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GEOTECHNICAL INVESTIGATION
ALASKA HIGHWAY, KILOMETER 1322, RIGHT,
YUKON TERRITORY
APRIL, "1992"

HOGGAN ENGINEERING & TESTING
(1980) LTD.

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Original Report

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ALASKA HIGHWAY, KILOMETER 1322, RIGHT,
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HOGGAN ENGINEERING & TESTING (1980) LTD.

REPORT NUMBER: 8002-219

GEOTECHNICAL INVESTIGATION
ALASKA HIGHWAY, KILOMETER 1322, RIGHT,
YUKON TERRITORY, "1992"

PREPARED BY:

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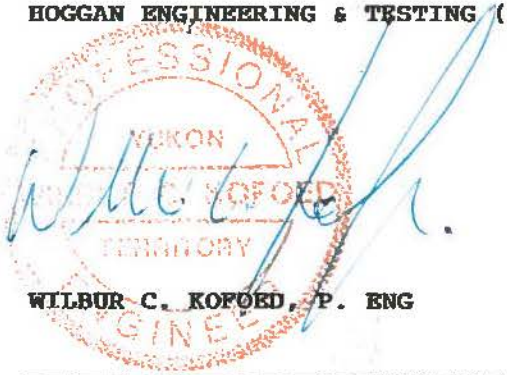

WILBUR C. KOPOED, P. ENG

APRIL, 1992

HOGGAN ENGINEERING & TESTING (1980) LTD.
14 BURNS ROAD
WHITEHORSE, YUKON TERRITORY
Y1A 4Y9

REPORT NUMBER: 8002-219

GEOTECHNICAL INVESTIGATION
ALASKA HIGHWAY, KILOMETER 1322, RIGHT,
YUKON TERRITORY, "1992"

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HOGGAN ENGINEERING & TESTING (1980) LTD.

GEOTECHNICAL INVESTIGATION

PROJECT: **Geotechnical Investigation**
Teslin Airport Upgrading
Teslin, Yukon Territory

LOCATION: **Kilometer 1322, Right, Alaska Highway**

CLIENT: **Government of Yukon**
Community and Transportation Services
Transportation Engineering Branch S-3
Box 2703
Whitehorse, Yukon
Y1A 2C6

Attention: Mr. Iain Blown, Geotechnical Projects Manager

INTRODUCTION

This report presents the results of the geotechnical investigation conducted at Kilometer 1322, right of the Alaska Highway (Kilometer 1322.7 being approximately the Deadman Creek crossing of the Alaska Highway).

The objective of the investigation was to obtain subsurface soil profile data to detail the potential of the proposed gravel borrow source for airport runway construction materials. These materials include Transportation Engineering Branch designated Granular "E" and Granular "F" aggregates

The requirements for the proposed production of Granular "E" aggregates was estimated at 40,000 cubic meters. The total requirement for Granular "F" aggregate was 10,000 cubic meters. However, future production requirements, of Granular "F", would be based on the quantity and quality of an existing crush stockpile located on the site.

The investigation of the potential borrow source consisted of conducting a test pit excavating program and a onsite reconnaissance of the potential borrow area. During the field program accurate test pit logs were maintained with pertinent soils information noted. Also, during excavating soil samples were obtained for laboratory testing which included moisture content and grainsize determination on all samples retained.

Authorization to proceed with this investigation was received from Iain Blown, Geotechnical Projects Manager of Yukon Territory Government, Community and Transportation Services, Transportation Engineering Branch, on March 20, 1992.

SITE DESCRIPTION

The investigation area was located right of the Alaska Highway between 670 meters and 1470 meters south of the Deadman Creek Bridge on the Alaska Highway. The site extended right (east) from 30 to 280 meters of the Alaska Highway. This site is an existing gravel reserve for which the legal description has been enclosed in Appendix I of this report.

The site was the remnants of the Deadman Creek outwash deposit.

The natural land features on the east and north portions of the site generally consisted of ridges which traverse the site from the east to the north west, approximately paralleling Deadman Creek. The various ridges vary in relief up to 2 meters. The exception is a hill located on the south east corner of the site which borders the outwash deposit.

The west and center portions of the site consist of previous and existing quarry operation workings. These include:

- Waste overburden disposal site.
- Crushed aggregate stockpile site.
- Existing small private quarry operations.
- Previous quarry deposit area.

The investigated area was cleared of tree growth from the south gravel reserve limit to 300 meters north, on the east reserve boundary, and to 550 meters north, on the west reserve boundary. The north limit of clearing is approximated by the low marsh area (which is predominate on the north portion of the site) with mainly willow growth.

SUBSURFACE SOIL PROFILES AND AGGREGATE ASSESSMENT

The subsurface soil investigation consisted of excavating 13 test pits within the south east portion of the existing gravel reserve. The location of the test pits have been shown on a site sketch enclosed in the appendix of this report.

The soil profiles noted at the individual test pit locations tended to vary substantially between locations. These variations included overburden depths, granular stratum depths, and the depth to the underlying glacial till and sedimentary silt and clay deposits.

The variations in the soil profiles noted in this investigation are similar to those noted during our firm's past experience with quarry operations on this reserve. These variations would be expected in consideration of the geologic outwash nature of the deposits.

The subsurface soil profiles are given in detail on the soil profile logs enclosed in Appendix "B" of this report. However, in general, the subsurface soil profiles consisted of surface organic stratums up to 300 millimeter in depth with an average depth of 100 millimeters. Underlying the organic materials were moist, non plastic, sandy silts, silt sands and sands (fine to medium grained sands) which extended to, on average, 0.7 meters below the ground surface and ranged in depths between 0.2 meters and the full depth of Test Pit 29-92. The surface sands with silt were underlain by clean, (1.0% to 3.0% silt) sandy gravel materials with medium to coarse grained sands and up to 30 percent cobbles and boulders in size to 450 millimeters with the odd boulder to 750 millimeters. The granular materials are underlain silt and clay tills and sedimentary deposits. The silt and clay materials are moist to wet with low to medium plasticity.

The materials encountered on this site would be considered as follows for the following construction materials.

GRANULAR "E" Fair to Good

- **Screening of plus 200mm oversize material will be required, oversize quantity may vary to 20%.**

- **The addition of surface sandy silts and silty sand for binder would be recommended.**

GRANULAR "F" Fair to Good

- **The addition of surface sandy silts and silty sand for binder would be recommended (100mm of overburden per 1000mm of granular depth, estimate).**

- **Assuming minus 300 millimeter material to be processed oversize reject may vary to 10%.**

PROJECTED AGGREGATE QUANTITY

The estimated quantity of attainable granular material within the granular reserve would be 21,500 cubic meters. This quantity of aggregate was as noted in two separate areas, encompassing Test Pits 25-92, 26-92, 27-92, 34-92, and Test Pits 31-92, 32-92. This quantity was estimated assuming all overburden materials would be removed and that the full, on average, depth of gravel of 1.95 meters would be mined.

For this investigation no quantities were assumed adjacent to Test Pits 22-92, 23-92, 24-92, 28-92, 29-92, 30-92 and 34-92. Granular quantities were not estimated from these areas for various reasons including lack of suitable granular material (Test Pits 24-92 and 29-92), insufficient depth of granular material (Test Pits 22-92, 23-92, 30-92 and 33-92) and excessive depth of overburden (Test Pit 28-92).

The existing granular stockpile located on the Kilometer 1322, right granular reserve was sampled as part of this investigation. The grainsize analyses completed on the samples indicate that the material is suitable for Granular "F", 20 millimeter crushed runway surfacing aggregate. The quantity of material in the stockpile was estimated at 15,000 to 20,000 cubic meters. This estimate was obtained by taping the pile base and visually estimating the stockpile height. The stockpile appears to be relatively untouched from the original crush pile, thus Government of Yukon crusher control documentation may be used to verify exact quantity and quality of existing materials.

SITE DEVELOPMENT

The materials quantified during this investigation indicate that the Granular "F" requirements of 10,000 cubic meters could be obtained from the existing stockpile. However, we feel that an insufficient quantity of granular material exists to meet the requirements of 40,000 cubic meters of Granular "E".

The estimate quantity of Granular "E" materials on this site would be 21,500 cubic meters.

The future development of this site to obtain the 21,500 cubic meter reserve of granular material would include the following:

-Site Access Development
- -Generally good, however, some upgrading of existing trails and accesses to proposed quarry deposits would be required.

-Site Clearing
- -The proposed quarry deposits are generally cleared with the exception of a 1.5 to 2.0 hectare area adjacent to Test Pit 34-92. The vegetation cover consisted of young to mature, medium dense poplar and spruce with some birch.

-Overburden Removal
- -Relatively large quantities of overburden will require removal to access granular deposits. The depths of overburden noted in the proposed quarry deposits varied between 0.45 meters and 1.00 meters with an average depth of 0.70 meters. Utilizing the average depth a total quantity of overburden would be 9,000 cubic meters (Note: Large variations in overburden depths may be encountered over short distances).

In utilizing this site for Granular "E" production screening of plus 200 millimeter site material will be required (up to 20%). Also, in consideration of the clean and medium to coarse sand materials a varying amount of the surface overburden materials should be utilized as binder material.

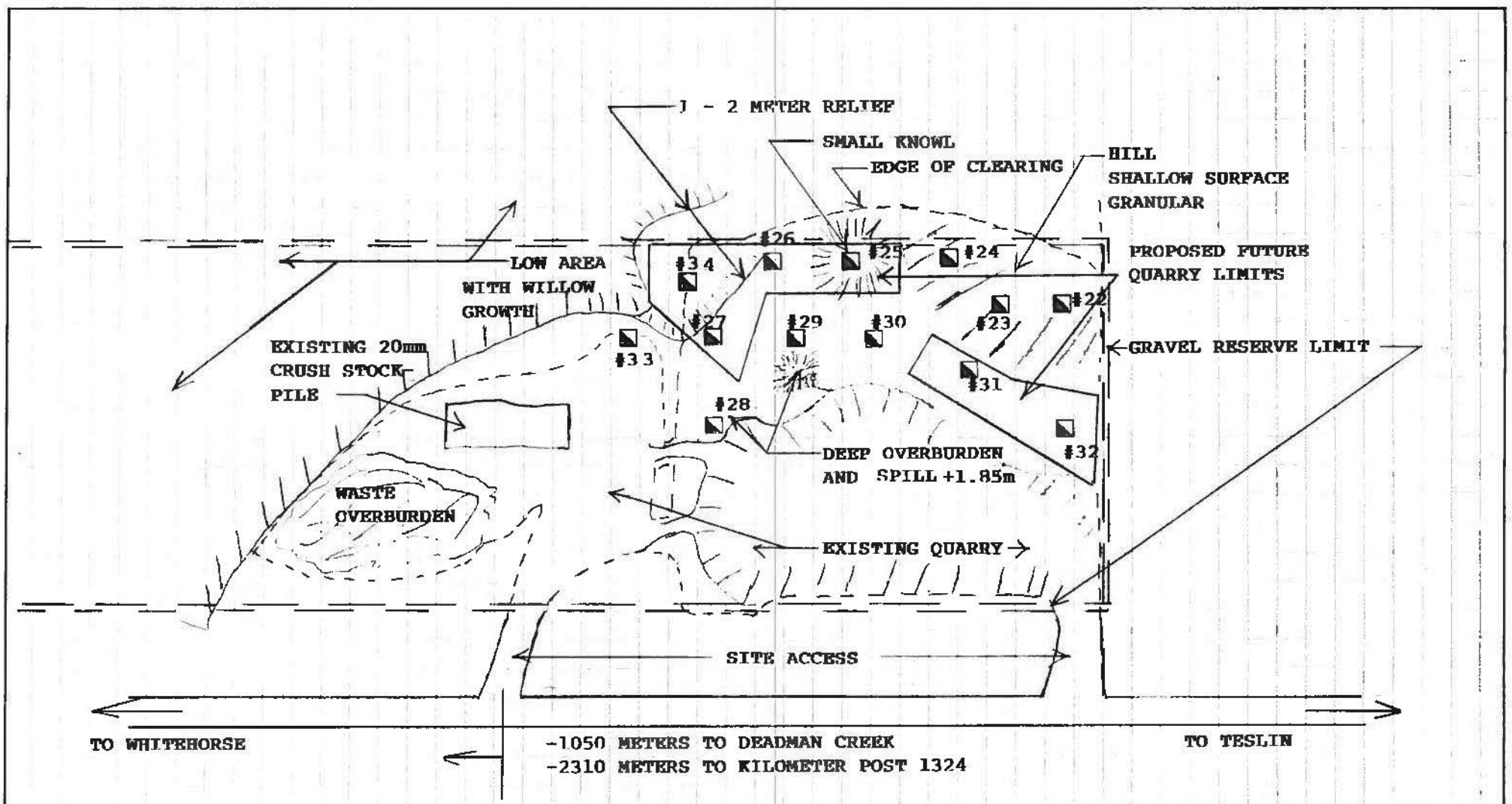
The underlying glacial till and sedimentary deposits will likely show some loss of bearing capacity with repeated truck or loader traffic which may result in rutting. Thus, grading of the pit bottom during the quarry operation may be required.

Following the mining of the proposed quarry deposits noted in this investigation this granular reserve would generally be considered depleted. The exception would be small scale quarry operations possibly up to the magnitude of 1,000 to 3,000 cubic meters.

SUPPLEMENTAL

The comments given are based on the subsurface soil conditions encountered during the test pit excavating program. Due to geological randomness of many soils formations, no interpolation of soil conditions between test holes had been made or implied. Soil conditions are known only at the test hole locations.

APPENDIX "A"
-Site Sketch
-Air Photo Laser Copy
-Legal Description, Kilometer 1322, Right, Granular Reserve



■ -#00, TEST PIT LOCATION AND NUMBER (TP#00-92)

J. R. Paine & Associates Ltd.
CONSULTING AND TESTING ENGINEERS

GEOTECHNICAL INVESTIGATION
KILOMETER 1322, RIGHT,
ALSKA HIGHWAY, YUKON

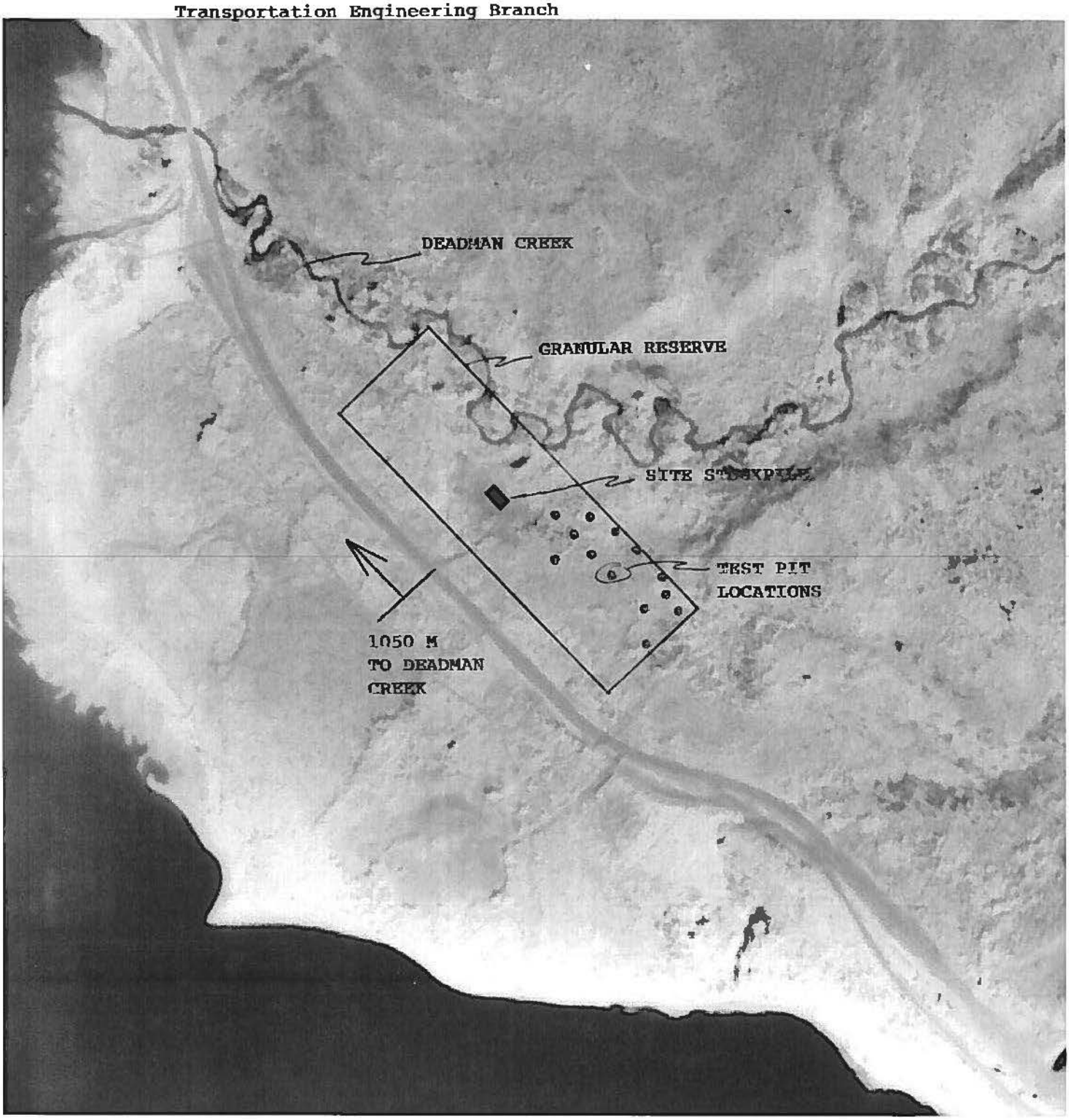
Dwn. By WCK	Date 1992/04/29
Scale APPROX 1 - 400	Plate No. 1

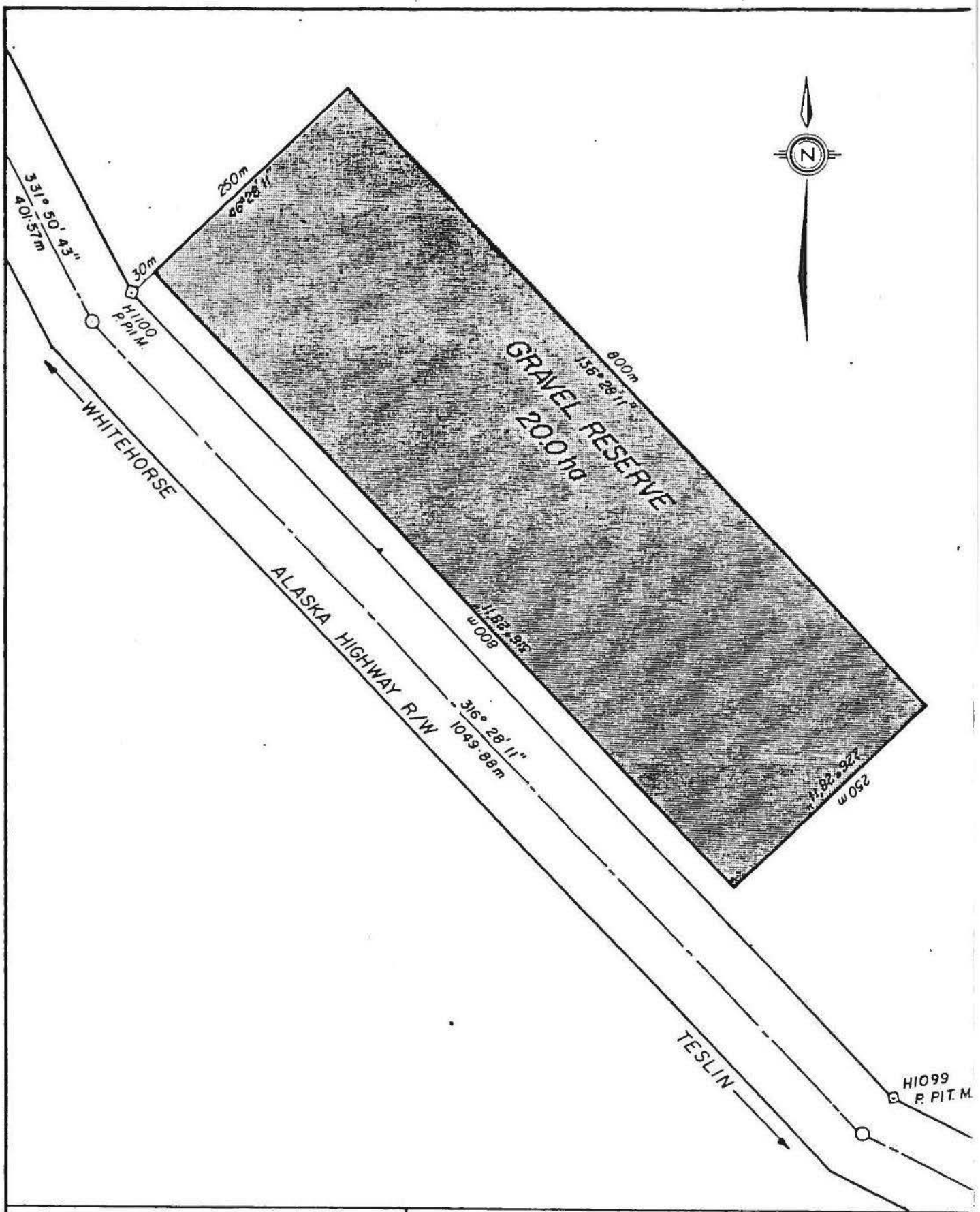
PROJECT: Geotechnical Investigation
Alaska Highway, Kilometer 1322, Right,
Yukon Territory, "1992"

FILE: 8002-219

CLIENT: GOVERNMENT OF YUKON
Community and Transportation Services
Transportation Engineering Branch

DATE: 1992/04/30





Public Works Canada

Design / Construction

Pacific Region

Whitehorse Y.T

Drawing title:

GRAVEL RESERVE

ALASKA HIGHWAY

km 1322.0

R.H.S.

designed by: date:	B.C.F.
drawn by: date:	R.L. OCT. '81
scale:	1:5000
approved by: date	
project no:	dwg. no 22-494

APPENDIX "B"
-Test Pit Logs

YTG, C&T SERVICES, TRANSPORTATION ENG.	KM 1322 ALASKA HIGHWAY, GEOTECHNICAL	BOREHOLE No. TP#22-92
DEADMAN CREEK ENTERPRISES		Project No: 8002-219
YUTANI EXCAVATOR		ELEVATION 0.00 (m)

SAMPLE TYPE: TUBE | GRAB | AUGER | BULK | SPT | CORE

DEPTH (m)	SAMPLE TYPE	SAMPLE NO	SOIL DESCRIPTION	USC	DEPTH (m)
0.0			-silt with rootlets, brown	ML-PT	0.0
			0.30M		
		1	-sandy gravel, to 30% cobbles in size to to 300mm, medium to course sand, damp, medium dense, brown	GW	
1.0			0.80M		1.0
			Seasonal frost to 1.00M		
		2	-sand, fine to medium, trace to some silt, odd gravel, to silty sand in seams throughout(100mm seams), medium dense, moist, brown	SM	
2.0					2.0
3.0					3.0
		3	-silt, trace to some sand, laminated with fine sand seams, trace of oxidation, moist, medium dense, grey-brown	ML-CL	
4.0			End of hole @ 3.60M No bulk sample		4.0
5.0					5.0
6.0					6.0
7.0					7.0
8.0					8.0

LIQUID 10 20 30 40 | PLASTIC 10 20 30 40 | PLASTIC — N.C — LIQUID 10 20 30 40

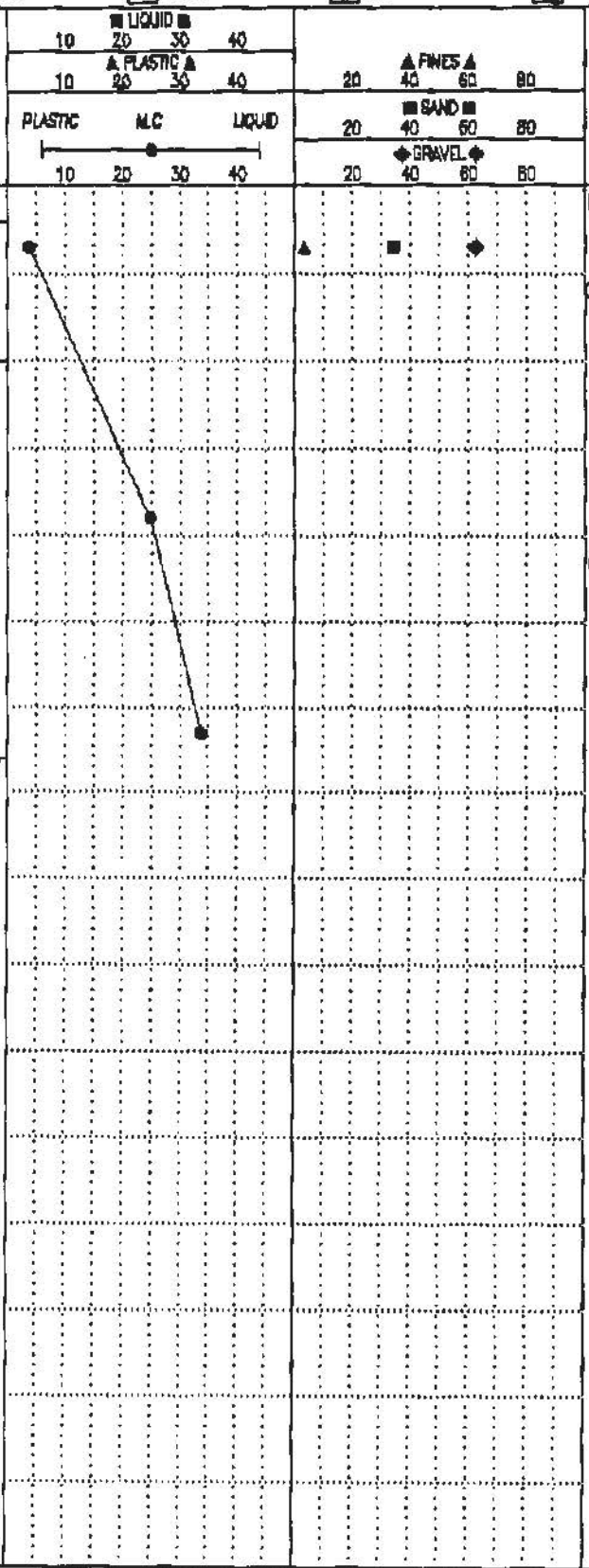
FINES 20 40 60 80 | SAND 20 40 60 80 | GRAVEL 20 40 60 80

