

DOCUMENT MICROFILMING IDENTIFICATION

GEOCRES No. 31 E - 88

DIST. 11 REGION NORTHERN

W.P. No. 622-72-02

CONT. No. 77-128

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

STR. SITE No. 44-72

HWY. No. 124

LOCATION DISTRESS RIVER BRIDGE

1.4 MI E. OF SEC. HWY. 510

\_\_\_\_\_

OVERLAY DRAWINGS TO BE INCLUDED WITH THIS REPORT 3

REMARKS: \_\_\_\_\_

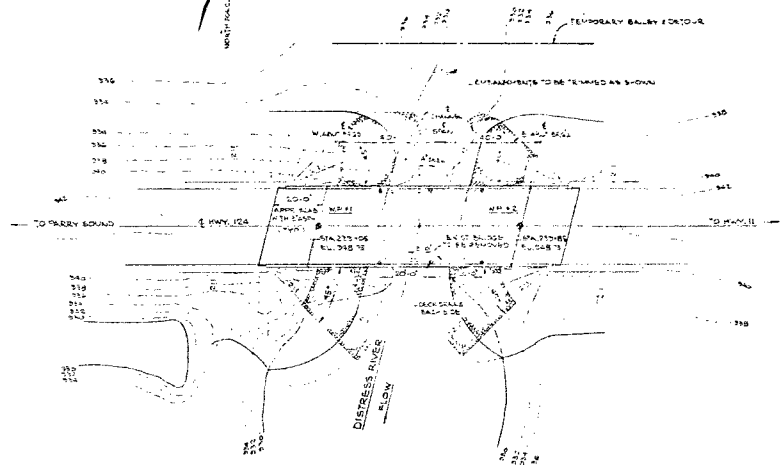
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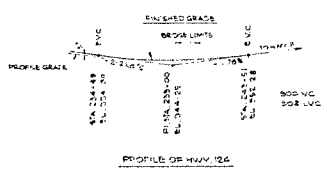
PROPERTY OF TRANSPORTATION AND COMMUNICATIONS DIVISION 24-28-10 4-78

31E-85  
T.M. 10 512  
L.M. 5 27274  
T.M. 5 24328

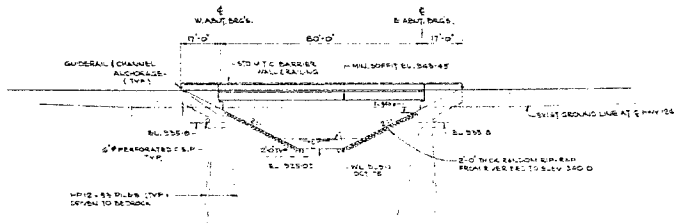
CONT No	WP No
SHEET	



TYP. DECK SECTION  
1/4" = 1'-0"



PROFILE OF MAIN SPAN  
1/4" = 1'-0"



ELEVATION  
1/4" = 1'-0"

BM 345.82  
SECTION 10  
CC 100.00 24.5.7 24.5.10

NOTES:  
1. REVISIONS TO BE MADE AS SHOWN  
2. REVISIONS TO BE MADE AS SHOWN  
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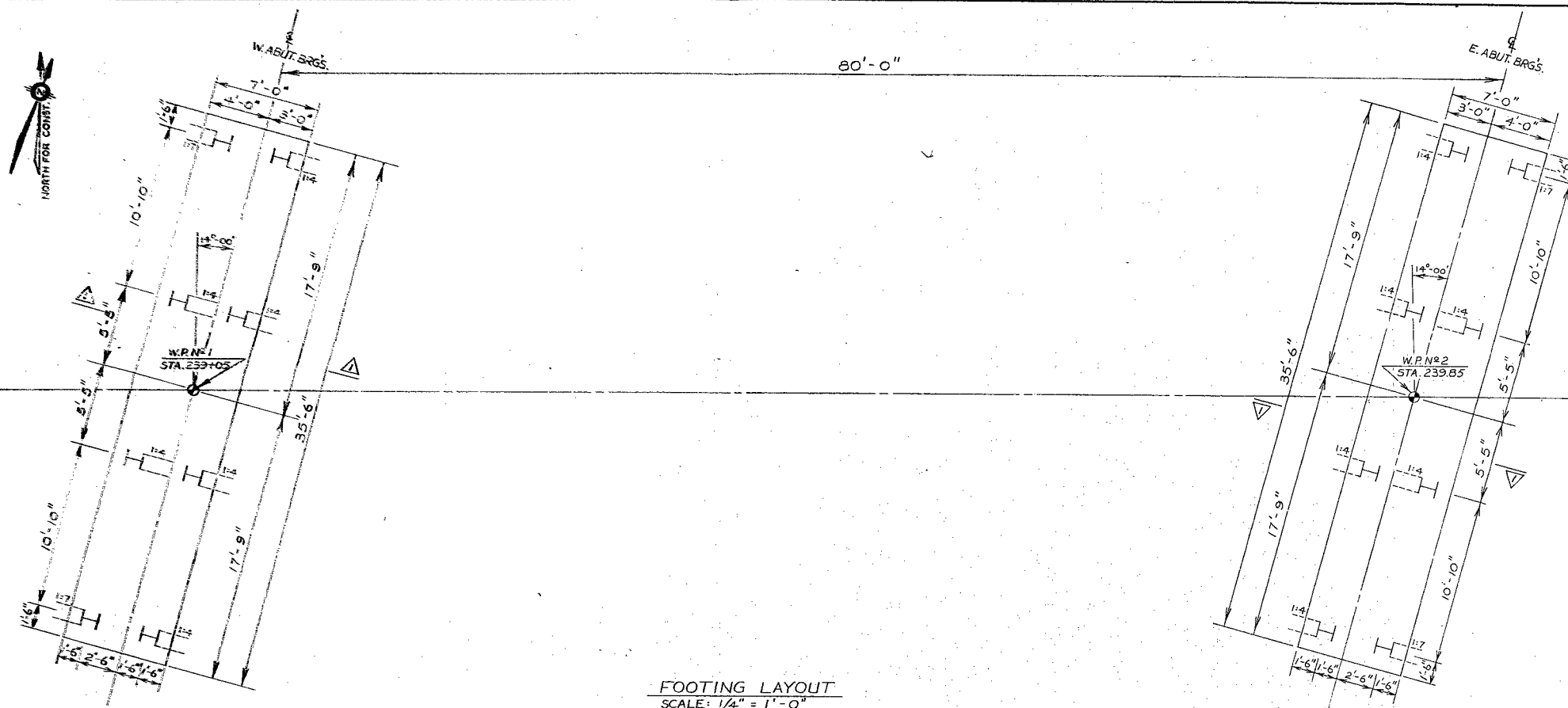
CONCRETE QUANTITIES  
100 CUBIC YARDS  
75 CUBIC YARDS  
15 CUBIC YARDS  
50 CUBIC YARDS



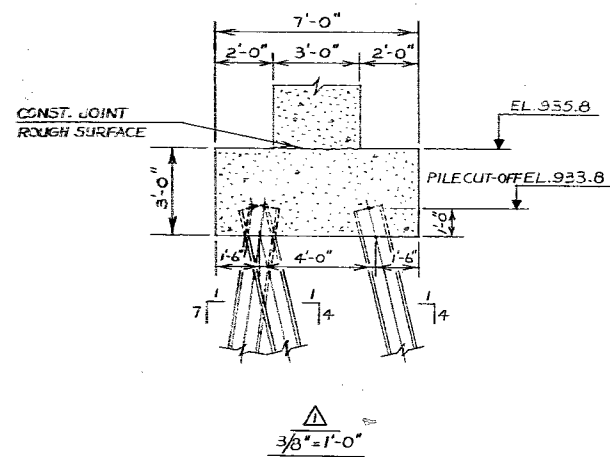
FOR REDUCED PLAN

1/4" = 1'-0"

DATE	DESCRIPTION
10/1/76	DESIGN
10/1/76	CHECK
10/1/76	APPROVE
10/1/76	DATE



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

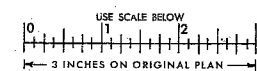


LIST OF STEEL H - PILES

LOCATION	TYPE	Nº REQ'D	LENGTH	REMARK
W. ABUT.	HP 12 x 53	8	78'-0"	WITH DRIVING SHOE
E. ABUT.	HP 12 x 53	8	72'-0"	



