

DOCUMENT MICROFILMING IDENTIFICATION

GEOCRES No. 30M12-128

DIST 4 REGION Central

W.P. No. 158-75-04


CONT. No. 79-31

W. O. No. _____

STR. SITE No. 10-280

HWY. No. 403

LOCATION Burnhamthorpe Rd.
Underpass

OVERSIZE DRAWINGS TO BE INCLUDED WITH THIS REPORT. 

REMARKS: documents to be unfolded
before microfilming

FOUNDATION INVESTIGATION REPORT

For

Burnhamthorpe Road Underpass
W.P. 158-75-04, Site 10-280
Hwy. 403, District 4, Hamilton

INTRODUCTION

This report contains the results of a foundation investigation carried out at the site of the above mentioned project during the period of June, 1976 and August 11 and 12, 1977. The fieldwork consisted of six sampled boreholes advanced by means of a continuous flight auger machine equipped with hollow stem ($3\frac{1}{4}$ " I.D.) augers.

The boreholes ranged in depth from 17.0 feet to 61.0 feet below the ground surface.

SITE DESCRIPTION AND GEOLOGY

The site is located about 350 feet east of 9th line and Sneider Corner on existing Burnhamthorpe Road in the City of Mississauga, Regional Municipality of Peel.

The topography of the area is gently sloping in a southerly direction. The land is developed for farming purposes. Physiographically, the site is situated in the region of "South Slope". The characteristic deposit in the vicinity of the area under investigation is composed of cohesive glacial till and granular deposits. The overburden is underlain by shale bedrock of Meaford Dundas formation, Ordovician Period.

This physiographic region is well drained by the Credit, Oakville and Etobicoke Creeks which have cut deep valleys into the overburden. However, in many of the interstream areas drainage is still imperfect.

SUBSURFACE CONDITIONS

General

The subsurface conditions were found to be quite uniform over the site. Under a thin layer of topsoil is a stratum of cohesive glacial till which is underlain by a deposit of silt with traces of sand and occasional clayey silt layers.

Detailed descriptions of the various soil types encountered in each borehole are given in the Record of Borehole Sheets. The estimated stratigraphical profile and sections shown in Drawing No. 1587504-A are based upon this information. From ground level downwards the various soil types encountered are as follows:

Glacial Till

Underlying a thin layer of topsoil a deposit of cohesive glacial till was encountered at all locations over the site. In the explored boreholes the minimum thickness of the glacial till was found to be 34 feet, while the maximum thickness was not explored more than 36 feet in depth. The cohesive glacial till is comprised of a heterogeneous mixture of clayey silt, sand and gravel. The Standard Penetration Tests gave 'N' values ranging from 26 blows to over 100 blows per foot, indicating that the glacial till has a very stiff to hard consistency, but generally hard.

The physical properties of the glacial till as determined from laboratory testing are summarized below:

	<u>Range</u>
Liquid Limit (W_L) %	18-29
Plastic Limit (W_p) %	10-15
Moisture Content (W) %	7-16

The results of the Atterberg Limit tests are shown on the Plasticity Chart (Fig. 1) and the typical grain size distribution curves are presented in an envelope form in Fig. 2 which are included in the Appendix of this report. The Atterberg Limits indicate that the cohesive stratum is inorganic and of low plasticity.

Silt With Trace of Sand, Occasional Clayey Silt Layers

This deposit underlies the cohesive glacial till stratum and was explored only in B.H. 2 to a depth of 27 feet. The material in the stratum is mainly silt with traces of sand and occasional thin layers of clayey silt. The 'N' values obtained from split spoon sampling ranged from 54 to over 100 blows per foot indicating that the relative density of the granular material is very dense.

Groundwater

The groundwater levels were observed by measuring in the open boreholes during and after the completion of the foundation investigation. The groundwater levels were found to vary between elevations 592.9 (B.H. 3) and 582 (B.H. 2) which corresponds to depths of 3 feet to 13 feet below the existing ground surface.

The groundwater levels are shown on the Record of Borehole Sheets, as well as on Drawing No. 1587504 A.

DISCUSSION AND RECOMMENDATIONS

As part of the new Hwy. 403 construction, an underpass structure has been proposed at the crossing of the new Hwy. 403 and the existing Burnhamthorpe Road. It is understood that the Burnhamthorpe Road will be widened to a four lane road in this area.

In the vicinity of the proposed structure the existing grade of the Burnhamthorpe Road varies from 596.0 (south side) to 597.0 (north side). The revised grade of the Burnhamthorpe Road will be at 613.7 (south side) and 609.7 (north side). The proposed grade of Hwy. 403 will be at elevation 590.3. This will necessitate fills up to 18 feet and cuts of 7 feet.

A two span structure (80'-80') consisting of closed type abutments with a centre pier are presently being considered at this site.

Pier Foundation

The pier may be founded on spread footings located within a competent glacial till stratum at or below elevation 586.0 with an allowable load of up to 4 t.s.f. A minimum earth cover of 4 feet from the base of the footings should be provided for frost protection requirements.

No major dewatering problems are anticipated for the construction of foundations since the subsoil is relatively impervious. Any seepage or surface run-off into the excavation could be controlled by pumping from sumps. It should be noted that the foundation excavation base should be kept dry at all times prior to the placing of concrete.

