

GEOCRES No. 30m12-122

DIST. 6 REGION CENTRAL

W.P. No. 103-69-08

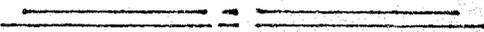
CONT. No. 76-129

W. O. No. _____

STR. SITE No. N/A

HWY. No. 410

LOCATION Culverts from Steeles Avenue to Derry Road



OVERSIZE DRAWINGS TO BE INCLUDED WITH THIS REPORT. 0

REMARKS: (2) Documents to be unfolded before microfilming

30 M 12-122
GEOCRE'S No.

FOUNDATION INVESTIGATION & DESIGN REPORT

W.P. 103-69-08 DIST. 6

HWY. 410 STR. SITE N/A

From Steeles Avenue Southerly
to Derry Road Culverts

DISTRIBUTION

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SAMPLE DISPOSITION NOTICE		
TYPE	DISCARD AFTER	RECOMM. BY
JARS	21st Dec/76	M.A.
TUBES	"	"
ROCK CORES	"	"

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INTRODUCTION

The first stage of Hwy. 410 is scheduled to be built as a new two lane facility from Derry Road to Steeles Avenue and as a single lane widening (3 lane) of existing Heart Lake Road from Steeles Avenue to Hwy. 7.

As part of the new section of roadway, Derry Road to Steeles Avenue, five new culverts and one extension to the existing culvert between Steeles Ave. and Hwy. 7 will be required.

In order to assess the foundation a detailed subsoil investigation was carried out by the Soil Mechanics Section as per request from Regional Structural Planning Office (memorandum dated July 15, 1976, from G.C.E. Burkhardt, Regional Structural Planning Engineer. This report presents all the factual information obtained from this investigation. Included are recommendations pertaining to foundation design at the various structure sites, as well as the stability considerations associated with the approach fills.

This Section already provided the pertinent information verbally to the Regional Structural Planning Section in order to facilitate the planning requirements.

DESCRIPTION OF SITE AND GEOLOGY

The area under investigation is bounded by the following :

South - Hwy. 401

North - Hwy. 7

West - First Line

East - Second Line (Heart Lake Road)

The area is in the cities of Mississauga and Brampton, Municipality of Peel. The ground surface of the general area varies from elevation 590 to 740 feet and is generally sloping towards Lake Ontario. The land is primarily used for farming purposes with the northern section (north of Steeles Avenue) occupied with industrial buildings. The area under investigation is drained by Etobicoke Creek and its tributaries.

The site is located in the physiographic region known as the "Peel Plain". The characteristic deposit in the vicinity of the areas under investigation

is composed of cohesive glacial till whose thickness varies from 11 to 30 feet. The overburden is underlain by shale bedrock. This physiographic region is well drained by Credit, Oakville and Etobicoke Creeks which have cut deep valleys into the overburden. There is therefore no large undrained depression, swamp or bog areas, although in many of the interstream areas drainage is still imperfect.

The shale bedrock is of the Meaford-Dundas formation, Ordovician Period.

FIELD AND LABORATORY WORK

Eleven sampled boreholes, each accompanied by dynamic cone penetration tests, were put down during the course of this field investigation. The borings were advanced by continuous Flight Auger machine (commercially known as C.M.E. 55, H.S.M.V.) adapted for soil sampling purposes.

Samples of the overburden were obtained in a 2" O.D. split-spoon sampler at required depths. The sampler was hammered into the soil according to the specifications of Standard Penetration tests. Bedrock was proven where possible, by obtaining BXL size rock core samples.

Groundwater level observations were carried out during the period of the investigation in the open boreholes. The soil, bedrock and groundwater conditions encountered at the boring locations are presented in the Record of Borehole Sheets. The location and elevations of the various boreholes were provided by personnel from Engineering Surveys, Central Region. The elevations in this report are referred to a Geodetic datum. Boring locations and elevations are shown on Drawing No. 1036908A.

All the samples were subjected to careful visual examination in the field and subsequently in the laboratory. Following this examination, laboratory tests were carried out on selected representative samples to determine the physical properties of the various soil types encountered, namely:

- Natural Moisture Content
- Atterberg Limits
- Grain-size Distribution

The results of this testing are plotted on the Record of Borehole Sheets, all contained in the Appendix of this report.

SUBSOIL AND BEDROCK CONDITIONS

General

The predominant stratum across the site is composed of a heterogeneous mixture of hard clayey silt, sand and gravel (glacial till) which in turn is underlain by shale bedrock.

Glacial Till (Clayey Silt With Sand and Gravel)

This stratum was encountered in all boring locations. It is a heterogeneous mixture of clayey silt, sand and gravel. The thickness of the glacial till deposit was not fully explored at all locations to its maximum depth but it is proven only its full depth of 11.5 feet at B.H. #6 and elsewhere at least to a depth of 30 feet below ground surface at the rest of the boreholes. ~~Grain size distribution curves for the samples of this stratum are plotted on Figure 2 of Appendix 1.~~

Results of Atterberg Limit tests performed on samples recovered in this stratum were plotted on the Record of Borehole Sheets, ~~as well as on the plasticity chart, Figure 1.~~ They are tabulated as below:

	Range
Liquid Limit (W_L) %	15-32
Plastic Limit (W_p) %	9-18
Natural Moisture Content (W) %	6-15

The above results indicate that the cohesive till is inorganic and of low plasticity. The 'N' values generally range from 23 to over 100 blows per foot with the exception of few surficial locations in the upper portion as low as 8 to 17 blows/foot. It is estimated that the consistency of the cohesive glacial till varies from very stiff increasing with depth to hard with the exception of firm to stiff localized zones in the upper portion of the deposit.

Shale Bedrock

Bedrock was found underlying the glacial till stratum. The bedrock was proven only in B.H. 6 by obtaining BXL size rock core samples.

The dominant type of bedrock encountered across the site is a dark grey shale with occasional bands of limestone and/or sandstone.

The bedrock elevation encountered in B.H. 6 was at 682.5.

GROUNDWATER CONDITIONS

Groundwater level observations were carried out during the period of investigation by recording the water level in the open boreholes. The observations are recorded on the Borelog sheets and summarized on Drawing No. 1036908A. The results of the measurements in the open boreholes indicate that the groundwater level ranges from 4.0 to 13.0 feet below existing ground surface, which corresponds to elevations between 593.0 (B.H. 1) and 690.0 (B.H. 6).

DISCUSSION AND RECOMMENDATIONS

General

It is proposed to construct Hwy. 410 in the first stage as a two lane facility between Derry Road and Steeles Avenue and also extend an extra lane for the existing Heart Lake Road from Steeles Avenue to Hwy. 7. A total of five culverts and one culvert extension will be required in this area. The pertinent location, size and invert elevation of these culverts are as follows:

<u>No.</u>	<u>Location</u>	<u>Size</u>	<u>Invert Elev.</u>
1	Sta. 262 + 25	14' x 5' x 120'	603.5
2	Sta. 285 + 45	10' x 5' x 135'	620.5
3	Sta. 328 + 60	5' x 4' x 95'	624.0
4	Sta. 336 + 90	20' x 5' x 115'	625.5
5	Sta. 350 + 10	20' x 6' x 135'	628.00
6	Sta. 433 + 34	18' x 9' x 15'	690.09
	Extension to the existing pipe arch		

At this stage the profile grades at the various structure crossings, as well as other pertinent data, have not been finalized. Preliminary grade lines along Hwy. 410 and the related cross roads are shown on the drawings contained in the report.

Recommendations pertaining to foundation design of the various structures, as well as the stability and settlement considerations for the approaches based on the preliminary data are presented in tabular form.