FOR REDUCED PLAN

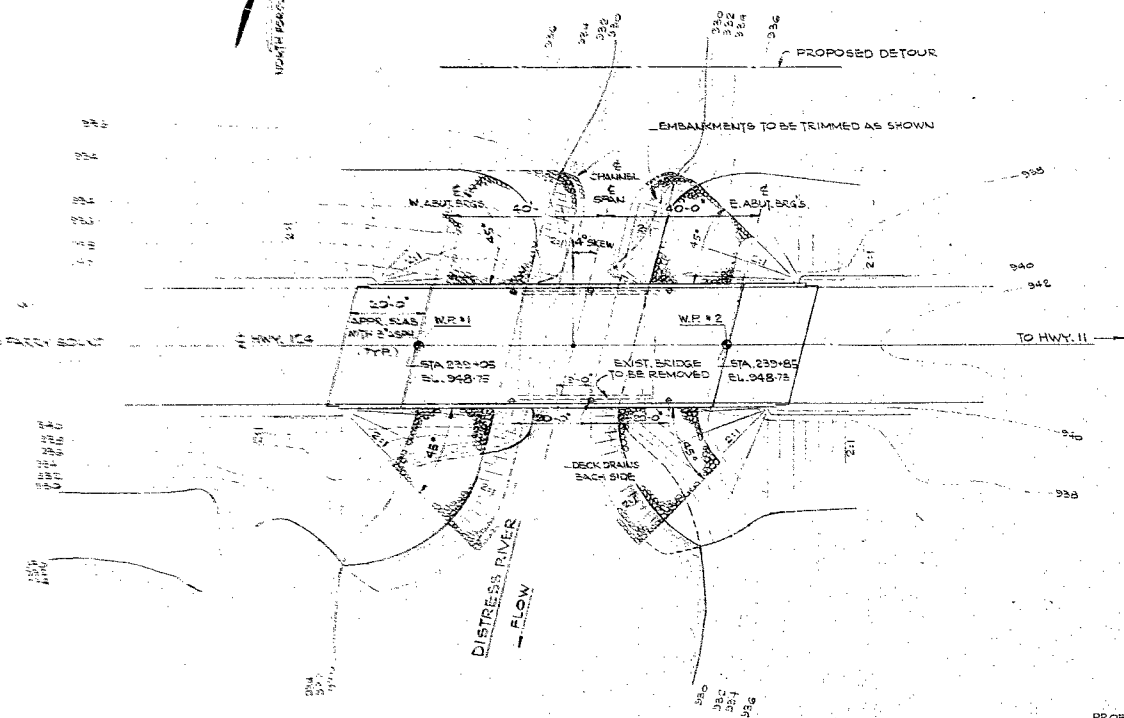


3.	REVISIONS				
	DATE	BY	DESCRIPTION		
	DESIGN F.C.	CHECK <i>Ac</i>	LOADING HS 20-44	DATE	<i>April</i>
	DRAWING L.A.	CHECK F.C.	SITE No 44-72	DWG.	3

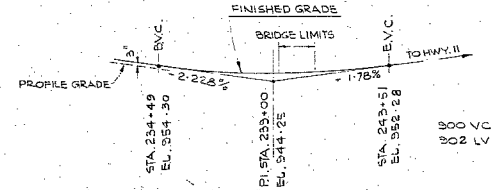
31E-85

DIST. 11	CONT No	SHEET
WP No 622-72-02		
DISTRESS RIVER BRIDGE GENERAL LAYOUT		

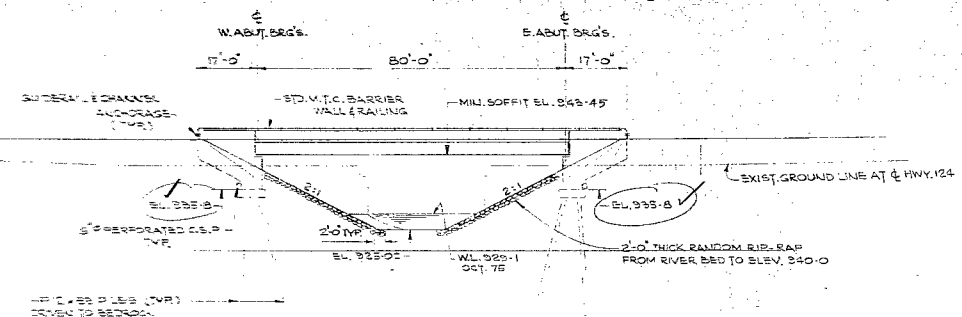
14° SKEW  
SIN. 0.241922  
COS. 0.970296  
TAN. 0.249328



PLAN  
1" = 20'

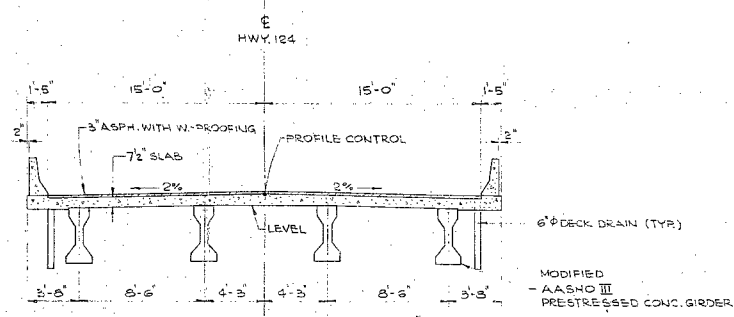


PROFILE OF HWY. 124  
N.T.S.



ELEVATION  
1" = 20'

BM 942.82  
GEODETIC DATUM  
C.C. ON R.K. 205' S. LT. 236' E.



TYP. DECK SECTION  
3/8" = 1'-0"

NOTES:

- REINFORCING STEEL GRADE  
PRECAST GIRDERS 40 KSI  
REMAINDER 50 KSI
- CLASS OF CONCRETE  
DECK AND BARRIER WALLS 4000 PSI  
REMAINDER 3000 PSI
- FOR PRESTRESSED GIRDER SEE DWG. 5
- CLEAR COVER ON REINFORCING STEEL  
FOOTINGS & ABUTMENTS 3"  
DECK 2" TOP, 1" BOTTOM  
BARRIER WALLS & DIAPHRAGMS 1 1/2"  
APPROACH SLABS 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  $\pm 1/8"$ .  
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 BARS SHALL BE PLACED PRIOR TO CONCRETING.  
WITH A CLEAR COVER OF  $2 1/2"$ ,  $\pm 1/2"$  TOLERANCE.

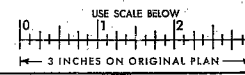
LIST OF DRAWINGS

- 44-72-1 GENERAL LAYOUT
- 2 BORE HOLE LOCATION & SOIL STRATA
- 3 FOOTING LAYOUT
- 4 ABUTMENTS
- 5 PRESTRESSED GIRDERS & BEARINGS
- 6 DECK DETAILS
- 7 CONCRETE BARRIER WALL (2'-8" HIGH)
- 8 STEEL PARAPET RAILING (SINGLE TUBE)
- 9 20' APPROACH SLAB
- 10 STANDARD DETAILS I
- 11 STANDARD DETAILS II
- 12 AS CONSTRUCTED ELEV. & DIM.

CONCRETE QUANTITIES  
CONCRETE IN ABUTMENTS & WINGWALLS CU.YD.  
CONCRETE IN DECK & DIAPHRAGM CU.YD.  
CONCRETE IN BARRIER WALLS CU.YD.  
CONCRETE IN APPROACH SLABS CU.YD.



FOR REDUCED PLAN



REVISIONS	DATE	BY	DESCRIPTION
DESIGN F.C.	CHECK H.C.	LOADING HS 20-44	DATE APRIL 77
DRAWING W.L.	CHECK F.C.	ISITE No 44-72	DWG 1

DOCUMENT MICROFILMING IDENTIFICATION

GEOCRES No. 31E-85

DIST. 11 REGION Northern

W.P. No. 622-72-02

CONT. No. 77-128

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

STR. SITE No. 44-72

HWY. No. 124

LOCATION Distress River Bridge

1.4 mi E. of Sec. Hwy. 510

OVERSIDE DRAWINGS TO BE INCLUDED WITH THIS REPORT. 3

REMARKS: documents to be unfolded  
before microfilming

## INTRODUCTION

The Soil Mechanics Section was requested to carry out a foundation investigation to determine the feasibility of relocating the above structure on a diversion west of the present bridge or at the existing site.

Following this request a field investigation was carried out by this office to determine the subsurface conditions which are of significance to the planning and design of the proposed diversion and new structure.

This report contains the results obtained from our investigations along with our recommendations pertaining to the approaches, abutments, and river diversion.

## SITE DESCRIPTION

The site is located within a depression in the terrain with its main water-course being the Distress River. The land adjacent to the site is at approximate elevation 935' with an approximate roadway elevation of 942'. Various bedrock outcroppings are evident at an approximate radius of 700' from the site within an angle from southwest to northwest. No other outcroppings were evident within the immediate area.

Geologically, the site is located within a region which forms part of the Lake Melville Plate within the Grenville Province of the Precambrian Shield. This area is characterized by the presence of certain metasedimentary and metavolcanic rocks of which approximately two-thirds are granites, generally granite-gneisses. This is followed by a concentration of metasediments including crystalline limestone, quartzite, amphibolite, and paragneiss.

In reference to overburden material, the immediate area is characterized by clay plains located within a vast area of rock ridges and shallow till deposited during the retreat of the most recent Wisconsinan ice sheet.

