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GEOTECHNICAL INVESTIGATION
ALASKA HIGHWAY, KILOMETER 1490
YUKON TERRITORY, "1992"

HOGGAN ENGINEERING & TESTING (1980) LTD.

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ALASKA HIGHWAY, KILOMETER 1490
YUKON TERRITORY, "1992"

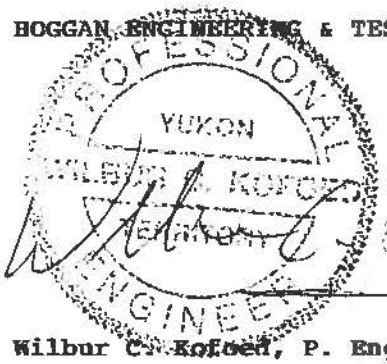
HOGGAN ENGINEERING & TESTING (1980) LTD.

REPORT NUMBER: 8002-218

GEOTECHNICAL INVESTIGATION
ALASKA HIGHWAY, KILOMETER 1490
YUKON TERRITORY, "1992"

PREPARED BY:

HOGGAN ENGINEERING & TESTING (1980) LTD.



Wilbur C. Kofoed, P. Eng

MARCH, 1992

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

HOGGAN ENGINEERING & TESTING (1980) LTD.

REPORT NUMBER: 8002-218

GEOTECHNICAL INVESTIGATION
ALASKA HIGHWAY, KILOMETER 1490
YUKON TERRITORY, "1992"

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HOGGAN ENGINEERING & TESTING (1980) LTD.

GEOTECHNICAL INVESTIGATION

PROJECT: **Geotechnical Investigation**
Alaska Highway, Yukon, "1992"

LOCATION: **Kilometer 1490, Left**

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 geotechncial investigation conducted at Kilometer 1490, left, of the Alaska Highway. Access to the investigated site was located 1.6 kilometers west of the north Klondike Highway and the Alaska Highway Intersection.

The objective of the investigation was to obtain subsurface soil profile data to detail the potential of the proposed gravel borrow source for highway construction materials. These include the following Transportation Engineering Branch designated highway construction materials (material specifications enclosed in Appendix "D").

- -Granular "A", 20mm Crushed Base Course
- -Granular "B", 50mm Crushed Sub-Base Course
- -Granular "D", 80mm Pitrun Sub-Base Course
- -Hot Mix Aggregate, Asphaltic Paving

The investigation of the potential borrow source consisted of conducting a field investigation program followed by a laboratory testing program.

The field program consisted of drilling a series of test holes to depths up to 12.35 meters below the ground surface and excavating a series of test pits to 4.0 meters in depth. The drilling program was undertaken to obtain a preliminary estimate of quality and quantity (depth) of granular materials. The test pit excavating program was undertaken to more accurately assess the quality of the granular materials. The test hole and test pit soil profile logs have been enclosed in Appendix "B" of this report. Laboratory testing was completed on all samples obtained during the field drilling and excavating program. Initially, all samples were tested for moisture content and grainsize distribution. Following the initial tests selected bulk samples were further tested for Trial Crush grainsize distribution, Los Angeles abrasion resistance and magnesium sulfate soundness. The laboratory test summary sheets have been enclosed in Appendix "C" of this report (magnesium sulfate soundness test results will be forwarded when testing is completed).

Authorization to proceed with this investigation was received from Mr. Iain Blown, Geotechnical Projects Manager of Government of Yukon, Community and Transportation Services, Transportation Engineering Branch on February 26, 1992. The field work program was completed March 4, 1992.

SITE DESCRIPTION

The investigated area was located between the Alaska Highway on the north and 300 meters south. The site extended west of the Heckell Hill Road 700 meters.

The site is an outwash deposit originating from water courses traversing the adjacent glaciofluvial terrace deposits located directly north of the Alaska Highway.

The proposed source area was located west and east of a previous granular borrow. The undeveloped area west of the existing quarry generally skirts the existing pit perimeter and is bounded of it's west limit by a drainage path with an approximate relief of 1 to 2 meters. The undeveloped area east of existing quarry is more extensive and extends up to 250 meters east and is bounded on it's east limit by the Heckell Hill Road.

The south limit of the proposed quarry area is the base of hill which rises to the south.

Site topography is generally level in the undeveloped area. The existing pit is extensive and covers an area of 5 hectares in the west centre portions of the deposit. The existing pit depth varies in depth from 2 meters on the west to 4 meters on the east and south.

The vegetation cover on the site varied between sparse to medium dense mixed growth of young and old, spruce and poplar on the west, to dense old growth of spruce and poplar on the east.

At the time of this investigation, our forces were unable to assess accurately the depth of the existing granular bank feeds, due to ice and snow accumulations. Special note should be given to the ice deposit at the pit bottom which indicates that water flowing into the pit has recently occurred (i.e.: prior to or after freezing in the fall of 1991).

Subsurface Soil Profiles and Aggregate Assessment

The subsurface soil investigation consisted of drilling four test holes to a maximum depth of 12.35 meters and excavating 7 seven test pits to 4.0 meters in depth.

The test holes were drilled with a C.M.E. 750 Drill mounted on a FN60 tracked Nodwell. The soil samples were obtained off 150 millimeter continuous flight augers. The test pits were excavated with a 225 Caterpillar Backhoe.

The subsurface soil profiles have been enclosed in Appendix "B" of this report. However, in general, the subsurface soil profile consisted of 150 millimeters of surface organics and silty sandy gravel with rootlets. At all test pit locations the surface stratums were underlain by sandy gravels and gravelly sands which extended to the maximum depth of excavating of 4.0 meters at Test Pits 15, 16, 17, 18 and 19-92 located in the east portion of the deposit. At Test Pits 20 and 21-92, located in the west portion of the pit, the sandy gravels extended to 2.4 meters and 3.40 meters below the ground surface, respectively. The gravel materials were found to be coarse in nature with medium to coarse grained sands, variable cobble content between 5 percent and 30 percent and boulder content ranging up to 5 percent to 800 millimeters in size. At Test Pits 20 and 21-92, the gravels were underlain by wet gravelly sandy silts, sandy silts and silts with sand which extended to the maximum depth of test pit.

Intermediate seams of silty sandy gravels and gravelly sands were noted at Test Pit 19-92 within the upper granular stratum. These intermediate seams may be expected throughout the quarry as they are typical of outwash deposits.

Within the east portion of the site gravel materials appear to extend to depths in excess of 4.0 meters (depth of test pit excavation) as indicated by material encountered during test hole drilling program. At Test Hole 13-92, located in the south east portion of the investigated area, sandy gravel and gravelly sand materials extended to 5.40 meters in depth. At Test Hole 14-92, located in the east centre portion of the site, sandy gravel materials extended to 7.60 meters at which depth auger penetration refusal was attained.

At Test Hole 12-92, located in the existing pit bottom, and additional 2.5 meters of sandy gravel materials were found below the pit bottom. The gravel materials contained a trace of silt, and ranged to cobbles in size.

All test hole drilling locations have shown that the upper granular materials are underlain by variable outwash stratums. These materials vary from soft, saturated and sensitive silts with 5 millimeter thick fine sand seams to wet silty sandy gravels and silty gravelly sands. The fines content of the sands and gravels was at a minimum of 15 percent to 20 percent.

Subsurface ground water was found at 5 of the 11 test hole/pit locations. At Test Hole/Pits 11, 20 and 21-92 located in the west portion of the site ground water was found at depths of 3.70 meters, 3.00 meters and 3.40 meters below the ground surface, respectively. The depth to ground water corresponded to the interface of the upper clean granular stratum and the underlying silt or silty granular stratum at Test Hole/Pit 11 and 21-92. Thus, it is likely that this ground water level is perched.

Within the existing pit at Test Hole 12-92, ground water was found at 4.80 meters. At the Test Hole 13-92, ground water was found at 9.15 meters below the ground surface.

The remaining Test Holes/Pits where no ground water was attained were located in the east portion of the site. These locations include Test Hole 14-92, drilled to 7.60 meters and Test Pits 15, 16, 17, 18, and 19-92 excavated to 4.0 meters in depth.

The presence of ground water at shallower depths was indicated by ice build up on the existing pit bottom, noted at the time of the field investigation. No free water existed on the pit bottom and ice, where previously floating, had sunk and was resting on the pit bottom.

The granular materials encountered within the investigated area have a fair to excellent potential for use as highway construction materials. For the purposes of this investigation we have evaluated the potential of source development into two sections. The first section would be the west portion of the site which is characterized by a relatively shallow granular deposit of, on average 2.90 meters which is shown on Test Hole/Pit logs designated 11-92, 20-92 and 21-92. The second section would be the east portion of the site which is characterized by a relatively deeper deposit of between 5.40 meters to possibly in excess of 7.60 meters as indicated on Test Hole Logs 13-92 and 14-92.

The materials in Section 1 (West) and Section 2 (East) of this site would be rated as follows for suitability of highway construction materials.

SECTION 1 (WEST)
-Portion of the site located west, north and south of the west portion of the existing granular quarry.

-Granular "A", 20mm Crushed Base
  -Poor - Fair
  -May vary to silty

-Granular "B", 50 mm Crushed Subbase
  -Poor - Fair
  -May vary to silty

-Granular "D", 80 mm Pitrun Subbase
  -Fair - Good
  -Will require screening of 5% - 20% oversize materials, crushing may be considered.

-Granular "E", 200mm Pitrun Subbase
  -Good - Excellent
  -May require up to 10% screening of oversize.

-Hot Mix Aggregate, Type 111, 16mm
    -Fair - Good
    -May vary to coarse
    -Screening of aggregate into sand and gravel materials would be recommended.

SECTION 2 (EAST)
-Portion of the site located east and north of the east portion of the existing granular quarry.

-Granular "A", 20mm Crushed Base
    -Good
    -May vary to coarse

-Granular "B", 50mm Crushed Subbase
    -Good
    -May vary to coarse

-Granular "D", 80mm Pitrun Subbase
    -Poor - Fair - Good
    -May require screening of up to 30% of oversize material. Crushing may be considered.

-Granular "E", 200mm Pitrun Subbase
    -Fair - Good - Excellent
    -May require screening of up to 15% of oversize material.

-Hot Mix Aggregate, Type 111, 16mm
    -Fair
    -May vary to coarse depending on location in pit.

    -Sand may vary to medium to coarsed grained, thus a blend sand may be required.

    -Screening of aggregate into sand and gravel materials would be recommended.

The materials encountered on this site would be suitable for the above noted highway construction materials. Overall the material would vary to coarse due to the amount of cobble size materials and medium to coarse nature of the sand material and possibly silty within Section 1 (West) of the site.

Projected Aggregate Quantity

The estimated quantity of granular material in Section 1 of the proposed quarry area would be 23,000 cubic meters. This quantity was estimated assuming the following:

-Section 1 Quarry Area, 8,000 square meters

-Full removal of all surface organics and sandy silt and silt materials, average depth 0.25 meters.

-Depth of underlying granular reserve, 2.9 meters.

-Setback from Alaska Highway edge of clearing 40 meters (approximately 60 meters from centre line of highway).

The estimated quantity of granular material in Section 2 of the Proposed Quarry area would be 300,000 cubic meters. This quantity was estimated assuming the following :

-Section 2 Quarry Area, 47,400 square meters

-Full removal of all surface organics, depth 0.15 meters

-Depth of underlying granular reserve, 6.35 meters (based on depth of granular stratum at Test Hole 13-92 and 14-92.

-Setback from Alaska Highway and Heckel Hill roadway edge of clearing, 40 meters.

No further quantity has been estimated from below the bottom of the existing granular quarry area. From a review of the air photo, it appears that the west portion of the existing quarry is near depletion (noting depth of granular stratum noted in this investigation and depth of quarry). Within the east portion of the existing quarry, it appears that suitable granular materials may exist to 2.5 meters below quarry area bottom (as shown at Test Hole 12-92). However, insufficient data was obtained to detail a specific quantity.

SITE DEVELOPMENT

The materials quantified during this investigation indicated that granular materials are available for the proposed production of the following quantities.

-Granular "A" - 25,000 m^3
-Granular "B" - 25,000 m^3
-Granular "D" - 75,000 m^3
-Granular "E"
-Hot Mix Aggregate - 12,000 m^3

The quantity of aggregate was determined assuming a 40 meter vegetation screen adjacent to the Alaska Highway and Heckel Hill Road to limit the visual impact of the quarry operation.

Vegetation and overburden removal estimates for the proposed source areas would be as follows:

Section 1 (West)
-Clearing - 9,000 m^2
-Overburden - 2,000 m^3
  -Assuming complete overburden removal

Section 2 (East)
-Clearing - 50,000 m^2
-Overburden - 3,500 m^3
  -Assuming only organic materials removed, average depth 75mm

In utilizing the materials from this quarry development considerations should be given to the variation in quarry materials. Due to the slightly higher fine sand and fines content and some what less percentage of oversize materials noted in Section 1 (West) portion of the quarry these materials appear to be best suited for Granular "D", Granular "E" and hot mix aggregate production. Section 2 (East) portion of the quarry would be more suited to the production of Granular "A" and Granular "B" materials. Due to the generally high cobble and boulder content and fine to coarse clean sands the materials will vary to coarse in nature.

In consideration of the ice buildup of up to 500 millimeters on the existing quarry bottom, it would be recommended not to locate the granular stockpiles within the quarry bottom. The relocation of the stockpiles may not be required if proposed construction in 1993 were to be scheduled after spring thaw. Possible locations for the stockpiles may be on the upper level of the west portion of the existing pit.

The above stockpile site comments are based on our findings in March, 1992. It has not been determined whether the ice build up is a perenial occurance or is a result of the excessive precipitation noted in late summer and fall of 1991.

The present access to the existing quarry development may be in an inconvenient location in consideration of future pit developments. This inconvenience may be with regards to traffic congestion in the centre of the quarry development area and location of the access over existing granular reserves.

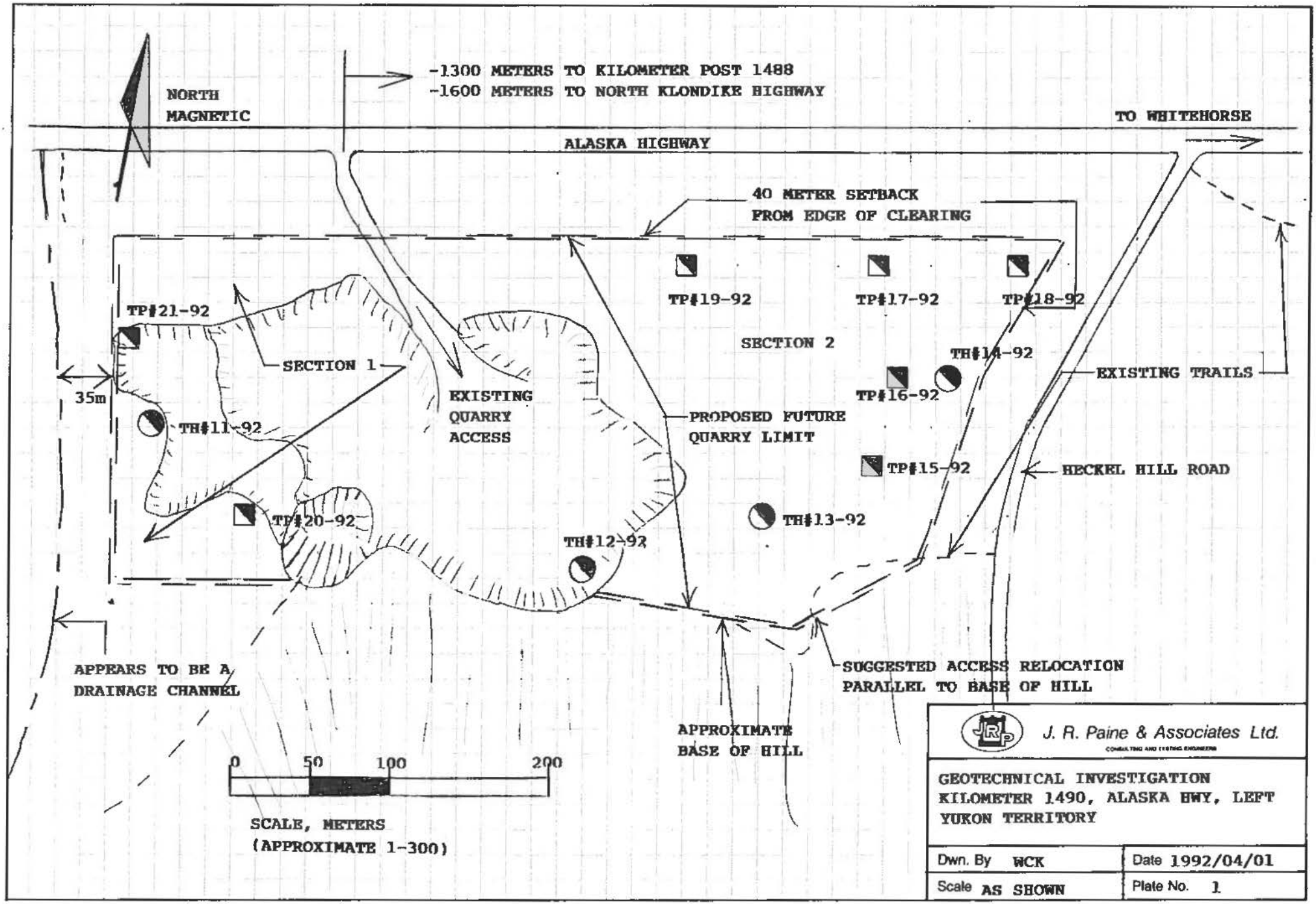
A possible alternate location for the access would be adjacent to the south east perimeter of the proposed future quarry limit designated as the base of hill on the enclosed site sketch. In relocating the access to the site, 250 meters of new road would need to be constructed which would connect the existing pit to the Heckel Hill road at a point approximately 250 meters south of Alaska Highway. Also, the upgrading of the Heckel Hill raod may be required to facilitate the additional heavy traffic.

Supplemental

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

APPENDIX

APPENDIX "A"
-Site Sketch
-Air Photo Laser Copy



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

GEOTECHNICAL INVESTIGATION
KILOMETER 1490, ALASKA HWY, LEFT
YUKON TERRITORY

Dwn. By WCK	Date 1992/04/01
Scale AS SHOWN	Plate No. 1

Attention: Mr. Iain Blown, Geotechnical Projects Manager

CLIENT: Community and Transportation Services
Transportation Engineering Branch
Box 2703
Whitehorse, Yukon, Y1A 4Y9

PROJECT NO: 8002-218

DATE: 1992/04/01

PROJECT: Geotechnical Investigation
Kilometer 1490, Left, Alaska Highway, Yukon Territory

-Air Photo Laser Copy
-Approximate Scale, 1-400 (Meters)

APPENDIX "B"
-Test Pit Logs

YTG, C&T SERVICES, TRANSPORTATION ENG.	KM 1490 ALASKA HWY. GEOTECHNICAL INVES.	BOREHOLE No. TH#11-92
IBEX CONTRACTING LTD.	@ CENTRE SOUTHWEST OF PIT	Project No: 8002-218
C.M.E. TRACK MOUNTED DRILL	10 METRES SOUTHWEST OF TREELINE	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			-silty sand to sandy silt, odd gravel in size, with rootlets, brown	PT-SM	0.0
			0.15M		
	X	1	Seasonal Frost to 0.45m -silty sand, some gravel, medium dense moist, brown	SM	
1.0			1.05M		1.0
	X	2	-sandy gravel, some silt, fine to medium sand, moist, brown	GM	
2.0					2.0
	X	3	-sandy gravel, some silt, medium to course sand, moist, brown		
3.0					3.0
			3.70M	SM-ML	
4.0	X	4	Free water @ 3.70m -sandy silt, some gravel, fine sand, wet, grey-brown		4.0
	X	5	-sandy silt to silt some sand, fine sand, odd gravel, wet, medium dense, grey		
5.0					5.0
	X	6	-silt, trace of sand and trace of gravel, dense, wet, grey	ML	
6.0					6.0
7.0					7.0
	X	7	-silt, trace to some sand in seams throughout, fine sand, medium dense, wet, grey		
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 9.2 m | COMPLETE 92/02/29

LOGGED BY MJK | DWG NO.1 |

YTG, C&T SERVICES, TRANSPORTATION ENG.	KM 1490 ALASKA HWY. GEOTECHNICAL INVES.	BOREHOLE No. TH#11-92
IBEX CONTRACTING LTD.	@ CENTRE SOUTHWEST OF PIT	Project No: 8002-216
C.M.E. TRACK MOUNTED DRILL	10 METRES SOUTHWEST OF TREELINE	ELEVATION 0.00 (m)

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

DEPTH (m)	SAMPLE TYPE	SAMPLE NO	SOIL DESCRIPTION	USC	DEPTH (m)
8.0				ML	8.0
9.0	X	8	-silt, trace to some sand in seams throughout, fine sand, medium dense, wet, grey		9.0
			End of hole @ 9.35M		
10.0			Vegetation primarily a mix of young and old growth spruce and poplar		10.0
11.0					11.0
12.0					12.0
13.0					13.0
14.0					14.0
15.0					15.0
16.0					16.0

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 9.2 m	COMPLETE 92/02/29	
	LOGGED BY MJK	DWG NO.1	Page 2 of 2

YTG, C&T SERVICES, TRANSPORTATION ENG.	KM 1490 ALASKA HWY. GEOTECHNICAL INVES.	BOREHOLE No. TH#12-92
IBEX CONTRACTING LTD.	IN EXISTING PIT BOTTOM EAST END	Project No: 8002-218
C.M.E. TRACK MOUNTED DRILL	40 METRES WEST OF EMBANKMENT	ELEVATION 0.00 (m)

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

DEPTH (m)	SAMPLE TYPE	SAMPLE NO	SOIL DESCRIPTION
0.0			-sandy gravel, medium to course sand, brown
			Seasonal Frost to 0.45m
	AUGER	9	-sandy gravel, trace of silt, medium to course sand, brown
1.0			
	AUGER	10	-sandy gravel, trace of silt, medium to course sand, brown
2.0			
	AUGER	11	-gravelly sand to sandy gravel, medium to fine sand, moist, brown
3.0			3.15M
	AUGER	12	-sand, trace of silt,some gravel, fine to medium sand, moist, medium dense, brown
4.0			
	AUGER	13	-sand, odd gravel, some silt, fine to medium sand, medium dense, moist, brown
			Free water @ 4.80M
5.0			4.90M
			-sand, fine to medium, medium dense, wet, brown
			5.50M
	AUGER	14	-silty sandy gravel, wet, medium dense, brown
6.0			
7.0			
	AUGER	15	-gravelly sand, some silt to silty, medium to course sand, moist, brown
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: GW-GM | SW | SP | SP-SM | SP | GM | SM-SW | SM

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 12.4 m	COMPLETE 92/02/29
	LOGGED BY MJK	DWG NO.2

YTG, C&T SERVICES, TRANSPORTATION ENG.	KM 1490 ALASKA HWY. GEOTECHNICAL INVES.	BOREHOLE No. TH#12-92
IBEX CONTRACTING LTD.	IN EXISTING PIT BOTTOM EAST END	Project No: 8002-218
C.M.E. TRACK MOUNTED DRILL	40 METRES WEST OF EMBANKMENT	ELEVATION 0.00 (m)

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

DEPTH (m)	SAMPLE TYPE	SAMPLE NO	SOIL DESCRIPTION	USC	DEPTH (m)
8.0	☒	16	-silty gravelly sand, dense, medium to course sand, wet, brown	SM	8.0
9.0	☒	17	-silty gravelly sand, dense, fine to course sand, wet, brown	SM	9.0
10.0			10.20M		10.0
	☒	18	-gravelly silt, some sand, medium dense to dense, fine to medium sand, wet, grey	ML	
11.0			11.10M		11.0
12.0	☒	19	-sandy silty gravel, medium dense, fine sand, wet, grey	GM	12.0
			End of hole @ 12.35M		
13.0			Bottom east end of existing pit		13.0
14.0					14.0
15.0					15.0
16.0					16.0

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 12.4 m	COMPLETE 92/02/29
	LOGGED BY MJK	DWG NO.2
		Page 2 of 2

YTG, C&T SERVICES, TRANSPORTATION ENG.	KM 1490 ALASKA HWY. GEOTECHNICAL INVES.	BOREHOLE No. TH#13-92
IBEX CONTRACTING LTD.	130 METRES WEST OF ROADWAY	Project No: 8002-218
C.M.E. TRACK MOUNTED DRILL	65 METRES EAST OF EDGE OF PIT	ELEVATION 0.00 (m)

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

DEPTH (m)	SAMPLE TYPE	SAMPLE NO	SOIL DESCRIPTION
0.0			-silty sandy gravel, brown, some organics
			0.15M
	AUGER	20	-sandy gravel, medium to course sand, trace of silt, damp, brown
1.0			
	AUGER	21	-sandy gravel, medium to course sand, trace of silt, damp, brown
2.0			
	AUGER	22	-gravelly sand, trace to some silt, fine to medium sand, damp, brown
3.0			
			(s#22,23, and 24, auger action indicates material may vary to sandy gravel)
	AUGER	23	-gravelly sand, fine to medium sand, trace of silt, damp, brown
4.0			
	AUGER	24	-gravelly sand, fine to medium sand, trace of silt, damp, brown
5.0			
			5.40M
	AUGER	25	-gravelly sandy silt, medium to course sand, moist, medium dense, brown
6.0			
			6.20M
7.0			
	AUGER	26	-silty gravelly sand, fine to medium, medium dense, moist, brown
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: PT-SM | GW-GM | SW-SM | ML | SM

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 12.4 m	COMPLETE 92/02/29
	LOGGED BY MJK / DWG NO.3	Page 1 of 2

YTG, C&T SERVICES, TRANSPORTATION ENG.	KM 1490 ALASKA HWY. GEOTECHNICAL INVES.	BOREHOLE No. TH#13-92
IBEX CONTRACTING LTD.	130 METRES WEST OF ROADWAY	Project No: 8002-218
C.M.E. TRACK MOUNTED DRILL	65 METRES EAST OF EDGE OF PIT	ELEVATION 0.00 (m)

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

DEPTH (m)	SAMPLE TYPE	SAMPLE NO.	SOIL DESCRIPTION	USC	DEPTH (m)
8.0					8.0
9.0	AUGER	27	-silty sandy gravel, fine to medium sand, medium dense, moist, brown Free water @ 9.15M	GM	9.0
10.0					10.0
11.0	AUGER	28	-silty gravelly sand, fine to medium sand, medium dense, moist, brown	SM	11.0
12.0	AUGER	29	-silty gravelly sand, fine to medium sand, medium dense, moist, brown End of hole @ 12.35M		12.0
13.0			1 refusal @ 3.00m, moved ahead 2.00m Vegetation primarily sparsely populated old growth spruce and poplar		13.0
14.0					14.0
15.0					15.0
16.0					16.0

LIQUID 10 20 30 40 | PLASTIC 10 20 30 40 | PLASTIC — NLC — LIQUID 10 25 30 40

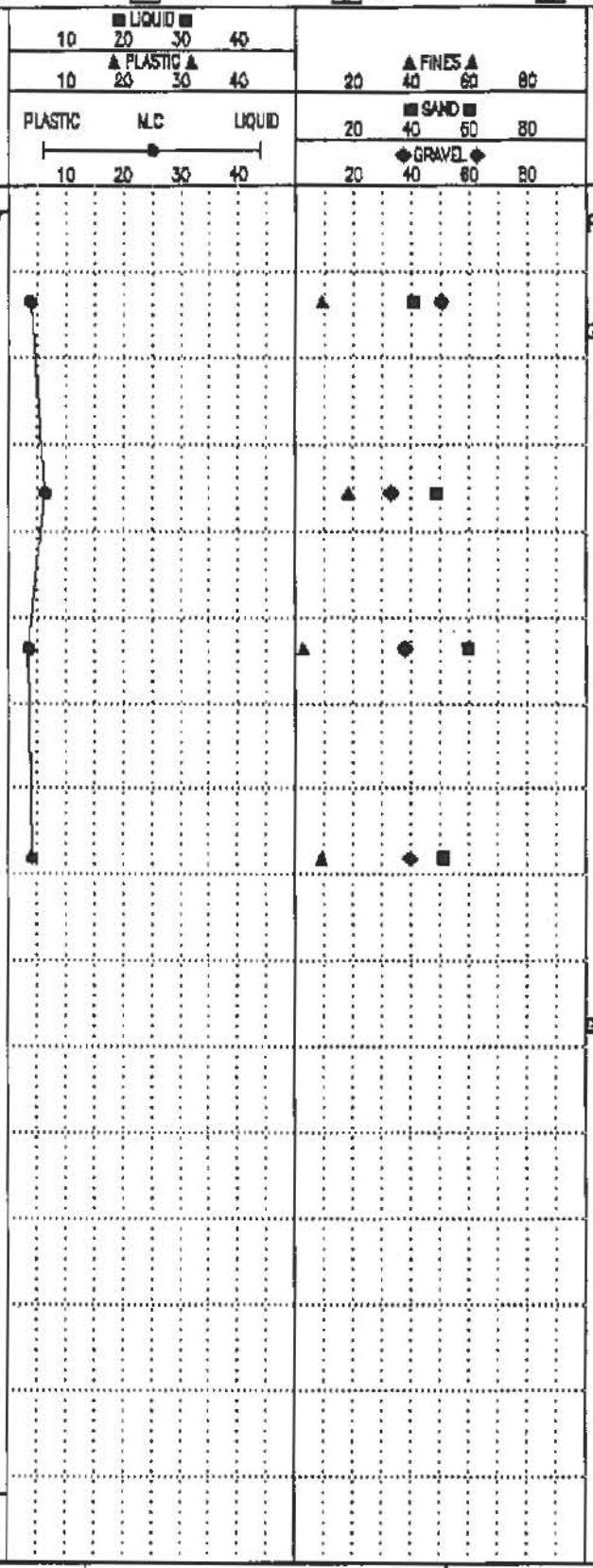
FINES 20 40 60 80 | SAND 20 40 60 80 | GRAVEL 20 40 60 80

J.R. Paine and Associates Ltd. Edmonton, Alberta	COMPLETION DEPTH 12.4 m	COMPLETE 92/02/29	
	LOGGED BY MJK	DWG NO.3	Page 2 of 2

YTG, C&T SERVICES, TRANSPORTATION ENG.	KM 1490 ALASKA HWY. GEOTECHNICAL INVES.	BOREHOLE No. TH#14-92
IBEX CONTRACTING LTD.	90 METRES NORTHWEST OF ROADWAY	Project No: 8002-218
C.M.E. TRACK MOUNTED DRILL	200 METRES SOUTH OF ALASKA HIGHWAY	ELEVATION 0.00 (m)

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

DEPTH (m)	SAMPLE TYPE	SAMPLE NO	SOIL DESCRIPTION
0.0			-silty sand gravel, some organics and rootlets, brown
			0.15M
	⊠	30	-sandy gravel, medium to course sand, trace of silt, to cobbles in size to 200mm, damp, brown
1.0			
	⊠	31	-silty sandy gravel, medium to course sand, medium dense, damp, brown, (bad sample retained due to segregation on the auger)
2.0			
	⊠	32	-sandy gravel, fine to medium sand, medium dense, damp, brown, (bad sample retained due to segregation on the auger)
3.0			
	⊠	33	-sandy gravel, trace of silt, fine to medium sand, dense, damp, brown, (bad sample retained due to segregation on the auger)
4.0			
	⧄	34	-no sample retained, auger action pertained to gravel drilling
5.0			
	⧄	35	-no sample retained, auger action pertained to gravel drilling
6.0			
7.0			
	⧄	36	-no sample retained, auger action pertained to gravel drilling
			Refusal @ 7.60M
8.0			



USC	DEPTH (m)
PT-SM	0.0
GW-GM	1.0
GM	2.0
	3.0
	4.0
GW-SW	5.0
	6.0
	7.0
	8.0

J.R. Paine and Associates Ltd. Edmonton, Alberta	COMPLETION DEPTH 9.0 m	COMPLETE 92/02/29	
	LOGGED BY MJK	DWG NO.4	Page 1 of 2

YTG, C&T SERVICES, TRANSPORTATION ENG.	KM 1490 ALASKA HWY. GEOTECHNICAL INVES.	BOREHOLE No. TH#14-92
IBEX CONTRACTING LTD.	90 METRES NORTHWEST OF ROADWAY	Project No: 8002-218
C.M.E. TRACK MOUNTED DRILL	200 METRES SOUTH OF ALASKA HIGHWAY	ELEVATION 0.00 (m)

SAMPLE TYPE ■ TUBE ⊘ LOST ⊠ AUGER ▭ BULK ▯ SPT ▮ CORE

DEPTH (m)	SAMPLE TYPE	SAMPLE NO	SOIL DESCRIPTION	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)
8.0			1 refusal @ 5.00m, moved ahead 4.00m refusal @ 7.60m				8.0
9.0			Vegetation primarily densely populated old growth spruce and poplar				9.0
10.0							10.0
11.0							11.0
12.0							12.0
13.0							13.0
14.0							14.0
15.0							15.0
16.0							16.0

J.R. Paine and Associates Ltd. Edmonton, Alberta	COMPLETION DEPTH 9.0 m	COMPLETE 92/02/29
	LOGGED BY MJK	DWG NO.4

YTG, C&T SERVICES, TRANSPORTATION ENG.	KM 1490 ALASKA HWY. GEOTECHNICAL INVES.	BOREHOLE No. TP#15-92
IBEX CONTRACTING LTD.	30 METRES NORTH OF TRAIL	Project No: 8002-218
225 BACKHOE	60 METRES WEST OF OLD ROADWAY	ELEVATION 0.00 (m)

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

DEPTH (m)	SAMPLE TYPE	SAMPLE NO	SOIL DESCRIPTION
0.0			-silty sandy gravel, organics and rootlets, brown
			0.15M
			Seasonal Frost to 0.45m
1.0		37	-sandy gravel, trace of silt, 10-15% cobbles in size to 250mm, round to subround in shape, fine to medium sand, same oxidation, damp, brown
2.0		38	-sandy gravel, 5-10% cobbles in size to 200mm, round to subangular shape, medium to course sand, medium dense, damp, brown
3.0		39	-sandy gravel, 15-20% cobbles in size to 300mm, odd to 5% boulders in size to 600mm, medium to course sand, damp, brown
4.0		40	-sandy gravel, 15-20% cobbles in size to 300mm, odd to 5% boulders in size to 600mm, medium to course sand, damp, brown
			End of hole @ 4.00M
5.0			Vegetation primarily old growth spruce and poplar, medium dense population
6.0			-Bulk sample #40A from 0.15-4.00m sandy gravel, GW 4.2% moisture 64.9% gravel 30.9% sand 4.2% silt
7.0			-Trial crush, LA abrasion and sulfate soundness tests completed
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: GW-PT (0.0-4.0), GW (4.0-8.0)

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 4.0 m		COMPLETE 92/03/03
LOGGED BY MJK	DWG NO.5	Page 1 of 1

YTG, C&T SERVICES, TRANSPORTATION ENG.	KM 1490 ALASKA HWY. GEOTECHNICAL INVES.	BOREHOLE No. TP#16-92
IBEX CONTRACTING LTD.	90 METRES WEST OF TRAIL	Project No: 8002-218
225 BACKHOE	240 METRES SOUTH OF ALASKA HIGHWAY	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			-silty sandy gravel, organics and rootlets, brown	CH-PT	0.0
			0.15M		
			Seasonal Frost to 0.45m		
1.0		41	-sandy gravel, trace of silt, 20-30% cobbles in size to 250mm, round to subround in shape, fine to medium sand, some oxidation, damp, brown		1.0
2.0		42	-sandy gravel, 5-10% cobbles in size to 200mm, round to subangular shape, odd boulder to 350mm in size, some oxidation, medium dense, brown	GW	2.0
3.0		43	-sandy gravel, 15-20% cobbles in size to 300mm, odd boulder in size to 600mm, medium to course sand, some oxidation, clean, damp, brown		3.0
4.0		44	-sandy gravel, 15-20% cobbles in size to 300mm, odd boulder in size to 600mm, medium to course sand, damp, brown		4.0
			End of hole @ 4.00M		
5.0			Vegetation primarily old growth spruce and poplar, medium dense population		5.0
6.0			-Bulk sample #44A from 0.15-4.00m sandy gravel, GW 2.9% moisture 53.2% gravel 42.5% sand 4.3% silt		6.0
7.0			-Trial crush, LA abrasion and sulfate soundness tests completed		7.0
8.0					8.0

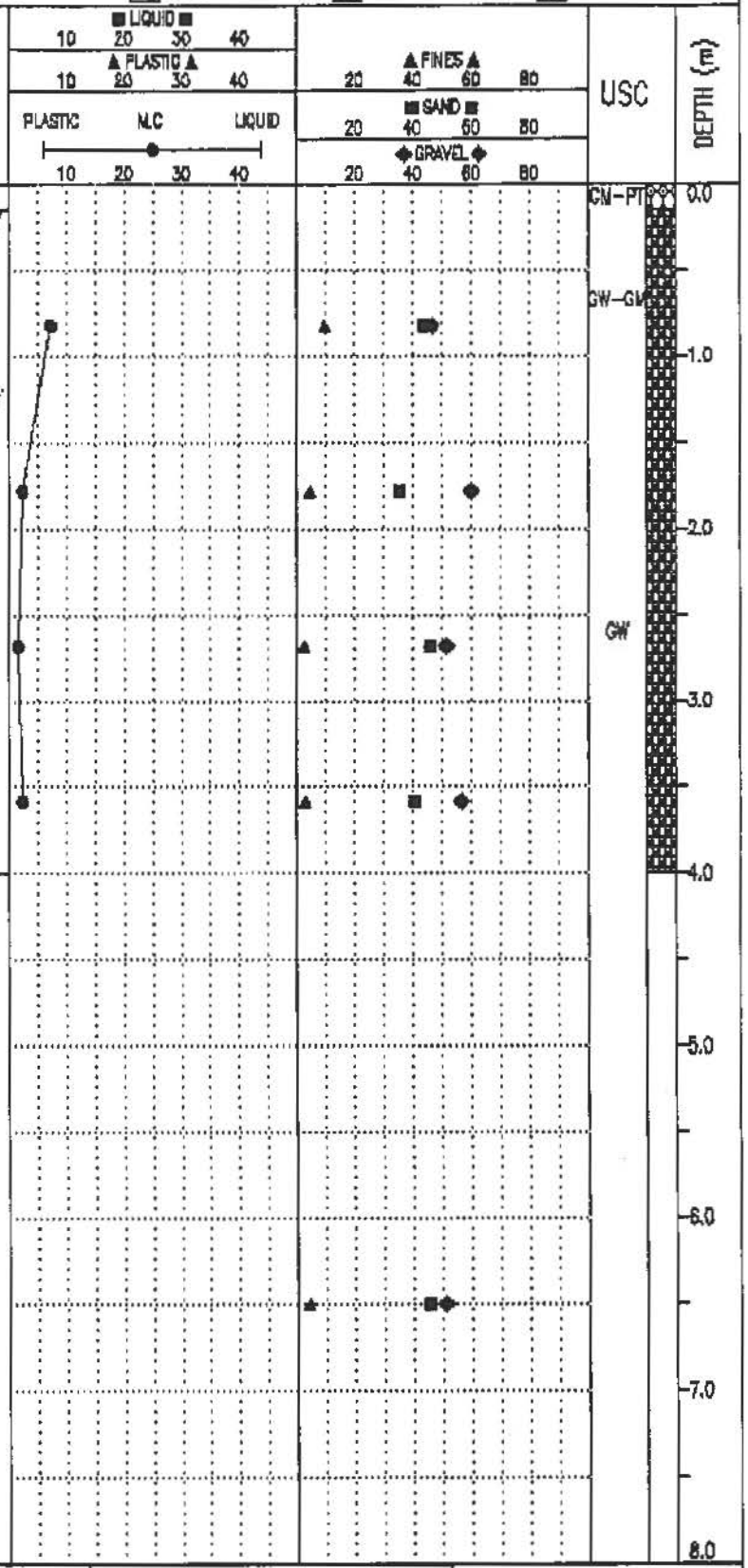
LIQUID 10 20 30 40 | PLASTIC 10 20 30 40 | PLASTIC — NLC — LIQUID 10 20 30 40 | FINES 20 40 60 80 | SAND 20 40 60 80 | GRAVEL 20 40 60 80

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

YTG, C&T SERVICES, TRANSPORTATION ENG.	KM 1490 ALASKA HWY. GEOTECHNICAL INVES.	BOREHOLE No. TP#17-92
IBEX CONTRACTING LTD.	280 METRES EAST OF ENTRANCE TO PIT	Project No: 8002-218
225 BACKHOE	40 METRES SOUTH OF TREELINE	ELEVATION 0.00 (m)

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

DEPTH (m)	SAMPLE TYPE	SAMPLE NO	SOIL DESCRIPTION
0.0			-silty sandy gravel, organics and rootlets, brown
			0.15M
			Seasonal Frost to 0.45m
1.0		45	-sandy gravel, trace to some silt, 20% cobbles in size to 250mm, round to subround in shape, some oxidation, damp, brown
2.0		46	-sandy gravel, 10-20% cobbles in size to 200mm, round to subangular shape, medium dense to dense, medium to course sand, some oxidation, damp, brown
3.0		47	-sandy gravel, 10-20% cobbles in size to 200mm, odd boulder in size to 600mm, medium to course sand, some oxidation, clean, damp, brown
		48	-sandy gravel, 5-20% cobbles in size to 200mm, medium to course sand, damp, clean, dense, brown
4.0			End of hole @ 4.00M
5.0			Vegetation primarily old growth spruce and poplar, medium dense population
6.0			-Bulk sample #48A from 0.00-4.00m sandy gravel, GW 3.1% moisture 50.9% gravel 45.3% sand 3.8% silt
7.0			-Trial crush, LA abrasion and sulfate soundness tests completed
8.0			

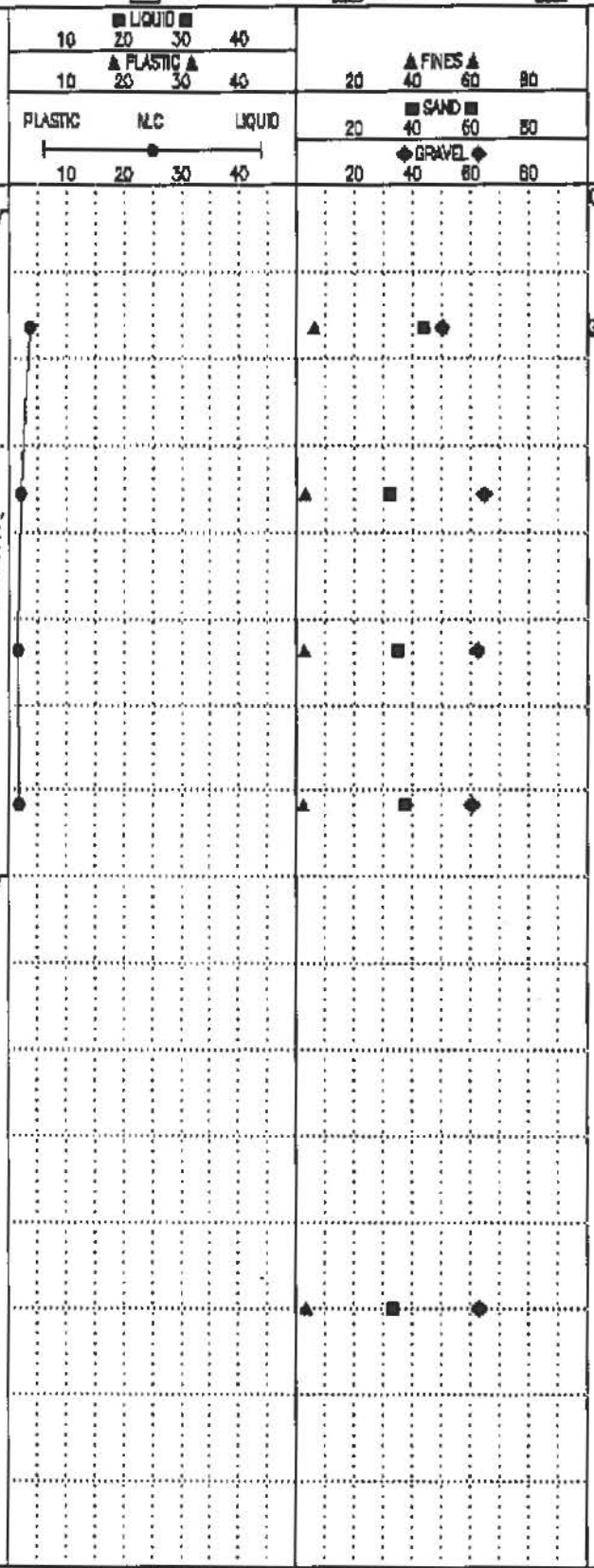


J.R. Paine and Associates Ltd. Edmonton, Alberta	COMPLETION DEPTH 4.0 m	COMPLETE 92/03/03
	LOGGED BY MJK	DWG NO.7
		Page 1 of 1

YTG, C&T SERVICES, TRANSPORTATION ENG.	KM 1490 ALASKA HWY. GEOTECHNICAL INVES.	BOREHOLE No. TP#18-92
IBEX CONTRACTING LTD.	90 METRES EAST OF TP#17-92	Project No: 8002-218
225 BACKHOE	40 METRES SOUTH OF TREELINE	ELEVATION 0.00 (m)

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

DEPTH (m)	SAMPLE TYPE	SAMPLE NO	SOIL DESCRIPTION
0.0			-silty sandy gravel, organics and rootlets, brown
			0.15M
			Seasonal Frost to 0.45m
1.0		49	-sandy gravel, trace to some silt, 25-30% cobbles in size to 200mm, round to subround in shape, fine to medium sand, some oxidation, odd to 5% boulders in size to 600mm, dense, damp, brown
2.0		50	-sandy gravel, to cobbles in size to 200mm, round to subangular in shape, dense, medium to course sand, some oxidation, damp, brown
3.0		51	-sandy gravel, 15-30% cobbles in size to 300mm, medium to course sand, some oxidation, odd to 5% boulders to 450mm, damp,dense,brown
4.0		52	-sandy gravel, 15-30% cobbles in size to 200mm, medium to course sand, some oxidation, odd to 5% boulders in size to 450mm, damp, clean, dense, brown
			End of hole @ 4.00M
5.0			Vegetation primarily a mix of old growth and young growth medium to densely populated spruce and poplar and poplar
6.0			-Bulk sample #52A from 0.00-4.00m sandy gravel, GW 2.1% moisture 63.0% gravel 33.5% sand 3.5% silt
7.0			-Trial crush, LA abrasion and sulfate soundness tests completed -1 boulder to 800mm in size see photo #11
8.0			

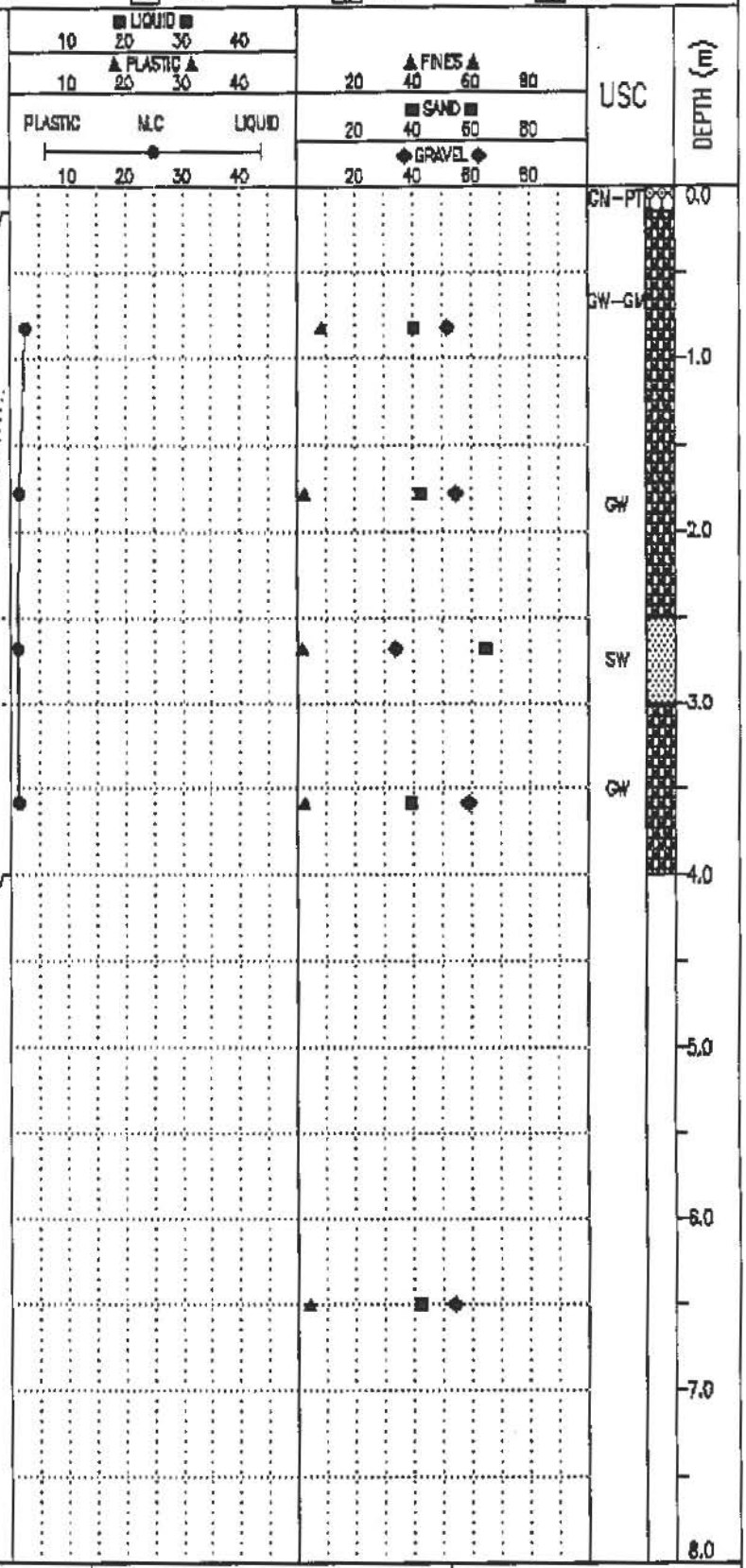


J.R. Paine and Associates Ltd. Edmonton, Alberta	COMPLETION DEPTH 4.0 m	COMPLETE 92/03/03	
	LOGGED BY MJK	DWG NO.B	Page 1 of 1