Abutment Foundations

In case closed type abutments are contemplated, the recommendations will be similar to those of pier foundations.

However, if perched abutments are contemplated they should be supported on a core of well compacted granular 'A' material above the natural subsoil as per our current practices. An allowable load of $2\frac{1}{2}$ t.s.f. may be used for design purposes. All the topsoil should be removed to the full base width of the granular core.

Approaches

No stability problems are anticipated for the proposed approach fills and cuts are constructed with 2:1 slopes.

Related Conditions

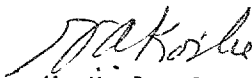
The abutments should be designed to withstand a lateral earth pressure exerted by the backfill and this pressure is dependent on the deformation characteristics of the retaining structure. If some movement of the top of the wall is permitted, then a coefficient of active earth pressure (K_a) of 0.35 can be used. On the other hand, if the structure is designed as rigid frame, then a coefficient of earth pressure at rest (K_0) of 0.5 should be used. To compute the sliding resistance between the rough concrete footing base and cohesive subsoil, an adhesion value of 2000 p.s.f. should be used.

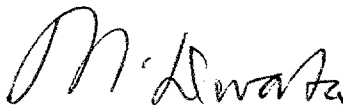
MISCELLANEOUS

The fieldwork was carried out during August 11 and 12, 1977 under the supervision of Mr. V. Korlu, Project Engineer, who also prepared this report.

The drilling equipment was owned and operated by D.S.I.L. Drilling Inc. of Toronto.

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


V. Korlu, P. Eng.
Project Engineer


M. Devata, P. Eng.
Supervising Engineer



MD/VK/gs
October, 1977

FIELD AND LABORATORY WORK

Six sampled boreholes, each accompanied by a dynamic cone penetration test, were carried out at this site. The five boreholes (No. 1, 3, 4, 5 & 6) were carried out during recent field investigation, while one borehole (No. 2) was carried out earlier during a preliminary investigation. The borings were advanced by continuous flight auger machines (commercially known as C.M.E.75, 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 Test. The silt layer was explored (B.H. 2) during a preliminary investigation (W.O. 76-11005) and has been incorporated into this report.

Groundwater level observations were carried out during the time of investigation in the open boreholes. The soil and groundwater conditions encountered at the boring locations are presented in the Record of Borehole Sheets. The locations and elevations of the various boreholes were provided by personnel from Construction Office, Central Region. The elevations in this report are referred to a Geodetic Datum. Boring locations and elevations are shown on Drawing No. 1587504-A.

All 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 and summarized on Fig. 1 and 2, all contained in Appendix 1 of this report.

RECORD OF BOREHOLE No 1

4820093 287385

W P 158-75-04 LOCATION Co-ords N 15,813,952; E 942,864 ORIGINATED BY V.K.
 DIST 4 HWY 403 BOREHOLE TYPE 3/4" H.S. Auger & Cone Test COMPILED BY V.K.
 DATUM Geodetic DATE August 11, 1977 CHECKED BY RS

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	'N' VALUES			20 40 60 80 100	100/10"					
597.7	Ground Level													
0.0	Topsoil													
	Heterogeneous Mixture of Clayey Silt, Sand and Gravel. (Glacial Till) Hard		1	SS	32									16 18 45 21
			2	SS	48		590							
			3	SS	144/	9"			100/10"					
			4	SS	94									
	Brown Grey		5	SS	179/	11"	580							0 9 79 12
			6	SS	153									
			7	SS	155/	11"	570							8 25 47 20
			8	SS	138/	11"								
561.2			9	SS	145									
36.5	End of Borehole						560							
1.12														

+3, x5: Numbers refer to Sensitivity

20
15 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No 2 (Formerly BH 3 W.O. 76-11005)

W P 158-75-04 LOCATION Co-ord's. N 15,811.034; E 942,898 ORIGINATED BY VK
 DIST 4 HWY 403 BOREHOLE TYPE H.S. 3½" Auger (CME#55) & Cone Test COMPILED BY VK
 DATUM Geodetic DATE June 30, 1976 CHECKED BY RS

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	'N' VALUES			20	40	60	80	100					
595.0	Ground Level																
0.0	Topsoil																
	Het. mix. of clayey silt with sand, occasional gravel (Glacial Till)		1	SS	45		590										0 34 52 14
	Hard		2	SS	100	9"											
	Brown		3	SS	98	9"											
	Grey		4	SS	100	8"											
			5	SS	120	6"	580										
			6	SS	125	6"											
			7	SS	100	9"	570										
			8	SS	97												0 11 47 42
561.0			9	SS	54		560										0 23 68 9
34.0	Silt with trace of sand, occ. clayey silt layers		10	SS	115												22 75 (3)
	Very Dense gravelly sand Dense		11	SS	125	11"	550										
	clayey silt Hard		12	SS	100	9"											0 2 87 11
			13	SS	70	11"	540										0 3 95 2
534.0	Clayey silt Hard		14	SS	100	11"											0 1 89 10
61.0	End of Borehole																