The recent Distress River diversion downstream of the existing site has created considerable scour into the east embankment. The rapid current and sudden change in direction is constantly washing away the sandy material at an enormous rate while also cutting into grazing pasture. A portion of

the original river still remains directly adjacent to the roadway.

In addition, it is also evident that the existing Hwy. #124 has previously been widened. Markings in the concrete abutments indicate bridge widening from a single lane to a double lane structure. There did not appear to be any evidence of shoulder widening on the northwest side of Hwy. #124. On the southeast slope, however, it appears that the road has been widened approximately 7' with rock fill having maximum size of 2'  $\pm$ . This rock fill extends to the bottom of the slope from the west bridge abutment west-erly several hundred feet.

#### SUBSURFACE CONDITIONS

In general, the subsoil within the immediate area is quite uniform as indicated by samples obtained from all four boreholes.

There exists approximately 5' of granular fill followed by approximately 15' to 18' of a non-cohesive material ranging from sand to silt. The only exceptions to this is that no granular fill was found in borehole #3 and approximately 4' of boulder was found in borehole #1 through the river bed.

This is followed by a stratum of silty clay with  $\frac{1}{4}$ " layers of clayey silt and intermittent layers  $\frac{1}{4}$ " thick of organic clay. This stratum varies in thickness from approximately 32' to approximately 46'.

Below this was found a stratum of non-cohesive material from 13' to 17' thick. Samples obtained from boreholes 1 and 2 within this stratum indicated a layer of silt with a trace of fine sand approximately 6' to 11' thick followed by sand and gravel till to bedrock. Wash samples obtained from borehole 3 indicates a medium to coarse sand approximately 13' thick directly over bedrock.

#### Fine to Medium Sand, Some Silt

As indicated on the Record of Borehole Sheets within the appendix of this report, this material is located directly on top of the silty clay stratum. The grain size distribution chart for this material shows that it is quite uniform in particle size. 'N' values obtained during sampling with a split-spoon sampler range from 1 to 8 indicating a relative density of very loose to loose.

### Silt to Fine Sandy Silt, Trace of Clay

This material shown as a grain-size envelope in Fig. 2 varies from a silt to a fine sandy silt with a trace of clay. This variation is indicative of the variation in grain sizes from borehole to borehole within the same stratum as shown on the Record of Borehole Sheets. 'N' values ranging from 3 to 20 indicate a relative density ranging from very loose to loose in the upper levels to compact in the lower levels.

### Silty Clay, Layers of Clayey Silt

This material is the predominating feature in all boreholes. This stratum also contains  $\frac{1}{4}$ " layers of clayey silt spaced approximately 1" apart. Within the top 10-15 feet of this stratum, various layers of black organic clay approximately  $\frac{1}{4}$ " thick were found. Undrained shear strengths determined with the use of laboratory and field vane tests range from 1,000 - 1,200 PSF indicating a firm to stiff consistency. Remolded shear strengths indicate that this stratum contains a fairly sensitive material with sensitivities ranging from 3 to 16 with an average of 7.

Atterberg limit tests performed on this material indicate an average plasticity index of 13 and an average liquid limit of 37%. The average moisture content was higher again at approximately 47%. Results from these tests are shown on the plasticity chart of Fig. 4.

### Sand and Gravel, Trace of Silt (Glacial Till)

This stratum approximately 7 to 14 feet thick, lying directly on bedrock, has a relative density of compact to dense as indicated by 'N' values ranging between 15 and 33.

### Bedrock

Examination of rock cores obtained from boreholes 1, 2 and 4 indicates that the bedrock at this site consists of a moderately fractured, hard gneiss. This is a fairly sound rock capable of supporting sufficiently high loads.

Based upon these rock cores, bedrock was proven at the following elevations.

BH #1	867.0
2	858.4
4	870.8



### Groundwater

Stream water readings taken on July 16, 1976 indicated a relatively low stream level of 928.8'.

Groundwater readings taken following the soils investigation indicate groundwater levels of 926.8, 930.5 and 928.0 for boreholes 2,3 and 4 respectively.

### RECOMMENDATIONS

It is proposed to construct a new structure at this site to replace the existing single span 30 ft. long steel and concrete structure. The new grade will be some 6.5' higher than the existing and the centreline will remain as is. The height of the new approaches will be approximately 19 ft. above the river bed.

#### Structure Foundation

The entire structure may be founded on steel H piles driven to bedrock. Design of the piles will be based upon maximum structural capacity. Pile lengths may be determined on the stratigraphical profile on Dwg. 6227202-A. Reinforced pile tips will be required to prevent damage when driving into the till layer.

Pile caps should be constructed so as to ensure at least 6 ft. of cover for frost protection. In the case of the pier, the pile caps should be founded at an elevation at least 6 ft. below the minimum established water level. Therefore the pile caps may be founded at elevation 921.5'  $\pm$ .

Excavation for pile caps may be carried out below groundwater level. Subsoil at this elevation consists of a fine granular material which may be subject to boiling conditions due to an unbalanced hydrostatic head. Therefore, a temporary dewatering scheme will be required.

An alternative scheme is to utilize a steel trestle design. This would entail the use of steel H piles as vertical columns. Again the pile tips will be required to be reinforced to prevent damage during driving. In addition, the steel piles may be encased in concrete to the frost level to ensure a suitable appearance.

This scheme would be more economic since no dewatering would be required.

### Structure Approaches

It is proposed to increase the grade approximately an additional 6.5'. This would increase the approach fill heights from approximately 12.5'  $\pm$  to 19'  $\pm$ . With this scheme, it is not anticipated to encounter any slope stability problems or significant settlements. (Less than 2")

Cobbles exceeding a diameter of 3 inches should be removed from this fill to prevent damage to the piles. It is recommended that the forward and side slopes be constructed at a maximum inclination of 2:1. In addition, to ensure stabilization of the toe of the forward slopes, rip rap should be placed as per recommendations by the Hydrology Section.

### River Diversion

It was also proposed to divert the Distress River to accommodate the new structure west of its present site by excavating a channel to an approximate elevation of 927'.

No problems are anticipated with this proposal, however, it must be noted that the diverted water course will be rerouted through a sandy material. In order to prevent excessive scour, rip-rap should be provided.

### MISCELLANEOUS

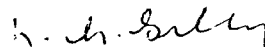
The field work pertaining to this report was performed during the period of July 12-16, 1976 by the writer.

A hollow stem auger type CME 45 mounted on a muskeg vehicle was used to drill down 4 boreholes, two of which were preceded by cone penetration tests.

Borehole elevations were determined by using a bridge elevation of 941.3.



R. Van Veen  
Project Engineer




K.G. Selby, P. Eng.  
Supervising Engineer

KGS/bp  
August, 1976

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS-ONTARIO

ENGINEERING SERVICES BRANCH-GEOTECHNICAL OFFICE - SOIL MECHANICS SECTION

RECORD OF BOREHOLE NO 1


WP 622-72-02 LOCATION Sta. 239 + 49 o/s 9' Lt. 0 Hwy. 124 ORIGINATED BY RVV  
DIST 11 HWY 124 BORING DATE July 14, 1976 COMPILED BY RVV  
DATUM Geodetic BOREHOLE TYPE H.S.Auger, BX Casing & BX Rock Core CHECKED BY 

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT $\frac{w_L}{w_p}$ PLASTIC LIMIT $\frac{w_p}{w_L}$ WATER CONTENT $\frac{w}{w_L}$			UNIT WEIGHT $\gamma$ PCF	REMARKS % GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	'N' VALUES		20	40	60	80	100	$w_p$	$w$	$w_L$		
941.3	Bridge Deck Elev.															
0.0	Bridge Deck															
0.9																
928.8	Water Level															
12.5	River Bottom															
13.5	Medium sand and boulders 1'0															
923.3																
18.0	Fine to medium sand, trace to some silt		1	SS	8											0 96 ( 4 )
918.3	Loose															
23.0			2	SS	4											
	Silty clay,		3	TW	PH										104	
	layers of clayey		4	TW	PH											
	silt		5	SS	2											
			6	TW	PH										109	
	Firm to Stiff		7	TW	PH											
884.3			8	TW	PH											
57.0	Silt, layers of clayey silt.		9	SS	12											0 1 91 8
876.8	Compact		10	SS	15											34 50 ( 16 )
64.5	Sand and gravel, trace of silt		11	WS	-											
	Compact															
867.0	Glacial Till															
74.3	Bedrock Gneiss		12	RC	Rec.											
861.7	moderately fractured			BXL	74%											
79.6	End of Borehole															