Hwy. 410--Culvert no. 1 (Sta. 262 + 25)--Ref. B.H. #1(1) and #1(2)

A. Approx. existing ground elev. B. Approx. grade of Hwy. 410	Predominant overburden strata Approx. thickness in feet.	Recommendations		
		Structure	Approaches: Fills Maximum Ht.--12.5 ft	Remarks
A. 605.97 606.85 B. 618.0 C. Proposed invert of culvert elev. 603.5	<u>Glacial Till</u> - 0 to 30.5 ft. - Cohesive - v. stiff to hard <u>Ground Water</u> Elev. 593.0	<u>Foundations:</u> Spread footings founded within the glacial till. Allowable pressure up to 4 t.s.f. (At or below elev. 602.0.)	No stability problems with 2:1 slopes.	No development problems anticipated

Hwy. 410--Culvert no. 1 (Sta. 262 + 25)--Ref: B.H. #1(1) and #1(2)

existing grade	Predominant overburden strata Approx. thickness in feet.	Recommendations		
		Structure	Approaches: Fills Maximum Ht.--12.5 ft	Remarks
of elev.	<u>Glacial Till</u> - 0 to 30.5 ft. - Cohesive - v. stiff to hard <u>Ground Water</u> Elev. 593.0	<u>Foundations:</u> Spread footings founded within the glacial till. Allowable pressure up to 4 t.s.f. (At or below elev. 602.0.)	No stability problems with 2:1 slopes.	No dewatering problems are anticipated.

A. Approx. existing ground elev. B. Approx. grade of Hwy. 410	Predominant overburden strata Approx. thickness in feet.	Recommendations		
		Structure	Approaches: Fills Maximum Ht.--14 ft.	
A. 620.6 622.3 B. 637.0 C. Proposed invert of culvert elev. 620.5	<u>Glacial Till</u> - 0 to 24.5 ft. - Cohesive - stiff to hard <u>Ground Water</u> Elev. 614.5 616.0	<u>Foundations:</u> Spread footings founded within the glacial till. Allowable pressure up to 3 t.s.f. (at or below elev. 618.0)	No stability problems with 2:1 slopes.	No de prob anti the cons

x. existing lev. x. grade of	Predominant overburden strata Approx. thickness in feet.	Recommendations		
		Structure	Approaches: Fills Maximum Ht.--14 ft.	Remarks
6 3 0 posed of culvert 0.5	<u>Glacial Till</u> - 0 to 24.5 ft. - Cohesive - stiff to hard <u>Ground Water</u> Elev. 614.5 616.0	<u>Foundations:</u> Spread footings founded within the glacial till. Allowable pressure up to 3 t.s.f. (at or below elev. 618.0)	No stability problems with 2:1 slopes.	No dewatering problems are anticipated for the culvert construction.

A. Approx. existing ground elev. B. Approx. grade of Hwy. 410	Predominant overburden strata Approx. thickness in feet.	Recommendations		Re
		Structure	Approaches: Fills Maximum Ht.--8.0 ft.	
A. 632.2 630.0 B. 637.0 C. Proposed invert of culvert elev. 624.0	<u>Glacial Till</u> - 0 to 30 ft. - Cohesive - hard <u>Ground Water</u> Elev. 621.5 618.0	<u>Foundations:</u> Spread footings founded within the glacial till. Allowable pressure up to 4 t.s.f. (at or below elev. 625.0)	No stability problems with 2:1 slopes.	No prot ant

x. existing lev.	Predominant overburden strata Approx. thickness in feet.	Recommendations		
		Structure	Approaches: Fills Maximum Ht.--8.0 ft.	Remarks
410 2 .0 0 posed of culvert 24.0	<u>Glacial Till</u> - 0 to 30 ft. - Cohesive - hard <u>Ground Water</u> Elev. 621.5 618.0	<u>Foundations:</u> Spread footings founded within the glacial till. Allowable pressure up to 4 t.s.f. (at or below elev. 625.0)	No stability problems with 2:1 slopes.	No dewatering problems anticipated.

A. Approx. existing ground elev. B. Approx. grade of Hwy. 410	Predominant overburden strata Approx. thickness in feet.	Recommendations		
		Structure	Approaches: Fills Maximum Ht.--10 ft.	Rem
A. 628.4 628.5 B. 638.0 C. Proposed invert of culvert elev. 625.5	<u>Glacial Till</u> - 0 to 30.8 ft. - Cohesive - stiff to hard <u>Ground Water</u> Elev. 622.5 621.5	<u>Foundations:</u> Spread footings founded within the glacial till. Allowable pressure up to 4 t.s.f. (at or below elev. 623.0)	No stability problems with 2:1 slopes.	No dew proble anitic

existing v. grade	Predominant overburden strata Approx. thickness in feet.	Recommendations		
		Structure	Approaches: Fills Maximum Ht.--10 ft.	Remarks
ed culvert 5	<p><u>Glacial Till</u></p> <ul style="list-style-type: none"> - 0 to 30.8 ft. - Cohesive - stiff to hard <p><u>Ground Water</u></p> <p>Elev. 622.5 621.5</p>	<p><u>Foundations:</u> Spread footings founded within the glacial till. Allowable pressure up to 4 t.s.f. (at or below elev. 623.0)</p>	<p>No stability problems with 2:1 slopes.</p>	<p>No dewatering problems are anticipated.</p>

A. Approx. existing ground elev. B. Approx. grade of Hwy. 410	Predominant overburden strata Approx. thickness in feet.	Recommendations		
		Structure	Approaches: Fills Maximum Ht.--10 ft.	Remarks
A. 631.1 631.6 B. 641.5 C. Proposed invert of culvert elev. 628.0	<u>Glacial Till</u> - 0 to 30.0 ft. - Cohesive - stiff to hard <u>Ground Water</u> Elev. 630.0 628.5	<u>Foundations:</u> Spread footings founded within the glacial till. Allowable pressure up to 4 t.s.f. (at or below elev. 626.0)	No stability problems with 2:1 slopes.	No de probl antic

Existing elev. grade 10	Predominant overburden strata Approx. thickness in feet.	Recommendations		
		Structure	Approaches: Fills Maximum Ht.--10 ft.	Remarks
7 6 6 posed of culvert 8.0	<u>Glacial Till</u> - 0 to 30.0 ft. - Cohesive - stiff to hard <u>Ground Water</u> Elev. 630.0 628.5	<u>Foundations:</u> Spread footings founded within the glacial till. Allowable pressure up to 4 t.s.f. (at or below elev. 626.0)	No stability problems with 2:1 slopes.	No dewatering problems are anticipated.

A. Approx. existing ground elev. B. Approx. grade of Hwy. 410	Predominant overburden strata Approx. thickness in feet.	Recommendations		
		Structure	Approaches: Fills Maximum Ht.--6.0 ft.	
A. 694.0 B. 700.0 C. Proposed invert of culvert elev. 690.0	<u>Glacial Till</u> - 0 to 11.5 ft. - Cohesive - hard <u>Shale Bedrock</u> - 11.5 to 16.5 sound shale <u>Ground Water</u> Elev. 690.0	<u>Foundations:</u> Spread footings founded within the glacial till. Allowable pressure up to 4 t.s.f. (at or below elev. 690.0)	No stability problems with 2:1 slopes.	A te stre may duri cons

x. existing lev. x. grade 110	Predominant overburden strata Approx. thickness in feet.	Recommendations		
		Structure	Approaches: Fills Maximum Ht.--6.0 ft.	Remarks
used culvert 0.0	<u>Glacial Till</u> - 0 to 11.5 ft. - Cohesive - hard <u>Shale Bedrock</u> - 11.5 to 16.5 sound shale <u>Ground Water</u> Elev. 690.0	<u>Foundations:</u> Spread footings founded within the glacial till. Allowable pressure up to 4 t.s.f. (at or below elev. 690.0)	No stability problems with 2:1 slopes.	A temporary stream diversion may be required during construction.

Other Considerations

The proposed structures will be of the open type rigid frame concrete culverts.

At this site the culverts will be located within the relatively impervious, cohesive glacial till type subsoil. The structures will be supported on spread footings founded at about 4 feet below the proposed invert elevation. A minimum of 4 feet of earth cover should be provided to the underside of the footings against frost action.

