156-04
PWC/O&M YUKON	A/H KM 1647 RHS	Project No: 859167
BACKHOE: CASE 688	LOCATION: See Plan	ELEVATION 0.000 (m)

SAMPLE TYPE: RETURN, S.P.T., AUGER, BULK, TUBE, CORE

DEPTH (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	USC
0.0	ORGANIC MATERIAL			
	ORGANIC SANDY SILT			
	GRAVELLY SAND -brown -damp			
1.0	POORLY GRADED SAND WITH GRAVEL (SP) -brown -damp -maximum 75mm material		5	SP
2.0	SILTY SAND (SM) -brown -damp			
3.0				
4.0			6	SM
	END HOLE at 4.7m -hole up on bench			
5.0				
6.0				

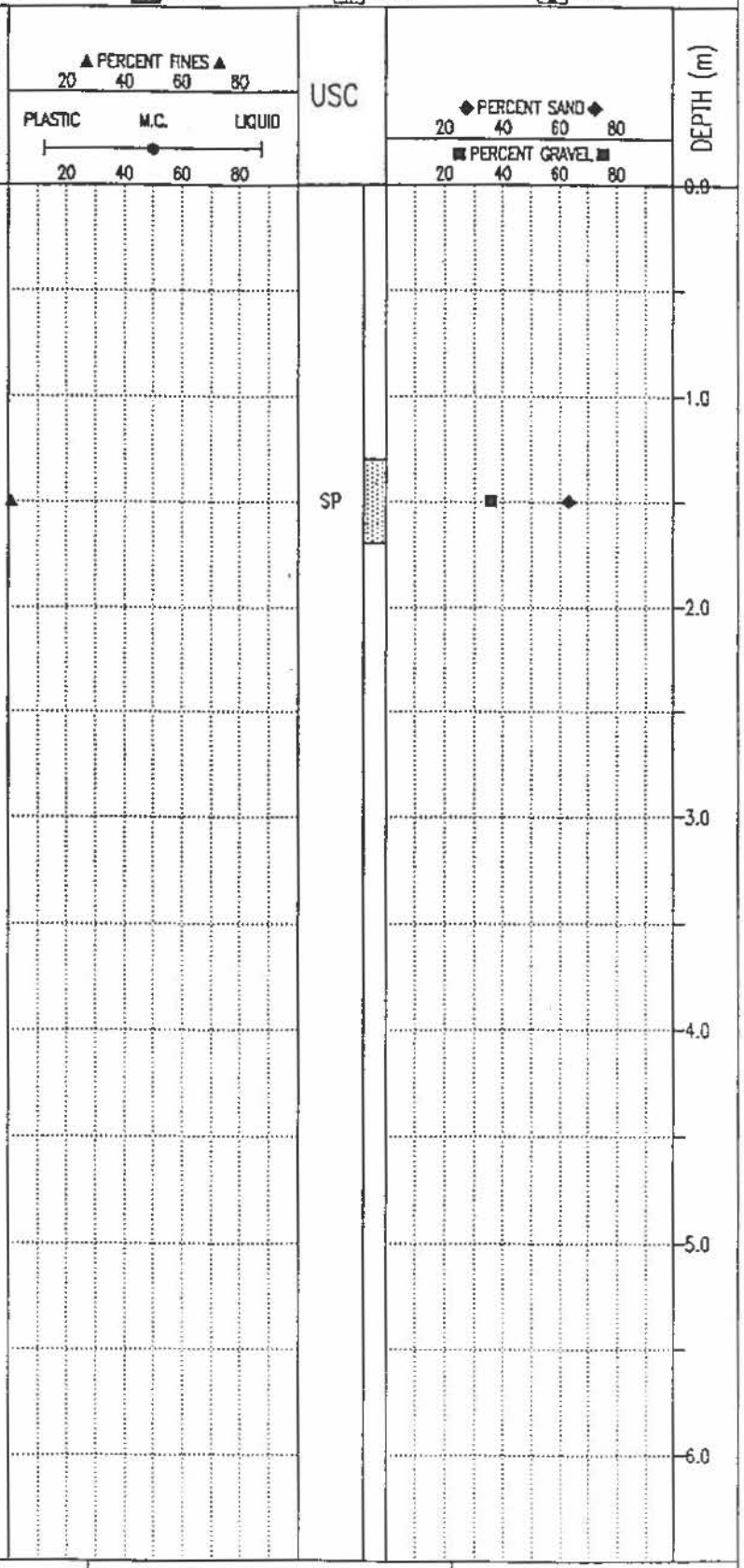


Public Works Canada Whitehorse, Yukon Territory.	COMPLETION DEPTH 4.7 m	COMPLETE 91/11/13
	LOGGED BY DT	DWG NO.
		Page 1 of 1

SUBSURFACE EXPLORATION AND TEST REPORT	ALASKA HIGHWAY GRANULAR INVESTIGATION	BOREHOLE No. 156-05
PWC/O&M YUKON	A/H KM 1647 RHS	Project No: 859167
BACKHOE: CASE 688	LOCATION: See Plan	ELEVATION 0.000 (m)

SAMPLE TYPE: RETURN, S.P.T., AUGER, BULK, TUBE, CORE

DEPTH (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	USC
0.0	ORGANIC MATERIAL			
	ORGANIC GRAVELLY SILT -frozen Nb (seasonal)			
	POORLY GRADED SAND WITH GRAVEL (SP) -brown -damp -maximum 100mm material -caving in below 0.5m		7	SP
1.0				
2.0				
3.0				
4.0				
	END HOLE at 4.5m -depth approximate due to caving in -hole up on higher bench			
5.0				
6.0				

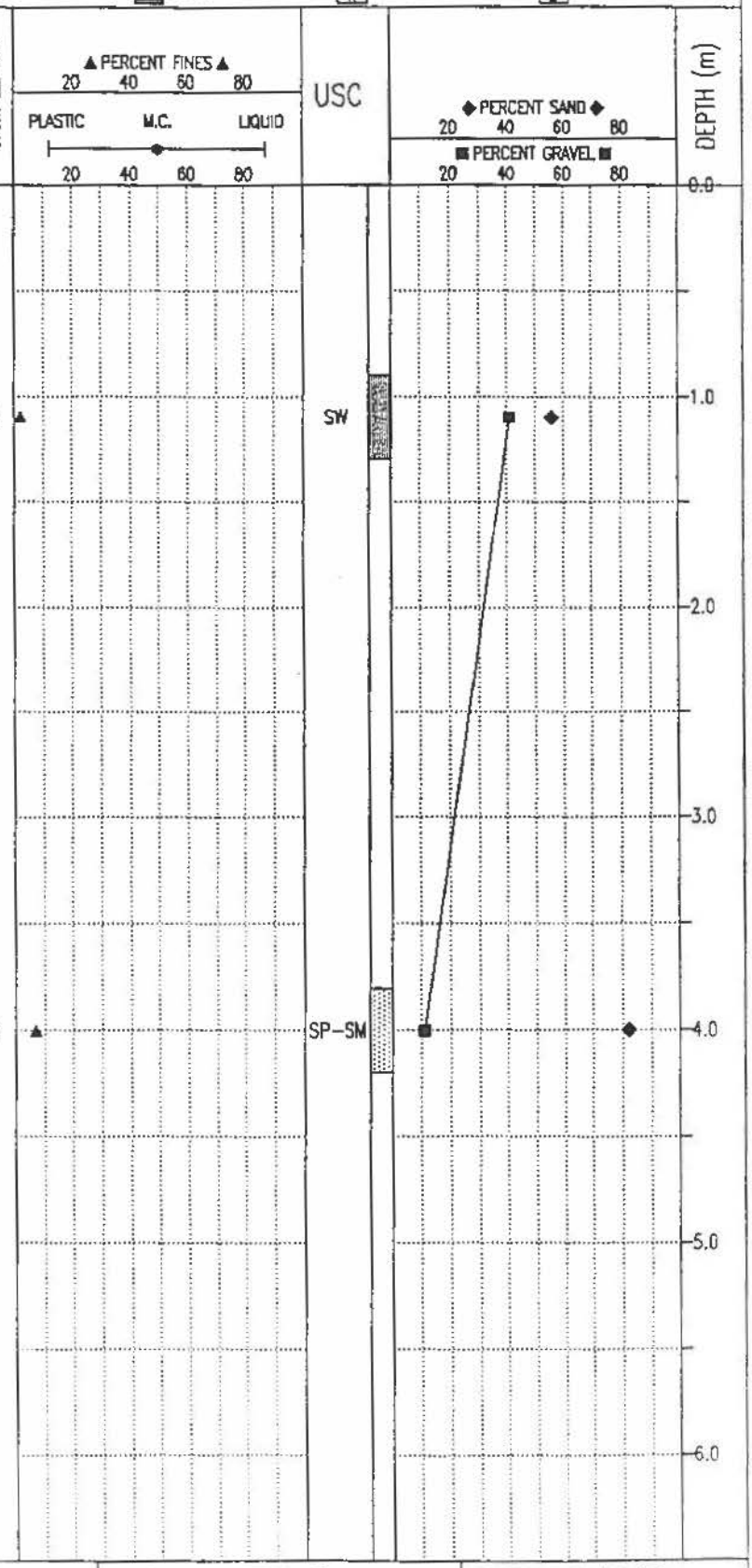


Public Works Canada Whitehorse, Yukon Territory.	COMPLETION DEPTH 4.5 m	COMPLETE 91/11/13
	LOGGED BY DT	DWG NO.
		Page 1 of 1

SUBSURFACE EXPLORATION AND TEST REPORT	ALASKA HIGHWAY GRANULAR INVESTIGATION	BOREHOLE No. 156-06
PWC/O&M YUKON	A/H KM 1647 RHS	Project No: 859167
BACKHOE: CASE 688	LOCATION: See Plan	ELEVATION 0.000 (m)

SAMPLE TYPE: RETURN, S.P.T., AUGER, BULK, TUBE, CORE

DEPTH (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	USC
0.0	ORGANIC MATERIAL			
	ORGANIC GRAVELLY SILT -frozen Nb (seasonal)			
	WELL-GRADED SAND WITH GRAVEL (SW) -brown -damp -maximum 100mm material		8	SW
1.0				
	POORLY GRADED SAND WITH SILT (SP-SM) -brown -damp			
2.0				
3.0				
4.0			9	SP-SM
	END HOLE at 4.5m -on edge of valley			
5.0				
6.0				



Public Works Canada
Whitehorse, Yukon Territory.

COMPLETION DEPTH 4.5 m	COMPLETE 91/11/13
LOGGED BY DT	DWG NO.	Page 1 of

SUBSURFACE EXPLORATION AND TEST REPORT	ALASKA HIGHWAY GRANULAR INVESTIGATION	BOREHOLE No. 156-07
PWC/O&M YUKON	A/H KM 1647 RHS	Project No: 859167
BACKHOE: CASE 688	LOCATION: See Plan	ELEVATION 0.000 (m)

SAMPLE TYPE ■ RETURN ⧄ S.P.T. ☒ AUGER ■ BULK ▯ TUBE ▯ CORE

DEPTH (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	▲PERCENT FINES▲ 20 40 60 80 / PLASTIC M.C. LIQUID 20 40 60 80	USC	◆PERCENT SAND◆ 20 40 60 80 / ■PERCENT GRAVEL■ 20 40 60 80	DEPTH (m)
0.0	ORGANIC MATERIAL						0.0
	SANDY SILT WITH ROOTS –frozen to 0.2m Nb (seasonal)						
	SANDY SILT						
1.0							1.0
2.0							2.0
	SILT –brown –moist –trace of sand and gravel						
3.0	END HOLE at 3.0m –heavy spruce cover						3.0
4.0							4.0
5.0							5.0
6.0							6.0

Public Works Canada Whitehorse, Yukon Territory.	COMPLETION DEPTH 3.0 m	COMPLETE 91/11/14
	LOGGED BY DT	DWG NO. / Page 1 of 1

SUBSURFACE EXPLORATION AND TEST REPORT	ALASKA HIGHWAY GRANULAR INVESTIGATION	BOREHOLE No. 156-08
PWC/O&M YUKON	A/H KM 1647 RHS	Project No: 859167
BACKHOE: CASE 688	LOCATION: See Plan	ELEVATION 0.000 (m)

