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G.I.-30 SEPT. 1976

GEOCRES No. 31E-107

DIST. 11 REGION                     

W.P. No. 341-87-00

CONT. No.                     

W. O. No.                     

STR. SITE No.                     

HWY. No. 11

LOCATION Hwy 11 Near Allensville Rd  
and Rowanwood Rd.

No of PAGES -                     

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OVERSIZE DRAWINGS TO BE INCLUDED WITH THIS REPORT.                     

REMARKS:



Ministry  
of  
Transportation

*Peter  
Edwards*

**FILE No.** \_\_\_\_\_ **DATE** \_\_\_\_\_

**REMARKS** \_\_\_\_\_

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# memorandum



To: P. Furst  
Head, Structural Section  
Norther Region

From: Foundation Design Section  
Room 315, Central Building

Re: Interchange at Highway 11 near  
Allensville Road and Rowanwood Road  
W.P. 341-87-00  
District 11, Huntsville

Date: 1991 10 15

A preliminary foundation investigation was carried out to provide information for the planning of the proposed structure and approach fill at the above site.

The field work for this investigation was carried out between 91 09 24 and 91 09 26, and comprised of two sampled boreholes and Dynamic Cone Penetration Test adjacent to these holes. Boreholes were advanced to bedrock.

We understand that the bridge will be a two span post tensioned cast-in-place structure with approach fill in the order of 6.5 m to 7.0 m high.

The borings at the site indicate the presence of 1.7 m to 2.2 m loose to compact sandy silt underlain by 9.4 m to 11.0 m very loose to compact silt to low plastic silt. The silty layer is followed by 2.4 m to 9.2 m very soft to soft clayey silt to silty clay layer. This is underlain by compact to dense silt to sandy silt which extends up to the depth probed.

The subsurface conditions encountered during the course of the investigation together with the field and laboratory test results are shown on the Record of Borehole Sheets appended to this memo. In addition, the borehole information from the site investigation carried out for the existing culvert at Hwy. 11 & Bullen Creek located at about 400 m north of the proposed site is also included in the Appendix.


Considering the subsoil condition at this site, the structure will have to be supported on piles driven to bedrock which may be encountered approximately 28.7 m to 37.2 m (El: 253 to 244) below the existing ground level.

Construction of 7 m high approach embankment may require berm and also the embankment is expected to undergo settlement in the order of 0.3 to 0.5 m. In view of this, the fill should be placed well in advance to reduce the post construction settlements.

.../2

Dewatering problems during the construction of pile caps for the abutments could be avoided by providing perched abutments. However, the pile caps for the pier will have to be constructed 1.8 m below the grade level, and for dewatering purposes, sheet piles may have to be used. The information provided in this memo is only for planning purposes and a detailed site investigation should be carried out before the design of structure foundation and approach fill.

If there are any questions, please call.



M. Vasavithasan, P. Eng.  
Foundation Engineer

for

D. Dundas, P. Eng.  
Sr. Foundation Engineer

DD/MV/jb

# RECORD OF BOREHOLE No 1

1 of 1 METRIC

W.P. 341 - 87 - 00 LOCATION STA. 500 + 56 O/S 10<sup>th</sup> RT. CL. HWY. 11 ORIGINATED BY A.P.  
 DIST 11 HWY 11 BOREHOLE TYPE CONE TEST & HOLLOW STEM AUGER COMPILED BY  
 DATUM GEODETIC DATE 1974 10 28 & 29 CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT w <sub>p</sub>	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w <sub>L</sub>	UNIT WEIGHT 7 kN/m <sup>3</sup>	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	'N' VALUES			20 40 60 80 100	20 40 60 80 100					
281.3														
0.0 280.4	SILT, Some Sand, Trace of Clay, Loose		1	SS	1								Org=0.5%	
0.9	ORGANIC SILT, Trace of Sand, Trace of Clay, Soft		2	TW	PM									0 4 88 8
278.7			3	SS	OW								Org=3.5%	
2.6	Some Sand		4	TW	PM								Org=0.8%	0 19 79 2
			5	SS	4								Org=0.8%	0 19 77 4
			6	TW	PM									
			7	SS	6								Org=0.1%	0 1 79 20
	SILT to LOW PLASTIC SILT, Trace of Sand, Very Loose to Loose		8	TW	PM									
			9	SS	OW									0 3 89 8
			10	TW	PM									
266.7														
14.6			11	SS	7									
			12	SS	4									0 11 88 1
	SILT to SANDY SILT, Loose													
255.7														
25.6	End of Borehole Probable BEDROCK													
	Note: Artesian Condition Encountered at El: 260 Rose to El. 283.5													
	Formerly BH #1 of W.P. 149 - 73 - 01													