The cohesive glacial till subsoil is relatively impervious in nature. During construction, any seepage water into the excavations can be handled by standard methods, such as pumping from sumps. Backfill for the culvert excavations should comply with currently used Ministry standards.

The culverts will be designed as a rigid frame. Therefore, a coefficient of earth pressure at rest (K_0) of 0.5 should be assumed for the granular backfill behind the wall, when designing the wall sections. In addition, the design should incorporate the full effect of the surcharge located above the current walls. In computing the horizontal sliding resistance of the footings, an adhesion value of 2,000 p.s.f. may be used between the rough concrete surface and the glacial till.

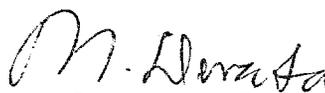
MISCELLANEOUS

The field work performed during the period of July 14, 1976 to July 30, 1976 was supervised by Mr. V. Korlu, Project Engineer, who also prepared this report.

Equipment was owned and operated by Atcost Drilling Company of Toronto.

This report was reviewed by Mr. M. Devata, Supervising Engineer.


V. Korlu, P. Eng.
Project Engineer


M. Devata, P. Eng.
Supervising Engineer



APPENDIX

ENGINEERING SERVICES BRANCH-GEOTECHNICAL OFFICE-SOIL MECHANICS SECTION

RECORD OF BOREHOLE NO 1(1) (Culvert 1)

WP 103-69-08 LOCATION Co-ords. N 15,865,017 E 949,335 ORIGINATED BY VK
 DIST 6 HWY 410 BORING DATE July 28, 1976 COMPILED BY VK
 DATUM Geodetic BOREHOLE TYPE C.M.E. 5.1 (1) M.V.H.S. CHECKED BY OP

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100	LIQUID LIMIT w_L PLASTIC LIMIT w_p WATER CONTENT w w_p — w — w_L WATER CONTENT % 10 20 30	UNIT WEIGHT γ	REMARKS % GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	'N' VALUES					
605.9	Ground Level									
0.0			1	SS	23	600				4 27 52 17
	Brown		2	SS	60					7 23 53 17
	Grey		3	SS	72	6"	100/4"			3 27 56 14
	Het. mix. of clayey silt, sand and gravel (Glacial Till)		4	SS	172	9"				4 37 50 9
			5	SS	100	6"				
			6	SS	100	6"				
	Very Stiff to hard		7	SS	52	580				10 29 51 10
575.4			8	SS	100	6"				
30.5	End of Borehole									

OFFICE REPORT ON SOIL EXPLORATION

20
15 \diamond 5 % STRAIN AT FAILURE
10

ENGINEERING SERVICES BRANCH-GEOTECHNICAL OFFICE-SOIL MECHANICS SECTION

RECORD OF BOREHOLE No 1(2) (Culvert 1)

WP 103-69-08 LOCATION Co-ords. N 15,864,997 E 949,213 ORIGINATED BY VK
 DIST 6 HWY 410 BORING DATE July 27, 1976 COMPILED BY VK
 DATUM Geodetic BOREHOLE TYPE C.M.E. 5.1 (1) M.V.H.S. CHECKED BY [Signature]

SOIL PROFILE			SAMPLES			GROUND WATER	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT W_L PLASTIC LIMIT W_P			UNIT WEIGHT γ	REMARKS			
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	'N' VALUES		20	40	60	80	100	WATER CONTENT W W_p W W_L							
606.8	Ground Level					ELEV													
0.0	Brown Grey Het. mix. of clayey silt, sand and gravel (Glacial Till) Very stiff to hard		1	SS	28	600													1 24 54 21 16 23 44 17 6 29 46 19 11 30 48 11
			2	SS	67														
			3	SS	105														
			4	SS	160														
			5	SS	182														
			6	SS	100														
579.3						590													
27.5	End of Borehole																		

OFFICE REPORT ON SOIL EXPLORATION

ENGINEERING SERVICES BRANCH-GEOTECHNICAL OFFICE - SOIL MECHANICS SECTION

RECORD OF BOREHOLE NO 2 (1) (Culvert 2)

WP 103-69-08 LOCATION Co-ords. N 15,866,682 E 947,725 ORIGINATED BY VK
 DIST 6 HWY 410 BORING DATE July 23, 1976 COMPILED BY VK
 DATUM Geodetic BOREHOLE TYPE C.M.E. 5.1 (1) M.V.H.S. CHECKED BY [Signature]

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT				LIQUID LIMIT w_L PLASTIC LIMIT w_p WATER CONTENT w			UNIT WEIGHT γ	REMARKS	
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	'N' VALUES		20	40	60	100	w_p	w	w_L			
620.6	Ground Level					620										
0.0	Brown Grey Het. mix. of clayey silt, sand and gravel (Glacial Till) Very stiff to hard		1	SS	27	620									2 15 57 26	
			2	SS	132	610										17 33 40 10
			3	SS	119	610										13 29 45 13
			4	SS	100	6"										
			5	SS	100	6"										
			6	SS	100	6"										
			7	SS	100	6"										
596.1						600										
24.5	End of borehole															

OFFICE REPORT ON SOIL EXPLORATION

ENGINEERING SERVICES BRANCH-GEOTECHNICAL OFFICE-SOIL MECHANICS SECTION

RECORD OF BOREHOLE NO 2 (2) (Culvert 2)

WP 103-69-08 LOCATION Co-ords. N 15,866,670 E 947,592 ORIGINATED BY VK
 DIST 6 HWY 410 BORING DATE July 23, 1976 COMPILED BY VK
 DATUM Geodetic BOREHOLE TYPE C.M.E. 5.1 (1) M.V.H.S. CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100	LIQUID LIMIT w_L PLASTIC LIMIT w_p WATER CONTENT w $w_p \quad w \quad w_L$	UNIT WEIGHT γ P.C.F.	REMARKS % GR SA SI CL	
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	'N' VALUES						SHEAR STRENGTH ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE
622.3	Ground Level										
0.0	Brown Grey Het. mix. of clayey silt, sand and gravel (Glacial Till)					620			Org. 0.53% 0.72%	10 32 41 17 32 17 37 14 32 5 46 17 49 13 31 7	
			1	SS	11						
			2	SS	43						100/3"
			3	SS	64						
			4	SS	144						610
603.5	Stiff to hard		5	SS	100/3"						
18.8	End of Borehole										

OFFICE REPORT ON SOIL EXPLORATION

ENGINEERING SERVICES BRANCH-GEOTECHNICAL OFFICE-SOIL MECHANICS SECTION

RECORD OF BOREHOLE NO 3(1) (Culvert 3)

WP 103-69-08

LOCATION Co-ords. N 15,870,340 E 945,576

ORIGINATED BY VK

DIST 6 HWY 410

BORING DATE July 21, 1976

COMPILED BY VK

DATUM Geodetic

BOREHOLE TYPE C.M.E. 5.1 (1) M.V.H.S.

CHECKED BY *[Signature]*

SOIL PROFILE		STRAT. PLOT	SAMPLES			GROUND WATER	DYNAMIC CONE PENETRATION RESISTANCE PLOT				LIQUID LIMIT W_L	PLASTIC LIMIT W_P	WATER CONTENT w	UNIT WEIGHT γ	REMARKS
ELEV DEPTH	DESCRIPTION		NUMBER	TYPE	'N' VALUES		20	40	60	80					
632.2	Ground Level														
0.0						ELEV									
			1	SS	34	630									5 18 47 30
			2	SS	70										5 28 48 19
	Brown		3	SS	100	6"									13 34 52 1
	Grey		4	SS	115										
	Het. mix. of clayey silt, sand and gravel (Glacial Till)		5	SS	115	620									
			6	SS	75	6"									
	Hard		7	SS	70	6"									
602.1			8	SS	80	1"									4 23 47 26
30.1	End of Borehole														

OFFICE REPORT ON SOIL EXPLORATION

ENGINEERING SERVICES BRANCH-GEOTECHNICAL OFFICE-SOIL MECHANICS SECTION

RECORD OF BOREHOLE NO 3(2) (Culvert 3)

WP 103-69-08

LOCATION Co-ords. N 15,870,376; E 945,660

ORIGINATED BY VK

DIST 6 HWY 410

BORING DATE July 22, 1976

COMPILED BY VK

DATUM Geodetic

BOREHOLE TYPE C.E. 5.1 (1) M.V.H.S.