+ 3, x 5: Numbers refer to Sensitivity

20
15 ϕ 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No 3

W P 158-75-04 LOCATION Co-ords N 15,814,085; E. 942,972 ORIGINATED BY V.K.
 DIST 4 HWY 403 BOREHOLE TYPE 3/4 H.S. Auger & Cone Test COMPILED BY V.K.
 DATUM Geodetic DATE August 11, 1977 CHECKED BY RS

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT Y	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	'N' VALUES			20	40	60	80	100					
595.6	Ground level																
0.0	Topsoil																
	Het.Mix. of Clayey Silt, Sand and Gravel (Glacial Till) Hard		1	SS	45		590										0 24 50 26
			2	SS	71												
			3	SS	120												
	Brown Grey		4	SS	74												
			5	SS	101		580										
			6	SS	54												0 54 38 8
			7	SS	60		570										4 12 45 39
			8	SS	42												
561.6	Silty sand (fine)																
559.1	V. Dense		9	SS	53		560										0 93 (7)
36.5	End of Borehole																

+3, x5: Numbers refer to Sensitivity

20
15 ϕ 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No 4

W P 158-75-04 LOCATION Co-ords N ^{4,820,147} 15,814,130: E ^{287,401} 942,918 ORIGINATED BY V.K.
 DIST 4 HWY 403 BOREHOLE TYPE 3½ H.S. Auger & Cone Test COMPILED BY V.K.
 DATUM Geodetic DATE August 12, 1977 CHECKED BY RS

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	'N' VALUES			20	40	60	80	100					
593.9	Ground level																
0.0	Topsoil																
	Het. Mix. of Clayey Silt, Sand and Gravel.		1	SS	84		590										30 22 36 12
	(Glacial Till)		2	SS	62												13 25 44 18
	Hard		3	SS	100/	4"											
	Brown		4	SS	56		580										4 27 48 21
	Grey																
576.9	Boulders		5	SS	100/	4"											
17.0	End of Borehole																

+³, x⁵: Numbers refer to Sensitivity

20
15 ϕ 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No 5

W P 158-75-04 LOCATION Cr-ords N 15,814,062; E 942,863 ORIGINATED BY V.K.
 DIST 4 HWY 403 BOREHOLE TYPE 3 1/2" H.S. Auger & Cone Test COMPILED BY V.K.
 DATUM Geodetic DATE August 12, 1977 CHECKED BY RS

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT Y	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	'N' VALUES			20 40 60 80 100						
595.2	Ground level													
0.0	Topsoil													
	Het. Mix of Clayey Silt, Sand and Gravel. (Glacial Till)		1	SS	48		590							25 18 41 16
	Hard		2	SS	79									
	Brown		3	SS	105									
	Grey		4	SS	96		580							0 29 56 15
			5	SS	99									
			6	SS	46									0 32 49 19
			7	SS	56		570							
			8	SS	49									1 30 30 39
558.7			9	SS	65		560							3 24 57 16
36.5	End of Borehole													

+³, x⁵: Numbers refer to Sensitivity

20
15 ϕ 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No 6

W P 158-75-04 LOCATION Co-ords N 15,813,997; E 942,809 ORIGINATED BY V.K.
 DIST 4 HWY 403 BOREHOLE TYPE 3 1/2" H.S. Auger & Cone Test COMPILED BY V.K.
 DATUM Geodetic DATE August 12, 1977 CHECKED BY RS