## RECORD OF BOREHOLE No 2

1 OF 1

METRIC

W.P. 341 - 87 - 00

LOCATION STA. 500 + 74 O/S 110' RT, CL HWY. 11

ORIGINATED BY A P

DIST 11 HWY 11BOREHOLE TYPE CONE TEST & HOLLOW STEM AUGER

COMPILED BY \_\_\_\_\_

DATUM GEODETIC

DATE 1974 10 30 & 31

**CHECKED BY** \_\_\_\_\_

[illegible]

+3, x5: Numbers refer to Sensitivity

20  
15  $\phi$  5 (%) STRAIN AT FAILURE  
10

# RECORD OF BOREHOLE No 101

1 OF 1

METRIC

W.P. 341 - 87 - 00 LOCATION HWY. 11 AND PROP. INTER. AT ROWANWOOD RD. ORIGINATED BY M.V.  
DIST 11 HWY 11 BOREHOLE TYPE CONE TEST & HOLLOW STEM AUGER COMPILED BY M.V.  
DATUM GEODETIC DATE 1991 09 24 & 25 CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT w <sub>p</sub>	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w <sub>L</sub>	UNIT WEIGHT 7 kN/m <sup>3</sup>	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL	
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	'N' VALUES			SHEAR STRENGTH kPa							WATER CONTENT (%) 20 40 60
								○ UNCONFINED ● QUICK TRIAXIAL	+ FIELD VANE × LAB VANE						
282.0	Ground Surface							20 40 60 80 100							
0.0	Topsoil														
279.8 2.2	SANDY SILT, Trace of Clay, Compact to Loose		1	SS	11									0 28 70 2	
			2	SS	9										
			3	SS	8									0 2 93 5	
			4	SS	6										
			5	SS	9										
			6	SS	4										
			7	SS	2										
			8	SS	13										
			9	SS	13									0 1 81 18	
			10	SS	11										
			11	SS	OW										
268.4			12	SS	OW										
13.6	CLAYEY SILT to SILTY CLAY, Very Soft to Firm		13	SS	6										
266.0			14	SS	27										
16.0	SILT to SANDY SILT, Compact		15	SS	25										
			16	SS	20								0 7 83 10		
			17	SS	17										
			18	SS	9										
			19	SS	27								0 4 (96)		
253.3															
28.7	End of Borehole Probable BEDROCK														

# RECORD OF BOREHOLE No 102

1 OF 2

METRIC

W.P. 341 - 87 - 00

LOCATION HWY. 11 AND PROP. INTER. AT ALLENSVILLE RD.

ORIGINATED BY M.V.

DIST 11 HWY 11

BOREHOLE TYPE CONE TEST & HOLLOW STEM AUGER

COMPILED BY M.V.

DATUM GEODETIC

DATE 1991 09 25 & 26

CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100	PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT W <sub>p</sub> W W <sub>L</sub>	WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m <sup>3</sup>	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	'N' VALUES							
283.0	Ground Surface											
0.0	Topsoil											
281.3	SANDY SILT, Trace of Clay, Loose to Compact		1	SS	4		282					0 34 64 2
1.7			2	SS	14							
			3	SS	7							
			4	SS	6							
	SILT to LOW PLASTIC SILT, Trace of Sand, Loose to Very Loose		5	SS			280					
			6	SS								
			7	SS			278					0 0 80 20
			8	SS	13		276					
	Compact		9	SS	11		274					
271.9			10	SS	3		272					
11.1			11	SS			270					
	CLAYEY SILT to SILTY CLAY, Soft to Very Soft		12	SS	2		268					
			13	SS	12		266					
262.7			14	SS	32		264					0 0 50 50
20.3			15	SS	16		262					0 0 84 16
	SILT to SANDY SILT, Compact to Dense						260					
							258					
							256					0 55 (45)
							254					
252.5												
30.5												

