

DOCUMENT MICROFILMING IDENTIFICATION

GEOCRES No. 41J-116

DIST. 17 REGION NORTHERN

W.P. No. 129-76-02

CONT. No. 80-209

W. O. No. _____

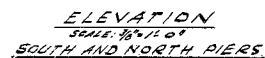
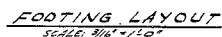
STR. SITE No. 46-173

HWY. No. 549

LOCATION LITTLE PANACHE CREEK

OVERSEEN DOCUMENT TO BE INCLUDED WITH THIS REPORT 3

REMARKS: _____



NOTES.

- PILES TO BE DRIVEN TO BEDROCK.
- TEMPORARY BRACING FOR PIER BENTS TO BE PROVIDED DURING CONSTRUCTION.

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- TEMPORARY BRACING FOR PIER BENTS TO BE PROVIDED DURING CONSTRUCTION.

North Abutment

$$\frac{80.3}{19'} \cdot \frac{10}{3} = 26' \quad \text{OK}$$

South Abutment

$$\frac{77.9}{11'} \cdot \frac{10}{3} = 12' \quad \text{(use 15', OK)}$$

North Pier

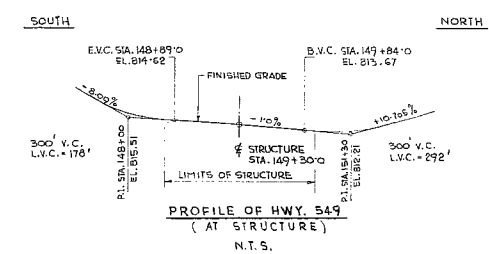
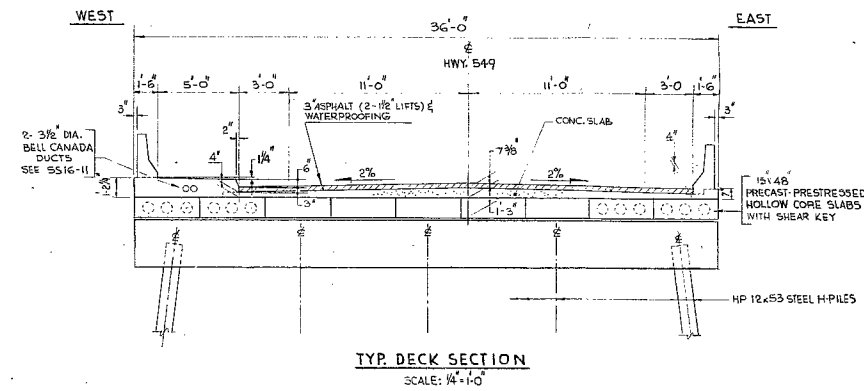
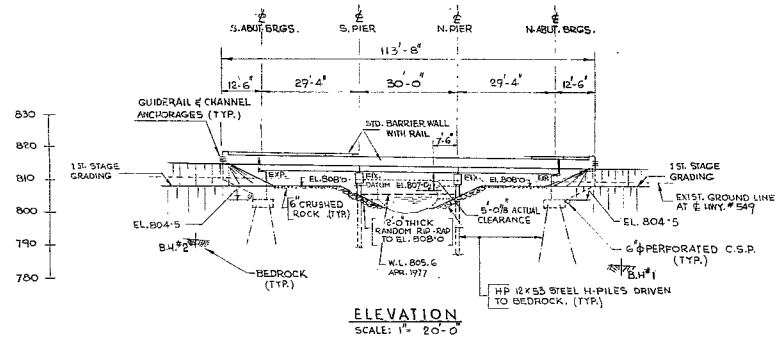
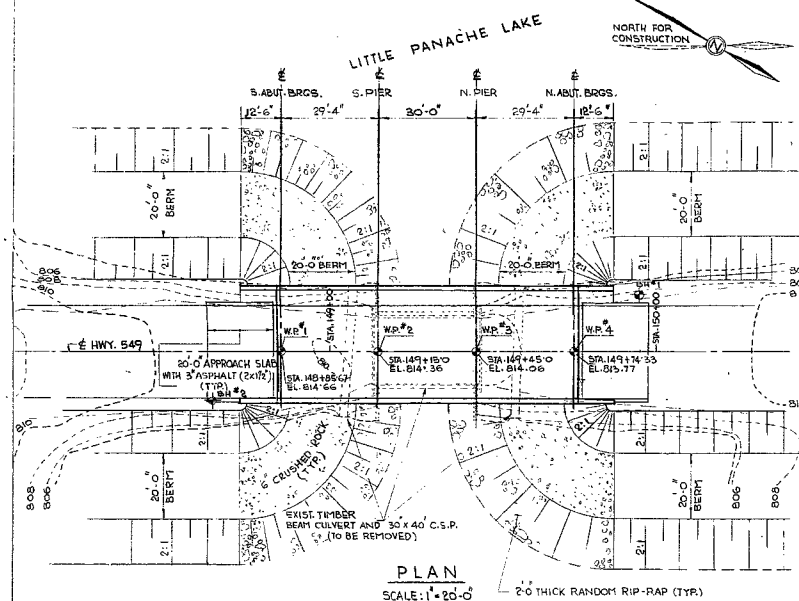
$$\frac{810.4}{72.5'} = \text{use } 26' \quad \text{OK}$$