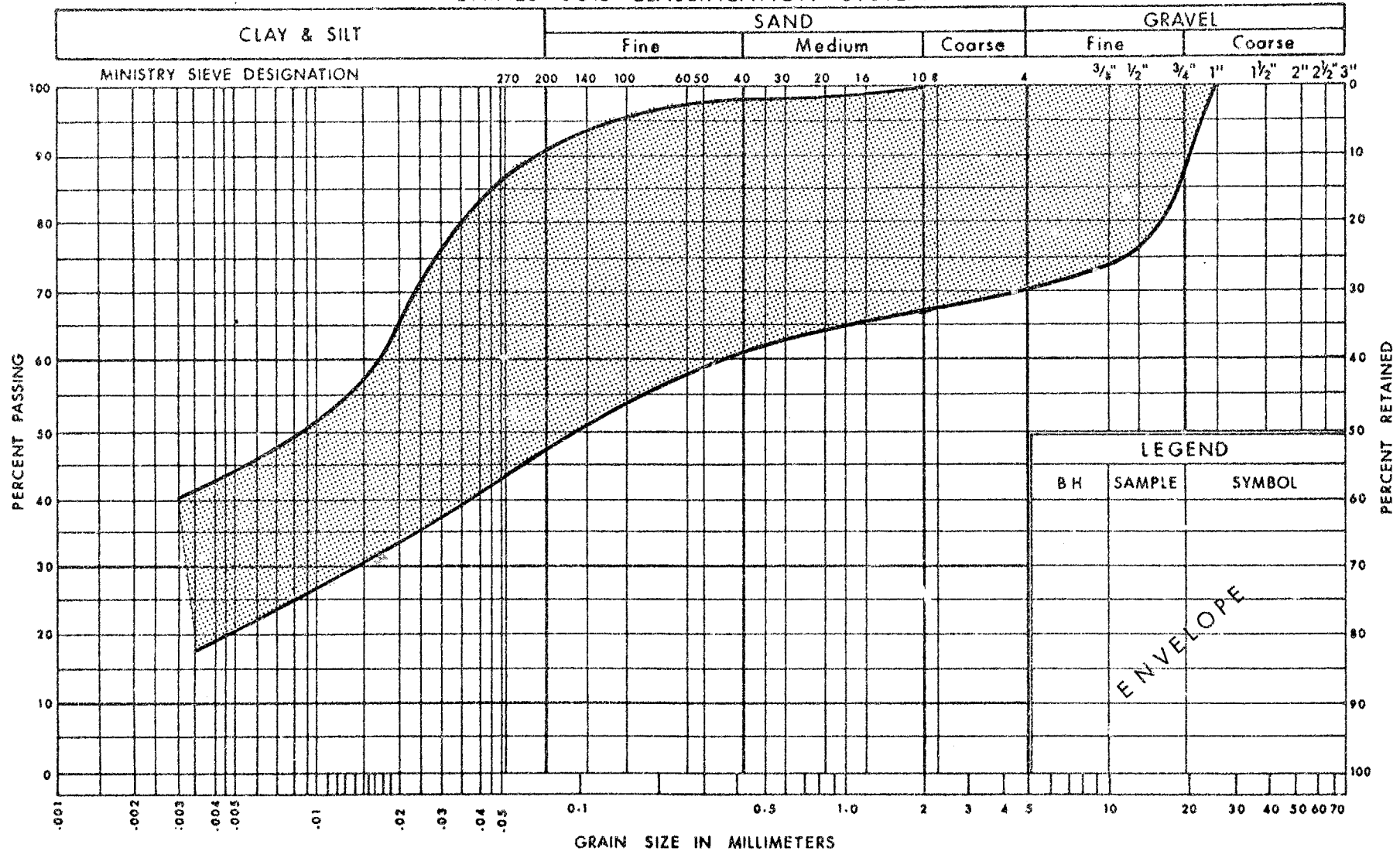
SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT	NATURAL MOISTURE CONTENT	LIQUID LIMIT	UNIT WEIGHT	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE			20 40 60 80 100		W _p	W	W _L		
597.4	Ground Level												
0.0	Topsoil												
	Fin. Mix. of Clayey Silt, Sand and Gravel (Glacial Till) Very Stiff to Hard		1	SS	38								4 19 52 25
			2	SS	54								
			3	SS	123								
	Brown		4	SS	51								
	Grey		5	SS	101								0 23 62 15
			6	SS	63								
			7	SS	26								
			8	SS	135								
560.9													0 19 60 21
36.5	End of Borehole		9	SS	36								

Ministry of
Transportation and
Communications

PLASTICITY CHART COHESIVE GLACIAL TILL

W P 158 - 75 - 04

UNIFIED SOIL CLASSIFICATION SYSTEM



Ontario

Ministry of
Transportation and
Communications

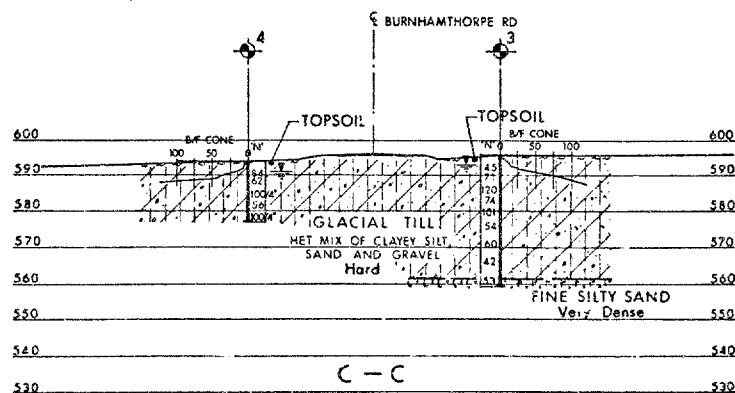
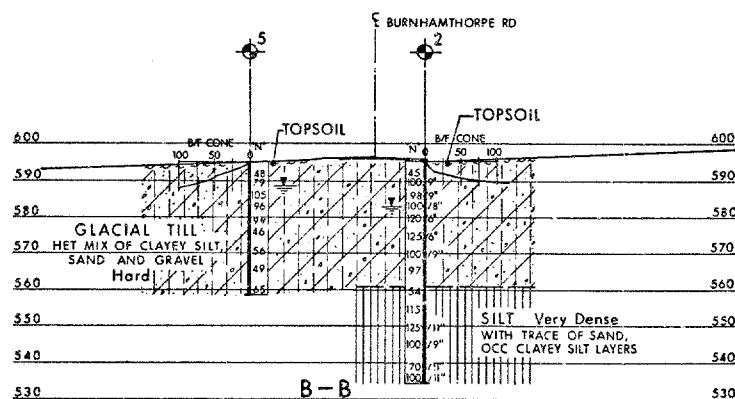
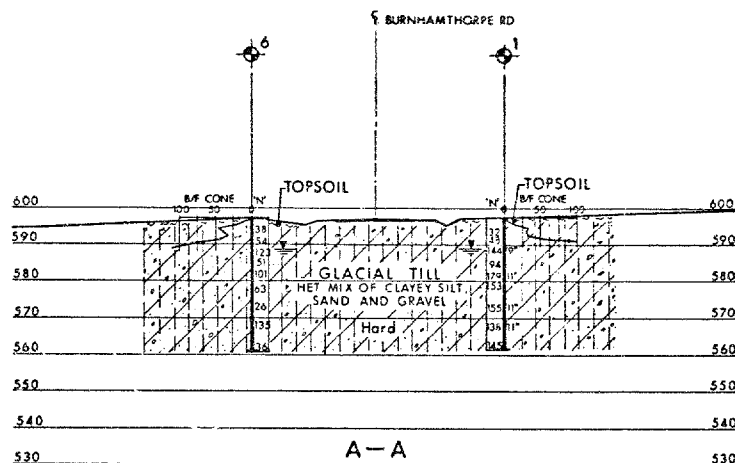
GRAIN SIZE DISTRIBUTION