YTG, C&T SERVICES, TRANSPORTATION ENG.	KM 1490 ALASKA HWY. GEOTECHNICAL INVES.	BOREHOLE No. TP#19-92
IBEX CONTRACTING LTD.	120 METRES WEST OF TP#17-92	Project No: 8002-218
225 BACKHOE	40 METRES SOUTH OF TREELINE	ELEVATION 0.00 (m)

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

DEPTH (m)	SAMPLE TYPE	SAMPLE NO	SOIL DESCRIPTION
0.0			-silty sandy gravel, organics and rootlets, brown
			0.15M
			-20% cobbles in size to 300mm, odd to 5% boulders in size to 600mm
1.0		53	below surface
			Seasonal Frost to 0.45m
			-sandy gravel, trace to some silt, 10-20% cobbles in size to 250mm, round to subround in shape, fine to medium sand, some oxidation, odd to 5% boulders in
		54	size to 750mm, dense, damp, brown
2.0			-sandy gravel, 20-30% cobbles in size to 300mm, round to subangular shape, medium to course sand, some oxidation, damp, brown
		55	-gravelly sand, 15-20% cobbles in size to 300mm, medium to course sand, some oxidation, damp, dense, brown
3.0			
		56	-sandy gravel, 15-20% cobbles in size to 300mm, medium to course sand, some oxidation, damp, dense, brown
4.0			-more sand with depth
			End of hole @ 4.00M
5.0			Vegetation primarily old growth lightly populated spruce and poplar
6.0			-Bulk sample #56A from 0.00-4.00m sandy gravel, GW 2.2% moisture 54.0% gravel 42.2% sand 3.8% silt
7.0			-Trial crush, LA abrasion and sulfate soundness tests completed
8.0			

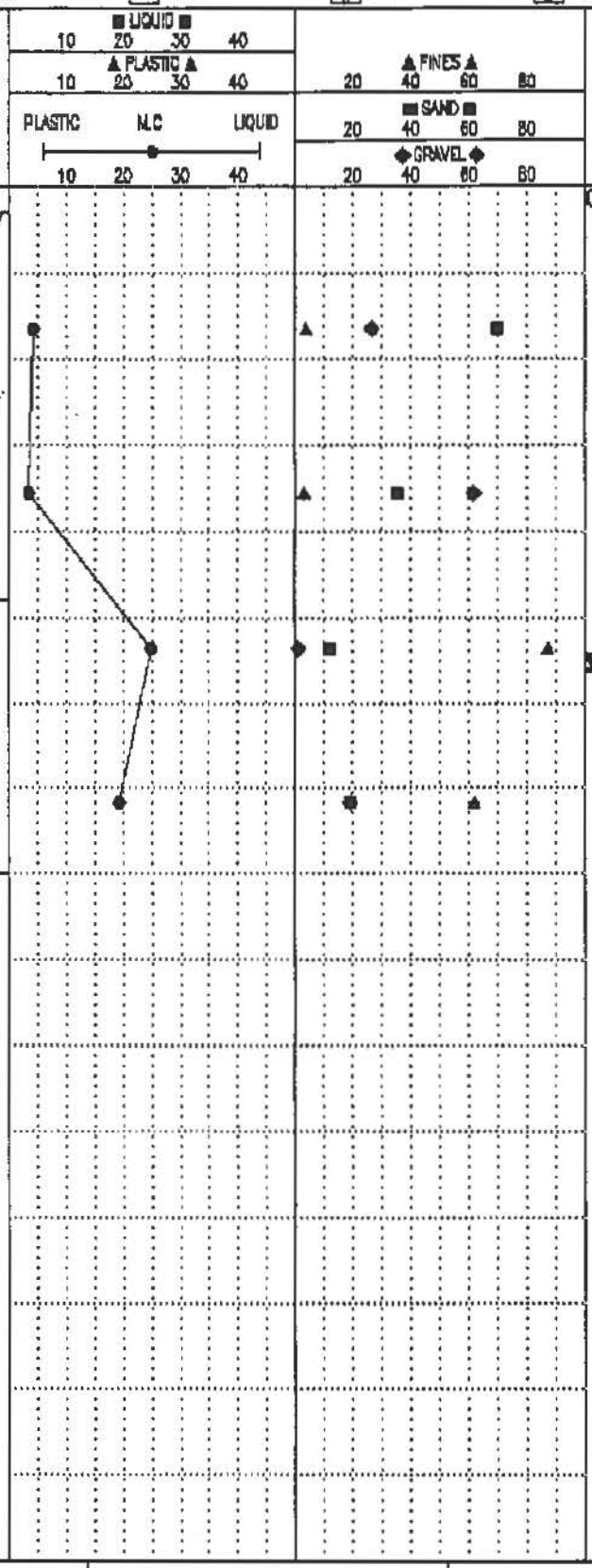


J.R. Paine and Associates Ltd. Edmonton, Alberta	COMPLETION DEPTH 4.0 m	COMPLETE 92/03/03
	LOGGED BY MJK	DWG NO.9
		Page 1 of 1

YTG, C&T SERVICES, TRANSPORTATION ENG.	KM 1490 ALASKA HWY, GEOTECHNICAL INVES.	BOREHOLE No. TP#20-92
IBEX CONTRACTING LTD.	20 METRES SOUTHWEST OF TREELINE	Project No: 8002-218
225 BACKHOE	SOUTHWEST END OF PIT	ELEVATION 0.00 (m)

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

DEPTH (m)	SAMPLE TYPE	SAMPLE NO	SOIL DESCRIPTION
0.0			-silty sandy gravel, organics and rootlets, brown
			0.15M
			Seasonal Frost to 0.45m
1.0		57	-gravelly sand, 5-10% cobbles in size to 250mm, round to subround in shape, dense, some oxidation, brown
2.0		58	-sandy gravel, 20-30% cobbles in size to 300mm, round to subangular shape, medium to course sand, damp, brown
			2.40M
3.0		59	-silt, some sand, medium dense, saturated, brown
			Free water @ 2.80M
		60	-sandy gravelly silt to gravelly sandy silt, sand in seams throughout, saturated medium dense, grey
4.0			End of hole @ 4.00M
5.0			Vegetation primarily a mix of old growth and young growth lightly populated spruce and poplar
6.0			-no bulk sample
7.0			
8.0			



USC: CN-PT, SW, GW, ML

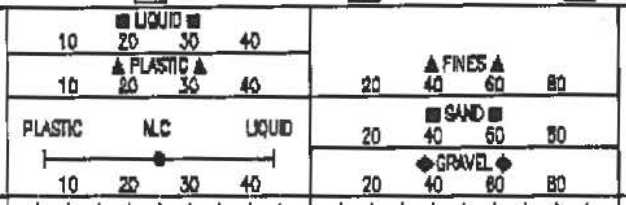
DEPTH (m): 0.0, 1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 7.0, 8.0

J.R. Paine and Associates Ltd. Edmonton, Alberta	COMPLETION DEPTH 4.0 m	COMPLETE 92/03/03
	LOGGED BY MJK	DWG NO.10
		Page 1 of 1

YTG, C&T SERVICES, TRANSPORTATION ENG.	KM 1490 ALASKA HWY. GEOTECHNICAL INVES.	BOREHOLE No. TP#21-92
IBEX CONTRACTING LTD.	@ TREELINE	Project No: 8002-218
225 BACKHOE	NORTHWEST END OF PIT	ELEVATION 0.00 (m)

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

SOIL DESCRIPTION



DEPTH (m)	SAMPLE TYPE	SAMPLE NO	SOIL DESCRIPTION	USC
0.0			-sandy silt to silty sand, some organics, some gravel to gravelly, brown	SM-PT
			0.35M	
			Seasonal Frost to 0.45m	
1.0		61	-sandy gravel, trace to some silt, 10-20% cobbles in size to 250mm, round to subround in shape, fine to medium sand, dense, some oxidation, brown	
2.0		62	-sandy gravel, trace to some silt, 10-20% cobbles in size to 200mm, round to sub-round in shape, fine to medium sand, dense, some oxidation, damp, brown	GW
3.0		63	-sandy gravel, odd cobble in size to 200mm round to subround in shape, medium to course sand, some oxidation, dense, damp to moist, brown	
			3.40M	
		64	Free Water @ 3.40M -silty sandy gravel, wet, dense, brown	GM-GW
4.0			End of hole @ 4.00M	
5.0			-Bulk sample #63A from 0.00-3.40m sandy gravel, GW 4.0% moisture 72.1% gravel 23.1% sand 4.8% silt -Trial crush test completed	
6.0				
7.0				
8.0				

DEPTH (m) duplicated: 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 4.0 m		COMPLETE 92/03/03
LOGGED BY MJK	DWG NO.11	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.
Project: km 1490 Alaska Hwy Geotechnical Inves.
Sample: 1 Depth: 0.60-0.75m
Location: TH#11-92
Made by: MK Job No.: 8002-218
Ck'd by: Date: 1992/03/03

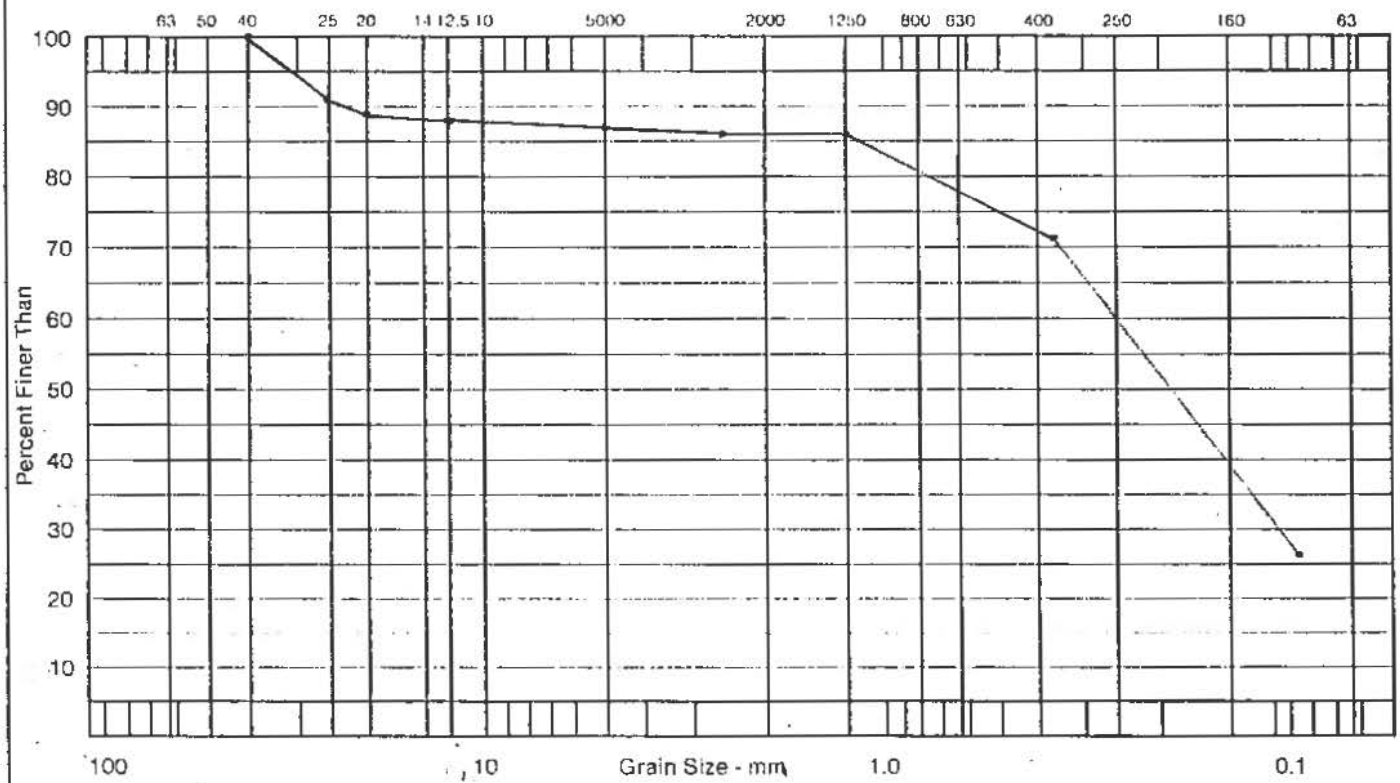
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					
40,000	40.0					100.0
25,000	25.0					90.2
20,000	20.0					89.0
12,500	12.5					88.0
10,000	10.0					
5,000	5.0					87.0
2500	2.5					86.4
1,250	1.25					85.5
800	0.800					
630	0.630					
315	0.315					71.1
250	0.250					
160	0.160					
80	0.080					26.7

Description of Sample: Silty sand, some gravel, brown, SM

Time of Sieving: Min. 15

Method of Preparation: Dry: Washed: X

Remarks:
10.5% Moisture
13.0% Gravel
60.3% Sand
26.7% Silt



J. R. Paine & Associates Ltd.

CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services Transportation Eng.
Project: km 1490 Alaska Hwy Geotechnical Inves.
Sample: 2 Depth: 1.70-1.85m
Location: TH#11-92
Made by: MK Job No.: 8002-218
Ck'd by: [illegible] Date: 1992/03/03

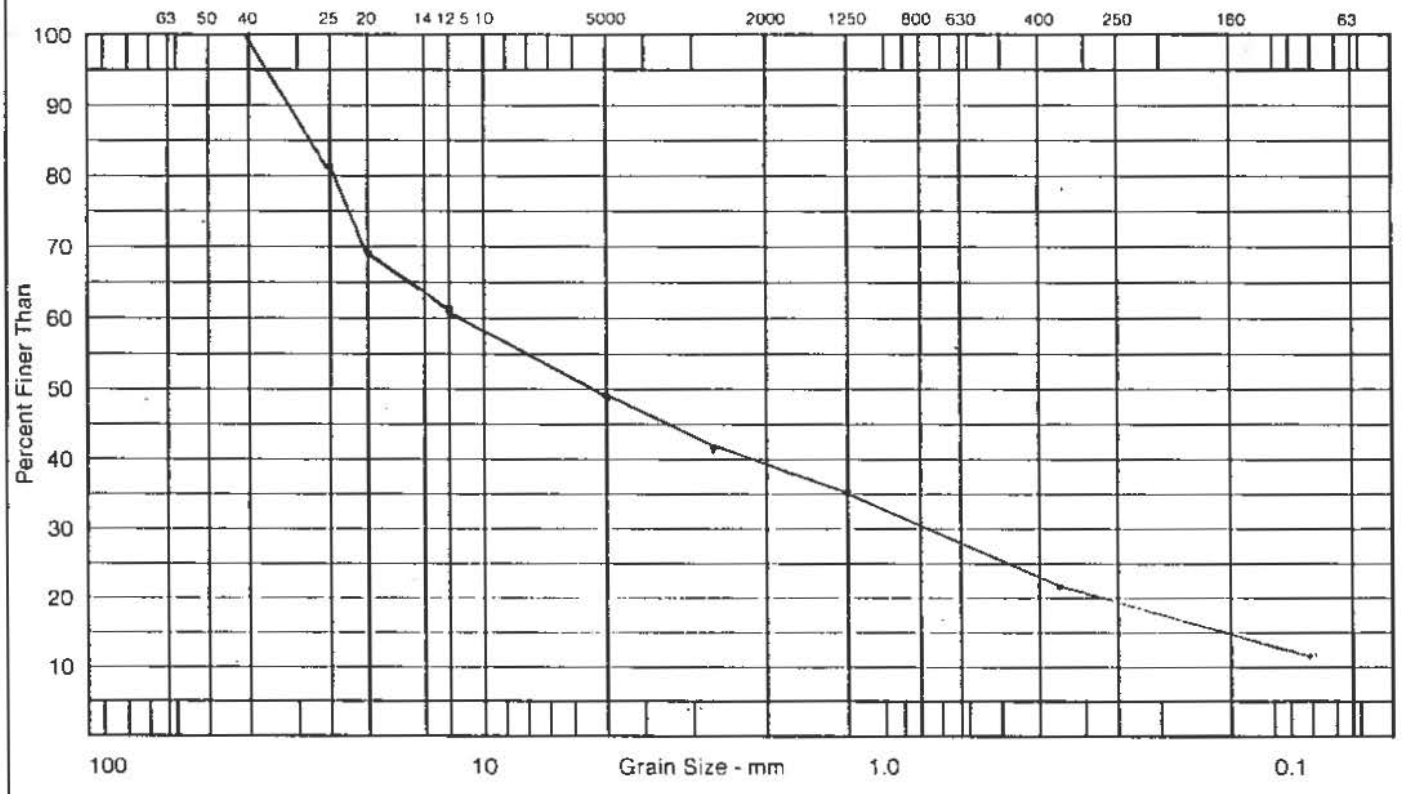
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63.000	63.0					
50.000	50.0					
40.000	40.0					100.0
25.000	25.0					81.2
20.000	20.0					69.0
12.500	12.5					61.3
10.000	10.0					
5.000	5.0					49.7
2500	2.5					42.0
1.250	1.25					35.0
800	0.800					
630	0.630					
315	0.315					21.2
250	0.250					
160	0.160					
80	0.080					12.1

Description of Sample: Sandy gravel, some silt, brown, GM

Time of Sieving: Min. 15

Method of Preparation: Dry ____ Washed X

Remarks:
7.0 %Moisture
50.3 %Gravel
37.6 %Sand
12.1 %Silt



J. R. Paine & Associates Ltd.

CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services Transportation Eng.

Sample: 3 Depth: 2.60-2.75m

Project: km 1490 Alaska Hwy Geotechnical Inves.

Location: TH#11-92

Made by: MK Job No.: 8002-218

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

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					82.7
20,000	20.0					74.0
12,500	12.5					63.7
10,000	10.0					
5,000	5.0					47.5
2500	2.5					40.3
1,250	1.25					32.6
800	0.800					
630	0.630					
315	0.315					19.0
250	0.250					
160	0.160					
80	0.080					10.8

Description of Sample: Sandy gravel, some silt, GM

Time of Sieving _____ Min. 15

Method of Preparation _____ Dry _____ Washed X

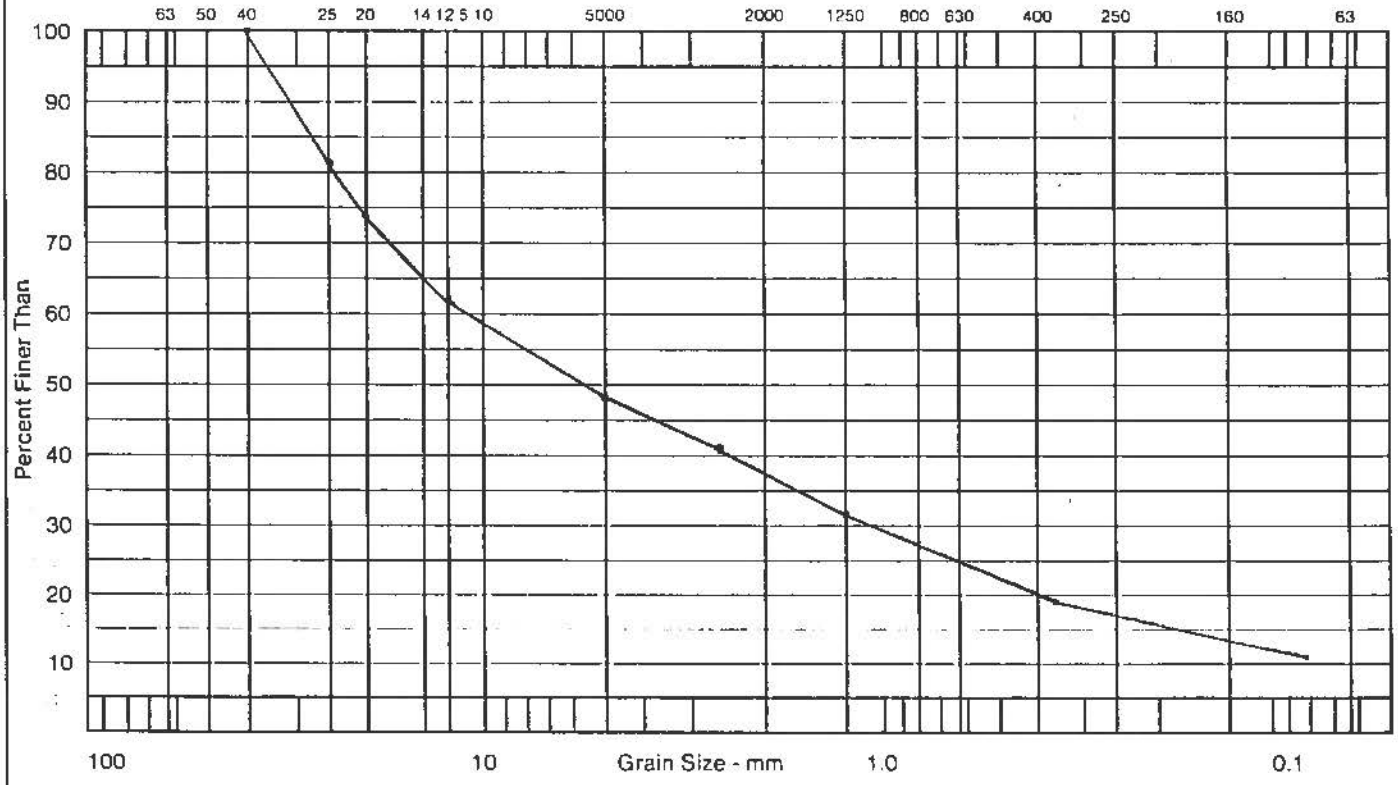
Remarks:

6.0 %Moisture

52.5 %Gravel

36.7 %Sand

10.8 %Silt



J. R. Paine & Associates Ltd.

CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services Transportation Eng.
Project: km 1490 Alaska Hwy Geotechnical Inves.
Sample: 4 Depth: 3.80-4.00m
Location: TH#11-92
Made by: MK Job No.: 8002-218
Ck'd by: WCIL Date: 1992/03/03

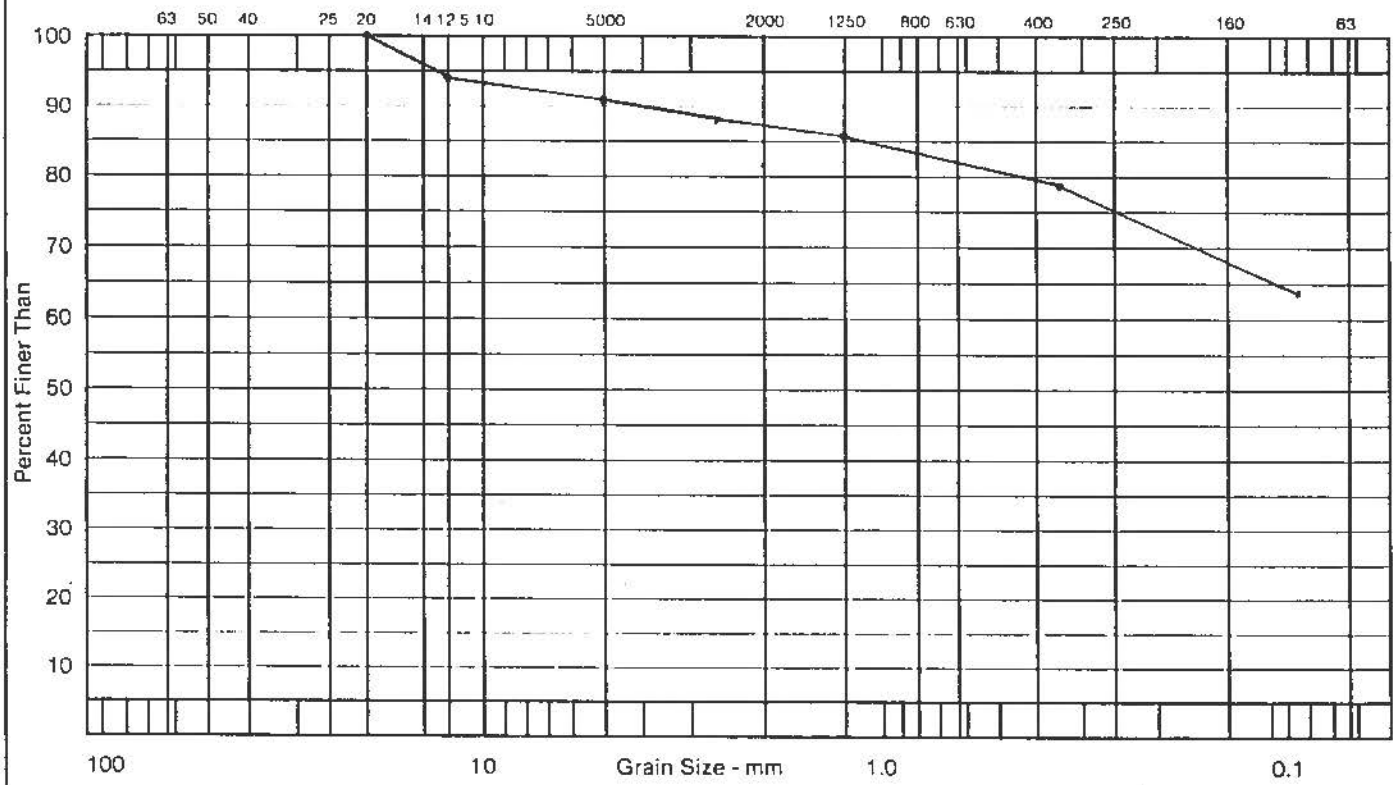
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					
40,000	40.0					
25,000	25.0					
20,000	20.0					100.0
12,500	12.5					94.7
10,000	10.0					
5,000	5.0					90.8
2500	2.5					88.3
1,250	1.25					85.9
800	0.800					
630	0.630					
315	0.315					79.0
250	0.250					
160	0.160					
80	0.080					64.2

Description of Sample: Sandy silt, some gravel, ML

Time of Sieving: Min. 15

Method of Preparation: Dry ____ Washed X

Remarks:
15.7%Moisture
9.2%Gravel
26.6%Sand
64.2%Silt



J. R. Paine & Associates Ltd.

CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services Transportation Eng.
Project: km 1490 Alaska Hwy Geotechnical Inves.
Sample: 5 Depth: 4.60-4.85m
Location: TH#11-92
Made by: MK Job No.: 8002-218
Ck'd by: [illegible] Date: 1992/03/03

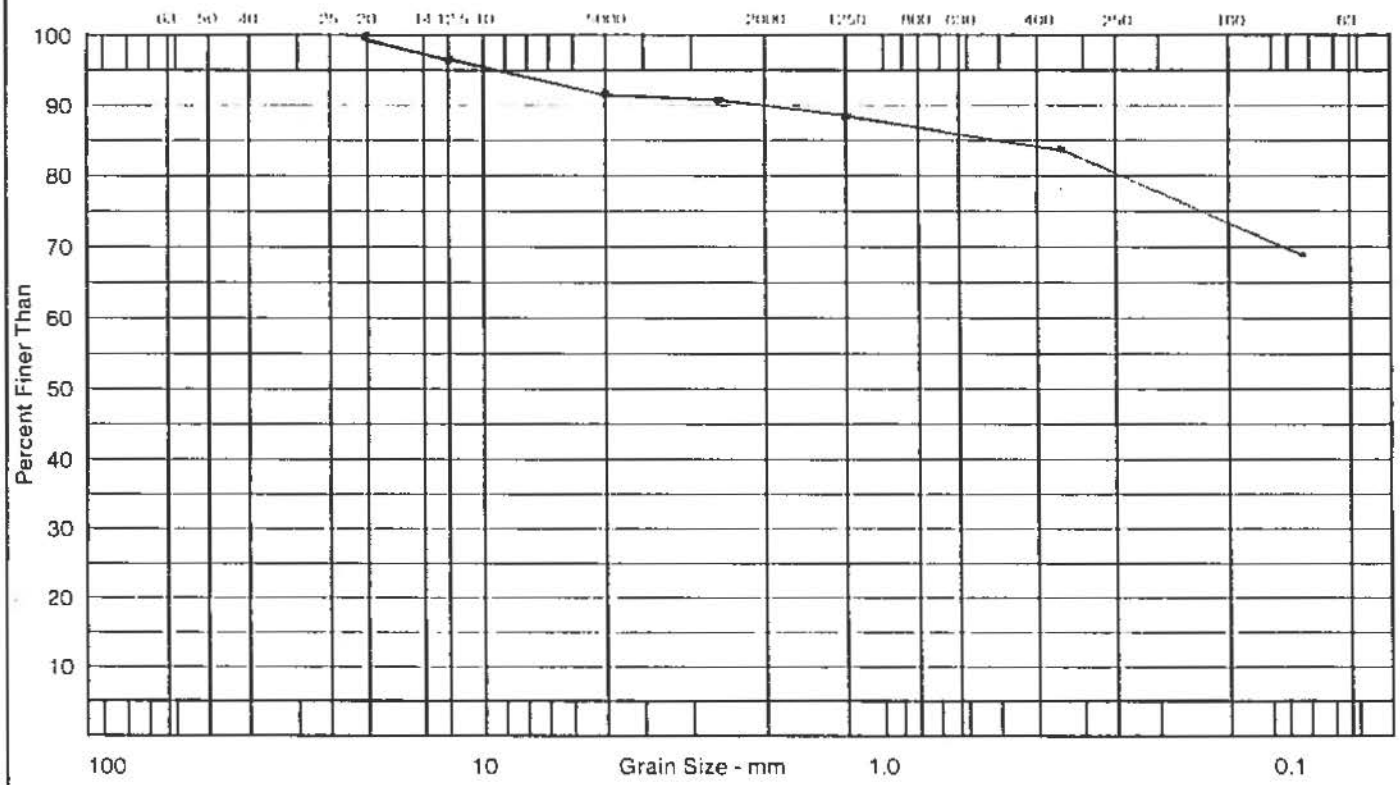
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					
40,000	40.0					
25,000	25.0					
20,000	20.0					100.0
12,500	12.5					97.1
10,000	10.0					
5,000	5.0					93.2
2500	2.5					90.6
1,250	1.25					88.4
800	0.800					
630	0.630					
315	0.315					84.0
250	0.250					
160	0.160					
80	0.080					68.7

Description of Sample: Sandy silt, trace of gravel, ML

Time of Sieving: Min. 15

Method of Preparation: Dry ____ Washed X

Remarks:
16.6 %Moisture
6.8 %Gravel
24.5 %Sand
68.7 %Silt



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CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services Transportation Eng.
Project: km 1490 Alaska Hwy Geotechnical Inves.
Sample: 6 Depth: 5.65-5.80m
Location: TH#11-92
Made by: MK Job No.: 8002-218
Ck'd by: [illegible] Date: 1992/03/03

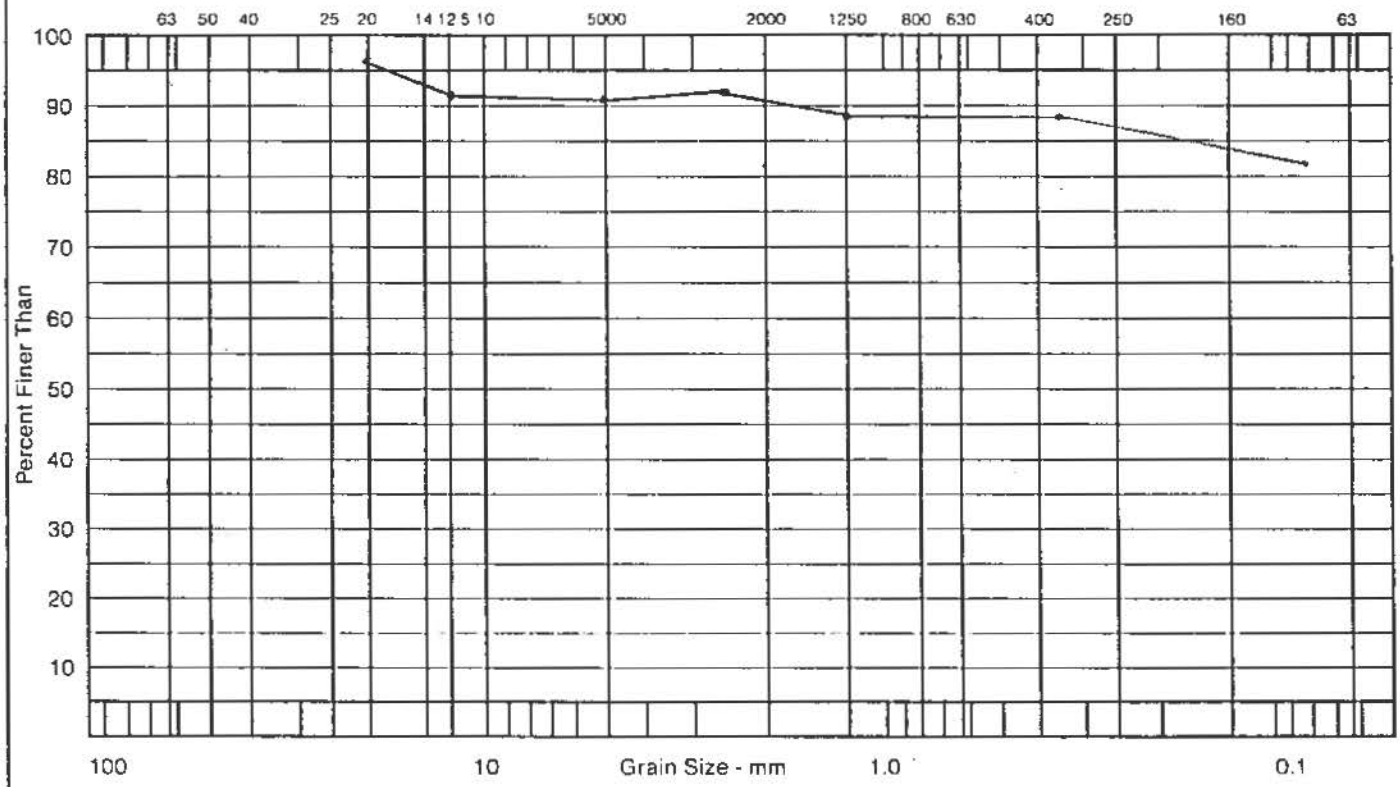
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					
40,000	40.0					
25,000	25.0					100.0
20,000	20.0					97.0
12,500	12.5					93.4
10,000	10.0					
5,000	5.0					91.1
2500	2.5					90.5
1,250	1.25					89.9
800	0.800					
630	0.630					
315	0.315					88.9
250	0.250					
160	0.160					
80	0.080					82.4

Description of Sample: Silt, trace of sand and trace of gravel, ML

Time of Sieving: Min. 15

Method of Preparation: Dry: Washed: X

Remarks:
24.4 %Moisture
8.9 %Gravel
8.7 %Sand
82.4 %Silt



J. R. Paine & Associates Ltd.

CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services Transportation Eng.
Project: km 1490 Alaska Hwy Geotechnical Inves.
Sample: 7 Depth: 7.30-7.60m
Location: TH#11-92
Made by: MK Job No.: 8002-218
Ck'd by: [illegible] Date: 1992/03/03

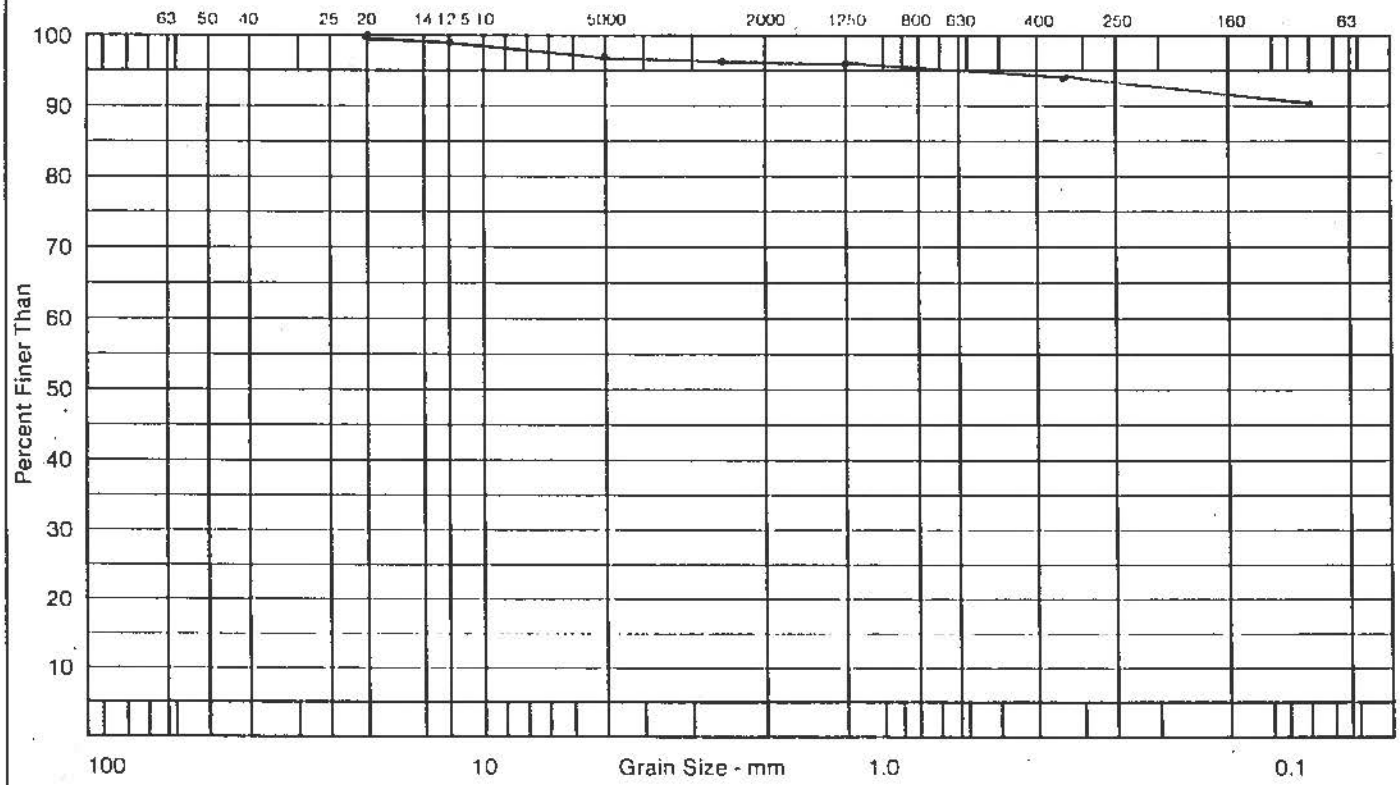
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					
40,000	40.0					
25,000	25.0					
20,000	20.0					100.0
12,500	12.5					99.5
10,000	10.0					
5,000	5.0					97.6
2500	2.5					96.3
1,250	1.25					95.5
800	0.800					
630	0.630					
315	0.315					94.3
250	0.250					
160	0.160					
80	0.080					90.0

Description of Sample: Silt, trace of sand, ML

Time of Sieving: Min. 15

Method of Preparation: Dry: Washed: X

Remarks:
16.1 %Moisture
2.4 %Gravel
7.6 %Sand
90.0 %Silt



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CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Sample: 8 Depth: 9.00-9.30m
Location: TH#11-92

Client: YTG, C&T Services Transportation Eng.
Project: km 1490 Alaska Hwy Geotechnical Inves.
Made by: MK Job No.: 8002-218
Ck'd by: [illegible] Date: 1992/03/03

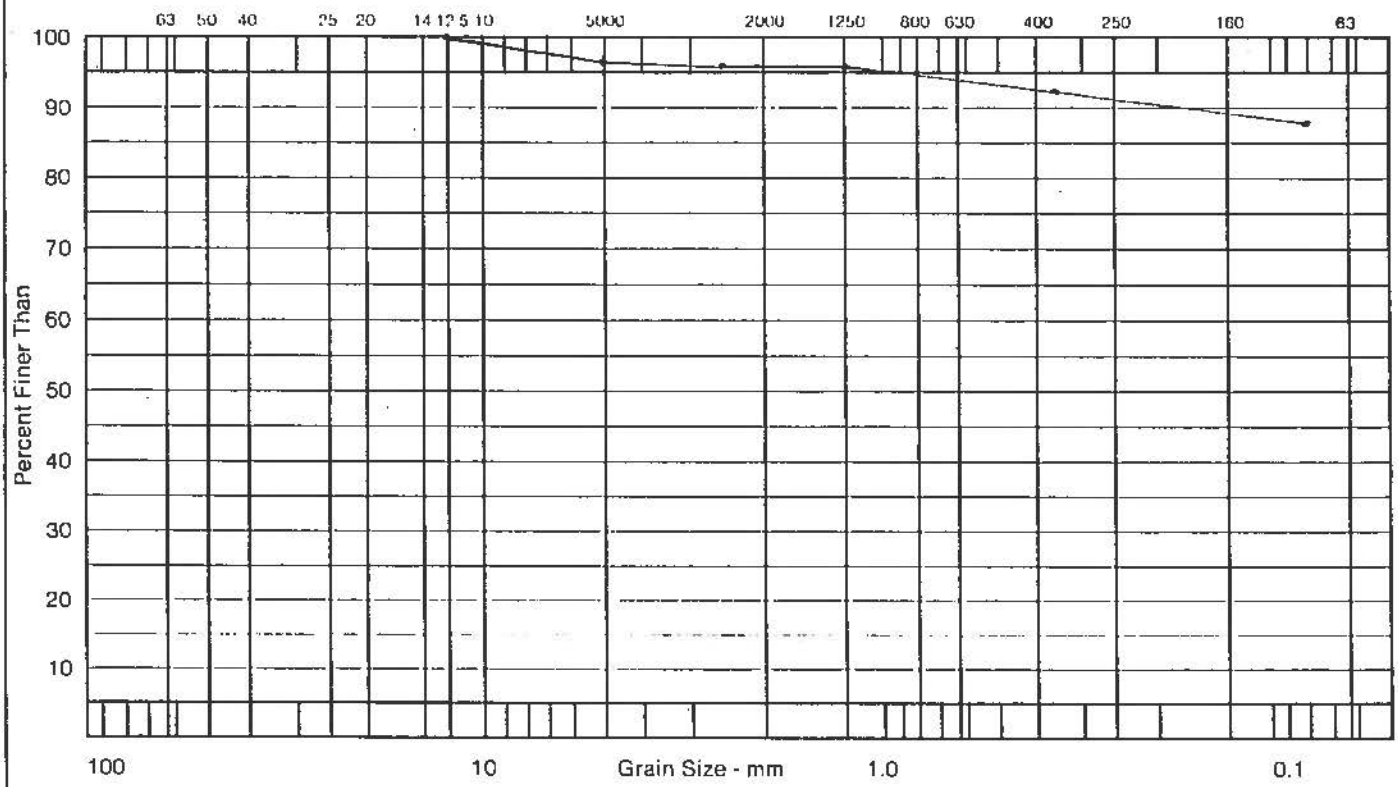
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					
40,000	40.0					
25,000	25.0					
20,000	20.0					
12,500	12.5					100.0
10,000	10.0					
5,000	5.0					97.6
2500	2.5					96.2
1,250	1.25					95.2
800	0.800					
630	0.630					
315	0.315					93.7
250	0.250					
160	0.160					
80	0.080					88.5

Description of Sample: Silt, trace to some sand, ML

Time of Sieving: Min. 15

Method of Preparation: Dry ____ Washed X

Remarks:
19.2 %Moisture
2.4 %Gravel
9.1 %Sand
88.5 %Silt



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CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Sample: 9 Depth: 0.60-0.75m

Location: TH#12-92

Client: YTG, C&T Services Transportation Eng.

Project: km 1490 Alaska Hwy Geotechnical Inves.

