

HOGGAN ENGINEERING & TESTING (1980) LTD.

GEOTECHNICAL INVESTIGATION

SOUTH ACCESS PUBLIC QUARRY

WHITEHORSE, YUKON

JUNE, "1992"



HOGGAN ENGINEERING & TESTING (1980) LTD.

REPORT NUMBER: 8002-222

**GEOTECHNICAL INVESTIGATION
SOUTH ACCESS PUBLIC QUARRY
WHITEHORSE, YUKON TERRITORY, "1992"**

PREPARED BY:

HOGGAN ENGINEERING & TESTING (1980) LTD.



A circular red seal for a Professional Engineer in Yukon Territory. The outer ring contains the text "PROFESSIONAL ENGINEER" at the top and "YUKON TERRITORY" at the bottom. In the center, the name "WILBUR C. KOFOED" is printed. A handwritten signature in black ink is written over the seal.

WILBUR C. KOFOED, P. ENG

JUNE, 1992

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

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REPORT NUMBER: 8002-222

GEOTECHNICAL INVESTIGATION

SOUTH ACCESS PUBLIC QUARRY

WHITEHORSE, YUKON TERRITORY, "1992"

TABLE OF CONTENTS

<u>CHAPTER</u>	<u>PAGE</u>
INTRODUCTION.....	1
SITE DESCRIPTION.....	2
SUBSURFACE SOIL PROFILES AND AGGREGATE ASSESSMENT.....	2
PROJECTED AGGREGATE QUANTITY.....	3
SITE DEVELOPMENT.....	3
SUPPLEMENTAL.....	3
APPENDIX "A"	
-Site Sketch	
APPENDIX "B"	
-Test Pit Logs	
APPENDIX "C"	
-Laboratory Test Summary Sheets	
APPENDIX "D"	
-Photograph Summary and Photographs	

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GEOTECHNICAL INVESTIGATION

PROJECT: Geotechnical Investigation
South Access Public Quarry
Whitehorse, Yukon Territory, "1992"

LOCATION: South Access
Whitehorse, Yukon

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

Attention: Mr. Iain Blown, Geotechnical Projects Manager

INTRODUCTION

This report presents the results of the geotechnical investigation conducted in the vicinity of the South Access Public Quarry in Whitehorse, Yukon Territory.

The objective of the investigation was to obtain subsurface soil profile data to detail the potential of the proposed borrow source for highway construction materials.

The investigation of the potential borrow source consisted of conducting a test pit excavating program and a onsite reconnaissance of the potential borrow area.

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 June 5, 1992. The field work was initiated June 8, 1992.

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SITE DESCRIPTION

The South Access Public Quarry is located south of the South Access Road approximately 600 meters east of the Alaska Highway.

The investigation area was the bottom of the existing South Access Public Quarry which encompasses the north and east centre portions of the actual public lease and extends north and north east of the lease.

The proposed source area (quarry bottom) is generally level with no vegetation regrowth.

The proposed source area is presently occupied by spill piles of overburden and clearing randomly located.

SUBSURFACE SOIL PROFILES AND AGGREGATE ASSESSMENT

The subsurface soil investigation consisted of excavating 5 test pits to a minimum depth of 4.0 meters with a 225 Caterpillar Backhoe. The location of the test pits have been shown on a site sketch enclosed in the appendix of this report.

The subsurface soil profiles are given in detail on the individual soil profile logs enclosed in the appendix of this report. However, in general, soil profile consisted of a surface stratum of fine to medium grained sands and silty sands at 4 of the 5 test pits excavated. The surface sand stratum ranged in depth from 0.30 meters to 1.0 meters at Test Pits 92-39 and 92-36, respectively. Underlying the surface sands and below the ground surface at Test Pit 92-38 were silt and clayey silt materials. The silt materials were generally found to be wet with moisture contents at or near the liquid limit at the ground surface and decreasing to near the plastic limit with depth: The silt and clayey silt materials extended to the maximum depth of excavation at the 5 test pit locations.

In addition to the test pits excavated as part of this investigation a number of test pits excavated within the south (generally vegetated) portion of the site were viewed. These test pits were excavated by a dozer and shallow in nature. Within the 1.2 meter to 1.8 meter depth of pit the soils exposed were low to medium plastic silts and clayey silts as noted in the existing developed quarry area.

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The materials encountered within the existing developed limits of the South Access Quarry are of limited value as highway construction materials.

-The thin surface stratum of sand and silty sand varies from nonexistent to 1.0 meter in depth and will be contaminated with organics and stripping materials.

-The underlying silt and clayey silt materials are wet, sensitive to disturbance, frost susceptible and would have a low bearing capacity.

PROJECTED AGGREGATE QUANTITY

No estimates of suitable highway construction materials will be made for this site.

SITE DEVELOPMENT

Due to the lack of suitable highway construction materials on this site, it is recommended that further development on this site be limited.

It is possible that small quantities of sandy materials, in the magnitude of possibly 100 cubic meters, will exist in discontinuous locations. However, in general, the granular borrow source would be considered depleted.

Reclamation of the public pit quarry area should be undertaken in lieu of the depleted granular reserves. This reclamation is critical on the existing north bank feed area north of the public pit lease. This bank facilitates a visual buffer between the South Access and the public pit area.