SAMPLE TYPE: RETURN | S.P.T. | AUGER | BULK | TUBE | CORE

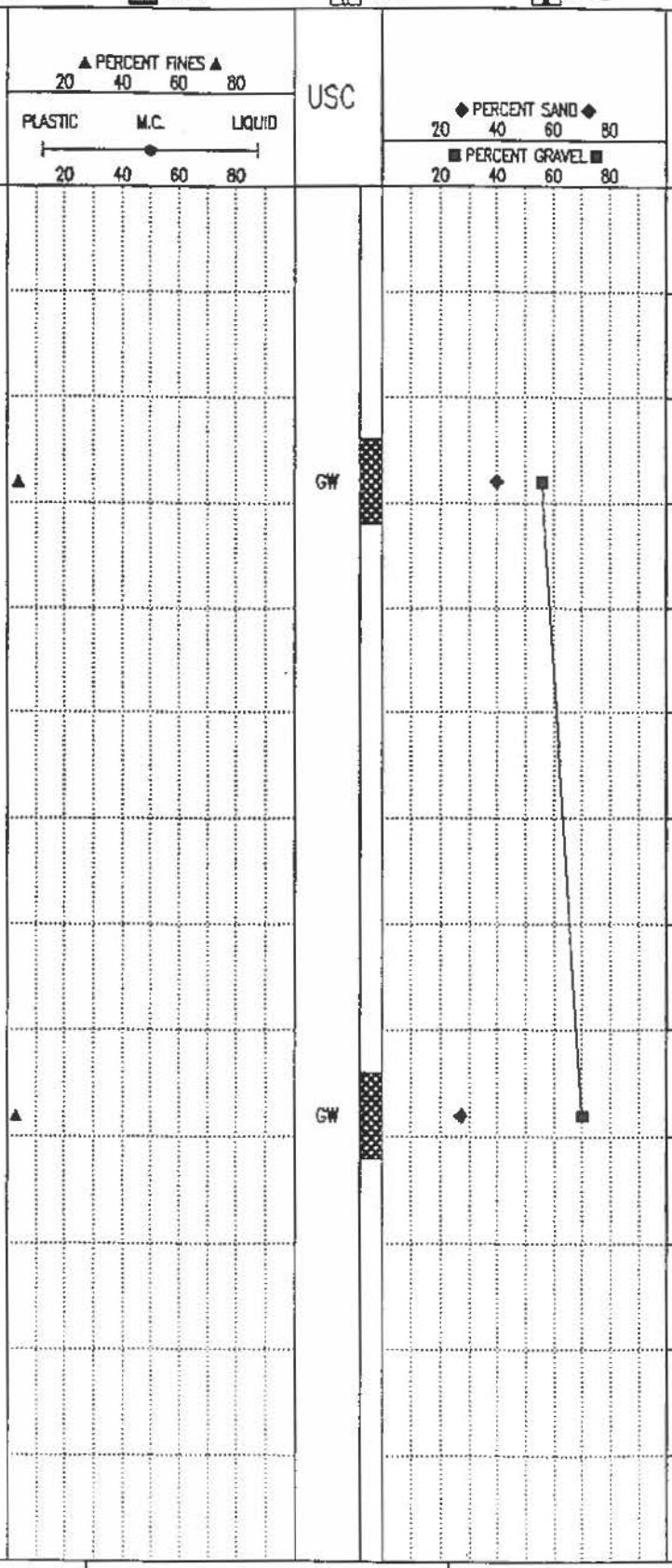
DEPTH (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	▲ PERCENT FINES ▲ 20 40 60 80 / PLASTIC M.C. LIQUID 20 40 60 80	USC	◆ PERCENT SAND ◆ 20 40 60 80 / ■ PERCENT GRAVEL ■ 20 40 60 80	DEPTH (m)
0.0	ORGANIC MATERIAL -frozen Nb (seasonal)						0.0
	SILT -brown -frozen Nb to 0.3m (seasonal) -moist -trace of sand and gravel						
1.0							1.0
2.0							2.0
3.0	END HOLE at 3.0m -poplar cover						3.0
4.0							4.0
5.0							5.0
6.0							6.0

Public Works Canada Whitehorse, Yukon Territory.	COMPLETION DEPTH 3.0 m	COMPLETE 91/11/14
	LOGGED BY DT	DWG NO. / Page ' of '

SUBSURFACE EXPLORATION AND TEST REPORT	ALASKA HIGHWAY GRANULAR INVESTIGATION	BOREHOLE No. 156-09
PWC/O&M YUKON	A/H KM 1647 RHS	Project No: 859167
BACKHOE: CASE 688	LOCATION: See Plan	ELEVATION 0.000 (m)

SAMPLE TYPE: RETURN | S.P.T. | AUGER | BULK | TUBE | CORE

DEPTH (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	USC
0.0	ORGANIC MATERIAL			
	SANDY SILT -brown -trace organics -frozen Nb to 0.5m (seasonal)			
	WELL-GRADED GRAVEL WITH SAND (GW) -brown -moist -maximum 200mm material -estimate 1% +100mm		10	GW
1.0				
2.0				
3.0				
4.0			11	GW
5.0	END HOLE at 5.0m -on old pipeline			
6.0				



Public Works Canada Whitehorse, Yukon Territory.	COMPLETION DEPTH 5.0 m	COMPLETE 91/11/15
	LOGGED BY DT	DWG NO.
		Page 1 of 1

SUBSURFACE EXPLORATION AND TEST REPORT	ALASKA HIGHWAY GRANULAR INVESTIGATION	BOREHOLE No. 156-10
PWC/O&M YUKON	A/H KM 1647 RHS	Project No: 859167
BACKHOE: CASE 688	LOCATION: See Plan	ELEVATION 0.000 (m)

SAMPLE TYPE: RETURN, S.P.T., AUGER, BULK, TUBE, CORE

DEPTH (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	USC
0.0	ORGANIC MATERIAL			
	CLAYEY SILT -brown -frozen Nb (seasonal) -some organics			
1.0	WELL-GRADED GRAVEL WITH SAND (GW) -brown -moist -maximum 200mm material -estimate 1% +100mm		12	GW
2.0				
3.0				
4.0			13	GW
5.0	END HOLE at 5.0m			
6.0				

▲ PERCENT FINES ▲ (20, 40, 60, 80)

PLASTIC — M.C. — LIQUID (20, 40, 60, 80)

◆ PERCENT SAND ◆ (20, 40, 60, 80)

■ PERCENT GRAVEL ■ (20, 40, 60, 80)

Public Works Canada Whitehorse, Yukon Territory.	COMPLETION DEPTH 5.0 m	COMPLETE 91/11/15
	LOGGED BY DT	DWG NO.
		Page 1 of *

SUBSURFACE EXPLORATION AND TEST REPORT	ALASKA HIGHWAY GRANULAR INVESTIGATION	BOREHOLE No. 156-11
PWC/O&M YUKON	A/H KM 1647 RHS	Project No: 859167
BACKHOE: CASE 688	LOCATION: See Plan	ELEVATION 0.000 (m)

SAMPLE TYPE ■ RETURN ☐ S.P.T. ☒ AUGER ■ BULK ▯ TUBE ▯ CORE

DEPTH (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	▲ PERCENT FINES ▲ 20 40 60 80 / PLASTIC M.C. LIQUID 20 40 60 80	USC	◆ PERCENT SAND ◆ 20 40 60 80 / ■ PERCENT GRAVEL ■ 20 40 60 80	DEPTH (m)
0.0	ORGANIC MATERIAL						0.0
	GRAVELLY SILT -brown -frozen Nb (seasonal) -some organics						
	WELL-GRADED GRAVEL WITH SILT AND SAND (GW-GM) -brown -damp -maximum 250mm material -estimate 2% +100mm						
1.0			14	▲	GW-GM	◆ ■	1.0
2.0							2.0
3.0							3.0
4.0							4.0
			15	▲	GW-GM	◆ ■	
5.0	END HOLE at 5.0m						5.0
6.0							6.0

Public Works Canada Whitehorse, Yukon Territory.	COMPLETION DEPTH 5.0 m	COMPLETE 91/11/15
	LOGGED BY DT	DWG NO. / Page 1 of 1

SUBSURFACE EXPLORATION AND TEST REPORT	ALASKA HIGHWAY GRANULAR INVESTIGATION	BOREHOLE No. 156-12
PWC/O&M YUKON	A/H KM 1647 RHS	Project No: 859167
BACKHOE: CASE 688	LOCATION: See Plan	ELEVATION 0.000 (m)

SAMPLE TYPE: RETURN, S.P.T., AUGER, BULK, TUBE, CORE

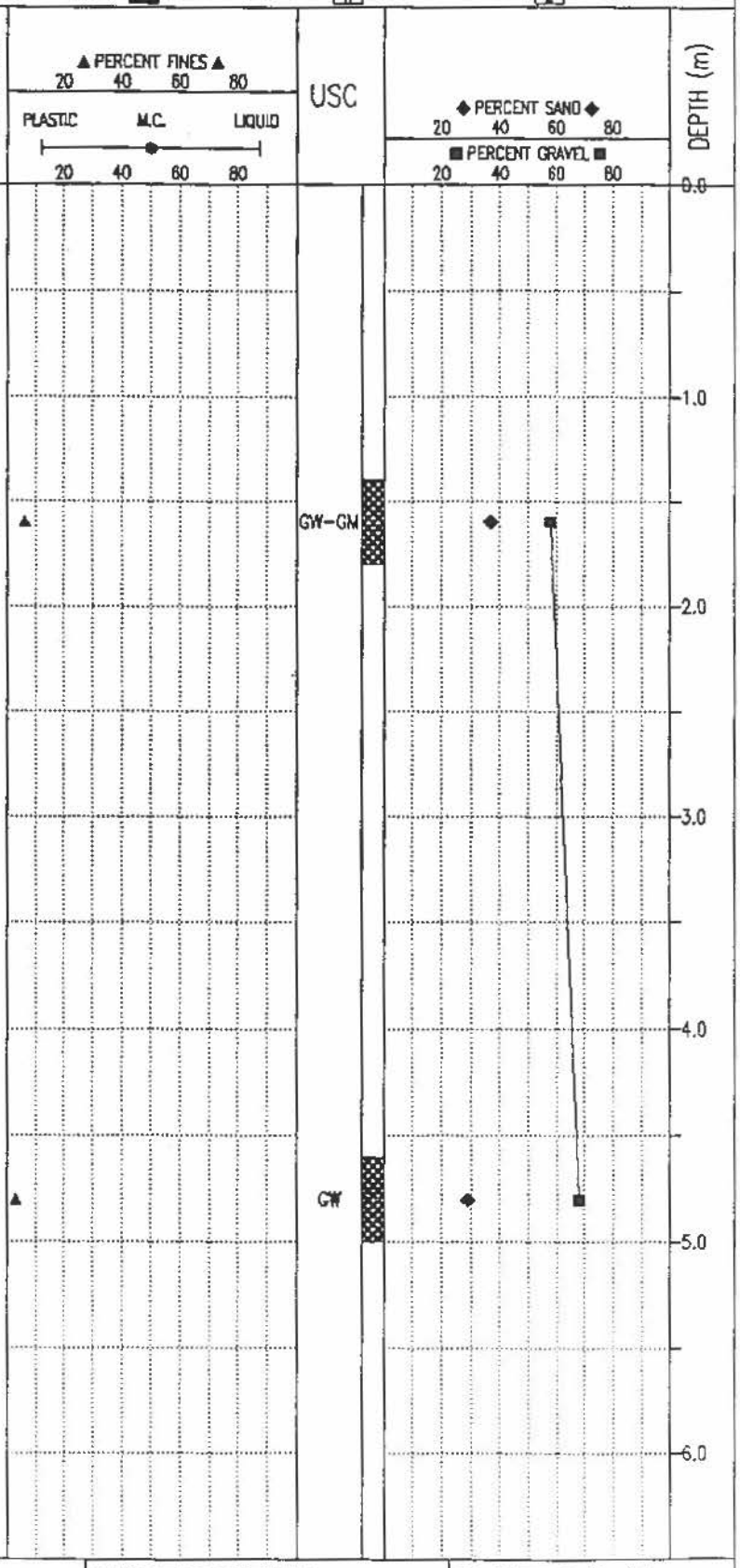
DEPTH (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	▲ PERCENT FINES ▲ 20 40 60 80 / PLASTIC M.C. LIQUID 20 40 60 80	USC	◆ PERCENT SAND ◆ 20 40 60 80 / ■ PERCENT GRAVEL ■ 20 40 60 80	DEPTH (m)
0.0	ORGANIC MATERIAL						0.0
	SILT -brown -damp -trace of sand						
1.0							1.0
	GRAVELLY SILTY SAND -brown -damp						
	CLAYEY SILT -brown -moist -trace of boulders						
2.0							2.0
3.0							3.0
	END HOLE at 3.5m						
4.0							4.0
5.0							5.0
6.0							6.0

Public Works Canada Whitehorse, Yukon Territory.	COMPLETION DEPTH 3.5 m	COMPLETE 91/11/15
	LOGGED BY DT	DWG NO. / Page 1 of 1

SUBSURFACE EXPLORATION AND TEST REPORT	ALASKA HIGHWAY GRANULAR INVESTIGATION	BOREHOLE No. 156-13
PWC/O&M YUKON	A/H KM 1647 RHS	Project No: 859167
BACKHOE: CASE 688	LOCATION: See Plan	ELEVATION 0.000 (m)

SAMPLE TYPE: RETURN, S.P.T., AUGER, BULK, TUBE, CORE

DEPTH (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	USC
0.0	ORGANIC MATERIAL			
	CLAYEY SILT -brown -frozen Nb to 0.5m (seasonal) -trace of sand -some roots			
1.0	WELL-GRADED GRAVEL WITH SILT AND SAND (GW-GM) -brown -moist -maximum 150mm material -estimate <1% +100mm		16	GW-GM
2.0				
3.0	WELL-GRADED GRAVEL WITH SAND (GW) -brown -moist -maximum 150mm material -estimate 2% +100mm			
4.0			17	GW
5.0	END HOLE at 5.0m			
6.0				



Public Works Canada Whitehorse, Yukon Territory.	COMPLETION DEPTH 5.0 m	COMPLETE 91/11/15
	LOGGED BY DT	DWG NO.