J.R. Paine and Associates Ltd. Edmonton, Alberta	COMPLETION DEPTH 3.6 m	COMPLETE 92/03/26	
	LOGGED BY WCK	DWG NO.1	Page 1 of 1

YTG, C&T SERVICES, TRANSPORTATION ENG.	KM 1322 ALASKA HIGHWAY, GEOTECHNICAL	BOREHOLE No. TP#23-92
DEADMAN CREEK ENTERPRISES		Project No: 8002-219
YUTANI EXCAVATOR		ELEVATION 0.00 (m)

SAMPLE TYPE: TUBE | LOST | AUGER | BULK | SPT | CORE

DEPTH (m)	SAMPLE TYPE	SAMPLE NO	SOIL DESCRIPTION
0.0			-silt with rootlets, brown
			0.20M
		4	-sandy gravel, trace of silt, with fine sand seams to 50mm, 15-20% cobbles in size to 300mm, medium dense, damp, brown
1.0			1.00M
			Seasonal frost to 1.00M
2.0		5	-silt, clayey silt in laminations to 25mm, medium dense, moist, grey-brown
3.0		6	-silt, clayey silt in laminations to 100mm, moist, medium dense, grey-brown
			End of hole @ 3.30M
4.0			No bulk sample
5.0			
6.0			
7.0			
8.0			



USC: ML-PT | GW-GM | ML-CL

DEPTH (m): 0.0 | 1.0 | 2.0 | 3.0 | 4.0 | 5.0 | 6.0 | 7.0 | 8.0

J.R. Paine and Associates Ltd.
Edmonton, Alberta

COMPLETION DEPTH 3.3 m		COMPLETE 92/03/26
LOGGED BY WCK	DWG NO.2	Page 1 of 1

YTG, C&T SERVICES, TRANSPORTATION ENG.	KM 1322 ALASKA HIGHWAY, GEOTECHNICAL	BOREHOLE No. TP#24-92
DEADMAN CREEK ENTERPRISES		Project No: 8002-219
YUTANI EXCAVATOR		ELEVATION 0.00 (m)

SAMPLE TYPE ■ TUBE ⧄ LOST ⊠ AUGER ▤ BULK ▥ SPT ▥ CORE

DEPTH (m)	SAMPLE TYPE	SAMPLE NO	SOIL DESCRIPTION	USC	DEPTH (m)
0.0			-100mm of organics -silts, with sandy gravel and rootlets, brown	PT GM-PT	0.0
			0.45M		
1.0		7	-silts, clayey silt in laminations to 25mm, moist, medium dense, grey Seasonal frost to 0.70M	ML-CL	1.0
2.0		8	-silt, clayey silt in laminations to 100mm, medium dense, moist-wet, grey		2.0
			End of hole @ 2.50M		
3.0					3.0
4.0			No bulk sample		4.0
5.0					5.0
6.0					6.0
7.0					7.0
8.0					8.0

■ LIQUID ■ 10 20 30 40
▲ PLASTIC ▲ 10 20 30 40
PLASTIC N.C LIQUID 10 20 30 40
▲ FINES ▲ 20 40 60 80
■ SAND ■ 20 40 60 80
◆ GRAVEL ◆ 20 40 60 80

J.R. Paine and Associates Ltd.
Edmonton, Alberta

COMPLETION DEPTH 2.5 m		COMPLETE 92/03/26
LOGGED BY WCK	DWG NO.3	Page 1 of 1

YTG, C&T SERVICES, TRANSPORTATION ENG.	KM 1322 ALASKA HIGHWAY, GEOTECHNICAL	BOREHOLE No. TP#25-92
DEADMAN CREEK ENTERPRISES		Project No: 8002-219
YUTANI EXCAVATOR		ELEVATION 0.00 (m)

SAMPLE TYPE ■ TUBE ⧄ LOST ☒ AUGER ▤ BULK ▯ SPT ▮ CORE

DEPTH (m)	SAMPLE TYPE	SAMPLE NO	SOIL DESCRIPTION
0.0			-organics
		9	0.15M
			-silty sand, fine sand, medium dense, some rootlets, moist, brown
			Seasonal frost to 0.40M
			0.60M
1.0			-sandy gravel, 15-20% cobbles in size to 300mm, odd boulder to 400mm in size, medium dense, medium to course sand, damp, brown
		10	
2.0			
			-sand seam, clean, fine to medium, brown
		11	-sandy gravel, 5-10% oversize to 200mm, medium dense, medium to course sand, moist, brown
3.0			-2 boulders in size to 750mm
		12	3.00M
			-silt, clayey silt, moist to wet laminated to 100mm, medium dense, brown
4.0			End of hole @ 3.60M
			-Bulk sample # 25A-92, 0.60-3.00M
			-sandy gravel, GW
			-64.4% gravel
			-32.8% sand
5.0			-2.8% silt
			-subangular to subround rock
6.0			
7.0			
8.0			

■ LIQUID ■ 10 20 30 40
▲ PLASTIC ▲ 10 20 30 40
PLASTIC M.C LIQUID 10 20 30 40

▲ FINES ▲ 20 40 60 80
■ SAND ■ 20 40 60 80
◆ GRAVEL ◆ 20 40 60 80

USC	DEPTH (m)
PT	0.0
SM	
	1.0
GW	
	2.0
GW	
SP	
GW	3.0
ML-CL	
	4.0
	5.0
	6.0
	7.0
	8.0

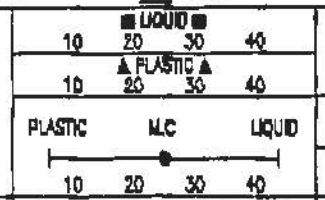
J.R. Paine and Associates Ltd.
Edmonton, Alberta

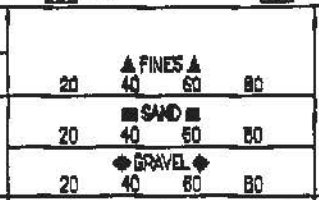
COMPLETION DEPTH 3.6 m		COMPLETE 92/03/26
LOGGED BY WCK	DWG NO.4	Page 1 of 1

YTG, C&T SERVICES, TRANSPORTATION ENG.	KM 1322 ALASKA HIGHWAY, GEOTECHNICAL	BOREHOLE No. TP#26-92
DEADMAN CREEK ENTERPRISES		Project No: 8002-219
YUTANI EXCAVATOR		ELEVATION 0.00 (m)

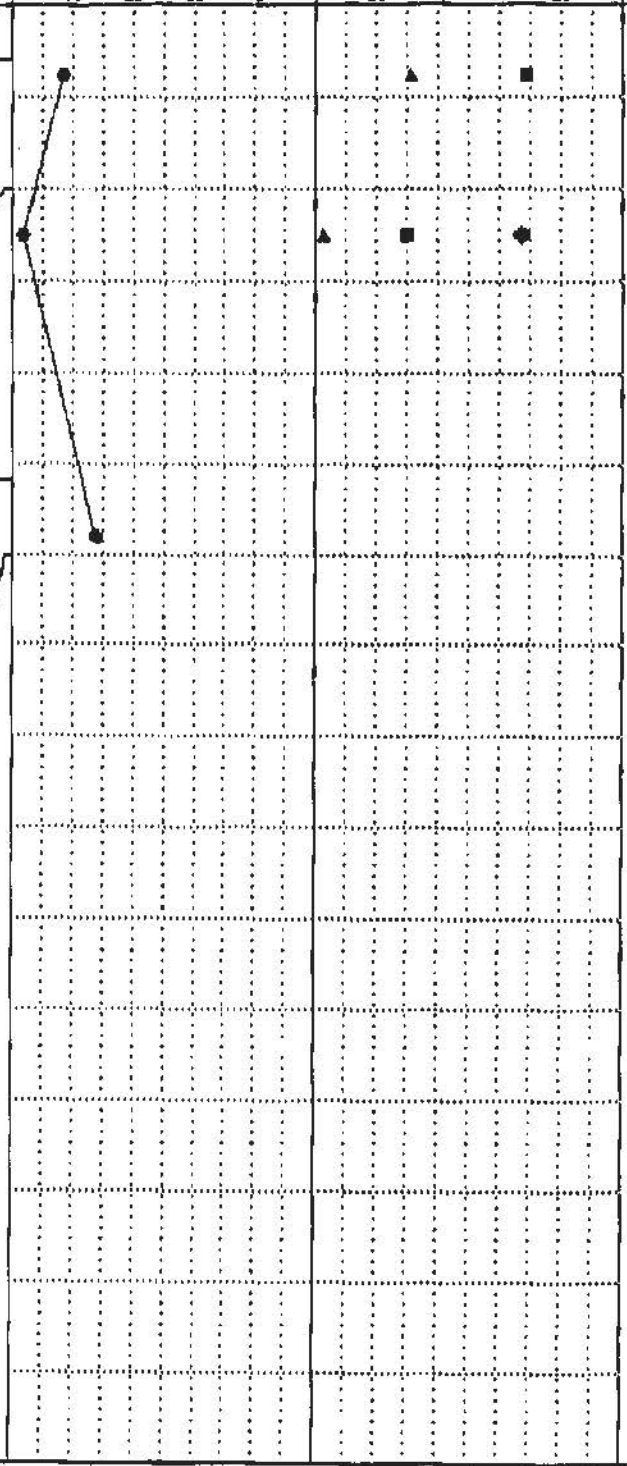
SAMPLE TYPE: TUBE | LOST | AUGER | BULK | SPT | CORE

DEPTH (m)	SAMPLE TYPE	SAMPLE NO	SOIL DESCRIPTION
0.0			-organics
		13	0.30M Seasonal frost to 0.30M -sand, fine to medium grained, with silt and clayey silt seams to 50mm, medium dense, moist, brown
1.0			1.00M
		14	-sandy gravel, 15-20% cobbles and boulders in size to 400mm, damp, medium dense, brown
2.0			
			2.60M
3.0		15	-sandy silt to silty sand, odd gravel in size, till, dense, moist, dark brown End of hole @ 3.00M
4.0			No bulk sample
5.0			
6.0			
7.0			
8.0			





USC: PT | SM | GW | ML

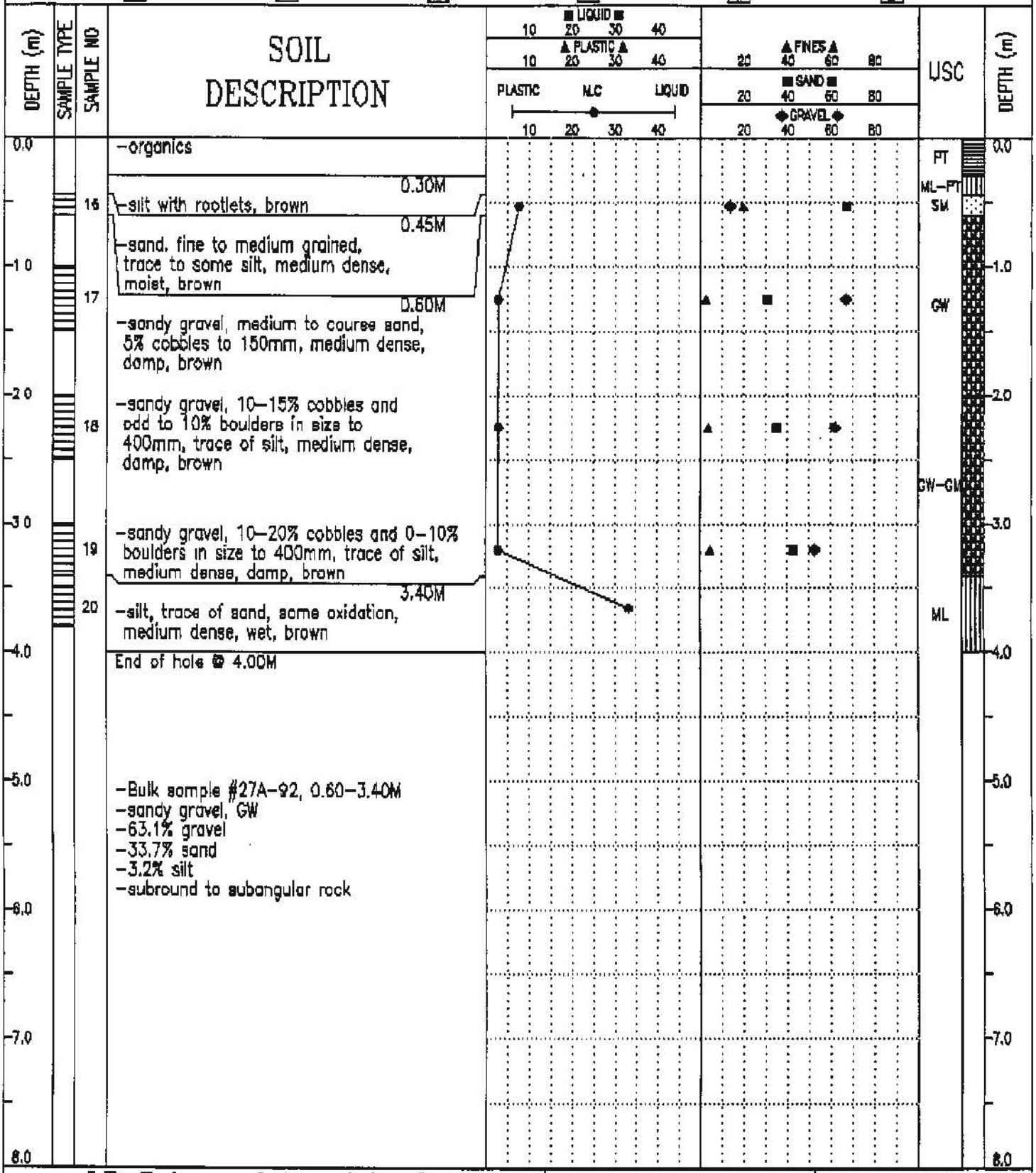


DEPTH (m): 0.0, 1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 7.0, 8.0

J.R. Paine and Associates Ltd. Edmonton, Alberta	COMPLETION DEPTH 3.0 m	COMPLETE 92/03/26
	LOGGED BY WCK	DWG NO.5
		Page 1 of 1

YTG, C&T SERVICES, TRANSPORTATION ENG.	KM 1322 ALASKA HIGHWAY, GEOTECHNICAL	BOREHOLE No. TP#27-92
DEADMAN CREEK ENTERPRISES		Project No: 8002-219
YUTANI EXCAVATOR		ELEVATION 0.00 (m)

SAMPLE TYPE: TUBE | LOST | AUGER | BULK | SPT | CORE



J.R. Paine and Associates Ltd. Edmonton, Alberta	COMPLETION DEPTH 4.0 m	COMPLETE 92/03/26
	LOGGED BY WCK	DWG NO.8
		Page 1 of 1

YTG, C&T SERVICES, TRANSPORTATION ENG.	KM 1322 ALASKA HIGHWAY, GEOTECHNICAL	BOREHOLE No. TP#28-92
DEADMAN CREEK ENTERPRISES		Project No: 8002-219
YUTANI EXCAVATOR		ELEVATION 0.00 (m)

SAMPLE TYPE: TUBE | LOST | AUGER | BULK | SPT | CORE

DEPTH (m)	SAMPLE TYPE	SAMPLE NO	SOIL DESCRIPTION
0.0			-appears to be stripped of organics
			-sand, fine to medium, trace to some silt, moist, brown
			Seasonal Frost to 0.70M
1.0		21	
			1.80M
2.0		22	-sandy gravel, coarse sand, gravel to 50mm, 10% gravel to 50mm - 100mm, some oxiadtion, brown
			-sandy gravel, 10-20% cobbles in size to 200mm, odd cobbles in size to 300mm, moist, brown
3.0		23	(odd silty sand seam to 150mm)
			3.40M
		24	Free water perched @ silt interface
			-silt, wet, brown
4.0			End of hole @ 3.80M
5.0			-Bulk sample #28A-92, 1.80-3.40M
			-sandy gravel, GW
			-67.6% gravel
			-29.7% sand
			-2.7% silt
6.0			-subround to subangular rock
7.0			
8.0			

LIQUID 10 20 30 40 | PLASTIC 10 20 30 40 | PLASTIC N.C LIQUID 10 20 30 40

FINES 20 40 60 80 | SAND 20 40 60 80 | GRAVEL 20 40 60 80

USC: SM-SW | GW | GW | ML

DEPTH (m): 0.0 1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0

J.R. Paine and Associates Ltd. Edmonton, Alberta	COMPLETION DEPTH 3.8 m	COMPLETE 92/03/28
	LOGGED BY WCK	DWG NO.8
		Page 1 of 1

YTG, C&T SERVICES, TRANSPORTATION ENG.	KM 1322 ALASKA HIGHWAY, GEOTECHNICAL	BOREHOLE No. TP#29-92
DEADMAN CREEK ENTERPRISES		Project No: 8002-219
YUTANI EXCAVATOR		ELEVATION 0.00 (m)

SAMPLE TYPE ■ TUBE ☑ LOST ☒ AUGER ▤ BULK ▥ SPT ▥ CORE

DEPTH (m)	SAMPLE TYPE	SAMPLE NO	SOIL DESCRIPTION	USC	DEPTH (m)
0.0			-organics & wood	ML-PT	0.0
			0.30M		
			Seasonal Frost to 0.45M		
1.0		25	-silty sand, fine to medium grained, with sandy silt seams throughout (50mm), moist brown	SM	1.0
2.0		26	-sand, trace to some silt, with odd sandy gravel seam to 600mm, damp, brown		2.0
			2.90M		
3.0		27	-silty clay, with oxidized 3mm sand seams, moist, grey	CL	3.0
			End of hole @ 3.00M		
4.0					4.0
5.0			No bulk sample		5.0
6.0					6.0
7.0					7.0
8.0					8.0

■ LIQUID ■ 10 20 30 40
▲ PLASTIC ▲ 10 20 30 40
PLASTIC M.C LIQUID 10 20 30 40

▲ FINES ▲ 20 40 60 80
■ SAND ■ 20 40 60 80
◆ GRAVEL ◆ 20 40 60 80

J.R. Paine and Associates Ltd.
Edmonton, Alberta

COMPLETION DEPTH 3.3 m | COMPLETE 92/03/26
LOGGED BY WCK | DWG NO.9 | Page 1 of 1

YTG, C&T SERVICES, TRANSPORTATION ENG.	KM 1322 ALASKA HIGHWAY, GEOTECHNICAL	BOREHOLE No. TP#30-92
DEADMAN CREEK ENTERPRISES		Project No: 8002-219
YUTANI EXCAVATOR		ELEVATION 0.00 (m)

SAMPLE TYPE: TUBE | LOST | AUGER | BULK | SPT | CORE

DEPTH (m)	SAMPLE TYPE	SAMPLE NO	SOIL DESCRIPTION	LIQUID / PLASTIC / PLASTIC–NAT–LIQUID	FINES / SAND / GRAVEL	USC	DEPTH (m)
0.0			-organics & silts			ML–PT	0.0
			0.20M				
		28	-sandy gravel, very gravelly, 20–25% cobbles in size to 200mm, trace to some silt, damp, subangular rock, brown			GW–GM	
1.0			1.00M				1.0
		29	-clayey silt to silty clay, laminated to 150mm, moist at the top to wet at the bottom, grey			CL	
2.0							2.0
3.0			End of hole @ 3.00M				3.0
4.0							4.0
5.0			No bulk sample				5.0
6.0							6.0
7.0							7.0
8.0							8.0

J.R. Paine and Associates Ltd.
Edmonton, Alberta

COMPLETION DEPTH 3.0 m		COMPLETE 92/03/26
LOGGED BY WCK	DWG NO.10	Page 1 of 1

YTG, C&T SERVICES, TRANSPORTATION ENG.	KM 1322 ALASKA HIGHWAY, GEOTECHNICAL	BOREHOLE No. TP#31-92
DEADMAN CREEK ENTERPRISES		Project No: 8002-219
YUTANI EXCAVATOR		ELEVATION 0.00 (m)

SAMPLE TYPE ■ TUBE ☑ LOST ☒ AUGER ▤ BULK ▯ SPT ▮ CORE

DEPTH (m)	SAMPLE TYPE	SAMPLE NO	SOIL DESCRIPTION	USC	DEPTH (m)
0.0			-silts with coarse sandy seams to 100mm, moist, brown	ML-SP	0.0
			0.60M		
1.0		30	Seasonal Frost to 1.00M -sandy gravel, 10 -20% cobbles in size to 200mm, odd cobble to 300mm, medium to course sand, damp, brown	GW	1.0
2.0			2.00M		2.0
		31	-clayey silt and silts laminated to 100mmm, moist brown	CL	
3.0			End of hole @ 3.00M		3.0
4.0					4.0
5.0			No bulk sample		5.0
6.0					6.0
7.0					7.0
8.0					8.0

LIQUID 10 20 30 40 | PLASTIC 10 20 30 40 | PLASTIC — N.C — LIQUID 10 20 30 40

FINES 20 40 60 80 | SAND 20 40 60 80 | GRAVEL 20 40 60 80

J.R. Paine and Associates Ltd. Edmonton, Alberta	COMPLETION DEPTH 3.0 m	COMPLETE 92/03/26
	LOGGED BY WCK	DWG NO.11
		Page 1 of 1

YTG, C&T SERVICES, TRANSPORTATION ENG.	KM 1322 ALASKA HIGHWAY, GEOTECHNICAL	BOREHOLE No. TP#32-92
DEADMAN CREEK ENTERPRISES		Project No: 8002-219
YUTANI EXCAVATOR		ELEVATION 0.00 (m)

SAMPLE TYPE ■ TUBE ☒ AUGER ▤ BULK ▯ SPT ▮ CORE

DEPTH (m)	SAMPLE TYPE	SAMPLE NO	SOIL DESCRIPTION	USC	DEPTH (m)
0.0			-organics & silt	ML-PT	0.0
		32	0.20M -silty sand to sand trace to some silt in seams to 100mm, fine sand, moist, brown	SM	
1.0			0.60M Seasonal Frost to 0.70M		1.0
		33	-sandy gravel, 25-30% cobbles in size to 300mm, odd boulder in size to 350mm, some oxidation, subangular rock, moist, brown	GW	
2.0					2.0
		34	2.30M -silt with fine sandy laminations to 25mm, moist, brown	ML	
3.0			End of hole @ 3.00M		3.0
4.0					4.0
5.0			-Bulk sample #32A, 0.60-2.30M -62.8% gravel -35.9% sand -1.3% silt		5.0
6.0					6.0
7.0					7.0
8.0					8.0

LIQUID 10 20 30 40 | PLASTIC 10 20 30 40 | PLASTIC — MC — LIQUID 10 20 30 40

FINES 20 40 60 80 | SAND 20 40 60 80 | GRAVEL 20 40 60 80

J.R. Paine and Associates Ltd. Edmonton, Alberta	COMPLETION DEPTH 3.0 m	COMPLETE 92/03/26
	LOGGED BY WCK	DWG NO.12
		Page 1 of 1

YTG, C&T SERVICES, TRANSPORTATION ENG.	KM 1322 ALASKA HIGHWAY, GEOTECHNICAL	BOREHOLE No. TP#33-92
DEADMAN CREEK ENTERPRISES		Project No: 8002-219
YUTANI EXCAVATOR		ELEVATION 0.00 (m)

SAMPLE TYPE: TUBE | LOST | AUGER | BULK | SPT | CORE

DEPTH (m)	SAMPLE TYPE	SAMPLE NO	SOIL DESCRIPTION	LIQUID / PLASTIC / PLASTIC–NAT–LIQUID	FINES / SAND / GRAVEL	USC	DEPTH (m)
0.0			-silts & organics			ML-PT	0.0
			0.20M Seasonal Frost to 0.20M -clayey silt with sandy silt seame, moist, brown			ML-CL	
1.0		36	0.60M -sandy gravel, 20-30% cobbles in size and 5% boulders in size to 400mm, 1 boulder to 600mm, subangular, damp, brown			GW	1.0
		37	1.30M -sandy silt, odd gravel, (till), medium dense, moist-wet, brown			ML	
2.0			End of hole @ 2.00M				2.0
3.0							3.0
4.0							4.0
5.0			No bulk sample				5.0
6.0							6.0
7.0							7.0
8.0							8.0

J.R. Paine and Associates Ltd. Edmonton, Alberta	COMPLETION DEPTH 2.0 m	COMPLETE 92/03/26
	LOGGED BY WCK	DWG NO.13
		Page 1 of 1

YTG, C&T SERVICES, TRANSPORTATION ENG.	KM 1322 ALASKA HIGHWAY, GEOTECHNICAL	BOREHOLE No. TP#34-92
DEADMAN CREEK ENTERPRISES		Project No: 8002-219
YUTANI EXCAVATOR		ELEVATION 0.00 (m)

SAMPLE TYPE ■ TUBE ☒ AUGER ▨ BULK ▯ SPT ▮ CORE

DEPTH (m)	SAMPLE TYPE	SAMPLE NO	SOIL DESCRIPTION	USC	DEPTH (m)
0.0			-organics & silts with some rootlets		0.0
			0.30M	ML-PT	
		38	Seasonal Frost to 0.30M -silty sand, moist, brown	SM	
1.0			1.00M		1.0
		39	-sandy gravel, 20-30% cobbles in size to 300mm, add to 5% boulders in size to 400mm, damp, brown	GW	
2.0		40	-sandy gravel, 5% cobbles in size to 200mm in size, moist @ the top to wet @ the bottom, Free water @ bottom of the gravel, brown		2.0
3.0			2.90M		3.0
		41	-silt to clayey silt, laminated to 50mm, moist, brown	ML	
			End of hole @ 3.50M		
4.0					4.0
5.0			No bulk sample		5.0
6.0					6.0
7.0					7.0
8.0					8.0

LIQUID: 10 20 30 40 | PLASTIC: 10 20 30 40 | PLASTIC — N.C — LIQUID: 10 20 30 40

FINES: 20 40 60 80 | SAND: 20 40 60 80 | GRAVEL: 20 40 60 80

J.R. Paine and Associates Ltd. Edmonton, Alberta	COMPLETION DEPTH 3.5 m	COMPLETE 92/03/28
	LOGGED BY WCK	DWG NO.14
		Page 1 of 1

APPENDIX "C"
-Laboratory Test Summary Sheets

J. R. Paine & Associates Ltd.

CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services, Transportation Eng

Sample: 1A East Depth: Project: km 1322, Alaska Hwy. Geotech. Inves.