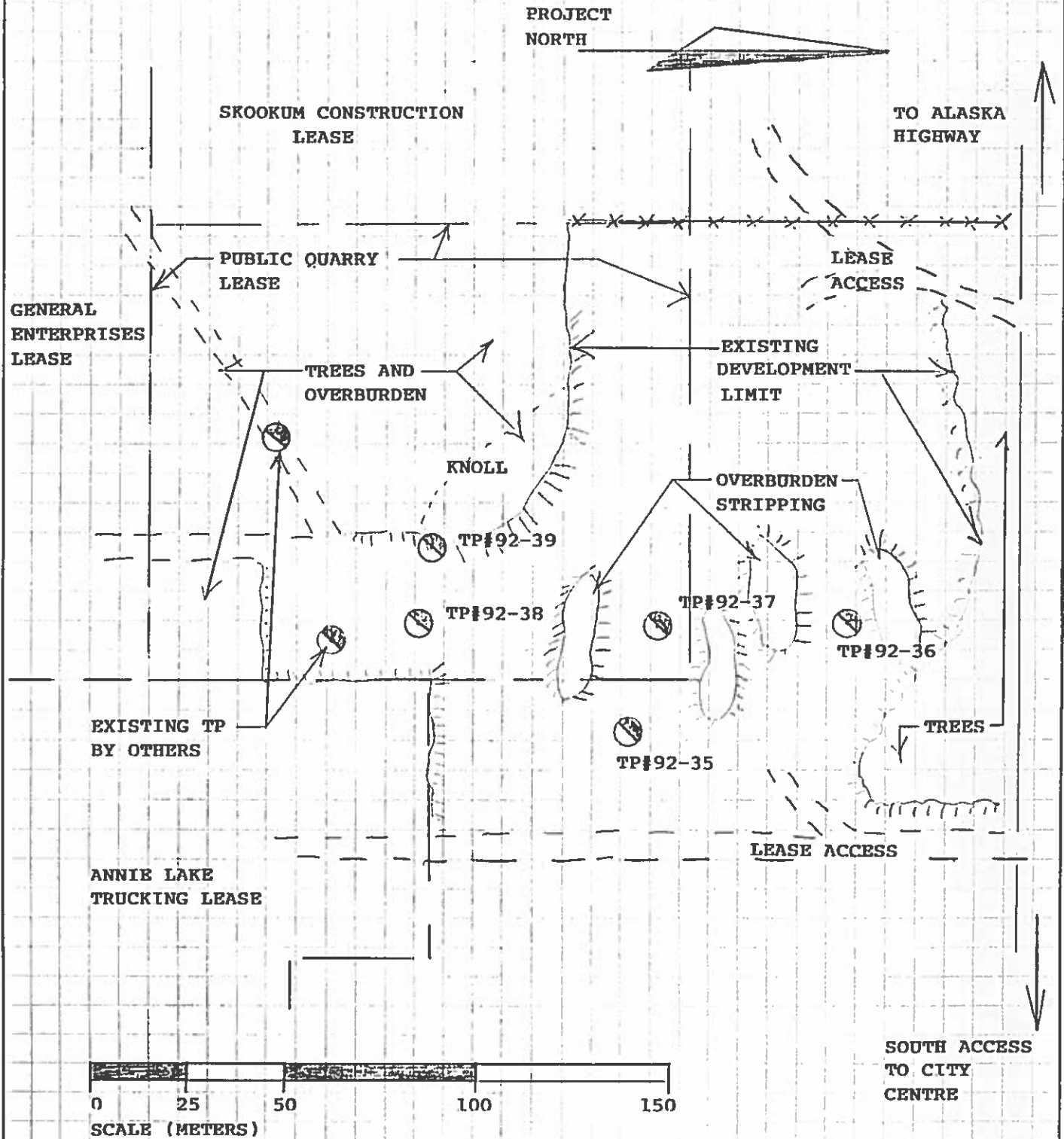
SUPPLEMENTAL

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

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APPENDIX "A"
-Site Sketch

SITE SKETCH



J. R. Paine & Associates Ltd.

CONSULTING AND TESTING ENGINEERS

**GEO TECHNICAL INVESTIGATION
SOUTH ACCESS PUBLIC QUARRY,
WHITEHORSE, YUKON TERRITORY**

Dwn. By AB/WCK

Date 1992/06/26

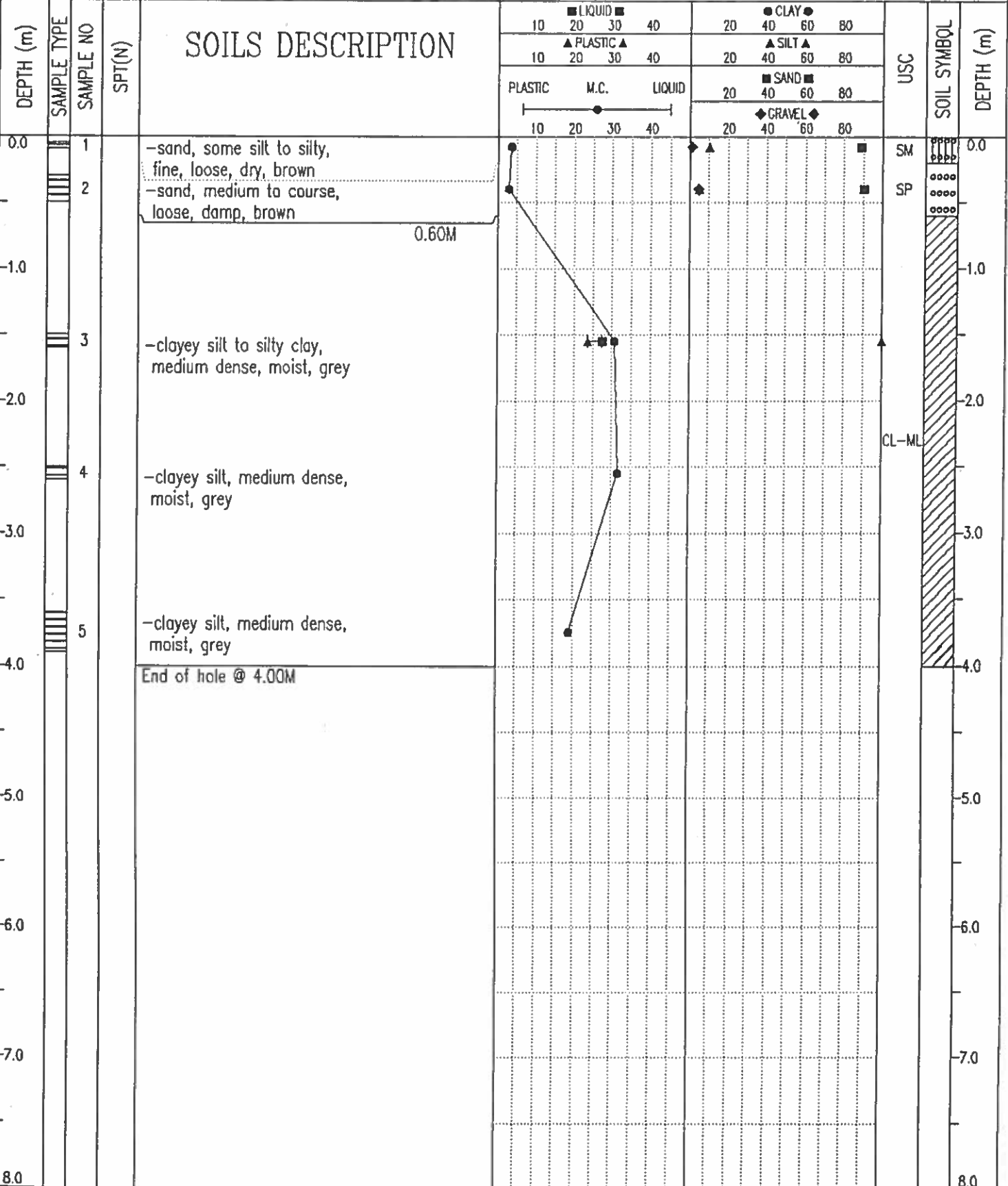
Scale AS SHOWN

Plate No. 1

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**APPENDIX "B"
-Test Pit Logs**

SAMPLE TYPE TUBE LOST AUGER BULK SPT CORE



YTG, C&T SERVICES, TRANSPORTATION ENG.

GEOTECHNICAL INVESTIGATION SOUTH ACCESS

TESTPIT No: TP#92-36

IBEX CONTRACTING

Project No: 8002-222

225 CATERPILLAR BACKHOE

ELEVATION: 0.0 (m)

SAMPLE TYPE TUBE

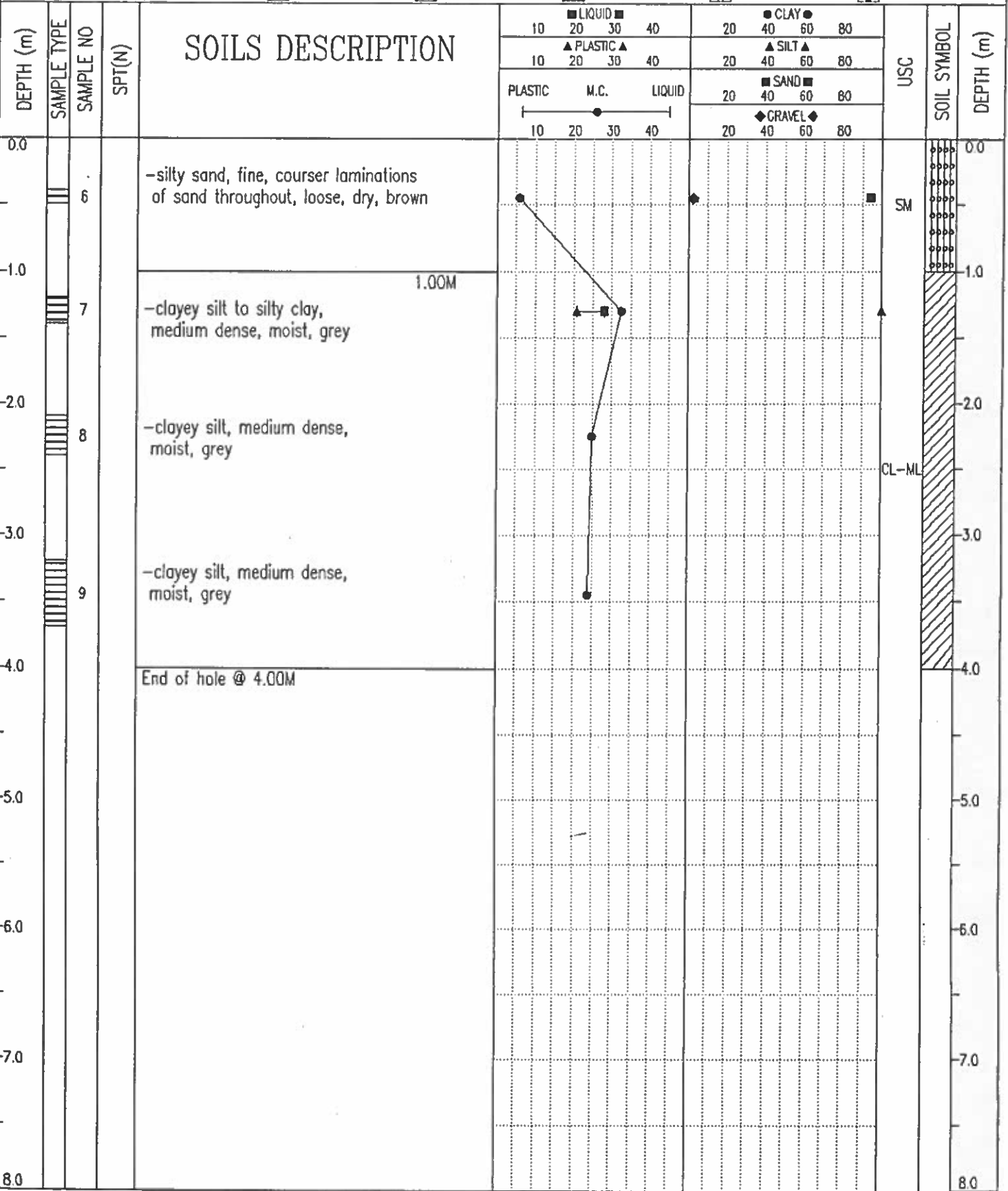
LOST

AUGER

BULK

SPT

CORE



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

LOGGED BY: AB MK

REVIEWED BY: WCK

Fig. No: 2

COMPLETION DEPTH: 4.0 m

COMPLETE: 92/06/08

YTG, C&T SERVICES, TRANSPORTATION ENG.

GEOTECHNICAL INVESTIGATION SOUTH ACCESS

TESTPIT No: TP#92-38

IBEX CONTRACTING

Project No: 8002-222

225 CATERPILLAR BACKHOE

ELEVATION: 0.0 (m)

SAMPLE TYPE TUBE

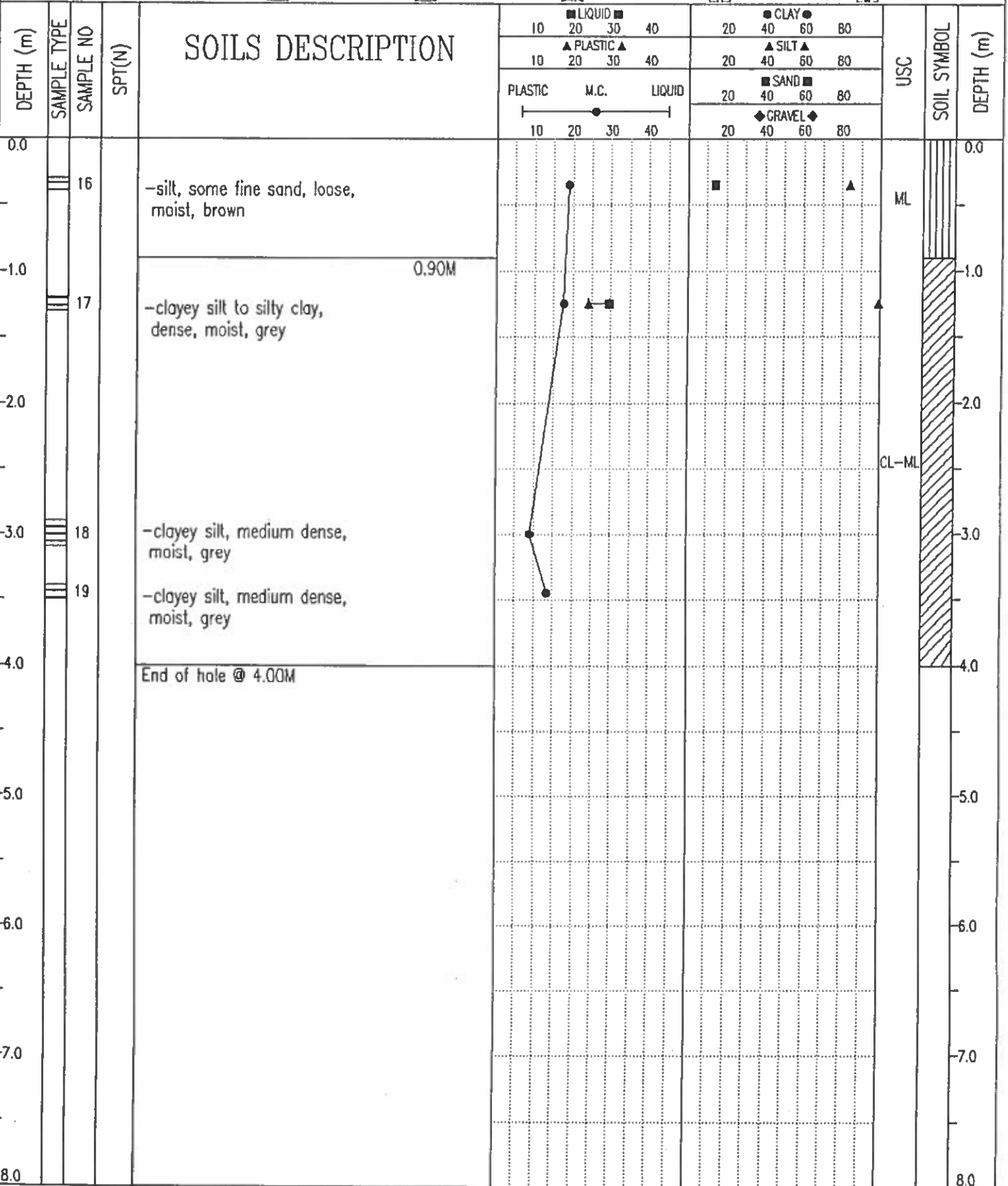
LOST

AUGER

BULK

SPT

CORE



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

LOGGED BY: AB MK

REVIEWED BY: WCK

Fig. No: 4

COMPLETION DEPTH: 4.0 m

COMPLETE: 92/06/08

Page 1 of 1

YTG, C&T SERVICES, TRANSPORTATION ENG.