SUBSURFACE EXPLORATION AND TEST REPORT	ALASKA HIGHWAY GRANULAR INVESTIGATION	BOREHOLE No. 156-14
PWC/O&M YUKON	A/H KM 1647 RHS	Project No: 859167
BACKHOE: CASE 688	LOCATION: See Plan	ELEVATION 0.000 (m)

SAMPLE TYPE: RETURN, S.P.T., AUGER, BULK, TUBE, CORE

DEPTH (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	USC
0.0	ORGANIC MATERIAL			
	CLAYEY SILT -some roots			
1.0	SILTY GRAVEL WITH SAND (GM) -light brown -damp -maximum 100mm material		18	
2.0				
3.0	-more silt, less gravel below 3.0m			
4.0			19	GM
5.0	END HOLE at 5.0m			
6.0				

▲ PERCENT FINES ▲ 20 40 60 80

PLASTIC M.C. LIQUID 20 40 60 80

◆ PERCENT SAND ◆ 20 40 60 80

■ PERCENT GRAVEL ■ 20 40 60 80

Public Works Canada Whitehorse, Yukon Territory.	COMPLETION DEPTH 5.0 m	COMPLETE 91/11/15
	LOGGED BY DT	DWG NO.

PROJECT NUMBER:	859167	HOLE NUMBER:	156-01
CLIENT:	PWC/O&M YUKON		
PROJECT NAME:	ALASKA HIGHWAY GRANULAR INVESTIGATION		
PROJECT LOCATION:	A/H KM 1647 RHS		
DRILL UNIT:	BACKHOE: CASE 688		
HOLE LOCATION:	SEE PLAN		
LOGGED BY:	DT	DATE COMPLETED:	91.11.12

FIELD NO: 1
LAB NO: 5413
DEPTH: 1.5-1.9
TYPE: BULK

SIEVE SIZE	PERCENT PASSING
101.6	--
76.2	--
50.8	100
38.1	96
25.4	88
19.0	81
12.7	71
9.5	66
4.76	55
2.38	--
2.00	47
1.19	--
0.841	41
0.595	--
0.42	34
0.297	--
0.177	--
0.149	12
0.074	4

M.C.(%): --

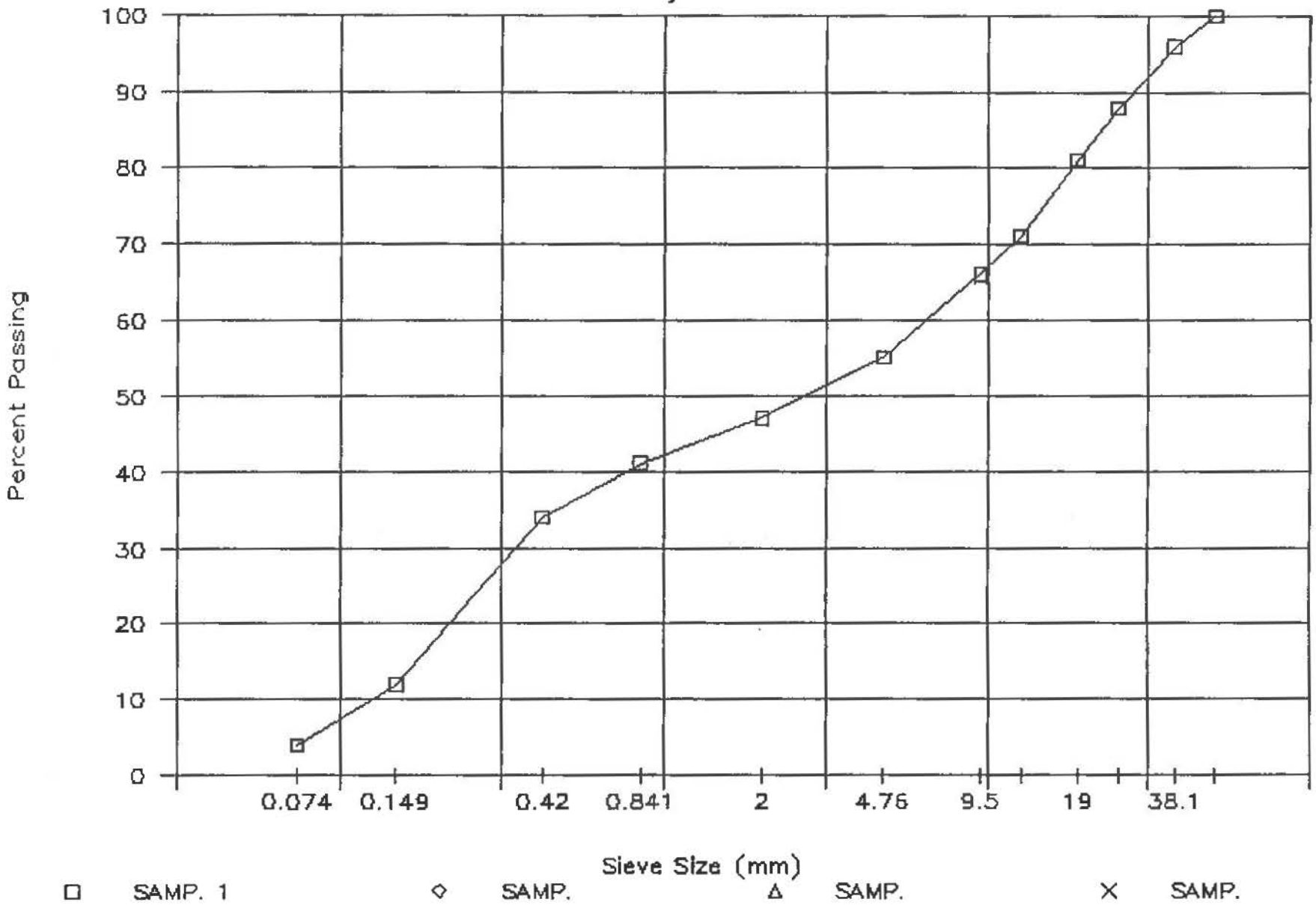
LIMITS
LIQUID: --
PLASTIC: --
P.I.: N.P.

% GRAVEL: 45
% SAND: 51
% FINES: 4

CLASSIFICATION:
POORLY GRADED
SAND WITH GRAVEL
(SP)

PUBLIC WORKS CANADA – WHITEHORSE, Y.T.

Grain Size Analysis – Hole 156–01



□ SAMP. 1 ◇ SAMP. △ SAMP. × SAMP.

PROJECT NUMBER:	859167	HOLE NUMBER:	156-02
CLIENT:	PWC/O&M YUKON		
PROJECT NAME:	ALASKA HIGHWAY GRANULAR INVESTIGATION		
PROJECT LOCATION:	A/H KM 1647 RHS		
DRILL UNIT:	BACKHOE: CASE 688		
HOLE LOCATION:	SEE PLAN		
LOGGED BY:	DT	DATE COMPLETED:	91.11.13

FIELD NO: 2
LAB NO: 5414
DEPTH: 2.6-3.0
TYPE: BULK

SIEVE SIZE	PERCENT PASSING
101.6	--
76.2	--
50.8	100
38.1	90
25.4	84
19.0	75
12.7	66
9.5	60
4.76	48
2.38	--
2.00	38
1.19	--
0.841	29
0.595	--
0.42	20
0.297	--
0.177	--
0.149	8
0.074	5

M.C.(%): --

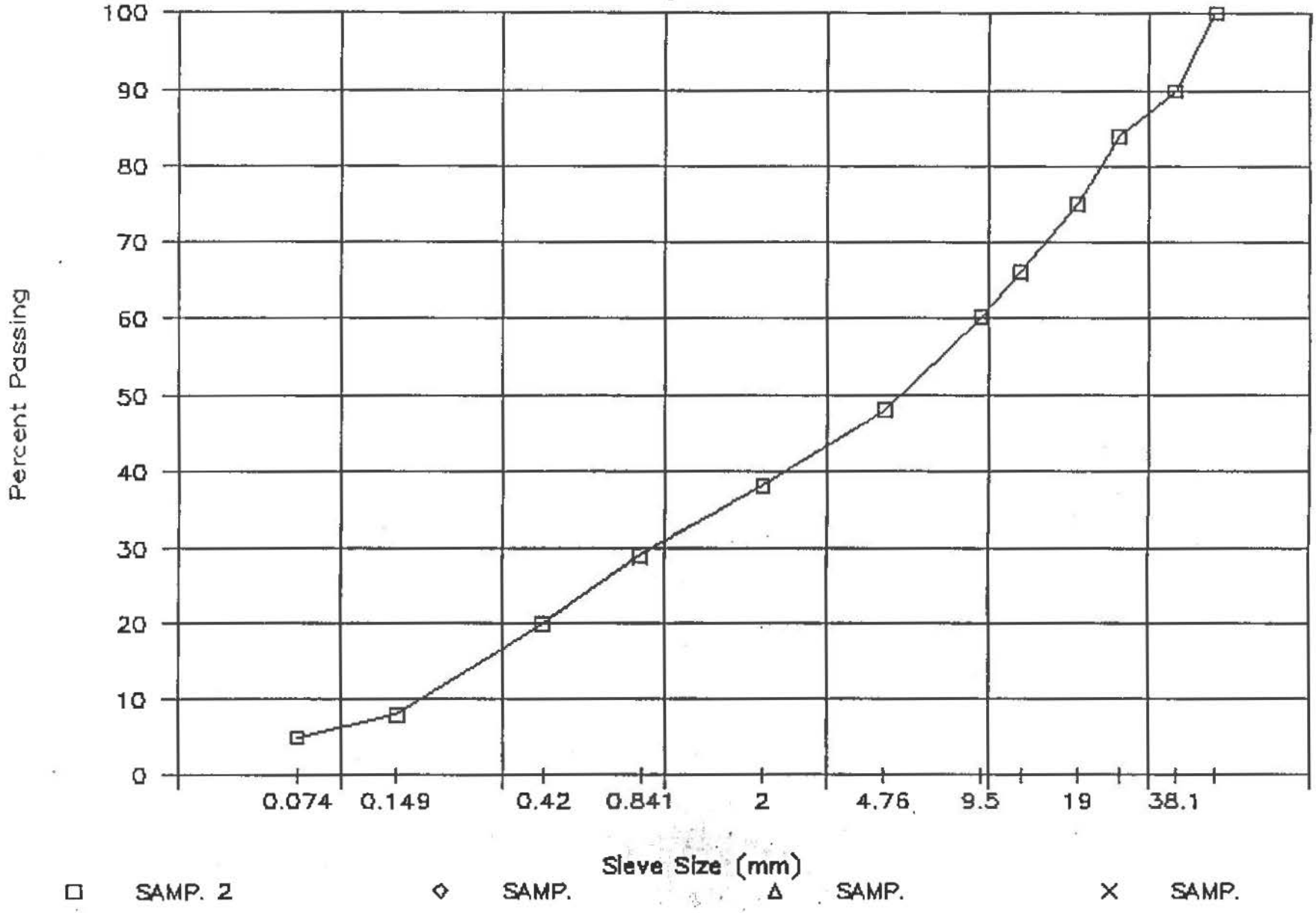
LIMITS
LIQUID: --
PLASTIC: --
P.I.: N.P.

% GRAVEL: 52
% SAND: 43
% FINES: 5

CLASSIFICATION:
POORLY GRADED GRAVEL WITH SILT & SAND (GP-GM)

PUBLIC WORKS CANADA — WHITEHORSE, Y.T.

