

GEOCRES No. 41J-33

DIST. 18 REGION NORTH WESTERN

W.P. No. 14-74-04

CONT. No. 76-83

W. O. No. \_\_\_\_\_

STR. SITE No: \_\_\_\_\_

HWY. No. 129

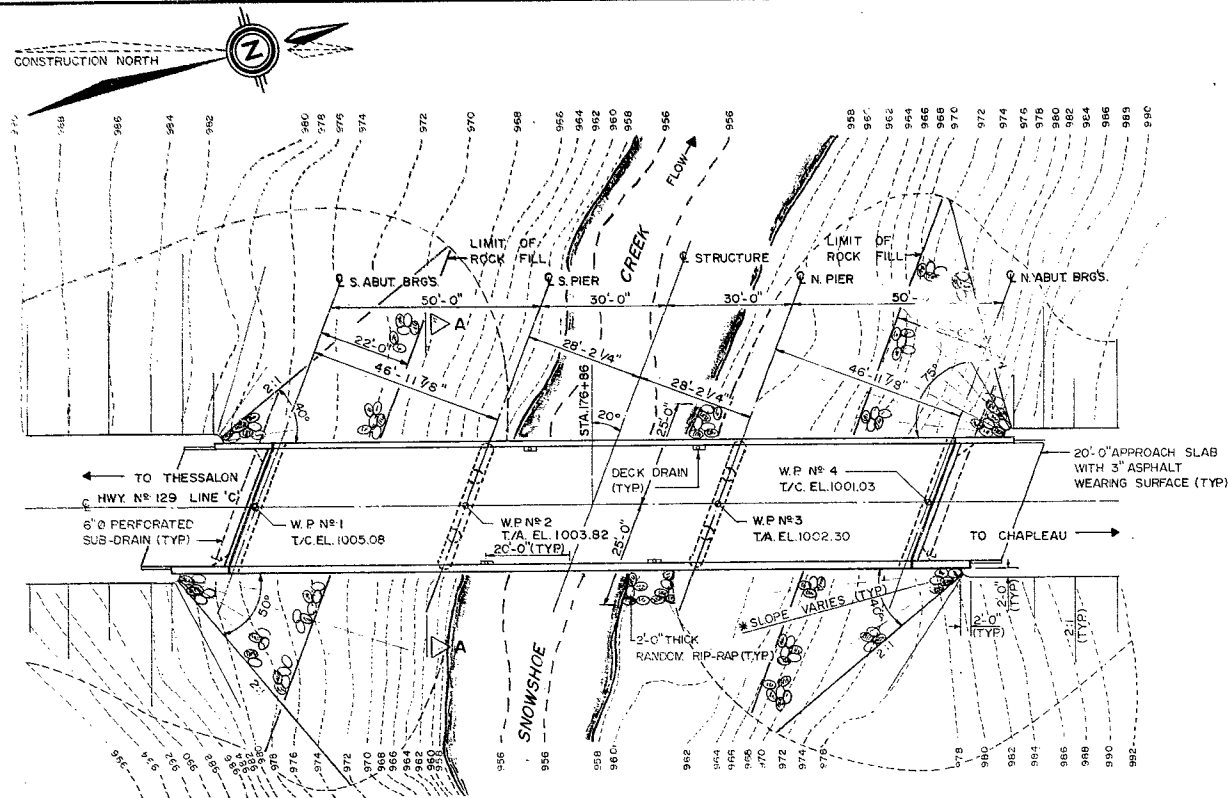
LOCATION SNOW SHOE CREEK

Hwy 129

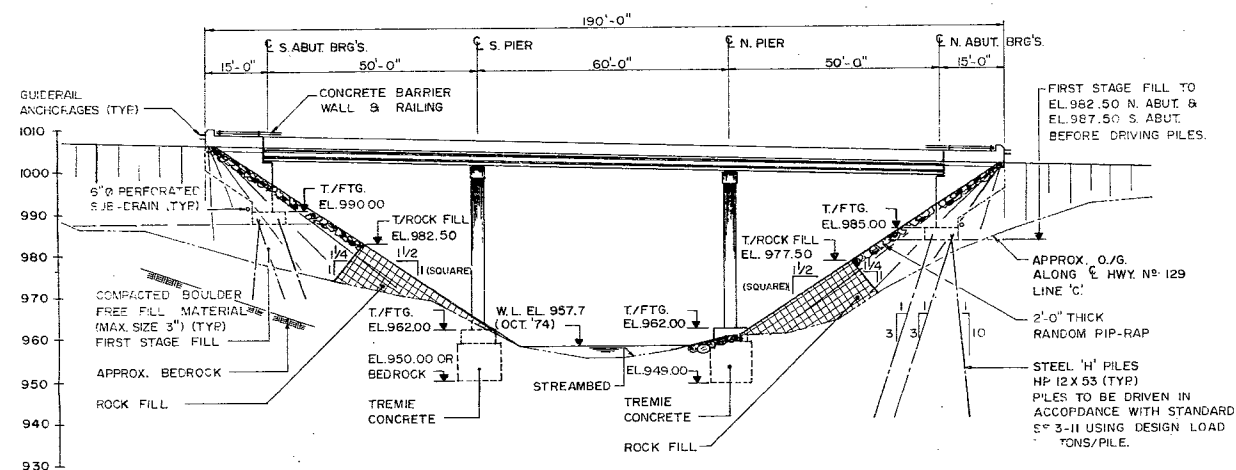
OVERSIZE DRAWINGS TO BE INCLUDED WITH THIS REPORT. 2

REMARKS: 2 documents to be unfolded before

microfilming



PLAN  
SCALE: 1" = 20'-0"



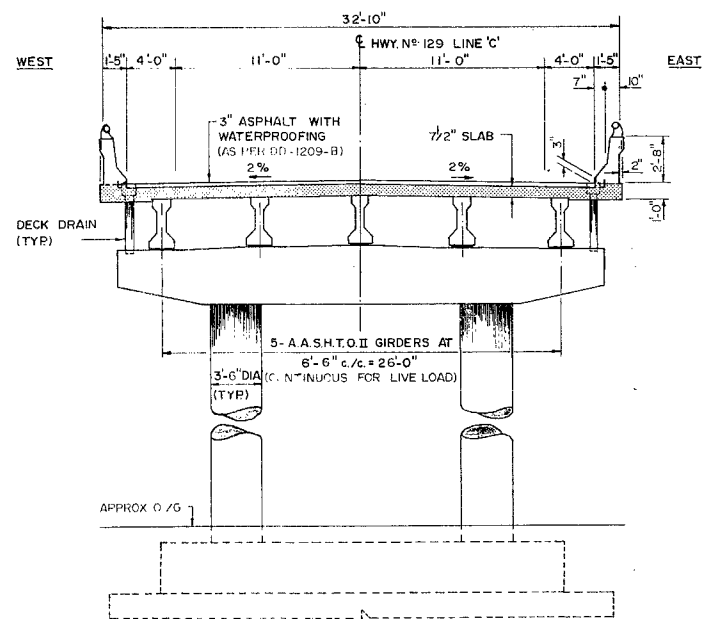
#### SEQUENCE OF CONSTRUCTION

1. CONSTRUCT PIER FOOTINGS.
2. PLACE FIRST STAGE FILL.
3. DRIVE 'H' PILES FOR ABUT FOOTINGS.
4. COMPLETE THE STRUCTURE.

#### ELEVATION

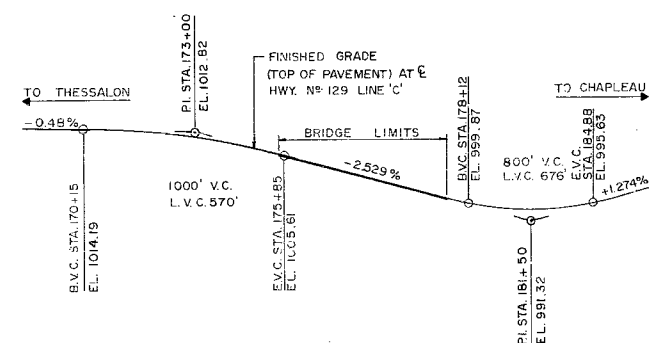
SCALE: 1" = 20'-0"

- NOTES:
- W.P. DENOTES WORKING POINT.
  - T.C. DENOTES TOP OF CONCRETE DAM.
  - T.A. DENOTES TOP OF ASPHALT WEARING SURFACE.
  - \* DENOTES SLOPE VARIES 1 1/2:1 TO 2:1



#### SECTION A-A

SCALE: 1" = 5'-0"



#### PROFILE ALONG C. HWY. NO. 129

LINE 'C'  
N.T.S.

#### CONCRETE QUANTITIES

CONCRETE QUANTITIES ARE LISTED BELOW FOR THE APPROPRIATE CONCRETE LUMP SUM TENDER ITEMS:

- CONC. IN PIERS, ABUTMENTS & WINGWALLS. . . . . 131 cu yd 3,000 p.s.i.
- CONC. IN DECK & DIAPHRAGMS . . . . . 65 cu yd 4,000 p.s.i.
- CONC. IN BARRIER WALLS . . . . . 151 cu yd
- CONC. IN APPROACH SLABS . . . . . 33 cu yd

FUNCTIONS OF 20° 00' 00"	
SIN.	0.34202
COS.	0.93969
TAN.	0.36397
SEC.	1.06418

CONT No.  
WP No. 14-74-04

SNOWSHOE CREEK BRIDGE  
GENERAL ARRANGEMENT  
KING'S HIGHWAY NO. 129. DIST. NO. 18.

SHEET

totten sims hubicki associates limited  
CONSULTANTS

#### NOTES

##### CLASS OF CONCRETE

- DECK, DIAPHRAGMS & BARRIER WALLS 4,000 P.S.I.
- PRESTRESSED GIRDERS 5,000 P.S.I.
- PIERS 4,000 P.S.I.
- REMAINDER 3,000 P.S.I.

##### CLEAR COVER TO REIN. STEEL

- FOOTINGS 3"
- ABUTMENTS & WINGWALLS 3"
- DECK 1" BOT., 2" TOP.
- APPROACH SLABS 2"
- CONC. BARRIER WALLS 1 1/2"
- PIERS AS NOTED.
- GIRDERS 1"

##### CONSTRUCTION NOTES

- THE CONTRACTOR IS RESPONSIBLE FOR FINISHING THE BEARING SEATS DEAD LEVEL TO THE SPECIFIED ELEVATIONS WITH A TOLERANCE OF  $\pm 1/8"$ .
- 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 OF REINFORCING STEEL IN THE DECK SLAB SHALL BE PLACED PRIOR TO CONCRETING WITH A CLEAR COVER OF  $2 1/2" \pm 1/2"$  TOLERANCE.

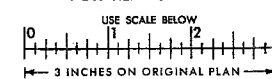
##### LIST OF DRAWINGS

- 38 S-3-1 - GENERAL ARRANGEMENT.
- 2 - BOREHOLE LOCATIONS & SOIL STRATA.
- 3 - FOOTINGS.
- 4 - ABUTMENTS.
- 5 - WINGWALLS.
- 6 - PIERS.
- 7 - PRESTRESSED GIRDERS & BEARINGS.
- 8 - DECK DETAILS.
- 9 - DECK REINFORCEMENT.
- 10 - 20 FT. APPROACH SLAB (BARRIER WALL).
- 11 - CONCRETE BARRIER WALL (2'-8" HIGH).
- 12 - STEEL PARAPET RAILING (SINGLE TUBE).
- 13 - STANDARDS.
- 14 - STANDARDS.
- 15 - AS CONSTRUCTED ELEV. & DIM.

M.T.C. B.M. NO. 131-70  
ELEV. 1011.12  
STEEL ROD WITH BRASS CAP  
111' RIGHT OF STA. 106+07

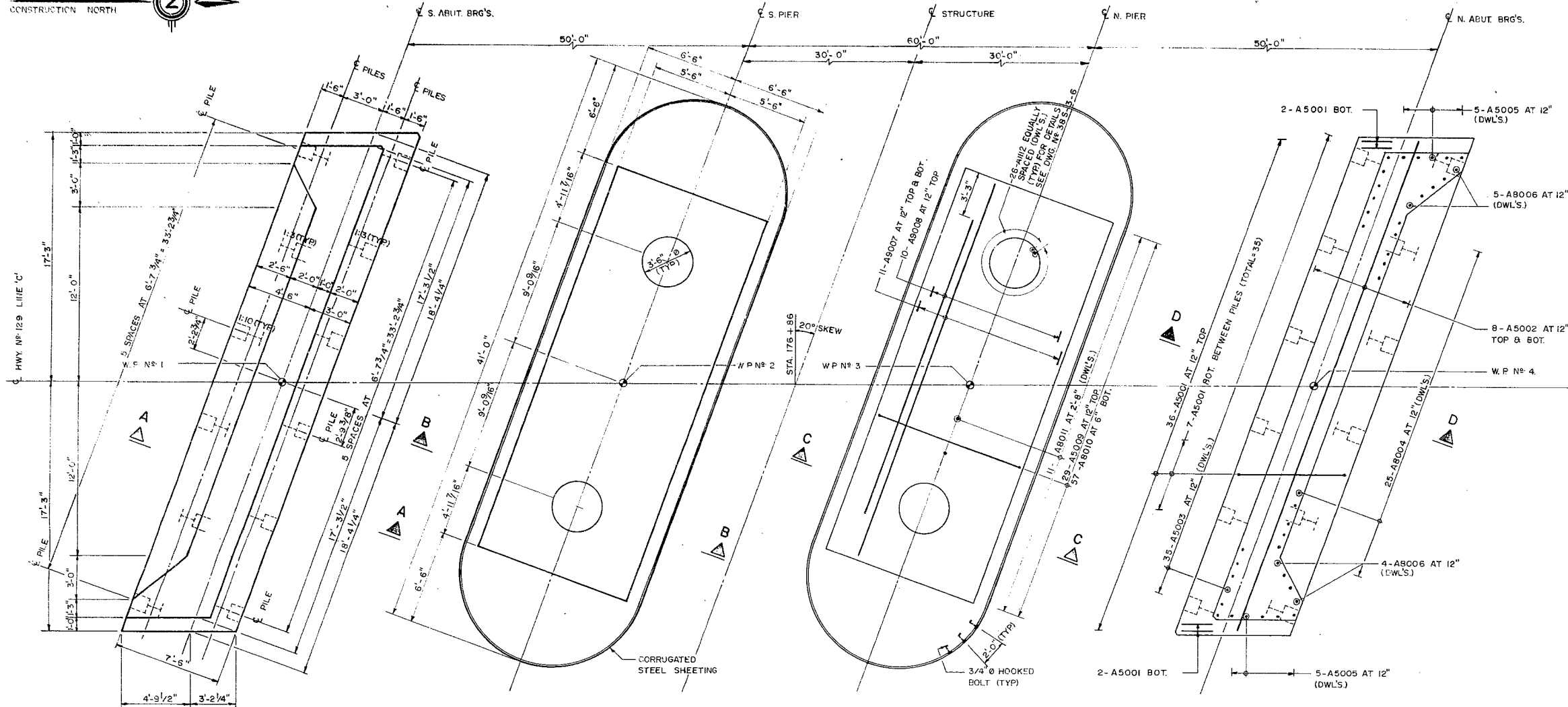
SCALE AS NOTED.