South Pier

$$\frac{810.7}{787.5'} = \text{use } 26' \quad \text{OK}$$



REVISIONS					
	DATE	BY	DESCRIPTION		
DESIGN P.O.L.	CHECK		LOADING HS20-44	DATE JUN 87	
DRAWING A.V.	CHECK P.O.L.		SITE No 36-173	DWG 3	



B.M. 831.57
GEODETIC DATUM
N.E.W. IN ROOT 200 PINE
78' RT. 193+04

413-116

DIST. 17	CONT No	SHEET
WP	No 129-76-02	
LITTLE PANACHE NARROWS BRIDGE 80MI. SOUTH OF HWY. 7 GENERAL LAYOUT		

NOTES:

REINFORCING STEEL GRADE
PRESTRESSED HOLLOW CORE SLAB GRADE 40W
REMAINDER GRADE 400

CLASS OF CONCRETE
DECK, SIDEWALK AND BARRIER WALLS 4000 P.S.I.
REMAINDER 3000 P.S.I.

FOR PRESTRESSED HOLLOW CORE SLAB SEE DWG. #5

CLEAR COVER ON REINFORCING STEEL
FOOTING, ABUTMENTS & PIERS 3"
DECK TOP & SIDEWALK 2"
AND/OR AS NOTED ON DRAWINGS

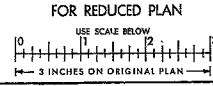
CONSTRUCTION NOTES
THE CONTRACTOR IS RESPONSIBLE FOR FINISHING THE BEARING SEATS DEAD LEVEL TO THE SPECIFIED ELEVATIONS WITH A TOLERANCE OF ± 1/8".
NO CONCRETE SHALL BE PLACED ABOVE THE ABUTMENT BEARING SEATS UNTIL THE CONCRETE IN THE DECK HAS BEEN PLACED.
TO ACHIEVE THE MINIMUM CLEAR COVER OF 2" SPECIFIED, THE TOP LAYER REINFORCEMENT SHALL BE PLACED PRIOR TO CONCRETING, WITH A CLEAR COVER OF 2 1/2" ± 1/2" TOLERANCE.
FORM WORK FOR THE BALLAST WALLS (9'S EXPANDED POLYSTYRENE) NEXT TO THE END OF PRESTRESSED SLABS SHALL BE REMOVED.

LIST OF DRAWINGS

- 46-173-1 GENERAL LAYOUT
- 2 BORE HOLE LOCATIONS & SOIL STRATA
- 3 FOOTING LAYOUT & PIERS
- 4 ABUTMENTS
- 5 PRESTRESSED SLABS & BEARINGS
- 6 DECK DETAILS
- 7 BARRIER WALL
- 8 BARRIER WALL WITH SIDEWALK
- 9 STEEL RAILING (SINGLE TUBE)
- 10 20' APPROACH SLAB
- 11 STANDARD DETAILS I
- 12 STANDARD DETAILS II
- 13 STANDARD DETAILS III
- 14 AS CONSTRUCTED SURV. & DIM.
- 15 BAILEY BRIDGE

CONCRETE QUANTITIES FOR LUMP SUM TENDER ITEMS

CONCRETE IN PIER CAPS, ABUTMENTS & WINGWALLS	C.Y.
CONCRETE IN DECK (CAST IN PLACE)	C.Y.
CONCRETE IN BARRIER WALLS	C.Y.
CONCRETE IN APPROACH SLABS	C.Y.