Grain Size Analysis — Hole 156—02



PROJECT NUMBER:	859167	HOLE NUMBER:	156-03
CLIENT:	PWC/O&M YUKON		
PROJECT NAME:	ALASKA HIGHWAY GRANULAR INVESTIGATION		
PROJECT LOCATION:	A/H KM 1647 RHS		
DRILL UNIT:	BACKHOE: CASE 688		
HOLE LOCATION:	SEE PLAN		
LOGGED BY:	DT	DATE COMPLETED:	91.11.13

FIELD NO: 3
LAB NO: 5415
DEPTH: 1.0-1.4
TYPE: BULK

SIEVE SIZE	PERCENT PASSING
101.6	--
76.2	100
50.8	79
38.1	77
25.4	67
19.0	57
12.7	48
9.5	40
4.76	28
2.38	--
2.00	19
1.19	--
0.841	15
0.595	--
0.42	12
0.297	--
0.177	--
0.149	7
0.074	6

M.C.(%): --

LIMITS
LIQUID: --
PLASTIC: --
P.I.: N.P.

% GRAVEL: 72
% SAND: 22
% FINES: 6

CLASSIFICATION:
POORLY GRADED GRAVEL WITH SILT & SAND (GP-GM)

FIELD NO: 4
LAB NO: 5416
DEPTH: 4.4-4.8
TYPE: BULK

SIEVE SIZE	PERCENT PASSING
101.6	--
76.2	100
50.8	96
38.1	80
25.4	75
19.0	67
12.7	60
9.5	55
4.76	45
2.38	--
2.00	37
1.19	--
0.841	30
0.595	--
0.42	23
0.297	--
0.177	--
0.149	5
0.074	3

M.C.(%): --

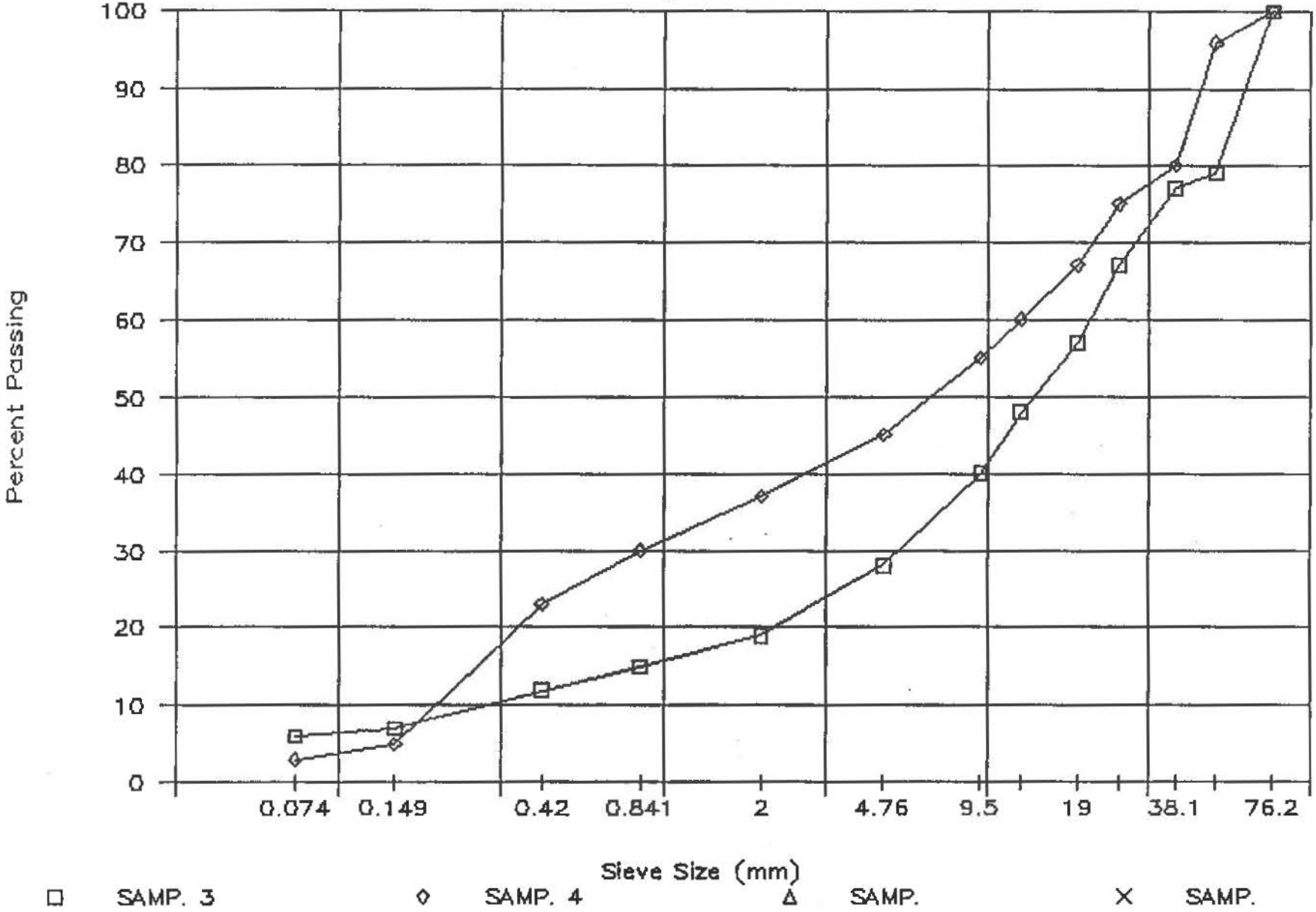
LIMITS
LIQUID: --
PLASTIC: --
P.I.: N.P.

% GRAVEL: 55
% SAND: 42
% FINES: 3

CLASSIFICATION:
POORLY GRADED GRAVEL WITH SAND (GP)

PUBLIC WORKS CANADA — WHITEHORSE, Y.T.

Grain Size Analysis — Hole 156—03



□ SAMP. 3 ◊ SAMP. 4 Δ SAMP. X SAMP.

PROJECT NUMBER: 859167 HOLE NUMBER: 156-04
CLIENT: PWC/O&M YUKON
PROJECT NAME: ALASKA HIGHWAY GRANULAR INVESTIGATION
PROJECT LOCATION: A/H KM 1647 RHS
DRILL UNIT: BACKHOE: CASE 688
HOLE LOCATION: SEE PLAN
LOGGED BY: DT DATE COMPLETED: 91.11.13

FIELD NO: 5
LAB NO: 5417
DEPTH: 1.6-2.0
TYPE: BULK

SIEVE SIZE	PERCENT PASSING
101.6	--
76.2	--
50.8	100
38.1	93
25.4	89
19.0	86
12.7	79
9.5	74
4.76	64
2.38	--
2.00	49
1.19	--
0.841	34
0.595	--
0.42	15
0.297	--
0.177	--
0.149	2
0.074	1

M.C.(%): --

LIMITS
LIQUID: --
PLASTIC: --
P.I.: N.P.

% GRAVEL: 36
% SAND: 63
% FINES: 1

CLASSIFICATION:
POORLY GRADED SAND WITH GRAVEL (SP)

FIELD NO: 6
LAB NO: 5418
DEPTH: 4.2-4.6
TYPE: BULK

SIEVE SIZE	PERCENT PASSING
101.6	--
76.2	--
50.8	--
38.1	--
25.4	100
19.0	99
12.7	98
9.5	96
4.76	93
2.38	--
2.00	90
1.19	--
0.841	87
0.595	--
0.42	84
0.297	--
0.177	--
0.149	66
0.074	46

M.C.(%): --

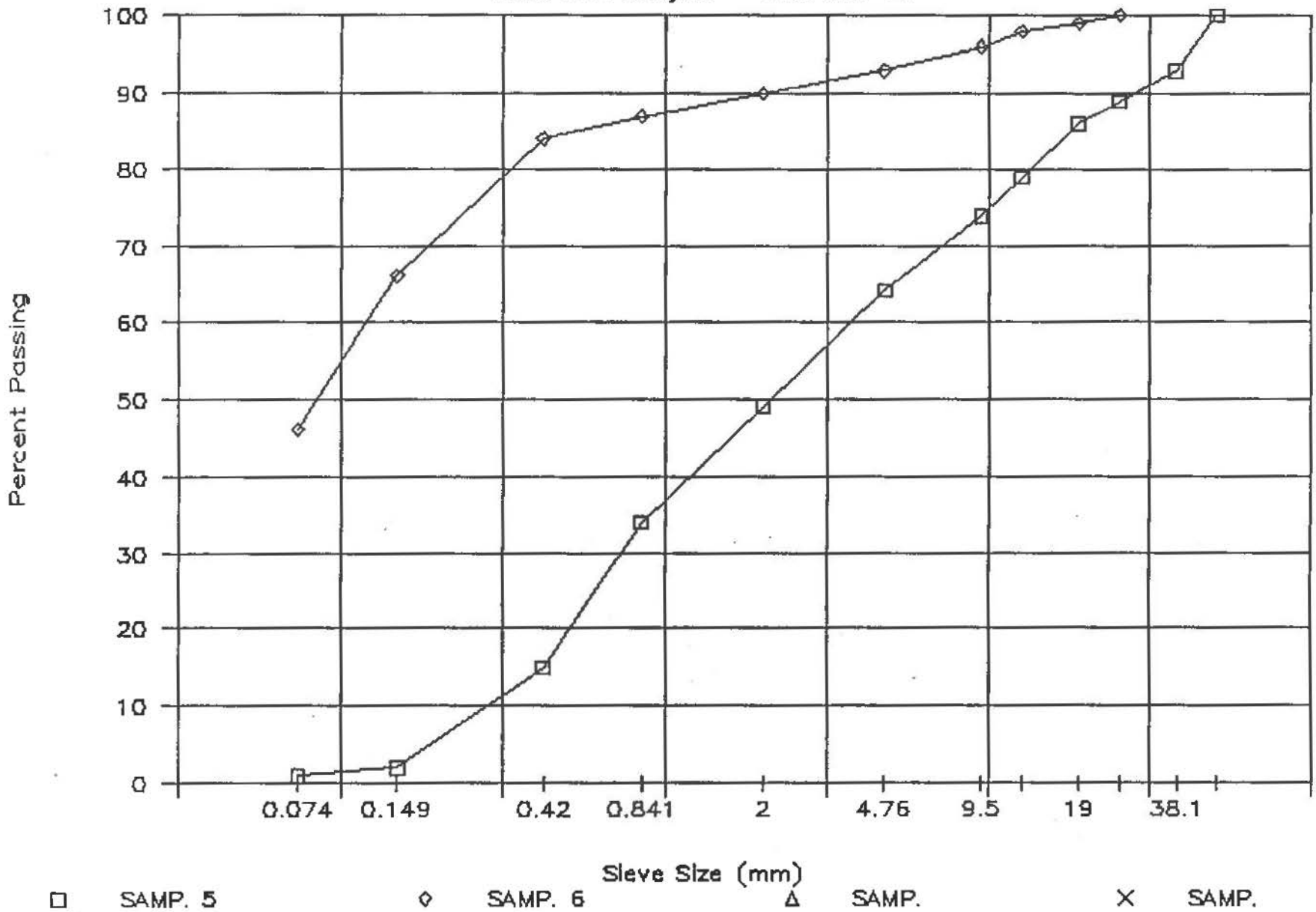
LIMITS
LIQUID: --
PLASTIC: --
P.I.: N.P.

% GRAVEL: 7
% SAND: 48
% FINES: 46

CLASSIFICATION:
SILTY SAND (SM)

PUBLIC WORKS CANADA — WHITEHORSE, Y.T.