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS-ONTARIO

ENGINEERING SERVICES BRANCH-GEOTECHNICAL OFFICE-SOIL MECHANICS SECTION

RECORD OF BOREHOLE NO 2

WP 622-72-02 LOCATION Sta. 238 + 55 o/s 10' Rt. 6 Hwy. 124 ORIGINATED BY RVV  
DIST 11 HWY 124 BORING DATE July 15, 1976 COMPILED BY RVV  
DATUM Geodetic BOREHOLE TYPE H.S Auger, BX Casing & BX Rock Core 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 $\gamma$ PCF	REMARKS % GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	N' VALUES		20	40	60	80	100	$W_P$	$W$	$W_L$		
941.8	Ground Level															
0.0	Sand					940										
936.8	Fill Material		1	AS											1.68% org.	0 50 44 6
5.0	Fine sandy silt, trace of clay & organics.		2	SS	4											
			3	SS	6											
	Very Loose to Loose		4	SS	6	930									2.98% org.	0 32 64 4
927.3			5	SS	3											
14.5	Fine to medium sand, trace to some silt.		6	SS	3											0 96 ( 4 )
921.3	Very Loose															
20.5			7	SS	4	920										
	Silty Clay		8	SS												
			9	SS	4	910									110	
	intermittent layers of organic clay		10	TW	PH				+s8	x s5						
										+s8						
	layers of clayey silt and silt		11	TW	PH	900										
			12	SS	2					+s7						
	Firm to Stiff															
			13	TW	PH	890										
			14	TW	PH					+s5						
881.8										+s5					117.5	
60.0	Silt, some fine sand, trace of clay, layers of clayey silt.		15	SS	10	880										
			16	SS	5											
	Loose to Compact															
			17	SS	20	870										
864.8			18	SS	12											0 19 71 10
77.0	Sand & gravel, trace of silt. Dense		19	SS	33	860										
859.2	Glacial Till															
82.6	cobbles		20	RC												
83.4	Bedrock Gneiss															
852.9	Moderately fractured		21	RC BXL	Rec. 98%											
88.9	End of Borehole															

20  
15  $\diamond$  5 % STRAIN AT FAILURE  
10

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS-ONTARIO

ENGINEERING SERVICES BRANCH-GEOTECHNICAL OFFICE-SOIL MECHANICS SECTION

RECORD OF BOREHOLE NO 3

WP 622-72-02 LOCATION Sta. 238 + 20 o/s 42' Lt. & Hwy. 124 ORIGINATED BY RVV  
 DIST 11 HWY 124 BORING DATE July 13, 1976 COMPILED BY RVV  
 DATUM Geodetic BOREHOLE TYPE H. S. Auger and Cone Test CHECKED BY *ep.*

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT $w_L$ PLASTIC LIMIT $w_p$ WATER CONTENT $w$			UNIT WEIGHT $\gamma$ PCF	REMARKS % GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	'N' VALUES		20	40	60	80	100	$w_p$	$w$	$w_L$		
933.5	Ground Level															
0.0	Fine to Medium Sand		1	SS	1	930										
	trace of organics		2	SS	1											
	some silt		3	SS	1											
	Very Loose to Loose		4	SS	6											
915.5			5	SS	2	920										
18.0	Silty clay		6	SS	7											
	intermittent layers of organic clay		7	TW	PH	910										
	layers of clayey silt		8	TW	PH											
	Firm to Stiff		9	TW	PH	900										
886.5			10	TW	PM											
47.0	Fine to medium sand, trace of silt		11	SS	3	890										
			12	WS		880										
870.5																
63.0	End of Borehole Probable Bedrock															

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS-ONTARIO  
ENGINEERING SERVICES BRANCH-GEOTECHNICAL OFFICE-SOIL MECHANICS SECTION

## RECORD OF BOREHOLE NO 4

WP 622-72-02 LOCATION Sta. 237 + 46 o/s 12' Rt. E Hwy. 124 ORIGINATED BY RVV  
DIST 11 HWY 124 BORING DATE July 15, 16, 1976 COMPILED BY RVV  
DATUM Geodetic BOREHOLE TYPE H.S. Auger, BX Casing & BX Rock Core & Cone Test CHECKED BY ep.

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT				LIQUID LIMIT $w_L$ PLASTIC LIMIT $w_p$ WATER CONTENT $w$			UNIT WEIGHT $\gamma$ PCF	REMARKS % GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	N' VALUES		20	40	60	100	$w_p$	$w$	$w_L$		
943.0	Ground Level														
0.0	Sand		1	AS		940									
938.0	Fill Material		2	SS	7										0 6 84 10
5.0	Silt		3	SS	9										
933.5	Loose		4	SS	3										0 77 18 5
9.5	Fine to medium sand some silt		5	SS	3										
	Very Loose to Loose		6	SS	8									0.50% org.	0 87 (13)
922.5			7	SS	1										
20.5	Silty Clay		8	SS	5										
	intermittent layers of organic clay		9	TW	PH										
	layers of clayey silt		10	TW	PH										
	Firm to Stiff		11	TW	PH										
			12	TW	PH									111	
			13	SS	1										
885.0			14	SS	17										
58.0	Sand and gravel, trace of silt Compact		15	SS	15										54 44 (2)
	Glacial frequent boulders		16	RC	63%										
870.8	Till		17	WS											
72.2	Bedrock Gneiss		18	RC	Rec										
867.3	moderately fractured			BXL	100%										
75.7	End of Borehole														



Ministry of  
Transportation and  
Communications

# DIAMOND DRILL RECORD

HOLE NO. \_\_\_\_\_ SHEET NO. \_\_\_\_\_

DIP

PROPERTY W.P. 622-72-02  
LOCATION Hwy. 124 (Magnetawan)  
Distress River Structure  
LATITUDE \_\_\_\_\_  
DEPARTURE \_\_\_\_\_  
BEARING \_\_\_\_\_

90°  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
TOTAL FOOTAGE \_\_\_\_\_

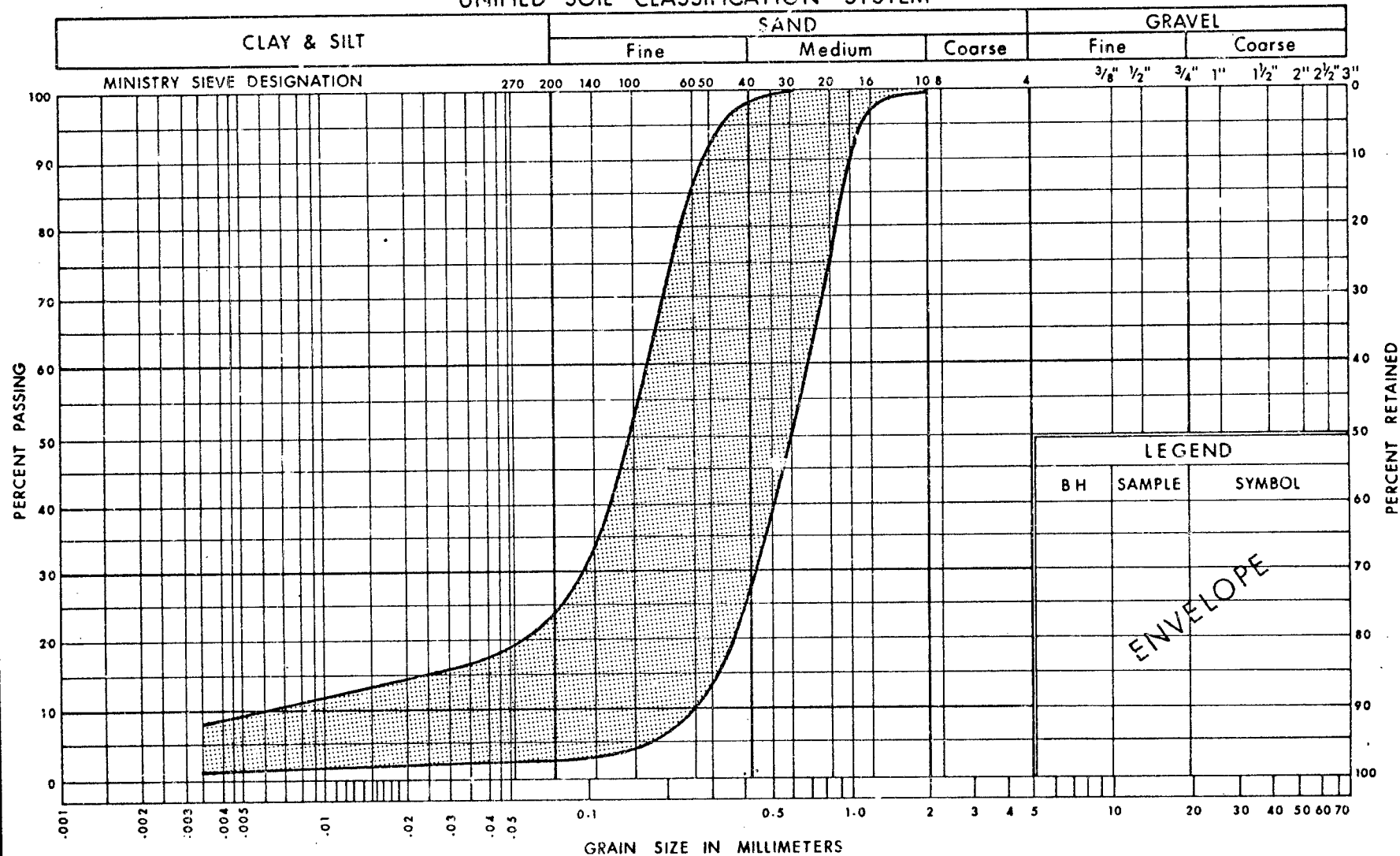
ELEV. COLLAR \_\_\_\_\_  
DATUM \_\_\_\_\_  
DATE STARTED \_\_\_\_\_  
DATE COMPLETED \_\_\_\_\_  
DRILLED BY \_\_\_\_\_  
LOGGED BY \_\_\_\_\_