REVISIONS	DATE BY	DESCRIPTION
DESIGN P.O. CHECK	LOADINGS 20-44	DATE JUNE 78
DRAWING P.O. CHECK	SITE 46-173	DWG 1

GEOCRES No. 41I-116DIST 17 REGION NorthernW.P. No. 129-76-02CONF. No. 80-209

W. C. No. _____

STR. SITE No. 46-173HWY. No. 549LOCATION Little Panache CreekCOVERED BY SINGS TO BE INCLUDED WITH THIS REPORT. 3REMARKS: @documents to be unfolded
before microfilming@photos included

FOUNDATION INVESTIGATION REPORT

For

Little Panache Creek
W.P. 129-76-02, Site 46-173
Hwy. 549, District 17, Sudbury

INTRODUCTION

This report contains the results of a foundation investigation carried out at the site of the above mentioned project by the Trow Group Ltd. who were retained for this purpose by the Ministry. The fieldwork portion of the investigation was carried out on June 21 to 24, 1977. Two borings, each accompanied by a dynamic cone penetration test, were advanced by washboring techniques to depths of up to 36 feet below ground surface. Bedrock was proven by obtaining up to 12 feet of AX size rock core.

SITE DESCRIPTION AND GEOLOGY

The site is located approximately 7.5 miles south of Highway 17 along Secondary Road 549 at the crossing of Little Panache Lake. The existing structure comprises a single lane timber bridge with a clear span of about 18 feet. The banks of the lake rise fairly steeply on both sides of the bridge and the shoreline, which is covered in thick bush, consists of bedrock out-crops or sand, gravel and cobbles. The approach fills have been built out from either bank approximately 100 feet across the lake narrows and appear stable.

The area under consideration is located in the physiographic region known as the Canadian Shield, characterized by shallow overburden deposits and precambrian bedrock. The bedrock in the area is of early Proterozoic or Archean Age, comprising various sedimentary rocks which have commonly been intruded by the Nipissing diabase and other mafic intrusives.

SUBSOIL CONDITIONS

Subsoil conditions consist of a deposit of soft varved silty clay, varying from 2 to 8 feet thick, overlying a 1 to 7 foot thick deposit of a glacial till which in turn is underlain by bedrock. The borehole data

indicates that the parent subsoil conditions are overlain by a granular fill which is 9.5 to 13.0 feet thick.

Details of the subsurface conditions encountered in the boreholes are included in borehole sheets, which form part of the Appendix to this report. An inferred soil stratigraphy, as well as the borehole locations and elevations are included on Contract Drawing No. 46-173-2.

The various soil strata encountered in the boreholes from the ground surface downwards are described in detail as follows:

Sand and Gravel Fill

The boreholes, which were put down through the existing approach fills, indicate a depth of fill some 9.5 to 13.0 feet thick. The fill comprises mainly well-graded sand and gravel with some silt and occasional cobble and possible boulder sizes. Although no boulders impeded the advancement of the boreholes, several large cobbles and boulders are visible at surface in the vicinity, particularly around the existing abutments. Most of the boulders have been placed as rip-rap for scour protection purposes.

Moisture contents of the fill vary from 5 to 12 per cent. The 'N' values indicate a range of from 4 to 28, confirming that the heterogeneous fill is in a loose to compact state.

Silty Clay

Underlying the fill, a stratum of soft, varved silty clay was encountered. The thickness of the silty clay varied from about 2 feet south of the existing structure to about 7.5 feet north of the existing structure. This stratum comprises a thinly stratified (approximately 1/16 to 1/4 inch bands) grey silty clay and clay with occasional small fossilized shells included.

Field vanes taken in the silty clay in borehole 1 indicate shear strengths of 270 to 290 p.s.f. indicating a soft consistency. A quick triaxial carried out on thin wall sample indicated a laboratory shear strength of 260 p.s.f.

Moisture contents of the silty clay vary from 57 per cent to 62 per cent. A one-dimensional consolidation test was performed on a representative sample from this deposit and the results are plotted on Figure 2 in the

the Appendix. These tests indicate that the clay is very slightly overconsolidated by approximately 200 p.s.f. and has a coefficient of consolidation (M_v) of $0.10 \text{ ft}^2/\text{ton}$. The clay can be classified as highly compressible.

Glacial Till (Silty Sand and Gravel)

Underlying the silty clay is a thin layer of granular glacial till which has a estimated thickness of 7.0 to 1.5 feet in Boreholes 1 and 2, respectively. The samples indicate that the till is composed of coarse granular fragments in a partially cemented matrix of silty sand. Based on the cone penetration resistance and nature of drilling, it is estimated that some cobbles and boulders are also present in the stratum. A grain size distribution test plot of a sample of the deposit is included in the Appendix on Figure 1. It should be noted, however, that because the sample was recovered with a 2 inch O.D. split spoon sampler, it cannot be considered representative for a soil with cobble and boulder inclusions.