Made by: MK Job No.: 8002-218

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

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					72.9
25,000	25.0					68.6
20,000	20.0					60.9
12,500	12.5					52.2
10,000	10.0					
5,000	5.0					35.1
2500	2.5					
1,250	1.25					19.0
800	0.800					
630	0.630					
315	0.315					8.1
250	0.250					
160	0.160					
80	0.080					3.8

Description of Sample: Sandy gravel, GW

Time of Sieving: ____ Min. 15

Method of Preparation: ____ Dry ____ Washed X

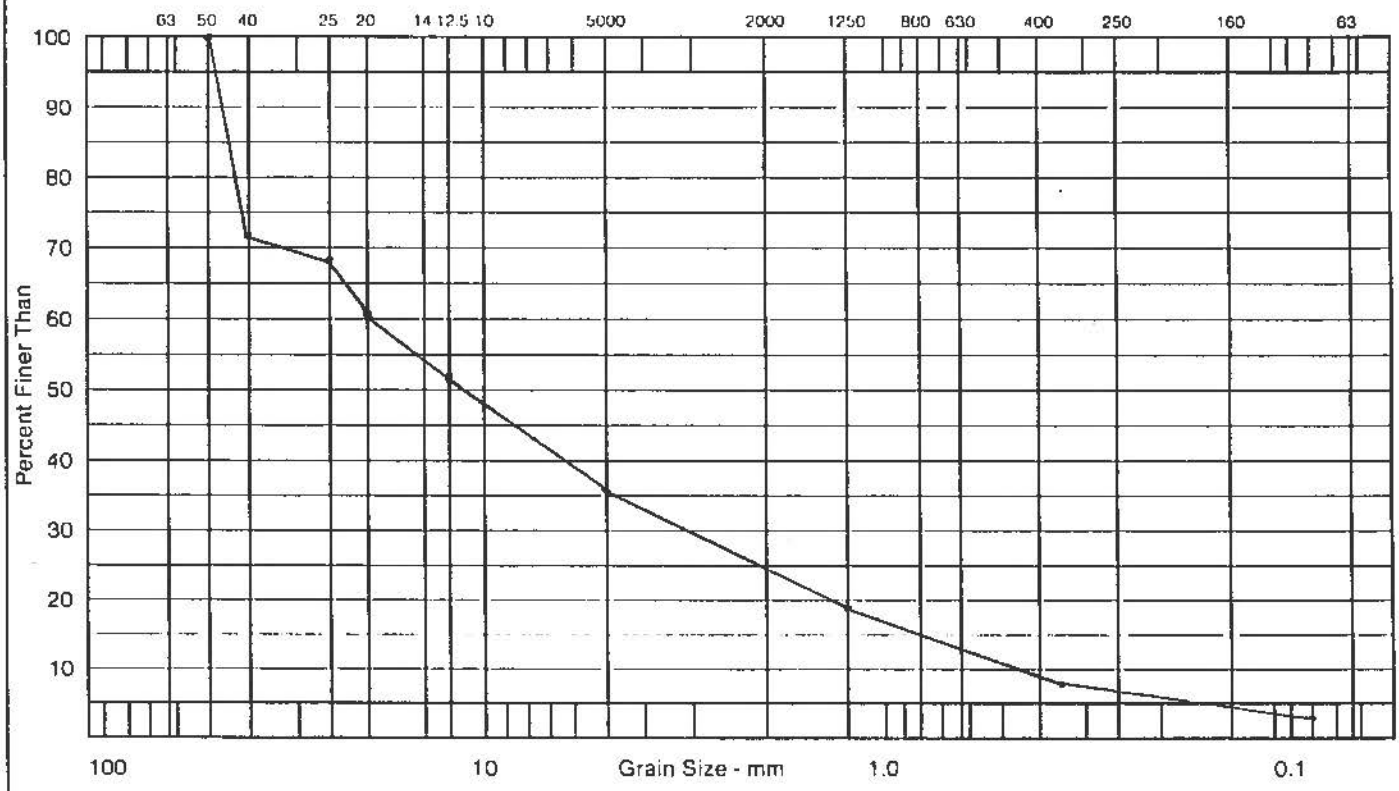
Remarks:

2.0 %Moisture

64.9 %Gravel

31.3 %Sand

3.8 %Silt



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CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services Transportation Eng.
Project: km 1490 Alaska Hwy Geotechnical Inves.
Sample: 10 Depth: 1.70-1.85m
Location: TH#12-92
Made by: MK Job No.: 8002-218
Ck'd by: WCK Date: 1992/03/03

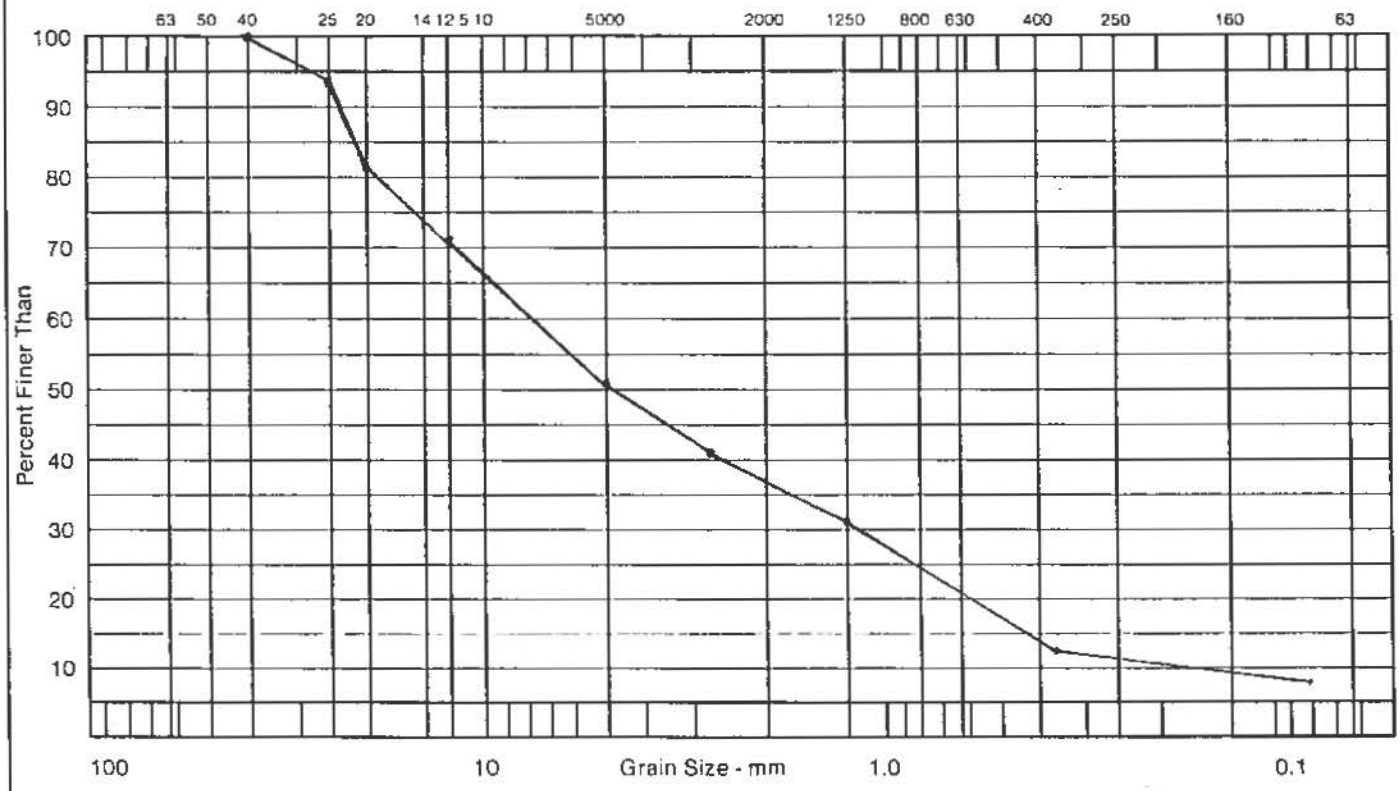
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63.000	63.0					
50.000	50.0					
40.000	40.0					100.0
25.000	25.0					94.4
20.000	20.0					82.8
12.500	12.5					72.1
10.000	10.0					
5.000	5.0					51.8
2500	2.5					40.2
1.250	1.25					30.7
800	0.800					
630	0.630					
315	0.315					13.4
250	0.250					
160	0.160					
80	0.080					8.2

Description of Sample: Sandy gravel, trace of silt, GW

Time of Sieving: Min. 15

Method of Preparation: Dry: Washed: X

Remarks:
- 2.3 %Moisture
- 48.2 %Gravel
- 43.6 %Sand
- 8.2 %Silt



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CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services Transportation Eng.
Project: km 1490 Alaska Hwy Geotechnical Inves.
Sample: 11 Depth: 2.60-2.75m
Location: TH#12-92
Made by: MK Job No.: 8002-218
Ck'd by: WLC Date: 1992/03/03

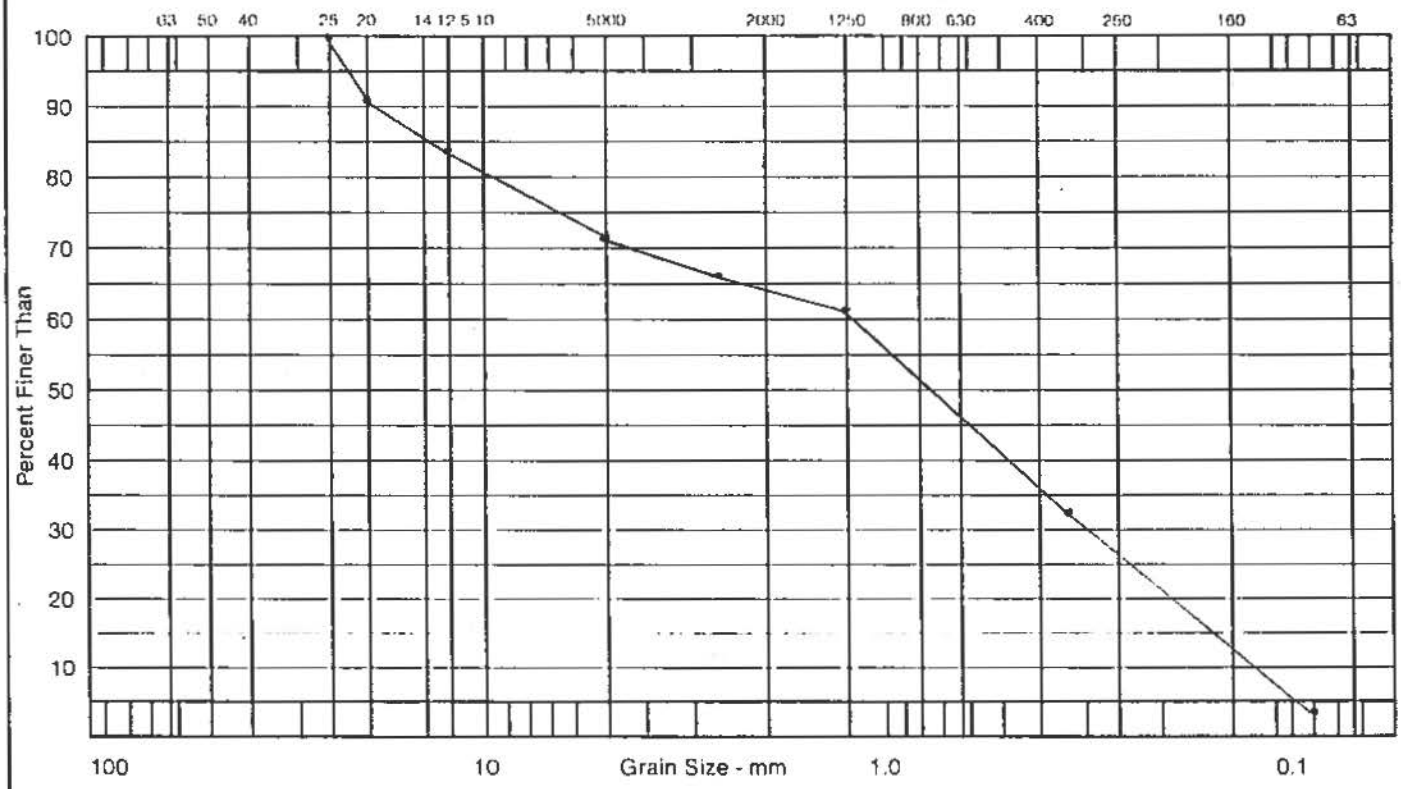
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					
40,000	40.0					
25,000	25.0					100.0
20,000	20.0					90.5
12,500	12.5					84.8
10,000	10.0					
5,000	5.0					71.5
2500	2.5					66.1
1,250	1.25					61.4
800	0.800					
630	0.630					
315	0.315					33.8
250	0.250					
160	0.160					
80	0.080					4.4

Description of Sample: Gravelly sand, SW

Time of Sieving: Min. 15

Method of Preparation: Dry: Washed: X

Remarks:
2.6 %Moisture
28.5 %Gravel
67.1 %Sand
4.4 %Silt



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CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Sample: 12 Depth: 3.80-4.00m

Location: TH#12-92

Client: YTG, C&T Services Transportation Eng.

Project: km 1490 Alaska Hwy Geotechnical Inves.

Made by: MK Job No.: 8002-218

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

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					98.5
12,500	12.5					91.1
10,000	10.0					
5,000	5.0					86.0
2500	2.5					82.6
1,250	1.25					79.5
800	0.800					
630	0.630					
315	0.315					41.7
250	0.250					
160	0.160					
80	0.080					5.8

Description of Sample: Sand, some gravel, trace of silt, SP

Time of Sieving _____ Min. 15

Method of Preparation _____ Dry _____ Washed X

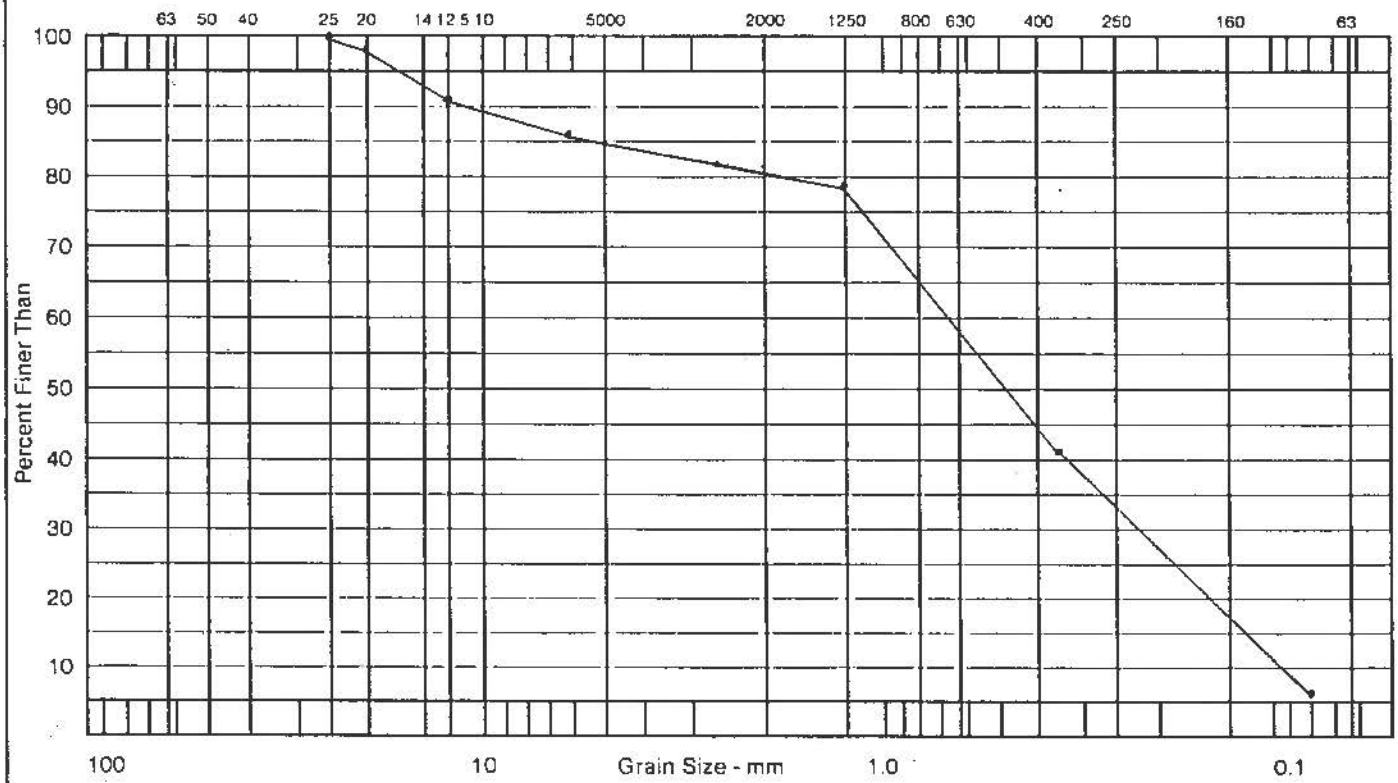
Remarks

3.2 %Moisture

14.0 %Gravel

80.2 %Sand

5.8 %Silt



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CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Sample: 13 Depth: 4.60-4.85m

Location: TH#12-92

Client: YTG, C&T Services Transportation Eng.

Project: km 1490 Alaska Hwy Geotechnical Inves.

Made by: MK Job No.: 8002-218

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

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					99.3
10,000	10.0					
5,000	5.0					96.7
2500	2.5					94.7
1,250	1.25					93.0
800	0.800					92.0
630	0.630					91.0
315	0.315					74.1
250	0.250					58.9
160	0.160					31.1
80	0.080					10.0

Description of Sample: Sand, some silt, SP-SM

Time of Sieving: ____ Min. 15

Method of Preparation: ____ Dry ____ Washed X

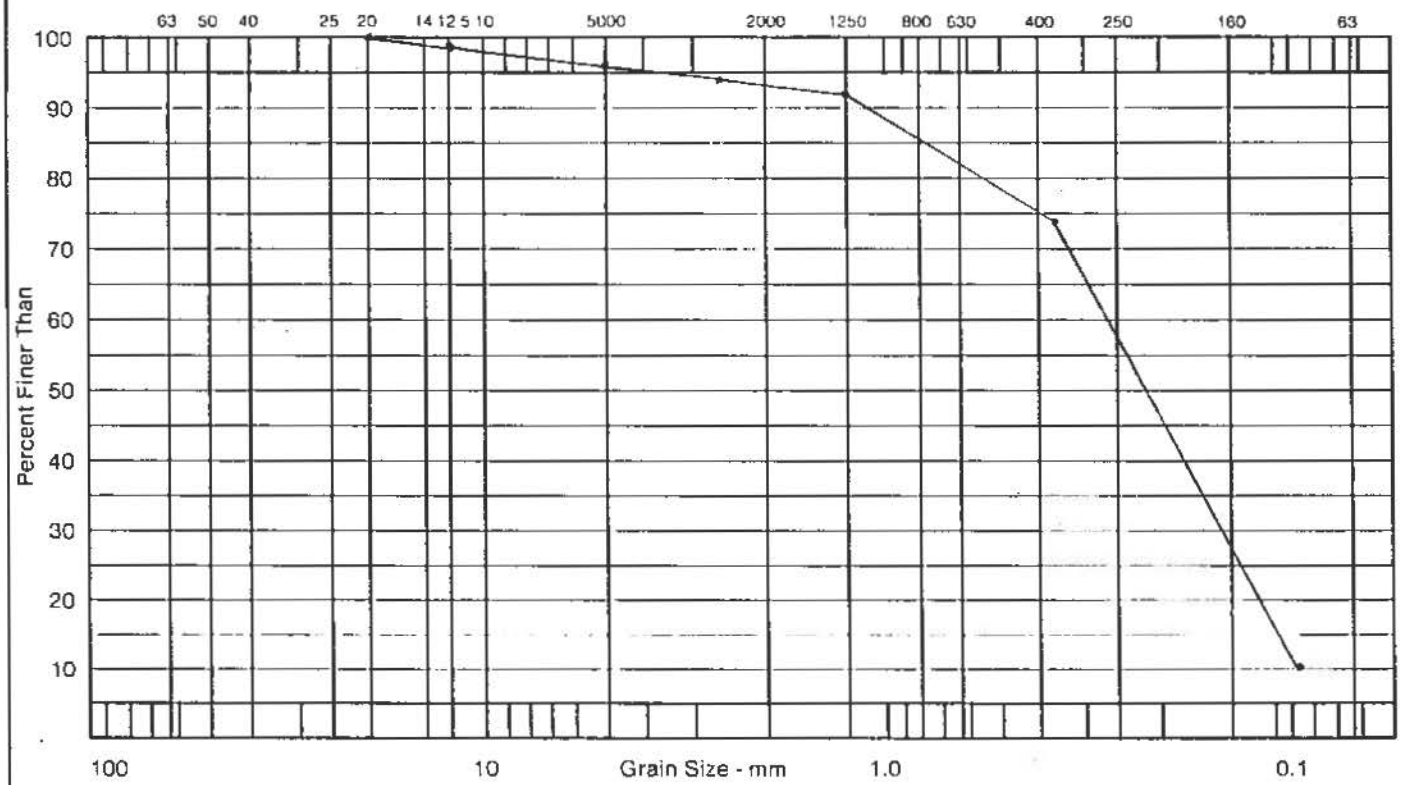
Remarks:

6.9 %Moisture

3.3 %Gravel

86.7 %Sand

10.0 %Silt



J. R. Paine & Associates Ltd.

CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services Transportation Eng.
Project: km 1490 Alaska Hwy Geotechnical Inves.
Sample: 14 Depth: 5.65-5.80m
Location: TH#12-92
Made by: MK Job No.: 8002-218
Ck'd by: WLC Date: 1992/03/03

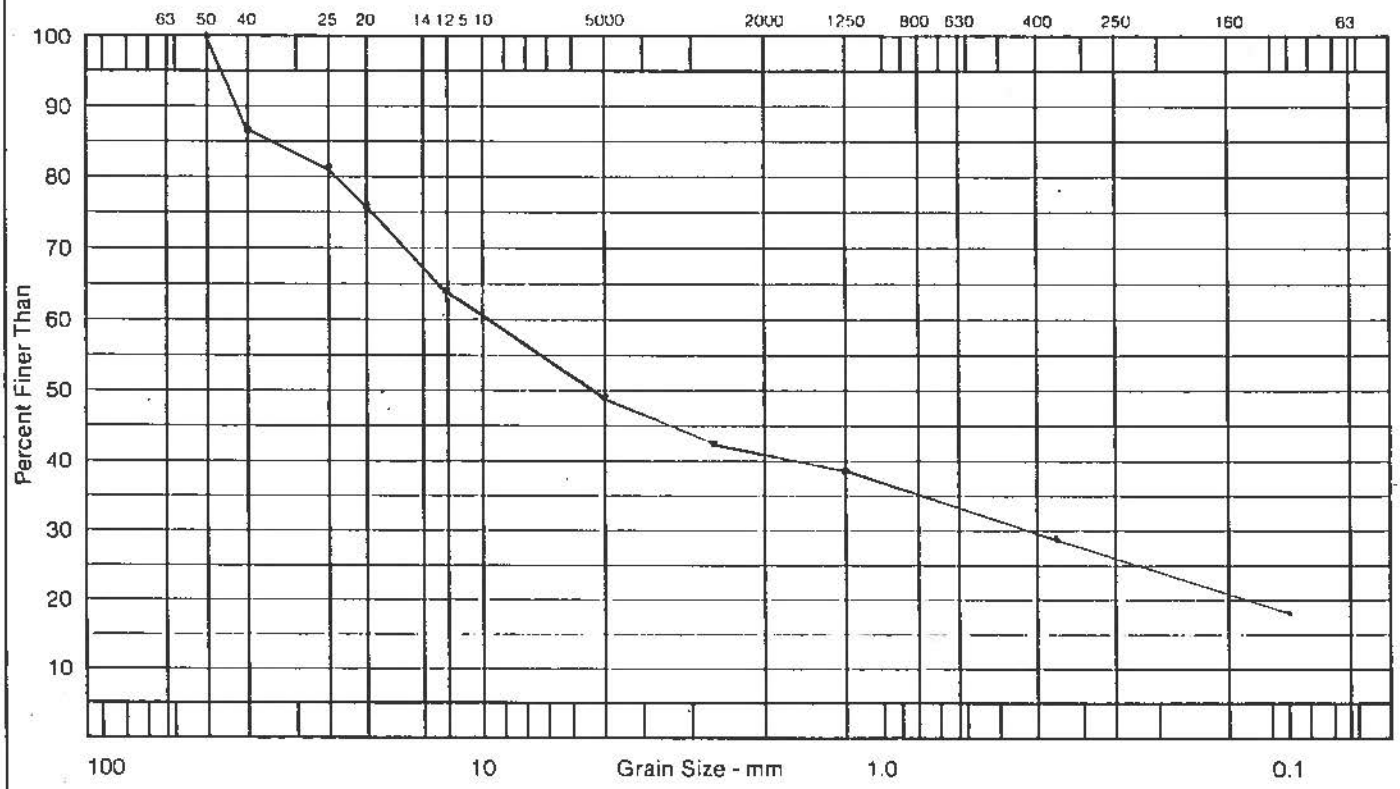
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					100.0
40,000	40.0					87.6
25,000	25.0					82.6
20,000	20.0					75.1
12,500	12.5					63.1
10,000	10.0					
5,000	5.0					49.4
2500	2.5					43.8
1,250	1.25					39.2
800	0.800					
630	0.630					
315	0.315					29.8
250	0.250					
160	0.160					
80	0.080					18.6

Description of Sample: Silty sandy gravel, GM

Time of Sieving: Min. 15

Method of Preparation: Dry: Washed: X

Remarks:
6.2 %Moisture
50.6 %Gravel
30.8 %Sand
18.6 %Silt



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CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services Transportation Eng.
Project: km 1490 Alaska Hwy Geotechnical Inves.
Sample: 15 Depth: 7.30-7.60m
Location: TH#12-92
Made by: MK Job No.: 8002-218
Ck'd by: [illegible] Date: 1992/03/03

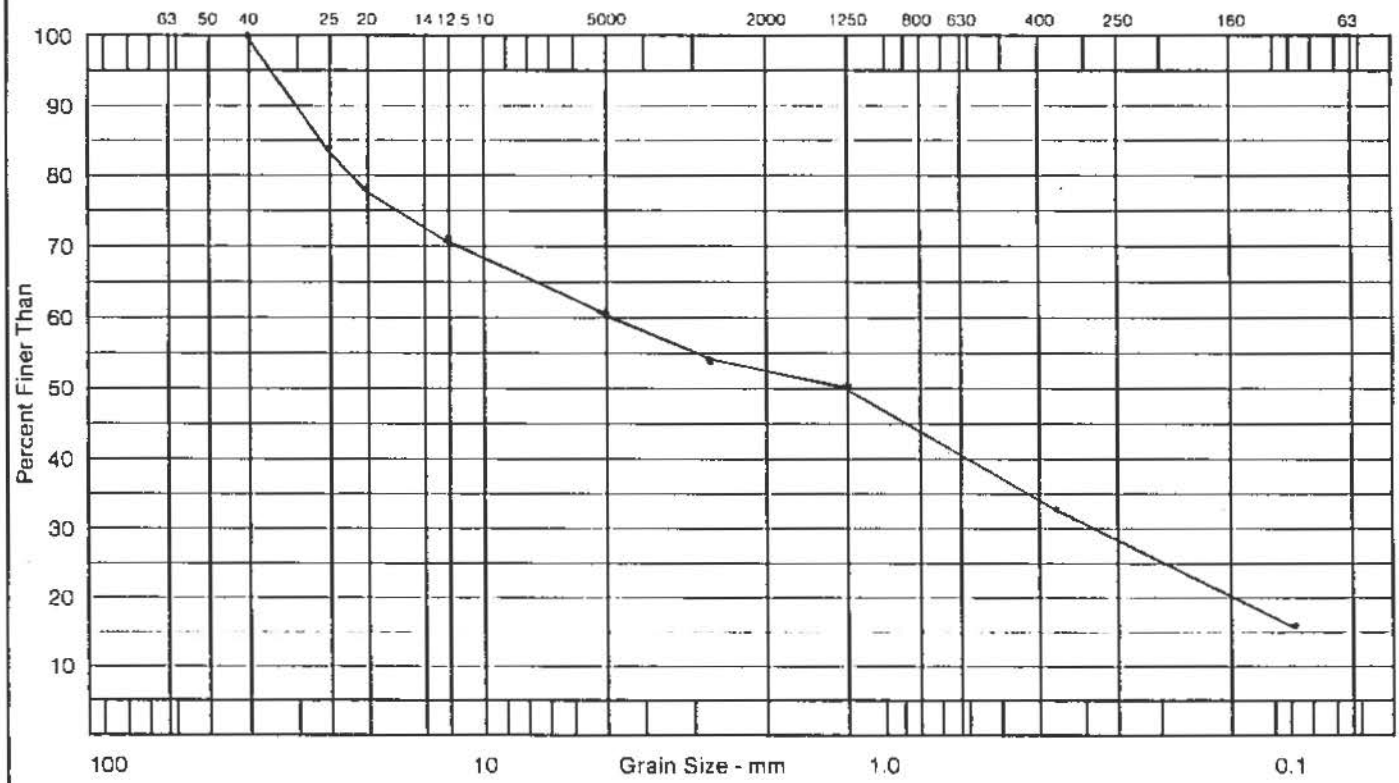
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					
40,000	40.0					100.0
25,000	25.0					84.6
20,000	20.0					78.9
12,500	12.5					71.3
10,000	10.0					
5,000	5.0					60.4
2500	2.5					54.7
1,250	1.25					50.0
800	0.800					
630	0.630					
315	0.315					33.4
250	0.250					
160	0.160					
80	0.080					15.2

Description of Sample: Gravelly sand, some silt to silty, SM-SW

Time of Sieving: Min. 15

Method of Preparation: Dry: Washed: X

Remarks:
5.2 %Moisture
39.6 %Gravel
45.2 %Sand
15.2 %Silt



J. R. Paine & Associates Ltd.

CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services Transportation Eng.
Project: km 1490 Alaska Hwy Geotechnical Inves.
Sample: 16 Depth: 7.90-8.10m
Location: TH#12-92
Made by: MK Job No.: 8002-218
Ck'd by: W C/C Date: 1992/03/03

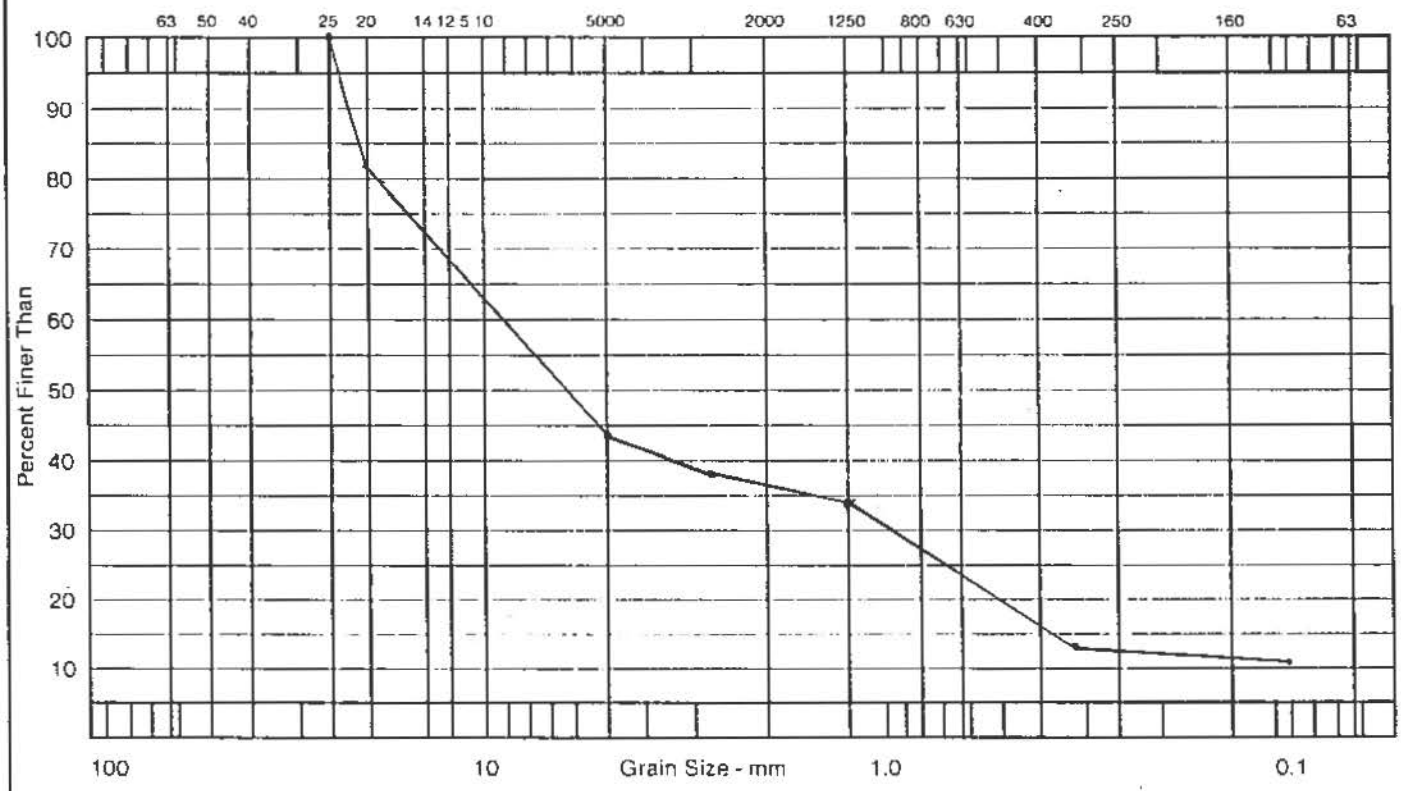
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					
40,000	40.0					
25,000	25.0					100.0
20,000	20.0					83.3
12,500	12.5					75.2
10,000	10.0					
5,000	5.0					44.4
2500	2.5					38.9
1,250	1.25					34.0
800	0.800					
630	0.630					
315	0.315					13.4
250	0.250					
160	0.160					
80	0.080					11.0

Description of Sample: Sandy gravel, some silt, GM

Time of Sieving: Min. 15

Method of Preparation: Dry: Washed: X

Remarks:
9.0 %Moisture
55.6 %Gravel
33.4 %Sand
11.0 %Silt



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CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services Transportation Eng.
Project: km 1490 Alaska Hwy Geotechnical Inves.
Sample: 17 Depth: 9.00-9.30m
Location: TH#12-92
Made by: MK Job No.: 8002-218
Ck'd by: [illegible] Date: 1992/03/03

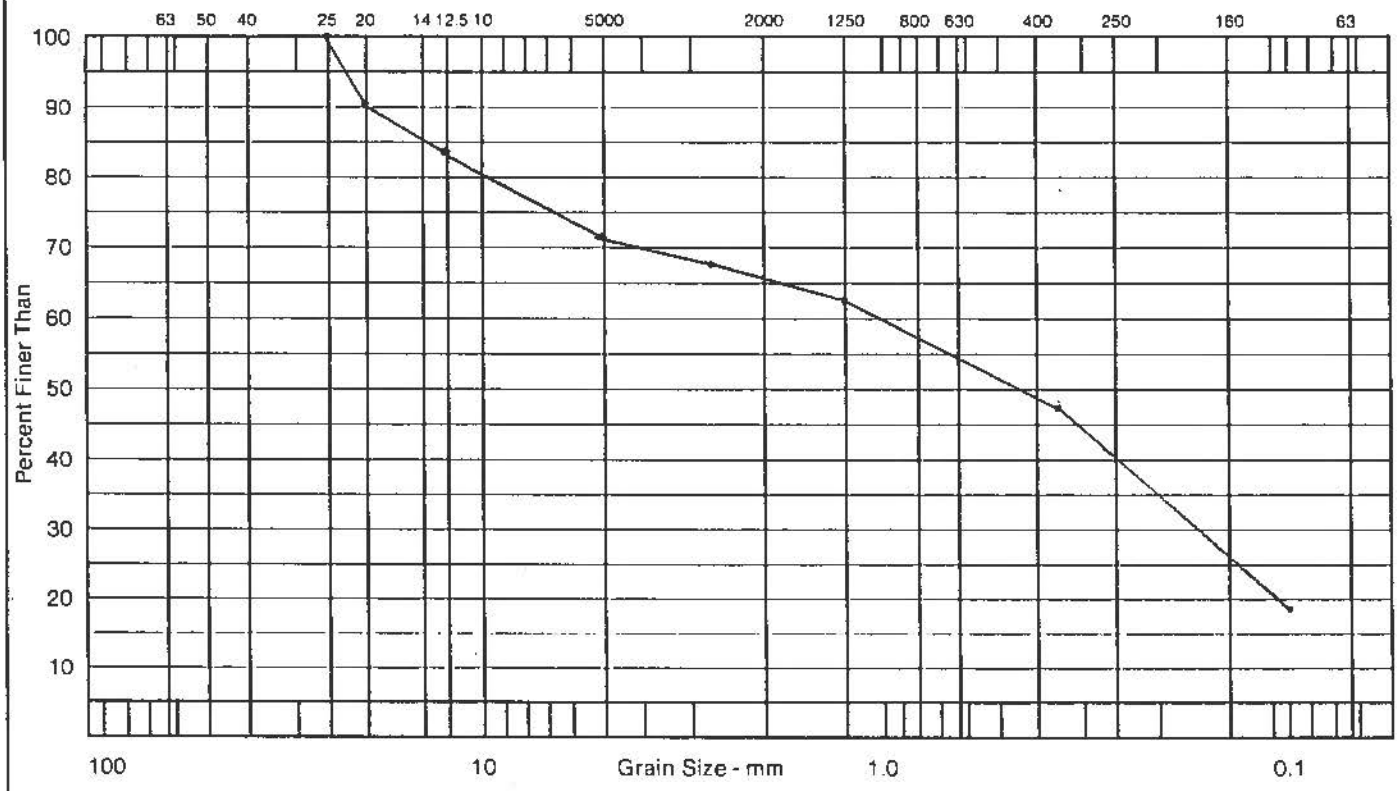
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					
40,000	40.0					
25,000	25.0					100.0
20,000	20.0					90.3
12,500	12.5					84.8
10,000	10.0					
5,000	5.0					72.7
2500	2.5					68.1
1,250	1.25					63.6
800	0.800					
630	0.630					
315	0.315					47.3
250	0.250					
160	0.160					
80	0.080					18.5

Description of Sample: Silty gravelly sand, SM

Time of Sieving: ____ Min. 15

Method of Preparation: ____ Dry ____ Washed X

Remarks:
10.1% Moisture
27.3% Gravel
54.2% Sand
18.5% Silt



J. R. Paine & Associates Ltd.

CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Sample: 18 Depth: 10.50-10.70m

Location: TH#12-92

Client: YTG, C&T Services Transportation Eng.

Project: km 1490 Alaska Hwy Geotechnical Inves.

Made by: MK Job No.: 8002-218

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

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					88.3
12,500	12.5					84.4
10,000	10.0					
5,000	5.0					80.0
2500	2.5					77.7
1,250	1.25					76.8
800	0.800					
630	0.630					
315	0.315					72.6
250	0.250					
160	0.160					
80	0.080					63.5

Description of Sample: Gravelly silt, some sand, ML

Time of Sieving ... Min. 15

Method of Preparation ... Dry ... Washed X

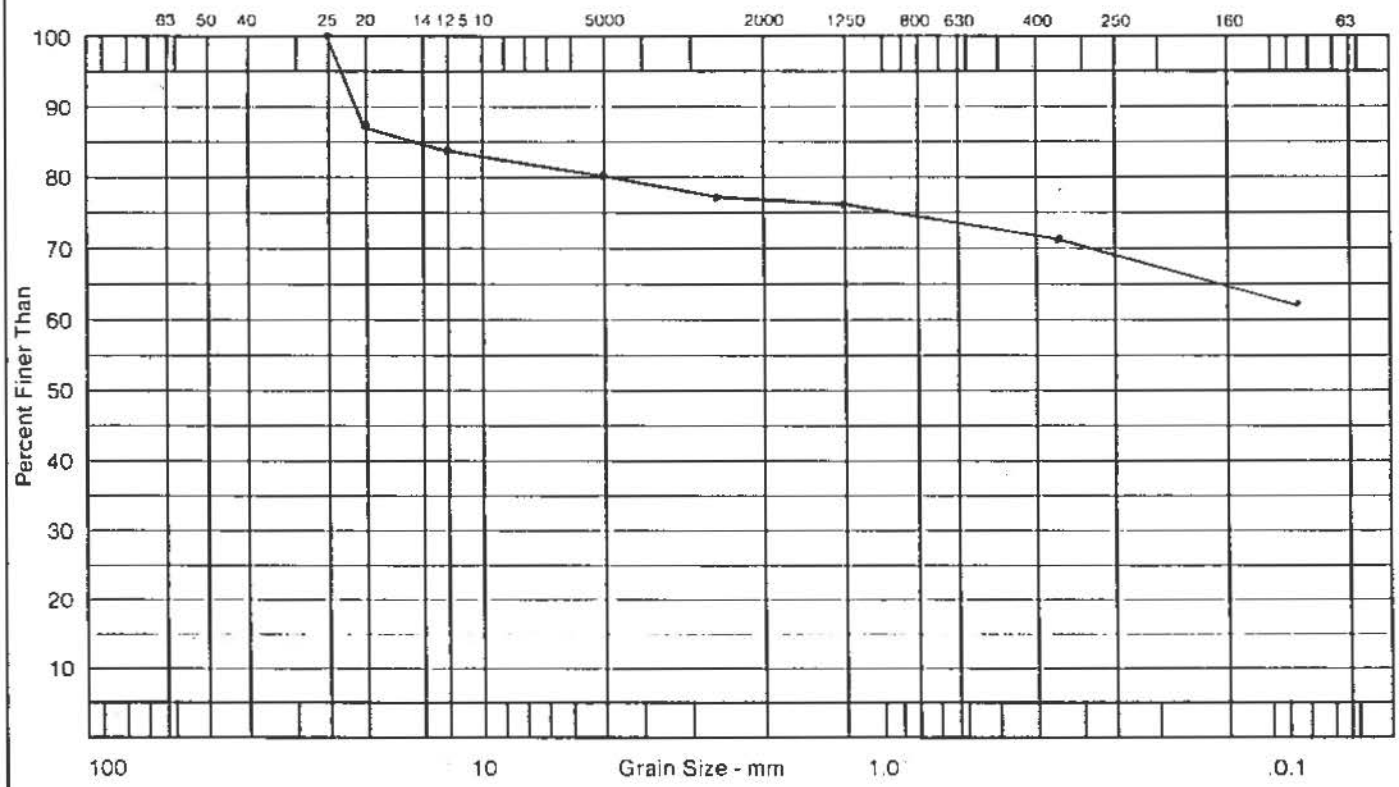
Remarks:

18.1 %Moisture

20.0 %Gravel

16.5 %Sand

63.5 %Silt



J. R. Paine & Associates Ltd.

CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Sample: 19 Depth: 12.20-12.35m

Location: TH#12-92

Client: YTG, C&T Services Transportation Eng.

Project: km 1490 Alaska Hwy Geotechnical Inves.

Made by: MK Job No.: 8002-218

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

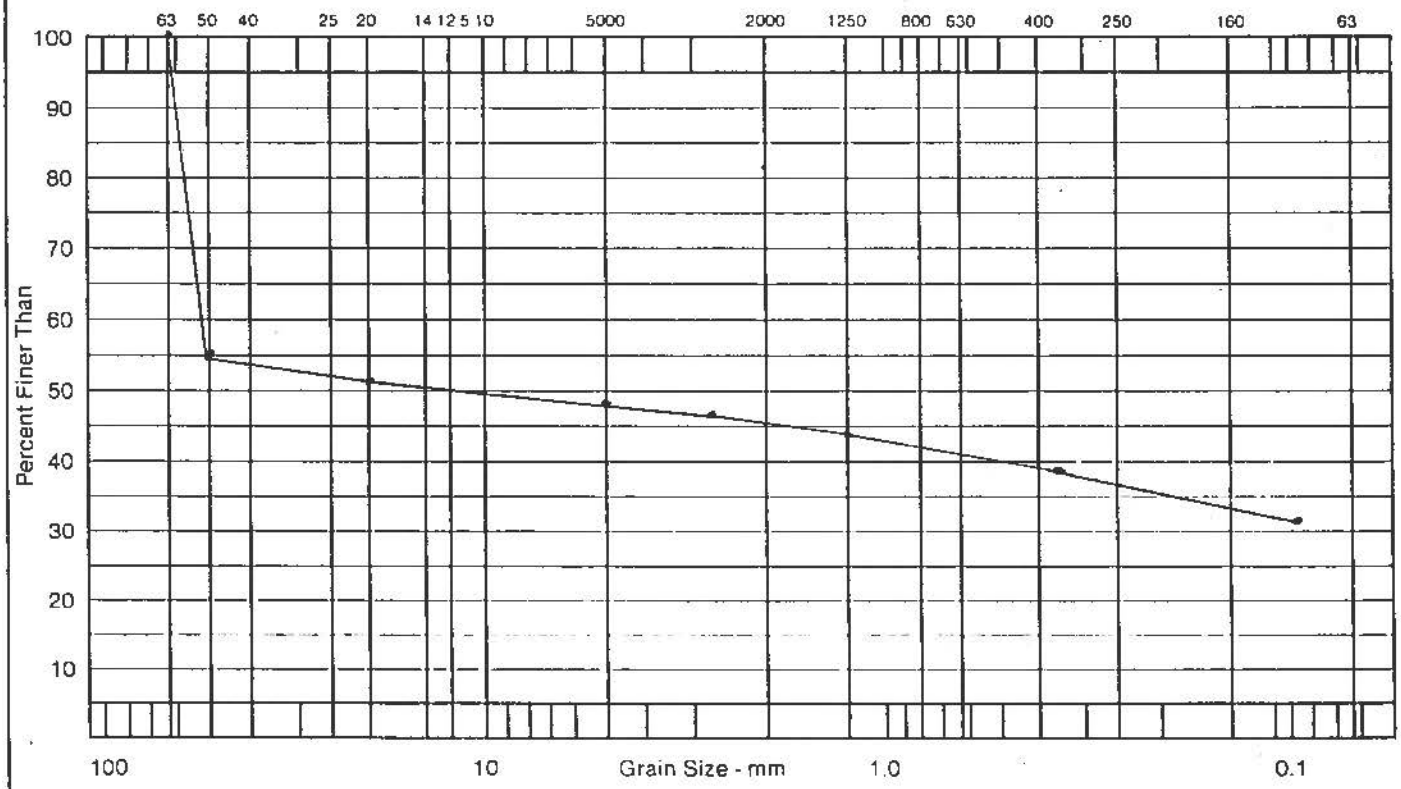
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					100.0
50,000	50.0					55.0
40,000	40.0					
25,000	25.0					
20,000	20.0					52.8
12,500	12.5					
10,000	10.0					
5,000	5.0					48.2
2500	2.5					46.5
1,250	1.25					44.8
800	0.800					
630	0.630					
315	0.315					39.9
250	0.250					
160	0.160					
80	0.080					31.4

Description of Sample: Sandy silty gravel, GM

Time of Sieving: Min. 15

Method of Preparation: Dry ____ Washed X

Remarks:
11.0% Moisture
51.8% Gravel
16.8% Sand
31.4% Silt



J. R. Paine & Associates Ltd.

CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Sample: 20 Depth: 0.60-0.75m

Location: TH#13-92

Client: YTG, C&T Services Transportation Eng.

Project: km 1490 Alaska Hwy Geotechnical Inves.