#### FOR REDUCED PLAN



REVISIONS	DATE	BY	DESCRIPTION
1			
2			
3			

DESIGN T.V.M. CHECK P.Y. LOADING HS 20-44 DATE JAN. 76  
DRAWING AGL. CHECK G.L. SITE No. 38 S-3 DWG /



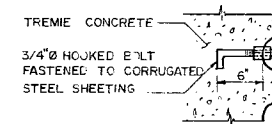
FOOTING DIMENSIONS

S. ABUT. & N. ABUT. FTG'S. SIMILAR  
S. PIER & N. PIER FTG'S. SIMILAR  
EXCEPT AS NOTED.

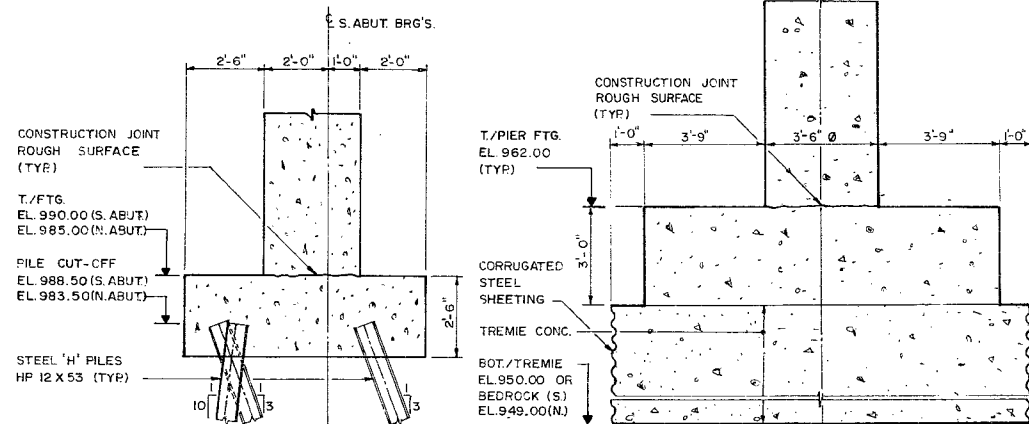
PLAN

SCALE: 1/4" = 1'-0"

FOOTING REINFORCEMENT



DETAIL 'E'  
N.T.S.

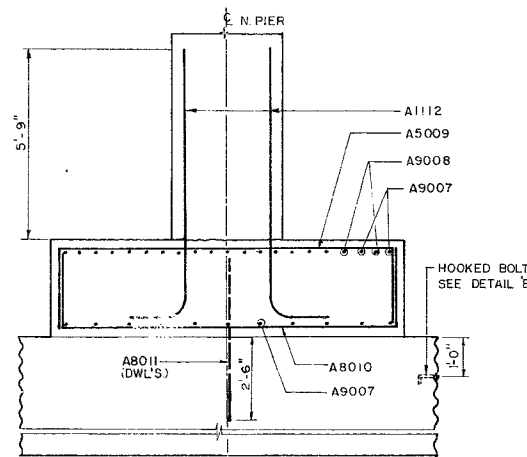


SECTION A-A

SCALE: 3/8" = 1'-0"

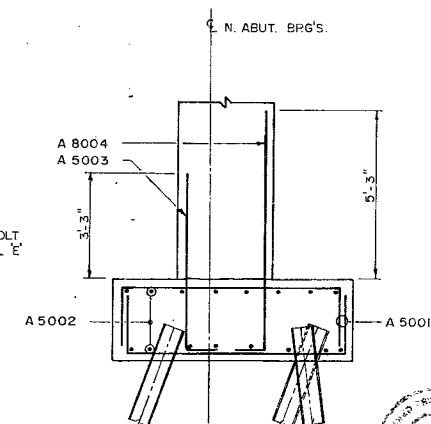
SECTION B-B

SCALE: 3/8" = 1'-0"



SECTION C-C

SCALE: 3/8" = 1'-0"



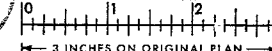
SECTION D-D

SCALE: 3/8" = 1'-0"



FOR REDUCED PLAN

USE SCALE BELOW



CONT No  
WP No. 14-74-04

SNOWSHOE CREEK BRIDGE  
FOOTINGS  
KING'S HIGHWAY N° 129, DIST. N° 18.



SHEET

totten sims hubicki associates limited  
CONSULTANTS

LIST OF PILES

LOCATION	N°	LENGTH	TYPE
SOUTH ABUT.	12	30'-0"	HP 12 X 53
NORTH ABUT.	12	50'-0"	HP 12 X 53

NOTES:

- SPACING OF PILES TO BE MEASURED AT UNDERSIDE OF FOOTINGS.
- PILES TO BE DRIVEN IN ACCORDANCE WITH STANDARD SS 3-11 USING DESIGN LOAD 70 TONS / PILE.
- CORRUGATED STEEL SHEETING SHALL BE 10 GAUGE 6" X 2" CORRUGATIONS IN ACCORDANCE WITH C.S.P.I. SPEC. 501, LATEST REVISIONS.
- ALL BOLTS TO BE 3/4" Ø A.S.T.M. A325 GALVANIZED, 4 BOLTS PER FOOT.
- HOOKE BOLTS SHALL CONFORM TO A.S.T.M. A307.
- ALL STEEL SHALL BE HOT DIPPED GALVANIZED IN ACCORDANCE WITH C.S.A. G154.
- CORRUGATED STEEL SHEETING TO BE BRACED TO MAINTAIN THE REQUIRED SHAPE AND STABILITY.

SCALE AS NOTED.

REVISIONS	DATE BY	DESCRIPTION
DESIGN TVM	CHECK P.Y.	LOADING HS 20-44
DRAWINGAGL	CHECKGL	SITE N° 385-3
		DWG 3



extra copy

# DOMINION SOIL INVESTIGATION LIMITED

CONSULTING SOIL & FOUNDATION ENGINEERS

104 CROCKFORD BLVD., SCARBOROUGH, ONT. M1R 3C6 (416) 751-6565 · TELEX 06-963578 · CABLES: DOMSOIL

41 J-33  
GEOCREs No.

JUN 02 1975

FOUNDATION INVESTIGATION  
PROPOSED CROSSING  
SNOW SHOE CREEK - HIGHWAY 129  
TOWNSHIP OF CASSON

WP. 14-74-04  
CONT. 76-83

RFF. NO. 75-3-12

MAY 1975

Prepared For:

The Ministry of Transportation & Communications,  
Downsview, Ontario.

DISTRIBUTION:

- 15 copies - The Ministry of Transportation & Communications
- 2 copies - Dominion Soil Investigation Limited

C O N T E N T S

	<u>Page No.</u>
1.0 INTRODUCTION .....	1
2.0 THE SITE & GEOLOGY .....	2
3.0 FIELD WORK .....	3,4
4.0 LABORATORY WORK .....	4
5.0 SOIL & BEDROCK CONDITIONS .....	5
5.1 General .....	5
5.2 Sand & Gravel .....	5,6
5.3 Silty Sand Till .....	6
5.4 Bedrock .....	7
6.0 GROUNDWATER CONDITIONS .....	7
7.0 DISCUSSION OF THE RESULTS .....	8
7.1 BRIDGE STRUCTURE .....	8
7.1.1 Piers .....	8,9
7.1.2 Abutments .....	9,10,11
7.1.3 Approach Fill .....	11
7.2 CULVERT STRUCTURE .....	12
7.3 STREAM DIVERSION .....	12,13
7.4 CONSTRUCTION .....	13,14



E N C L O S U R E S

Encl. No.

BOREHOLE LOCATIONS & SOIL STRATA .....	Dwg.#147404-A
BOREHOLE LOGS .....	Encl. 1 to 4 incl.
GRAIN SIZE DISTRIBUTION .....	Encl. 5,6

1.0 INTRODUCTION

This report describes the subsurface and foundation conditions encountered at the site of the proposed crossing of Snow Shoe Creek and the proposed new alignment of Highway #129.

The investigation was requested by Mr. B.J. McKenna, Regional Structural Planning Engineer for the north-western region and authorization to carry out the investigation was contained in a letter by Mr. A. Rutka, P. Eng., Manager of Geotechnical Office, dated April 1, 1975.

The scope of the investigation was discussed with Mr. M. Devata, P. Eng., Supervising Engineer. The foundation study was to cover two alternative schemes, a three span structure located between stations 175 + 90 and 177 + 75, and a large diameter C.S.P. culvert located at mid-stream.

The following report presents the factual data obtained from the investigation and discusses the subsurface conditions as relevant to the foundation design and construction of the proposed structures.

.../...

2.0 THE SITE & GEOLOGY

The site is located in the Township of Casson in the District of Algoma (District #18).

The topography in the area is hilly. Snow Shoe Creek at the point of the proposed crossing flows in an approximately 300 ft. wide and 50 ft. deep valley. The side slopes of the valley are moderately to very steep. Bedrock is exposed on the south side of the creek with a small outcrop on the line of the proposed crossing and a larger outcrop about 50 ft. east of the proposed centre line. There are no visible rock outcrops on the north-side although the ground surface is covered with large boulders east of the proposed centre line. The stream bed is covered with gravel, cobbles and boulders. The slopes are tree covered and apparently stable in the immediate area of the crossing, but are bare and showing signs of severe erosion both upstream and downstream of the bridge site.

Geologically the site is located within the Canadian Shield. The bedrock in the area is a slightly metamorphosed sedimentary rock belonging to the Proterozoic Era. During the last ice age the area was invaded by continental ice sheets from the north-west. The ice sheets eroded much of the bedrock and deposited glacial drift on its surface. Upon the retreat of the ice sheet, alluvial deposits consisting of sand and gravel were laid down on the surface of the till.

.../...

3.0 FIELD WORK

The field work was carried out during the period of April 26 to May 5, 1975. During this period four (4) boreholes were put down at the locations shown on Drawing #147404-A attached.

The boreholes were generally located at the proposed bridge abutment and pier locations. Due to the very steep bank on the south side of the creek, access to the proposed south pier location was not possible and therefore the borehole (Borehole #2) had to be relocated about 18 ft. south of its proposed location. Similarly Borehole #3, which was to be located at mid-stream, had to be omitted because of the swift current and the deep water (6 ft.) in the creek at the time of the investigation.

The boreholes were advanced by both augering and diamond drilling technique to depths ranging between 21 and 50 ft. below the ground surface. Dynamic cone penetration tests were performed adjacent to Boreholes #1 and #5. Disturbed samples of the overburden were recovered by means of a standard 2-inch outside diameter split-spoon sampler driven into the soil with an energy of 350 ft. lb. per blow according to the specifications of the Standard Penetration Test. The same drilling energy was used to perform the dynamic cone penetration tests. Diamond drilling through the boulders and bedrock was carried out in sizes ranging between NX and AX.

.../...



Groundwater level observations were carried out during the drilling and the boreholes were left open to the end of the field work to permit periodic water level observations.

The field work was carried out under the supervision of a soils technologist who kept a record of the borings and also obtained ground surface elevations at the borehole locations. Elevations were referred to a local benchmark established by M.T.C. and shown on their Drawing #E-5163-1.

The soil, bedrock and groundwater conditions encountered at the boring locations are presented on the individual borehole logs presented as Enclosures 1,2,3 and 4. Boring locations and elevations are shown on Drawing #147404-A attached. The inferred soil profile along the centre line of the construction is shown on the same drawing.

#### 4.0 LABORATORY WORK

All soil and rock samples were shipped back to our laboratory in Toronto where they were re-examined for the purpose of classification. Representative samples were then selected for testing. The laboratory testing programme consisted of sieve and hydrometer analyses, the results of which are shown on Enclosures #5 and 6.

.../...



## 5.0 SOIL & BEDROCK CONDITIONS

### 5.1 General

Details of the soil and bedrock conditions are shown on the Borehole Logs presented as Enclosures 1 to 4 inclusive and the inferred soil profile is shown on Drawing #147404-A.

A reference to the above indicates that the north bank of the creek is made up of dense sand and gravel deposits extending approximately to the level of the creek bed. These deposits are underlain by a very dense silty sand till.

At the south bank the overburden consists of a thin surface layer of wet sand underlain by 3 to 5 ft. of very dense silty sand till which in turn is underlain by an approximately 5 ft. thick layer of boulders. Bedrock is exposed on the proposed centre line at Station 175 + 30, but near the proposed abutment and pier locations it lies at depths of 13 ft. and 18 ft. respectively.

### 5.2 Sand & Gravel

A layer of sand and gravel, which is believed to be a post glacial alluvial deposit, was encountered at each borehole location. At the south bank (Boreholes 1 and 2) it is present only as a thin layer approximately 3 to 4 ft. thick. In the boreholes located on the north bank (Boreholes 4 and 5) the thickness of the stratum ranges between 7 ft. and 29 ft. It appears that the entire north bank is made up of these deposits which extend to elevation 954 to 951 ft.

The shallow surface deposit encountered on the south bank appears to be loose as indicated by the dynamic cone penetration test performed in Borehole #1 (N = 2 to 5 blows per foot). The deposit under the north bank, however, is dense to very dense as inferred from Standard Penetration Tests ranging between 32 and over 100 blows per foot.