GLACIAL TILL

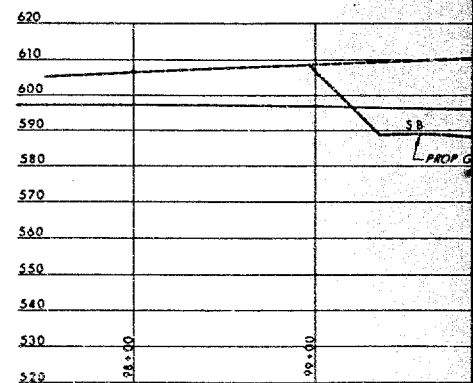
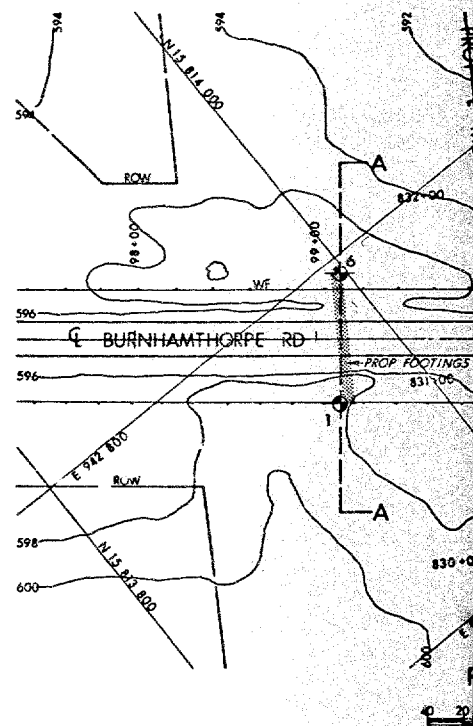
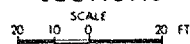
HET MIX OF CLAYEY SILT, SAND & GRAVEL

FIG No 2

WP 158 - 75 - 04



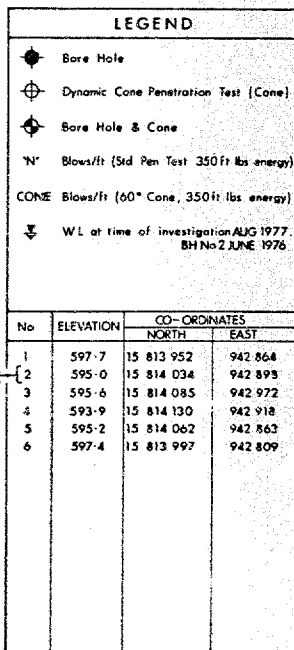
SECTIONS



6 PROFILE - BUR



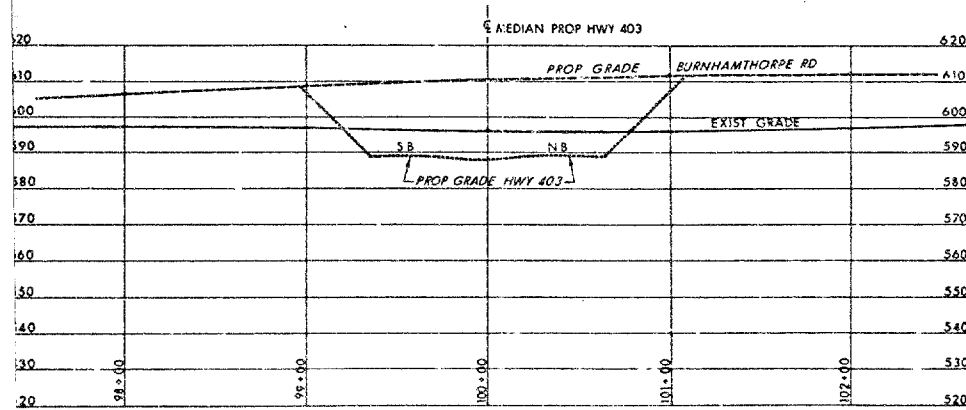
SHEET



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

[illegible]

MMF No. 403 DIST 4
S. G. M. W. K. 13 CHECKED DATE Oct 13, 1977 SITE 10-230
DRAWN BY J. CHECKED TNG 1587504-A



REF: DE LEUW CATHER CONS ENG
DWG No 911-702



Ontario

Telephone 248-3446

Ministry of
Transportation and
Communications

Planning and Design Section,
Central Region,
3501 Dufferin Street,
Downsview, Ontario.
M3K 1N6.