Location: Made by: LK & MP Job No.: B002-219

EXISTING SITE STOCKPILE Ck'd by: Date: 1992/03/30

Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					
40,000	40.0					
25,000	25.0					100.0
20,000	20.0					99.5
12,500	12.5					82.5
10,000	10.0					73.5
5,000	5.0					55.0
2500	2.5					43.6
1,250	1.25					36.1
800	0.800					
630	0.630					30.0
315	0.315					23.0
250	0.250					
160	0.160					15.3
80	0.080					9.1

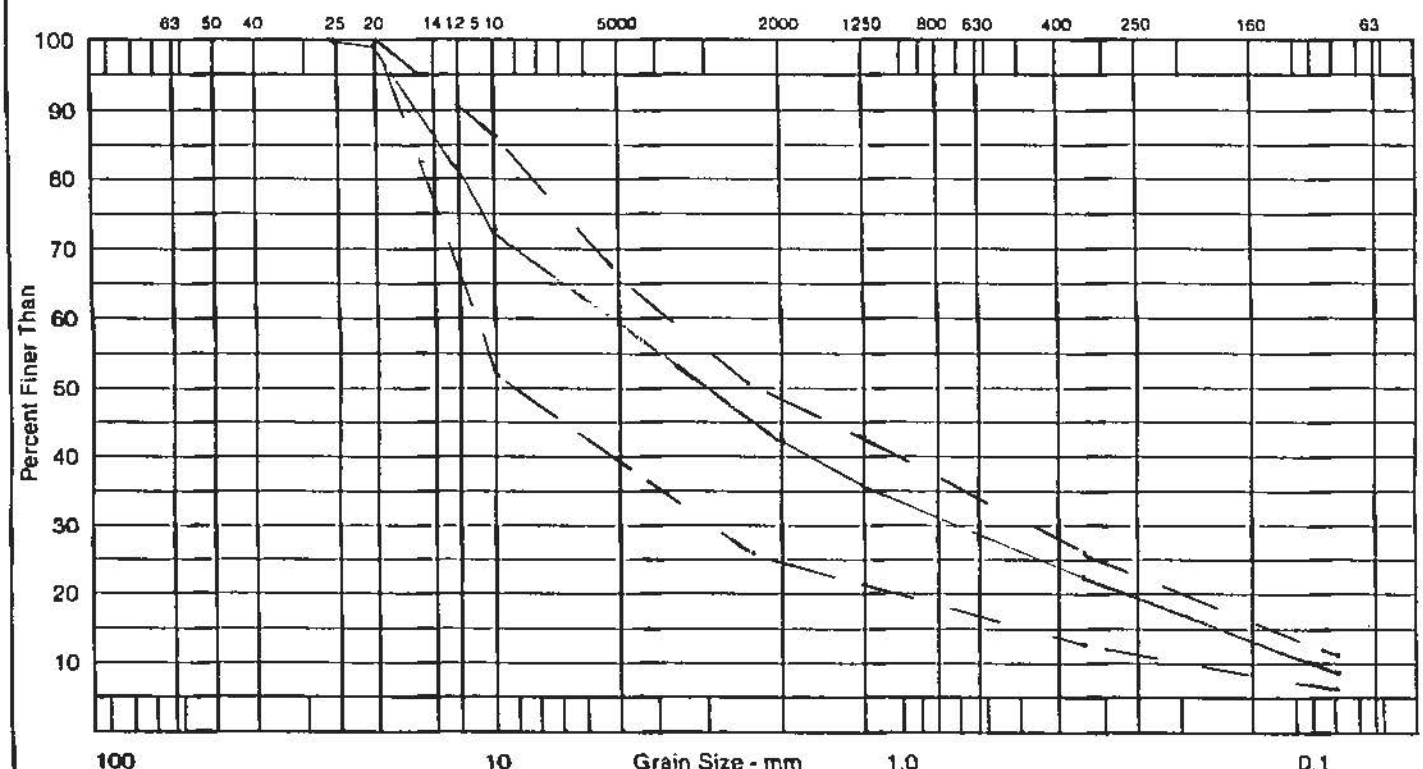
Description of Sample

Gravelly sand to sandy gravel, trace to some silt, SW-GW

Time of Sieving Min. 15

Method of Preparation Dry Washed: X

Remarks Moisture - 6.9%
Gravel - 45.0%
Sand - 45.9%
Silt - 9.1%



J. R. Paine & Associates Ltd.

CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services, Transportation Eng

Sample: 2A West Depth: Project: km 1322, Alaska Hwy. Geotech. Inves.

Location: Made by: LK & MF Job No.: 8002-219

EXISTING SITE STOCKPILE Ck'd by: JCR Date: 1992/03/30

Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					
40,000	40.0					
25,000	25.0					100.0
20,000	20.0					99.1
12,500	12.5					84.5
10,000	10.0					70.2
5,000	5.0					50.7
2500	2.5					39.0
1,250	1.25					30.8
800	0.800					
630	0.630					24.4
315	0.315					16.4
250	0.250					
160	0.160					10.0
80	0.080					6.0

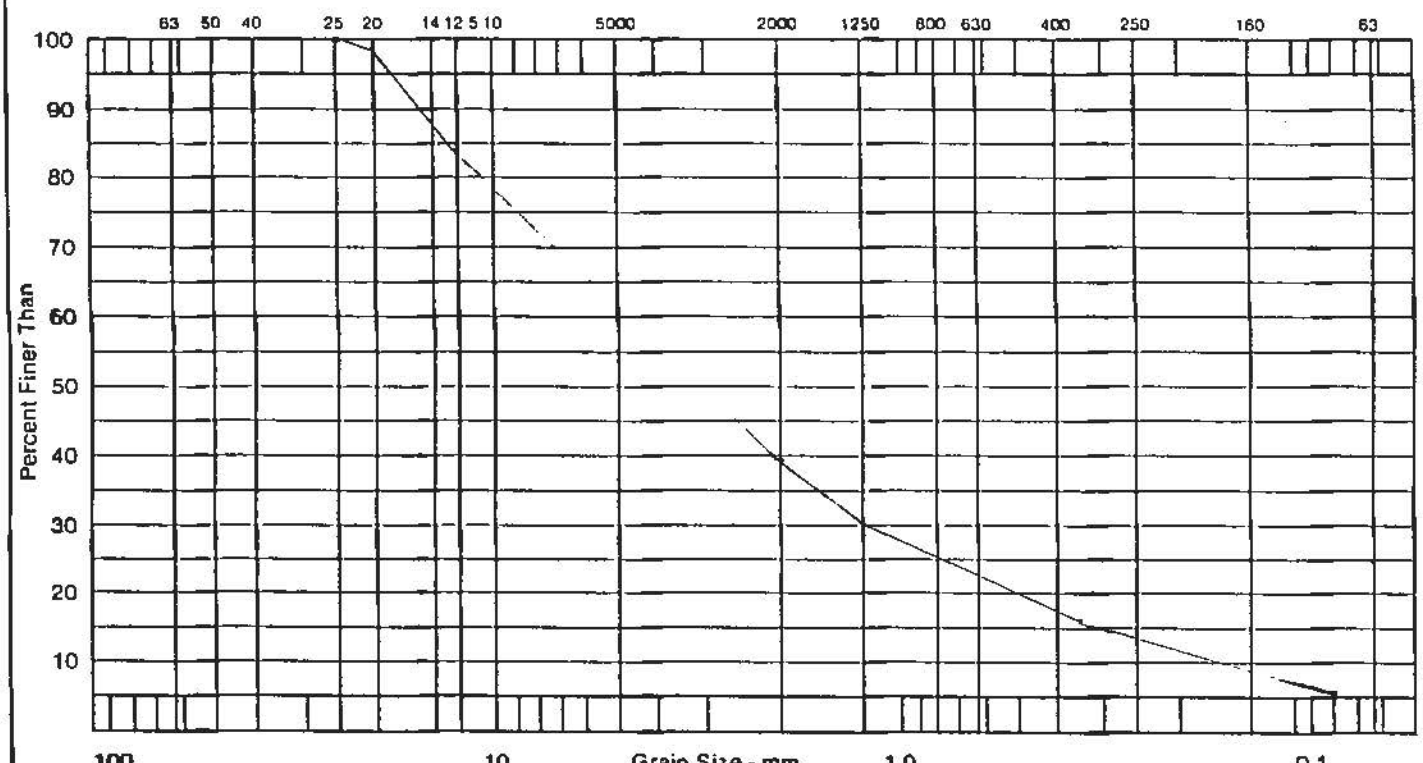
Description of Sample

Gravelly sand to sandy gravel, trace of silt, SW-GW

Time of Sieving Min. 15

Method of Preparation Dry Washed X

Remarks Moisture - 4.5%
Gravel - 49.3%
Sand - 44.7%
Silt - 6.0%



J. R. Paine & Associates Ltd.

CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services, Transportation Eng
Sample: 1 Depth: 0.30-0.80m
Project: km 1322, Alaska Hwy. Geotech. Inves.
Location: TP#22-92
Made by: LK & MF Job No.: 8002-219
Ck'd by: [illegible] Date: 1992/03/30

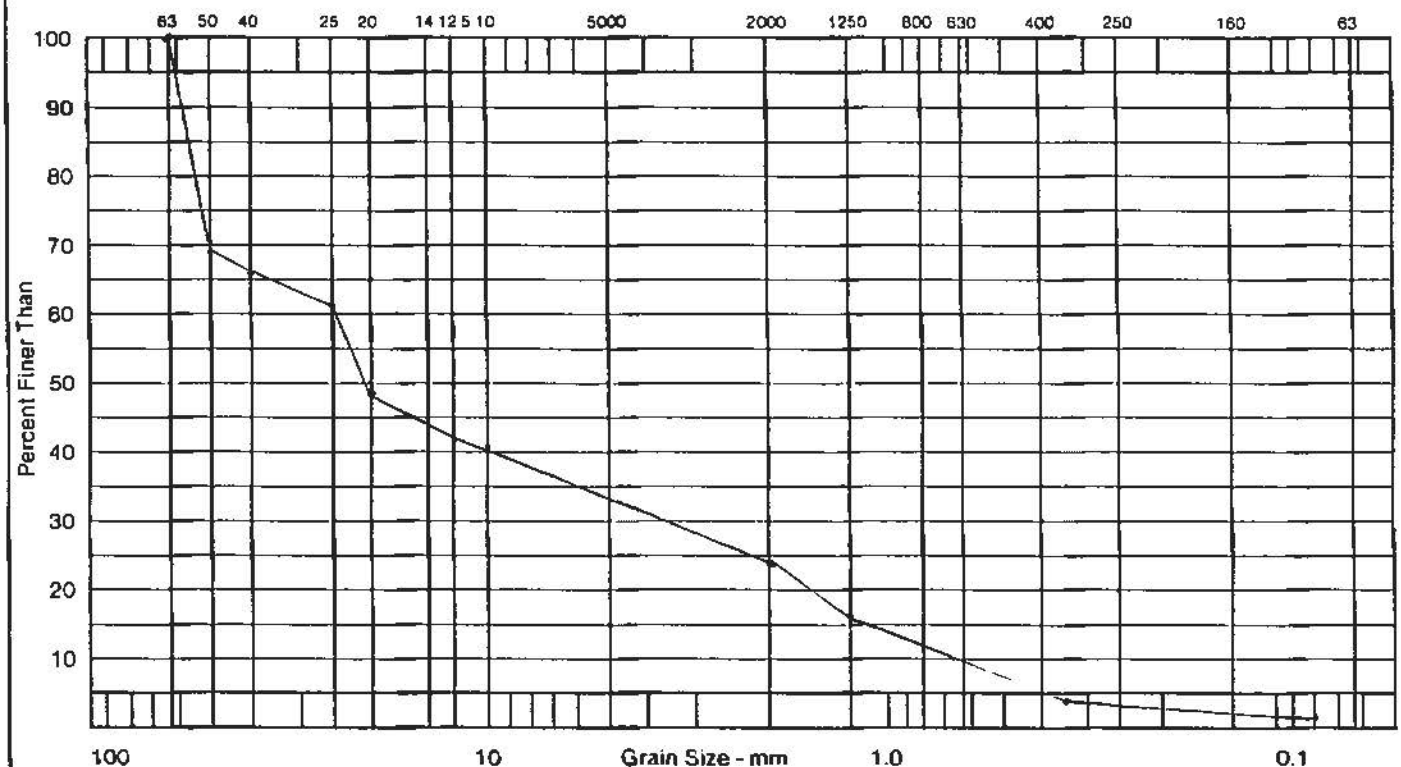
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					100.0
50,000	50.0					69.8
40,000	40.0					65.1
25,000	25.0					60.5
20,000	20.0					48.6
12,500	12.5					43.3
10,000	10.0					40.5
5,000	5.0					31.9
2500	2.5					24.4
1,250	1.25					16.6
800	0.800					11.6
630	0.630					9.3
315	0.315					4.4
250	0.250					
160	0.160					2.2
80	0.080					1.2

Description of Sample: Sandy gravel, GW.

Time of Sieving: Min. 15

Method of Preparation: Dry ___ Washed X

Remarks: Moisture - 2.1%
Gravel - 68.1%
Sand - 30.7%
Silt - 1.2%



J. R. Paine & Associates Ltd.

CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services, Transportation Eng
Sample: 2 Depth: 1.70-2.10m Project: km 1322, Alaska Hwy. Geotech. Inves.
Location: Made by: LK & MF Job No.: 8002-219
TP#22-92 Ck'd by: WCR Date: 1992/03/30

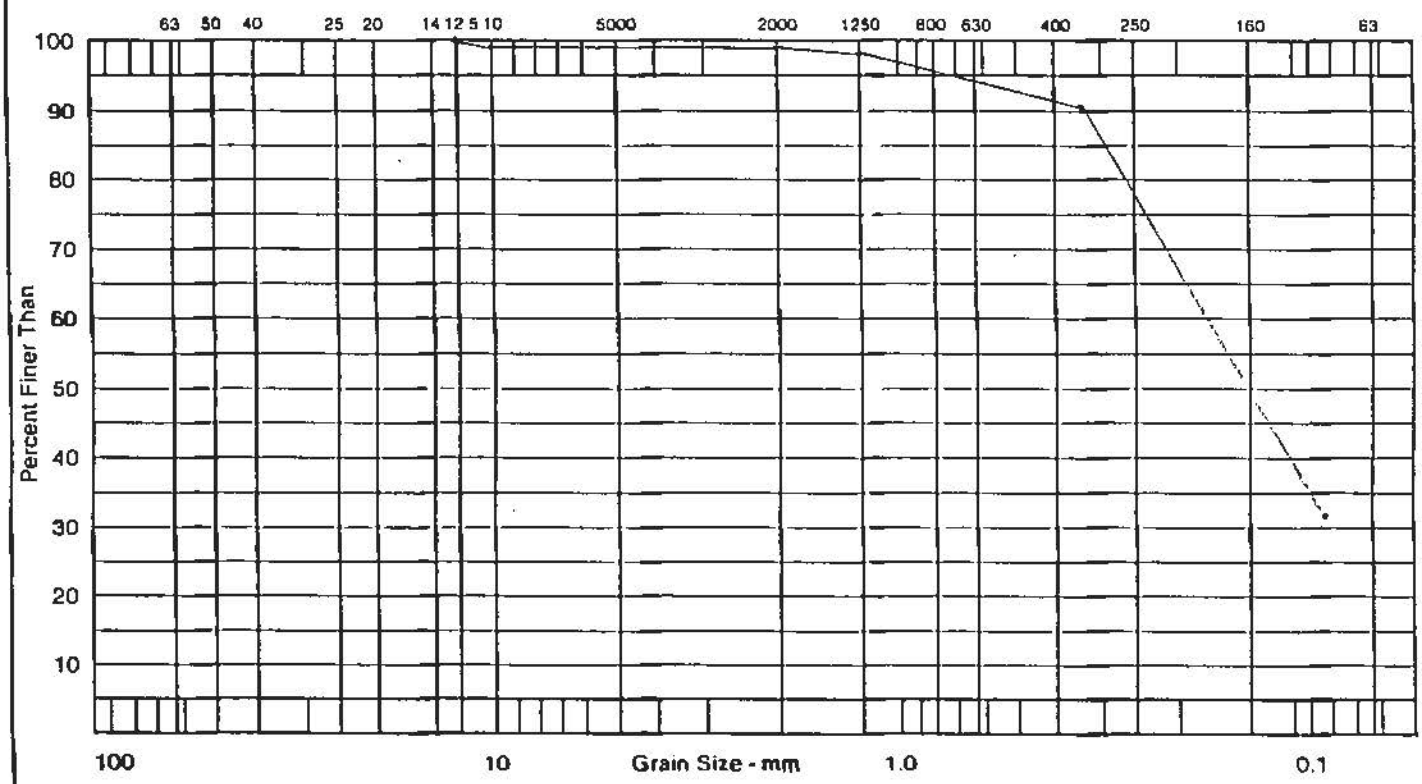
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					
40,000	40.0					
25,000	25.0					
20,000	20.0					
12,500	12.5					100.0
10,000	10.0					99.3
5,000	5.0					99.2
2500	2.5					98.9
1,250	1.25					98.3
800	0.800					97.8
630	0.630					97.4
315	0.315					90.5
250	0.250					
160	0.160					62.7
80	0.080					32.9

Description of Sample: Silty sand, SM

Time of Sieving: Min. 15

Method of Preparation: Dry: Washed: X

Remarks: Moisture - 9.3%
Gravel - 0.8%
Sand - 66.3%
Silt - 32.9%



J. R. Paine & Associates Ltd.

CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

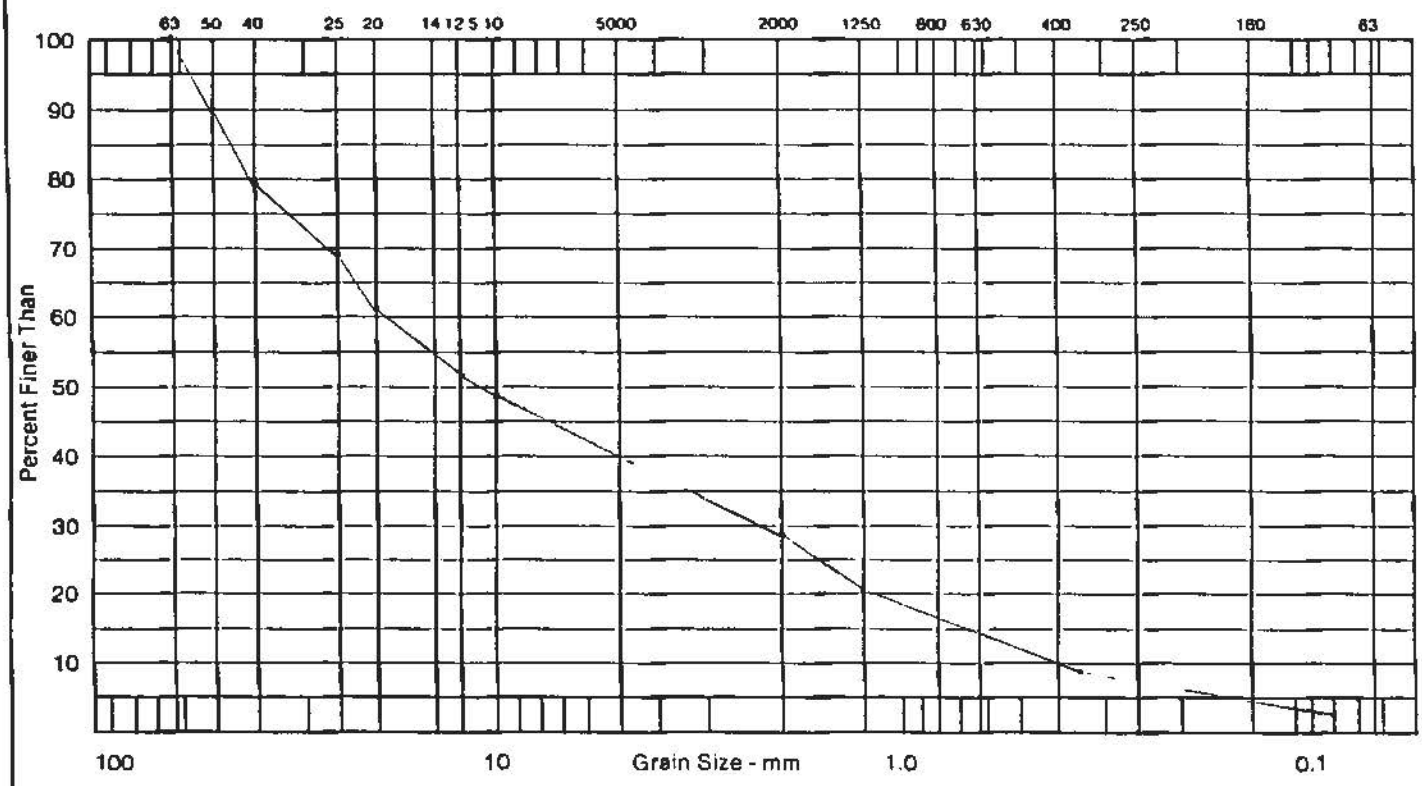
Client: YTG, C&T Services, Transportation Eng
Sample: 4 Depth: 0.20-0.50m Project: km 1322, Alaska Hwy, Geotech. Inves.
Location: Made by: LK & MP Job No.: 8002-219
TP#23-92 Ck'd by: WCK Date: 1992/03/30

Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					100.0
50,000	50.0					90.0
40,000	40.0					79.3
25,000	25.0					69.1
20,000	20.0					62.7
12,500	12.5					53.8
10,000	10.0					48.8
5,000	5.0					37.4
2500	2.5					28.4
1,250	1.25					20.9
800	0.800					16.8
630	0.630					14.8
315	0.315					9.2
250	0.250					
160	0.160					5.4
80	0.080					3.1

Description of Sample
Sandy gravel, GW

Time of Sieving Min. 15

Method of Preparation Dry Washed X
Remarks Moisture - 3.9%
Gravel - 62.6%
Sand - 34.3%
Silt - 3.1%



J. R. Paine & Associates Ltd.

CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

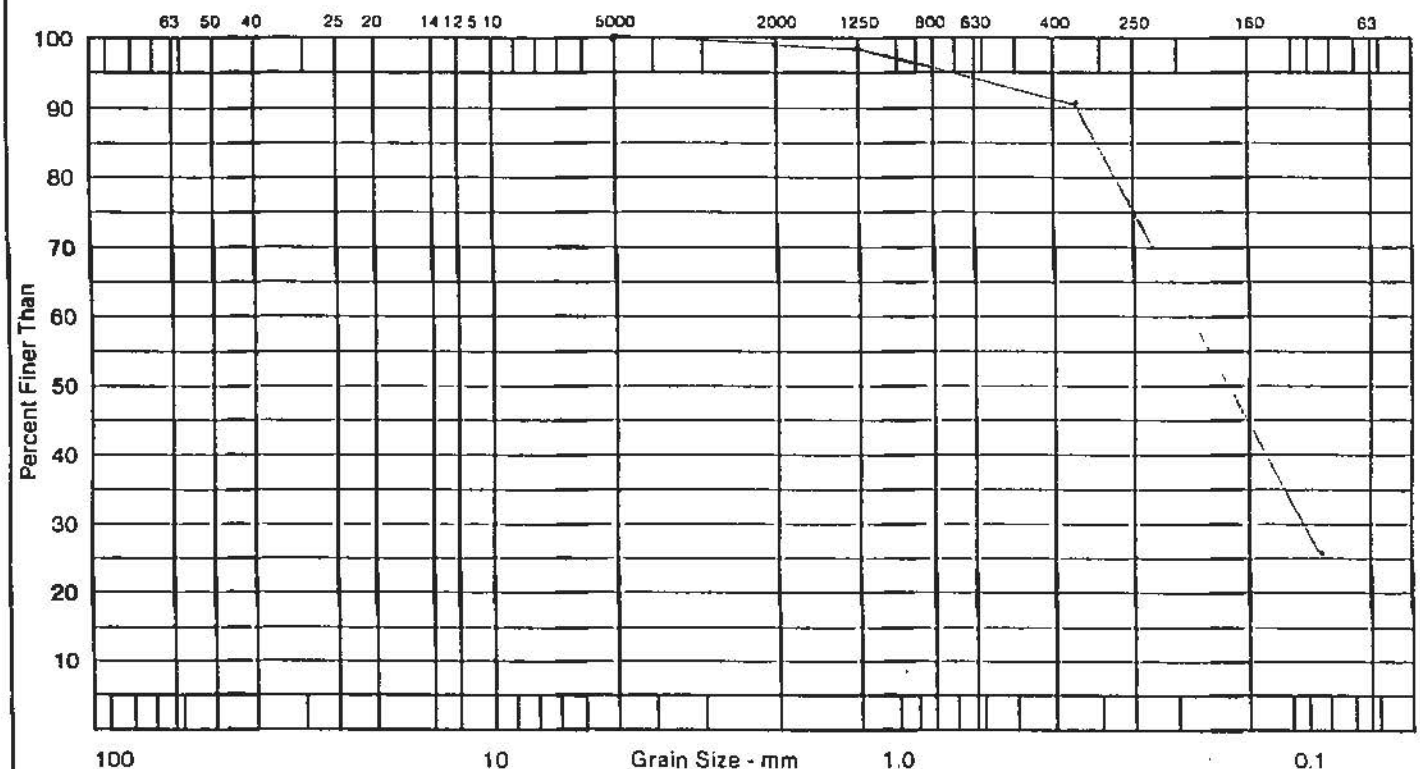
Client: YTG, C&T Services, Transportation Eng
Sample: 9 Depth: 0.15-0.60m Project: km 1322, Alaska Hwy, Geotech. Inves.
Location: Made by: LK & MP Job No.: 8002-219
TP#25-92 Ck'd by: [illegible] Date: 1992/03/30

Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					
40,000	40.0					
25,000	25.0					
20,000	20.0					
12,500	12.5					
10,000	10.0					
5,000	5.0					100.0
2500	2.5					99.3
1,250	1.25					98.2
800	0.800					97.4
630	0.630					96.8
315	0.315					91.6
250	0.250					
160	0.160					61.0
80	0.080					26.1

Description of Sample
Silty sand, SM

Time of Sieving Min. 15

Method of Preparation Dry Washed X
Remarks Moisture - 6.8%
Gravel -
Sand - 73.9%
Silt - 26.1%



J. R. Paine & Associates Ltd.

CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services, Transportation Eng
Sample: 10 Depth: 1.50-2.00m Project: km 1322, Alaska Hwy. Geotech. Inves.
Location: Made by: LK & MF Job No.: 8002-219
TP#25-92 Ck'd by: WCC Date: 1992/03/30

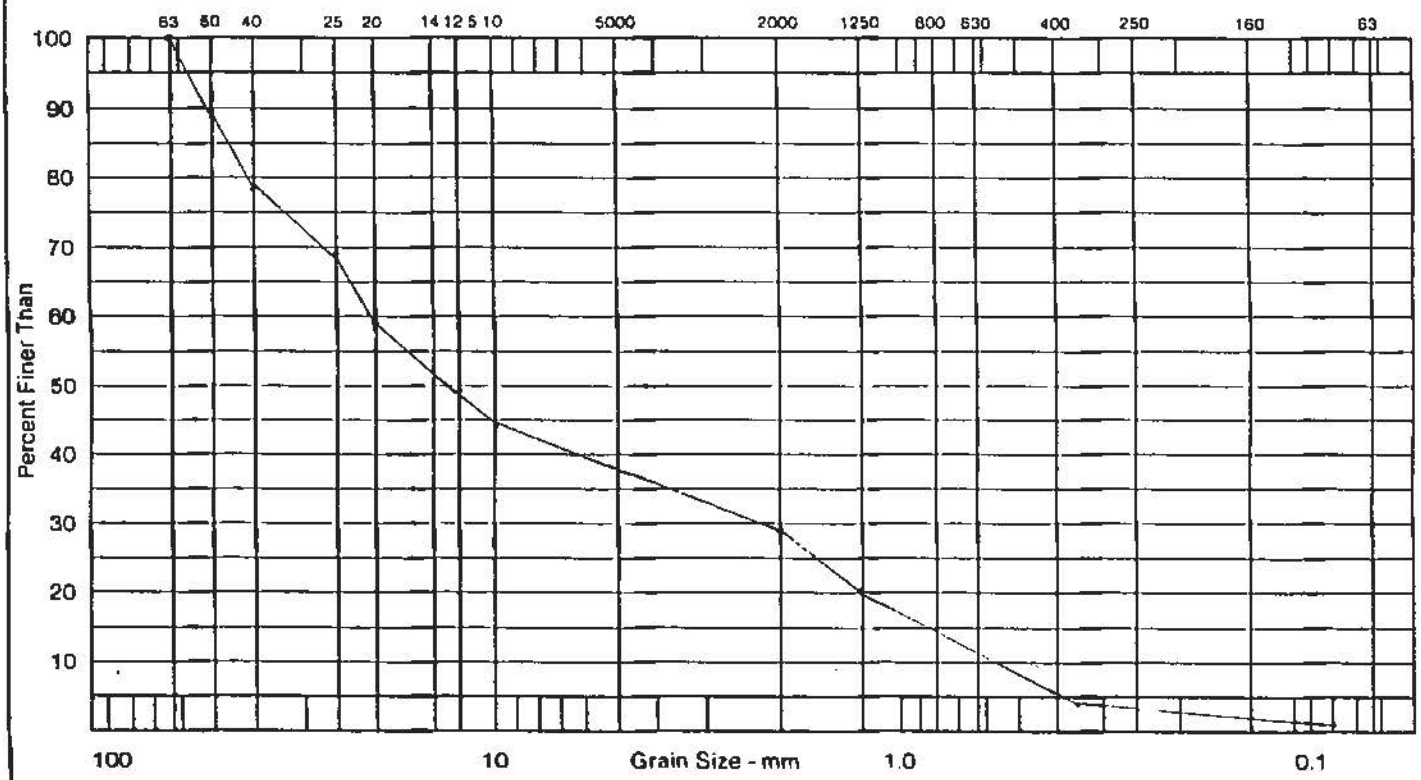
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					100.0
50,000	50.0					89.3
40,000	40.0					78.3
25,000	25.0					68.5
20,000	20.0					58.3
12,500	12.5					48.1
10,000	10.0					44.2
5,000	5.0					35.7
2500	2.5					28.9
1,250	1.25					20.0
800	0.800					13.1
630	0.630					10.0
315	0.315					4.2
250	0.250					
160	0.160					2.3
80	0.080					1.3

Description of Sample: Sandy gravel, GW

Time of Sieving: Min. 15

Method of Preparation: Dry: Washed: X

Remarks: Moisture - 1.9%
Gravel - 64.3%
Sand - 34.4%
Silt - 1.3%



J. R. Paine & Associates Ltd.

CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services, Transportation Eng
Sample: 11 Depth: 2.50-2.80m Project: km 1322, Alaska Hwy. Geotech. Inves.
Location: Made by: LK & MF Job No.: 8002-219
TP#25-92 Ck'd by: [illegible] Date: 1992/03/30

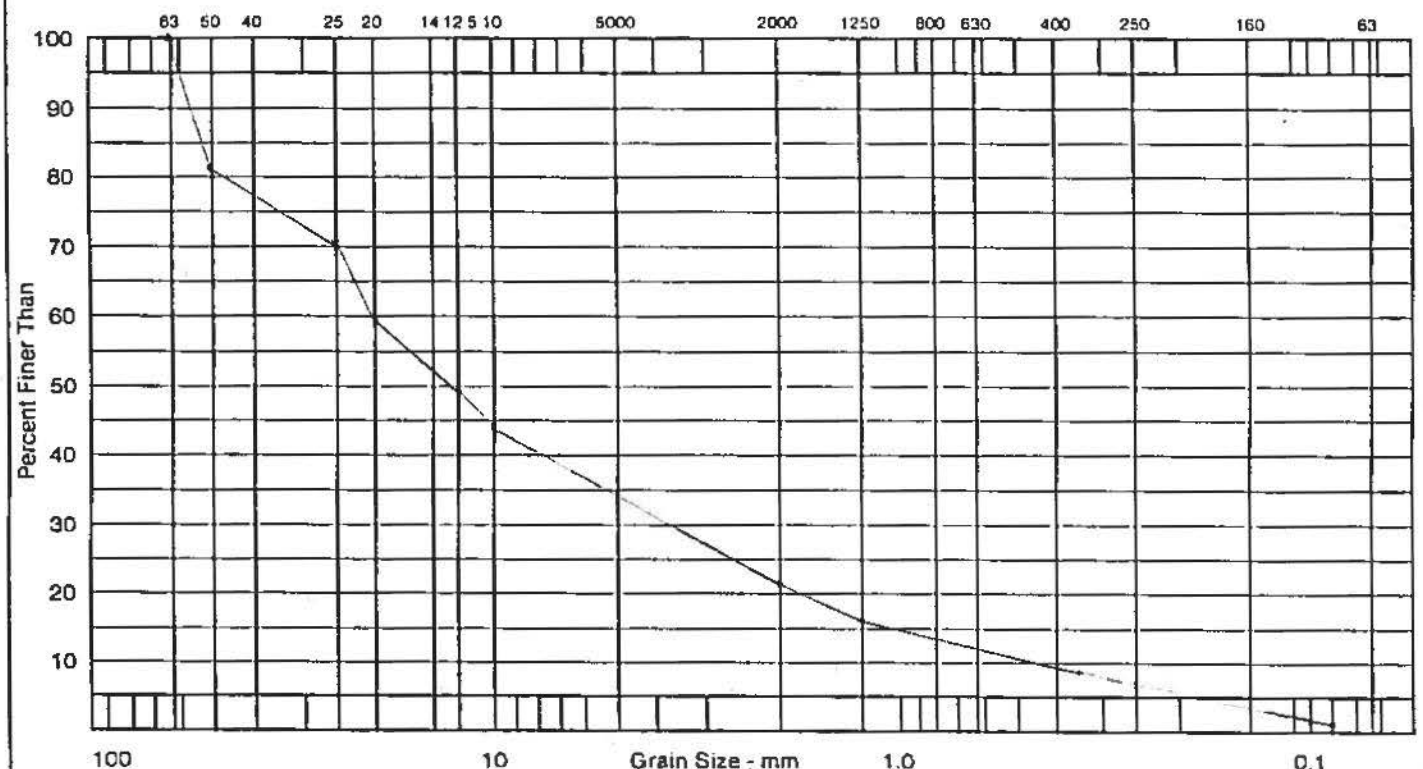
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					100.0
50,000	50.0					83.3
40,000	40.0					
25,000	25.0					70.8
20,000	20.0					59.8
12,500	12.5					49.9
10,000	10.0					44.2
5,000	5.0					31.8
2500	2.5					22.7
1,250	1.25					16.8
800	0.800					14.7
630	0.630					13.7
315	0.315					8.5
250	0.250					
160	0.160					3.7
80	0.080					1.5

Description of Sample: Sandy gravel, GW

Time of Sieving: Min. 15

Method of Preparation: Dry: Washed: X

Remarks: Moisture - 1.8%
Gravel - 68.2%
Sand - 30.3%
Silt - 1.5%



J. R. Paine & Associates Ltd.

CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services, Transportation Eng
Sample: 13 Depth: 0.30-0.45m Project: km 1322, Alaska Hwy, Geotech. Inves.
Location: Made by: LR & MP Job No.: 8002-219
TP#26-92 Ck'd by: WCC Date: 1992/03/30

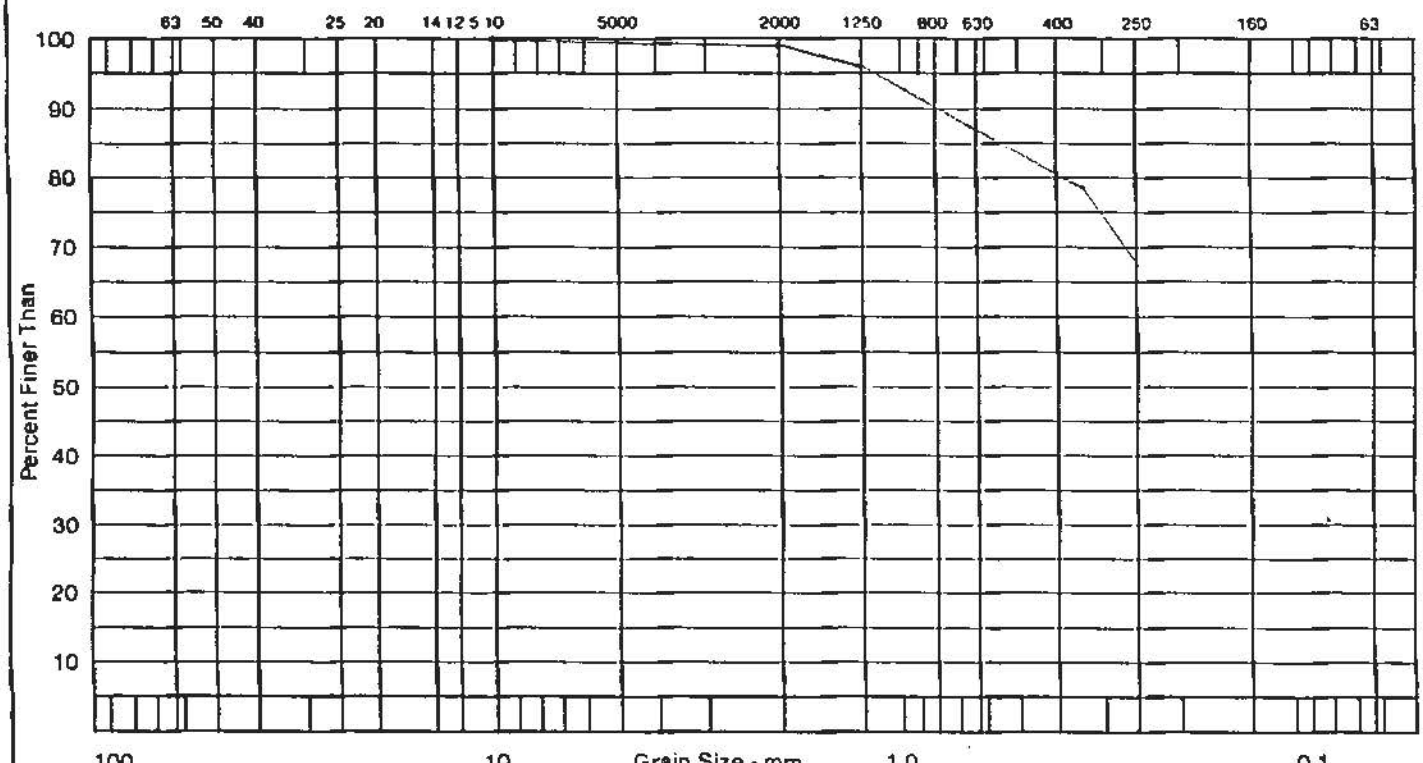
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					
40,000	40.0					
25 000	25.0					
20.000	20.0					
12.500	12.5					
10.000	10.0					100.0
5.000	5.0					99.9
2500	2.5					98.6
1.250	1.25					97.3
800	0.800					95.8
630	0.630					94.3
315	0.315					78.3
250	0.250					
160	0.160					53.7
80	0.080					31.1

Description of Sample
Silty sand, SM

Time of Sieving Min. 15

Method of Preparation Dry Washed X

Remarks Moisture - 8.5%
Gravel -
Sand - 68.8%
Silt - 31.1%



J. R. Paine & Associates Ltd.

CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services, Transportation Eng

Sample: 14 Depth: 1.00-1.50m Project: km 1322, Alaska Hwy. Geotech, Inves.

Location: TP#26-92 Made by: LK & MP Job No.: 8002-219

Ck'd by: DJCL Date: 1992/03/30

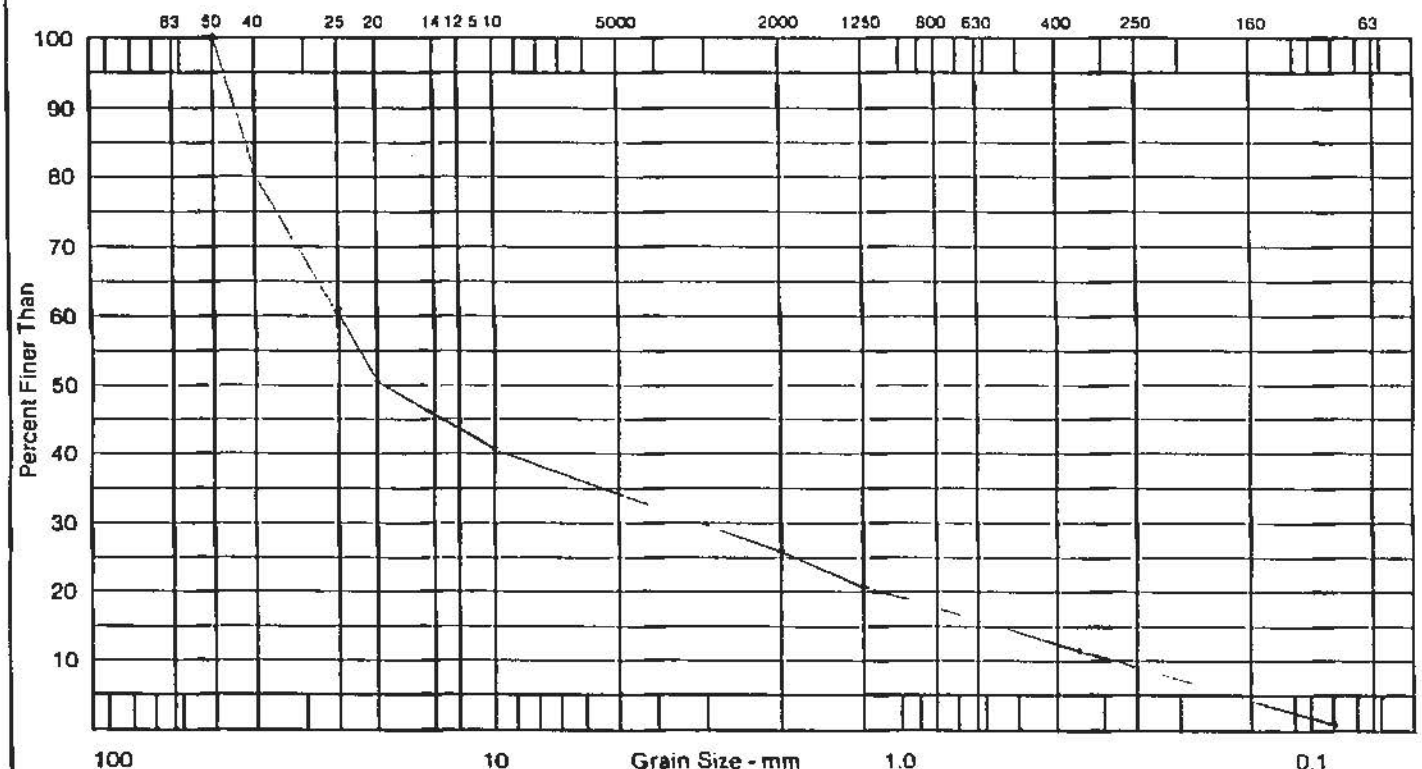
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					100.0
40,000	40.0					81.0
25,000	25.0					61.7
20,000	20.0					51.7
12,500	12.5					44.2
10,000	10.0					41.1
5,000	5.0					32.6
2500	2.5					26.3
1,250	1.25					20.9
800	0.800					18.1
630	0.630					16.9
315	0.315					12.3
250	0.250					
160	0.160					6.0
80	0.080					2.6

Description of Sample: Sandy gravel, GW

Time of Sieving: ____ Min. 15

Method of Preparation: ____ Dry ____ Washed: X

Remarks: Moisture - 1.9%
Gravel - 67.4%
Sand - 30.0
Silt - 2.6%



J. R. Paine & Associates Ltd.

CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services, Transportation Eng
Sample: 16 Depth: 0.45-0.60m Project: km 1322, Alaska Hwy. Geotech. Inves.
Location: Made by: LK & MF Job No.: 8002-219
TP#27-92 Ck'd by: WCH Date: 1992/03/30

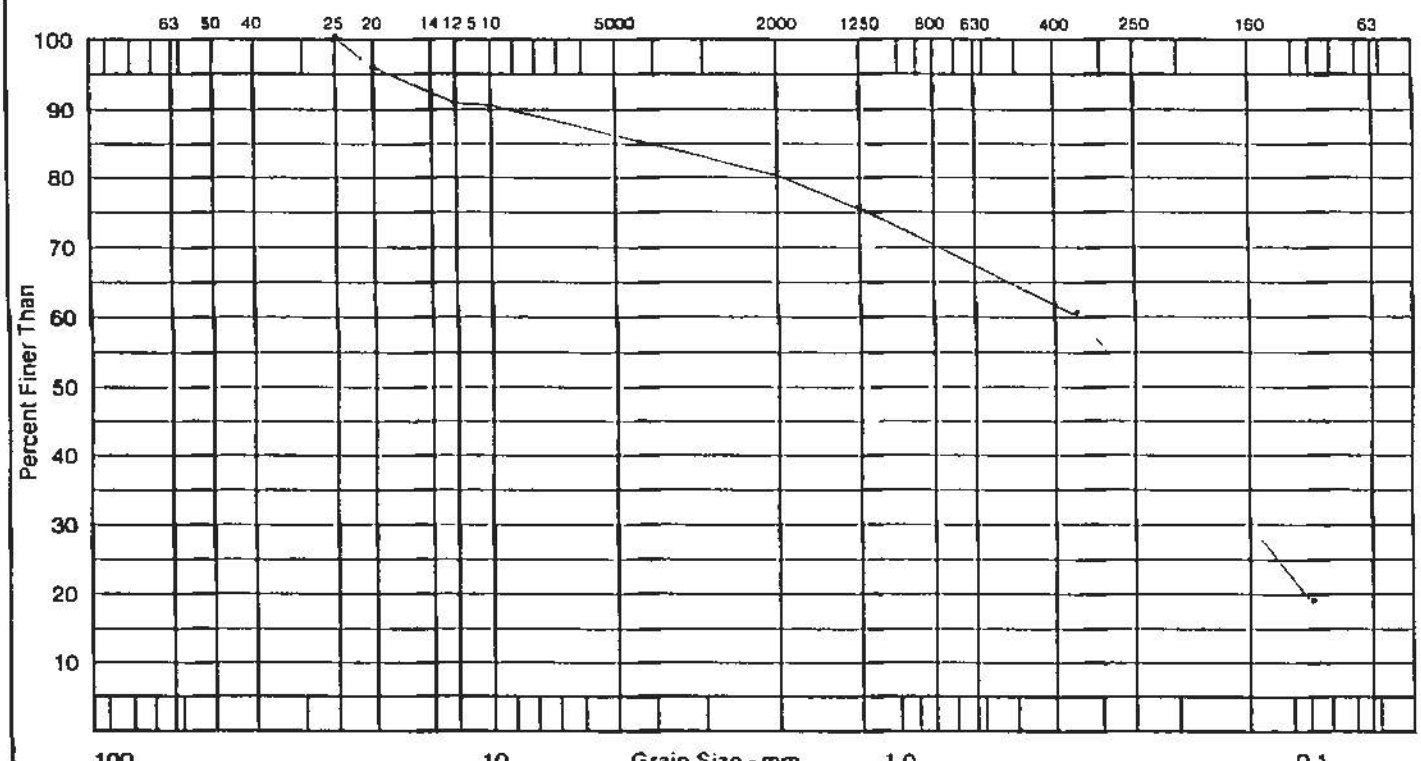
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					
40,000	40.0					
25,000	25.0					100.0
20,000	20.0					95.5
12,500	12.5					93.3
10,000	10.0					91.4
5,000	5.0					86.5
2500	2.5					80.7
1,250	1.25					75.5
800	0.800					72.9
630	0.630					71.6
315	0.315					61.4
250	0.250					
160	0.160					34.3
80	0.080					19.6

Description of Sample
Silty sand, some gravel, SM

Time of Sieving Min. 15

Method of Preparation Dry Washed X

Remarks Moisture - 7.7%
Gravel - 13.5%
Sand - 66.9%
Silt - 19.6%



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CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services, Transportation Eng

Sample: 17 Depth: 1.00-1.50m Project: km 1322, Alaska Hwy. Geotech. Inves.