The 'N' values recorded in the granular deposit are 20 and 23, indicating that it is compact. The cone tests indicate that the deposit becomes dense with depth.

Quartzite Bedrock

Bedrock was proven by recovering 12.0 and 11.5 feet of Ax size core. The bedrock surface was encountered at depths of 24.0 and 16.5 feet corresponding to elevation 794 to 782, sloping down to the north.

The bedrock in both boreholes is similar, comprising mainly a light grey, fine-grained quartzite which is bedded in a nearly vertical direction. The quartzite is also intruded with odd, thin intrusive dykes of diabase which appears to follow the bedding of the parent material.

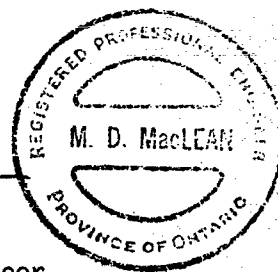
Because of the near vertical layering, some difficulty was encountered recovering core samples and considerable grinding of the bedrock occurred. The rock is considered to be sound, based on a visual examination.

Groundwater

Groundwater measurements taken in the boreholes indicate that the water table coincides with the lake level (measured at 805.5 at the time of the investigation), and was encountered approximately 3.0 feet below grade. With the granular nature of the overlying fill, it is expected that the water table will rise and fall with corresponding changes in the lake elevation.