May 30, 1978

DeLeuw, Cather Engineering Ltd.,
133 Wynford Drive,
Don Mills, Ontario.
M3C 1K1.

Attn: Mr. A. Scott, P.Eng.

Re: W.P. 158-75-06, -01, Highway 403,
W.C. Blvd. to south of Hwy. 5,
District 4, Hamilton.

Gentlemen:

This is to confirm the decision to revise the profile that was reached at our meeting held on May 26, 1978 in our offices attended by yourself, Josselyn, Ernesaks, Burnfield, Roters, Cameron and myself. The revision is required to eliminate 250,000 cubic yards of surplus material and would avoid the high ground-water table at Highway 5 and south of Burnhamthorpe Road, thereby resulting in a saving of about \$700,000 in construction cost.

You are now advised to re-establish the profile for the above section of highway in order to achieve the earth balance within individual contract limits, i.e., I.P. 158-75-06 and W.P. 158-75-01.

As agreed, your latest completion date for the composite contract drawings and documents will be September 13, 1978 which is the late finish date as per Critical Path Schedule. In order to meet this date, the profile should be finalized on or before June 19, 1978, and Bridge Site plans revised and submitted by June 26, 1978. This should provide the Structural Office at least six (6) weeks, which it needs, to revise the structural design. The latest date for receiving structural plan and B-A should be August 25, 1978.



Continued ... /2

May 30, 1978

DeLoux, Gathor Engineering Ltd. - Re: W.P. 158-75-06, -01.

I was recently advised that the contract for W.P. 158-75-06 would be awarded in advance of W.P. 159-75-01. Therefore, I am requesting Mr. Greskow by copy of this memorandum to make available to you the relevant removal and grading drawings for the placement of 60,000 cyds. of materials on or before August 18, 1978. The current Critical Path Schedule should be updated as early as possible to reflect the above changes.

I will now appreciate receiving your request for an addendum for the above revision with appropriate breakdown of work.

Yours very truly,

N. Sen

N. Sen, P.Eng.
Sr. Project Manager

HS/CD

c.c. R. Fitzgibbon
G. Burkhardt
C. Grobski
D. Gunter
W. Kelly
H. Devata
D. Waller
A. Greskow

→ Bin Ly → Please see this and give me your comments.

101.44

78 06 02

Raising the profile grade will be advantageous as it will eliminate the groundwater problems (i.e. wet cuts ^{+ related treatments}) and ^{the} disposal of surplus material. Raising the profile grade will not require a redesign of the footings of the structures.



Memorandum

To: Mr. M.R. Ernesaks
Head, Planning and Design
Central Region
3501 Dufferin Street

From: Soil Mechanics Section
Engineering Materials Office
Room 315, Central Building

Attention: Mr. N. Sen

Date: 78 07 04

Our File Ref.

In Reply to

Subject: Re: W.P. 158-75-⁰⁴~~00~~, Hwy. 403
Underpass Structures at
Burnhamthorpe Road, Site 10-280,
Hwy. 5, Site 10-281
District 4, Hamilton

The proposed Hwy. 403 at the above locations will be in cut sections. The subsurface information obtained in these areas indicate that the cuts would be constructed in granular subsoil below the groundwater level. For design and construction purposes, detailed groundwater conditions will be necessary.

At the request of the Regional Geotechnical Office, the Soil Mechanics Section carried out an investigation to determine the groundwater conditions at the above mentioned sites. In this investigation three piezometers were installed at each of the two sites to observe the piezometric head at different elevations in the overburden. In addition, a field pumping test was also performed at the proposed Hwy. 5 Underpass site. The locations and tip elevations of the piezometers, as well as the piezometric water levels, are summarized in the attached tabular forms and also in Figures 1 and 2.

The field pumping test was carried out to observe the recharge conditions and was done in the boring of B1 using NX size casing which was extended below the glacial till stratum into shale bedrock to elevation 530.5. The cased well was pumped out completely and the recharge rate was observed. The results are as follows:

<u>Time Elapsed (Min.)</u>	<u>Water Level in the Cased Well</u>
0	Elev. 530.7
20	Elev. 530.9
65	Elev. 531.8
100	Elev. 532.9

(Original GWL in the cased well prior to pumping was at Elev. 565+)

The piezometer readings and the recharge observations indicate that

1. The groundwater level at these sites exist at a very shallow depth below ground surface.

cont'd.....

2. At the Hwy. 5 Underpass site, recharge of groundwater was found to be in the lower portion of the glacial till stratum at the contact of shale bedrock. However, the shale bedrock was not a confined aquifer as the rate of recharge was observed to be very slow.
3. At the Burnhamthorpe Road Underpass site, the piezometric water levels indicated a hydrostatic condition.

Based on these observations the following conclusions may be drawn:

1. The proposed 2:1 cut slopes for a distance of 100 feet on either side of the structures should be protected with a granular blanket as outlined in our foundation reports. Alternatively, filter fabric can also be used. If such a scheme is adopted, specific recommendations can be provided by Mr. A. Barsvary of the Quality Assurance Section. In addition, a permanent subdrain system should be incorporated under the roadway of Hwy. 403.
2. The proposed 9 foot deep cuts should not have a major effect on deep walls in the surrounding area.
3. These cuts, however, may hinder the supply of groundwater to the adjacent shallow ponds.