FOOTAGE		FORMATION	SAMPLE NUMBER			REMARKS
FROM	TO					
		HOLE #1				
74.3'	79.6'	Gneiss, pink grey colour, hard, medium texture, lineation 40°				moderately fractured along lineation bandings.
		HOLE #2				
83.6'	88.9'	Gneiss, pink grey colour, hard, medium texture, lineation 40°				moderately fractured along lineation bandings.
		HOLE #4				
68.4'	69.4'	Gneiss, white grey colour, hard, medium to coarse texture, lineation 90°				this section is a boulder area 68.4' to 70.2'
69.4'	70.2'	Gneiss, white grey colour, hard, medium to coarse texture, lineation 40°				missing core 70.2' - 72.2' or an area of voids or till
72.2'	75.7'	Gneiss, grey colour, hard, medium texture, lineation 40°				bedrock at 72.2' which is moderately fractured

DATE OF EXAMINATION August/76

B.K. Glassford

## UNIFIED SOIL CLASSIFICATION SYSTEM



Ontario

 Ministry of  
Transportation and  
Communications

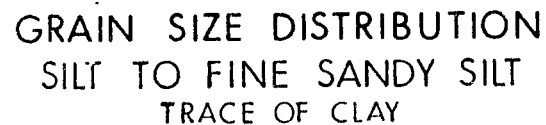
ENGINEERING SERVICES BRANCH

GRAIN SIZE DISTRIBUTION  
FINE TO MEDIUM SAND  
TRACE TO SOME SILT

FIG No 1

W P 622-72-02