GEOTECHNICAL INVESTIGATION SOUTH ACCESS

TESTPIT No: TP#92-39

IBEX CONTRACTING

Project No: 8002-222

225 CATERPILLAR BACKHOE

ELEVATION: 0.0 (m)

SAMPLE TYPE TUBE

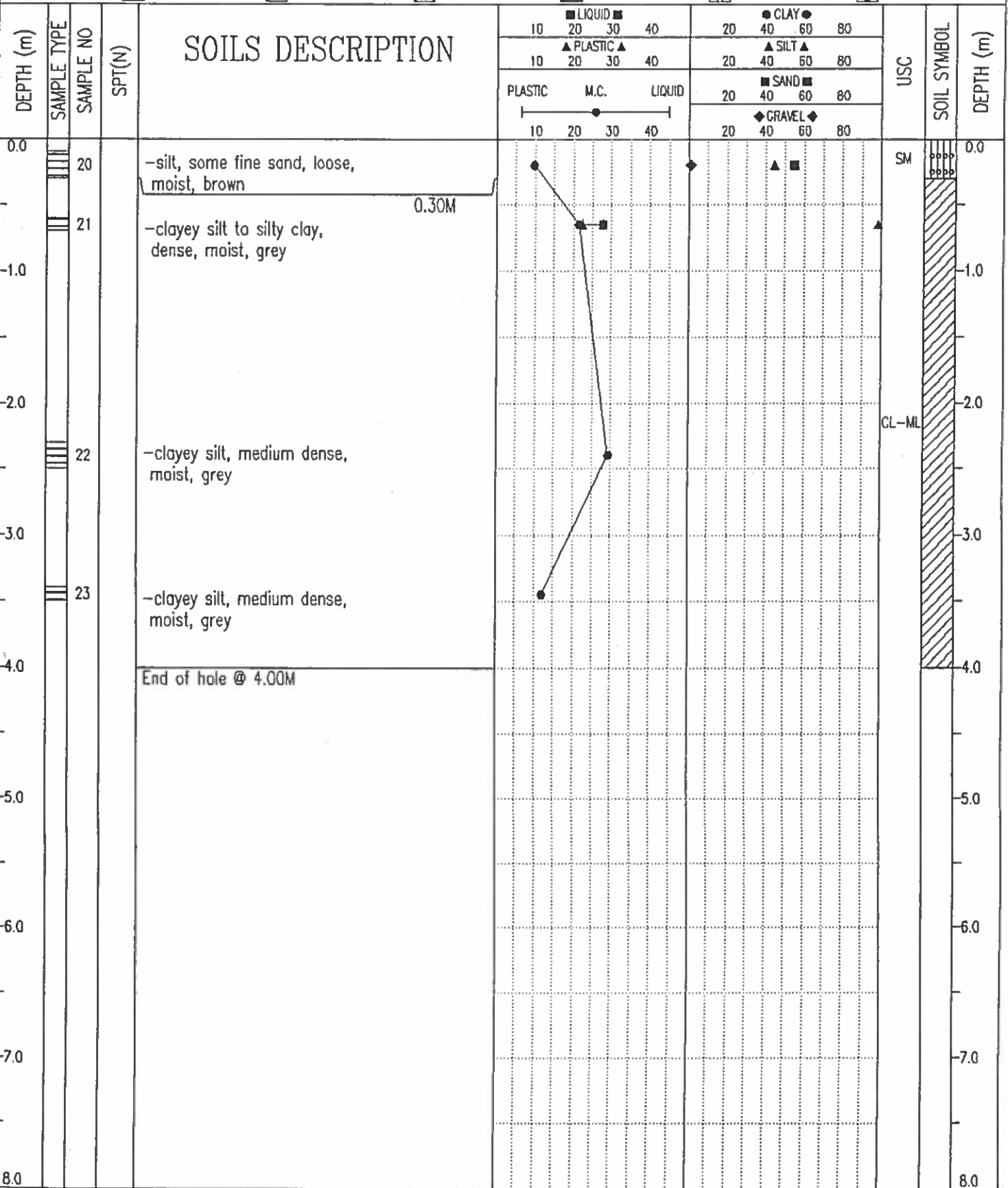
LOST

AUGER

BULK

SPT

CORE



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

LOGGED BY: AB MK

REVIEWED BY: WCK

Fig. No: 5

COMPLETION DEPTH: 4.0 m

COMPLETE: 92/06/08

Page 1 of 1

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APPENDIX "C"
-Laboratory Test Summary Sheets



HOGGAN ENGINEERING & TESTING (1980) LTD.

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3051 Parsons Road, Edmonton, Alberta T6N 1C8

Sample: 1 Depth: 0.1-0.2m

Client: YTG, C&T Services, Transportation Eng'
Project: Geotechnical Investigation South Access

Location: TP#35-92

Made by: AB Job No.: 8002-222

Ck'd by: WCL Date: 1992/06/15

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				
12.500	12.5				100.0
10.000	10.0				
5.000	5.0				98.9
2500	2.5				97.5
1.250	1.25				93.6
800	0.800				
630	0.630				
400	0.400				
375	0.375				45.7
160	0.160				
80	0.080				10.1

Description of Sample _____

Method of Preparation _____ Dry _____ Washed X

Sand, SW-SM

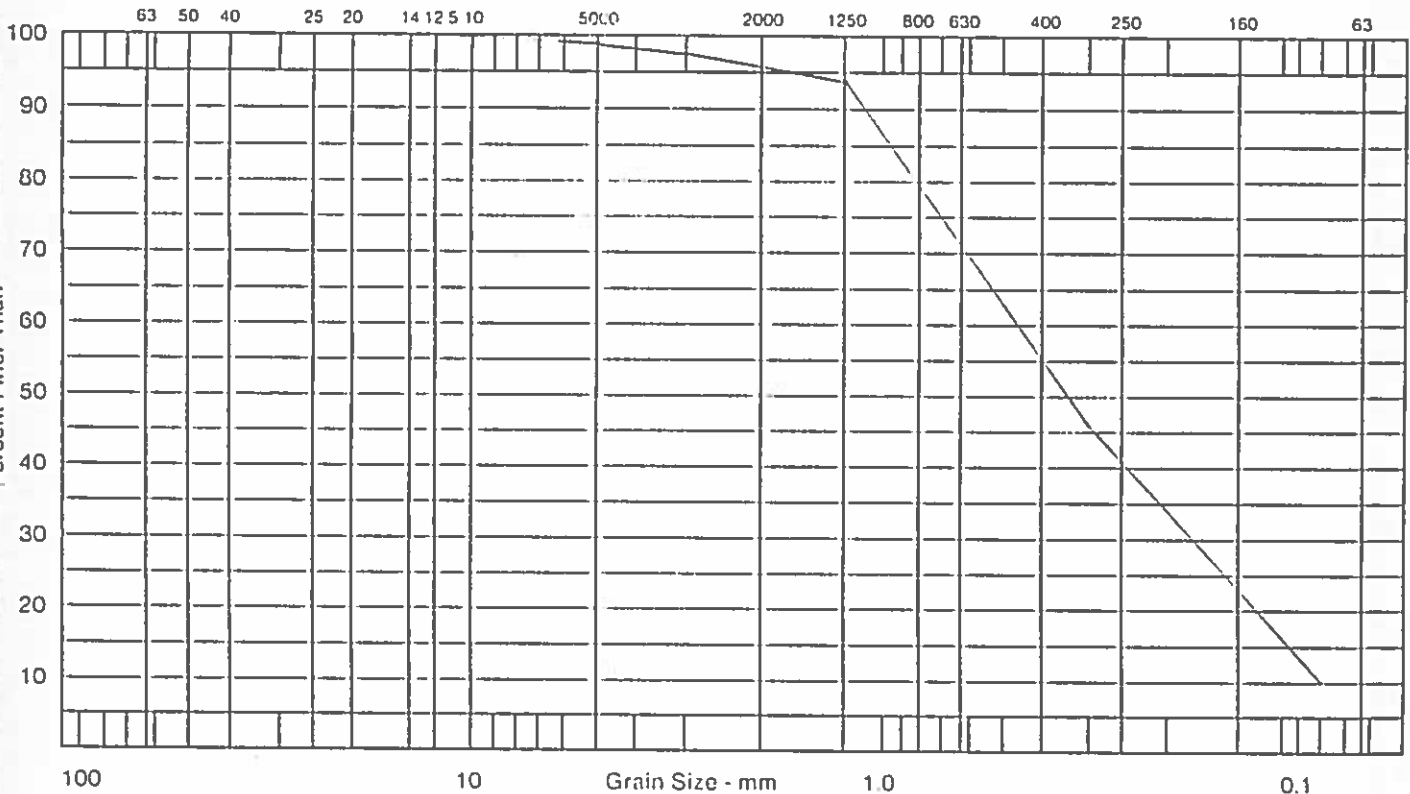
Remarks _____

Gravel 1.1%

Sand 88.8%

Silt 10.1%

Time of Sieving _____ Min. 15





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3051 Parsons Road, Edmonton, Alberta T6N 1C8

Client: YTG, C&T Services, Transportation Eng'
 Project: Geotechnical Investigation South Access
 Sample: 2 Depth: 0.4-0.6m Made by: AB Job No.: 8002-222
 Location: _____ Ck'd by: WCB Date: 1992/06/15
TP#135-92