The above details were discussed verbally with the Regional Geotechnical Office and Regional Planning and Design Office during various meetings. It is understood that considerations are being given to raise the profile grade of Hwy. 403 an additional 2 to 3 feet in these areas in order to achieve a design with balanced cuts and fills. In our opinion, such a revision would be advantageous since it will minimize the treatments required for the cut sections.

It should be noted that raising of the profile grade of Hwy. 403 as being contemplated will not alter the design of the structure foundations.

Should you require additional information, please contact this Office.

M. Machea
for
B. Ly
Senior Engineer

For: M. Devata
Supervising Engineer

BL/MD/gs

cc: R.D. Gunter
G.C.E. Burkhardt
C.S. Grebski
A. Barsvary
Files

Table 1 Piezometric Data at
Hwy. 403 - Burnhamthorpe Road

<u>Piezometer</u>	<u>Location</u> (Ø Hwy. 403)	<u>GL</u>	<u>Tip Elevation</u>	<u>Piezometric WL</u>	
				(Dec. 77)	(Jan. 78)
A1	821+00; 4.5 Rt	601.6	564.1	597.1	598.5
A2	820+92; 8.2 Rt	601.7	580.2	596.7	597.2
A3	820+83; 11.7 Rt	601.7	591.2	595.7	595.8

- Remarks:
1. All Borings were advanced by means of 3¼ inches I.D. hollow stem augers
 2. The WL inside the augers rose to Elevation 595.7+ as soon as the sand layer was intercepted. This sand layer underlies the surficial clayey silt at a depth of about 6.5 feet below the ground surface.
 3. For subsoil strata, refer to foundation report WP 158-75-04.

Table 2 Piezometric Data at
Hwy. 403 - Hwy. 5

<u>Piezometers</u>	<u>Location (ϕ Hwy. 403)</u>	<u>GL</u>	<u>Tip Elevation</u>	<u>Piezometric W.L.</u>	
				<u>(Dec. 1977)</u>	<u>(Jan. 1977)</u>
B1	759+80; 33.0 Lt.	566.9	531.9	566.9	566.9
B2	759+72; 41.3 Lt.	567.4	546.4	562.4	564.0
B3	759+66; 47.7 Lt.	567.9	557.4	563.9	561.5

- Remarks:
1. B1 was advanced by washboring techniques using NX casing.
B2 and B3 were put down by means of 3 $\frac{1}{4}$ " I.D. hollow stem augers.
 2. B2 was dry before a depth of 15 feet was reached.
 3. The WL inside the augers left in the boring of B3 was observed at elevation 565.4 sixteen hours after the completion of augering.
 4. For subsoil strata, refer to Foundation Report W.P. 159-75-03.