Grain Size Analysis — Hole 156—04



PROJECT NUMBER:	859167	HOLE NUMBER:	156-05
CLIENT:	PWC/O&M YUKON		
PROJECT NAME:	ALASKA HIGHWAY GRANULAR INVESTIGATION		
PROJECT LOCATION:	A/H KM 1647 RHS		
DRILL UNIT:	BACKHOE: CASE 688		
HOLE LOCATION:	SEE PLAN		
LOGGED BY:	DT	DATE COMPLETED:	91.11.13

FIELD NO: 7
LAB NO: 5419
DEPTH: 1.3-1.7
TYPE: BULK

SIEVE SIZE	PERCENT PASSING
101.6	--
76.2	--
50.8	--
38.1	100
25.4	96
19.0	94
12.7	87
9.5	82
4.76	64
2.38	--
2.00	52
1.19	--
0.841	27
0.595	--
0.42	12
0.297	--
0.177	--
0.149	2
0.074	1

M.C.(%): --

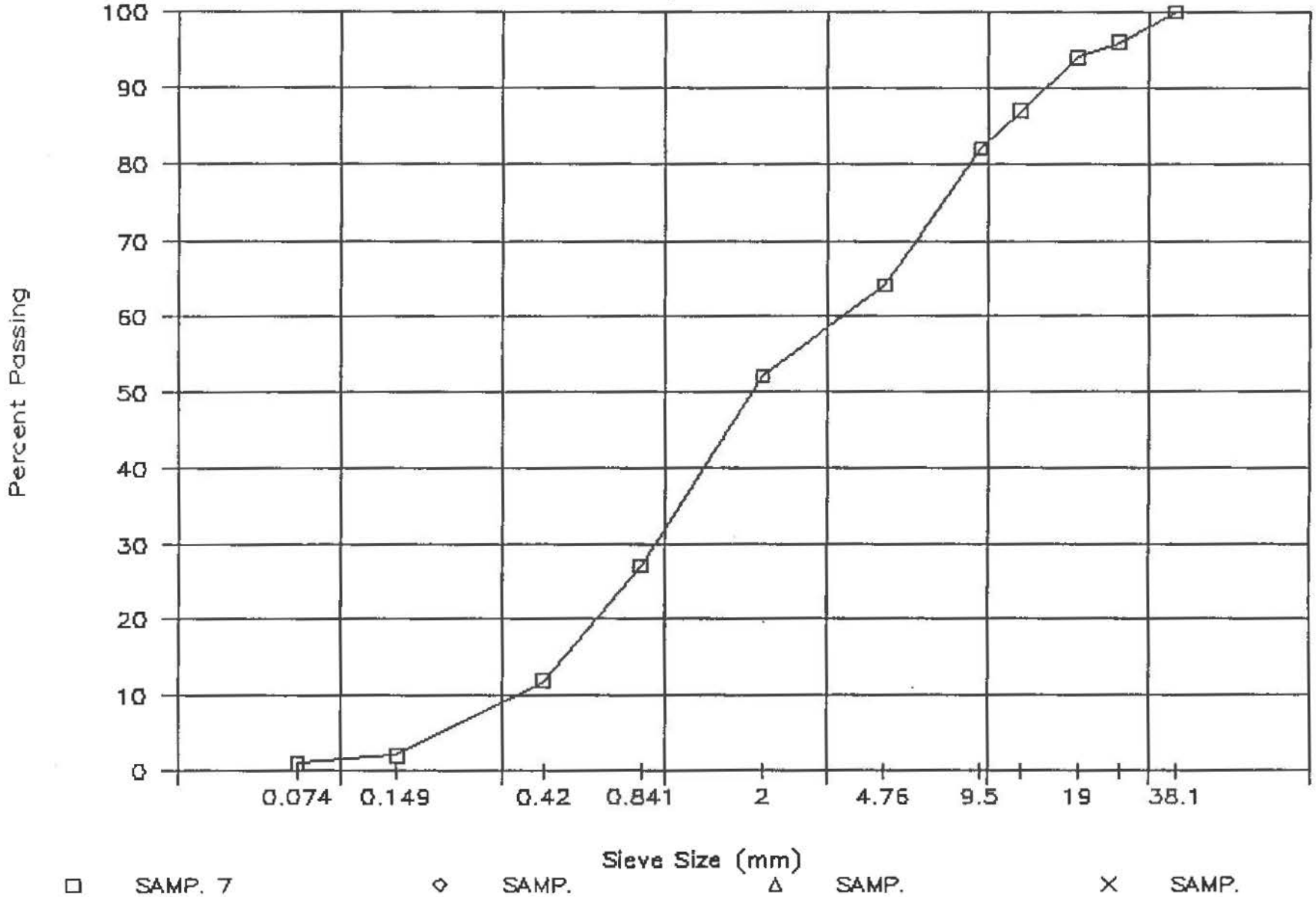
LIMITS
LIQUID: --
PLASTIC: --
P.I.: N.P.

% GRAVEL: 36
% SAND: 63
% FINES: 1

CLASSIFICATION:
POORLY GRADED
SAND WITH GRAVEL
(SP)

PUBLIC WORKS CANADA — WHITEHORSE, Y.T.

Grain Size Analysis — Hole 156—05



PROJECT NUMBER: 859167 HOLE NUMBER: 156-06
CLIENT: PWC/O&M YUKON
PROJECT NAME: ALASKA HIGHWAY GRANULAR INVESTIGATION
PROJECT LOCATION: A/H KM 1647 RHS
DRILL UNIT: BACKHOE: CASE 688
HOLE LOCATION: SEE PLAN
LOGGED BY: DT DATE COMPLETED: 91.11.13

FIELD NO: 8
LAB NO: 5420
DEPTH: 0.9-1.3
TYPE: BULK

SIEVE SIZE	PERCENT PASSING
101.6	--
76.2	--
50.8	100
38.1	98
25.4	97
19.0	94
12.7	86
9.5	78
4.76	59
2.38	--
2.00	38
1.19	--
0.841	25
0.595	--
0.42	16
0.297	--
0.177	--
0.149	5
0.074	2

M.C.(%): --

LIMITS
LIQUID: --
PLASTIC: --
P.I.: N.P.

% GRAVEL: 41
% SAND: 56
% FINES: 2

CLASSIFICATION:
WELL-GRADED SAND WITH GRAVEL (SW)

FIELD NO: 9
LAB NO: 5421
DEPTH: 3.8-4.2
TYPE: BULK

SIEVE SIZE	PERCENT PASSING
101.6	--
76.2	--
50.8	--
38.1	--
25.4	100
19.0	99
12.7	97
9.5	94
4.76	89
2.38	--
2.00	80
1.19	--
0.841	70
0.595	--
0.42	57
0.297	--
0.177	--
0.149	19
0.074	7

M.C.(%): --

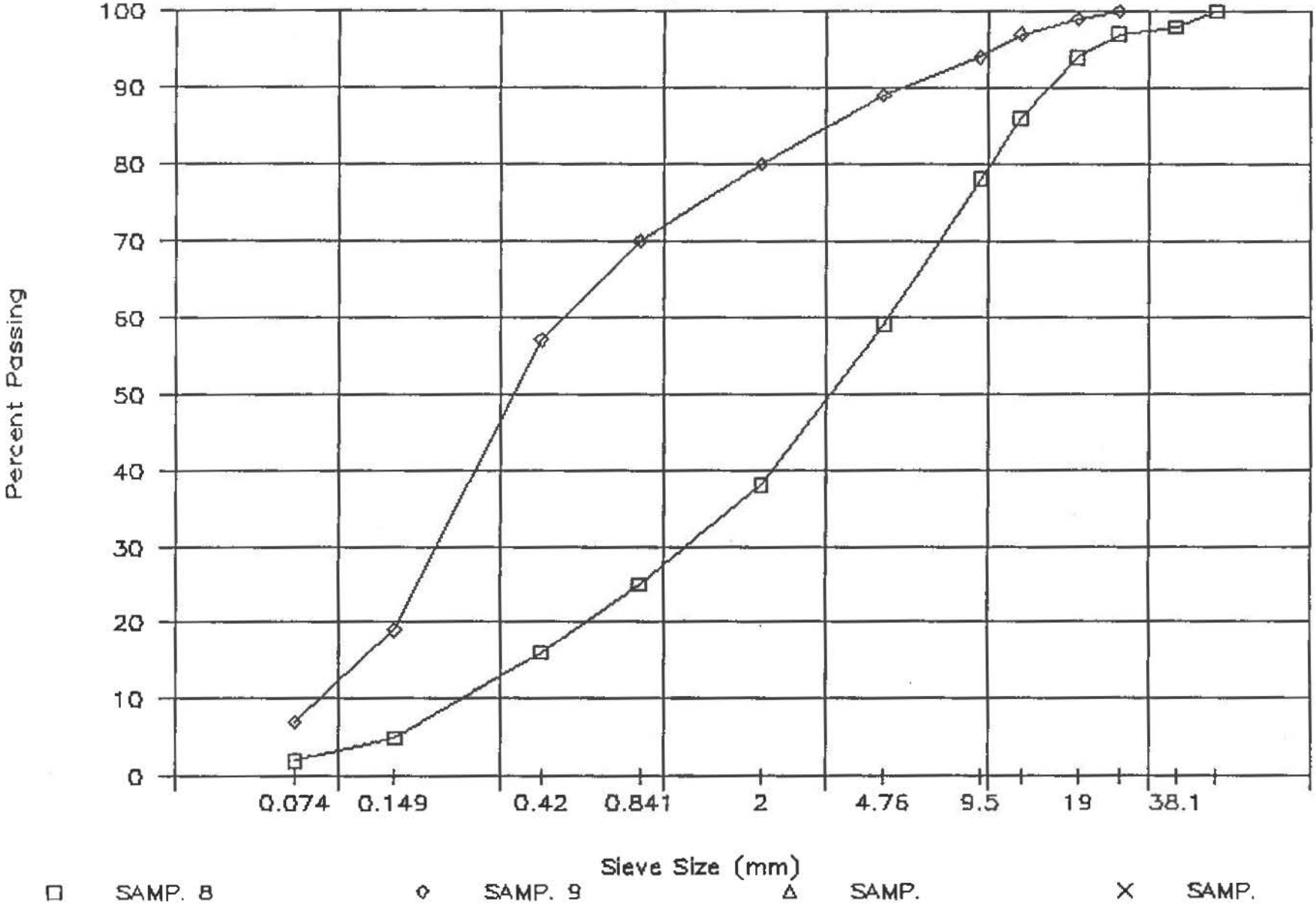
LIMITS
LIQUID: --
PLASTIC: --
P.I.: N.P.

% GRAVEL: 11
% SAND: 82
% FINES: 7

CLASSIFICATION:
POORLY GRADED SAND WITH SILT (SP-SM)

PUBLIC WORKS CANADA — WHITEHORSE, Y.T.

Grain Size Analysis — Hole 156—06



PROJECT NUMBER: 859167 HOLE NUMBER: 156-09
CLIENT: PWC/O&M YUKON
PROJECT NAME: ALASKA HIGHWAY GRANULAR INVESTIGATION
PROJECT LOCATION: A/H KM 1647 RHS
DRILL UNIT: BACKHOE: CASE 688
HOLE LOCATION: SEE PLAN
LOGGED BY: DT DATE COMPLETED: 91.11.15

FIELD NO: 10
LAB NO: 5422
DEPTH: 1.2-1.6
TYPE: BULK

SIEVE SIZE	PERCENT PASSING
101.6	--
76.2	100
50.8	93
38.1	90
25.4	82
19.0	75
12.7	63
9.5	57
4.76	44
2.38	--
2.00	31
1.19	--
0.841	20
0.595	--
0.42	13
0.297	--
0.177	--
0.149	5
0.074	4

M.C.(%): --

LIMITS
LIQUID: --
PLASTIC: --
P.I.: N.P.