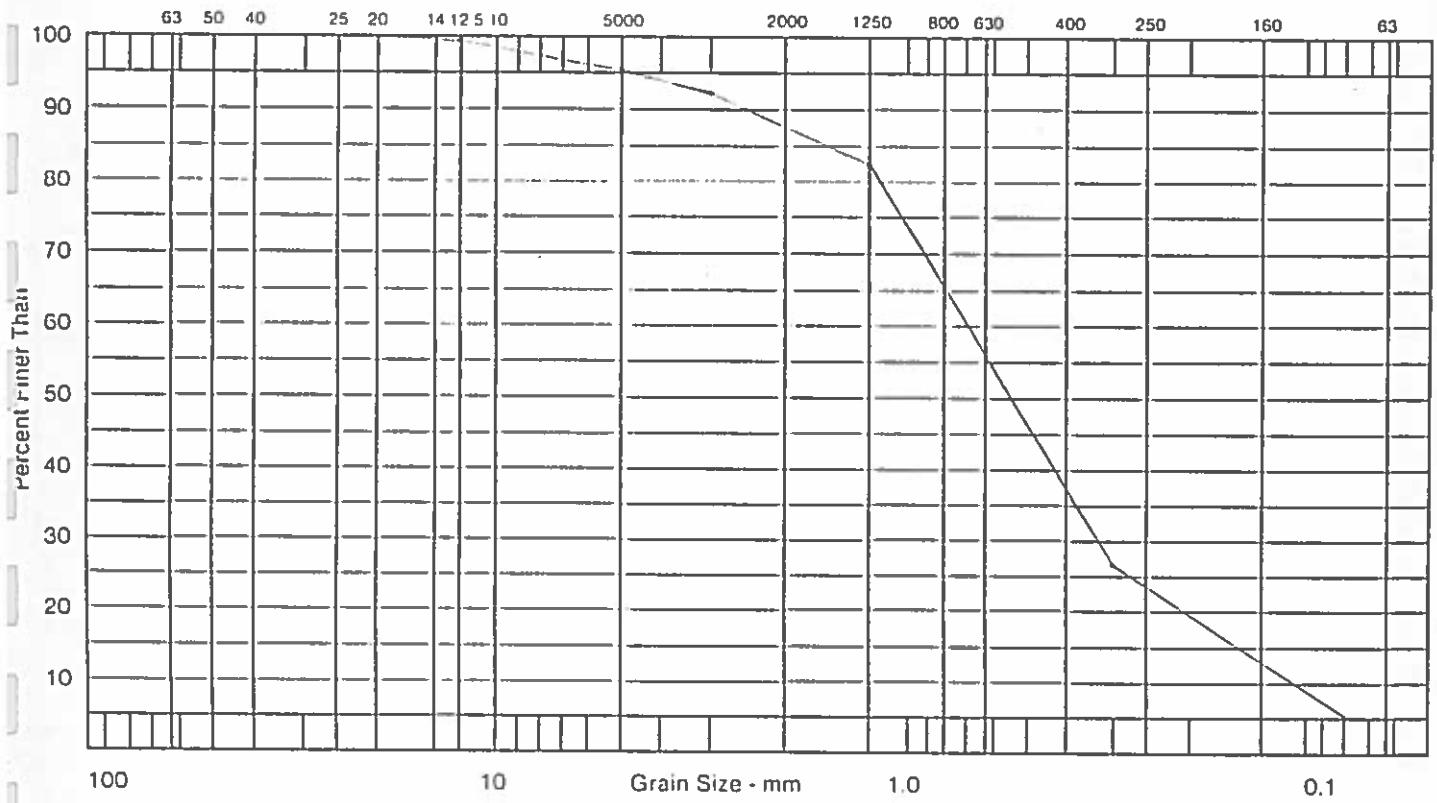
Sieve No.	Size of Opening MM	Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63.000	63.0				
50.000	50.0				
40.000	40.0				
25.000	25.0				
20.000	20.0				100.0
12.500	12.5				99.2
10.000	10.0				
5.000	5.0				95.4
2500	2.5				92.2
1.250	1.25				82.3
800	0.800				
630	0.630				
400	0.400				
375	0.375				26.6
160	0.160				
80	0.080				5.0

Description of Sample _____

Sand, SP

 Time of Sieving _____ Min. 15

Method of Preparation _____ Dry _____ Washed X
 Remarks _____
Gravel 4.6%
Sand 90.4%
Silt 5.0%





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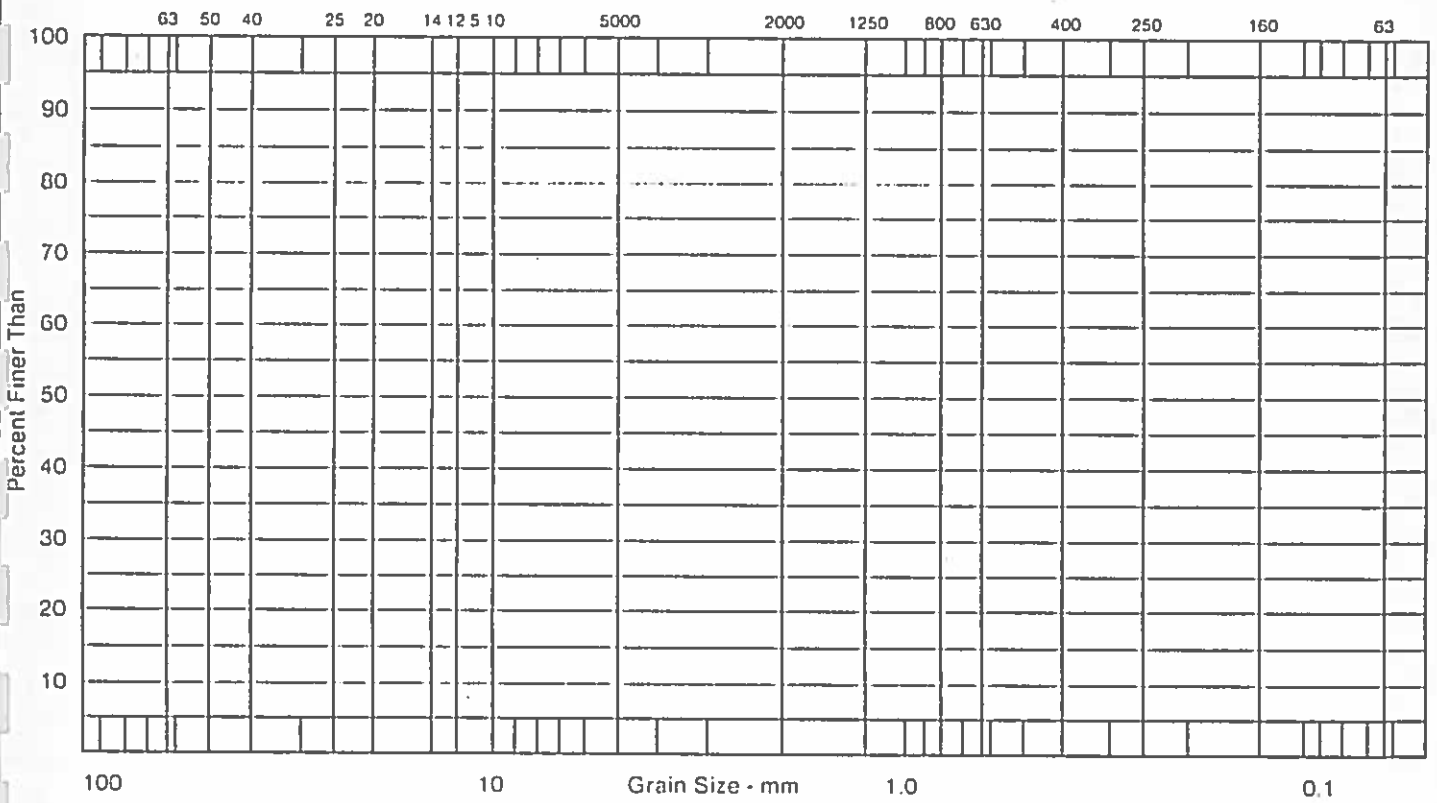
Sample: 3 Depth: 1.5-1.65m Client: YTG, C&T Services, Transportation Eng'
 Location: TP#35-92 Project: Geotechnical Investigation South Access
 Made by: AB Job No.: 8002-222
 Ck'd by: WCK Date: 1992/06/15

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				
12.500	12.5				
10.000	10.0				
5.000	5.0				
2500	2.5				
1.250	1.25				
800	0.800				
630	0.630				
400	0.400				
375	0.375				
160	0.160				
80	0.080				99.9

Description of Sample _____
Silt, ML

 Time of Sieving _____ Min. 15

Method of Preparation _____ Dry _____ Washed X
 Remarks _____





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Client: YTG, C&T Services, Transportation Eng'
 Project: Geotechnical Investigation South Access
 Sample: 6 Depth: 0.4-0.5m Made by: AB Job No.: 8002-222
 Location: _____ CK'd by: WCL Date: 1992/06/15
TP#36-92

