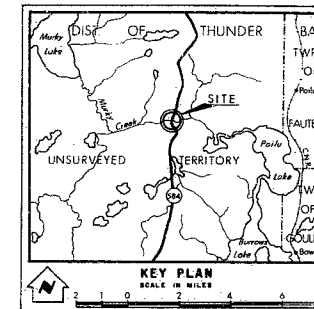
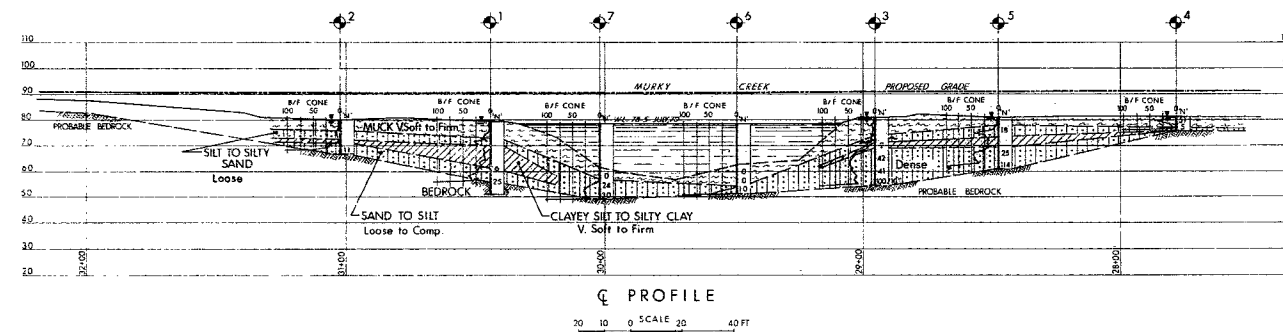
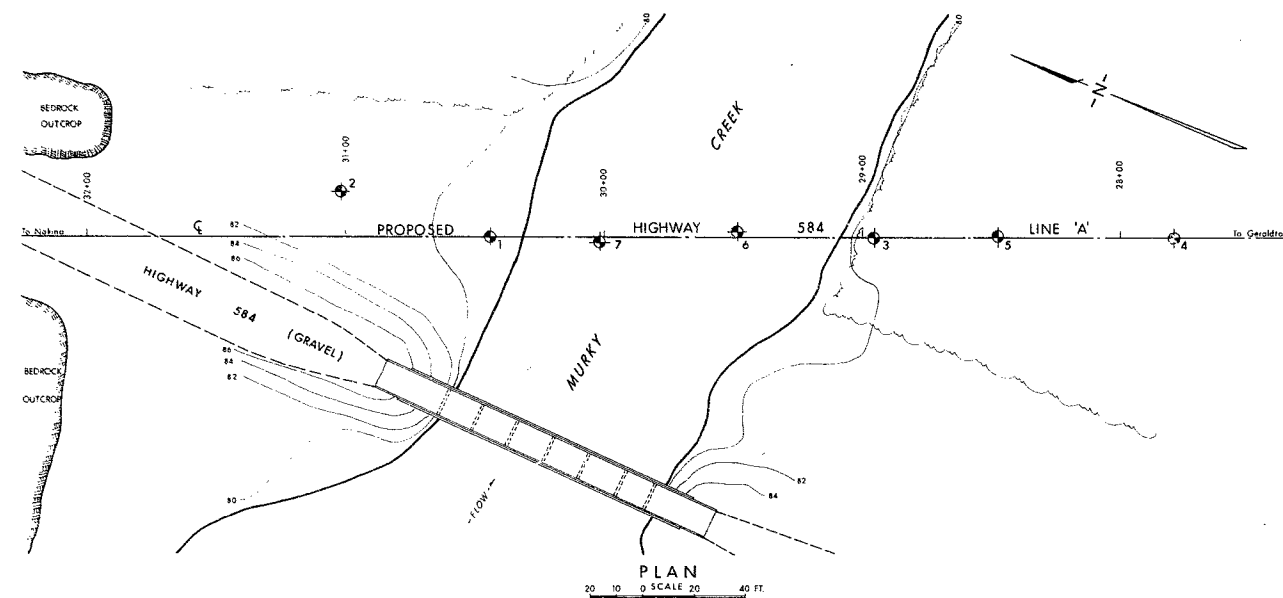


CONT. 71-127

MURKY CREEK

+ HWY. 584

42L-1



- LEGEND**
- Bore Hole
 - ⊕ Cone Penetration Hole
 - ⊕ Bore & Cone Penetration Hole
 - Water Levels established at time of field investigation, JULY 1970

NO.	ELEVATION	STATION	OFFSET
1	79.5	30+4.5	CL
2	80.0	31+0.2	17' RT.
3	81.0	28+9.5	CL
4	82.0	27+7.9	CL
5	81.2	28+4.8	1' RT.
6	78.5	29+4.8	2' RT.
7	78.5	30+0.2	2' LT.

NOTE

The boundaries between soil strata have been established only at Bore Hole locations. Between Bore Holes the boundaries are assumed from geological evidence and may be subject to considerable error.

NO.	DATE	DESCRIPTION

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & TESTING OFFICE - FOUNDATION SECTION

MURKY CREEK

KING'S HIGHWAY NO. 584 LINE 'A' DIST. NO. 19
TWP. UNSURVEYED TERRITORY

BORE HOLE LOCATIONS & SOIL STRATA

DESIGNED BY	CHECKED BY	DATE	W.P. NO.	M.E.T. DRAWING NO.
			29-68-02	70-11058A
DRAWN BY	CHECKED BY	DATE	JOB NO.	
		29 SEPT. 1970	70-11058	
APPROVED BY	CHECKED BY	DATE	SITE NO.	

GEOCREG NO. 42L-1

MEMORANDUM

42 L-1

To: Mr. B. R. Davis,
Bridge Engineer,
Bridge Office,
Admin. Bldg.

FROM: Foundation Section,
Materials & Testing Office,
Room 107, Lab. Bldg.

ATTENTION: Mr. S. McCombie

DATE: November 12, 1970

OUR FILE REF.