M Maclean

M.D. MacLean
Project Foundations Engineer



M. Devata

M. Devata
Senior Foundations Engineer

March 18, 1980

HIGHWAY ENGINEERING DIVISION - ENGINEERING MATERIALS OFFICE - SOIL MECHANICS SECTION

RECORD OF BOREHOLE NO 1

WP 129-76-02 LOCATION Sta. 149 + 95, o/s 18' Lt. of Hwy. 549 ORIGINATED BY _____
 DIST 17 HWY 549 BORING DATE June 21, 22, 1977 COMPILED BY _____
 DATUM Geodetic BOREHOLE TYPE Washboring NW Casing CHECKED BY _____

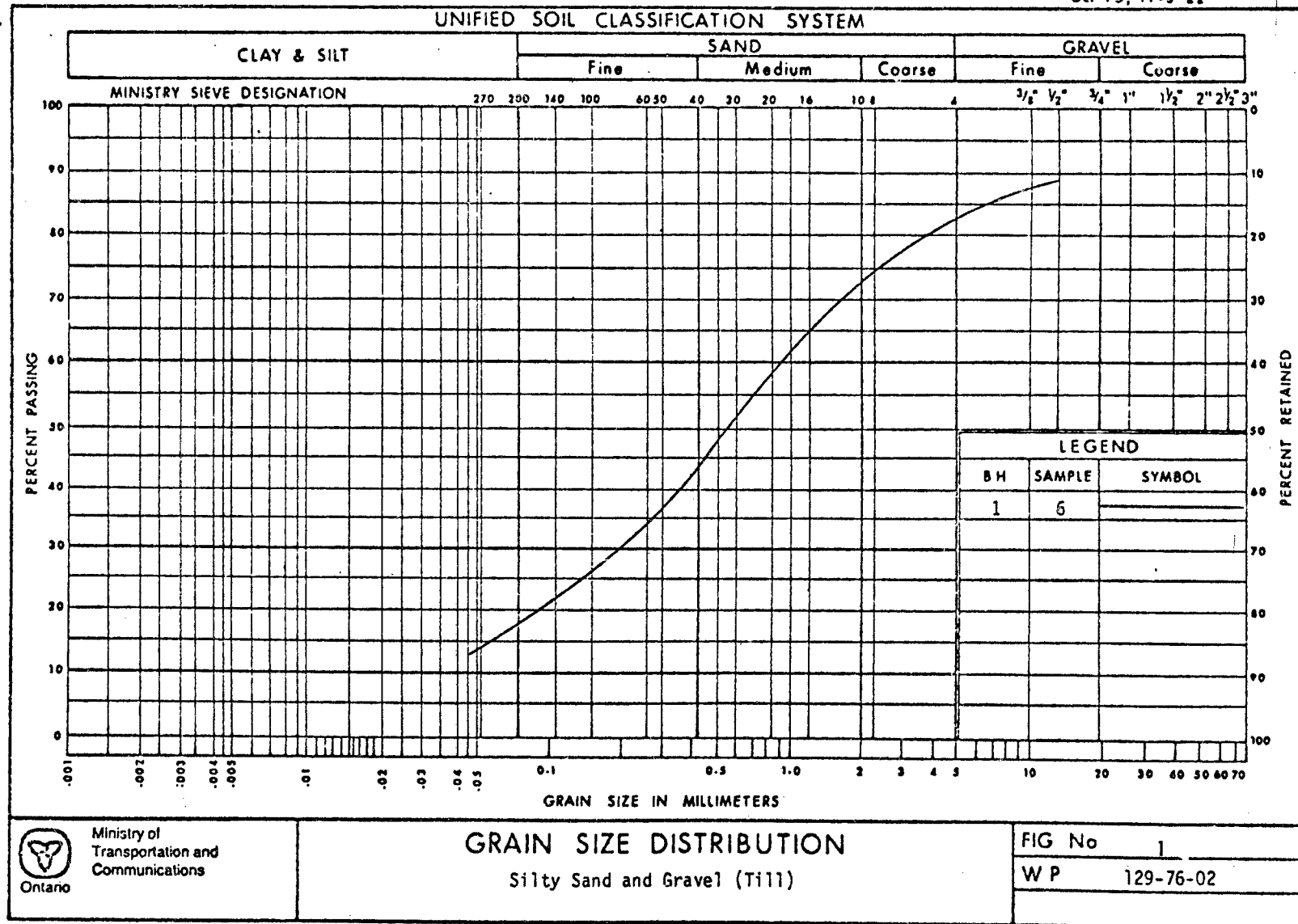
SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w			UNIT WEIGHT γ	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	'N' VALUES		20	40	60	80	100	w_p	w	w_L		
808.4	GROUND SURFACE															
0.0	SAND & GRAVEL (FILL) some silt, organic in upper 2', possible occasional cobble or boulder sizes (compact)		1	SS	20											
			2	SS	28											
798.9			3	SS	8											
9.5	SILTY CLAY-varved, grey (soft)		4	SS	1											
791.4			5	TW	PM											
17.0	SILTY SAND & GRAVEL (TILL)-grey (compact to dense)		6	SS	20											
784.4			7	RC	70% Rec.											
24.0	QUARTZITE BEDROCK sound, grey		8	AX	83% Rec.											
			9	AX	80% Rec.											
			10	RC	50% Rec.											
			11	AX	100% Rec.											
772.4																
36.0	END OF BOREHOLE															