% GRAVEL: 56
% SAND: 40
% FINES: 4

CLASSIFICATION:
WELL-GRADED GRAVEL WITH SAND (GW)

FIELD NO: 11
LAB NO: 5423
DEPTH: 4.2-4.6
TYPE: BULK

SIEVE SIZE	PERCENT PASSING
101.6	100
76.2	78
50.8	72
38.1	69
25.4	63
19.0	53
12.7	44
9.5	40
4.76	30
2.38	--
2.00	21
1.19	--
0.841	15
0.595	--
0.42	10
0.297	--
0.177	--
0.149	4
0.074	3

M.C.(%): --

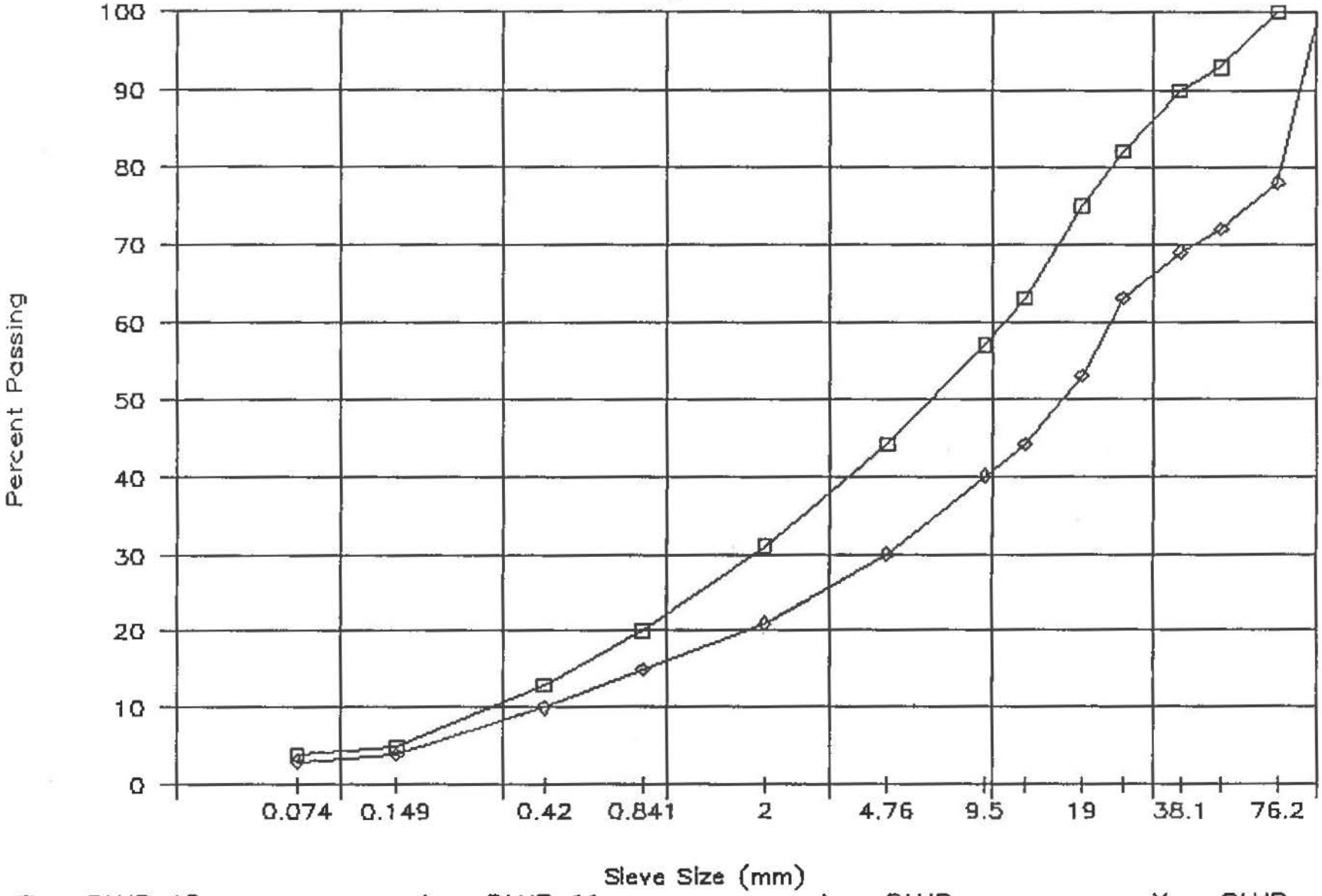
LIMITS
LIQUID: --
PLASTIC: --
P.I.: N.P.

% GRAVEL: 70
% SAND: 27
% FINES: 3

CLASSIFICATION:
WELL-GRADED GRAVEL WITH SAND (GW)

PUBLIC WORKS CANADA — WHITEHORSE, Y.T.

Grain Size Analysis — Hole 156—09



□ SAMP. 10 ◇ SAMP. 11 △ SAMP. X SAMP.

PROJECT NUMBER:	859167	HOLE NUMBER:	156-10
CLIENT:	PWC/O&M YUKON		
PROJECT NAME:	ALASKA HIGHWAY GRANULAR INVESTIGATION		
PROJECT LOCATION:	A/H KM 1647 RHS		
DRILL UNIT:	BACKHOE: CASE 688		
HOLE LOCATION:	SEE PLAN		
LOGGED BY:	DT	DATE COMPLETED:	91.11.15

FIELD NO: 12
LAB NO: 5424
DEPTH: 1.1-1.5
TYPE: BULK

SIEVE SIZE	PERCENT PASSING
101.6	--
76.2	--
50.8	100
38.1	95
25.4	83
19.0	76
12.7	61
9.5	54
4.76	39
2.38	--
2.00	28
1.19	--
0.841	20
0.595	--
0.42	14
0.297	--
0.177	--
0.149	6
0.074	4

M.C.(%): --

LIMITS
LIQUID: --
PLASTIC: --
P.I.: N.P.

% GRAVEL: 61
% SAND: 35
% FINES: 4

CLASSIFICATION:
WELL-GRADED GRAVEL WITH SAND (GW)

FIELD NO: 13
LAB NO: 5425
DEPTH: 4.6-5.0
TYPE: BULK

SIEVE SIZE	PERCENT PASSING
101.6	--
76.2	100
50.8	89
38.1	85
25.4	76
19.0	67
12.7	55
9.5	49
4.76	36
2.38	--
2.00	25
1.19	--
0.841	17
0.595	--
0.42	11
0.297	--
0.177	--
0.149	5
0.074	3

M.C.(%): --

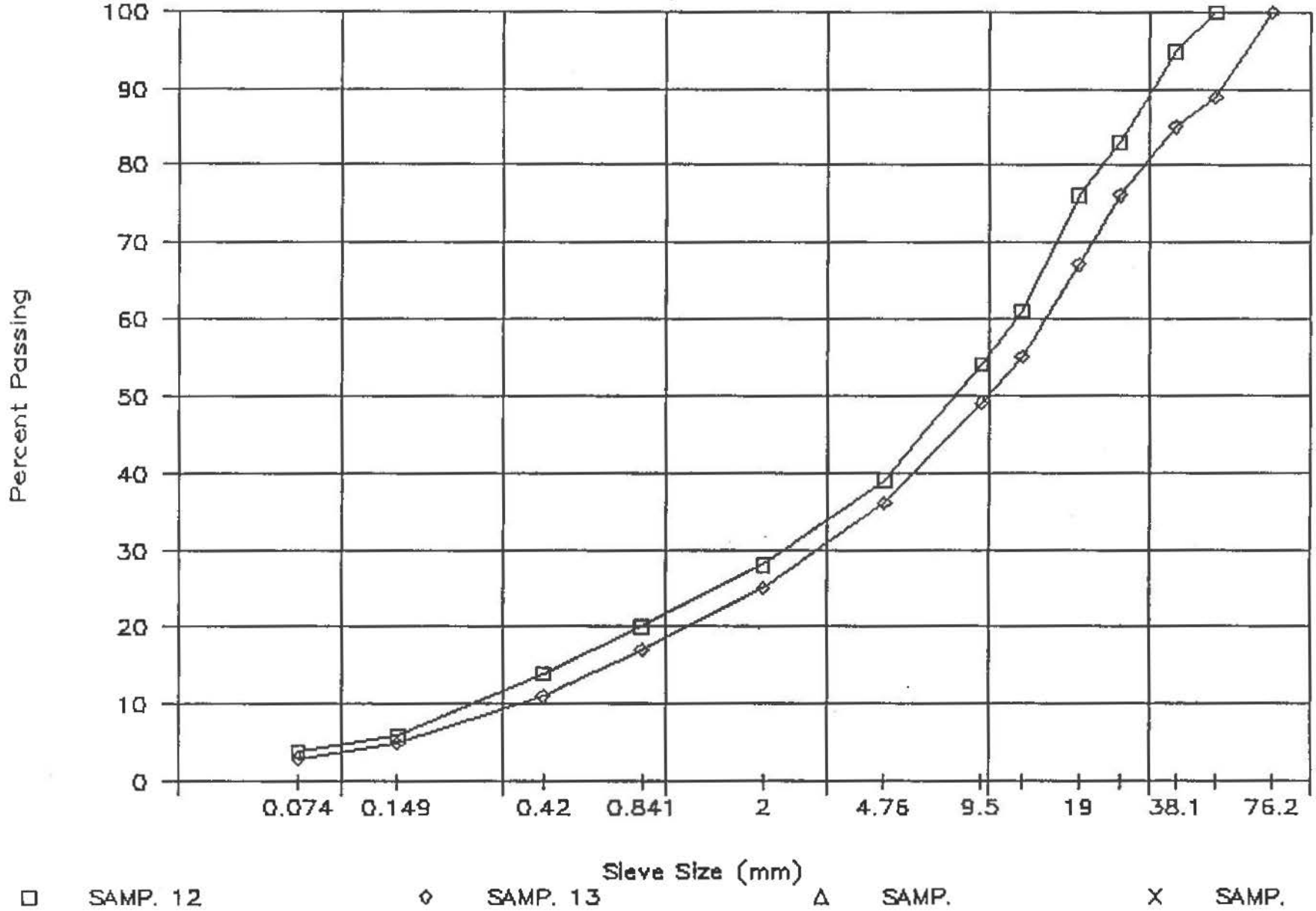
LIMITS
LIQUID: --
PLASTIC: --
P.I.: N.P.

% GRAVEL: 64
% SAND: 33
% FINES: 3

CLASSIFICATION:
WELL-GRADED GRAVEL WITH SAND (GW)

PUBLIC WORKS CANADA — WHITEHORSE, Y.T.

Grain Size Analysis — Hole 156—10



□ SAMP. 12 ◇ SAMP. 13 Δ SAMP. X SAMP.

PROJECT NUMBER:	859167	HOLE NUMBER:	156-11
CLIENT:	PWC/O&M YUKON		
PROJECT NAME:	ALASKA HIGHWAY GRANULAR INVESTIGATION		
PROJECT LOCATION:	A/H KM 1647 RHS		
DRILL UNIT:	BACKHOE: CASE 688		
HOLE LOCATION:	SEE PLAN		
LOGGED BY:	DT	DATE COMPLETED:	91.11.15

FIELD NO: 14
LAB NO: 5426
DEPTH: 0.8-1.2
TYPE: BULK

SIEVE SIZE	PERCENT PASSING
101.6	--
76.2	100
50.8	88
38.1	83
25.4	77
19.0	73
12.7	63
9.5	58
4.76	45
2.38	--
2.00	32
1.19	--
0.841	21
0.595	--
0.42	14
0.297	--
0.177	--
0.149	7
0.074	5

M.C.(%): --

LIMITS
LIQUID: --
PLASTIC: --
P.I.: N.P.

% GRAVEL: 55
% SAND: 41
% FINES: 5

CLASSIFICATION:
WELL-GRADED GRAVEL WITH SILT & SAND (GW-GM)

FIELD NO: 15
LAB NO: 5427
DEPTH: 4.3-4.7
TYPE: BULK

SIEVE SIZE	PERCENT PASSING
101.6	--
76.2	--
50.8	100
38.1	96
25.4	88
19.0	77
12.7	63
9.5	57
4.76	43
2.38	--
2.00	31
1.19	--
0.841	22
0.595	--
0.42	15
0.297	--
0.177	--
0.149	7
0.074	6

M.C.(%): --

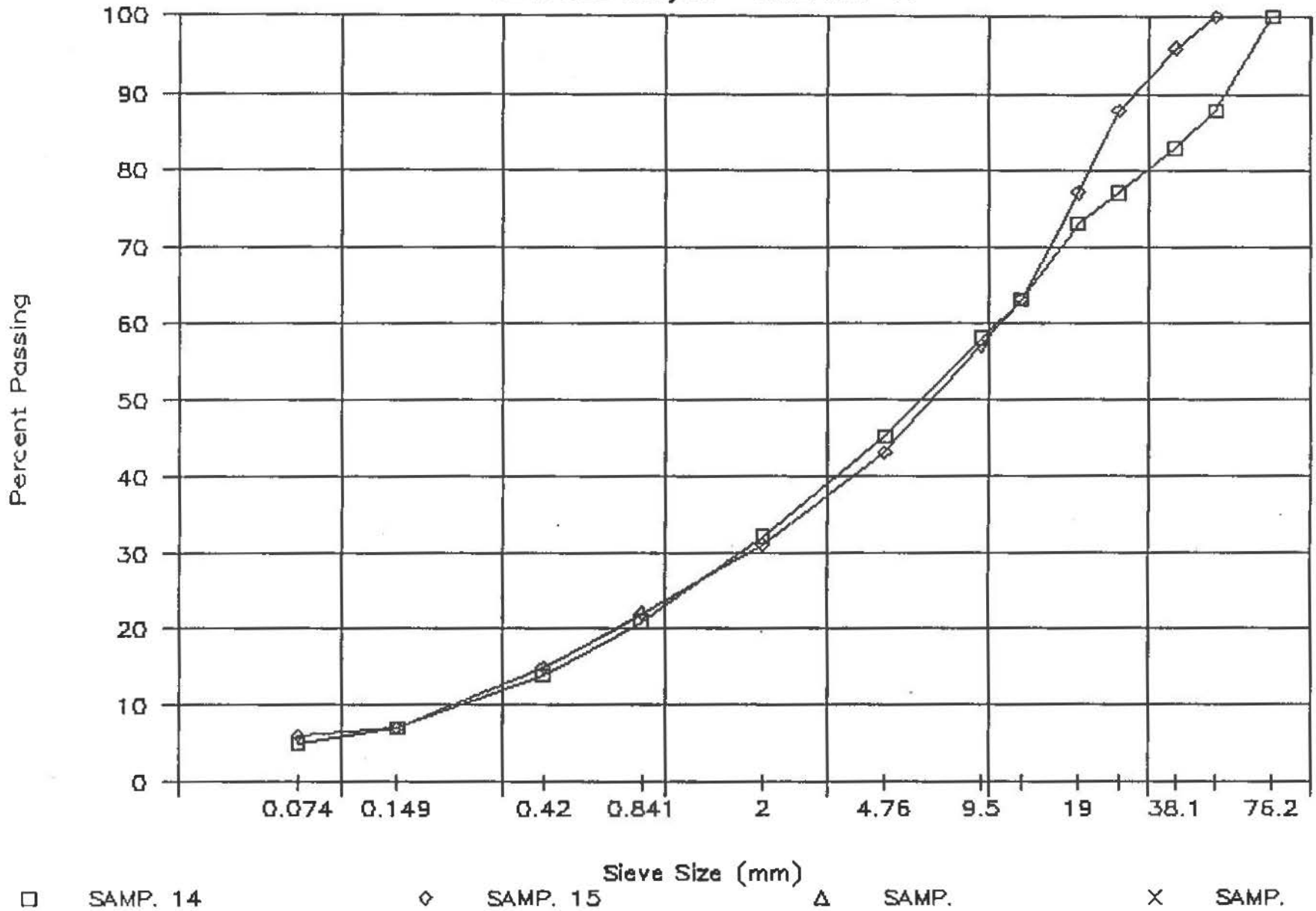
LIMITS
LIQUID: --
PLASTIC: --
P.I.: N.P.