IN REPLY TO NOV 17 1970

SUBJECT:

FOUNDATION INVESTIGATION REPORT
For

Proposed Crossing at Murky Creek
And Hwy. #58^{1/2}

Proposed Revision Line 'A'
Unsurveyed Territory

District No. 19 (Thunder Bay)
H.O. 70-11058 -- W.P. 29-68-02

CONT 71-127 site 48E-4

Attached, we are forwarding to you our detailed foundation investigation report on the subsoil conditions existing at the above structure site.

We believe that the factual data and recommendations contained therein, will prove adequate for your design requirements. Should additional information be required, please feel free to contact our Office.

AGS/MdeF
Attach.

cc: Messrs. B. R. Davis
H. A. Tregaskes
D. W. Farren
H. W. Hurrell
J. G. Tillcock
P. Lester (2)
R. Morgenroth
B. J. Giroux
B. A. Singh

Foundations Files
Gen. Files

A. G. Stermac
A. G. Stermac
PRINCIPAL FOUNDATION ENGINEER

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 2. DESCRIPTION OF SITE.
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 - 4.3) Silt to Silty Sand.
 - 4.4) Clayey Silt to Silty Clay.
 - 4.5) Sand to Silt.
 - 4.6) Bedrock.
 5. GROUNDWATER CONDITIONS.
 6. DISCUSSION AND RECOMMENDATIONS:
 - 6.1) General.
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 - Scheme No. 2
 7. MISCELLANEOUS.
-

FOUNDATION INVESTIGATION REPORT
For
Proposed Crossing at Murky Creek
And Hwy. #584
Proposed Revision Line 'A'
Unsurveyed Territory
District No. 19 (Thunder Bay)
W.O. 70-11058 -- W.P. 29-68-02

1. INTRODUCTION:

A request for a foundation investigation at the crossing of Murky Creek and Hwy. #584, proposed Revision Line 'A', was received from Mr. S. B. Davidson, Regional Bridge Planning Engineer, in a memo dated June 18, 1970.

A field investigation was subsequently carried out by the Foundation Section to determine the subsoil conditions existing at the site. This report contains the results of this investigation and our recommendations pertaining to the design of the proposed structure foundations, and the approach embankments.

2. DESCRIPTION OF SITE:

The site of the proposed crossing is situated about 28 miles north of Geraldton and about 15 miles south of Nakina on Hwy. #584. About 0.5 miles south of the site, the existing Hwy. #584 takes a left-hand turn and goes around the treed area. It is proposed to eliminate or ease this curve; therefore, the proposed crossing will be located about 50 to 100 feet east of the present crossing.

At this place the creek flows in a west to east direction. The existing structure is a Bailey bridge.

The surrounding area is relatively flat and is forested except for the land cleared for the existing highway.

3. FIELD AND LABORATORY WORK:

The field work at the proposed site consisted of a total of 7 sampled boreholes and 7 dynamic cone penetration tests. The boreholes were advanced using bombardier-mounted continuous flight augers, except Boreholes 6 and 7 which were put down from the raft using conventional diamond drill. Disturbed samples were obtained using a 2-inch O.D. split-spoon sampler driven according to the specifications for the Standard Penetration Test. Undisturbed samples were recorded using 2-inch I.D. Shelby tubes which were pushed into the soil manually. Wherever possible, field vane tests were carried out at elevations 12 inches below sample depths.

Dynamic cone penetration tests were carried out adjacent to each borehole. Driving energy to advance the cone was 350 ft.-lbs. per blow.

The bedrock was proved at one borehole location using BXT rock coring equipment. In other boreholes the bedrock was assumed to be at elevations where refusal to cone, augering, or driving the split-spoon, was achieved.

Samples were visually examined in the field and subsequently in the laboratory. Tests were carried out on selected samples to determine the following physical properties:

1. Grain-Size Distribution
2. Atterberg Limit
3. Natural Moisture Content
4. Bulk Density
5. Organic Content
6. Unconfined Shear Strength
7. Consolidation Characteristics

The results of the field and laboratory tests are summarized in the Record of Borehole sheets, which are contained in the Appendix to the report.

4. SUBSOIL CONDITIONS:

4.1) General:

In general, the subsoil at the site consists of muck up to 8 ft. thick followed by a silt to silty sand stratum which, in turn, is underlain by a clayey silt to silty clay layer, followed by a sand to silt deposit. The overburden is underlain by bedrock.

The boundaries between various soil types are shown on the Record of Borehole sheets. The estimated stratigraphical profile shown on Drawing 70-11058A, is based upon this information.

From ground level downward, the various strata are described in some detail with regard to soil types and soil properties, as follows:

4.2) Muck:

This deposit was found in all boreholes. The thickness of the muck varied from 3.2 ft. (B.H. #5) to 8.5 ft. (B.H. #6). The shear strength values vary from 200 p.s.f. to 800 p.s.f., indicating it to be very soft to firm, but in general, it is soft to firm.

4.3) Silt to Silty Sand:

This material was intersected in Boreholes #1, 2, 3, 4 and 5. In Boreholes #6 and 7 it merges with the underlying sand to silt deposit. In other boreholes these two strata are separated by a clayey silt to silty clay layer. The thickness of the deposit, in general, varied from 3 to 5 ft. The composition of the material varies from silt to silty sand. However, in Borehole #3 it contained a considerable amount of organics, and exhibited shear strength values between 200 and 500 p.s.f. Most of the samples in this layer were recovered using a Shelby tube, indicating, in general, a loose relative density.

The grain-size analyses indicate the following distributions (Fig. 1).

Sand	0	-	13%
Silt & Clay	87	-	100%

4. SUBSOIL CONDITIONS: (cont'd.) ...

4.4) Clayey Silt to Silty Clay:

This material was encountered in Boreholes #1, 2, 3 & 5. The thickness of the material varied from 1.5 ft. (B.H. #2) to 8.5 ft. (B.H. #1). The material consists of clayey silt to clay, and is layered; but in general, it is clayey silt to silty clay.

Physical properties of the material, as determined from field and laboratory tests, are as follows:

Liquid Limit	32	-	62 %
Plastic Limit	18	-	28 %
Moisture Content	35	-	57 %
Bulk Density	110	-	120 p.c.f.
Field Vane Shear Strength	200	-	400 p.s.f.
Unconfined Shear Strength	130	-	580 p.s.f.

From the shear strength values, it is seen that the consistency varies from very soft to firm. However, it is believed that an average shear strength value of 200 p.s.f. would be more representative of the material.