RECORD OF BOREHOLE NO 2

W.F. 12-76-00 LOCATION Sta. 148 + 65, o/s 15' R.L. Hwy. 549 ORIGINATED BY _____
 DIST 17 HWY 549 BORING DATE June 23, 24, 1977 COMPILED BY _____
 DATUM Geodetic BOREHOLE TYPE Washboring NW Casing CHECKED BY _____

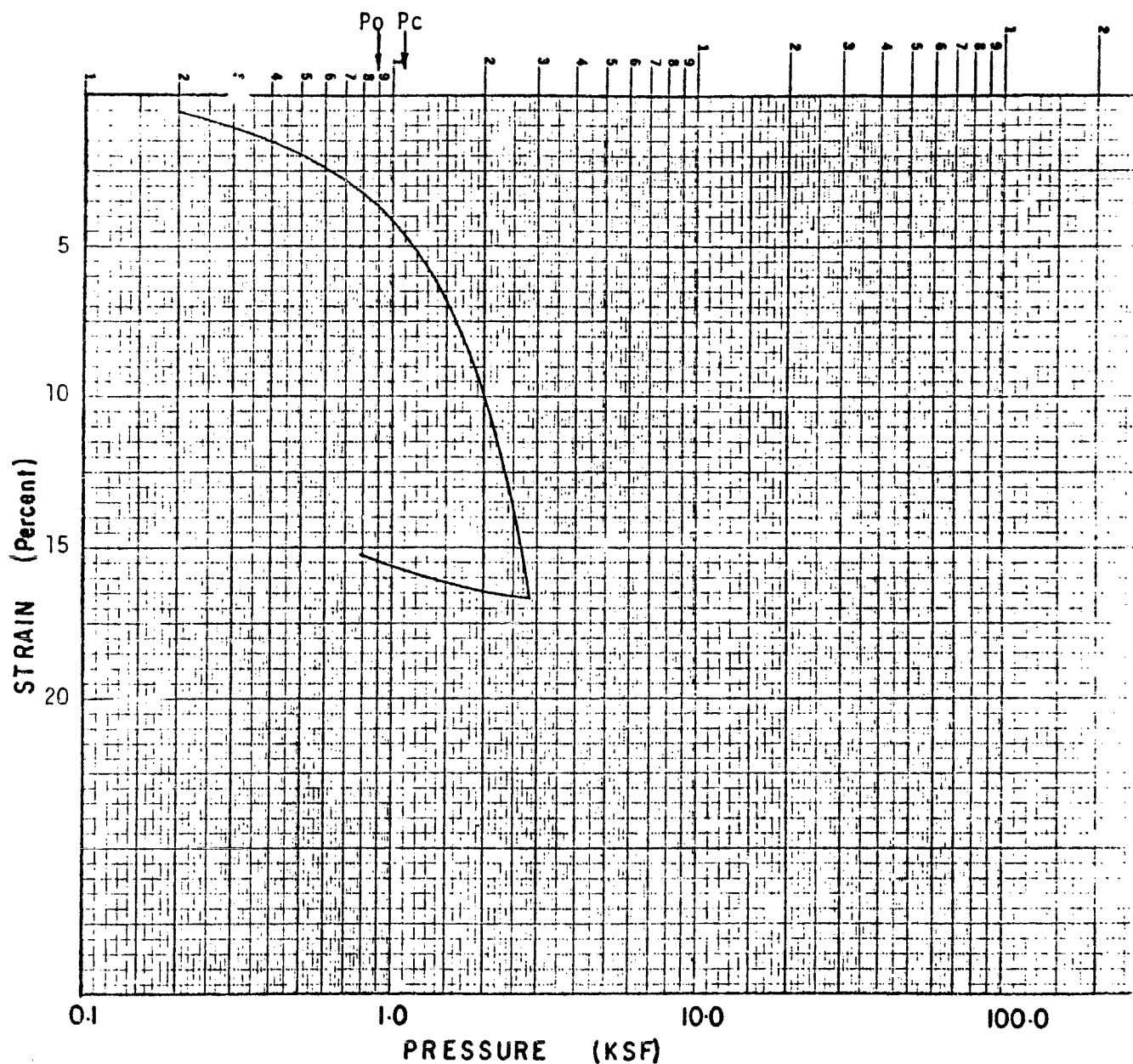
SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT _____ PLASTIC LIMIT _____ WATER CONTENT _____			UNIT WEIGHT γ	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	N' VALUES		20	40	60	80	100	W _p	W	W _L		
800.5	SAND & GRAVEL (FILL) some silt, organics in upper 2', possible occasional cobble & boulder sizes (loose to compact)		1	SS	20	800										
			2	SS	4											
			3	SS	6											
			4	SS	24											
782.5	CLAY - varved, grey (SSS)		5	SS	23	790										
782.7	SILTY SAND & GRAVEL (TILL) - compact/dense		6	RC AX	50% Rec.											
16.5	QUARTZITE BEDROCK grey, sound		7	RC AX	100% Rec.											
780.5			8	RC AX	100% Rec.	780										
28.0	END OF BOREHOLE															

20
15 \diamond 5 % STRAIN AT FAILURE
10



W.P. NO. 129-76-02Fig. No. 2

CONSOLIDATION TEST RESULTS



Borehole No 1
 Depth 15 - 16.5 ft.
 Moisture Content 62 %

Sample Description: Soft Silty Cla

$$M_v = \frac{\Delta \text{ strain}}{\Delta \text{ pressure}} = 0.10 \text{ ft.}^2/\text{ton}$$

(within anticipated loading range)

Mr. J. McAllister
Head, Structural Section
Northern Region, North Bay

Soil Mechanics Section
Engineering Materials Office
West Building, Downsview

77 08 23

Foundation Investigation Report
for
Proposed New Structure at the Crossing of
Sec. Rpa, 549 and Little Panache Lake Narrows
District of Sudbury, District #17
Site 46-173, W.P. 129-76-02

The Trow Group Limited, Geotechnical Consultants, have been retained by the Ministry to carry out a subsurface investigation and provide necessary recommendations for the above mentioned structure. We have now received the foundation report prepared by the Consultants. Our comments are as follows:

The type and length of structure which are feasible at this site depend to a large extent on the stability of the approach fills. The Consultants have presented several alternatives to resolve the stability problems and have recommended various foundation schemes for the structure corresponding to these measures. The Consultants' recommendations and subsoil information should be adequate for you to carry out a cost comparison to determine the most economical structure scheme. When the type of structure has been decided on, we will provide specific recommendations with regard to the design and construction of the foundations as well as the related earthworks, if necessary.

Should you have any queries, please contact this office.