CHECKED BY *[Signature]*

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT				LIQUID LIMIT W_L PLASTIC LIMIT W_P WATER CONTENT w			UNIT WEIGHT γ	REMARKS		
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	'N' VALUES		20	40	60	80	100	W_p	w			W_L	
630.0	Ground Level																
0.0	Brown Grey Het. mixture of clayey silt, sand and gravel (Glacial Till) Hard		1	SS	43										8 22 49 21		
			2	SS	129												25 32 29 14
			3	SS	50		620										9 33 56 2
			4	SS	120												
			5	SS	137/6"												
			6	SS	100/6"		610										
			7	SS	160												12 23 46 19
603.5	End of Borehole																
26.5																	

OFFICE REPORT ON SOIL EXPLORATION

RECORD OF BOREHOLE NO 4 (1) (Culvert 4)

WP 103-69-08

LOCATION Co-ords. N 15,871,122; E 945,418

ORIGINATED BY VK

DIST 6 HWY 410

BORING DATE July 20, 1976

COMPILED BY VK

DATUM Geodetic

BOREHOLE TYPE C.M.E. 5.1 (1) M.V.H.S.

CHECKED BY *CP*

SOIL PROFILE		SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT				LIQUID LIMIT W_L PLASTIC LIMIT W_P WATER CONTENT w			UNIT WEIGHT γ P.C.F.	REMARKS % GR SA SI CL		
ELEV DEPTH	DESCRIPTION	NUMBER	TYPE	'N' VALUES		20	40	60	80	100	W_p	w			W_L	
628.4	Ground Level															
0.0	Brown Grey Het. mix. of clayey silt, sand and gravel (Glacial Till) Very Stiff to hard	1	SS	17										Org.	1 21 55 23	
		2	SS	67											1.92%	0 26 57 17
		3	SS	110	6"											15 30 45 10
		4	SS	145												15 32 43 10
		5	SS	100												
		6	SS	105	8"											
		7	SS	80	3"											
597.6			8	SS	100	3"										18 36 36 10
30.8	End of Borehole															

OFFICE REPORT ON SOIL EXPLORATION

ENGINEERING SERVICES BRANCH-GEOTECHNICAL OFFICE-SOIL MECHANICS SECTION

RECORD OF BOREHOLE NO 4 (2) (Culvert 4)

WP 103-69-08 LOCATION Co-ords. N 15,871,165; E 945,314 ORIGINATED BY VK
 DIST 6 HWY 410 BORING DATE July 20, 1976 COMPILED BY VK
 DATUM Geodetic BOREHOLE TYPE C.M.E. 5.1 (1) M.V.H.S. CHECKED BY [Signature]

SOIL PROFILE		SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT w_L PLASTIC LIMIT w_p WATER CONTENT w			UNIT WEIGHT γ	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE		'N' VALUES	20	40	60	80	100	w_p	w		
628.5	Ground Level														
0.0			1	SS	12										4 21 50 25
	Brown Grey		2	SS	35										11 23 48 18
			3	SS	50/2"										7 33 51 9
	Het. mixture of clayey silt, sand and gravel (Glacial Till)		4	SS	110/9"										17 30 43 10
			5	SS	66										17 34 44 10
			6	SS	100/1"										
			7	SS	85										
597.8	Stiff to hard		8	SS	100/2"										17 18 47 18
30.7	End of Borehole														

OFFICE REPORT ON SOIL EXPLORATION

RECORD OF BOREHOLE NO 5(1) (Culvert 5)

WP 103-69-08

LOCATION Co-ords. N 15,872,360; E 944,915

ORIGINATED BY VK

DIST 6 HWY 410

BORING DATE July 15, 1976

COMPILED BY VK

DATUM Geodetic

BOREHOLE TYPE C.M.E. 5.1 (1) M.V.H.S.

CHECKED BY *[Signature]*

SOIL PROFILE		SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT				LIQUID LIMIT w_L PLASTIC LIMIT w_p			UNIT WEIGHT γ	REMARKS		
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE		VALUES	20	40	60	80	100	WATER CONTENT w				
						SHEAR STRENGTH				WATER CONTENT %						
						○ UNCONFINED + FIELD VANE				w_p — w — w_L						
						● QUICK TRIAXIAL × LAB VANE				10 20 30			P.C.F.	% GR SA SI CL		
631.1	Ground Level															
0.0	Het. mixture of clayey silt, sand and gravel (Glacial Till)	<i>[Strat. Plot]</i>	1	SS	8									Org.	0 27 53 20	
			2	SS	100/5"										0.23%	9 26 40 25
			3	SS	100/5"											3 29 47 21
			4	SS	85/5"											
			5	SS	120/5"											46 26 23 5
604.2			Stiff to hard		6	SS	50/5"									
26.9	End of Borehole															

OFFICE REPORT ON SOIL EXPLORATION

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

RECORD OF BOREHOLE NO 5(2) (Culvert 5)

WP 103-69-08 LOCATION Co-ords. N 15,872,368 E 944,803 ORIGINATED BY VK
 DIST 6 HWY 410 BORING DATE July 15, 1976 COMPILED BY VK
 DATUM Geodetic BOREHOLE TYPE C.M.E. 5.1 (1) M.V.H.S. CHECKED BY *JP*

SOIL PROFILE		SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT				LIQUID LIMIT w_L PLASTIC LIMIT w_p WATER CONTENT w			UNIT WEIGHT γ P.C.F.	REMARKS % GR SA SI CL	
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE		'N' VALUES	20	40	60	80	100	w_p			w
631.6	Ground Level														
0.0	Het. mixture of clayey silt, sand & gravel (Glacial Till) Brown Grey		1	SS	20	630									
			2	SS	97										
			3	SS	85	6"									
			4	SS	80	6"	620								
			5	SS	75	6"									
			6	SS	89		610								
			7	SS	110	3"									
			8	SS	120	6"									
601.6	Very stiff to hard														
30.0	End of Borehole														

OFFICE REPORT ON SOIL EXPLORATION

ENGINEERING SERVICES BRANCH-GEOTECHNICAL OFFICE-SOIL MECHANICS SECTION

RECORD OF BOREHOLE NO 6(1) (Culvert 6)

WP 103-69-08 LOCATION Co-ords. N 15,878,285; E 939,065 ORIGINATED BY VK
 DIST 6 HWY 410 BORING DATE July 14, 1976 COMPILED BY VK
 DATUM Geodetic BOREHOLE TYPE C.M.E. 5.1 (1) M.V.H.S.-Core with BXL Bit CHECKED BY

SOIL PROFILE		SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT	LIQUID LIMIT w_L	PLASTIC LIMIT w_p	UNIT WEIGHT γ	REMARKS	
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE		'N' VALUES	20 40 60 80 100	WATER CONTENT w			WATER CONTENT %
694.0	Ground Level										
0.0	Brown Grey Het. mix. of clayey silt, sand & gravel (glacial till) hard		1	SS	51		○	-----	○	11 39 42 8	
			2	SS	60						21 14 43 22
682.5			3	SS	100						13 7 60 20
11.5	Bedrock		4	BXL RC	100% REC	680					
678.5	Sound Shale										
16.5	End of Borehole										

OFFICE REPORT ON SOIL EXPLORATION

FF-A-24 3 Rev. or 73

ABBREVIATIONS & SYMBOLS USED IN THIS REPORT

PENETRATION RESISTANCE

N-STANDARD PENETRATION RESISTANCE : - THE NUMBER OF BLOWS REQUIRED TO ADVANCE A STANDARD SPLIT SPOON SAMPLER 12 INCHES INTO THE SUBSOIL, DRIVEN BY MEANS OF A 140 POUND HAMMER FALLING FREELY A DISTANCE OF 30 INCHES.