Made by: MK Job No.: 8002-218

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

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					84.6
12,500	12.5					71.6
10,000	10.0					
5,000	5.0					48.9
2500	2.5					38.9
1,250	1.25					31.5
800	0.800					
630	0.630					
315	0.315					14.4
250	0.250					
160	0.160					
80	0.080					7.6

Description of Sample: Sandy gravel, trace of silt, GW - GM

Time of Sieving: ____ Min. 15

Method of Preparation: ____ Dry ____ Washed X

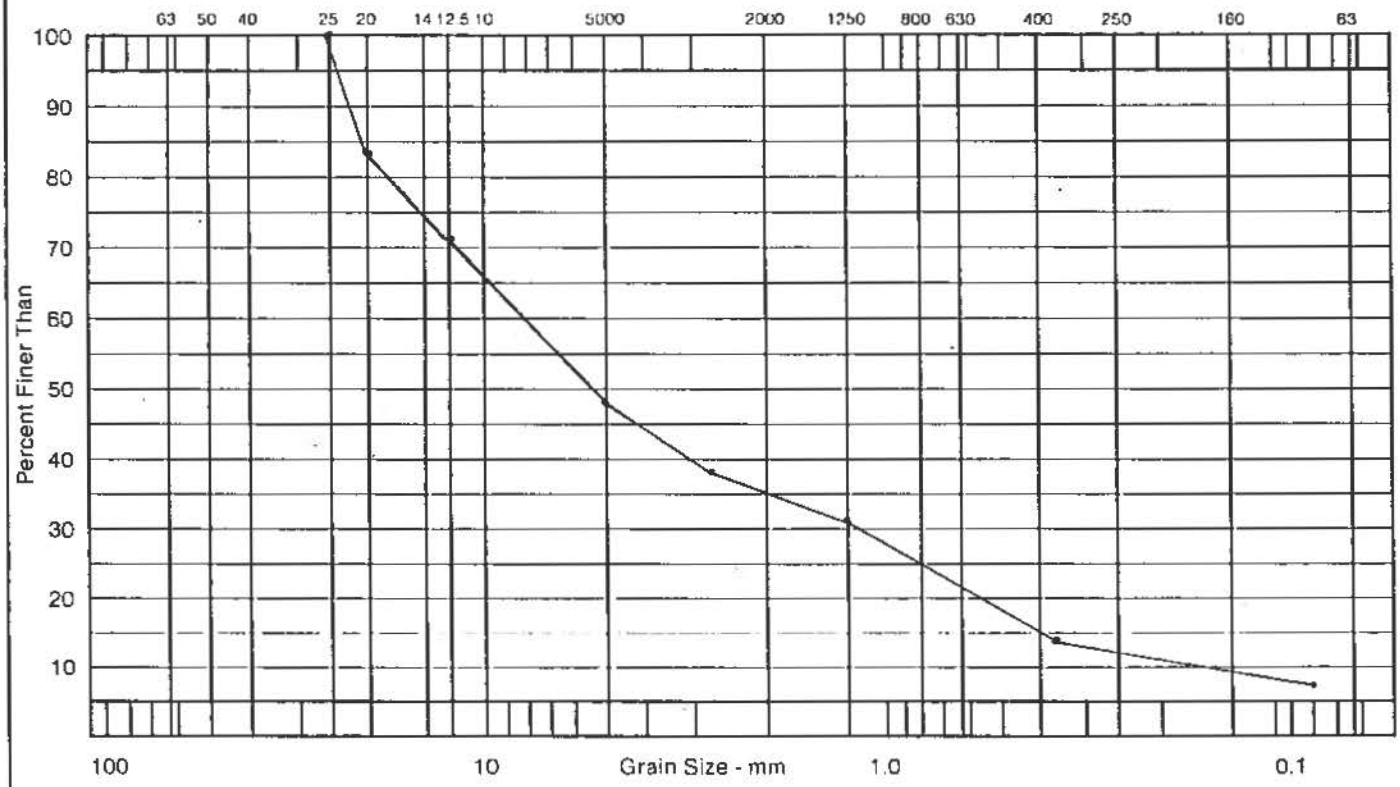
Remarks:

3.3 %Moisture

51.1 %Gravel

41.3 %Sand

7.6 %Silt



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CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Sample: 21 Depth: 1.70-1.85m
Location: TH#13-92

Client: YTG, C&T Services Transportation Eng.
Project: km 1490 Alaska Hwy Geotechnical Inves.
Made by: MK Job No.: 8002-218
Ck'd by: C-K Date: 1992/03/03

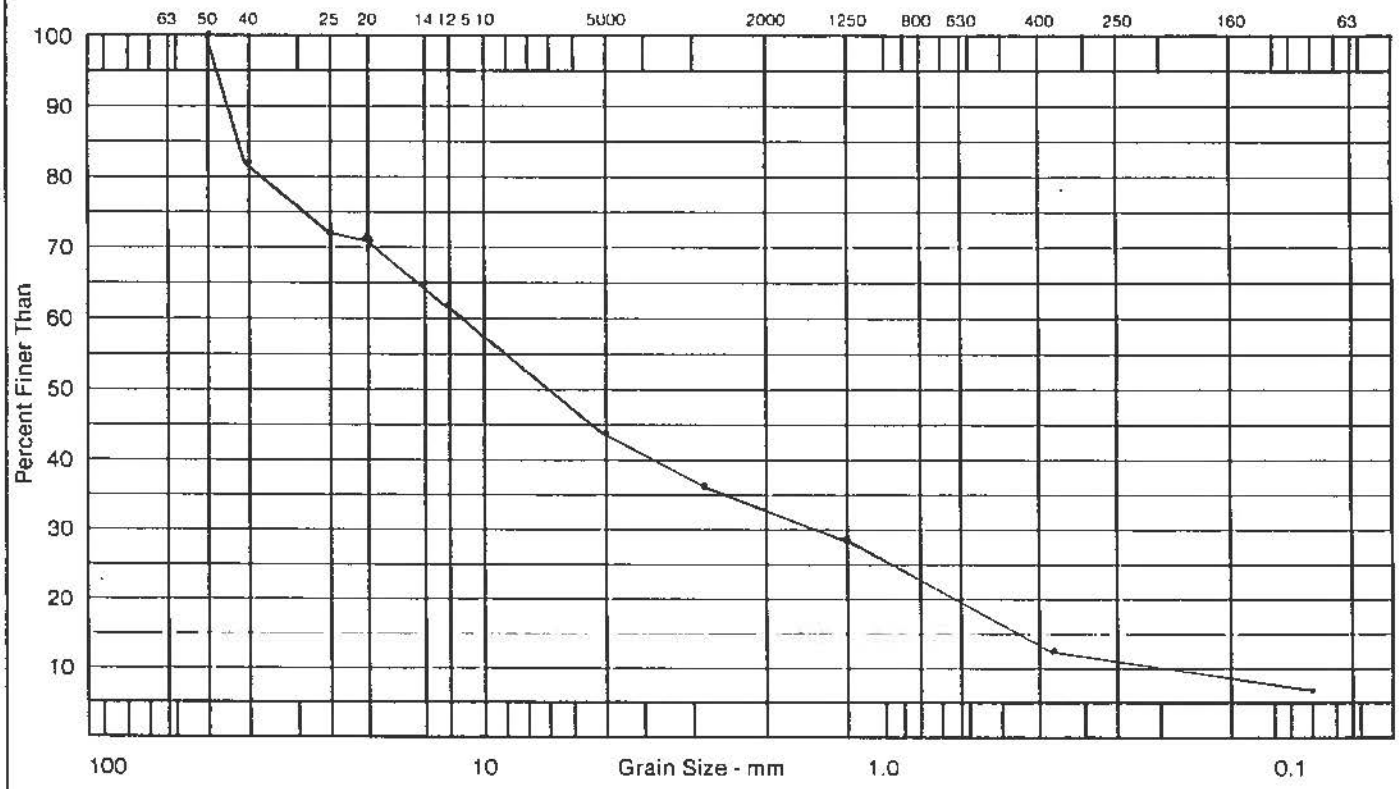
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					100.0
40,000	40.0					83.0
25,000	25.0					72.7
20,000	20.0					71.4
12,500	12.5					62.3
10,000	10.0					
5,000	5.0					44.3
2500	2.5					36.1
1,250	1.25					29.2
800	0.800					
630	0.630					
315	0.315					13.5
250	0.250					
160	0.160					
80	0.080					6.4

Description of Sample: Sandy gravel, trace of silt, GW - GM

Time of Sieving: Min. 15

Method of Preparation: Dry: Washed: X

Remarks:
2.7 %Moisture
55.7 %Gravel
37.9 %Sand
6.4 %Silt



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CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services Transportation Eng.
Project: km 1490 Alaska Hwy Geotechnical Inves.
Sample: 22 Depth: 2.60-2.75m
Location: TH#13-92
Made by: MK Job No.: 8002-218
Ck'd by: [illegible] Date: 1992/03/03

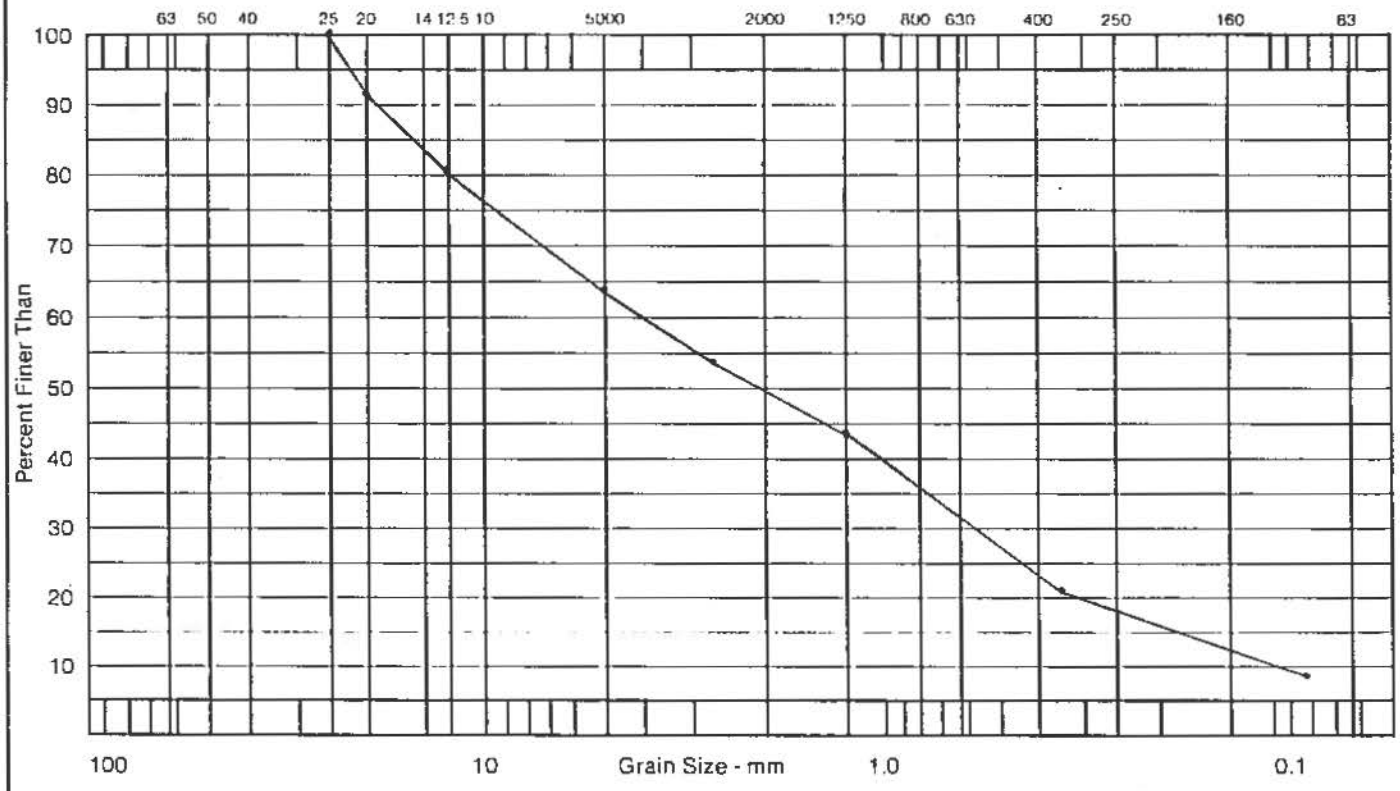
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					
40,000	40.0					
25,000	25.0					100.0
20,000	20.0					93.4
12,500	12.5					81.2
10,000	10.0					
5,000	5.0					64.4
2500	2.5					54.5
1,250	1.25					44.8
800	0.800					
630	0.630					
315	0.315					20.3
250	0.250					
160	0.160					
80	0.080					9.7

Description of Sample: Gravelly sand, trace to some silt, SW - SM

Time of Sieving: Min. 15

Method of Preparation: Dry: Washed: X

Remarks:
4.4 %Moisture
35.6 %Gravel
54.7 %Sand
9.7 %Silt



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CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services Transportation Eng.
Project: km 1490 Alaska Hwy Geotechnical Inves.
Sample: 23 Depth: 3.80-4.00m
Location: TH#13-92
Made by: MK Job No.: 8002-218
Ck'd by: [illegible] Date: 1992/03/03

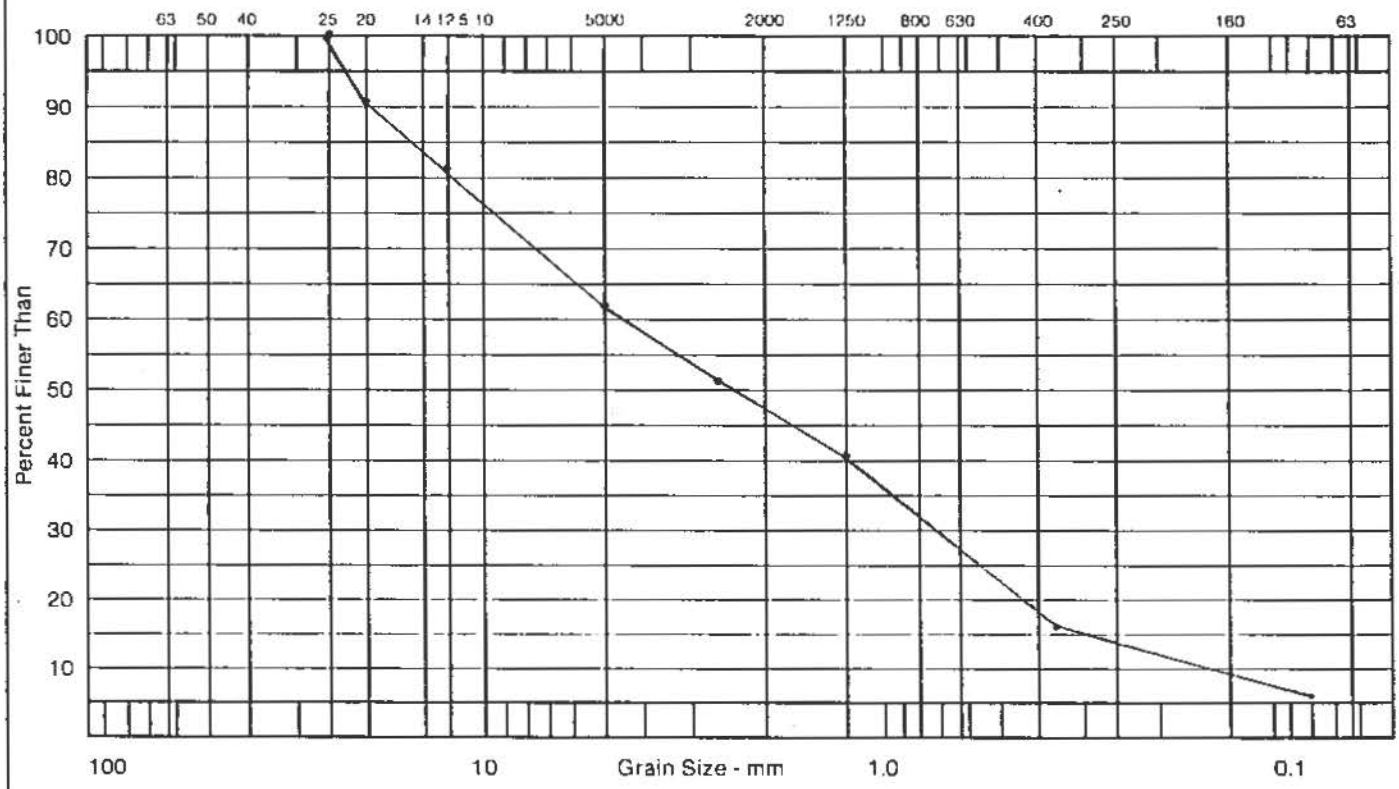
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					
40,000	40.0					
25,000	25.0					100.0
20,000	20.0					90.7
12,500	12.5					81.7
10,000	10.0					
5,000	5.0					62.4
2500	2.5					50.9
1,250	1.25					40.1
800	0.800					
630	0.630					
315	0.315					15.7
250	0.250					
160	0.160					
80	0.080					5.5

Description of Sample: Gravelly sand, trace of silt, SW - SM

Time of Sieving: Min. 15

Method of Preparation: Dry: Washed: X

Remarks:
4.4 %Moisture
37.6 %Gravel
56.9 %Sand
5.5 %Silt



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CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services Transportation Eng.
Project: km 1490 Alaska Hwy Geotechnical Inves.
Sample: 24 Depth: 4.60-4.85m
Location: TH#13-92
Made by: MK Job No.: 8002-218
Ck'd by: [illegible] Date: 1992/03/03

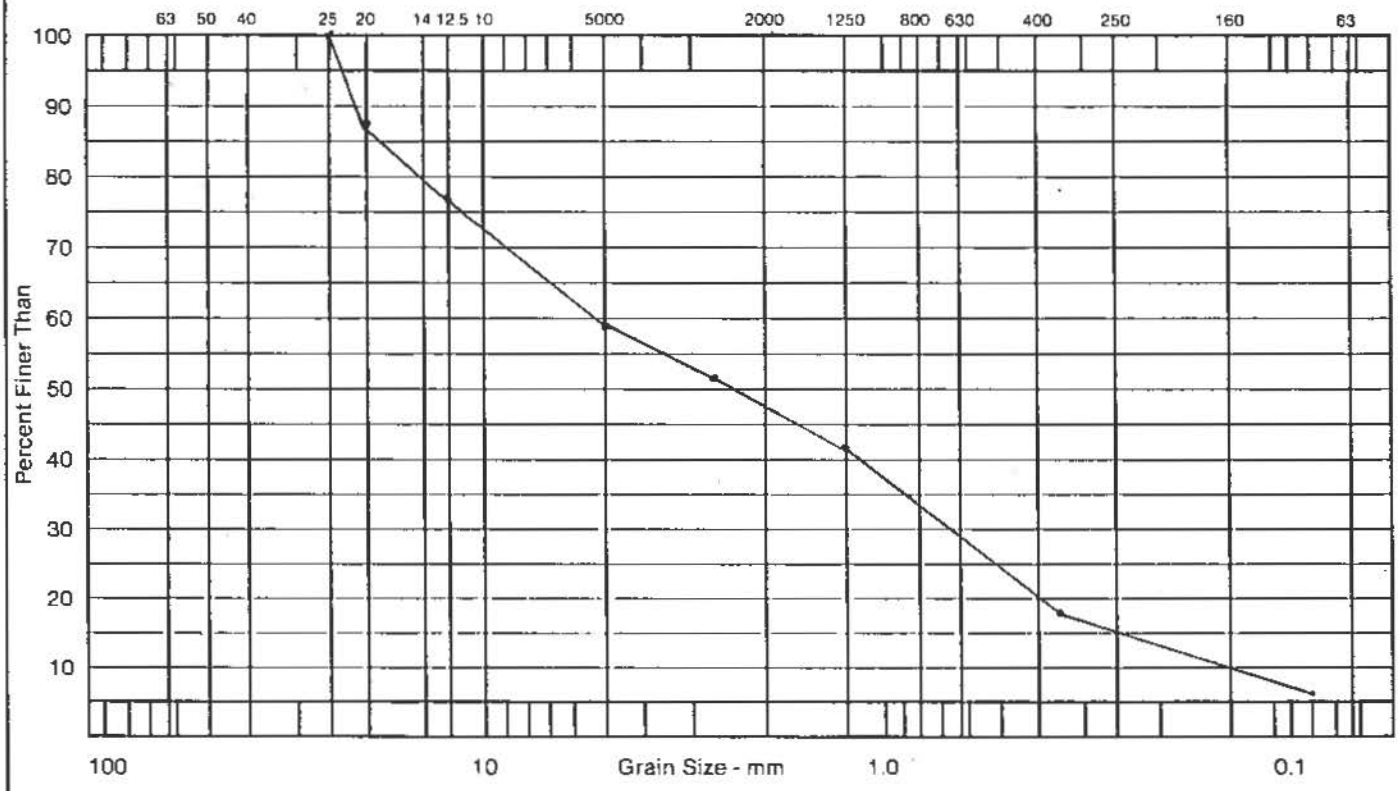
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					
40,000	40.0					
25,000	25.0					100.0
20,000	20.0					88.7
12,500	12.5					77.0
10,000	10.0					
5,000	5.0					59.2
2500	2.5					51.2
1,250	1.25					42.0
800	0.800					
630	0.630					
315	0.315					17.3
250	0.250					
160	0.160					
80	0.080					5.3

Description of Sample: Gravelly sand, trace of silt, SW - SM

Time of Sieving: ____ Min. 15

Method of Preparation: ____ Dry ____ Washed X

Remarks:
3.7 %Moisture
40.8 %Gravel
53.9 %Sand
5.3 %Silt



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CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Sample: 25 Depth: 5.65-5.80m

Location: TH#13-92

Client: YTG, C&T Services Transportation Eng.

Project: km 1490 Alaska Hwy Geotechnical Inves.

Made by: MK Job No.: 8002-218

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

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					93.0
12,500	12.5					87.2
10,000	10.0					
5,000	5.0					79.1
2500	2.5					74.5
1,250	1.25					69.7
800	0.800					
630	0.630					
315	0.315					56.2
250	0.250					
160	0.160					
80	0.080					40.5

Description of Sample: Gravelly sandy silt, ML

Time of Sieving: Min. 15

Method of Preparation: Dry: Washed: X

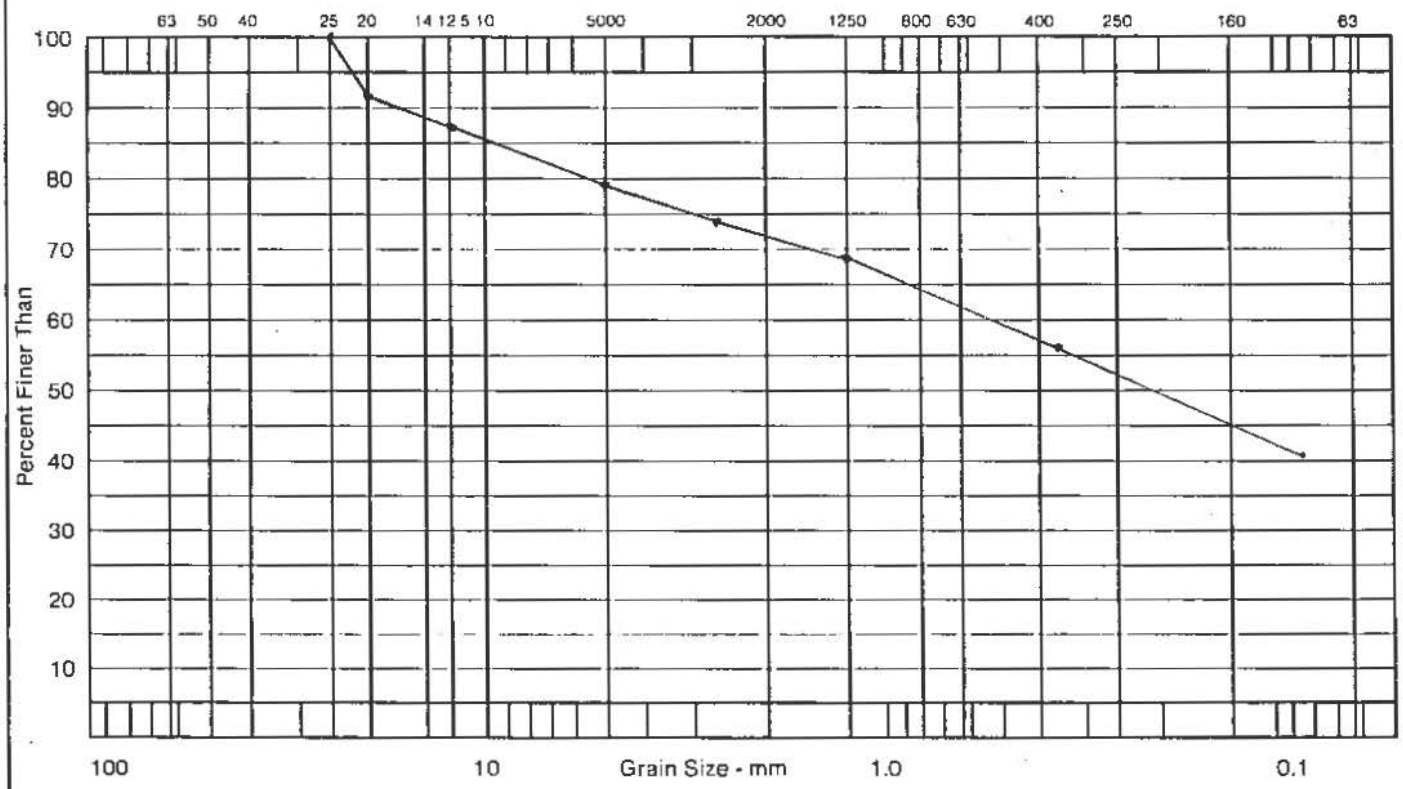
Remarks:

6.7 %Moisture

20.9 %Gravel

38.6 %Sand

40.5 %Silt



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SCREEN ANALYSIS

Sample: 26 Depth: 7.30-7.60m

Location: TH#13-92

Client: YTG, C&T Services Transportation Eng.

Project: km 1490 Alaska Hwy Geotechnical Inves.

Made by: MK Job No.: 8002-218

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

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					87.1
20,000	20.0					74.8
12,500	12.5					74.0
10,000	10.0					
5,000	5.0					67.3
2500	2.5					63.7
1,250	1.25					59.8
800	0.800					
630	0.630					
315	0.315					43.3
250	0.250					
160	0.160					
80	0.080					26.0

Description of Sample: Silty gravelly sand, SM

Time of Sieving: ____ Min. 15

Method of Preparation: ____ Dry ____ Washed X

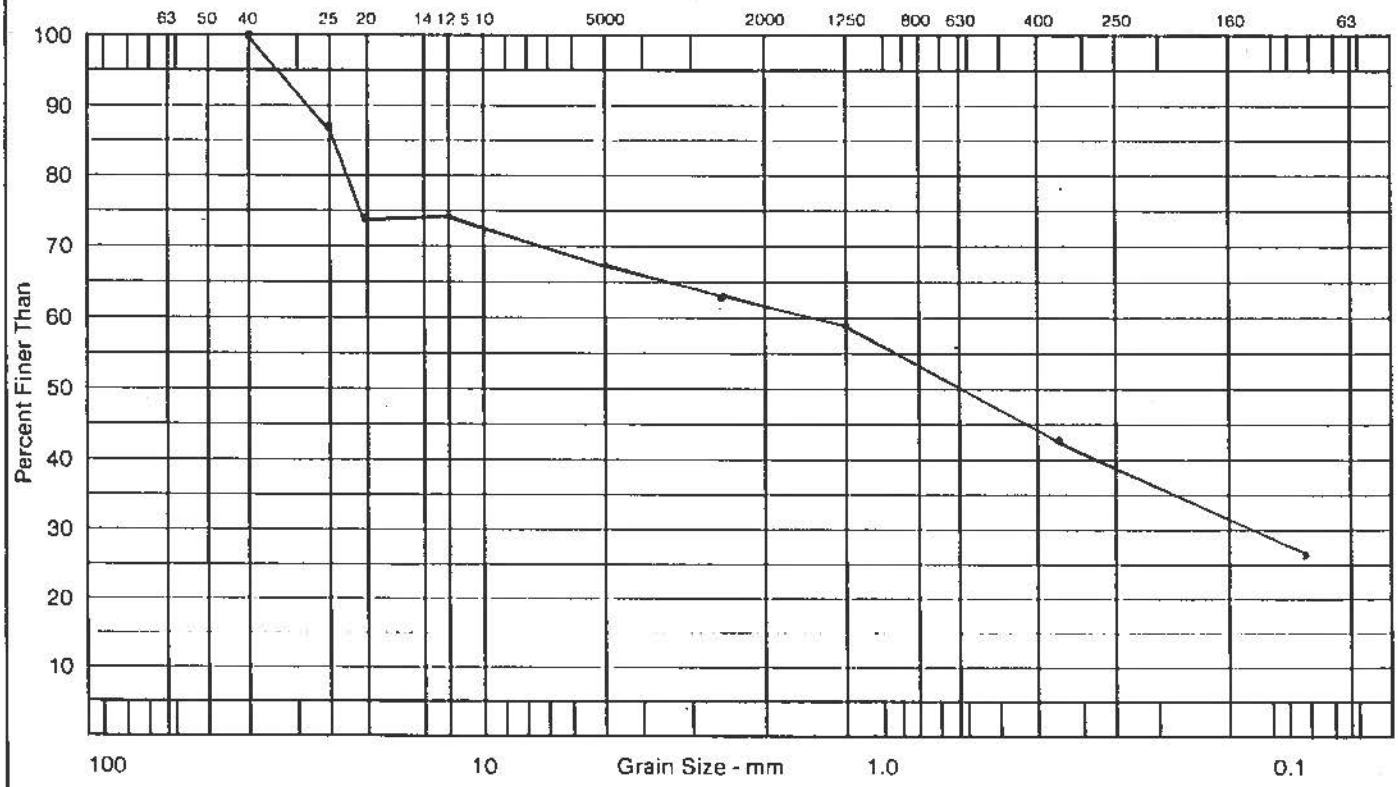
Remarks:

5.3 %Moisture

32.7 %Gravel

41.3 %Sand

26.0 %Silt



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CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Sample: 27 Depth: 9.00-9.30m
Location: TH#13-92

Client: YTG, C&T Services Transportation Eng.
Project: km 1490 Alaska Hwy Geotechnical Inves.
Made by: MK Job No.: 8002-218
Ck'd by: WCH Date: 1992/03/03

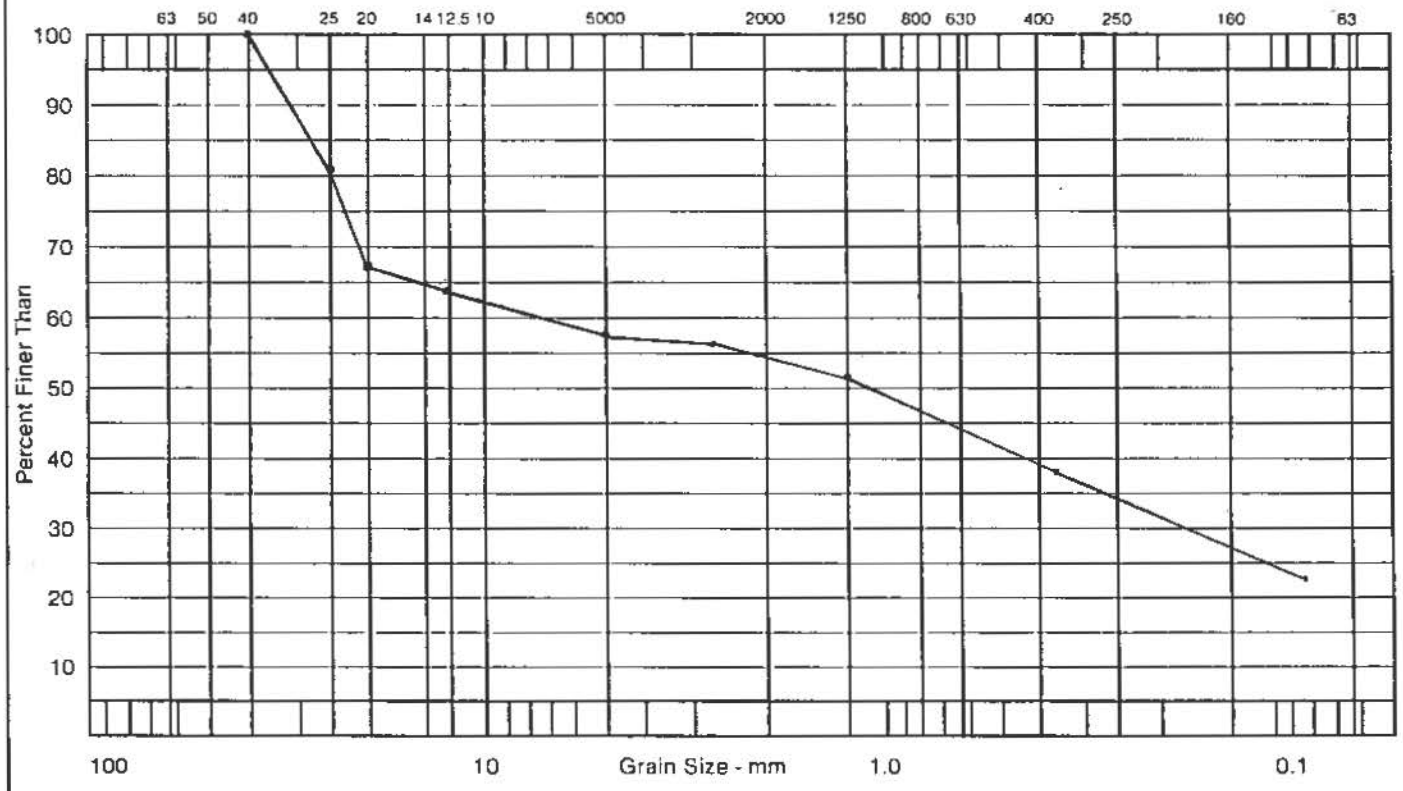
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					
40.000	40.0					100.0
25.000	25.0					80.7
20,000	20.0					67.3
12,500	12.5					64.6
10,000	10.0					
5,000	5.0					58.7
2500	2.5					55.7
1,250	1.25					52.7
800	0.800					
630	0.630					
315	0.315					38.5
250	0.250					
160	0.160					
80	0.080					23.2

Description of Sample: Silty sandy gravel, GM

Time of Sieving: Min. 15

Method of Preparation: Dry: Washed: X

Remarks:
5.1 %Moisture
41.3 %Gravel
35.5 %Sand
23.2 %Silt



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CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Sample: 28 Depth: 10.50-10.70m
Location: TH#13-92

Client: YTG, C&T Services Transportation Eng.
Project: km 1490 Alaska Hwy Geotechnical Inves.
Made by: MK Job No.: 8002-218
Ck'd by: [illegible] Date: 1992/03/03

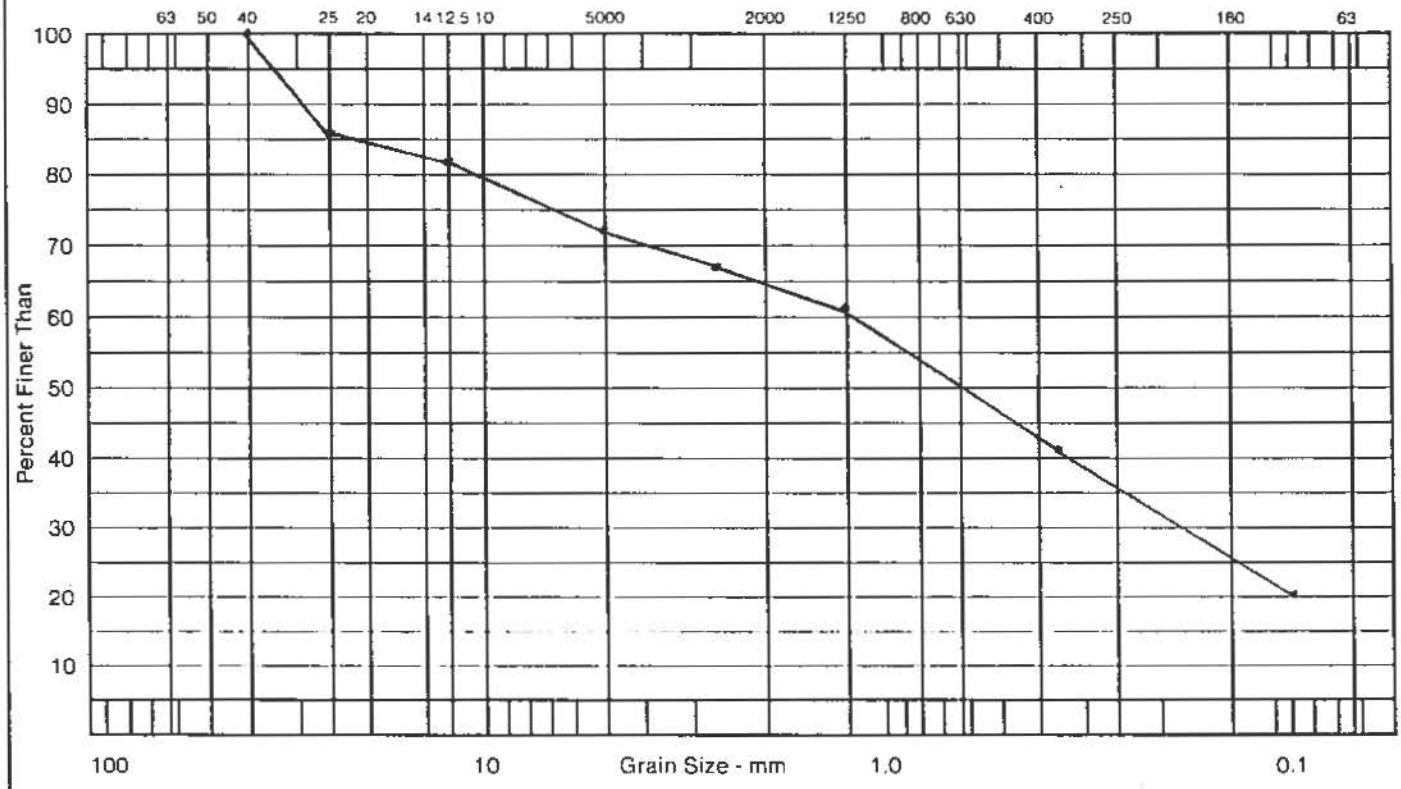
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					
40,000	40.0					100.0
25,000	25.0					86.9
20,000	20.0					
12,500	12.5					83.0
10,000	10.0					
5,000	5.0					73.2
2500	2.5					67.3
1,250	1.25					61.9
800	0.800					
630	0.630					
315	0.315					41.5
250	0.250					
160	0.160					
80	0.080					20.0

Description of Sample: Silty gravelly sand, SM

Time of Sieving: Min. 15

Method of Preparation: Dry: Washed: X

Remarks:
5.3 %Moisture
26.8 %Gravel
53.2 %Sand
20.0 %Silt



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CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services Transportation Eng.
Project: km 1490 Alaska Hwy Geotechnical Inves.
Sample: 29 Depth: 12.20-12.35m
Location: TH#13-92
Made by: MK Job No.: 8002-218
Ck'd by: [illegible] Date: 1992/03/03

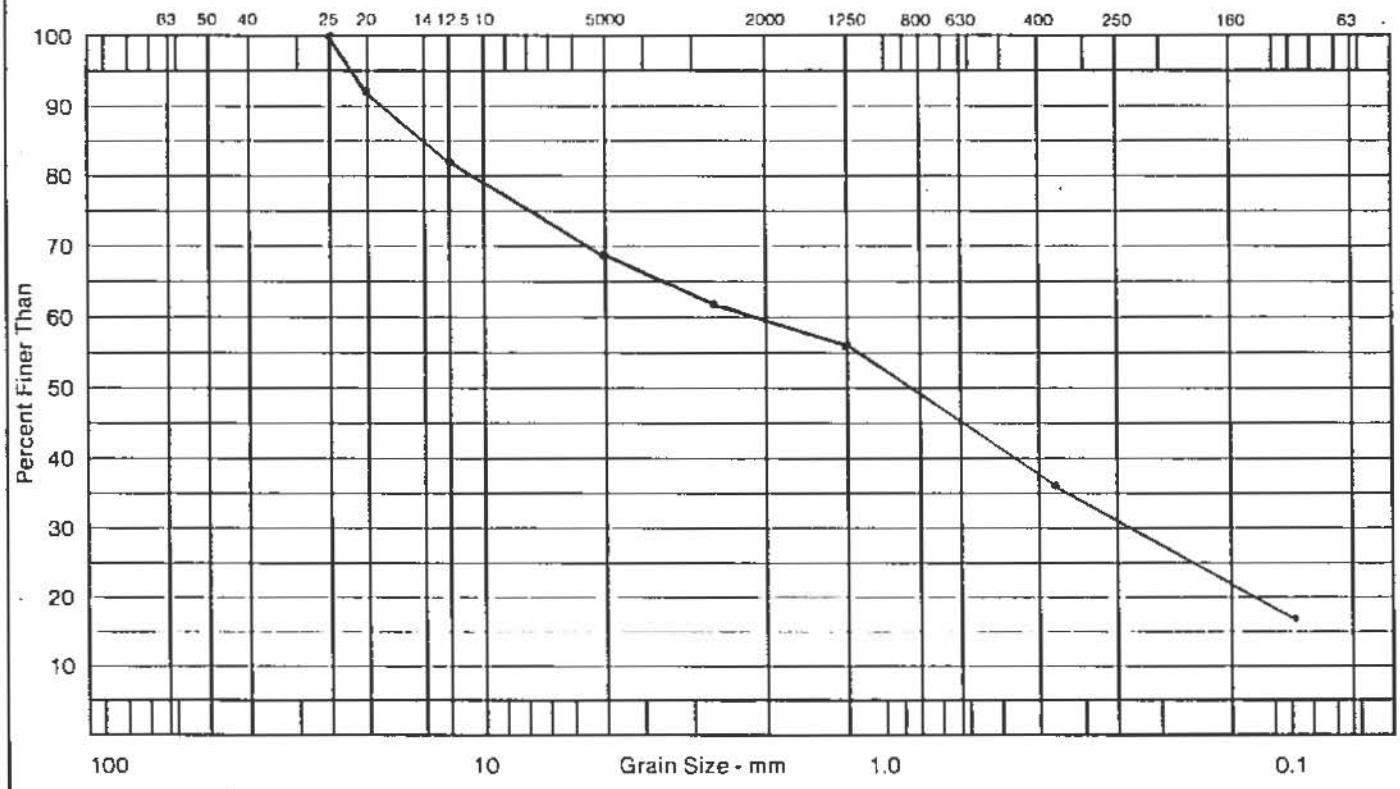
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					
40,000	40.0					
25,000	25.0					100.0
20,000	20.0					93.3
12,500	12.5					83.2
10,000	10.0					
5,000	5.0					68.3
2500	2.5					61.3
1,250	1.25					55.2
800	0.800					
630	0.630					
315	0.315					35.6
250	0.250					
160	0.160					
80	0.080					17.3

Description of Sample: Silty gravelly sand, SM

Time of Sieving: ____ Min. 15

Method of Preparation: ____ Dry ____ Washed X

Remarks:
4.7 %Moisture
31.7 %Gravel
51.0 %Sand
17.3 %Silt



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CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services Transportation Eng.
Project: km 1490 Alaska Hwy Geotechnical Inves.
Sample: 30 Depth: 0.60-0.75m
Location: TH#14-92
Made by: MK Job No.: 8002-218
Ck'd by: WC Date: 1992/03/03

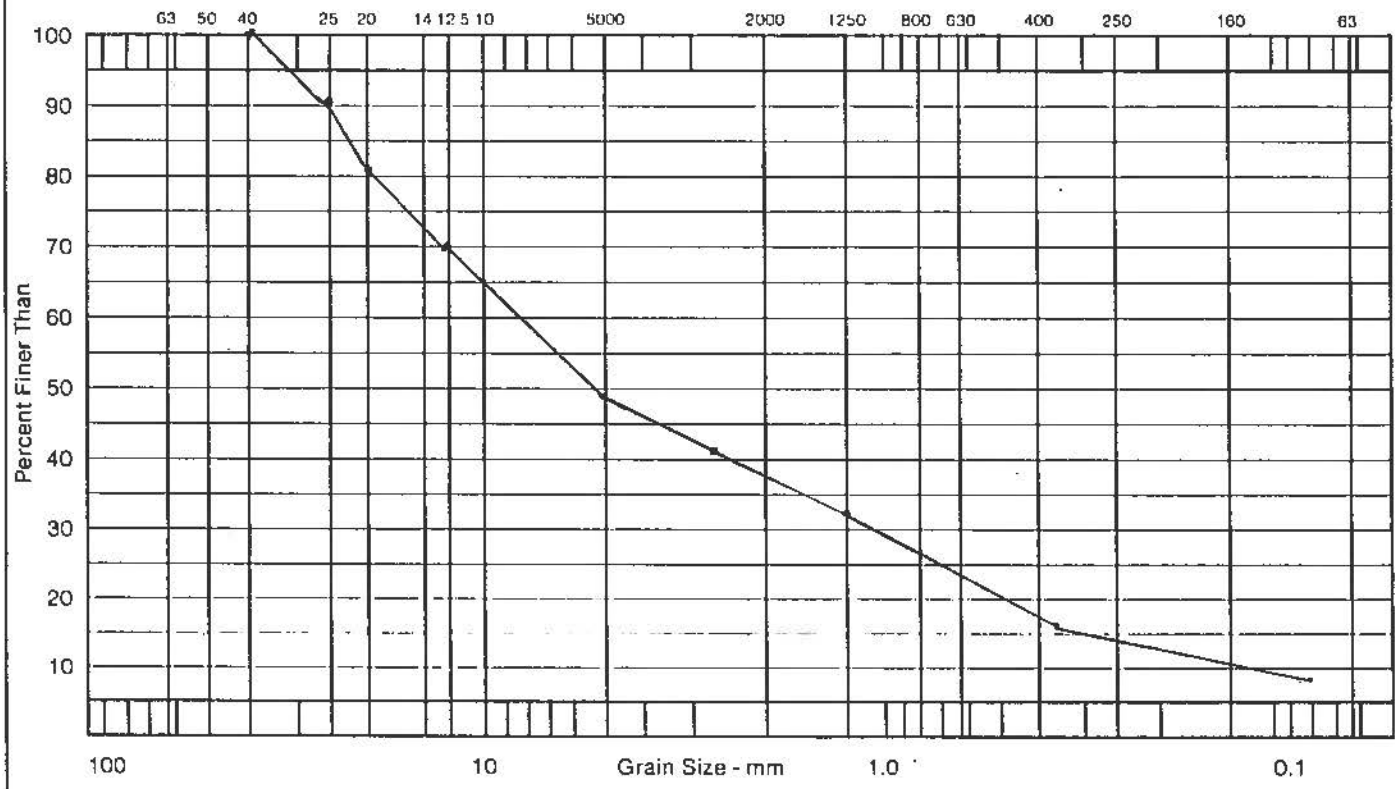
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					
40,000	40.0					100.0
25,000	25.0					90.7
20,000	20.0					81.8
12,500	12.5					70.0
10,000	10.0					
5,000	5.0					49.8
2500	2.5					40.6
1,250	1.25					33.1
800	0.800					
630	0.630					
315	0.315					16.1
250	0.250					
160	0.160					
80	0.080					8.9

Description of Sample: Sandy gravel, trace of silt, GW - GM

Time of Sieving: Min. 15

Method of Preparation: Dry: Washed: X

Remarks:
3.9 %Moisture
50.2 %Gravel
40.9 %Sand
8.9 %Silt



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CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Sample: 31 Depth: 1.70-1.85m

Location: TH#14-92

Client: YTG, C&T Services Transportation Eng.

Project: km 1490 Alaska Hwy Geotechnical Inves

Made by: MR Job No.: 8002-218

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

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					94.2
12,500	12.5					84.1
10,000	10.0					
5,000	5.0					66.9
2500	2.5					58.2
1,250	1.25					51.2
800	0.800					
630	0.630					
315	0.315					30.9
250	0.250					
160	0.160					
80	0.080					18.3

Description of Sample: Silty gravelly sand, SM

Time of Sieving: Min. 15

Method of Preparation: Dry: Washed: X

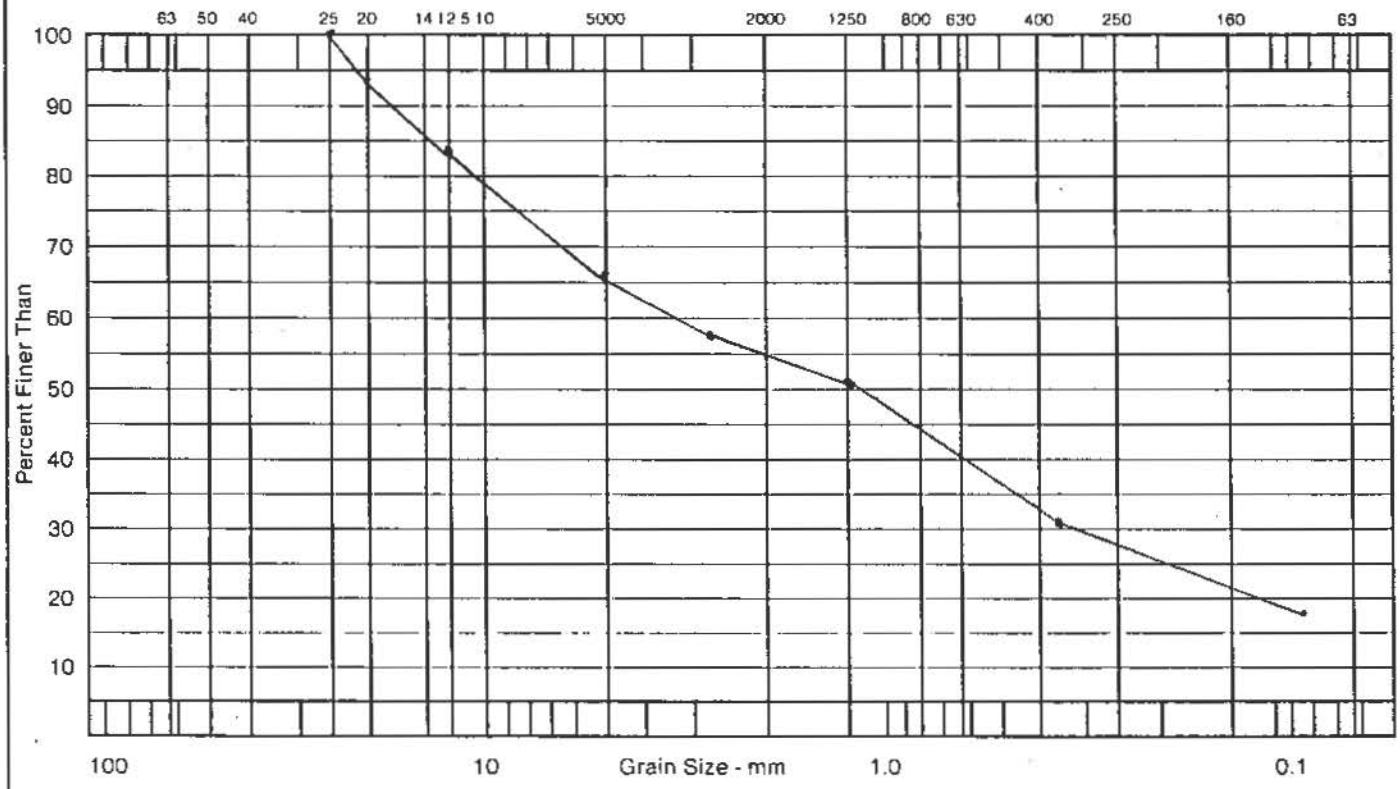
Remarks:

6.5 %Moisture

33.1 %Gravel

48.6 %Sand

18.3 %Silt



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CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services Transportation Eng.
Project: km 1490 Alaska Hwy Geotechnical Inves.
Sample: 32 Depth: 2.60-2.75m
Location: TH#14-92
Made by: MK Job No.: 8002-218
Ck'd by: [illegible] Date: 1992/03/03

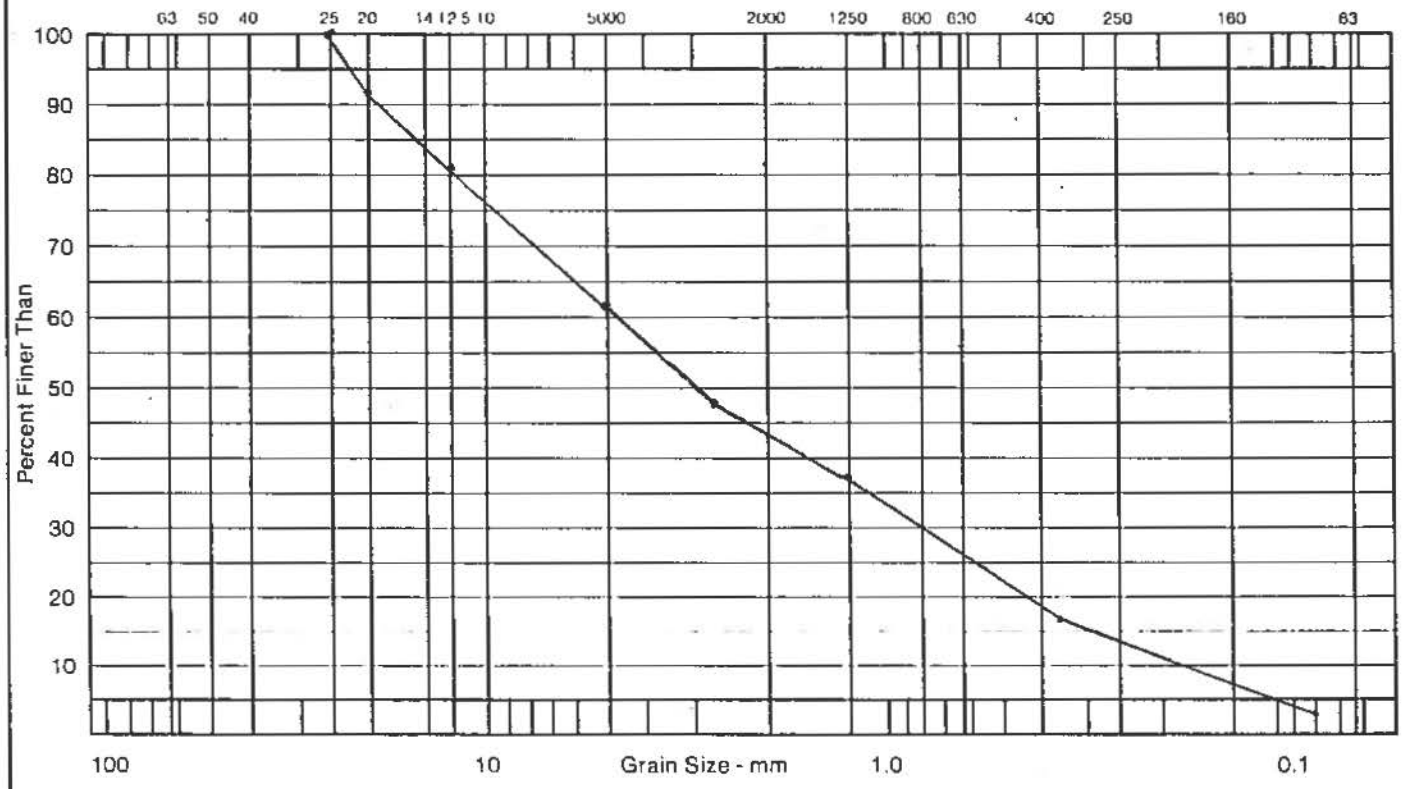
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63.000	63.0					
50.000	50.0					
40.000	40.0					
25.000	25.0					100.0
20.000	20.0					92.0
12.500	12.5					80.6
10.000	10.0					
5.000	5.0					62.1
2500	2.5					48.9
1.250	1.25					37.4
800	0.800					
630	0.630					
315	0.315					17.8
250	0.250					
160	0.160					
80	0.080					2.6