Continued

+3, x5: Numbers refer to  
Sensitivity

20  
15-5 (%) STRAIN AT FAILURE  
10

Continued



# RECORD OF BOREHOLE No 102

2 OF 2

METRIC

W.P. 341 - 87 - 00 LOCATION HWY. 11 AND PROP. INTER. AT ALLENSVILLE RD. ORIGINATED BY M V  
 DIST 11 HWY 11 BOREHOLE TYPE CONE TEST & HOLLOW STEM AUGER COMPILED BY M V  
 DATUM GEODETIC DATE 1991 09 25 & 26 CHECKED BY \_\_\_\_\_

SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W <sub>p</sub>	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W <sub>L</sub>	UNIT WEIGHT 7 KN/m <sup>3</sup>	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE			'N' VALUES	20					
30.5	Continued		16	SS	33								
						252							
						250							
						248							
245.8						246							
37.2	End of Borehole  Probable BEDROCK												

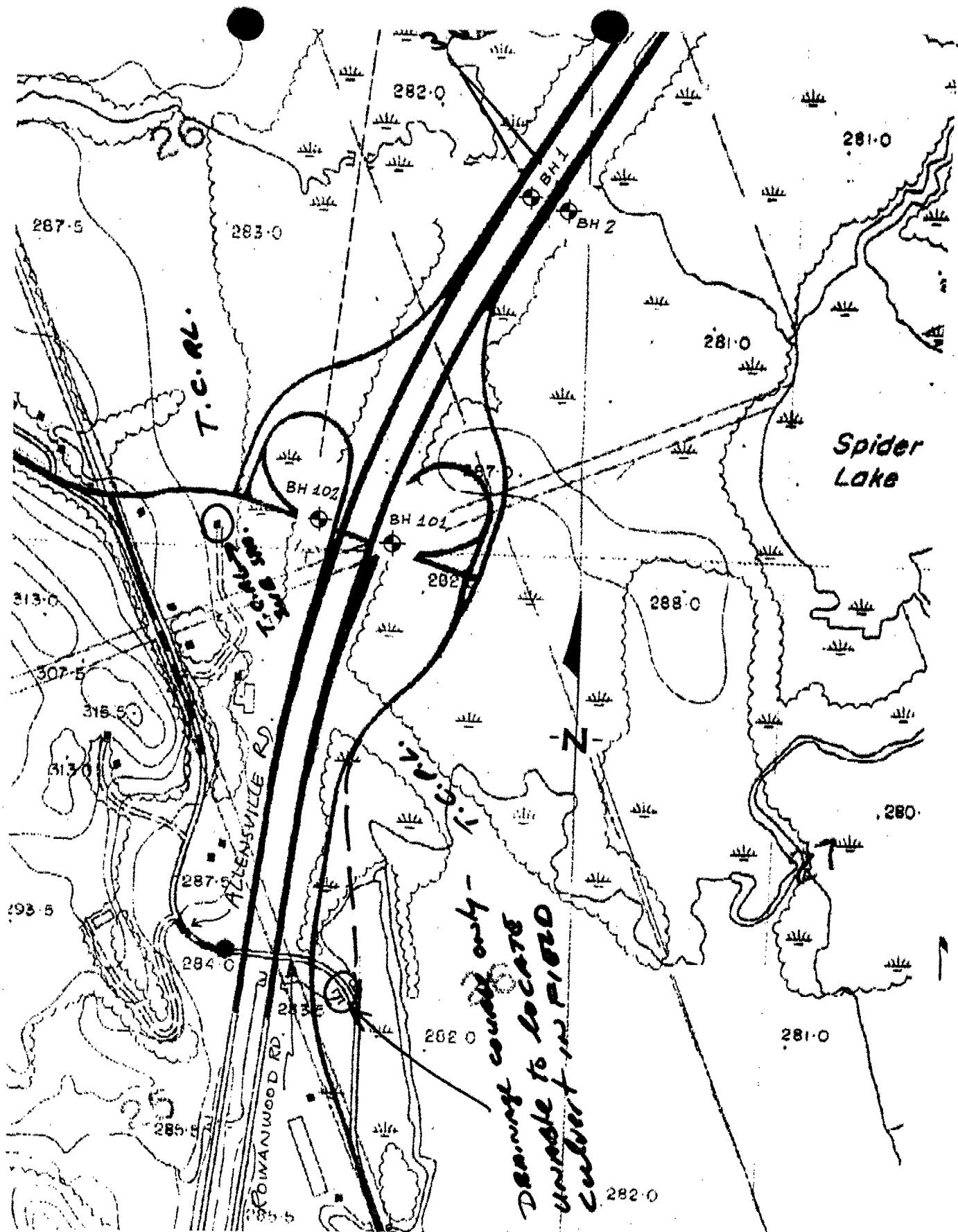
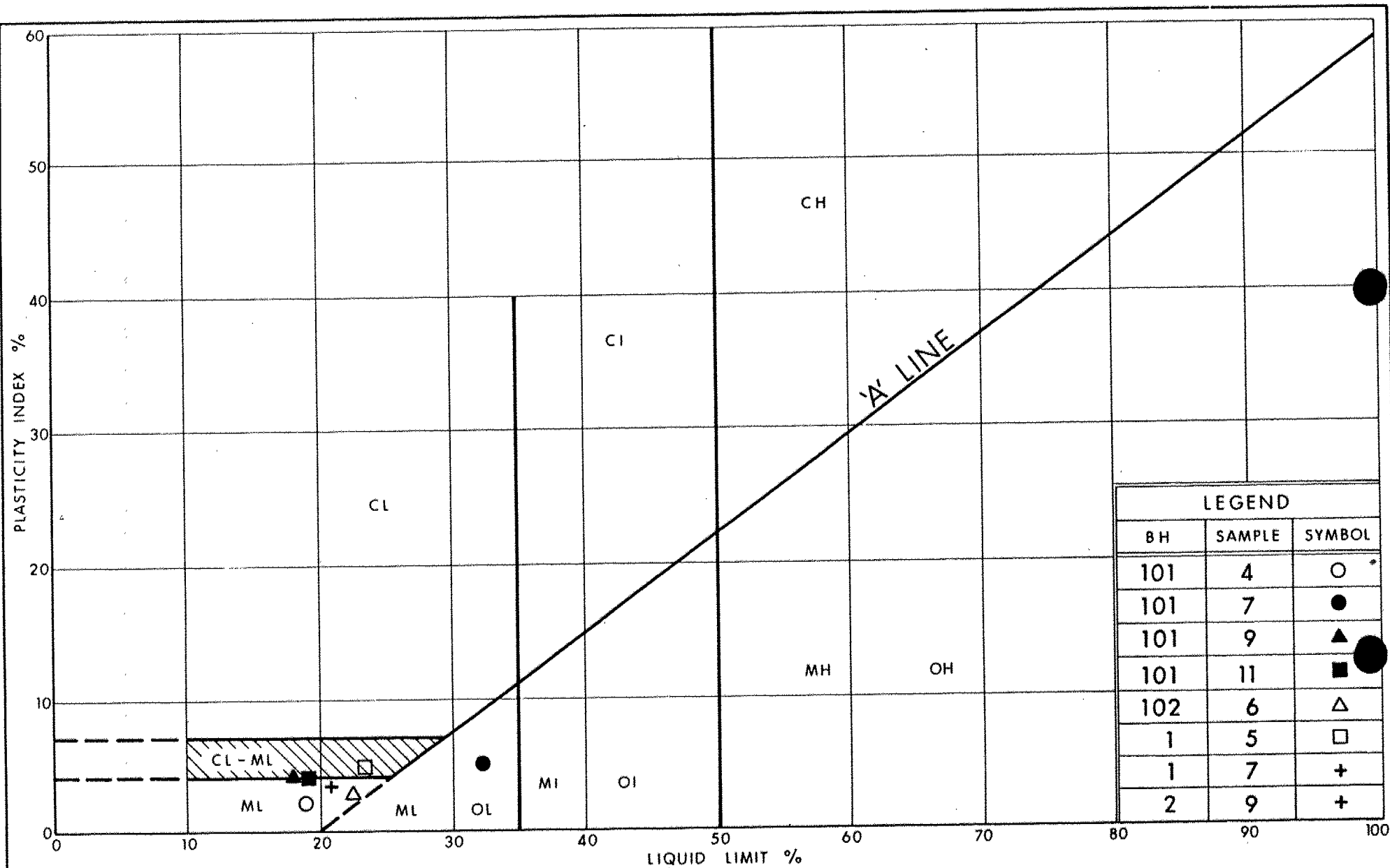