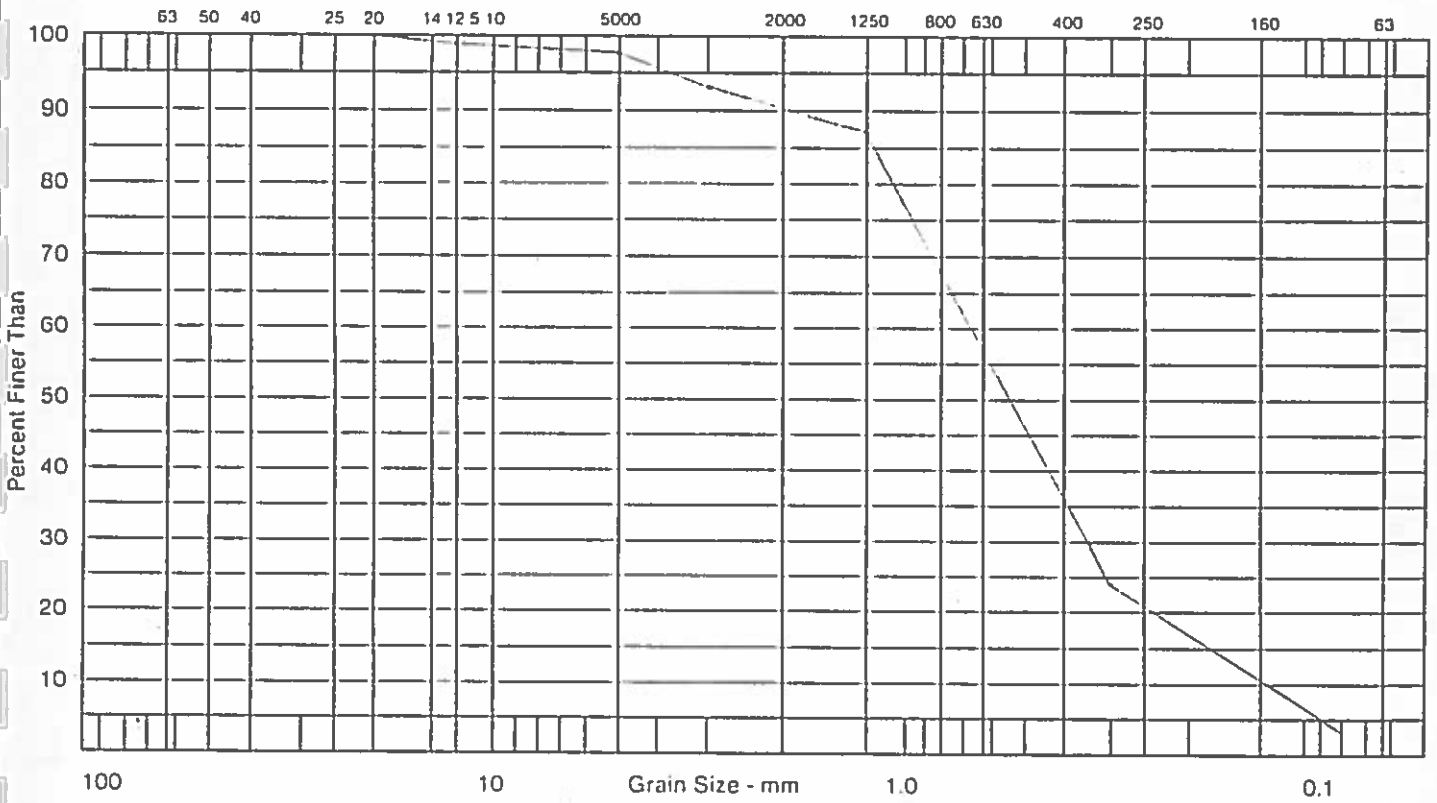
Sieve No.	Size of Opening MM	Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63.000	63.0				
50.000	50.0				
40.000	40.0				
25.000	25.0				
20.000	20.0				100.0
12.500	12.5				98.9
10.000	10.0				
5.000	5.0				97.6
2500	2.5				93.6
1.250	1.25				87.0
800	0.800				
630	0.630				
400	0.400				
375	0.375				24.0
160	0.160				
80	0.080				2.8

Description of Sample _____

Sand, SP

 Time of Sieving _____ Min. 15

Method of Preparation _____ Dry _____ Washed X
 Remarks _____
Gravel 2.4%
Sand 94.0%
Silt 2.8%





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Client: YTG, C&T Services, Transportation Eng'
 Project: Geotechnical Investigation South Access
 Sample: 7 Depth: 1.2-1.4m Made by: AB Job No.: 8002-222
 Location: _____
 TP# 36-92 Cl'd by: WUC Date: 1992/06/15

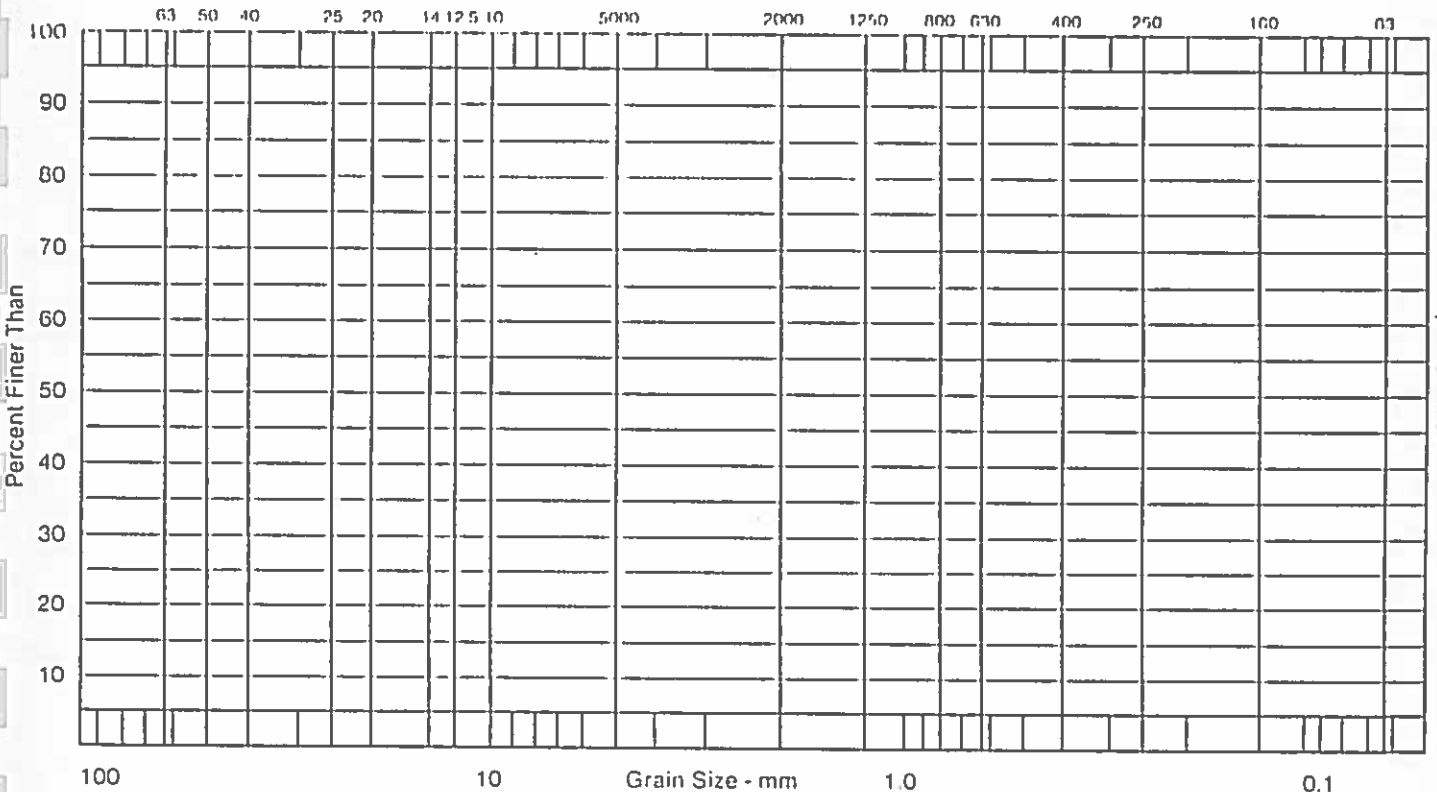
Sieve No.	Size of Opening MM	Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63.000	63.0				
50.000	50.0				
40.000	40.0				
25.000	25.0				
20.000	20.0				
12.500	12.5				
10.000	10.0				
5.000	5.0				
2500	2.5				
1.250	1.25				
800	0.800				
630	0.630				
400	0.400				
375	0.375				
160	0.160				
80	0.080				100.0

Description of Sample _____

Silt, ML-CL

 Time of Sieving _____ Min. 15

Method of Preparation _____ Dry _____ Washed X
 Remarks _____





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Client: YTG, C&T Services, Transportation Eng'
 Project: Geotechnical Investigation South Access
 Sample: 10 Depth: 0.3-0.45m Made by: AB Job No.: 8002-222
 Location: _____ CK'd by: WCL Date: 1992/06/15
TP#37-92

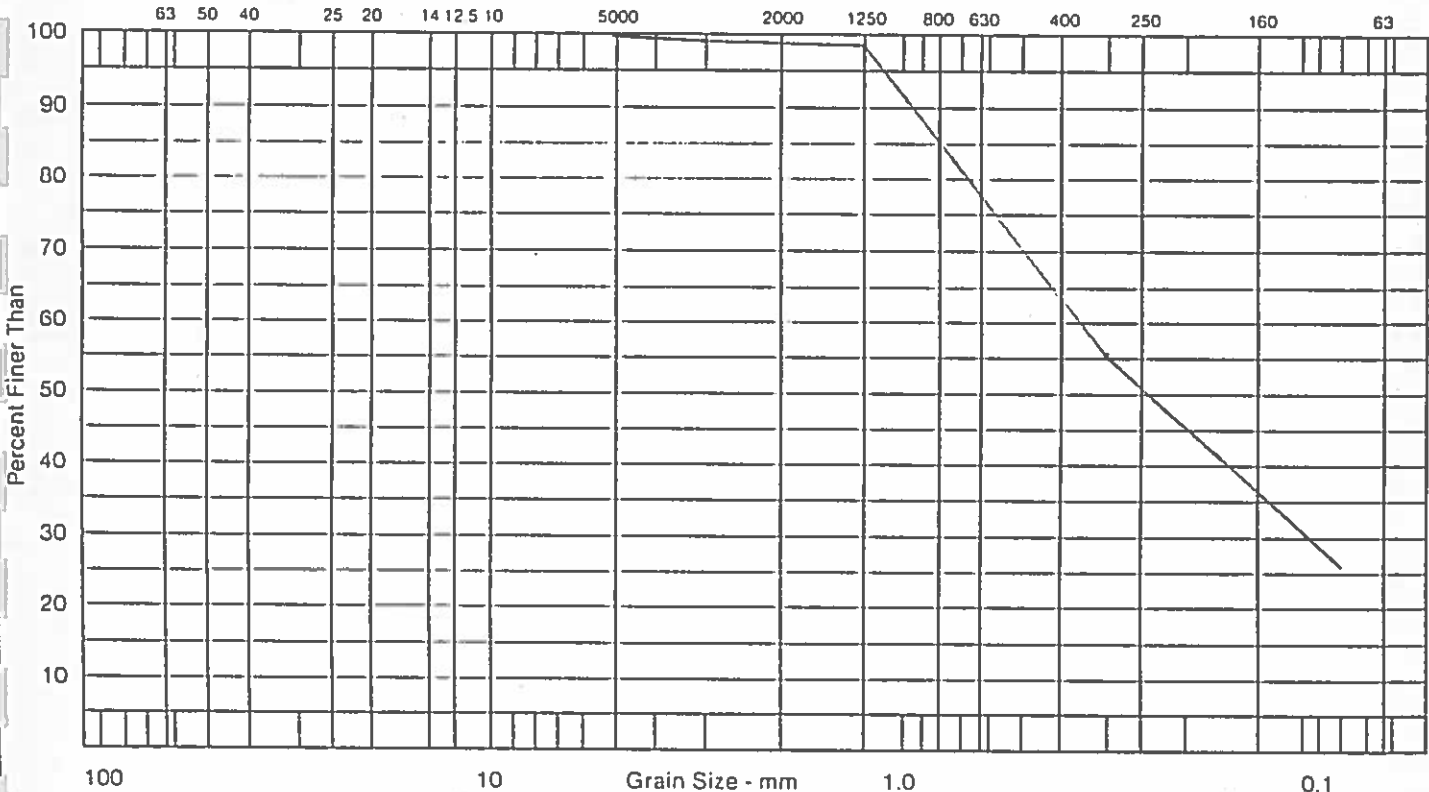
Sieve No.	Size of Opening MM	Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0				
50,000	50.0				
40,000	40.0				
25,000	25.0				
20,000	20.0				
12,500	12.5				
10,000	10.0				
5,000	5.0				99.8
2500	2.5				99.2
1,250	1.25				98.0
800	0.800				
630	0.630				
400	0.400				
375	0.375				55.3
160	0.160				
80	0.080				26.0