Description of Sample: Gravelly sand, SW

Time of Sieving ..... Min. 15

Method of Preparation ____ Dry ____ Washed X

Remarks:
3.6 %Moisture
37.9 %Gravel
59.5 %Sand
2.6 %Silt



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CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services Transportation Eng.
Project: km 1490 Alaska Hwy Geotechnical Inves.
Sample: 33 Depth: 3.80-4.00m
Location: TH#14-92
Made by: MK Job No.: 8002-218
Ck'd by: [illegible] Date: 1992/03/03

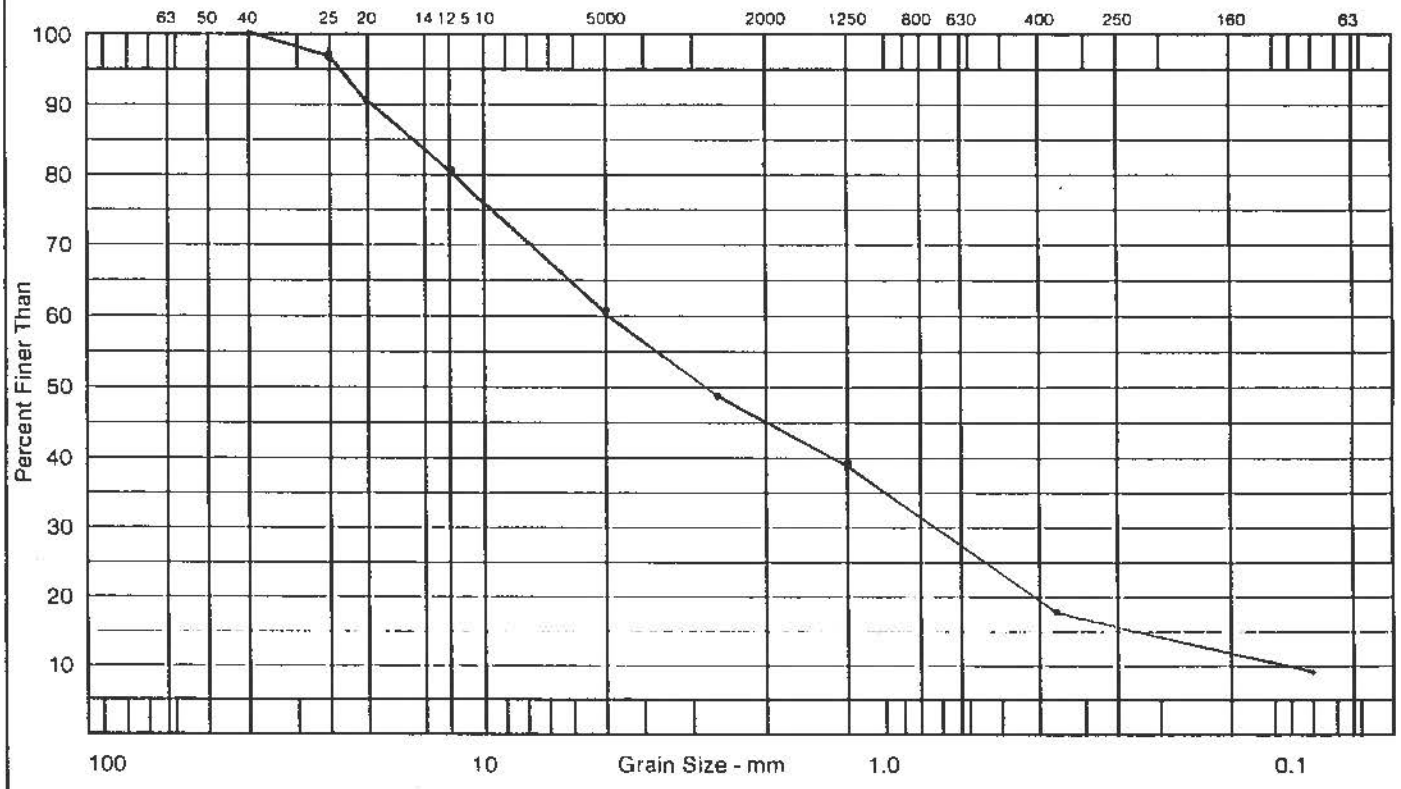
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					
40,000	40.0					100.0
25,000	25.0					97.1
20,000	20.0					90.4
12,500	12.5					80.5
10,000	10.0					
5,000	5.0					60.3
.2500	2.5					49.1
1,250	1.25					39.1
800	0.800					
630	0.630					
315	0.315					17.9
250	0.250					
160	0.160					
80	0.080					9.1

Description of Sample
Gravelly sand, trace of silt,
SW - SM

Time of Sieving Min. 15

Method of Preparation Dry Washed X

Remarks
4.2 %Moisture
39.7 %Gravel
51.2 %Sand
9.2 %Silt



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CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services Transportation Eng.
Project: km 1490 Alaska Hwy Geotechnical Inves.
Sample: 37 Depth: 0.75-0.90m
Location: TP #15-92
Made by: MK Job No.: 8002-218
Ck'd by: [illegible] Date: 1992/03/03

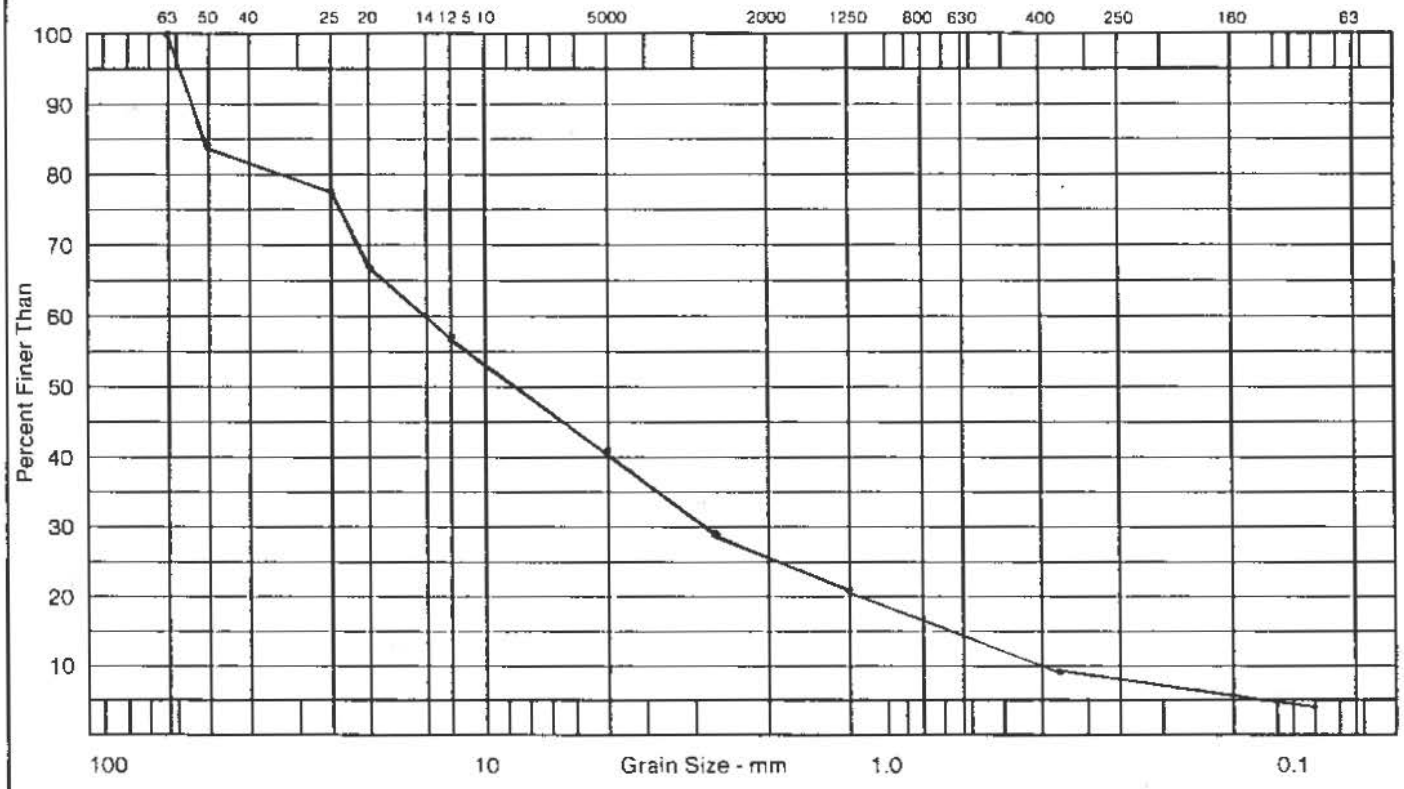
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					100.0
50,000	50.0					84.8
40,000	40.0					
25,000	25.0					78.7
20,000	20.0					67.5
12,500	12.5					57.6
10,000	10.0					
5,000	5.0					41.9
2500	2.5					29.6
1,250	1.25					20.6
800	0.800					
630	0.630					
315	0.315					9.3
250	0.250					
160	0.160					
80	0.080					4.8

Description of Sample: Sandy gravel, GW

Time of Sieving: Min. 15

Method of Preparation: Dry: Washed: X

Remarks:
2.5 %Moisture
58.1 %Gravel
37.1 %Sand
4.8 %Silt



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CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services Transportation Eng.
Project: km 1490 Alaska Hwy Geotechnical Inves.
Sample: 38 Depth: 1.70-1.85m
Location: TP#15-92
Made by: MK Job No.: 8002-218
Ck'd by: [illegible] Date: 1992/03/03

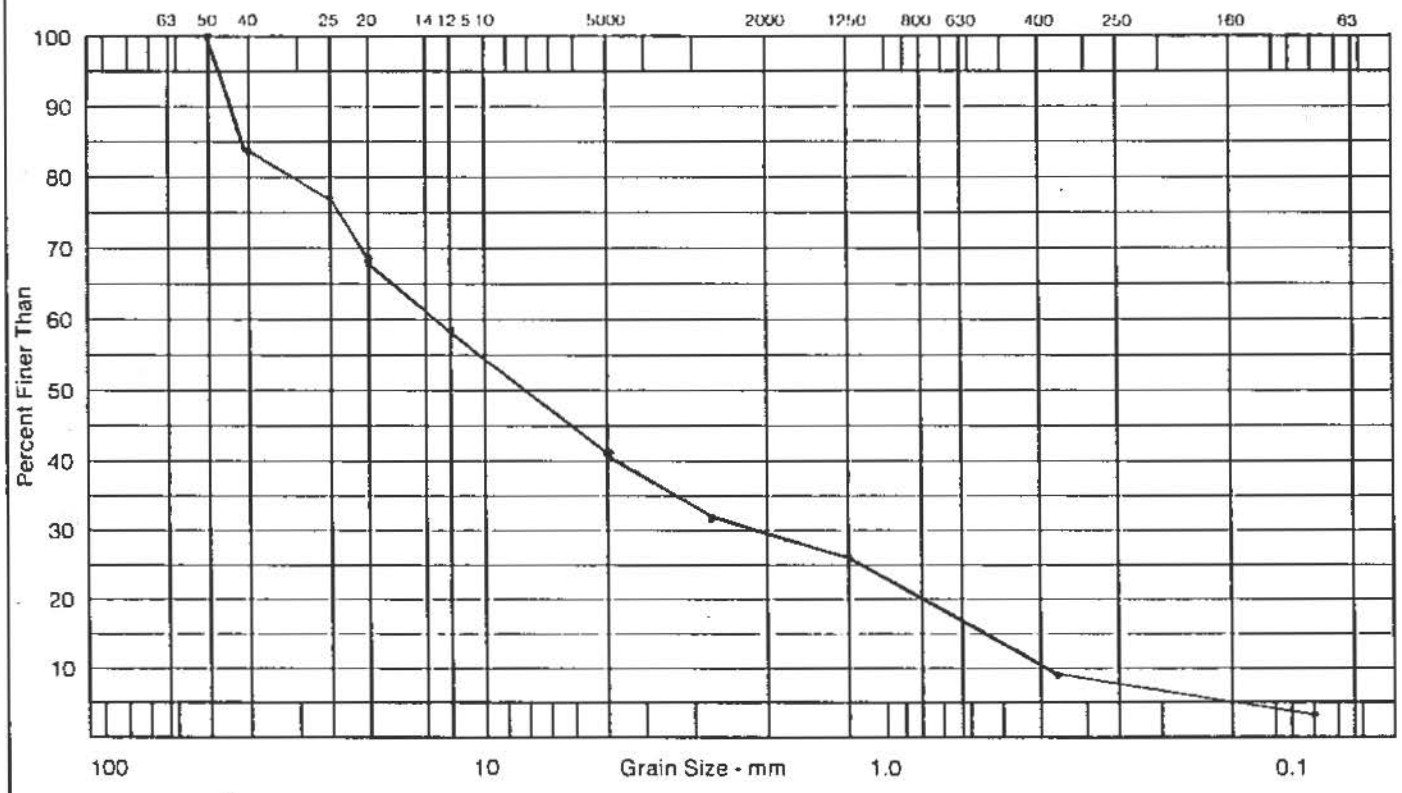
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					100.0
40,000	40.0					84.7
25,000	25.0					77.8
20,000	20.0					68.2
12,500	12.5					58.7
10,000	10.0					
5,000	5.0					42.6
2500	2.5					33.8
1,250	1.25					26.2
800	0.800					
630	0.630					
315	0.315					9.5
250	0.250					
160	0.160					
80	0.080					3.2

Description of Sample: Sandy gravel, GW

Time of Sieving: Min. 15

Method of Preparation: Dry: Washed: X

Remarks:
2.1% Moisture
57.4% Gravel
39.4% Sand
3.2% Silt



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CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services Transportation Eng.
Project: km 1490 Alaska Hwy Geotechnical Inves.
Sample: 39 Depth: 2.60-2.75m
Location: TP#15-92
Made by: MK Job No.: 8002-218
Ck'd by: WCR Date: 1992/03/03

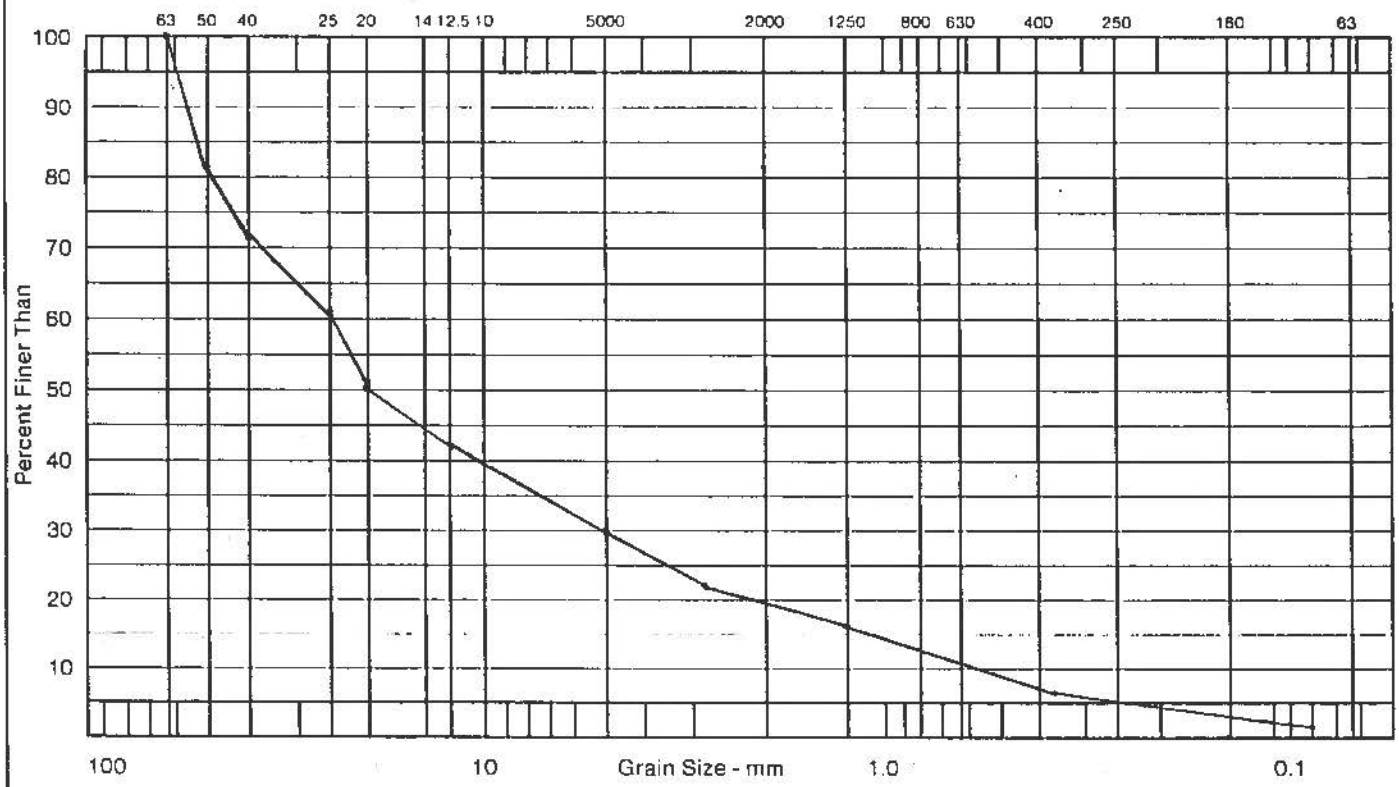
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					100.0
50,000	50.0					82.4
40,000	40.0					72.8
25,000	25.0					60.5
20,000	20.0					51.5
12,500	12.5					43.6
10,000	10.0					
5,000	5.0					30.0
2500	2.5					22.7
1,250	1.25					16.9
800	0.800					
630	0.630					
315	0.315					6.7
250	0.250					
160	0.160					
80	0.080					2.3

Description of Sample: Sandy gravel, GW

Time of Sieving: Min. 15

Method of Preparation: Dry: Washed: X

Remarks:
1.4% Moisture
70.0% Gravel
27.7% Sand
2.3% Silt



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CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services Transportation Eng.
Project: km 1490 Alaska Hwy Geotechnical Inves.
Sample: 40 Depth: 3.50-3.65m
Location: TP#15-92
Made by: MK Job No.: 8002-218
Ck'd by: W.L.C. Date: 1992/03/03

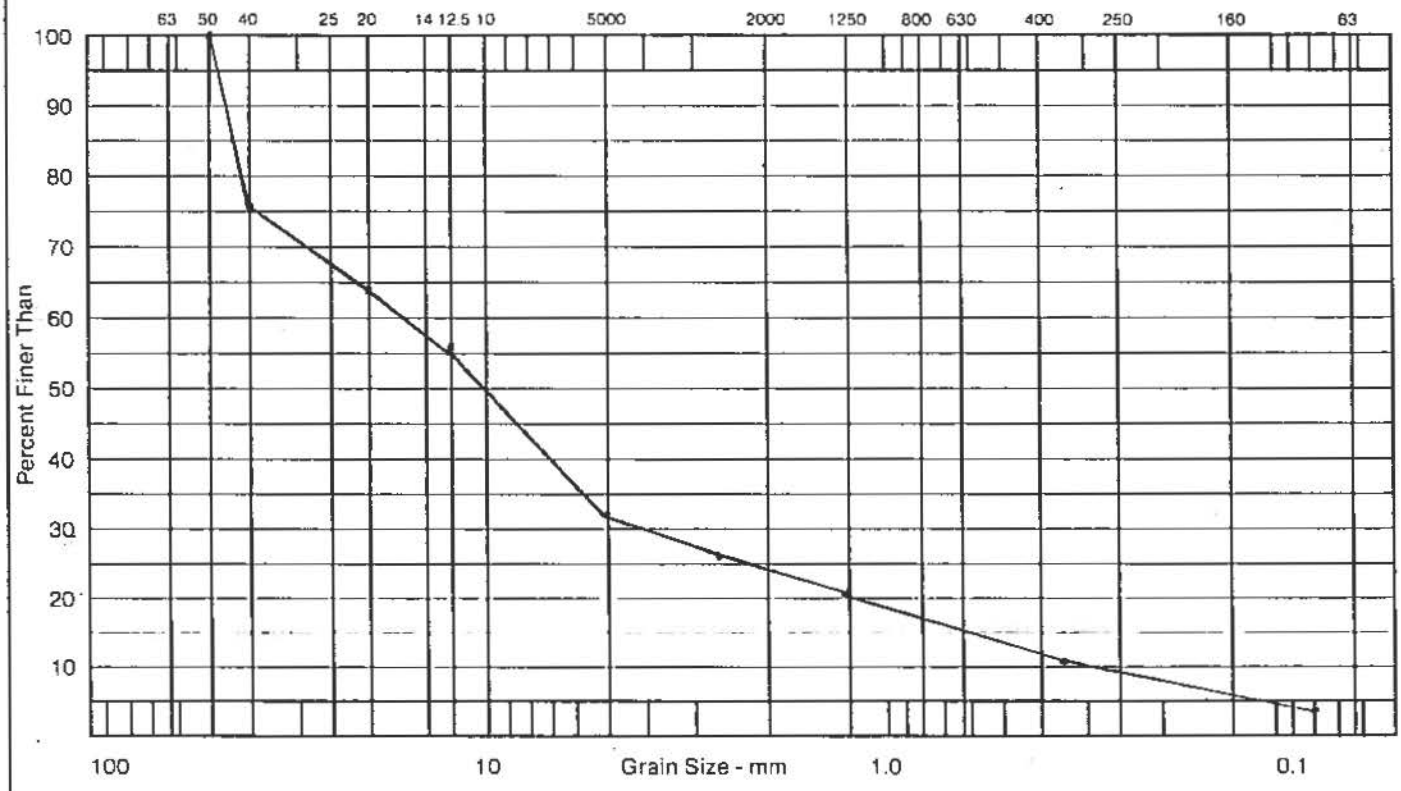
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					100.0
40,000	40.0					75.3
25,000	25.0					
20,000	20.0					64.9
12,500	12.5					55.7
10,000	10.0					
5,000	5.0					33.3
2500	2.5					26.8
1,250	1.25					21.9
800	0.800					
630	0.630					
315	0.315					10.4
250	0.250					
160	0.160					
80	0.080					4.2

Description of Sample: Sandy gravel, GW

Time of Sieving: Min. 15

Method of Preparation: Dry: Washed: X

Remarks:
2.2% Moisture
66.7% Gravel
29.1% Sand
4.2% Silt



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CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services Transportation Eng.
Project: km 1490 Alaska Hwy Geotechnical Inves
Sample: 41 Depth: 0.75-0.90m
Location: TP #16-92
Made by: MK Job No.: 8002-218
Ck'd by: [illegible] Date: 1992/03/03

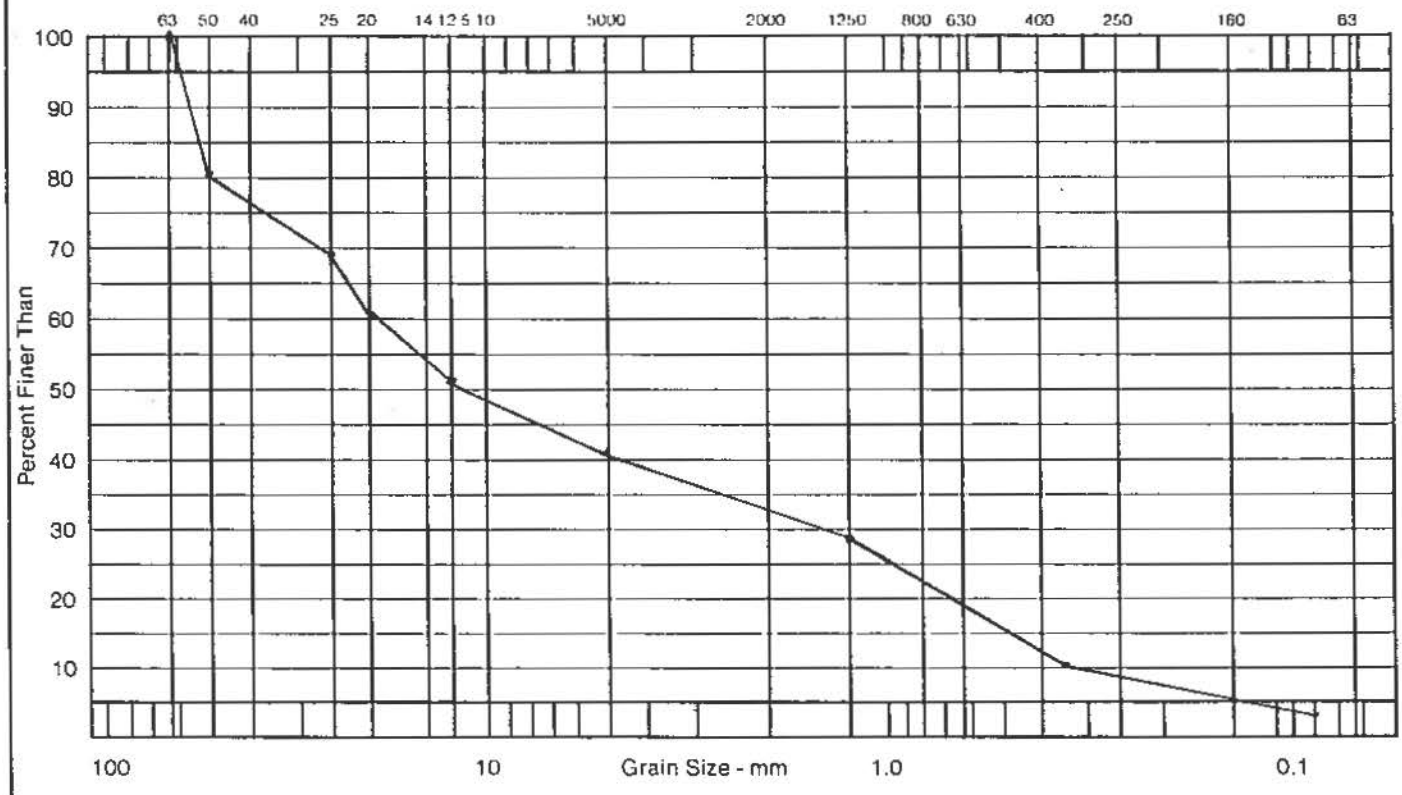
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					100.0
50,000	50.0					80.9
40,000	40.0					
25,000	25.0					69.7
20,000	20.0					61.7
12,500	12.5					53.2
10,000	10.0					
5,000	5.0					42.1
2500	2.5					35.5
1,250	1.25					28.7
800	0.800					
630	0.630					
315	0.315					10.1
250	0.250					
160	0.160					
80	0.080					3.7

Description of Sample: Sandy gravel, GW

Time of Sieving: Min. 15

Method of Preparation: Dry: Washed: X

Remarks:
2.4% Moisture
57.9% Gravel
38.4% Sand
3.7% Silt



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CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services Transportation Eng.
Sample: 42 Depth: 1.70-1.85m Project: km 1490 Alaska Hwy Geotechnical Inves.
Location: Made by: MK Job No.: 8002-218
TP 16-92 Ck'd by: WCR Date: 1992/03/03

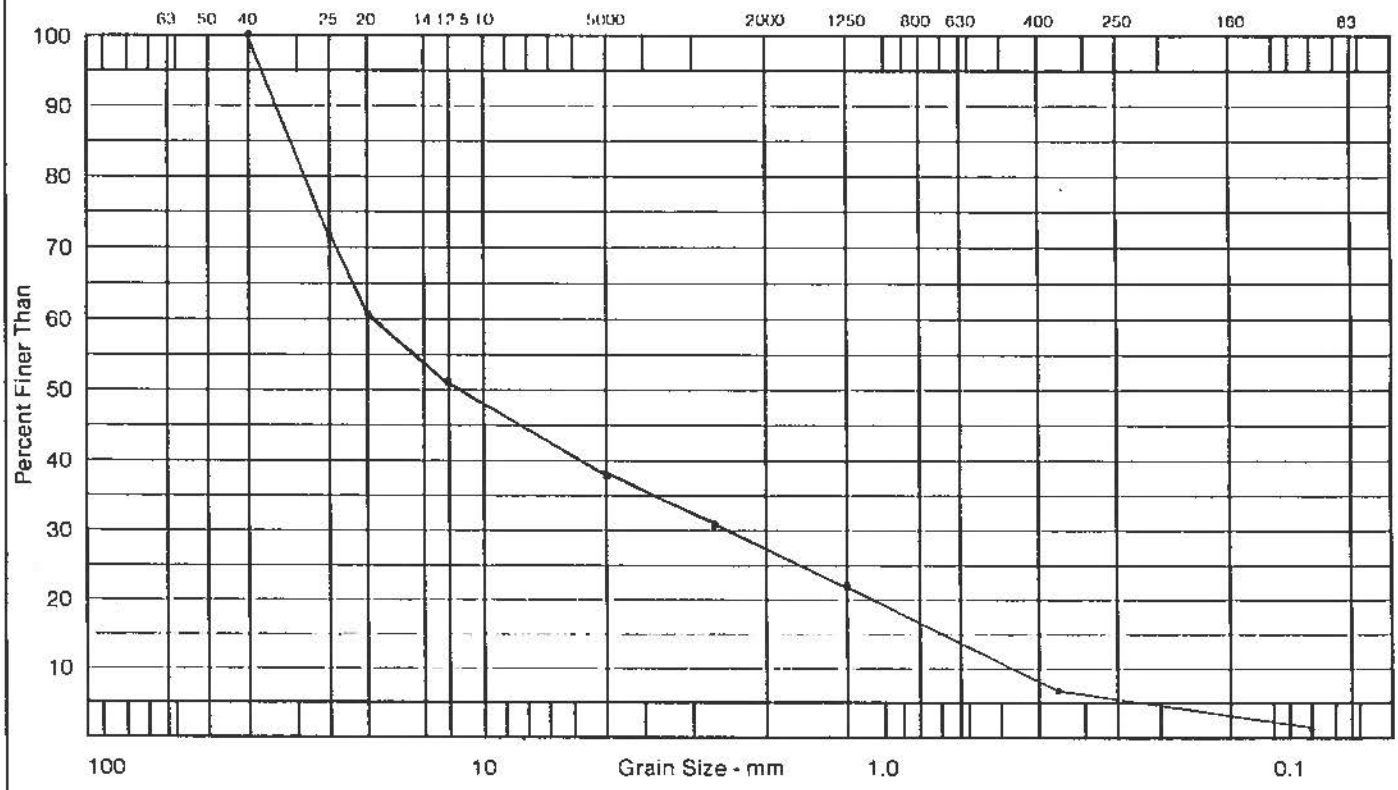
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					
40,000	40.0					100.0
25,000	25.0					73.3
20,000	20.0					61.0
12,500	12.5					52.0
10,000	10.0					
5,000	5.0					38.1
2500	2.5					31.2
1,250	1.25					23.2
800	0.800					
630	0.630					
315	0.315					6.2
250	0.250					
160	0.160					
80	0.080					2.4

Description of Sample: Sandy gravel, GW

Time of Sieving: ____ Min. 15

Method of Preparation: ____ Dry ____ Washed X

Remarks:
1.7 %Moisture
61.9 %Gravel
35.7 %Sand
2.4 %Silt



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SCREEN ANALYSIS

Client: YTG, C&T Services Transportation Eng.
Sample: 43 Depth: 2.60-2.75m Project: km 1490 Alaska Hwy Geotechnical Inves.
Location: Made by: MK Job No.: 8002-218
TP#16-92 Ck'd by: [illegible] Date: 1992/03/03

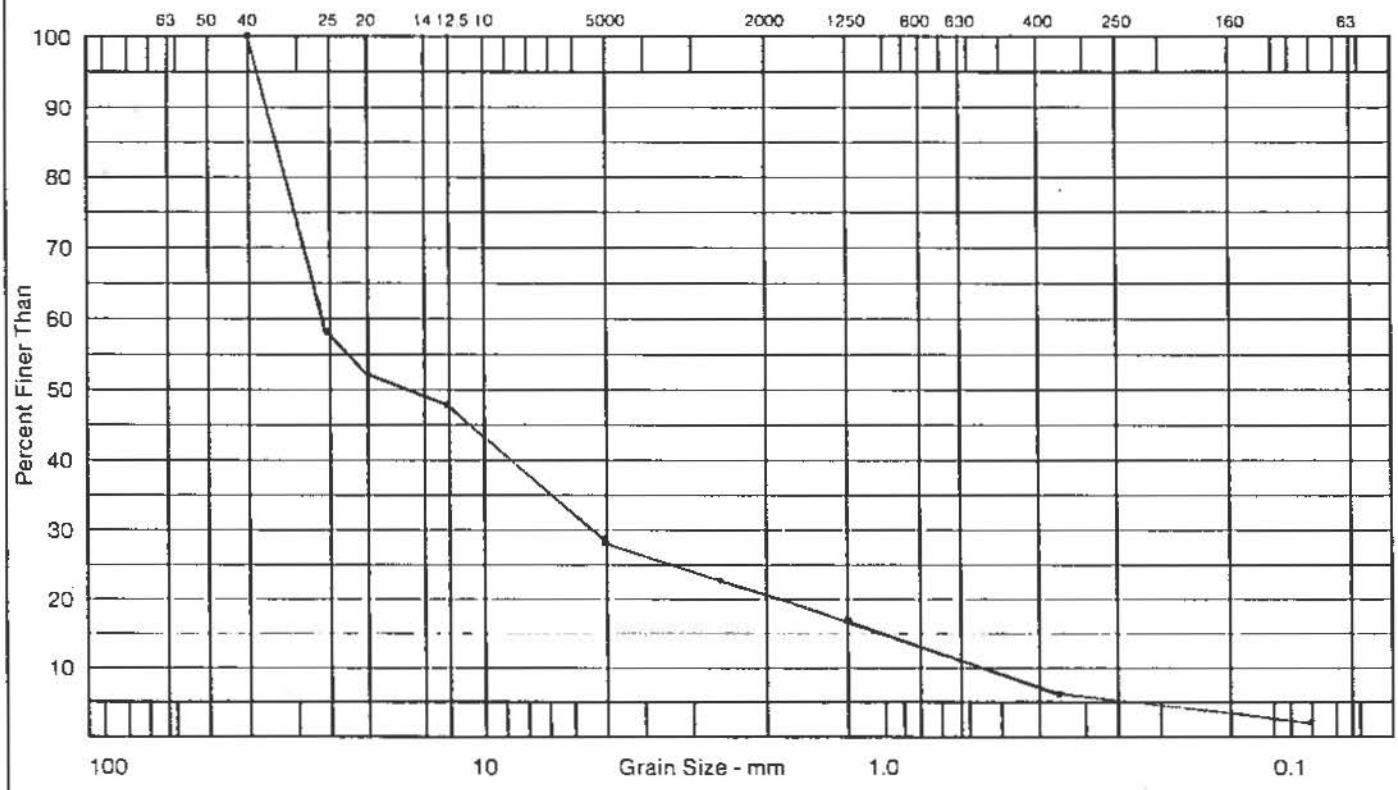
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					
40,000	40.0					100.0
25,000	25.0					58.4
20,000	20.0					53.0
12,500	12.5					48.2
10,000	10.0					
5,000	5.0					29.5
2500	2.5					23.2
1,250	1.25					17.9
800	0.800					
630	0.630					
315	0.315					6.3
250	0.250					
160	0.160					
80	0.080					2.5

Description of Sample: Sandy gravel, GW

Time of Sieving: Min. 15

Method of Preparation: Dry: Washed: X

Remarks:
1.7%Moisture
70.5%Gravel
27.0%Sand
2.5%Silt



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CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services Transportation Eng.
Project: km 1490 Alaska Hwy Geotechnical Inves.
Sample: 44 Depth: 3.50-3.65m
Location: TP #16-92
Made by: MK Job No.: 8002-218
Ck'd by: [illegible] Date: 1992/03/03

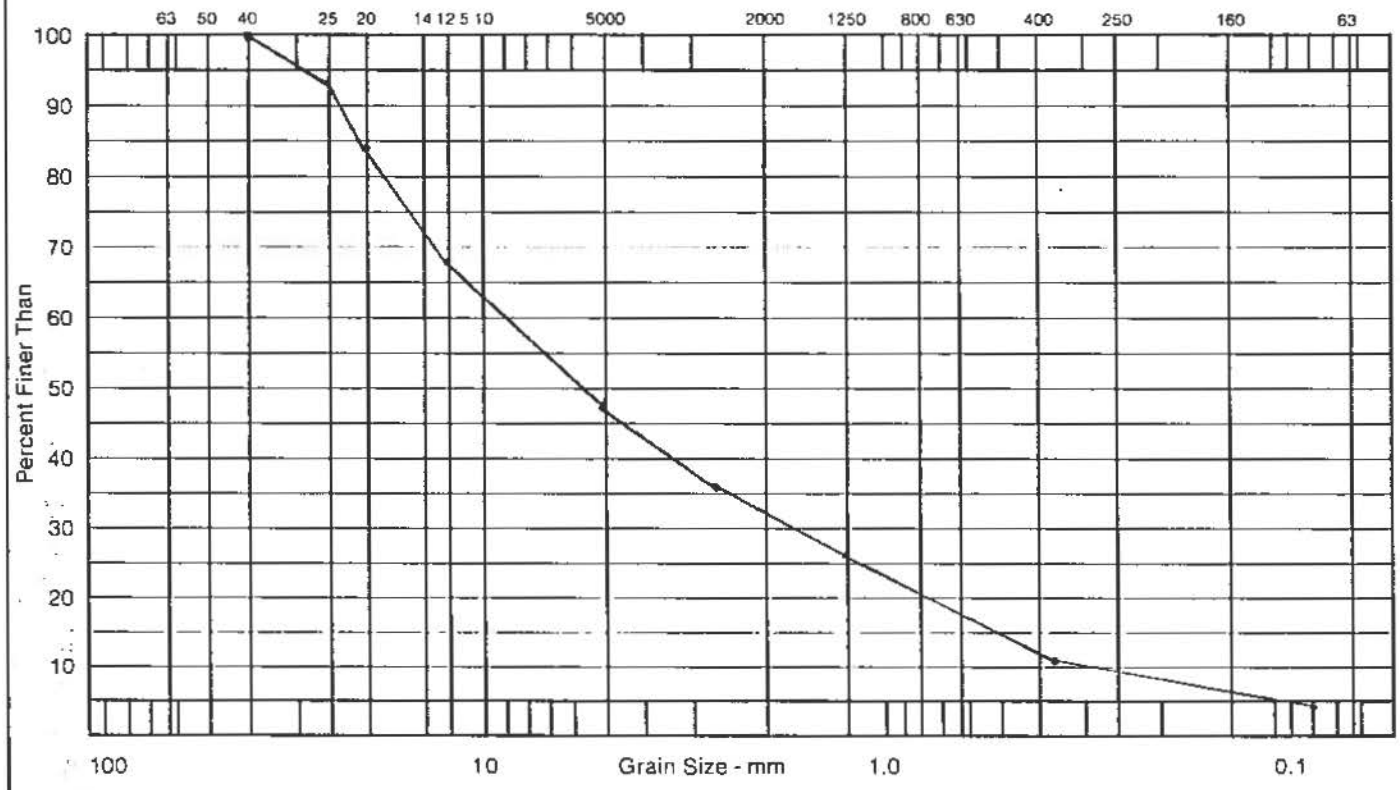
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					
40,000	40.0					100.0
25,000	25.0					94.7
20,000	20.0					84.2
12,500	12.5					68.4
10,000	10.0					
5,000	5.0					47.1
2500	2.5					35.9
1,250	1.25					26.2
800	0.800					
630	0.630					
315	0.315					11.8
250	0.250					
160	0.160					
80	0.080					4.9

Description of Sample: Sandy gravel, GW

Time of Sieving: Min. 15

Method of Preparation: Dry ____ Washed X

Remarks:
2.7% Moisture
52.9% Gravel
42.2% Sand
4.9% Silt



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CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Sample: 45 Depth: 0.75-0.90m

Location: TP #17-92

Client: YTG, C&T Services Transportation Eng.

Project: km 1490 Alaska Hwy Geotechnical Inves.

Made by: MK Job No.: 8002-218

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

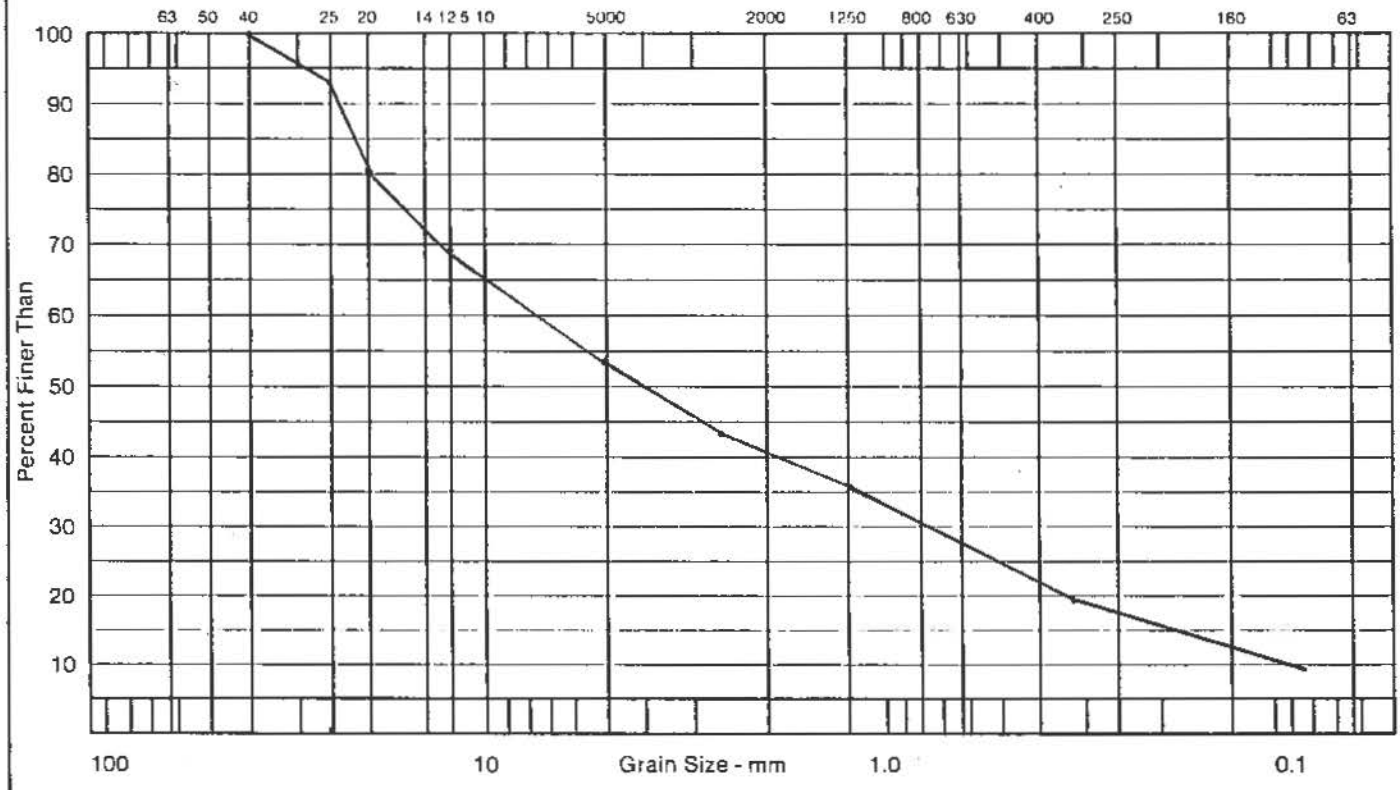
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					
40,000	40.0					100.0
25,000	25.0					92.9
20,000	20.0					80.8
12,500	12.5					69.9
10,000	10.0					
5,000	5.0					53.5
2500	2.5					43.8
1,250	1.25					35.4
800	0.800					
630	0.630					
315	0.315					19.7
250	0.250					
160	0.160					
80	0.080					9.5

Description of Sample: Sandy gravel, some silt, GW-GM

Time of Sieving: Min. 15

Method of Preparation: Dry ____ Washed X

Remarks: 7.3%Moisture, 46.5%Gravel, 44.0%Sand, 9.5%Silt



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CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services Transportation Eng.
Project: km 1490 Alaska Hwy Geotechnical Inves.
Sample: 46 Depth: 1.70-1.85m
Location: TP #17-92
Made by: MK Job No.: 8002-218
Ck'd by: WCL Date: 1992/03/03

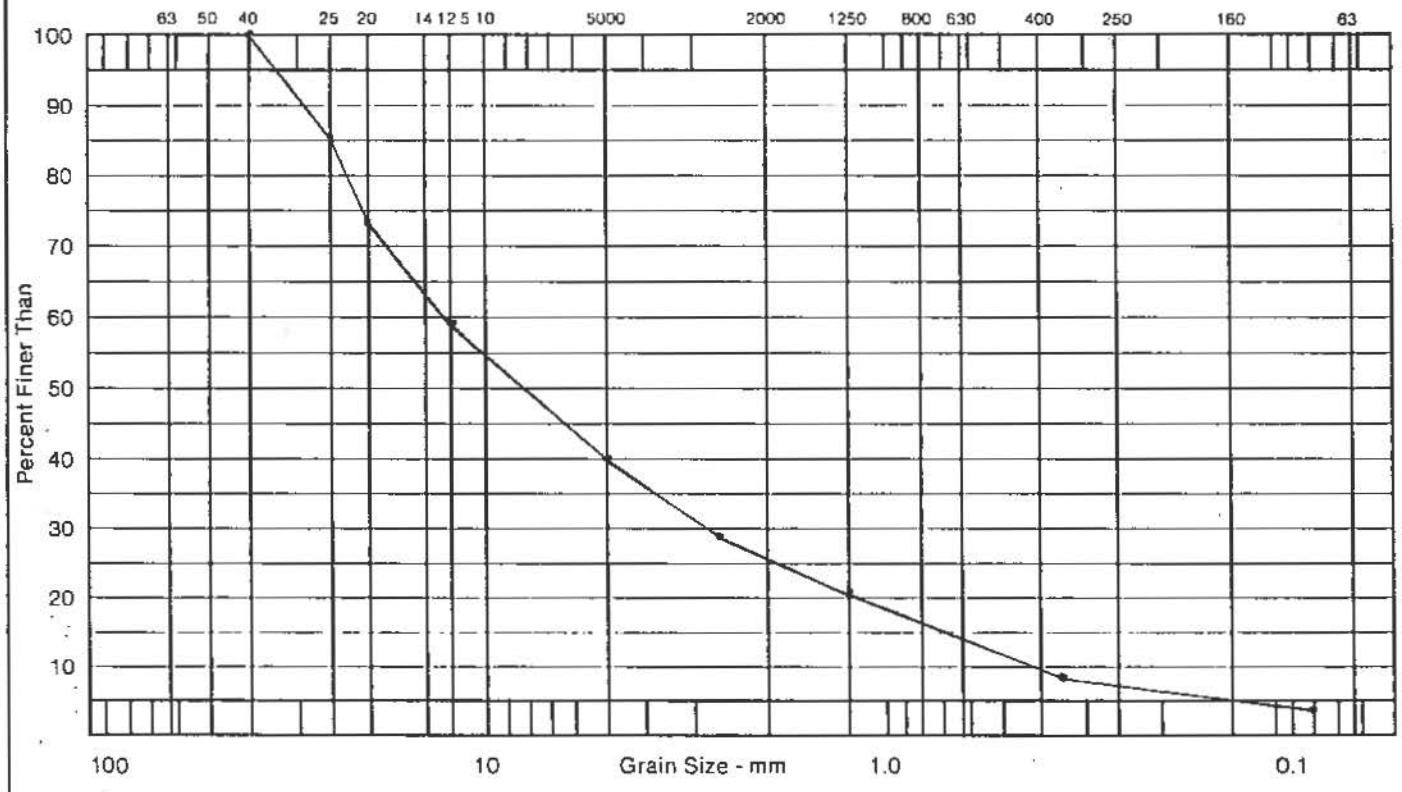
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					
40,000	40.0					100.0
25,000	25.0					86.0
20,000	20.0					73.5
12,500	12.5					59.2
10,000	10.0					
5,000	5.0					40.0
2500	2.5					29.2
1,250	1.25					20.9
800	0.800					
630	0.630					
315	0.315					8.9
250	0.250					
160	0.160					
80	0.080					4.5

Description of Sample: Sandy gravel, GW

Time of Sieving: Min. 15

Method of Preparation: Dry ____ Washed X

Remarks:
2.4% Moisture
60.0% Gravel
35.5% Sand
4.5% Silt



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SCREEN ANALYSIS

Client: YTG, C&T Services Transportation Eng.

Sample: 47 Depth: 2.60-2.75m

Project: km 1490 Alaska Hwy Geotechnical Inves.