DYNAMIC PENETRATION RESISTANCE : - THE NUMBER OF BLOWS REQUIRED TO ADVANCE A 2 INCH, 60 DEGREE CONE, FITTED TO THE END OF DRILL RODS, 12 INCHES INTO THE SUBSOIL, THE DRIVING ENERGY BEING 350 FOOT POUNDS PER BLOW.

DESCRIPTION OF SOIL

THE CONSISTENCY OF COHESIVE SOILS AND THE RELATIVE DENSITY OR DENSENESS OF COHESIONLESS SOILS ARE DESCRIBED IN THE FOLLOWING TERMS :-

<u>CONSISTENCY</u>	<u>c LB/SQ FT</u>	<u>DENSENESS</u>	<u>N BLOWS / FT.</u>
VERY SOFT	0 - 250	VERY LOOSE	0 - 4
SOFT	250 - 500	LOOSE	4 - 10
FIRM	500 - 1000	COMPACT	10 - 30
STIFF	1000 - 2000	DENSE	30 - 50
VERY STIFF	2000 - 4000	VERY DENSE	> 50
HARD	> 4000		

TERMS TO BE USED IN DESCRIBING SOILS:-

TRACE < 10% , SOME 10-25% , WITH 25-40% , > 40% SILTY, SANDY, GRAVELLY, CLAYEY ETC

TYPE OF SAMPLE

S.S	SPLIT SPOON	T.W	THINWALL OPEN
W.S	WASHED SAMPLE	T.P	THINWALL PISTON
S.T	SLOTTED TUBE SAMPLE	O.S	OESTERBERG SAMPLE
A.S	AUGER SAMPLE	F.S	FOIL SAMPLE
C.S	CHUNK SAMPLE	R.C	ROCK CORE

P.H. SAMPLE ADVANCED HYDRAULICALLY

P.M. SAMPLE ADVANCED MANUALLY

SOIL TESTS

U	UNCONFINED COMPRESSION	L.V	LABORATORY VANE
UU	UNCONSOLIDATED UNDRAINED TRIAXIAL	F.V	FIELD VANE
CIU	CONSOLIDATED ISOTROPIC UNDRAINED TRIAXIAL	C	CONSOLIDATION
CID	" " DRAINED "	S	SENSITIVITY
CAU	" ANISOTROPIC UNDRAINED "		
CAD	" " DRAINED "		

FF-A-24(b) (Rev. 12-73)

ABBREVIATIONS & SYMBOLS USED IN THIS REPORT

SOIL PROPERTIES

γ	UNIT WEIGHT OF SOIL (BULK DENSITY)
γ_s	UNIT WEIGHT OF SOLID PARTICLES
γ_w	UNIT WEIGHT OF WATER
γ_d	UNIT DRY WEIGHT OF SOIL (DRY DENSITY)
γ'	UNIT WEIGHT OF SUBMERGED SOIL
G	SPECIFIC GRAVITY OF SOLID PARTICLES $G = \frac{\gamma_s}{\gamma_w}$
e	VOID RATIO
n	POROSITY
w	WATER CONTENT
S_r	DEGREE OF SATURATION
w_L	LIQUID LIMIT
w_p	PLASTIC LIMIT
I_p	PLASTICITY INDEX
w_s	SHRINKAGE LIMIT
I_L	LIQUIDITY INDEX = $\frac{w - w_p}{I_p}$
I_c	CONSISTENCY INDEX = $\frac{w_L - w}{I_p}$
e_{max}	VOID RATIO IN LOOSEST STATE
e_{min}	VOID RATIO IN DENSEST STATE
I_D	DENSITY INDEX = $\frac{e_{max} - e}{e_{max} - e_{min}}$
	RELATIVE DENSITY D_r IS ALSO USED
h	HYDRAULIC HEAD OR POTENTIAL
q	RATE OF DISCHARGE
v	VELOCITY OF FLOW
i	HYDRAULIC GRADIENT
k	COEFFICIENT OF PERMEABILITY
j	SEEPAGE FORCE PER UNIT VOLUME
m_v	COEFFICIENT OF VOLUME CHANGE = $\frac{-\Delta e}{(1+e)\Delta\sigma}$
c_v	COEFFICIENT OF CONSOLIDATION
C_c	COMPRESSION INDEX = $\frac{\Delta e}{\Delta \log_{10} \sigma}$
T_v	TIME FACTOR = $\frac{c_v t}{d^2}$ (d, DRAINAGE PATH)
U	DEGREE OF CONSOLIDATION
τ_f	SHEAR STRENGTH
c'	EFFECTIVE COHESION INTERCEPT
ϕ'	EFFECTIVE ANGLE OF SHEARING RESISTANCE, OR FRICTION
c_u	APPARENT COHESION
ϕ_u	APPARENT ANGLE OF SHEARING RESISTANCE, OR FRICTION
μ	COEFFICIENT OF FRICTION
S_p	SENSITIVITY

GENERAL

π	= 3.1416
e	BASE OF NATURAL LOGARITHMS 2.7183
$\log_e \sigma$ OR $\ln \sigma$	NATURAL LOGARITHM OF σ
$\log_{10} \sigma$ OR $\log \sigma$	LOGARITHM OF σ TO BASE 10
t	TIME
g	ACCELERATION DUE TO GRAVITY
V	VOLUME
W	WEIGHT
M	MOMENT
F	FACTOR OF SAFETY

STRESS AND STRAIN

u'	PORE PRESSURE
σ	NORMAL STRESS
σ'	NORMAL EFFECTIVE STRESS ($\bar{\sigma}$ IS ALSO USED)
τ	SHEAR STRESS
ϵ	LINEAR STRAIN
γ	SHEAR STRAIN
ν	POISSON'S RATIO (μ IS ALSO USED)
E	MODULUS OF LINEAR DEFORMATION (YOUNG'S MODULUS)
G	MODULUS OF SHEAR DEFORMATION
K	MODULUS OF COMPRESSIBILITY
η	COEFFICIENT OF VISCOSITY

EARTH PRESSURE

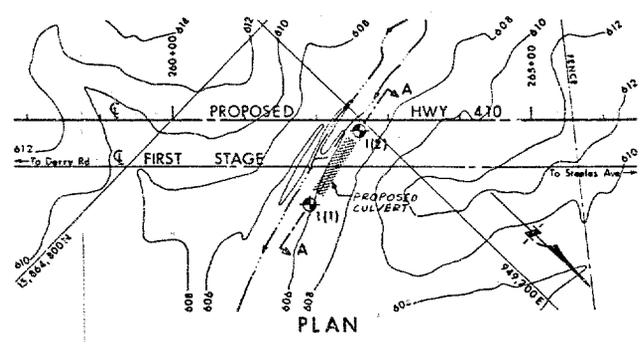
d	DISTANCE FROM TOP OF WALL TO POINT OF APPLICATION OF PRESSURE
δ	ANGLE OF WALL FRICTION
K	DIMENSIONLESS COEFFICIENT TO BE USED WITH VARIOUS SUFFIXES IN EXPRESSIONS REFERRING TO NORMAL STRESS ON WALLS
K_0	COEFFICIENT OF EARTH PRESSURE AT REST