4.5) Sand to Silt:

This deposit was found in all boreholes. The composition of the material varies from silt with small amounts of clay to fine sand. This deposit is underlain by bedrock.

The grain-size analyses indicate the following distributions (Fig. 2):

Sand	0	-	97 %
Silt and Clay	3	-	100 %

The Standard Penetration Test gave N-values ranging from 6 to 42 blows/ft., indicating a loose to dense relative density. However, the high number of blows were found in Borehole #3 only, where the relative density could be described as dense; in other boreholes it varies from loose to compact.

4. SUBSOIL CONDITIONS: (cont'd.) ...

4.6) Bedrock:

The bedrock was proven in Borehole #1. In other boreholes the bedrock surface was assumed to be the level at which practical refusal to augering, driving the split-spoon sampler or the cone, was reached. Bedrock outcrops can be seen about 150 ft. north, and about 200 ft. south of the proposed crossing. The bedrock is in sound condition. The surface of the bedrock is dish-shaped (along the centre-line) sloping from either bank towards the centre of the creek. The elevation of the bedrock surface varies from 49.5 (B.H. #7) to 76.5 (B.H. #4).

5. GROUNDWATER CONDITIONS:

Water levels recorded in the boreholes at the time of investigation, indicate the groundwater to be at the ground surface - i.e., El. 79.5 to 82.0. The water level in the creek was at El. 78.5.

6. DISCUSSION AND RECOMMENDATIONS:

6.1) General:

It is proposed to construct a new bridge to carry Hwy. #584 over Murky Creek. The existing bridge is a Bailey bridge, 50 - 100 ft. upstream (east) of the proposed crossing. Approach fills of about 10 ft. are proposed, resulting in a maximum approach height of about 34 ft. above the creek bed.

Subsoil at the site consists generally of soft muck (3 - 8 ft.), underlain by loose silt to silty sand (3 - 5 ft.), followed by very soft clayey silt to silty clay (1 - 8 ft.), followed by a loose to dense silt to sand deposit extending down to the bedrock. Bedrock surface varies from El. 49.5 to 76.5.

6. DISCUSSION AND RECOMMENDATIONS: (cont'd.) ...

6.1) General: (cont'd.) ...

A three-span (35'-50'-35') steel beam bridge with timber deck, supported by timber piles or steel H-piles has been proposed at this site. The presence of very soft muck and the underlying very soft clayey silt to silty clay presents stability problems for the forward slopes of the proposed embankment. There are two possible solutions to this problem, and these are described below.

SCHEME 1.

The instability of the forward slopes is caused by the weight of the fill to be placed on top of the existing slopes, which are stable by themselves. Therefore, one solution is to place the abutments well behind, so that the stability of the existing slopes is not endangered, and at the same time ensuring that the fill is stable. In this case, the toe of slope of the North approach fill should be at Sta. 30+70 \pm , and of the South approach Sta. 28+75 \pm in the approximate plane of the original ground surface (see Figs. 3 and 4). This would, of course, necessitate a longer bridge. A timber trestle type structure would be most suitable for this purpose. The timber piles supporting the structure should be driven down to bedrock. However, in the river bed there is very little overburden available to provide lateral support to the piles. Therefore, it is recommended that individual pile bents should be permanently braced together to provide lateral support in the transverse direction. In addition, the pile bents should be temporarily braced in the longitudinal direction during the construction period. It is recommended that a safe load of 25 tons per pile be assumed for design purposes, in the case of No. 14 timber-treated piles.

It should be noted that the success of this scheme is dependent on the ability of the existing banks to resist scouring action which we believe will be negligible. However, this point must be taken up with the Bridge Hydrology Section.

6. DISCUSSION AND RECOMMENDATIONS: (cont'd.) ...

SCHEME 1. - (cont'd.) ...

The underlying clayey silt to silty clay layer is unable to support the additional fill to be placed for the bridge approaches. The maximum height of fill that the silty clay layer can support is about 6 ft. Therefore, it is recommended that all clayey material under the fill and in front of the abutment should be excavated and replaced with granular material, leaving the existing banks undisturbed. A scheme showing the extent of excavation is given in Figs. 3 and 4. Elsewhere, all organic material under the proposed embankment should be removed as per D.H.O. standards.

SCHEME 2.

The other solution consists of removing all muck and clayey silt to silty clay material and replacing it with granular material. This would involve excavating under water. A scheme showing the extent of excavation is given in Figs. 5 and 6. It is recommended that the entire structure be supported on No. 14 treated timber piles driven to bedrock. A safe load of 25 tons per pile may be assumed for design purposes. The pile bents should be permanently braced together in the lateral direction, and temporarily in the longitudinal direction during the construction period as described in the previous subsection. All organic material under the proposed embankment outside of the areas shown on Figs. 5 and 6, should be removed as per D.H.O. standards.

The second scheme offers three advantages over the first one:

- 1) It requires a shorter bridge.

6. DISCUSSION AND RECOMMENDATIONS: (cont'd.) ...

SCHEME 2. - (cont'd.) ...

ii) There is no danger of movement of piles which could occur if, at some later date, the muck under water would slide down. This risk is inherent in the first scheme, because muck under water is not removed in the first scheme.

iii) It is technically sounder than the first scheme.

However, the selection of the scheme should be based on economic considerations and hydrologic requirements.

7. MISCELLANEOUS:

The field work for this project was carried out during the period July 8 - 13, 1970, under the supervision of Mr. A. Prakash, Project Foundation Engineer, who also prepared this report.

The equipment used was owned and operated by Dominion Soil Investigation Ltd.

This report was reviewed by Mr. K. G. Selby, Supervising Foundation Engineer.