B. Ly

B. Ly
Senior Engineer

BL/kr

cc: W.J. Peck
S. McCombie
J.M. Bernhardt
E. Van Bellen
G.A. Wrong
B.J. Giroux
R.S. Pillar
R. Hore
L. Argo
J. Anderson
G. Sloan
Files✓



Memorandum

To: File (5005-1-2(b))

From: Soil Mechanics Section
Engineering Materials Office
West Building, Downsview

Attention:

Date: 77 04 15

Our File Ref.

In Reply to

Subject: Minutes of Meeting

A Client Committee meeting was held on 77 04 14 at 15:00 hrs. to discuss the Consultant Assignments for foundation investigations of the following projects:

1. W.P. 14-74-07, Site #38S-13, Hwy. 129, District 18, Sault Ste. Marie
2. W.P. 14-74-08, Site #38S-332, Hwy. 129, District 18, Sault Ste. Marie
3. W.P. 14-74-09, Site #38S-331, Hwy. 129, District 18, Sault Ste. Marie
4. W.P. 129-76-02, Site #46-173, Hwy. 549, District 17, Sudbury

This meeting was attended by Messrs. A.G. Stermac, C. Mirza and M. Devata at the office of the Manager, Engineering Materials Office, West Building, Downsview.

After a careful review of the past performance of the Consultants' work on Ministry projects, it was agreed that there is an advantage to assign individual consultants for each project rather than assigning one consultant for all the three projects in District 18, Sault Ste. Marie on Hwy. 129. In this case we may be paying some added premiums with regard to mobilization costs of drilling equipment and field engineering services but the benefits are of significant value to the Ministry. This will enable us to compare the performance and costs of three consulting firms who are generally engaged by the Ministry for geotechnical services in Northern Ontario. Since these three jobs are of a similar nature, a more realistic appraisal can be made on the work of three commonly used consultants in this area, namely Dominion Soil Investigation Ltd., Thunder Bay; Morton, Dodds and Partners, Thunder Bay; and Trow Group, Sudbury. As a result of this the Consultant Committee concluded that three separate consultants should be assigned for the three work projects on Hwy. 129 in District 18.

The fourth project is located in Sudbury District and the consultants normally to be considered will be Trow Group, Sudbury, and Geocon (1975) Ltd. Sudbury. The performance of Geocon Ltd. was not entirely satisfactory on their most recent project with the Ministry and some careful review is underway. In view of this the Committee was of the opinion that new assignments to Geocon (1975) Ltd. should be deferred for the present time. With regard to Trow Group, there was no added benefit to assign the fourth project since they were already being considered for a project in District 18.

cont'd.....

It was finally agreed by the Committee that the consultant assignments will be as follows:

First Choice

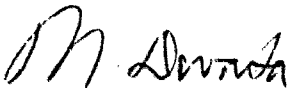
W.P. 14-74-07, Hwy. 129, Dominion Soil Investigation Ltd. Thunder Bay

W.P. 14-74-08, Hwy. 129, Morton, Dodds and Partners, Thunder Bay

W.P. 14-74-09, Hwy. 129, Trow Group, Sudbury

W.P. 129-76-02, Hwy. 549, Golder and Associates, Mississauga

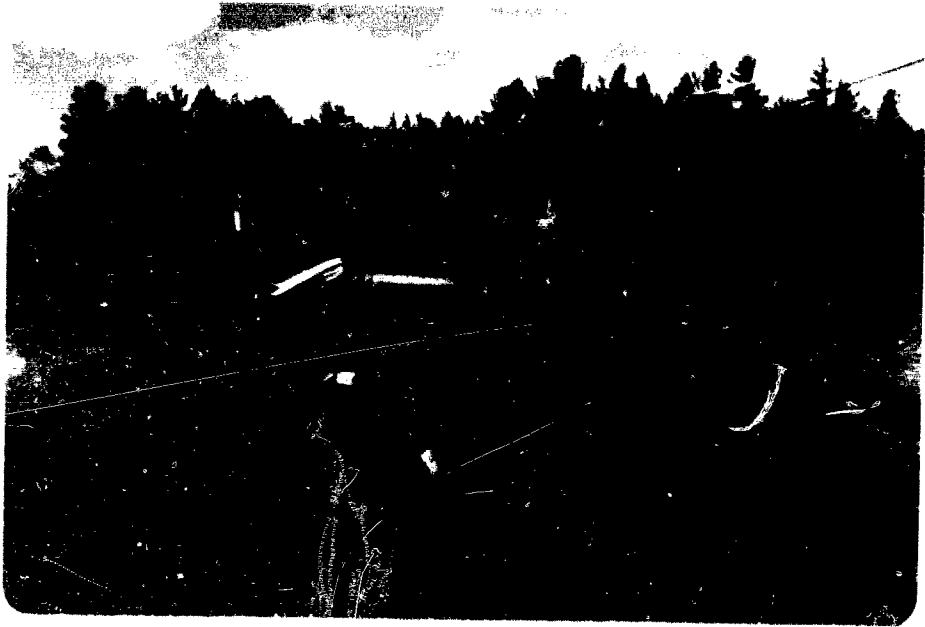
The meeting adjourned at 15:30 hrs.