Location: TP17-92

Made by: MK Job No.: 8002-218

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

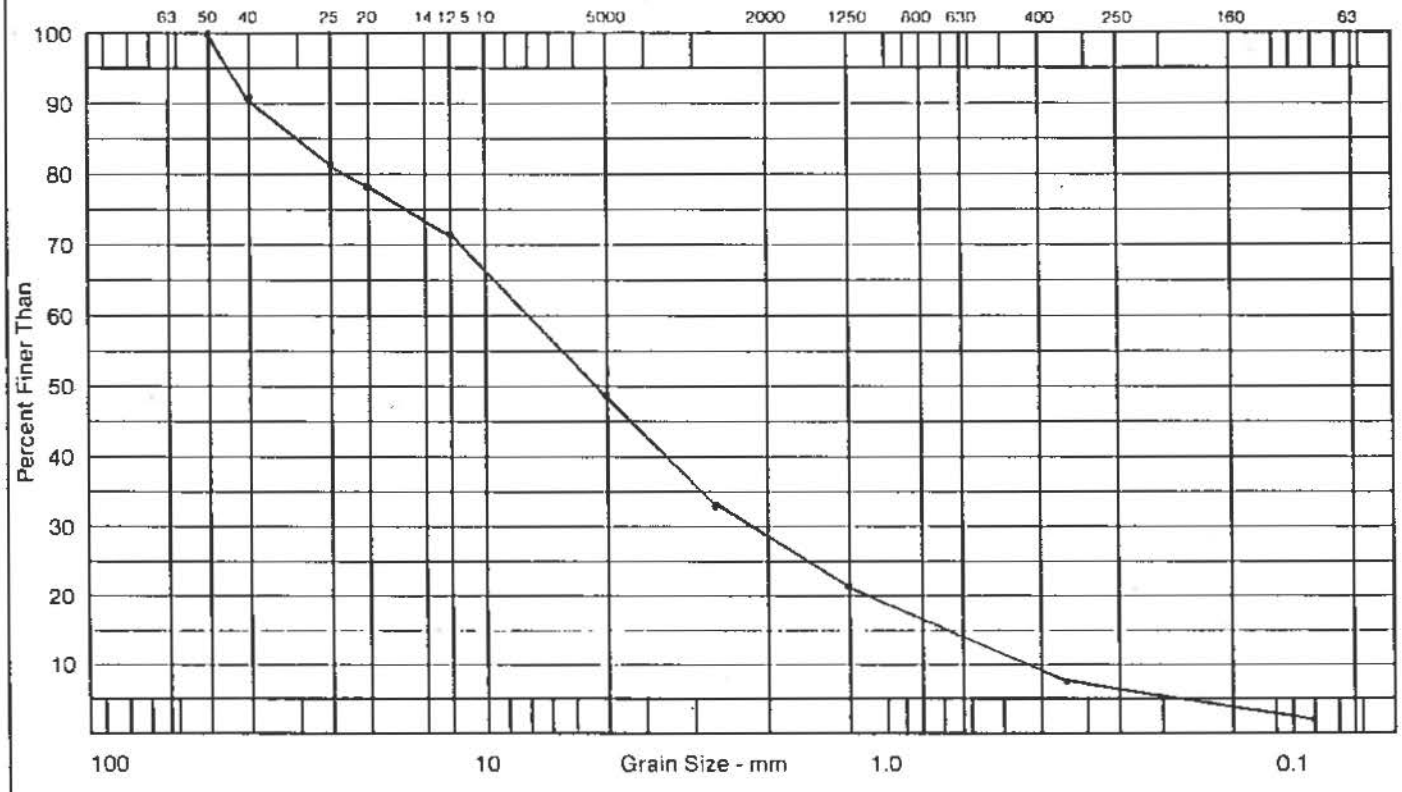
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					100.0
40,000	40.0					91.8
25,000	25.0					82.0
20,000	20.0					78.1
12,500	12.5					72.8
10,000	10.0					
5,000	5.0					48.6
2500	2.5					33.0
1,250	1.25					21.8
800	0.800					
630	0.630					
315	0.315					7.0
250	0.250					
160	0.160					
80	0.080					2.4

Description of Sample: Sandy gravel, GW

Time of Sieving ____ Min. 15

Method of Preparation ____ Dry ____ Washed X

Remarks:
1.7% Moisture
51.4% Gravel
46.2% Sand
2.4% Silt



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CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services Transportation Eng.
Project: km 1490 Alaska Hwy Geotechnical Inves.
Sample: 48 Depth: 3.50-3.65m
Location: TP#17-92
Made by: MK Job No.: 8002-218
Ck'd by: W.C.L. Date: 1992/03/03

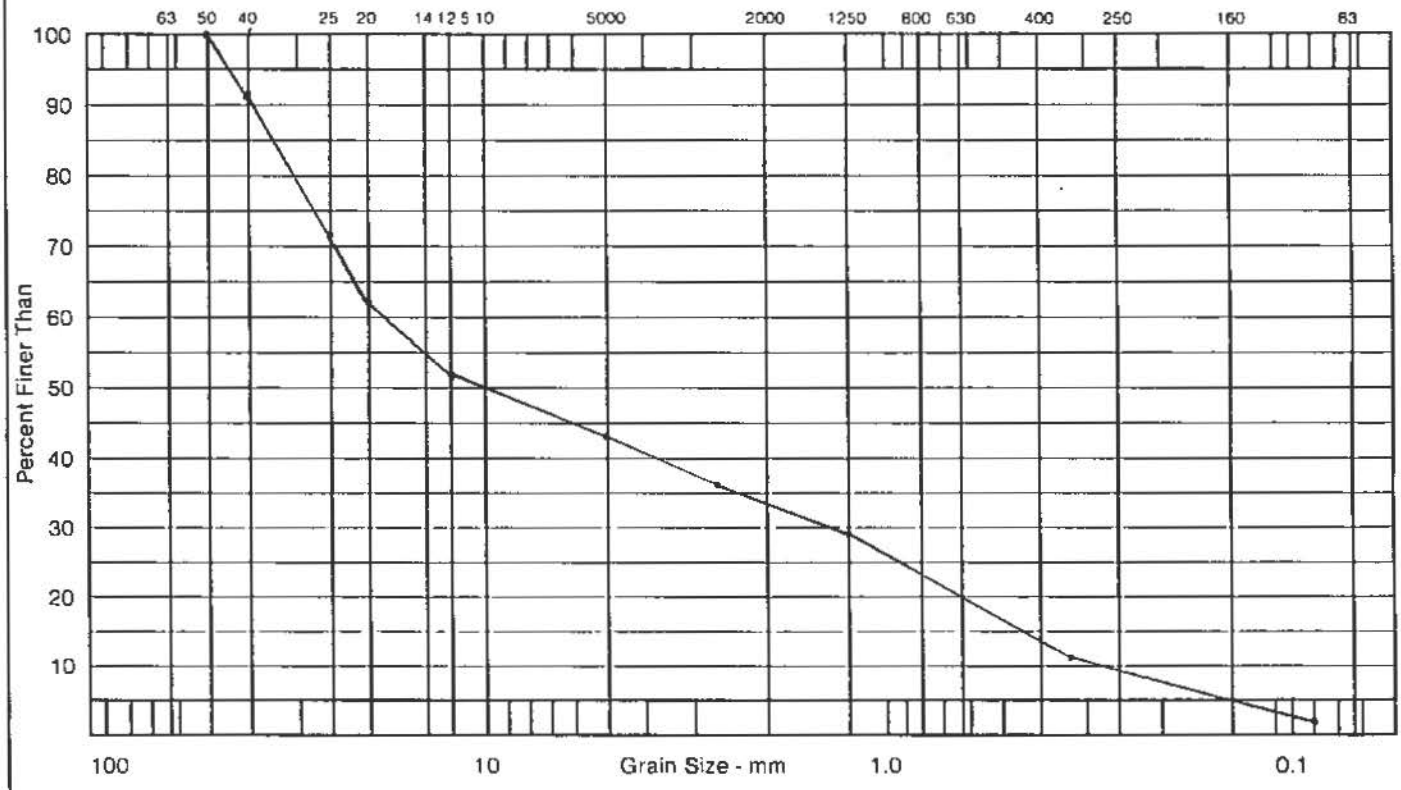
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					100.0
40,000	40.0					93.1
25,000	25.0					72.2
20,000	20.0					63.4
12,500	12.5					53.9
10,000	10.0					
5,000	5.0					43.4
2500	2.5					36.7
1,250	1.25					29.6
800	0.800					
630	0.630					
315	0.315					10.7
250	0.250					
160	0.160					
80	0.080					2.8

Description of Sample: Sandy gravel, GW

Time of Sieving: Min. 15

Method of Preparation: Dry ____ Washed X

Remarks:
2.4% Moisture
56.6% Gravel
40.6% Sand
2.8% Silt



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CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services Transportation Eng.
Sample: 49 Depth: 0.75-0.90m Project: km 1490 Alaska Hwy Geotechnical Inves.
Location: Made by: MK Job No.: 8002-218
TP#18-92 Ck'd by: Date: 1992/03/03

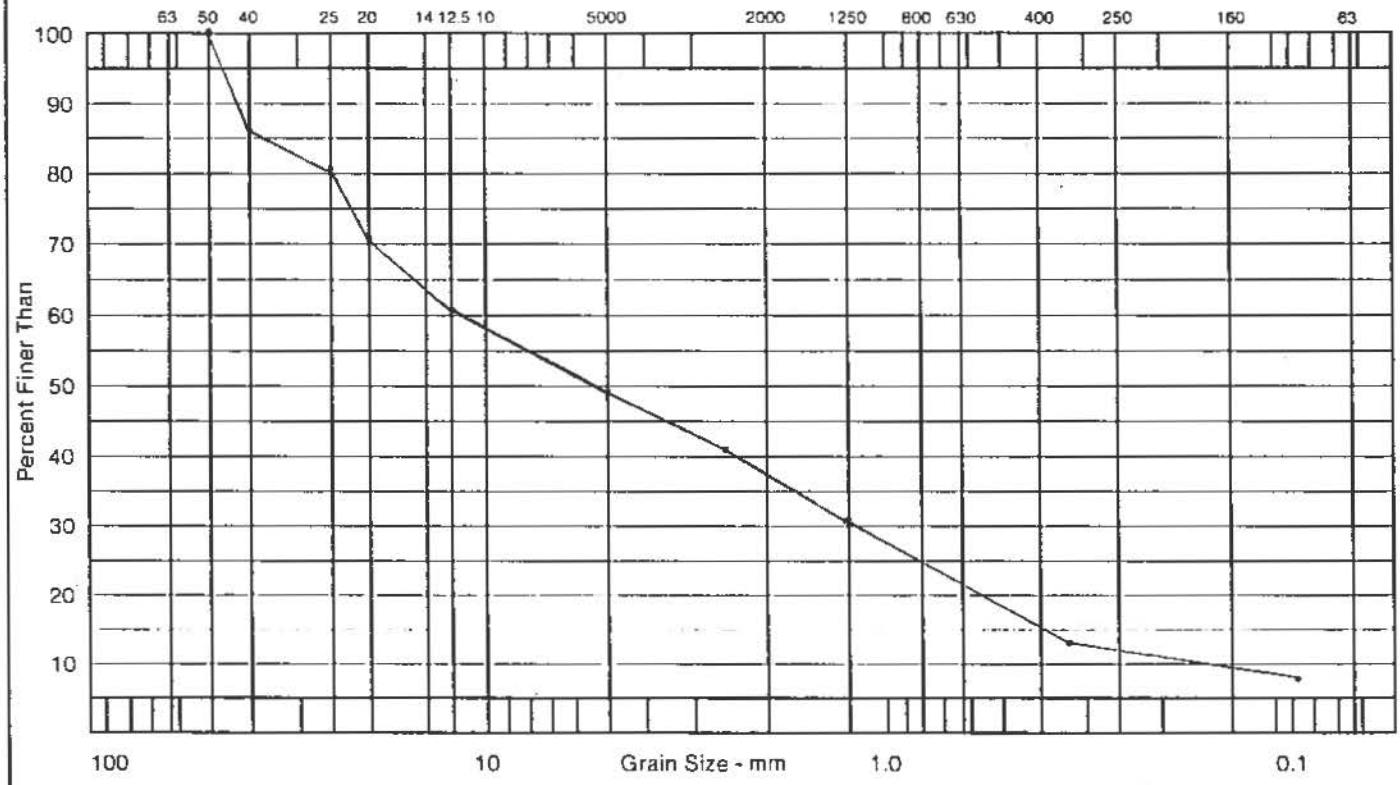
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					100.0
40,000	40.0					87.4
25,000	25.0					80.4
20,000	20.0					71.2
12,500	12.5					61.8
10,000	10.0					
5,000	5.0					49.7
2500	2.5					41.8
1,250	1.25					31.9
800	0.800					
630	0.630					
315	0.315					12.7
250	0.250					
160	0.160					
80	0.080					5.9

Description of Sample: Sandy gravel, trace of silt, GW - GM

Time of Sieving: Min. 15

Method of Preparation: Dry ____ Washed X

Remarks:
3.8% Moisture
50.3% Gravel
43.8% Sand
5.9% Silt



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CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services Transportation Eng.
Project: km 1490 Alaska Hwy Geotechnical Inves.
Sample: 50 Depth: 1.70-1.85m
Location: TP#18-92
Made by: MK Job No.: 8002-218
Ck'd by: [illegible] Date: 1992/03/03

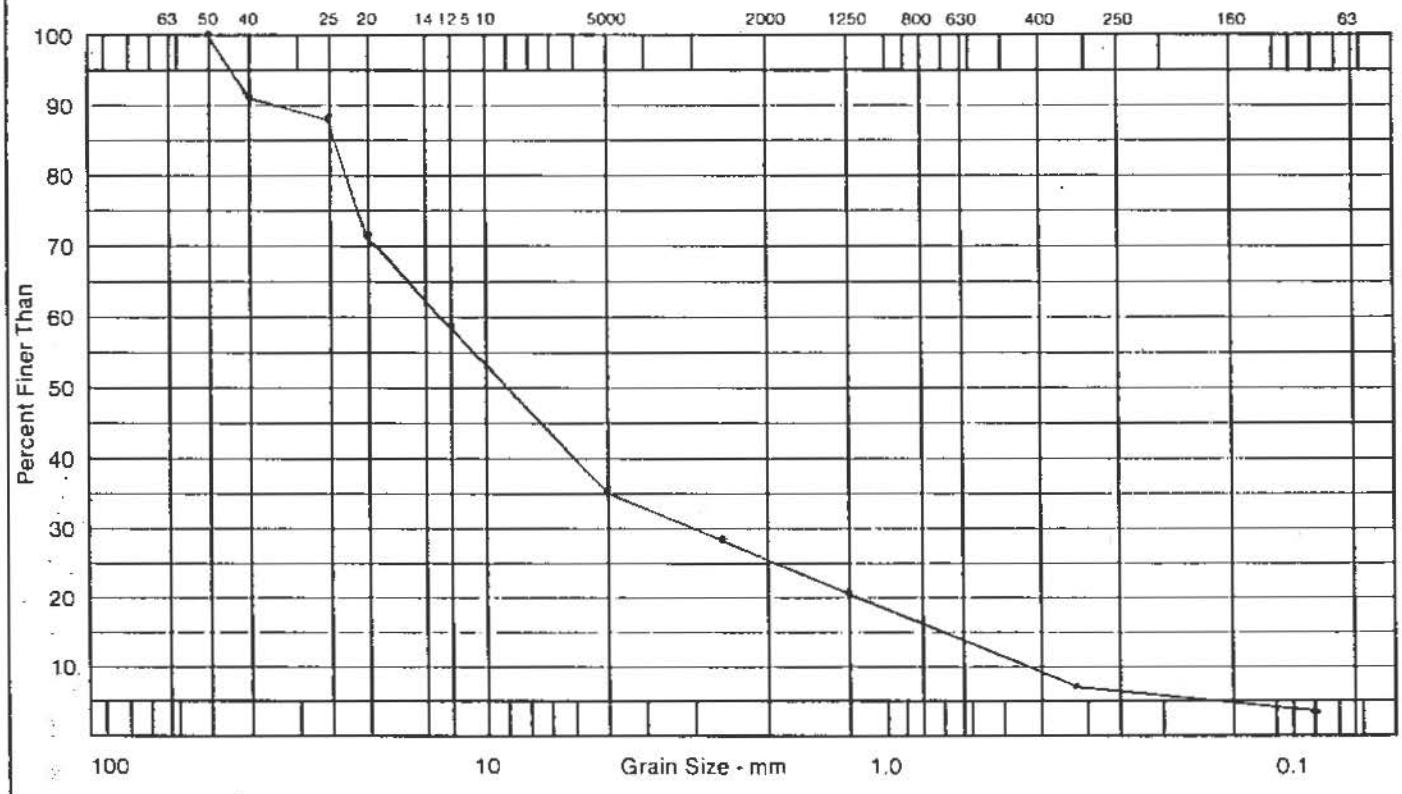
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					100.0
40,000	40.0					92.4
25,000	25.0					88.4
20,000	20.0					73.4
12,500	12.5					58.2
10,000	10.0					
5,000	5.0					35.2
2500	2.5					27.5
1,250	1.25					20.6
800	0.800					
630	0.630					
315	0.315					6.7
250	0.250					
160	0.160					
80	0.080					2.9

Description of Sample: Silty gravel, trace of sand, GM

Time of Sieving: Min. 15

Method of Preparation: Dry ____ Washed X

Remarks:
2.2% Moisture
64.8% Gravel
32.3% Sand
2.9% Silt



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CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services Transportation Eng.
Project: km 1490 Alaska Hwy Geotechnical Inves.
Sample: 51 Depth: 2.60-2.75m
Location: TP# 18-92
Made by: MK Job No.: 8002-218
Ck'd by: WHC Date: 1992/03/03

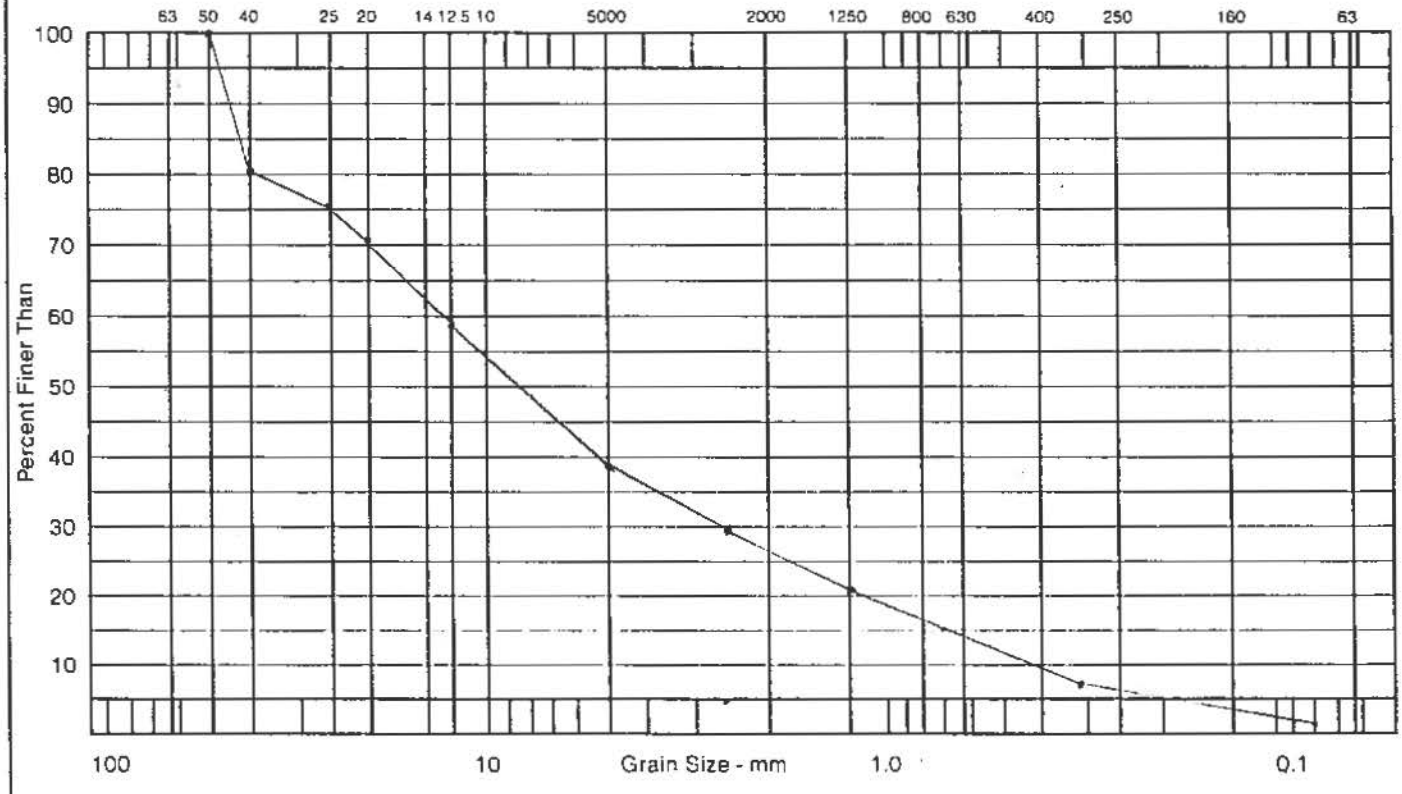
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					100.0
40,000	40.0					82.3
25,000	25.0					75.3
20,000	20.0					71.2
12,500	12.5					57.1
10,000	10.0					
5,000	5.0					37.6
2500	2.5					30.0
1,250	1.25					20.9
800	0.800					
630	0.630					
315	0.315					5.8
250	0.250					
160	0.160					
80	0.080					2.6

Description of Sample: Sandy gravel, GW

Time of Sieving: ____ Min. 15

Method of Preparation: ____ Dry ____ Washed X

Remarks:
1.7% Moisture
62.4% Gravel
35.0% Sand
2.6% Silt



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CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services Transportation Eng.
Project: km 1490 Alaska Hwy Geotechnical Inves.
Sample: 52 Depth: 3.50-3.65m
Location: TP#18-92
Made by: MK Job No.: 8002-218
Ck'd by: WJ Date: 1992/03/03

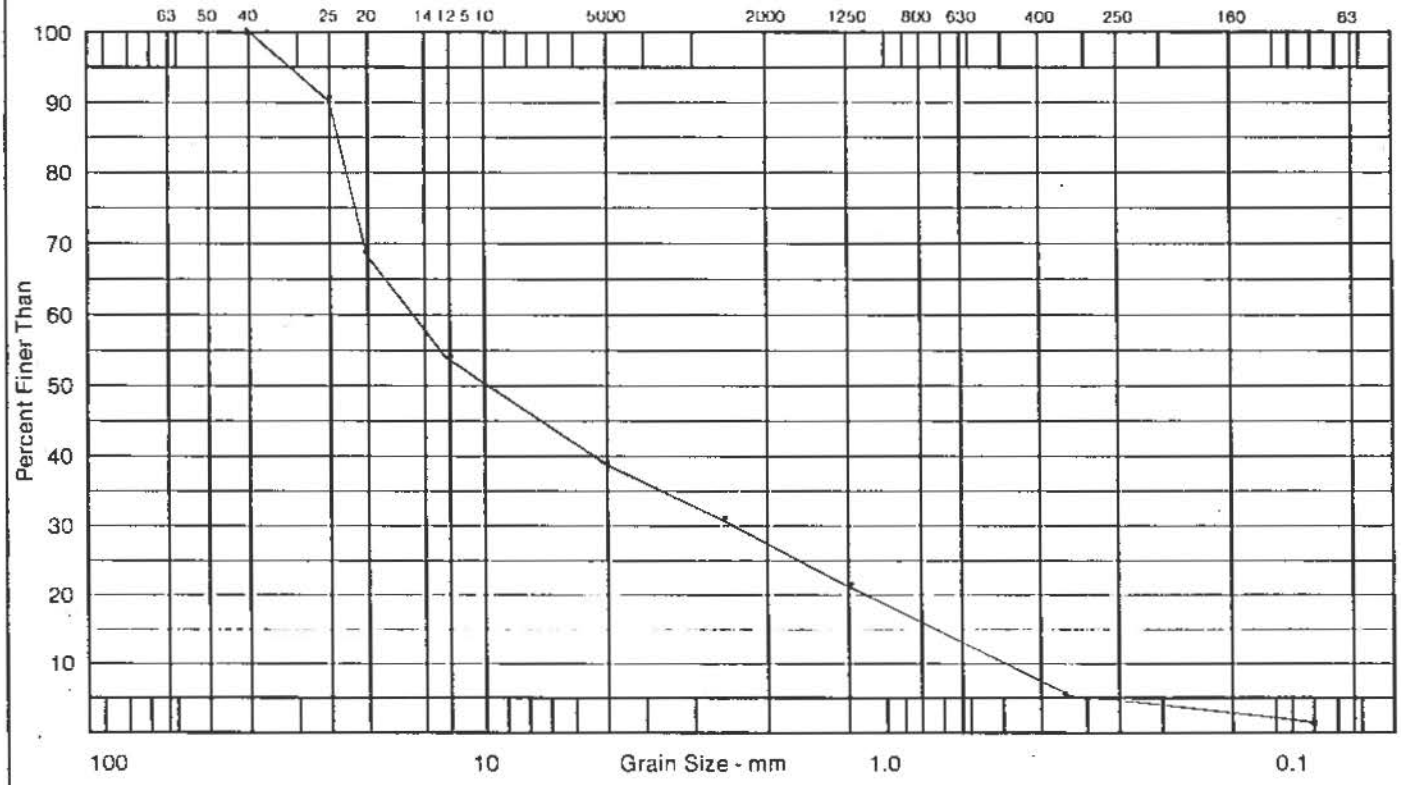
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					
40,000	40.0					100.0
25,000	25.0					91.5
20,000	20.0					69.0
12,500	12.5					54.2
10,000	10.0					50.0
5,000	5.0					39.5
2500	2.5					31.6
1,250	1.25					22.5
800	0.800					16.1
630	0.630					12.8
315	0.315					5.3
250	0.250					4.3
160	0.160					3.1
80	0.080					2.2

Description of Sample: Sandy gravel, GW

Time of Sieving: Min. 15

Method of Preparation: Dry ____ Washed X

Remarks:
1.9% Moisture
60.5% Gravel
37.3% Sand
2.2% Silt



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CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services Transportation Eng.
Project: km 1490 Alaska Hwy Geotechnical Inves.
Sample: 53 Depth: 0.75-0.90m
Location: TP#19-92
Made by: MK Job No.: 8002-218
Ck'd by: WCM Date: 1992/03/03

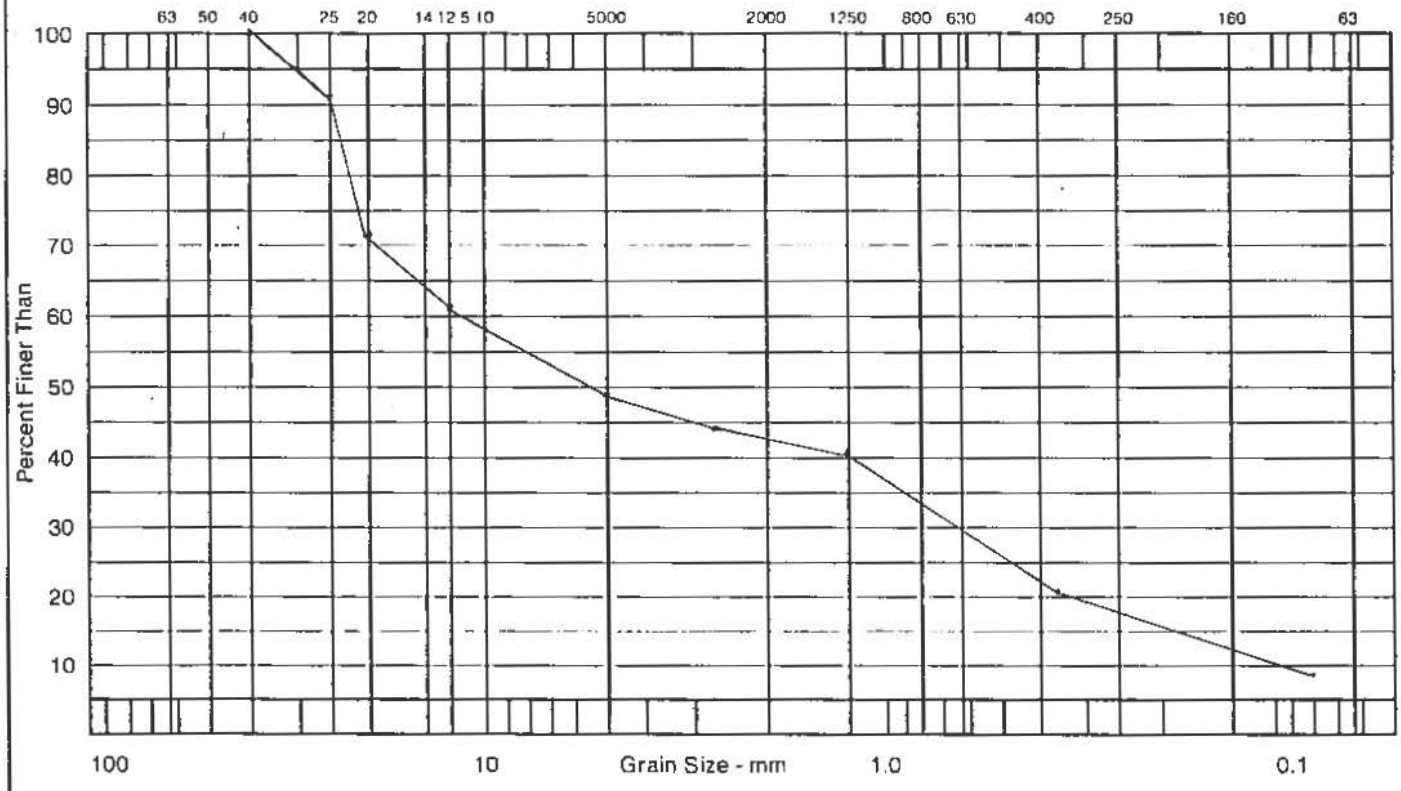
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					
40,000	40.0					100.0
25,000	25.0					92.7
20,000	20.0					73.0
12,500	12.5					62.7
10,000	10.0					58.7
5,000	5.0					48.3
2500	2.5					44.7
1,250	1.25					40.1
800	0.800					36.5
630	0.630					33.7
315	0.315					20.3
250	0.250					17.1
160	0.160					11.9
80	0.080					8.0

Description of Sample: Sandy gravel, trace of silt, GW - GM

Time of Sieving: Min. 15

Method of Preparation: Dry ____ Washed X

Remarks:
2.8% Moisture
51.7% Gravel
40.3% Sand
8.0% Silt



J. R. Paine & Associates Ltd.

CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services Transportation Eng.
Project: km 1490 Alaska Hwy Geotechnical Inves.
Sample: 54 Depth: 1.70-1.85m
Location: TP#19-92
Made by: MK Job No.: 8002-218
Ck'd by: [illegible] Date: 1992/03/03

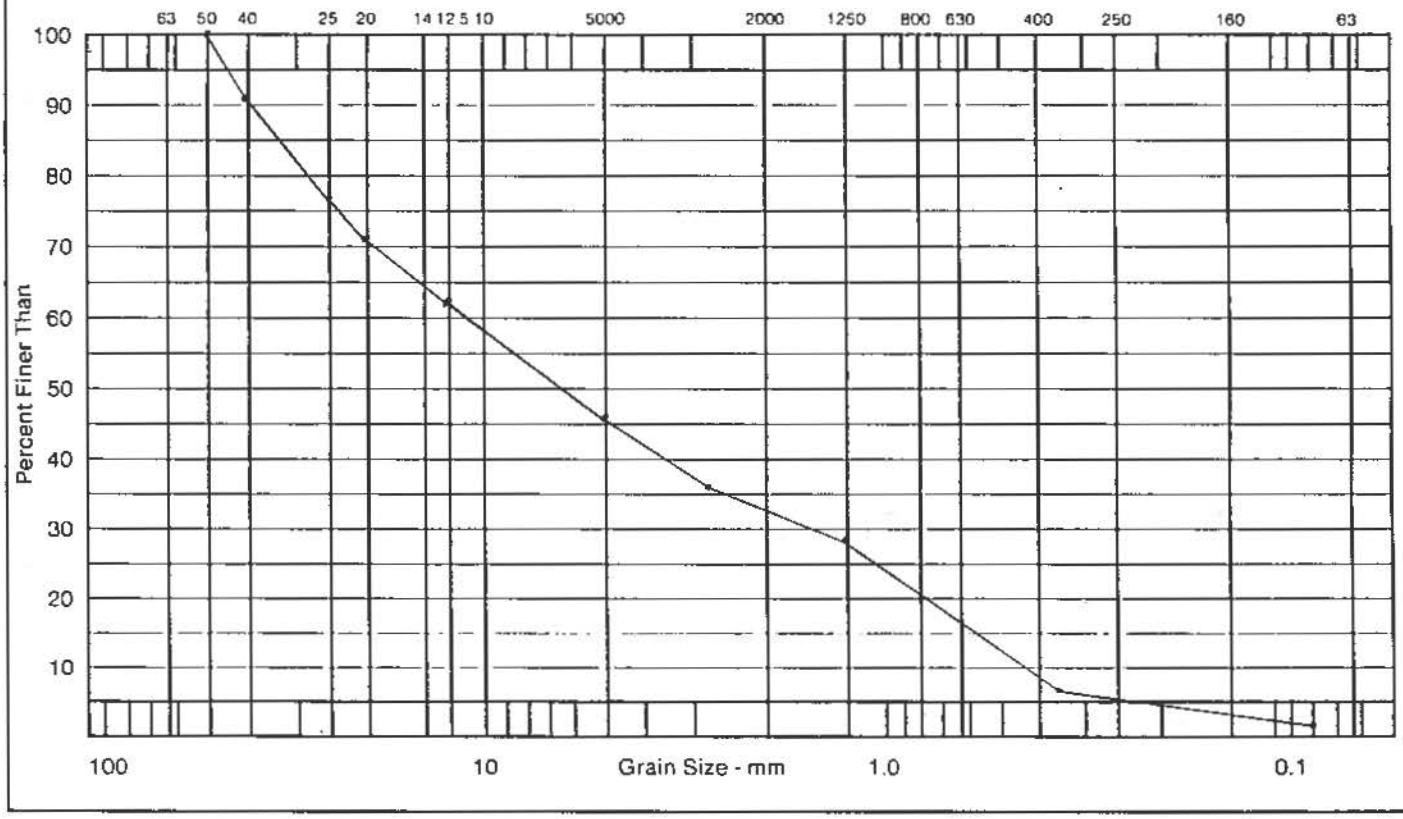
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					100.0
40,000	40.0					91.6
25,000	25.0					77.3
20,000	20.0					71.3
12,500	12.5					63.9
10,000	10.0					59.0
5,000	5.0					45.3
2500	2.5					36.0
1,250	1.25					28.6
800	0.800					22.9
630	0.630					19.3
315	0.315					7.9
250	0.250					6.1
160	0.160					3.8
80	0.080					2.3

Description of Sample: Sandy gravel, GW

Time of Sieving ____ Min. 15

Method of Preparation ____ Dry ____ Washed X

Remarks:
1.6% Moisture
54.7% Gravel
43.0% Sand
2.3% Silt



J. R. Paine & Associates Ltd.

CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services Transportation Eng.
Project: km 1490 Alaska Hwy Geotechnical Inves.
Sample: 55 Depth: 2.60-2.75m
Location: TP#19-92
Made by: MK Job No.: 8002-218
Ck'd by: [illegible] Date: 1992/03/03

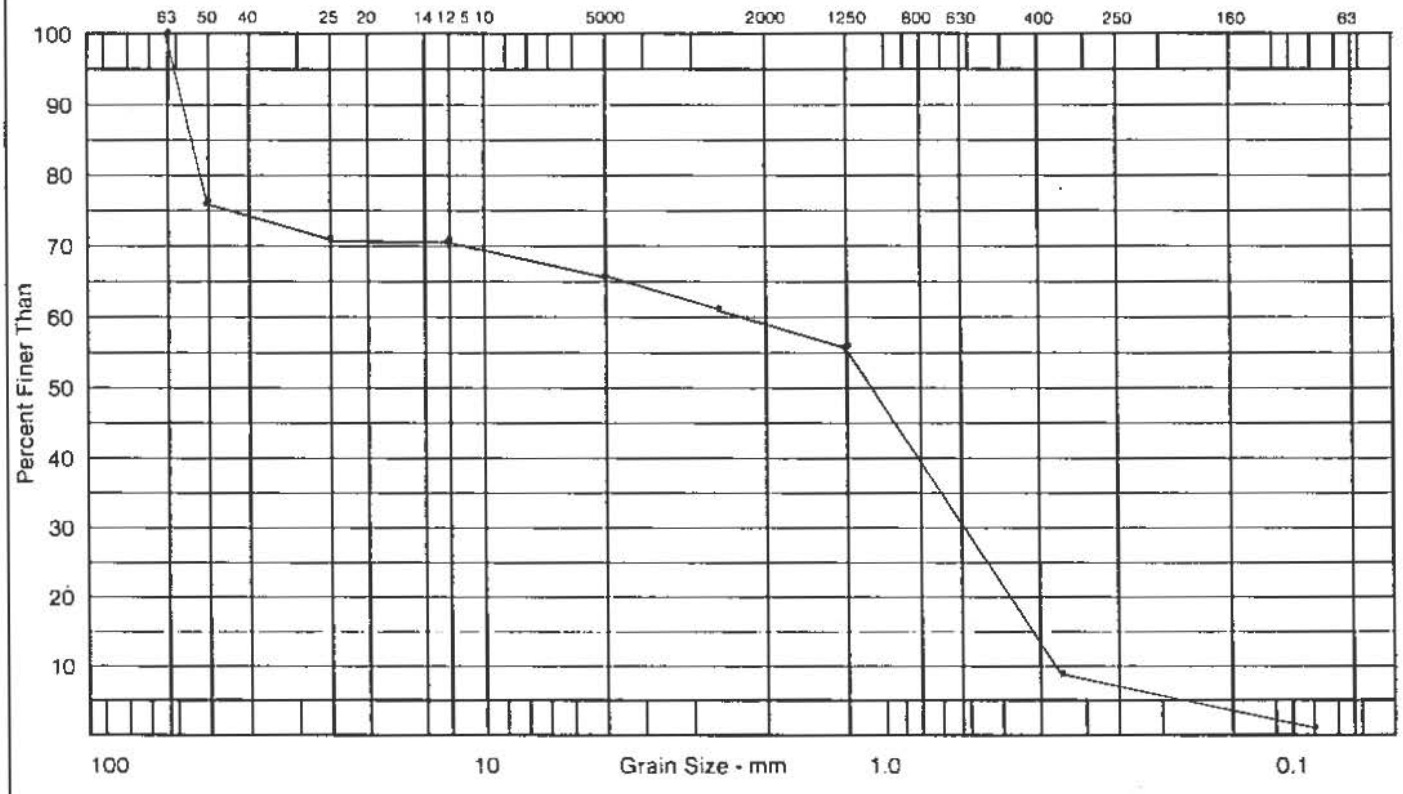
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					100.0
50,000	50.0					77.2
40,000	40.0					
25,000	25.0					71.7
20,000	20.0					
12,500	12.5					70.3
10,000	10.0					69.3
5,000	5.0					66.1
2500	2.5					62.6
1,250	1.25					56.8
800	0.800					47.5
630	0.630					38.9
315	0.315					9.3
250	0.250					6.0
160	0.160					2.9
80	0.080					1.4

Description of Sample: Gravelly sand, SW

Time of Sieving: Min. 15

Method of Preparation: Dry ____ Washed X

Remarks:
1.3% Moisture
33.9% Gravel
64.7% Sand
1.4% Silt



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CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Sample: 56 Depth: 3.50-3.65m

Location: TP#19-92

Client: YTG, C&T Services Transportation Eng.

Project: km 1490 Alaska Hwy Geotechnical Inves.

Made by: MK Job No.: 8002-218

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

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					72.3
25,000	25.0					72.3
20,000	20.0					63.3
12,500	12.5					54.1
10,000	10.0					50.0
5,000	5.0					41.2
2500	2.5					33.2
1,250	1.25					23.9
800	0.800					17.6
630	0.630					14.3
315	0.315					6.4
250	0.250					5.1
160	0.160					3.4
80	0.080					2.2

Description of Sample: Sandy gravel, GW

Time of Sieving: Min. 15

Method of Preparation: Dry Washed X

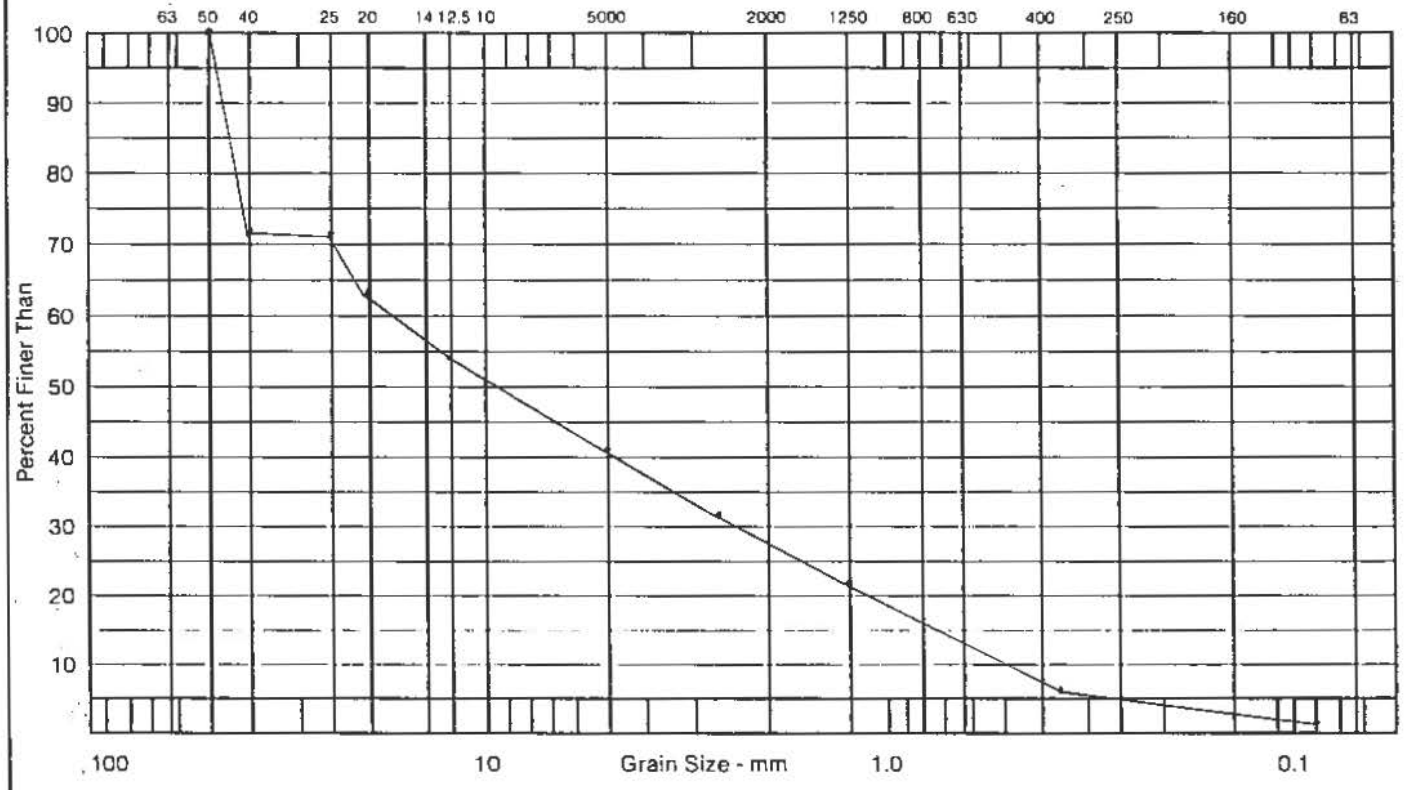
Remarks:

1.5% Moisture

58.8% Gravel

39.0% Sand

2.2% Silt



J. R. Paine & Associates Ltd.

CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services Transportation Eng.
Project: km 1490 Alaska Hwy Geotechnical Inves.
Sample: 57 Depth: 0.75-0.90m
Location: TP#20-92
Made by: MK Job No.: 8002-218
Ck'd by: [illegible] Date: 1992/03/03

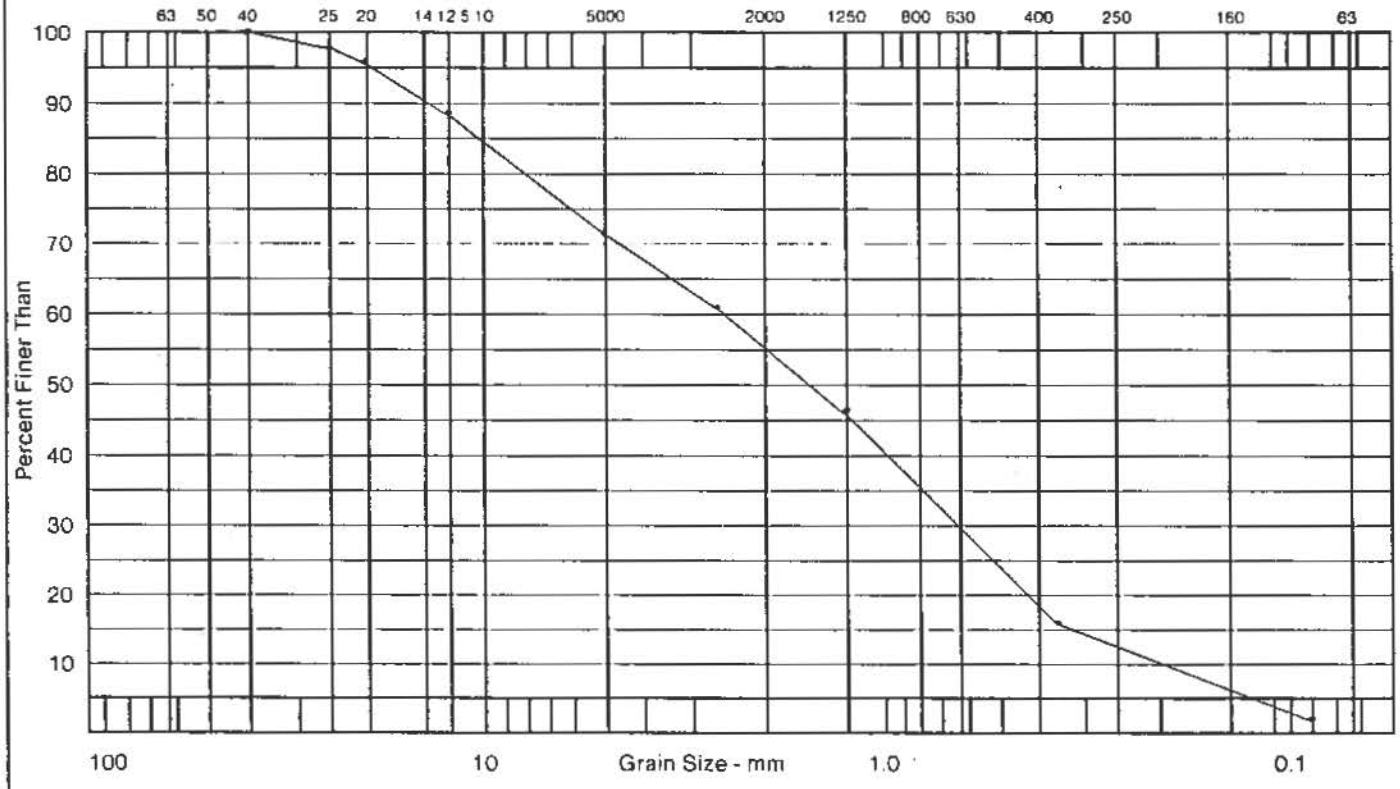
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					
40,000	40.0					100.0
25,000	25.0					97.5
20,000	20.0					95.7
12,500	12.5					89.5
10,000	10.0					85.4
5,000	5.0					73.5
2500	2.5					61.2
1,250	1.25					47.8
800	0.800					39.0
630	0.630					34.1
315	0.315					15.8
250	0.250					12.1
160	0.160					6.8
80	0.080					3.6

Description of Sample: Gravelly sand, SW

Time of Sieving: ____ Min. 15

Method of Preparation: ____ Dry ____ Washed X

Remarks:
4.3%Moisture
26.5%Gravel
69.9%Sand
3.6%Silt



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CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Sample: 58 Depth: 1.70-1.85m
Location: TP#20-92

Client: YTG, C&T Services Transportation Eng.
Project: km 1490 Alaska Hwy Geotechnical Inves.
Made by: MK Job No.: 8002-218
Ck'd by: WL Date: 1992/03/03