The deposit is a well to poorly graded mixture of fine to coarse sand and gravel with occasional cobbles and boulders. Typical grain size distribution curves of the deposit are shown on Enclosure #5.

### 5.3 Silty Sand Till

Below the sand and gravel stratum a grey silty sand till was encountered. The till is a heterogenous mixture of silt, sand and gravel size particles. The gravel content increased with depth and the lower zones of the till contain numerous cobbles and boulders. Standard Penetration Resistances range between 38 and over 100 blows per foot. Typical grain size distribution curves of samples obtained from the finer, upper zone of the till are shown on Enclosure #6.

.../...

S

#### 5.4 Bedrock

The bedrock in the area is a dark grey sedimentary rock belonging to the Proterozoic Era. Based on visual examination of the recovered cores, it is classified as a Dolomitic Marl with thin (1/16 to 1/4 inch) seams of red sandstone located approximately 1 to 2-inches apart. The bedding planes enclose an angle of about 38 degrees with the horizontal. The recovered cores were fractured along these bedding planes at approximately 4 to 8-inch intervals. The fractures were tight but the planes of fracture were generally smooth and shiny indicating a higher concentration of clay minerals. Except this the bedrock is generally sound.

#### 6.0 GROUNDWATER CONDITIONS

The groundwater level in the boreholes put down on the north bank of the creek corresponded to the water level in the creek (Elevation 960<sup>+</sup> ft.) at the time of the investigation. The water table in Boreholes 1 and 2 was close to the ground surface within the upper sand deposit. As the drilling was carried out at the peak of the spring run-off, it is believed that the observed water levels reflect a temporary water table perched in the pervious sand above the less pervious till stratum.

.../...

## 7.0 DISCUSSION OF THE RESULTS

Two alternative schemes were proposed by the Ministry for the crossing. One alternative calls for a three span bridge structure measuring approximately 200 ft. in length. The second alternative consists of a large diameter corrugated steel pipe culvert to be located at mid-stream of the creek. The subsurface conditions in relation to these alternatives will be discussed in the following paragraphs.

## 7.1 BRIDGE STRUCTURE

### 7.1.1 Piers

The foundations of the proposed piers to be located at Stations 176 + 53 and 177 + 13 should be taken below the anticipated maximum depth of scour but not less than 5 ft. below the creek bed. Due to a general lack of cementation between the soil particles the silty sand till is considered to be susceptible to erosion and scour.

Based on the results of Boreholes #2 and 3 it is anticipated that footings placed below Elevation 951 $\pm$  ft. will be resting either within the very dense silty sand till or, in the case of the south pier, on the stratum of boulders encountered above at the surface of the bedrock. In either case an allowable bearing pressure of 5 t.s.f. is recommended.

If an inspection of the excavation at the south pier location indicates that the boulder deposit is open graded, that is the voids between the boulders are not tightly filled with

.../...

finer (gravel, sand and silt size particles), then it is recommended that the voids be grouted within an area extending about 3 ft. beyond the perimeter of the foundation.

It is estimated that the settlement under the footings will be less than 1-inch and that all movement will take place shortly after the load has been applied.

#### 7.1.2 Abutments

The tentative location of the south abutment is at Station 175 + 50 with the north abutment being tentatively located at Station 177 + 75. The soil conditions at these locations are shown by Boreholes 1 and 5 respectively. At both locations competent deposits were encountered which could support the abutments on normal spread footings or, in the case of spill-through type of abutments, on piles driven through the fill.

Spread footings should be placed below an imaginary line drawn from the toe of the creek bank at an angle of 3.5 horizontal in 1 vertical. At the proposed abutment locations, this results in a foundation grade at or below Elevation 976 ft. The footings should also have at least 5 ft. of earth cover for the purpose of frost protection. The footings at this level can be designed for an allowable bearing pressure of 4 t.s.f. It is estimated that the settlements corresponding to the above bearing pressure and under the anticipated loadings will be less than 1-inch. Only immediate or short term settlements are expected.

.../....



At the proposed foundation level the footings of the south abutment would probably be located on the surface of the boulder stratum. If during construction, the visual inspection of the excavation indicates that the boulders are open graded, then it is recommended that the voids between the boulders be grouted. Alternatively the excavation could be extended to the surface of the bedrock which is expected to be at Elevation 970 $\pm$  ft. Footings founded on the bedrock could be designed for an allowable bearing pressure of 15 t.s.f. It is recommended that the bearing surface of the rock be carefully inspected within the foundation area to assess fully the effect of the inclined fracture planes noted in the recovered core samples (see Section 5.4). Should these defects in the rock be considered serious then consideration may have to be given to reinforcement of the rock with rock bolts.

Open end or spill-through type of abutments could be supported on piles driven through the approach fill. Steel H-piles would be the best suited for the site conditions. These could be driven to end bearing within the dense deposits encountered at the site or, in case of the south abutment, to the surface of the bedrock. Due to the presence of cobbles and boulders, the tips of the piles should be reinforced and equipped with a suitable driving shoe. The driving of the piles in the field should be controlled by the use of the Hiley formula.\* Tentatively, the carrying capacity of

\*M.T.C. Standard SS-3-11

the piles can be evaluated on the basis of 10 k.s.i. allowable steel stress, thus the capacity of the pile will depend on the section adopted. The length of the piles is expected to vary throughout the site but for the purpose of design it can be assumed that at the south abutment location, the piles will reach the surface of the bedrock at Elevation 970 ft. At the north abutment it can be assumed that some of the piles will penetrate the very dense silty sand till for a depth of about 10 ft. (Tip Elevation 940 ft.<sup>±</sup>).

#### 7.1.3 Approach Fill

To meet the proposed grades, approach fills up to 20 ft. in height will be placed. The proposed end slopes are 1.75 horizontal in 1 vertical.

Assuming that (i) clean free draining granular material will be used for the approaches, (ii) the material will be placed in shallow lifts and, (iii) each lift will be compacted to a uniform high density of at least 95% of its Standard Proctor Maximum Dry Density, the estimated safety factor of the embankment will be about 1.3. Before the approach fill is placed, the face of the slope should be grubbed and stripped of all organic material and the existing slope should be benched according to M.T.C. Standard #DD-414. The toe of the embankment and the bottom of the creek in the area of the proposed crossing and for some distance upstream and downstream should be protected with heavy rip-rap or other suitable means to prevent scour and undercutting of the slopes by the stream.

S

7.2

CULVERT STRUCTURE

The deep and swift current in the creek at the time of the investigation did not permit the drilling of a test hole mid-stream however, based on the evidence of the boreholes located at the edge of the creek and the visual inspection of the stream bed, it is believed that the soil conditions below the creek bed will be similar to those encountered at the shore. Based on this, no foundation problems are envisaged and it is expected that the culvert could be constructed according to the current M.T.C. Standard #DD-808A.

7.3

STREAM DIVERSION

According to the request of the hydrology section of the Ministry we have attempted to investigate the material present in the north bank of the creek about 60 to 80 ft. east of the proposed centre line. Here the creek makes a bend around what appears to be an erosion resistant section of the north bank. Although this point is opposite the rock outcrop on the south bank, there was no rock exposed at the surface. Numerous large boulders cover the ground surface and several hand dug test pits put down in the boulder free areas encountered refusal at a shallow depth (between 12 and 24-inches) on what appeared to be similar large diameter (larger than 3 feet) boulders. Based on this information it is our opinion that this promontory is probably made up of large diameter boulders and that the surface of the bedrock lies possibly above the creek level. In view of this the proposed channel

.../...

diversion is expected to encounter excavation problems involving rock excavation and blasting.

#### 7.4 CONSTRUCTION

Excavations for the spread footing foundations of the piers will extend through very dense bouldery material to several feet below the creek level.

The dense bouldery deposits will be difficult and, depending on the size of boulders, may even require the use of explosives.

Dewatering problems are also foreseen. Significant amount of flow can be expected through the sand and gravel deposit and the boulder stratum above the surface of the bedrock. Somewhat less, but probably still significant flow can be expected through the silty sand till. Because of the dense and bouldery nature of the overburden a cofferdam consisting of steel sheet piles driven around the perimeter of the excavation does not appear to be feasible and therefore, alternative measures will have to be considered. The rate of flow into the excavation could be decreased by placing an earth dyke between the excavation and the creek. If relatively impervious material can be found in the area and placed on the stream bed it may be feasible to reduce the flow sufficiently to keep the excavation dewatered by large capacity sump pumps. However, if dewatering by pumping proves to be inadequate or results in unsafe

.../...

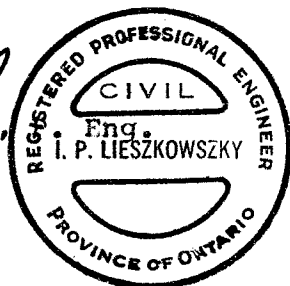
caving conditions, then consideration may have to be given to pouring of the footings by the tremie method.

DOMINION SOIL INVESTIGATION LIMITED

*I. P. Lieszkowsky*

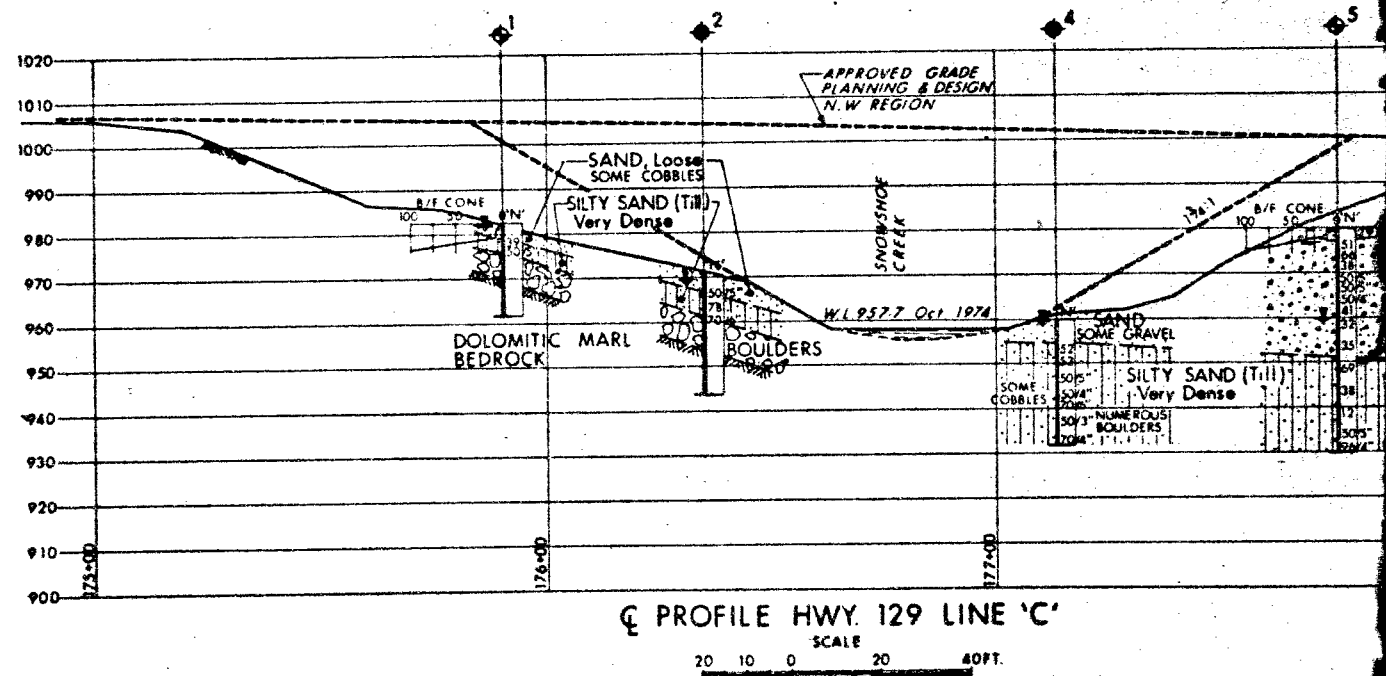
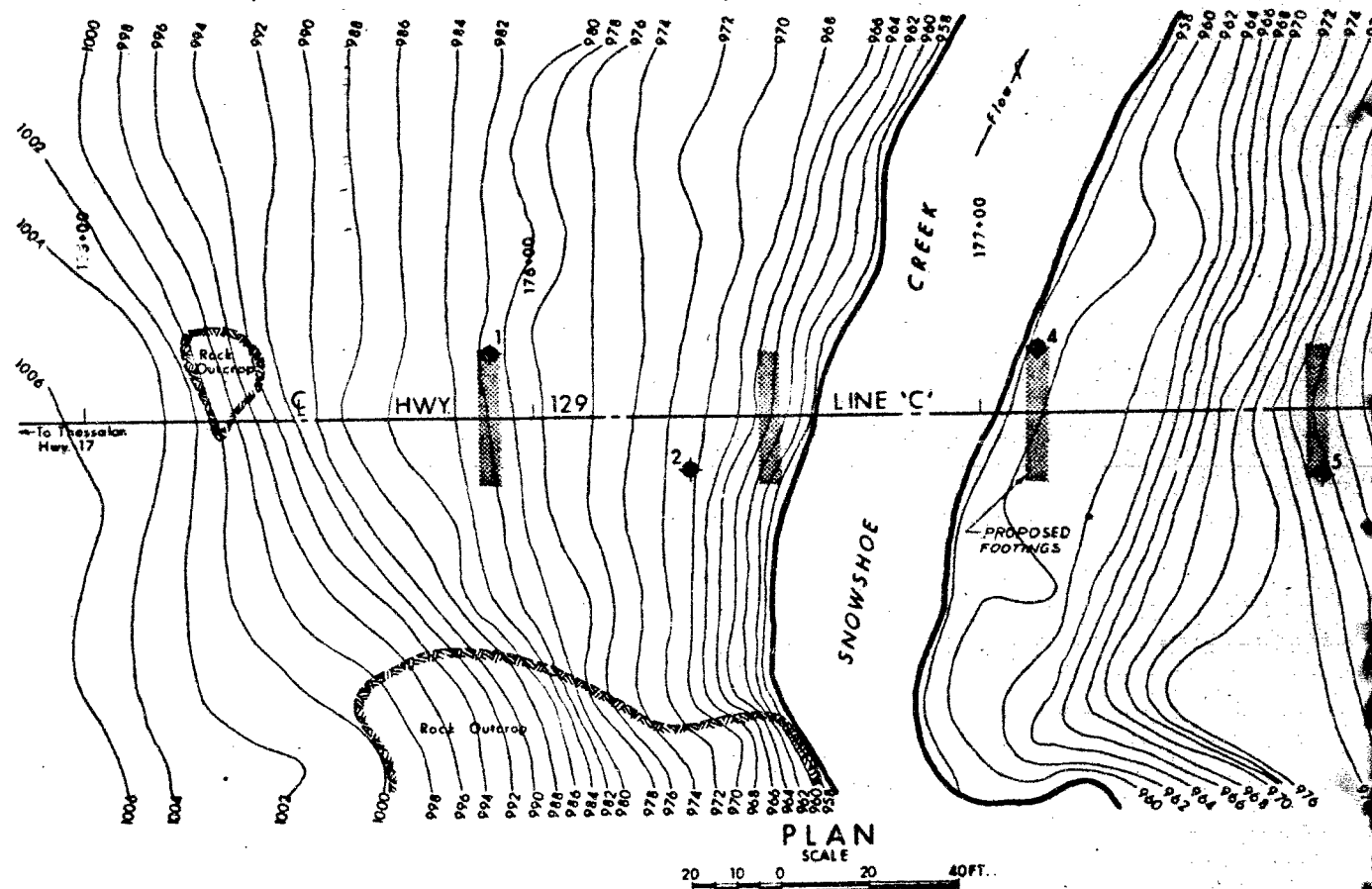
I. P. Lieszkowsky,