November, 1970

APPENDIX I

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & TESTING OFFICE

RECORD OF BOREHOLE No. 1

FOUNDATION SECTION

JOB 70-11058

LOCATION Hwy. 584 Sta. 30 + 45 @

ORIGINATED BY AP

W P 29-68-02

BORING DATE July 8, 1970

COMPILED BY

DATUM Temporary

BOREHOLE TYPE **Bombardier Flight Auger, BX Core & Cone**

CHECKED BY

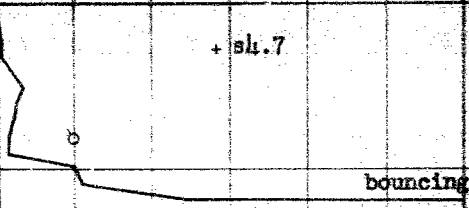
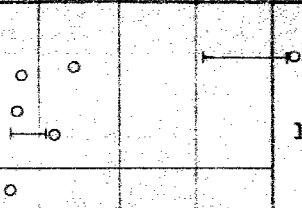
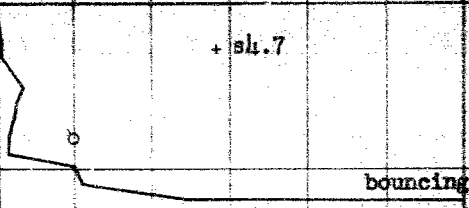
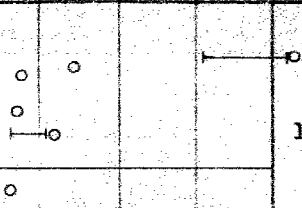
SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION BLOWS / FOOT	RESISTANCE	LQUID LIMIT ——— W _L	PLASTIC LIMIT ——— W _P	WATER CONTENT ——— W	BULK DENSITY Y P.C.F.	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT		30 40 60 80 100						
							SHEAR STRENGTH PS F.						
79.5	Ground Level												
0.0	Muck Very Soft to Firm		1	TW	PM			+ 35.0				88	Org. 11%
73.0			2	TW	PM			+ sl. 5					Org. 1%
6.5	Silt to sandy silt Loose		3	TW	PM								0 41 55 4
70.0			4	TW	PM	70		+ 35.0				120	0 0 (100)
9.5	Clayey silt to clay (layered) Very Soft		5	TW	PM			+ sl. 5				110	
61.5			6	TW	PM			+ sl. 2					0 97 (3)
18.0	Sand		7	SS	6	60							
55.8	Loose to Compact		8	SS	25			110/8" bouncing					
23.7	Bedrock		9	HXT	100%								
50.8													
28.7	End of Borehole					50							

DEPARTMENT OF HIGHWAYS- ONTARIO
MATERIALS & TESTING OFFICE

RECORD OF BOREHOLE No. 2

FOUNDATION SECTION

JOB 70-11058 LOCATION Hwy. 58h Sta. 31 + 02 17' Rt. ORIGINATED BY AP
 W.P. 29-68-02 BORING DATE July 8, 1970 COMPILED BY AP
 DATUM Temporary BOREHOLE TYPE Bombardier Flight Auger & Cone CHECKED BY *AP*

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE	LIQUID LIMIT — w_L	BULK DENSITY	REMARKS	
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT		BLOWS / FOOT	PLASTIC LIMIT — w_p			WATER CONTENT — w
							20 40 60 80 100				
							SHEAR STRENGTH P.S.F.	w_p — w — w_L			
							○ UNCONFINED + FIELD VANE				
							● QUICK TRIAXIAL x LAB. VANE				
							200 400 600 800 1000		WATER CONTENT %		
									30 50 90		
80.0	Ground Level		1	TW	PM	70			115	GRYSA SI. CL.	
76.0	Muck Soft		2	TW	PM						0 44 55 1
72.5	Sandy silt to silty sand. Loose		3	TW	PM						9 84 (16)
71.0	Clayey Silt. Very Soft		4	TW	PM						0 56 33 1
9.0	Sand to silty sand		5	SS	11	60			115	0 80 (20)	
66.7	Loose to Compact										
13.3	Probable Bedrock End of Borehole										

+ sl. 7

bouncing

0 44 55 1
 9 84 (16)
 0 66 33 1
 0 80 (20)

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & TESTING OFFICE

RECORD OF BOREHOLE No. 3

FOUNDATION SECTION

JOB 70-11058

LOCATION Hwy. 584 Sta. 28 + 96 #

ORIGINATED BY AP

W.P. 29-68-02

BORING DATE July 9, 1970

COMPILED BY AP

DATUM Temporary

BOREHOLE TYPE Bombardier Flight Auger & Cone

CHECKED BY

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE					LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w			BULK DENSITY γ P.C.F.	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT		20	40	60	80	100	w_p	w	w_L		
81.0	Ground Level															
0.0	Muck Soft to Firm		1	TW	PM	80				+s3.2						
74.0			2	TW	PM					+s4.5						
7.0	Organic Silt		3	TW	PM											
71.0	Soft		8	TW	PM					+s4.7						
69.8	Clayey silt to silty clay. Soft		4	SS	2	70				+s5.0						
12.0																
	Silty sand to silt Dense		5	SS	42											
			6	SS	41	60										
54.7			7	SS	100/10"					bouncing						
26.3	Probable Bedrock End of Borehole					50										

GRS A, SI, CL

Org. 15%

W/C 133%

103

0 67 (33)

0 2 90 8

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & TESTING OFFICE

RECORD OF BOREHOLE No. 4

FOUNDATION SECTION

JOB 70-11058

LOCATION Hwy. 584 Sta. 27 + 79 #

ORIGINATED BY AP

W.P. 29-68-02

BORING DATE July 9, 1970

COMPILED BY AP

DATUM Temporary

BOREHOLE TYPE Bombardier Flight Auger & Cone

CHECKED BY

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT					LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w			BULK DENSITY γ P.C.F.	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS / FOOT		20	40	60	80	100	w_p	w	w_L		
82.0	Ground Level															
0.0	Muck		1	SS	51	80										
76.8	Soft to Firm															
	Sandy Silt		2	SS	5											
5.5	Probable Bedrock					70										
	End of Borehole															

GRYSA, S.I.C.
0-2. 70%
W/C 263%
Org. 27%
0 30 65

DEPARTMENT OF HIGHWAYS- ONTARIO
MATERIALS & TESTING OFFICE

RECORD OF BOREHOLE No. 5

FOUNDATION SECTION

JOB 70-11058

LOCATION Hwy. 504 Sta. 28 + 48 o/s 1' Rt.