FIG. 1

WP 341-87-00  
 HWY 11, DIST. 11  
 GEOCREs No 31E-107



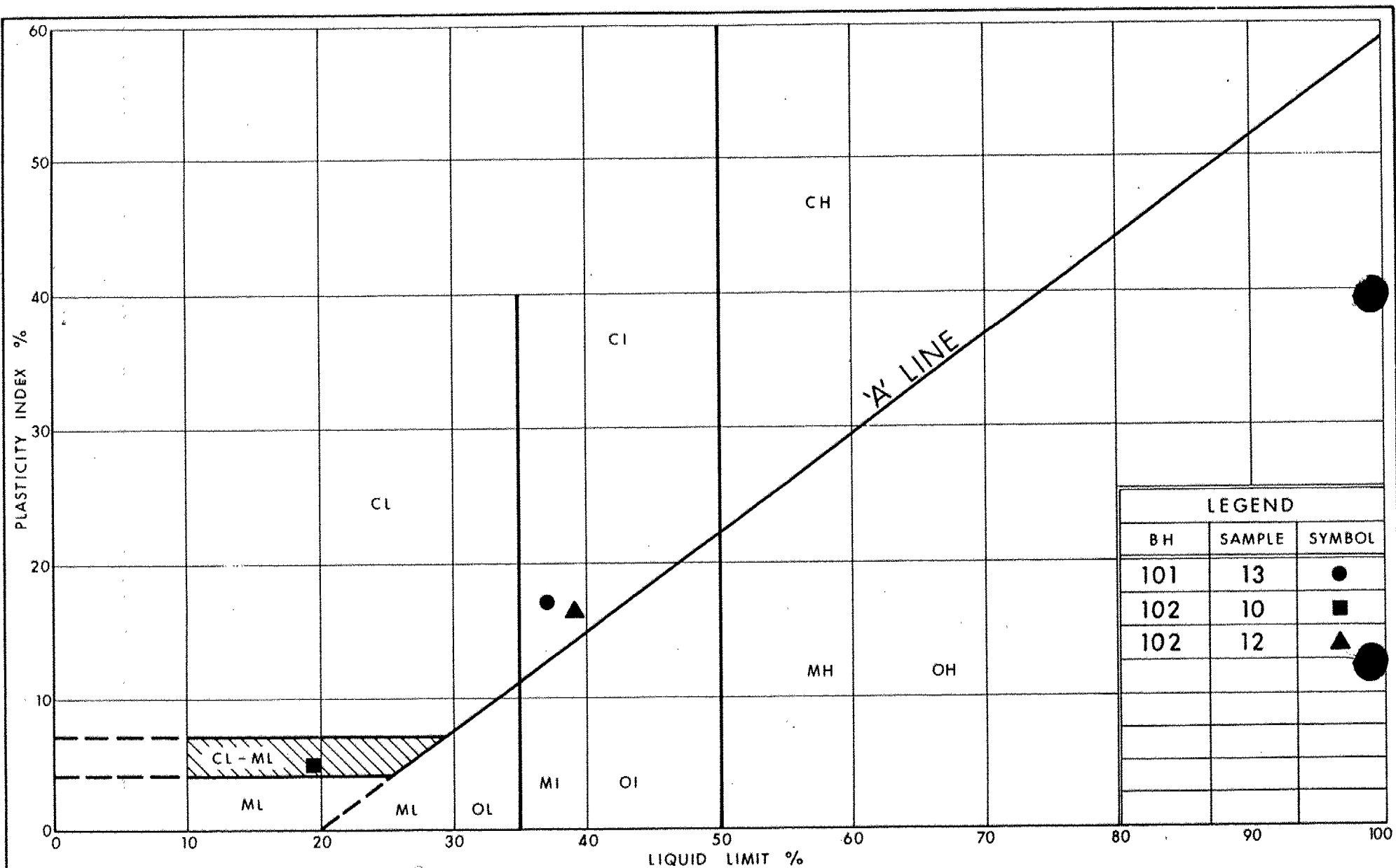
Ontario

Ministry of  
Transportation

# PLASTICITY CHART SILT TO LOW PLASTIC SILT, TRACE OF SAND

FIG No 2

W P 341-87-00



Ministry of  
Transportation

Ontario

# PLASTICITY CHART CLAYEY SILT TO SILTY CLAY

FIG No 3

W P 341-87-00