Description of Sample _____

Silty sand, SM

 Time of Sieving _____ Min. 15

Method of Preparation _____ Dry _____ Washed X
 Remarks _____
Gravel 0.2%
Sand 78.3%
Silt 26.0%





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Client: YTG, C&T Services, Transportation Eng'
 Project: Geotechnical Investigation South Access
 Sample: 11 Depth: 0.65-0.75m Made by: AB Job No.: 8002-222
 Location: _____ CK'd by: WCL Date: 1992/06/15
TP# 37-92

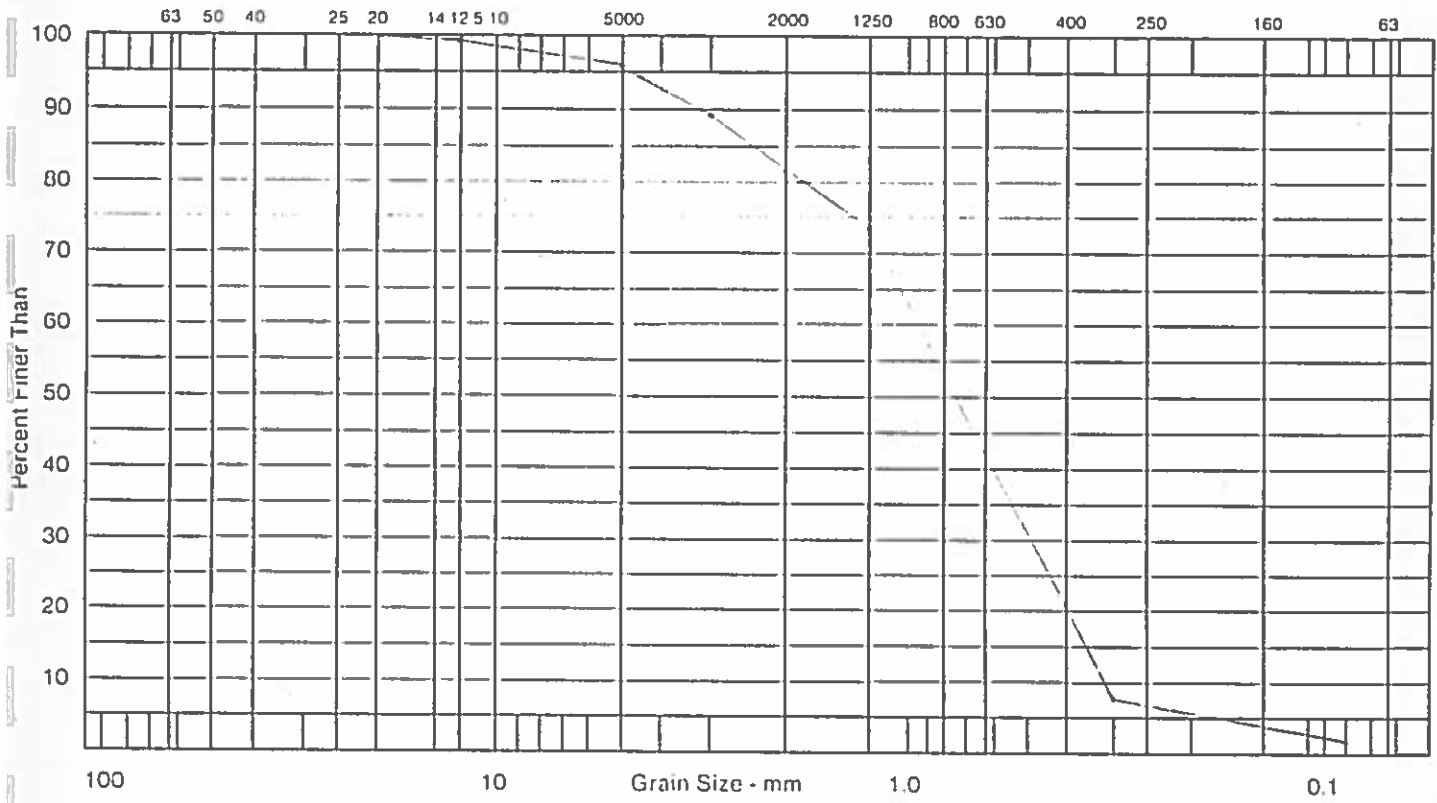
Sieve No.	Size of Opening MM	Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63.000	63.0				
50.000	50.0				
40.000	40.0				
25.000	25.0				
20.000	20.0				100.0
12.500	12.5				98.3
10.000	10.0				
5.000	5.0				95.7
2500	2.5				88.9
1.250	1.25				73.4
800	0.800				
630	0.630				
400	0.400				
375	0.375				7.7
160	0.160				
80	0.080				0.9

Description of Sample _____

Sand, SP

 Time of Sieving _____ Min. 15

Method of Preparation _____ Dry _____ Washed X
 Remarks _____
Gravel 4.3%
Sand 94.8%
Silt 0.9%





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Client: YTG, C&T Services, Transportation Eng'
 Sample: 12 Depth: 1.0-1.2m Project: Geotechnical Investigation South Access
 Location: _____ Made by: AB Job No.: 8002-222
TP#37 92 CK'd by: WCL Date: 1992/06/15

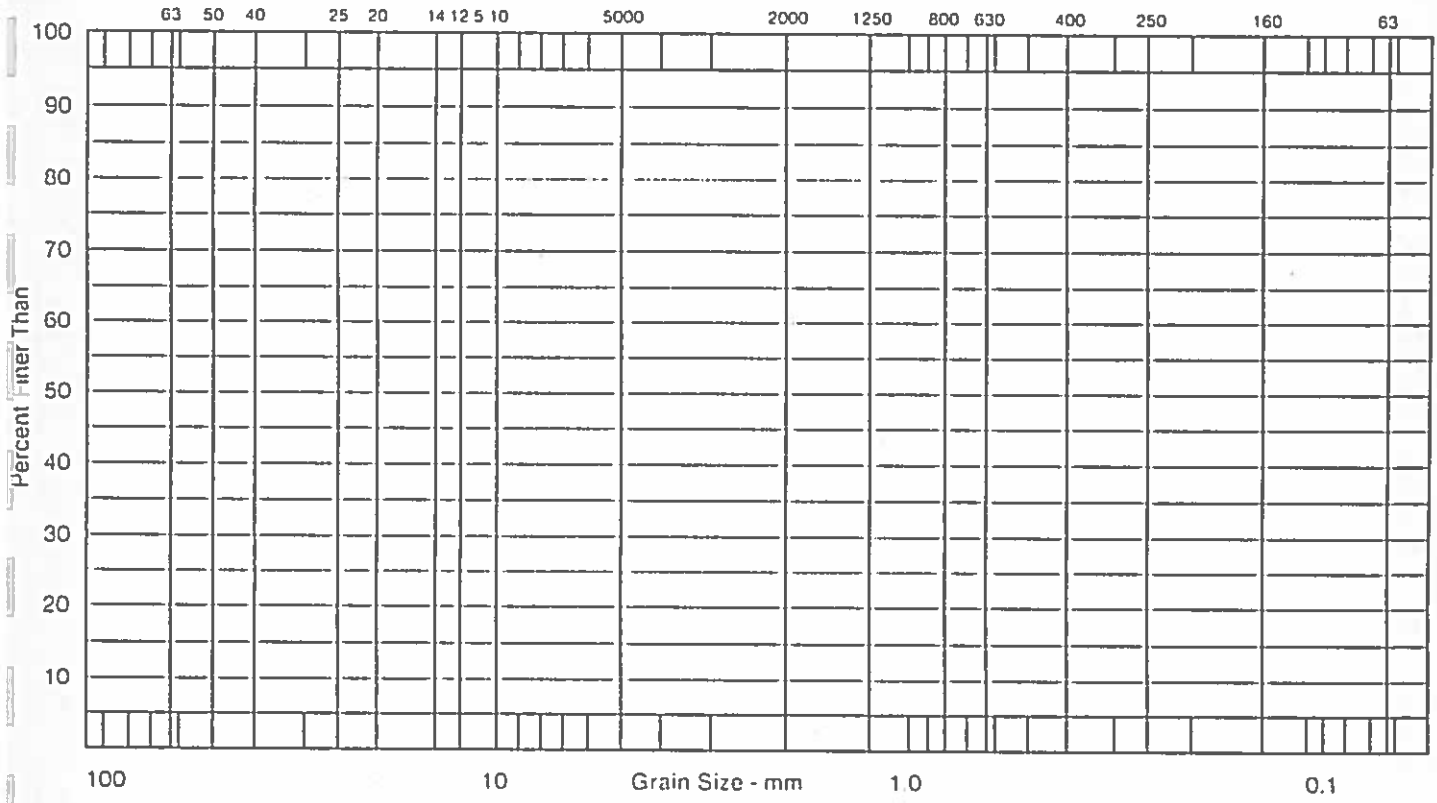
Sieve No.	Size of Opening MM	Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0				
50,000	50.0				
40,000	40.0				
25,000	25.0				
20,000	20.0				
12,500	12.5				
10,000	10.0				
5,000	5.0				
2500	2.5				
1,250	1.25				
800	0.800				
630	0.630				
400	0.400				
375	0.315				
160	0.160				
80	0.080				99.9

Description of Sample _____

Silt ML-CL

 Time of Sieving _____ Min. 15

Method of Preparation _____ Dry _____ Washed X
 Remarks _____





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Client: YTG, C&T Services, Transportation Engr'
 Project: Geotechnical Investigation South Access
 Sample: 16 Depth: 0.3-0.4m Made by: AB Job No.: 8002-222
 Location: _____
TP#38-92 CK'd by: WCA Date: 1992/06/15