ORIGINATED BY AP

W.P. 29-68-02

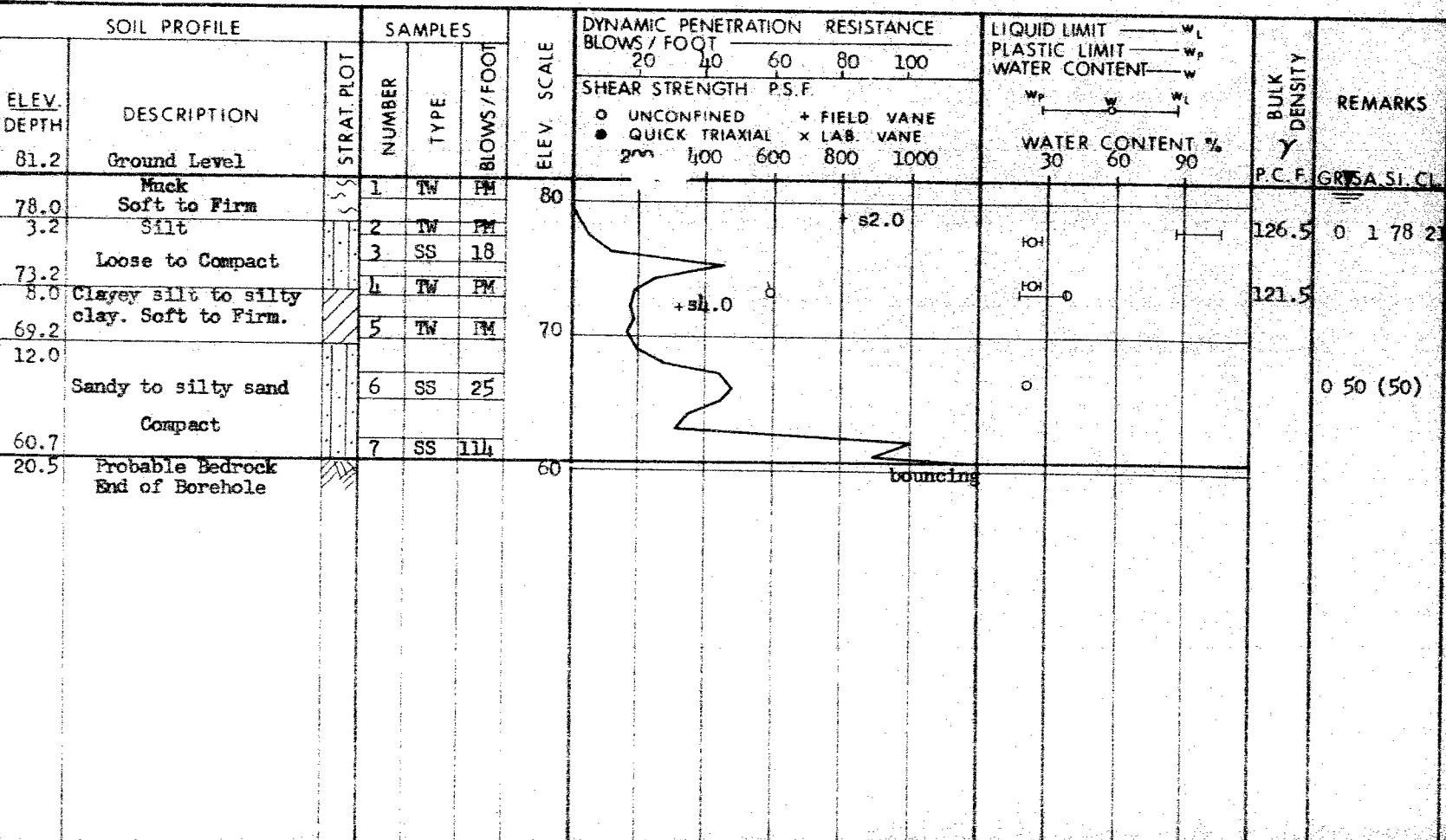
BORING DATE July 10, 1970

COMPILED BY AP

DATUM Temporary

BOREHOLE TYPE Bombardier Flight Auger & Cone

CHECKED BY



DEPARTMENT OF HIGHWAYS- ONTARIO

MATERIALS & TESTING OFFICE

RECORD OF BOREHOLE No. 6

FOUNDATION SECTION

JOB 70-11058

LOCATION Hwy. 581, Sta. 29 + 43 2' Rt.

ORIGINATED BY AP

W.P. 29-68-02

BORING DATE July 13, 1970

COMPILED BY AP

DATUM Temporary

BOREHOLE TYPE Diamond Drill & Cone

CHECKED BY

SOIL PROFILE		SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION		RESISTANCE		LIQUID LIMIT — w_L		BULK DENSITY	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE		BLOWS/FOOT	BLOWS/FOOT	BLOWS/FOOT	BLOWS/FOOT	BLOWS/FOOT	PLASTIC LIMIT — w_p		
79.0	Top of Raft												
0.5	Water Level												
	Water												
63.0													
16.0	Muck		1	SS	0								
	Very Soft		2	SS	0								
54.5													
24.5	Sand to Silt		3	SS	10								
51.8	Loose												
27.2	Probable Bedrock												
	End of Borehole												

SHEAR STRENGTH P.S.F.
 ○ UNCONFINED + FIELD VANE
 ● QUICK TRIAXIAL x LAB. VANE
 200 400 600 800 1000

WATER CONTENT %
 30 60 90

P.C.F. GR. SA. SI. CL.

Org. 17%
 w/c 225%
 Org. 6.5%
 0.92 (8)

DEPARTMENT OF HIGHWAYS- ONTARIO
MATERIALS & TESTING OFFICE

RECORD OF BOREHOLE No. 7

FOUNDATION SECTION

JOB 70-11058

LOCATION Hwy. 58h Sta. 30 + 02 2' Lt.