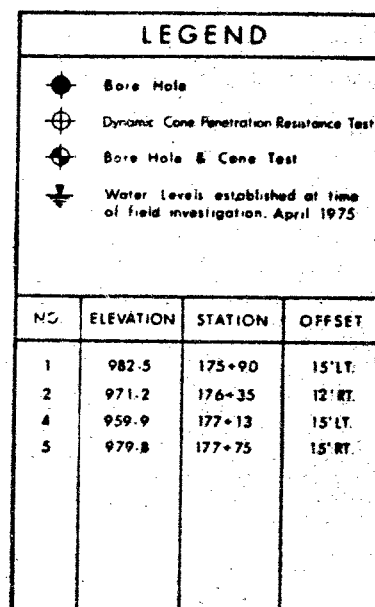
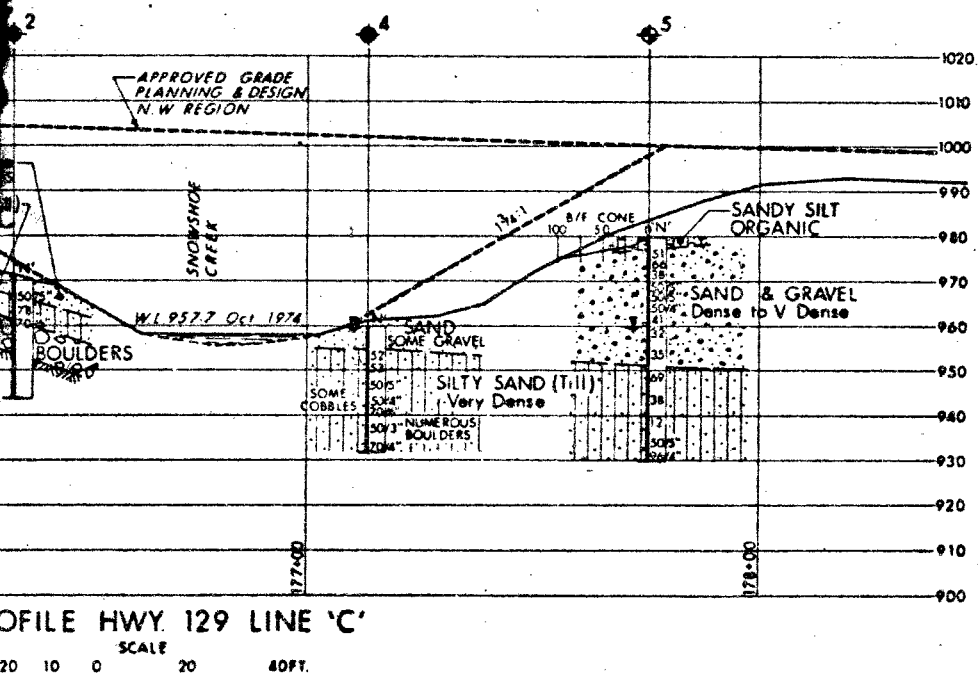
IPL/ok





ENCLOSURES





-NOTE-  
BOREHOLE #3 OMITTED

- NOTE -

The boundaries between soil strata have been established only at Bore Hole locations. Between Bore Holes the boundaries are assumed from geological evidence.

REVISIONS				
	DATE	BY	DESCRIPTION	
DOMINION SOIL INVESTIGATION LTD.				
MINISTRY OF TRANSPORTATION AND COMMUNICATIONS—ONTARIO				
ENGINEERING SERVICES BRANCH—GEOTECHNICAL OFFICE—SOIL MECHANICS SECTION				
SNOWSHOE CREEK				
HIGHWAY NO. <u>129 LINE 'C'</u> DIST. NO. <u>18</u>				
DIST. of <u>ALGOMA</u>				
TWP <u>CASSON</u> LOT <u>      </u> CON <u>      </u>				
BORE HOLE LOCATIONS & SOIL STRATA				
SUBMIT	IL	CHECKED	WP NO 14-74-04	DRAWING NO
DRAWN	JAP	CHECKED	W.O. NO (75-3-12)	<b>147404-A</b>
DATE MAY 22, 1975			SITE NO 385-3	BRIDGE DRAWING NO
APPROVED			CONT NO	

# LOG OF BOREHOLE ..... 1 .....

Enclosure No. .... 1 .....

Our Reference No. 75-3-12 W.P. 14-74-04

CLIENT: MINISTRY OF TRANSPORTATION & COMMUNICATIONS

PROJECT: PROPOSED CROSSING

LOCATION: SNOW SHOE CREEK, STA. 175+90 15'.L.

DATUM ELEVATION: G.S.C.

## DRILLING DATA

Method: AUGERING & DIAMOND DRILLING

Diameter: 6 1/2" (Nx, Bx, & Ax)

Date: APRIL 29, 1975

SUBSURFACE		PROFILE		SAMPLES			PENETRATION RESISTANCE					WATER CONTENT			REMARKS	
ELEVATION Ft.	DEPTH Ft.	DESCRIPTION	SYMBOL	GROUND WATER	NUMBER	TYPE	'N' Blows/Ft.	Blows/Foot					PLASTIC LIMIT W <sub>p</sub>	NATURAL W		% LIQUID LIMIT W <sub>L</sub>
								20	40	60	80	100				
								UNDRAINED SHEAR STRENGTH								
+ FIELD VANE TEST					● COMPRESSION TEST											
<div>WATER CONTENT SCALE: W<sub>p</sub> — W — W<sub>L</sub></div>																

982.5	0	GROUND SURFACE													
		4" Peat													
		Loose, Brown													
		Sand													
		Some cobbles													
979.0	3.5	Very Dense, Brown			1	SS	29								
	5	Silty Sand Till													
		Some Gravel			2	SS	50/5"								
976.0	6.5	BOULDERS			3	RC	30%								
		(possibly													
	10	extensively			4	RC	-								
		fractured rock)													
969.8	12.7	BEDROCK			5	RC	100%								
	15	DOLOMITIC MARL			6	RC	50%								
		- grey with													
		occasional red													
		sandstone seams.													
		38° fracture			7	RC	100%								
		planes (at 4" to													
	20	8" intervals)													
961.7	20.8	END OF BOREHOLE													

W.L. 982.0 Ft.

CONE

AUGERING

DIAMOND DRILLING

VERTICAL SCALE: 1 inch to 5 feet

DOMINION SOIL INVESTIGATION LIMITED

DRAWN: F.L.

CHECKED:

## LOG OF BOREHOLE.....2.....

Our Reference No. 75-3-12 W.P. 14-74-04

Enclosure No. 2

CLIENT: MINISTRY OF TRANSPORTATION & COMMUNICATIONS  
PROJECT: PROPOSED CROSSING  
LOCATION: SNOW SHOE CREEK, STA. 176+35 12'.R.  
DATUM ELEVATION: G.S.C.

## DRILLING DATA

Method: AUGERING & DIAMOND DRILLING

Diameter:

Date: MAY 5, 1975

SUBSURFACE		PROFILE		SAMPLES			PENETRATION RESISTANCE					Blows/Ft.			WATER CONTENT %			REMARKS
ELEVATION Ft.	DEPTH Ft.	DESCRIPTION	SYMBOL	GROUND WATER	NUMBER	TYPE	'N' Blows/Ft.	20	40	60	80	100	PLASTIC LIMIT	NATURAL	LIQUID LIMIT			
								UNDRAINED SHEAR STRENGTH p.s.f.					W <sub>p</sub> W                      W <sub>L</sub>					
								+ FIELD VANE TEST      • COMPRESSION TEST										
GROUND SURFACE																		
971.2	0	12" Peat Brown Sand		W.L. 969.4 ft.													↑ AUGERING ↓ DIAMOND DRILLING	
		wet																
966.74	5	Very Dense Brown Silty Sand Till some cobbles			1	SS	50/5"							0				
					2	SS	78							0				
961.2	10	BOULDERS			3	SS	70/6"							0				
	15				4	RC	-											
953.7	17.5	BEDROCK		5	RC	50%												
	20	DOLOMITIC MARL Grey, with red sandstone seams, bedding planes at 38°		6	RC	60%												
	25			7	RC	100%												
943.9	27.5	END OF BOREHOLE																

## LOG OF BOREHOLE.....4.....

Our Reference No. 75-3-12 (W.P. 14-74-04)

Enclosure No. 3

CLIENT: MINISTRY OF TRANSPORTATION & COMMUNICATIONS

PROJECT: PROPOSED CROSSING

LOCATION: SNOW SHOE CREEK, STA. 177+33, 15' L.

DATUM ELEVATION:

### DRILLING DATA

Method: DIAMOND DRILLING

Diameter: NW & BX

Date: April 27, 1975

[illegible]

# LOG OF BOREHOLE

Our Reference No. 75-3-12

Enclosure No. 4

CLIENT: MINISTRY OF TRANSPORTATIONS & COMMUNICATIONS  
 PROJECT: PROPOSED CROSSING  
 LOCATION: SNOW SHOE CREEK, STA. 177 + 75; 15' R.  
 DATUM: ELEVATION: C.S.C.

## DRILLING DATA

Method: AUGERING (H/S)  
 Diameter: 6 1/2"  
 Date: APRIL 28, 1975

SUBSURFACE PROFILE		SAMPLES		PENETRATION RESISTANCE					WATER CONTENT %			REMARKS				
ELEVATION ft	DEPTH ft	DESCRIPTION	SYMBOL	GROUND WATER	NUMBER	TYPE	IN Blows/ft	Blows/ft					PLASTIC LIMIT	NATURAL	LIQUID LIMIT	
								70	80	90	100					
UNDRAINED SHEAR STRENGTH								p.s.f.								
+ FIELD VANE TEST								@ COMPRESSION TEST								
979.6	0	GROUND SURFACE														
		Sandy Silt organic.														
977.32.5	5	Dense to Very Dense Sand			1	SS	51									
					2	SS	66									
					3	SS	38									
	10	Gravel damp mottled			4	SS	50/1"									
					5	SS	50/1"									
	15				6	SS	50/1"									
					7	SS	41									
	20				8	SS	32									
					9	SS	45									
950.80	29.0	VERY DENSE GRAY SILTY SAND TILL			10	SS	62									
	35				11	SS	38									
	40				12	SS	12									
	45				13	SS	50/1"									
					14	SS	96/17"									
929.8	50	END OF BOREHOLE														
Refusal at.. FL 929.8 FT POSSIBLY ON BOULDERS																

VERTICAL SCALE: 1 inch to 5 ft

DOMINION SOIL INVESTIGATION LIMITED

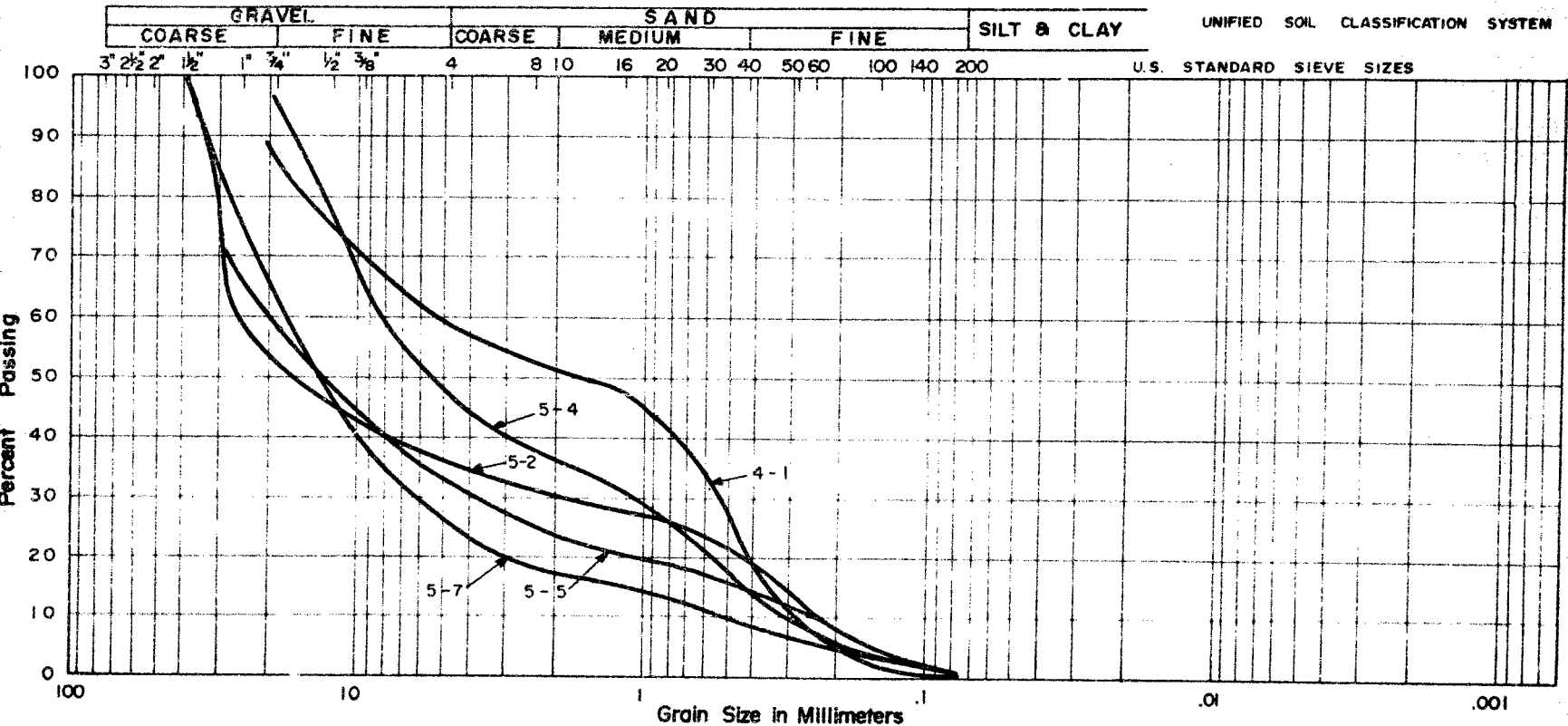
DRAWN: F.L. CHECKED

Refusal at.  
 EL 929.8 FT  
 POSSIBLY ON  
 BOULDERS

# DOMINION SOIL INVESTIGATION LIMITED

## GRAIN SIZE DISTRIBUTION

OUR REFERENCE NO. 75-3-12



PROJECT: CROSSING  
 LOCATION: SNOW SHOE CREEK - HWY. 129  
 BOREHOLE NO: 4 5 5 5 5  
 SAMPLE NO: 1 2 4 5 7  
 DEPTH: 2' 5' 5' 10' 13' 18'  
 ELEVATION:

COEFFICIENT OF UNIFORMITY:  
 COEFFICIENT OF CURVATURE:

Classification of Sample and Group Symbol:

SAND AND GRAVEL

PLASTIC PROPERTIES

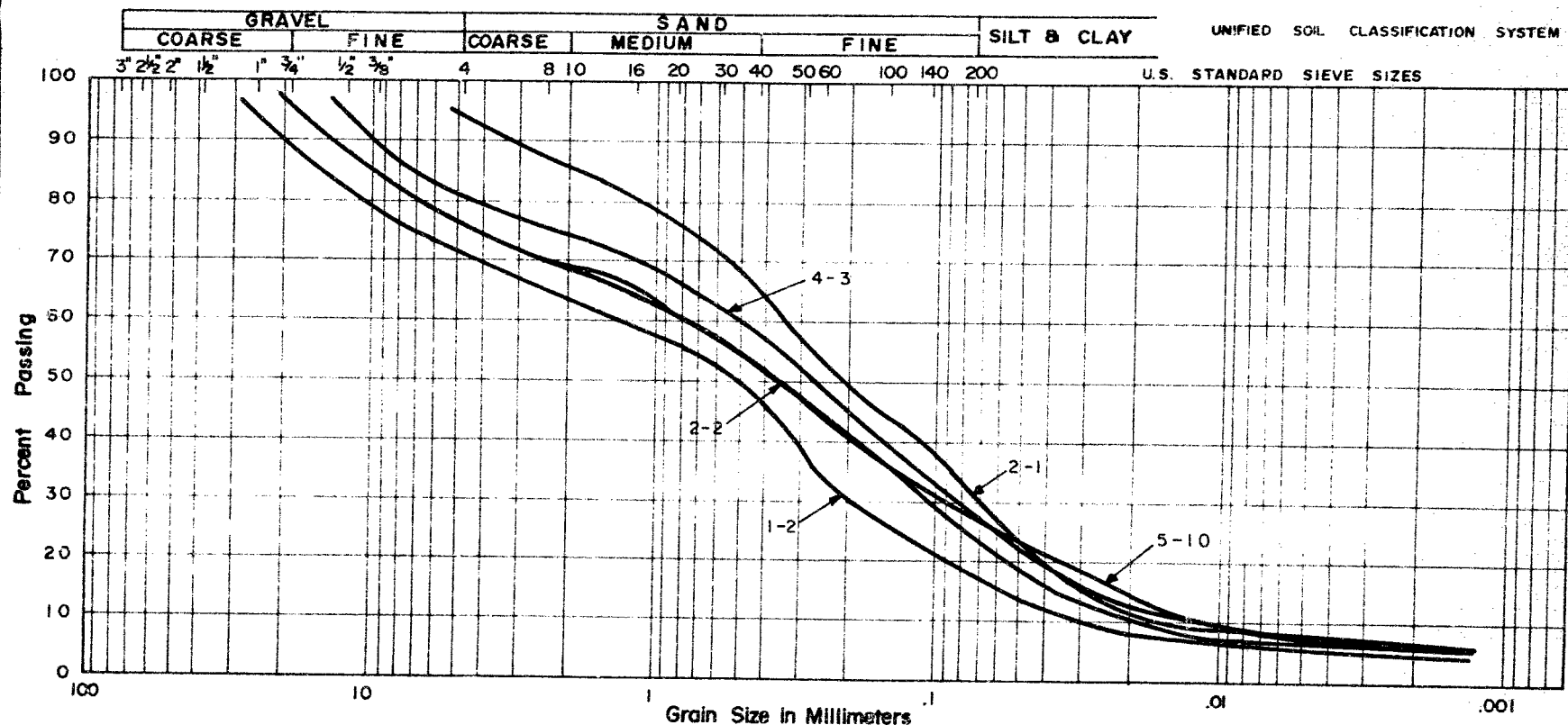
LIQUID LIMIT	% =
PLASTIC LIMIT	% =
PLASTICITY INDEX	% =
MOISTURE CONTENT	% =

ENCLOSURE NO. 5

# DOMINION SOIL INVESTIGATION LIMITED

## GRAIN SIZE DISTRIBUTION

OUR REFERENCE NO 75-3-12



PROJECT: CROSSING  
 LOCATION: SNOW SHOE CREEK-HWY. 129  
 BOREHOLE NO: 1 2 2 4 5  
 SAMPLE NO: 2 1 2 3 10  
 DEPTH: 5' 5' 7.5' 8.5' 30'  
 ELEVATION:

COEFFICIENT OF UNIFORMITY:  
 COEFFICIENT OF CURVATURE:

Classification of Sample and Group Symbol:

SILTY SAND TILL

PLASTIC PROPERTIES B.H.1, SA.2

LIQUID LIMIT      % =  
 PLASTIC LIMIT    % =  
 PLASTICITY INDEX   % = N.P.  
 MOISTURE CONTENT   % = 8-11

ENCLOSURE NO 6



Ontario

Ministry of  
Natural  
Resources

P.O. Box 190,  
Blind River, Ontario.  
POR 1B0.

November 5, 1974.

Telephone

(705) 356-2234

File number

TO: Ministry of Transportation & Communications  
P.O. Box 1177,  
Thunder Bay "F", Ontario.  
Attn: Mr. Bob Belle  
Title Processing Supervisor

FROM: Blind River District

---

Re: R.W. Reservations - Casson (188) Twp. and Dagle (1F) Twp.

Reference is made to your telephone conversation of to-day's date (Belle-Miller-Connell) requesting permission to carry out a soil investigation survey for alternate bridge locations on Hwy. 129, within Location R.W. 4 (Two-Camp Creek crossing) - Casson Twp. and within Location R.W. 5 (Lafoe Creek crossing) Dagle Twp.

These two R.W. locations, along with many other similar locations in the area, were established several years ago as park site reservations. These sites are crown land reservations and have been under discussion for some time, as to future disposition and use.

Your Ministry may have permission to carry out your required soil investigation surveys but we would ask that you forward an "Application for a Work Permit" form (copies attached) and a brief outline, and sketch, of your proposed work areas. A "Work Permit" will be issued at an as early as possible date outlining required conditions as to any debris disposal, control of any sludge from drill holes, etc.

Thank you for your telephone call and we will look forward to receiving an application at your convenience.

*G.W. Connell*  
G.W. CONNELL/vh

Attach.

*D.L. Hagar*  
D.L. Hagar,  
District Manager.



## Memorandum

To: Mr. C. Mirza  
Principal Foundation Engineer  
Foundations Office, West Bldg.  
Downsview, Ontario

From: Structural Planning Section  
Northwestern Region

Attention:

Date: February 10, 1975

Our File Ref.

In Reply to

Subject: Snowshoe Creek, W.P. 14-74-04  
Site No. 38S-3  
Hwy. 129, District 18

Enclosed please find a Reconnaissance Report along with plans, profiles and photographs of the above site.

We would like to have a foundation study carried out for this site, with a report to be issued by April 16, 1975.

We are assuming that the structure will be 3-span, about 200' long, with footing locations at stations 175+90, 176+53, 177+13 and 177+75.

There is a possibility that a large CSP is used instead, so we would like a borehole at midstream as well.

Please verify footing locations with Mr. A. Radkowski of Structural Design.

H. J. Dost

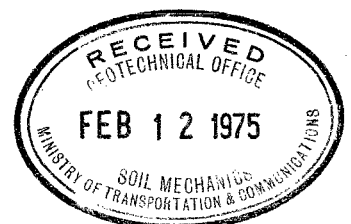
H. J. Dost  
REGIONAL STRUCTURAL  
PLANNING SUPERVISOR

FOR:

B. J. McKenna  
REGIONAL STRUCTURAL  
PLANNING ENGINEER

HJD/em  
Encl.

cc: Mr. N. Maluzynsky  
Mr. A. Radkowski



MEMORANDUM

W.P. 14-74-04

TO: Mr. J. B. Wilkes,  
Executive Director,  
Design Division.

FROM: A. Rutka

ATTENTION:

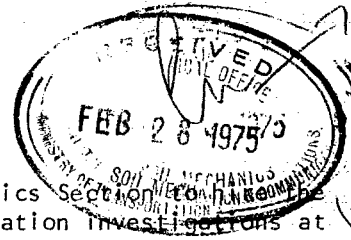
DATE: February 28, 1975

OUR FILE REF.

IN REPLY TO

SUBJECT:

FOUNDATION INVESTIGATIONS  
Consultant Assignment



Attached are three requests from the Soil Mechanics Section for the services of a geotechnical consultant to carry out foundation investigations at the following structure location sites:

- 1) W.P. 14-74-04 - Snowshoe Creek - 11.6 Mi. N. of Sec. Hwy. 544
- 2) W.P. 14-74-05 - Stoney Creek - 17.0 Mi. N. of Sec. Hwy. 544
- 3) W.P. 14-74-06 - Lafoe Creek - 19.1 Mi. N. of Sec. Hwy. 544

Because the sites are close together, we would recommend that they all be assigned to one consultant.

Our first choice would be Dominion Soil Investigations Ltd. They have not had any engineering work assigned to them this year, but they have been assigned a number of drilling contracts. In view of the rugged nature of the terrain, there may be some advantage in assigning the work to a firm that has the capability of doing the drilling and engineering work for good co-ordinative purposes.

Morton, Dodds and Partners also have the facilities for drilling and engineering work, but we have not used their engineering services to date. We have, however, used their drilling services. Because they have not had any engineering work, we have not been in a position to analyze their capability in this respect and it may not be desirable to have them undertake the three jobs at one time.

Peto MacCallum, and Golder have not been assigned engineering work by the Geotechnical Office this fiscal year. Golder has, however, supplied the services of a technician on two occasions.

If the three projects can be assigned to one consultant, we believe all of those listed would provide a satisfactory product. At least three-quarters of the estimated costs will be required for drilling purposes.

Our due date for all projects is April 16. An early approval would be appreciated.

*A. Rutka*

AR/MdeF  
Attach. (3)  
cc: Mr. C. Mirza ✓

A. Rutka  
Manager, Geotechnical Office

# MINISTRY OF TRANSPORTATION AND COMMUNICATIONS, ONTARIO

## MEMORANDUM

TO: Mr. A. Rutka  
Manager,  
Geotechnical Office

FROM: Soil Mechanics Section  
Geotechnical Office

ATTENTION:

DATE: February 21, 1975

OUR FILE REF.

IN REPLY TO

SUBJECT: REQUEST FOR CONSULTANT ASSIGNMENT  
GEOTECHNICAL CONSULTANTS - STANDING LIST DATED:

ENGINEERING SERVICE	Routine Project <input checked="" type="checkbox"/>	TECHNICIAN SERVICE	SPECIALIST SERVICE
	Complex Project <input type="checkbox"/>		

W.P. 14-74-04 TYPE Str. & Apprs. HWY. 129 DISTRICT 18 SITE NO. 38 S-3  
LOCATION Snowshoe Creek Str.; 11.6 mi. north of sec. Hwy. 554

CURRENT PROGRAM YEAR 1976 VALUE 150,000 SCHEDULED DUE DATE April 16, 1975

NATURE OF ASSIGNMENT - Subsurface investigation for proposed structure and approaches, laboratory testing, engineering analyses and reporting.

JUSTIFICATION - Soil Mechanics Section has commitments to complete two feasibility studies and three foundation projects by March and April 1975 in this District. In addition, staff is also occupied with other projects in other areas. Section has two vacancies in Engineer complement. With the present staff complement and work load commitments, it is not possible to meet the scheduled due date of this project.