Location: Made by: LK & MF Job No.: 8002-219

TP#27-92 Ck'd by: WCIC Date: 1992/03/30

Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					
40,000	40.0					100.0
25,000	25.0					83.6
20,000	20.0					72.4
12,500	12.5					58.9
10,000	10.0					51.4
5,000	5.0					33.1
2500	2.5					21.2
1,250	1.25					15.3
800	0.800					13.6
630	0.630					12.7
315	0.315					8.6
250	0.250					
160	0.160					4.6
80	0.080					2.4

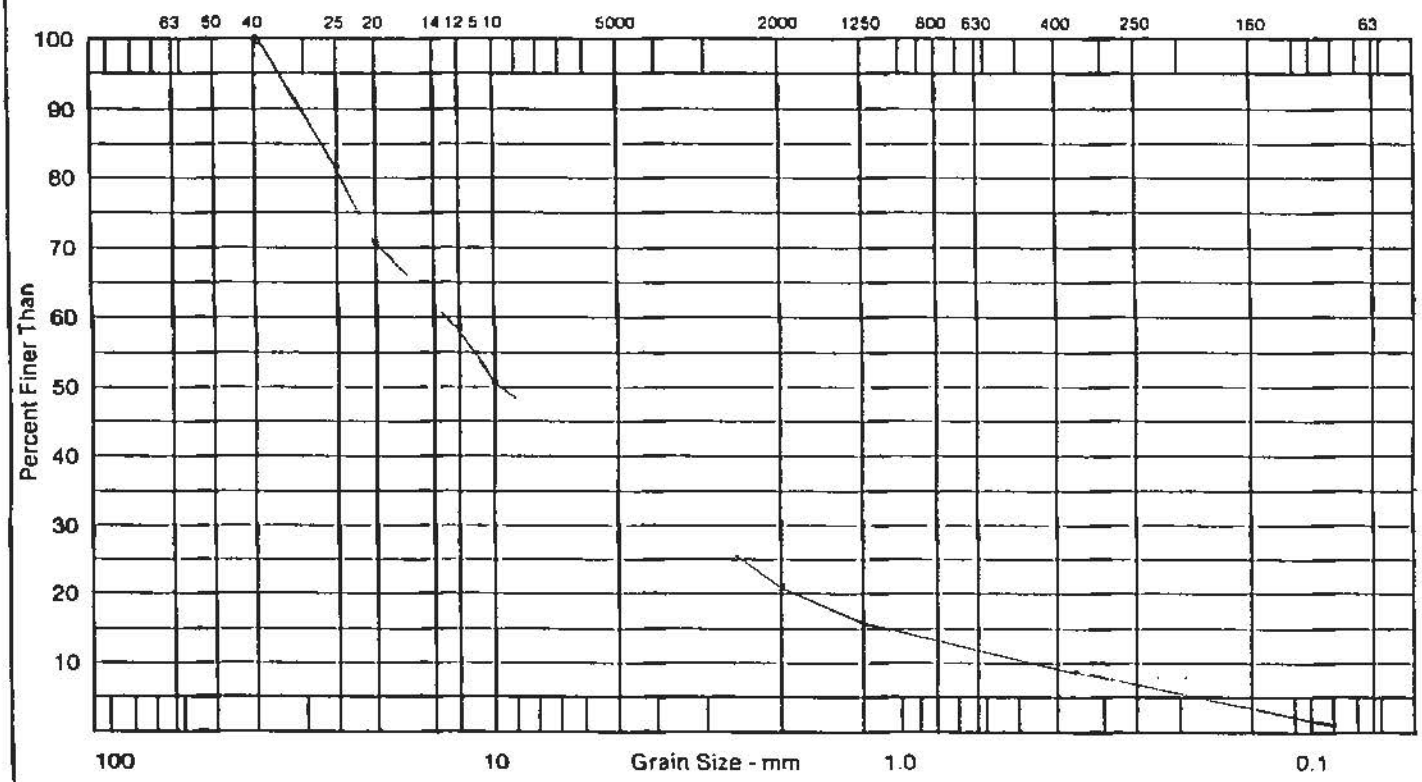
Description of Sample

Sandy gravel, GW

Time of Sieving Min. 15

Method of Preparation Dry Washed X

Remarks Moisture - 3.0%
Gravel - 66.9%
Sand - 30.7%
Silt - 2.4%



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CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services, Transportation Eng
Sample: 18 Depth: 2.00-2.50m
Project: km 1322, Alaska Hwy. Geotech. Inves.
Location: TP#27-92
Made by: LK & MF Job No.: 8002-219
Ck'd by: [illegible] Date: 1992/03/30

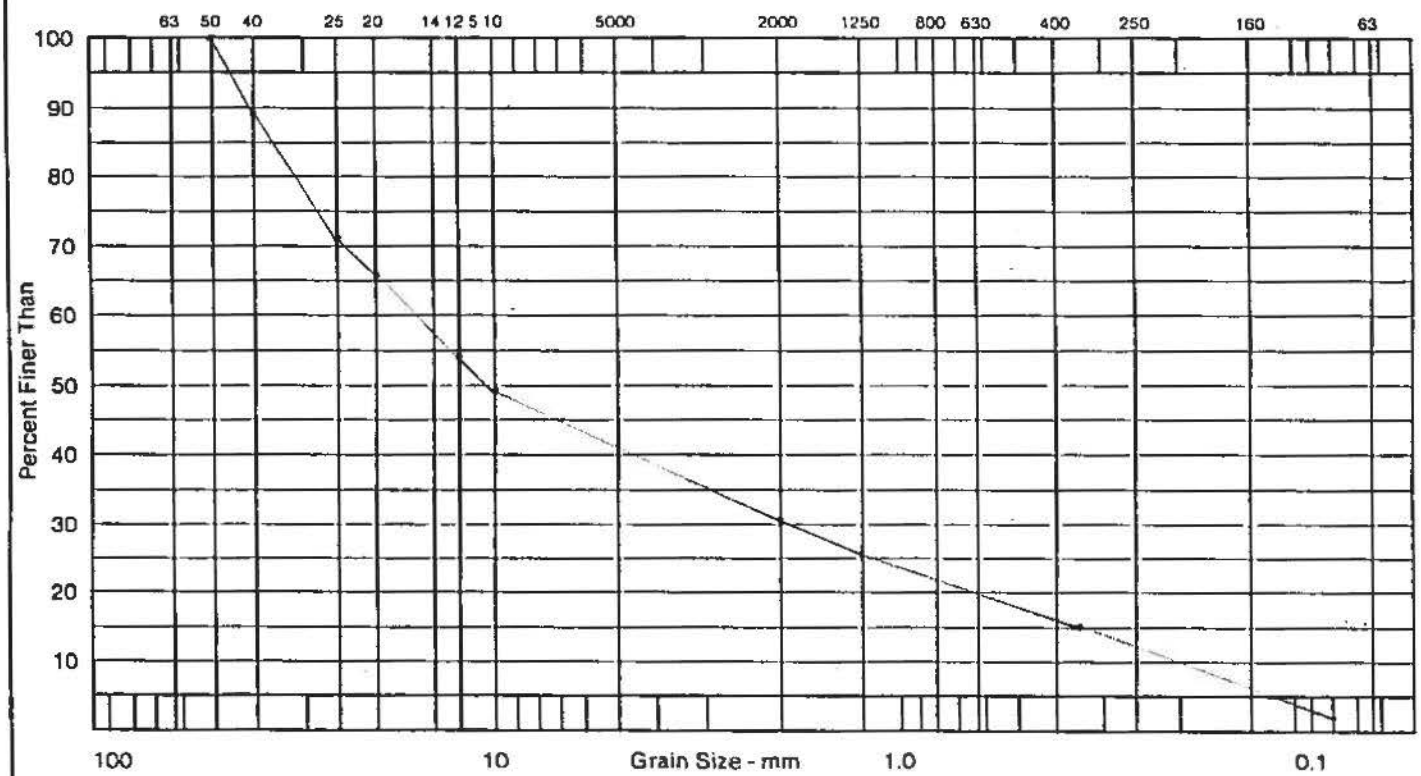
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					100.0
40,000	40.0					89.7
25,000	25.0					72.9
20,000	20.0					65.1
12,500	12.5					54.4
10,000	10.0					49.7
5,000	5.0					38.1
2500	2.5					30.7
1,250	1.25					25.5
800	0.800					22.9
630	0.630					21.5
315	0.315					15.0
250	0.250					
160	0.160					7.6
80	0.080					3.3

Description of Sample: Sandy gravel, GW

Time of Sieving: Min. 15

Method of Preparation: Dry: Washed: X

Remarks: Moisture - 3.0%
Gravel - 61.9%
Sand - 34.8%
Silt - 3.3%



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CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Sample: 19 Depth: 3.00-3.40m
Location: TP#27-92

Client: YTG, C&T Services, Transportation Eng
Project: km 1322, Alaska Hwy. Geotech. Inves.
Made by: LK & MF Job No.: 8002-219
Ck'd by: [illegible] Date: 1992/03/30

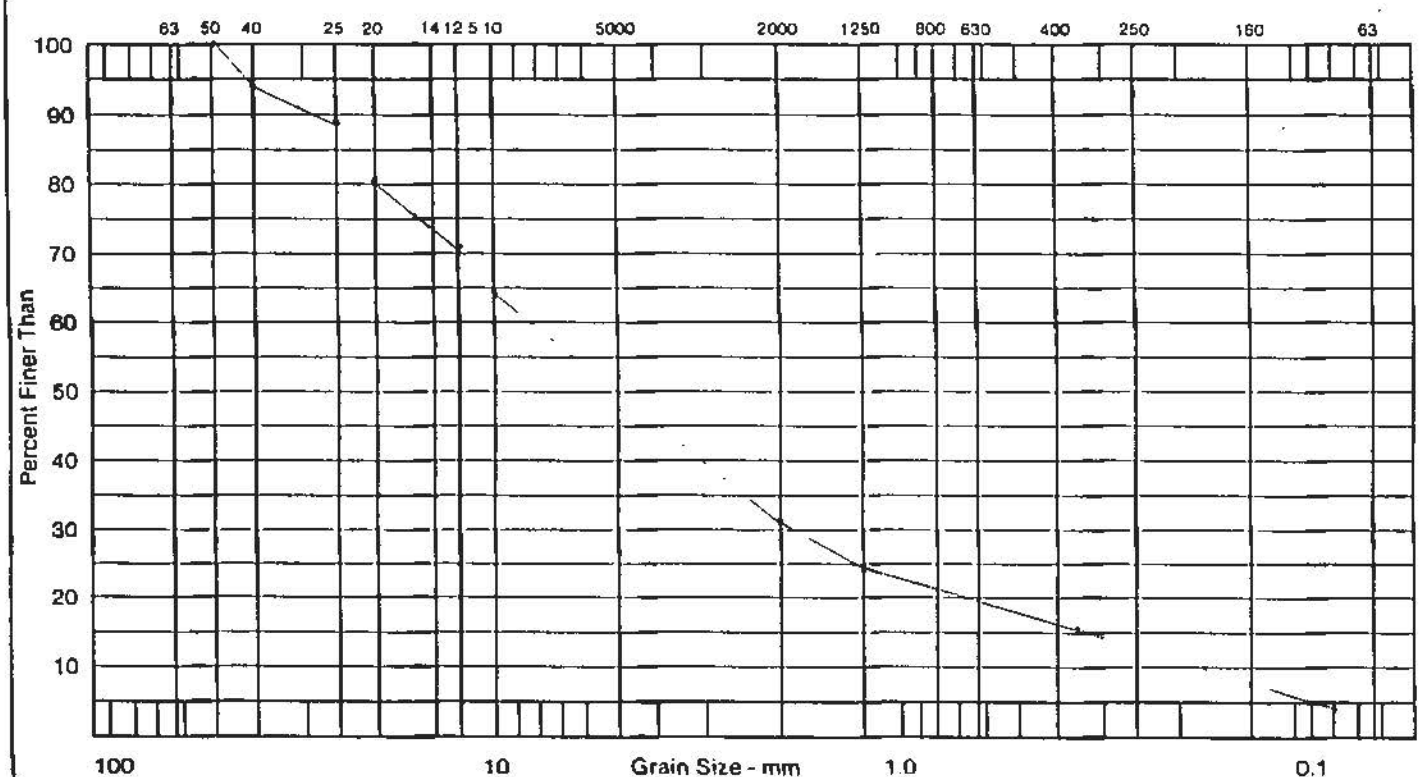
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					100.0
40,000	40.0					94.4
25,000	25.0					88.3
20,000	20.0					81.9
12,500	12.5					72.2
10,000	10.0					64.1
5,000	5.0					47.4
2500	2.5					32.7
1,250	1.25					24.4
800	0.800					20.4
630	0.630					15.2
315	0.315					
250	0.250					
160	0.160					8.8
80	0.080					4.5

Description of Sample: Sandy gravel, GW

Time of Sieving: Min. 15

Method of Preparation: Dry ____ Washed X

Remarks: Moisture - 3.0%
Gravel - 52.6%
Sand - 42.9%
Silt - 4.5%



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CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services, Transportation Eng
Sample: 21 Depth: 1.00-1.30m Project: km 1322, Alaska Hwy. Geotech. Inves.
Location: Made by: LK & MF Job No.: 8002-219
TP#28-92 Ck'd by: [illegible] Date: 1992/03/30

Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					
40,000	40.0					
25,000	25.0					
20,000	20.0					
12,500	12.5					
10,000	10.0					100.0
5,000	5.0					99.9
2500	2.5					99.8
1,250	1.25					99.4
800	0.800					99.0
630	0.630					98.6
315	0.315					92.8
250	0.250					
160	0.160					58.0
80	0.080					19.1

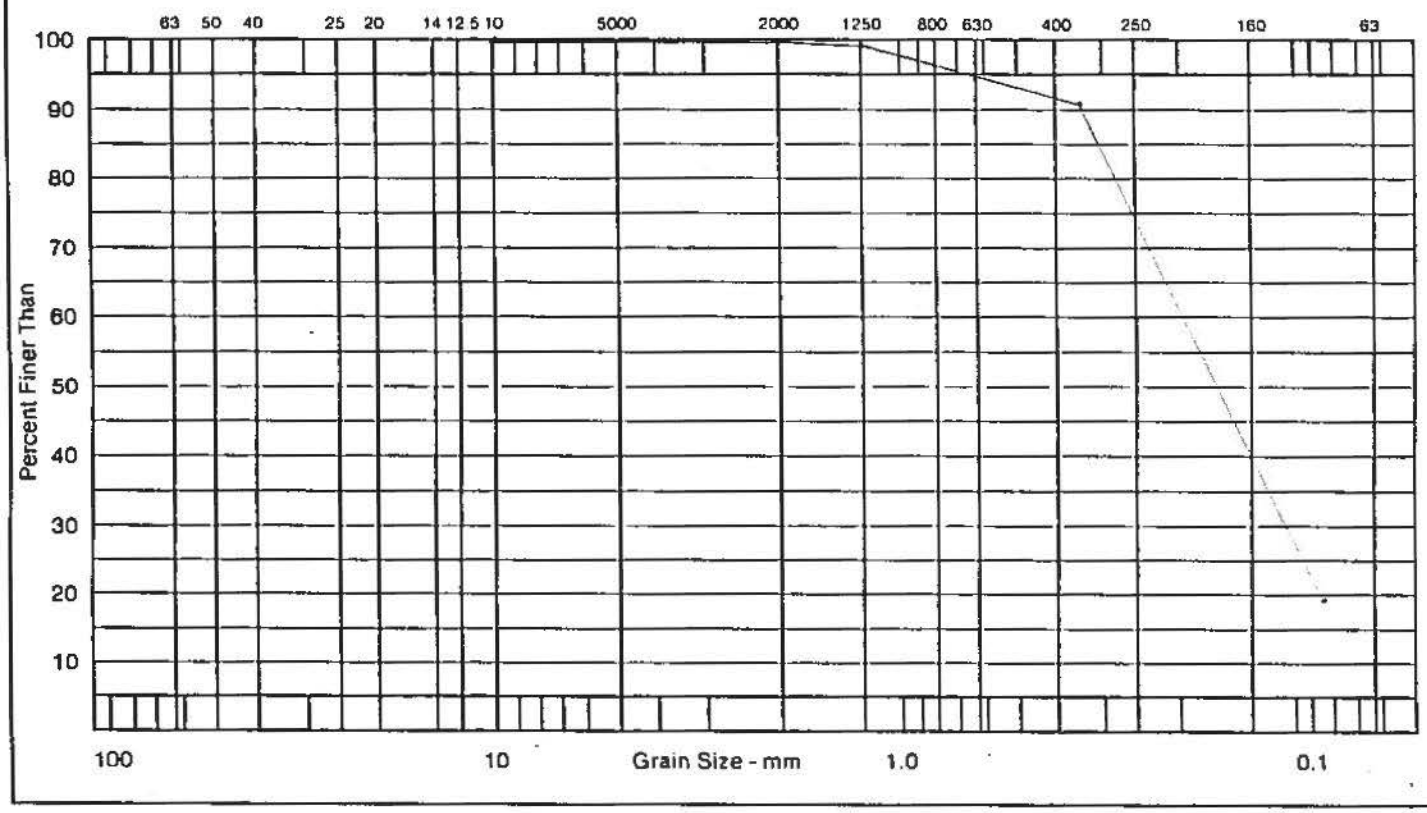
Description of Sample

Silty sand, SM

Time of Sieving Min. 15

Method of Preparation Dry Washed X

Remarks Moisture - 4.5%
Gravel -
Sand - 80.8%
Silt - 19.1%



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CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services, Transportation Eng

Sample: 22 Depth: 1.90-2.30m Project: km 1322, Alaska Hwy. Geotech, Inves.

Location: Made by: LK & MF Job No.: 8002-219

TP#28-92 Ck'd by: WCR Date: 1992/03/30

Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					100.0
40,000	40.0					94.5
25,000	25.0					85.8
20,000	20.0					77.9
12,500	12.5					60.5
10,000	10.0					49.6
5,000	5.0					27.2
2500	2.5					9.6
1,250	1.25					5.5
800	0.800					4.9
630	0.630					4.6
315	0.315					3.5
250	0.250					
160	0.160					2.4
80	0.080					1.8

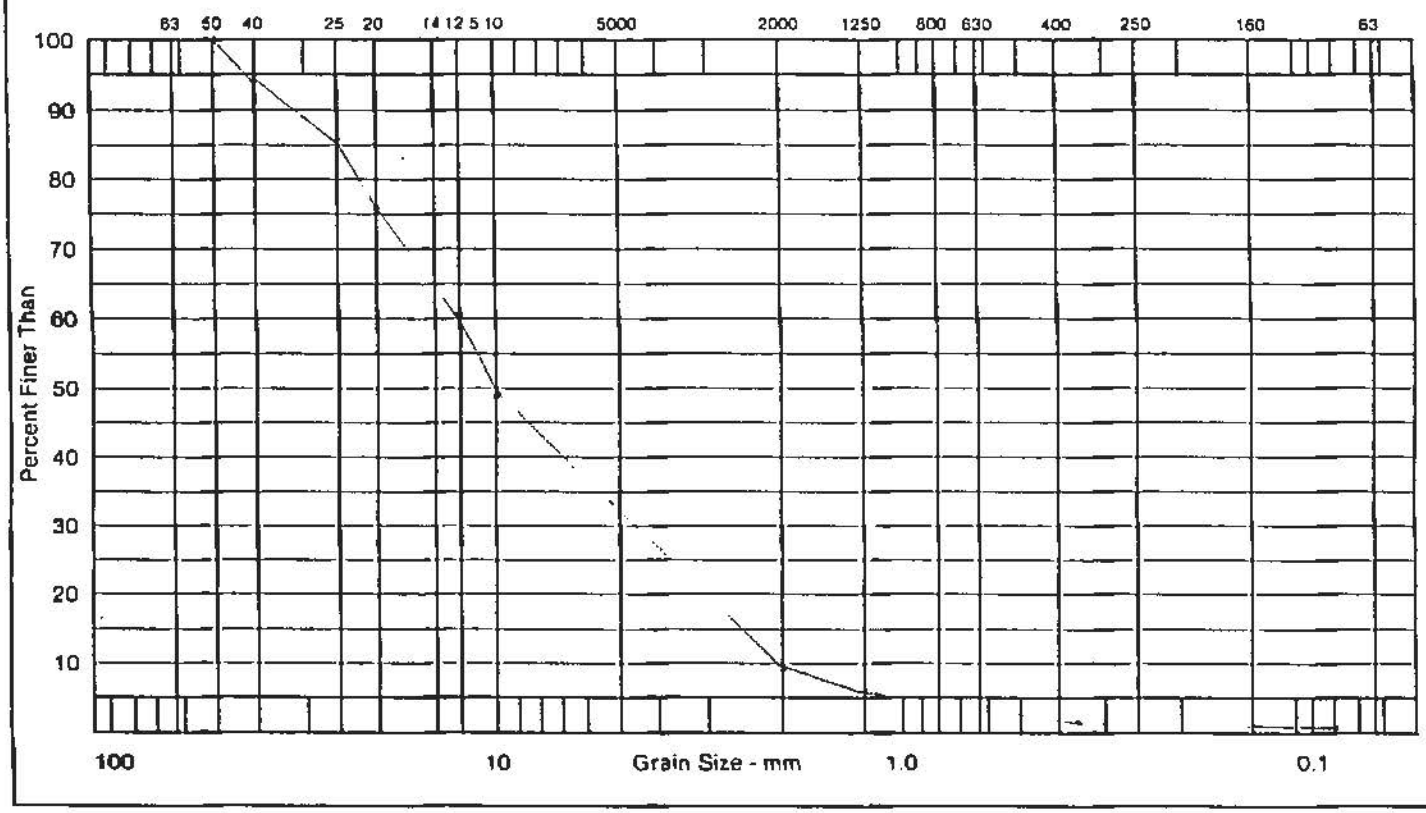
Description of Sample

Sandy gravel, GW

Time of Sieving Min. 15

Method of Preparation Dry Washed X

Remarks Moisture - 2.8%
Gravel - 72.8%
Sand - 25.4%
Silt - 1.8%



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CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services, Transportation Eng

Sample: 23 Depth: 2.70-3.00m Project: km 1322, Alaska Hwy. Geotech. Inves.

Location: TP#28-92 Made by: LK & MF Job No.: 8002-219

Ck'd by: WCR Date: 1992/03/30

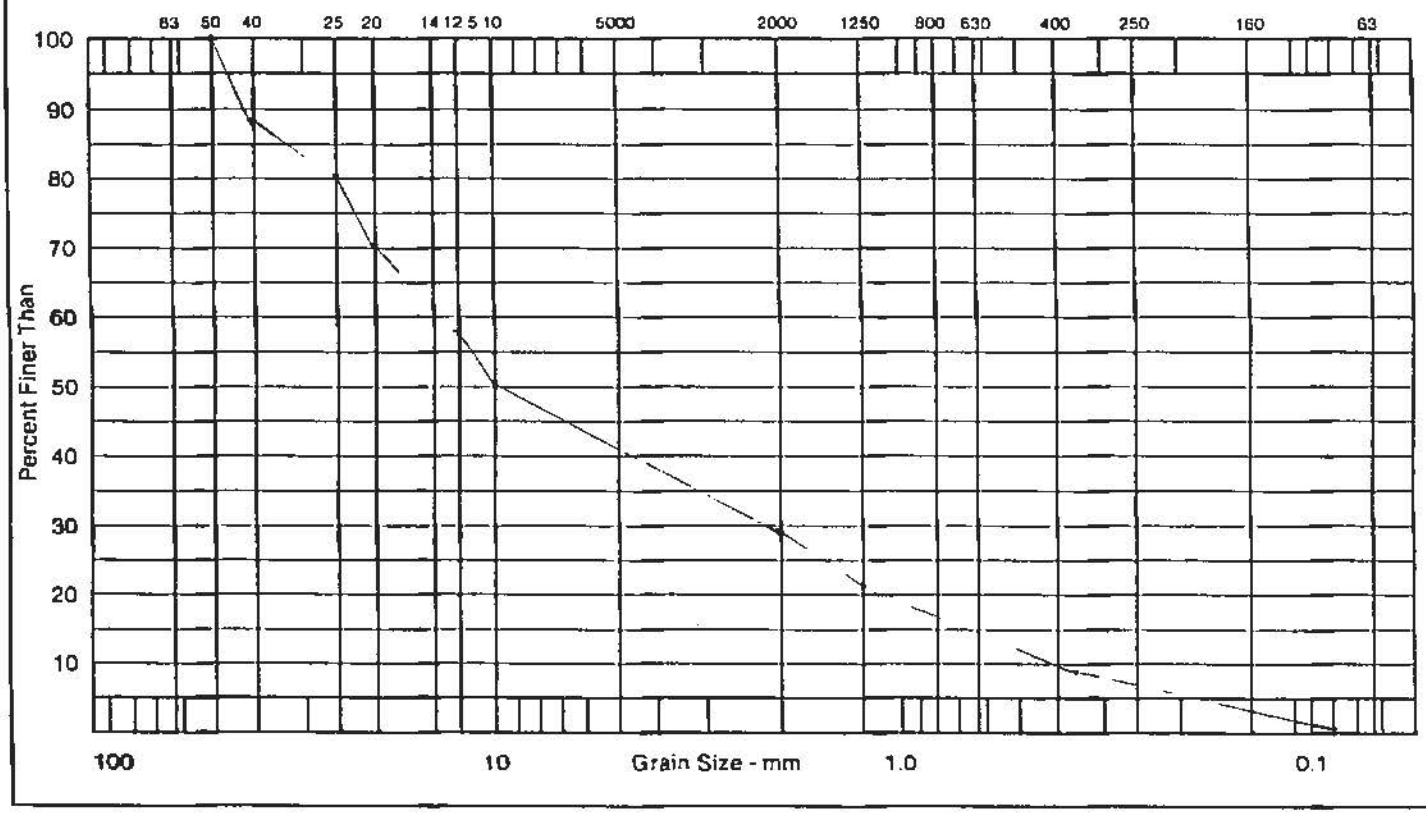
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					100.0
40,000	40.0					88.6
25,000	25.0					80.1
20,000	20.0					70.1
12,500	12.5					57.9
10,000	10.0					50.8
5,000	5.0					37.9
2500	2.5					29.7
1,250	1.25					23.7
800	0.800					19.4
630	0.630					16.6
315	0.315					8.3
250	0.250					
160	0.160					3.8
80	0.080					1.9

Description of Sample: Sandy grave;, GW

Time of Sieving: Min. 15

Method of Preparation: Dry: Washed: X

Remarks: Moisture - 2.6%
Gravel - 62.1%
Sand - 36.0%
Silt - 1.9%



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CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services, Transportation Eng

Sample: 25 Depth: 1.00-1.30m

Project: km 1322, Alaska Hwy. Geotech. Inves.