ORIGINATED BY AP

W.P. 29-68-02

BORING DATE July 13, 1970

COMPILED BY AP

DATUM Temporary

BOREHOLE TYPE Diamond Drill & Cone

CHECKED BY

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE		LIQUID LIMIT — w_L		BULK DENSITY γ P.C.F.	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT		BLOWS / FOOT		PLASTIC LIMIT — w_p			
							20	40	60	80		
							SHEAR STRENGTH P.S.F.		WATER CONTENT %			
							○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB. VANE		w_p — w — w_L			
									30 60 90			
79.0	Top of Raft											
0.5	Water level											
	Water					70						
61.0												
18.0	Muck					60						
57.0	Very Soft		1	SS	0							
22.0	Sand to Silt		2	SS	2h							
49.5	Compact		3	SS	30	50						
29.5	Probable Bedrock											
	End of Borehole					40						

0 94 (6)
0 89 (11)
0 3 90 7

50/2"

UNIFIED SOIL CLASSIFICATION SYSTEM

CLAY & SILT

SAND

GRAVEL

DEPARTMENT SIEVE DESIGNATION

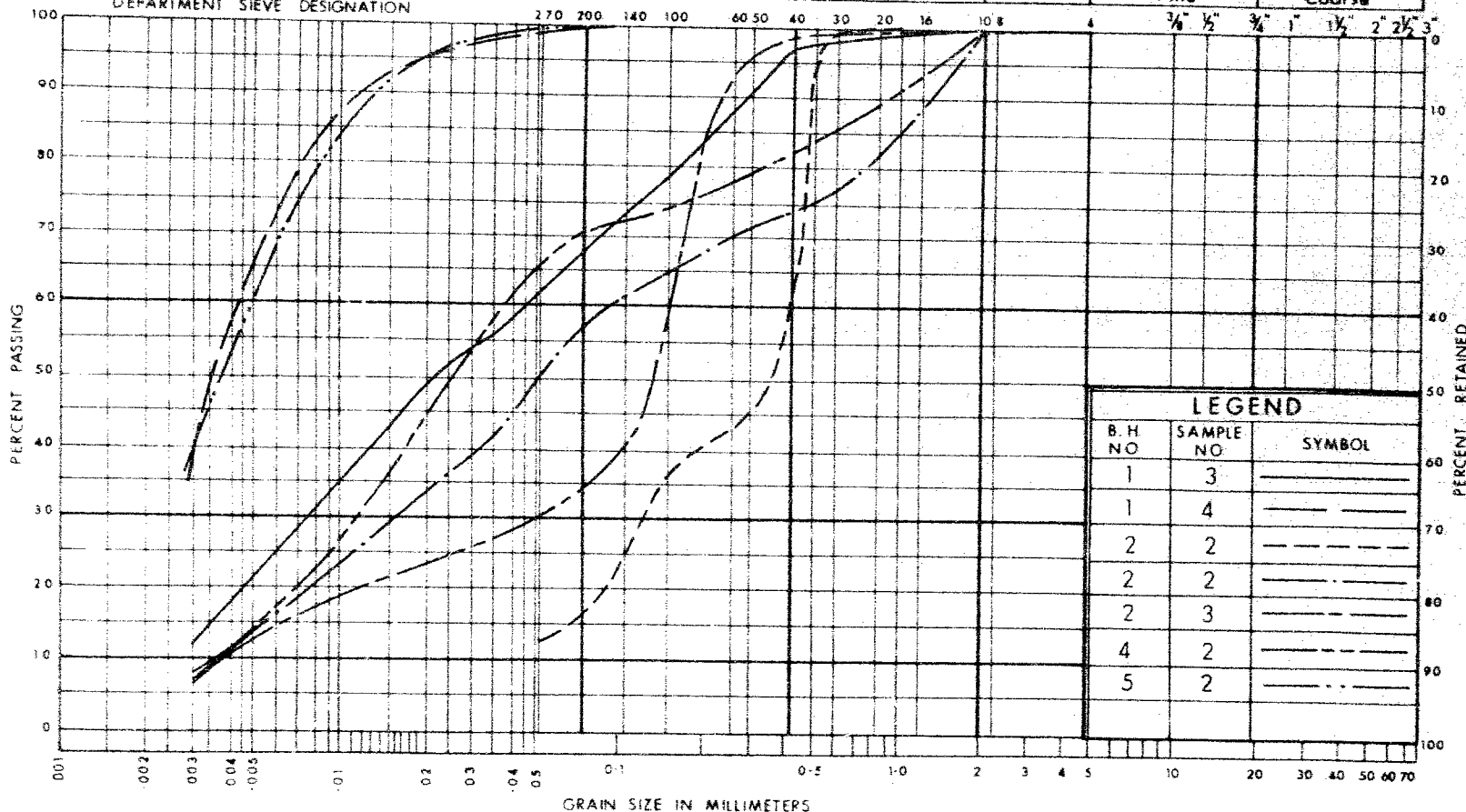
Fine

Medium

Coarse

Fine

Coarse



DEPARTMENT OF HIGHWAYS
MATERIALS and
TESTING
DIVISION

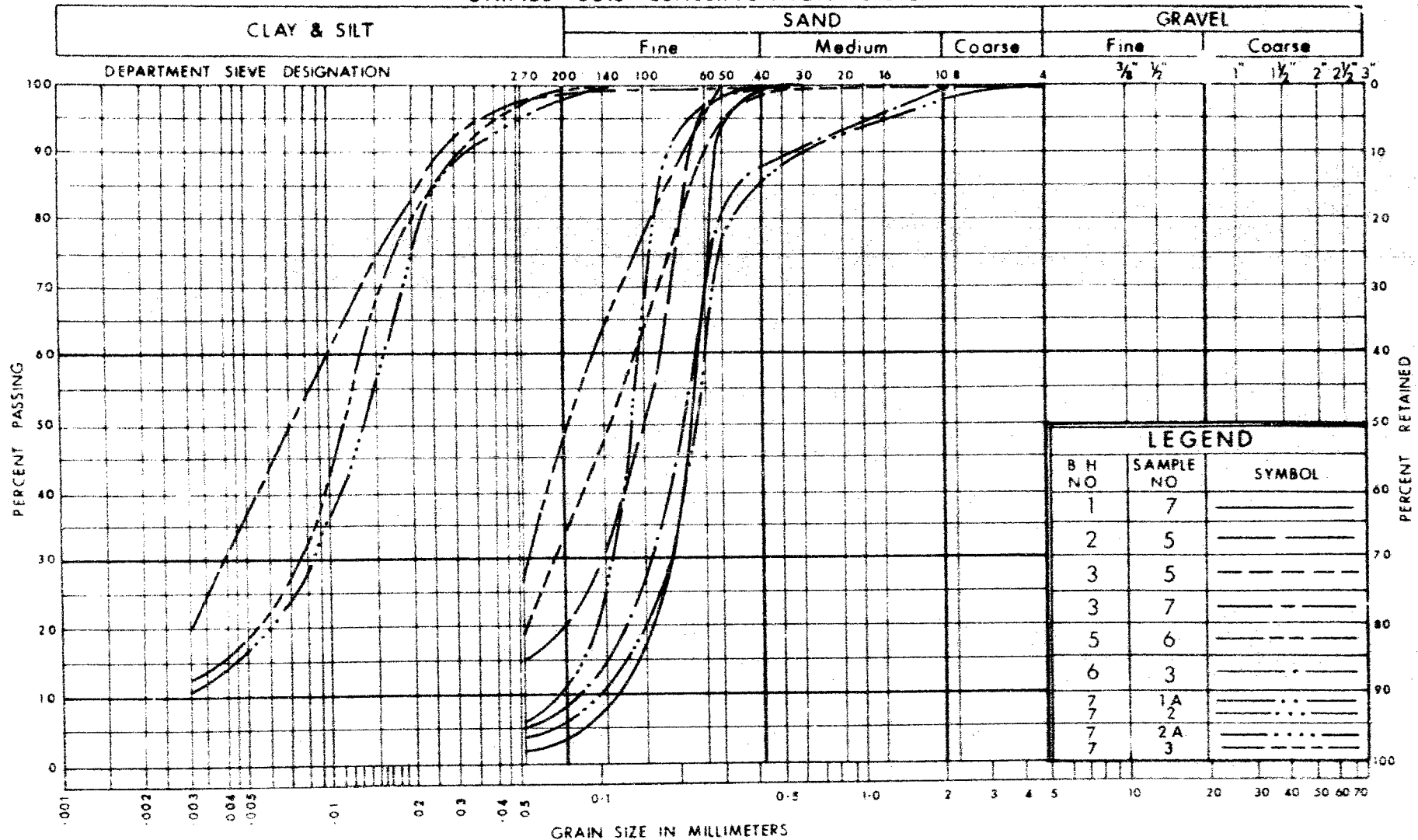
GRAIN SIZE DISTRIBUTION
SILT TO SILTY SAND