FOUNDATIONS

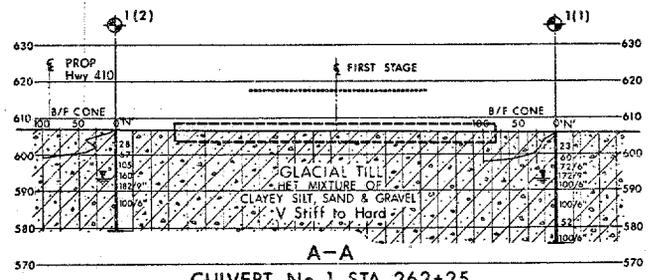
B	BREADTH OF FOUNDATION
L	LENGTH OF FOUNDATION
D	DEPTH OF FOUNDATION BENEATH GROUND
N	DIMENSIONLESS COEFFICIENT USED WITH A SUFFIX APPLYING TO SPECIFIC GRAVITY, DEPTH AND COHESION ETC. IN THE FORMULA FOR BEARING CAPACITY
k_s	MODULUS OF SUBGRADE REACTION

SLOPES

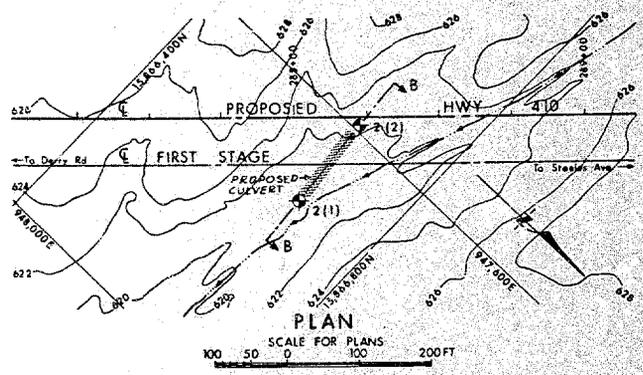
H	VERTICAL HEIGHT OF SLOPE
D	DEPTH BELOW TOE OF SLOPE TO HARD STRATUM
β	ANGLE OF SLOPE TO HORIZONTAL



PLAN

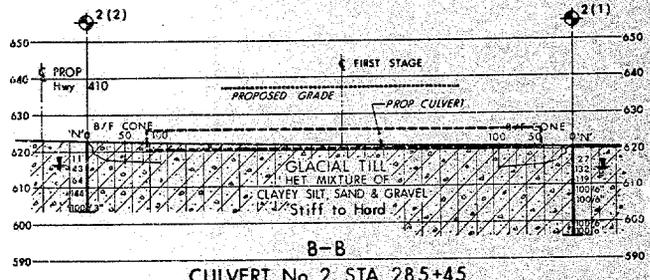


A-A
CULVERT No 1 STA 262+25



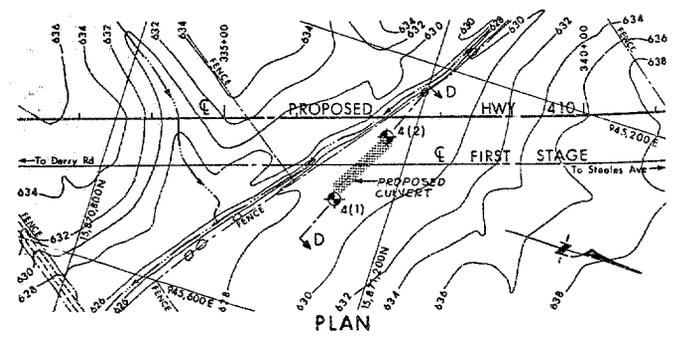
PLAN

SCALE FOR PLANS
100 50 0 100 200FT

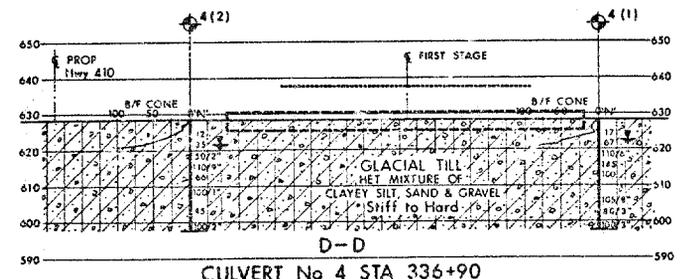


B-B
CULVERT No 2 STA 285+45

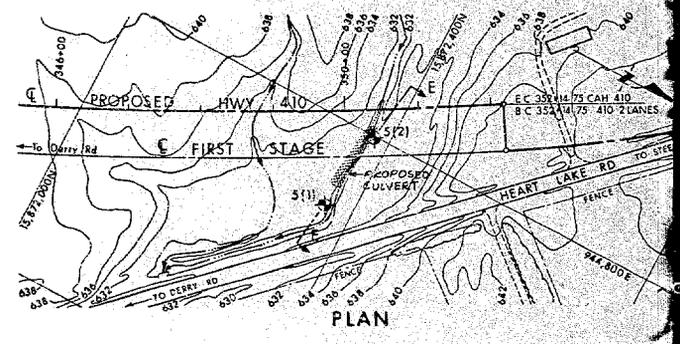
SCALE FOR SECTIONS
20 10 0 20 40FT



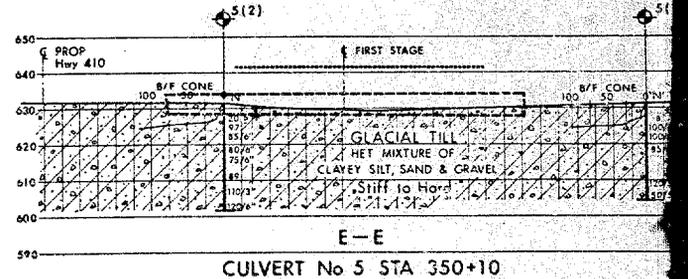
PLAN



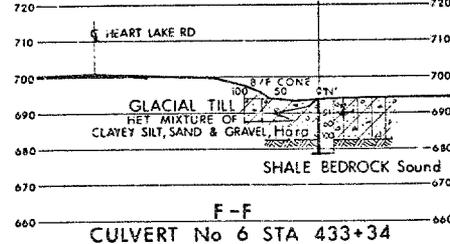
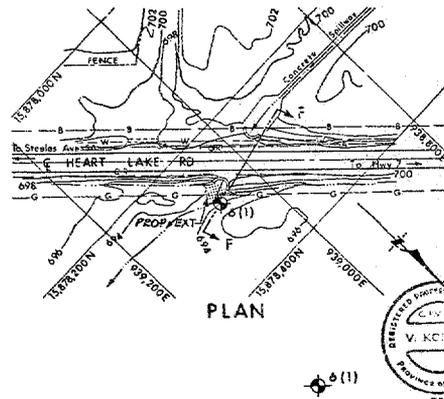
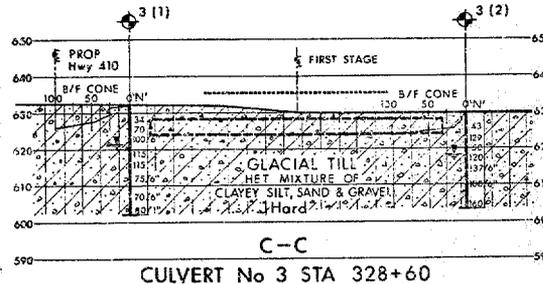
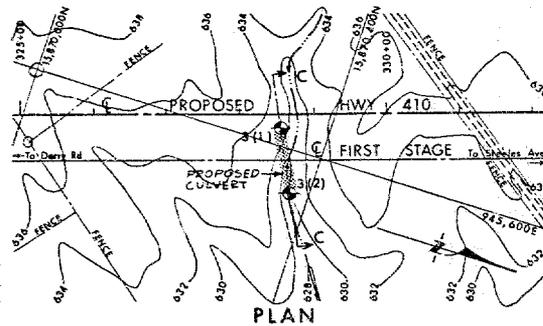
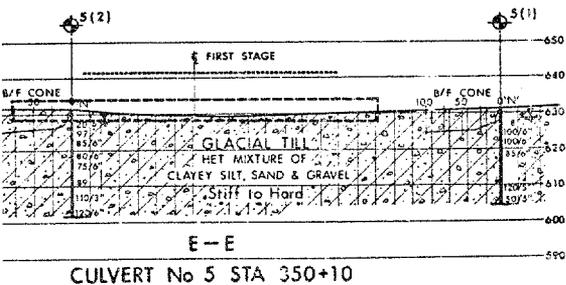
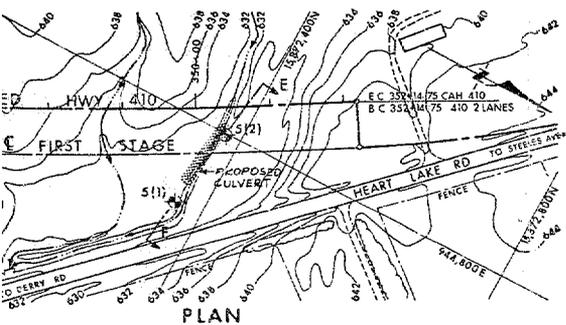
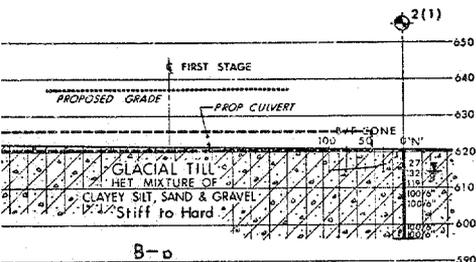
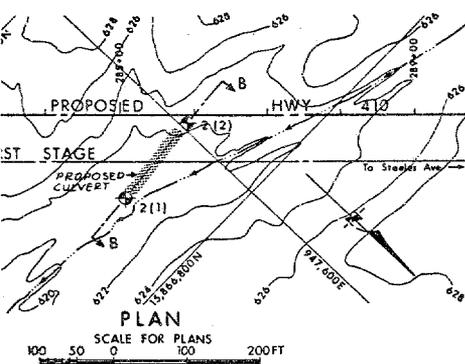
D-D
CULVERT No 4 STA 336+90