Location: TP#29-92

Made by: LK & MF Job No.: 8002-219

Ck'd by: WCC Date: 1992/03/30

Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					
40,000	40.0					
25,000	25.0					
20,000	20.0					
12,500	12.5					
10,000	10.0					
5,000	5.0					
2500	2.5					
1,250	1.25					100.0
800	0.800					99.9
630	0.630					99.8
315	0.315					99.0
250	0.250					
160	0.160					94.5
80	0.080					57.0

Description of Sample

Sandy silt, ML

Time of Sieving ____ Min. 15

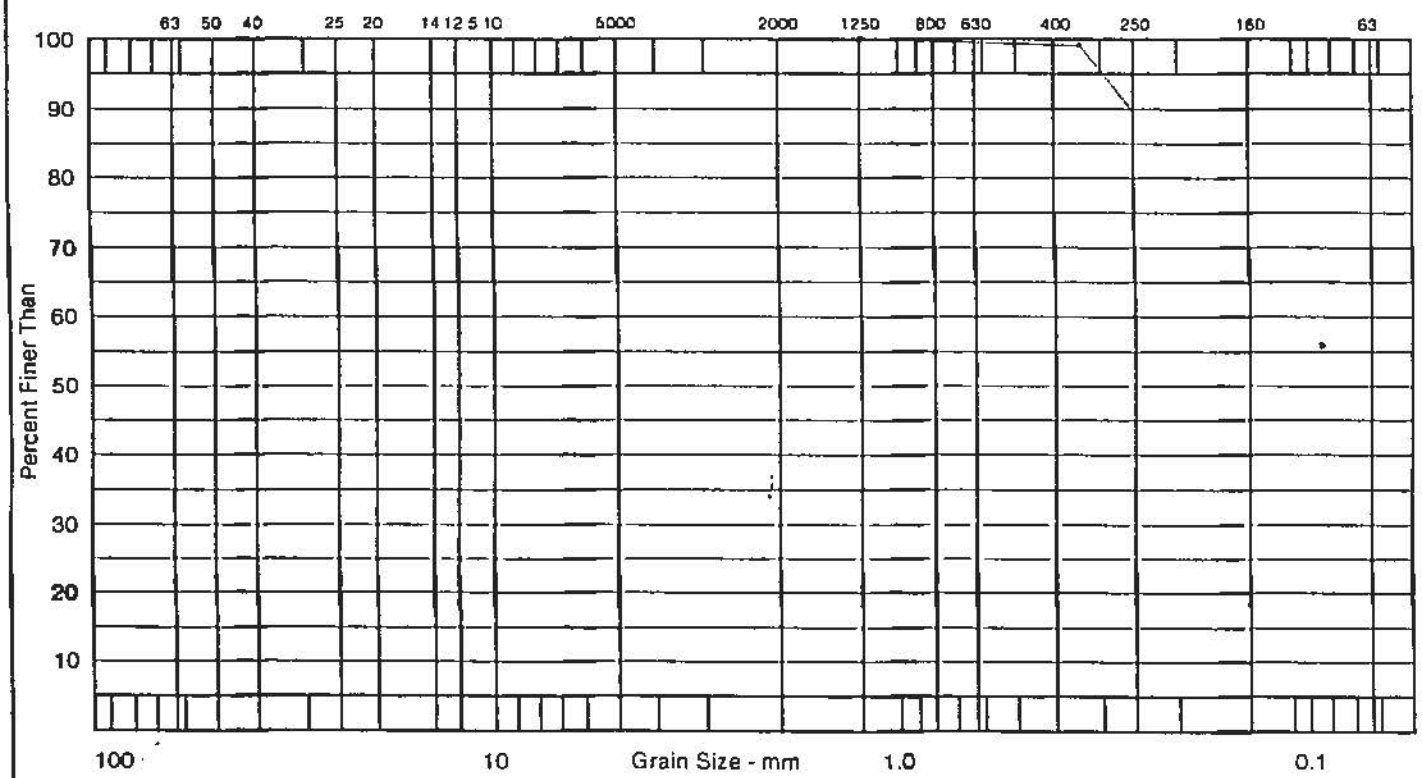
Method of Preparation ____ Dry ____ Washed X

Remarks Moisture - 16.0%

Gravel -

Sand - 43.0%

Silt - 57.0%



J. R. Paine & Associates Ltd.

CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Sample: 26 Depth: 1.80-2.30m

Location: TP#29-92

Client: YTG, C&T Services, Transportation Eng

Project: km 1322, Alaska Hwy. Geotech. Inves.

Made by: LK & MF Job No.: 8002-219

Ck'd by: [illegible] Date: 1992/03/30

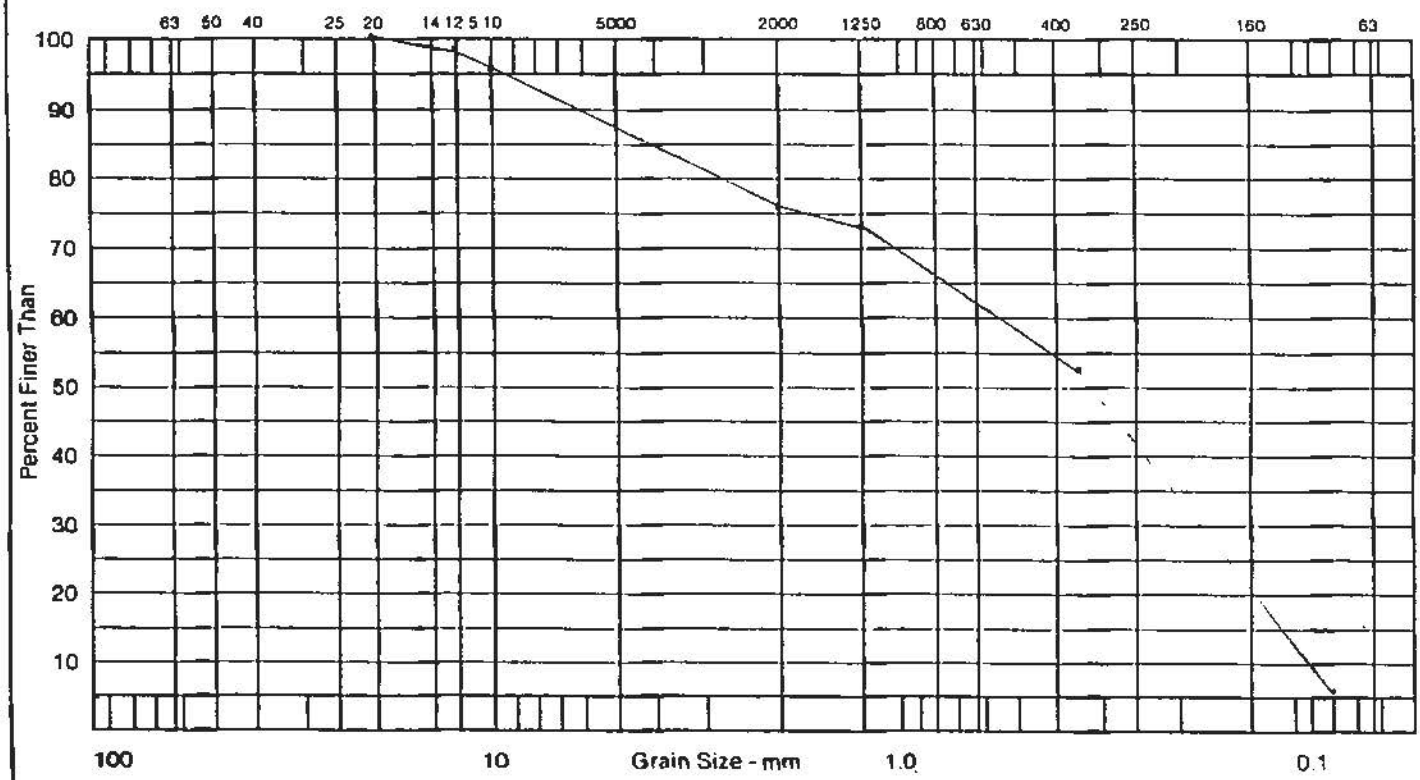
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					
40,000	40.0					
25,000	25.0					
20,000	20.0					100.0
12,500	12.5					98.5
10,000	10.0					95.8
5,000	5.0					86.5
2500	2.5					76.4
1,250	1.25					68.3
800	0.800					62.8
630	0.630					60.4
315	0.315					53.6
250	0.250					
160	0.160					24.0
80	0.080					6.4

Description of Sample: Sand , some gravel trace of silt

Time of Sieving: ____ Min. 15

Method of Preparation: ____ Dry ____ Washed: X

Remarks: Moisture - 6.9%
Gravel - 13.5%
Sand - 80.1%
Silt - 6.4%



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CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Sample: 28 Depth: 0.50-1.00m

Location: TP#30-92

Client: YTG, C&T Services, Transportation Eng

Project: km 1322, Alaska Hwy. Geotech. Inves.

Made by: LK & MF Job No.: 8002-219

Ck'd by: WCK Date: 1992/03/30

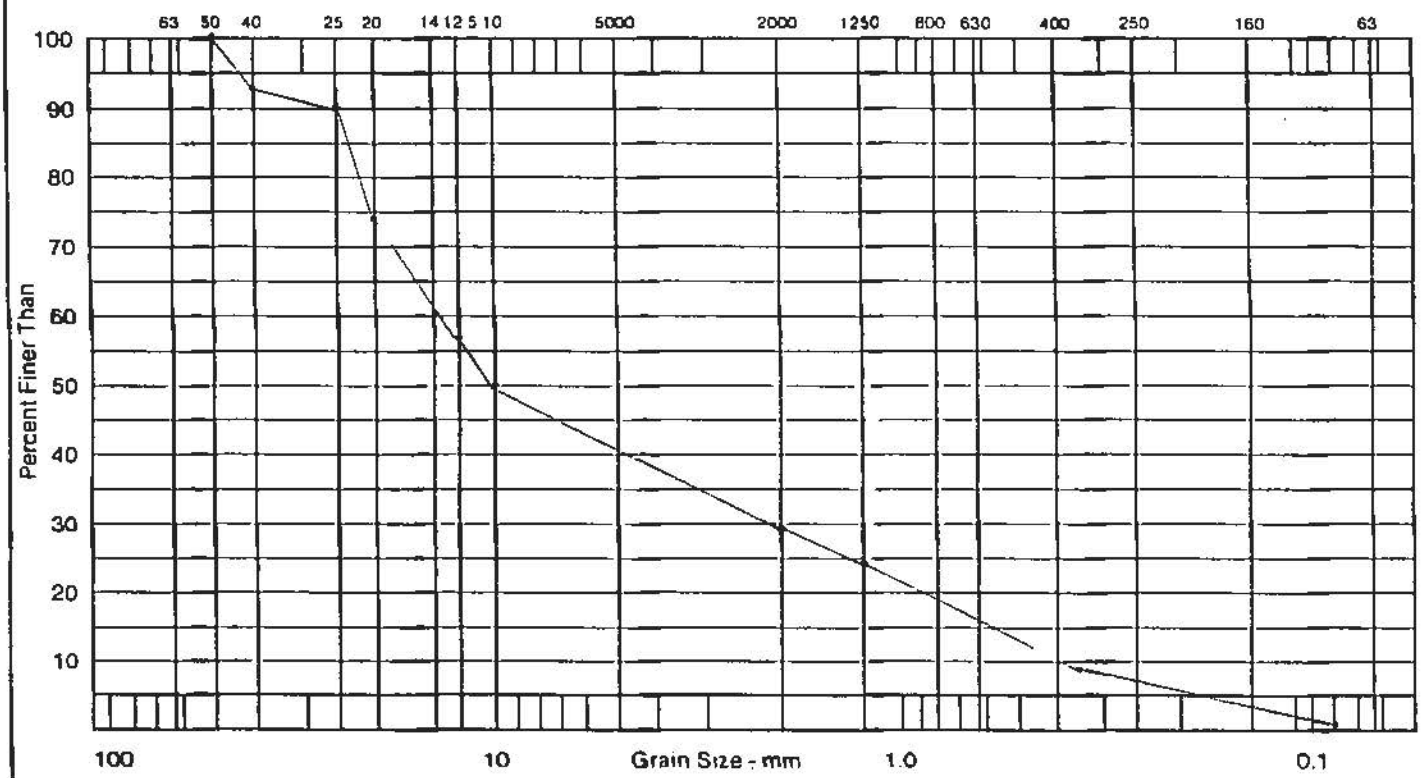
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					100.0
40,000	40.0					93.2
25,000	25.0					90.4
20,000	20.0					74.2
12,500	12.5					57.9
10,000	10.0					50.0
5,000	5.0					37.2
2500	2.5					29.8
1,250	1.25					24.0
800	0.800					20.1
630	0.630					17.7
315	0.315					9.5
250	0.250					
160	0.160					4.0
80	0.080					1.7

Description of Sample: Sandy gravel, GW

Time of Sieving: Min. 15

Method of Preparation: Dry: Washed: X

Remarks: Moisture - 2.8%
Gravel - 62.8%
Sand - 35.5%
Silt - 1.7%



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CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Sample: 30 Depth: 1.00-1.50m

Location: TP#31-92

Client: YTG, C&T Services, Transportation Eng

Project: km 1322, Alaska Hwy. Geotech. Inves.

Made by: LK & MP Job No.: 8002-219

Ck'd by: WCH Date: 1992/03/30

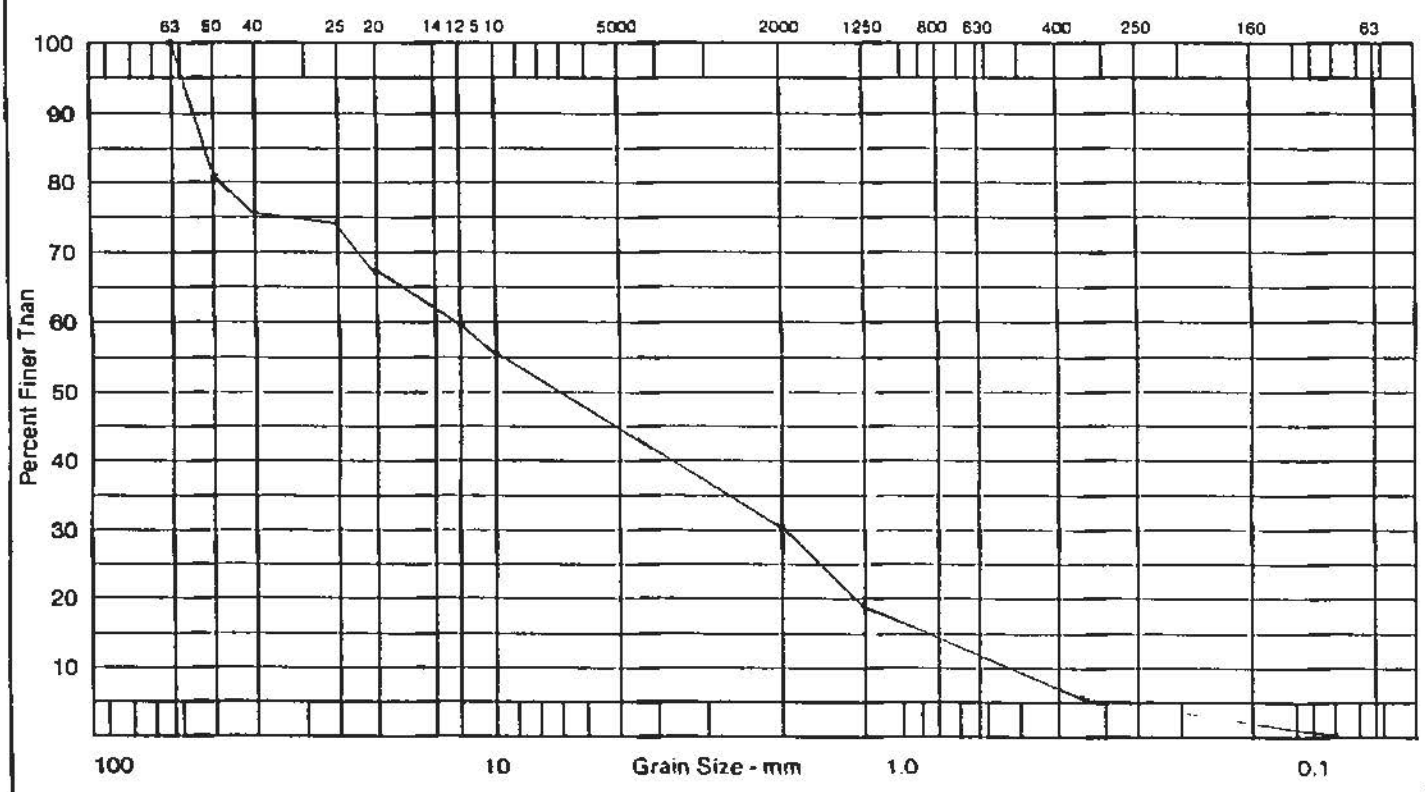
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					100.0
50,000	50.0					80.1
40,000	40.0					76.0
25,000	25.0					74.6
20,000	20.0					67.8
12,500	12.5					59.9
10,000	10.0					55.4
5,000	5.0					42.3
2500	2.5					30.1
1,250	1.25					19.7
800	0.800					14.8
630	0.630					12.8
315	0.315					5.5
250	0.250					
160	0.160					2.0
80	0.080					.9

Description of Sample: Sandy gravel, GW

Time of Sieving: Min. 15

Method of Preparation: Dry: Washed: X

Remarks: Moisture - 1.8%
Gravel - 57.7%
Sand - 41.4%
Silt - 0.9%



J. R. Paine & Associates Ltd.

CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Sample: 32 Depth: 0.30-0.50m

Location: TP#32-92

Client: YTG, C&T Services, Transportation Eng

Project: km 1322, Alaska Hwy. Geotech. Inves.

Made by: LK & MF Job No.: 8002-219

Ck'd by: WCK Date: 1992/03/30

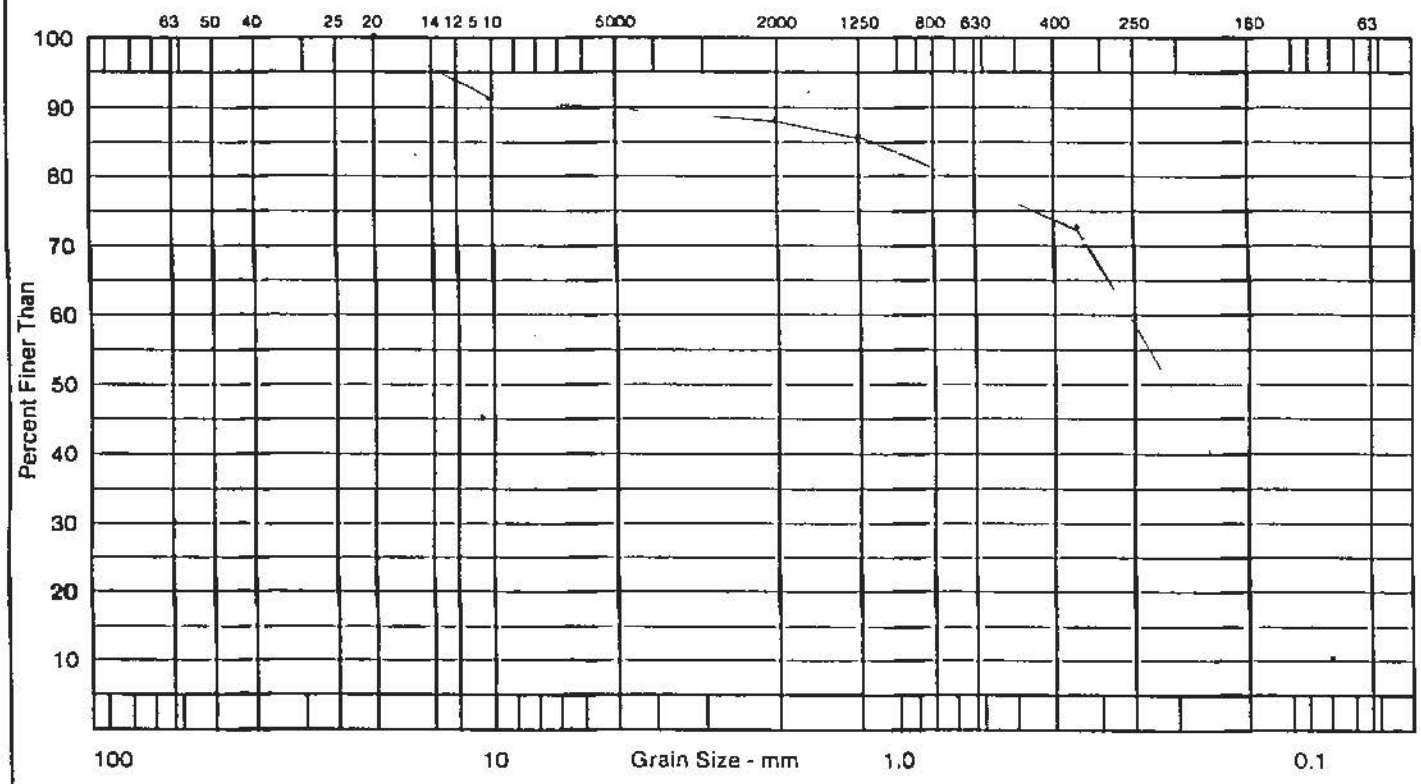
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					
40,000	40.0					
25,000	25.0					
20,000	20.0					100.0
12,500	12.5					94.3
10,000	10.0					92.8
5,000	5.0					90.3
2500	2.5					88.8
1,250	1.25					86.9
800	0.800					85.4
630	0.630					84.6
315	0.315					73.2
250	0.250					
160	0.160					33.3
80	0.080					10.4

Description of Sample: Sand some silt some gravel, SP

Time of Sieving: ____ Min. 15

Method of Preparation: ____ Dry ____ Washed: X

Remarks: Moisture - 4.9%
Gravel - 9.7%
Sand - 79.9%
Silt - 10.4%



J. R. Paine & Associates Ltd.

CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services, Transportation Eng
Sample: 33 Depth: 1.50-2.00m Project: km 1322, Alaska Hwy. Geotech. Inves.
Location: Made by: LK & MF Job No.: 8002-219
TP#32-92 Ck'd by: [illegible] Date: 1992/03/30

Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					100.0
40,000	40.0					71.1
25,000	25.0					62.4
20,000	20.0					50.1
12,500	12.5					39.2
10,000	10.0					33.9
5,000	5.0					24.9
2500	2.5					19.8
1,250	1.25					15.8
800	0.800					13.4
630	0.630					11.9
315	0.315					6.1
250	0.250					
160	0.160					3.0
80	0.080					2.0

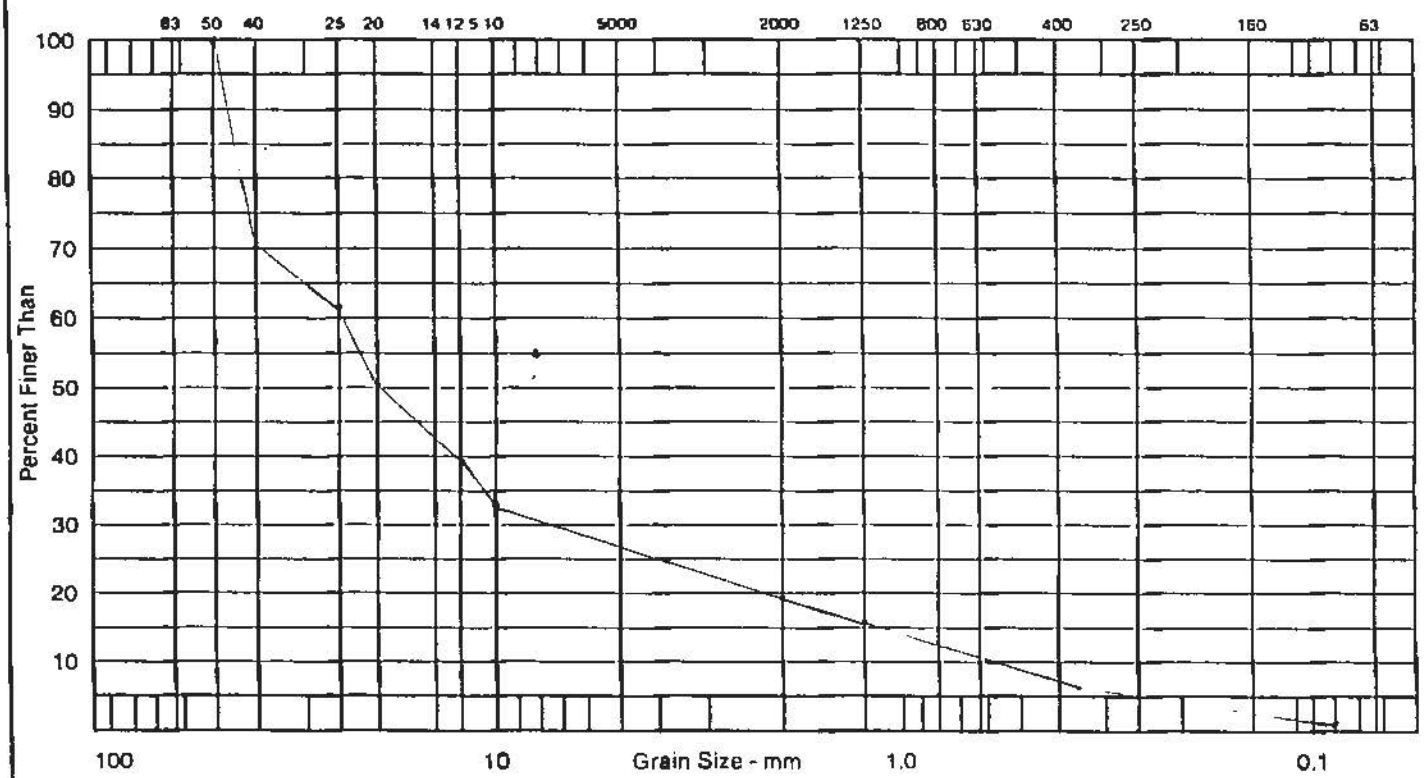
Description of Sample
Sandy gravel, GW

Time of Sieving Min. 15

Method of Preparation Dry Washed X

Remarks
Moisture - 1.5%
Gravel - 75.1%
Sand - 22.9%
Silt - 2.0%

Fractured rock, oxidized in fracture



J. R. Paine & Associates Ltd.

CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services, Transportation Eng
Sample: 34 Depth: 2.40-2.70m Project: km 1322, Alaska Hwy. Geotech. Inves.
Location: Made by: LK & MP Job No.: 8002-219
TP#32-92 Ck'd by: WCH Date: 1992/03/30

Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					
40,000	40.0					
25,000	25.0					
20,000	20.0					100.0
12,500	12.5					99.1
10,000	10.0					
5,000	5 0					98.9
2500	2.5					98.7
1,250	1.25					98.2
800	0.800					97.9
630	0.630					96.8
315	0.315					95.9
250	0.250					
160	0.160					88.0
80	0.080					64.5