WP No. 29-68-02

JOB No. 70-11058

FIG. 1

UNIFIED SOIL CLASSIFICATION SYSTEM



DEPARTMENT OF HIGHWAYS
MATERIALS and
TESTING
DIVISION

GRAIN SIZE DISTRIBUTION SAND TO SILT

W.P. No. 29-68-02

JOB No. 70-11058

FIG. 2

EXCAVATION OF ORGANIC MATERIAL & SOFT SILTY CLAY

SCHEME 1 — NORTH APPROACH

JOB No. 70-11058

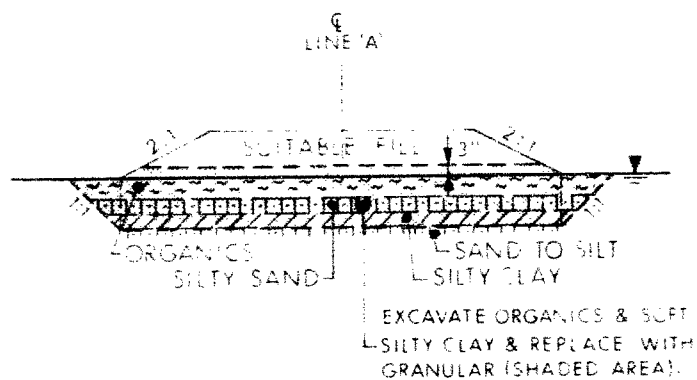
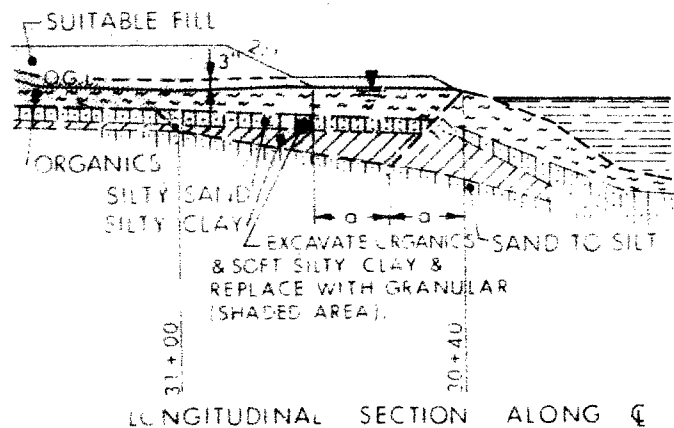
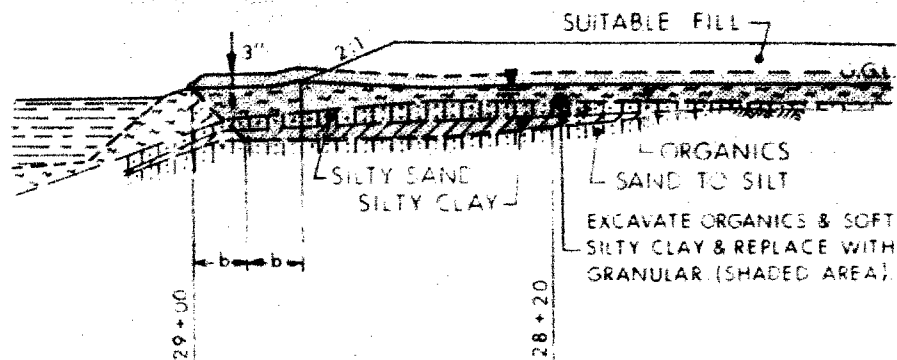


FIGURE 3

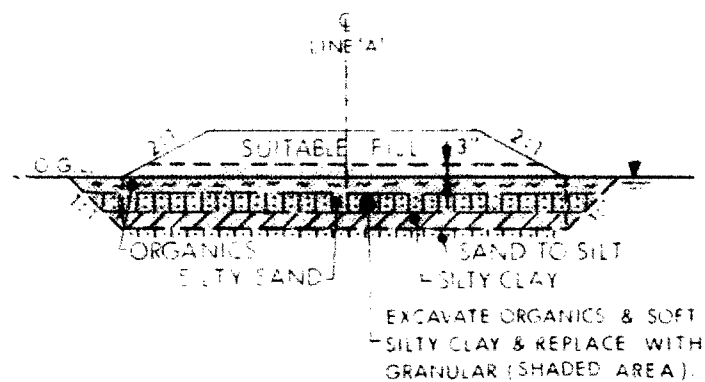
EXCAVATION OF ORGANIC MATERIAL & SOFT SILTY CLAY