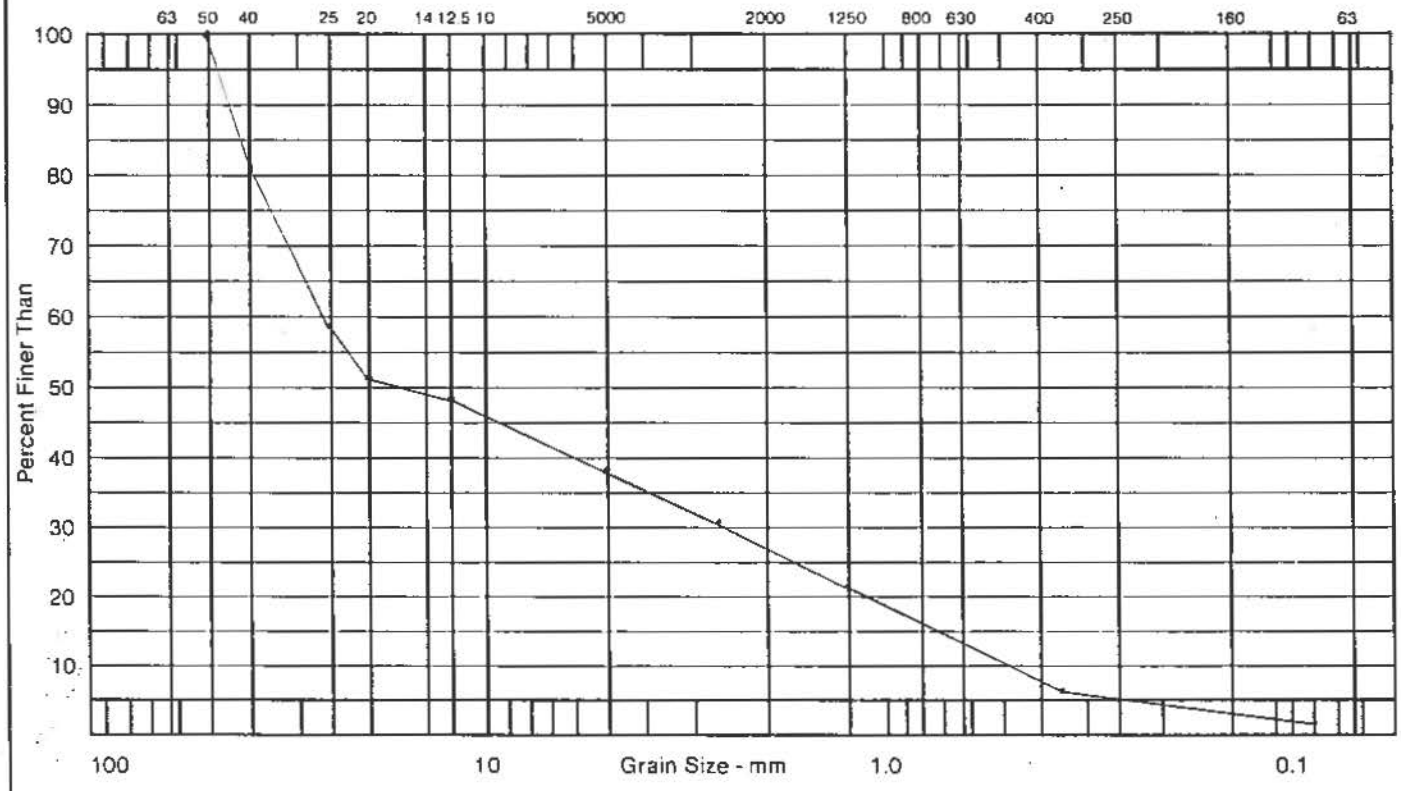
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					100.0
40,000	40.0					81.9
25,000	25.0					58.0
20,000	20.0					52.8
12,500	12.5					48.7
10,000	10.0					46.4
5,000	5.0					38.3
2500	2.5					30.8
1,250	1.25					23.3
800	0.800					17.6
630	0.630					14.4
315	0.315					6.6
250	0.250					5.5
160	0.160					4.1
80	0.080					3.0

Description of Sample: Sandy gravel, GW

Time of Sieving: Min. 15

Method of Preparation: Dry: Washed: X

Remarks:
3.5% Moisture
61.7% Gravel
35.3% Sand
3.0% Silt



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CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services Transportation Eng.
Project: km 1490 Alaska Hwy Geotechnical Inves.
Sample: 59 Depth: 2.60-2.75m
Location: TP#20-92
Made by: MK Job No.: 8002-218
Ck'd by: Date: 1992/03/03

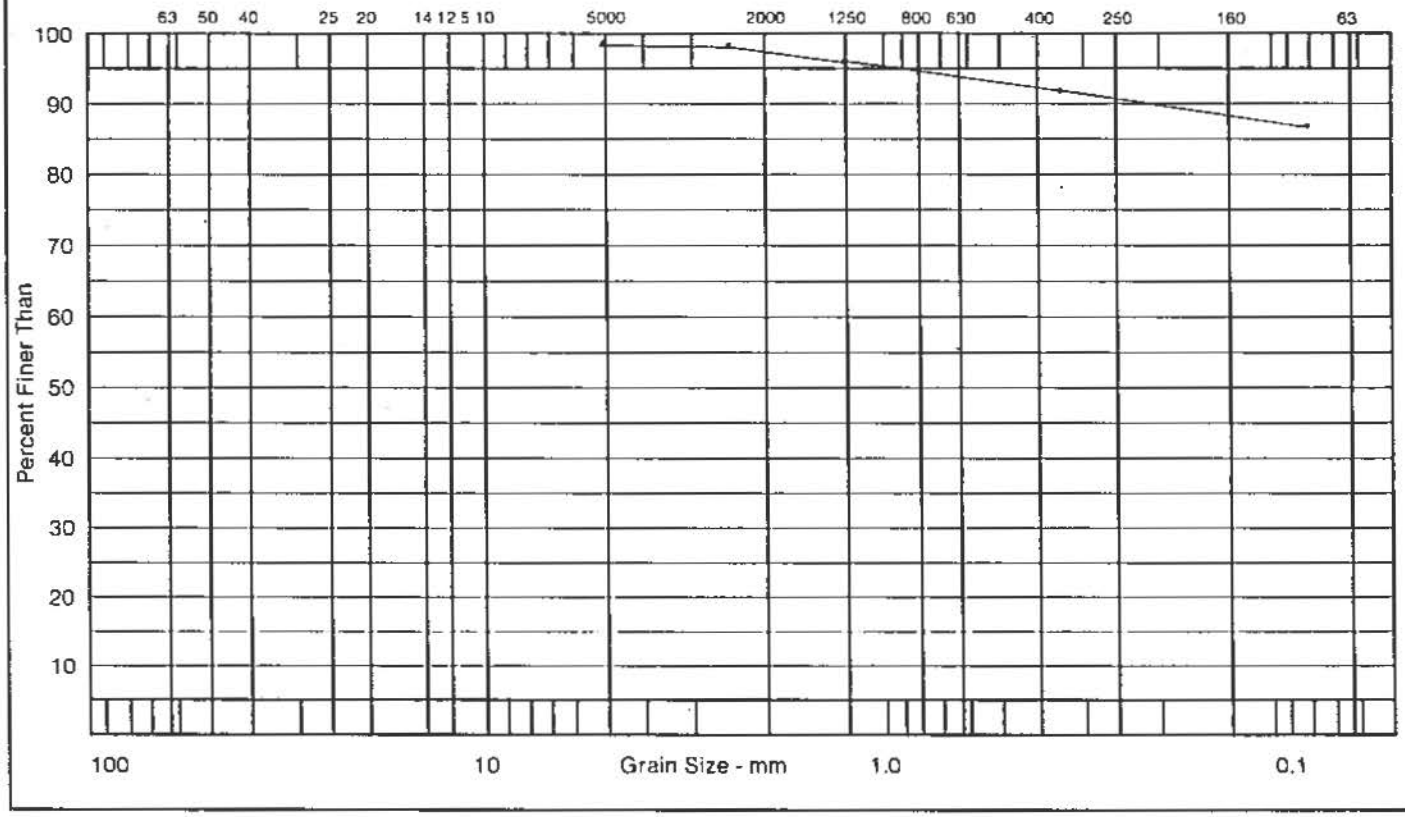
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					
40,000	40.0					
25,000	25.0					
20,000	20.0					
12,500	12.5					
10,000	10.0					100.0
5,000	5.0					98.9
2500	2.5					98.2
1,250	1.25					96.9
800	0.800					95.9
630	0.630					95.2
315	0.315					93.0
250	0.250					92.2
160	0.160					90.3
80	0.080					87.3

Description of Sample: Silt, some sand, ML

Time of Sieving: ____ Min. 15

Method of Preparation: ____ Dry ____ Washed X

Remarks:
24.8% Moisture
1.1% Gravel
11.6% Sand
87.3% Silt



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CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services Transportation Eng.
Project: km 1490 Alaska Hwy Geotechnical Inves.
Sample: 60 Depth: 3.50-3.65m
Location: TP#20-92
Made by: MK Job No.: 8002-218
Ck'd by: [illegible] Date: 1992/03/03

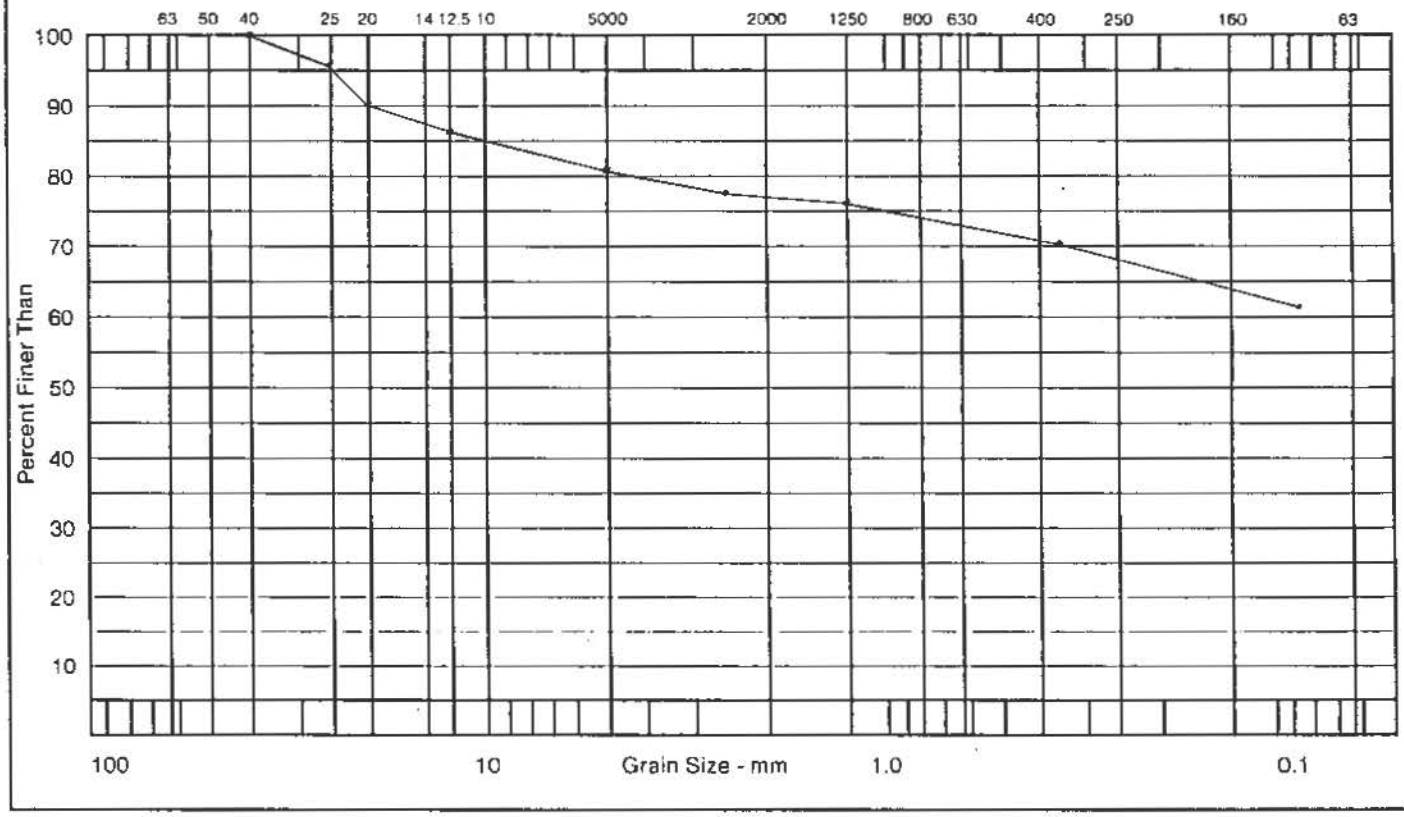
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					
40,000	40.0					100.0
25,000	25.0					95.1
20,000	20.0					90.0
12,500	12.5					86.8
10,000	10.0					84.5
5,000	5.0					80.9
2500	2.5					78.4
1,250	1.25					75.8
800	0.800					73.9
630	0.630					72.9
315	0.315					70.0
250	0.250					69.3
160	0.160					67.5
80	0.080					62.0

Description of Sample: Sandy gravelly silt to gravelly sandy silt, ML

Time of Sieving: ____ Min. 15

Method of Preparation: ____ Dry ____ Washed X

Remarks:
19.3% Moisture
19.1% Gravel
18.9% Sand
62.0% Silt



J. R. Paine & Associates Ltd.

CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services Transportation Eng.
Project: km 1490 Alaska Hwy Geotechnical Inves.
Sample: 61 Depth: 0.75-0.90m
Location: TP#21-92
Made by: MK Job No.: 8002-218
Ck'd by: WC/C Date: 1992/03/03

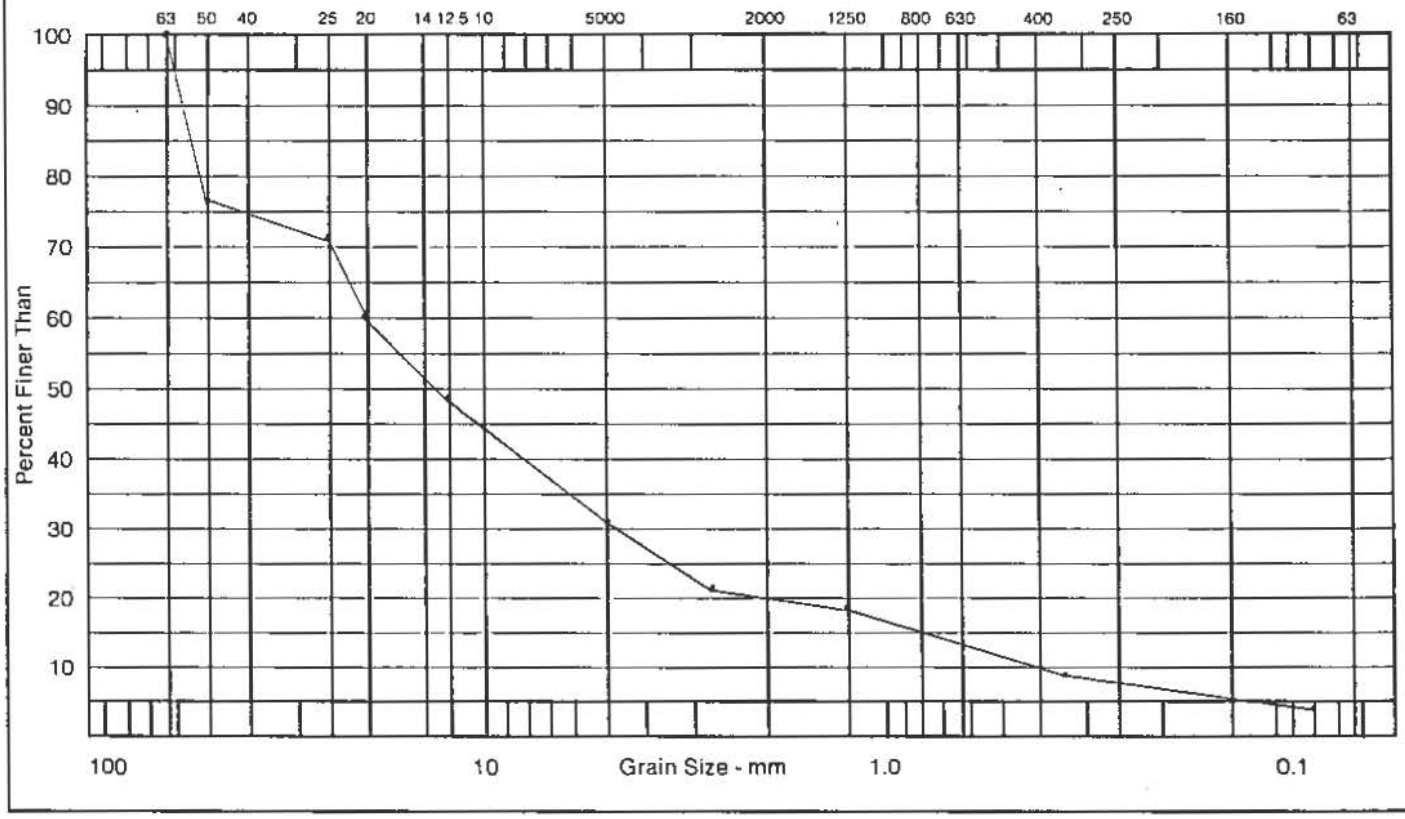
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					100.0
50,000	50.0					77.3
40,000	40.0					
25,000	25.0					72.4
20,000	20.0					60.6
12,500	12.5					48.5
10,000	10.0					41.2
5,000	5.0					30.4
2500	2.5					23.8
1,250	1.25					18.5
800	0.800					15.9
630	0.630					14.5
315	0.315					9.7
250	0.250					8.6
160	0.160					6.6
80	0.080					4.5

Description of Sample: Sandy gravel, GW

Time of Sieving: Min. 15

Method of Preparation: Dry ____ Washed X

Remarks:
4.0% Moisture
69.6% Gravel
25.9% Sand
4.5% Silt



J. R. Paine & Associates Ltd.

CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services Transportation Eng.
Project: km 1490 Alaska Hwy Geotechnical Inves.
Sample: 62 Depth: 1.70-1.85m
Location: TP#21-92
Made by: MK Job No.: 8002-218
Ck'd by: [illegible] Date: 1992/03/03

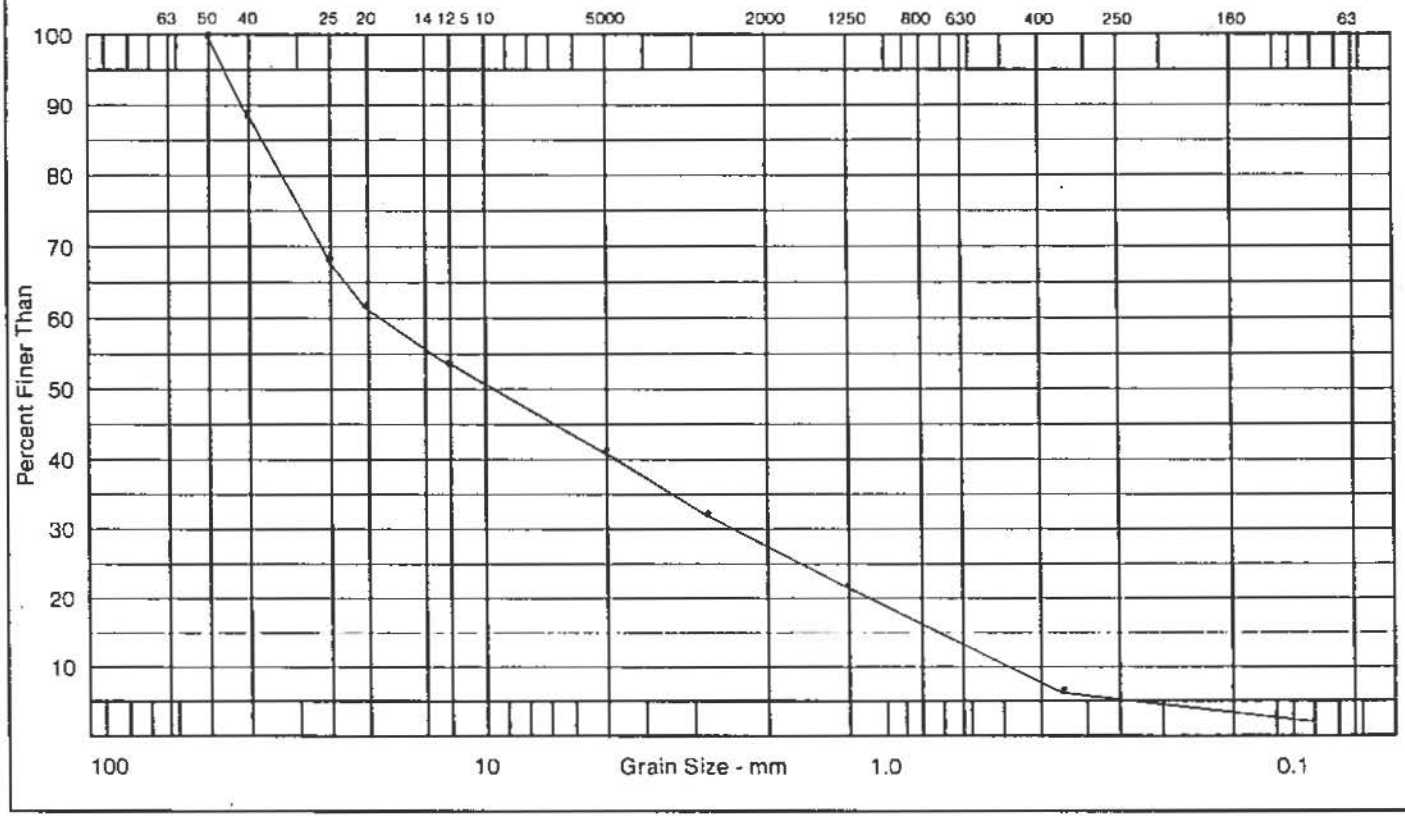
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					100.0
40,000	40.0					89.7
25,000	25.0					68.9
20,000	20.0					63.8
12,500	12.5					54.7
10,000	10.0					51.9
5,000	5.0					41.8
2500	2.5					33.3
1,250	1.25					23.3
800	0.800					15.6
630	0.630					12.1
315	0.315					5.7
250	0.250					5.0
160	0.160					4.1
80	0.080					3.1

Description of Sample: Sandy gravel, GW

Time of Sieving: Min. 15

Method of Preparation: Dry: Washed: X

Remarks:
3.0% Moisture
58.2% Gravel
38.7% Sand
3.1% Silt



J. R. Paine & Associates Ltd.

CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Sample: 63 Depth: 2.60-2.75m
Location: TP#21-92

Client: YTG, C&T Services Transportation Eng.
Project: km 1490 Alaska Hwy Geotechnical Inves.
Made by: MK Job No.: 8002-218
Ck'd by: [illegible] Date: 1992/03/03

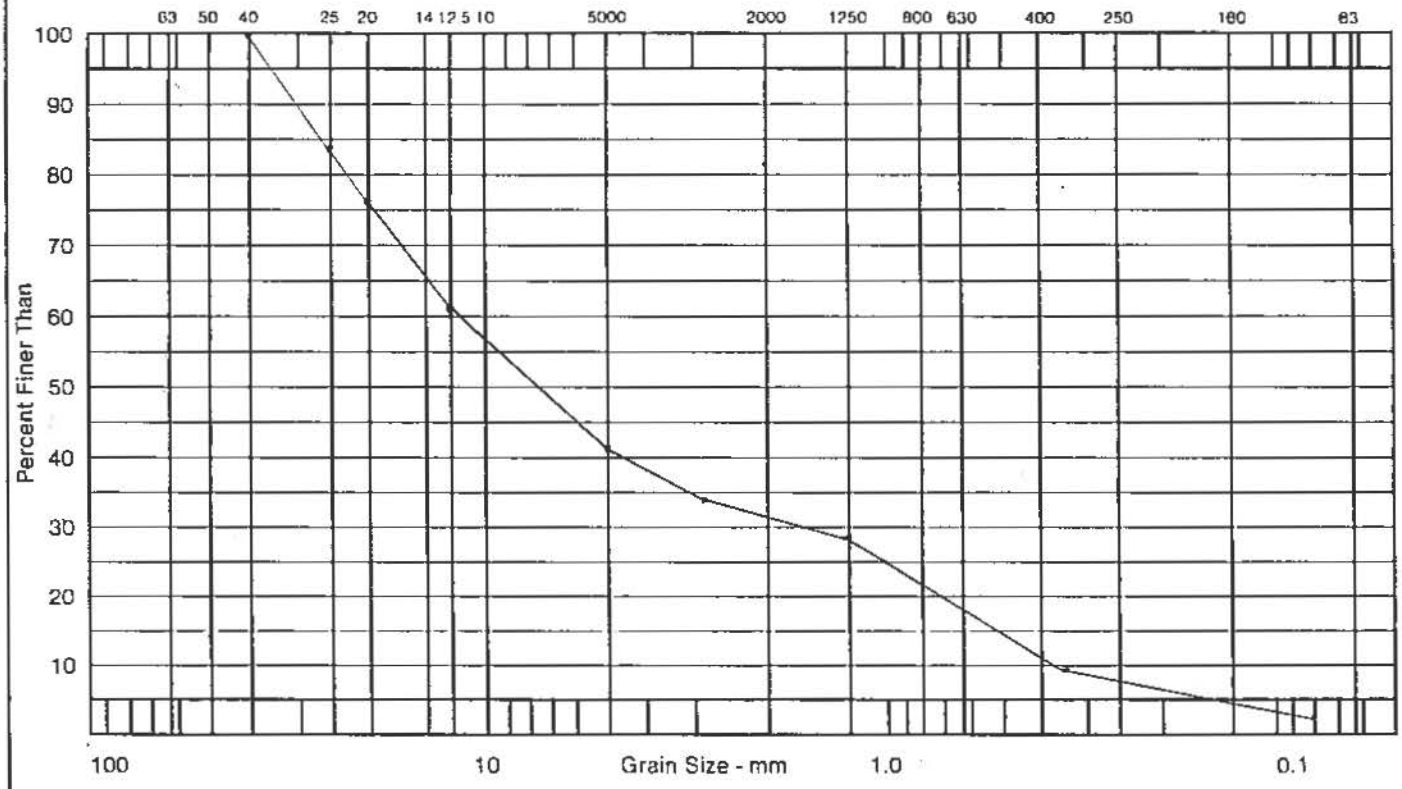
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					
40,000	40.0					100.0
25,000	25.0					84.4
20,000	20.0					75.8
12,500	12.5					61.1
10,000	10.0					54.0
5,000	5.0					42.3
2500	2.5					34.9
1,250	1.25					28.7
800	0.800					24.7
630	0.630					22.2
315	0.315					9.9
250	0.250					7.4
160	0.160					4.3
80	0.080					2.5

Description of Sample: Sandy gravel, GW

Time of Sieving: Min. 15

Method of Preparation: Dry ____ Washed X

Remarks:
2.8% Moisture
57.7% Gravel
39.8% Sand
2.5% Silt



J. R. Paine & Associates Ltd.

CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services Transportation Eng.

Sample: 64 Depth: 3.50-3.65m

Project: km 1490 Alaska Hwy Geotechnical Inves.

Location: TP#21-92

Made by: MK Job No.: 8002-218

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

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					96.8
20,000	20.0					87.2
12,500	12.5					71.3
10,000	10.0					60.1
5,000	5.0					36.9
2500	2.5					25.8
1,250	1.25					21.1
800	0.800					19.4
630	0.630					18.7
315	0.315					16.2
250	0.250					15.5
160	0.160					14.1
80	0.080					12.3

Description of Sample: Sandy gravel, some silt, GM-GW

Method of Preparation: Dry ____ Washed X

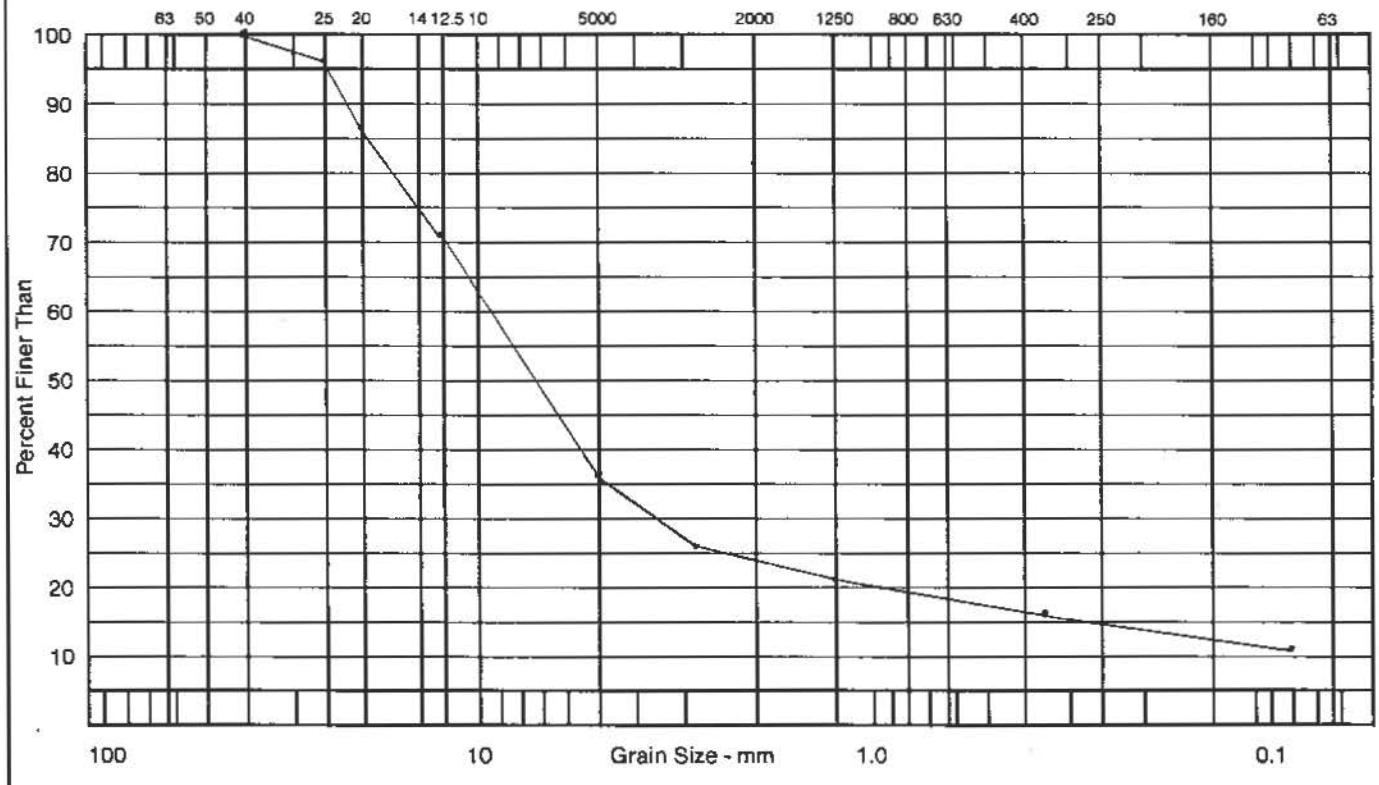
Remarks: 8.8% Moisture

63.1% Gravel

24.6% Sand

12.3% Silt

Time of Sieving: ____ Min. 15



SUMMARY OF TRIAL CRUSH LABORATORY TESTING

SAMPLE NUMBER	LOCATION	GRAINSIZE ANALYSES (PITRUN)			GRAINSIZE ANALYSES (CRUSHED SAMPLE)			CRUSH COUNT	L.A. ABRASION	*MAGNESIUM SOUNDNESS	SULFATE % LOSS
		GRAVEL	SAND	FINES	GRAVEL	SAND	FINES	%	% LOSS	COARSE AGGREGATE	FINE AGGREGATE
40A	TP#15-92	64.9	30.9	4.2	58.5	36.7	4.8	75.4	13.8		
44A	TP#16-92	53.2	42.5	4.3	52.6	43.1	4.3	69.7			
48A	TP#17-92	50.9	45.3	3.8	48.4	47.8	3.8	60.4	13.0		
52A	TP#18-92	63.0	33.5	3.5	54.6	41.1	4.3	82.2			
56A	TP#19-92	54.0	42.2	3.8	52.2	43.9	3.9	77.0			
63A	TP#21-92	72.1	23.1	4.8	50.0	43.0	7.0	62.3			

*TEST RESULT TO BE FORWARDED AS THEY ARE COMPLETED.

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

GEOTECHNICAL INVESTIGATION
KILOMETER 1490, LEFT, ALASKA HIGHWAY,
YUKON TERRITORY, "1992"

Dwn. By MCK	Date 1992/04/03
Scale N/A	Plate No. 1

J. R. Paine & Associates Ltd.

CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services Transportation Eng.
Project: km 1490 Alaska Hwy Geotechnical Inves.
Sample: 40A Depth: 0.00-4.00m
Location: TP#15-92
Made by: MK Job No.: 8002-218
Ck'd by: [illegible] Date: 1992/03/03

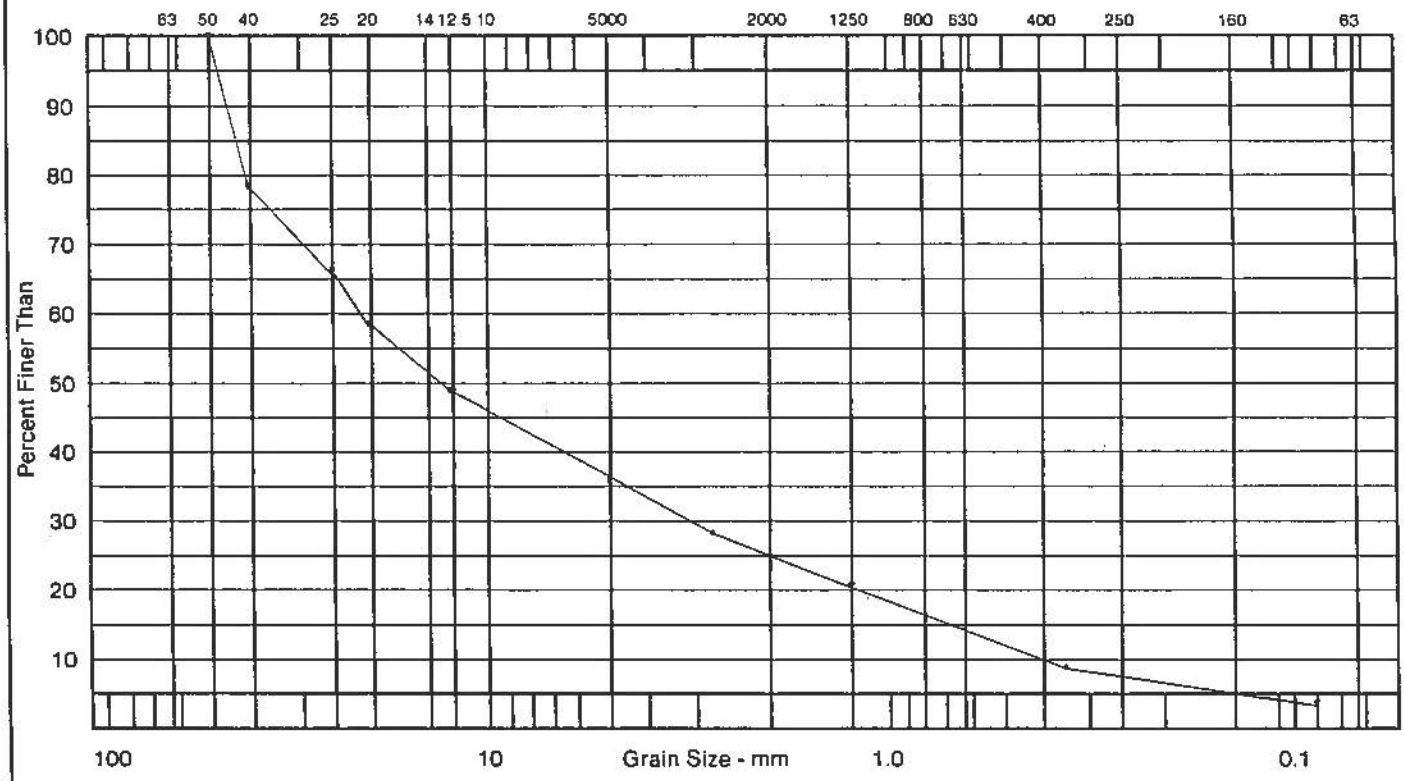
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					100.0
40,000	40.0					78.4
25,000	25.0					65.7
20,000	20.0					58.5
12,500	12.5					49.6
10,000	10.0					44.9
5,000	5.0					35.1
2500	2.5					27.2
1,250	1.25					20.7
800	0.800					17.0
630	0.630					15.0
315	0.315					9.3
250	0.250					8.0
160	0.160					6.0
80	0.080					4.2

Description of Sample: Sandy gravel, GW

Time of Sieving: Min. 15

Method of Preparation: Dry: Washed: X

Remarks:
4.2% Moisture
64.9% Gravel
30.9% Sand
4.2% Silt



J. R. Paine & Associates Ltd.

CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services Transportation Eng.

Sample: 44A Depth: 0.00-4.00m

Project: km 1490 Alaska Hwy Geotechnical Inves.

Location: TP#16-92

Made by: MK Job No.: 8002-218

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

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					91.8
25,000	25.0					80.1
20,000	20.0					73.8
12,500	12.5					61.3
10,000	10.0					56.4
5,000	5.0					46.8
2500	2.5					38.6
1,250	1.25					29.7
800	0.800					23.3
630	0.630					19.7
315	0.315					10.5
250	0.250					8.8
160	0.160					6.4
80	0.080					4.3

Description of Sample: Sandy gravel, GW

Time of Sieving: Min. 15

Method of Preparation: Dry: Washed: X

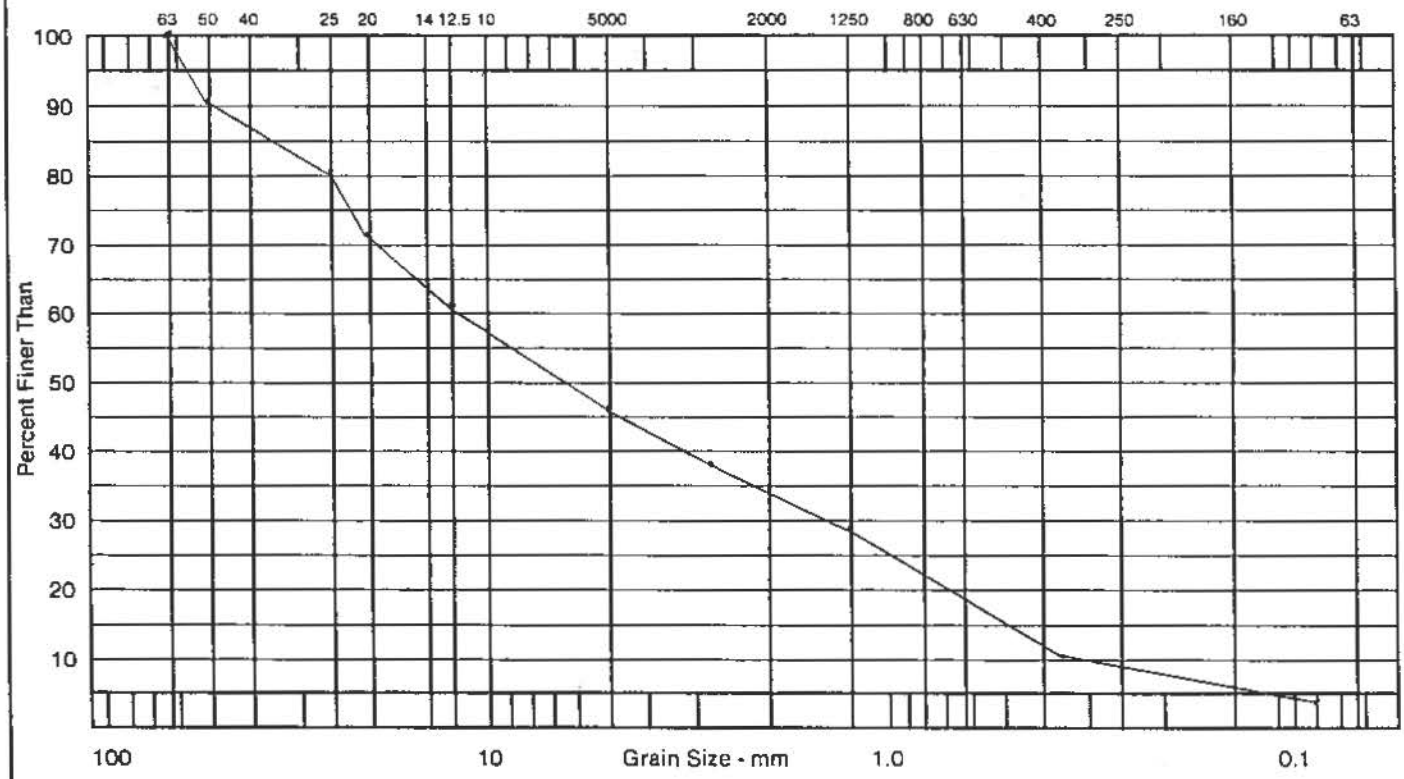
Remarks:

2.9 %Moisture

53.2 %Gravel

42.5 %Sand

4.3 %Silt



J. R. Paine & Associates Ltd.

CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services Transportation Eng.

Sample: 48A Depth: 0.00-4.00m

Project: km 1490 Alaska Hwy Geotechnical Inves.

Location: TP#17-92

Made by: MK Job No.: 8002-218

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

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					94.6
25,000	25.0					87.8
20,000	20.0					78.3
12,500	12.5					60.4
10,000	10.0					62.0
5,000	5.0					49.1
2500	2.5					38.1
1,250	1.25					29.2
800	0.800					23.2
630	0.630					20.0
315	0.315					10.3
250	0.250					8.4
160	0.160					5.7
80	0.080					3.8

Description of Sample: Sandy gravel, GW

Time of Sieving: ____ Min. 15

Method of Preparation: ____ Dry ____ Washed X

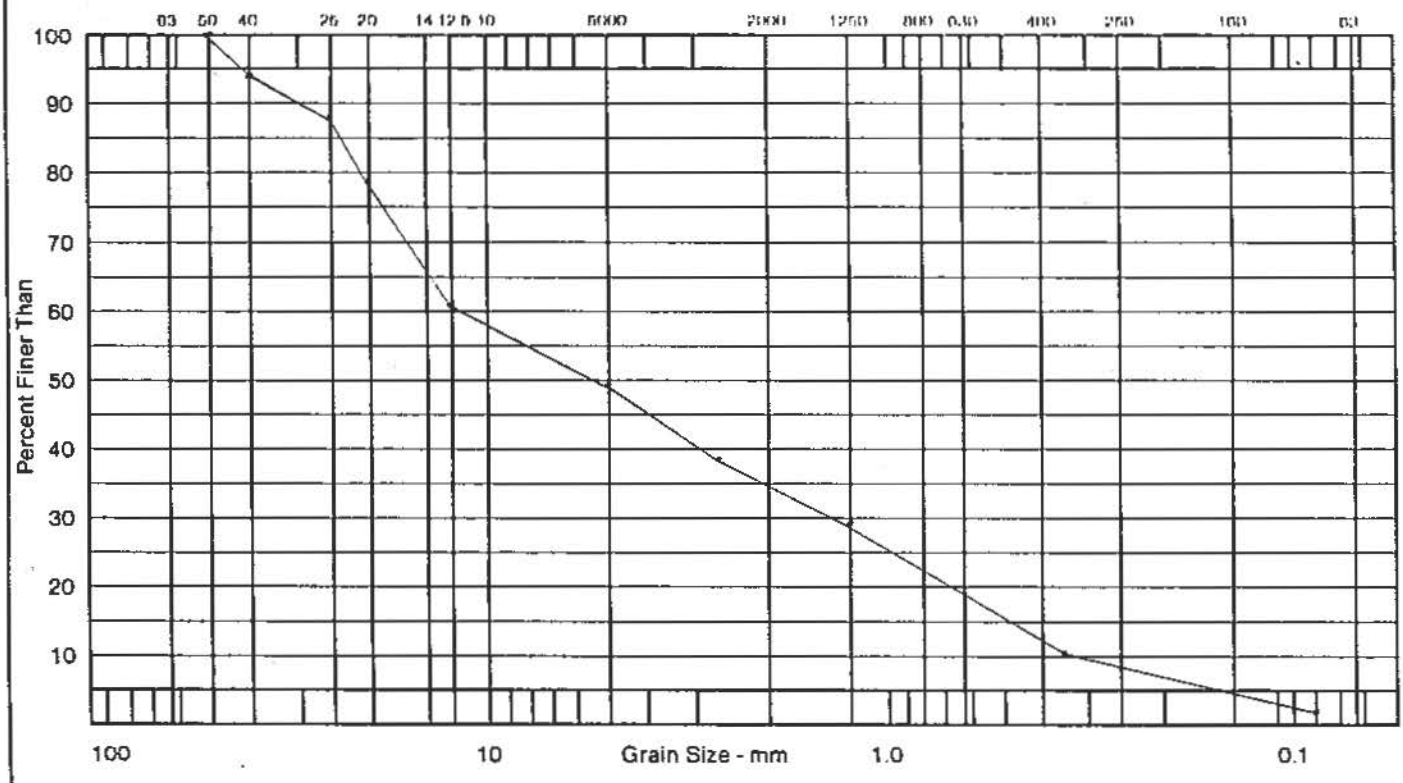
Remarks:

3.1 %Moisture

50.9 %Gravel

45.3 %Sand

3.8 %Silt



J. R. Paine & Associates Ltd.

CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services Transportation Eng.

Sample: 52A Depth: 0.00-4.00m Project: km 1490 Alaska Hwy Geotechnical Inves.

Location: TP#18-92 Made by: MK Job No.: 8002-218

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

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					72.4
20,000	20.0					59.3
12,500	12.5					50.0
10,000	10.0					45.4
5,000	5.0					37.0
2500	2.5					30.1
1,250	1.25					22.6
800	0.800					17.4
630	0.630					14.5
315	0.315					7.6
250	0.250					6.4
160	0.160					4.8
80	0.080					3.5

Description of Sample: Sandy gravel, GW

Time of Sieving: Min. 15

Method of Preparation: Dry: Washed: X

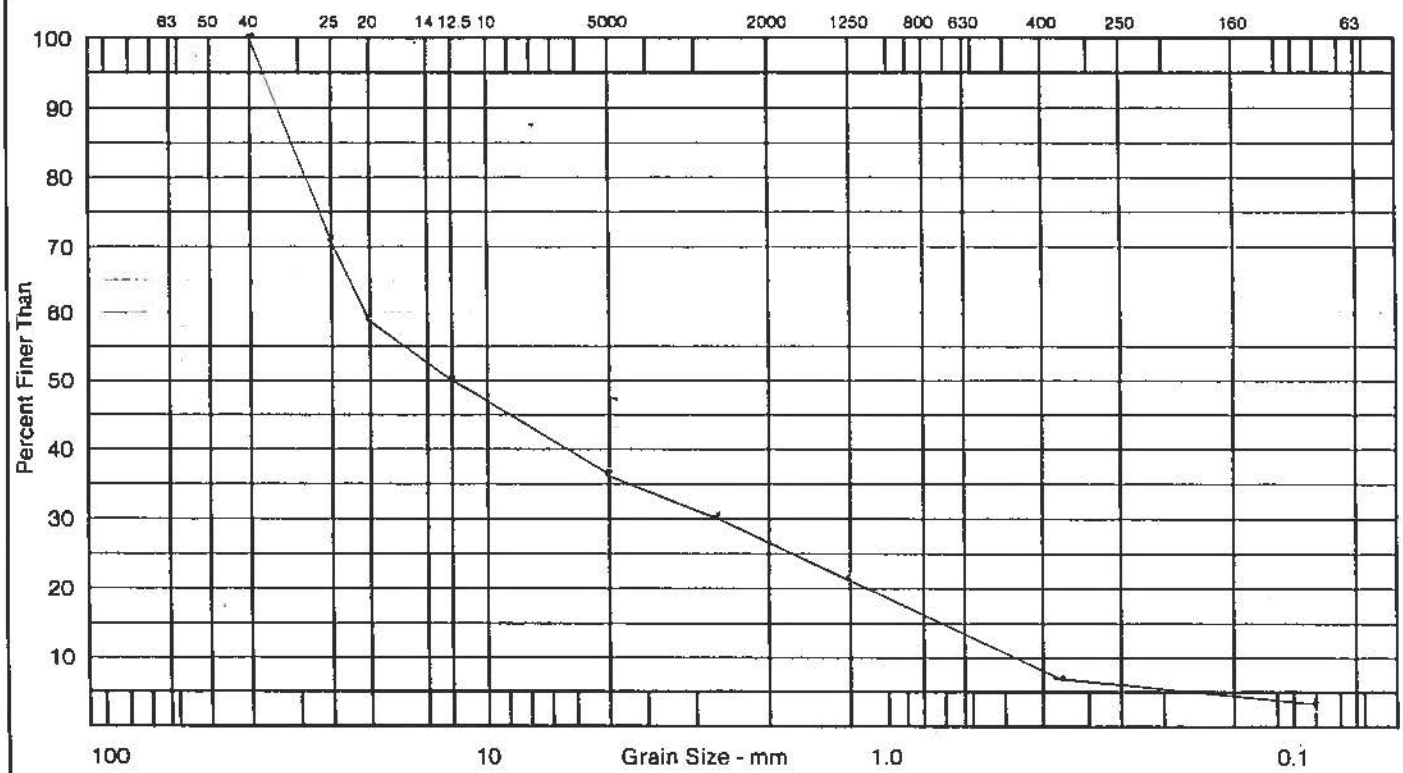
Remarks:

2.1 %Moisture

63.0 %Gravel

33.5 %Sand

3.5 %Silt



J. R. Paine & Associates Ltd.

CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services Transportation Eng.
Sample: 56A Depth: 0.00-4.00m Project: km 1490 Alaska Hwy Geotechnical Inves.
Location: Made by: MK Job No.: 8002-218
TP#19-92 Ck'd by: DCC Date: 1992/03/03

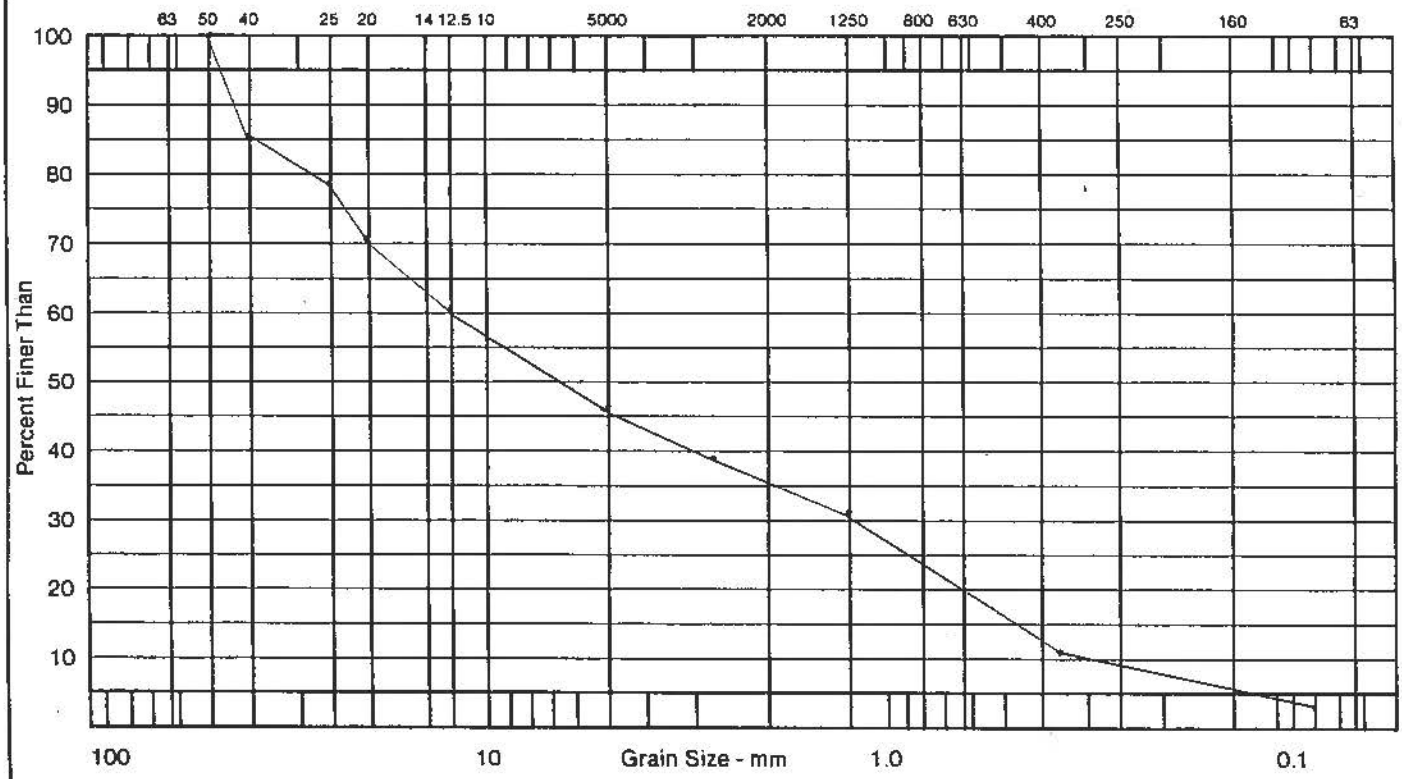
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					100.0
40,000	40.0					85.8
25,000	25.0					78.2
20,000	20.0					70.5
12,500	12.5					60.1
10,000	10.0					55.2
5,000	5.0					46.0
2500	2.5					39.0
1,250	1.25					32.4
800	0.800					27.2
630	0.630					23.9
315	0.315					11.7
250	0.250					9.5
160	0.160					6.2
80	0.080					3.8

Description of Sample: Sandy gravel, GW

Time of Sieving ____ Min. 15

Method of Preparation ____ Dry ____ Washed X

Remarks:
2.2 %Moisture
54.0 %Gravel
42.2 %Sand
3.8 %Silt



J. R. Paine & Associates Ltd.

CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services Transportation Eng.