RECOMMENDED CONSULTANT(S)	EST. TOTAL COST	REMARKS
1. Dominion Soil Investigation Ltd. Thunder Bay	\$7,000	Because of unknown nature of subsoil, the estimated cost may exceed by 50% due to additional drilling requirements.
2. Morton, Dodds & Partners Thunder Bay	\$7,000	
3. Peto MacCallum Ltd., Concord	\$7,000	
4. H. Q. Golder & Associates Cooksville	\$7,000	

cc:  
Files  
Documents

PREPARED BY:

M. DEVATA, Supervising Engineer.

AUTHORIZED BY:

# MINISTRY OF TRANSPORTATION AND COMMUNICATIONS, ONTARIO

## MEMORANDUM

TO: Mr. A. Rutka  
Manager,  
Geotechnical Office

FROM: Soil Mechanics Section  
Geotechnical Office

ATTENTION:

DATE: February 21, 1975

OUR FILE REF:

IN REPLY TO

SUBJECT: REQUEST FOR CONSULTANT ASSIGNMENT  
GEOTECHNICAL CONSULTANTS - STANDING LIST DATED:

ENGINEERING	Routine Project <input checked="" type="checkbox"/>	TECHNICIAN	<input type="checkbox"/>	SPECIALIST	<input type="checkbox"/>
SERVICE	Complex Project <input type="checkbox"/>	SERVICE		SERVICE	

W.P. 14-74-04      TYPE Str. & Apprs. HWY. 129      DISTRICT 18      SITE NO. 38 S-3  
LOCATION Snowshoe Creek Str.; 11.6 mi. north of sec. Hwy. 554

CURRENT PROGRAM YEAR 1976      VALUE 150,000      SCHEDULED DUE DATE April 16, 1975

NATURE OF ASSIGNMENT - Subsurface investigation for proposed structure and approaches, laboratory testing, engineering analyses and reporting.

JUSTIFICATION - Soil Mechanics Section has commitments to complete two feasibility studies and three foundation projects by March and April 1975 in this District. In addition, staff is also occupied with other projects in other areas. Section has two vacancies in Engineer complement. With the present staff complement and work load commitments, it is not possible to meet the scheduled due date of this project.

RECOMMENDED CONSULTANT(S)	EST. TOTAL COST	REMARKS
1. Dominion Soil Investigation Ltd. Thunder Bay	\$7,000	Because of unknown nature of subsoil, the estimated cost may exceed by 50% due to additional drilling requirements.
2. Morton, Dodds & Partners Thunder Bay	\$7,000	
3. Peto MacCallum Ltd., Concord	\$7,000	
4. H. Q. Golder & Associates Cooksville	\$7,000	

cc:  
Files  
Documents

PREPARED BY:-

- M. DEVATA, Supervising Engineer.

AUTHORIZED BY:

MEMORANDUM

TO: Mr. C. Mirza,  
Head,  
Soil Mechanics Section,  
West Building.

FROM: Hydrology Section

ATTENTION: M. Devata,  
Supervising Engineer.

DATE: March 4th, 1975.

OUR FILE REF. 5908-2

IN REPLY TO

SUBJECT: Re Snowshoe Creek, <sup>11.6 mi N. of Hwy 554</sup> ~~20 mi. N. of Thessalon, ?~~  
Site 38 S-3, WP 14-74-01, BW 659A  
Hwy. 129, Dist. 18, Sault Ste. Marie



As discussed yesterday, we would like to have additional information at this site as follows.

In the area 80± ft. (26± m.) east of sta. 177+00, the stream makes a bend around what appears to be an erosion resistant bank.

By locating a culvert, as shown on the attached photocopy, or relocating the channel, for a bridge, structure costs may be decreased and flow characteristics improved.

In particular, it would be desirable to know if there is bedrock in this area and if so at what elevation.

If bedrock is not encountered, or is say 6+ ft. (2+ m.) below streambed, a general assessment of the feasibility of constructing a diversion or placing a culvert would be helpful, i.e. is the material mainly sand and gravel, or does it contain numerous very large boulders?

*J.W. Carter*

J.W. Carter,  
Project Hydrology Engineer.

JWC/rh  
cc: B. McKenna

File. W.P. 14-74-04



# DOMINION SOIL INVESTIGATION LIMITED

CONSULTING SOIL & FOUNDATION ENGINEERS

10 CROCKFORD BLVD., SCARBOROUGH, ONT. M1R 3C6 · (416) 751-6565 · TELEX 02-21210 · CABLES: DOMSOIL

*Copy - Mr. P. Mirza  
only*

April 2, 1975

REF. NO. 75-3-12

Mr. A. Rutka, P. Eng.,  
Manager,  
Geotechnical Office,  
Ministry of Transportation  
& Communications,  
West Building,  
Downsview, Ontario.



Attention: Mr. M. Devata, P. Eng.,  
Supervising Engineer.

RE: Foundation Investigation  
Proposed Bridge  
Snowshoe Creek - Highway #129  
WP# 14-74-04

Dear Sirs:

Thank you for your recent request for providing you with soil testing and engineering services on the above project.

The details and requirements of the proposed project were discussed with your Mr. M. Devata at a meeting in your offices on March 21, 1975. At this meeting we have also been provided with the following documents:

- 1) Plan showing bridge site (Plan #E-5163-1).
- 2) Memorandum from Mr. H.J. Dost to Mr. C. Mirza dated February 10, 1975.
- 3) Field reconnaissance report dated December 18, 1974.
- 4) Memorandum from Mr. J.W. Carter to Mr. C. Mirza dated March 4, 1975.
- 5) Three photographs showing the site, dated November 13, 1974.

.../...

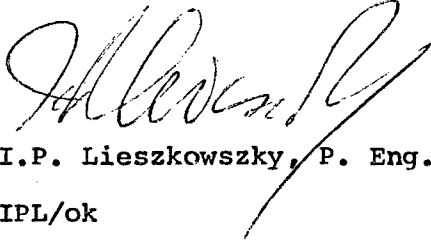
- 6) Profile along the proposed revision to Kings Highway #129, Drawing #C-994-129-1.
- 7) Plan, Drawing #B-994-129-1.

We have also examined aerial photographs available from this site in order to assess accessibility and drilling conditions.

We wish to extend our thanks for the help and assistance your department has given us on this project.

Yours very truly,

DOMINION SOIL INVESTIGATION LIMITED



I.P. Lieszkowsky, P. Eng.

IPL/ok



# DOMINION SOIL INVESTIGATION LIMITED

CONSULTING SOIL & FOUNDATION ENGINEERS

104 CROCKFORD BLVD., SCARBOROUGH, ONT. M1R 3C6 (416) 751-6565 TELEX 06-963578 CABLES DOMSOIL

May 9, 1975

*Copies mailed to C.S. Greboki  
B. McKenna*

REF. NO. 75-3-12

Mr. A. Rutka, P. Eng.,  
Manager, Geotechnical Office,  
Ministry of Transportation &  
Communications,  
West Building,  
Downsview, Ontario.

Attention: Mr. M. Devata, P. Eng.,  
Supervising Engineer.

RE: Foundation Investigation  
Proposed Bridge  
Snowshoe Creek - Highway #129  
WP #14-74-04  
Preliminary Report

Dear Sirs:

Further to your request, we have investigated the subsurface conditions at the above site. We have now completed the fieldwork and are pleased to report our preliminary findings and tentative recommendations.

## The Site

Snowshoe Creek, at the point of the proposed crossing, flows in an approximately 350 ft. wide and 50 ft. deep valley. The side slopes of the valley are moderately to very steep. Sections as steep as 1.5 horizontal in 1 vertical (33.5 degrees) exist on both sides, while the average slope of the bank ranges between 2.67 in 1 on the north side, and 3.25 to 1 on the south side. The igneous bedrock is exposed at the surface on the south side of the creek with a smaller outcrop on the line of the proposed crossing and a larger outcrop about 50 ft. east of the proposed centre line. There are no visible rock outcrops on the north side although the surface is covered with large boulders east of the proposed centre line.

.../...

The slopes in the immediate area of the crossing appear to be stable, but unstable conditions were noted both upstream and downstream of the proposed crossing. These apparent unstable conditions are believed to be caused by river erosion and the undercutting of the slopes. The slopes are tree covered and the generally vertical growth of the trees indicates stable conditions at present.

#### Field Work

Four (4) boreholes were put down at the proposed locations of the piers and abutments. The fifth borehole which was to be located at the centre of the creek had to be omitted because of the swift current and the deep water (6 ft.) in the creek at the time of the investigation.

Copies of the field logs are attached, and the subsurface conditions are summarized on the enclosed inferred soil profile.

#### Soil Conditions

As shown, the north bank appears to be made up of dense sand and gravel deposits which extend approximately to the level of the creek bed where it is underlain by very dense silty sand till. At the south bank, the overburden consists of a thin surface layer of wet sand, underlain by the very dense silty sand till which is followed by an approximately 5 ft. thick layer of boulders. At the proposed abutment and pier locations, the surface of the bedrock was encountered at depths ranging between 13 and 18 ft. below the ground surface. The surface of the bedrock appears to have a 35.5 degree dip in the northerly direction.

#### Discussion

Based on the field tests, and the visual examination of the samples, our tentative recommendations for the foundation treatment of the proposed structure are as follows.

- i) The south abutment is to be located at Station 175 + 90 (Borehole 1). It could be founded on spread footings at or below elevation 976 ft. (that is, 6 ft. below the ground surface). Tentatively an allowable bearing pressure of 8 k.s.f. is suggested. Alternatively the footing could be carried down to the surface of the bedrock (El. 968.5 ft.) where an allowable bearing pressure of 50 k.s.f. is suggested.

.../...

- ii) The proposed location of the south pier is at Station 176 + 53. Borehole 2 put down at this location indicated 5 ft. of loose sand underlain by 8 ft. of very dense silty sand till followed by a 5 ft. thick layer of boulders. The surface of the bedrock was encountered at about El. 945 ft. or 11 ft. below the bottom of the creek. To provide the piers with sufficient protection against scour the footings should be established at least 5 ft. below the creek bed (that is, at or below El. 951 ft.). At this level, the footings would be founded on the layer of boulders where tentatively an allowable bearing pressure of 8 k.s.f. is suggested. Some excavation and dewatering problems can be expected and depending on how open graded the boulder deposit is, it may be necessary to place the footings by the tremie method or to grout the boulders.
- iii) Borehole 4 was located at the north pier location (at Station 177 + 13). This borehole showed a loose to compact sand deposit to a depth of 5 ft. underlain by very dense sand till which contains numerous bouldery zones below a depth of 11 ft. The borehole was terminated at a depth of 28 ft. without encountering bedrock. The silty sand till is a competent bearing stratum to carry the pier on spread footing foundations which should be established below the anticipated maximum depth of scour. Footings established 5 ft. or more below the creek bed (at or below elevation 951 ft.) could be designed for an allowable bearing pressure of 8 k.s.f.
- iv) Borehole 5 was located at the position of the proposed north abutment (at Station 177 + 75). This borehole shows a very dense sand and gravel deposit to a depth of 29 ft. (that is, to about El. 953  $\frac{1}{2}$  ft.). Below this, and extending to a depth of at least 50 ft. the subsoil is a very dense silty sand till with occasional boulders. The abutment could be placed on spread footings within the dense sand and gravel deposit. The footings should be placed below an imaginary line drawn from the toe of the creek bank at an angle of 3  $\frac{1}{2}$  horizontal in 1 vertical (that is, at or below El. 976 ft.). The tentative allowable bearing pressure at this level is 8 k.s.f. The abutment could also be supported on H-piles driven to a sufficient set within the dense silty sand till. The working capacity of the piles is expected to range between 50 and 100 tons depending on the cross section adopted. The length of the piles is expected to vary depending on the boulders within the till or the underlying sand and gravel deposit. Some of the piles are expected to extend to El. 935 ft. (that is, about 48 ft. below the present grade).

.../...

To preserve the stability of the existing river banks, the toe of the bank should be adequately protected against scour. This protection should extend to some distance above and below the bridge site.

We trust that the above is adequate for your immediate requirements. However, if you have any questions which you wish to discuss before receiving our final report, please do not hesitate to call us.

Yours very truly,

DOMINION SOIL INVESTIGATION LIMITED



I.P. Lieszkowszky, P. Eng.

IPL/ok

Encl.

Mr. B. McKenna (2)  
Reg. Structural Planning Engineer  
Northwestern Region  
Thunder Bay

Soil Mechanics Section  
Geotechnical Office  
West Building, Downsview

May 28, 1975

**FOUNDATION INVESTIGATION REPORT**

Snowshoe Creek Structure (11.6 miles N. of Sec. Hwy. 554), Hwy. 129  
Site No. 38S-3, W.P. 14-74-04  
Dist. #18 (Sault Ste. Marie)

Attached please find your copy of the Foundation Investigation Report carried out for the above mentioned structure site on our behalf by Dominion Soil Investigation Ltd., Consulting Soil and Foundation Engineers.

We have reviewed this report and consider its contents in general to be adequate for your purposes. We note that the consultant in the report made some reference pertaining to scour depth and scour protection requirements. We are forwarding a copy of this report to our Hydrology Section to provide necessary comments with regard to protective measures for scour. With regard to spread footings in the overburden we recommend a 6 ft. earth cover for frost protection requirements.

If you have any queries in connection with this project, please contact this Section.

M. Devata  
Supervising Engineer

c.c. E.J. Orr  
B.R. Davis  
B.J. Giroux  
G.A. Wrong  
W.L. Lees  
R. Morgenroth  
R.W. Franks  
R. Hore  
J.D. Harris  
J. Anderson  
N.G. Maluzinsky } memo only  
Files  
Record Services



*Cam:*  
*you might keep these in your Files*  
**Memorandum**

To: See Below

From: Program Section,  
Northwestern Region.

Attention:

Date: August 13, 1975.

Our File Ref.

In Reply to

Subject: W.P. 14-74-04, Snowshoe Creek Structure, Site 38S-3  
W.P. 14-74-05, Stoney Creek Structure, Site 38S-9  
Highway 129 - District 18 - Sault Ste. Marie

Attached please find copy of Structural Planning Report for the above-noted projects for your information.

Please note that both projects are grouped with G.D. GB. of Highway 129, from 10.0 Mi. north of Secondary Highway 554 northerly, 13.0 Mi. under W.P. 14-74-01.

The Planning Report for Lafoe Creek Structure included with the above-noted group of projects will be issued at a later date.

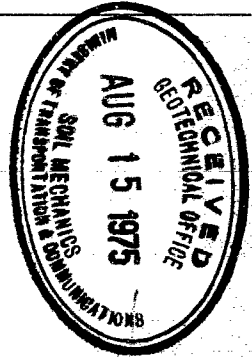
TNS:mjd  
Attach.

*T. N. Smith*  
T. N. Smith,  
Regional Schedule Co-Ordinator.

For: N. G. Maluzynsky,  
Regional Program Officer.