M. Devata
Supervising Engineer

MD/gs

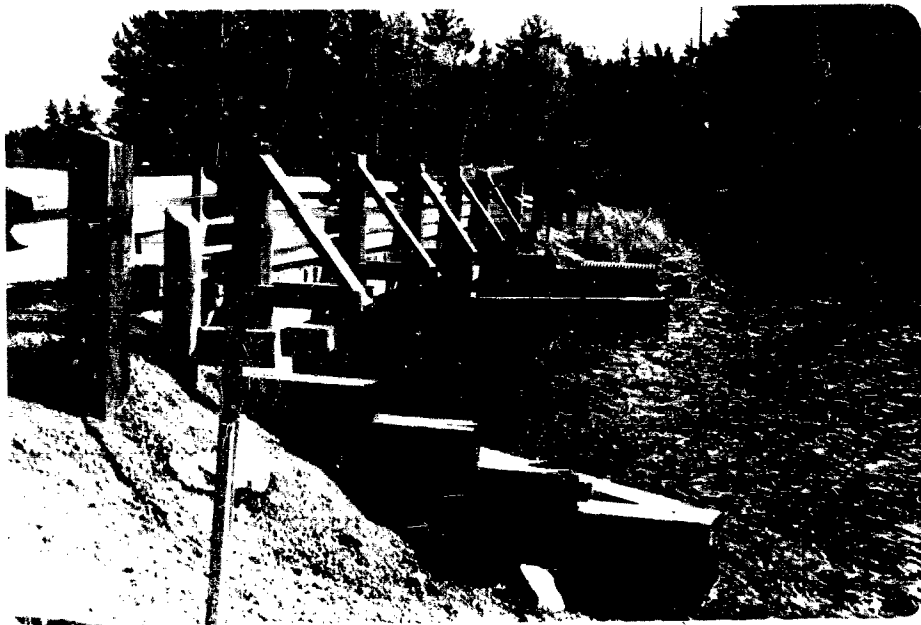
cc: Files ✓
Record Services



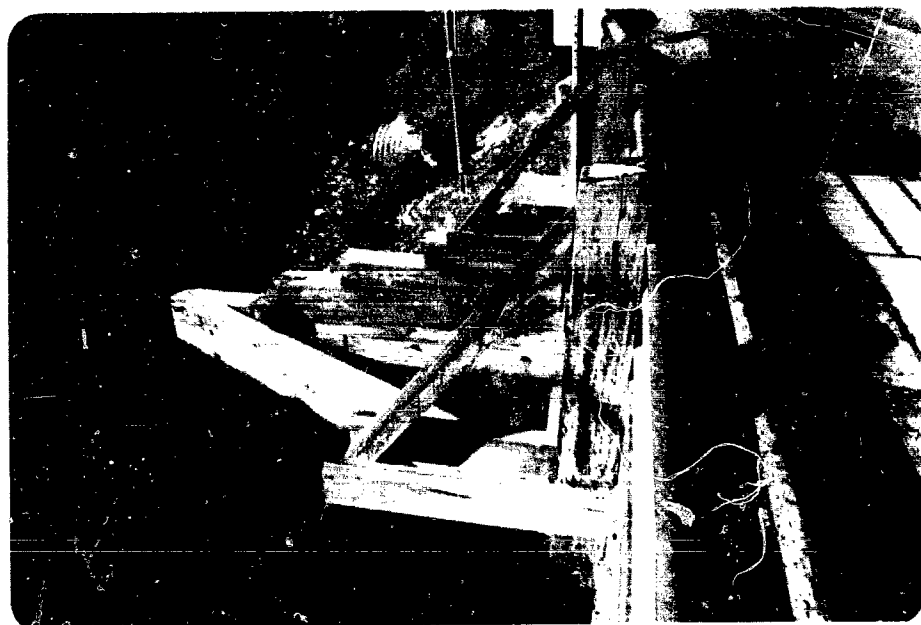
LOOKING SOUTH



EAST ELEVATION



LOOKING SOUTH. ON WEST SIDE.



WEST SIDE