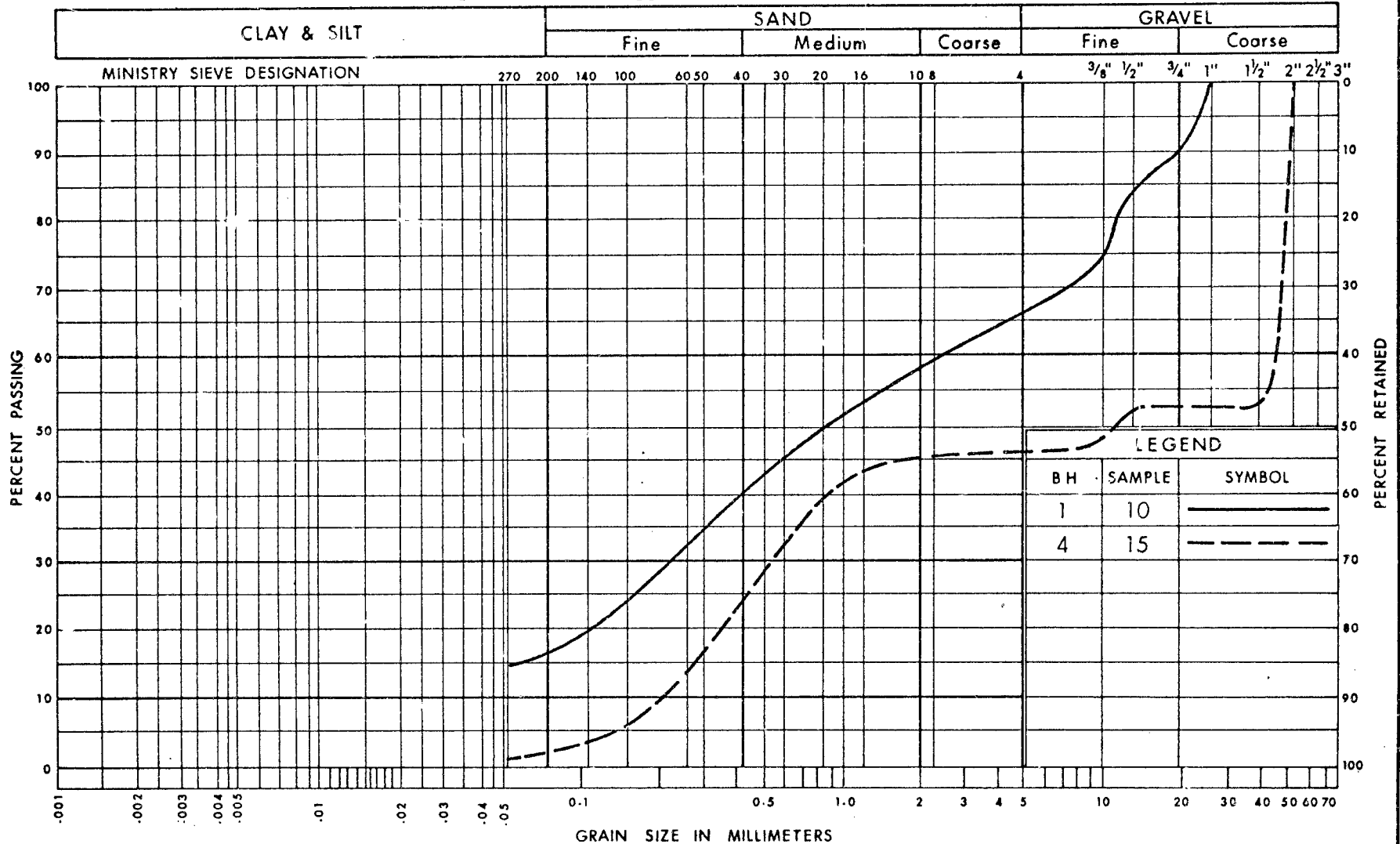
W P 622-72-02



Ministry of  
Transportation and  
Communications

ENGINEERING SERVICES BRANCH

## UNIFIED SOIL CLASSIFICATION SYSTEM



GRAIN SIZE DISTRIBUTION  
SAND & GRAVEL, TRACE OF SILT  
Glacial Till

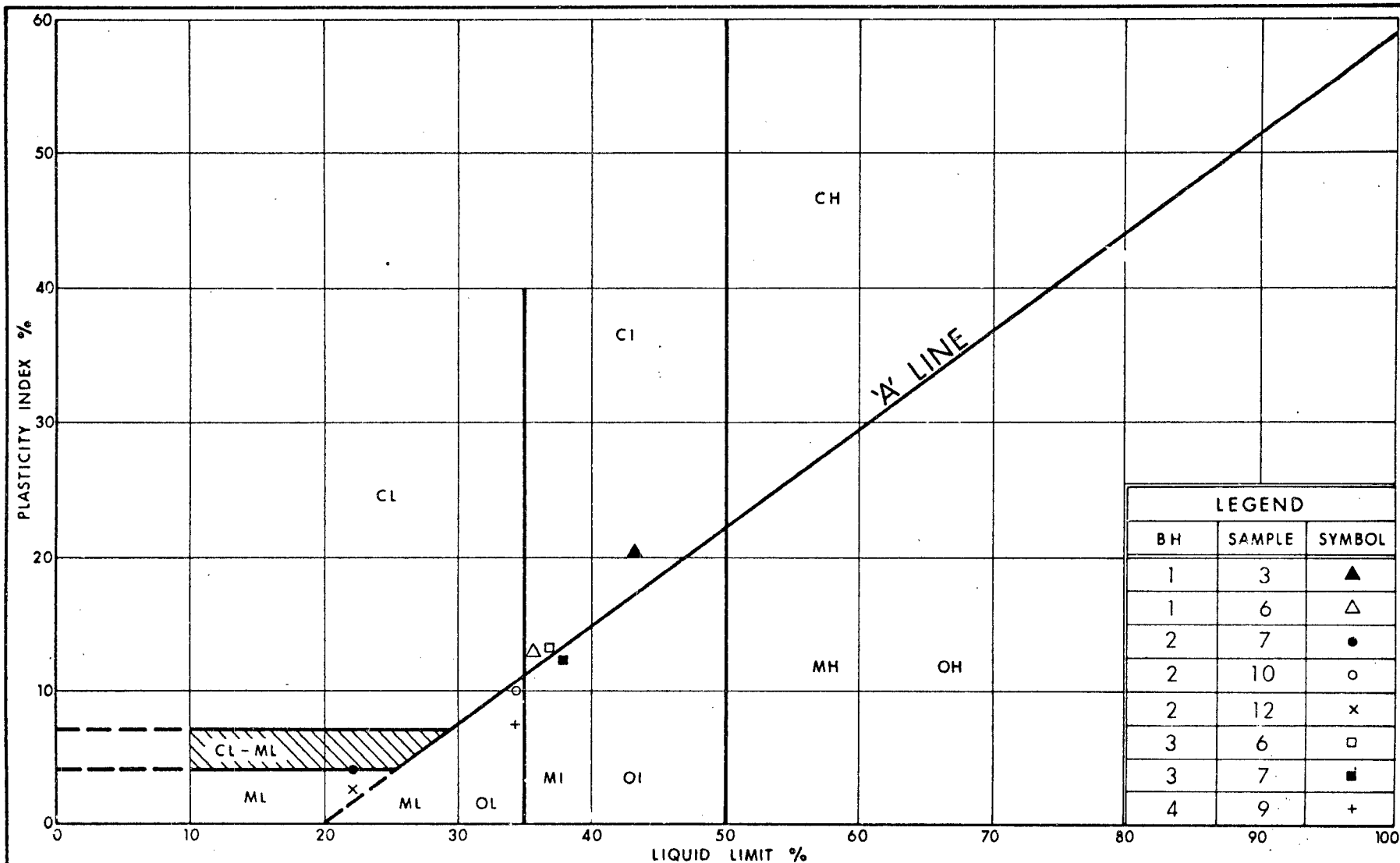
FIG No 3

W P 622-72-02



Ministry of  
Transportation and  
Communications

Ontario  
ENGINEERING SERVICES BRANCH



Ontario

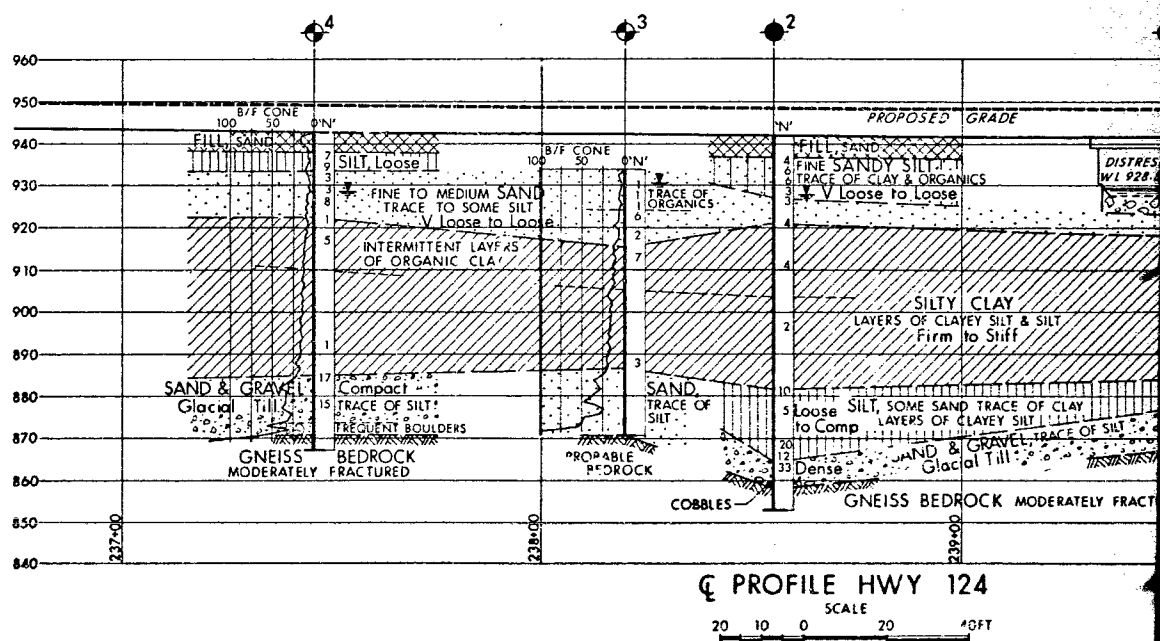
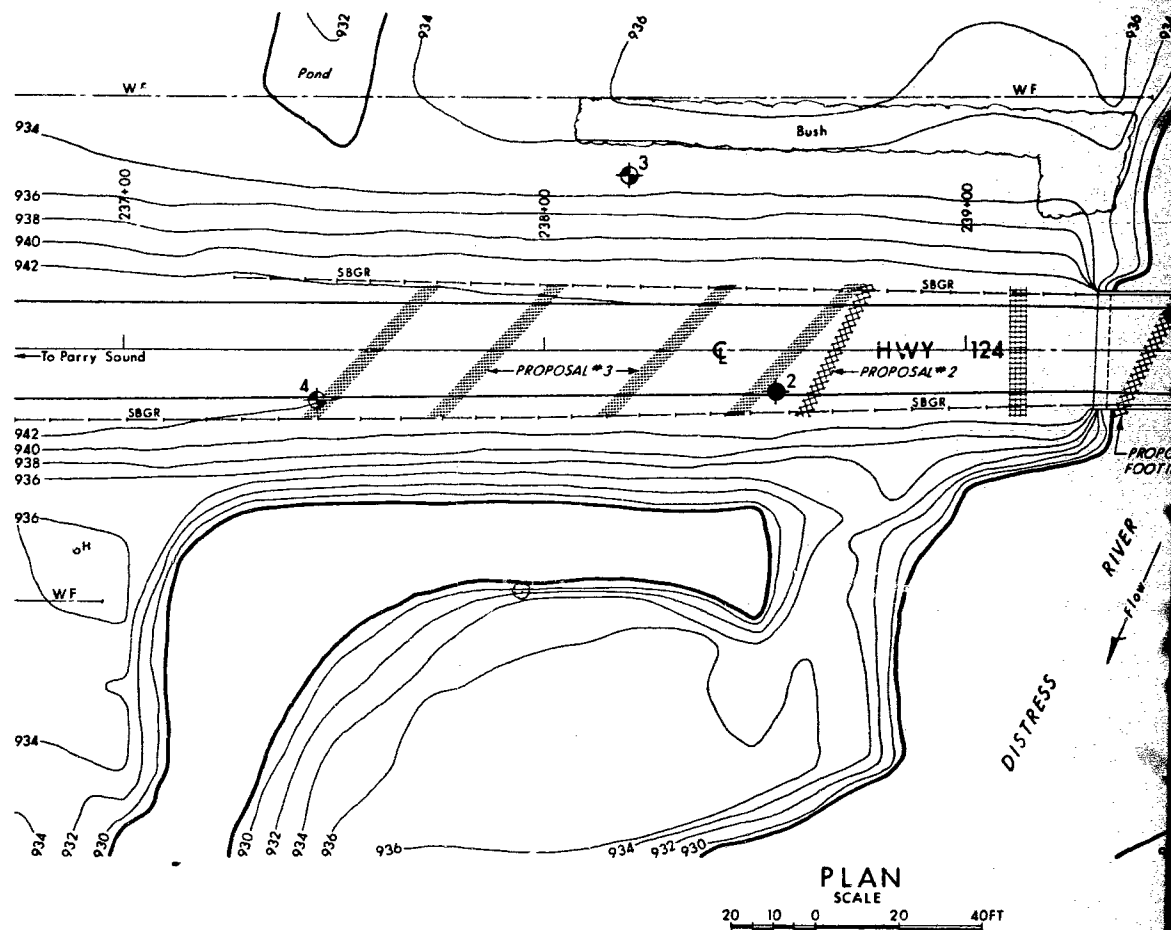
Ministry of  
Transportation and  
Communications

ENGINEERING SERVICES BRANCH

# PLASTICITY CHART SILTY CLAY, LAYERS OF CLAYEY SILT VARIOUS LAYERS OF ORGANIC CLAY

FIG No 4

W P 622-72-02



CONT No  
WP No 622-72-02

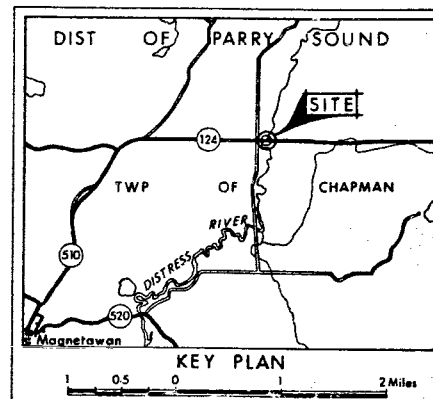


DISTRESS RIVER

(1.4 Mi East of Sec Hwy 510)

BORE HOLE LOCATIONS & SOIL STRATA

SHEET



# LEGEND

- Bore Hole
- ⊕ Dynamic Cone Penetration Test (Cone)
- ⊕ Bore Hole & Cone
- 'N' Blows/ft (Std Pen Test 350ft lbs energy)
- CONE Blows/ft (60° Cone, 350ft lbs energy)
- ↓ WL at time of investigation July 1976