Sample: 63A Depth: 0.00-3.40m

Project: km 1490 Alaska Hwy Geotechnical Inves.

Location: TP#21-92

Made by: MK Job No.: 8002-218

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

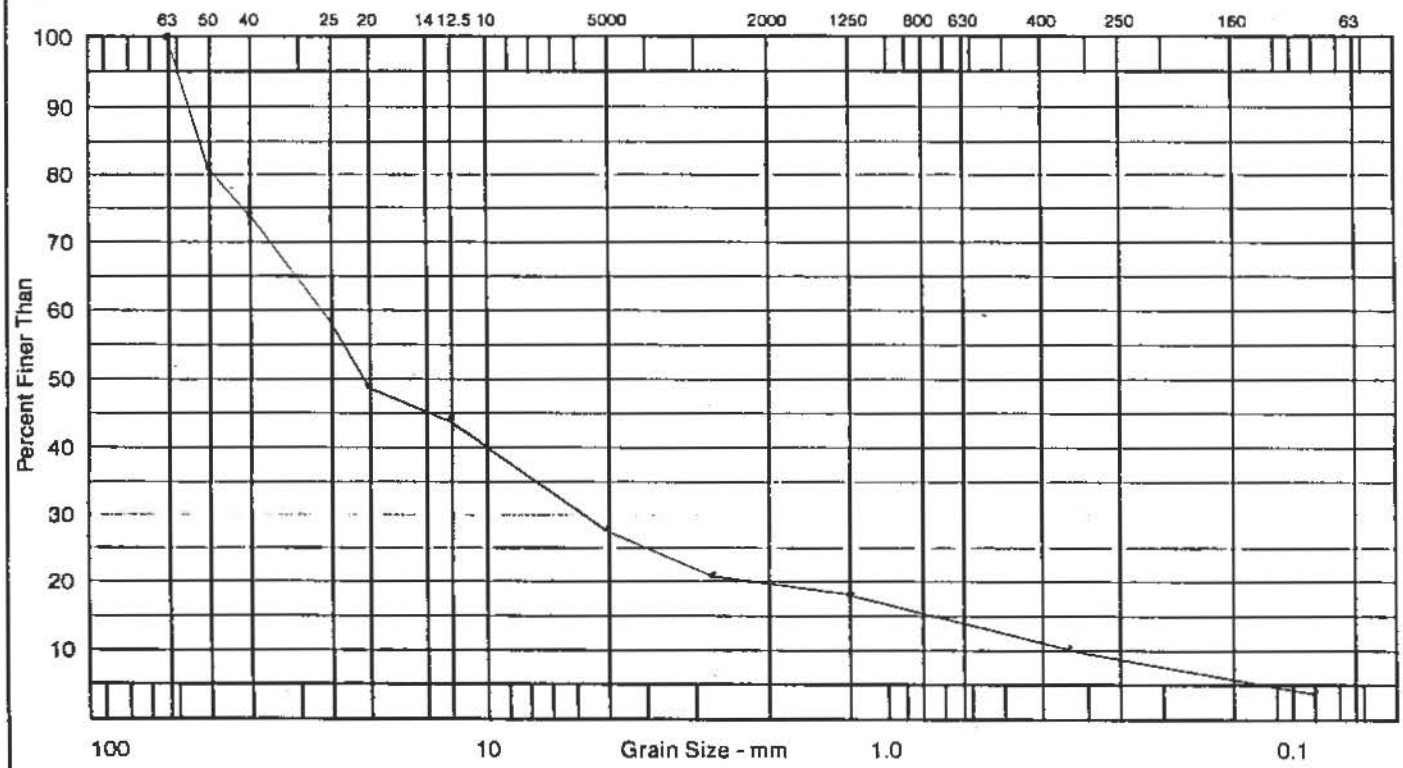
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					100.0
50,000	50.0					82.7
40,000	40.0					74.6
25,000	25.0					58.9
20,000	20.0					49.5
12,500	12.5					44.5
10,000	10.0					35.4
5,000	5.0					27.9
2500	2.5					21.8
1,250	1.25					18.4
800	0.800					16.6
630	0.630					13.8
315	0.315					10.2
250	0.250					8.8
160	0.160					6.6
80	0.080					4.8

Description of Sample: Sandy gravel, GW

Method of Preparation: Dry Washed X

Remarks:
4.0 %Moisture
72.1 %Gravel
23.1 %Sand
4.8 %Silt

Time of Sieving Min. 15



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CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services, Trans. Engineering Br.

Sample: 40A Depth: 0.00-4.00m Project: km 1490 Alaska Hwy, Geotech Inves.

Location: Made by: LK Job No.: 8002-218

TP #15-92 Ck'd by: Date: 1992/03/15

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					99.2
12,500	12.5					75.5
10,000	10.0					61.8
5,000	5.0					41.5
2500	2.5					31.1
1,250	1.25					23.4
800	0.800					19.1
630	0.630					16.9
315	0.315					10.6
250	0.250					
160	0.160					6.9
80	0.080					4.8

Description of Sample

20mm laboratory crushed sample

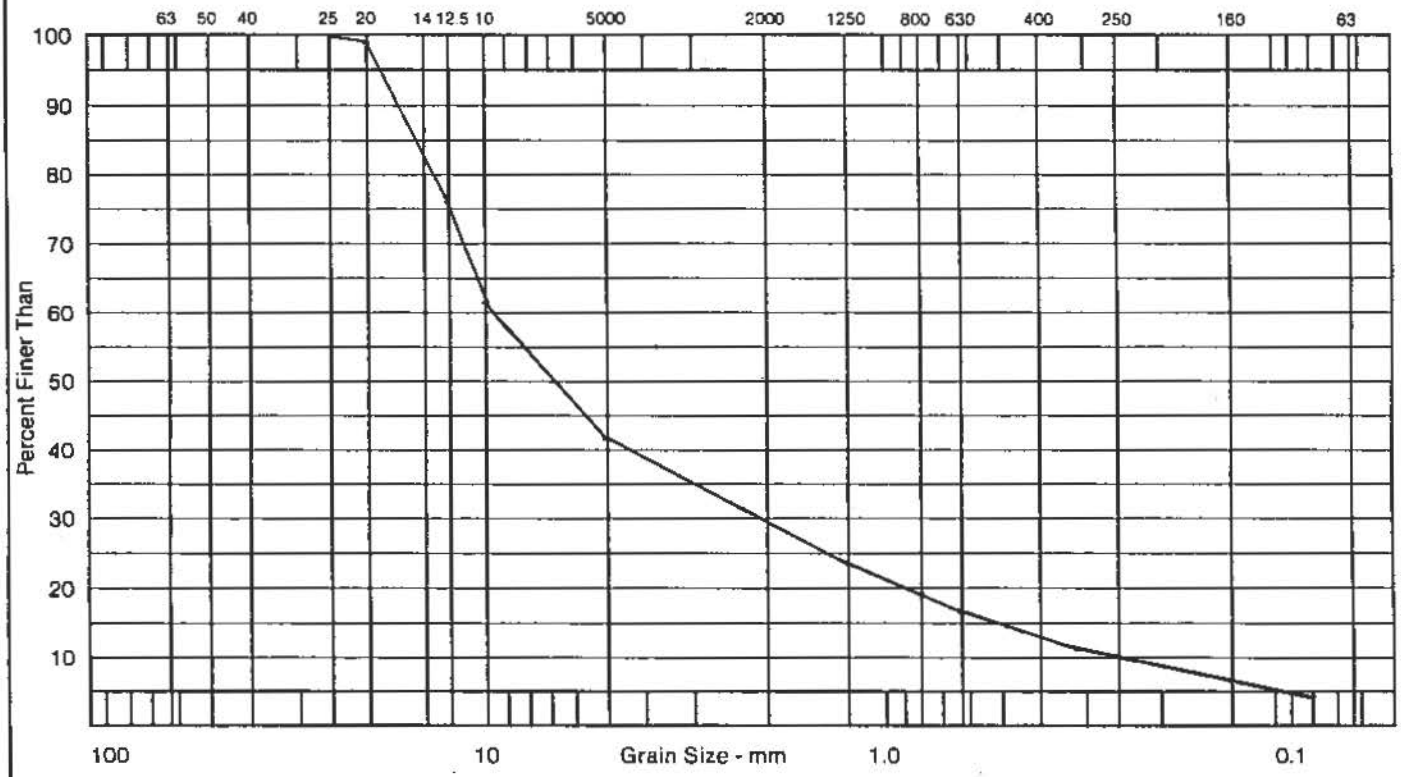
Time of Sieving Min. 15

Method of Preparation Dry Washed X

Remarks

-75.4% crush count (1 or more face)

-L.A. Abrasion & sulphate soundness tests completed.



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CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services, Trans. Engineering Br.
Sample: 44A Depth: 0.00-4.00m Project: km 1490 Alaska Hwy, Geotech Inves.
Location: Made by: LK Job No.: 8002-218
TP #16-92 Ck'd by: WLC Date: 1992/03/15

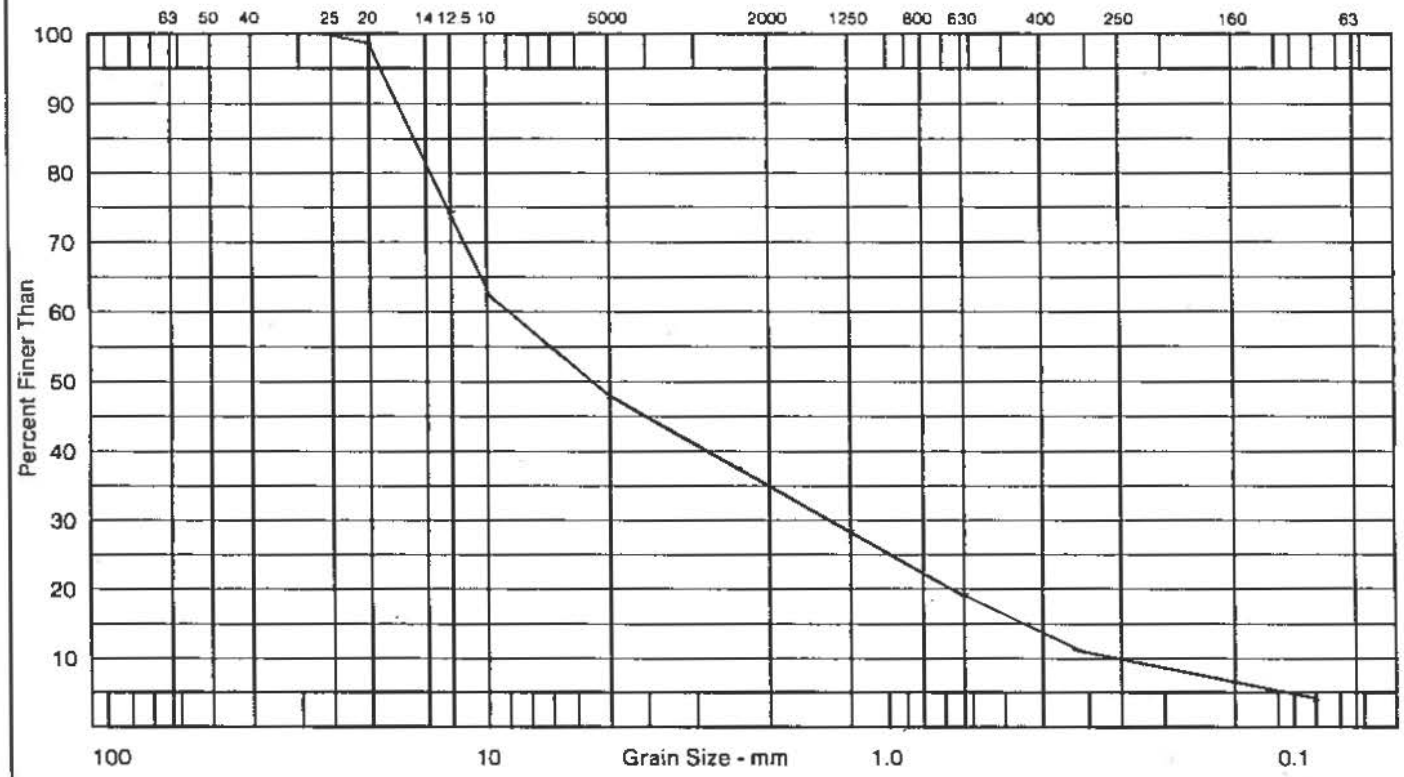
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					
40,000	40.0					
25,000	25.0					100.0
20,000	20.0					98.7
12,500	12.5					74.5
10,000	10.0					62.5
5,000	5.0					47.4
2500	2.5					37.7
1,250	1.25					28.7
800	0.800					22.6
630	0.630					19.2
315	0.315					10.6
250	0.250					
160	0.160					6.4
80	0.080					4.3

Description of Sample: 20mm laboratory crushed sample

Time of Sieving: Min. 15

Method of Preparation: Dry: Washed: X

Remarks:
-69.7% crush count (1 or more face)
-L.A. Abrasion & sulphate soundness tests completed.



J. R. Paine & Associates Ltd.

CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services, Trans. Engineering Br.
Sample: 48A Depth: 0.00-4.00m Project: km 1490 Alaska Hwy, Geotech Inves.
Location: Made by: LK Job No.: 8002-218
TP #17-92 Ck'd by: Date: 1992/03/15

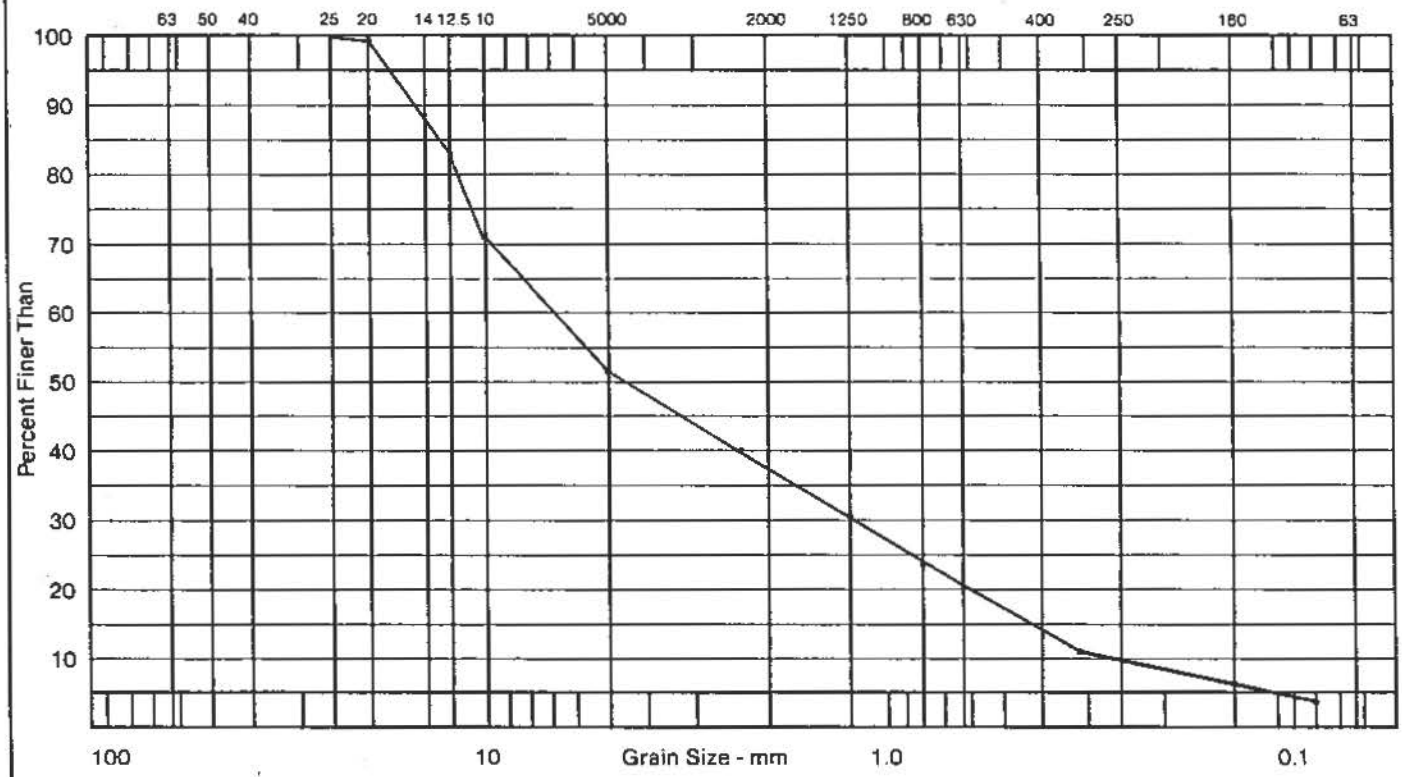
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					
40,000	40.0					
25,000	25.0					100.0
20,000	20.0					99.4
12,500	12.5					83.0
10,000	10.0					70.7
5,000	5.0					51.6
2500	2.5					40.0
1,250	1.25					30.2
800	0.800					23.9
630	0.630					20.4
315	0.315					10.6
250	0.250					
160	0.160					6.0
80	0.080					3.8

Description of Sample
20mm laboratory crushed sample

Time of Sieving Min. 15

Method of Preparation Dry Washed X

Remarks
-60.4% crush count (1 or more face)
-L.A. Abrasion & sulphate soundness tests completed.



J. R. Paine & Associates Ltd.

CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services, Trans. Engineering Br.

Sample: 52A Depth: 0.00-4.00m

Project: km 1490 Alaska Hwy, Geotech Inves.

Location: TP #18-92

Made by: LK Job No.: 8002-218

Ck'd by: [illegible] Date: 1992/03/15

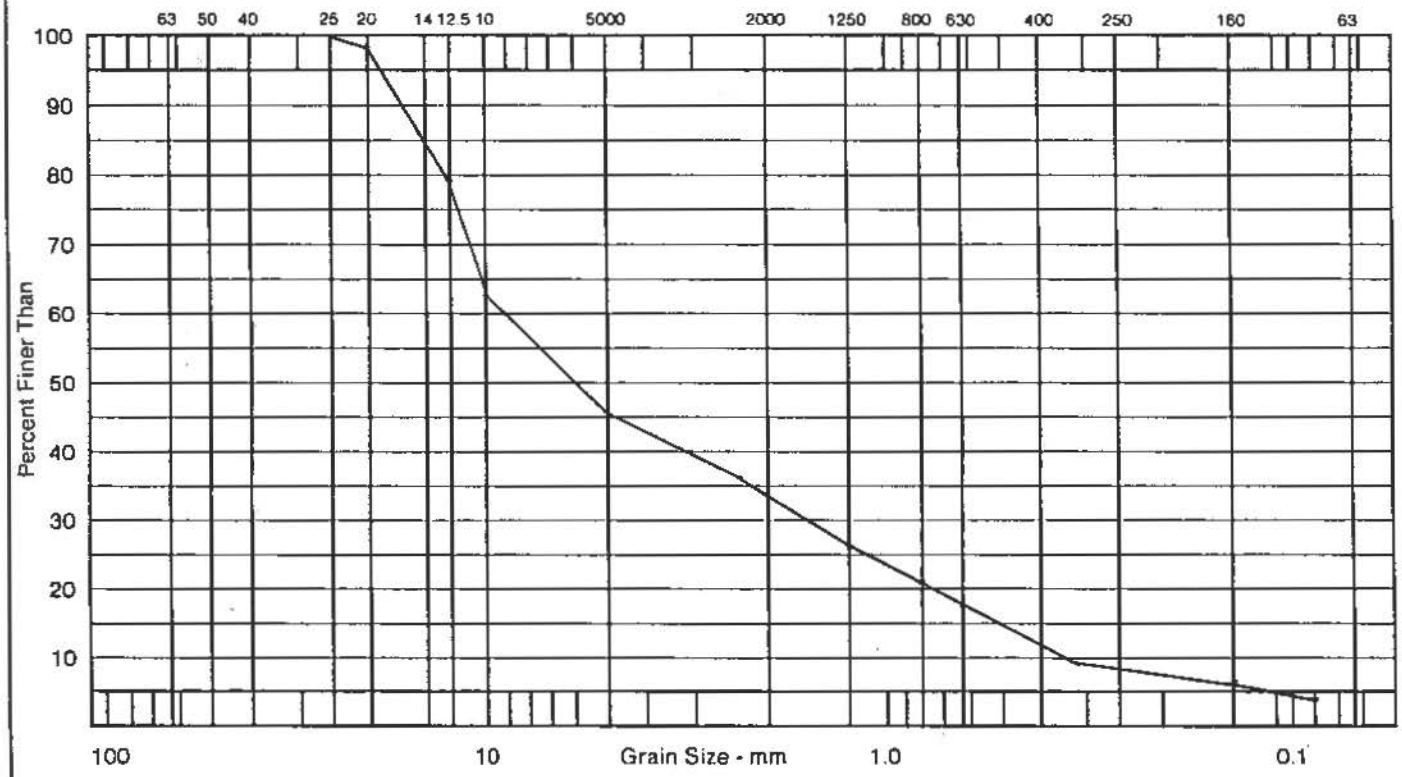
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					
40,000	40.0					
25,000	25.0					100.0
20,000	20.0					98.5
12,500	12.5					79.5
10,000	10.0					63.0
5,000	5.0					45.4
2500	2.5					35.7
1,250	1.25					26.9
800	0.800					20.8
630	0.630					17.6
315	0.315					9.5
250	0.250					
160	0.160					6.1
80	0.080					4.3

Description of Sample: 20mm laboratory crushed sample

Time of Sieving: Min. 15

Method of Preparation: Dry ____ Washed X

Remarks:
-82.2% crush count (1 or more face)
-L.A. Abrasion & sulfate soundness tests completed.



J. R. Paine & Associates Ltd.

CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services, Trans. Engineering Br.

Sample: 56A Depth: 0.00-4.00m Project: km 1490, Alaska Hwy, Geotech Inves.

Location: Made by: LK Job No.: 8002-218

TP #19-92 Ck'd by: WCK Date: 1992/03/15

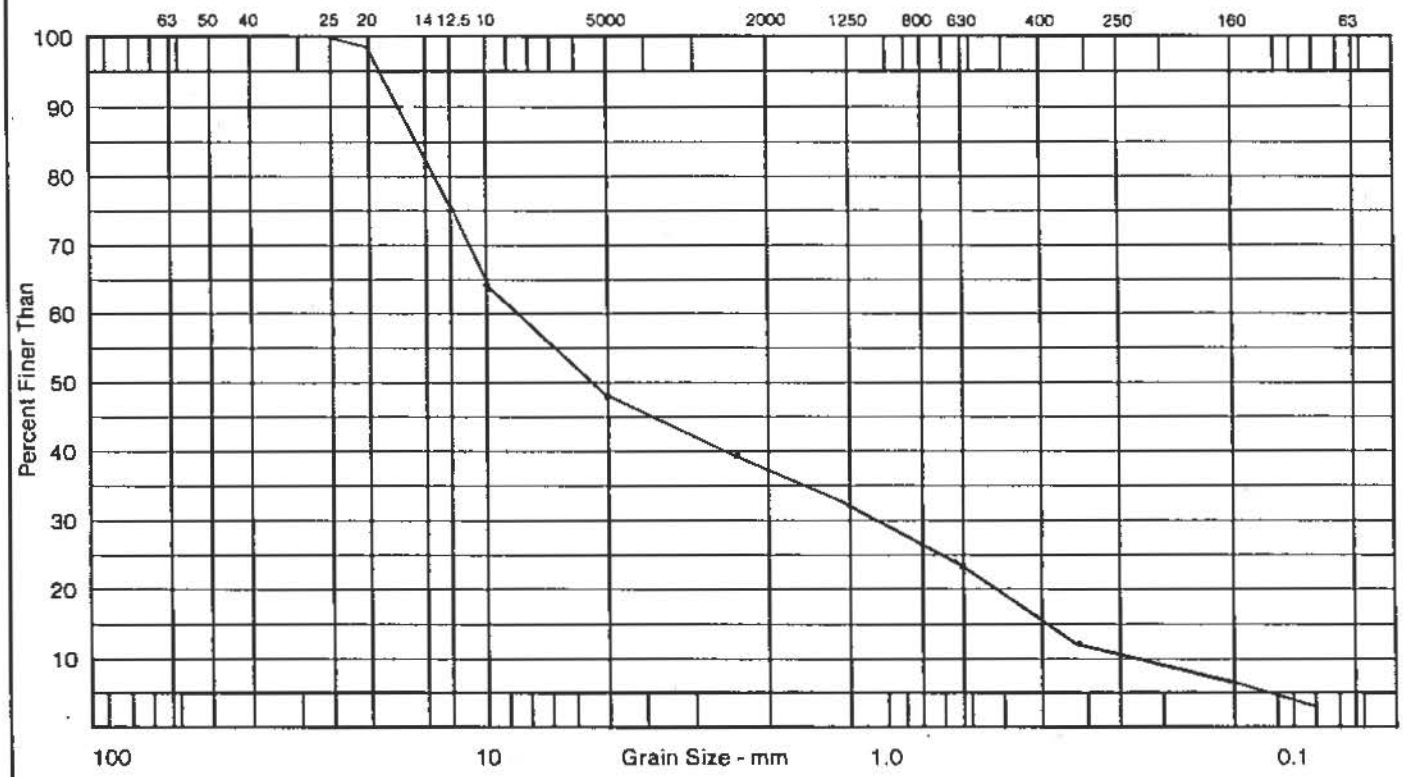
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					
40,000	40.0					
25,000	25.0					100.0
20,000	20.0					98.3
12,500	12.5					75.0
10,000	10.0					64.4
5,000	5.0					47.8
2500	2.5					39.4
1,250	1.25					32.1
800	0.800					26.5
630	0.630					23.4
315	0.315					12.1
250	0.250					
160	0.160					6.4
80	0.080					3.9

Description of Sample: 20mm laboratory crushed sample

Time of Sieving: Min. 15

Method of Preparation: Dry: Washed: X

Remarks: 77.0% crush count (1 or more face) L.A. Abrasion & sulfate soundness tests completed.



J. R. Paine & Associates Ltd.

CONSULTING AND TESTING ENGINEERS

SCREEN ANALYSIS

Client: YTG, C&T Services, Trans. Engineering Br.
Sample: 63A Depth: 0.00-3.40m Project: km 1490 Alaska Hwy, Geotech Inves.
Location: TP #21-92 Made by: LK Job No.: 8002-218
Ck'd by: Date: 1992/03/15

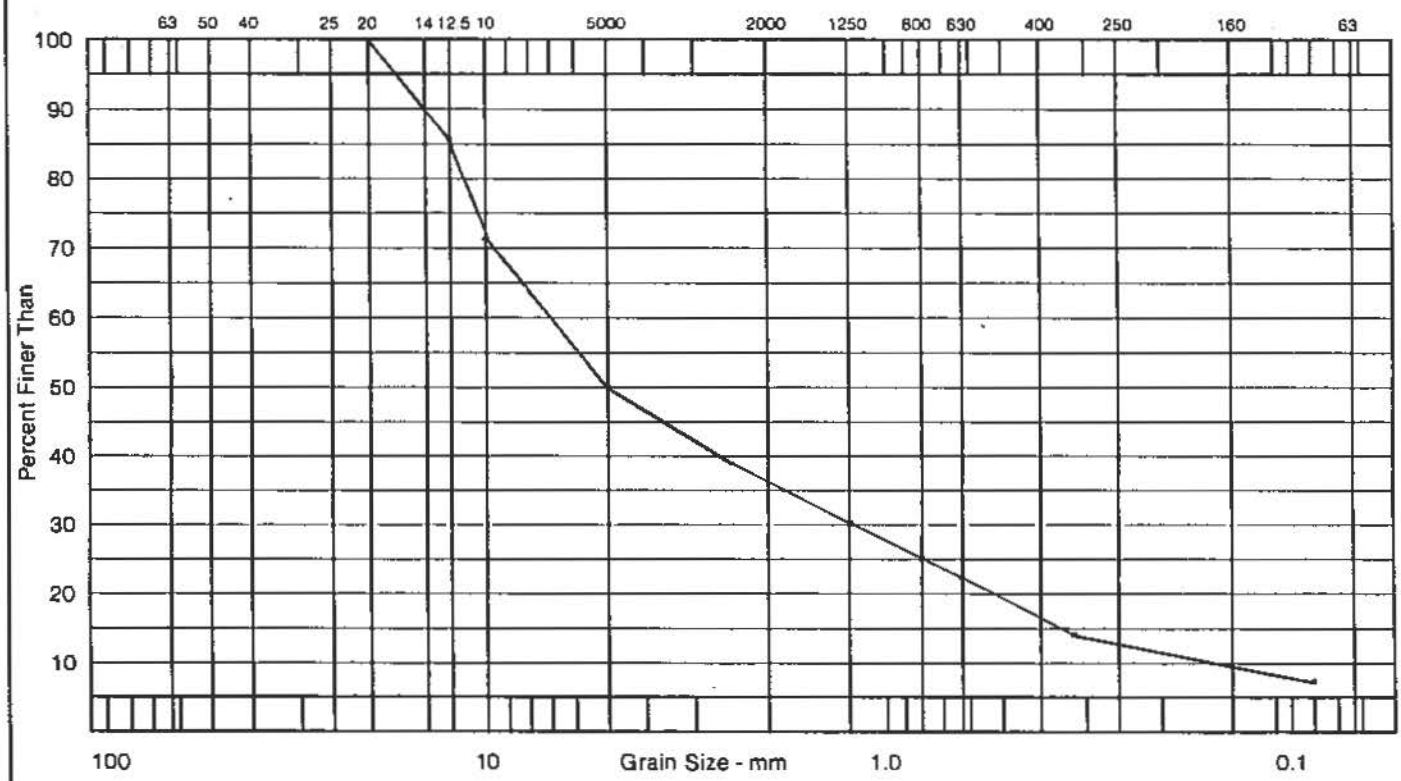
Sieve No.	Size of Opening MM		Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0					
50,000	50.0					
40,000	40.0					
25,000	25.0					
20,000	20.0					100.0
12,500	12.5					85.1
10,000	10.0					71.3
5,000	5.0					50.0
2500	2.5					39.0
1,250	1.25					30.0
800	0.800					25.0
630	0.630					22.5
315	0.315					14.3
250	0.250					
160	0.160					9.5
80	0.080					7.0

Description of Sample: 20mm laboratory crushed sample

Method of Preparation: Dry: Washed: X

Remarks: 62.3% crush count (1 or more face)

Time of Sieving: Min.



APPENDIX "D"
-Highway Construction Material Specifications, (Government of Yukon, Community and Transportation Services, Transportation Engineering Branch)

PART 1 - GENERAL

1.1 Description

.1 This specification covers the specific requirements for aggregates for use as granular courses for sub base and base and shouldering material.

1.2 Measurement for Payment

.1 No payment to be made under this item. Payment to be to the terms of the appropriate Aggregate Production specification.

.2 Pit development, processing, sampling, testing, and stockpiling shall conform to the Aggregate General Section.

PART 2 - PRODUCTS

2.1 Materials Granular A, B, C & F

.1 Granular A, B, C & F shall satisfy all requirements of Tables 1 and 2 of this specification and unless otherwise specified shall be:

Crushed rock composed of hard, uncoated, cubical fragments, produced from rock formations or boulders of uniform quality.

or

Crushed gravel composed of hard, durable, uncoated particles, produced from naturally formed deposits.

2.2 Materials Granular D & E

.1 Granular D and E shall be composed of clean, hard, durable uncoated particles and shall satisfy all requirements of Tables 1 and 2 of this specification for the material required.

.2 Granular D and E shall be obtained from deposits of sand or gravel, talus rock, quarries, disintegrated granite, mine waste, or other suitable granular materials.

.3 Crushing of Granular D and E shall not be required except that the Contractor may, at his option, elect to crush any oversize present in the deposit as an alternative to screening.

2.3 Physical Requirements

.1 Irrespective of compliance with the physical requirements, aggregates may be accepted or rejected based on past field performance.

TABLE 1
AGGREGATE GRADATION TABLE
GRANULAR COURSE MATERIAL .

C.G.S.B. 8-GP-2M Sieve Designation	Percent Passing by Mass					
	Gran "A" 20 mm Crushed Base Course Aggregate	Gran "B" 50 mm Crushed Sub Base Course Aggregate	Gran "C" 80 mm Crushed Sub Base Course Aggregate	Gran "D" 80 mm Pit Run Sub Base Course Aggregate	Gran "E" 200 mm Pit Run Sub Base Course Aggregate	Gran "F" 20 mm Crushed Runway Surfacing Aggregate
200,000 um	----	----	----	----	100	
80,000 um	----	----	100	100	75 - 100	
50,000 um	----	100	----	----	----	
25,000 um	----	55 - 100	55 - 100	55 - 100	55 - 100	
20,000 um	100	----	----	----		100%
12,500 um	64 - 100	38 - 71	42 - 84	42 - 84	42 - 84	
10,000 um						52 - 86
5,000 um	36 - 72	22 - 54	26 - 65	26 - 65	26 - 65	36 - 66
2,500 um						26 - 51
1,250 um	12 - 42	9 - 33	11 - 47	11 - 47	11 - 47	21 - 43
315 um	4 - 22	3 - 20	3 - 30	3 - 30	3 - 30	13 - 26
80 um	3 - 6	0 - 7	0 - 8	0 - 8	0 - 8	5.5 - 10.5

TABLE 2
PHYSICAL REQUIREMENTS
GRANULAR COURSE MATERIALS

Physical Test	Gran "A" 20 mm Crushed Base Course Aggregate	Gran "B" 50 mm Crushed Sub Base Course Aggregate	Gran "C" 80 mm Crushed Sub Base Course Aggregate	Gran "D" 80 mm Pit Run Sub Base Course Aggregate	Gran "E" 200 mm Pit Run Sub Base Course Aggregate	Gran "F" 20 mm Crushed Runway Surfacing Aggregate
Los Angeles Abrasion ASTM C131 Gradation "B" Percent Max.	35	35	35	35	35	35
Percent Crushed Minimum *	60%	20%	20%	----	----	60%
Liquid Limit ASTM D4318 Percent Maximum	25	25	25	25	25	25
Plasticity Index ASTM D4318 Percent Maximum	6	6	6	6	6	6

*The percent of crushed material will be determined by examining the fraction retained on the 5,000 um sieve and dividing by the mass of the crushed particles by the total mass retained on the 5,000 um sieve.

PART 1 - GENERAL

1.1 Description

.1 This specification covers the specific requirements for aggregates for use as Bituminous Surface Treatment.

1.2 Measurement for Payment

.1 No payment to be made under this item. Payment to be to the terms of the appropriate aggregate production specification.

.2 Pit development, processing, sampling, testing, and stockpiling shall conform to the Aggregate General Section.

PART 2 - PRODUCTS

2.1 Materials

.1 B.S.T. Aggregate shall satisfy all requirements of Tables 1 and 2 of this specification and unless otherwise specified shall be:

Crushed rock composed of hard, uncoated, cubical fragments, produced from rock formations or boulders of uniform quality.

or

Crushed gravel composed of hard, durable, uncoated particles, produced from naturally formed deposits.

2.2 Physical Requirements

.1 Irrespective of compliance with the physical requirements, aggregates may be accepted or rejected based on past field performance.

Table 1

C.G.S.B. 8-GP-2M Sieve Designation	Percent Passing Designated Sieve		
	Type I 12.5 mm B.S.T. Aggregate	Type II 20 mm B.S.T. Aggregate	Type III 16 mm B.S.T. Aggregate
20,000 um	----	100	----
16,000 um	----	----	100
12,500 um	100	63 - 89	----
10,000 um	82 - 100	----	70 - 90
5,000 um	42 - 72	36 - 56	32 - 60
2,500 um	27 - 52	18 - 38	22 - 46
1,250 um	19 - 36	12 - 30	15 - 34
315 um	9 - 23	4 - 18	7 - 15
80 um	0 - 5	0 - 5	0 - 5

Table 2

Physical Test	Type I 12.5 mm B.S.T. Aggregate	Type II 20 mm B.S.T. Aggregate	Type III 16 mm B.S.T. Aggregate
Los Angeles Abrasion ASTM C131 Gradation "B" Percent Max Loss	25	25	25
Percent Crushed Minimum*	60%	60%	60%
Flat & Elongated Particles Ratio 5:1 Percent Maximum	8	8	8

*The percent of crushed material will be determined by examining the fraction retained on the 5,000 um sieve and dividing by the mass of the crushed particles by the total mass retained on the 5,000 um sieve.

PART 1 - GENERAL

1.1 Description

.1 This specification covers the specific requirements for aggregates for use as Hot Mix Paving.

1.2 Measurement for Payment

.1 No payment to be made under this item. Payment to be to the terms of the appropriate aggregate production specification.

.2 Pit development, processing and stockpiling shall conform to Aggregate General Section.

PART 2 - PRODUCTS

2.1 Materials

.1 Hot Mix Paving Aggregate shall satisfy all requirements of Tables 1 and 2 of this specification and unless otherwise specified shall be:

Crushed rock composed of hard, uncoated, cubical fragments, produced from rock formations or boulders of uniform quality.

or

Crushed gravel composed of hard, durable, uncoated particles, produced from naturally formed deposits.

.2 Coarse aggregates shall meet quality requirements of ASTM D692-71.

.3 Fine aggregates shall consist of natural sand and/or manufactured material derived from crushing stone, slag or gravel. All particles shall be clean, durable, moderately sharp and free from coatings of clay, silt or other deleterious materials and shall contain no organic matter.

2.2 Physical Requirements

.1 Irrespective of compliance with the physical requirements, aggregates may be accepted or rejected based on past field performance.

2.4 Gradation

.1 Gradation of aggregates blended to job mix formula to be within the limits shown in Table I when tested to ASTM C117 and ASTM C136 (AASHTO T27 and T11) and giving smooth curve without sharp breaks when plotted on semi-log grading chart.

.2 Coarse aggregate is aggregate retained on 5,000 um sieve and fine aggregate is aggregate passing 5,000 um sieve.

.3 When dryer drum mixing plant is used, process aggregate through a 5,000 um sieve and stockpile fine aggregate separately from coarse aggregate.

Table I

C.G.S.B. 8-GP-2M Sieve Designation	Percent Passing Designated Sieve			
	Type I Sand Mix	Type II 12.5 mm	Type III 16 mm	Type IV 20 mm
20,000 um	100	100		100
16,000 um			100	
12,500 um	100	100		83 - 100
10,000 um	83 - 100		75 - 100	72 - 92
5,000 um	47 - 81	55 - 75	50 - 72	50 - 70
2,500 um	33 - 65			36 - 55
2,000 um		35 - 55	32 - 51	
1,250 um	24 - 51			27 - 42
630 um	17 - 41			18 - 30
400 um		15 - 30	15 - 27	
315 um	13 - 30			14 - 24
160 um	7 - 19	5 - 16		8 - 16
80 um	3 - 10	3 - 8	3 - 8	4 - 10

Table II

Physical Tests for
Type I, II & III Hot Mix Aggregate

Physical Test	Fine Aggregate	Coarse Aggregate	
Los Angeles Abrasion ASTM C131 Gradation "B" Max Percent Loss	---	35	
Percent Crushed Minimum * (Minimum 1 freshly fractured face)	---	60	
Sand Equivalent ASTM D2419 (AASHTO T176) Minimum	35	---	
Magnesium Sulphate Soundness ASTM C88 (AASHTO T104) Max % Loss	16	12	
Absorption ASTM C127 (AASHTO T35) Max % by Mass	---	1.75	
Loss by Washing ASTM C117 (AASHTO T11) Max % Passing Sieve	---	1.5	
Light Weight Particles (Specific Gravity less than 1.95) ASTM C123 AASHTO T150 Max % By Mass		1.5	For Surface Course Only
Flat & Elongated Particles Ratio greater than 5:1 Max % by Mass	---	15	
Liquid Limit ASTM D423	25	---	
Plasticity Index ASTM D424	4	---	

*The percent of crushed material will be determined by examining the fraction retained on the 5,000 um sieve and dividing by the mass of the crushed particles by the total mass retained on the 5,000 um sieve.

2.5 Mineral Filler:

.1 Finely ground particles of limestone, hydrated lime, Portland cement or other approved non-plastic mineral matter, thoroughly dry and free from lumps.

.2 Add mineral filler when necessary to meet job mix aggregate gradation or as directed to improve mix properties.

.3 Mineral filler to be dry and free flowing when added to aggregate.

2.6 Blend Sand:

.1 Shall be one or a blend of following:

.1 Natural Sand.

.2 Manufactured Sand.

.3 Screenings produced in crushing of quarried rock, boulders or gravel.

.2 Add blend sand when necessary to meet job mix aggregate gradation or as directed, to improve mix properties.

.3 Blend sand to be sufficiently dry to be free flowing when added to aggregate.

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

Yukon Government

INTER-OFFICE MEMORANDUM

TO: Florian

FROM: Walt

OUR FILE:

YOUR FILE:

DATE: 01 Sept 92

DEPARTMENT: S-3

SUBJECT: Km 1490 pit. Alaska Hwy

Can you please discuss this pit with Glynnis ASAP re: history of development plan etc.

Thanx

Walt.

APPENDIX "F"
-Photograph Summary and Photographs

HOGGAN ENGINEERING & TESTING (1980) LTD.

PHOTOGRAPH SUMMARY SHEET

PROJECT: Geotechnical Investigation
Kilometer 1490, Alaska Highway (Right)
Yukon Territory, "1992"

DATE: 1992/03/03

CLIENT: GOVERNMENT OF YUKON
Community and Transportation Services
Transportation Engineering Branch S-3
Box 2703
Whitehorse, Yukon
Y1A 2C6

PROJECT: 8002-218

ATTENTION: Mr. Ian Blown, Geotechnical Projects Manager

PHOTOGRAPH #	DESCRIPTION
1	-Test Hole #11-92, underlying silt materials.
2, 3, 4,	-Panoramic view of existing borrow area taken from Test Hole #11-92, location looking east (P#2), north - east (P#3) and north (P#4).
5	-Test Hole #12-92 looking at south - east bank of existing pit.
6	-Test Pit #15-92, spill pile.
7	-Test Pit #16-92, sample spill pile.

PHOTO #1, TP 12-92

PHOTO #2, TP 12-92, WEST WALL

HOGGAN ENGINEERING & TESTING (1980) LTD.

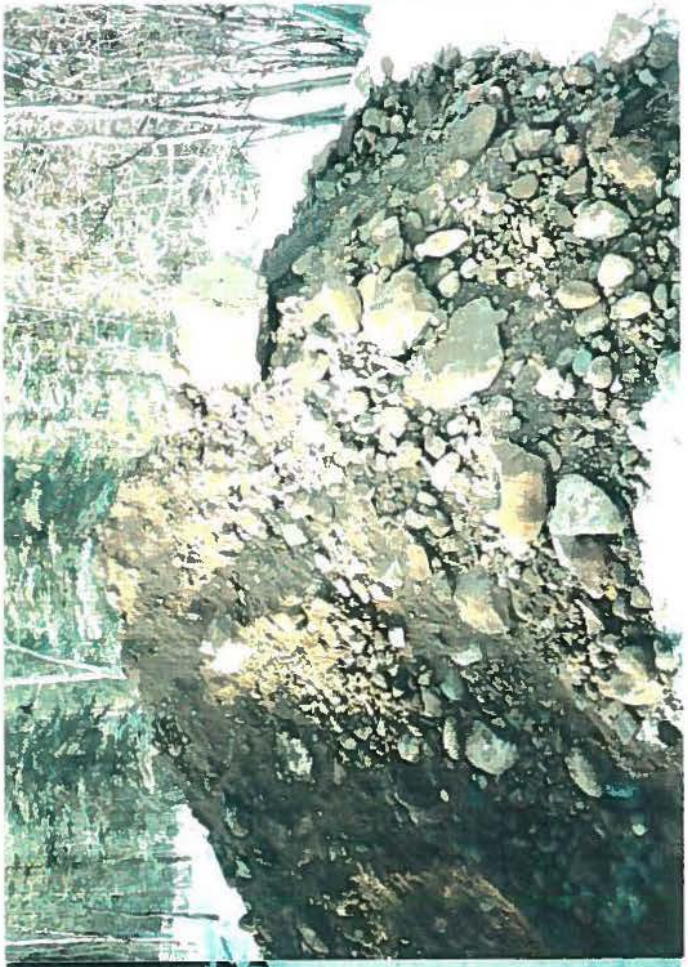


PHOTO #6, TP15-92

PHOTO #5, EXISTING PIT

PHOTO #7, TP16-92

HOGGAN ENGINEERING & TESTING (1980) LTD.

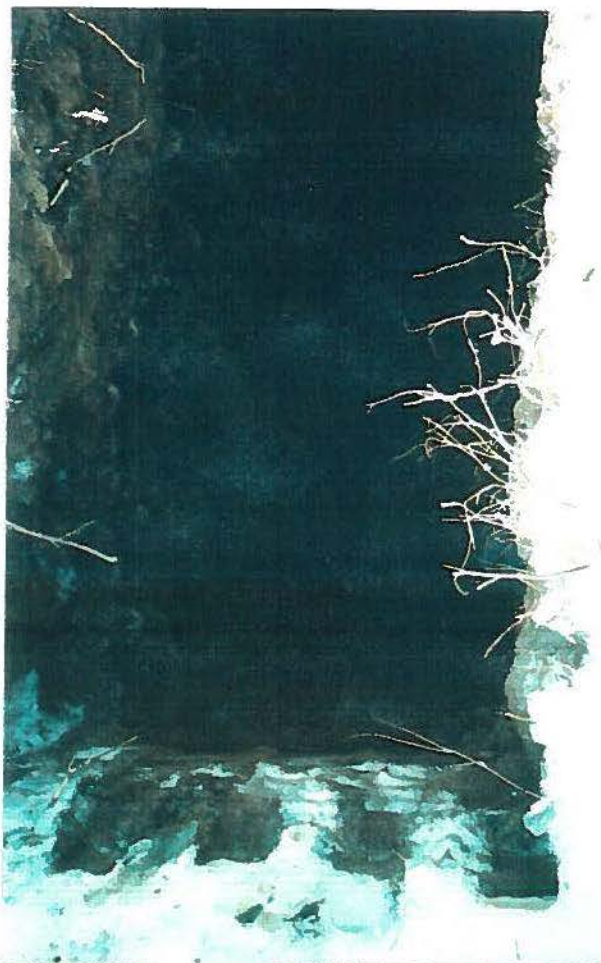


PHOTO #14 - TEST PIT 20-92

PHOTO #15 - TEST PIT 20-92

PHOTO #16 - TEST PIT 21-92

GR-01
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