TO:

Messrs. E. J. Orr J. T. Gourlay G. E. French (2)  
E. J. McCabe W. L. Lees  
W. S. Melinyshyn  
B. J. Giroux D. A. Jarvis (2)  
✓ A. Rutka J. R. Morgenroth  
Z. L. Katona K. A. Roberts  
G. A. Wrong D. G. Lowman  
C. S. Grebski H. Welker  
G. K. Hunter G. M. Jordan  
E. Bond B. J. McKenna



*From  
Class  
review*



BRIDGE PLANNING REPORTSTONEY CREEKHWY. 129, BRIDGE SITE 38S-9, DISTRICT 18W.P. 14-74-051. Introduction

Stoney Creek Bridge is a 90' triple-single bailey which is being replaced due to realignment and reconstruction of Hwy. 129 between Thessalon and Aubrey Falls.

2. Location

The new structure will be located about 50' east of the existing bridge, which is located about 38 miles north of Thessalon.

3. Reference Documents

Plan	B-994-129-2
Profile	C-994-129-2
Site Plan	E-5166-1
Hydrology Report	BW-660
Foundation Report	75-3-13

4. Alignment

Horizontal: Tangent  
Vertical: +2.625% grade

5. Scheduling

Preliminary Plan	Sept. 29, 1975
Design Complete	Feb. 18, 1976
Construction Year	1976

6. Cross-section

If bridge: 3' shoulder, two 11' lanes, 3' shoulder, between New Jersey Barriers.

If culvert: 2' rounding, 3' shoulder, two 11' lanes, 3' shoulder, 2' rounding.

7. Navigation

Stoney Creek is considered not navigable.

8. Cost-sharing

The Ministry of Transportation & Communications pays 100%.

9. Services

No provisions need be made.

10. Construction

No detour is required. Concrete will need to be manufactured at the site, since no ready-mix is available in the vicinity.

11. Approach Slabs

If a bridge is designed for this site, approach slabs will be required. Paving will be part of a separate contract.

12. Hydrology

For a bridge, a span of 30' - 35' is considered an adequate waterway opening. If a culvert is used, the recommended size is a 10' x 19' C.S.P. or a 16' x 8' concrete box culvert.

### 13. Foundations

Construction problems are anticipated for dewatering of pier foundations. The streambed is considered suitable for a culvert installation.

### 14. Recommendations

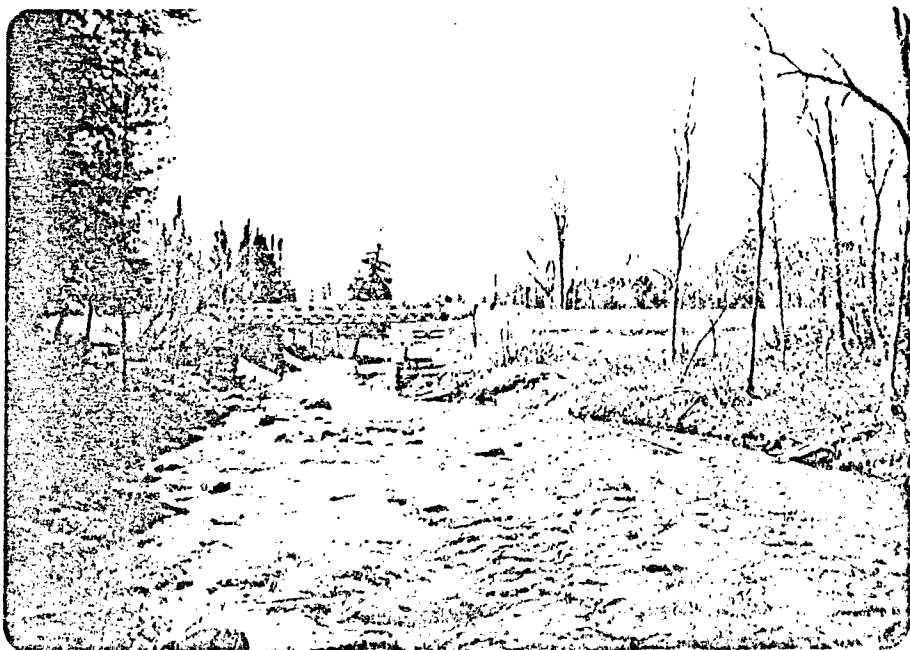
A 10' x 19' horizontal ellipse C.S.P. is probably the most economical solution for this site. It can be placed in the dry at about Sta. 456+25 and the stream alignment can then be improved by directing it to the new location.

H. J. Dost

H. J. Dost  
REGIONAL STRUCTURAL PLANNING  
SUPERVISOR

for:  
B. J. McKenna  
REGIONAL STRUCTURAL PLANNING  
ENGINEER

BJM/HJD/lg



## MEMORANDUM

TO: Mr. B.J. McKenna  
Reg. Struct. Plan. Eng.,  
Northwestern Region,  
Thunder Bay.

FROM: Hydrology Section

ATTENTION:

DATE: July 31, 1975.

OUR FILE NO.

IN REPLY TO

SUBJECT: Re: Stoney Creek, 25 mi. N. of Thessalon,  
Site 38S-9, W.P. 14-74-05, BW 660A  
Hwy. 129, Dist. #18, Sault Ste. Marie

### Final Hydrology

This memo summarizes the office and field investigation and gives hydraulic recommendations for the proposed crossing.

### Watershed and River

The drainage area is 27 sq. miles, including 6% lakes; the soil is mainly sand and the land use, forest. Lake storage is augmented by swamps and possibly 3 dams, and the overall shape is elongated. This is considered a class 4 - watershed.

The river has an effective slope of 0.004+ ft./ft. but steepens considerably in the site area, (0.0095 ft./ft.). Although ice and debris are not normally a problem, it was reported that in the worst flood in recent memory (June 1970) beaver dam debris may have contributed to the washout of the north abutment of the present bridge. Debris including large trees may be anticipated. The flood plain is generally well defined; nevertheless local jamming can sharply alter the main channel and easily erode the sandy/gravelly banks.

### Site

The effective waterway width of the present bridge is 45 to 50 ft., but appears somewhat oversized. The bridge maintenance reports indicate the previous overall span was 70 ft. (vs. present 90 ft.) and noted the remains of an old center pier, plus a debris clogged, crooked channel prior to 1970. At present, there is a side channel, (north, upstream) which could carry considerable flood flows.

Erosion of the north abutment fill was observed in 1957; the 1970 flood partially washed out the north abutment and the bridge dropped 4 to 5 ft.

Stoney Creek joins the Mississagi River 1000+ ft. below the site; H.E.P.C. data indicates a HWL of 951, with ice, thus it is unlikely to affect the site.

At Hwy. 129, the average streambed elevation is 956, the NWL is 957, and the estimated 50 year HWL is 961, for relatively free flow; during the 1970 flood, with severe channel blockage, the HWL may have approached 963 temporarily.

The foundation report lists the following material below streambed; 1 to 2 ft. of loose cobbles and boulders with sand; 15+ ft. of sand, gravel, cobbles and boulders.

It is probable that channel obstructions directed flow at the north abutment, prior to the 1970 flood; after that flood, the channel was reshaped by bulldozer and the gravel-cobble-boulder banks appear to be controlling flow satisfactorily.

### Design Criteria

Both the bridge and culvert alternatives are designed for a 50 year storm. For a Regional flood, the bridge has a reasonable chance of survival, although considerable scour and erosion would occur; culverts would probably be blocked and the resulting backup would create a large head across the fill, which could result in a roadway failure. No property problems are apparent, either upstream or downstream.

In general, a bridge is preferred hydraulically to a culvert, particularly a metal pipe, because of less risk of jamming. A concrete box is preferred to a metal pipe, because (a) it can be better designed to fit the hydraulic characteristics of the site and (b) it is less likely to fail structurally. The bridge waterway is based partly on equalling the existing channel, rather than on scour or backwater limits.

A diversion appears feasible and should provide better flow alignment and a lesser skew. There is a risk, with a bridge, that flood flows would be directed strongly at the spillthrough fill, causing heavy scour and/or erosion. The availability of heavy rip-rap should minimize this risk.

A culvert will require a very flat invert slope to reduce outlet velocities.

### Summary of Recommendations

Waterway - provide a minimum effective width of 32 ft. measured at elevation 958.5. (spillthrough design assumed).

Soffit - minimum elevation 970 to provide estimated 3± ft. clearance for a Regional flood.

Location and skew - center the bridge on station 456 + 60± at 10° right skew.

Footing protection - for spread footings the bottom elevation should be 948 or lower.

Fill protection - place a 3 ft. layer of heavy random rip-rap on the faces and/or corners of the fill as follows: upstream side - to elevation 963 (this should be taken along the face to a point where it meets the natural ground elevation of 963); downstream side - to elevation 962.

Diversion channel - center the channel on station 456 + 60± at 100° Right skew and provide a minimum width of 25 ft. at NWL. Join the diversion to the existing channel so as to provide a streamlined configuration. The diversion invert elevation may be determined by simply joining the junctions with the natural channel with a straight line.

#### Culvert Alternatives

- (a) Preferred - provide a 16 x 8 ft. concrete box with flared wingwalls upstream, with outlet invert at elevation 954.0± and the inlet invert 0.25' higher. The cutoff wall at the inlet should be at least 4 ft. below the invert (wing-wall footings also to 4 ft. below invert elevation).
- (b) provide a single 19.3 by 10.6 ft. horizontal ellipse or equivalent S.P.P.A. (18'-0" x 11'-7") with the outlet invert at elevation 953.5 and the inlet invert at elevation 954.4. At the inlet provide a concrete cutoff wall and flared wingwalls. Preferably the inlet should have a complete concrete collar. The cutoff wall and wingwall footings should be to at least 4 ft. below the invert.

If the bed material is quite open, it is suggested that grouting be considered to minimize piping and loss of fines.

Location - at station 456 + 60± at 100° Right skew.

Fill protection - place a 3 ft. layer of heavy random rip-rap on the upstream side to elevation 962 and on the downstream side place a 2 ft. layer to elevation 961. On the upstream side, it would be very desirable to place the rip-rap laterally to a point where it meets the natural ground elevation of 962, (including the side channel to the north).

Note: for either culvert, as specified, there will be a drop of 2± ft. between the inlet invert and original streambed, which will tend to induce streambed degradation; this should cause no concern at this site.

#### Miscellaneous

1. There is a side channel, opposite station 458±, upstream, the north side, which could carry significant flow at certain times. It is advisable to provide a cross channel (20± ft. bottom) from this side channel to the main channel; preferably this cross channel should be located at least 20 ft. from the toe of the fill.

2. The comments of the Regional M.N.R. office should be obtained.

A handwritten signature in cursive script, appearing to read "J.W. Carter".

J.W. Carter,  
Project Hydrology Engineer.

JWC/rh

BRIDGE PLANNING REPORTSNOWSHOE CREEKHWY. 129, BRIDGE SITE 38S-3, DISTRICT 18W.P. 14-74-041. Introduction

Reconstruction of Hwy. 129 between Thessalon and Aubrey Falls affords the opportunity to improve the horizontal alignment and replace some bailey bridges, of which Snowshoe Creek is the southern-most.

2. Location

The new structure will be located about 2,000' west of the present bridge, which is a 70' D.S. bailey located 32 miles north of Thessalon.

3. Reference Documents

Plan	B-994-129-1
Profile	C-994-129-1
Site Plan	E-5163-1
Hydrology Report	BW-659-A
Foundation Report	75-3-12

4. Alignment

Horizontal: Tangent  
Vertical: - 2.529% grade

5. Scheduling

Preliminary	Sept. 17, 1975
Final Plans	Feb. 4, 1976
Construction Year	1976

6. Cross-section

If bridge: 3' shoulder, two 11' lanes, 3' shoulder between New Jersey barriers.

If culvert: 2' rounding, 3' shoulder, two 11' lanes, 3' shoulder, 2' rounding.

7. Navigation

Snowshoe Creek is considered not navigable.

8. Cost-sharing

Ministry of Transportation & Communications pays 100%.

9. Services

No provisions need be made.

10. Construction

No detour is required. Ready-mix is not available within an acceptable distance, hence site batching will be necessary.

11. Approach Slabs

If a bridge is used for this site, approach slabs will be required, although paving will be part of a separate contract.

12. Recommendations

If a 20' culvert is economically justifiable with the height of fill required at the site, then that would seem the logical alternative. Otherwise a three-span bridge of about 180' in length would appear the best solution.

H. J. Dost

H. J. Dost  
REGIONAL STRUCTURAL PLANNING  
SUPERVISOR

For:  
B. J. McKenna  
REGIONAL STRUCTURAL PLANNING  
ENGINEER

BJM/HJD/lg



## MEMORANDUM

TO: Mr. B.J. McKenna,  
Reg. Struct. Plan. Eng.,  
Northwestern Region,  
Thunder Bay.

FROM: Hydrology Section

ATTENTION:

DATE: July 30th, 1975.

OUR FILE REF.

IN REPLY TO

SUBJECT: Re: Snowshoe Cr., 20 mi. N. of Thessalon  
Site 38S-3, W.P. 14-74-01, BW 659A  
Hwy. 129, Dist. #18, Sault Ste. Marie.

Final Hydrology

The foundation report has been received and this memo summarizes the hydrological and hydraulic design for this site. Note that the actual site was not observed.

Watershed and River

The drainage area is 72 sq. m., with 20% lake storage. The soils are mainly sand till, and the land use is forest. A rock filled timber crib dam at the outlet of Wakomata Lake 1½ miles upstream, is reported to be in good condition; it does not have gates, therefore flood flows simply spill over. Because of the large lake storage this watershed is estimated to be class 5. (The June 1970 flood was the worst in recent memory).

The local channel gradient is quite steep resulting in a relatively small flood rise and fast flow.

Although beaver were not reported to cause trouble, there is a potentially hazardous debris problem from trees being undermined and dropping into the river.

Existing bridge

The original bridge (timber) was probably built by a logging company sometime in the 1940's. It was then used by the HEPC and first inspected by the M.T.C. in 1959. In 1959 it was a 50 ft. bailey and in 1964 it was replaced by a 70 ft. bailey. The 1959 inspection noted that the N.E. corner was in danger of washing out. After the 1970 flood, additional rip rap was provided at the north abutment and it was noted that the channel location had been altered, downstream. The effective span is calculated to be 32± ft., with a flood rise of 4 to 5 ft.