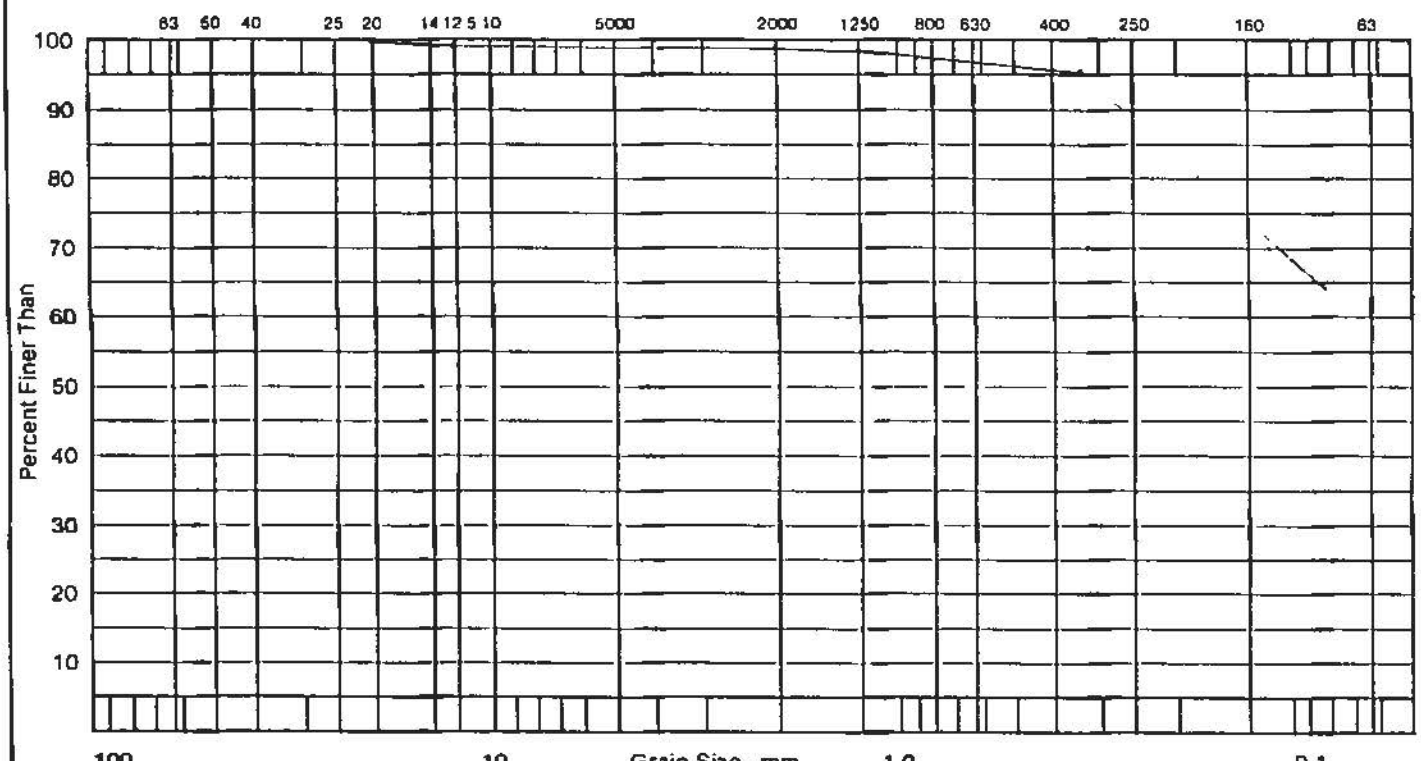
Description of Sample

Sandy silt, ML

Time of Sieving Min. 15

Method of Preparation Dry Washed X

Remarks Moisture - 15.8%
Gravel - 1.1%
Sand - 34.4%
Silt - 64.5%



J. R. Paine & Associates Ltd.

CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services, Transportation Eng
Sample: 36 Depth: 0.80-1.30m
Project: km 1322, Alaska Hwy. Geotech. Inves.
Location: TP#33-92
Made by: LK & MF Job No.: 8002-219
Ck'd by: WCC Date: 1992/03/30

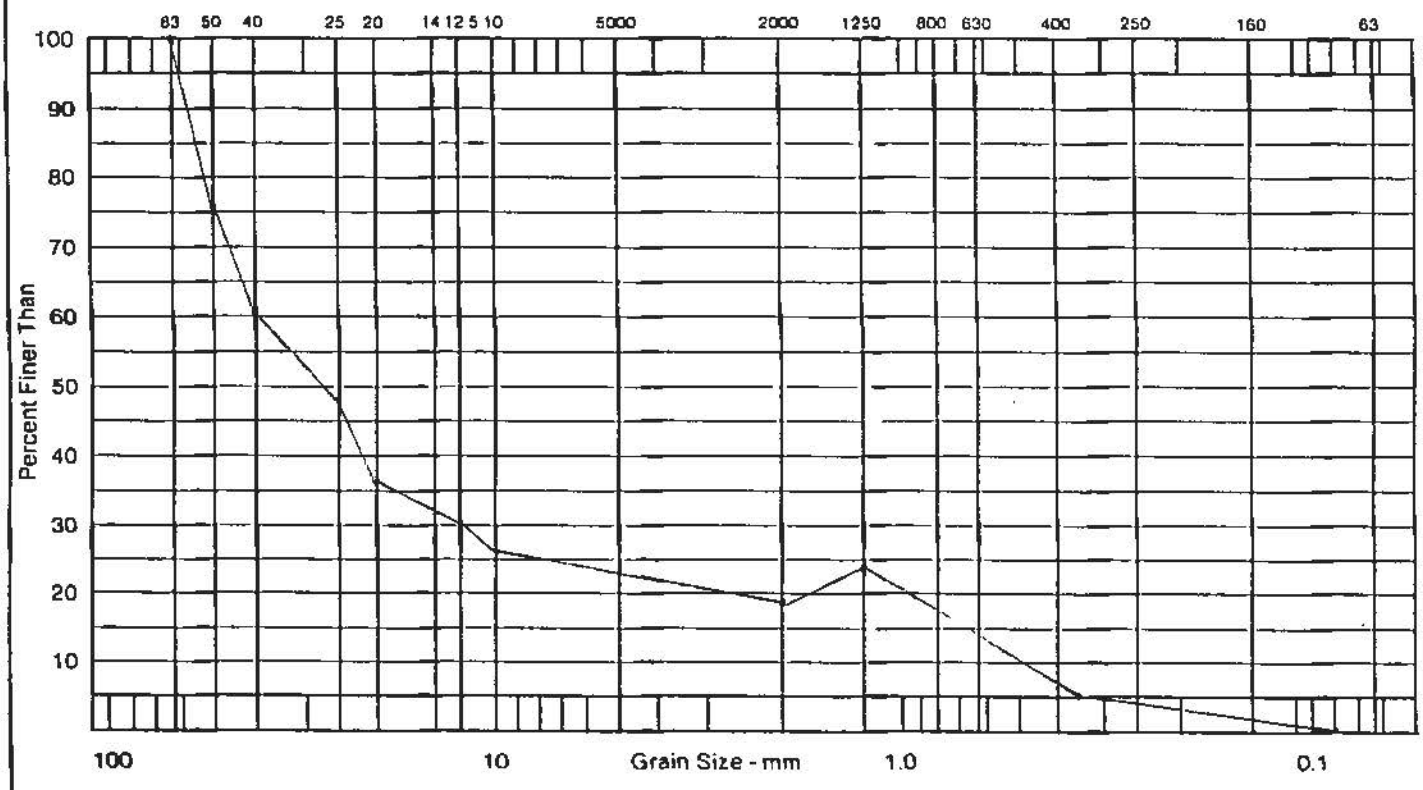
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					100.0
50,000	50.0					76.2
40,000	40.0					60.1
25,000	25.0					48.9
20,000	20.0					37.6
12,500	12.5					30.7
10,000	10.0					27.1
5,000	5.0					22.1
2500	2.5					18.3
1,250	1.25					14.1
800	0.800					11.3
630	0.630					9.9
315	0.315					5.9
250	0.250					
160	0.160					3.1
80	0.080					1.3

Description of Sample: Sandy gravel, GW

Time of Sieving: Min. 15

Method of Preparation: Dry: Washed: X

Remarks: Moisture - 2.6%
Gravel - 77.9%
Sand - 20.8%
Silt - 1.3%



J. R. Paine & Associates Ltd.

CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services, Transportation Eng
Sample: 3B Depth: 0.40-0.60m Project: km 1322, Alaska Hwy. Geotech. Inves.
Location: Made by: LK & MP Job No.: 8002-219
TP#34-92 Ck'd by: WCIC Date: 1992/03/30

Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					
40,000	40.0					
25,000	25.0					
20,000	20.0					
12,500	12.5					
10,000	10.0					100.0
5,000	5.0					99.7
2500	2.5					99.4
1,250	1.25					99.1
800	0.800					98.8
630	0.630					98.5
315	0.315					95.6
250	0.250					
160	0.160					68.2
80	0.080					34.8

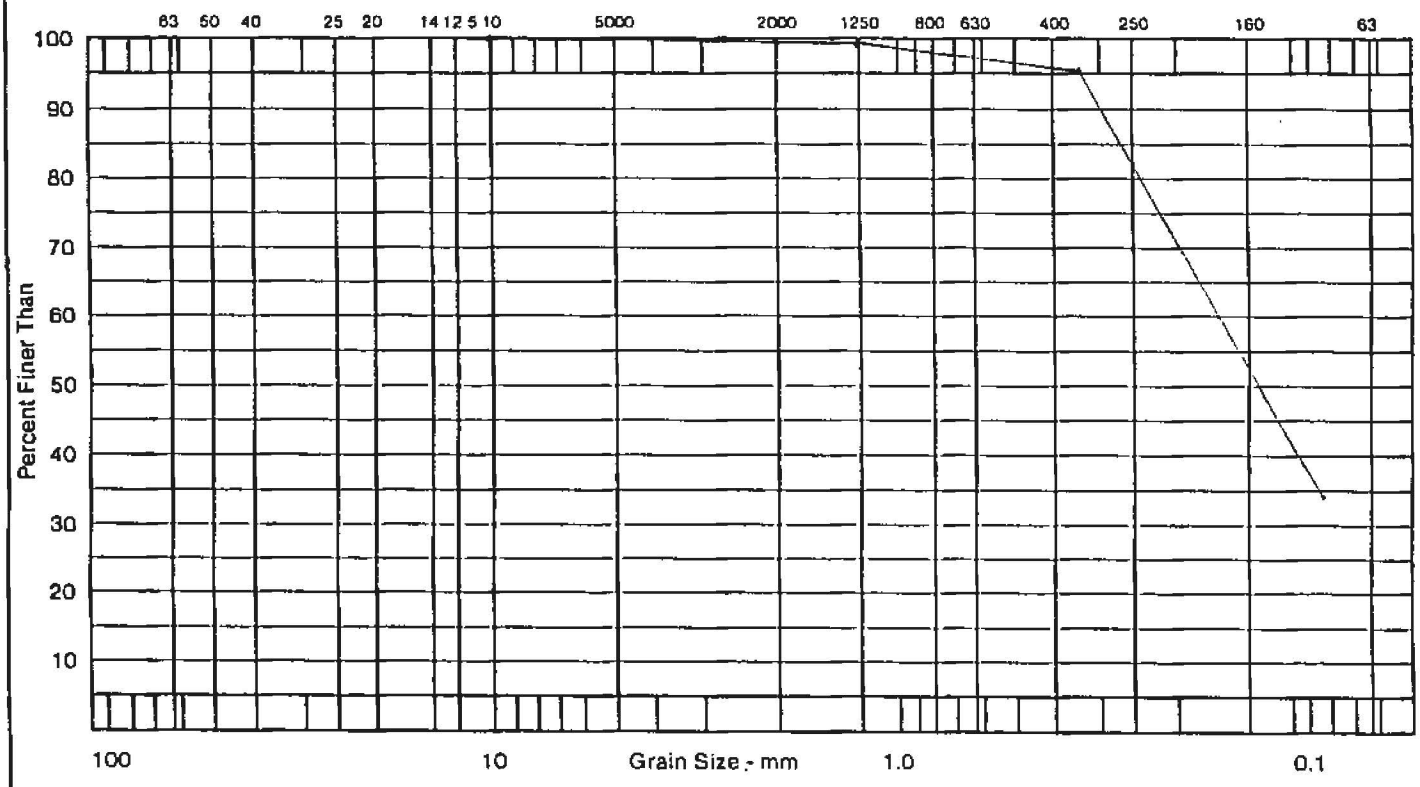
Description of Sample

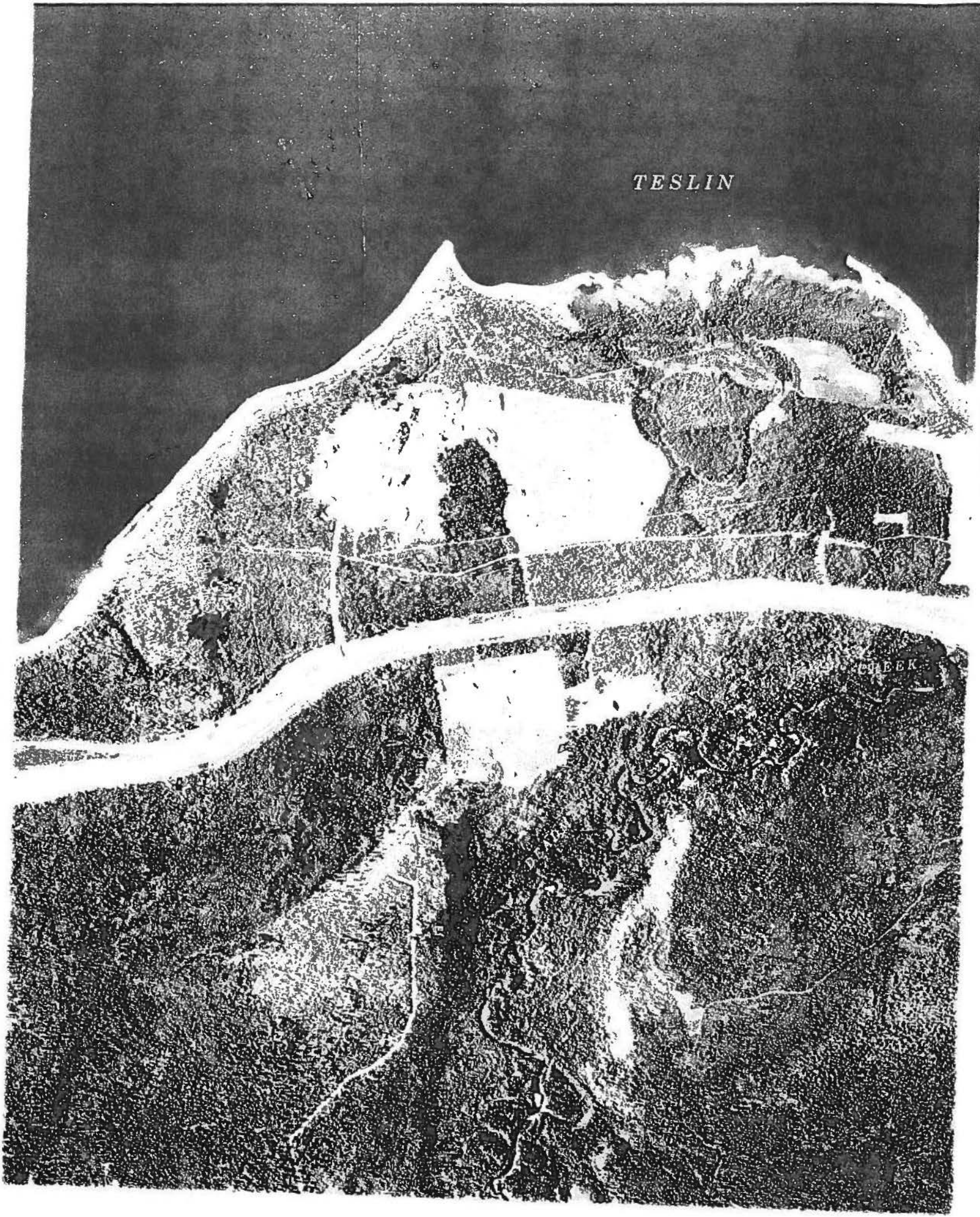
Silty sand, SM

Time of Sieving Min. 15

Method of Preparation Dry Washed X

Remarks Moisture - 9.3%
Gravel -
Sand - 64.9%
Silt - 34.8%

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CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services, Transportation Eng

Sample: 39 Depth: 1.20-1.70m Project: km 1322, Alaska Hwy, Geotech. Inves.

Location: TP#34-92 Made by: LK & MP Job No.: 8002-219

Ck'd by: WLC Date: 1992/03/30

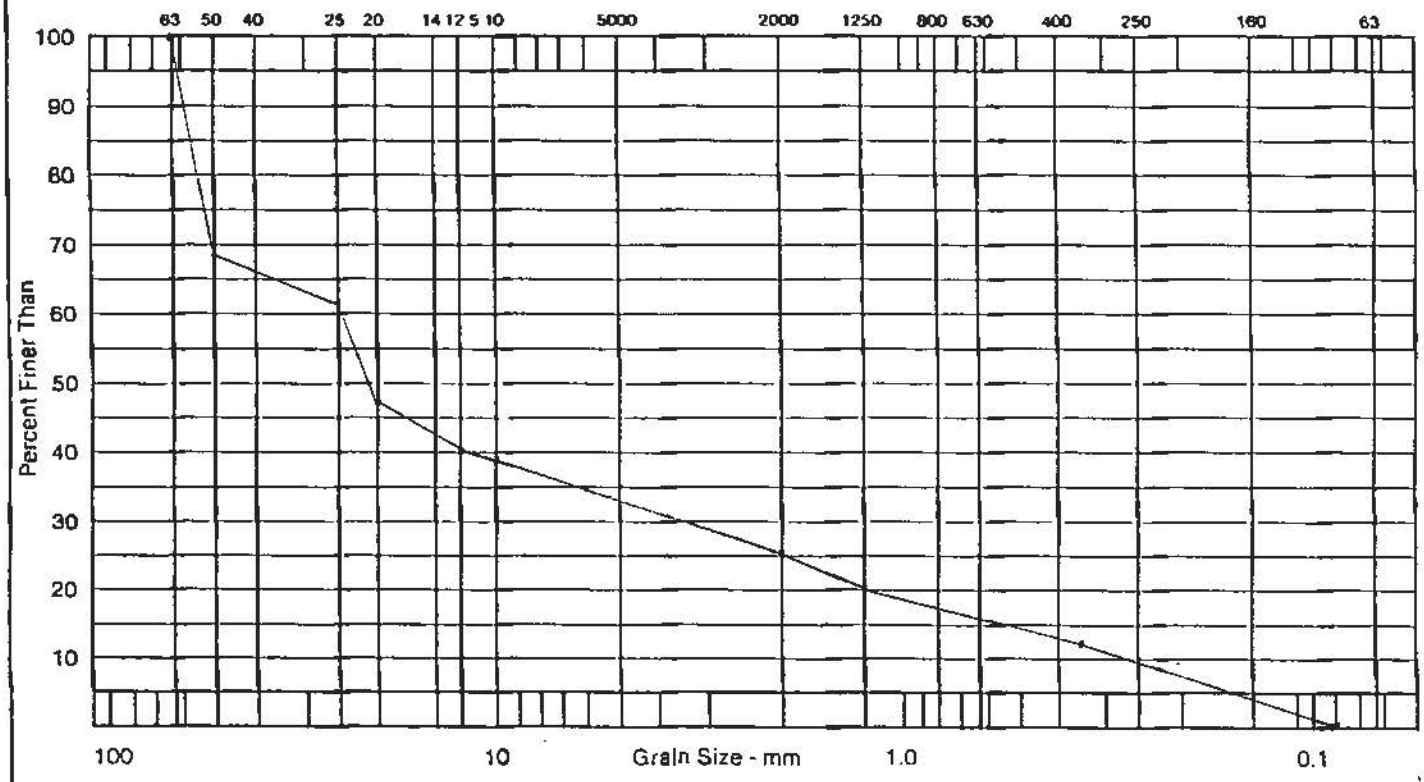
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					100.0
50,000	50.0					68.5
40,000	40.0					
25,000	25.0					62.1
20,000	20.0					47.4
12,500	12.5					40.9
10,000	10.0					38.2
5,000	5.0					31.4
2500	2.5					25.7
1,250	1.25					20.9
800	0.800					18.7
630	0.630					17.6
315	0.315					13.3
250	0.250					
160	0.160					5.7
80	0.080					1.7

Description of Sample: Sandy gravel, GW

Time of Sieving ____ Min. 15

Method of Preparation ____ Dry ____ Washed X

Remarks: Moisture - 1.4%
Gravel - 68.6%
Sand - 29.7%
Silt - 1.7%



J. R. Paine & Associates Ltd.

CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Sample: 40 Depth: 2.20-2.70m

Location: TP#34-92

Client: YTG, C&T Services, Transportation Eng

Project: km 1322, Alaska Hwy. Geotech. Inves.

Made by: LK & MP Job No.: 8002-219

Ck'd by: [illegible] Date: 1992/03/30

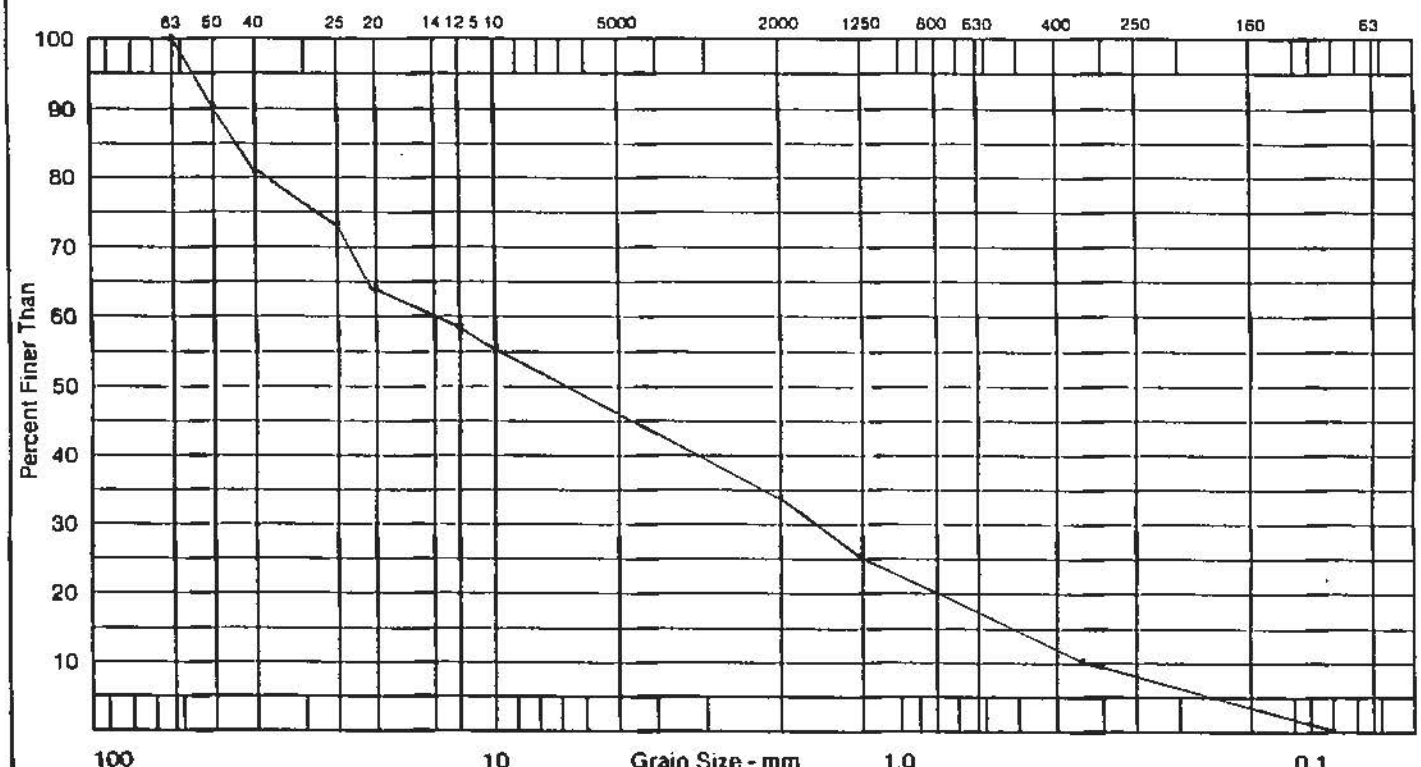
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					100.0
50,000	50.0					90.4
40,000	40 0					81.6
25,000	25 0					73.5
20,000	20.0					64.2
12,500	12.5					58.8
10,000	10 0					56.1
5,000	5 0					45.5
2500	2.5					34.5
1,250	1.25					25.1
800	0 800					20.3
630	0 630					18.1
315	0.315					11.9
250	0.250					
160	0.160					4.9
80	0.080					1.4

Description of Sample: Sandy gravel, GW

Method of Preparation: Dry ____ Washed: X

Remarks: Moisture - 2.2%
Gravel - 54.5%
Sand - 44.1%
Silt - 1.4%

Time of Sieving: ____ Min. 15



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CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services, Transportation Eng

Sample: 25A-92 Depth: 0.60-3.00m Project: km 1322, Alaska Hwy. Geotech. Inves.