PLAN



E-E
CULVERT No 5 STA 350+10

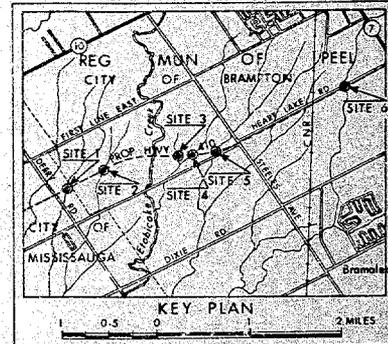


CONT No
WP No 103-69-08

CULVERTS 1, 2, 3, 4, 5 & 6
[From DERRY ROAD to HWY 7]
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)
- W.L. at time of investigation July 1976

No	ELEVATION	CO-ORDINATES	
		NORTH	EAST
1(1)	605.9	15,865,017	949,335
1(2)	606.8	15,864,997	949,213
2(1)	620.6	15,866,682	947,725
2(2)	622.3	15,866,670	947,592
3(1)	632.2	15,870,340	945,576
3(2)	630.0	15,870,376	945,660
4(1)	628.4	15,871,122	945,418
4(2)	628.5	15,871,165	945,314
5(1)	631.1	15,872,360	944,915
5(2)	631.6	15,872,363	944,803
6(1)	694.0	15,878,285	939,063

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 PROP 410 DIST 6
SURVEY BY CHECKED DATE Nov 8, 1976 SITE
DRAWN BY CHECKED DATE 12-2-1976 DWG 1036908-A

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

Tel: (416) 248-3232

Date: July 13, 1976

Atcost Drilling Inc.
2160 Highway 7
CONCORD, Ontario
L4K 1B6

Dear Sirs:

This letter confirms our request by telephone of July 13, 1976 for the supply of a C.M.E. 5.1 (i) Auger machine together with all necessary equipment, as per your Tender for Supply Contract S-76-1002 at Brampton on July 14, 1976.

Mobilization will be from Previous job W.P. 157-75-01.

Our Project Number is 103-69-08.

Yours truly,

M. Devata
Supervising Engineer

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

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

Tel: (416) 248-3282

July 14, 1976

F.E. Johnston Drilling Co. Ltd.
377 Munster Avenue
Toronto, Ontario
M8Z 3C8

Dear Sirs:

This letter confirms our request by telephone of July 14, 1976 for the supply of a C.M.E. 5.1 (i) as per your Tender for Supply Contract S-76-1002 for our Project 103-69-08 at Brampton, Ontario, starting in a couple of days, at which time we were advised by Mr. F. Lusk that you were not able to comply with our request.

Yours truly,

M. Devata
Supervising Engineer

cc: Files
Record Services

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

Te1: (416) 248-3282

July 14, 1976

Geocon Limited
14 Haas Road
Rexdale, Ontario
M9W 3A2

Dear Sirs:

This letter confirms our request by telephone of July 14, 1976 for the supply of a C.M.E. 5.1 (i) as per your Tender for Supply Contract S-76-1002 for our Project 103-69-03 at Brampton, Ontario, starting on or about July 15, 1976, at which time we were advised by Mr. German that you were not able to comply with our request.

Yours truly,

M. Devata
Supervising Engineer

cc: Files
Record Services



Memorandum

To: Mr. C. Mirza,
Head, Soils Mechanics Section,
West Building.

From: G. C. E. Burkhardt,
Structural Planning Office,
3501 Dufferin Street.

Attention:

Date: July 15, 1976.

Our File Ref.

In Reply to

Subject: Highway 410 - Culverts,
From Derry Road to Highway 7,
W.P. 103-69-08, Site 24-
District 6.

The first stage of Highway 410 is scheduled to be built as a new two lane facility from Derry Road to Steeles Avenue and as a single lane widening (3 lane) of existing Heart Lake Road from Steeles Avenue to Highway 7.

As part of the new section of roadway, Derry Road to Steeles Avenue, five (5) culverts will be required. the sizes and locations as proposed at this time are as follows:

- 1) Sta. 262 + 25 - 14' x 5'
- 2) Sta. 285 + 45 - 10' x 5'
- 3) Sta. 328 + 60 - 5' x 4'
- 4) Sta. 336 + 90 - 20' x 5'
- 5) Sta. 350 + 10 - 20' x 6'

Culvert #5 located at Sta. 350 + 10 which presently is a 20' x 6' may possibly have to be increased to a 24' x 7' structure due to requirements of other authorities.

In addition to the five new culverts mentioned above, it will be necessary to extend an existing 18' x 9' pipe arch under Heart Lake Road to provide one additional lane on the east side of the present roadway. The extension of this 18' x 9' pipe arch, at approximately Sta. 430 + 70, will be a special design culvert.

Preliminary details of the proposed culverts are indicated on the plan and profile which was left with Mr. V. Korlu, of your office, during the discussion of this project on July 13, 1976. A copy of this plan was also forwarded to Engineering Surveys.

Could you please prepare a Foundation Investigation Report of sufficient scope to facilitate the design of the proposed culverts. The current schedule calls for a complete Foundation Investigation by September 8, 1976.



*→ MID.
Please take appropriate
action.*

Due to very tight time constraints the actual design of the culverts will commence before this scheduled date for completion of your report. Therefore, if any foundation problems are encountered which may effect the utilization of the standard culvert design for the culverts on this project, we would appreciate being notified as early as possible.

Should additional clarification and/or details be required please do not hesitate to call this office.



K. A. Jeffries,
STRUCTURAL PLANNING SUPERVISOR,
for:
G. C. E. Burkhardt,
REG. STRUCTURAL PLANNING ENG.

RAJ:lm

c.c. Z. Byblow
D. Gunter
J. Anderson
R. Fitzgibbon
W. Roters

Mr. W. Roters
Planning & Design
Central Region

Mr. N. Sen

Structural Planning
Central Region
3501 Dufferin St.,

August 20, 1976

Re: Hwy. 410 Derry Road to Hwy.7
16' x 9' C.S.P. at Sta. 430 & 70
W.P. 103-69-08, Site 24-228 Dist. 6



I carried out an inspection of the above culvert on August 17, 1976.