Site

The proposed alignment of Hwy. 129 crosses Snowshoe Cr. approximately 2700 ft. below the existing highway and 1+ mile above the Mississagi River. The rock outcrop, 70± ft. east of centerline on the south bank should have a stabilizing

effect on the channel alignment. The foundation report indicates sand, silty sand, boulders and bedrock on the south side, and sand, silty sand, plus boulders on the north side. The actual streambed material is not identified. Normal water level is 957.5± and the estimated 50 year HWL is 962±; average streambed is elevation 956±.

### Design Criteria

A 50 year design discharge was used for this site. The bridge recommendation should have a reasonable chance of surviving a Regional flood. Although the concrete culvert would be less likely to fail than a metal culvert, in a Regional flood, both are likely to jam, and the resulting high head across the fill could cause an embankment failure.

The possibility of the Wakomata Lake dam failing was considered.

Backwater should be no problem, with respect to property upstream.

Protection against scour for a bridge is on the conservative side, since the streambed material is estimated at sand and gravel, with an unknown amount of cobbles and boulders.

Culvert alternatives are given, but considered less desirable than a bridge for the following reasons - (1) more prone to jamming, (2) very poor alignment, at the inlet, for flood flows, (3) possible bedding problems, (4) a potentially dangerous hydraulic gradient through the fill, (loss of fines) and (5) high outlet velocities.

### Summary of Recommendations

Bridge (preferred to culvert)

Waterway - provide a minimum effective width of 32 ft. at elevation 959 (a spillthrough design is assumed); note that it may be advisable to increase the span by 6 to 8 ft. to avoid spilling fill into the channel (compare the cost of additional span versus heavy rip-rap at the toe of the fill).

Soffit - minimum elevation 970 (should provide a small clearance for a Regional flood, or dam washout).

Footing protection - spread footings should be taken to elevation 950, or bedrock (if higher than 950). If steel H piles are considered for the pier on the north bank, the estimated maximum scour for a Regional flood is to elevation 951.

Fill protection - place a 2 ft. layer of random rip-rap on the corners and forward faces of the fill to elevation 964. If the fill spills into the river, specific toe protection will be given when the preliminary design is prepared.

Location and skew - locate the bridge at station 176+83± at 20° right skew.

Culvert Alternatives

- (a) Preferred - provide a 20 x 10 ft. concrete box, with the outlet invert at elevation 954.5± and the inlet invert at 954.7±. To fit the channel and main flow, locate the culvert as indicated on Drawing 1.

Place a 2 ft. layer of random rip-rap on the fill to elevation 965 at the inlet and elevation 964 at the outlet and extending laterally 10 ft. minimum beyond the culvert walls. Wing wall footings should be at least 4 ft. below the culvert invert. (same as the standard cut-off wall).

- (b) Provide a single 20.5 x 12.8 ft. S.P.P.A., with the outlet invert at elevation 954.0 and the inlet invert at elevation 954.75. The location and skew should follow approximately that indicated for the concrete box on Drawing 1, particularly at the inlet.

If the inlet alignment is difficult to obtain with an S.P.P.A., then a special inlet design in concrete might be considered.

Note: S.P.P.A. suppliers can provide details on curvature.

At the inlet provide a concrete headwall with wingwalls at 45°. The cutoff wall and wingwall footings should be at least 4 ft. below the invert.

Place a 2 ft. layer of random rip-rap on the fill, to elevation 966 at the inlet, and 965 at the outlet, and extending laterally from the culvert walls at least 10 ft.

For either culvert, it is recommended that a 2± ft. clay seal be placed on the upstream fill face, (including under the rip-rap), to elevation 980, and laterally at least 25 ft. beyond the culvert. This should reduce the potential head across the fill at the culvert.

Adequate bedding may be a problem, since the cobble and boulder streambed may be quite open (voids). Grouting would be a solution to this problem and would minimize loss of fines due to piping.

Miscellaneous

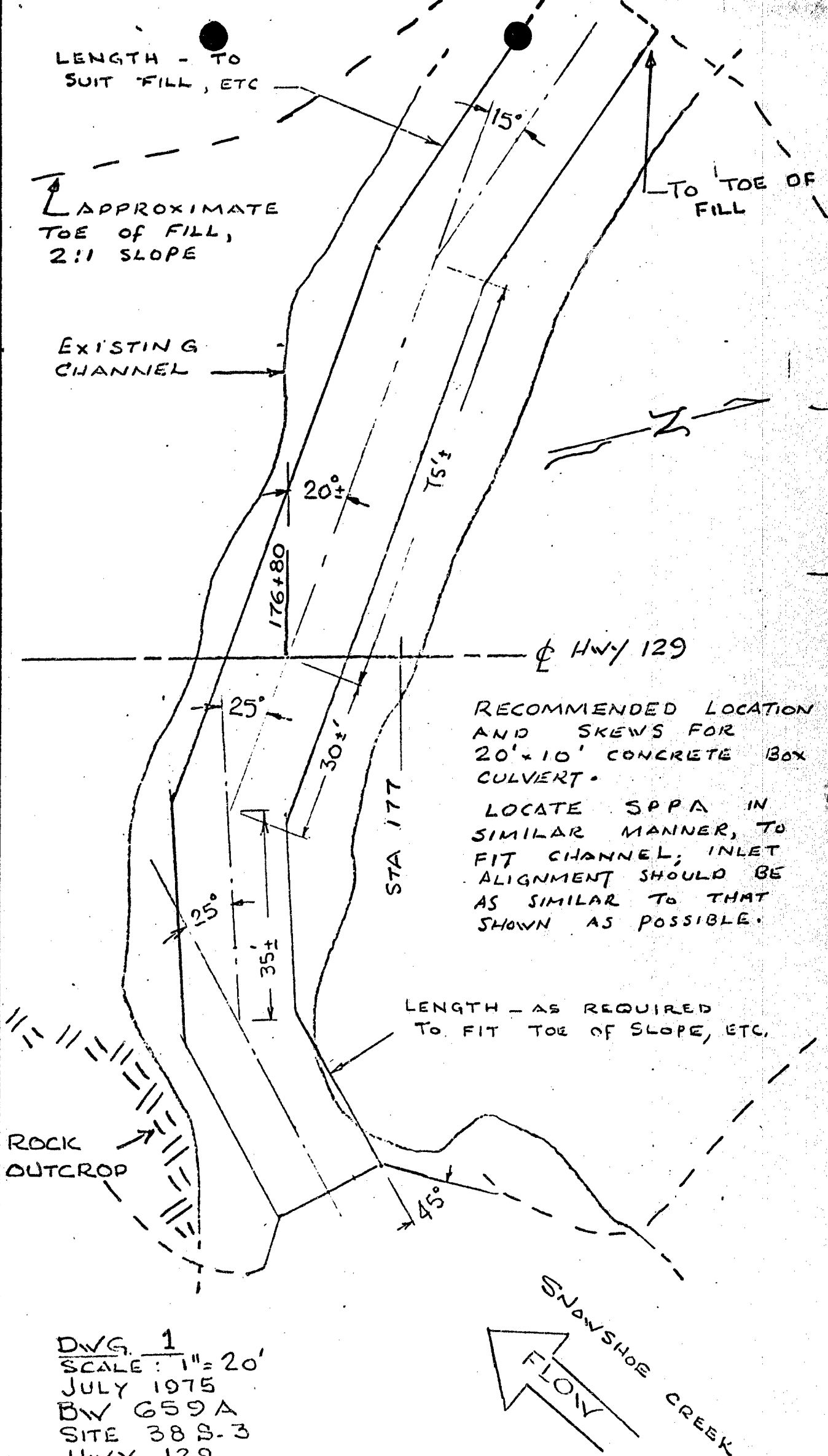
For either a bridge or culvert, the comments of the Ministry of Natural Resources should be obtained.



J.W. Carter,

JWC/rh

Project Hydrology Engineer.



LENGTH - TO  
SUIT FILL, ETC

APPROXIMATE  
TOE OF FILL,  
2:1 SLOPE

EXISTING  
CHANNEL

TO TOE OF  
FILL

C HWY 129

RECOMMENDED LOCATION  
AND SKEWS FOR  
20'x10' CONCRETE BOX  
CULVERT.

LOCATE SPPA IN  
SIMILAR MANNER, TO  
FIT CHANNEL; INLET  
ALIGNMENT SHOULD BE  
AS SIMILAR TO THAT  
SHOWN AS POSSIBLE.

LENGTH - AS REQUIRED  
TO FIT TOE OF SLOPE, ETC,

ROCK  
OUTCROP

SNOWSHOE CREEK  
FLOW

DWG. 1  
SCALE: 1"=20'  
JULY 1975  
BW 659A  
SITE 38 S-3  
HWY 129  
DIST. 18



## Memorandum

To: Mr. B. J. McKenna,  
Reg. Structural Planning Engineer,  
Northwestern Region,  
Thunder Bay, Ontario.

From: Structural Office,  
West Building, Downsview.

Attention:

Date: November 25, 1975.

Our File Ref.

In Reply to

Subject: Snowshoe Creek Bridge,  
W. P. 14-74-04, Site 38S-3,  
Highway 129, District #18.

Attached herewith are prints of the Preliminary Bridge  
Plan Drawing 38S-3-P1 for the above mentioned structure.

The estimated cost of the proposed structure is \$260,000.00  
which includes tender, materials, engineering and sundry  
construction.

We have sent a copy of the Preliminary Plan to the Hydrology  
Office for their comments.

Any comments or revisions you may have should be submitted  
at your earliest convenience.

CSG/cf  
Attch.

C. S. Grebski,  
Structural Design Engineer.

*Refer to memo Jan 6, 1975  
H. Shal*

c.c. B. R. Davis  
A. E. McKim  
W. D. Birch  
A. Radkowski  
M. Stoyanoff  
J. Harris  
→ C. Mirza  
J. Anderson  
N. Maluzynsky  
S. Edwards



Mr. C.S. Grebski  
Structural Design Engineer  
Structural Office  
West Building, Downsview

Mr. A. Radkowski

Soil Mechanics Section  
Geotechnical Office  
West Building, Downsview

January 6, 1976

Snowshoe Creek Bridge  
W.P. 14-74-04 Site 38S-3  
Hwy. 129, District 18

---

We have received the preliminary drawings on the above mentioned structure and these are our comments.

1. The stability of the approaches were discussed with the Geotechnical Consultant (Dominion Soil Investigation Ltd.) and ascertained that the approach slopes should be constructed with 1.75 horizontal to 1 vertical or flatter, in order to provide adequate stability both in the longitudinal and transverse directions.
2. In the vicinity of the south abutment, a bouldery layer of about 7 ft. in thickness overlies the bedrock surface. It is possible that the end-bearing piles may not penetrate through the bouldery zone even with reinforced tips. Interpolating between boreholes 1 and 2, the top of the bouldery layer lies approximately between elevations 970 and 974. In light of this, the design should be reviewed to ascertain whether the piles will have adequate embedded length and also if they will provide sufficient amount of lateral support for the abutments.
3. In view of the presence of the bouldery zone at a shallow depth in case of south abutment, and also some 45 feet long piles required for the north abutment, it may be desirable to reconsider spread footing supports for the abutment foundations as discussed in the Foundations Report.
4. As stated in the Foundations Report, the portion of the new embankment should be 'keyed' into the existing embankment in accordance with current M.T.C. practices.

H. Shah  
Project Engineer

For: M. Devata  
Supervising Engineer

cc: B. McKenna  
D. Aspinwall  
Files  
Record Services

O.K'D using 1 1/2:1 slope  
with use of rock fill  
toe. H. Shah

Jan. 14, 1976



Ministry of  
Transportation and  
Communications

## Memorandum

To: C. Mirza,  
Head, Soil Mechanics Section,  
West Building, Downsview.

From: Structural Office,  
West Building, Downsview.

Attention:

Date: January 23, 1976.

Our File Ref.

In Reply to

Subject:

Snowshoe Creek Bridge  
W.P. #14-74-04      Site # 38S-3  
Highway # 129      District #18

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.

CSG/cf  
Atch.

C. S. Grebski,  
Structural Design Engineer.



*See Memo.  
Dated, Feb 6, 1976*

Mr. C.S. Grebski  
Structural Design Engineer  
Structural Office  
West Building, Downsview

Mr. A. Radkowski

Soil Mechanics Section  
Geotechnical Office  
West Building, Downsview

February 6, 1976

Snowshoe Creek Bridge  
W.P. 14-74-04, Site 38 S-3  
Hwy. 129, District 18

We have reviewed the final drawings on the above mentioned structure and these are our comments.

1. The Soils Profile, Dwg. 147404-A, indicates the presence of a surficial organic sandy silt deposit 1-2 feet thick in the vicinity of the north abutment. This soil should be completely excavated to its full depth within the plan limits of the approach embankments for a minimum distance of at least 25 feet behind the abutment prior to the placement of the approach fills.
2. We would like to draw your attention to our comments concerning items 2 and 4 of our memo to your Office dated January 6, 1976.

R. Barnes  
Project Engineer

For: M. Devata  
Supervising Engineer

cc: B. McKenna  
D. Aspinwall  
Files *W: LBS on 16th Mar/76*  
Record Services



## Memorandum

To: Mr. W.L. Lees,  
Regional Manager,  
Reg. Planning and Design,  
Northwestern Region, Thunder Bay.

Attention:

From: Structural Office,  
West Building,  
Downsview, Ontario.

Date: February 6, 1976.

Our File Ref.

In Reply to

Subject: W.P. 14-74-04, Site 383-3  
Snowshoe Creek Bridge  
Hwy. 129, District 18

Please find enclosed four sets of prints of drawings 383-3-1,-3 to -15 for your use.

One print of drawing 383-3-1 is being forwarded to the Systems Design Project Review Section.

One set of prints is also being forwarded to the following:

Estimating Section  
Regional Structural Planning Engineer  
Assistant Construction Engineer (Structures)  
District Office  
Structural Maintenance Engineer  
Soil Mechanics Section  
Hydrology Section

The D4 and Special Provisions will follow.

NE/ac  
Encl.

*H. Stovanoff*  
H. Stovanoff,  
Structural Contract Engineer.

c.c. J. Wear  
B. Giroux  
B. McKenna  
A.E. McKim  
G.E. French  
W. Birch  
C. Mirza ✓  
J. Harris  
H.G. Maluzynsky  
J. Anderson