% GRAVEL: 57
% SAND: 38
% FINES: 6

CLASSIFICATION:
WELL-GRADED GRAVEL WITH SILT & SAND (GW-GM)

PUBLIC WORKS CANADA — WHITEHORSE, Y.T.

Grain Size Analysis — Hole 156—11



PROJECT NUMBER: 859167 HOLE NUMBER: 156-13
CLIENT: PWC/O&M YUKON
PROJECT NAME: ALASKA HIGHWAY GRANULAR INVESTIGATION
PROJECT LOCATION: A/H KM 1647 RHS
DRILL UNIT: BACKHOE: CASE 688
HOLE LOCATION: SEE PLAN
LOGGED BY: DT DATE COMPLETED: 91.11.15

FIELD NO: 16
LAB NO: 5428
DEPTH: 1.4-1.8
TYPE: BULK

SIEVE SIZE	PERCENT PASSING
101.6	--
76.2	100
50.8	92
38.1	77
25.4	71
19.0	67
12.7	59
9.5	53
4.76	42
2.38	--
2.00	30
1.19	--
0.841	21
0.595	--
0.42	14
0.297	--
0.177	--
0.149	7
0.074	6

M.C.(%): --

LIMITS
LIQUID: --
PLASTIC: --
P.I.: N.P.

% GRAVEL: 58
% SAND: 37
% FINES: 6

CLASSIFICATION:
WELL-GRADED GRAVEL WITH SILT & SAND (GW-GM)

FIELD NO: 17
LAB NO: 5429
DEPTH: 4.6-5.0
TYPE: BULK

SIEVE SIZE	PERCENT PASSING
101.6	--
76.2	100
50.8	78
38.1	74
25.4	63
19.0	57
12.7	48
9.5	43
4.76	32
2.38	--
2.00	22
1.19	--
0.841	15
0.595	--
0.42	11
0.297	--
0.177	--
0.149	5
0.074	3

M.C.(%): --

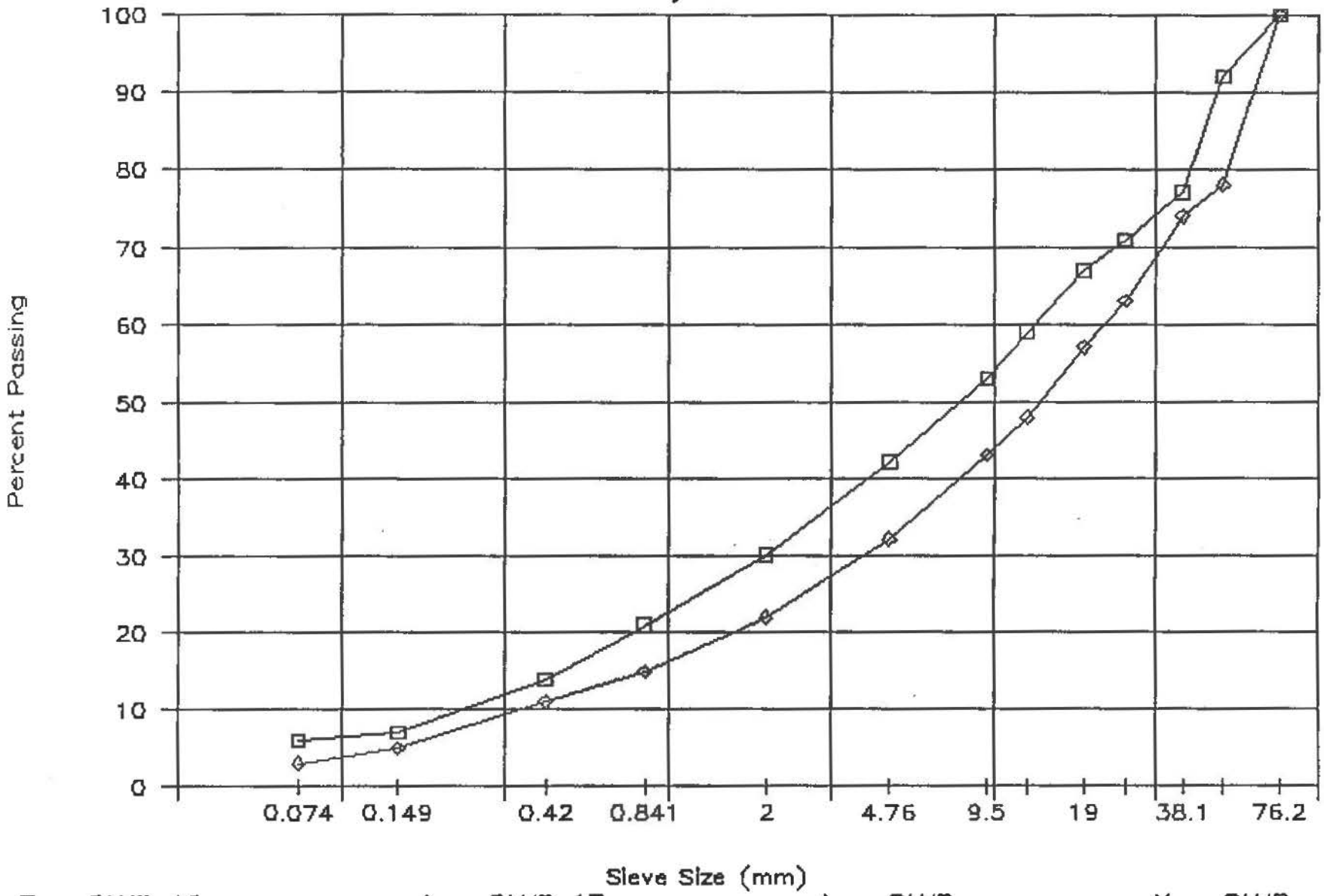
LIMITS
LIQUID: --
PLASTIC: --
P.I.: N.P.

% GRAVEL: 68
% SAND: 29
% FINES: 3

CLASSIFICATION:
WELL-GRADED GRAVEL WITH SAND (GW)

PUBLIC WORKS CANADA — WHITEHORSE, Y.T.

Grain Size Analysis — Hole 156—13



□ SAMP. 16 ◇ SAMP. 17 △ SAMP. X SAMP.

PROJECT NUMBER: 859167 HOLE NUMBER: 156-14
CLIENT: PWC/O&M YUKON
PROJECT NAME: ALASKA HIGHWAY GRANULAR INVESTIGATION
PROJECT LOCATION: A/H KM 1647 RHS
DRILL UNIT: BACKHOE: CASE 688
HOLE LOCATION: SEE PLAN
LOGGED BY: DT DATE COMPLETED: 91.11.15

FIELD NO: 18
LAB NO: 5430
DEPTH: 1.4-1.8
TYPE: BULK

SIEVE SIZE	PERCENT PASSING
101.6	--
76.2	--
50.8	--
38.1	--
25.4	--
19.0	--
12.7	--
9.5	--
4.76	--
2.38	--
2.00	--
1.19	--
0.841	--
0.595	--
0.42	--
0.297	--
0.177	--
0.149	--
0.074	--

M.C.(%): --

LIMITS
LIQUID: --
PLASTIC: --
P.I.: N.P.

% GRAVEL: --
% SAND: --
% FINES: --

CLASSIFICATION:

FIELD NO: 19
LAB NO: 5431
DEPTH: 4.1-4.5
TYPE: BULK

SIEVE SIZE	PERCENT PASSING
101.6	--
76.2	--
50.8	100
38.1	91
25.4	79
19.0	74
12.7	65
9.5	61
4.76	52
2.38	--
2.00	44
1.19	--
0.841	38
0.595	--
0.42	34
0.297	--
0.177	--
0.149	21
0.074	13

M.C.(%): --

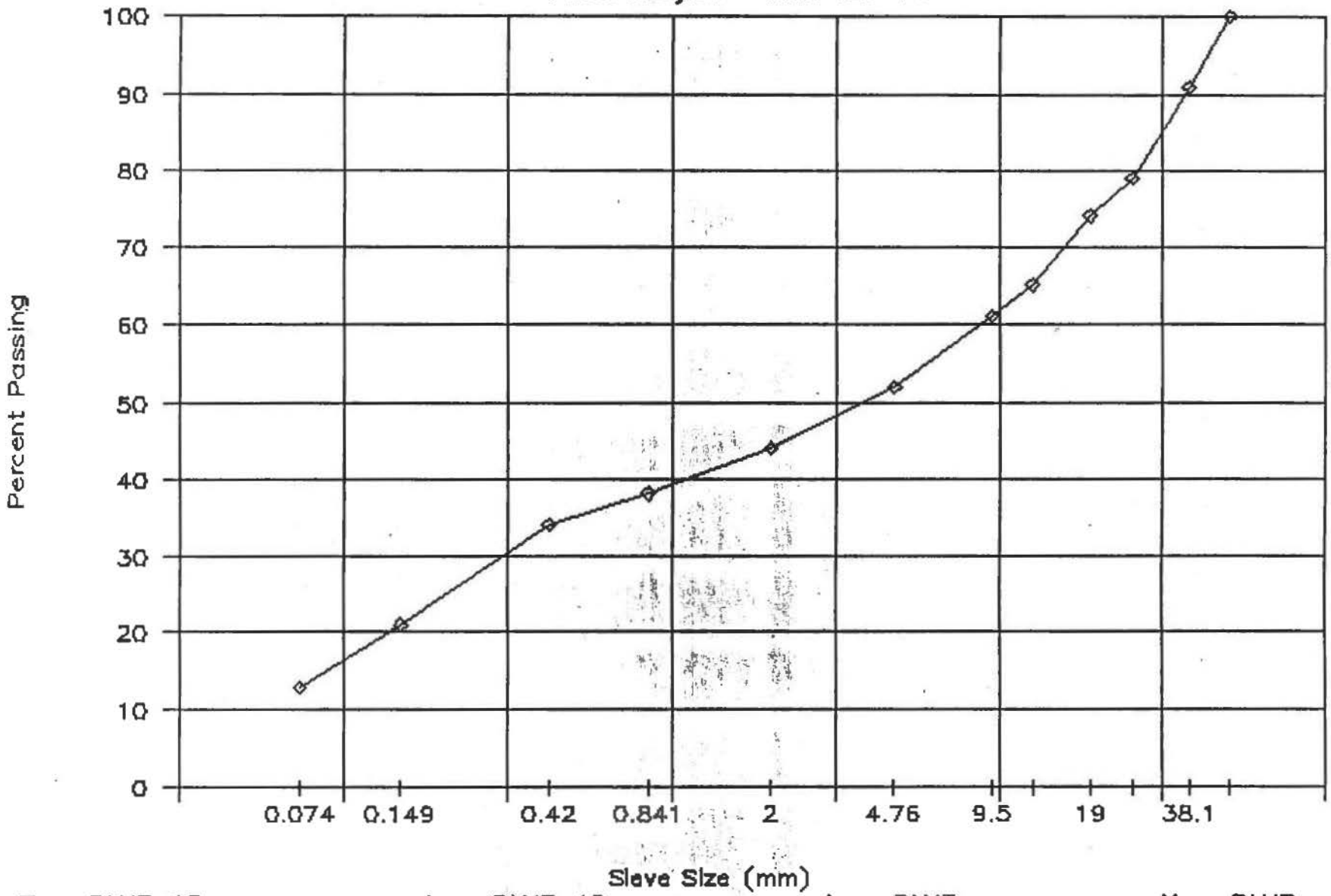
LIMITS
LIQUID: --
PLASTIC: --
P.I.: N.P.