SCHEME 1 — SOUTH APPROACH

JOB No. 70-11058



LONGITUDINAL SECTION ALONG \mathcal{C}



TYPICAL SECTION
RIGHT ANGLE TO \mathcal{C}

EXCAVATION OF ORGANIC MATERIAL & SOFT SILTY CLAY

SCHEME 2 — NORTH APPROACH

JOB No. 70-11058

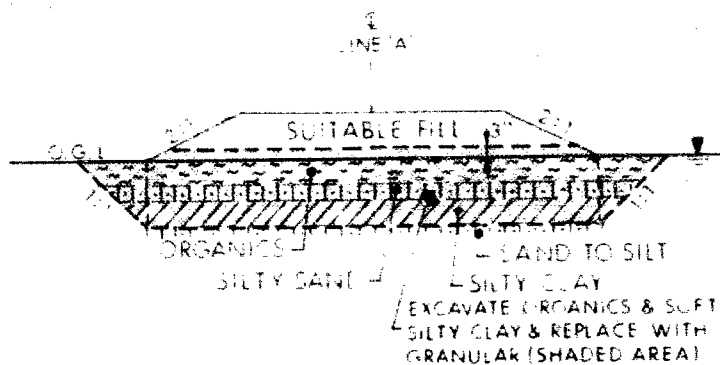
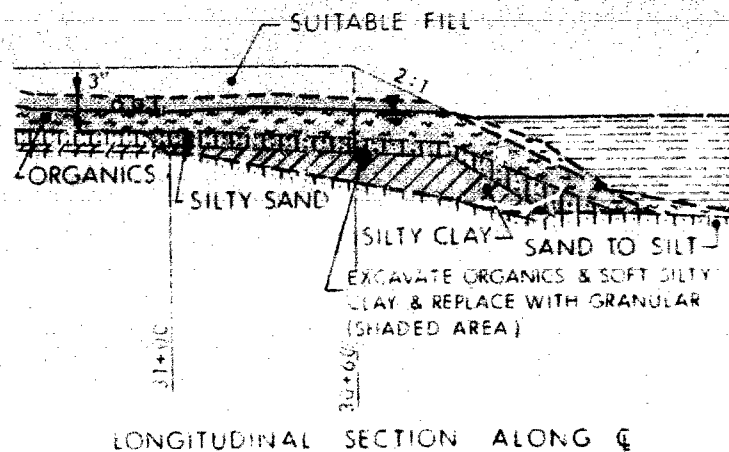
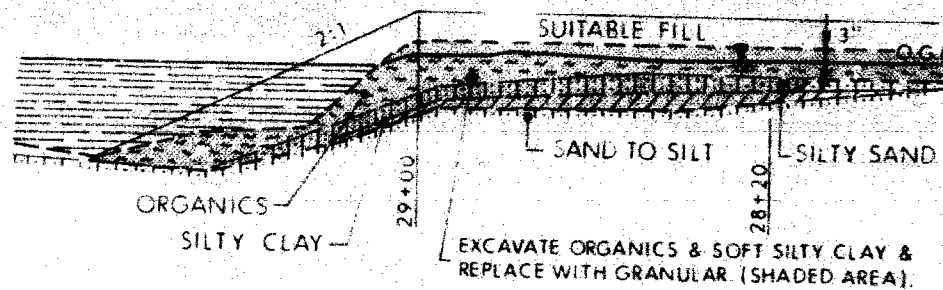


FIGURE 5

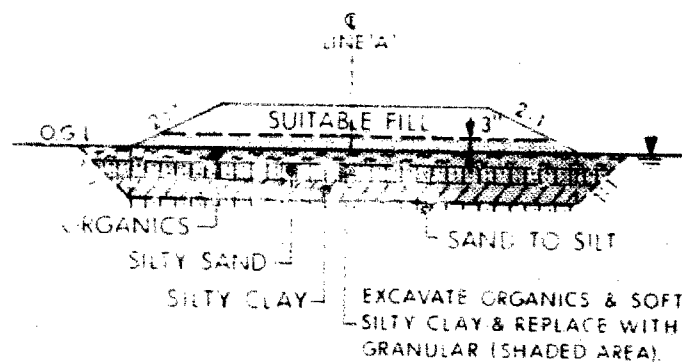
EXCAVATION OF ORGANIC MATERIAL & SOFT SILTY CLAY

SCHEME 2 — SOUTH APPROACH

JOB No. 70-11058



LONGITUDINAL SECTION ALONG CL



TYPICAL SECTION
RIGHT ANGLE TO CL

FIGURE 6

Department of Highways Ontario

Copy for the information of
Foundation Office.

Mr. A. Stermac,
Principal Foundation Engineer,
Room 107, Lab. Bldg.

C. S. Grebski,
Bridge Office.

May 10, 1971.

Murky Creek Bridge,
30.2 Mi. North of Jct. Hwy. #11
W.P. #29-68-02 Site No. 48E-4
Hwy. #584 District #19.

70-11-058

Attached herewith we are submitting the final
bridge drawings which show the foundation design for
this structure.

Kindly give us your comments at your earliest
convenience.

C. S. Grebski,
Bridge Design Engineer.

CSG/mh
ENCL*

cc: Foundation Office.

It is presumed that the extent of excavation
at north and south approaches (as shown on grading
drawings, not attached) conforms to the recommendations
contained in our report, specifically Figs 5 and 6.
There is no table of pile lengths included. No other
comments

14/5

20 June 71

APR 14/5/71

Department of Highways Ontario

Copy for the information of
Mr. A. Stermac

Mr. P. Lester,

Reg. Bridge Planning Engineer,
Thunder Bay Regional Office

Bridge Office,
Downsview

January 14, 1971

Murky Creek Bridge
30.2 Mi. N. of Jct. Hwy. #11
W.P. 29-68-02, Site No. 48E-4
Highway 584, District No. 19

70-11058

Attached herewith are prints of the Preliminary Bridge Plan
Drawing D-6969-P1 for the above-mentioned structure.

The estimated cost of the proposed structure is \$90,000. This
cost includes tender, materials, engineering and sundry construction.

Any comments or revisions you may have should be submitted
within three weeks.

C.S. Grabaki,
Bridge Design Engineer

CSG:rd

Attach.

C.C. B. Davis
A. Stermac (2)
J. Anderson