Location: TP#25-92 BULK SAMPLE Made by: LK & MP Job No.: 8002-219

Ck'd by: Date: 1992/03/30

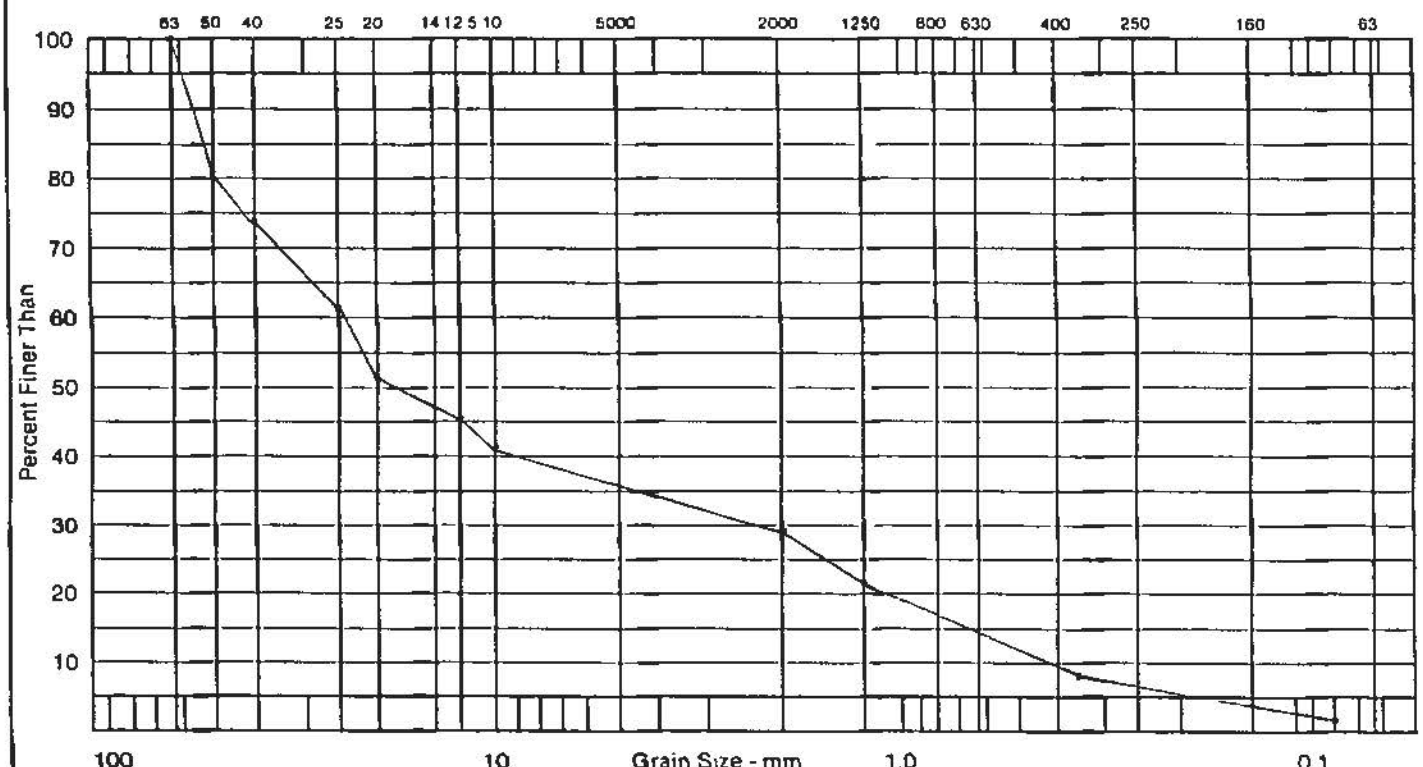
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					100.0
50,000	50.0					81.9
40,000	40.0					74.3
25,000	25.0					62.7
20,000	20.0					52.1
12,500	12.5					45.8
10,000	10.0					42.4
5,000	5.0					35.6
2500	2.5					29.8
1,250	1.25					22.7
800	0.800					17.6
630	0.630					15.0
315	0.315					8.7
250	0.250					
160	0.160					5.1
80	0.080					2.8

Description of Sample: Sandy gravel, GW

Method of Preparation: Dry: Washed: X

Remarks: Moisture -
Gravel - 64.4%
Sand - 32.8%
Silt - 2.8%

Time of Sieving: Min. 15



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CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Sample: 27A-92 Depth: 0.60-3.40m
Location: TP#27-92 BULK SAMPLE

Client: YTG, C&T Services, Transportation Eng
Project: km 1322, Alaska Hwy. Geotech. Inves.
Made by: LK & MP Job No.: 8002-219
Ck'd by: _____ Date: 1992/03/30

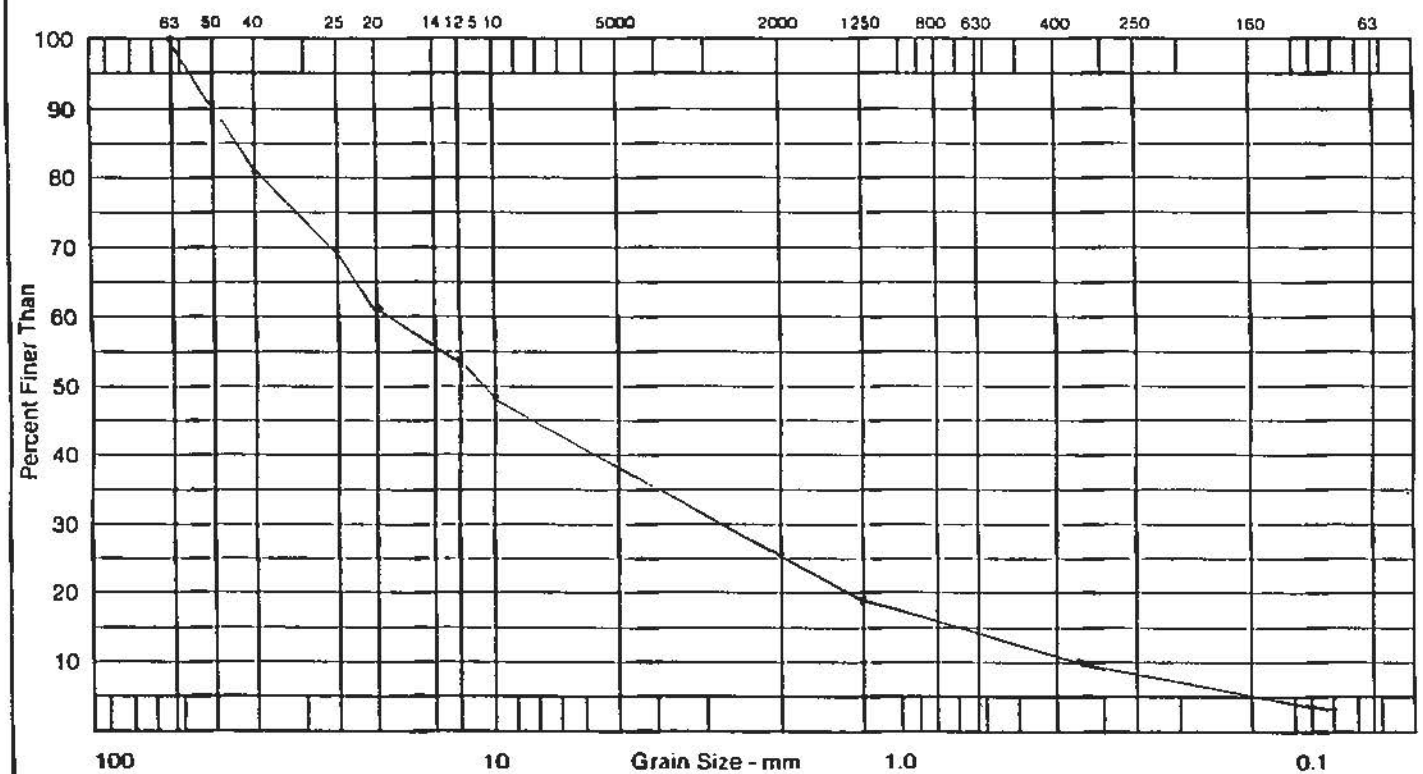
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Org. Sample
63,000	63.0					100.0
50,000	50.0					91.4
40,000	40.0					81.1
25,000	25.0					69.7
20,000	20.0					61.5
12,500	12.5					54.5
10,000	10.0					48.9
5,000	5.0					36.9
2500	2.5					26.1
1,250	1.25					19.8
800	0.800					17.1
630	0.630					15.7
315	0.315					10.7
250	0.250					
160	0.160					5.8
80	0.080					3.2

Description of Sample: Sandy gravel, GW

Time of Sieving _____ Min. 15

Method of Preparation _____ Dry _____ Washed X

Remarks: Moisture -
Gravel - 63.1%
Sand - 33.7%
Silt - 3.2%



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SCREEN ANALYSIS

Client: YTG, C&T Services, Transportation Eng

Sample: 28A-92 Depth: 1.80-3.40m

Project: km 1322, Alaska Hwy. Geotech. Inves.

Location: BULK SAMPLE TP#28-92

Made by: LK & MP Job No.: 8002-219

Ck'd by: _____ Date: 1992/03/30

Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					100.0
50,000	50.0					83.5
40,000	40.0					77.4
25,000	25.0					72.4
20,000	20.0					63.2
12,500	12.5					53.4
10,000	10.0					46.0
5,000	5 0					32.4
2500	2.5					23.7
1,250	1.25					17.8
800	0 800					15.0
630	0 630					13.4
315	0.315					8.4
250	0.250					
160	0.160					4.6
80	0.080					2.7

Description of Sample

Sandy gravel, GW

Time of Sieving _____ Min. 15

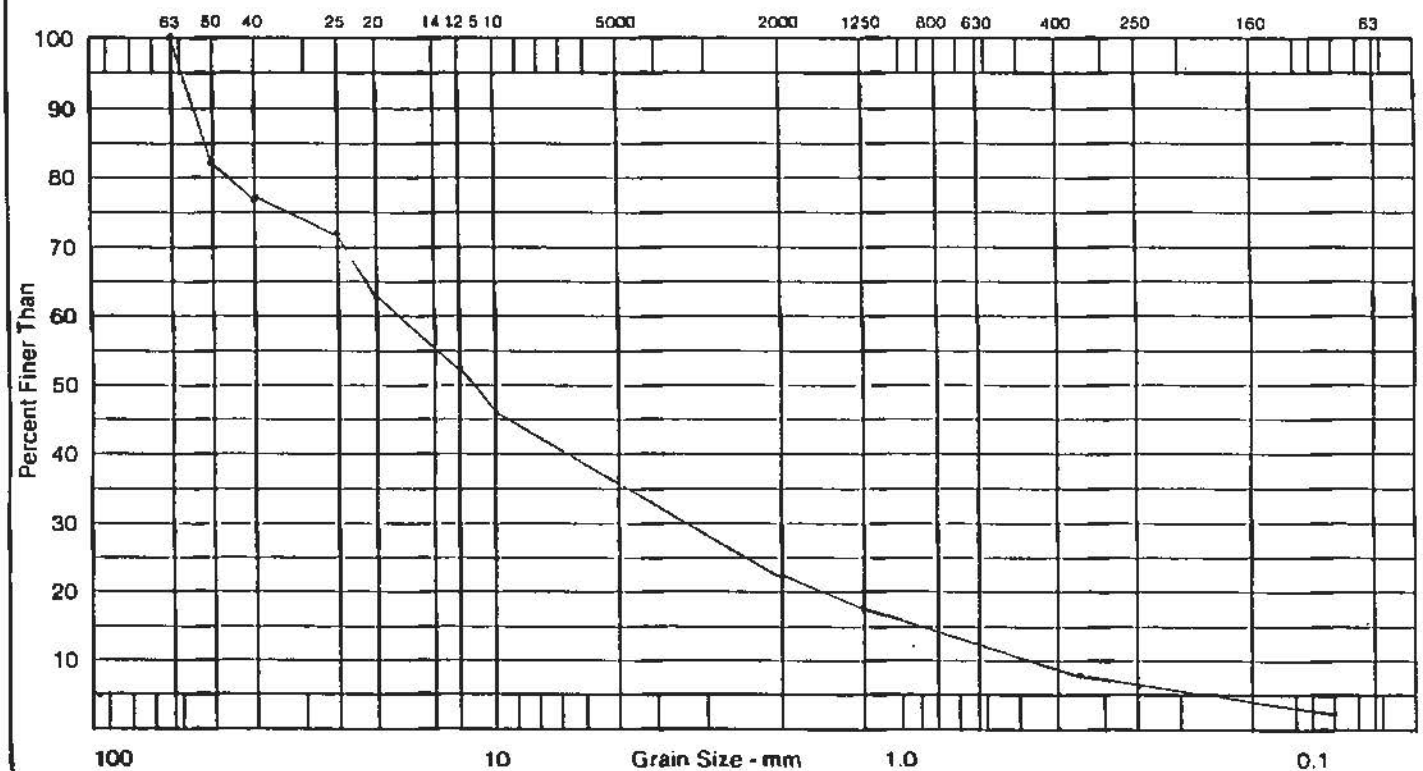
Method of Preparation _____ Dry _____ Washed X

Remarks Moisture -

Gravel - 67.6%

Sand - 29.7%

Silt - 2.7%



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SCREEN ANALYSIS

Client: YTG, C&T Services, Transportation Eng

Sample: 32A-92 Depth: 0.60-2.30m Project: km 1322, Alaska Hwy. Geotech. Inves.

Location: Made by: LK & MF Job No.: 8002-219

TP#32-92 BULK SAMPLE Ck'd by: Date: 1992/03/30

Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					73.6
50,000	50.0					
40,000	40.0					58.3
25,000	25.0					51.7
20,000	20.0					47.1
12,500	12.5					37.2
10,000	10.0					29.4
5,000	5.0					22.2
2500	2.5					16.8
1,250	1.25					13.6
800	0.800					5.6
630	0.630					
315	0.315					
250	0.250					
160	0.160					2.5
80	0.080					1.3

Description of Sample

Sandy gravel, GW

Time of Sieving Min. 15

Method of Preparation Dry Washed X

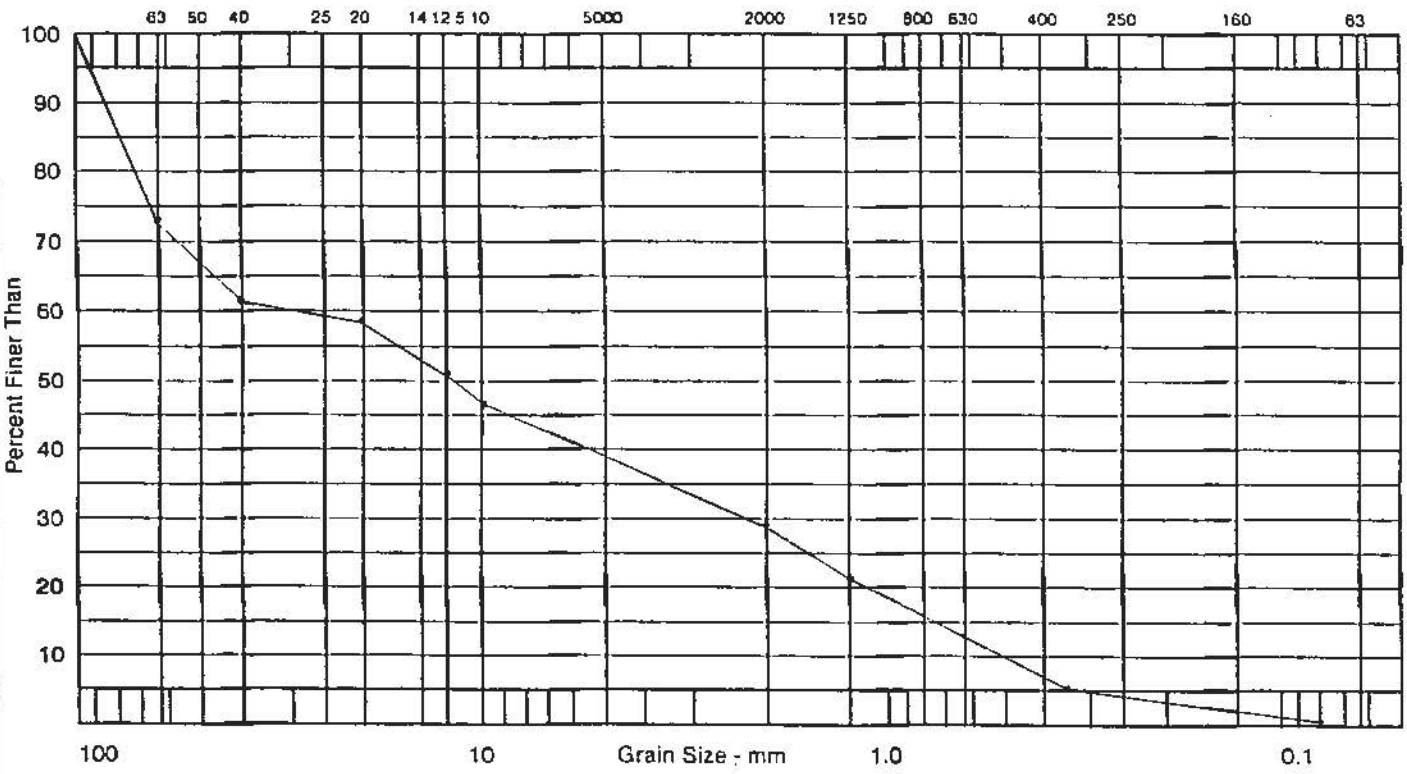
Remarks Moisture -

Gravel - 62.8%

Sand - 35.9%

Silt - 1.3%

100% Passing 100mm



SAMPLE #	TEST PIT #	DEPTH (M)	MOISTURE (%)	CLASSIFICATION	TYPE
3	22-92	3.30-3.60	27.5	Silt, trace to some sand, grey-brown	ML
5	23-92	1.80-2.00	24.9	Silt, some clay, grey-brown	ML
6	23-92	3.00-3.30	33.7	Silt, trace of clay, grey-brown	ML
7	24-92	0.70-1.00	28.0	Silt, some clay, grey	ML
8	24-92	2.30-2.50	32.6	Silt, some clay, grey	ML
12	25-92	3.30-3.50	24.0	Silt, trace of fine sand, grey-brown	ML
15	26-92	2.80-3.00	13.9	Silt, some sand, trace of gravel	ML
20	27-92	3.50-3.80	33.2	Silt, grey	ML
24	28-92	3.60-3.80	22.5	Silt, some sandy gravel, trace of clay, brown	ML
27	29-92	3.00-3.30	33.9	Silt, brown	ML
29	30-92	1.50-1.80	32.3	Silt, grey brown	ML
31	31-92	2.00-2.30	36.3	Silt, trace of clay, grey	ML-CL
37	33-92	1.30-2.00	16.5	Gravelly sandy silt, trace of clay, grey-brown	ML
41	34-92	2.90-3.40	26.0	Silt, grey	ML

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GEOTECHNICAL INVESTIGATION
KILOMETER 1322, ALASKA HIGHWAY, RIGHT,
YUKON TERRITORY

Dwn. By MJK	Date 1992/04/03
Scale	Plate No. 1

APPENDIX "D"
-Test Hole Log Diskette
ESE Base Format

APPENDIX "E"
-Photograph Summary and Photographs

HOGGAN ENGINEERING & TESTING (1980) LTD.

PHOTOGRAPH SUMMARY SHEET

PROJECT: Geotechnical Investigation
Kilometer 1322, Alaska Highway, Right
Yukon Territory

DATE: 1992/04/29

CLIENT: GOVERNMENT OF YUKON
Community and Transportation Services
Transportation Engineering Branch
Box 2703
Whitehorse, Yukon
Y1A 2C6

PROJECT: 8002-219

Attention: Mr. Iain Blown, Geotechnical Projects Manager

PHOTOGRAPH NUMBER	DESCRIPTION
1	-Test Pit 92-22, sample spill piles
2	-Test Pit 92-23, sample spill piles
3	-Test Pit 92-25, sample spill piles
4	-Test Pit 92-26, sample spill piles
5	-Test Pit 92-27, sample spill piles
6	-Test Pit 92-28, sample spill piles
7	-Test Pit 92-29, sample spill piles
8	-Test Pit 92-32, sample spill piles
9,10,11	-Panoramic view from top of existing crush pile, west looking east.
12,13,14	-Panoramic view from top of existing crush pile, south looking north

J. R. Paine & Associates Ltd.

KM 1322, ALASKA HWY - B.C.

P#2, TP 92-23

P#4, TP 92-23

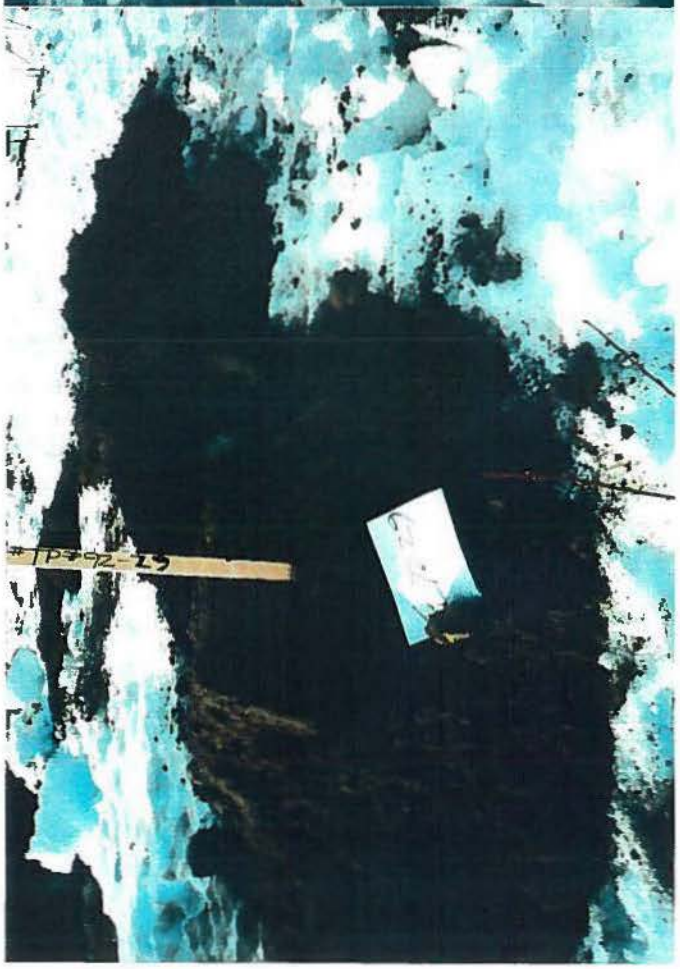
P#1, TEST PIT (TP) 92-22

P#3, TP 92-25

92-26, 9, #1

92-26, 8, #1

92-26, 5, #1



92-26, 4, #1

KM 1382, Alaska Hwy, BC
PAGE 3 OF 4

Photo #1

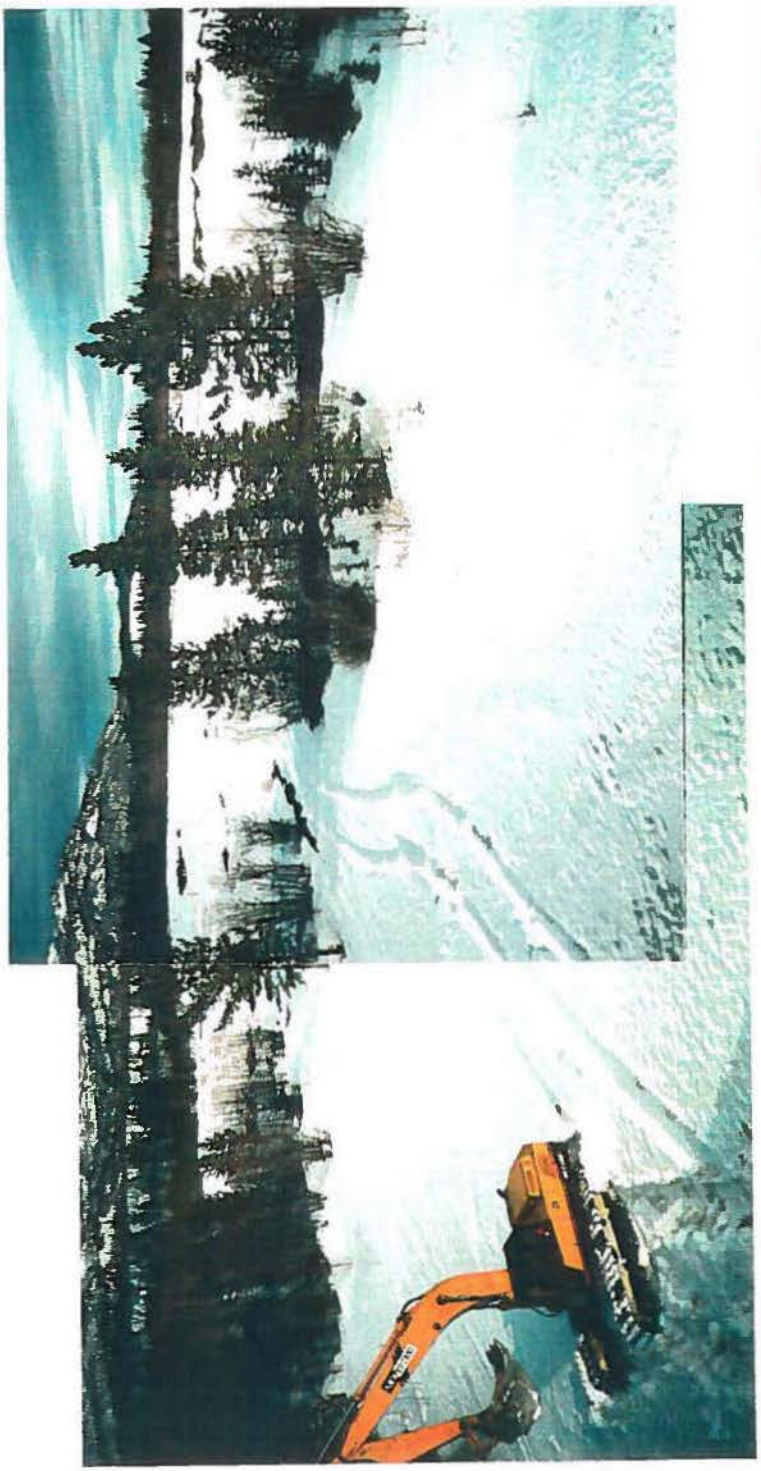


Photo #10

Panoramic View from Top of Existing Crush Pile, West Looking East

KM 1322, Alaska Hwy, FE
PAGE 4 of 4

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P#12

P#13

PANORAMIC VIEW
FROM FE
EXISTING CREEK
FLOW SOUTH
LOOKING NORTH.

Original Report

Do Not Remove from Building
Please Return to Geotech

GR-01
002