% GRAVEL: 48
% SAND: 39
% FINES: 13

CLASSIFICATION:
SILTY GRAVEL
WITH SAND (GM)

PUBLIC WORKS CANADA — WHITEHORSE, Y.T.

Grain Size Analysis — Hole 156—14



□ SAMP. 18 ◇ SAMP. 19 Δ SAMP. X SAMP.

APPENDIX B

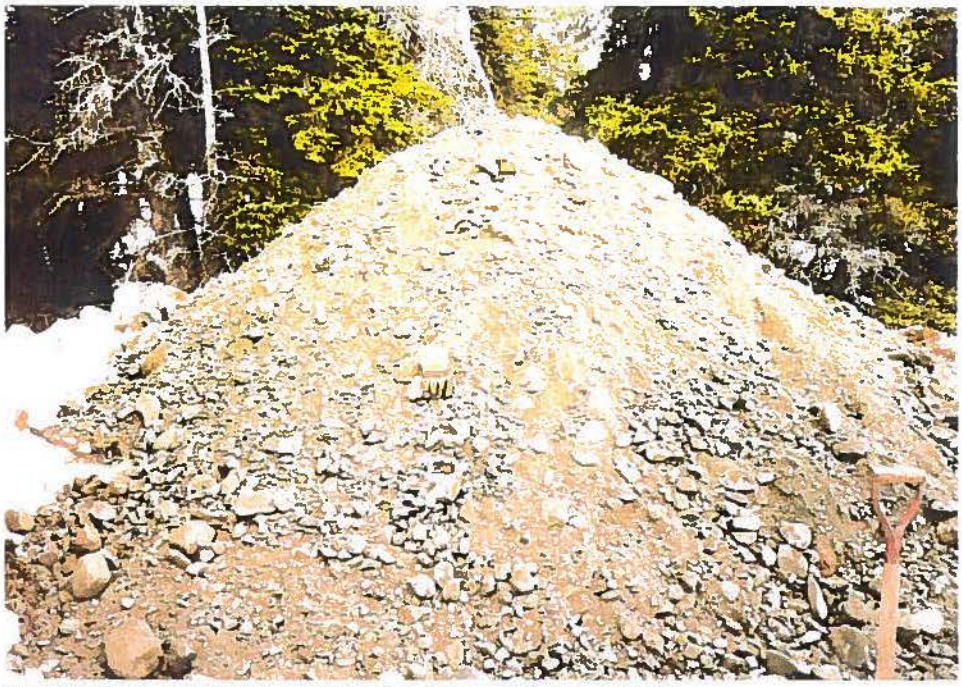
km 1647 R.H.S.

(PHOTO OVEREXPOSED - UNAVAILABLE)

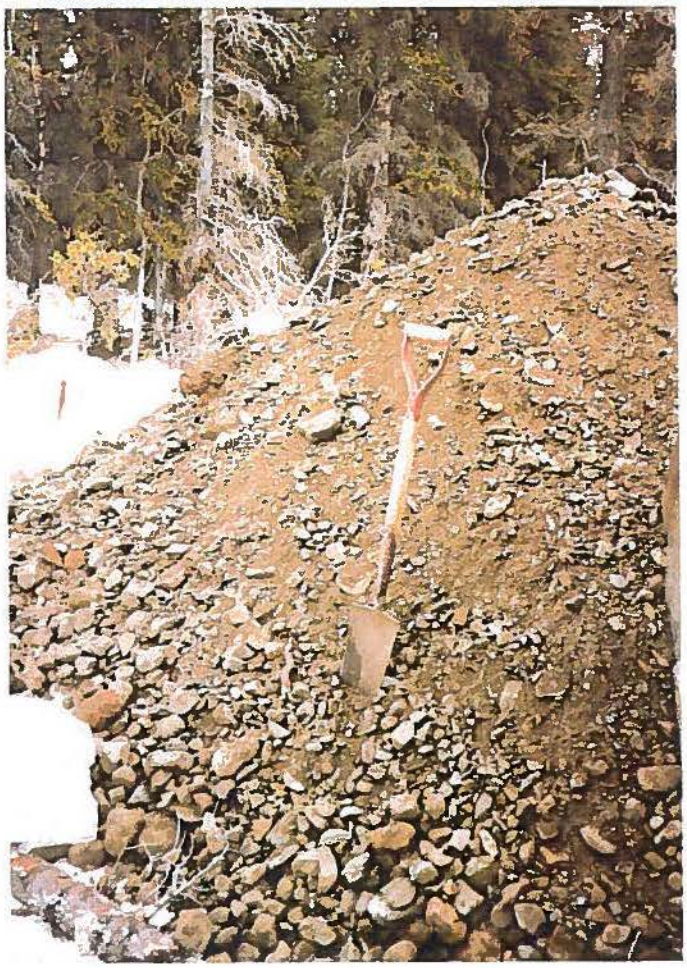
TP 92-001E

TP 92-002E

km 1647 R.H.S.



TP 92-003E



TP 92-004E

km 1647 R.H.S.

TP 92-005E

TP 92-006E

km 1647 R.H.S.

TP 92-007E

TP 92-008E

km 1647 R.H.S.

TP 92-009E

TP 92-010E

km 1647 R.H.S.

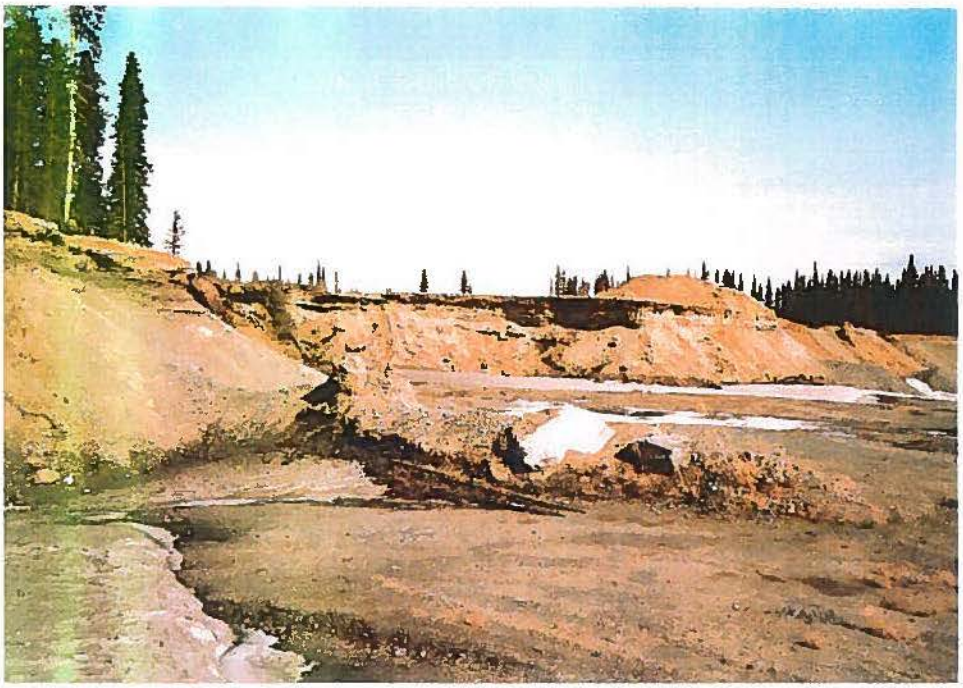
TP 92-011E

TP 92-012E

km 1647 R.H.S.

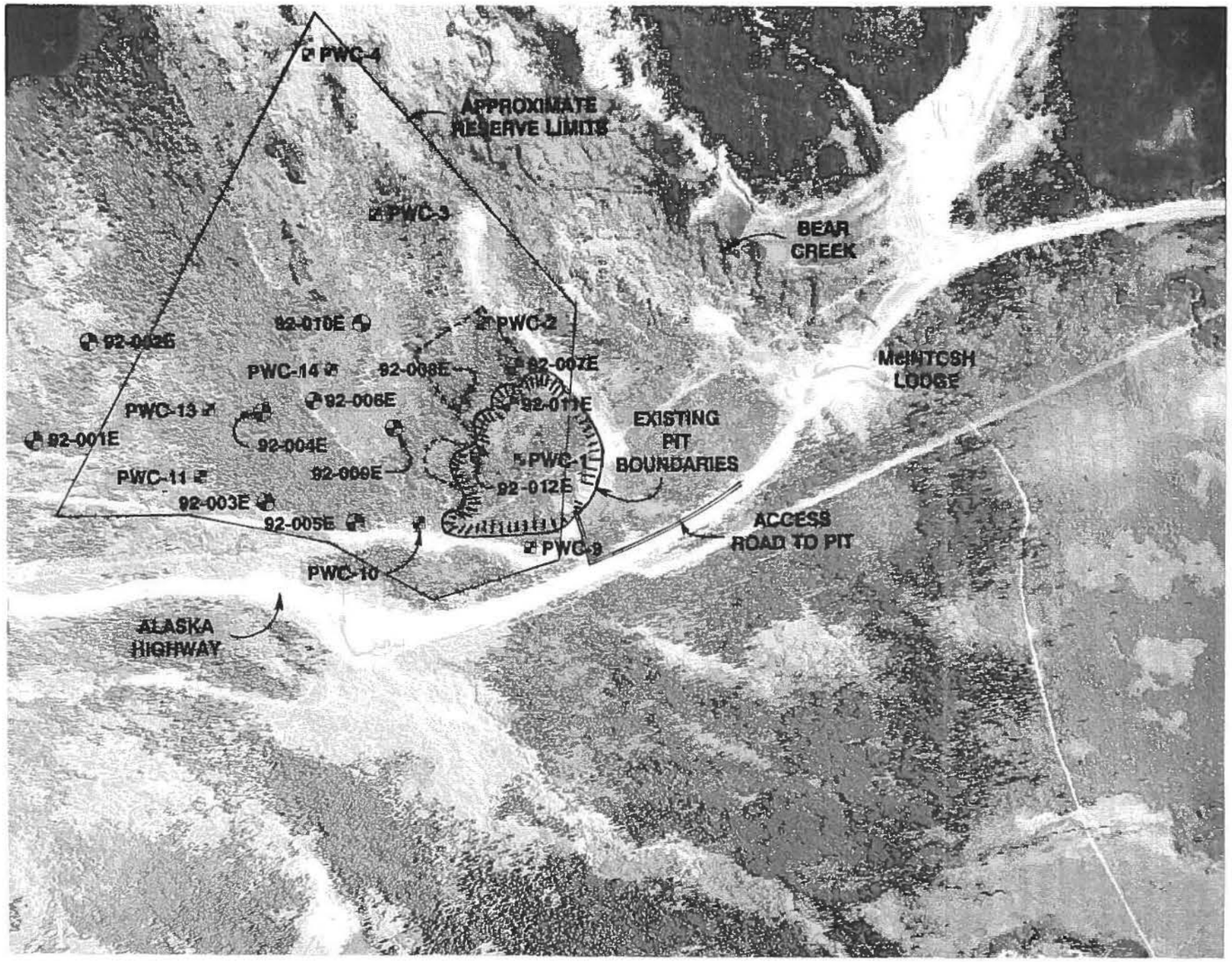
TYPICAL PIT EXPOSURES - NORTH SIDE OF PIT
NOTE SILT OVERBURDEN AND LENSES
IN TOP 1.5 M OF PIT FACE

km 1647 R.H.S.



TYPICAL PIT EXPOSURE - EAST SIDE OF PIT

NOTE SILT OVERBURDEN AND LENSES
IN TOP 1.5 m OF PIT FACE



1992 TESTPITS (EBA ENGINEERING)

1991 TESTPITS (PWC)

GRANULAR SOURCE: km 1647 R.H.S.
NORTH ALASKA HIGHWAY

APPROXIMATE SCALE OF AIR PHOTO
1:8000

EBA Engineering Consultants Ltd.			PROJECT GRANULAR SOURCE EVALUATION	
CLIENT GOVERNMENT OF YUKON			TITLE SITE PLAN SHOWING RECENT TESTHOLE LOCATIONS	
DATE 92-04-18	DWN. MCP	CHKD.	FILE NO. 0201-10923	10923-A-01

GR-01
012