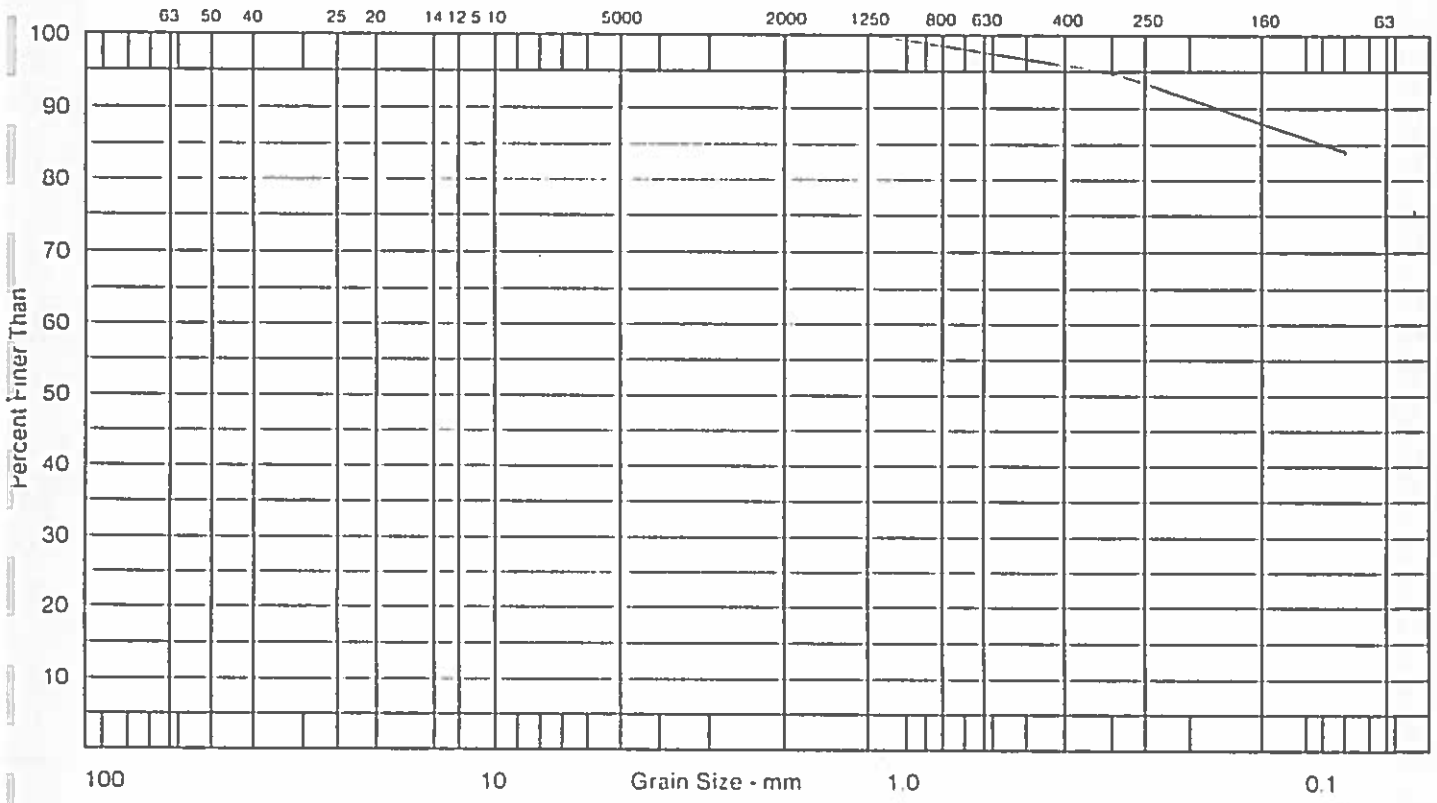
Sieve No.	Size of Opening MM	Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63.000	63.0				
50.000	50.0				
40.000	40.0				
25.000	25.0				
20.000	20.0				
12.500	12.5				
10.000	10.0				
5.000	5.0				100.0
2500	2.5				100.0
1.250	1.25				99.9
800	0.800				
630	0.630				
400	0.400				
375	0.375				94.6
160	0.160				
80	0.080				84.0

Description of Sample _____

Some sand, ML

Method of Preparation _____ Dry _____ Washed X
 Remarks _____
Gravel 0.0%
Sand 14.0%
Silt 84.0%

Time of Sieving _____ Min. 15





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Sample: 17 Depth: 1.2-1.3m
Location: TP#38-92

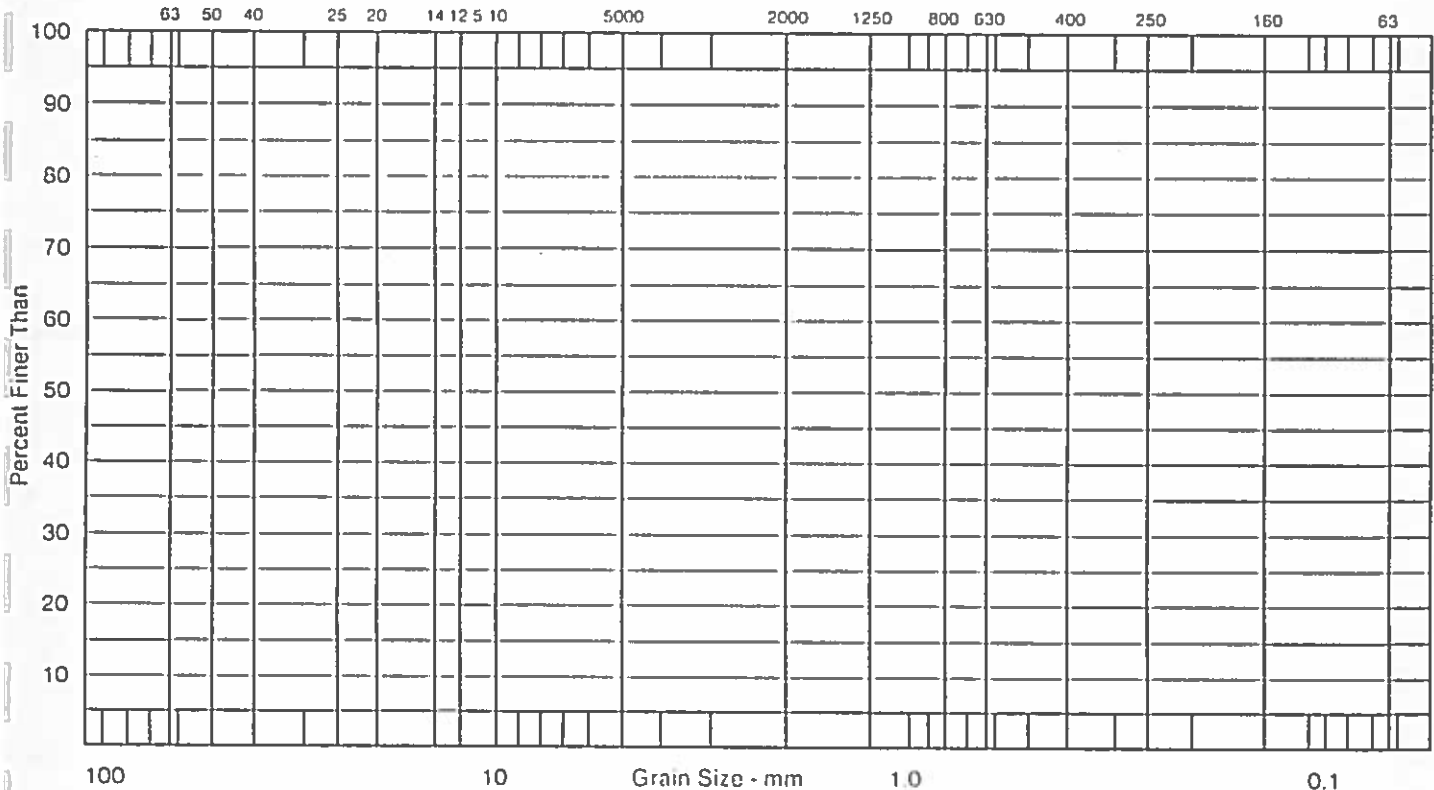
Client: YTG, C&T Services, Transportation Eng'
Project: Geotechnical Investigation South Access
Made by: AB Job No.: 8002-222
CK'd by: WCK Date: 1992/06/15

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				
12.500	12.5				
10.000	10.0				
5.000	5.0				
2500	2.5				
1250	1.25				
800	0.800				
630	0.630				
400	0.400				
375	0.375				
160	0.160				
80	0.080				99.1

Description of Sample _____
Silt, ML

Method of Preparation _____ Dry _____ Washed X
Remarks _____

Time of Sieving _____ Min. 15





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3051 Parsons Road, Edmonton, Alberta T6N 1C8

Client: YTC, C&T Services, Transportation Eng'
 Sample: 20 Depth: 0.1-0.3m Project: Geotechnical Investigation South Access
 Location: TP#39-92 Made by: AB Job No.: 8002-222
 CK'd by: WCC Date: 1992/06/15