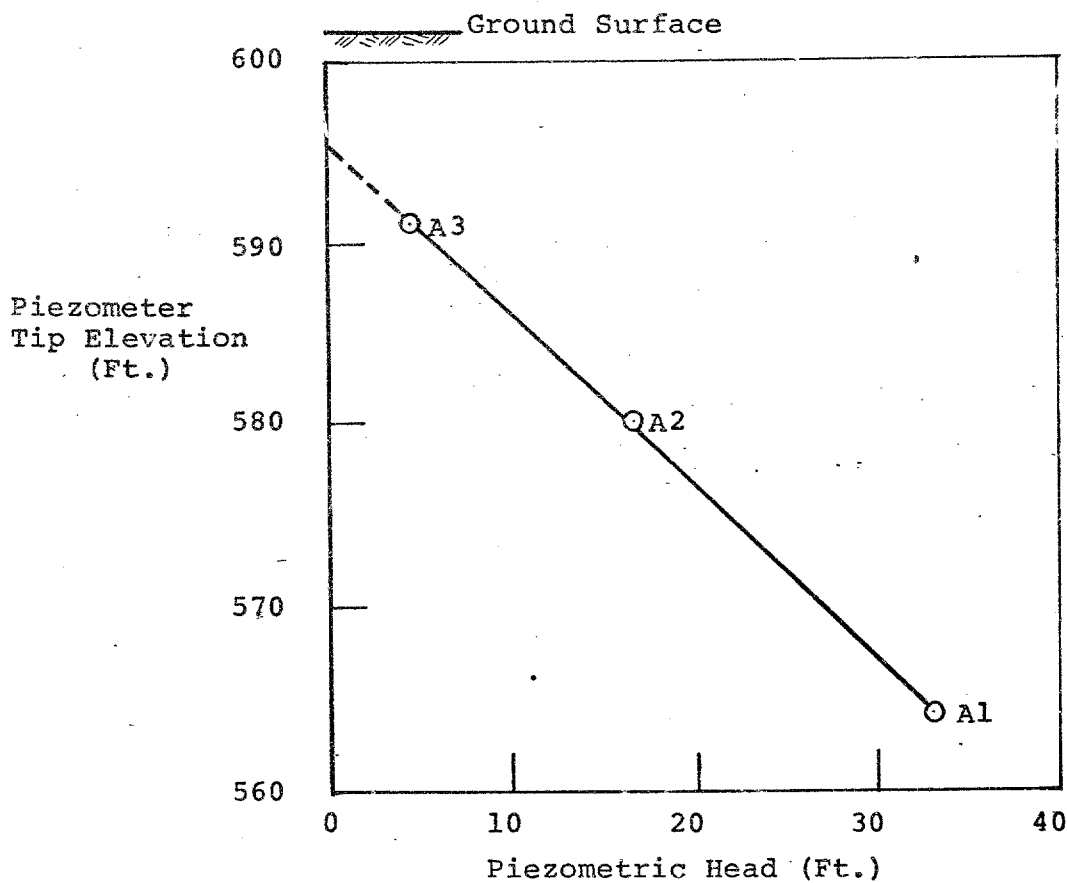


Fig. 1
Piezometric Data
at the
Burnhamthorpe
Underpass Site

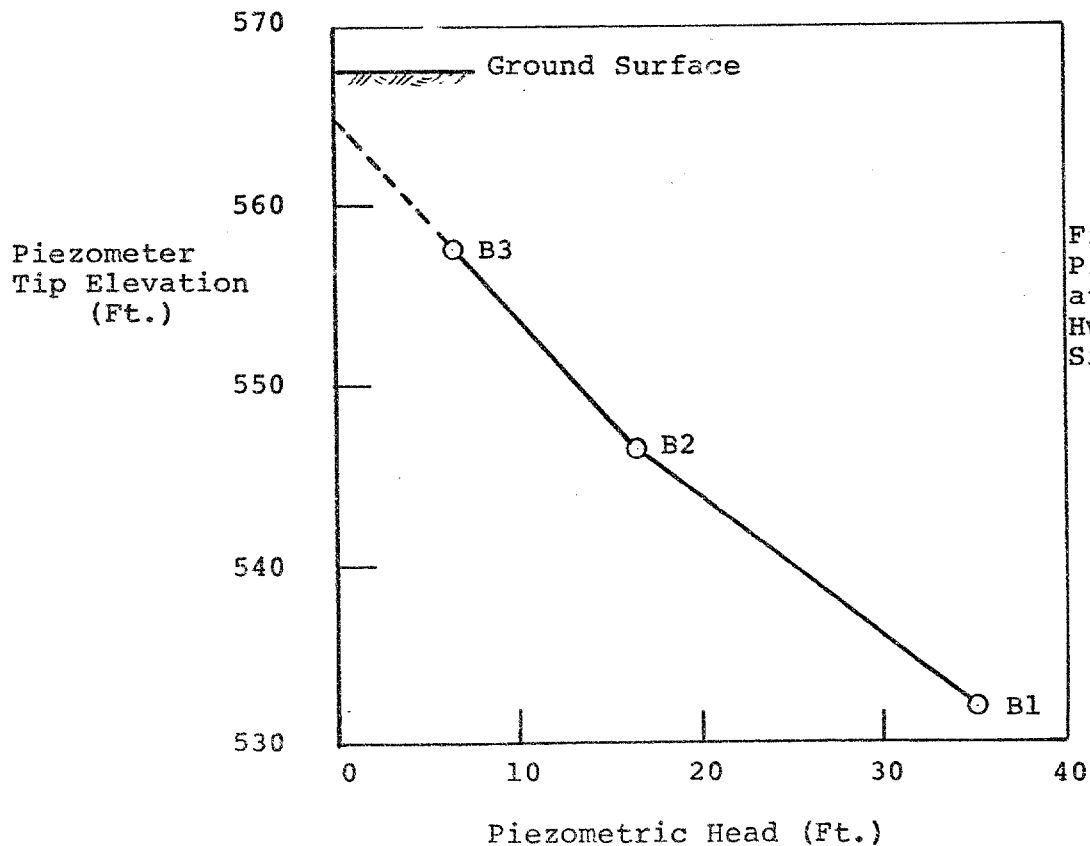


Fig. 2
Piezometric Data
at the
Hwy. 5 Underpass
Site 10-280



Memorandum

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

From: G.C.E. Burkhardt,
Structural Section,
Central Region

Attention: Mr. M. Devata

Date: June 14, 1977

Our File Ref.

In Reply to

Subject: RE: Burnhamthorpe Road Underpass,
Site 10-280, W.P. 158-75-04
Highway 403 Link, District 4

The above mentioned structure is scheduled for design during 1977-78 as part of the group W.P. 158-75-01.

Could you please prepare a Foundation Investigation Report for the Burnhamthorpe Road Underpass site.

I have enclosed for your information, two copies of the plans which detail the initial geometrics and profile. Indicated on this plan in red pencil are the approximate locations of the proposed footings.

When you reach the stage of preparing the Bore Hole Locations and Soil Strata Drawing, please contact me. At that time a plan should be available at a 1" = 40' scale that should be of assistance to you in preparing the drawing.

To maintain the present design schedule, the Foundation Investigation Report should be completed by October 12, 1977.

If further information is required, please do not hesitate to contact the undersigned.

DB:gj
Encl.

D.H. Bye,
Structural Planning Supervisor,
for:
G.C.E. Burkhardt,
Head, Structural Section

c.c. J. Anderson
Z. Byblow
R. Fitzgibbon
R.D. Gunter
N. Sen



Murty
Please confirm
whether this is
Dist 4 or
Dist 6.
Thanks
Car
no need