No	ELEVATION	STATION	OFFSET
1	941.3	239+49	9' LT
2	941.8	238+55	10' RT
3	933.5	238+20	42' LT
4	943.0	237+46	12' RT

## NOTE

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

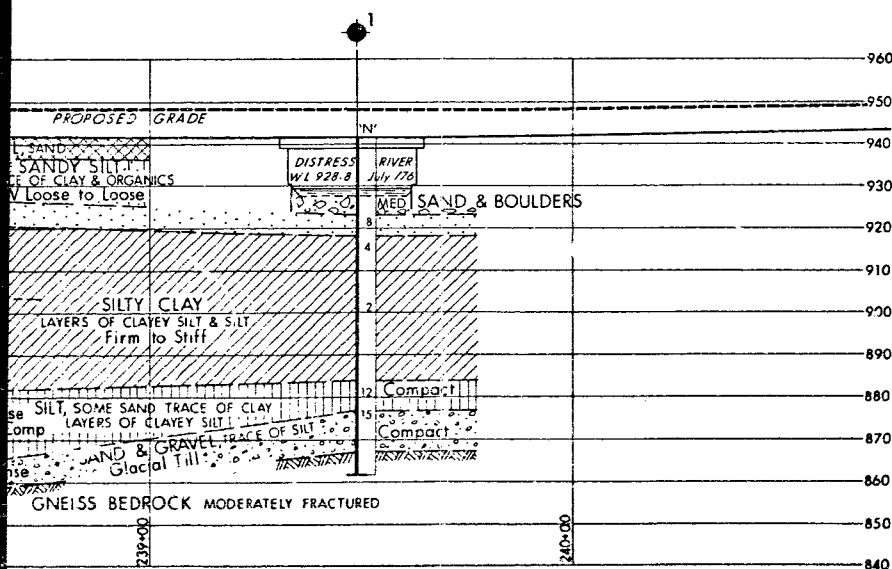
REVISIONS	DATE	BY	DESCRIPTION

HWY No 124	DIST 11
SUBMITTED BY CHECKED DATE Aug 27, 1976	SITE 44-72
DRAWN BY CHECKED	DWG 6227202-A

REF No E-5064-1, April 1976

PLAN  
SCALE

20 40FT



E HWY 124  
SCALE

20 40FT

RECEIVED  
TECHNICAL OFFICE  
MAY 12 1976  
SOIL MECHANICS  
144 WEST 14TH ST. APT. 6  
COMMUNICATIONS

SITE 44-72  
DISTRESS R.  
Hwy. #124  
W. BOYES

LOT 25

E-4479-1

GRAVEL RD.

+30 Church 1000 R1

DISTRICT OF COLUMBIA

Entrances

6  
7  
8  
9  
10  
11  
12

+00 5142.5 F+

450

500' V.G.  
EXIST.

500 V.C.

SOUNDINGS LEFT  
SEE POAM 0.5%

500 V.C.  
EXIST.

450 V.C

700' V.C.

500' V.C. Exst.

HWL	933.47	
W	930.00	Feb 6/68

CLAY

CONC.-STEEL CONT. BEAM BRIDGE  
30'4" CLEAR SPAN

343+41	T/O	14'2	Rt.	938.7
	T/O	14'2	Lt.	938.7

+75 H. 845 Lt. 247 8  
+48 S. 1345 Lt. 247 8

C-543-9

76  
 11/1/79  
 SHH  
 from 4.3 miles W to  
 Hwy 11 W to 12.3 miles  
 on 4.4 miles W.

CONTRACT # 77-128

CONTRACTOR: Smith's Construction Co., Arnprior Ltd.  
 HWY 124.

DESCRIPTION: Grading, drainage, granular base, hot mix paving, structure, patrol yard and various patching areas

REGION: Northern Region

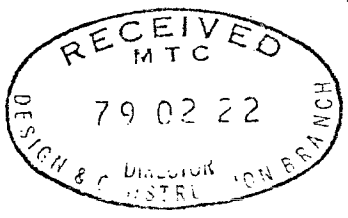
DESIGNED BY: Ministry of Transportation and Communications, North Bay Regional Design Branch and District #11 Personnel

PREPARED BY: Ron Phillips, Project Supervisor

RECOMMENDED BY: W. G. Muckler, Construction Supervisor

DATED: February 12, 1979

\* \* \* \* \*



Mostly new surface, widening with  
 considerable grading - cuts  
 + filling in some  
 spots

1 - \$1,927,581.20

Later Re - 2,000

*[Handwritten signature]*



### 2.3 Foundation and Soils Information:

#### The Accuracy and Interpretation of the Information:

This is one area where I feel more time and information could be presented. It is my opinion that more boring should be taken to determine the rock lines for footings, etc.

#### Problems resulting from Soils and Foundation Information:

No problems.

1285

Meeting of  
Structural Review Committee

Time: 9:30 a.m. August 10, 1977

Place: Boardroom B, West Building

Attending: Messers:

A. E. McKim	-- Construction Branch
F. Chan	-- Structural Office
N. Zoltay	-- Structural Office
✓K. Selby	-- Soil Mechanics Section (part time)
M. DeVata	-- Soil Mechanics Section (part time)
B. Ly	-- Soil Mechanics Section (part time)
A. Ma	-- Hydrology Section
P. Roy	-- Structural Maintenance Section

Projects Reviewed: W.P. 622-72-02; Site 44-72,  
Distress River Bridge  
Hwy. 124, District 11

W.P. 61-74-08; Site 46-296A  
Vermillion River Bridge (EBL)  
W.P. 61-74-09; Site 46-296A  
Vermillion River Bridge (WBL)  
W.P. 61-74-11; Site 46-302  
Regional Road #3 Underpass  
Hwy. 17, District 17

Distress River Bridge (W.P. 622-72-01)

Mr. Chan opened the meeting by making a presentation for the bridge, outlining the design and construction features.

The following points were put forth as noted below with recommendations where applicable.

Foundations

The piling requirements were reviewed and the proposed scheme complies with the recommendations of the foundation report. No problems are expected in the driving of piles.

Cont'd . . .



### Hydrology

Top of rip-rap elevation is lower than the high water level. This matter is to be investigated and resolved by Mr. Chan and, if necessary, the drawing and the quantity of the applicable tender item are to be corrected.

### Structure

The deck is to be machine finished. This recommendation is subject to the agreement of the Regional Quality Assurance Section.

### Special Provisions and D4

Special Provisions and D4 are to be reviewed by the Designer and amended where necessary in order to reflect the Ministry's policy and practise.

### Regional Road #3 Underpass (W.P. 61-74-11)

### Foundations

The design incorporates the recommendations of the Foundation Report for the bridge foundations; however, the design drawings should show the treatment of approaches--as indicated in paragraph 5.4 - Foundation Report--and refer to grading drawings for details. The designer should advise the Regional Planning and Design Office for the above.

### Structure

#### (a) Drawing #8

The need of simultaneous stressing at both ends of the longitudinal cables was discussed by the Committee. If stressings are not simultaneous the elongations will be different and they should be indicated on the drawing. To be confirmed by Structural Office.

#### (b). The deck is to be machine finished.

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Vermillion River Bridge EBL and WBL

W.P. 61-74-08 and 61-74-09

Foundations

The approach fill will be constructed with granular material in the area where piles are to be driven. Elsewhere rock fill will be used.

The Soil Mechanics Section (Mr. B. Ly) will investigate if any special treatment will be required between the rock fill and granular fill, and will advise the Structural Office.

If special treatment will be required, it shall be incorporated in the drawings.

Hydrology

The design complies with the recommendations of the Hydrology Section.

Structure

(a) Drawings #9 and #10

The dimensions of stiffener's clip are different on Drawings #9 and #10 ( $1\frac{1}{2}$ " and 1" respectively). They should be consistent.

To be confirmed by the Designer.

(b) Drawing #11

Abutment's bearing plates show shop welded. In order to give more construction flexibility, the committee recommends that the plates are to be field welded.

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Cont'd . . .

No further matters were brought up and the meeting adjourned at 11:45 a.m.

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N. Zoltay,  
Structural Contract  
Specifications Engineer.

NZ:pw

cc: All present  
J. B. Wilkes  
R. A. Dorton  
C. S. Grebski  
E. Van Beilen  
K. Bassi  
W. A. Stewart

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Structural Review Committee

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Place: Boardroom B, West Building

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N. Zoltay	-- Structural Office
K. Selby	-- Soil Mechanics Section (part time)
✓M. DeVata	-- Soil Mechanics Section (part time)
B. Ly	-- Soil Mechanics Section (part time)
A. Ma	-- Hydrology Section
P. Roy	-- Structural Maintenance Section

Projects Reviewed:

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Distress River Bridge  
Hwy. 124, District 11

W.P. 61-74-08; Site 46-296A  
Vermillion River Bridge (EBL)  
W.P. 61-74-09; Site 46-296A  
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### Regional Road #3 Underpass (W.P. 61-74-11)

*NB Reg. Planning & Design  
McCombie will look after this (Aug. 17, 1977)*

### Foundations

The design incorporates the recommendations of the Foundation Report for the bridge foundations; however, the design drawings should show the treatment of approaches--as indicated in paragraph 5.4 - Foundation Report--and refer to grading drawings for details. The designer should advise the Regional Planning and Design Office for the above.