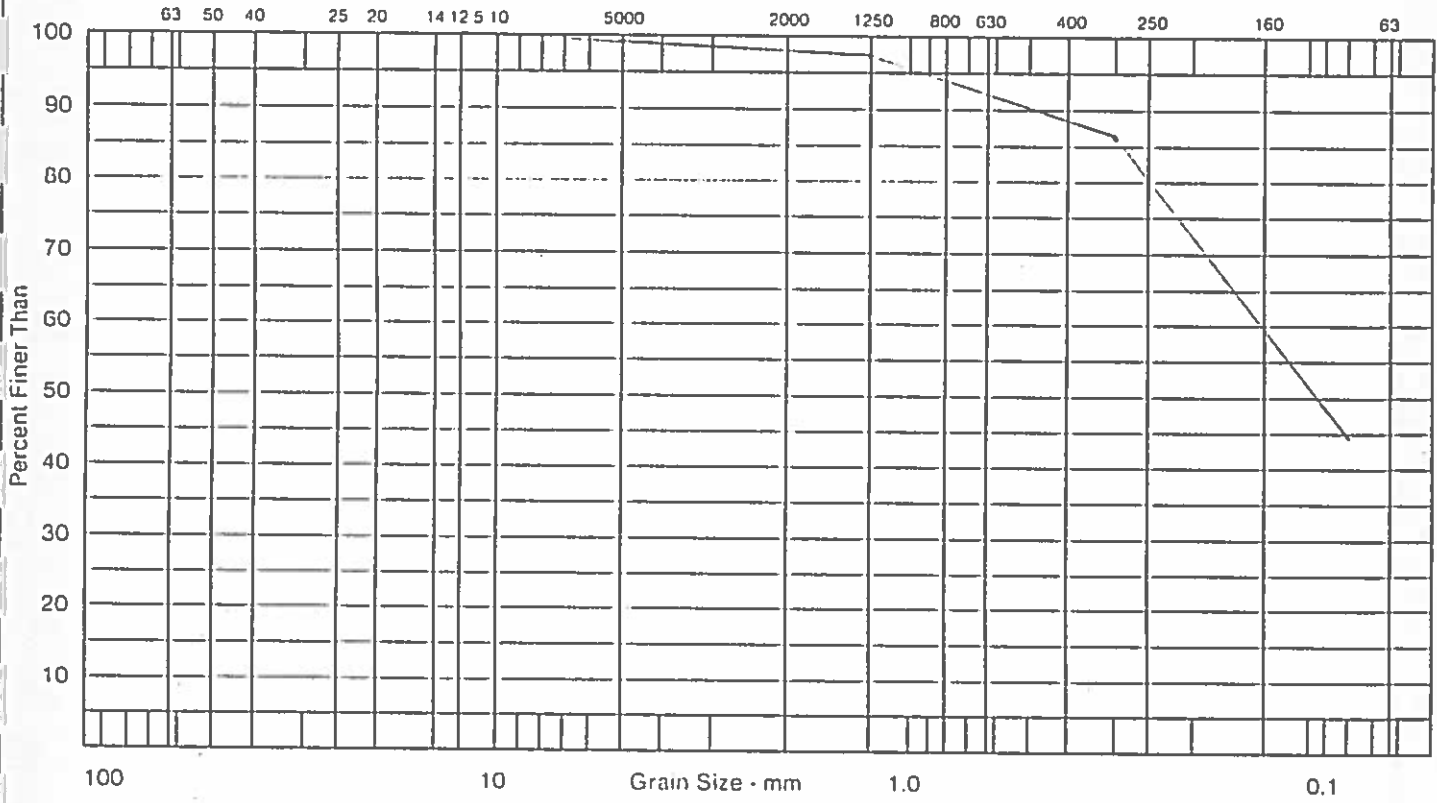
Sieve No.	Size of Opening MM	Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0				
50,000	50.0				
40,000	40.0				
25,000	25.0				
20,000	20.0				
12,500	12.5				100.0
10,000	10.0				
5,000	5.0				99.1
2500	2.5				98.4
1,250	1.25				97.5
800	0.800				
630	0.630				
400	0.400				
375	0.375				86.2
160	0.160				
80	0.080				44.4

Description of Sample _____

Silty sand, SM

 Time of Sieving _____ Min. 15

Method of Preparation _____ Dry _____ Washed X
 Remarks _____
Gravel 0.9%
Sand 54.7%
Silt 44.4%





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3051 Parsons Road, Edmonton, Alberta T6N 1C8

Client: YTG, C&T Services, Transportation Eng^r
 Project: Geotechnical Investigation South Access
 Sample: 21 Depth: 0.6-0.7m Made by: AB Job No.: 8002-222
 Location: _____
TP#139-92 Ck'd by: WCK Date: 1992/06/15

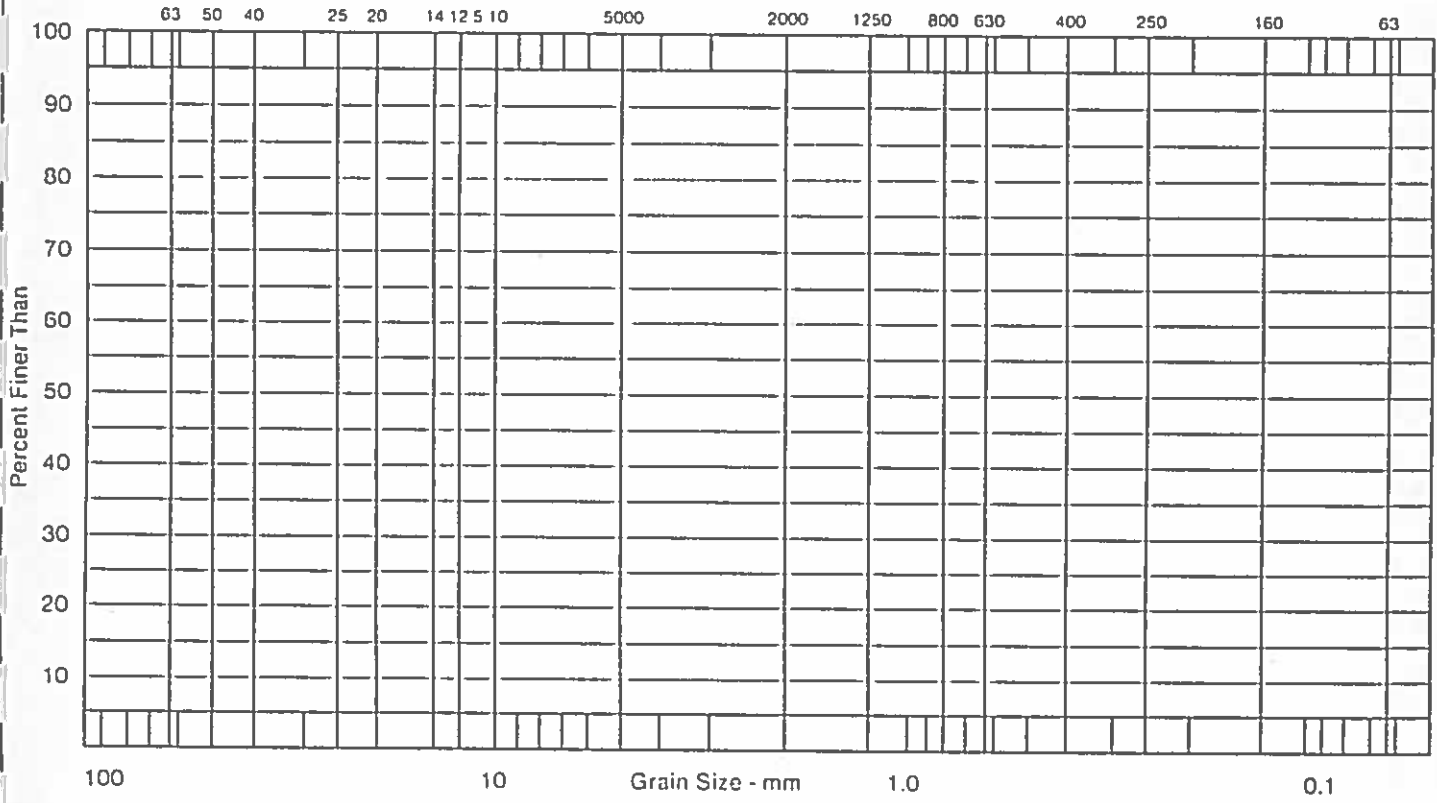
Sieve No.	Size of Opening MM	Weight Retained gms	Total Wt. Finer Than gms	Percent Finer Than	% Finer Than Basis Orig. Sample
63,000	63.0				
50,000	50.0				
40,000	40.0				
25,000	25.0				
20,000	20.0				
12,500	12.5				
10,000	10.0				
5,000	5.0				
2500	2.5				100.0
1,250	1.25				99.9
800	0.800				
630	0.630				
400	0.400				
375	0.375				99.7
160	0.160				
80	0.080				98.3

Description of Sample _____

Silt ML-CL

 Time of Sieving _____ Min. 15

Method of Preparation _____ Dry _____ Washed X
 Remarks _____



HOGGAN ENGINEERING & TESTING (1980) LTD.

APPENDIX "D"
-Photograph Summary and Photographs

HOGGAN ENGINEERING & TESTING (1980) LTD.

PHOTOGRAPH SUMMARY

PROJECT: Geotechnical Investigation
Public Pit, South Access Road
Yukon Territory

DATE: 1992/06/15

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

FILE NO: 8002-222

ATTENTION: Mr. Iain Blown, Geotechnical Projects Manager

PHOTOGRAPH #	DESCRIPTION
1	-Test Pit 35-92, sample spill piles
2	-Test Pit 36-92, sample spill piles
3	-Test Pit 37-92, sample spill piles
4	-Test Pit 38-92, sample spill piles
5	-Test Pit 39-92, sample spill piles
6-9	-Panoramic view of site



Photo # 2 TP# 36-92

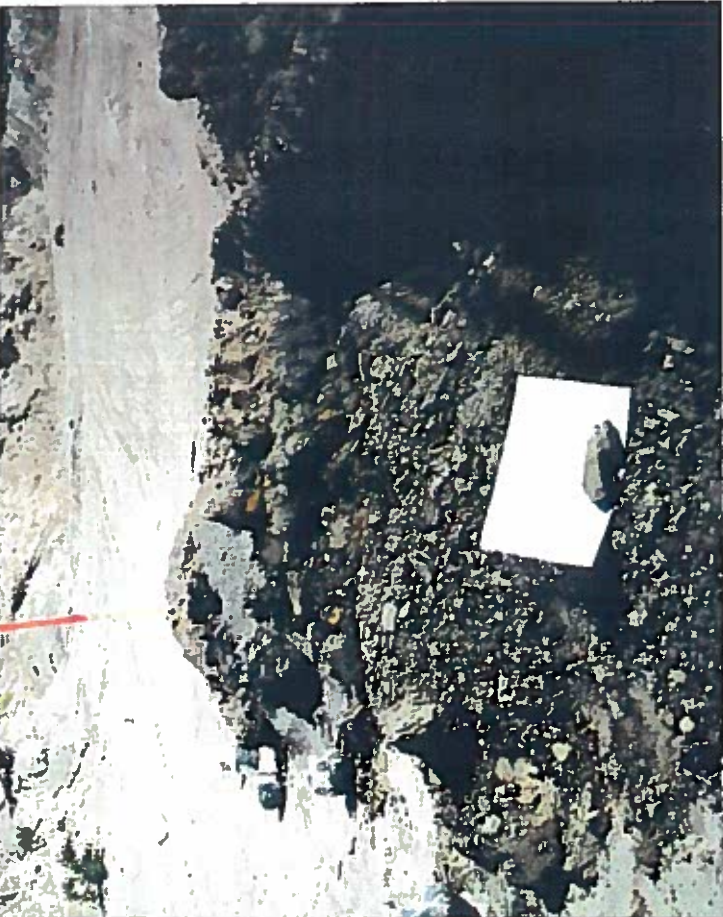


Photo # 1 TP# 35-92



Photo # 3 TP# 37-92



PHOTO'S # 6-9 ANEISMIC VIEW OF SITE