This culvert has been in place for five years and was installed with a fill cover of 6"± rather than the 3 ft. minimum recommended by the supplier.

The culvert is in good condition and does not appear to have suffered any damage or permanent deformation due to the insufficient fill cover.

At the present time, the top plates of the culvert are exhibiting local elastic buckling under truck wheel loads, and the magnitude of the deformation is heightened by the impact caused by the local depression in the road surface.

If the present situation is allowed to continue there is a possibility that either (or a combination) of the two following results would occur.

- (1) Under the present loading, fatigue cracks may eventually occur in the top plates causing a reduction in stiffness of the plates and subsequent permanent local deformations.
- (2) If the culvert is subjected to larger vertical forces either by heavier wheel loads or by an increase in the impact effect in elastic buckling or yielding of the top plates could occur, again causing permanent local deformations.

If permanent deformations are induced in the top plates of the culvert, the impact effect would be increased considerably and it is possible that this could result in a progressive failure of the full length of the culvert.

At the present time it is planned to widen this culvert in 1977 and I am confident that if the required 3 ft. of fill is placed on the culvert then it will perform satisfactorily for the normal service life of this type of installation.

Nothing to do with us.

Wak

I would recommend that:

- (1) The depressions in the road surface be filled in immediately to provide a smooth surface.
- (2) The required 3 ft. of fill be placed on the culvert as soon as possible and that frequent inspections be made of the culvert until the time that this fill is placed.

C. F. Farrell,
Senior Structural Planning Eng.

For: G.C.E. Burkhardt,
Reg. Structural Planning Eng.

CFF:ml

cc: M. Devata ✓
R. Fitzgibbon
K. KLEINSTEIBER



Memorandum

To: Mr. V. Korlu,
Soil Mechanics Section
Central Region,
3501 Dufferin Street
Toronto, Ontario

From: Insurance & Claims Section
1201 Wilson Avenue
Downsview, Ontario

Attention:

Date: August 24, 1976

Our File Ref. 98-76-GL

In Reply to

Subject: Form SB-RW-57

The Property Damage Report submitted by you to this office dated July 25, 1976, with reference to crop damage occasioned on July 20, 1976, on Heart Lake Road, Highway #410, when Bombardier mounted drilling equipment trampled crop during the process of reaching the borehole locations. Damaged crops, wheat, barley and oats - total damage, 4,100 sq. ft.

In order that we may notify our insurers we need a more detailed and comprehensive report concerning the above mentioned incident.

Please submit at your earliest possible convenience so that we may proceed further with the matter.

We would also appreciate you advising us what the cash value for 2500 sq. ft. of wheat, 1200 sq. ft. of barley and 400 sq. ft. of oats would be?

GK/li

G. Kleban
G. Kleban
Claims Assistant

3127

Frank Spickett



*Spoke with Kleban
Aug. 26/76*

*Spoke with Mr. Frank Spickett. I
sent a print of our sketch of the
damaged area. o.k.*

*Aug. 26/76
MHC*

Mr. F.W. Spickett
Claims Administrator
Insurance and Claims Section
East Building, Downsview

Soil Mechanics Section
Geotechnical Office
West Building, Downsview

September 16, 1976

Re: Form SB-RW-57
Crop Damage Claim - Mr. Stuart Keyes
41 Clarence Street, Brampton, Ontario, W.P. 103-69-08

Our enquiry through the Regional Structural Planning Office identified the above mentioned property where the crop damage took place as follows:

Site of Culvert 3 - Conc. II (east), Lot 14
Site of Culvert 4 - Conc. II (east), Lot 14
City of Mississauga
Region of Peel

Our entry to the above mentioned sites was strictly by personal permission from Mr. S. Keyes obtained from him at the site. He was handed my personal card and no other permission to enter form was used.

V. Korlu
Project Engineer

For: M. Devata
Supervising Engineer

MD/VK/gs

cc: R. Jeffries
Files ✓
Record Services



Memorandum

To: Mr. V. Korlu
Soil Mechanics Section
Central Region
3501 Dufferin Street
Downsview
98-76-GL

From: Insurance & Claims Section
East Building, Downsview

Attention:

Date: September 2nd, 1976

Our File Ref. In Reply to

Subject: Form SB-RW-57
Crop Damage Claim - Mr. Stuart Keyes
41 Clarence Street, Brampton, Ontario

This will acknowledge your sketch showing the approximate location of your work on Mr. Keyes' property.

We had contacted our Right-of-Way Branch, Central Region to ascertain whether any property was being considered for purchasing or expropriation for the new Highway 410, and would appreciate the lot and concession number and whether a permission-to-enter form was used in your dealings with Mr. Keyes.

I trust your report will be sent as quickly as possible.


F. W. Spickett
Claims Administrator
Insurance & Claims Section

FWS:ok

cc: Mr. W. T. Whittle
Administrative Manager
Central Region



Mr. F.W. Spickett
Claims Administrator
Division Support & Claims
East Bldg.

Soil Mechanics Section
Geotechnical Office
West Bldg.

November 2, 1976

Form SB-RW-57
Crop Damage Claim - Mr. Stuart Keyes
41 Clarence St., Brampton, Ont.
W.P. 103-69-08

We would like to clarify a few points mentioned in your letter dated September 30, 1976.

1. The trailer, which Mr. Keyes maintains that was left on his property, belongs to Atcost Drilling Co. of Toronto (Concord - Tel 669-1253). This Company was retained by M.T.C. to carry out our soil investigation work under our technical supervision. In my telephone conversation with Mr. Tony Archer, who is one of the owners of the Company and also the equipment operator at the time, he admitted that they left the trailer at this site with Mr. Keyes' permission and if he claimed any payment (within reasonable limits) they were ready to compensate Mr. Keyes for it.
2. Mr. Keyes was approached and explained where the borehole locations were, how we would proceed and finally he was shown the extent of the crop damage in the field. Definitely this took some of his time (max. 3 hrs.) while he was busy at his farm.

We would like to state in summary that:

- a) Mr. Keyes was duly informed about our work at this site.
- b) He confirmed the extent of crop damage as stated to you previously.
- c) The trailer in question belongs to the drilling company. They inform me now that it was left there with Mr. Keyes' knowledge and if necessary they are ready to compensate him.
- d) The "valuable time" spent by Mr. Keyes during this routine operation could not be avoided. As per our regulations we had to inform him about our presence and intention at this site.

V. Korlu
Project Engineer

VK/bp
cc: Files /
Record Services



Memorandum

To: Mr. V. Korlu
Project Engineer
Soil Mechanics Section
Geotechnical Office
West Building

Attention:

Our File Ref. 98-76-GL

From: Insurance & Claims Section
East Building

Date: September 30th, 1976

In Reply to

Subject: Form SB-RW-57
Crop Damage Claim - Mr. Stuart Keyes
41 Clarence Street, Brampton, Ontario

Further to your memo of September 16th, we now find something that was not mentioned on the original reports.

Mr. Keyes maintains that your staff left a trailer on his land for approximately three weeks which caused him inconvenience. May we have confirmation as to whether this is correct and the reasons for same.

Also, Mr. Keyes says he lost valuable time in the field when he was approached by your staff for various discussions including crop lost which we feel is minimal.

I trust you will send a report on these items as quickly as possible.


F. W. Spickett
Claims Administrator
Insurance & Claims Section

FWS:ok

*Called Oct 8/76
and discussed
on letter Nov 3/76*



Fergus
Queens
Toronto
M7A

7

OFFICERS

resident - Aranka Hofstadter
ec./Tres. - Vera Rubinstein
.-Pres. - Judith Rubinstein

part of Lot 14, CON. 2 E.H.S.
104 acres

c/o Newman Reiber & Co. Barr.
43 Eglinton Ave. E. Ste. 901
Toronto, Ontario
M4P 2W1

DIRECTORS

as above

Highway 410 requirements = 48.00 acres
Public Open Space " = 15.8 "

total requirements 63.8 acres



would you
id replace