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N. Zoltay,  
Structural Contract  
Specifications Engineer.

NZ:pw

cc: All present  
J. B. Wilkes  
R. A. Dorton  
C. S. Grebski  
E. Van Beilen  
K. Bassi  
W. A. Stewart

Meeting of  
Structural Review Committee

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M. DeVata	-- Soil Mechanics Section (part time)
✓B. Ly	-- Soil Mechanics Section (part time)
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Hwy. 124, District 11

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W.P. 61-74-08 and 61-74-09

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*Memo to W. Peck (Aug. 16, )*

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The design complies with the recommendations of the Hydrology Section.

Structure

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N. Zoltay,  
Structural Contract  
Specifications Engineer.

NZ:pw

cc: All present  
J. B. Wilkes  
R. A. Dorton  
C. S. Grebski  
E. Van Beilen  
K. Bassi  
W. A. Stewart

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

Soil Mechanics Section  
Engineering Materials Office  
West Building, Downsview

January 31, 1977

Distress River Bridge  
W.P. 622-72-02, Site 44-72  
District 11, Huntsville

In reference to your memorandum dated January 19, 1977 regarding the Preliminary Bridge Plan Drawing 44-72-P2, we have reviewed the preliminary design and the subsequent comments are as follows.

Our foundation report recommends a minimum frost protection of 6 feet. The preliminary design indicates a proposed frost cover of only 5 feet. It is advised that, in order to comply with the report recommendations, the proposed pile cap elevations be lowered to provide the required 6 feet of frost protection.

R. Van Veen

R. Van Veen  
Project Engineer

RVV/gs

cc: Files ✓  
Record Services

Soil Mechanics Section  
Geotechnical Office  
West Building  
1201 Wilson Avenue  
Downsview, Ontario  
M3M 1J8

July 14, 1976

Geocon Limited  
1255 Kingsway  
Sudbury, Ontario

Dear Sirs:

This letter confirms our request by telephone of July 7, 1976 for the supply of a Type II Auger (Item 5.2 i), together with all necessary equipment, as per your Tender for Supply Contract S-76-1002 at Magnetawan on July 12, 1976.

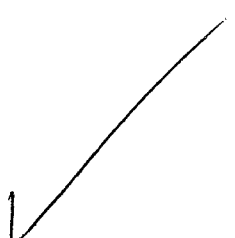
Mobilization will be from Sudbury.

Our Project Number is W.P. 622-72-02.

Yours truly,

K.G. Selby  
Supervising Engineer

cc: W.W. Fry  
(Attn: V. Di Marco)  
Files  
Record Services



## BORING CONTRACTORS - COMPARATIVE COSTS

SUPPLY CONTRACT No. S - 76 - 1002

PERIOD FROM MAY 1<sup>st</sup>, 1976 TO OCT. 31<sup>st</sup>, 1976DRILL ITEM NO. 5.2START DATE JULY 12 / 76ESTIMATED DRILLING FOOTAGE 240UNIT REQUIRED 5.2(I)SITE #44-72, DISTRESS RIVER BRIDGEESTIMATED FEET PER HOUR 5.5W. P. 622-72-02RAFT REQUIRED YES ☐ NO ☒HIGHWAY #124, DIST. #11ESTIMATED TOTAL HOURS 43.6W. O. 

CONTRACTOR	EQUIPMENT DESCRIPTION AND RATES									MOBILIZATION RATES			MOBILIZATION POINTS	MILES ONE WAY	MOB. COST	DRILLING COST	OTHER COST	TOTAL COST
	S. 2(A) S. A. TRAIL	S. 2(B) S. A. TRUCK	S. 2(C) S. A. M.V.	S. 2(D) H.S. 2 1/4" TRAIL	S. 2(E) H.S. 2 1/4" TRUCK	S. 2(F) H.S. 2 1/4" M.V.	S. 2(G) H.S. 3 1/4" TRAIL	S. 2(H) H.S. 3 1/4" TRUCK	S. 2(I) H.S. 3 1/4" M.V.		S. 2(A) TRAIL	6.2(B) TRUCK	6.2(C) M.V.					
ATCOST	36.00	36.00	40.00	38.00	38.00	40.00	38.00	38.00	(40.00)		1.40	1.40	(1.50)	CONCORD, BELLEVILLE, LONDON, NORTH BAY	53.5	160.50	1744.00	1904.50
CANADIAN LONGYEAR	37.00	37.00	40.50	39.50	39.50	43.00	39.50	39.50	43.00		1.35	1.35	1.65	CONCORD (WITHIN 50 MILES)				
	40.00	40.00	43.50	42.50	42.50	46.00	42.50	42.50	(46.00)		1.35	1.35	(1.65)	CONCORD, NORTH BAY, LONDON, SUDBURY	53.5	176.55	2005.60	2182.15
	* RATES APPLY TO ALL JOBS MORE THAN 50 MILES FROM CONCORD WAREHOUSE																	
GEOCON	-	31.00	35.00	-	33.00	37.00	-	33.00	(37.00)		-	1.00	(1.50)	TORONTO, SUDBURY, HAMILTON	137.1	411.30	1613.20	2024.50
R.B. DODDS OR MORTON DODDS	45.00	45.00	50.00	45.00	45.00	50.00	45.00	45.00	(50.00)		1.50	1.50	(1.50)	TORONTO, SUDBURY, THUNDER BAY	137.1	411.30	2180.00	2591.30
DOMINION SOIL	PLUS 1.20/MILE MOTEL TO JOB SITE OR 22.00/HOUR TRAVELLING TIME IN CLIENT'S VEHICLE																	
	50.00	50.00	50.00	-	-	-	50.00	50.00	(50.00)		1.50	1.50	(1.50)	TORONTO, KITCHENER, LONDON, THUNDER BAY, WINDSOR, OTTAWA, NORTH BAY	53.5	160.50	2180.00	2340.50
	PLUS \$1.50/MILE, MOTEL TO JOB SITE AND RETURN DAILY, THUNDER BAY, NORTH BAY, OTTAWA																	
AWTHORNE	-	-	-	-	-	-	-	38.00	(42.00)		-	2.00	(2.00)	OTTAWA	258	1032.00	1831.20	2863.20
JOHNSTON	32.00	32.00	37.00	35.00	35.00	40.00	35.00	40.00	40.00		1.25	1.25	1.50	OTTAWA, TORONTO (WITHIN 30 MILES)				
	35.00	35.00	40.00	38.00	38.00	43.00	38.00	43.00	(43.00)		1.25	1.25	(1.50)	OTTAWA, TORONTO (OUTSIDE 30 MILES)	173.2	519.60	1874.80	2394.40
MASTER	34.00	34.00	39.50	36.50	36.50	42.00	36.50	36.50	(42.00)		1.35	1.35	(1.65)	TORONTO, LONDON, NORTH BAY, OTTAWA	53.5	176.55	1831.20	2007.75
P. V. K.	-	-	-	-	-	40.00	-	-	-		-	-	2.00	TORONTO, BURLINGTON, LONDON				
SITE INVESTIGATION SERVICES	-	37.50	40.00	-	37.50	40.00	-	37.50	(40.00)		-	1.15	(1.90)	PETERSBURGH, PORT HOPE, BELLEVILLE, OSHAWA, BRAMPTON, LINDSAY	146.7	557.46	1744.00	2301.40

ASSIGNED TO GEOCON

GIVE REASON IF OTHER THAN LOWEST COST CONTRACTOR ABLE TO SUPPLY EQUIPMENT ON REQUIRED DATE

REMARKS





## Memorandum

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

From: Structural Section,  
Northern Region,  
North Bay.

Attention: Mr. K. Selby

Date: May 11, 1976.

Our File Ref.

In Reply to

Subject:

W.P. 622-72-02, Site 44-72  
Distress River Bridge  
Highway #124, District #11  
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At this time, only a preliminary hydrology has been carried out for the above crossing. The decision to relocate the structure on a diversion west of the present bridge or at the existing site will be postponed until a foundation report covering all alternatives is available and a complete assessment of the economics of the various alternatives can be carried out.

I am enclosing prints of the B-plan and profile of the area together with two copies of the site plan E-4479-1 showing the alternatives being considered. The site plan is at present being revised to show a diversion downstream which was completed since the site plan was drawn. A copy of the revised site plan will be forwarded to you when it is available.

Although it seems that we are asking for a very wide-spread investigation, the similarity of the soils over the three alternatives is very obvious and I expect only a minimum amount of work at the two diversions. I tend to prefer a structure at the existing site, of a size that will not increase the downstream scour hole, rather than the other crossings which might create new problems.

In the event that the existing site is chosen a bailey detour will be necessary to maintain traffic. The bailey would be single lane with a deck elevation 942.0 and would be located on the north side some 60' centre to centre from the existing bridge.

Please return the enclosed photographs of the crossing along with your report.

J. C. McALLISTER,  
HEAD, STRUCTURAL SECTION.

JCMcA:jem  
Encl.  
c.c. R. Murphy

